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TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE

F-100 AWCIS CHECK AND ADJUSTMENT PROCEDURES

HUGHES AIRCRAFT COMPANY
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CHAPTER 1

GENERAL

1-1. DESCRIPTION AND PURPOSE.

1-1a. This manual contains information for use in performing check and adjustment procedures of the MA-1 and AN/ASQ-25 systems. The technical orders listed below are used in conjunction with this manual to accomplish maintenance of the MA-1 and AN/ASQ-25 systems on the flightline.

T.O. 1F-106A-2-27-1	**F-106 AWCIS Condensed Maintenance Guide**
T.O. 1F-106A-2-27-3	**F-106 AWCIS Fault Isolation Procedures**
T.O. 1F-106A-2-27-5	**F-106 AWCIS Theory and Functional Diagrams**
T.O. 1F-106A-2-27-6	**F-106 AWCIS Flightline Classified Information**
T.O. 1F-106A-2-27-7	**F-106 AWCIS Dynamic Flightline Checkout Procedures (AN/MPM-54)**
T.O. 1F-106A-2-27-7-1	**Fault Detection Tester AN/MPM-54, Fault Isolation Procedures, USAF Series F-106A/B Aircraft.**
T.O. 1F-106A-2-27-9	**F-106 AWCIS Data Analysis Manual**

1-1b. The instructions in this manual are intended for use on the flightline to accomplish preflight and/or postflight maintenance. The basis for completion of maintenance is the short system ground check, which allows one man (or two for AN/ASQ-25 systems) to perform a rapid, qualitative, go-no go check of the system.

1-1c. Classified information is contained in T.O. 1F-106A-2-27-6. References to other technical orders are included in this manual where the referenced information is too extensive for inclusion in this manual.

1-1d. Chapter 1 of this manual contains the preliminary switch settings (table 1-1), a list of special abbreviations (table 1-2), and a description and use of the procedures. Chapter 2 contains the short system ground check procedures. Chapter 3 contains the radar procedures. Chapter 4 contains the IR procedures. Chapter 5 contains the armament procedures. Chapter 6 contains the computer procedures. Chapter 7 contains the power procedures. Chapter 8 contains the FC&M procedures. Chapter 9 contains the CN&L procedures. Chapter 10 contains the replacement procedures. Chapter 11 contains the test equipment set-up procedures. Chapter 12 contains the connector repair procedures. Chapter 13 contains the boresight procedures. Chapter 14 contains the multiple Airborne Target Trajectory System (MATTS) installation and checkout.

1-1e. For convenience, the system components are listed and referred to in this manual by their common unit numbers. For example: the 464003 unit is referred to as 003 and 472595 (F-106B) is referred to as 595. Unless otherwise specified, it is understood that all unit numbers are preceded by 464 (472 for F106B only units).

1-2. PRELIMINARY SWITCH SETTINGS.

Refer to table 1-1 for a list of preliminary switch settings used for all procedures in this manual. All test switches are assumed to be in the off or normal position.

NOTE

Wherever the 080 unit panel controls are indicated, they now apply to the 080 unit, 52800 unit (ODU), or the Filter and Control Assembly and Information panel, depending upon the system configuration.

Table 1-1. Initial Switch Settings

LOCATION	ITEM	SETTING	LOCATION	ITEM	SETTING
796	SELECTOR TEST	OFF	505	Function switch	MAN
905	POWER	OFF	505	Power switch	OFF
C-6280	MASTER	OFF	505	Manual frequency selectors	MART UHF frequency
C-6280	IDENT-MIC	OUT	ACP	ARM-SAFE	SAFE
C-6280	RAD TEST-OUT-MON	OUT	ACP	LOCK-UNLOCK	LOCK
C-6280	M1	OUT	ACP	Selector	VIS IDENT
C-6280	M2	OUT	LH console	AIR-2A	Out (off)
C-6280	M3/A	OUT	LH console	ALTITUDE BAND SELECTOR	OFF
C-6280	M-C	OUT	755	CHANNEL SELECTOR	MART ILS channel
C-6280	MODE 4	OUT	755	VOL	Fully ccw
C-6280	MODE 1	73	855	IR THRESHOLD VIDEO	Fully ccw
C-6280	MODE 3/A	0077	855	IR THRESHOLD TONE	Mid-position
505	VOL	As required			

Table 1-1. Initial Switch Settings (Cont)

LOCATION	ITEM	SETTING
855	IR VOLUME	Fully ccw
855	EL SCAN	NORM
855	LOBE FREQ	3
855	AZ SCAN	B
080	ERASE INTENSITY	Approx 10 o'clock
080	ATTACK INTENSITY	Fully cw
080	DIMMER	Fully ccw
080	IF GAIN	Fully cw
080	VIDEO GAIN	Fully cw
163	ALT HOLD	OFF
163	HDG HOLD	OFF
163	FLT MODE	DIR MAN
163	DISP/AUTO MODE	DL MIN TIME
Inst panel	HDG SEL	NORM
Inst panel, RH	ALTITUDE WARNING SELECTOR	00000
463	BRG SEL	NORM
▯ AVVI	BARO	29.92
○ 259	BARO. SET	29.92
305	NOSE-TAIL	NOSE
305	RDR	NORM
305	CHAFF	OFF
305	IR	STOW
305	TUNE	NORM
305	RANGE	16SP
181	MODE	AUTO
181	LAMP	1
181	RED FILTER	OUT
181	RADIUS MILES	50
181	OFF-BRT	OFF
083	ANT ELEV	Detent
083	LOCK-UNLOCK	UNLOCK
083	Boresight switch	NORM-TRACK
405	VOL	Fully ccw
405	MODE	X
405	RANGE	300
405	MAN	As required
405	PRESET	As required
405	Function switch	OFF
RH console	DATA LINK ANT	NORM
RH console	PITOT HEAT	OFF
○ RH console	TACAN BEARING/ ADF SELECT	TACAN BEARING
955	HOMING POINT SELECTOR	A
019	VOLUME	OFF
019	Display switch	DISPLAY OFF
019	MANUAL FREQ	As required
019	ADDRESS SELECT	As required
CSC	SLAVE/DG	SLAVE
CSC	LAT	Local latitude
Radar compt	IR COOL'G INTLK	Closed
Radar compt	IR AZ&EL INTLK	Closed
Computer compt	IR MANUAL VALVE	FLIGHT
596	NOSE-TAIL	TAIL
596	PURSUIT-LEAD COLL	LEAD COLL
596	A-NORMAL	NORMAL
596	A'-NORMAL	NORMAL
596	B-NORMAL	NORMAL
596	C-NORMAL	NORMAL
596	D-NORMAL	NORMAL
596	E-NORMAL	NORMAL
596	FWD	OFF
596	AFT	OFF
596	TIMING PROG	NORMAL
596	TEST SELECTOR	OPEN LOOP
596	FWD TEST MISFIRE	Down (off)
596	AFT TEST MISFIRE	Down (off)

1-3. LIST OF SPECIAL ABBREVIATIONS.

Refer to table 1-2 for a list of special abbreviations used in this manual.

1-4. LIST OF COMMON NAMES.

Refer to table 1-3 for a list of common names used in this manual. If the unit is not listed in table 1-3, the common unit number (i.e., 003) is considered the common name. To conserve space in tabular information, the unit number is used in place of the common name. For example: The antenna will be designated 017 in tables.

Table 1-2. List of Special Abbreviations

ABBREVIATION	DEFINITION
ACP	Armament control panel
ADF	Automatic direction finder
ADI	Attitude director indicator
adj	Adjust or adjustment
afc	Automatic frequency control
AFCS	Automatic flight control system
A_H	Yaw angle to turn through (space coordinates)
$\tilde{A}_H$	Smoothed yaw angle to turn through (space coordinates)
AHI	Approach horizon indicator
AHRG	Attitude Heading Reference Group
A_J	Pitch angle to turn through (aircraft coordinates)
A_K	Yaw angle to turn through (aircraft coordinates)
A_L	Aircraft lift acceleration
AMCP	Armament manual control panel
AMI	Airspeed Mach indicator
API	Angle position indicator
approx	Approximately
ATOT	Angle track on target
ATROT	Attenuated track-range on target.
ATS	Armament test set
A_V	Pitch angle to turn through (space coordinates)
$\tilde{A}_V$	Smoothed pitch angle to turn through (space coordinates)
AVVI	Altitude vertical velocity indicator
AWCIS	Aircraft weapon control interceptor system
az	Azimuth
baro	Barometer
BCD	Binary coded decimal

Table 1-2. List of Special Abbreviations (Cont)

ABBREVIATION	DEFINITION
CADJ	Counter angle deception jamming
CCM	Counter-counter measures
ccw	Counterclockwise
CN&L	Communication, navigation, and landing
compt	Compartment
cont	Continued
CSC	Compass System Controller
CVAC	Convair Aircraft Co.
cw	Clockwise
db	Decibel
dbm	Decibels relative to 1 milliwatt
defl	Deflection
DGA	Displacement gyroscope assembly
DI	Digital input
DIRT	Delayed infrared track
DIROT	Delayed infrared on target
DL	Data link
DR	Dead reckoning
DRO	Destructive readout
DROT	Delayed range on target
DSR	Direct scope recorder
ECA	Electronic control amplifier
ECM	Electronic countermeasures
E_h	High end of band voltage
el	Elevation
E_l	Low end of band boltage
ess	Essential
F	Fahrenheit
FC&M	Flight control and measurement
FDT	Fault Detection Tester
fig	Figure
FIR	Falcon in range
freq	Frequency
fwd	Forward
gnd	Ground
GPU	Ground power unit
GS	Glide slope
HAC	Hughes Aircraft Co.

Table 1-2. List of Special Abbreviations (Cont)

ABBREVIATION	DEFINITION
HEP	Hydraulic elevon package
HIG	Hermetic integrating gyro
hom	Homing
H_p	Pressure altitude
HRP	Hydraulic rudder package
HSI	Horizontal situation indicator
h_t	Target altitude
IAS	Indicated airspeed
iaw	In accordance with
IFF	Identification friend or foe
ILAS	Instrument landing approach system
ILS	Instrument landing system
inst	Instrument
I/P	Identification of position
ir	Infrared
IR	Infrared subsystem
IROT	Infrared on target
IRT	Infrared track
IRTOT	Infrared track on target
jam	Jamming
kts	Knots
K_h	+0.485
K_1	-0.485
LC	Lead collision
LH	Left hand
LMWW	Left main wheel well
LOS	Line of sight
lsd	Least significant digit
LVDT	Linearly variable displacement transformer
M	Mach
MAD	Magnetic Azimuth Detector
maggie	Magnetron
MAN IF	Manual IF Gain
MART	Mobile automatic radiating tester
max	Maximum
M_C	Command Mach
mds	Minimum discernible signal

Table 1-2. List of Special Abbreviations (Cont)

ABBREVIATION	DEFINITION
min	Minimum
MLG	Main landing gear
MMST	Multi-mode storage tube
MMT	Manual mode trigger
mod	Modulator
msd	Most significant digit
MSM	Maximum safe Mach
MSR	McDonnell simulator recorder
MWP	Master warning panel
MWW	Main wheel well
mx	Missile
NWW	Nose wheel well
para	Paragraph
PARAMP	Parametric amplifier
PE	Percent excitation
PFN	Pulse forming network
p-p	Peak-to-peak
pps	Pulses per second
prf	Pulse repetition frequency
P_s	Static pressure
P_{si}	Indicated static pressure
psia	Pounds per square inch absolute
psig	Pounds per square inch gage
pss	Power supply start
P_t	Total pressure (RAM)
PTF	Power test fail
PUR	Pursuit
q_c	Differential pressure
$\dot{R}$	Radar range rate
rcvr	Receiver
RH	Right hand
ROT	Range on target
RTOT	Range track on target
SCC	Stable coordinate converter
sec	Second

Table 1-2. List of Special Abbreviations (Cont)

ABBREVIATION	DEFINITION
SHEN	SnapShoot enable.
SHON	SnapShoot on
SIF	Selective identification features
SSGC	Short system ground check
sync	Synchronize
TACAN	Tactical air navigation
tach	Tachometer
T_F	Armament travel time
T.O.	Technical Order
TROT	Track-range on target
TRT	Turn rate transmitter
TSD	Tactical situation display
TTG	Time-to-go
uhf	Ultra high frequency
UHF	Ultra high frequency (when referring to UHF radio)
vert	Vertical
VI	Visual identification
vp-p	voltage peak-to-peak
WSEM	Weapon system evaluator missile
xtal	Crystal
α	Angle of attack
ΔH	Differential altitude
ΔP	Differential pressure
δ_D	Radar antenna azimuth track error
δ_E	Radar antenna elevation track error
ϵ	Radar antenna elevation angle (aircraft coordinates)
η_s	Radar antenna azimuth angle (space coordinates)
ϕ	Phase
<	Less than
≤	Less than or equal to
>	Greater than
≥	Greater than or equal to

Table 1-3. Common Names

UNIT	COMMON NAME
017	Antenna
054	Rail
073	Radar rack
074	CN&L rack
472074	Coffin rack
083	Flight control stick
174	Armament rack
273	Computer rack
472473	Saddle rack
767	IR head
857	Computer drum
Altitude - Vertical Speed Indicator	AVVI
Attitude Director Indicator	ADI
Compass System Controller	CSC
Displacement Gyroscope Assembly	DGA
Electronic Control Amplifier	ECA
Horizontal Situation Indicator	HSI
Mach Safe Speed Air Speed Indicator	AMI
Magnetic Azimuth Detector	MAD
Receiver-Transmitter RT-749/ARC-109	RT-749

1-5. DESCRIPTION AND USE OF PROCEDURES.

1-5a. These procedures are to be used for checks and adjustments of the MA-1 and AN/ASQ-25 systems.

1-5b. Each procedure (except short system ground check) contains a short descriptive explanation of the check or adjustment procedure to be performed, the test equipment required to complete the procedure, the equipment hookup required prior to the start of the procedure, and preliminary procedures required prior to performing the procedure.

1-5c. Probable faulty units are listed with each procedure. This does not indicate that all possible faulty units are listed, only the most likely to cause failure of the procedures.

1-5d. References to functional diagrams by exact title and figure number are included as follows; Attack Displays (T.O. 27-5/Fig. 3-18). This indicates a reference to T.O. 1F-106A-2-27-5, Figure 3-18, Attack Displays Functional Diagram.

1-5e. References to fault isolation procedures by exact title and figure number are included as follows; Attack Display (T.O. 27-3/Fig. 3-12). This indicates a reference to T.O. 1F-106A-2-27-3, Figure 3-12, Attack Display Fault Isolation Procedure.

1-5f. The instruction column of each procedure contains a location, an item, and an action. For exanple: [905] POWER: ON indicates a location (905 unit), an item (POWER switch), and an action (set to ON). If more than one item is contained at the same location, the location is not repeated.

1-5g. The indication column format is the same as the instruction column but contains a location, an item, and an indication. If more than one item is contained at the same location, the located is not repeated but a dash (–) is used to indicate more than one item.

1-5h. Differences of configuration between round and vertical instrument aircraft are noted by a bar (▯) for vertical instruments and a circle (○) for round instruments.

1-5i. Test equipment is referred to by common names in this manual. These common names are listed in table 1-4. Equivalent test equipment may be used in place of any of this equipment.

1-6. MINIMUM ACCEPTABLE CONFIGURATION STATUS.

1-6a. The minimum acceptable configuration status of F-106A/B Aircraft and Weapon Control Interceptor System (AWCIS) components and associated Aerospace Ground Equipment are listed in Table 1-5 and Table 1-6. No modification beyond those cited in Table 1-5 and Table 1-6 will be accomplished by any organizational/intermediate level activity without express written permission of ADCOM/LGMW and SA-ALC/MMC.

1-6b. AWCIS check and adjustment procedures in this manual are applicable to components and AGE listed in Table 1-5 and Table 1-6.

1-6c. Changes to Table 1-5 and Table 1-6 will be made solely by the System Manager/SA-ALC/MMC.

Table 1-4. Common Names (Test Equipment)

NOMENCLATURE	COMMON NAME
AN/ARM-25A Radio Test Set	AN/ARM-25A
AN/UPM-33 Spectrum Analyzer	Spectrum analyzer
AN/USM-26 Frequency Counter	Frequency counter
HP X347A Noise Generator	Noise generator
HP 340B Noise Figure Meter	Noise figure meter
HP 431B Power Meter	Power meter
HP 478A Thermistor Mount	Thermistor mount
PSM-6/A Multimeter	Multimeter
TKX-545-S4 Oscilloscope	Oscilloscope
TS-505 D/U Electronic Multimeter	VTVM
AN/UPM-141 Radar Test Set	UPM-141
TTU-205 B/E Pressure - Temperature Test Set	TTU-205 B/E
T-121 Digital Multimeter	Digital Multimeter
486117 Armament Test Set	486117
486126 Infrared Test Set	486126
486138 IR Target Simulator	486138
486180 Test Set	486180
*3452296 AHRG Test Programmer	AHRG Test Programmer
901754-1-1 Nitrogen Service Unit	Nitrogen Service Unit

*Normally part of Shop FC&M Test Stand, but may be removed from test stand for flight testing.

NOTE

Applicable Aircraft Codes in Tables 1-5 and 1-6:

A = F-106A Round
B = F-106A Vertical
C = F-106B Round
D = F-106B Vertical/MTS, RTE
All = All F-106 Models, MTS, RTE, Peculiar F-106A/B AGE

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TABLE 1-5

F-106 AWCIS COMPONENTS (BLOCK U)

Block U Unit Part No.	Appl Acft Code	Nomenclature	Federal Stock No.	Appl TO	Data Code	Pre-Block U Dash No.
C-6280/APX72MD1	All	Transponder, Control	5895-782-0844CW			C6280/APX72MD1
RT749/ARC-109	All	Transmitter Receiver, Radio	5821-900-4006			RT749/ARC-109
RT-859/APX72	All	Radio Receiver	5895-089-7179CW			RT-859/APX72
TS1843A/APX72	All	Transponder	5895-895-4446CW			TS1843A/APX72
1964703-1	All	Computer Air Date (Type CPU 111)	6610-232-1525NT			1964703-1
464002-160	All	Rack, Elec Equip	1270-984-2197			-160
*464003-182	All	Synchronizer, Elec	1270-490-7755			-182
464008-150	All	Power Supply	1270-534-8845			-150
464009-150	All	Amplifier, Control	1270-557-7207			-150
464016-175	All	Waveguide Assy	1270-225-0994			-175
464017-175MD3 or MDX23	All	Antenna, Radar	1270-019-9753			-175MD3 or -MDX23
464019-150MD2	All	Control (TDDL) (C-2558/ARR)	5821-675-7395AY			-150MD2
464020-179	All	Converter, Wave	1270-010-4824	11F1-MA1-598	1106879	-178
464024-150	All	Indicator, Pressure	6685-557-0645			-150
464026-150	All	Power Supply, Paramp	1270-054-7111			-150
464034-150	All	Annunciator	6350-556-8398			-150
464040-160MD1	All	Converter, Signal Data (IR)	1270-764-8544			-160MD1
464041-150 Double White Dot	All	Amplifier, Control	1270-593-3042			-150 Double White Dot
464043-153	All	Control, Channel	1270-973-9190			-153
464045-151	All	Compressor, Reciprocating	4310-555-0042AY			-151
464054-154MD3 or 169605	All	Launcher, Missile	1440-994-4969AA 1440-483-5478AA			-154MD3
464061-150	All	Accelerometer	1270-594-6528			-150
464063-181	All	Relay Switch	1270-152-7399			-181
464065-175MD5 White Dot	All	Receiver/ Transmitter Radar	1270-158-4300			-175MD5 White Dot
464073-136	A,C	Rack, LH, Fwd	1270-00-173-9696	11F1-MA1-595/11F1-MA-1-598		134A/134

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TABLE 1-5
(Continued)

F-106 AWCIS COMPONENTS (BLOCK U)

Block U Unit Part No.	Appl Acft Code	Nomenclature	Federal Stock No.	Appl TO	Data Code	Pre-Block U Dash No.
464073-137	B,D	Rack, LH, Fwd	1270-00-173-9697	11F1-MA-1-595/11F1-MA-1-598		135A/135
464074-192	A,B	Rack, Elec, LH Aft	1270-188-6514	11F1-MA1-591	1106325	-191
464080-183	All	Indicator, Flt Command	1270-00-173-9680	11F1-MA1-595	1106780	-182
464082-180	All	Gate, Electronic	1270-984-9661			-180
464083-180MD3 or MDX3	All	Control, Radar	1270-458-7907			-180MD3 or MDX3
464084-175	All	Coupler, Directional	5985-054-7109AY			-175
464087-152	All	Control, Power	1270-135-1835			-152
464095-178	All	Amplifier, Video	1270-103-0682			-178
464096-175	All	Meter, Self-Test	1270-225-1006			-175
463097-100MD1	All	Dehydrator	4440-329-7966			-100MD1
464102-151MD1	A,C	Rack, HSI	1270-983-8515			-151MD1
464102-161	B,D	Rack, HSI	1270-985-4005			-161
*464103-176	All	Synchronizer, Elec	1270-853-7147			-176
464106-176 White Dot	All	Amplifier, Control	1270-068-5604			-176 White Dot
464107-150	All	Valve, Pressure	1270-593-8904			-150
464109-151	All	Amplifier, Control	1270-931-9564			-151
464117-151	All	Antenna, ADF	1270-646-3689			-151
464140-164	All	Converter	1270-00-173-9679	11F1-MA1-595	11067803	-163
464141-177	All	Amplifier, Control	1270-135-1841			-177
464149-182	All	Recorder, Direct Scope	Non-Pub	11F86-2-503	1106897	-181

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TABLE 1-5
(Continued)

F-106 AWCIS COMPONENTS (BLOCK U)

Block U Unit Part No.	Appl Acft Code	Nomenclature	Federal Stock No.	Appl TO	Data Code	Pre-Block U Dash No.
(330887 or 917FA)	All	Camera	6710-932-2360			330887
(330880 or 6230CA)	All	Magazine	6760-937-2619			330880
(652855-1)	All	Housing	1270-01-028-7513	11F86-2-503	1106897	652855
464163-155	A,C	Control, Flight	1270-477-5635	11F13-12-4-505	1106838	-154
464163-165	B,D	Control, Flight	1270-477-5644	11F13-12-4-505	1106838	-164
464173-175	All	Rack, Antenna, Rec and Trans	1270-054-0692			-175
464174-174	All	Rack, RH, Aft	1270-01-010-4722	11F1-MA1-598	1106879	-173
464181-157	A,C	Indicator, TSD	1270-880-3703			-157
(440170-3 MD1)	A,C	Control Box Assy Right	1270-919-2840			440170-3 MD1
(487226)	All	Housing Control Box	1270-919-2838			487226
(487225)	A,C	Control Box Sub-Assy	1270-919-2842			487225
(487227)	All	Control Box Sub-Assy	1270-918-6836			487227
(458783-1)	All	Control Box Assy Left	1270-906-2912			458783-1
464181-167	B,D	Indicator, TSD	1270-880-3705			-167
(440170-4 MD1)	B,D	Control Box Assy, Right	1270-919-2839			440170-4 MD1
(487226)	All	Housing Control Box	1270-919-2838			487226
(487225-1)	B,D	Control Box Sub-Assy	1270-919-2841			487225-1
(487227)	All	Control Box Sub-Assy	1270-918-6836			487227

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TABLE 1-5
(Continued)

F-106 AWCIS COMPONENTS (BLOCK U)

Block U Unit Part No.	Appl Acft Code	Nomenclature	Federal Stock No.	Appl TO	Data Code	Pre-Block U Dash No.
(458783-1)	All	Control Box Assy, Left	1270-906-2912			458783-1
464190-150	All	Duct Air	1270-570-9196			-150
464195-181	All	Amplifier	1270-064-2033			-181
464196-178	All	Relay Switch	1270-01-010-4718	11F1-MA1-598	1106879	-177
464206-152 White Dot	All	Amplifier, Control	1270-727-5491			-152 White Dot
464209-150	All	Demod, Channel	1270-603-2069			-150
464216-175	All	Waveguide Assy	1270-686-2313			-175
464220-150	All	Converter (TDDL) (CV703/ARR61)	5821-675-7399AY			-150
464223-176 White Dot	All	Converter, Signal Data	1270-765-8463			-176 White Dot
464241-182	All	Amplifier, Computer	1270-454-4585			-182
464259-150	A,C	Control, Indicator	1270 591-9146			-150
464264-152	All	Relay Assy	1270-931-9565			-152
464267-153	All	Receiver, Radio	1270-00-917-1537			-153
464273-185	All	Rack, RH, Fwd	1270-00-148-8499	11F1-MA1-595	1106780	-184
464281-150	All	Indicator, Liquid Nitrogen	1270-807-1281			-150
464289-151	All	Stable Element	1270-939-3771			-151
~~464289-150~~	~~All~~	~~Stable Element~~	~~1270-605-7962~~			~~-150~~
~~or 151~~	~~All~~	~~Stable Element~~	~~1270-939-3771~~			~~or 151~~
464295-177 White Dot	All	Amplifier, IF	1270-225-1004			-177 White Dot
464305-183	All	Control Radar Set	1270-01-010-4719	11F1-MA1-598	1106879	-182
464306-160	A,C	Amplifier Assy	1270-934-1518			-160
464309-150	All	Amplifier, Control	1270-557-3901			-150

TABLE 1-5
(Continued)

F-106 AWCIS COMPONENTS (BLOCK U)

Block U Unit Part No.	Appl Acft Code	Nomenclature	Federal Stock No.	Appl TO	Data Code	Pre-Block U Dash No.
464346-179 White Dot	All	Computer, Steering Signal	1270-458-7956	11F1-MA1-590 11F1-MA1-593	1106320 1106357	-179 White Dot
464364-153	All	Relay Assy	1270-01-010-4720	11F1-MA1-598	1106879	-152
464367-155	All	Receiver, Radio	1270-136-6850			-155
464374-150MD1 or MD2	All	Rack, Electronic	1270-557-5083			-150MD1 or MD2
464389-180	All	Generator, Sweep	1270-984-9665			-180
464395-182	All	Amplifier Assy	1270-00-173-9652	11F1-MA1-595	1106780	-181
464396-152	All	Test Set	1270-103-3783			-152
464405-170	All	Control, Selector	1270-899-7359			-170
464409-152	All	Junction Box	1270-931-9566			-152
464432-150	All	Duplexer	1270-463-7789			-150
464441-151	All	Amplifier	1270-997-4761			-151
464463-150	B,D	Control, Converter	1270-672-1772			-150
464464-162	All	Relay Assy	1270-135-1838			-162
464474-150	All	Rack, Electrical	1270-586-5578			-150
464484-150	All	Coupler, Directional Test	5985-686-2314AY			-150
464496-154	All	Relay Assy	1270-458-7943			-154
464499-150	All	Cable, Special	1270-020-7659			-150
464505-161	All	Control, Selector	1270-00-518-7169	11F1-MA1-596	1106845	-160
464506-176	All	Amplifier, Control	1270-853-7149			-176
464511-150	A,C	Rack	1270-646-8887			-150
464516-150	All	Waveguide Assy	1270-463-7790			-150
464518-150	All	Logic/Switching	1270-091-8627	1F-106-1081	0142622	

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TABLE 1-5
(Continued)

F-106 AWCIS COMPONENTS (BLOCK U)

Block U Unit Part No.	Appl Acft Code	Nomenclature	Federal Stock No.	Appl TO	Data Code	Pre-Block U Dash No.
464520-160	B,D	Converter, Signal Data	1270-934-1519			-160
464523-162	All	Converter, Signal Data	1270-181-3720			-162
464526-151	All	Power Supply	1270-931-9365			-151
464529-151 White Dot	All	Receiver/ Transmitter	1270-00-309-7199	11F36-18-502	1106803	-150 White Dot
464541-151	All	Programmer	1270-176-1078			-151
464596-152	All	Panel, Test, Elec	1270-859-5764			-152
464602-150MDX2	All	Rack, Elec	1270-646-8882			-150MDX2
464606-162	All	Amplifier, Control	1270-00-518-7164	11F1-MA1-596	1106845	-161
464620-153	B,C	Converter, Signal Data	1270-901-8844			-153
464629-151	All	Converter, Signal Data	1270-235-8451	11F15-3-11-510		-150
*464641-151 or 151MD1	All	Amplifier, AFC	1270-145-9200			-151 or -151MD1
*(3269955)	All	Synchronizer Assy	1270-774-3361			3269955
(3269900)	All	Int. Module	1270-173-4199			3269900
(3269960)	All	Amplifier	1270-458-7911			3269960
*(3269971)	All	Power Supply	1270-458-7930			3269971
*(3269959)	All	Discriminator	1270-458-7912			3269959
(3269964)	All	Regulator	1270-458-7910			3269964
464663-164	All	Relay Switch Assy	1270-458-7957			-164
464667-150MD8	All	Receiver (TDDL)	5821-675-7397AY			-150MD8
464674-150	All	Rack, Dehydrator	4440-553-6830			-150
464720-151	A,C	Converter, Signal Data	1270-815-2999			-151

TABLE 1-5
(Continued)

F-106 AWCIS COMPONENTS (BLOCK U)

Block U Unit Part No.	Appl Acft Code	Nomenclature	Federal Stock No.	Appl TO	Data Code	Pre-Block U Dash No.
464741-151	All	Power Supply	1270-145-9204			-151
464755-151	All	Control, Receiver	1270-086-7329			-151
464767-155	All	Receiver IR	1270-954-1588			-155
464774-150	All	Rack, Dehydrator Filter	4440-553-6831			-150
464780-150	All	Indicator	1270-899-7373			-150
464796-153	All	Panel, Self Test	1270-997-7942			-153
464802-151	All	Rack, Elec	1270-987-9677			-151
464811-150	All	Rack, Elec	1270-773-7800			-150
464821-151	All	Amplifier, Interface	1270-148-9018	11F81-3-2-503	1106814	-150
464841-151	All	Amplifier, Hydraulic Drive	1270-196-6586			-151
464846-151	All	Control Computer	1270-010-027-9711	11 F13-14-8-501	1107276	-150
~~464846-150~~	~~All~~	~~Control, Computer~~	~~1270-944-1958~~			~~150~~
464855-179	All	Control Radar	1270-454-3602			-179
464857-150	All	Magnetic Drum	1270-984-2039			-150
* 464866-176	All	Amplifier, Control	1270-196-6087			-176
464873-160	All	Rack, Elect. Equip	1270-188-6531	11F1-MA1-591	1106325	-155
464880-150	A,C	Indicator, Mach	1270-586-5577			-150
464896-150	All	Transmitter, Self Test	1270-980-1246			-150
464902-150	All	Rack, Elec	1270-810-5219			-150
464905-175	All	Control Power Supply	1270-158-4299			-175
464920-156	All	Converter, Signal Data	1270-954-8450			-156
464926-150	All	Multi-DC Power Supply	1270-098-7100	1F-106-1081	0142622	

See pg 17 sup 41

TABLE 1-5
(Continued)

F-106 AWCIS COMPONENTS (BLOCK U)

Block U Unit Part No.	Appl Acft Code	Nomenclature	Federal Stock No.	Appl TO	Data Code	Pre-Block U Dash No.
464955-150	All	Control, Navigation	1270-593-4073			-150
464980-150	A,C	Indicator, Target	1270-586-5575			~~150~~
~~464-989-151~~ 464-989-151	~~All~~ ALL	~~1000 HZ~~ 1000 HZ				-150
~~464989-150~~	~~All~~	~~1000 HZ~~ w/r sup.	~~1270-091-8629~~	~~1F-106-1081~~	~~0142622~~	
		~~Power Supply~~	1270-01-028-7491	11F-33-3-B-501		
472005-150	C,D	Control, Intercom	1270-578-5002			-150
~~472074-120~~	~~C,D~~	~~Rack, Elec~~	~~1270-01-010-4721~~	~~11F1-MA1-598~~	~~1106879~~	~~119~~
472074-122	C,D	Rack. Elec.	1270-01-013-5976	11F1-MA1-599	1106882	-120
~~472074-121~~	~~C,D~~	~~Rack, Elec~~	~~1270-01-010-4724~~	~~11F1-MA1-598~~	~~1106879~~	~~119~~
472074-123			1270-01-013-5977	11F1-MA1-599	1106882	-121
472473-161	C,D	Rack, Elec	1270-118-5116	11F1-MA1-591	1106325	-160
472564-175	C,D	Relay, Assy	1270-054-0711			-175
472595-180	C,D	Amplifier, DC	1270-984-9672			-180
472664-150	C	Relay Assy	1270-581-6259			-150
472664-160	D	Relay Assy	1270-682-9441			-160
472764-150	C	Relay Assy	1270-581-6260			-150
472764-160	D	Relay Assy	1270-681-6331			-160
472864-150	C	Relay Assy	1270-581-6261			-150
472864-160	D	Relay Assy	1270-681-6330			-160
516680-2-1	All	Relay Capacitor	4130-854-0272			516680-2-1
52300	B	Camera	6710-00-303-4262	1F-106-1122		0148356
52450	B	Support Electronics	1270-00-282-2120	1F-106-1122		0148356
52630	All	Jumper Connector	1270-00-282-2119	1F-106-1122		0148356
52800	B	Optical Display Unit	1270-00-282-2118	1F-106-1122		0148356
5339-040692	All	Buffer Assy	4920-417-6165BK	1F-106-1123	0148362	5339-0406-92
571840-3-1	All	Compressor	4130-891-3565			571840-3-1
7640017-10	All	Altwarnsel.	6625-01-040-2918BK	1F-106-1158	052123	
800914-1-1	All	Accumulator	4130-854-0278			800914-1-1
800936-2-1	All	Dehydrator	4130-110-6139YR			800936-2-1
800938-1-1	All	Adsorber	4130-854-0280			800938-1-1

* MA-1/ASQ-25 UNITS CLASSIFIED CONFIDENTIAL.

TABLE 1-6

PECULIAR AGE FOR F-106A/B AWCIS (BLOCK U)

Block U Unit Part No.	Appl Acft Code	Nomenclature	Federal Stock No.	Appl TO	Data Code	Pre-Block U Dash No.
~~486102-157 ASTI~~ 486102-159	All	Test Stand, Flt	~~4920-01-021-2020~~	~~33D5-1-625~~ 33D5-1-634		~~-155MD3AST1~~ -155MD3AST1FDT (33D5-1-639) -157-AST1/AST1FDT
~~486102-158 ASTI FDT~~ 486-102-160	All	Test Stand, Flt	~~4920-01-021-2023~~	~~33D5-1-625~~ 33D5-1-634		-156MD3AST1FDT -158MDX4 AST1/AST1 FDT (33D5-1-639) -158 AST1/AST1 FDT (33 D5-1-625)
~~486104-413 ASTI~~	All	Test Stand, Radar	~~4920-01-020-8080~~	~~33D5-1-625~~/ 33D5-1-632		~~407MD10AST1~~/ ~~407MD9AST1~~
~~486104-414 ASTI~~	All	Test Stand, Radar	~~4920-01-021-2022~~	~~33D5-1-625~~/ 33D5-1-632		~~408MD10AST1~~/ -408MD9AST1
~~486104-415 ASTI~~	All	Test Stand, Radar	~~4920~~	~~33D5-1-625~~/ ~~33D5-1-632~~		~~409MD10AST1~~/ ~~409MD9AST1~~
~~486104-416~~ ASTI FDT	All	Test Stand, Radar	~~4920-01-021-2021~~	~~33D5-1-625~~/ 33D5-1-632		~~410MD10AST1FDT~~/ ~~410MD9AST1FDT~~
~~486104-417 ASTI FDT~~	All	Test Stand, Radar	~~4020-01-1184875~~	~~33D5-1-625~~ 33D5-1-632		~~411MD10AST1FDT~~ -411MD9AST1FDT
~~486104-418 ASTI FDT~~ 486104-419	All	Test Stand, Radar	~~4200-00-118-4876~~ 492000-118-4877	~~33D5-1-625~~ 33D5-1-634		~~412MD10AST1FDT~~ -412MD9AST1FDT
486108-100	All	Stand, Equip (TDDL)	4920-793-7464			-100
464104-420	All	Test Stand, Rdr.	4920-00-118-4883	33D5-1-634		
464104-421	"	"	4920-00-48-4853	33D5-1-634		
486109-101MD2 or MDX2	All	Test Set, Air Data	4920-165-3967			-101MD2 or MDX2
486110-121	All	Truck, Hand	4920-872-5546			-121
486117-133 MDX3	All	Test Set, Arm.	4920-063-3571	33D5-12-43-524		-133MD2
486118-111	All	Test Set, Stab	4920-676-4551			-111
486126-110MD2	All	Test Set Infrared	4920-793-1618			-110MD2
486136-100	All	Boresight Align Fixture	4920-804-9014			-100
486137-110	All	Dehydrator	4440-621-4481			-110
486138-100	All	Simulator, IR Target	4920-804-9013			-100

See 09 19-Sup 41

TABLE 1-6
(Continued)

PECULIAR AGE FOR F-106A/B AWCIS (BLOCK U)

Block U Unit Part No.	Appl Acft Code	Nomenclature	Federal Stock No.	Appl TO	Data Code	Pre-Block U Dash No.
486140-110	All	Adapter, Dummy Load	4920-601-5516			-110
486141-100	All	Dummy Load	4920-557-5812			-100
486144-110	All	Test Set, Radar Antenna	4920-059-8637			-110
486148-120	All	Hand Truck, Maint	4920-972-3496			-120
486149-110	All	Receiver, Trans	4920-789-1400CX			-110
486150-111 MD3	All	Trailer	4920-785-7375	33D5-12-52-506	3304288C	-111MD2
486153-120	All	Stand, Radar	4920-472-8496			-120
486154-110	All	Stand, CN&L	4920-785-4550			-110
486155-100	All	Stand, FCM/Power	4920-674-0075			-100
486156-120	C,D	Test Set, Relay	4920-227-1041			-120
486158-111 MOD ASTI	B,D	Test Stand, Cockpit Instl	4920-872-5544			-111 MOD
486159-100	A,C	Test Set, Signal Data Converter (Flt Dir)	4920-649-5515			-100
~~486166-135MD2 ASTI~~ 486166-137	~~All~~ All	~~Test Stand~~ Teststand Arm.	~~4920-088-5291~~	~~33D5-1-632~~ 33D5-1-634	~~3308823~~	~~-135MD1 ASTI~~
~~486166-136MD2 ASTI FDT~~	~~All~~	~~Test Stand~~	~~4920-088-5292~~	~~33D5-1-632~~	~~3308823~~	~~-136MD1~~ ASTI FDT
486180-100	All	Adapter Set	4920-822-5050			-100
~~486192-150 ASTI MD2~~ 486192-151	~~All~~ ALL	~~Test Set, CN&L~~ (TDDL) Test Stand, CN&L	~~4920-842-2457~~	~~33D5-10-7-511~~ 33D5-1-634	~~3307371A~~	~~-150 ASTI~~ -150 MDX3 ASTI (33D5-1-636) -150MD2 ASTI
486194-100	All	Test Set, Parametric Amp	4920-076-9399			-100
486396-100	All	Test Set, Radar Pressure	4920-649-4521			-100
~~486097-105~~ 486097-106	~~All~~ All	~~Test Stand,~~ Computer Teststand, computer	~~4920-01-020-8010~~	33D5-1-634		~~103~~ -105 MD1 (33D5-1-625) -105

TABLE 1-6
(Continued)

PECULIAR AGE FOR F-106A/B AWCIS (BLOCK U)

Block U Unit Part No.	Appl Acft Code	Nomenclature	Federal Stock No.	Appl TO	Data Code	Pre-Block U Dash No.
641696	All	Titler, Motion Picture Film	6740-00-435-9855			641696
651002	All	Test Set, Radar	6625-539-9211			651002
651379	All	Multimeter Dig	6625-541-2542			651379
651697	All	Processor Film	6740-680-7935			651697
651984	All	Stand, TGT/ Radar	4920-973-0192			651984

CHAPTER 2. MA-1 AND AN/ASQ-25 SYSTEM

SECTION I. GENERAL

2-1. INTRODUCTION.

The operational checkout procedure is a qualitative check of the MA-1 or AN/ASQ-25 system. Successful completion of this procedure provides a high level of assurance that the system will perform its mission. The complete procedure should be performed after extensive maintenance has been accomplished on the MA-1 or AN/ASQ-25 system or as required by T.O. 1F-106A-6. Applicable tests and adjustments after unit replacement or short system ground check (SSGC) should be performed after minor maintenance. The operational checkout procedure consists of SSGC, the track operational check (para. 3-17d), and the search display checks (para. 3-19)

2-2. TEST CONSIDERATIONS.

2-2a. The short system ground check can be accomplished with either the aircraft engine operating or a ground power unit (GPU) and a cooling cart.

2-2b. If aircraft engine operation is utilized, refer to T.O. 1F-106A-2-2 for applicable safety precautions and procedures.

WARNING

The short system ground check must NOT be accomplished on aircraft loaded with live armament.

2-2c. The SSGC cannot be accomplished if a missile simulator or a WSEM is loaded on any rail.

2-2d. Performance of SSGC in the F-106B is identical to the F-106A, except that the cockpit displays and control units of the rear cockpit of the F-106B must be checked additionally. Two personnel are required for the F-106B checkout. Each man should put on headsets connected to respective headset jacks.

2-2e. In the F-106B, the 780 unit in the cockpit that has control will be correct. The indication on the other 780 unit will have no significance.

2-3. PRELIMINARY PREPARATION.

2-3a. Check the GPU and cooling air cart operation. Connect to the aircraft but do not apply electrical power.

WARNING

Insure RH console pitot heat switch is placed in OFF position. Failure to do so may result in injury to personnel.

2-3b. Position the angle of attack transducer vane (radar compartment door) to simulate a zero angle of attack (centered).

2-3c. Set CABIN AIR switch (right-hand cockpit console) to OFF.

2-3d. Perform preliminary switch settings indicated in table 1-1.

2-4. SAFETY PRECAUTIONS.

WARNING

If an ejection seat is installed in the aircraft, ensure the ejection seat safety pins are properly installed. Ensure the canopy hold-open support is properly installed. Ensure no live armament is loaded on the aircraft.

CAUTION

If the aircraft engine (or hydraulic mule) is operating, the HYDRAULIC PRESS WARN fuse (right-hand cockpit console) must be removed. Vari-ramps may be damaged if maximum hydraulic pressure is applied during SSGC.

SECTION II. CHECKS

2-5. PREPARATION FOR SSGC.

NOTE

Wherever the 080 unit panel controls are indicated, they now apply to the 080 unit, 52800 unit (ODU), or the Filter and Control Assembly and Information panel, depending upon the system configuration.

2-5a. This procedure is provided to reduce the number of actions required during the SSGC testing sequence.

2-5b. Switch or switch settings preceded by a vertical bar (▯) are applicable to only vertical instrument aircraft. Switch or switch settings preceded by a circle (O) are applicable to only round instrument aircraft. Switch or switch settings which are not preceded by either symbol are applicable to both types of aircraft.

CAUTION

Use the lowest setting of the 080 ATTACK INTENSITY control required to obtain a minimum acceptable viewing level while observing the attack display. Excessive attack intensity will cause damage to the MMST.

CAUTION

The Canopy Lock Lever should not be placed in the locked position with the Canopy open, except as noted when performing 080 Unit adjustment on F-106B aircraft.

NOTE

The 080 ON and OFF switches are bypassed when the aircraft canopy is closed and the canopy lock lever is in the locked position.

2-5c. When the 080 displays are required, the 080 must be turned on by pressing and releasing the 080 ON switch. After a 35 ± 10 second time-in period, the 080 will present the search display. If the attack display is also desired, press and hold the 080 ON switch for at least 3 seconds. The attack display turns off automatically after a 3 ± 1 minute interval. To obtain another interval, the 080 ON switch must be pressed and held for at least 3 seconds.

2-5d. Apply cooling air to the aircraft. Ensure that cooling air temperature and pressure are correct.

NOTE

Perform step 2-5dA only if AHRG Test Programmer (3452296) is available; otherwise proceed to step 2-5e.

2-5dA. Disconnect P29601 from J29601 on LH Aft Electrical Equipment Rack (7839890); connect P29601 to J29601 on AHRG Test Programmer (3452296). Attach red streamer to programmer to warn of unsafe flight condition.

2-5e. Ensure that the output voltage of the ground power unit is 105 to 120 V, three phase 400 Hz. Apply power to the aircraft. Set TRT/GYRO switch (LMWW) to ON. The following indications can be observed:

(1) Cockpit lamps indicate presence of a-c power.

(2) ACP special weapon annunciator indicates LOCK (if shackles on special weapon rack in armament bay are open, the special weapon annunciator gives a barberpole indication).

NOTE

In the F-106B, each 080 ON switch must be pressed to obtain MMST illumination and attack display in desired cockpit.

2-5f. Place F-106A canopy latch to the lock position.

2-5g. Set 955 HOMING POINT SELECTOR to A.

2-5h. Set 019 CHANNEL to 26.

2-5i. Set 405 PRESET to local TACAN station.

2-5j. Set 181 RADIUS MILES to 200.

▯ 2-5k. Set 181 MODE to AUTO.

◯ 2-5l. Set 181 MODE to ADF CMD.

CAUTION

If master warning panel ELECTRONIC COOLING light comes on after POWER is set to ON, return POWER to OFF to prevent damage to MA-1 units.

2-5m. Set 905 GRID REFERENCE to 045 and POWER to ON.

▯ 2-5n. ADI power off flag (▯) or ADI power flag (◯) is visible for approximately 85 seconds after 905 POWER is set to WARM or higher, then disappears.

2-5o. The 905 annunciator indicates WAIT during the 85-second AHRG time-in interval and then OK to denote completion of the interval. The AHRG time-in interval is initiated when the 905 POWER switch is set to WARM or above.

2-5p. Set CSC SLAVE/DG to DG.

2-5q. Press and turn HDG/PUSH TO SYNC control until HSI heading is 45° (181 also indicates 45°).

2-5r. Deleted.

2-5s. As soon as system times-in to standby, proceed with procedures in table 2-1.

2-5t. During the initial procedure in each of tables 2-2 thru 2-7 the digital computer checks selected inputs. If the inputs are correct the 080 VI WARN comes on. If an input is incorrect the 080 VI WARN flashes and the ▯ AVVI COMMAND (◯ 980 COMMAND ALTITUDE) indicates the first failed input. In each case the 796 GND TEST INTER must be pressed and released to continue the test. Refer to table 2-6.1 for a cross reference from altitude to input.

2-5u. The incorrect input can also be determined by use of the 140 DIGITAL INPUTS switches. Six status words in the computer provide the state of all inputs checked when performing SSGC. Refer to table 2-8.1 for the significance of each status word.

NOTE

The 796 FLIGHT light is on and all other 796 lights are off.

The 796 AFCS light is off in all positions of the 796 SELECTOR TEST switch and is no longer used.

Table 2-1. SSGC Preliminary Preparation

STEP	INSTRUCTION	INDICATION	REMARKS
1	[281] Switch: CELL COOL DOWN and hold ZERO ADJUST: Adjust to obtain indication	[281] Meter: Zero	. . .
2	[181] OFF-BRT: 1st detent from OFF	[181] TSD map: On	Allow projection lamp to warm for 30 sec before going to a higher illumination level
3	[305] RANGE: 80LP, 40SP, 16SP, 4SP and return to 40LP	[080] 80, 40, 16, 4 & 10 lamps: On when selected	. . .
4	[305] TUNE: NORM RDR: NORM CHAFF: OFF NOSE-TAIL: NOSE IR: RDR SCAN	[767] IR head: Extends	Provides capability for system to cross-mode to IR dominant

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Table 2-1. SSGC Preliminary Preparation (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
5	[083] RDR IR SELECT: Press and release to obtain radar dominant mode	[017] Antenna: Searches 53° left to 53° right [767] IR head: Searches same as 017	. . .
6	[855] IR VOLUME: As required IR THRESHOLD TONE: Fully cw, then ccw until indication is obtained	[Headset] Aural tone: Continuous high pitched, decreasing in pitch until null	505 VOL must be set cw to provide audio
7	[855] AZ SCAN: C EL SCAN: 2 BAR	[080] B-sweep: Searches from 30° right to 30° left —— El marker: 2 bar scan	. . .
8	[855] AZ SCAN: L	[080] B-sweep: Searches from 6° right to 53° left	. . .
9	[855] AZ SCAN: R	[080] B-sweep: Searches from 53° right to 6° left	. . .
10	[855] AZ SCAN: B	[080] B-sweep: Searches from 53° right to 53° left	. . .
11	[855] EL SCAN: 1 BAR	[080] El marker: Stationary	. . .
12	[855] EL SCAN: NORM [083] ANT ELEV: Detent	[080] El marker: 4 bar scan	Two steps should be above center and one below center
13	[083] ANT ELEV: UP, DN, and back to detent	[080] El marker: Moves up and down then center —— B-sweep: Search limits narrow as el marker approaches either top or bottom of display	. . .
14	[083] Action switch: Press to 1st detent and hold (this initiates supersearch mode)	[080] B-sweep: Searches approx from 16.5° right to 16.5° left of (selectable) center point —— El marker: Stationary —— Erase sweep: Disappears	El marker remains at same step it was on when supersearch first initiated
15	[083] Hand control: Move right, left and back to detent	[080] B-sweep: Searches as in step 14 with center point selected by hand control position	. . .
16	[083] Action switch: Press to 2nd detent and hold	[080] B-sweep: Centered; range gate appears at 30 miles	Jizzle added to B-sweep in hand control and remains in most track conditions
17	[083] Hand control: Move fully forward and fully back at different rates	[080] B-sweep: Range gate moves smoothly in to min range and back to 30 miles. Intensity should remain constant with different slewing rates	. . .
18	[083] Hand control: Move right, left and back to detent	[080] B-sweep: Follows hand control movement	. . .

Table 2-1. SSGC Preliminary Preparation (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
19	[083] Action switch: Release [305] RANGE: 16SP [083] Action switch: Press to 2nd detent and hold Hand control: Slightly forward and fully back	[080] B-sweep: Range gate appears at 16 miles, then disappears	. . .
20	[083] Action switch: Release [305] RANGE: 4SP [083] Action switch: Press to 2nd detent and hold Hand control: Slightly forward and fully back	[080] B-sweep: Range gate appears at 4 miles, then disappears	. . .
21	[083] Action switch: Release [305] RANGE: 40SP [083] Action switch: Press to 1st detent and release	[080] B-sweep: Range gate moves to 30 miles	. . .
22	[083] AUTO SEARCH: Press and release [080] ATTACK INTENSITY: Adjust IF GAIN: Fully cw VIDEO GAIN: Fully cw DIMMER: Adjust ERASE INTENSITY: 10 o'clock	[080] All display elements: Optimum	Do not use excessive attack display intensity level
23	[905] HOR ADJ: Adjust as required PRESS TO ERECT: Press and release	[080] Artificial horizon: Centered and level	Indication is affected by aircraft attitude
24	[855] LOBE FREQ: 3 EL SCAN: 1 BAR	[080] B-sweep: Ground target return present —— El marker: Stationary	. . .
25	**NOTE** If possible, select a small, isolated ground target at a range of 10 miles or more which will provide an antenna look angle of less than 18 degrees.		
	[083] ANT ELEV: As required to to obtain indication	[080] B-sweep: Optimize selected target	Note az and el position and range of target for reference
26	**NOTE** The following switch position setting changes are made to ensure that no significant degradation occurs to the selected target video in various modes of transmitter-receiver operation. The amount of degradation or change is difficult to evaluate unless the target is checked in all modes.		
	[855] CADJ-NORM: CADJ and hold, then release (note video level with CADJ-NORM released)	[080] B-sweep: Target video level decreases, then returns to normal level	. . .
27	[305] RDR: HOM	[080] B-sweep: Target video level does not degrade from normal level	. . .
28	[305] TUNE: F MAX	[080] B-sweep: Target video level does not degrade from normal level	. . .
29	[305] RANGE: 40LP	[080] B-sweep: Target video level does not degrade from normal level	. . .

Table 2-1. SSGC Preliminary Preparation (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
30	[305] TUNE: F MIN	[080] B-sweep: Target video level does not degrade from normal level	. . .
31	[305] RANGE: 40SP	[080] B-sweep: Target video level does not degrade from normal level	. . .
32	[305] RDR: MAN IF	[080] B-sweep: Target video level does not degrade from normal level MODE lamp 2: Comes on.	. . .
32.1	[305] RANGE: 16SP [083] Action switch: Press to 2nd detent and hold. Lock-on to a strong target and release action switch.	No AGC action	. . .
32.2	[080] Turn IF GAIN control knob CCW.	[080] Decrease in target return. Lock-on will be lost when gain is turned fully CCW.	. . .
32.3	[080] Turn IF GAIN fully CW. Reaccomplish lock-on if necessary. [305] RDR: NORM	Presence of AGC action after approximately one and one-half seconds.	. . .
32.4	[080] Rotate IF GAIN control CCW and then back to fully CW.	[080] Rotation of IF GAIN control has no effect on video.	. . .
32.5	[305] RANGE: 40SP [083] Auto search: Press and release.	[080] B-sweep: Searches and target video level do not degrade from normal level.	. . .
33	[305] TUNE: NORM	[080] B-sweep: Target video level does not degrade from normal level	. . .
34	**NOTE** The steering dot, antenna movement, and agc indication are dependent upon the characteristics of the target. Any object within the radar beam may influence system operation. [305] RANGE: 16SP [083] Action switch: Press to 2nd detent and hold, lock on to selected target and release action switch	[080] B-sweep: Jizzle appears — Time-to-go circle: Appears — Reference circle: Appears — Steering dot: Appears, indicates antenna look angle — Reference circle: Follows steering dot — Range rate scale lamps: -33, 0, 50, 100, 200, and 300 on — Time-to-go circle: 2.8 in. diameter — VI WARN: Off	Dot will be saturated if antenna look angle is 18° or more Deflection is 1/4 that of steering dot Indicates target range 2000 yd or more Indicates target range 500 yd or more

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Table 2-1. SSGC Preliminary Preparation (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
35	[ACP] Selector: MISSILES ALL	[ACP] SELECT: NO [080] Steering dot: In reference circle, showing more movement than with VIS IDENT selected — Time-to-go circle: 2.8 in. diameter — Range rate scale lamps: 0, 200, 400, 800, and 1200 on MODE lamp 3: Comes on.	. . . Indicates 20 sec or more to fire signal
36	[083] AUTO SEARCH: Press and release	[080] B-sweep: Searches — Time-to-go circle, reference circle and steering dot: Disappear — Range rate scale lamps: Go off	. . .
37	[ACP] Selector: VIS IDENT	[ACP] SELECT: Blank	. . .
38	[083] Action switch: Press to 2nd detent and hold, position antenna for min target return, and release action switch	[080] Displays: No change	Lockon does not occur
39	[083] AUTO SEARCH: Press and release	[080] B-sweep: Searches	. . .
40	[855] EL SCAN: NORM	[080] El marker: 4 bar scan pattern	. . .
41	[281] Switch: CELL COOL DOWN and hold	[281] Meter: 7 to 70 microamps	Satisfactory IR subsystem cooling
42	[305] IR: RDR SLVD [281] Switch: Release [ACP] Selector: MISSILES ALL [083] RDR IR SELECT: Press and release to obtain IR dominant mode	[080] Az-el dot: Searches a 4 bar C-scan from 53° left to 53° right — El marker: Moves to left side of MMST and becomes IR range marker [866] PARAMP ON: On	If valid data link is not available, the IR range marker is positioned on the right side of the MMST centered in el and has no significance Indicates paramp operation in IR dominant
43	[083] Action switch: Press to 2nd detent and hold, lock on to best available IR target and release action switch	[080] Expanded C-scan: Appears for approx 8.5 sec then is replaced by B-sweep at same az position as IR target — Firing bar: Appears, 2.8 in. long — IR range marker: Becomes FIR marker and is positioned on the left side of the MMST at the top	B-sweep and expanded C-scan cannot appear simultaneously
44	[083] RDR IR EXP-LC/PUR: RDR IR EXP and hold	[080] Expanded C-scan: Reappears and replaces B-sweep	. . .
45	[083] RDR IR EXP-LC/PUR: Release	[080] B-sweep: Reappears and replaces C-scan	. . .

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Table 2-1. SSGC Preliminary Preparation (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
46	[305] IR: RDR SCAN	[080] B-sweep: Searches from 53° left to 53° right	. . .
47	[083] AUTO SEARCH: Press and release ANT ELEV: Detent	[080] C-scan: Searches from 53° left to 53° right	. . .
48	[083] RDR IR SELECT: Press and release to obtain radar dominant mode	[080] B-sweep: Searches from 53° left to 53° right	. . .
48.1	ALTITUDE WARN SELECTOR: 00000 BARO SET KNOB: Set for altimeter reading of field elevation plus 200 feet. ALTITUDE WARN SELECTOR: Field elevation. BARO SET KNOB: Vary slowly to cause altimeter to read field elevation minus 200 feet. BARO SET KNOB: Reset for altimeter reading of field elevation plus 200 feet. BARO SET KNOB: Vary slowly to cause altimeter to read field elevation minus 200 feet. GEAR AUDIO WARNING CUTOFF BUTTON: Depress. ALTITUDE WARN SELECTOR: 00000 BARO SET KNOB: Set to current barometric pressure.	Altitude audible warning should initiate at an altimeter reading of field elevation ± 100 feet. Altitude audible warning should terminate. Altitude audible warning should initiate at an altimeter reading of field elevation ± 100 feet. Audible warning should terminate.	
48.1.1	(163) DISP/AUTO MODE: MAX RNG or MIN TIME (955) Homing point selector: T ALTITUDE WARN SELECTOR: 01110 10000, 15550, 19990, (other settings if desired).	COMMAND ALTITUDE INDICATOR: Should display reading within ± 00100 of ALT WARN SEL. SETTING.	
48.1.2	ALTITUDE WARN SELECTOR: 00000		

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Table 2-1. SSGC Preliminary Preparation (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
48.2	[405] LOCAL PRESET		
48.3	[163] ILS for 5 sec. then AUTO NAV	Intcp bug centers on TSD.	
48.4	[405] MAN		
49	**NOTE** Perform steps 49 thru 55 if SSGC is being performed in an F-106B. To successfully transfer flight control functions, the 163 FLT MODE and DISP/AUTO MODE switches in both cockpits must be in the same positions. Verification of common selections is indicated by a YES in the WILL TRANS annunciator. Uncommon selections are indicated by a NO in the WILL TRANSFER annunciator.		
	[163, both cockpits] FLT MODE: DIR MAN [505, both cockpits] Function switch: MAN Manual frequency selectors: MART uhf frequency [LH console, rear cockpit] RADAR POWER: Press and release	[LH console, rear cockpit] RADAR POWER: Comes on	Indicates transfer of radar function control to rear cockpit

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Table 2-1. SSGC Preliminary Preparation (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
50	[LH console, rear cockpit] AFCS ILS AUTO NAV TRANS: Press and release	[LH console, rear cockpit] AFCS ILS AUTO NAV TRANS: Comes on	Indicates transfer of navigation function control to rear cockpit
51	[LH console, rear cockpit] UHF COMM TACAN: Press and release	[LH console, rear cockpit] UHF COMM TACAN: Comes on [780, rear cockpit] UHF: MART uhf frequency	Indicates transfer of uhf and TACAN function control to rear cockpit
52	[LH console, front cockpit] RADAR POWER: Press and release	[LH console, front cockpit] RADAR POWER: Comes on	Indicates transfer of radar function control to front cockpit
53	[LH console, front cockpit] AFCS ILS AUTO NAV TRANS: Press and release	[LH console, front cockpit] AFCS ILS AUTO NAV TRANS: Comes on	Indicates transfer of nagivation function control to front cockpit
54	[LH console, front cockpit] UHF COMM TACAN: Press and release	[LH console, front cockpit] UHF COMM TACAN: Comes on	Indicates transfer of uhf and TACAN function controls to front cockpit
55	[505, both cockpits] Power switch: OFF	Check complete	. . .

2-6. SSGC 1 PROCEDURE.

This procedure is accomplished by performing the procedures in table 2-2. If a malfunction is discovered, refer to T.O. 1F-106A-2-27-3 for fault isolation procedures.

NOTE

If SSGC 1 is being performed separately, set all switches iaw table 1-1. During SSGC 1 the computer cycles to the self test display routine (TR), but the routine is not actually entered until 45 seconds of SSGC 1 have elasped.

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Table 2-2. SSGC 1 Procedure

STEP	INSTRUCTION	INDICATION	REMARKS
1	**NOTE** If altitude readout per Table 2-6.1 indicated D143 not present and aircraft has a 464073-136 or -137 rack installed (TCTO 11F1-MA1-595), disregard VI warn flashing light. Press and release the trigger switch (083). Program will then proceed to check the remaining Digital Inputs. **CAUTION** If the aircraft engine (or hydraulic mule) is operating, the HYDRAULIC PRESS WARN fuse (right-hand cockpit console) must be removed. Variramps may be damaged if maximum hydraulic pressure is applied during SSGC. **NOTE** When the 796 SELECTOR TEST is placed to 1, the computer begins a sequence of events. If SSGC 1 is not desired, 796 SELECTOR TEST must be set to 2 within 7 seconds after GND test Inter is pressed.		
	[RH console] HYDRAULIC PRESS WARN FUSE: Remove if hydraulic pressure is applied		
	[905] POWER: ON		
	[163] DISP/AUTO MODE: AUTO NAV		
	[305] RANGE: 16SP		
	[ACP] Selector: If Snapshoot system is installed and snapshoot mode is selected (HUD) - SW/Gun If MSR is loaded - SW/Gun If none of the above - VIS IDENT		
	[796] SELECTOR TEST: 1	[080] B-sweep: 40° right and oscillates 1/4 in.	
		[080] VI WARN: Comes on	
		___ VI WARN: If flashing	Incorrect switch position (see table 2-6.1)
		[796] FLIGHT: On	Armament subsystem not in test condition
		___ TEST: On	Armament subsystem safe for test
		___ ARM AUX: On	Light circuit test
		[905] Annunciator: TEST	
1.1	[796] GND TEST INTER: Press and release	[080] VI WARN: Goes off	. . .
		[080] PTF: Off	
		[796] RADAR: On	If PTF is on, some power form has failed since the the last takeoff TF routine begins, requires 45 sec to complete
		[796] COMP: If on	TF routine successful
		[796] COMP: If flashing	Indicates TF routine failure which prevents the LZ routine from beginning
		[ ] [AMI] Mach: Slews toward 1.8M and returns to min	LZ routine begins, requires 45 sec to complete
		[ ] [AVVI] Altitude: Slews toward 57,000 ft and returns to min	Air data computer test for continuity of Mach and H_p digitizers

Table 2-2. SSGC 1 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
1.1 (Cont)		○[880] MACH: Slews toward 1.8M and returns to min ○[Altimeter] Slews toward 57,000 ft and returns to min [Inst panel] VARI RAMP: Off, on, then off —— MAX MANEUVER: Off, on, then off	On when Mach is 1.23 or more **CADC Fail Lite: ON when MACH and ALT Tapes are run up**
	NOTE Computer checks initial values of Mach and H_p digitizer inputs. If both are incorrect, the computer will not provide a signal to place air data computer in a test condition. The above indications will not occur on the AMI, AVVI, or 880 and the VARI RAMP light will not cycle. Instead, the 796 FLT SENS will be flashing.		
		[796] FLT SENS: If on —— FLT SENS: If flashing —— RADAR, COMP & FLT SENS: If off	Successful completion of LZ routine Failure of digitizer input (or inputs) from air data computer to computer Computer failure
2	**NOTE** In the following steps, az positioning of the B-sweep represents magnetron tuning information obtained from the LVDT.		
	[305] RANGE: 40SP [855] CADJ-NORM: CADJ and hold	[080] B-sweep: Moves smoothly from limit to limit and returns in approx 1 sec	Medium tune rate of magnetron thru complete frequency band
3	[855] CADJ-NORM: Release (drops to NORM)	[080] B-sweep: Oscillates 1/4 in. in az approx 1/2 in. from right side of MMST	. . .
4	[305] RANGE: 200LP TUNE: F MAX RDR: HOM	[080] B-sweep: Moves rapidly, display appears covered with individual sweeps approx 1/4 in. apart	Fast min tune rate of magnetron thru complete frequency band
5	[305] RANGE: 80LP	[080] B-sweep: Moves rapidly, display appears cross-hatched with adjacent sweeps 1/2 in. apart	Fast max tune rate of magnetron thru complete frequency band
6	[305] RDR: NORM	[080] B-sweep: Moves rapidly, confined to either right or left side of display	Fast max tune rate of magnetron within un-jammed bins.

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Table 2-2. SSGC 1 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
7	[305] RANGE: 40LP TUNE: F MIN RDR: HOM	[080] B-sweep: Moves rapidly, confined to either left or right side of display	Fast min tune rate of magnetron within unjammed bins. Artificial jamming is generated and limits tuning
8	**NOTE** B-sweep may reverse direction at other than 40° right if sniff circuits detect interference at frequencies other than in the paramp band.		
	[083] Action Switch: Press to 2nd detent and hold [305] RDR: NORM TUNE: SNIFF	[080] B-sweep: Moves 5°/sec to 40° right, reverses and increases to 20°/sec and then decreases to 5°/sec	Fixed tune rate of magnetron equals 5°/sec. Simulated jamming occurs due to noise introduced by abnormal paramp operation which causes magnetron to reverse and a slow tune rate (20°/sec) is established until magnetron tunes out of paramp band.
9	[083] Action switch: Release [305] TUNE: NORM [083] ANT ELEV: Detent AUTO SEARCH: Press and release	[080] El Marker: 4 bar pattern [796] FLIGHT: On —— TEST: On —— COMP: On —— RADAR: On —— FLT SENS: On —— ARM AUX: On	. . .
10	[163] FLT MODE: PITCH DAMP	[163] FLT MODE: Remains in PITCH DAMP	. . .
11	[083] EMER MANUAL: Press and release	[163] FLT MODE: Drops to DIR MAN [MWP] FLIGHT MODE FAIL: Comes on	. . .
12	[083] MMT: Press and release	[MWP] FLIGHT MODE FAIL: Goes off	SSGC 1 complete.
13	ALTITUDE WARN SELECTOR: 01110, 10000, 15550, 19990, (other settings if desired).	COMMAND ALTITUDE INDICATOR: Should display reading within ± 00100 of ALT WARN SEL. SETTING.	Deleted
	NOTE • To check warn tone function, perform steps 48.1 of SSGC Preliminary Preparation. • The computer cycles through the self test display routine (TR) during SSGC 2, except at the completion of SSGC 2 when the display register is used to indicate test results.		
14	ALTITUDE WARN SELECTOR: 00000		Deleted

2-7. SSGC 2 PROCEDURE.

This procedure is accomplished by performing the procedures in table 2-3. If a malfunction is discovered, refer to T.O. 1F-106A-2-27-3 for fault isolation procedures.

NOTE

If SSGC 2 is being performed separately, set all switches iaw table 1-1.

Table 2-3. SSGC 2 Procedure

STEP	INSTRUCTION	INDICATION	REMARKS
1	**NOTE** If the ejection seat is not installed, pins 6 and 7 of the seat plug must be jumpered. SSGC 2 will not pass the LO routine if hydraulic pressure is applied. When 796 SELECTOR TEST is set to 2, the computer beings a sequence of events. The indications for step 1 will remain until 796 SELECTOR TEST is set to 3. Therefore, time is not important when checking these indications. [905] POWER: ON [163] FLT MODE: PITCH DAMP OFF-HDG HOLD: HDG HOLD DISP/AUTO MODE: AUTO NAV [083] ANT ELEV: detent [181] RADIUS MILES: 50 [855] EL SCAN: 1 BAR [ACP] Selector: MISSILES ALL [796] SELECTOR TEST: 2 **[083] AUTO SEARCH: Press and release**	**[080] Mode lamp 3: Comes on.** [080] VI WARN: Comes on —— VI WARN: If flashing [080] B-sweep: Receiver test targets appear every 1000 yd [796] FLIGHT: Off —— TEST: On —— ARM AUX: On [Inst panel] VARI RAMP: Comes on —— MAX MANEUVER: Comes on ▯[AVVI] Vertical speed tape: 40000 ft/minute, then to 0 ±50 ft/minute —— Altitude tape: 56400 to 57600 ft —— Altitude scale: 56000 to 58000 ft ▯[AMI] Mach: 1.775 to 1.825 M —— IAS: 400 to 424 kts —— MSM: 1.73 to 1.79 M —— COMMAND KNOTS: 400 to 424 —— COMMAND MACH: 0.4 —— Command Mach marker: Min ○[880] MACH: 1.77 to 1.83 M —— MSM: 1.73 to 1.79 M ○[Altimeter] 56000 to 58000 ft	Incorrect switch position (see table 2-6.1) Armament subsystem in test condition Armament subsystem safe for test Light circuit test On when Mach is 1.23 or more Indicates only while altitude information is changing All air data computer conditions are maintained thru SSGC 5
1.1	[796] GND TEST INTER: Press and release	[080] VI WARN: Goes off —— Steering line: Moves 1 in. in az opposite movement of B-sweep with less than 1/8 in. el movement	Checks output of 017 resolvers. After 2 sec, computer begins LS/LE-1 routines (required time varies dependent on original antenna position)
	NOTE Step 2 must be performed within 10 seconds after 796 GND TEST INTER is pressed or the computer sequence will be improper and some routines will fail.		

Table 2-3. SSGC 2 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
2	[083] Action switch: Press to 2nd detent and release	[080] B-sweep: Jizzled and centered	. . .
	NOTE If the 017 unit is not centered ±1° approx 75 seconds after 796 SELECTOR TEST is set to 2, the LS routine is bypassed and the LE-1 routine begins. Step 3 must be accomplished within 10 seconds after steering dot and reference circle move down and right.		
		[080] E1 marker: Centered	LS routine performed (requires 4 sec)
		[080] B-sweep: Moves right to +16.4°, moves left to -16.4°, moves right to +16.4°, then back to center	LE-1 routine performed (requires approx 100 sec)
		—— E1 marker: Moves up to +16.4°, moves down to -16.4°, moves up to +16.4°	
		—— Steering dot and reference circle: Move up and left	LQ routine performed (requires approx 58 sec). If ejection seat is not installed, seat plug pins 6 and 7 must be jumpered or routine will fail.
		[080] Steering dot and reference circle: Move down and right	
3	**NOTE** Step 4 must be performed within 10 seconds after steering dot and reference circle center.		
	[163] FLT MODE: AUTO	[080] Steering dot and reference circle: Center (after approx 15 sec down and right)	The AFCS portion of the 821 unit is tested when the 163 FLT MODE is in AUTO
		—— Mode lamp 1: Comes on	
		[163] FLT MODE: Drops to ASSIST when steering dot centers	

Table 2-3. SSGC 2 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
4	[163] OFF-ALT HOLD: ALT HOLD	[163] OFF - ALT HOLD: Remains in ALT HOLD for at least 10 sec then drops to OFF	Drops to OFF (down) approx 20 sec after steering dot centers in step 3
		—— FLT MODE: Drops to PITCH DAMP when OFF - ALT HOLD drops to OFF	
		[080] Mode lamp 1: Goes off	**NOTE**
		—— If 296 unit is not installed, short version of LC routine will run for 7 seconds with no cockpit indications other than normal pass/fail indication from FLT SENS indicator. If 296 unit is installed, artificial horizon begins to move in pitch and roll 15 seconds after start of LC routine (requires approximately 170 seconds for successful completion).	A flashing FLT SENS indicator within 6 seconds of start of LC routine indicates an AHRG Test Programmer 3452296 failure. LC routine performed.
		[796] FLT SENS: Comes on	Indicates successful LC routine
		—— RADAR: Comes on	Indicates successful LQ routine
		—— COMP: Comes on	Indicates successful LS/LE-1 routine

NOTE

If the FLT SENS, RADAR, and/or COMP are flashing, failure(s) have occurred in the respective routine. Set 846 DISPLAY REGISTER switch to ON. This displays information stored in computer DRO location 3645. The indication below should be displayed. All lights with a 1 indication should be on. If the light is off, a failure of the routine is indicated. Additional information is stored in DRO locations 3640 and 3601 (LC routine), 3641 (LQ routine), 3642 (LE-1 routine), 3643 (LS routine), and 3644 (LZ routine).

6			5			4			3			2			1		
	LQ complete	LQ pass		LS complete		LS pass			LE-1 complete	LE-1 pass	LE-1 ant. centered	3452296 pass	LC complete	LC pass			
0	1	1	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0

STEP	INSTRUCTION	INDICATION	REMARKS
5	[083] AUTO SEARCH: Press and release	[080] B-sweep: Searches	SSGC 2 complete
	[163] OFF - HDG HOLD: OFF	—— El marker: 4' bar scan pattern	
	[ACP] Selector: VIS IDENT	[ACP] SELECT: Blank	
	[855] EL SCAN: NORM	[796] FLT SENS: On	
		—— COMP: On	
		—— RADAR: On	
		—— TEST: On	
		—— FLIGHT: Off	
		—— ARM AUX: On	
		—— AFCS: Off	796 AFCS is not connected
		WARNING	
		If SSGC 2 is run using AHRG test programmer, ensure that AHRG test programmer is removed and P29601 is connected to J29601 on LH Aft Electrical Equipment Rack (7839890-10).	

2-8. SSGC 3 PROCEDURE.

This procedure is accomplished by performing the procedures in table 2-4. If a malfunction is discovered, refer to T.O. 1F-106A-2-27-3 for fault isolation procedures.

NOTE

If SSGC 3 is being performed separately, set all switches iaw table 1-1. During SSGC 3 the computer cycles through the self test display routine (TR) each cycle.

Table 2-4. SSGC 3 Procedure

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] GRID REFERENCE: 045 [CSC] HDG/PUSH TO SYNC: Press and adjust for 45° on HSI [905] PRESS TO ERECT: Press and release [163] DISP/AUTO MODE: ILS [905] POWER: ON [305] RANGE: 40 SP [796] SELECTOR TEST: 3 [305] NOSE-TAIL: TAIL	[080] VI WARN: Comes on [796] FLIGHT: Off —— TEST: On —— FLT SENS: On —— ARM AUX: On —— AFCS: Off —— COMP: Off —— CADC Fail Lite: ON	See table 2-6.1 Armament subsystem in test condition Armament subsystem safe for test Light circuit test Light circuit test
2	[796] GND TEST INTER: Press and release	[080] PTF: Off	LW routine is performed every 2.4 sec. If a power form fails, PTF comes on
3	[163] DISP/AUTO MODE: ILS [HSI] COURSE SET: Adjust to obtain HSI indication [HSI] CRS: Adjust to obtain HSI indication	[HSI] COURSE: 075 —— Course arrow: 75° [796] COMP: On	. . .
4	[HSI] COURSE SET: Adjust to obtain HSI indication [HSI] CRS: Adjust to obtain HSI indication	[HSI] COURSE: 015 —— Course arrow: 15° [796] COMP: On	. . .
5	[HSI] COURSE SET: Adjust to obtain HSI indication [HSI] CRS: Adjust to obtain HSI indication	[HSI] COURSE: 045 —— Course arrow: 45° [796] COMP: Off	. . .
6	[163] DISP/Auto Mode: DL Min Time	—— B-sweep: Searches, receiver test targets present every 1000 yd to at least 20 miles	

Table 2-4. SSGC 3 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
6 .	[955] HOMING POINT SELECTOR: D [305] RANGE: 40 SP	The cockpit displays for data link depend on the position of the 181 RADIUS MILES, 163 DISP/AUTO MODE, and the dominant mode. The relationship between these factors and the various displays are shown below	. . .

Display	163 DISP/AUTO MODE position	
	DL MIN TIME	DL MAX RNG
DL annunciator	DL	DR
Command Mach	0.825 to 0.875 M	1.725 to 1.775 M
Command Altitude	17000 to 18000	52000 to 53000
Target Altitude	17000 to 18000	52000 to 53000
Command Heading	221 to 229	41 to 49
☐ HSI Target Range		
181 - 50 mi	069 to 071	069 to 071
181 - 200 mi	000	279 to 281
181 - 400 mi	568 to 572	568 to 572
☐ HSI Target Heading	89° to 97°	277° to 285°
☐ HSI Course Deviation Bar		
181 - 50 mi	Right of center	N/A
181 - 200 mi	Center	N/A
181 - 400 mi	Left of center	N/A
☐ HSI To-From Arrow		
181 - 50 mi	Down	Down
181 - 200 mi	Center	N/A
181 - 400 mi	Up	N/A

Table 2-4. SSGC 3 Procedure (Cont)

Display	163 DISP/AUTO MODE position	
	DL MIN TIME	DL MAX RNG
HSI Target Bearing		
181 - 50 mi	221° to 229°	221° to 229°
181 - 200 mi	N/A	N/A
181 - 400 mi	41° to 49°	221° to 229°
181 TACAN annunciator	DL	DR
Interceptor Bug		
181 - 50 mi	34 to 36 mi at 41° to 49°	34 to 36 mi at 41° to 49°
181 - 200 mi	Center	139 to 141 mi at 41° to 49°
181 - 400 mi	284 to 286 mi at 221° to 229°	283 to 287 mi at 41° to 49°
Bug Heading	41° to 49°	41° to 49°
Target Bug		
181 - 50 mi	34 to 36 mi at 221° to 229°	34 to 36 mi at 221° to 229°
181 - 200 mi	Center	139 to 141 mi at 221° to 229°
181 - 400 mi	284 to 286 mi at 41° to 49°	283 to 287 mi at 221° to 229°
Bug Heading	89° to 97°	277° to 285°
Time-to-Go Circle	Full size to zero, then repeats	(Radar dominant) Target Marker Circle goes to 50° upper left, then 50°R at 7/8, then 30°L at 3/4, then 30°R at 5/8, then 20°L at 1/2, than 20°R at 3/8, then 10°L at 1/4, then 10°R at 1/8, then center bottom, then repeats

STEP	INSTRUCTION	INDICATION	REMARKS
7	[ACP] Selector: MISSILES ALL [083] Boresight switch: BORS [163] DISP/AUTO MODE: DL MAX RNG	[080] Firing bar: Steps from 10 miles to 0 in 2 mile steps Mode lamp 3: Comes on.	. . .
8	[163] DISP/AUTO MODE: DL MIN TIME	[080] Firing bar: Steps from 10 miles to 0 in 2 mile steps and decrease from 3 in. long to 1/2 in. long in 1/2 in. steps	. . .

Table 2-4. SSGC 3 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
9	[305] IR: RDR SLVD [083] Boresight switch: NORM/TRACK RDR IR SELECT: Press and release to obtain IR dominant mode [163] DISP/AUTO MODE: DL MAX RNG [083] Auto search: Press and release	[080] Target marker circle: Moves to bottom center, then 50°L at bottom, then 50°R at 1/8, then 30°L at 1/4, then 30°R at 3/8, then 20°L at 1/2, then 20°R at 5/8, then 10°L at 3/4, then 10°R at 7/8 and repeats	Indication will repeat until switch positions are changed
10	[163] DISP/AUTO MODE: DL MIN TIME	[080] Time-to-go circle: Steps from max to min and repeats	
11	Deleted		
12	Deleted		
13	[181] RADIUS MILES: 50 [163] DISP/AUTO MODE: AUTO NAV [405] **PRESET: Local preset channel** [083] RDR IR SELECT: Press and release to obtain radar dominant mode	[181] Interceptor bug: **Moves along approximate true heading of 041° to 049°** from center [HSI] MILES: Increases [796] All lamps (except AFCS and COMP): On	Computer simulating dead reckoning of interceptor SSGC 3 complete

NOTE

In performing this procedure in an F-106B, transfer all controls to rear cockpit and repeat steps 3 thru 13.

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2-9. SSGC 4 PROCEDURE.

This procedure is accomplished by performing the procedures in table 2-5. If a malfunction is discovered, refer to T.O. 1F-106A-2-27-3 for fault isolation procedures.

NOTE

If SSGC 4 is being performed separately, set all switches iaw table 1-1. During SSGC 4 the computer cycles through the self test display routine (TR) at the completion of each computer cycle.

Table 2-5. SSGC 4 Procedure

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [083] RDR IR SELECT: Press and release to obtain radar dominant mode [ACP] Selector: VIS IDENT [305] RANGE: 4SP IR: RDR SLVD [796] SELECTOR TEST: 4	[080] VI WARN: Comes on —— VI WARN: If flashing [796] RADAR: Comes on —— FLT SENS: Comes on —— ARM AUX: Comes on [080] 4 mile light: Comes on —— B-sweep: Receiver test targets appear	Incorrect switch position (see table 2-6.1) 28 v pressure on okay Light circuit test Light circuit test 8 receiver test targets appear with the 8th target at 4 mile range
1.1	[796] GND TEST INTER: Press and release	[080] VI WARN: Goes off [796] COMP: Comes on CADC Fail Lite: ON	Computer in test and [305] CHAFF set to OFF

NOTE

Ensure 019 CHANNEL is at some preset channel. If 019 CHANNEL is set to M, step 2 will fail.

2	[083] Action switch: Press to 2nd detent and hold, lock on to 2nd receiver test target, and release action switch	[080] Range circle: Appears with 1.4 in. diameter —— Range rate gap: 0 —— B-sweep: Moves left —— E1 marker: Moves down —— Steering dot: Drives down and left —— Reference circle: Drives down and left	Steering dot may go off display Movement is 1/4 that of steering dot
3	[019] CHANNEL: M and wait 5 sec	[080] VI WARN: If flashing	LE-3 routine failed
3.1	[083] AUTO SEARCH: Press and release	[080] VI WARN: If on —— VI WARN: If flashing	LE-3 routine passed LE-3 routine failed
4	[019] CHANNEL: Any preset channel [ACP] Selector: MISSILES ALL [305] RDR: HOM NOSE-TAIL: TAIL	[080] Mode lamp 3: Comes on	
5	[083] Action switch: Press to 2nd detent and hold, position range gate so it is not coincident with any target, then release action switch	[080] Firing bar: Appears 2.8 in. long at 4000 yd —— Range gate: Disappears —— Steering dot: Indicates antenna position —— Reference circle: Follows steering dot	Movement is 1/4 that of steering dot
6	[305] RANGE: 16SP	[080] Firing bar: Remains at 4000 yd	. . .
7	[305] NOSE-TAIL: NOSE	[080] Firing bar: Moves to 8000 yd —— Mode lamp 3: Goes off	. . .
8	[305] TUNE: F MIN	[080] Firing bar: Disappears within 3 sec	. . .

Table 2-5. SSGC 4 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
9	[305] TUNE: NORM NOSE-TAIL: TAIL	[080] Firing bar: Appears, 2.8 in. long at 4000 yd	. . .
10	[083] Action switch: Press to 2nd detent and hold, lock on to 12th receiver test target (6 miles) then release action switch	[080] Time-to-go circle: Appears 1.4 in. diameter — Range rate gap: 0 — B-sweep: Moves left — E1 marker: Moves down — Steering dot: Moves down and left to a fixed position — Reference circle: Moves down and left to a fixed position	. . . Movement is 1/4 that of steering dot

Table 2-5. SSGC 4 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
11	[305] RDR: NORM RANGE: 40SP	[080] Display: Unchanged [796] RADAR: On —— TEST: On —— FLT SENS: On —— ARM AUX: On —— COMP: On	. . .
12	[305] RANGE: 16SP CHAFF: ALL [083] Action switch: Press to 2nd detent and hold, lock on to 12th receiver test target left of center and release action switch	[080] Mode lamp 4: Comes on —— B-sweep: Moves to center, then oscillates approx 1/4 in. about the center line [796] COMP: Goes off	VI WARN flashes on and off Indicates CHAFF: ALL
13	[083] Action switch: Press to 2nd detent and hold, lock on to twelfth receiver test target right of center and release action switch	[080] B-sweep: Same as step 12 [796] COMP: off	. . . Indicates CHAFF: ALL
14	[305] CHAFF: OFF	[080] B-sweep: Oscillation stops and sweep moves left —— Steering dot: Moves down and left to a fixed position —— Mode lamp 4: Goes off [796] COMP: Goes on	VI WARN light will flash on and off until steering dot reaches final position Indicates CHAFF: OFF
15	[855] LOBE FREQ: 1, then 2, then 4, then 3	[080] Steering dot: Position may change with each change of 855 LOBE FREQ	Steering dot should remain down and left. Lobe frequency 3 selection sets up the tracking loop gain test. If the test is passed, the VI WARN light will stay on. If the test is failed, the VI WARN light will flash on and off
16	[855] CADJ-NORM: CADJ	[080] B-sweep: Moves slightly towards center —— Steering dot: Moves slightly towards center	As the steering dot begins to center, a steady VI WARN indication (i.e., a passed tracking loop gain test) will change to a flashing indication. The flashing VI WARN indication will continue
17	[083] AUTO SEARCH: Press and release	[855] CADJ-NORM: Drops to NORM [080] Displays: Normal radar dominant search display —— VI WARN: Goes out	. . .
17.1	[305] RDR: MAN IF [083] Action switch: Press to 2nd detent and hold, lock-on to 2nd receiver test target and release action switch.	[080] B-sweep: No AGC action El Marker: Stationary Steering Dot: No movement [080] IF GAIN: Fully CW	. . .

Table 2-5. SSGC 4 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
17.2	[080] IF GAIN: Rotate very slowly CCW (continued rotation will cause loss of lock-on)	[080] AGC is indicated Steering Dot: Moves down and left El Marker: Moves down	B-sweep, E1 marker and Steering dot position will depend on amount of rotation of IF GAIN control
17.3	[083] Auto Search: Press and release. [305] RDR: NORM [080] IF GAIN: Full CW.	[080] Displays: Normal radar Dominant search display.	. . .
18	[083] RDR IR SELECT: Press and release to obtain IR dominant mode	[017] Az position: Centered —— El position: Centered [080] IR range marker: Centered in el and on right side in az —— Az-el dot: Moves in a 4 bar C-scan from 53° left to 53° right	. . .
19	[083] Action switch: Press to 2nd detent and hold, center hand control	[080] Az-el dot: Centered in az and el —— IR range bar: Moves to upper left corner of display	. . .
20	[083] Action switch: Release AUTO SEARCH: Press and release [855] EL SCAN: 2 BAR AZ SCAN: L [083] ANT ELEV: Toward UP to obtain indication	[Headset] Aural tone: Present as a function of target return	The target is located approx 45° left of and 10° up from center
21	[855] IR VOLUME: Vary, then set to a comfortable level	[Headset] Aural tone: Varies in intensity	. . .
22	[855] IR THRESHOLD VIDEO: Adjust slowly ccw to obtain indication	[080] IR target: Becomes smaller [Headset] Aural tone: Remains constant	. . .
23	[855] IR THRESHOLD VIDEO: Fully cw AZ SCAN: B EL SCAN: NORM [083] Action switch: Press to 2nd detent and hold, lock on to IR target, and release action switch	[Headset] Aural tone: Increases in pitch [080] Firing bar: Appears, 2.8 in. in length —— Expanded C-scan: Present for approx 8.5 sec, then replaced by B-sweep at 45° left —— IR range bar: Positions at upper left corner of display [796] COMP: On	. . .
24	Deleted		. . .

Table 2-5. SSGC 4 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
25	**NOTE** If 796 COMP fails to come on, perform the 896 Alignment Procedure iaw para 13-3c and repeat step 23. If 796 COMP light still does not come on, replace IR head.		
	[083] RDR IR EXP-LC/PUR: While observing indication, press to RDR IR EXP, hold, and then release	[080] Expanded C-scan: Replaces B-sweep while switch is held, then replaced by B-sweep when switch is released	. . .
26	[083] Action switch: Press to 1st detent and hold Hand control: Move forward and back Action switch: Release	[080] Range gate: Appears, moves in range when hand control is moved, and disappears when action switch is released	If range gate coincides with a target, the range rate scale lights will come on. If 083 RDR IR SELECT is pressed and released at this time, the system will crossmode to radar dominant
27	[305] IR: RDR SCAN	[080] B-sweep: Searches from approx 47.5° left to 47.5° right	. . .

Table 2-5. SSGC 4 Procedure (Cont)

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STEP	INSTRUCTION	INDICATION	REMARKS
28	[305] RANGE: 16SP [083] Action switch: Press to 2nd detent and hold	[080] . . .	. . .
29	[083] Hand control: Move to spotlight IR target Action switch: Release	[080] Expanded C-scan: Appears, replaced after approx 8.5 sec by B-sweep searching in az — Firing bar: 2.8 in. in length	The 8.5 sec delay can be shortened at any time by pressing 083 RDR IR EXP-LC/PUR to RDR IR EXP and releasing
30	[083] RDR IR SELECT: Press and release	[080] Displays: Do not change	System does not cross-mode to radar dominant
31	[305] IR: RDR SLVD	[080] B-sweep: Moves to 45° left and becomes stationary	. . .
32	[083] Action switch: Press to 1st detent and hold, lock on to any radar target, and release action switch	[080] Displays: Change to radar dominant attack display	System crossmodes to radar dominant by locking on to valid radar target
33	[083] AUTO SEARCH: Press and release	SSGC 4 complete	. . .

2-10. SSGC 5 PROCEDURE.

This procedure is accomplished by performing the procedures in table 2-6. If a malfunction is discovered, refer to T.O. 1F-106A-2-27-3 for fault isolation procedures.

NOTE

If SSGC 5 is being performed separately, set all switches iaw table 1-1. During SSGC 5 the computer cycles through the self-test display routine (TR) at the completion of each computer cycle.

Table 2-6. SSGC 5 Procedure

STEP	INSTRUCTION	INDICATION	REMARKS
1	**NOTE** Do not attempt to run SSGC 5 with either missile simulators or WSEMs loaded. The pull test (which checks the computer portion of the missile antenna positioning circuits) cannot run with rails loaded. Therefore, the check will fail. Prior to performing SSGC 5, the TACAN system should be operating and the 181 TACAN annunciator should indicate OK.		
	[905] POWER: ON [ACP] Selector: VIS IDENT [796] SELECTOR TEST: 5 [305] IR: RDR SLVD	[080] VI WARN: Comes on — VI WARN: If flashing [767] IR head: Extends if SSGC 4 was performed [796] TEST: Comes on — FLT SENS: Comes on — CADC Fail Lite: ON	Incorrect switch position (see table 2-6.1) If 305 IR is set to STOW, IR head will not extend Armament subsystem safe for test T_i (impact temperature) valid
1.1	[796] GND TEST INTER: Press and release	[080] VI WARN: Goes off	
2	[305] TUNE: F MIN NOSE-TAIL: NOSE [083] Action switch: Press to 2nd detent and hold	[080] B-sweep: 2 to 4 mile noise band at 4 miles	. . .
3	[083] Action switch: Release [ACP] Selector: MISSILES ALL	[080] B-sweep: Noise band disappears Mode lamp 3: Comes on. [796] COMP: Comes on	B-sweep intensity is same as noise band in step 2 CADC check and computer pull check passed

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Table 2-6. SSGC 5 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
4	[305] TUNE: NORM [083] ANT ELEV: Detent Boresight switch: BORS [305] NOSE-TAIL: TAIL for approx 5 sec, then NOSE	[017] Az position: Centered —— El position: -4.5° [796] COMP: Remains on	The 083 ANT ELEV in detent is necessary for proper 017 el position indication 305 NOSE-TAIL positioning directs computer to sense antenna boresight mode position Boresight check passed
5	[305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain IR dominant mode	[080] Expanded C-scan: Appears	. . .
6	[083] Boresight switch: NORM/TRACK	[080] Steering dot: Appears —— Reference circle: Appears	. . .
7	[083] AUTO SEARCH: Press and release	[080] Displays: Normal IR dominant search display	. . .
8	[083] RDR IR Select: Press and release to obtain radar dominant mode. ACTION SWITCH: Press to second detent and hold. Position range gate at approximately 15 miles and release.	 [080] Time circle appears and shrinks to half size in approximately 10 seconds and remains.	
8a	[083] RDR IR Exp. LC/PUR SW: Press to LC/PUR and release	[080] Normal pursuit display and VI Warn appears.	
9	**NOTE** Step 10 must be performed within 10 seconds after time-to-go circle begins to shrink. [083] AUTO Search: Press and release. RDR IR Exp. LC/PUR SW: Press to LC/PUR and release. [305] NOSE/TAIL: TAIL. [083] ACTION SW: Press to second detent and hold, position range gate at approx 15 miles, and release action switch	[080] Time-to-go circle: Appears and begins to shrink —— Range rate gap: 950 to 1200 —— Steering dot: Centered —— Reference circle: Centered —— E1 marker: Centers —— B-sweep: Centers	The time-to-go circle should shrink and the fire signal "X" should appear in 36 to 40 seconds

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Table 2-6. SSGC 5 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
10	[083] Trigger: Press to 2nd detent and hold	[080] Mode lamp 6: Comes on —— B-sweep: Jizzle disappears at C-time [796] RADAR: Comes on at C-time [181] TACAN: BV at C-time plus approx 6 sec [080] Fire signal "X": Appears, replaced by pullout "8" [796] COMP: On ARM AUX: On	. . . Only if TACAN is being received

NOTE

If the 796 COMP does not remain on, refer to paragraph 6-9 and monitor DRO location 3776. The indication below should be displayed. All lights with a 1 indication should be on. If the light is off, a failure of the routine is indicated.

Table 2-6. SSGC 5 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
10 (Cont)	SSGC 5 is running* Pull test passed Pull test ran Boresight passed Boresight ran CADC passed CADC ran 1 0 0 | 0 0 0 | 0 0 1 | 1 0 0 | 0 0 1 | 1 1 1 6 5 4 3 2 1 *Bit 18 is off if ACP selector is set to VIS IDENT after SSGC 5 is completed		
11	[083] Trigger: Release AUTO SEARCH: Press and release Action switch: Press to 2nd detent and hold, position range gate at approx 15 miles, and release action switch	[080] Mode lamp 6: Goes off —— Time-to-go circle: Appears and shrinks —— B-sweep: Jizzle does not disappear [181] TACAN: OK [080] Abort "A": Appears [796] RADAR: Off —— ARM AUX: Off	. . .
12	[305] RANGE: 4SP [083] AUTO SEARCH: Press and release Action switch: Press to 2nd detent and hold, position range gate at 4 miles and release action switch Trigger: Press to 2nd detent and hold	[080] Mode lamp 6: Comes on —— Time-to-go circle: Appears; shrinks, and is replaced by abort "A", which is replaced by pullout "8" when range gate is at 2400 to 4800 yd	. . .
13	[083] Trigger: Release	[080] Mode lamp 6: Goes off	. . .
14	**NOTE** Read step 14 prior to performing the instructions. An action before an elapsed time interval is involved. Step 15 must be performed within 10 seconds after step 14. [305] RANGE: 16SP [083] AUTO SEARCH: Press and release Action switch: Press to 2nd detent and hold, position range gate at 6 miles and release action switch RDR IR EXP-LC/PUR: Press to LC/PUR and release within 10 sec after 080 abort "A" appears	[080] Time-to-go circle: Appears and shrinks, replaced by abort "A" which is replaced by firing bar when RDR IR EXP-LC/PUR is pressed	. . .
15	**NOTE** Step 16 must be performed within 35 seconds after the fire signal "X" appears in step 15. [083] Trigger: Press to 2nd detent and hold	[080] Firing bar: Disappears Fire signal "X": Appears	. . .

Table 2-6. SSGC 5 Procedure (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
16	[083] Trigger: Release AUTO SEARCH: Press and release RDR IR EXP-LC/PUR: Press to LC/PUR and release	[080] Mode lamp 6: Goes off —— B-sweep: Searches	. . .
17	[955] HOMING POINT SELECTOR: Select a point less than 300 miles from interceptor [163] DISP/AUTO MODE: AUTO NAV	0 [AVVI] COMMAND ALTITUDE 40,000 w/o Tanks 37,000 w/ Tanks 0 [980] COMMAND ALTITUDE: 40,000 w/o Tanks 37,000 w/ Tanks [080] Steering line: Appears, deflects down and left or right —— Time-to-offset circle: Appears.	Selected homing point should be as near 300 miles as possible
18	[181] RADIUS MILES: 400 [955] HOMING POINT SELECTOR: Select a point greater than 360 miles from interceptor	[080] Time-to-offset circle: Disappears	. . .
19	[163] DISP/AUTO MODE: MAN NAV	[080] Navigation display: Disappears	. . .
20	[163] DISP/AUTO MODE: AUTO NAV	[080] Navigation display: Appears	. . .
21	[ACP] Selector: VIS IDENT	SSGC 5 complete	

Table 2-6.1 SSGC Input Error Indications

COMMAND* ALTITUDE	DIGITAL INPUT**		SSGC INITIAL CONDITIONS***
00000	D160	TACAN Data (MSB)	
00700	D161	TACAN Data	
01400	D162	TACAN Data	
02100	D163	TACAN Data (LSB)	
02800	D106	VI Selected	1 in SSGC 1
03500	D114	Man Pur	
04200	D122	Armed	0 in SSGC 1
04900	D130	SPL WPN or Gun Selected	1 in SSGC 6
05600	D101	Trigger	
06300	D109	AIM-4F Selected	
07000	D117	Missiles All Selected	
07700	D125	Confirm	
08400	D133	Nav Mode 1	0 in SSGC 1, 1 in SSGC 3
09100	D134	Nav Mode 2	0 in SSGC 1, 1 in SSGC 3
09800	D135	Map Scale 1	1 in SSGC 1, 0 in SSGC 2
10500	D136	Map Scale 2	0 in SSGC 1, 1 in SSGC 2
11200	D165	Self Test (DI Enter)	
11900	D166	Self Test (B9)	
12600	D167	Self Test (B8)	
13300	D168	Self Test (B7)	
14000	D107	System Test A	
14700	D115	System Test B	
15400	D123	TACAN Valid	
16100	D131	Computer Test	
16800	D102	Auto Engage	
17500	D110	Gun Aboard	
18200	D118	COD 1 Snapshoot Mode	
18900	D126	Nose	1 in SSGC 1
19600	D137	Data Link Address Select	
20300	D138	Data Link Address Select	
21000	D139	Data Link Address Select	

Table 2-6.1 SSGC Input Error Indications (Cont)

COMMAND* ALTITUDE	DIGITAL INPUT**		SSGC INITIAL CONDITIONS***
21700	D140	Data Link Address Select	
22400	D170	Self-Test (B4)	
23100	D171	Self-Test (B3)	
23800	D172	Self-Test (B2)	
24500	D173	Self-Test (B1)	
25200	D108	TACAN Station Select	1 in SSGC 1
2590C	D116	Homing Point	
26600	D124	Data Link Station Select	
27300	D132	AFCS Uncage	
28000	D103	IR Track	
28700	D111	Assist Engage	
29400	D119	Alt Hold/ILS Valid	
30100	D127	Heading Hold	
30800	D141	AGE Operation Only	
31500	D142	Binary/BCD Display	
32200	D143	Spare	
32900	D144	Drum Pressure	
33600	D180	Self-Test	
34300	D181	Self-Test	
35000	D182	Self-Test (B6)	
35700	D183	Self-Test (B5)	
36400	D176	Homing Point Select	
37100	D177	Homing Point Select	
37800	D178	Homing Point Select	
38500	D175	Homing Point Select	
39200	D104	System Test	
39900	D112	Computer Interrogate	
40600	D120	COD 2 Snapshoot Mode	
41300	D128	Data Link Address Select	
42000	D151	TACAN Station Select	0 in SSGC 1
42700	D152	TACAN Station Select	1 in SSGC 1
43400	D153	TACAN Station Select	1 in SSGC 1
44100	D150	TACAN Station Select	0 in SSGC 1
44800	D185	Tanks Installed	
45500	D186	Assist OK	
46200	D187	Chaff	
46900	D188	Gun Sight Selected (Snapshoot)	
47600	D146	Trim Down	
48300	D147	Trim Right	
49000	D148	Trim Left	
49700	D145	Trim Up	
50400	D105	Not Search	0 in SSGC 2
51100	D113	ROT	
51800	D121	DROT	
52500	D129	ATOT	
53200	D156	Data Link Station Select	
53900	D157	Data Link Station Select	
54600	D158	Data Link Station Select	
55300	D155	Data Link Station Select	
64400	A9	Interceptor Angle of Attack	SSGC 1
65100	E24	Cosine of Interceptor Heading Angle	SSGC 1
65800	E23	Sine of Interceptor Heading Angle	SSGC 1
66500	A6N	Sea Level Pressure	SSGC 1

*Command altitude readout is inoperative when 163 unit DISP/AUTO MODE is in ILS or ILS APCH.

**When more than one input is incorrect, only the first failed input is displayed by the command altitude readout. The TR routine, paragraph 6-9, may be used in conjunction with table 2-8.1 to determine the status of all inputs.

***Conditions listed must be met to prevent VI WARN light from flashing.

See pg 27 Sub 41

2-11. SSGC 6 PROCEDURE.

This procedure is accomplished by performing the procedures in table 2-7. If a malfunction is discovered, refer to T.O. 1F-106A-2-27-3 for fault isolation procedures.

NOTE

If SSGC 6 is being performed separately, set all switches iaw table 1-1. During SSGC 6 the computer cycles through the self-test display routine (TR) at the completion of each computer cycle.

Table 2-7. SSGC 6 Procedure

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [ACP] Selector: SPL WPN [796] SELECTOR TEST: 6 [163] DISP/AUTO MODE: AUTO NAV [955] HOMING POINT SELECTOR: Any point greater than 360 miles from interceptor	[080] VI WARN: Comes on —— VI WARN: If flashing [796] TEST: Comes on ▯[AMI] Mach tape: 0.77 to 0.80 M —— MACH: 0.77 to 0.80 M —— Airspeed tape: 271 to 285 kts —— KNOTS: 271 to 285 ◯[880] Mach: 0.77 to 0.80 M [Inst panel] MAX MANEUVER: Goes off ◯[Altimeter] 32200 to 33800 ft ▯[AVVI] Altitude tape: 32200 to 33800 ft —— COMMAND: 0 [796] FLT SENS: Comes on —— COMP: Off CADC Fail Lite: ON	Incorrect switch position (see table 2-6.1) Armament subsystem safe for test T_i (impact temperature) valid
1.1	[796] GND TEST INTER: Press and release	[080] VI WARN: Goes off —— Steering line: Deflects 1/2 in. up from center	. . .
2	[083] Action switch: Press to 2nd detent and hold, position range gate at 16 miles and release action switch, note time between release of action switch and appearance of pullout "8" Trigger: Press to 2nd detent and hold when time-to-go circle begins to shrink	[080] Time-to-go circle: Appears and begins to shrink —— Range rate gap: 950 to 1200 —— B-sweep: Centers —— El marker: Centers —— Steering dot: Centered —— Reference circle: Centered —— Mode lamp 6: Comes on —— Time-to-go circle: Shrinks to zero and replaced by pullout "8" 27 to 35 sec after action switch is released [796] ARM AUX: On —— COMP: On	. . . CADC check passed
3	[083] Trigger: Release [ACP] Selector: VIS IDENT [083] AUTO SEARCH: Press and release	SSGC 6 complete	. . .

see pg 38 Sup 41

2-12. SSGC 7 PROCEDURES.

This procedure is accomplished by performing the procedures in table 2-8. If a malfunction is discovered, refer to T.O. 1F-106A-2-27-3 for fault isolation procedures.

NOTE

During SSGC 7 the computer cycles through the self-test display routine (TR) at the completion of each computer cycle.

Table 2-8. SSGC 7 Procedure

STEP	INSTRUCTION	INDICATION	REMARKS
1	[796] SELECTOR TEST: 7	[796] FLIGHT: Off ___ AFCS: Off ___ RADAR: On ___ COMP: On ___ TEST: On ___ FLT SENS: On ___ ARM AUX: On	Computer runs LW routine continuously
2	[796] SELECTOR TEST: OFF [ACP] Selector: MISSILES ALL	[796] FLIGHT: Comes on ___ AFCS: Off ___ RADAR: Goes off ___ COMP: Goes off ___ TEST: Goes off ___ FLT SENS: Goes off ___ ARM AUX: Goes off [AVVI] Altitude tape: Local altitude [AMI] Mach tape: 0.2 M ___ MACH: 0.20 ___ **Airspeed tape: 35 to 65 kts** ___ **KNOTS: 35 to 65** **CADC Fail Lite: OFF** [880] Mach: 0.2 M [Altimeter] Local altitude	. . . AVVI BARO or 259 BARO SET must be set to current barometric pressure
3	[083] RDR IR SELECT: Press and release to obtain IR dominant mode [305] IR: STOW	[767] IR head: Retracts and system crossmodes to radar dominant mode	. . .
4	[096] S1: 6 S2: G [083] Action switch: Press to 2nd detent and hold, position range gate over target	[096] SELF TEST METER: Indication does not change	. . .
5	[080] IF GAIN: Adjust	[080] B-sweep: Intensity changes [096] SELF TEST METER: Indication changes	. . .
6	[083] Action switch: Release AUTO SEARCH: Press and release [ACP] Selector: VIS IDENT [096] S1: 1 S2: A [905] POWER: OFF	SSGC 7 complete	. . .

Table 2-8.1. SSGC Input Check Status Word Structure

140 DIGITAL INPUTS SWITCHES	STATUS WORD	BIT-NUMBER																	
		18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
000	WORD 1	0	0	D160	D161	D162	D163	D106	D114	D122	D130	D101	D109	D117	D125	D133	D134	D135	D136
001	WORD 2	0	0	D165	D166	D167	D168	D107	D115	D123	D131	D102	D110	D118	D126	D137	D138	D139	D140
002	WORD 3	0	0	D170	D171	D172	D173	D108	D116	D124	D132	D103	D111	D119	D127	D141	D142	D143	D144
003	WORD 4	0	0	D180	D181	D182	D183	D176	D177	D178	D175	D104	D112	D120	D128	D151	D152	D153	D150
004	WORD 5	0	0	D185	D186	D187	D188	D146	D147	D148	D145	D105	D113	D121	D129	D156	D157	D158	D155
005	WORD 6	0	0	AI 16	AI 15	AI 14	AI 13	AI 12	AI 11	AI 10	AI 9	AI 8	AI 7	AI 6	AI 5	AI 4	AI 3	AI 2	AI 1

NOTES:

1. Status words 1 thru 5 contain failed digital inputs and status word 6 contains failed analog inputs.
2. If bit is on, a failure is indicated.
3. The current configuration of analog input checks is used only in SSGC 1. The four analog inputs checked are A6N(AI1), E23(AI2), E24(AI3), and A9(AI4).

CHAPTER 3. RADAR SUBSYSTEM

SECTION I. GENERAL

3-1. INTRODUCTION.

3-1a. This chapter contains check and adjustment procedures for the radar subsystem. These procedures are performed after a unit has been replaced or when a malfunction is suspected.

3-1b. Each procedure provides the purpose of the procedure, equipment required, equipment hookup, preliminary procedure, probable faulty unit, and references to functional diagrams and fault isolation procedures, as well as the check or adjustment procedure.

3-1c. Table 3-1 lists the radar subsystem units and the checks required when these units are replaced.

3-2. TEST CONSIDERATIONS.

NOTE

Wherever the 080 unit panel controls are indicated, they now apply to the 080 unit, 52800 unit (ODU), or the Filter and Control Assembly and Information panel, depending upon the system configuration.

3-2a. The purpose of the procedures in this chapter is to provide for checking and adjusting of the radar subsystem. To verify proper radar subsystem operation, prescribed checks and adjustments are performed.

CAUTION

Use the lowest setting of the 080 ATTACK INTENSITY control required to obtain a minimum acceptable viewing level while observing the attack display. Excessive attack intensity will cause damage to the MMST.

NOTE

The 080 ON and OFF switches are bypassed when the aircraft canopy is closed or when the canopy lock lever (F-106A only) is in the locked position.

3-2b. When the 080 displays are required, the 080 must be turned on by pressing and releasing the 080 ON switch. After a 35 ±10 second time-in period the 080 will present the search display. If the attack display is also desired, press and hold the 080 ON switch for at least 3 seconds. The attack display turns off automatically after a 3 ±1 minute interval. To obtain another interval, the 080 ON switch must be pressed and held for at least 3 seconds.

3-3. CHECKS AND ADJUSTMENTS AFTER UNIT REPLACEMENT.

3-3a. Replacement or reinstallation of certain units requires performance of check or adjustment procedures described in this chapter. Due to interaction between units, it may be necessary to perform a number of check or adjustment procedures when only one unit has been replaced.

3-3b. Refer to table 3-1 whenever a unit of the radar subsystem is replaced to determine which checks or adjustments are required.

Table 3-1. Checks and Adjustments After Unit Replacement (Radar)

CHECK OR ADJUSTMENT	PARA NO.	003	017	020	026	041	045	063	065	080	082	083	084	095	103	106	107	141	195	206	223	241	295	346	389	395	484	506	523	541	595	641	663	741	841	855	866	Maggie	Mod Board	Receiver Barrel	TR Tube
741 Low Voltage Power Supply Check	3-4b																																	x								
017 Transmitter Signal Attenuation Check	3-4c		x																																							
017 Transmitted to Difference Attenuation Check	3-4d		x																																							
065 Preliminary Check and Magnetron Filament Voltage Scheduling Relay Check	3-4e																																					x	x		
065 Modulator Primary Supply and Magnetron Spectrum Check	3-4f																																					x	x		
065 Transmitter Power Output Check	3-4g																										x											x				
003 PRF Jitter Check	3-4h	x																																							
841 20 KC Ref Check	3-4i																																		x						
841 Tuning Range Check	3-4j																																		x	x					
841 High and Low Frequency Limit Check	3-4k								x																										x						
841 Tuning Rate Check	3-4l								x																										x						
866 Missile Mode Frequency Check	3-4m																																				x				
866 Paramp Band Check	3-4n																																				x				
541 Jamming Analog Threshold Check	3-4o																													x											
045 Compressor and 107 Absolute Valve Check	3-4p						x										x																									
Radar High Pressure Leakage and Interlock Check	3-4q		x			X		x				X				X										X												X	X	X	X
841 Det Bal Adjustment	3-5a																																		x						
841 AC Ampl Adjustment	3-5b																																		x						
866 AT 1 Adjustment	3-5c																																				x				

Table 3-1. Checks and Adjustments After Unit Replacement (Radar) (Cont)

CHECK OR ADJUSTMENT	PARA NO.	003	017	020	026	041	045	063	065	080	082	083	084	095	103	106	107	141	195	206	223	241	295	346	389	395	484	506	523	541	595	641	663	741	841	855	866	Maggie	Mod Board	Receiver Barrel	TR Tube
026 Paramp/RT Power Supply Check	3-6a				X																																				
017 Antenna Waveguide Shutter Check	3-6b		X																																						
017 Variable Post Check	3-6c		x																																						
017 Sum Signal Attenuation Check	3-6d		x																																						
065 TR Tube Keep Alive Voltage Check	3-6e																																							x	x
065 Receiver Recovery and Local Oscillator Anode Voltage Droop Check	3-6f																															X								x	
641 Preset Error Check	3-6g																															X			x						
641 AFC Loop Check	3-6h																															X									
Noise Figure Measurement Check	3-6i		x						X																							X			x						
Alternate Noise Figure Measurement Check	3-6j		x						X																							X			x						
065 Image Rejection Mixer Check	3-6k																															X								x	
541 Scram Ramp Step and Slope Check	3-6l																													X											
084 Variable AFC Coupling Adjustment	3-7a												X																												
065 AT452 Crystal Current Adjustment	3-7b																																								x	
641 30 MC Adjust	3-7c																															X									
080 IF Gain Control Switching Logic Check	3-8a			X						X																															
020 Dynamic AGC Check	3-8b			X																																					
063 Sniffer Gate Check	3-8c							x																																	
095 AGC Video Gain Adjustment	3-9a			X										x																											

Table 3-1. Checks and Adjustments After Unit Replacement (Radar) (Cont)

CHECK OR ADJUSTMENT	PARA NO.	003	017	020	026	041	045	063	065	080	082	083	084	095	103	106	107	141	195	206	223	241	295	346	389	395	484	506	523	541	595	641	663	741	841	855	866	Maggie	Mod Board	Receiver Barrel	TR Tube
020 Video Gain Adjustment	3-9b			x																																					
020 Norm Rest Potential Adjustment	3-9c			x																			x																		
295 Norm Gain and Paramp Gain Adjustments	3-9d																						x																		
020 AGC Delay Adjustment	3-9e			x																																				
020 Hom Rest Potential Adjustment	3-9f			x																																				
095 On Target Adjustment	3-9g													x	x																									
020 ATOT Sensitivity Adjustment	3-9h			x																																				
295 Sniff Threshold Adjustment	3-9i						x																x																		
195 V6 Bias Adjustment	3-9j																		x																						
095 Edge Angle Delay Adjustment	3-9k			x										x																											
Receiver Sensitivity Check	3-10a		x																																					x	
Display Video Sensitivity Check	3-10b																						x																	x	
082 Video Gain Check	3-10c										x																														
195 Video Gain Check	3-10d									x									x																						
Auto Search Pattern Check	3-11a																						x																		
Manual Search Pattern Check	3-11b																						x																		
Antenna Supersearch Check	3-11c																						x															x			
Elevation Scan Overlap Check	3-11d		x																				x																		
241 Az Bal Adjustment	3-12b		x																				x																		
241 Search Width Adjustment	3-12c		x																				x																		

Table 3-1. Checks and Adjustments After Unit Replacement (Radar) (Cont)

CHECK OR ADJUSTMENT	PARA NO.	003	017	020	026	041	045	063	065	080	082	083	084	095	103	106	107	141	195	206	223	241	295	346	389	395	484	506	523	541	595	641	663	741	841	855	866	Maggie Mod Board	Receiver Barrel	TR Tube
241 Az Cont Rate Adjustment	3-12d																					x																		
017 Resolver Adjustment	3-12e		x																																				
Lockon Sensitivity and Range Track Check	3-13a																						x												x				
Reposition Gate, Video Check	3-13b			x											x																								
Reposition Gate, Track Check	3-13c			x											x																								
103 Drift Adjust	3-14a													x	x																								
103 Short Range Cal Adjustment	3-14b														x																								
103 Slope Adjust	3-14c														x																								
017 Azimuth and Elevation Difference Attenuation Check	3-15a		x																																				
017 Isolation Check	3-15b		x																																				
141 Reference Voltage Check	3-15c																	x																					
017 CADJ Gain Check	3-15d		x																																				
Edge Angle Bias Roll Compensation Check	3-15e																	x										x											
Selective Scan Roll Compensation Check	3-15f														x																								
Selective Scan Operational Check	3-15g														x																								
Steering Compensation Check	3-15h																	x																					
141 75 Volt Power Supply Check	3-15i																	x																					
017 Modulator Heater Current Check	3-15j		x																																				
Tracking Error Adjustment	3-16a																	x																					

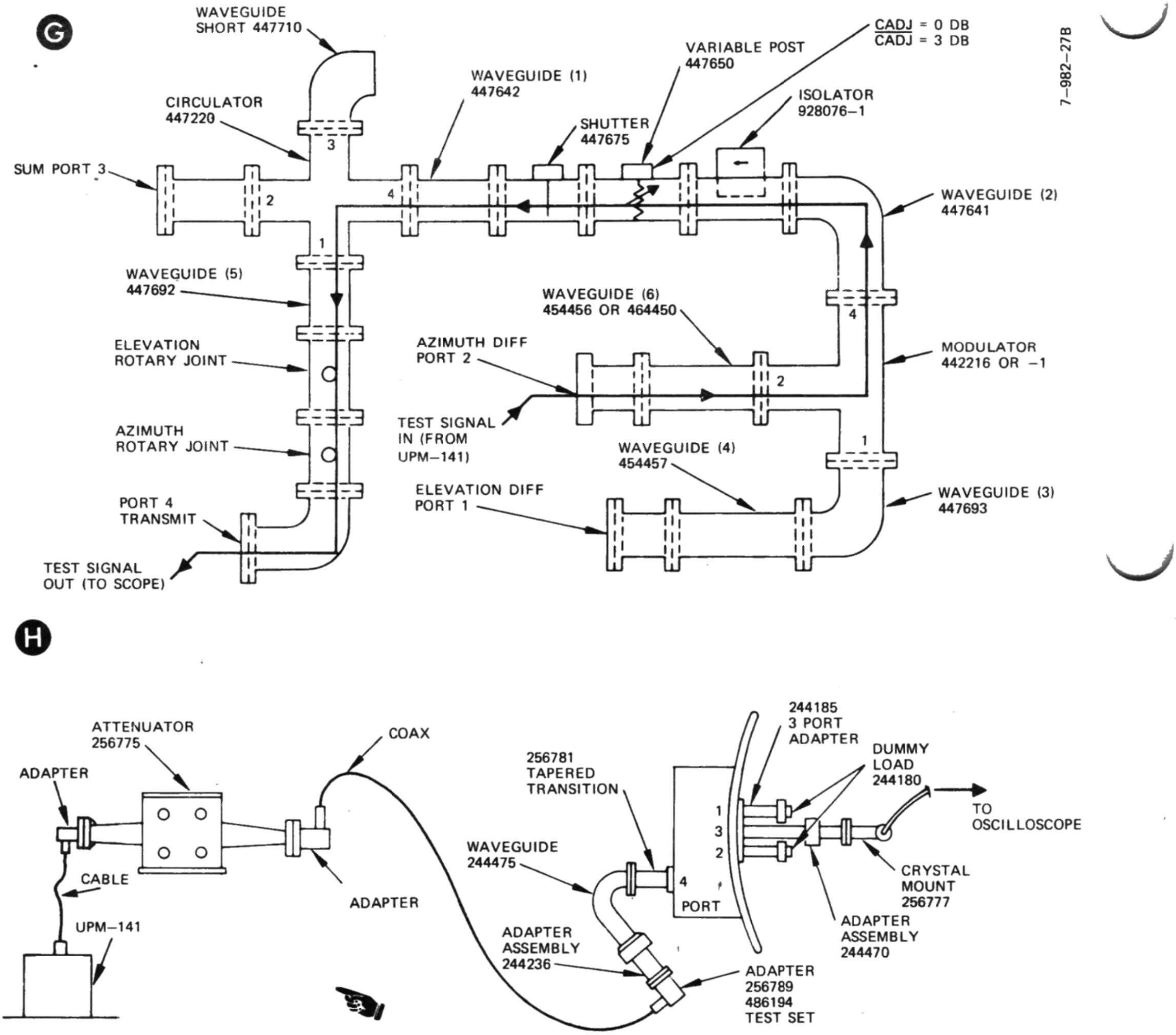


Figure 3-1. Antenna Waveguide Signal Flow and Test Setup Diagram (Sheet 4 of 5)

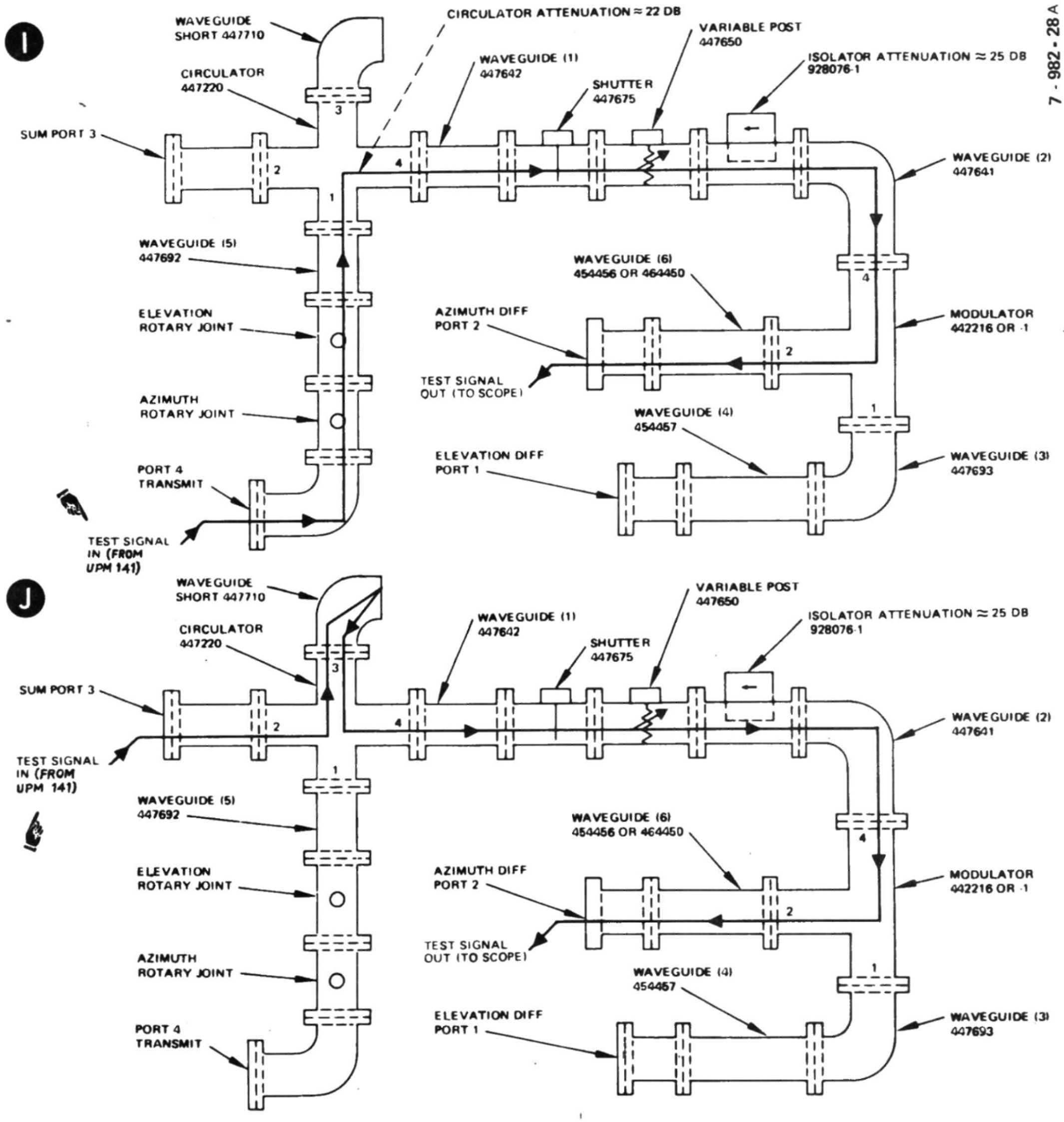


Figure 3-1. Antenna Waveguide Signal Flow and Test Setup Diagram (Sheet 5 of 5)

elevation and azimuth rotary joints, and out port 4 transmit (rear of antenna). The allowable insertion loss in search shall not exceed 1.8 db. If the insertion loss exceeds 1.8 db, a failure has occurred in the sum waveguide, the circulator, waveguide (1), the shutter assembly, or in the azimuth and elevation rotary joints.

CAUTION

When inducing the r-f signal into the front of the antenna, the operator should be careful not to cause flexing of the coax cable when rotating the antenna. Flexing may cause false insertion loss indications or damage to the coax cable. It is not necessary to be cautious while inserting the r-f signal into the rear (port 4) of the antenna. The coax cables should be kept in good repair. A degraded coax cable will give erroneous indications indicating false insertion losses.

EQUIPMENT REQUIRED

1. UPM-141
2. 486180 Test Set
3. Oscilloscope

EQUIPMENT HOOKUP

Remove radome iaw para 10-4m and pin antenna in azimuth and elevation. Refer to H, fig 3-1 (for reference only) when making the following 486180 test set, UPM-141, and oscilloscope connections. Remove antenna feedhorn and install 244185 three-port adapter. Connect 256781 tapered transition to port 4 (transmit) on rear of antenna; connect 244475 curved waveguide to 256781 tapered transition. Connect UPM-141 via cable to adapter on 256775 precision attenuator. Connect 256775 precision attenuator adapter via coax to 256789 adapter. Connect 256789 adapter to 244236 adapter. Connect 244236 adapter to 244475 curved waveguide on rear of antenna. Connect 244180 dummy loads to ports 1 and 2 of 244185 three-port adapter. Connect 256777 crystal detector assembly via 244470 adapter to port 3 of 244185 three-port adapter. Set 256775 precision attenuator dial to zero. **Set UPM-141 for CW Signal Generator operation in accordance with paragraph 11-3k. at a frequency near center of radar transmitter range and select max attenuation on RF POWER OUTPUT-DBM switches. Connect oscilloscope to 256777 crystal mount assembly. Set up oscilloscope to indicate d-c voltage; set POLARITY to NORMAL; adjust vertical channel gain VOLTS/CM (coarse and fine) for lowest (most sensitive) setting.**

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017

REFERENCES

FUNCTIONAL DIAGRAM

Transmitting (T.O. 27-5/Fig. 3-4)

FAULT ISOLATION

Radar Transmitter Operation (T.O. 27-3/Fig. 3-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [UPM-141] RF POWER OUTPUT-DBM Select to obtain indication [Oscilloscope] Voltage: Record vertical deflection in cm	[Oscilloscope) Voltage: Full scale deflection from d-c (0 cm) reference level	. . .
2	**NOTE** During the following steps ensure that coaxial cabling is not degraded or does not become flexed giving the appearance of a faulty rotary joint.		
	[017] Antenna: Remove az locking pin and slowly swing antenna through full az range [Oscilloscope] Voltage: Record lowest dip of d-c level [017] Antenna: Insert az locking pin and remove el locking pin. Slowly swing antenna through full el range [Oscilloscope] Voltage: Record lowest dip of d-c level [017] Antenna: Insert el locking pin [486180] 244236 adapter assembly: Disconnect 244470 adapter assembly: Disconnect 244236 and 244470 adapter assemblies: Connect together using 244479 adapter coupling (See D, fig 3-1 for reference only) Precision attenuator dial: Adjust to obtain oscilloscope indication Precision attenuator dial: Record indication	[Oscilloscope] Voltage: Vertical deflection is the same as recorded in step 1 [486180] Precision attenuator dial: Less than or equal to 1.0 db	
3	[486180] Precision attenuator dial: Adjust to obtain oscilloscope indication Precision attenuator dial: Record indication	[Oscilloscope] Voltage: Vertical deflection is the same as lowest dip recorded in step 2 az movement [486180] Precision attenuator dial: Should not exceed 1.0 db (record indication obtained)	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
4 .	[486180] Precision attenuator dial: Adjust to obtain oscilloscope indication Precision attenuator dial: Record indication	[Oscilloscope] Voltage: Vertical deflection is the same as lowest dip in step 2 el movement [486180] Precision attenuator dial: Should not exceed 1.0 db	. . .
5	**NOTE** Perform the equipment hookup as indicated at the beginning of this paragraph except set UPM-141 for CW SIG GEN output near the high end of frequency band in accordance with paragraph 11-3k.		
	Perform steps 1 thru 4	Indications are as obtained in steps 1 thru 4	. . .
6	**NOTE** Perform the equipment hookup as indicated at the beginning of this paragraph except set UPM-141 for CW SIG GEN output near the low end of frequency band in accordance with paragraph 11-3k.		
	Perform steps 1 thru 4	Indications are as obtained in steps 1 thru 4	. . .
7	[486180] 244470 and 244236 adapter assemblies: Disconnect 244479 adapter coupling from adapter assemblies 244470 adapter assembly: Connect to curved waveguide on rear of antenna 244236 adapter assembly: Connect to port 3 on three-port adapter (see B, fig 3-1) and repeat steps 1 thru 4	Indications are as obtained in steps 1 thru 4 except 486180 precision attenuator dial shall not exceed 1.8 db in steps 2 thru 4	. . .
8	**NOTE** Perform the equipment hookup as indicated at the beginning of this paragraph except set UPM-141 for CW SIG GEN output near high end of frequency band in accordance with paragraph 11-3k.		
	Perform steps 1 thru 4	Indications are as obtained in steps 1 thru 4 except 486180 precision attenuator dial shall not exceed 1.8 db in steps 2 thru 4	. . .
9	**NOTE** Perform the equipment hookup as indicated at the beginning of this paragraph except set UPM-141 for CW SIG GEN output near low end of frequency band in accordance with paragraph 11-3k.		

STEP	INSTRUCTION	INDICATION	REMARKS
9 (cont)	Perform steps 1 thru 4	Indications are as obtained in steps 1 thru 4 except 486180 precision attenuator dial shall not exceed 1.8 db in steps 2 thru 4	. . .
10	[905] POWER: OFF [017] Locking pins: Remove [Test equipment] Disconnect [017] Reassemble and perform Radar High Pressure Leakage and Interlock Check iaw para. 3-4q [Radome] Reinstall iaw para. 10-4m	Check complete	. . .

3-4d. 017 TRANSMITTED TO DIFFERENCE ATTENUATION CHECK. The purpose of this procedure is to check the isolation between the transmit channel and the difference channels. The isolation is required to prevent the transmitted signal from passing through the modulator and out the difference ports during the track mode of operation which would cause the transmitted beam to be modulated at the lobing frequency. Modulation of the transmitted signal by the modulator would provide the lobing frequency to the target and enhance the jamming capability of the target.

NOTE

If it is desired to isolate a malfunction to a waveguide component, it is suggested that the technician perform 017 sum signal attenuation check in paragraph 3-6d, 017 Azimuth and Elevation Difference Attenuation Check in paragraph 3-15a, then perform 017 Transmitter Signal Attenuation Check in paragraph 3-4c, then perform the procedure in this paragraph, and finally perform 017 Isolation Check in paragraph 3-15b. Each procedure is, however, independent of the others and can be performed alone if desired. It is not necessary that the radar system be operational, if the procedure does not require that the shutter or variable post be energized.

In this check (I, fig. 3-1), the r-f signal from the UPM-141 is inserted into port 4 (transmit) on the rear of the antenna and passes through the azimuth and elevation rotary joints, waveguide (5), into port 1 and out port 4 of the circulator (dummy load is attached to port 3 of three-port adapter). The attenuation between port 1 and port 4 of the circulator is approx 22 db. The signal then passes through waveguide (1), the shutter assembly (which is open), variable post (which is in the CADJ position), the isolator (the attenuation through the isolator is approx 25 db), waveguide (2) into port 4 and out port 2 of the modulator, through waveguide (6), and out azimuth difference port 2. The attenuation through the described path must exceed 37 db. If the attenuation is below the specified limit and all previous checks have passed, the probable fault is the circulator or the isolator.

CAUTION

When inducing the r-f signal into the front end of the antenna, the operator should be careful to not cause flexing of the coax cable when rotating the antenna. Flexing may cause false insertion loss indications or damage to the coax cable. It is not necessary to be as cautious while inserting the r-f signal into the rear (port 4) of the antenna. The coax cables should be kept in good repair. A degraded coax cable will give erroneous indications indicating false insertion losses.

EQUIPMENT REQUIRED

1. UPM-141
2. 486180 test set
3. Oscilloscope

EQUIPMENT HOOKUP

Remove radome iaw para 10-4m and pin antenna in az and el. Refer to H, fig 3-1 (for reference only) when making the following 486180 test set, UPM-141, and oscilloscope connections. Remove antenna feedhorn and install 244185 three-port adapter. Connect 256781 tapered transition to port 4 (transmit) on rear of antenna; connect 244475 curved waveguide to 256781 tapered transition. Connect UPM-141 via cable to adapter on precision attenuator. Connect 256775 precision attenuator adapter via coax to 256789 adapter. Connect 256789 adapter to 244236 adapter. Connect 244236 adapter to 244475 curved waveguide on rear of antenna. Connect 244180 dummy loads to ports 1 and 3 of 244185 three-port adapter. Connect 256777 crystal detector assembly via 244470 adapter to port 2 of 244185 three-port adapter. Set 486180 precision attenuator dial to zero. Set UPM-141 for CW SIG GEN in accordance with paragraph 11-3k. at frequency near center of radar transmitter range and select min attenuation on RF POWER OUTPUT-DBM switches. Connect oscilloscope to 256777 crystal mount assembly. Set up oscilloscope to indicate d-c voltage; set POLARITY to NORMAL; adjust vertical channel gain VOLTS/CM (coarse and fine) for lowest (most sensitive) setting.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017

REFERENCES

FUNCTIONAL DIAGRAM

Transmitting
(T.O. 27-5/Fig. 3-4)

FAULT ISOLATION

Radar Transmitter
Operation (T.O. 27-3/Fig. 3-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action switch: Press to 2nd detent and release [196] SHUTTER: ANT/RCVR [855[CADJ-NORM: CADJ [Oscilloscope] VOLTS/CM: Adjust for readable level [Oscilloscope] Voltage: Record vertical deflection in cm [486180] 244236 adapter: Disconnect from 244475 curved waveguide 244470 adapter: Disconnect from port 2 of 244185 three-port adapter 244236 and 244470 adapters: Connect together using 244479 adapter coupling (D, fig 3-1) [486180] Precision attenuator dial: Adjust to obtain oscilloscope indication Precision attenuator dial: Record indication	[Oscilloscope] Voltage: Vertical deflection is the same as recorded deflection [486180] Precision attenuator dial: Greater than 37.0 db	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
2	**NOTE** Perform the equipment hookup as indicated at the beginning of this paragraph except set UPM-141 for CW SIG GEN output near the low end of the frequency band in accordance with paragraph 11-3k.		
	Perform step 1	Indications are the same as obtained in step 1	. . .
3	**NOTE** Perform the equipment hookup as indicated at the beginning of this paragraph except set UPM-141 for CW SIG GEN output near the high end of frequency band in accordance with paragraph 11-3k.		
	Perform step 1	Indications are the same as obtained in step 1	. . .
4	[905] POWER: OFF [196] SHUTTER: NORM [017] Locking pins: Remove [Test equipment] Disconnect [017] Reassemble and perform Radar High Pressure Leakage and Interlock Check iaw para 3-4q [Radome] Reinstall iaw para 10-4m	Check complete	. . .

3-4e. 065 PRELIMINARY CHECK AND MAGNETRON FILAMENT VOLTAGE SCHEDULING RELAY CHECK. The purpose of this procedure is to check the maggie current and crystal current in both long and short pulse operation

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

Mod board

Receiver barrel

REFERENCES

FUNCTIONAL DIAGRAM

Transmitting (T.O. 27-5/Fig. 3-4)

Receiving (T.O. 27-5/Fig. 3-5)

FAULT ISOLATION

Radar Transmitter Operation (T.O. 27-3/Fig. 3-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40 LP [083] AUTO SEARCH: Press and release [096] S1: 3 S2: A	[096] SELF TEST METER: 2.0 to 9.5 units	Checks crystal current No. 1. Full scale is 2 ma.
2	[096] S2: B	[096] SELF TEST METER: 2.0 to 9.5 units	Checks crystal current No. 2. Full scale is 2 ma.
3	[096] S2: C	[096] SELF TEST METER: 2.0 to 9.5 units	Checks crystal current No. 3. Full scale is 2 ma.
4	[096] S2: D	[096] SELF TEST METER: 2.0 to 9.5 units	Checks crystal current No. 4 Full scale is 2 ma.
5	[096] S2: E	[096] SELF TEST METER: 0 units	. . .
6	[096] S2: F	[096] SELF TEST METER: 0 units	. . .
7	[096] S2: G	[096] SELF TEST METER: Steady indication	This is a check of receiver noise level. Full scale is 100 ma.
8	[065] S3: 9 MAG FIL I [196] MOD TEST: Up (on)	[065] MOD TEST METER: 0 units	
9	[096] S2: E	[096] SELF TEST METER: 5 units	This is a check of maggie current. Full scale is 1 ma
10	[096] S2: F	[096] SELF TEST METER: 5 units	This is a check of modulator current. Full scale is 1 ma
11	[305] RANGE: 16SP	[065] MOD TEST METER: 6.5 ±2.0 units	. . .
12	[196] MOD TEST: Down (off) [096] S1: 1 S2: A [065] S3: OFF [905] POWER: OFF	Check complete	. . .

3-4f. 065 MODULATOR PRIMARY SUPPLY AND MAGNETRON SPECTRUM CHECK. The purpose of this procedure is to check the magnetron current and to check for overall stable operation of the magnetron.

EQUIPMENT REQUIRED

1. Multimeter
2. Spectrum analyzer

EQUIPMENT HOOKUP

Connect spectrum analyzer to 484 J48401. Connect multimeter to 841 XMTR REF and SIGNAL RETURN

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-4a

PROBABLE FAULTY UNIT

Maggie

Mod board

REFERENCES

FUNCTIONAL DIAGRAM

Transmitting (T.O. 27-5/Fig. 3-4)

FAULT ISOLATION

Radar Transmitter Operation (T.O. 27-3/Fig. 3-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40LP TUNE: SNIFF [196] MOD TEST: Up (on) [063] S1 SNIFFER SELF TEST: Press and hold [065] S3: 10/MAG I	[065] MOD TEST METER: Indicates between 5.4 and 6.5 as transmitter tunes from limit to limit [Spectrum analyzer] Display: Satisfactory stable operation within a few minutes	If 065 MOD TEST METER indicates greater than 6.5, proceed to step 2. If magnetron spectrum is satisfactory but 065 MOD TEST METER indicates less than 5.4, proceed to step 3. If indication is between 5.4 and 6.5, proceed to step 4
2	[065] MODULATOR PRI SUPPLY SW4, SW5, and SW6: Reduce setting in 5 volt steps	[065] MOD TEST METER: Indicates between 5.4 and 6.5 [Spectrum analyzer] Display: Satisfactory, stable operation within a few minutes	. . .
3	[065] MODULATOR PRI SUPPLY SW4, SW5, and SW6: Increase setting in 5 volt steps	[065] MOD TEST METER: Indicates between 5.4 and 6.5 [Spectrum analyzer] Display: Indicates satisfactory, stable operation at each step	. . .
4	[063] S1 SNIFFER SELF TEST: Release [841] Self test switch: MAN SLOW FREQ SET: Slowly adjust cw to obtain indication	[Multimeter] D-c voltage: +4.0 v	. . .
5	**NOTE** Spectrum analysis may be very difficult due to hydraulic servo jitter. A better display may be obtained with hydraulics off, but this limits analysis to transmitter center frequency. In steps 6 and 8, examine spectrum at any particular point where 065 MOD TEST METER indication is erratic. When examining the spectrum display at these points, set spectrum analyzer frequency to the appropriate level.		

Table 3-1. Checks and Adjustments After Unit Replacement (Radar) (Cont)

CHECK OR ADJUSTMENT	PARA NO.	003	017	020	026	041	045	063	065	080	082	083	084	095	103	106	107	141	195	206	223	241	295	346	389	395	484	506	523	541	595	641	663	741	841	855	866	Maggie	Mod Board	Receiver Barrel	TR Tube	52450	52800
Tracking Loop Adjustment	3-16b		x			x										x				x								x															
141 Mod Current R52 Adjustment	3-16c																	x																											
141 Lobing Frequency Adjustment	3-16d																	x																											
017 Gyro Crosstalk Adjustment	3-16e		x																									x														•			
141 Dither Freq R4 Adjustment	3-16g		x															x																											
506 Az and El Adjustments	3-16h		x															x										x																	
Edge Angle Bias Test (LB)	3-16i																											x																	
Indicator Display Check	3-17a								x												x				x				x															
Pursuit Firing Bar Check	3-17b							x													x				x				x															
223 Collision Warning Check	3-17c																				x																							
Track Operational Check	3-17d		x															x																											
SnapShoot System Check	3-17e																																										x	x
52800 Check	3-17f																																											x
SnapShoot Yaw Rate Check	3-17g																																										x	
223 Time Circle Scale Factor Adjustment	3-18b																				x																							
523 Time Circle Phase Adjustment	3-18c																												x															
523 Ref Circle Phase Adjustment	3-18d																												x															
395 $\dot{R}$ Zero Adjustment and $\dot{R}$ Scale Factor Adjustment	3-18e																									x																		
395 $\dot{R}$ Gap Width Adjustment	3-18f																									x																		
395 Hor Ampl Gain Control, Hor Ampl Ctr Cont, Vert Ampl Gain Control, and Vert Ampl Ctr Cont Adjustments	3-18g																									x																		

STEP	INSTRUCTION	INDICATION	REMARKS
5 (cont)	[Spectrum Analyzer] Frequency: Set to appropriate level Display: Observe	[Spectrum Analyzer] Display: Does not contain short or missing lines, ragged envelope or excessively large side bands	If display is incorrect, replace maggie
6	[841] FREQ SET: Slowly adjust ccw to obtain indication	[Multimeter] D-c voltage: 0 vdc	. . .
7	[Spectrum Analyzer] Frequency: Set to appropriate level Display: Observe	[Spectrum Analyzer] Display: Does not contain short or missing lines, ragged envelope or excessively large side bands	If display is incorrect, replace maggie
8	[841] FREQ SET: Slowly adjust ccw to obtain indication	[Multimeter] D-c voltage: -4.0 v	. . .
9	[Spectrum Analyzer] Frequency: Set to appropriate level Display: Observe	[Spectrum Analyzer] Display: Does not contain short or missing lines, ragged envelope or excessively large side bands	If display is incorrect, replace maggie
10	[Spectrum Analyzer] Display: Observe [841] DITHER ADJ: Adjust, if necessary, to obtain indication. If loss of side lobe minima is evident, slowly adjust 841 DITHER ADJ ccw until spectrum side lobes are clearly visible. If horizontal movement of spectrum is evident, slowly adjust 841 DITHER ADJ cw until horizontal movement ceases. Do not adjust further since an increase will cause loss of spectrum side lobes	[Spectrum Analyzer] Display: No loss of side lobe minima or horizontal movement of spectrum	. . .
11	[065] MODULATOR PRI SUPPLY SW4, SW5, and SW6: Increase to 5 volt step higher than setting in step 1, 2, or 3	[Spectrum Analyzer] Display: Stable and satisfactory in less than 10 minutes	If transmitter goes to reduced power, set 196 MOD TEST to off (down) then up (on). If spectrum does not display satisfactory and stable operation within 10 minutes, it is an indication that maggie is nearing the end of its life and replacement of maggie is recommended

STEP	INSTRUCTION	INDICATION	REMARKS
12	[065] MODULATOR PRI SUPPLY SW4, SW5, and SW6: Return to original setting as obtained in step 1, 2, or 3 [305] TUNE: NORM [841] Self test switch: OFF [196] MOD TEST: Down (off) [905] POWER: OFF [065] S3: OFF [Test equipment] Disconnect	Check complete	. . .

3-4g. 065 TRANSMITTER POWER OUTPUT CHECK. The purpose of this procedure is to check for proper transmitter power output. This check can be performed using either the UPM-141 or the HP 431 B power meter and a multimeter. The UPM-141 measures the transmitter power output in terms of peak power values and the HP 431 B measures the transmitter power output in terms of average power values.

EQUIPMENT REQUIRED

1. UPM-141
2. Or HP 431 B power meter and multimeter

EQUIPMENT HOOKUP

Connect UPM-141 RF IN/OUT (J7) to J48401. Set UPM-141 to measure power and frequency in accordance with paragraph 11-3f. Or, if using power meter, connect x-band 20 db attenuator in series with HP478A thermistor mount. Use UG-565/A adapter to connect 20 db attenuator to 484J48401. Set power meter range to +5 DBM. Set power meter POWER to AC. Zero meter using coarse and vernier ZERO adjustments. Set RES to 200 ohm position. Connect multimeter to 841 XMTR REF and SIGNAL RETURN.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

484

Maggie

REFERENCES

FUNCTIONAL DIAGRAM

Transmitting
(T.O. 27-5/Fig. 3-4)

FAULT ISOLATION

Radar Transmitter

Operation (T.O. 27-3/Fig. 3-4)

NOTE

484 directional coupler is calibrated to measure transmitter power output at high, medium, and low frequencies. These values are stenciled on the directional coupler. Power output can be measured between these frequencies by using linear extrapolation.

Accuracy of the UPM-141 is ±1.0 dbm. If check fails (or is within the 81 to 82 dbm tolerance limit), perform the check a second time using the HP 431 B power meter. If the check does not pass in either case, perform 065 Preliminary Check and Magnetron Spectrum Check iaw para 3-4f.

When using the UPM-141, perform steps 1 thru 7. When using the HP 431 B power meter, perform steps 8 thru 11.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40LP [196] MOD TEST: Up (on) [841] Self test switch: MAN SLOW FREQ SET: Adjust to obtain indication	[UPM-141] Digital display: Indicates high frequency limit iaw MA-1 classified information codes (T.O. 27.6) —— FREQ LOCK: Comes on	. . .
2	[UPM-141] MEASUREMENT SELECT: RF PWR	[UPM-141] MEASUREMENT (M1): Value on upper scale greater than 82 dbm when added to cable and 484 unit attenuation	. . .
3	[UPM-141] MEASUREMENT SELECT: RDR FREQ (MHZ) [841] FREQ SET: Adjust to obtain indication	[UPM-141] Digital display: Indicates center frequency iaw MA-1 classified information codes (T.O. 27-6) —— FREQ LOCK: Comes on	. . .
4	[UPM-141] MEASUREMENT SELECT: RF PWR	[UPM-141] MEASUREMENT (M1): Value on upper scale greater than 82 dbm when added to cable and 484 unit attenuation	. . .
5	[UPM-141] MEASUREMENT SELECT: RDR FREQ (MHZ) [841] FREQ SET: Adjust to obtain indication	[UPM-141] Digital display: Indicates low frequency limit iaw MA-1 classified information codes (T.O. 27-6) —— FREQ LOCK: Comes on	. . .
6	[UPM-141] MEASUREMENT SELECT: RF PWR	[UPM-141] MEASUREMENT (M1): Value on upper scale greater than 82 dbm when added to cable and 484 unit attenuation	. . .
7	[905] POWER: OFF [305] RANGE: 16SP [196] MOD TEST: Down (off) [841] Self test switch: OFF [Test equipment] Disconnect	Check complete	. . .
8	**NOTE** Five db greater than 1 mw indicates zero (full scale) on +5 dbm scale of power meter. If meter indicates -1.8 dbm on +5 dbm range, power level is 5 - 1.8 or +3.2 dbm.		
	[905] POWER: RADAR STBY [305] RANGE: 40LP [196] MOD TEST: Up (on) [841] Self test switch: MAN SLOW FREQ SET: Slowly adjust cw to obtain multimeter indication	[Multimeter] D-c voltage: +4.0 v [Power meter] Power: Greater than 52 dbm above 1 mw when 484 directional coupler and fixed attenuator db are added	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
9	[841] FREQ SET: Slowly adjust ccw to obtain multimeter indication	[Multimeter] D-c voltage: 0 vdc [Power meter] Power: Greater than 52 dbm above 1 mw when 484 directional coupler and fixed attenuator db are added	. . .
10	[841] FREQ SET: Slowly adjust ccw to obtain multimeter indication	[Multimeter] D-c voltage: -4.0 v [Power meter] Power: Greater than 52 dbm above 1 mw when 484 directional coupler and fixed attenuator db are added	. . .

Table 3-1. Checks and Adjustments After Unit Replacement (Radar) (Cont)

CHECK OR ADJUSTMENT	PARA NO.	005	017	020	026	041	045	063	065	080	082	083	084	095	103	106	107	141	195	206	223	241	295	346	389	395	484	506	523	541	595	641	663	741	841	855	866	Maggie	Mod Board	Receiver Barrel	TR Tube	52450
595 Horiz Attack Center, Horiz Attack Gain, Vert Attack Deflection Center, and Vert Attack Deflection Gain Adjustments	3-18h																														x												
52450 Vert Bias Vert Gain Horiz Bias Horiz Gain Size	3-18i																																									x
Jizzle Check	3-19a	x																	x																							
El Marker Check	3-19b											x										x							x													
389 Sweep Centering and Sweep Length Adjustments	3-20a								–																x					–												
195 Az Sw Center and Az Sw Gain Adjustments	3-20b																		x																							
195 Range Gate Am. Adjustment	3-20c																		x																							
080 Unit Adjustments	3-20d								x																																	
595 Search Azimuth Center and Search Azimuth Gain Adjustments	3-20e																														x											
595 Range Sweep Center and Range Sweep Length Adjustment	3-20f																														x											
IR Video Sensitivity Check	4-5a																																x								
IR Acquisition and Lockon Sensitivity Check	4-5b											x										x											x									
663 Tone Null and 040 Aural Tone Balance Adjustments	4-6																																x							x	
Automatic Search Pattern Checks	4-7b																					x											x							x	

Table 3-1. Checks and Adjustments After Unit Replacement (Radar) (Cont)

CHECK OR ADJUSTMENT	PARA NO.	003	017	020	026	041	045	063	065	080	082	083	084	095	103	106	107	141	195	206	223	241	295	346	389	395	484	506	523	541	595	641	663	741	841	855	866	Maggie	Mod Board	Receiver Barrel	TR Tube
Manual Search Check	4-7c											X										x											X								
Search Pattern Stabilization Check	4-7d																							x																		
Supersearch Check	4-7e																					x																				
767 Search Rate Check	4-7f																					x																				
Search Pattern Overlap Check	4-7g																																x								
663 El Steps Adj, Vert Center, and ϵ_s Gain Adjustment	4-8a																																x								
663 Int Adjustment	4-8b																																x								
663 Video Amp Adjustment	4-8c																																x								
595 IR Gain and IR Center Adjustments	4-8d																														x										
Expanded Sweep Presentation Check	4-11																																x								
663 FIR Threshold Adjustment	4-12b																																x								
LS-2 Routine	6-28		x																			x																				
LS Routine	6-29		x									x										x																				
LQ Routine	6-30																	x																								
LE-1 Routine	6-31		x		x												x			x																						
LE-2 Routine	6-31.1		x		x												x			x																						
LE-3 Routine	6-32															x																										
LR Routine	6-33																x	x	x																								

SECTION II. CHECKS AND ADJUSTMENTS

3-4. TRANSMITTER CHECKS.

3-4a. RAPID TUNE HYDRAULIC POWER SUPPLY CHECK. The purpose of this procedure is to check the hydraulic fluid level and the hydraulic pressure of the rapid tune hydraulic power supply.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

RTM hydraulic pump

REFERENCES

FUNCTIONAL DIAGRAM

Transmitting (T.O. 27-5/Fig.3-4)

FAULT ISOLATION

Radar Transmitter

Operation (T.O. 27-3/Fig. 3-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [NWW] RAPID TUNE MAGNETRON GND OPER: Center (off) [RH engine access door] Hydraulic fluid level indicator: Note position	[RH engine access door] Pressure gage: 1180 to 1220 psig	If pressure is not as specified, perform the hydraulic purging procedure iaw T.O. 1F-106A-2-3
2	[NWW] RAPID TUNE MAGNETRON GND OPER: Up (test)	[RH engine access door] Hydraulic fluid level indicator: Movement from the position noted in step 1 is 3/8 in. max —— Pressure gage: 1800 to 2200 psig	If hydraulic fluid level indicator movement is greater than 3/8 in., perform rapid tune magnetron purging and bleeding procedures iaw T.O. 1F-106A-2-3
3	[NWW] RAPID TUNE MAGNETRON GND OPER: Down (normal)	Check complete	. . .

3-4b. 741 LOW VOLTAGE POWER SUPPLY CHECK. The purpose of this procedure is to check the voltage output and the noise level of the 741 low voltage power supply.

EQUIPMENT REQUIRED	EQUIPMENT HOOKUP	PRELIMINARY PROCEDURE
1. Multimeter	Connect multimeter to 741 TP1	Table 1-1
2. Oscilloscope	+25 VDC and TP2 GND	

PROBABLE FAULTY UNIT

741

REFERENCES

FUNCTIONAL DIAGRAM	FAULT ISOLATION
RT/PA (T.O. 27-5/Fig. 3-9)	Jam Avoidance and RTM (T.O. 27-3/Fig. 3-11)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY	[Multimeter] D-c voltage: +24.25 to +25.75 v	. . .
2	[Multimeter] Leads: Connect to 741 TP3 -25 VDC and TP2 GND	[Multimeter] D-c voltage: -24.25 to -25.75 v	. . .
3	[Multimeter] Leads: Disconnect [Oscilloscope] Leads: Connect to 741 TP1 +25 VDC and TP2 GND	[Oscilloscope] Noise level: Does not exceed 25 mv	. . .
4	[Oscilloscope] Leads: Connect to 741 TP3 -25 VDC and TP2 GND	[Oscilloscope] Noise level: Does not exceed 25 mv	. . .
5	[905] POWER: OFF [Oscilloscope] Leads: Disconnect	Check complete	. . .

3-4c. 017 TRANSMITTER SIGNAL ATTENUATION CHECK. The purpose of this procedure is to check the insertion losses in the transmit channel of the antenna. If the insertion losses are greater than the specified limits, arcing or loss of transmitted energy may occur. If this occurs the radar transmitter may go into reduced power or power off.

NOTE

If it is desired to isolate a malfunction to a waveguide component, it is suggested that the technician perform 017 Sum Signal Attenuation Check in paragraph 3-6d, 017 Azimuth and Elevation Difference Attenuation Check in paragraph 3-15a, the procedure in this paragraph, 017 Transmitted to Difference Attenuation Check in paragraph 3-4d, and 017 Isolation Check in paragraph 3-15b. Each procedure is, however, independent of the others and can be performed alone if desired. It is not necessary that the radar system be operational if the procedure does not require that the shutter or variable post be energized.

In this check (F, fig. 3-1), the r-f signal from the UPM-141 is inserted into port 4 (transmit) on the rear of the antenna. This r-f signal passes through transmit port (4) waveguide, the azimuth and elevation rotary joints, waveguide (5), into port 1 and out port 2 of the circulator, and out sum port 3. The allowable insertion loss in this test shall not exceed 1.0 db. If the insertion loss in search exceeds 1.0 db, a failure has occurred in the azimuth or elevation rotary joints or in the circulator.

In search (A, fig. 3-1), the r-f signal from the UPM-141 is inserted into sum port 3 on the antenna. This r-f signal passes through the sum port waveguide into port 2 and out port 3 of the circulator. Port 3 has a waveguide short that reflects the signal back into the circulator and out port 4 of the circulator. The signal passes through waveguide (1) to the shutter assembly. In the search mode, the shutter is closed and reflects the signal back through waveguide (1) into port 4 and out port 1 of the circulator, through waveguide (5), the

7-982-110A

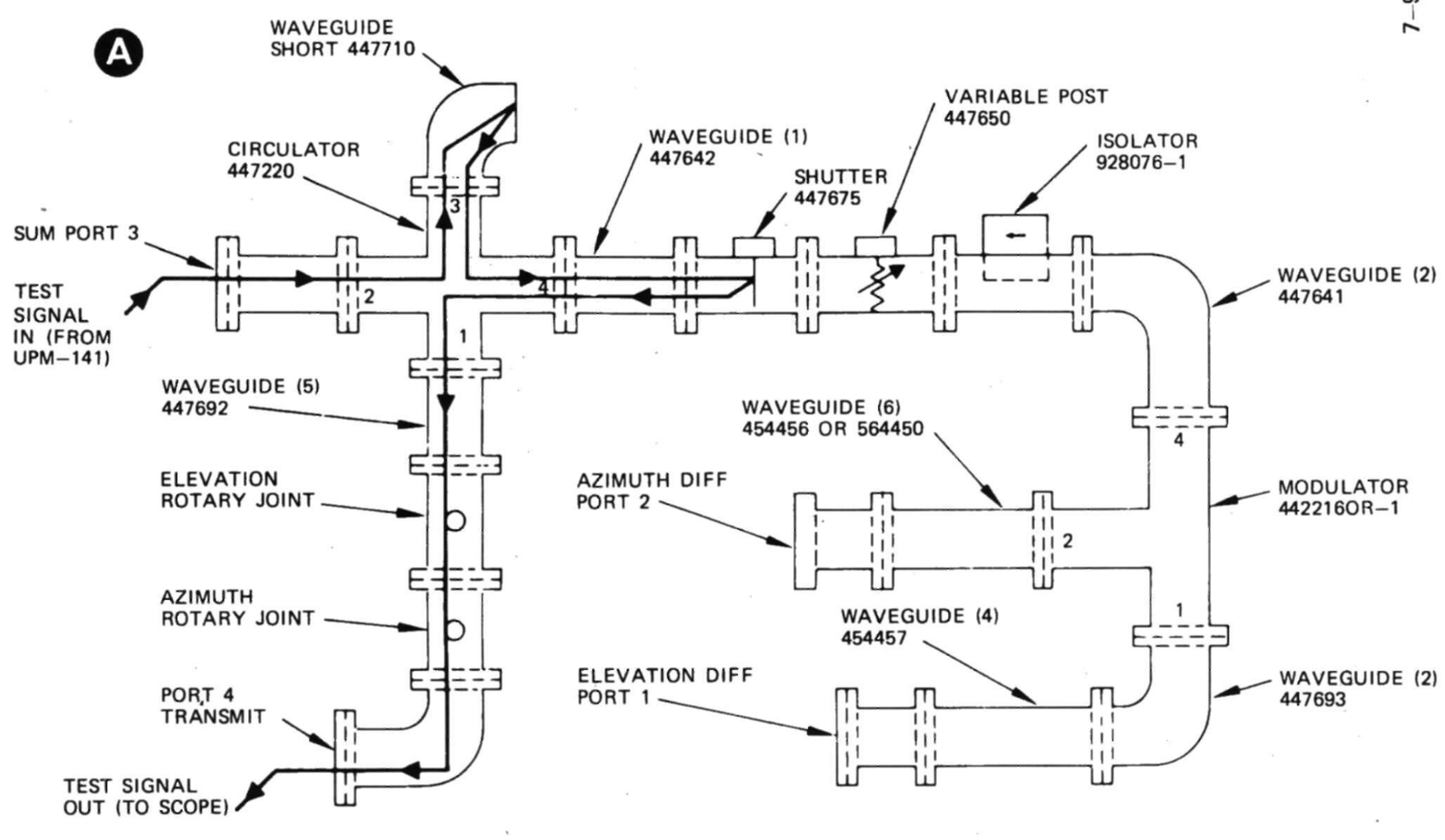


Figure 3-1. Antenna Waveguide Signal Flow and Test Setup Diagram (Sheet 1 of 5)

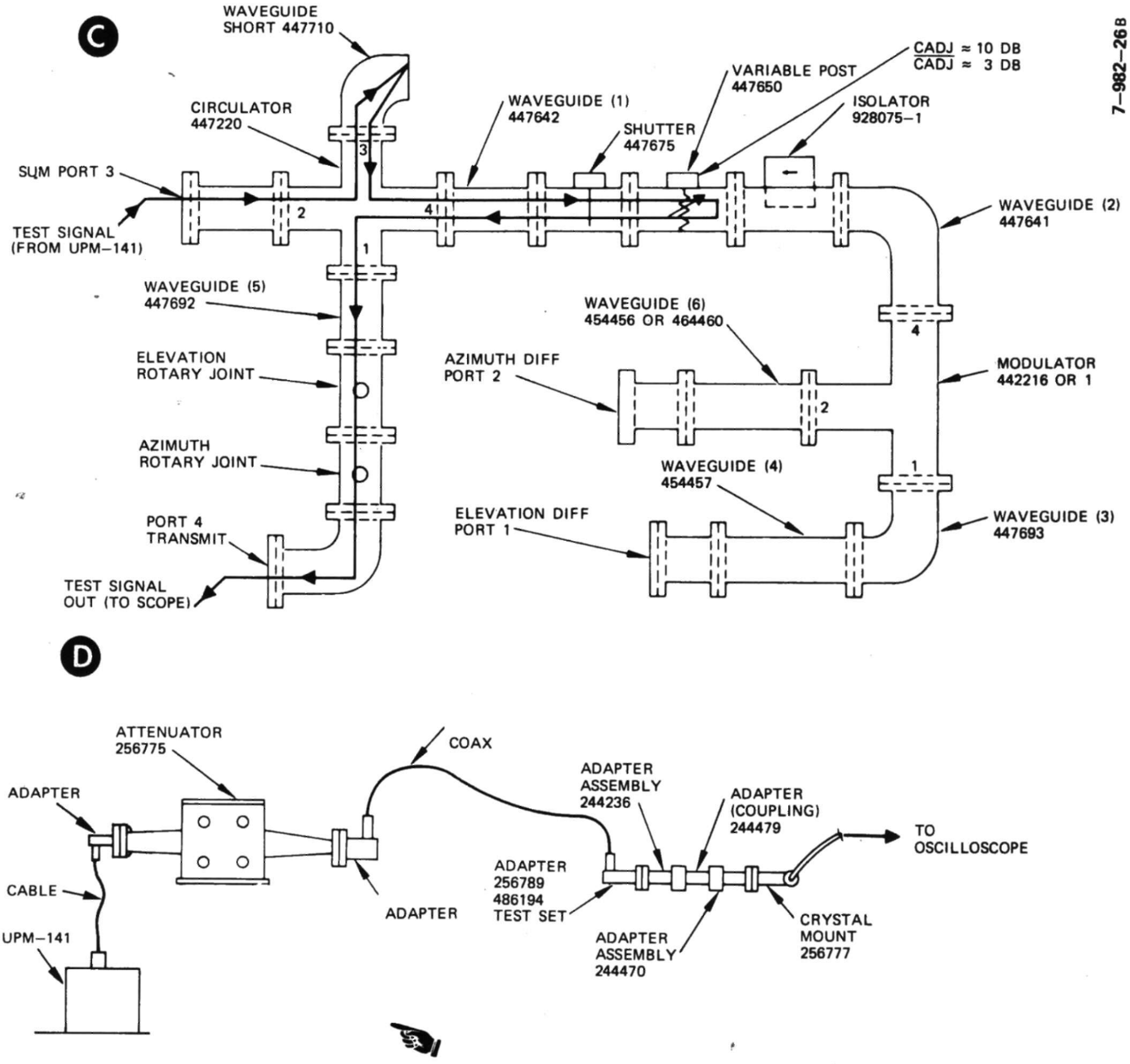


Figure 3-1. Antenna Waveguide Signal Flow and Test Setup Diagram (Sheet 2 of 5)

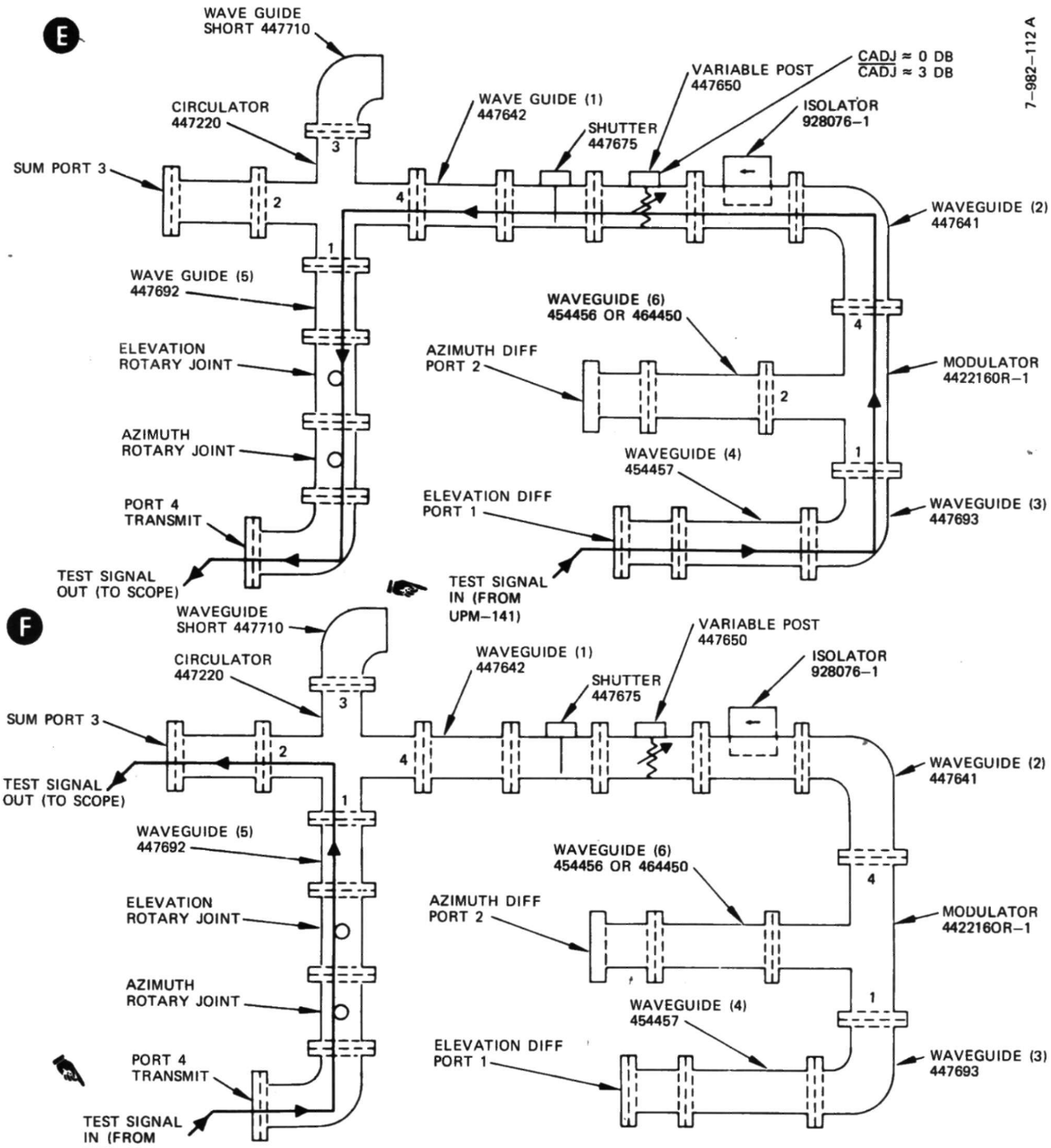


Figure 3-1. Antenna Waveguide Signal Flow and Test Setup Diagram (Sheet 3 of 5)

STEP	INSTRUCTION	INDICATION	REMARKS
11	[305] RANGE: 16SP [196] MOD TEST: Down (off) [841] Self test switch: OFF [905] POWER: OFF [Test equipment] Disconnect	Check complete	. . .

3-4h. 003 PRF JITTER CHECK. The purpose of this procedure is to check that the 003 can be coordinated with the prf requirements of the AIM-4F radar missile.

EQUIPMENT REQUIRED

Oscilloscope

EQUIPMENT HOOKUP

Connect oscilloscope to 003 MASTER TRIGGER and ground

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

003

REFERENCES

FUNCTIONAL DIAGRAM

Transmitting
(T.O. 27-5/Fig. 3-4)

FAULT ISOLATION

Radar Transmitter

Operation
(T.O. 27-3/Fig. 3-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action switch: Press to 2nd detent and release [Oscilloscope] Timing control: Adjust to obtain indication	[Oscilloscope] Pulses: First two pulses are visible; second pulse is jittering	. . .
2	[195] VIDEO TEST: Press and hold	[Oscilloscope] Pulses: PRF goes to Mx PRF iaw MA-1 classified information codes (T.O. 27-6) and jitter disappears	. . .
3	[195] VIDEO TEST: Release [905] POWER: OFF [Oscilloscope] Disconnect	Check complete	

3-4i. 841 20 KC REF CHECK. The purpose of this procedure is to check for the proper 20 KC oscillator output.

EQUIPMENT REQUIRED

VTVM

EQUIPMENT HOOKUP

Connect VTVM to 841 20 KC REF and SIGNAL RETURN

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

841

REFERENCES

FUNCTIONAL DIAGRAM

RT/PA
(T.O. 27-5/Fig. 3-9)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [196] MOD TEST: Up (on) [841] Self test switch: MAN SCRAM	[VTVM] A-c voltage: 10.0 to 13.0 vac	. . .
2	[196] MOD TEST: Down (off) [841] Self test switch: OFF [905] POWER: OFF [VTVM] Disconnect	Check complete	. . .

3-4j. 841 TUNING RANGE CHECK. The purpose of this procedure is to check the 841 high, center, and low tuning frequencies.

EQUIPMENT REQUIRED

1. UPM-141
2. Digital multimeter

EQUIPMENT HOOKUP

Connect UPM-141 RF IN/OUT (J7) to J48401. Set UPM-141 to measure frequency in accordance with paragraph 11-3f. Connect digital multimeter to 841 Xmitter Ref and set for D-C input.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-4a

PROBABLE FAULTY UNIT

841

866

REFERENCES

FUNCTIONAL DIAGRAM

RT/PA (T.O. 27-5/Fig. 3-9)

FAULT ISOLATION

Jam Avoidance and RTM Operation (T.O. 27-3/Fig. 3-11)

NOTE

Before performing this procedure, calculate E_h (representing the high end of band voltage) and E_l (representing the low end of band voltage). These values will vary from system to system. Note code decal on 065 unit. A typical code decal and calculation is as follows:

065 code plate indicates

Code	PE
X	8.10
A	2.86
B	8.25

PE represents percent excitation from maggie

$E_h = (\text{code B PE})\ (K_h)$

$E_h = (8.25)\ (+0.485) = +4.00$ v

K_h is a constant value = +0.485

$E_l = (\text{code X PE})\ (K_l)$

$E_l = (8.10)\ (-0.485) = -3.93$ v

K_l is a constant value = -0.485

The nominal value (magnitude) for both E_h and E_l is 4.0 vdc. In no case should the computed values (magnitude) of E_h and E_l be less than 3.69 vdc or greater than 4.31 vdc.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [196] MOD TEST: Up (on) [841] Self test switch: MAN SCRAM FREQ SET: Adjust to obtain digital multimeter indication	[Digital multimeter] D-c voltage: 0 vdc [UPM-141] Digital display: Indicates center frequency iaw MA-1 classified information codes (T.O. 27-6) — FREQ LOCK: Comes on	. . .
2	[841] FREQ SET: Adjust to obtain digital multimeter indication	[Digital multimeter] D-c voltage: E_h ±0.3 vdc [UPM-141] Digital display: Indicates high limit frequency iaw MA-1 classified information codes (T.O. 27-6) — FREQ LOCK: Comes on	. . .
3	[841] FREQ SET: Adjust to obtain digital multimeter indication	[Digital multimeter] D-c voltage: E_l ±0.3 vdc [UPM-141] Digital display: Indicates low limit frequency iaw MA-1 classified information codes (T.O. 27-6) — FREQ LOCK: Comes on	. . .
4	[841] Self test switch: OFF [196] MOD TEST: Down (off) [905] POWER: OFF [Test equipment] Disconnect	Check complete	. . .

3-4k. 841 HIGH AND LOW FREQUENCY LIMIT CHECK. The purpose of this procedure is to check for the proper output voltage with the transmitter at its high and low frequency limit.

EQUIPMENT REQUIRED

Oscilloscope

EQUIPMENT HOOKUP

Connect oscilloscope to 841 XMTR REF and set up for d-c input. Sync oscilloscope externally from 841 SW DN. Calibrate oscilloscope for 0 vdc center scale indication with vertical gain of 2 v/cm.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

065

841

REFERENCES

FUNCTIONAL DIAGRAM

RT/PA
(T.O. 27-5/Fig. 3-9)

FAULT ISOLATION

Jam Avoidance and
RTM Operation
(T.O. 27-3/Fig. 3-11)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [196] MOD TEST: Up (on) [841] Self test switch: MEDIUM LIMIT HI: Adjust, if necessary, to obtain indication	[Oscilloscope] Waveform: +4.0 ±0.2v max positive voltage	. . .
2	[841] LIMIT LOW: Adjust, if necessary, to obtain indication	[Oscilloscope] Waveform: -4.0 ±0.2v max negative voltage	. . .
3	[841] Self test switch: OFF [196] MOD TEST: Down (off) [905] POWER: OFF [Oscilloscope] Disconnect	Check complete	. . .

3-41. 841 TUNING RATE CHECK. The purpose of this procedure is to check the tuning rate of the maggie in the radar transmitter.

EQUIPMENT REQUIRED

Oscilloscope

EQUIPMENT HOOKUP

Connect oscilloscope (set for d-c input) to 841 XMTR REF.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

065

841

REFERENCES

FUNCTIONAL DIAGRAM

RT/PA
(T.O. 27-5/Fig. 3-9)

FAULT ISOLATION

Jam Avoidance and RTM

Operation
(T.O. 27-3/Fig. 3-11)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [196] MOD TEST: Up (on) [841] Self test switch: FAST MAX LP [080] IF GAIN: Fully ccw [841] RATE CONT: Adjust, if necessary, to obtain indication	[Oscilloscope] Waveform: Voltage time period is 41 ±6 msec for one full cycle, voltage varies between +4.0 ±0.2 v and -4.0 ±0.2 v, and triangular shaped cycle is symmetrical	Setting 841 RATE CONT for proper FAST MAX LP tuning rate sets the other tuning rates properly
2	[841] Self test switch: FAST MAX SP	[Oscilloscope] Waveform: Voltage time period is 19.1 msec for one full cycle and voltage varies as in step 1	. . .
3	[841] Self test switch: FAST MIN	[Oscilloscope] Waveform: Voltage time period is 68 ±10 msec for one full cycle and voltage varies as in step 1	. . .

See pg 39 Sup 41

STEP	INSTRUCTION	INDICATION	REMARKS
4	[841] Self test switch: MEDIUM	[Oscilloscope] Waveform: Voltage decreases from max positive to max negative (1/2 period) in 560 to 860 msec and increases from max negative to max positive in 560 to 860 msec. Voltage varies as in step 1	. . .
5	[841] Self test switch: SLOW	[Oscilloscope] Waveform: Voltage decreases from max positive to max negative (1/2 period) in 3.4 to 6.9 sec and increases from max negative to max positive in 3.4 to 6.9 sec. Voltage varies as in step 1	. . .
6	[841] Self test switch: FIXED	[Oscilloscope] Waveform: Voltage decreases from max positive to max negative (1/2 period) in a time greater than 17 sec and increases from max negative to max positive in a time greater than 17 sec. Voltage varies as in step 1	. . .
7	[841] Self test switch: OFF [196] MOD TEST: Down (off) [905] POWER: OFF [Oscilloscope] Disconnect	Check complete	. . .

3-4m. 866 MISSILE MODE FREQUENCY CHECK. The purpose of this procedure is to check for the proper missile frequency which is used in an AIM-4F radar missile attack to tune the maggie to a preselected missile frequency.

EQUIPMENT REQUIRED

UPM-141

EQUIPMENT HOOKUP

Connect UPM-141 RF IN/OUT (J7) to J48401. Set UPM-141 to measure frequency in accordance with paragraph 11-3f.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

866

REFERENCES

FUNCTIONAL DIAGRAM

RT/PA
(T.O. 27-5/Fig. 3-9)

FAULT ISOLATION

Jam Avoidance and
RTM Operation
(T.O. 27-3/Fig. 3-11)

NOTE

When measuring radar frequency with the AN/UPM-141 in the following steps the digital display indication may be random if the radar transmitter under test has a frequency jitter greater than ±1.0 MHz. The jitter tolerance for the MA-1 magnetron is a total of 1 MHz (or +.5 MHz), which is equal to 2 microseconds of oscillation on the trailing edge of TP5 or TP6 (866). The MA-1 jitter tolerance is within the capability of the AN/UPM-141. That is, with 2 microseconds or less oscillation at TP5 or TP6 the AN/UPM-141 should count the frequency, however some test sets do display random counting even though frequency jitter is less than ± 1MHz.
If the AN/UPM-141 display is readable (but random) and the oscillation on pulse at TP5 or TP6 is 2 microseconds or less, then disregard the random count. If the oscillation on pulse at TP5 or TP6 is 2 microseconds or less, but the AN/UPM-141 is too random to read then the AN/UMP-141 is at fault.

CAUTION

During steps 3, 4 and 5 do not hold 195 VIDEO TEST switch depressed longer than necessary to observe indications as damage may occur to the 080 unit.

See pg 40 Sup 41

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY []96] MOD TEST: Up (on) [841] Self test switch: MISSILE [866] MISSILE R. F. CHANNELS: F	[866] SERVO ON: Comes on [UPM-141] Digital display: Indicates Mx F frequency iaw MA-1 classified information codes (T.O. 27-6) —FREQ LOCK: Comes on	. . .
2	[195] VIDEO TEST: Press and hold	[866] SERVO ON: Remains on [UPM-141] Digital display: Indicates value within ±1.0 MHz of value in step 1 —FREQ LOCK: Remains on	. . .
3	[195] VIDEO TEST: Release [866] MISSILE R.F. CHANNELS: E	[866] SERVO ON: Comes on [UPM-141] Digital display: Indicates Mx E frequency iaw MA-1 classified information codes (T.O. 27-6) —FREQ LOCK: Remains on	. . .
4	[195] VIDEO TEST: Press and hold	[866] SERVO ON: Remains on [UPM-141] Digital display: Indicates value within ±1.0 MHz of value in step 3 — FREQ LOCK: Remains on	. . .
5	Repeat steps 3 and 4 as 866 MISSILES R.F. CHANNELS is set to D, C, B, and A	[UPM-141] Digital display: Indicates Mx D, C, B, and A, respectively, iaw MA-1 classified information codes (T.O. 27-6)	. . .
6	[841] Self test switch: OFF [196] MOD TEST: Down (Off) [866] MISSILE R.F. CHANNELS: C [905] POWER: OFF [BDS] Disconnect	Check complete	. . .

3-4n. 866 PARAMP BAND CHECK. The purpose of this procedure is to ensure that the 866 unit is operational when the maggie is tuned to the paramp band.

EQUIPMENT REQUIRED

1. UPM-141
2. Oscilloscope

EQUIPMENT HOOKUP

Connect UPM-141 RF IN/OUT (J7) to J48401. Set UPM-141 to measure frequency in accordance with paragraph 11-3f. Set up oscilloscope for a-c input, dual trace operation; set CHANNEL A and CHANNEL B POLARITY to NORMAL. Connect CHANNEL A to 866 TP5 HI; connect CHANNEL B to 866 TP6 LOW. Sync oscilloscope from 103 SWEEP TRIGGER; position CHANNEL A trace to center and CHANNEL B trace to lower scribe line; set oscilloscope to 0.5 μsec/cm.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

866

NOTE

When measuring radar frequency with the AN/UPM-141 in the following steps the digital display indication may be random if the radar transmitter under test has a frequency jitter greater than ±1.0 MHz. The jitter tolerance for the MA-1 magnetron is a total of 1 MHz (or ±.5 MHz), which is equal to 2 microseconds of oscillation on the trailing edge of TP5 of TP6 (866). The MA-1 jitter tolerance is within the capability of the AN/UPM-141. That is, with 2 microseconds or less oscillation at TP5 or TP6 the AN/UPM-141 should count the frequency, however some test sets display random counting even though frequency jitter is less than ± 1MHz.
If the AN/UPM-141 display is readable (but random) and the oscillation on pulse at TP-5 or TP-6 is 2 microseconds or less, then disregard the random count. If the oscillation on pulse at TP5 or TP6 is 2 microseconds or less, but the AN/UPM-141 is too random to read then the AN/UPM-141 is at fault.

FUNCTIONAL DIAGRAM

RT/PA
(T.O. 27-5/Fig. 3-9)

REFERENCES

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40SP [841] FREQ SET: Midrange [196] MOD TEST: Up (on) [841] Self test switch: MAN SCRAM [866] S2 PARAMP: TEST	[866] PARAMP ON: Comes on	. . .
2	[841] FREQ SET: Slowly adjust ccw to obtain indication	[Oscilloscope] Channel B: Positive pulse	. . .
3	[841] **FREQ SET: Adjust to obtain oscilloscope indication of maximum pulse width.**	[Oscilloscope] Channel B: Max pulse amplitude should be 13.0 to 20.0 v [UPM-141] Digital display: Indicates paramp low limit frequency iaw MA-1 classified information codes (T.O. 27-6)	. . .
4	[841] FREQ SET: Slowly adjust cw to obtain indication	[Oscilloscope] Channel A: Positive pulse	. . .
5	[841] **FREQ SET: Adjust to obtain oscilloscope indication of maximum pulse width**	[Oscilloscope] Channel A: Max pulse amplitude should be 13.0 to 20.0 v [UPM-141] Digital display: Indicates paramp high limit frequency iaw MA-1 classified information codes (T.O. 27-6)	. . .
6	[305] RANGE: 40LP and then perform steps 2 thru 5 but do not measure frequency on the UPM-141	Same as in steps 2 thru 5 except frequency is not measured	. . .
7	[196] MOD TEST: Down (off) [841] Self test switch: OFF [866] S2 PARAMP: NORM [305] RANGE: 16SP [905] POWER: OFF [Test equipment] Disconnect	Check complete	. . .

3-4o. 541 JAMMING ANALOG THRESHOLD CHECK. The purpose of this procedure is to ensure that the 541 unit is operational when jamming signals occur.

EQUIPMENT REQUIRED

Digital multimeter

EQUIPMENT HOOKUP

Connect digital multimeter to 541 TP9 ANLG and TP12 GND.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

541

FUNCTIONAL DIAGRAM

AFC Programmer
(T.O.27-5/Fig. 3-10)

REFERENCES

FAULT ISOLATION

Jam Avoidance and RTM Operation
(T. O. 27-3/Fig. 3-11)

NOTE

Jamming analog threshold cannot be adjusted on the aircraft. If this check is not satisfactory, the 541 unit must be aligned in the mockup.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40LP TUNE: F MIN [541] P54102: Disconnect [196] MOD TEST: Up (on)	[Digital multimeter] D-c voltage: +3.3 to +4.1 v	. . .
2	**CAUTION** Ensure that P54102 is disconnected from J54102 prior to pressing 541 S1 ANLG. Pressing S1 ANLG with P54102 connected may result in damage to the 541 unit.		
	[541] S1 ANLG: Press and hold	[Digital voltmeter] D-c voltage: +7.5 to +8.5 v	. . .
3	[541] S1 ANLG: Release [196] MOD TEST: Down (off) [305] RANGE: 16SP TUNE: NORM [905] POWER: OFF [Digital multimeter] Disconnect [541] P54102: Connect	Check complete	. . .

3-4p. 045 COMPRESSOR AND 107 ABSOLUTE VALVE CHECK. The purpose of this procedure is to check that proper pressure can be maintained in the radar pressurization system. This test is performed with a restrictor plug installed which will simulate high altitude conditions.

EQUIPMENT REQUIRED

Restrictor plug in which a number 69 hole (0.029 in. diameter) has been drilled

EQUIPMENT HOOKUP

Install restrictor plug on 045 unit air intake fitting.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

045

107

REFERENCES

FUNCTIONAL DIAGRAM

Pressurization
(T.O. 27-5/Fig. 3-2)

FAULT ISOLATION

Radar Transmitter

Operation
(T.O. 27-3/Fig. 3-4)

NOTE

Record ambient temperature and local ambient pressure before proceeding.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [024] S1: Press and hold	[024] 32 PSIA SYS: 41 psia in less than 16 minutes	Improper 045 unit operation is indicated if time exceeds 16 minutes
2	[024] S1: Release [905] POWER: OFF [024] 17 and 32 PSIA SYS BLEED VALVES: Press and hold to obtain indication	[024] 17 and 32 PSIA SYS: Indicate local ambient pressure	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3	[024] 17 and 32 PSIA SYS BLEED VALVES: Release [905] POWER: RADAR STBY	[024] 17 PSIA SYS: Indicates 17 psia in 5 minutes or less	Improper adjustment of absolute valve is indicated if time exceeds 5 minutes
4	[905] POWER: OFF [045] Air intake fitting: Remove restrictor plug and reconnect tubing [674] Dehydrator air intake fitting: Install restrictor plug [905] POWER: RADAR STBY [024] S1: Press and hold to obtain indication	[024] 32 PSIA SYS: 41 psia in appropriate time (see fig 3-2)	. . .
5	[024] S1: Release [905] POWER: OFF [024] 17 and 32 PSIA SYS BLEED VALVES: Press and hold to obtain indication	[024] 17 and 32 PSIA SYS: Indicates local ambient pressure	. . .
6	[024] 17 and 32 PSIA SYS BLEED VALVES: Release [905] POWER: RADAR STBY	[024] 17 PSIA SYS: Indicates 17 psia in 5 minutes or less	. . .
7	[905] POWER: OFF [674] Restrictor plug: Remove [Tubing] Reconnect and perform Radar High Pressure Leakage and Interlock. Check iaw para. 3-4q	Check complete	. . .

3-4q. RADAR HIGH PRESSURE LEAKAGE AND INTERLOCK CHECK. The purpose of this procedure is to check the leakage rate of the radar high pressurization system.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017

065

REFERENCES

FUNCTIONAL DIAGRAM

Pressurization
(T.O. 27-5/Fig. 3-2)

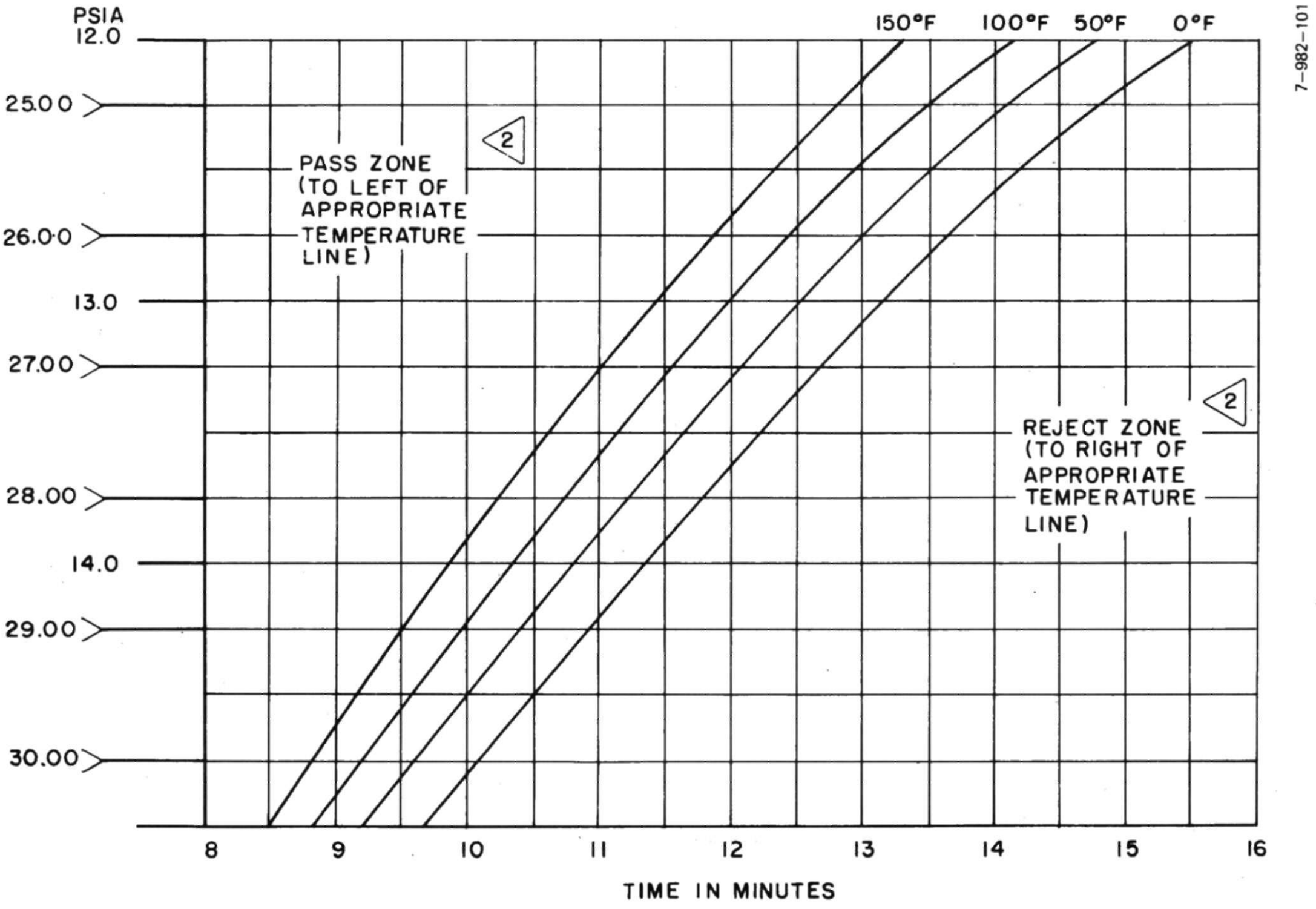
FAULT ISOLATION

Radar Transmitter

Operation
(T.O. 27-3/Fig. 3-4)

NOTE

Whenever pressurization system is opened, this test must be performed after resealing is completed.



NOTES:

1. Local field pressure (approx 15 psia).
2. If elapsed time is less than 7 min, check air return lines to 045, 107, 097 units and cockpit for leakage; if elapsed time exceeds 7 min, use above chart for pass–zone qualification.

EXAMPLE:

In a given 32–psia system test the ambient pressure (1) is 14.50 psia (29.50 in.) and the temperature is 50° F. If interval of 10 minutes is required for the pressure indication to reach 41 psia, this elapsed time lies just within the "pass zone" and the compressor is considered satisfactory. If the elapsed time has exceeded 10 minutes, the compressor would have been considered faulty.

Figure 3-2. Compressor Check Chart

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON	[024] 32 PSIA SYS: 28.0 to 32.0 psia —— 17 PSIA SYS: 17.0 psia [065, relay rack] HV ON DS301: Comes on	. . .
2	[024] S1: Press and hold to obtain indication	[024] 32 PSIA SYS: 47 psia	. . .
3	[024] S1: Release	[024] 32 PSIA SYS: Leakage rate does not exceed 3 psia per minute —— 17 PSIA SYS: Leakage rate does not exceed 1 psia in 5 minutes	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
4	[024] 32 PSIA SYS BLEED VALVES: Press and hold to obtain indication	[065, relay rack] HV ON DS301: Goes off when 024 32 PSIA SYS indicates between 28.5 and 26.0 psia	. . .
5	[024] 32 PSIA SYS BLEED VALVES: Release	[065, relay rack] HV ON DS301: Comes on when 024 32 PSIA SYS indicates between 26.0 and 28.5 psia	. . .
6	[905] POWER: OFF	Check complete	. . .

3-5. TRANSMITTER ADJUSTMENTS

3-5a. 841 DET BAL ADJUSTMENT. The purpose of this procedure is to adjust the 841 unit for proper operation in all tuning modes.

EQUIPMENT REQUIRED

1. Digital multimeter
2. UPM-141

EQUIPMENT HOOKUP

Connect digital multimeter to 841 XMTR REF and SIGNAL RETURN. Connect UPM-141 RF IN/OUT (J7) to J48401. Set UPM-141 to measure frequency in accordance with paragraph 11-3f.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-4a

PROBABLE FAULTY UNIT

841

REFERENCES

FUNCTIONAL DIAGRAM

RT/PA
(T.O. 27-5/Fig. 3-9)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40SP [841] Self test switch: MAN SCRAM [196] MOD TEST: Up (on) [841] FREQ SET: Adjust to obtain indication	[Digital multimeter] D-c voltage: 0 vdc	. . .
2	[841] DET BAL: Adjust, if necessary, to obtain indication	[UPM-141] Digital display: Indicates center frequency iaw MA-1 classified information codes (T.O. 27-6)	
3	[196] MOD TEST: Down (off) [841] Self test switch: OFF [905] POWER: OFF [Test equipment] Disconnect	Adjustment complete	. . .

See pg 41 Sup 41

3-5b. 841 AMPL ADJUSTMENT. The purpose of this procedure is to ensure the 841 unit is operational during jamming conditions.

EQUIPMENT REQUIRED

1. UPM-141
2. Digital multimeter

EQUIPMENT HOOKUP

Connect UPM-141 RF IN/OUT (J7) to J48401. Set UPM-141 to measure frequency in accordance with paragraph 11-3f.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-4a

PROBABLE FAULTY UNIT

841

FUNCTIONAL DIAGRAM

RT/PA
(T.O. 27-5/Fig. 3-9)

REFERENCES

FAULT ISOLATION

None

NOTE

Before performing this procedure, calculate E_h (representing the high end of band voltage) and E_l (representing the low end of band voltage). These values will vary from system to system. Note code decal on 065. A typical code decal and calculation is as follows:

065 code plate indicates

Code	PE
X	8.10
A	2.86
B	8.25

PE represents percent excitation from maggie.

$$E_h = (\text{code B PE})\ (K_h)$$

$$E_h = (8.25)\ (+0.485) = +4.00\ \text{v}$$

K_h is a constant value = +0.485

$$E_l = (\text{code X PE})\ (K_l)$$

$$E_l = (8.10)\ (-0.485) = -3.93\ \text{v}$$

K_l is a constant value = -0.485

The nominal value (magnitude) for both E_h and E_l is 4.0 vdc. In no case should the computed values (magnitude) of E_h and E_l be less than 3.69 vdc or greater than 4.31 vdc.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40SP [196] MOD TEST: Up (on) [841] Self test switch: MAN SLOW FREQ SET: Adjust to obtain indication	[Digital multimeter] D-c voltage: E_h ±0.1 v	. . .
2	[841] AC AMPL: Adjust, if necessary, to obtain indication	[UPM-141] Digital display: Indicates high limit frequency iaw MA-1 classified information codes (T.O. 27-6)	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3	[841 FREQ SET: Adjust to obtain digital multimeter indication	[Digital multimeter] D-c voltage: E_1 0.1 vdc [UPM-141] Digital display: Indicates low limit frequency iaw MA-1 classified information codes (T.O. 27-6)	If this check fails, perform 841 High and Low Frequency Limit Check iaw para 3-4k
4	[841] Self test switch: OFF [196] MOD TEST: Down (off) [305] RANGE: 16SP [905] POWER: OFF [Test equipment] Disconnect	Adjustment complete	. . .

3-5c. 866 AT1 ADJUSTMENT. The purpose of this procedure is to ensure that all 866 unit channel pulses are correct and all channels are operational.

EQUIPMENT REQUIRED

Oscilloscope

EQUIPMENT HOOKUP

Connect oscilloscope to 866 TP1 +PULSE.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

866

REFERENCES

FUNCTIONAL DIAGRAM

RT/PA
(T.O. 27-5/Fig. 3-9)

FAULT ISOLATION

Jam Avoidance and RTM Operation
(T.O. 27-3/Fig. 3-11)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [196] MOD TEST: Up (on) REC TEST: Up (on) [083] Action switch: Press to 2nd detent, lock on to receiver test target, and release action switch [841] Self test switch: MISSILE [866] MISSILE R.F. CHANNELS: Set to positions A thru F while observing oscilloscope at each position [Oscilloscope] Voltage: Record the six voltage levels as 866 MISSILE R.F. CHANNELS is set to positions A thru F	[Oscilloscope] Voltage: 30 to 50 v	. . .
2	**NOTE** If 866 AT1 is increased, the voltage level will decrease. AT1 is located inside the 866 unit and the unit must be removed for adjustment.		

STEP	INSTRUCTION	INDICATION	REMARKS
2 (cont)	[866] MISSILE R.F. CHANNELS: Set to position which yielded the lowest voltage level in step 1 AT1: Adjust, if necessary, to obtain 30 v.	[Oscilloscope] Voltage: 30V	. . .
3	[866] MISSILE R.F. CHANNELS: Set to all positions except the position used in step 2	[Oscilloscope] Voltage: Greater than 30 v and less than 55 v	All voltages observed should remain constant within ±0.5 v
4	[Oscilloscope] CHANNEL A: Connect to 866 TP5 HI CHANNEL B: Connect to 866 TP6 LOW [866] MISSILE R.F. CHANNELS: Set to positions A thru F while observing oscilloscope at each position	[Oscilloscope] Waveforms: Channel A and channel B waveforms are identical; amplitude is 15 ±3 v; the pulses are clipped and approximately 10 μsec wide at the top of the pulses when frequency lock-on is obtained	The value of the 10 μsec wide pulse width is approximate and in proportion to the pulse amplitude at 866 TP1
5	[083] AUTO SEARCH: Press and release [305] RANGE 4SP [796] SELECTOR TEST: 4 [083] Action switch: Press to 2nd detent, position range gate between 7th and 8th receiver test target, and release action switch [305] RDR: HOM	[020] ATOT: Comes on	. . .
6	[866] MISSILE R.F. CHANNELS: Set to positions A thru F while observing oscilloscope at each position	[Oscilloscope] Waveforms: Channel A and B waveforms are identical; amplitude is 15 ±3 v; pulse width is approx 20 μsec at the top of the pulses	. . .
7	[Oscilloscope] CHANNEL A: Connect to 866 TP1 +PULSE [866] MISSILE R.F. CHANNELS: Set-to position used in step 2	[Oscilloscope] Voltage: Approx 80 v	. . .
8	[196] MOD TEST: Down (off) REC TEST: Down (off) [796] SELECTOR TEST: 7, then OFF [305] RANGE: 16SP RDR: NORM [866] MISSILE R.F. CHANNELS: C [Oscilloscope] Disconnect	Adjustment complete	. . .

3-5d. 065 TAP SWITCH ADJUSTMENT. This procedure can be accomplished by performing 065 Modulator Primary Supply and Magnetron Spectrum Check iaw para 3-4f. Do not use the spectrum analyzer. Set MODULATOR PRI SUPPLY SW4, SW5, and SW6 for correct indications.

3-6. VIDEO RECEIVING CHECKS

3-6a. 026 PARAMP/RT POWER SUPPLY CHECK. The purpose of this procedure is to check for proper 026 d-c voltage outputs and noise levels.

EQUIPMENT REQUIRED

1. Digital multimeter
2. Oscilloscope

EQUIPMENT HOOKUP

Connect digital multimeter to 026 +50 VDC and GND.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

026

REFERENCES

FUNCTIONAL DIAGRAM

RT/PA (T.O. 27-5/Fig. 3-9)

FAULT ISOLATION

Radar Video (T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [196] MOD TEST: Up (on)	[Digital multimeter] D-c voltage: +49.5 to +50.5 v	. . .
2	[026] -50 VDC: Monitor using digital multimeter	[Digital multimeter] D-c voltage: -49.5 to -50.5 v	. . .
3	[026] +375 VDC: Monitor using digital multimeter	[Digital multimeter] D-C voltage: +373 to +377v	. . .
4	[026] -400 VDC: Monitor using digital multimeter	[Digital multimeter] D-C voltage: -398 to -402 v	. . .
5	[Digital multimeter] Disconnect [026] +50 VDC: Monitor noise level using oscilloscope	[Oscilloscope] Noise level: 100 mv p-p or less	. . .
6	[026] -50 VDC: Monitor noise level using oscilloscope	[Oscilloscope] Noise level: 100 mvp-p or less	. . .
7	[026] +375 VDC: Monitor noise level using oscilloscope	[Oscilloscope] Noise level: 350 mvp-p or less	. . .
8	[026] -400 VDC: Monitor noise level using oscilloscope	[Oscilloscope] Noise level: 250 mvp-p or less	. . .
9	[196] MOD TEST: Down (off) [905] POWER: OFF [Oscilloscope] Disconnect	Check complete	. . .

3-6b. 017 ANTENNA WAVEGUIDE SHUTTER CHECK. The purpose of this procedure is to check for proper shutter operation.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017

REFERENCES

FUNCTIONAL DIAGRAM

Transmitter-Receiver Switching
(T.O. 27-5/Fig. 3-3)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [096] S1: 7 S2: F	[096] SELF TEST METER: 0 units	Antenna waveguide shutter is closed (shutter relay deenergized)
2	[083] Action switch: Press to 2nd detent and release [095] ON TARGET ADJ switch: Press and hold to obtain RTOT	[096] SELF TEST METER: 5 to 6 units	Antenna waveguide shutter is open (shutter relay energized)
3	[095] ON TARGET ADJ switch: Release [905] POWER: OFF [096] S1: 1 S2: A	Check complete	. . .

3-6c. 017 VARIABLE POST CHECK. The purpose of this procedure is to check that variable post is in its proper position in search and track.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017

REFERENCES

FUNCTIONAL DIAGRAM

Transmitter-Receiver Switching
(T.O. 27-5/Fig. 3-3)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [096] S1: 7 S2: G	[096] SELF TEST METER: 0 units	Variable post is in normal 3 db position (deenergized)
2	[083] Action switch: Press to 2nd detent and release [855] CADJ-NORM: CADJ	[096] SELF TEST METER: 5 to 6 units	Variable post is in 10 db position (energized)
3	[083] AUTO SEARCH: Press and release	[855] CADJ-NORM: Returns to NORM	. . .
4	[905] POWER: OFF [096] S1: 1 S2: A	Check complete	. . .

3-6d. 017 SUM SIGNAL ATTENUATION CHECK. The purpose of this procedure is to check the insertion losses in the sum channel of the antenna. The insertion loss is checked in three system modes: search, track or not CADJ, and track or CADJ. If the insertion loss is greater than the specified limits, the received r-f energy from the target will be attenuated excessively causing weak pick-up.

NOTE

If it is desired to isolate a malfunction to a waveguide component, it is suggested that the technician perform the procedure in this paragraph, then perform 017 azimuth and elevation difference attenuation check in paragraph 3-15a, then perform 017 Transmitter Signal Attenuation Check in paragraph 3-4c, then perform 017 Transmitted to Difference Attenuation Check in paragraph 3-4d, and finally perform 017 Isolation Check in paragraph 3-15b. Each procedure is, however, independent of the others and can be performed alone if desired.

It is not necessary that the radar system be operational, if the procedure does not require that the shutter or variable post be energized.

In search (A, fig. 3-1), the r-f signal from the UMP-141 is inserted into sum port 3 on the antenna. This r-f signal passes through the sum port waveguide into port 2 and out port 3 of the circulator. Port 3 has a waveguide short that reflects the signal back into the circulator and out port 4 of the circulator. The signal passes through waveguide (1) to the shutter assembly. In the search mode, the shutter is closed and reflects the signal back through waveguide (1) into port 4 and out port 1 of the circulator, through waveguide (5), the elevation and azimuth rotary joints and out port 4 transmit (rear of antenna). The allowable insertion loss in search shall not exceed 1.8 db. If the insertion loss exceeds 1.8 db, a failure has occurred in the sum waveguide, the circulator, waveguide (1), the shutter assembly, or in the azimuth and elevation rotary joints.

In the track mode (C, fig. 3-1), the shutter is open. Therefore, the signal, rather than being reflected by the shutter, as in the search mode, will pass through the shutter assembly to the variable post assembly. The variable post assembly, when in track or not CADJ, will attenuate the signal by approximately 3.0 db. The signal will be attenuated by approximately 3.0 db and will reflect back through the shutter assembly, waveguide (1) and into port 4 and out port 1 of the circulator, through and elevation and azimuth rotary joints, and out port 4 transmit (on rear of antenna).

The allowable sum channel insertion loss in track or not CADJ is 4.5 to 6.0 db. If the search insertion loss check passes and track or not CADJ fails, the probable fault is the shutter assembly or the variable post assembly.

In the track or CADJ mode (C, fig. 3-1), the r-f signal path is the same as the track or not CADJ mode except the attenuation through the variable post will be approximately 10 db. In this check the allowable insertion loss is 7.5 to 13.5 db.

CAUTION

When introducing the r-f signal into the front of the antenna, the operator should be careful to not cause flexing of the coax cable when rotating the antenna. Flexing may cause false insertion loss indications or damage to the coax cable. It is not necessary to be as cautious while inserting the r-f signal into the rear (port 4) of the antenna. The coax cables should be kept in good repair. A degraded coax cable will give erroneous indications indicating false insertion losses.

EQUIPMENT REQUIRED

1. UPM-141
2. 486180 test set
3. Oscilloscope

EQUIPMENT HOOKUP

Refer to B, fig. 3-1 (for reference only) when making the following 486180 test set, UPM-141, and oscilloscope connections. Remove antenna feedhorn and install 244185 three-port adapter. Connect 256781 tapered transition to port 4 (transmit) on rear of antenna; connect 244475 curved waveguide to 256781 tapered transition. Connect UPM-141 via cable to adapter on 256775 precision attenuator. Connect 256775 precision attenuator adapter via coax to 256789 adapter. Connect 256789 adapter to 244236 adapter. Connect 244236 adapter assembly to port 3 (sum) on 244185 three-port adapter. Connect 244180 dummy loads to ports 1 and 2 of 244185 three-port adapter. Connect 256777 crystal mount via 244470 adapter assembly to 244475 curved waveguide. Set 486180 precision attenuator dial to zero.

Set UPM-141 for CW SIG GEN operation in accordance with paragraph 11-3k. at a frequency near low end of radar transmitter range and select max attenuation on RF POWER OUT-

PRELIMINARY PROCEDURE

1. Table 1-1
2. Remove radome iaw para 10-4m
3. Pin antenna in az and el

PROBABLE FAULTY UNIT

017

EQUIPMENT HOOKUP (cont)

PUT-DBM switches. Connect oscilloscope to 256777 crystal mount assembly. Set up oscilloscope to indicate d-c voltage; set POLARITY to NORMAL; adjust vertical channel gain VOLTS/cm (coarse and fine) for lowest (most sensitive) setting.

REFERENCES

FUNCTIONAL DIAGRAM

Transmitting
(T.O. 27-5/Fig. 3-4)

FAULT ISOLATION

Radar Transmitter

Operation
(T.O. 27-3/Fig. 3-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action switch: Press to 2nd detent and release [196] SHUTTER: ANT/RCVR [855] CADJ-NORM: CADJ [UPM-141] RF POWER OUTPUT-DBM: Select to obtain indication	[Oscilloscope] Voltage: 1 cm deflection from d-c (0 cm) reference level	. . .
2	[855] CADJ-NORM: NORM	[Oscilloscope] Voltage: Record vertical deflection from d-c (0 cm) reference level	. . .
3	[083] AUTO SEARCH: Press and release [196] SHUTTER: NORM	[Oscilloscope] Voltage: Record vertical deflection from d-c (0 cm) reference level	
4	[486180 244236 adapter assembly: Disconnect 244470 adapter assembly: Disconnect 244236 and 244470 adapter assemblies: Connect together using 244479 adapter coupling (see D, fig. 3-1) [486180] Precision attenuator dial: Adjust to obtain oscilloscope indication	[Oscilloscope] Voltage: Vertical deflection is 1 cm from dc (0 cm) reference level in step 1 [486180] Precision attenuator dial: 8.0 to 13.0 db	
5	[486180 Precision attenuator dial: Adjust to obtain oscilloscope indication	[Oscilloscope] Voltage: Vertical deflection is the same as recorded in step 2 [486180] Precision attenuator dial: 3.0 to 5.5 db	. . .
6	[486180] Precision attenuator dial: Adjust to obtain oscilloscope indication	[Oscilloscope] Voltage: Vertical deflection is the same as recorded in step 3 [486180] Precision attenuator dial: Less than 1.8 db	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
7	**NOTE** Perform the equipment hookup as indicated at the beginning of this paragraph except set UPM-141 for CW SIG GEN output near center of frequency band in accordance with paragraph 11-3k.		
	Repeat steps 1 thru 6	Indications are as obtained in steps 1 thru 6	. . .
8	**NOTE** Perform the equipment hookup as indicated at the beginning of this paragraph except set UPM-141 for CW output near high end of frequency band in accordance with paragraph 11-3k.		
	Repeat steps 1 thru 6	Indications are as obtained in steps 1 thru 6	. . .
9	[905] POWER: OFF [017] Locking pins: Remove [Test equipment] Disconnect [017] Reassemble and perform Radar High Pressure Leakage and Interlock Check iaw para 3-4q [Radome] Reinstall iaw para 10-4m	Check complete	. . .

3-6e. 065 TR TUBE KEEP ALIVE VOLTAGE CHECK. The purpose of this procedure is to check for proper 065 TR tube voltage.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1

WARNING

If the system is pressurized, press 024 unit 17 PSIA SYS and 32 PSIA SYS BLEED VALVES to bleed air before attempting to remove receiver hat.

2. Remove 065 unit receiver hat

PROBABLE FAULTY UNIT

Receiver barrel

TR Tube

REFERENCES

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-5)

FAULT ISOLATION

Radar video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40SP [Receiver barrel] S452: 9 KEEP ALIVE	[Receiver barrel] M451: 1.5 to 4.1 units	If meter indication is below 1.5, check TR tube power supply; if meter indication is above 4.1, check image rejection mixer crystals. If crystals are good,replace TR tube. However, if crystals have failed, replace TR tube and crystals.
2	[305] RANGE: 16SP [Receiver barrel] S452: OFF [Receiver hat] Reinstall and perform Radar High Pressure Leakage and Interlock Check iaw para 3-4q	Check complete	. . .

3-6f. 065 RECEIVER RECOVERY AND LOCAL OSCILLATOR ANODE VOLTAGE DROOP CHECK. The purpose of this procedure is to ensure that the 065 unit processes video correctly with both minimum and maximum signal input.

EQUIPMENT REQUIRED

1. R-f blanket
2. UPM-141
3. Multimeter
4. VTVM
5. Oscilloscope

EQUIPMENT HOOKUP

Cover radome with r-f blanket. If r-f blanket is not available, connect DA-21/U dummy load to 651149 waveguide. Zero VTVM and connect between 295 DET DC and 041 TP1 GND. Connect UPM-141 RF IN/OUT (J7) to J48401. Set UPM-141 for XPONDER JAM (CW) in accordance with paragraph 11-3i. Connect oscilloscope vertical input to 295 TRACK. Set oscilloscope TIME/CM to 5 μsec. Sync oscilloscope from 103 SWEEP TRIGGER.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

Receiver barrel

641

REFERENCES

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-5)

FAULT ISOLATION

Radar video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[305] NORM [905] POWER: RADAR STBY [305] RANGE: 40SP [196] MOD TEST: Up (on) [080] IF GAIN: Fully CW		. . .

STEP	INSTRUCTION	INDICATION	REMARKS
2	[UPM-141] RF POWER OUTPUT-DBM: Select 090	[VTVM] D-c voltage: Min (record this voltage)	Adjust UPM-141 attenuation as necessary to avoid receiver saturation
3	[UPM-141] RF POWER OUTPUT-DBM: Select to obtain indication	[VTVM] D-c voltage: Approx two times the voltage recorded in step 2.	. . .
4	[305] RANGE: 40LP [UPM-141] RF POWER OUTPUT-DBM: Select as necessary to prevent saturation [Oscilloscope] Waveform: Determine voltage level of half-power point (0.707 times max carrier wave level)	[Oscilloscope] Waveform: Recovery time does not exceed 12 μsec. (Refer to Fig. 3-3)	If frequency drift is excessive, set 305 RANGE to 40SP and note recovery time does not exceed 10 μsec

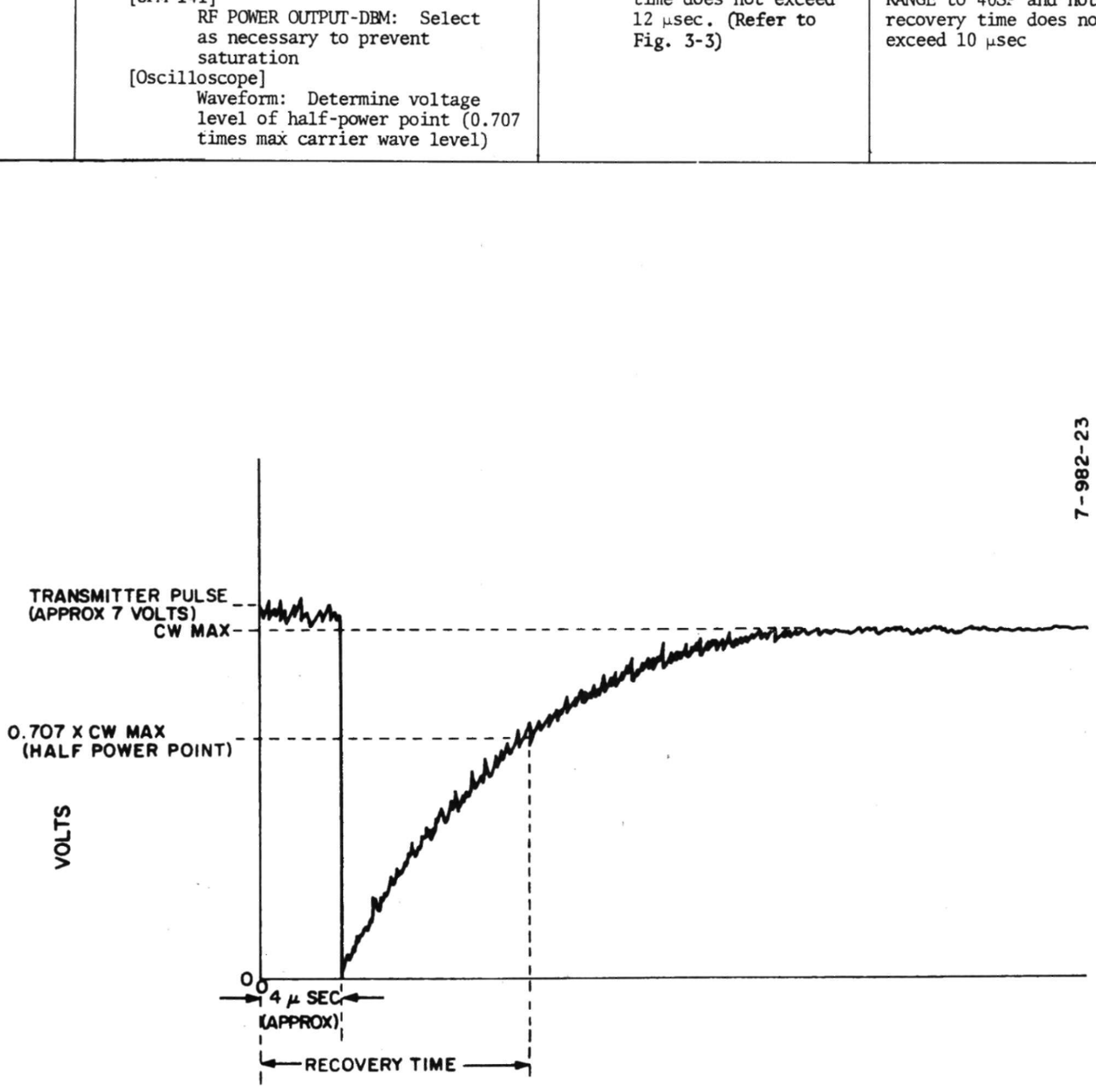


Figure 3-3. Oscilloscope Display (Long Pulse Operation)

STEP	INSTRUCTION	INDICATION	REMARKS
7	[UPM-141] TEST MODE: ACFT-XPONDER PULSE RANGE-INITIAL RANGE YDS: Select 2,000 yds RANGE-RESET: To RESET and release. RF PWR OUTPUT DBM: Select as necessary to prevent saturation. [Oscilloscope] TIME/CM: 200 sec Test Target: Note and record amplitude	[Oscilloscope] Test target: Present	. . .
8	[UPM-141] RANGE-INITIAL RANGE YDS: Select 2,000 yds to 80,000 yds in 2,000 yd increments RANGE-RESET: To RESET and release after each range selection	[Oscilloscope] Test target: Moves away from transmitter pulse, amplitude remains constant	. . .
9	[196] MOD TEST: Down (off) [841] Self test switch: OFF [305] RANGE: 16SP [080] VIDEO GAIN: Fully cw [905] POWER: OFF [Test equipment] Disconnect [R-f blanket] Remove	Check complete	. . .

3-6g. 641 PRESET ERROR CHECK. The purpose of this procedure is to ensure that the timing circuits in the 641 unit are operational.

EQUIPMENT REQUIRED

Multimeter

EQUIPMENT HOOKUP

Connect multimeter to 641 TP6 PRESET ERROR and TP2 GND.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

641

841

REFERENCES

FUNCTIONAL DIAGRAM

AFC Programmer
(T.O. 27-5/Fig. 3-10)

FAULT ISOLATION

Radar video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40SP [196] MOD TEST: Up (on) [841] Self test switch: SLOW [096] S1: 10 S2: F	[096] SELF TEST METER: Sweeps between 0 and 9 units at approx 7 sec intervals [Multimeter] D-c voltage: Sweeps between a high and low voltage level at approx 7 sec intervals. Max variation between high and low voltage is 1 v or less and voltage is within the range +1 v to -1 v	If these requirements are not met, mock-up alignment of either 641 or 841 is required
2	[841] Self test switch: OFF [196] MOD TEST: Down (off) [096] S1: 1 S2: A [305] RANGE: 16SP [905] POWER: OFF [Multimeter] Disconnect	Check complete	

3-6h. 641 AFC LOOP CHECK. The purpose of this procedure is to ensure the 641 afc loop is operational.

EQUIPMENT REQUIRED

1. Oscilloscope
2. Multimeter

EQUIPMENT HOOKUP

Using 10:1 probe, connect oscilloscope to 641 TP3 INTEG. Set vertical sensitivity to 2 V/CM. Connect oscilloscope EXT TRIG to 003 MASTER TRIGGER. Connect multimeter to 841 XMTR REF and SIGNAL RETURN.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

641

REFERENCES

FUNCTIONAL DIAGRAM

AFC Programmer
(T.O. 27-5/Fig. 3-10)

FAULT ISOLATION

Radar video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40LP [841] Self test switch: MAN SCRAM [196] MOD TEST: Up (on) [NWW] RAPID TUNE MAGNETRON GND OPER: Down (normal)	[Oscilloscope] Waveform: Similar to waveform in fig. 3-4. Note afc holding level position	. . .
2	[641] S1: MAN AFC and hold AFC MAN ADJ: Fully cw then ccw until afc locks in, then continue to adjust ccw until afc holding level just starts to become unstable	[Oscilloscope] Waveform: Voltage between afc holding level and preset level as set by 641 AFC MAN ADJ is greater than 2.5 v	. . .
3	[641] AFC MAN ADJ: Adjust cw until afc holding just starts to become unstable	[Oscilloscope] Waveform: Voltage between afc holding level and preset level as set by 641 AFC MAN ADJ is greater than 2.5 v	. . .
4	[641] S1: Release [Oscilloscope] Vertical sensitivity: 20 V/CM [841] Self test switch: SLOW	[Oscilloscope] Waveform: Afc holding level is horizontal and moves up and down the oscilloscope display as a function of time (no droop or break lock)	. . .
5	[841] Self test switch: MEDIUM, FAST MIN, FAST MAX LP, and FAST MAX SP observing oscilloscope at each position	[Oscilloscope] Waveform: Afc holding level appears as a horizontal line in all modes	. . .
6	[841] Self test switch: MAN SLOW [NWW] RAPID TUNE MAGNETRON GND OPER: Center (off) [Oscilloscope] Vertical sensitivity: 50 mV/CM	[Oscilloscope] Waveform: Vertical droop of afc holding level 60 mv or less (refer to fig. 3-5)	. . .
7	[305] RANGE: 40SP	[Oscilloscope] Waveform: Afc holding level droop is 180 mv or less	. . .

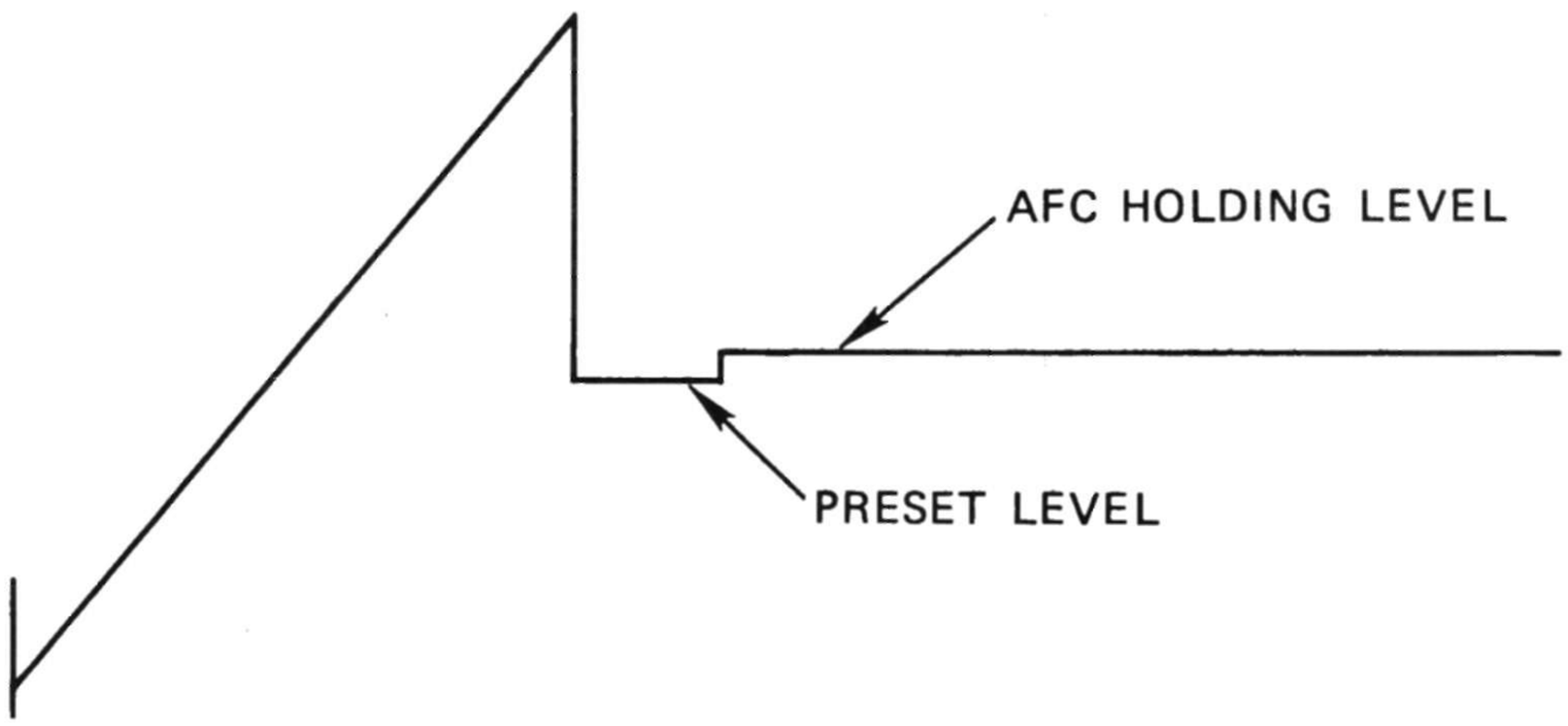


Figure 3-4. Oscilloscope Display (PRF Interval)

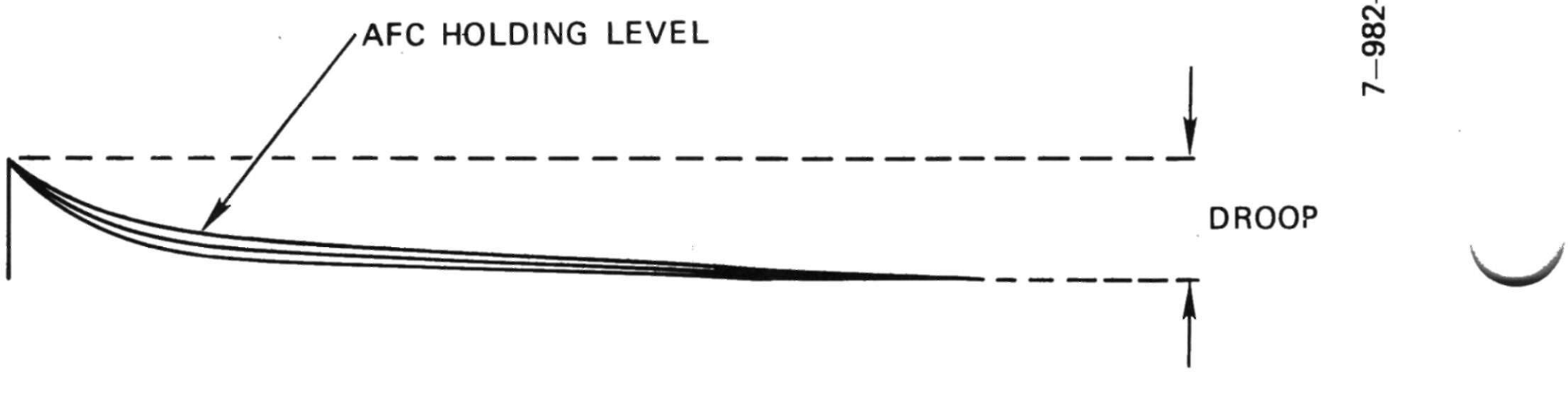


Figure 3-5. Oscilloscope Display (AFC Holding Level

STEP	INSTRUCTION	INDICATION	REMARKS
8	[841] Self test switch: MAN SCRAM	[Oscilloscope] Waveform: Afc holding level droop is 260 mv or less	. . .
9	[305] RANGE: 40LP	[Oscilloscope] Waveform: Afc holding level droop is 120 mv or less	. . .
10	[NWW] RAPID TUNE MAGNETRON GND OPER: Down (normal) [841] FREQ SET: Adjust to obtain multimeter indication	[Multimeter] D-c voltage: -4.0 v [Oscilloscope] Waveform: Afc holding level droop is 120 mv or less	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
11	[305] RANGE: 40SP	[Oscilloscope] Waveform: Afc holding level droop is 260 mv or less	. . .
12	[305] RANGE: 40LP [841] FREQ SET: Adjust to obtain multimeter indication	[Multimeter] D-c voltage: -3.0 v [Oscilloscope] Waveform: Afc holding level droop is 260 mv or less	. . .
13	[841] FREQ SET: Adjust for d-c voltage indication on multimeter; at each indication, observe waveform on oscilloscope	[Multimeter] D-c voltage: -2.0, -1.0, 0, +1.0, +2.0, +3.0 and +4.0 v, respectively [Oscilloscope] Waveform: Afc holding level droop is 260 mv or less for each voltage setting	. . .
14	[841] Self test switch: OFF [196] MOD TEST: Down (off) [305] RANGE: 16SP [905] POWER: OFF [Test equipment] Disconnect	Check complete	. . .

3-6i. NOISE FIGURE MEASUREMENT CHECK. The purpose of this procedure is to check the sensitivity of the radar receiving function. In this procedure the semi-rigid portion of the 464516 waveguide is removed and a flexible waveguide is connected to the radar receiver. The alternate receiver sensitivity check given in paragraph 3-6j is performed by removing the radome, removing the feedhorn from the antenna, and then connecting a three-port adapter to the antenna.

EQUIPMENT REQUIRED

1. Digital voltmeter
2. 486180 test set
3. Noise generator
4. Noise figure meter

EQUIPMENT HOOKUP

Connect digital voltmeter to 641 TP3 INTEG and TP2 GND.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-9c

PROBABLE FAULTY UNIT

017	641
065	841

REFERENCES

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-5)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [305] TUNE: NORM	[866] PARAMP ON: Comes on - [Digital voltmeter] D-c voltage: Record	. . .
2	**CAUTION** When disconnecting the 516 waveguide or when connecting FG090A18 (AT-3-B-090-1800) flexible waveguide (part of 486180 test set), extreme care must be exercised to prevent bending 451228 waveguide assembly or excessive bending of semi-rigid portion of the 516 waveguide (pressing hard against 516 waveguide mounting screws may bend 451228 waveguide). Ensure that FG090A18 flexible waveguide and noise generator are properly supported.		
	[905] POWER: OFF [516] Waveguide: Remove semi-rigid portion [486180] Flexible waveguide: Connect to 065 unit (451228 waveguide assembly)	[Noise figure meter] Indication: Zero	. . .
	NOTE The noise generator is nondirectional. Either end may be connected to the FG090A18 flexible waveguide.		
	[Noise generator] Lead: Connect to 486180 flexible waveguide [486180] 244236 waveguide: Connect to noise generator 244479 waveguide: Connect to 244236 waveguide 244180 dummy load: Connect to 244479 waveguide [Noise figure meter] GAS TUBE connector: Connect to noise generator [065] P06512: Disconnect from J06512 [Noise figure meter] INPUT connector: Connect coax cable from J06512 Power input: Connect to 115 v 60 Hz Power switch: ON [305] RANGE: 40LP RDR: NORM CHAFF: OFF		
	NOTE To ensure correct system setup, maintain system in standby until check is completed.		
	[905] POWER: RADAR STBY and wait approx 4 minutes for system to time in [841] Self test switch: MAN SCRAM [641] P64106: Disconnect from J64106 [841] Self test switch: MAN SLOW		

STEP	INSTRUCTION	INDICATION	REMARKS
2 (Cont)	[196] SHUTTER: RCVR [Noise figure meter] NOISE SOURCE: GAS TUBE METER FUNCTION: ZERO CALIBRATION INPUT MC: 30 MC ZERO CALIBRATION control: Adjust to obtain indication		
3	[Noise figure meter] METER FUNCTION: INF CALIBRATION INF CALIBRATION control: Adjust to obtain indication	[Noise figure meter] Indication: Infinity	. . .
4	[Noise figure meter] METER FUNCTION: CURRENT 4 MA GAS TUBE CURRENT control: Adjust to obtain indication	[Noise figure meter] Indication: 2 ma (center scale)	. . .
5	[Noise figure meter] METER FUNCTION: CURRENT 2 MA GAS TUBE CURRENT control: Adjust to obtain indication	[Noise figure meter] Indication: 2 ma (full scale)	. . .
	NOTE 641 S1 must be pressed and held to MAN AFC for each of the indications in steps 6 thru 11.		
6	[Noise figure meter] METER FUNCTION: NOISE FIGURE [NWW] RAPID TUNE MAGNETRON GND OPER: Test (up) [641] S1: Press to MAN AFC and hold AFC MAN ADJ: Adjust to obtain indication	[Digital voltmeter] D-c voltage: Same as voltage recorded in step 1 ±0.2 v [Noise figure meter] GAS TUBE (top) scale: Less than or equal to 11 db	. . .
7	[641] S1: Release [866] S2 PARAMP: TEST	[Noise figure meter] GAS TUBE (top) scale: Less than or equal to 8 db	. . .
8	[641] AFC MAN ADJ: Adjust to obtain indication	[Digital voltmeter] D-c voltage: Same as voltage recorded in step 1 ±0.2 v	. . .
9	[641] AFC MAN ADJ: Adjust through a range of ±2.0 v from the voltage obtained in step 8	[Noise figure meter] GAS TUBE (top) scale: Varies less than 1 db	. . .
10	[866] S2 PARAMP: NORM [641] AFC MAN ADJ: Adjust to obtain indication	[Digital voltmeter] D-c voltage: +37.3 to +37.7 v	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
11	[641] AFC MAN ADJ: Slowly adjust while observing noise figure meter	[Digital voltmeter] D-c voltage: +112.3 to +112.7 v [Noise figure meter] GAS TUBE (top) scale: Less than 11 db with a variation of less than 2 db as voltage changes from +37.5 to +112.5 v	. . .
	CAUTION When disconnecting flexible waveguide or reconnecting 516 waveguide, extreme care must be exercised to prevent bending 451228 waveguide assembly or excessive bending of the semi-rigid portion of the 516 waveguide.		
12	[905] POWER: OFF [486180] Flexible waveguide: Disconnect from 065 unit [516] Waveguide: Reinstall semi-rigid portion [065] P06512: Reconnect to J06512 [641] P64106: Reconnect to J64106 [841] Self test switch: OFF [196] SHUTTER: NORM [NWW] RAPID TUNE MAGNETRON GND OPER: Normal (down) [Test equipment] Disconnect	Check complete	. . .

3-6j. ALTERNATE NOISE FIGURE MEASUREMENT CHECK. The purpose of this procedure is to check the sensitivity of the radar receiving function. In this procedure, the radome is removed, the feedhorn is removed from the antenna, and a three-port adapter is connected to the antenna.

EQUIPMENT REQUIRED

1. Digital multimeter
2. 486180 test set
3. Noise generator
4. Noise figure meter

EQUIPMENT HOOKUP

Connect digital multimeter to 641 TP3 INTEG and TP2 GND.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-9c

PROBABLE FAULTY UNIT

017	641
065	841

REFERENCES

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-5)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [Digital multimeter] D-c voltage: Record when PARAMP ON comes on	[866] PARAMP: Comes on	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
2	**CAUTION** Ensure that FG090A18 (AT-3-B-090-1800) flexible waveguide and noise generator are properly supported.		
	[905] POWER: OFF [Aircraft] Radome: Remove iaw para 10-4m [017] Feedhorn: Remove [486180] 244185 three-port adapter: Connect to antenna Flexible waveguide: Connect to center port of 244185 three-port adapter [486180] 244180 dummy load: Connect to remaining port of 244185 three-port adapter	[Noise figure meter] Indication: Zero	. . .
	NOTE The noise generator is nondirectional. Either end may be connected to the flexible waveguide.		
	[Noise generator] Lead: Connect to flexible waveguide [486180] 244236 waveguide: Connect to noise generator 244479 waveguide: Connect to 244236 waveguide 244180 dummy load: Connect to 244479 waveguide [Noise figure meter] GAS TUBE connector: Connect to noise generator [065] P06512: Disconnect from J06512 [Noise figure meter] INPUT connector: Connect coax cable from J06512 Power connector: Connect to 115 v 60 Hz Power switch: ON [305] RANGE 40LP		
	NOTE To ensure correct system setup, maintain system in radar standby until check is completed.		
	[905] POWER: RADAR STBY [841] Self test switch: MAN SCRAM [641] P64106: Disconnect from J64106 [841] Self test: MAN SLOW [196] SHUTTER: RCVR [Noise figure meter] NOISE SOURCE: GAS TUBE METER FUNCTION: ZERO CALIBRATION INPUT MC: 30 MC ZERO CALIBRATION control: Adjust to obtain indication		

STEP	INSTRUCTION	INDICATION	REMARKS
3	[Noise figure meter] METER FUNCTION: INF CALIBRATION INF CALIBRATION control: Adjust to obtain indication	[Noise figure meter] Indication: Infinity	. . .
4	[Noise figure meter] METER FUNCTION: CURRENT 4 MA GAS TUBE CURRENT control: Adjust to obtain indication	[Noise figure meter] Indication: 2 ma (center scale)	. . .
5	[Noise figure meter] METER FUNCTION: CURRENT 2 MA GAS TUBE CURRENT control: Adjust to obtain indication	[Noise figure meter] Indication: 2 ma (full scale)	. . .
	NOTE 641 S1 must be pressed and held to MAN AFC for each of the indications in steps 6 thru 11.		
6	[Noise figure meter] METER FUNCTION: NOISE FIGURE [NWW] RAPID TUNE MAGNETRON GND OPER: Test (up) [641] S1: Press to MAN AFC and hold AFC MAN ADJ: Adjust to obtain indication	[Digital multimeter] D-c voltage: Same as recorded in step 1 ±0.2 v [Noise figure meter] GAS TUBE (top) scale: Less than or equal to 13 db	. . .
7	[866] S2 PARAMP: TEST	[Noise figure meter] GAS TUBE (top) scale: Less than 10 db	. . .
8	[641] AFC MAN ADJ: Adjust to obtain indication	[Digital multimeter] D-c voltage: Same as voltage in step 1 ±0.2 v	. . .
9	[641] AFC MAN ADJ: Adjust through a range of ±2.0 v from the voltage obtained in step 8	[Noise figure meter] GAS TUBE (top) scale: Varies less than 1 db	. . .
10	[866] S2 PARAMP: NORM [641] AFC MAN ADJ: Adjust to obtain indication	[Digital multimeter] D-c voltage: +37.3 to +37.7 v	. . .
11	[641] AFC MAN ADJ: Slowly adjust while observing noise figure meter	[Digital multimeter] D-c voltage: +112.3 to +112.7 v [Noise figure meter] GAS TUBE (top) scale: Less than 13 db and with a variation of less than 2 db as voltage changes from +37.5 to +112.5 v	. . .
12	[641] S1: Release [905] POWER: OFF [486180] 244185 three-port adapter: Remove from antenna [017] Feedhorn: Install [065] P06512: Connect to J06512	Check complete	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
12 (cont)	[641] P64106: Connect to J64106 [841] Self test switch: OFF [196] SHUTTER: NORM [NWW] RAPID TUNE MAGNETRON GND OPER: Normal (down) [Test equipment] Disconnect		

3-6k. 065 IMAGE REJECTION MIXER CHECK. The purpose of this procedure is to ensure the 065 image rejection mixer is operational.

EQUIPMENT REQUIRED

1. R-f blanket
2. VTVM
3. UPM-141

EQUIPMENT HOOKUP

NOTE

Do not disconnect test equipment after performing steps 1 thru 5 of para 3-10a.

Set up UPM-141 for CW SIG GEN operation in accordance with paragraph 11-3i. at a frequency 60 MHz below paramp center frequency in accordance with T.O. 27-6.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Para 3-10a, steps 1 thru 5 at center of paramp band iaw MA-1 classified information codes (T.O. 27-6). Record dbm and VTVM values obtained in step 5

PROBABLE FAULTY UNIT

641
Receiver barrel

FUNCTIONAL DIAGRAM

Receiver
(T.O. 27-5/Fig. 3-5)

REFERENCES

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[UPM-141] RF POWER OUTPUT-DBM: Select to obtain VTVM indication	[VTVM] D-c voltage: Indicates value calculated in para 3-10a, step 5 [UPM-141] RF POWER OUTPUT-DBM: Selected value plus cable and 484 unit attenuation is a minimum of 16 dbm from that recorded in para 3-10a, step 5	. . .
2	[841] Self test switch: OFF [196] MOD TEST: Down (off) [305] RANGE: 16SP [905] POWER: OFF [Test equipment] Disconnect [R-f blanket] Remove	Check complete	. . .

3-61. 541 SCRAM RAMP STEP AND SLOPE CHECK. The purpose of this procedure is to ensure that the 541 unit is operational.

EQUIPMENT REQUIRED

1. UPM-141
2. Oscilloscope

EQUIPMENT HOOKUP

Connect UPM-141 RF IN/OUT (J7) to J48401. Set UPM-141 MEASUREMENT SELECT to RDR FREQ (MHZ) and set TEST MODE to ACFT-XPONDER PULSE.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

541

REFERENCES

FUNCTIONAL DIAGRAM

AFC Programmer (T.O. 27-5/Fig. 3-10)

FAULT ISOLATION

Jam Avoidance and RTM Operation (T.O. 27-3/ Fig. 3-11)

NOTE

Allow radar transmitter a 10 minute warmup period, in transmitting mode, before performing this check.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [196] MOD TEST: Up (on) [841] Self test switch: MAN SCRAM FREQ SET: Adjust to obtain indication	[UPM-141] Digital display: Indicates low limit frequency iaw MA-1 classified information codes (T.O. 27-6) — FREQ LOCK: Comes on	. . .
2	**NOTE** If 541 R2 SLOPE or R3 STEP adjustment is required, both adjustments must be repeated until min interaction is observed. When adjusting R3 STEP, set frequency as in step 1 and when adjusting R2 SLOPE, set frequency as in step 3.		
	[Oscilloscope] TRIGGER: Connect to 541 TP6 SHAPE TRIG to SYNC oscilloscope [541] R3 STEP: Adjust, if necessary, to obtain indication	[Oscilloscope] Waveform: Scram ramp lowest point is 2.5 ±1.0 v below local oscillator holding time voltage level and reset time is less than 15 μsec (see fig. 3-6) VERT INPUT: Connect to 641 TP3.	. . .
3	[841] FREQ SET: Adjust to obtain indication	[UPM-141] Digital display: Indicates high limit frequency iaw MA-1 classified information codes (T.O. 27-6) — FREQ LOCK: Remains on on	. . .
4	[541] R2 SLOPE: Adjust, if necessary, to obtain indication	[Oscilloscope] Waveform: Scram ramp highest point is 2.5 ±1.0 v above local oscillator holding time voltage level and reset time is less than 15 μsec (see fig. 3-7)	If full adjustment of 541 R2 SLOPE results in the highest point on the scram ramp being higher than the local oscillator holding time voltage, readjust both 541 R3 STEP (frequency set as in step 1) and R2 SLOPE (frequency set as in step 3) until the lowest point on the scram ramp

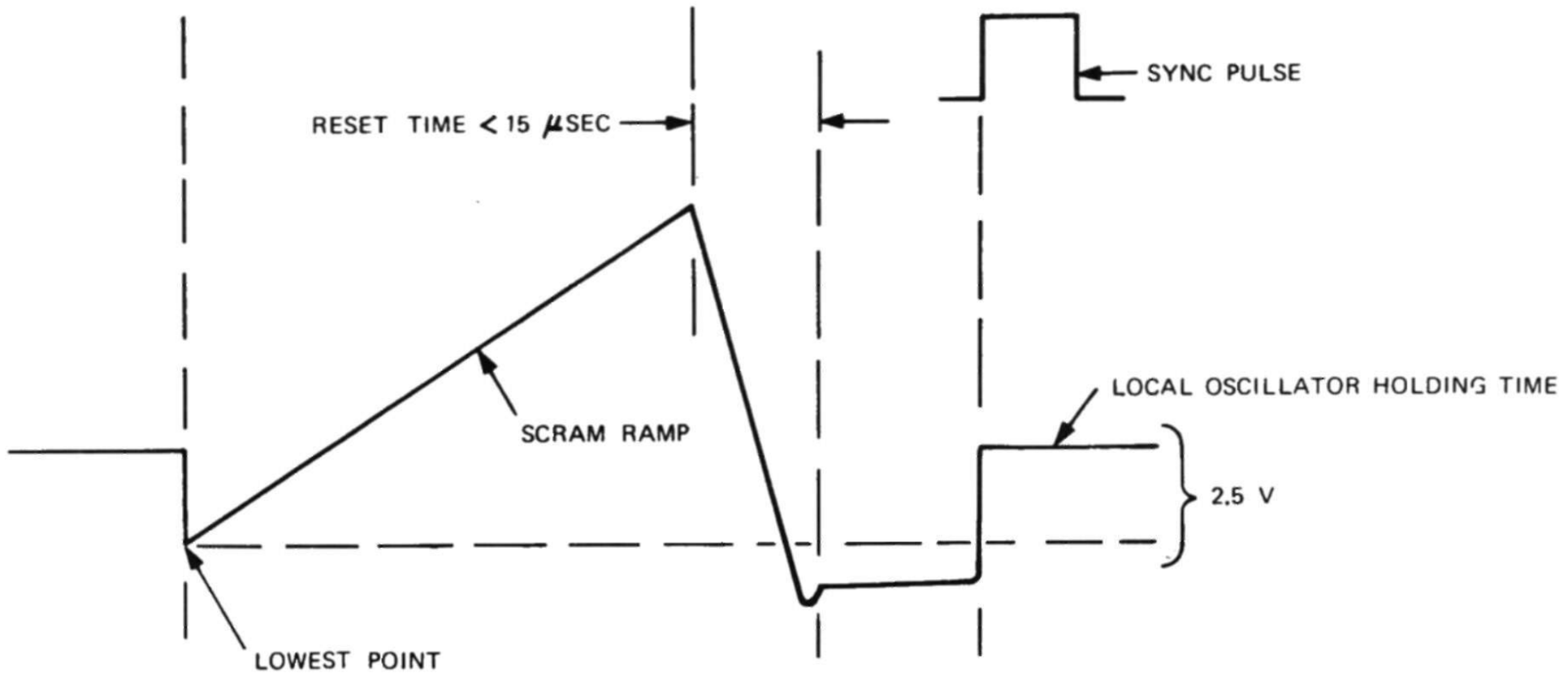


Figure 3-6. Scram Ramp Step Waveform

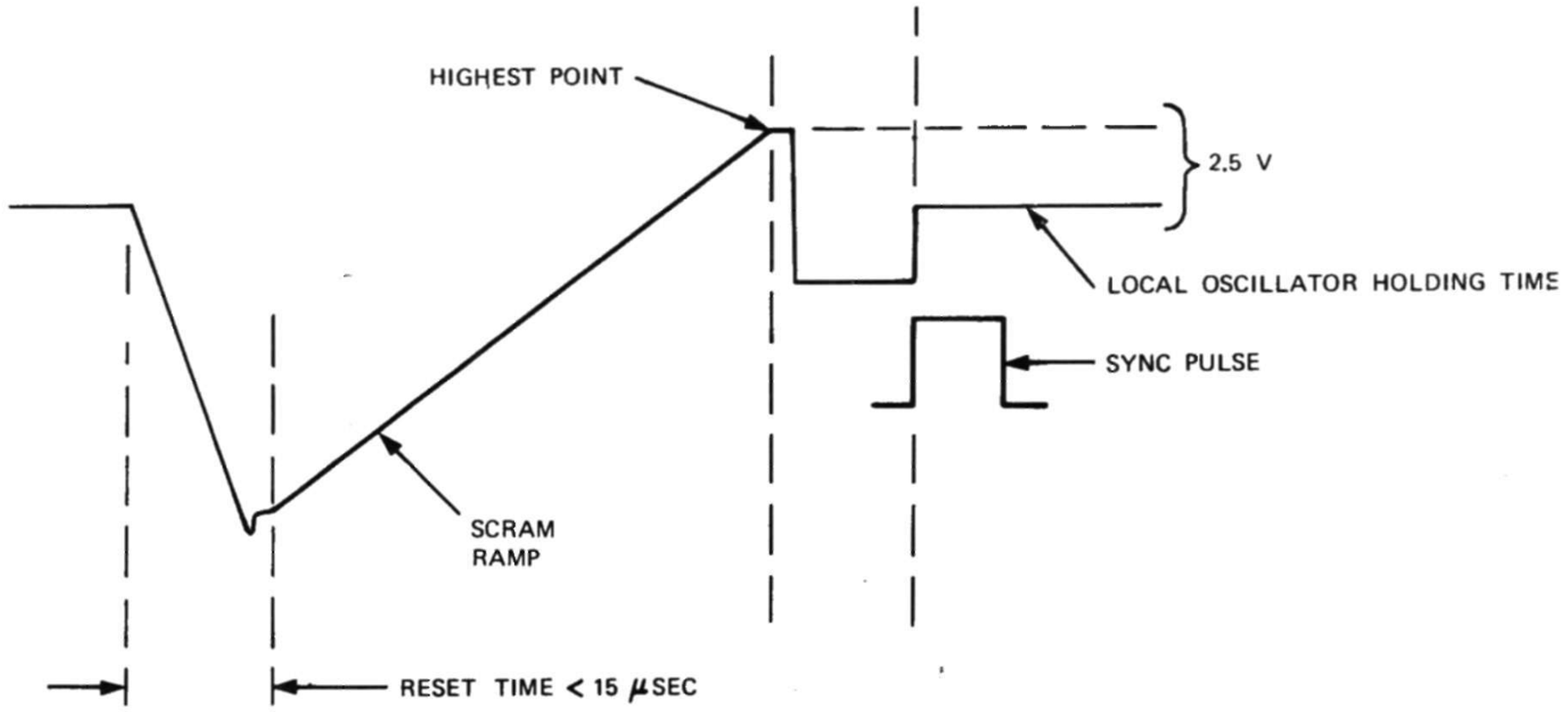


Figure 3-7. Scram Ramp Slope Waveform

STEP	INSTRUCTION	INDICATION	REMARKS
4 (cont)			is as much below the local oscillator holding time voltage (at frequency as in step 1) as the highest point is above the local oscillator holding time voltage (at frequency as in step 3)

STEP	INSTRUCTION	INDICATION	REMARKS
5	[196] MOD TEST: Down (off) [841] Self test switch: OFF [905] POWER: OFF [Test equipment] Disconnect	Adjustment complete	. . .

3-7. VIDEO RECEIVING ADJUSTMENTS

3-7a. 084 VARIABLE AFC COUPLING ADJUSTMENT. This adjustment ensures that sufficient transmitted r-f power is routed to the 641 unit to allow afc lockon. If this check fails, afc lockon may be degraded resulting in weak pickup.

EQUIPMENT REQUIRED

1. HP478A thermistor mount
2. HP431B power meter
3. UG 565A/U connector
4. UG701/U connector

EQUIPMENT HOOKUP

Using indicated connectors, connect thermistor mount and power meter (set on .1 mw scale and 200Ω) to 641 connector P64103

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

084

NOTE

Power meter must be zeroed while system is connected and with transmitter off to eliminate bias errors on low scales. Power meter must be kept as far away from aircraft as possible, or shielded, to prevent inaccurate indications due to stray radiation.

REFERENCES

FUNCTIONAL DIAGRAM

Transmitting
(T.O. 27-5/Fig. 3-4)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40SP [841] Self test switch: SLOW [196] MOD TEST: Up (on) [084] AT1: Adjust to obtain indication	[Power meter] Average power: 0.03 mw (0.015 mw min, 0.045 mw max)	Variations in indication represent variations in transmitter power out
2	[841] Self test switch: OFF [196] MOD TEST: Down (off) [305] RANGE: 16SP [905] POWER: OFF [Test equipment] Disconnect	Adjustment complete	

3-7b. 065 AT452 CRYSTAL CURRENT ADJUSTMENT. The crystal current adjustment verifies proper output of the 641 local oscillator, ensures that the 065 signal crystals are properly matched, and harmonizes the local oscillator output to the signal output.

EQUIPMENT REQUIRED

1. HP431B power meter
2. HP478A thermistor mount
3. 20 db attenuator
4. UG565/U connector

EQUIPMENT HOOKUP

Using indicated connector, connect 20 db attenuator, thermistor mount and power meter (set on 3 mw scale) to 641 connector J64104.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

Receiver Barrel

REFERENCES

FUNCTIONAL DIAGRAM

Receiving (T.O. 27-5/Fig. 3-5)

FAULT ISOLATION

Radar Video (T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40SP [196] MOD TEST: Up (on) [841] Self test switch: FIXED [Power Meter] Record high and low indications for following steps	[Power meter] Power: Between 0.3 and 1.5 mw over a period of approx 60 sec	Power meter indication times 100 equals local oscillator output
	NOTE If power indication cannot be obtained, perform step 2; otherwise proceed to step 3.		
2	[841] Self test switch: MAN SLOW FREQ SET: Adjust to obtain indication	Same as step 1	. . .
3	[Test equipment] Disconnect [641] P64104: Connect to J64104 [096] S1: 3 S2: A [841] Self test switch: MAN SLOW FREQ SET: Adjust to obtain max indication [096] SELF TEST METER: Note and record max indication	[096] SELF TEST METER: 2.0 to 9.5 units	Indication shall be within limits of graph A of fig. 3-8
4	[096] S2: B	[096] SELF TEST METER: Within 2 units of indication in step 3	Same as step 3
5	[096] S2: C	Same as step 4	Same as step 3
6	[096] S2: D	Same as step 4	Same as step 3
7	[096] S2: A [841] FREQ SET: Adjust to obtain indication [096] SELF TEST METER: Note and record min indication	[096] SELF TEST METER: 2.0 to 9.5 units	Same as step 3
8	[096] S2: B	[096] SELF TEST METER: Within 2 units of indication in step 7	Same as step 3
9	[096] S2: C	Same as step 4	Same as step 3
10	[096] S2: D	Same as step 4	Same as step 3
11	**NOTE** If any one of steps 3 thru 10 indications are incorrect, perform step 11; otherwise proceed to step 15 **WARNING** Prior to removing receiver hat, press 024 17PSIA and 32PSIA BLEED VALVES until pressurization is reduced to atmospheric pressure.		

STEP	INSTRUCTION	INDICATION	REMARKS
11 (cont)	[065] Receiver hat: Remove [096] S1: 3 S2: A [065] S452: 1 XTAL CUR NO. 1 [065] AT452: Adjust, if necessary, to obtain indication [096] SELF TEST METER: Note and record indication	[065] M451: 2.0 to 7.0 units	Indications shall be within limits of graph B of fig. 3-8
12	[065] S452: 2 XTAL CUR NO. 2	[065] M451: Within 2 units of indication in step 11	Same as step 11
13	[065] S452: 3 XTAL CUR NO. 3	Same as step 12	Same as step 11
14	[065] S452: 4 XTAL CUR NO. 4	Same as step 12	Same as step 11
	NOTE Set S452 to OFF, reinstall receiver hat and perform Radar High Pressure Leakage and Interlock Check iaw para 3-4q.		
15	[841] Self test switch: OFF [196] MOD TEST: Down (off) [305] RANGE: 16SP [905] POWER: OFF	Adjustment complete	. . .

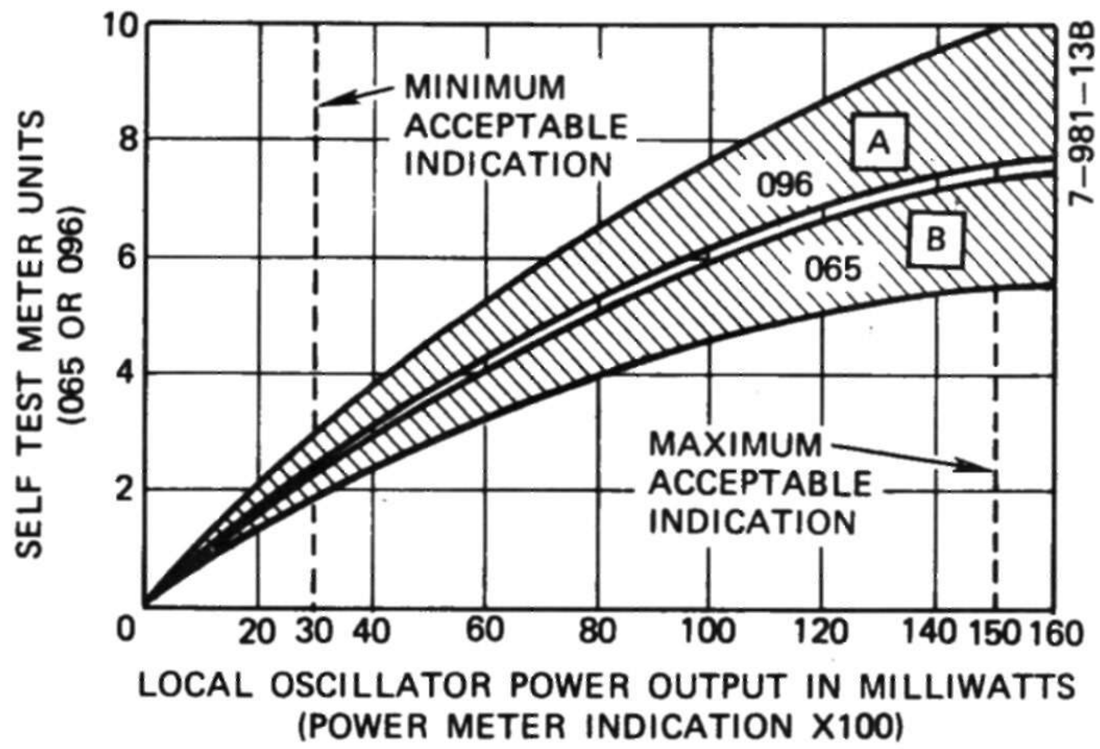


Figure 3-8. Crystal Current Adjustment

3-7c. 641 30 MC ADJUST. The purpose of this adjustment is to ensure that the local oscillator frequency is correct (nominally 30 MHz below the transmitter frequency). Correct alignment ensures that the i-f signal coming from the mixer will be matched to the bandpass of the i-f amplifiers in the 065 and 295 units. This check is performed utilizing the 30 MHz receiver test targets.

EQUIPMENT REQUIRED

Oscilloscope

EQUIPMENT HOOKUP

Connect oscilloscope VERTICAL input to 082 DISPLAY VIDEO IN test point and connect oscilloscope EXT TRIG input to 082 SWEEP TRIGGER test point.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

641

REFERENCES

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-5)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40LP [NWW] RAPID TUNE MAGNETRON GND OPER: Center (off) [196] MOD TEST: Up (on) REC TEST: Up (on) [080] IF GAIN: Adjust to obtain indication	[Oscilloscope] Receiver test targets: Amplitude approx 50% of receiver saturation	. . .
2	[641] 30 MC ADJUST: Adjust ccw to obtain indication	[Oscilloscope] Receiver test targets: Degradation just noticeable	Approx two turns required before degradation is apparent
3	[641] 30 MC ADJUST: Adjust cw to obtain indication [Oscilloscope] Receiver test targets: Note number of turns required to pass through peak pulse and obtain same degree of degradation obtained in step 2 [641] 30 MC ADJUST: Ccw one half the number of turns above [196] MOD TEST: Down (off) REC TEST: Down (off) [NWW] RAPID TUNE MAGNETRON GND OPER: Down (normal) [305] RANGE: 16SP [905] POWER: OFF [Oscilloscope] Disconnect	Adjustment complete	. . .

3-8. VIDEO CONTROL CHECKS.

3-8a. 080 IF GAIN CONTROL SWITCHING LOGIC CHECK. The purpose of this procedure is to check the i-f gain circuits in the 020 unit.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

020
305

REFERENCES

FUNCTIONAL DIAGRAM

AGC and HOM
(T.O. 27-5/Fig. 3-6)

FAULT ISOLATION

Lock-On and Range Tracking
(T.O. 27-3/Fig. 3-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [096] S1: 6 S2: G [305] RDR: HOM [080] IF GAIN: Fully ccw	[096] SELF TEST METER: Approx **5 units.**	. . .
2	[083] Action switch: Press to 2nd detent and release [020] SELF TEST: Press and hold and note 096 SELF TEST METER indication when 020 ATOT comes on	[020] ATOT: Comes on [096] SELF TEST METER: **Approx 1 unit followed by gradual increase to maximum indication**	. . .
3	[080] IF GAIN: Adjust thru entire range while observing 096 SELF TEST METER	[096] SELF TEST METER: Indication does not change from that obtained in step 2	. . .
4	[080] IF GAIN: Fully ccw [020] SELF TEST: Release and note 096 SELF TEST METER indication when 020 ATOT goes off	[020] ATOT: Goes off [096] SELF TEST METER: Approx 8 units	. . .
4.1	**[905] POWER: ON [305] RDR: MAN IF [080] IF GAIN: Fully CW [083] AUTO SEARCH: Press and release**	**[096] SELF TEST METER: Approximately 1 unit. [080] Mode lamp 2: Comes on.**	
4.2	**[196] REC TEST: Up (ON) [083] Action switch: Press to 2nd detent and lock-on to 2nd receiver test target.**	**[096] SELF TEST METER: Indication does not change from that obtained in Step 4.1**	
4.3	**[080] IF GAIN: Slowly rotate CCW control just prior to break lock. If break lock occurs, increase IF GAIN slightly and re-accomplish lock-on.**	**[096] SELF-TEST METER: Indication increases during ccw rotation and decreases during cw rotation.**	
4.4	**[305] RDR: NORM [080] IF GAIN: Fully cw.**	**[096] SELF TEST METER: Approximately 3.5 units after approximately 1 1/2 second delay.**	**[080] Vary IF GAIN control to insure that it has no control.**
5	[305] RDR: NORM [096] S1: 1 S2: A [905] POWER: OFF	Check complete	. . .

3-8b. 020 DYNAMIC AGC CHECK. The purpose of this procedure is to ensure that the gain of the 020 i-f circuits increases when lockon occurs.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

020

REFERENCES

FUNCTIONAL DIAGRAM

AGC and HOM
(T.O. 27-5/Fig. 3-6)

FAULT ISOLATION

Lock-On and Range Tracking
(T.O. 27-3/Fig. 3-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [080] IF GAIN: Fully cw [083] Action switch: Press to 2nd detent, position antenna and range gate for no target return, then release action switch [096] S1: 6 S2: G SELF TEST METER: Record indication [196] REC TEST: Up (on) [083] Action switch: Press to 2nd detent and lock on to 10th receiver test target	[096] SELF TEST METER: Indication increase	. . .
2	[196] REC TEST: Down (off) [096] S1: 1 S2: A [905] POWER: OFF	Check complete	. . .

3-8c 063 SNIFFER GATE CHECK. The purpose of this procedure is to ensure that the sniff circuits in the 063 unit are operational.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

063

REFERENCES

FUNCTIONAL DIAGRAM

RT/PA
(T.O. 27-5/Fig. 3-9)

FAULT ISOLATION

Radar Transmitter Operation
(T.O. 27-3/Fig. 3-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [096] S1: 9 S2: B [063] S1 SNIFFER SELF TEST: Press and hold	[096] SELF TEST METER: 7.6 to 10.0 units	096 SELF TEST METER should not peg
2	[063] S1 SNIFFER SELF TEST: Release [096] S1: 1 S2: A [905] POWER: OFF	Check complete	. . .

3-9. VIDEO CONTROL ADJUSTMENT

3-9a. 095 AGC VIDEO GAIN ADJUSTMENT. The agc video gain adjustment ensures correct gain of the 095 track (agc) video amplifiers.

EQUIPMENT REQUIRED

Multimeter

EQUIPMENT HOOKUP

Connect multimeter to 020 AGC VIDEO.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

020

095

REFERENCES

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-17)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action switch: Press to 2nd detent and release [095] SELF TEST: Press and hold AGC VIDEO GAIN: Adjust to obtain indication	[Multimeter] D-c voltage: +0.5 ±0.03 v	. . .
2	[095] SELF TEST: Release [905] POWER: OFF [Multimeter] Disconnect	Adjustment complete	. . .

3-9b. 020 VIDEO GAIN ADJUSTMENT. The video gain adjustment ensures the proper gain of the 020 error signal amplifier circuits.

EQUIPMENT REQUIRED

Oscilloscope

EQUIPMENT HOOKUP

Connect oscilloscope VERTICAL input to 020 AGC VIDEO.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

020

REFERENCES

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-6)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action switch: Press to 2nd detent and release [196] MOD TEST: Up (on) REC TEST: Up (on) [020] SELF TEST: Press and hold [Oscilloscope] Waveform: Note and record p-p amplitude [020] ERROR SIGNAL: Monitor using oscilloscope VIDEO GAIN: Adjust to obtain indication	[Oscilloscope] Waveform: Between 4.4 and 4.6 times p-p recorded amplitude	Ignore negative spikes
2	[020] SELF TEST: Release [196] REC TEST: Down (off) MOD TEST: Down (off) [905] POWER: OFF [Oscilloscope] Disconnect	Adjustment complete	. . .

3-9c. 020 NORM REST POTENTIAL ADJUSTMENT. The norm rest potential adjustment sets the minimum negative voltage level for gain control system operation.

EQUIPMENT REQUIRED

1. Multimeter
2. R-f blanket

EQUIPMENT HOOKUP

1. Connect multimeter to 020 AGC VOLTAGE.
2. Cover radome with r-f blanket.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

020
295

REFERENCES

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-5)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	**[905] POWER: RADAR STBY** **[305] TUNE: F MIN** **RANGE: 40SP** **[080] "IF" GAIN KNOB FULL CW** **[196] MOD TEST: Up (on)** **[020] NORM REST POTENTIAL: Adjust to obtain indication**	[Multimeter] D-c voltage: -1.0 ±0.1 v	. . .
2	[196] MOD TEST: Down (off) [305] TUNE: NORM RANGE: 16SP [905] POWER: OFF [R-f blanket] Remove [Multimeter] Disconnect	Check complete	. . .

3-9d. 295 NORM GAIN AND PARAMP GAIN ADJUSTMENT. The norm gain and paramp gain adjustments ensure that the proper i-f signal level from the 065 unit reaches the 295 unit in both normal and paramp modes.

EQUIPMENT REQUIRED

R-f blanket

EQUIPMENT HOOKUP

Cover radome with r-f blanket.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-9c

PROBABLE FAULTY UNIT

295

Receiver barrel

REFERENCES

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-5)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] TUNE: F MIN RANGE: 40SP [196] MOD TEST: Up (on) [096] S1: 3 S2: G [295] NORM GAIN ADJ: Adjust to obtain indication	[096] SELF TEST METER: 7 units	. . .
2	[305] RANGE: 40LP	[096] SELF TEST METER: Within 1 unit of indication obtained in step 1	
3	[305] RANGE: 40SP TUNE: NORM [295] PARAMP GAIN ADJ: Adjust to obtain indication	[096] SELF TEST METER: 7 units	. . .
4	[305] RANGE: 16SP [196] MOD TEST: Down (off) [096] S1: 1 S2: A [905] POWER: OFF [R-f blanket] Remove	Adjustment complete	. . .

3-9e. 020 AGC DELAY ADJUSTMENT. The agc delay adjustment ensures that the gain of the 020 agc circuits is correct with a constant amplitude input.

EQUIPMENT REQUIRED

1. Oscilloscope
2. VTVM

EQUIPMENT HOOKUP

1. Connect oscilloscope VERTICAL input to 020 AGC VIDEO.
2. Connect VTVM to 841 XMTR REF.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

020

REFERENCES

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-5)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [196] MOD TEST: Up (on) REC TEST: Up (on) [841] Self test switch: MAN SCRAM FREQ SET: Adjust to obtain indication	[VTVM] D-c voltage: 0 ±0.5 v	. . .
2	[083] Action switch: Press to 2nd detent, lock on to second receiver test target and release action switch [020] AGC DELAY: Adjust to obtain indication	[Oscilloscope] Second receiver test target: Amplitude of 6.5 ±0.5 v peak at midpoint of pulse modulation	. . .
3	[196] MOD TEST: Down (off) REC TEST: Down (off) [841] Self test switch: OFF [905] POWER: Off [Test equipment] Disconnect	Adjustment complete	. . .

3-9f. 020 HOM REST POTENTIAL ADJUSTMENT. The purpose of this procedure is to ensure that the homing mode circuits in the 020 unit are operational.

EQUIPMENT REQUIRED

Multimeter

EQUIPMENT HOOKUP

Connect to 020 ERROR SIGNAL.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-9d

PROBABLE FAULTY UNIT

020

D.S. 25-44
Pg 1

REFERENCES

FUNCTIONAL DIAGRAM

AGC and HOM
(T.O. 27-5/Fig. 3-6)

FAULT ISOLATION

Angle Tracking
(T.O. 27-3/Fig. 3-7)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [305] RANGE: 40SP [083] Action switch: Press to 2nd detent and hold Hand control: Move as necessary ANT ELEV: Adjust, as necessary, to obtain indication	[080] Display: Min clutter (no clutter in area of range gate)	. . .
2	[083] Action switch: Release	[Multimeter] D-c voltage: Note and record	. . .
3	[020] ATOT SENS: Fully ccw. [305] RDR: HOM	[020] ATOT: Off	Ensure no clutter appears in Range Gate area.
4	[020] HOM REST POTENTIAL: Adjust to obtain indication.	[Multimeter] Dc. voltage Same as step 2.	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
5	[020] ATOT SENS: Readjust in accordance with paragraph 3-9h.		. . .
6	[305] RANGE: 16SP RDR: NORM [905] POWER: OFF [Multimeter] Disconnect	Adjustment complete	. . .

3-9g. 095 ON TARGET ADJUSTMENT. The purpose of this procedure is to ensure that the on target circuitry in the 095 unit is properly adjusted.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

095

103

REFERENCES

FUNCTIONAL DIAGRAM

Range Track
(T.O. 27-5/Fig. 3-17)

FAULT ISOLATION

Lock-On and Range Tracking
(T.O. 27-3/Fig. 3-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [196] MOD TEST SW: TEST (UP) [083] Action switch: Press to 2nd detent and release [095] ON TARGET ADJ switch: Press and hold ON TARGET ADJ control: Slowly adjust cw to obtain indication	[095] ON TARGET: Just comes on	. . .
2	[095] ON TARGET ADJ switch: Release [196] MOD TEST SW: NORM (DOWN)	[095] ON TARGET: Goes off immediately	. . .
3	[905] POWER: OFF	Adjustment complete	

3-9h. 020 ATOT SENSITIVITY ADJUSTMENT. The purpose of this procedure is to ensure that the 020 ATOT circuitry is operational.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

020

REFERENCES

FUNCTIONAL DIAGRAM

Anti-chaff
(T.O. 27-5/Fig. 3-20)

FAULT ISOLATION

ATOT Circuit Operation
(T.O. 27-3/Fig. 3-10)

STEP	INSTRUCTION	INDICATION	REMARKS
1	**NOTE** After ATOT has been on for 10 seconds, perform step 2.		
	[905] POWER: RADAR STBY [305] RDR: HOM RANGE: 40SP [083] Action switch: Press to 2nd detent and release [196] MOD TEST: Up (on) [020] SELF TEST: Press and hold ATOT: Note and record time delay before light comes on SELF TEST: Release	[020] ATOT: Goes off after approx same time delay recorded	If delay times are not approx equal, adjust 020 ATOT SENSITIVITY in small increments and repeat steps 1 and 2. Adjusting 020 ATOT SENSITIVITY cw will **increase time to go off and decrease time to come on.**
2	[196] MOD TEST: Down (off) [305] RANGE: 16SP RDR: NORM [905] POWER: OFF	Adjustment complete	. . .

3-9i. 295 SNIFF THRESHOLD ADJUSTMENT. The sniff threshold adjustment establishes the video level required to activate the 295 unit sniff circuits.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

063

295

REFERENCES

FUNCTIONAL DIAGRAM

RT/PA
(T.O. 27-5/Fig. 3-9)

FAULT ISOLATION

Lock-On and Range Tracking
(T.O. 27-3/Fig. 3-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [083] Action switch: Press to 2nd detent and hold Hand control: Position to area with no targets and release action switch [063] S1 SNIFFER SELF TEST: ON and hold [295] SNIFF THRESHOLD ADJ: Adjust ccw to obtain indication	[295] SNIFF TEST: Off	. . .
2	[295] SNIFF THRESHOLD ADJ: Adjust slowly cw to obtain indication	[295] SNIFF TEST: Just comes on	. . .
3	[063] S1 SNIFFER SELF TEST: Release	[295] SNIFF TEST: Goes off	. . .
4	[905] POWER: OFF	Adjustment complete	. . .

3-9j. 195 V6 BIAS ADJUSTMENT. The V6 bias adjustment sets the gain of the 195 second display video amplifier.

EQUIPMENT REQUIRED

Multimeter

EQUIPMENT HOOKUP

Connect multimeter to 195 I_K V6.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

195

REFERENCES

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-5)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40LP [196] MOD TEST: Up (on) REC TEST: Up (on) [195] V6 BIAS: Adjust to obtain indication	[Multimeter] D-c voltage: +0.25 ±0.03 v	. . .
2	[196] MOD TEST: Down (off) REC TEST: Down (off) [305] RANGE: 16SP [905] POWER: OFF [Multimeter] Disconnect	Adjustment complete	. . .

3-9k. 095 EDGE ANGLE DELAY ADJUSTMENT. The purpose of this procedure is to ensure that the 095 delay circuitry is operational.

EQUIPMENT REQUIRED

VTVM

EQUIPMENT HOOKUP

Connect VTVM to 095 EDGE ANGLE CONT VOLT.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-9a thru 3-9h

PROBABLE FAULTY UNIT

020
095

REFERENCES

FUNCTIONAL DIAGRAM

Anti-chaff (T.O. 27-5/Fig. 3-20)

FAULT ISOLATION

Chaff Circuit Operation
(T.O. 27-3/Fig. 3-8)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [096] S1: 6 S2: G [083] Action switch: Press to 2nd detent and release [096] SELF TEST METER: Note and record indication [196] MOD TEST: Up (on) REC TEST: Up (on) [083] Action switch: Press to 2nd detent, lock on to a receiver test target that provides indication and release action switch	[096] SELF TEST METER: Increase of 2 units	Lockon to several receiver test targets may be necessary to obtain proper indication
2	[095] EDGE ANGLE DELAY: Fully cw to obtain indication [VTVM] D-c voltage: Note and record	[VTVM] D-c voltage: Approx +7.3 v	. . .
3	[095] EDGE ANGLE DELAY: Adjust ccw to obtain indication	[VTVM] D-c voltage: 0.2 v less than indication in step 2	. . .
3.1	[196] REC TEST: OFF Range gate not over any video.	ON target light extinguished and VTVM indicates slightly negative voltage.	If VTVM does not go negative, check AGC delay adj. (020 unit).
4	[196] MOD TEST: Down (off) REC TEST: Down (off) [096] S1: 1 S2: A [905] POWER: OFF [VTVM] Disconnect	Adjustment complete	. . .

3-10. VIDEO OVERALL CHECKS.

3-10a. RECEIVER SENSITIVITY CHECK. The purpose of this procedure is to ensure that the receiving circuits are operational.

NOTE

If an FDT is available, perform the MDS check iaw T.O. IF-106A-2-27-7 instead of this procedure.

EQUIPMENT REQUIRED

1. R-f blanket
2. VTVM
3. UPM-141

EQUIPMENT HOOKUP

Place r-f blanket over radome. Connect VTVM to 295 DET DC and 041 TP1 GND. Connect UPM-141 RF IN/OUT (J7) to J48401 and set up for XPONDER JAM (CW) in accordance with paragraph 11-3i.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAUNTY UNIT

295

Receiver barrel

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-5)

REFERENCES

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[305] TUNE: NORM [905] POWER: RADAR STBY [305] RANGE: 40 LP [196] MOD TEST: Up (on)	[065] HV ON DS301: Comes on	. . .
2	[UPM-141] RF POWER OUTPUT-DBM: Select 090 [080] IF GAIN: Fully ccw [VTVM] D-c voltage: Record indication	[VTVM] D-c voltage: Indicates V reference value	. . .
3	[080] IF GAIN: Fully cw [VTVM] D-c voltage: Record indication	[VTVM] D-c voltage: Indicates V reference plus V noise value	. . .
4	**NOTE** Calculate the desired value for the following VTVM indication using the formula; value from step 3 minus the value from step 2 times 1.5, plus the value from step 2; i.e. VTVM = 1.5V Noise + V Reference.		
	[UPM-141] RF POWER OUTPUT-DBM: Select to obtain VTVM indication and record selected value	[VTVM] D-c voltage: Indicates value calculated in preceding NOTE [UPM-141] RF POWER OUTPUT: Selected value plus cable and 484 unit attenuation is greater than -103 dbm.	Accuracy of UPM-141 is ±1.0 dbm.
5	**NOTE** To check receiver sensitivity in non-paramp, turn RTM GND OPER SW (NWW) to OFF and repeat steps 2 through 4. Receiver sensitivity should be greater than -100 dbm.		
6	Deleted		
7	[196] MOD TEST: Down (off) [841] Self test switch: OFF [305] RANGE: 16SP [905] POWER: OFF [R-f blanket] Remove [Test equipment] Disconnect [NWW] RTM GND OPER to OPER	Check complete	. . .

3-10b. DISPLAY VIDEO SENSITIVITY CHECK. The purpose of this procedure is to ensure the video circuits in the receiver barrel and 295 unit are operational.

EQUIPMENT REQUIRED

1. R-f blanket
2. AN/UPM-141

EQUIPMENT HOOKUP

Place r-f blanket over radome. Connect cable W5 from TEST jack J48401 (484 unit) to AN/UPM-141 RF IN/OUT jack. Set up AN/UPM-141 for return fixed target at 40,000 YDS in accordance with paragraph 11-3h.

REFERENCES

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

295 641
Receiver Barrel

FUNCTIONAL DIAGRAM

Receiving (T.O. 27-5/fig 3-5)

FAULT ISOLATION

Radar video (T.O. 27-3/fig 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40 LP [305] TUNE: NORM [080] IF GAIN: Fully CW VIDEO GAIN: Fully CW [083] RDR IR SEL: Press and release to obtain radar dominant mode [196] MOD TEST: UP (on)	[065] HV on DS 301: Comes on.	. . .
2	[AN/UPM-141] RF Power Output Switches: Adjust to obtain 080 indication	[080] Display: Target is just visible [AN/UPM-141] Greater than -109 dbm when added to coax cable attenuation and 484 duplexer attenuation.	Accuracy of the AN/UPM-141 is ± 1 dbm. This step checks long pulse paramp receiver sensitivity
3	[305] RANGE: SP [AN/UPM-141] RF Power Output Switches: Adjust to obtain 080 indication	[080] Display: Target is just visible [AN/UPM-141] RF Power Switches: Greater than -102 dbm when added to coax cable attenuation.	This step checks short pulse Paramp receiver sensitivity
	NOTE To check receiver sensitivity in non-paramp turn RTM GND OPER SW (NWW) to OFF and repeat steps 2 through 4. Receiver sensitivity should be greater than -106 bdm in long pulse and -99 in short pulse.		
4	[305] RANGE: 40LP [305] TUNE Switch: F-Max [AN/UPM-141] TEST MODE: Agile RF POWER OUTPUT SWITCHES: Adjust to obtain 080 indication	[080] Display: Target is just visible [AN/UPM-141] RF POWER SWITCHES: Greater than 100 dbm when added to coax cable attenuation and 484 duplexer attenuation.	
5	[196] MOD TEST: Down (OFF) [305] TUNE switch: NORM [905] POWER: OFF [R-f blanket] Remove [Test Equipment] Disconnect [NWW] RTM GND OPER to OPER	Check complete	
6	Deleted		

3-10c. **082 VIDEO GAIN CHECK. The purpose of this procedure is to check that video gain of the 082 unit is 100.**

EQUIPMENT REQUIRED

Oscilloscope

EQUIPMENT HOOKUP

Connect oscilloscope to 082 DISPLAY VIDEO IN. Set oscilloscope TIME/CM to 10 μsec/cm.

REFERENCES

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

082

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-5)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 40SP [196] REC TEST: Up (on) [196] MOD TEST switch: Up (on)	[Oscilloscope] Waveform: Receiver test targets decreasing in amplitude. Select any pulse with amplitude less than 0.12 v peak and record value	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
2	[080] IF GAIN: Fully cw VIDEO GAIN: Fully cw [082] DISPLAY VIDEO OUT: Monitor using oscilloscope	[Oscilloscope] Waveform: Amplitude of pulse selected in step 1 is 100 times greater than the amplitude recorded in step 1	Tolerance is ±16%
3	**[196] MOD TEST switch: Down (off)** [196] REC TEST: Down (off) [305] RANGE: 16SP [905] POWER: OFF [Oscilloscope] Disconnect	Check complete	. . .

3-10d. 195 VIDEO GAIN CHECK. The purpose of this procedure is to check for proper target attenuation on the 080 display.

EQUIPMENT REQUIRED

Oscilloscope

EQUIPMENT HOOKUP

Connect oscilloscope to 195 IND VIDEO.

>< C 0.S 25-44 Pg 5

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

080

195

REFERENCES

FUNCTIONAL DIAGRAM

Receiving
(T.O. 27-5/Fig. 3-5)

FAULT ISOLATION

Radar Video
(T.O. 27-3/Fig. 3-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action switch: Press to 2nd detent and release [080] IF GAIN: Fully cw VIDEO GAIN: Fully cw ERASE INTENSITY: Fully ccw, then 90° cw [196] REC TEST: Up (on) [083] Action switch: Press to first detent, position range gate at max, and release action switch [080] Display: Note target intensity	[080] Display: Targets appear	. . .
2	[083] AUTO SEARCH: Press and release	[080] Display: Target intensity is the same as in step 1	. . .
3	[083] Action switch: Press to 2nd detent and hold Hand control: Move in az but do not lock onto target	[080] Display: No attenuation in target intensity and no blooming [Oscilloscope] Waveform: Slight increase in video amplitude as 083 hand control is moved in az	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
4	[083] Action switch: Release [196] REC TEST: Down (off) [905] POWER: OFF [Oscilloscope] Disconnect	Check complete	. . .

3-11. SEARCH CHECKS

3-11a. AUTO SEARCH PATTERN CHECK. The purpose of this procedure is to check the scan in both azimuth and elevation with the radar subsystem operating in the search mode.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

241

REFERENCES

FUNCTIONAL DIAGRAM

Radar/IR Search, Super-search, and Hand Control (T.O. 27-5/Fig. 3-11)

FAULT ISOLATION

Radar Scan Pattern (T.O. 27-3/Fig. 3-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [106] AZ DRIVE MOTOR: TEST [506] MOTOR REF: TEST	[080] B-sweep: Searches from 53° left to 53° right —— El marker: 4 bar scan	It takes approx 4 minutes for system to time in
2	[855] EL SCAN: 2 BAR	[080] B-sweep: Searches from 53° left to 53° right —— El marker: 2 bar scan	. . .
3	[855] EL SCAN: 1 BAR	[080] B-sweep: Searches from 53° left to 53° right —— El marker: Stationary	. . .
4	[083] ANT ELEV: UP, DN, then back to detent	[080] El marker: Moves up and down, then to center —— B-sweep: Search limits narrow as el marker approaches top or bottom of display. Video disappears as el marker approaches bottom of display	. . .
5	[855] AZ SCAN: L	[080] B-sweep: Searches from 53° left to 6° right	. . .
6	[855] AZ SCAN: C	[080] B-sweep: Searches from 30° left to 30° right	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
7	[855] AZ SCAN: R	[080] B-sweep: Searches from 6° left to 53° right	. . .
8	[855] AZ SCAN: B EL SCAN: NORM [506] MOTOR REF: NORMAL [106] AZ DRIVE MOTOR: NORM [905] POWER: OFF	Check complete	. . .

3-11b. MANUAL SEARCH PATTERN CHECK. The purpose of this procedure is to check the operation of the radar subsystem operating in the hand control mode.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

241

REFERENCES

FUNCTIONAL DIAGRAM

Radar/IR Search, Supersearch, and Hand Control (T.O. 27-5/Fig. 3-11)

FAULT ISOLATION

Radar Scan Pattern (T.O. 27-3/Fig. 3-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [106] AZ DRIVE MOTOR: TEST [506] MOTOR REF: TEST	[080] B-sweep: Searches —— E1 marker: 4 bar scan	It takes approx 4 minutes for system to time in
2	[083] Action switch: Press to 2nd detent and hold Hand control: Move right, then left, then back to center	[080] B-sweep: Follows movement of hand control	. . .
3	[083] ANT ELEV: UP, DN, then back to detent	[080] E1 marker: Follows ANT ELEV position	. . .
4	[083] Action switch: Release [106] AZ DRIVE MOTOR: NORM [506] MOTOR REF: NORMAL [905] POWER: OFF	Check complete	. . .

3-11c. ANTENNA SUPERSEARCH CHECK. The purpose of this procedure is to check the operation of the radar subsystem operating in the supersearch mode.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

241

663

REFERENCES

FUNCTIONAL DIAGRAM

Radar/IR Search, Supersearch, and Hand Control (T.O. 27-5/Fig. 3-11)

FAULT ISOLATION

Radar Scan Pattern (T.O. 27-3/Fig. 3-3)

See pg 42 sup 41

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [106] AZ DRIVE MOTOR: TEST [506] MOTOR REF: TEST	[080] B-sweep: Searches from 53° right to 53° left	It takes approx 4 minutes for system to time in
2	[083] Action switch: Press to 1st detent and hold	[080] B-sweep: Searches from 16.5° left to 16.5° right (makes 10 complete sweeps in 6.5 to 8.5 sec) —— El marker: Stationary	One complete sweep is from 16.5° left to 16.5° right
3	[083] Hand control: Move slowly right, left, and then back to detent	[080] B-sweep: Searches from 16.5° right to 16.5° left of a center point selected by az position of hand control	. . .
4	[083] ANT ELEV: UP, DN, then back to detent	[080] El marker: Moves up and down, then center	. . .
5	[083] Action switch: Release	[080] B-sweep: Searches from 53° left to 53° right —— El marker: 4 bar scan	. . .
6	[905] POWER: OFF	Check complete	. . .

3-11d. ELEVATION SCAN OVERLAP CHECK. The purpose of this procedure is to check the antenna direction to ensure maximum video return.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017

241

REFERENCES

FUNCTIONAL DIAGRAM

Radar/IR Search, Supersearch, and Hand Control (T.O. 27-5/Fig. 3-11)

FAULT ISOLATION

Radar Scan Pattern (T.O. 27-3/Fig. 3-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [855] AZ SCAN: C [083] ANT ELEV: Adjust toward DN to obtain indication	[080] B-sweep: Target appears on top bar of 4 bar scan	El marker at uppermost position indicates antenna search along top bar of 4 bar scan
2	[083] ANT ELEV: Adjust slightly toward UP to obtain indication	[080] B-sweep: Target appears on top and 2nd bar of 4 bar scan	. . .
3	[083] ANT ELEV: Adjust slightly toward UP to obtain indication	[080] B-sweep: Target appears on 2nd and 3rd bars of 4 bar scan	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
4	[083] ANT ELEV: Adjust slightly toward UP to obtain indication	[080] B-sweep: Target appears on 3rd and bottom bars of 4 bar scan	. . .
5	[083] ANT ELEV: Detent [855] AZ SCAN: B [905] POWER: OFF	Check complete	. . .

3-12. SEARCH ADJUSTMENTS

3-12a. 241 EL BAL ADJUSTMENT. Perform the LS-2 routine iaw para 6-28.

3-12b. 241 AZ BAL ADJUSTMENT. The purpose of this procedure is to ensure that the antenna and B-sweep indicate the same position.

EQUIPMENT REQUIRED

1. VTVM
2. Jumper wire

EQUIPMENT HOOKUP

Connect jumper wire between 523 TP17 and 241 TP1; connect VTVM to 241 TP1 and 241 TP2; set VTVM to low sensitivity scale.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017

241

REFERENCES

FUNCTIONAL DIAGRAM

Radar/IR Search, Super-search, and Hand Control (T.O. 27-5/Fig. 3-11)

FAULT ISOLATION

Radar Scan Pattern (T.O. 27-3/Fig. 3-3

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [106] AZ DRIVE MOTOR: TEST [506] MOTOR REF: TEST [083] Action switch: Press to 2nd detent and hold [241] AZ BAL: Adjust, if necessary, to obtain indication	[VTVM] D-c voltage: 0 vdc	. . .
2	[241] TP1 and [523] TP17: Remove jumper wire [241] TP2: Monitor using VTVM	[VTVM] D-c voltage: +50.0 ±1.0 v	. . .
3	[083] Action switch: Release [106] AZ DRIVE MOTOR: NORM [506] MOTOR REF: NORMAL [905] POWER: OFF [VTVM] Disconnect	Adjustment complete	. . .

3-12c. 241 SEARCH WIDTH ADJUSTMENT. The purpose of this procedure is to ensure the antenna and B-sweep search patterns are 53° right of center.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1
2. Remove radome iaw para 10-4m

PROBABLE FAULTY UNIT

017

241

REFERENCES

FUNCTIONAL DIAGRAM

Radar/IR Search, Super-search, and Hand Control (T.O. 27-5/Fig. 3-11)

FAULT ISOLATION

Radar Scan Pattern (T.O. 27-3/Fig. 3-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [855] EL SCAN: 1 BAR [106] AZ DRIVE MOTOR: TEST [506] MOTOR REF: TEST	[017] Antenna: Searches 1 bar scan	. . .
2	[083] ANT ELEV: Detent [241] SEARCH WIDTH ADJ: Adjust, if necessary, to obtain indication	[017] Antenna: Clears limit ring by approx 1.5 in. on each side	. . .
3	[855] EL SCAN: NORM [106] AZ DRIVE MOTOR: NORM [506] MOTOR REF: NORMAL [905] POWER: OFF [Radome] Reinstall iaw para 10-4m	Adjustment complete	. . .

3-12d. 241 AZ CONT RATE ADJUSTMENT. The purpose of this procedure is to ensure that the B-sweep searches at the correct rate.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

241

REFERENCES

FUNCTIONAL DIAGRAM

Radar/IR Search, Super-search, and Hand Control (T.O. 27-5/Fig. 3-11)

FAULT ISOLATION

Radar Scan Pattern (T.O. 27-3/Fig. 3-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [106] AZ DRIVE MOTOR: TEST [506] MOTOR REF: TEST [241] AZ CONT RATE: Adjust, if necessary, to obtain indication	[080] B-sweep: Makes 10 complete sweeps in 12 ±1 sec	Complete sweep is from 53° left to 53° right or 53° right to 53° left
2	[506] MOTOR REF: NORMAL [106] AZ DRIVE MOTOR: NORM [905] POWER: OFF	Adjustment complete	. . .

3-12e. 017 RESOLVER ADJUSTMENT. The purpose of this procedure is to ensure that the antenna resolver limits are within tolerance and the resolvers have been properly nulled.

EQUIPMENT REQUIRED

1. Jumper wire
2. Oscilloscope

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1
2. Remove radome iaw para 10-4m
3. Pin antenna in az and el as indicated in figure 13-2

PROBABLE FAULTY UNIT

017

REFERENCES

FUNCTIONAL DIAGRAM

Radar Track Resolver Chain
(T.O. 27-5/Fig. 3-12)

FAULT ISOLATION

Radar Scan Pattern
(T.O. 27-3/Fig. 3-3)

NOTE

The output voltage of B7 is affected by adjusting B3 and the output voltage of B6 is affected by adjusting B2. If B2 or B3 are adjusted, recheck B6 and B7.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action switch: Press to 2nd detent and release [Oscilloscope] Leads: Connect ground to 241 TP7 (gnd); connect TRIGGER INPUT and CHANNEL B to 241 TP8; connect CHANNEL A to COSINE test points incicated in table 3-2 MODE: CHOPPED	[Oscilloscope] Cosine center voltage and phase as indicated in table 3-2	If phase is correct, loosen resolver clamping screws and adjust for proper indication Oscilloscope MODE must be set to CHOPPED to ensure proper phase indication
2	[Oscilloscope] Leads: Connect CHANNEL A to sine test points indicated in table 3-2	[Oscilloscope] Sine center voltage: Does not exceed value specified in table 3-2	If any sine voltage exceeds value specified in table 3-2, loosen resolver clamping screws and adjust for proper indication. Do not adjust resolver more than 90 degrees

STEP	INSTRUCTION	INDICATION	REMARKS
3	NOTE If the resolver being tested is B1, B2, or B3, proceed to step 3. If the resolver being tested is B6, B7, or B8, proceed to step 4. [Oscilloscope] Leads: Connect CHANNEL A to sine and cosine test points indicated in table 3-2 [017] Antenna: Remove az locking pin; move antenna in azimuth from limit to limit	[Oscilloscope] Sine voltage: Changes smoothly from minimun at center to maximum at limits Cosine voltage: Changes smoothly from maximum at center to minimum at limits (see table 3-2)	. . .
4	[Oscilloscope] Leads: Connect CHANNEL A to sine and cosine test points indicated in table 3-2	[Oscilloscope] Same as step 3	. . .
5	[Oscilloscope] Leads: Disconnect [905] POWER: OFF [017] Antenna: Ensure az and el locking pins removed [Radome] Reinstall iaw para 10-4m	. . .	. . .

3-12f. DELETED

Table 3-2. Resolver Adjustment

RESOLVER		COSINE				SINE			
NAME	SYMBOL	017 PHASE TEST POINT	ANTENNA CENTER VOLTAGE (p-p)	LIMIT VOLTAGE (p-p)	PHASE	017 (IN PHASE) TEST POINT	ANTENNA CENTER VOLTAGE (p-p)	LIMIT VOLTAGE (p-p)	IN PHASE DIRECTION
▷1 AZ COMPUTING	B1	TP 2	130	90	IN	TP 1	0.20	115	RIGHT
AZ POSITION	B2	TP 11	70	40	IN	TP 10	0.43	60	RIGHT
▷2 AZ RATE RESOLUTION	B3	TP 13	160	90	IN	TP 14	0.43	130	LEFT
EL POSITION	B6	TP 9	130	90	IN	TP 12	0.43	130	DOWN
▷2 EL RATE RESOLUTION	B7	TP 5	80	45	OUT	TP 6	0.43	60	UP
▷1 EL COMPUTING	B8	TP 4	130	90	IN	TP 3	0.20	130	UP

▷1 Computer must not be in test mode or noise will appear to exceed 0.20 volts peak-to-peak

▷2 Connect jumper between 241 TP 8 and 206 TP 12 to check B3 and B7. Remove jumper when check is completed.

See pg 43 Sup 41

3-13. RANGE TRACK CHECKS.

3-13a. LOCKON SENSITIVITY AND RANGE TRACK CHECK. The purpose of this procedure is to ensure that the video is of sufficient amplitude to permit lock on.

NOTE

If an FDT is available, perform the Lockon Sensitivity Check iaw T.O. 1F-106A-2-27-7 instead of this procedure.

EQUIPMENT REQUIRED

1. R-f blanket
2. UPM-141

EQUIPMENT HOOKUP

Place r-f blanket over rado me. Connect UPM-141 RF IN/OUT (J7) to J48401 and set up for pulse target RF link configuration operation in accordance with paragraph 11-3h. at center of paramp band frequency in accordance with MA-1 classified information codes (T.O. 27-6).

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

095
103
295

REFERENCES

FUNCTIONAL DIAGRAM

Range Track
(T.O. 27-5/Fig. 3-17)

FAULT ISOLATION

Lock-on and Range Tracking
(T.O. 27-3/Fig. 3-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[305] **TUNE: NORM** [905] **POWER: RADAR STBY** [305] **RANGE: 40SP** [196] **MOD TEST: Up (on)**	[065] HV ON DS301: Comes on	. . .
2	[UPM-141] RF POWER OUTPUT-DBM: **Select 50 DBM**	[VTVM] D-c voltage: Min value	. . .
3	[UPM-141] TEST MODE: ACFT-XPONDER PULSE RANGE-INITIAL RANGE YDS: Select 20,000 yds RANGE-RATE KNS: 0 RANGE-RESET: Press and release	[080] Display: Simulated target at 10 mi	. . .
4	[083] Action switch: Press to 2nd detent, lock on to simulated target and release action switch	[080] Range rate scale lights: Come on [095] ON TARGET: Comes on	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
6	[UPM-141] RF POWER OUTPUT-DBM: Select to obtain 080 unit indication wait 2 sec between selections	[080] Range rate scale lights: Go off [095] ON TARGET: Goes off 3 sec after 080 unit indication	. . .
7	[UPM-141] RF POWER OUTPUT-DBM: Select 1 dbm less attenuation and record value	[095] ON TARGET: Comes on [UPM-141] RF POWER OUTPUT-DBM: Selected value plus cable and 484 unit attenuation is min of -94.5 dbm	. . . Accuracy of UPM-141 is ±1.0 dbm
8	[UPM-141] RF POWER OUTPUT-DBM: Select value for 86 db signal input Initial Range: 40,000 yds RANGE-RATE KNS: 2400	[080] Display: Target slews in [095] ON TARGET: Stays on	Lock on indications will be maintained until simulated target approaches zero range, then lockon will be broken when the simulated target resets back to 10 miles.
9	[841] Self test switch: OFF [196] MOD TEST: Down (off) [905] POWER: OFF [R-f blanket] Remove [Test equipment] Disconnect	Check complete	. . .

3-13b. REPOSITION GATE, VIDEO CHECK. The purpose of this procedure is to ensure that the 020 video circuits are operational. This check should be performed on the system mockup.

3-13c. REPOSITION GATE, TRACK CHECK. The purpose of this procedure is to ensure that the 020 video circuits are operational in the track mode. This check should be performed on the system mockup.

3-13 d. REPOSITION GATE, ANTI-CHAFF MODE CHECK.

EQUIPMENT REQUIRED

1. FDT
2. UPM-141

EQUIPMENT HOOKUP

1. Set up FDT IAW T.O. 1F-106A-2-27-7.
2. Connect cable W5 from Test Jack J48401 (484 unit) to UMP-141 and set up IAW paragraph 11-3h for a moving target.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

020
103

FUNCTIONAL DIAGRAM

Anti-Chaff (T.O. 27-5/Fig. 3-20)

REFERENCES

T.O. 1F-106A-2-27-7

FAULT ISOLATION

Chaff Circuit (T.O. 27-3/Fig. 3-8)

Step	Instructions	Indication	Remarks
1	[905] POWER: RADAR STBY [305] RANGE: 40LP TUNE: NORM CHAFF: GATE [196] MOD TEST: Up (on)	[065] HV ON DS301: Comes On	. . .
2	[FDT]: FUNCT SEL / FUNCT Value A/B / EXEC Misc Cont 00/00 P & R RDR Range/ Rate 05/05 P & R POS/Rate 07/00 P & R RDR LEV 01/15 P & R	[080] B-sweep: Target Visible	. . .
3	[083] ACTION SW: Press to 2nd Detent, lock-on to simulated target and release action switch.	[080] Range Rate Scale Lights: Comes on [095] On Target: on.	. . .
4	[UPM-141]: RF POWER OUTPUT DBM: -80DB INITIAL RANGE YDS: 76.8K RANGE RATE KNS: Sufficient Range Rate to drive through FDT target	[080]: Note that the system did not transfer lock on to the UPM-141 target.	
5	[FDT]: FUNCT SEL / FUNCT Value A/B / EXEC RDR Range/Rate Rate 05/15 P & R	[080] B-sweep: Target Visible.	. . .
	NOTE Repeat step 3 if required. Repeat step 4.		
6	[196] MOD TEST: Down (off) [305] CHAFF: Off [905] POWER: Off	Check complete.	. . .

3-14. RANGE TRACK ADJUSTMENTS

3-14a. 103 DRIFT ADJUST. The purpose of this procedure is to ensure the range gate is stationary when the action switch is released.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

095

103

REFERENCES

FUNCTIONAL DIAGRAM

Range Track
(T.O. 27-5/Fig. 3-17)

FAULT ISOLATION

Lock-On and Range Tracking
(T.O. 27-3/Fig. 3-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [080] VIDEO GAIN: Fully cw [096] S1: 5 S2: A [080] ANT ELEV: Toward UP for no target return [083] Action switch: Press to 2nd detent and slew range gate to obtain indication	[096] SELF TEST METER: 4.0 units	The range gate should be at approx 10 miles
2	[083] Action switch: Release	[096] SELF TEST METER: Change does not exceed 1.2 units per minute	If change exceeds 1.2 units per minute, proceed to step 3. Otherwise proceed to step 4
3	[103] DRIFT ADJUST: Adjust for min rate of change [083] Action switch: Press to 2nd detent and slew range gate until 096 SELF TEST METER indicates 4.0 units, then release action switch	[096] SELF TEST METER: Change does not exceed 1.2 units per minute (if any drift is present, the range gate should drift out)	Repeat this step until a proper indication is obtained
4	[305] NOSE-TAIL: TAIL [083] Action switch: Press to 2nd detent and slew range gate to obtain indication	[096] SELF TEST METER: 4.0 units	The range gate should be at approx 10 miles
5	[083] Action switch: Release	[096] SELF TEST METER: Change does not exceed 1.2 units per minute	If change exceeds 1.2 units per minute, proceed to step 6. Otherwise proceed to step 7
6	[103] DRIFT ADJUST: Adjust for min rate of change [083] Action switch: Press to 2nd detent and slew range gate until 096 SELF TEST METER indicates 4.0 units, then release action switch	[096] SELF TEST METER: Change does not exceed 1.2 units per minute	Repeat this step until a proper indication is obtained. Then repeat the procedure beginning with step 1
7	[305] NOSE-TAIL: NOSE [096] S1: 1 S2: A [905] POWER: OFF	Adjustment complete	. . .

3.14b. 103 SHORT RANGE CAL AND SLOPE ADJUSTMENT.

EQUIPMENT REQUIRED

PSM-6

EQUIPMENT HOOKUP

Connect PSM-6 to range voltage test point on 464103 unit.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

103

REFERENCES

FUNCTIONAL DIAGRAM

(T.O. 27-5/Fig. 3-17)

FAULTY ISOLATION

(T.O. 27-3/Fig. 3-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] STANDBY [ACP] SELECTOR: MISSILES RADAR [196] Mod Test: UP Rec Test: UP [305] Range: 16 Mi. [083] Action SW: Press to 2nd detent, lock-on to 1st test target and release. [103] Short range Cal: Adjust to obtain indication	PSM-6 Reads 3.0V ± 0.05 VDC	. . .
2	[083] Action Switch: Press to 2nd detent, lock-on to 10th test target and release. [103] Slope Adj: Adjust to obtain indication	PSM-6 Reads 30V + 0.5 VDC	Steps 1 and 2 should be repeated until 3V ± 0.05 and 30V ± 0.5 are obtained on the 1st and 10th test target respectively.
3	[196] Mod Test: DOWN Rec Test: DOWN		

NOTE

If adjustment of either short range cal or slope is required adjustment should be made slowly or range break lock may occur.

3-14c. Deleted.

3-15. ANGLE TRACK CHECKS.

3-15a. 017 AZIMUTH AND ELEVATION DIFFERENCE ATTENUATION CHECK. The purpose of this procedure is to check the insertion losses in the azimuth and elevation difference channels of the antenna. The insertion losses are checked in the track mode with both CADJ and not CADJ. If the insertion losses are outside the specified levels, the antenna's ability to angular track the radar target in azimuth and elevation will be degraded due to distortion or less of the modulation on the received target r-f envelope.

NOTE

If it is desired to isolate a malfunction to a waveguide component, it is suggested that the technician perform 017 Sum Signal Attenuation Check iaw para 3-6d, then perform the procedure in this paragraph, then perform 017 Transmitter Signal Attenuation Check iaw para 3-4c, then perform 017 Transmitted To Difference Attenuation Check iaw para 3-4d, and finally perform 017 Isolated Check iaw para 3-15b. Each procedure is, however, independent of the others and can be performed alone if desired. It is not necessary that the radar system be operational, if the procedure does not require that the shutter or variable post be energized.

During the elevation difference channel (with CADJ selected) check (E, fig 3-1), the r-f signal is inserted into elevation difference port 1 of the three-port adapter. This r-f signal passes through the antenna elevation difference port 1 and waveguide, waveguides (4) and (3), into port 1 and out port 4 of the modulator, through waveguide (2), isolator assembly, variable post assembly, shutter assembly, waveguide (1), into port 4 and out port 1 of the circulator assembly, through waveguide (5), the elevation and azimuth rotary joints and out port 4 transmit (rear of antenna). **The allowable insertion loss with CADJ selected is 1.3 to 3.9 db. If the insertion loss is outside the specified limit, and the sum channel checks passed, a failure has occurred in the elevation difference port/waveguide, waveguides (3) or (4), the modulator, or the isloator.**

During the elevation difference channel (with CADJ not selected) check (D, fig 3-1), the r-f signal path is the same as in the track mode with CADJ selected except the attenuation through the variable post will be approximately 3.0 db. The allowable r-f insertion loss in this check **is 3.5 to 6.7 db.**

During the azimuth difference channel (with CADJ selected) check (G, fig 3-1), the r-f signal is inserted into azimuth difference port 2 of the three-port adapter. This r-f signal passes through the antenna azimuth difference port 2 and waveguide, through waveguide (6), into port 2 and out port 4 of the modulator. From here on the r-f signal flow is the same as that described for the elevation channel. **The allowable insertion loss with CADJ selected is 1.3 to 3.9 db. If the insertion loss is outside the specified limit, and the sum channel and elevation difference checks passed, a failure has occurred in the azimuth difference port and waveguide, waveguide (6), or the modulator.**

During the azimuth difference channel (with CADJ not selected) check (G, fig 3-1), the r-f signal path is the same as in the track mode with CADJ selected except the attenuation through the variable post will be approximately 3.0 db. The allowable r-f insertion loss in this check **is 3.5 to 6.7 db.**

CAUTION

When inducing the r-f signal into the front end of the antenna, the operator should be careful to not cause flexing of coax cable when rotating the antenna. Flexing may cause false insertion loss indications or damage to the coax cable. It is not necessary to be as cautious while inserting the r-f signal into the rear (port 4) of the antenna. The coax cables should be kept in good repair, a degraded coax cable will give erroneous indications indicating false insertion losses.

EQUIPMENT REQUIRED

1. 486180 test set
2. UPM-141
3. Oscilloscope

EQUIPMENT HOOKUP

Refer to B, Fig 3-1 (for reference only) when making the following 486180 test set, UPM-141, and oscilloscope connections. Remove antenna feedhorn and install 244185 three-port adapter. Connect 256781 tapered transition to port 4 (transmit) on rear of antenna; connect 244475 waveguide to 256781 tapered transition. Connect UPM-141 via cable to adapter on 256775 precision attenuator. Connect 256775 precision attenuator adapter via coax to 256789 adapter. Connect 256789 adapter to 244236 adapter. Connect 244236 adapter to port 1 of 244185 three-port adapter. Connect 244180

PRELIMINARY PROCEDURE

1. Table 1-1
2. Remove radome iaw para 10-4m
3. Pin antenna in az and el

EQUIPMENT REQUIRED

EQUIPMENT HOOKUP

dummy loads to ports 2 and 3 of 244185 three-port adapter. Connect 256777 crystal detector assembly via 244470 adapter assembly to 244475 waveguide on rear of antenna. Set 486180 precision attenuator dial to zero. Set up UPM-141 for CW SIG GEN operation in accordance with paragraph 3-11k at a frequency near center of radar transmitter range and select max attenuation on RF POWER OUTPUT-DBM switches. Connect oscilloscope (set for dc voltage) to 256777 crystal mount assembly. Set oscilloscope POLARITY to NORMAL.

PRELIMINARY PROCEDURE

REFERENCES

FUNCTIONAL DIAGRAM

Radar Angle Track
(T.O. 27-5/Fig. 3-16)

FAULT ISOLATION

Angle Tracking
(T.O. 27-3/Fig. 3-7)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action Switch: Press to 2nd detent and release [196] SHUTTER: ANT/RCVR [Oscilloscope] TIME/CM: Adjust until a sine wave is observed [UPM-141] RF POWER OUTPUT-DBM: Select to obtain indication	[Oscilloscope] Sine wave: Peak-to-peak level is 1 cm deflection from d-c reference level	. . .
2	[855] CADJ-NORM: CADJ [Oscilloscope] Sine wave: Record peak-to-peak value from d-c reference level [486180] 244236: Disconnect from port 1 of 244185 three-port adapter 24470: Disconnect from 244475 waveguide 244236 and 244470: Connect together with 244479 adapter coupling (D, fig 3-1) [486180] Precision attenuator dial: Adjust to obtain oscilloscope indication Precision attenuator dial: Record indication	[Oscilloscope] Sine wave: Peak-to-peak level is 1 cm deflection from d-c reference level [486180] Precision attenuator dial: Between 4.0 and 6.2 db	. . .
3	[486180] Precision attenuator dial: Adjust to obtain oscilloscope indication Precision attenuator dial: Record indication	[Oscilloscope] Sine wave: Peak-to-peak value is same as that recorded in step 2 [486180] Precision attenuator dial: Between 1.8 and 3.4 db	. . .
4	**NOTE** Perform equipment hookup as indicated at the beginning of this paragraph except connect 244236 adapter to port 2 of 244185 three-port adapter and connect 244180 dummy loads to ports 1 and 3 of three-port adapter. Refer to B, fig 3-1 for reference only. Perform steps 1 thru 3 except in step 2 set 855 CADJ-NORM to NORM	Indications are as obtained in steps 1 thru 3	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
6	[196] SHUTTER: NORM [905] POWER: OFF [017] Locking pins: Remove [Test equipment] Disconnect [017] Reassemble and perform Radar High Pressure Leakage and Interlock Check iaw para 3-4q [Radome] Reinstall iaw para 10-4m	Check complete	. . .

3-15b. 017 ISOLATION CHECK. The purpose of this procedure is to check the attenuation between the sum channel and the difference channel of the antenna. The attenuation is checked in the track mode with CADJ selected. If the attenuation loss is less than the specified limits, the antenna's ability to angular track the radar target in both azimuth and elevation will be degraded.

NOTE

If it is desired to isolate a malfunction to a waveguide component, it is suggested that the technician perform 017 Sum Signal Attenuation Check iaw para 3-6d, then perform 017 Azimuth and Elevation Difference Attenuation Check iaw para 3-15a, then perform 017 Transmitter Signal Attenuator Check iaw para 3-4c, then perform 017 Transmitted To Difference Attenuation Check iaw para 3-4d, and finally perform the procedure in this paragraph. Each procedure is, however, independent of the others and can be performed alone if desired. It is not necessary that the radar system be operational, if the procedure does not require that the shutter or variable post be energized.

In this check (J, Fig. 3-1), the r-f signal is inserted into sum port 3 on the antenna. This r-f signal passes through the sum port 3 on the antenna into port 2 and then to port 3 of the circulator. The waveguide short on port 3 of the circulator reflects the signal back onto port 3 and out port 4 of the circulator, through waveguide (1), shutter assembly (which is open), the variable post assembly (which is in the CADJ mode), into the isolator (which attenuates the signal approx 25 db), through waveguide (2), into port 4 and out port 2 of the modulator, through waveguide (6) and out azimuth difference port 2.

The attenuation in this test must exceed 25 db. If the attenuation is less than 25 db and all other tests have passed, a failure has occurred in the isolator.

CAUTION

When inducing the r-f signal into the front of the antenna, the operator should be careful to not cause flexing of the coax cable when rotating the antenna. Flexing may cause false insertion loss indications or damage to the coax cable. It is not necessary to be as cautious while inserting the r-f signal into the rear (port 4) of the antenna. The coax cables should be kept in good repair. A degraded coax cable will give erroneous indications indicating false insertion losses.

EQUIPMENT REQUIRED

1. 486180 test set
2. UPM-141
3. Oscilloscope

EQUIPMENT HOOKUP

Remove antenna feedhorn and install 244185 three-port adapter. Connect UPM-141, precision attenuator, coax to waveguide adapters, and coax via 244236 adapter to port 3 of 244185 three-port adapter (refer to B, fig 3-1 for reference only). Connect 244180 dummy load to port 1 of 244185 three-port adapter. Connect 256777 crystal detector assembly via 244470 adapter to port 2 of 244185 three-port adapter. Set 486180 precision attenuator dial to zero.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Remove radome iaw para 10-4m
3. Pin antenna in az and el

PROBABLE FAULTY UNIT

017

EQUIPMENT REQUIRED

EQUIPMENT HOOKUP

Set UPM-141 for CW SIG GEN operation in accordance with paragraph 3-11k. at a frequency near center of radar transmitter range and select min attenuation on RF POWER OUTPUT-DBM switches. Connect oscilloscope to 256777 crystal mount assembly.

PRELIMINARY PROCEDURE

REFERENCES

FUNCTIONAL DIAGRAM

Radar Angle Track
(T.O. 27-5/Fig. 3-16)

FAULT ISOLATION

Angle Tracking
(T.O. 27-3/Fig. 3-7)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action switch: Press to 2nd detent and release [196] SHUTTER: ANT/RCVR [855] CADJ-NORM: CADJ [Oscilloscope] VOLTS/CM: Adjust for a readable level Waveform: Record vertical deflection in cm [486180] 244236 and 244470 adapter assemblies: Disconnect from ports 3 and 2 respectively of 244185 three-port adapter; then connect assemblies together using 244479 adapter coupling (D, fig 3-1) [486180] Precision attenuator dial: Adjust to obtain oscilloscope indication	[Oscilloscope] Waveform: Same vertical deflection as recorded [486180] Precision attenuator dial: Greater than 25 db	. . .
2	[196] SHUTTER: NORM [855] CADJ-NORM: NORM [905] POWER: OFF [017] Locking pins: Remove [Test equipment] Disconnect [017] Reassemble and perform Radar High Pressure Leakage and Interlock Check iaw para 3-4q [Radome] Reinstall iaw para 10-4m	Check complete	. . .

3-15c. 141 REFERENCE VOLTAGE CHECK. The purpose of this procedure is to ensure the 141 is receiving the correct voltages to perform the target tracking functions.

EQUIPMENT REQUIRED

VTVM

EQUIPMENT HOOKUP

Connect VTVM to 141 TP11 and TP8 (gnd). Set VTVM on 25 vac scale.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

141

REFERENCES

FUNCTIONAL DIAGRAM

Radar Angle Track
(T.O. 27-5/Fig. 3-16)

FAULT ISOLATION

Angle Tracking
(T.O. 27-3/Fig. 3-7)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] RDR IR SELECT: Press and release to obtain radar dominant mode Action switch: Press to 2nd detent and release	[VTVM] A-c voltage: 15 to 21 vac	. . .
2	[141] TP12: Monitor using VTVM	[VTVM] A-c voltage: 15 to 20 vac	. . .
3	[905] POWER: OFF [VTVM] Disconnect	Check complete	. . .

3-15d. 017 CADJ GAIN CHECK. The purpose of this procedure is to ensure the CADJ circuits in the 017 and 141 units are operational.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017

REFERENCES

FUNCTIONAL DIAGRAM

Radar Angle Track
(T.O. 27-5/Fig. 3-16)

FAULT ISOLATION

Angle Tracking
(T.O. 27-3/Fig. 3-7)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [196] MOD TEST: Up (on) REC TEST: Up (on) [096] S1: 6 S2: E [083] Action switch: Press to 2nd detent, lock on to 10th receiver test target, and release action switch [096] SELF TEST METER: Record indication [855] CADJ-NORM: CADJ	[096] SELF TEST METER: Indication is approx 1/3 of recorded value	. . .
2	[855] CADJ-NORM: NORM [196] MOD TEST: Down (off) REC TEST: Down (off) [905] POWER: OFF	Check complete	. . .

3-15e. EDGE ANGLE BIAS ROLL COMPENSATION CHECK. The purpose of this procedure is to ensure the roll compensation circuits in the 506 unit are operational.

EQUIPMENT REQUIRED

1. 486118 stabilization data generator test set
2. Oscilloscope

EQUIPMENT HOOKUP

Set up 486118 iaw para 11-11. Adjust 486118 for zero degrees roll and pitch. Connect one channel of oscilloscope to 506 TP11, connect the other

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

141
506

EQUIPMENT REQUIRED

EQUIPMENT HOOKUP

channel to 141 TP14. Sync oscilloscope to 141 TP14. Set oscilloscope MODE to CHOPPED and adjust TIME/CM and VOLTS/CM controls until both signals appear

PRELIMINARY PROCEDURE

REFERENCES

FUNCTIONAL DIAGRAM

Anti-chaff (T.O. 27-5/Fig. 3-20)

FAULT ISOLATION

CADJ Circuit Operation (T.O. 27-3/Fig. 3-9)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] CHAFF: ALL [083] Action switch: Press to 2nd detent and release	[Oscilloscope] Waveform: Appears as in A, fig. 3-9	. . .
2	[486118] SIGNAL CONTROL: Center SIGNAL TEST: ROLL SIGNAL CONTROL: While observing oscilloscope, adjust for 315° on 486118 ROLL indicator	[Oscilloscope] Square wave: Shifts smoothly to the left as noted in B, fig 3-9	Artificial horizon rolls 45° ccw
3	[486118] SIGNAL CONTROL: While observing oscilloscope, adjust for 45° on 486118 ROLL indicator	[Oscilloscope] Square wave: Shifts smoothly to the right as noted in C, fig 3-9	Artificial horizon rolls 45° cw
4	**NOTE** If proceeding to para 3-16f, do not disconnect 486118 test set and oscilloscope. [305] CHAFF: OFF [905] POWER: OFF [Test equipment] Disconnect	Check complete	. . .

3-15f. SELECTIVE SCAN ROLL COMPENSATION CHECK. The purpose of this procedure is to ensure that the 103 unit is operational when the aircraft roll angle is changed.

EQUIPMENT REQUIRED

1. 486118 stabilization data generator test set
2. Oscilloscope

EQUIPMENT HOOKUP

Set up 486118 iaw para 11-11. Connect one channel of oscilloscope to 103 SEL SCAN EXC; connect the other channel to 141 TP14. Sync oscilloscope to 141 TP14. Adjust oscilloscope controls until both waveforms are visible.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

103

REFERENCES

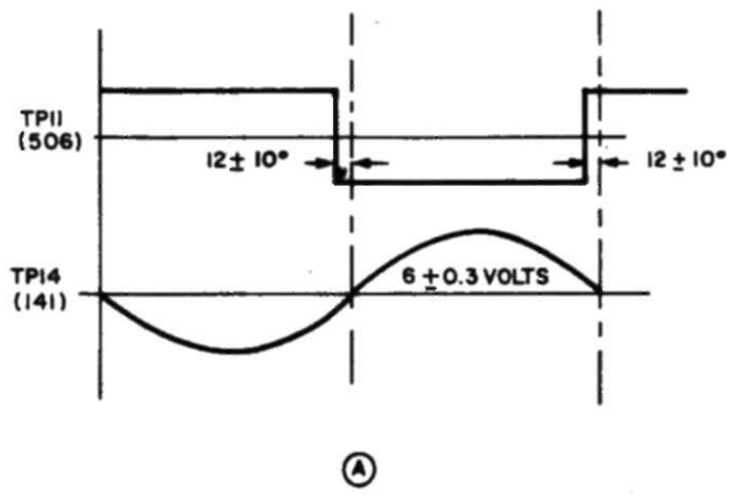
FUNCTIONAL DIAGRAM

Anti-chaff (T.O. 27-5/Fig. 3-20)

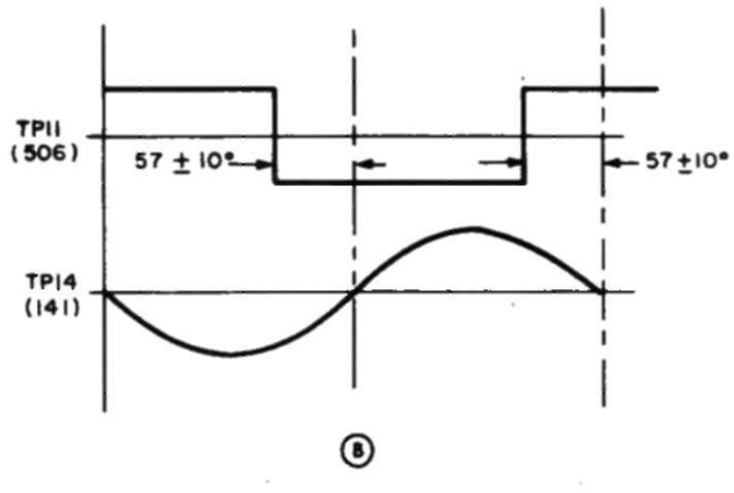
FAULT ISOLATION

Chaff Circuit Operation (T.O. 27-3/Fig. 3-8)

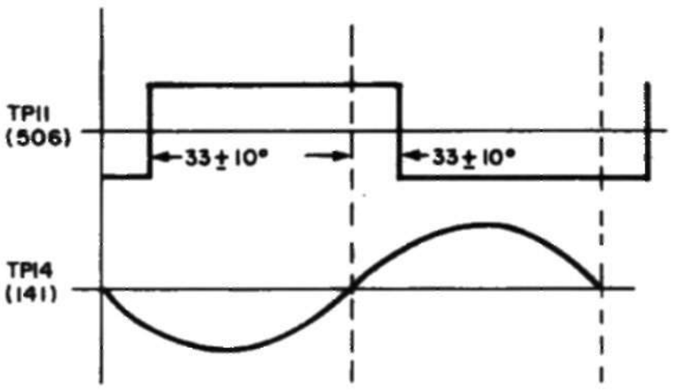
7-918-767A



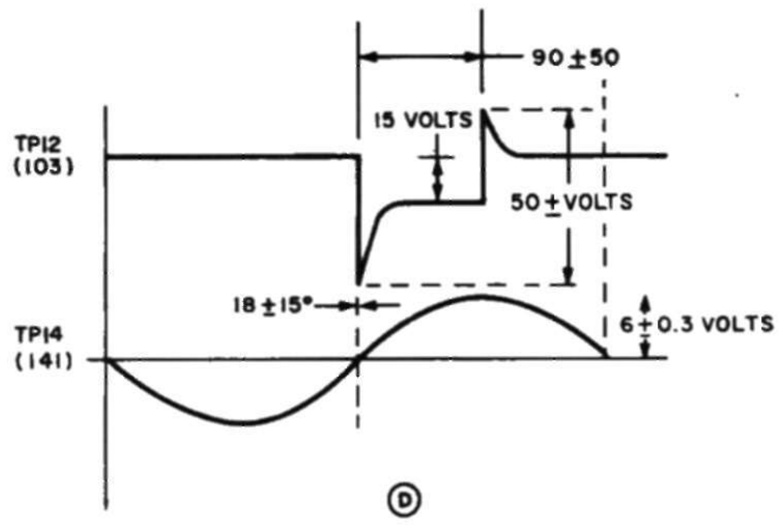
(A)



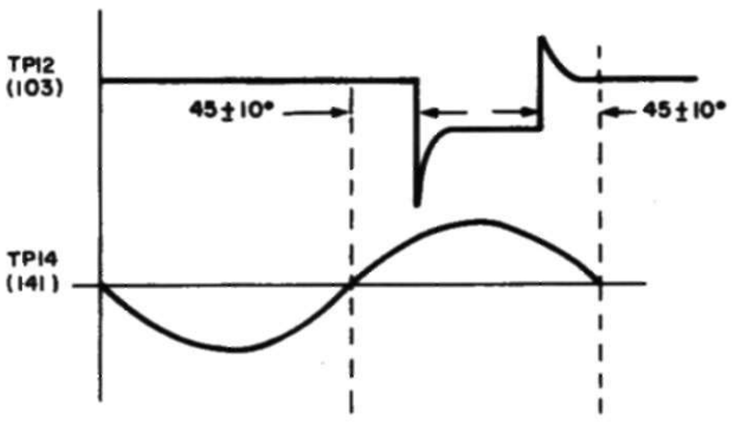
(B)



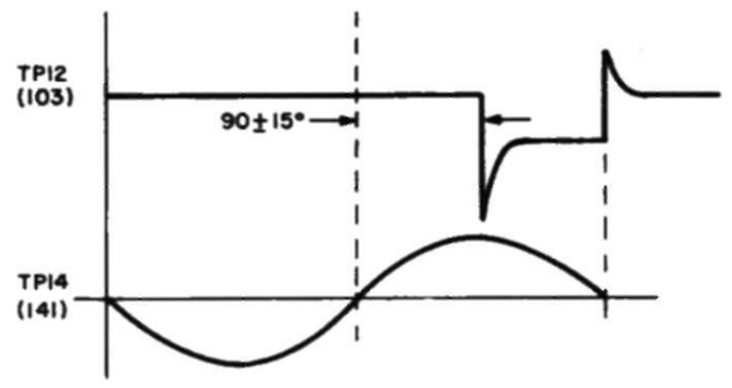
(C)



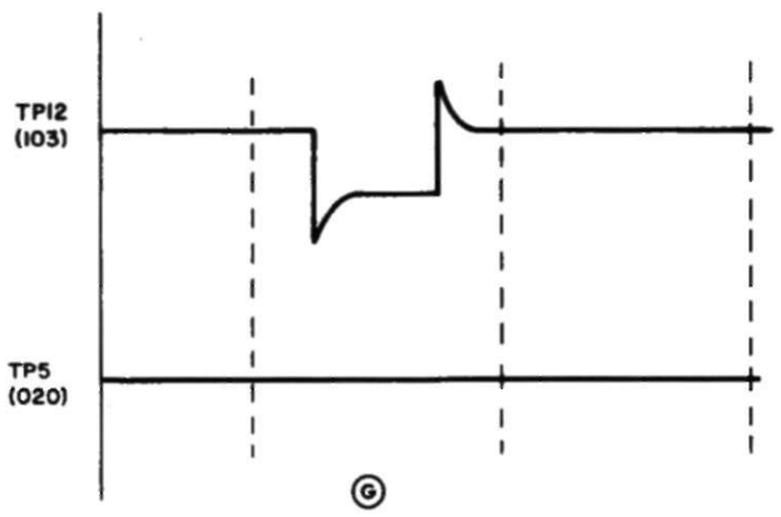
(D)



(E)



(F)



(G)

Figure 3-9. Edge Angle Bias Roll Compensation Waveform

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] CHAFF: ALL [196] MOD TEST: Up (on) REC TEST: Up (on) [083] Action switch: Press to 2nd detent, lock on to mid-range receiver test target and release action switch	[Oscilloscope] Waveform: Appears as in E, fig. 3-9	. . .
2	[486118] SIGNAL TEST: ROLL SIGNAL CONTROL: Adjust for 45° on 486118 ROLL indicator	[Oscilloscope] Waveforms: Appear as in F, fig. 3-9	Artificial horizon rolls 45° cw
3	[196] CHAFF: LEFT and hold	[Oscilloscope] Waveform at 103 SEL SCAN EXC: Position displaces 180° with respect to waveform at 141 TP14	. . .
4	[196] CHAFF: Release	[Oscilloscope] Waveforms: Appear as in F, fig 3-9	196 CHAFF returns to NORM
5	[486118] SIGNAL CONTROL: While observing oscilloscope, slowly adjust for 0° on 486118 ROLL indicator	[Oscilloscope] Waveform at 103 SEL SCAN EXC: Shifts smoothly to the left as shown in E, fig 3-9	. . .
6	[196] CHAFF: LEFT and hold	[Oscilloscope] Waveform at 103 SEL SCAN EXC: Displaces 180° with respect to waveform at 141 TP14	. . .
7	[196] CHAFF: Release [486118] SIGNAL CONTROL: While observing oscilloscope, slowly adjust for 315° on 486118 ROLL indicator	[Oscilloscope] Waveform at 103 SEL SCAN EXC: Shifts smoothly to the left as shown in D, fig 3-9	196 CHAFF returns to NORM
8	[196] MOD TEST: Down (off) REC TEST: Down (off) [305] CHAFF: OFF [905] POWER: OFF [Test equipment] Disconnect	Check complete	. . .

3-15g. SELECTIVE SCAN OPERATIONAL CHECK. The purpose of this procedure is to ensure that the 103 unit selective scan circuits are operational.

EQUIPMENT REQUIRED

Oscilloscope

EQUIPMENT HOOKUP

Connect channel A of oscilloscope to 103 SEL SCAN EXC; connect channel B (set for DC) to 020 AGC VOLTAGE. Sync oscilloscope to 141 TP14. Adjust oscilloscope until both traces are visible.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

103

REFERENCES

FUNCTIONAL DIAGRAM

Anti-chaff (T.O. 27-5/Fig. 3-20)

FAULT ISOLATION

Chaff Circuit Operation (T.O. 27-3/Fig. 3-8)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] CHAFF: ALL [196] RECTEST: ON MOD TEST: ON [083] ACTION SWITCH: Press to second detent, lock on to first receiver test target and release action switch	[Oscilloscope] Waveform: Appears as in G, fig 3-9	. . .
2	[103] SEL SCAN DISABLE: Press and hold	[Oscilloscope] Channel A waveform: Disappears Channel B waveform: No change in d-c voltage	. . .
3	[103] SEL SCAN DISABLE: Release [905] POWER: OFF [Oscilloscope] Disconnect	Check complete	. . .

3-15h. STEERING COMPENSATION CHECK. The purpose of this procedure is to ensure that the 141 unit chaff circuits are operational.

EQUIPMENT REQUIRED

Multimeter

EQUIPMENT HOOKUP

Connect multimeter (set on 10 vdc scale) to 141 TP13 and ground.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

141

REFERENCES

FUNCTIONAL DIAGRAM

Anti-chaff (T.O. 27-5/Fig. 3-20)

FAULT ISOLATION

Chaff Circuit Operation (T.O. 27-3/Fig. 3-8)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [855] LOBE FREQ: 4 [083] Action switch: Press to 2nd detent and release [141] SELF TEST: EL TEST-OPER: TEST and hold [Multimeter] Voltage: Record [305] CHAFF: ALL [Multimeter] Voltage: Record	[Multimeter] Voltage: Does not change by more than 5% from 1st voltage value recorded	. . .
2	[196] CHAFF: While observing multimeter, press to RIGHT for several seconds, then release to NORM	[Multimeter] Voltage: Does not change by more than 5% from 2nd voltage value recorded in step 1 as 196 CHAFF is set to RIGHT then to NORM	. . .
3	[305] CHAFF: OFF [141] TEST-OPER: Release SELF TEST: AZ TP5: Monitor using multimeter TEST-OPER: TEST and hold [Multimeter] Voltage: Record [305] CHAFF: ALL [Multimeter] Voltage: Record	[Multimeter] Voltage: Does not change by more than 5% from 1st voltage value recorded in this step	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
4	[196] CHAFF: While observing multimeter, press to RIGHT for several seconds, then release to NORM	[Multimeter] Voltage: Does not change by more than 5% from 2nd voltage value recorded in step 3 as 196 CHAFF is set to RIGHT then to NORM	. . .
5	[141] TEST-OPER: Release [305] CHAFF: OFF [855] LOBE FREQ: 3 [905] POWER: OFF [Multimeter] Disconnect	Check complete	. . .

3-15i. 141 75 VOLT POWER SUPPLY CHECK. The purpose of this procedure is to check for proper 141 voltage output.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

141

REFERENCES

FUNCTIONAL DIAGRAM

Anti-chaff (T.O. 27-5/Fig. 3-20)

FAULT ISOLATION

Chaff Circuit Operation (T.O. 27-3/Fig. 3-8)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [096] S1: 9 S2: D [083] Action switch: Press to 2nd detent and release	[096] SELF TEST METER: 6.0 to 8.25 units (75 ±7.5 v)	. . .
2	[096] S1: 1 S2: A [905] POWER: OFF	Check complete	. . .

3-15j. 017 MODULATOR HEATER CURRENT CHECK. The purpose of this procedure is to ensure the 017 modulator heater is operational.

EQUIPMENT REQUIRED

Multimeter

EQUIPMENT HOOKUP

Connect multimeter (set on 10 vac scale) to 096 LOBE MOD HEATER 1600 ~ test points

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017

REFERENCES

FUNCTIONAL DIAGRAM

Anti-chaff (T.O. 27-5/Fig. 3-20)

FAULT ISOLATION

Chaff Circuit Operation (T.O. 27-3/Fig. 3-9)

NOTE

This check should be performed after system has been off for one hour to ensure that 017 ferrite modulator is cold. If radome is removed, aircraft should be located where it will not be exposed to wind. If exposed to a 3 knot wind, modulator may not heat to correct temperature. Result will be reduced sensitivity to r-f signals and serious cross talk problems.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[305] RANGE: 40SP [855] LOBE FREQ: 1 [905] POWER: RADAR STBY, and record time	[Multimeter] A-c voltage: 2.3 to 3.3 vac (warm-up plus maintenance current). —— Within 6 minutes voltage drops to zero and then cycles between zero and 0.5 to 1.1 (maintenance current only)	. . .
2	[305] RANGE: 16SP [855] LOBE FREQ: 3 [905] POWER: OFF [Multimeter] Disconnect	Check complete	. . .

3-16. ANGLE TRACK ADJUSTMENTS

3-16a. TRACKING ERROR ADJUSTMENT. The purpose of this procedure is to align the error signal amplifiers in the 141 unit.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-9b

PROBABLE FAULTY UNIT

141

REFERENCES

FUNCTIONAL DIAGRAM

Radar Angle Track
(T.O. 27-5/Fig. 3-16)

FAULT ISOLATION

Angle Tracking
(T.O. 27-3/Fig. 3-7)

NOTE

Do not perform this adjustment merely for the purpose of just eliminating an active steering dot writeup.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [Computer] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 504 DIGITAL INPUTS ENTER: Up (on) [846] START ADDRESS: 15 ENTER START ADDRESS: Press and release RUN-STOP: RUN [083] Action switch: Press to 2nd detent and release	[096] SELF TEST METER: 0 ±1 unit [063] DS 1 LEAD COLLISION: on	. . .

See pg 44 Sup 41

STEP	INSTRUCTION	INDICATION	REMARKS
1 (cont)	[096] S1: 8 S2: G [141] RDR ERR-ZERO: Up (on) and hold [141] EL TRACK ERROR R26: Adjust, if necessary, to obtain indication		
2	[096] S2: F [141] AZ TRACK ERROR R36: Adjust, if necessary, to obtain indication	[096] SELF TEST METER: 0 ±1 unit	Perform steps 1 and 2 until indications do not drift
3	[523] ATTACK DISPLAY: ON	[080] Steering dot: Centered in reference circle	If indication is incorrect, closer adjustment in steps 1 and 2 may be required
4	[141] RDR ERR-ZERO: Release [523] ATTACK DISPLAY: OFF [096] S1: 1 S2: A [846] START ADDRESS: 00 TEST-NORMAL: NORMAL [140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS ENTER: Down (off) DIGITAL INPUTS: 00 [905] POWER: OFF	Adjustment complete	. . .

3-16b. TRACKING LOOP ADJUSTMENT. The purpose of this procedure is to eliminate any electrical bias from the angle track circuits.

EQUIPMENT REQUIRED

Multimeter (with output scale)

Oscilloscope (optional)

EQUIPMENT HOOKUP

Connect multimeter (set on AC and OUTPUT scale) to 041 TP1 and 041 TP2.

Connect oscilloscope (set on AC and 0.1 scale) to 041 TP1 and 041 TP2.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 6-31
3. Paragraph 6-31.1

PROBABLE FAULTY UNIT

017
041
106
206
506

REFERENCES

EQUIPMENT REQUIRED

Radar Angle Track (T.O. 27-5/Fig. 3-16)

FAULT ISOLATION

Angle Tracking (T.O. 27-3/Fig. 3-7)

NOTE

If the LE-1 and LE-2 routines pass, proceed to para 3-19c, otherwise proceed to step 1 of this procedure. If this procedure is performed, repeat the LE-1 and LE-2 routines. The new H1G GG1111 exhibits a slightly greater sensitivity during drift adjustments. An oscilloscope may be required in place of a multimeter. Multimeter and 096 meter not sensitive enough to quickly align new gyros.

see pg 44 sup 41

see pg 3 sup 42

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [Computer] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 504 DIGITAL INPUT ENTER: Up (on) [846] START ADDRESS: 15 ENTER START ADDRESS: Press and release RUN-STOP: RUN [346] ANTENNA SERVO ERROR TEST: Press and hold [083] Action switch: Press to 2nd detent and release [141] δ_E/δ_D ZERO: Up (on) and hold **RDR ERROR Zero: UP and hold** [041] **S1: Press and Release** **S2: Press and Release**	[Oscilloscope] A-c voltage: Varies at a smooth rate in both positive and negative directions	**141, T3, TP5, TP8 and TP9 may be jumpered instead of pressing $\delta E/\delta D$ ZERO up and holding**
2	[041] TP5: Monitor using oscilloscope [041] S1: Press and release S2: Press and release	[Oscilloscope] A-c voltage: Varies at a smooth rate in both positive and negative directions	. . .
3	[506] GYRO REF: Press and hold [Oscilloscope] A-c voltage: Note and record [506] GYRO REF: Release [041] S1 or S2: Press and release as necessary to provide same oscilloscope indication as above AZ ZERO DRIFT R2: Adjust, if necessary, to obtain indication	[Oscilloscope] A-c voltage: Does not drift from voltage recorded in instructions	. . .
4	[041] TP2: Monitor using oscilloscope [506] GYRO REF: Press and hold [Oscilloscope] A-c voltage: Note and record [506] GYRO REF: Release [041] S1 or S2: Press and release as necessary to provide same oscilloscope indication as above EL ZERO DRIFT R4: Adjust, if necessary, to obtain indication	[Oscilloscope] A-c voltage: Does not drift from voltage recorded in instruction	. . .
5	**[106] Az Drive Motor: Test** **[506] Motor Ref: Test** **[083] Action Switch: Press to 2nd detent and release** **[506] Gyro Ref: Press and hold .** **[206] DC EL: Adjust, if necessary, then release 506 Gyro Ref**	[Oscilloscope] A-c voltage: Min deflection as 506 GYRO REF is pressed and released	If the 017 is visible, minimum drift indicates proper adjustment
6	**[041] TP5: Monitor using oscilloscope** **[506] Gyro Ref: Press and hold** **[106] Az Servo Bal: Adjust if necessary, to obtain indication, then release 506 Gyro Ref**	[Oscilloscope] A-c voltage: Min deflection as 506 GYRO REF is pressed and released	Same as step 5
7	[506] GYRO REF: Press and release	[080] B-sweep: Does not move ___ E1 marker: Does not move	Repeat steps 5 and 6 until the proper indication is obtained

STEP	INSTRUCTION	INDICATION	REMARKS
8	[083] Action switch: Press to 2nd detent and hold ANT ELEV: Any position in el Hand control: Any position in az Action switch: Release	[080] B-sweep: Does not move —— El marker: Does not move	Repeat this step for various az and el positions. Repeat steps 5 and 6 until the proper indication is obtained
9	**CAUTION** Excessive holding of 206 OSC in AZ or EL position may cause excessive gear train wear. Do not set 206 AZ STAB below 4.0.		
	[346] ANTENNA SERVO ERROR TEST: Release [141] δ_E/δ_D ZERO: Release [846] START ADDRESS: 00 TEST-NORMAL: NORMAL [140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUTS ENTER: Down (off) [096] S1: 7 S2: A [206] KV TEST: AZ and hold OSC: AZ for at least 1 sec but no longer than 2 sec then release	[096] SELF TEST METER: Greater than 5 units (50 v) while 206 OSC is set to AZ. Less than 5 units within 5 sec after 206 OSC is released. If proper indication is not obtained, adjust 206 AZ STAB in 0.5 increments and repeat this step.	. . .
10	**CAUTION** Do not set 206 EL STAB below 4.0.		
	[096] S2: C [206] KV TEST: EL and hold OSC: EL for at least 1 sec but no longer than 2 sec then release	[096] SELF TEST METER: Greater than 5 units (50 v) while OSC is set to EL. Less than 5 units within 5 sec after OSC is released. If proper indication is not obtained, adjust 206 EL STAB in 0.5 increments and repeat this step	. . .
11	[096] S1: 1 S2: A [106] AZ DRIVE MOTOR: NORM [506] MOTOR REF: NORMAL [ACP] Selector: VIS IDENT [905] POWER: OFF [Oscilloscope] Disconnect	Adjustment complete	. . .

3-16c. 141 MOD CURRENT R52 ADJUSTMENT. The purpose of this procedure is to set the drive current level to the modulator in the 017 unit.

EQUIPMENT REQUIRED

VTVM

EQUIPMENT HOOKUP

Connect VTVM (set on 10 vac scale) to 141 TP15 and TP8 (gnd)

REFERENCES

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

141

FAULT ISOLATION

Chaff Circuit Operation (T.O. 27-3/Fig. 3-9)

FUNCTIONAL DIAGRAM

Anti-chaff (T.O. 27-5/Fig. 3-20)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action switch: Press to 2nd detent and release [141] MOD CURRENT R52: Adjust, if necessary, to obtain indication [VTVM] A-c voltage: Record	[VTVM] A-c voltage: 4.24 ±0.40 vac	. . .
2	[141] TP14: Monitor using VTVM	[VTVM] A-c voltage: Same as voltage recorded in step 1 ±1%	. . .
3	[141] TP11 and TP12: Monitor using VTVM	[VTVM] A-c voltage: 15 to 21 vac	Checks return of modulator voltage
4	[905] POWER: OFF [VTVM] Disconnect	Adjustment complete	. . .

3-16d. 141 LOBING FREQUENCY CHECK. The purpose of this procedure is to ensure that the 141 unit lobing frequencies are correct.

EQUIPMENT REQUIRED

1. Oscilloscope
2. Frequency counter

EQUIPMENT HOOKUP

Connect oscilloscope VERTICAL INPUT to 141 TP15.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

141

REFERENCES

FUNCTIONAL DIAGRAM

Anti-chaff (T.O. 27-5/Fig. 3-20)

FAULT ISOLATION

Chaff Circuit Operation (T.O. 27-3/Fig. 3-9)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action switch: Press to 2nd detent and release [Oscilloscope] VOLTS/CM: Adjust to obtain indication	[Oscilloscope] Peak-to-peak waveform: 6 cm	. . .
2	[Oscilloscope] TRIGGER or EXT SWEEP IN: Connect to 141 TP 15 HORIZONTAL DISPLAY: EXT SWEEP 5X MAGNIFIER: ON EXT SWEEP ATTEN: Adjust to obtain indication	[Oscilloscope] Horizontal waveform: 6 cm	. . .
3	[Oscilloscope] VERTICAL INPUT: Connect to 141 TP15 TRIGGER or EXT SWEEP IN: Connect to 141 TP14	[Oscilloscope] Waveform: Circular Lissajous pattern with no more than 3° tilt	This indicates a 90° phase difference between az and el lobing currents
4	[855] LOBE FREQ: Set to 1, 2, and 4 while observing oscilloscope at each position	[Oscilloscope] Waveform: Circular Lissajous pattern with no more than 3° tilt	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
5	[Oscilloscope] Leads: Disconnect from 141 TP14 but do not disconnect from TP15 [855] LOBE FREQ: 1 [Frequency counter] SIGNAL INPUT: Using a short coax line to minimize stray field pickup, connect to 141 TP14	[Frequency counter] Frequency: Indicates lobing frequency 1 iaw MA-1 classified information codes (T.O. 27-6)	. . .
6	[855] LOBE FREQ: Set to 2, 3, and 4 and note frequency at each position	[Frequency counter] Frequency: Indicates lobing frequency 2, 3, and 4 respectively iaw MA-1 classified information codes (T.O. 27-6)	Difference between lobing frequency 2 and 3 should be greater than 15 Hz; difference between lobing frequency 4 and twice lobing frequency 1 should be greater than 5 Hz
7	[855] LOBE FREQ: 3 [905] POWER: OFF [Test equipment] Disconnect	Adjustment complete	. . .

3-16e. 017 GYRO CROSSTALK ADJUSTMENT. The purpose of this procedure is to adjust 017 elevation HIG gyro for a minimum voltage change as the antenna is moved in azimuth and to adjust 017 azimuth HIG gyro for a minimum voltage change as the antenna is moved in elevation.

EQUIPMENT REQUIRED

VTVM

EQUIPMENT HOOKUP

Connect VTVM to 041 TP3 and TP1 GND. Set VTVM to ZERO CENTER scale.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Remove radome iaw para 10-4m
3. Pin antenna in elevation
4. Paragraph 6-31

PROBABLE FAULTY UNIT

017
506

REFERENCES

FUNCTIONAL DIAGRAM

Radar Angle Track
(T.O. 27-5/Fig. 3-16)

FAULT ISOLATION

Angle Tracking
(T.O. 27-3/Fig. 3-7)

CAUTION

HIG gyros are extremely delicate instruments and must be handled with extreme care to prevent permanent damage. Do not handle by cable.

NOTE

If the gyro crosstalk portion of the LE-1 routine passes, do not perform this procedure as gyro crosstalk is properly adjusted.

STEP	INSTRUCTION	INDICATION	REMARKS
1	**CAUTION** If radar compartment door gyro heat lights do not start to blink within 5 minutes after setting 905 POWER to WARM, set POWER to OFF and check 017 K1 and K2 and 017 B12 and B13 and 506 unit for possible fault. Damage to gyro may result if lights remain off.		
	[905] POWER: WARM	[017] B12 and B13 gyro cases: Warm to hot [Radar compt door] AZ and EL gyro heat lights: Blink on and off	Blinking lights indicate proper operation of heating circuits
2	[905] POWER: RADAR STBY [083] Action switch: Press to 2nd detent and hold [017] Antenna: Manually move back and forth in az at a constant rate	[VTVM] Voltage: Changes polarity as direction of antenna motion is changed	. . .
3	[017] B12: Loosen clamping screws and adjust as necessary to obtain indication	[VTVM] Voltage: Min change as antenna is moved back and forth	. . .
4	[017] B12: Tighten clamping screws Antenna: Manually move back and forth in az at a constant rate	[VTVM] Voltage: Changes the same amount as step 3	This step verifies that adjustment did not change when screws were tightened
5	[017] El locking pin: Remove Az locking pin: Install [VTVM] Leads: Connect to 041 TP4 and TP1 GND [017] Antenna: Manually move up and down in el at a constant rate	[VTVM] Voltage: Changes polarity as direction of antenna motion is changed	. . .
6	[017] B13: Loosen clamping screws and adjust as necessary to obtain indication	[VTVM] Voltage: Min change as antenna is moved up and down	. . .
7	[017] B13: Tighten clamping screws Antenna: Manually move up and down in el at a constant rate	[VTVM] Voltage: Changes the same amount as step 6	This step verifies that adjustment did not change when screws were tightened
8	[905] POWER: OFF [017] Az locking pin: Remove [VTVM] Disconnect [Computer] LE-1 routine: Perform iaw para 6-31, if gyro crosstalk does not pass, repeat this procedure [Radome] Reinstall iaw para 10-4m	Adjustment complete	. . .

3-16f. 017 GAIN ADJUST. This is a depot adjustment and is not to be performed on the aircraft.

3-16g. 141 DITHER FREQ R4 ADJUSTMENT. The purpose of this procedure is to ensure that the 017 unit will oscillate slightly when in the track mode without lockon.

EQUIPMENT REQUIRED

Oscilloscope

EQUIPMENT HOOKUP

Connect oscilloscope to 141 TP10. Set oscilloscope TIME/CM to 1 MILLISEC; set MULTIPLIER to 5 to obtain 5 milliseconds/cm sweep time.

PRELIMINARY PROCEDURE

1. Table 1-1

PROBABLE FAULTY UNIT

017
141

REFERENCES

FUNCTIONAL DIAGRAM

Radar Angle Track
(T.O. 27-5/Fig. 3-16)

FAULT ISOLATION

Angle Tracking
(T.O. 27-3/Fig. 3-7)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [106] AZ DRIVE MOTOR: TEST [506] MOTOR REF: TEST [083] Action switch: Press to 2nd detent and release [141] TP9: Connect to ground DITHER FREQ R4: Adjust fully ccw, then cw to obtain indication	[017] Antenna: Just begins to oscillate [Oscilloscope] Sine wave: One complete cycle is less than 10 cm wide	Grasp antenna dish lightly between thumb and forefinger to feel oscillation
2	[141] TP9: Remove ground connection [106] AZ DRIVE MOTOR: NORM [506] MOTOR REF: NORMAL [905] POWER: OFF [Oscilloscope] Disconnect	Adjustment complete	. . .

3-16h. 506 AZ AND EL ADJUSTMENTS. The purpose of this procedure is to calibrate the reference level of the lobing frequency signal supplied to the 506 unit chaff circuits.

EQUIPMENT REQUIRED

Multimeter

EQUIPMENT HOOKUP

Connect multimeter to 506 TP13.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017
141
506

REFERENCES

FUNCTIONAL DIAGRAM

Anti-Chaff
(T.O. 27-5/Fig. 3-20)

FAULT ISOLATION

Chaff Circuit Operation
(T.O. 27-3/Fig. 3-9)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action switch: Press to 2nd detent and release [506] AZ ADJ: Adjust, if necessary, to obtain indication	[Multimeter] A-c voltage: 3 vac	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
2	[506] TP12: Monitor using multimeter EL ADJ: Adjust, if necessary, to obtain indication	[Multimeter] A-c voltage: 3 vac	. . .
3	[905] POWER: OFF [Multimeter] Disconnect	Adjustment complete	. . .

3-16i. EDGE ANGLE BIAS TEST (LB). The purpose of this procedure is to provide the correct 506 unit edge angle track input to the 295 unit when operating in the chaff mode.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

NOTE

Correct edge angle delay adjustment (para 3-9k) must be accomplished prior to this test and video and tracking loop alignments must be accurate. FDT target cannot be used for this adjustment.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

506

REFERENCES

FUNCTIONAL DIAGRAM

Anti-Chaff (T.O. 27-5/Fig. 3-20)

FAULT ISOLATION

Chaff Circuit Operation (T.O. 27-3/Fig. 3-8)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load in accordance with para. 6-4 [905] POWER: ON [305] CHAFF: ALL NOSE/TAIL: NOSE RDR: NORMAL [796] Selector Test: 7 [096] S1: 6 S2: G [083] Action Switch: Press to 2nd detent and lock on to a sharp well defined dead ahead target that will produce at least 3.5 units on 096 meter when action switch is released [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 700 DIGITAL INPUTS ENTER: Up (on) [846] START ADDRESS: 15 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[063] DS2 PURSUIT: —— Comes on DS1 LEAD COLLISION: Comes on	If one light is off, proceed to step 2; if both lights are off, the 506 is faulty; if indication is correct, perform step 3. If a sharp well defined dead ahead target that will generate 3.5 volts AGC is unavailable set up UPM-141 in accordance with para 11-3g to simulate such a target. Place feedhorn approximately 20 feet from the antenna, dead ahead. Target range 20K yards, zero range rate.

STEP	INSTRUCTION	INDICATION	REMARKS
2	[096] S1: 5 S2: E [506] OUTPUT ADJ: Adjust to obtain indication	[096] SELF TEST METER: 5 units [063] DS2 PURSUIT: ——— Comes on DS1 LEAD COLLISION: Comes on	506 OUTPUT ADJ must be adjusted cw if DS2 PURSUIT is off and ccw if DS1 LEAD COLLISION is off
3	[140] DIGITAL INPUTS ENTER: Down (off) DIGITAL INPUTS: 000 DIGITAL DISPLAY: NORMAL [846] START ADDRESS: 00 TEST-NORMAL: NORMAL [096] S1: 1 S2: A [305] CHAFF: OFF [796] Selector Test: OFF [905] POWER: OFF	Adjustment complete	. . .

3-17. ATTACK DISPLAY CHECKS

When an 080 unit display is required during the following checks, the MMST must be turned on by pressing and releasing 080 ON. After approximately 35 seconds, the 080 unit will present all displays other than attack. If the attack display is required, press and hold 080 ON for a minimum of 3 seconds and release. If the displays are not required for a period of time, the 080 unit should be turned off by pressing and releasing 080 OFF. The 080 unit use time should be held down to conserve the MMST.

NOTE

The 080 ON and OFF switches are bypassed when the canopy is closed or the canopy latch is set to the locked position.

CAUTION

Excessive attack intensity may damage the 080 unit MMST. Set the 080 ATTACK INTENSITY fully ccw when not observing the attack display, and set for a minimum acceptable viewing level when observing the attack display. The 080 unit attack display gun turns off after approximately 3 minutes. Press and hold the 080 ON for a minimum of 3 seconds, and release to obtain the attack display for another cycle. This procedure must be repeated for each additional cycle required.

3-17a. INDICATOR DISPLAY CHECK. The purpose of this procedure is to ensure that the attack gun of the 080 unit is operational.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

080
223
395
523

REFERENCES

FUNCTIONAL DIAGRAM

Display (T.O. 27-5/Fig. 3-7)
Attack Displays (T.O. 27-5/Fig. 3-18)

FAULT ISOLATION

Attack Display
(T.O. 27-3/Fig. 3-12)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [523] ATTACK DISPLAY: ON [080] ON: After system has timed in to standby, press and release	[080] Search displays: Appear after approx 35 sec	It takes approx 3.5 min for system to time in
2	[080] ON: Press for 3 sec and release	[080] Artificial horizon: Appears, centered in az and el —— El marker: Appears, left side centered and right side indicating antenna position —— Time-to-go circle: Appears, 2.8 in. diameter —— Steering dot and reference circle: Appear	. . .
3	[080] OFF: Press and release [523] ATTACK DISPLAY: OFF [905] POWER: OFF	Check complete	. . .

See pg 46 sup 41

3-17b. PURSUIT FIRING BAR CHECK. The purpose of this procedure is to ensure that the firing bar appears at the proper range.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-20a

PROBABLE FAULTY UNIT

063 395
140 523
223

REFERENCES

FUNCTIONAL DIAGRAM

Attack Displays
(T.O. 27-5/Fig. 3-18)

FAULT ISOLATION

Pursuit Firing Range
(T.O. 27-3/Fig. 3-13)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 4SP [196] MOD TEST: Up (on) [017] Antenna: Centered [305] NOSE-TAIL: NOSE [955] HOMING POINT SELECTOR: A [796] SELECTOR TEST: 3 [083] ACTION Sw: LOCK-ON [796] GND TEST INTER: PRESS AND RELEASE	[080] The TTG circles are displayed followed by the REF circle and Firing Bar in different positions.	Automatic Display Sequence
2	[955] HOMING POINT SELECTOR: D	[080] Firing bar: Coincident with the 8th receiver test target.	The targets are 1000 yards apart.
3	[955] HOMING POINT SELECTOR: E	[080] Firing bar: Coincident with the main bang.	. . .
4	[955] HOMING POINT SELECTOR: F	[080] Firing bar: Coincident with the 5th receiver test target.	. . .
5	[955] HOMING POINT SELECTOR: G	[080] Firing bar: Coincident with the 3rd receiver test target.	. . .
6	[305] NOSE TAIL: TAIL [196] MOD TEST: Down (off) [796] SELECTOR TEST: 7, then OFF [905] POWER: OFF	Check complete	. . .

3-17c. 223 COLLISION WARNING CHECK. The purpose of this procedure is to ensure that the collision warning circuits in the 223 unit are operational.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

223

REFERENCES

FUNCTIONAL DIAGRAMS

Attack Displays
(T.O. 27-5/Fig. 3-18)

FAULT ISOLATION

Attack Display
(T.O. 27-3/Fig. 3-12)

See pg 47 Sup 41

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [196] MOD TEST: Up (on) REC TEST: Up (on) [223] R TEST (KNOTS): 1200 [083] Action switch: 2nd detent and lock on to 3rd self test target.	[080] Time-to-go circle: Appears Reference circle: Appears Steering dot: Appears Range gate gap: 1200 K.	. . .
2	[223] Press and hold collision warning test switch and note displays.	[080] Collision warning display appears, TTG circle disappears.	. . .
3	[083] Lock on to 18th self test TGT and note displays.	Normal attack displays.	. . .
4	[223] Set R TEST (KNOTS) switch to 800 K. [083] Press to 2nd detent and lock on to 3rd self test TGT and note displays.	[080] Normal attack displays.	. . .
5	[083] Press to 2nd detent and lock on to 2nd self test TGT and note displays.	[080] Collision warning display is present.	. . .
6	[223] COLLISION WARNING TEST: Release R TEST: OPERATE [196] REC TEST: Down (off) MOD TEST: Down (off) [ACP] Selector: VIS IDENT [905] POWER: OFF		. . .

3-17d. TRACK OPERATIONAL CHECK. The purpose of this procedure is to ensure the tracking circuits of the radar subsystem are operational.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017
141

REFERENCES

FUNCTIONAL DIAGRAM

1. Radar Angle Track (T.O. 27-5/Fig. 3-16)
2. Range Track (T.O. 27-5/Fig. 3-17)

FAULT ISOLATION

1. Angle Tracking (T.O. 27-3/Fig. 3-7)
2. Lock On and Range Tracking (T.O. 27-3/Fig. 3-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [083] Action switch: Press to 2nd detent and hold, lock on to edge of small isolated ground target, and release action switch	[080] B-sweep: Drives to center of target — Range circle: Appears — Range rate gap: 0 — Reference circle: Appears — Steering dot: Appears, indicates antenna look angle, direction of motion is same as direction of look angle, and movement is not excessive	30S RANGE may be set to 40SP if target is available beyond 16 miles. By using the same target each time a track operational check is performed, it can be determined (through experience) when the steering dot movement is excessive
2	**CAUTION** Do not perform the following step if missiles or WSEMs are installed. Setting the ACP selector to any missile position while system is locked-on may damage missile or WSEM head.		
	[ACP] Selector: MISSILES RAD	[080] Steering dot: Moves toward MMST center, movement increases but still is not excessive	Steering dot should always remain within the reference circle
3	[ACP] Selector: VIS IDENT [905] POWER: OFF	Check complete	. . .

3-17e. SNAPSHOOT SYSTEM CHECKS. The purpose of this procedure is to ensure that the SnapShoot system is operational.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1.
2. Paragraph 2-17a and 3-17d.

PROBABLE FAULTY UNIT

52450
52800
Computer Subsystem

FUNCTIONAL DIAGRAM

1. Displays (T.O. 27-5/Fig. 3-7)
2. Attack Displays (T.O. 27-5/Fig. 3-18)
3. SnapShoot System (T.O. 27-5/Fig. 10-1)

REFERENCES

Figure 3-10

FAULT ISOLATION

SnapShoot System (T.O. 27-3/Fig. 3-12.1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [196] REC TEST: Up (on) [083] Action switch: Press to 2nd detent, lock on to first receiver test target and release action switch.		

STEP	INSTRUCTION	INDICATION	REMARKS
	[ACP] Selector: SPL WPN [52800] MODE: 2 (RANGE) [196] REC TEST: Down (off)	[080] Display: Two pippers appear, one at a fixed 1000-foot range and the other at the target range. Target range pipper flashes. (See fig. 3-10.)	
2	[52800] MODE: 3 (NO RANGE)	[080] Display: Three pippers appear, one at 500-foot range, another at 1500 feet, and the third at 2500 feet. (See fig. 3-10.)	
3	[52800] MODE: 4 (DYNAMIC BORESIGHT)	[080] Display: Same as step 2.	
4	[083] Action switch: Press to 2nd detent and release. AUTO SEARCH: Press and release. Action switch: Press to 2nd detent and release. AUTO SEARCH: Press and release.	[080] Display: 2500-foot pipper becomes a dot superimposed on the 500-foot pipper.	
5	[083] Action switch: Press to 2nd detent and hold. Hand control: Move right, then left, then back to center.	[080] Display: Dot slowly follows movement of hand control.	
6	[083] ANT ELEV: UP, DN, then back to detent.	[080] Display: Dot slowly follows movement of ANT ELEV wheel.	
7	[083] Hand control: Move right to obtain indication. ANT ELEV: UP to obtain indication. Action switch: Release AUTO SEARCH: Press and release.	[080] Display: Dot appears at approximately 20^{o} to right and 20^{o} above the center reticle marks. Display: Freezes	
8	[52800] MODE: 3 (NO RANGE)	[080] Display: No range display in step 2 now appears at position at which the dot was moved in step 7.	
9	[52800] MODE: 1 (OFF), and then MODE: 3 (NO RANGE)	[080] Display: Same as step 2.	The display should move to the same position it was in step 2.
10	[52800] MODE: 7 (REFERENCE)	[080] Display: Three pippers appear superimposed on the three bezel dots. (See figure 3-10.)	If a broad white line appears, set MODE switch to 1 (OFF), and then to 7 (REFERENCE). Check computer subsystem.
11	[52800] MODE: 3 (NO RANGE) [955] Homing Point Selector: A	[080] Display: Horizontal line of 500-ft. pipper is 1/2 inches, 1500-ft. pipper is 1/4 inches, and 2500-ft. pipper is 1/8 inches. [52800] Combining glass: Three pippers appear.	

STEP	INSTRUCTION	INDICATION	REMARKS
12	[955] Homing Point Selector: B	[080] Display: Horizontal line of 500-ft. pipper is 3-1/4 inches, 1500-ft. pipper is 1-5/8 inches, and 2500-ft. pipper is 5/8 inches. [52800] Combining glass: Three pippers appear.	
13	[955] Homing Point Selector: C	[080] Display: Horizontal line of 500-ft. pipper is 1-1/2 inches, 1500-ft. pipper is 3/4 inches, and 2500-ft pipper is 1/4 inches. [52800] Combining glass: Three pippers appear.	
14	[52800] MODE 1 (OFF) [ACP] Selector: VI [905] POWER: OFF	Check complete.	

3-17f. SNAPSHOOT SYSTEM OPTICAL DISPLAY UNIT CHECK. The purpose of this procedure is to ensure that the shutter in the 52800 unit is operational.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

None

PROBABLE FAULTY UNIT

52800

FUNCTIONAL DIAGRAM

Displays (T.O. 27-5/Fig. 3-7)

REFERENCES

FAULT ISOLATION

SnapShoot System (T.O. 27-3/Fig. 3-12.1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[52300] Loosen the three mounting captive screws holding the 52300 unit to the 52800 unit. Remove the 52300 unit		
2	[905] POWER: RADAR STBY [52800] MODE: 2 (RANGE)	[52800] Sight through opening in 52800 unit that was left when 52300 unit was removed. Observe the outside world and the MMST display.	
3	[52800] MODE: 1 (OFF)	[52800] Sight through opening in 52800 unit. Observe that shutter covers the optical path and no image is seen.	
4	[52800] MODE: 1 (OFF) [905] POWER: OFF [52300] Install 52300 unit on the 52800 unit. Tighten the three captive screws to secure the 52300 unit.	Check complete	

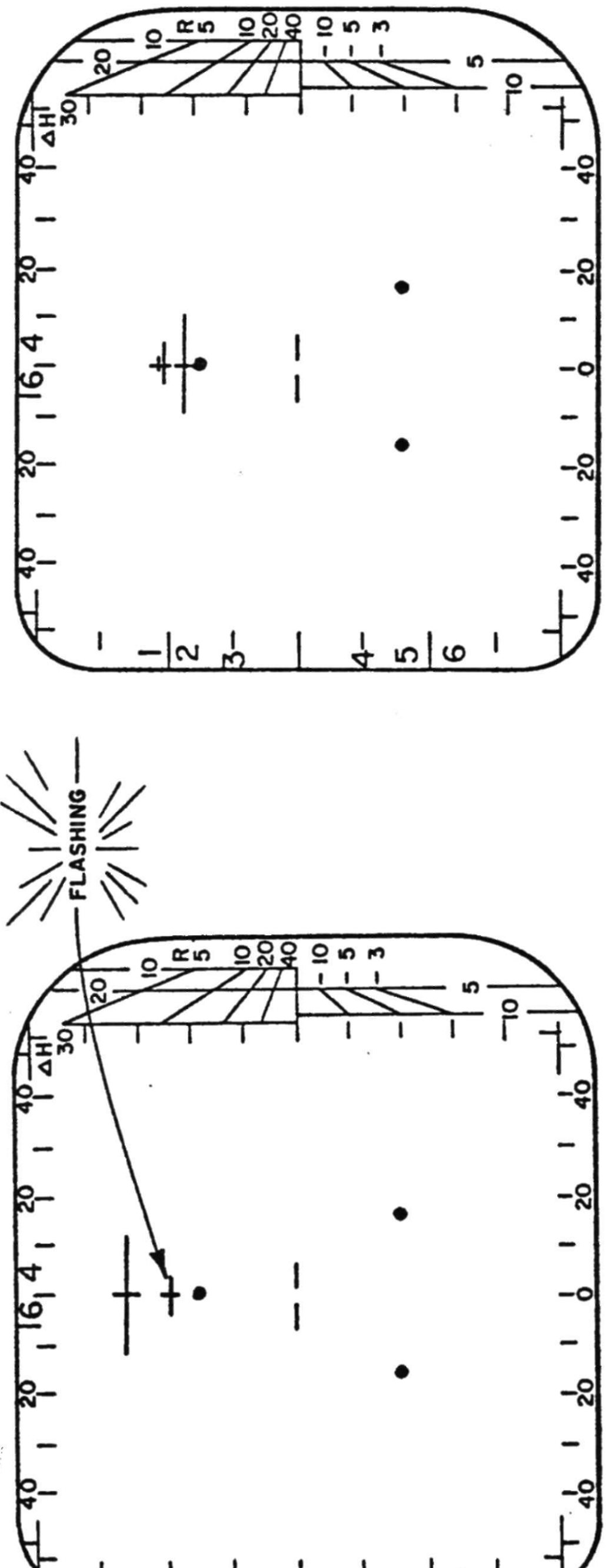


Figure 3-10. SnapShoot System Displays (Sheet 1 of 2)

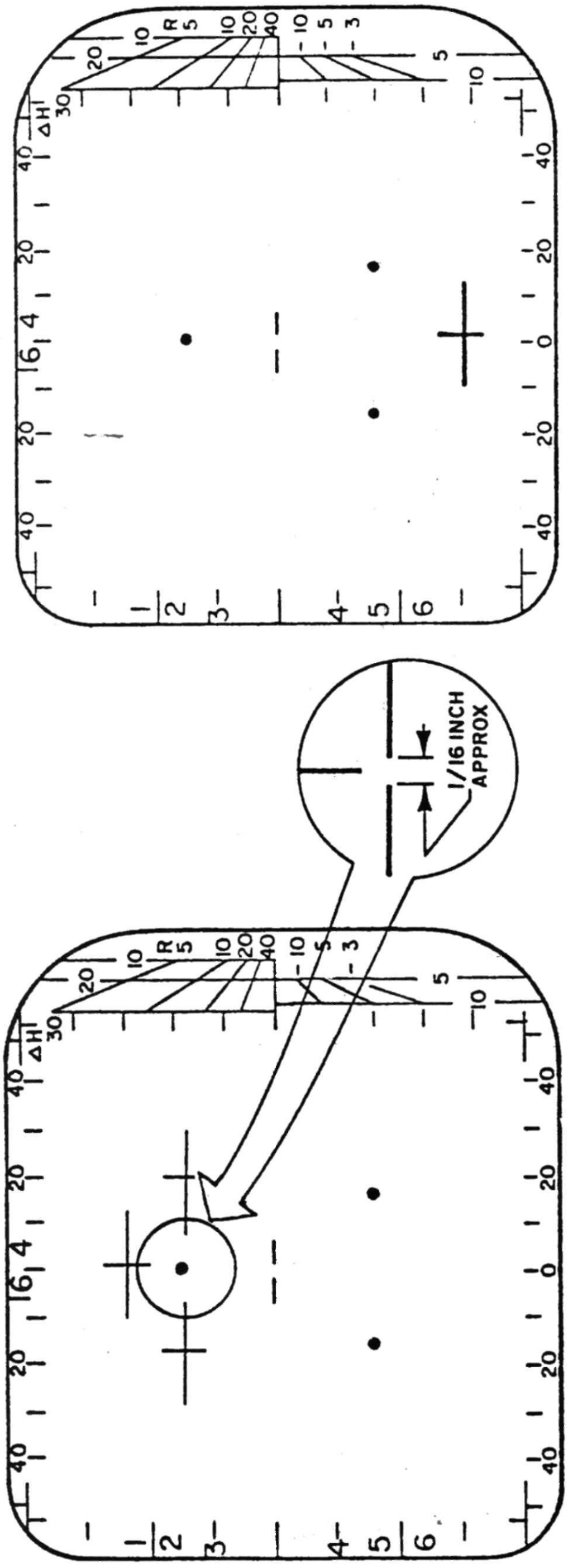


Figure 3-10. SnapShoot System Displays (Sheet 2 of 2)

See pg 48 Sup 41

3-17g. SNAPSHOOT SYSTEM YAW RATE CHECK. The purpose of this procedure is to ensure that the YAW rate circuit in the 52450 unit is operational.

EQUIPMENT REQUIRED	EQUIPMENT HOOKUP	PRELIMINARY PROCEDURE
TRT Switch box (Fabricate box per figure 8-1)	Indicated in the procedure	

PROBABLE FAULTY UNIT
52450

FUNCTIONAL DIAGRAM	REFERENCES	FAULT ISOLATION
SnapShoot System (T.O. 27-5/ Fig. 10-1)		SnapShoot System (T.O. 27-3/Fig. 3-12.1)

NOTE

Ensure that CPU-111 is not in any test condition and that it is producing ground condition parameters.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: OFF (Aircraft) TRT: Loosen nuts on three mounting bolts holding TRT to air-frame and cut safety wires from connector on TRT.		
2	[Aircraft] TRT: Install TRT switch box between aircraft harness and TRT.	—	
3	[905] POWER: RADAR STBY [ACP] Selector: SPL SPN [52800] MODE: 3 (NO RANGE) [Aircraft] TRT: While holding TRT firmly in place remove mounting bolts from TRT.		
4	[TRT Switch Box] PITCH RATE: OFF ROLL RATE: OFF YAW RATE: ON [52450] YAWR to GND: Monitor using oscilloscope for indications. [Aircraft] TRT: Move to right and left in azimuth.	[Oscilloscope] 0 to ± 100 vdc signal changing at YAW rate.	

STEP	INSTRUCTION	INDICATION	REMARKS
5	[Aircraft] TRT: Return TRT to its normal position.		
6	[52450] ILS to GND: Monitor using oscilloscope for indications. [Aircraft] TRT: Move to right and left in azimuth.	[Oscilloscope] Opposite polarity and 1/20 of YAW rate signal observed in step 4.	
7	[Aircraft] TRT: Return TRT to its normal position.		
8	[Aircraft] TRT: Reinstall three bolts, washers, and nuts removed in step 1 (do not tighten).		
9	[905] POWER: OFF [52800] MODE: 1 (OFF) [ACP] Selector: VI [Aircraft] TRT: Tighten three nuts on bolts on TRT installed in step 8. Remove TRT switch box. Install wiring harness on to TRT and safety wire connector.	Check complete.	

3-18. ATTACK DISPLAY ADJUSTMENTS.

When an 080 unit display is required during the following checks, the MMST must be turned on by pressing and releasing 080 ON. After approximately 35 seconds, the 080 unit will present all displays other than attack. If the attack display is required, press and hold 080 ON for a minimum of 3 seconds and release. If the displays are not required for a period of time, the 080 unit should be turned off by pressing and releasing 080 OFF. The 080 unit use time should be held down to conserve the MMST.

NOTE

The 080 ON and OFF switches are bypassed when the canopy is closed.

CAUTION

Excessive attack intensity may damage the 080 unit MMST. Set the 080 ATTACK INTENSITY fully ccw when not observing the attack display, and set for a minimum acceptable viewing level when observing the attack display.

The 080 unit attack display gun turns off after approximately 3 minutes. Press and hold the 080 ON for a minimum of 3 seconds, and release to obtain the attack display for another cycle. This procedure must be repeated for each additional cycle required.

3-18a. 223 $\dot{R}$ SCALE FACTOR ADJUSTMENT.

WARNING

The 223 $\dot{R}$ scale factor adjustment is critical and could cause erroneous collision warning information. If a problem is suspected, the 223 unit should be adjusted in the mock-up.

The following table of data is provided to employ the FDT and/or AN/UPM-141 test set in the evaluation and determination of scale factor accuracy:

RANGE RATE (KNOTS)	223 UNIT VOLTAGE @ TP-2 ALLOWABLE
100*	4.4 - 5.0
200	9.0 - 9.8
400	18.3 - 19.3
600**	27.4 - 29.0
800	36.6 - 38.8
1000	45.6 - 48.2
1200**	54.8 - 57.8
1400	63.7 - 67.7
2000*	91.0 - 96.6

* Available only W/UPM-141 Test Set
** For Range Rate Gap Checkout

3-18b. 223 TIME CIRCLE SCALE FACTOR ADJUSTMENT. The purpose of this procedure is to ensure that the time-to-go circle is 2.8 inches in diameter with 20 seconds or longer to go to fire signal generation.

See pg 49 Sup 41

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

223

REFERENCES

FUNCTIONAL DIAGRAM

Attack Displays
(T.O. 27-5/Fig. 3-18)

FAULT ISOLATION

Attack Displays
(T.O. 27-3/Fig. 3-12)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [196] MOD TEST: UP(on) [955] HOMING TEST SELECTOR: B [305] NOSE-TAIL: NOSE [796] SELECTOR TEST: 3 [796] GND TEST INTER: PRESS & RELEASE [083] ACTION SW; LOCK ON [223] TIME CIRCLE SCALE FACTOR: Adjust, if necessary, to obtain indication.	[080] Time-to-go circle: Vertical and horizontal amplitude equal to 2.8 in.	. . .
2	[305] NOSE-TAIL: TAIL [196] MOD TEST: Down (off) [796] SELECTOR TEST: 7, then OFF [905] POWER: OFF	Adjustment complete	. . .

3-18c. 523 TIME CIRCLE PHASE ADJUSTMENT. The purpose of this procedure is to ensure the time-to-go circle is round.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

523

REFERENCES

FUNCTIONAL DIAGRAM

Attack Displays
(T.O. 27-5/Fig. 3-18)

FAULT ISOLATION

Attack Display
(T.O. 27-5/Fig. 3-12)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [196] MOD TEST: Up (on) [955] HOMING TEST SELECTOR: B [305] NOSE–TAIL: NOSE [795] SELECTOR TEST: 3 [796] GND TEST INTER: PRESS & RELEASE [083] ACTION Sw: LOCK-ON [523] TIME CIRCLE PHASE: Adjust, if necessary, to obtain indication.	[080] Time-to-go circle: Circular	If phasing adjustment can not be accomplished perform 395 Hor Ampl Gain Control, Hor Ampl Ctr Cont., Vert Ampl Gain Control, and Vert Ampl Ctr Cont adjustments in accordance with para 3-18g.
2	[305] NOSE-TAIL: TAIL [196] MOD TEST: Down (off) [796] SELECTOR TEST: 7, then OFF [905] POWER: OFF	Adjustment complete	. . .

See pg 5e Sup 41

3-18d. 523 REF CIRCLE PHASE ADJUSTMENT. The purpose of this procedure is to ensure that the reference circle is round.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

523

REFERENCES

FUNCTIONAL DIAGRAM

Attack Displays
(T.O. 27-5/Fig. 3-18)

FAULT ISOLATION

Attack Display
(T.O. 27-3/Fig. 3-12)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [196] MOD TEST: Up (on) [955] HOMING TEST SELECTOR: B [305] NOSE-TAIL: NOSE [796] SELECTOR TEST: 3 [796] GND TEST INTER: PRESS & RELEASE [083] ACTION Sw: LOCK-ON [523] REF CIRCLE PHASE: Adjust, if necessary, to obtain indication.	[080] Reference circle: Circular	If phasing adjustment can not be accomplished, perform 395 Hor Ampl Gain Control, Hor Ampl Ctr Con., Vert Ampl Gain Control and Vert Ampl Ctr Cont adjustments in accordance with para 3-18g.
2	[305] NOSE-TAIL: TAIL [196] MOD TEST: Down (off) [796] SELECTOR TEST: 7, then OFF [905] POWER: OFF	Adjustment complete	. . .

3-18e. 395 $\dot{R}$ ZERO ADJUSTMENT AND $\dot{R}$ GAP SCALE FACTOR ADJUSTMENT. The purpose of this procedure is to ensure that the range rate gap is positioned at zero with zero input and is properly positioned.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

395

REFERENCES

FUNCTIONAL DIAGRAM

Attack Displays
(T.O. 27-5/Fig. 3-18)

FAULT ISOLATION

Attack Display
(T.O. 27-3/Fig. 3-12)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [223] $\dot{R}$ TEST (KNOTS): ZERO TIME CIRCLE TEST: 20-SEC [ACP] Selector: MISSILES ALL [523] ATTACK DISPLAY: ON [395] S2: Press to up (on) and hold	[080] Range rate gap: 0 ±50	. . .
2	[395] $\dot{R}$ ZERO ADJ: Adjust, if necessary, to obtain indication	[080] Range rate gap: 0	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3	[223] Ṙ TEST (KNOTS): 1200 [395] R SCALE FACTOR ADJ: Adjust, if necessary, to obtain indication	[080] Range rate gap: 1175 ±75	. . .
4	[ACP] Selector: VIS IDENT [223] Ṙ TEST (KNOTS): OPERATE [395] Ṙ ZERO ADJ: Adjust, if necessary, to obtain indication	[080] Range rate gap: 0	Repeat steps 1, 2, and 3, as necessary, until adjustment of 395 Ṙ ZERO ADJ and Ṙ SCALE FACTOR ADJ are not required.
5	[395] S2: Release [523] ATTACK DISPLAY: OFF [223] TIME CIRCLE TEST: OPERATE [905] POWER: OFF	Adjustment complete	. . .

3-18f. 395 Ṙ GAP WIDTH ADJUSTMENT. The purpose of this procedure is to ensure that the width of the range rate gap is correct.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

395

REFERENCES

FUNCTIONAL DIAGRAM

Attack Displays
(T.O. 27-5/Fig. 3-18)

FAULT ISOLATION

Attack Display
(T.O. 27-3/Fig. 3-12)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [223] TIME CIRCLE TEST: 20-SEC [523] ATTACK DISPLAY: ON [395] S2: Press to up (on) and hold [395] Ṙ WIDTH ADJ: Adjust, if necessary, to obtain indication	[080] Range rate gap: 1/4 ±1/16 in.	. . .
2	[395] S2: Release [523] ATTACK DISPLAY: OFF [223] TIME CIRCLE TEST: OPERATE [905] POWER: OFF	Adjustment complete	. . .

3-18g. 395 HOR AMPL GAIN CONTROL, HOR AMPL CTR CONT, VERT AMPL GAIN CONTROL, AND VERT AMPL CTR CONT ADJUSTMENTS. The purpose of this procedure is to ensure that the attack display is centered on the 080 MMST and the gain is correct.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

395

REFERENCES

FUNCTIONAL DIAGRAM

Attack Displays
(T.O. 27-5/Fig. 3-18)

FAULT ISOLATION

Attack Display
(T.O. 27-3/Fig. 3-12)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 4SP [196] MOD TEST: Up (on) [017] Antenna: Centered [305] NOSE-TAIL: NOSE [955] HOMING POINT SELECTOR: A [796] SELECTOR TEST: 3 [083] LOCK-ON to Self-Test Target [796] GND TEST INTER: PRESS & RELEASE [196] MOD TEST: UP (on)	[080] 8th receiver test: Positioned at top of B-Sweep. B-Sweep: Centered vertically if the antenna (017) is centered. (Perform para 3-20a with the antenna pinned in azimuth to center the azimuth circuits.)	The 8th receiver test target is at 8000 yards.

STEP	INSTRUCTION	INDICATION	REMARKS
2	[955] HOMING POINT SELECTOR: F or G [395] VERT AMPL CTR CONT: Adjust, if necessary, to obtain indication.	[080] Reference circle: centered in elevation.	. . .
3	[955] HOMING POINT SELECTOR: D [395] VERT AMPL GAIN CONTROL: Adjust, if necessary, to obtain indication.	[080] Firing bar; positioned on 8th receiver test target.	Repeat steps 2 and 3 until both indications are correct.
4	[395] HOR AMPL CTR CONT: Adjust, if necessary, to obtain indication.	Reference circle: Centered in azimuth.	
5	[395] HOR AMPL GAIN CONTROL. Adjust, if necessary, to obtain indication.	[080] Firing bar: 2.8 in. long, extends to horizontal and vertical scale marks.	Repeat steps 3 and 4 until both indications are correct.
	NOTE If any of the adjustments in steps 2, 3, 4 or 5 were necessary, perform 223 Time Circle Scale Factor Adjustment in accordance with paragraph 3-18b.		
6	[196] MOD TEST: Down (off) [305] NOSE-TAIL: TAIL [796] SELECTOR TEST: 7, then OFF [905] POWER: OFF	Adjustments complete	. . .

3-18h. 595 HORIZ ATTACK CENTER, HORIZ ATTACK GAIN, VERT ATTACK DEFLECTION CENTER, AND VERT ATTACK DEFLECTION GAIN ADJUSTMENTS. The purpose of this procedure is to ensure that the attack display on the 080 unit in the rear cockpit of the F-106B is centered on the MMST and the gain is correct.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

FAULT ISOLATION

1. Table 1-1
2. Paragraph 3-20f

PROBABLE FAULTY UNIT

595

REFERENCES

FUNCTIONAL DIAGRAM

B-Model Display
(T.O. 27-5/Fig. 3-8)

FAULT ISOLATION

Attack Display
(T.O. 27-3/Fig. 3-12)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 4SP [196] MOD TEST: Up (on) [017] Antenna: Centered [305] NOSE-TAIL: NOSE [955] HOMING POINT SELECTOR: F or G [796] SELECTOR TEST: 3 [796] GND. TEST INTER: PRESS & RELEASE [083] LOCK-ON to Self-Test Target [596] VERT ATTACK DEFLECTION CENTER: Adjust, if necessary, to obtain indication.	[080] Reference circle: Centered in elevation	The 595 unit adjustments change the displays of the 080 unit in the rear cockpit.
	NOTE Repeat steps 1 and 2 until indications are correct.		
2	[955] HOMING POINT SELECTOR: D [595] VERT ATTACK DEFLECTION GAIN: Adjust, if necessary, to obtain indication.	[080] Firing bar: Positioned on 8th receiver test target.	. . .
3	[955] HOMING POINT SELECTOR: D or E [595] HORIZ ATTACK DEFLECTION CENTER: Adjust, if necessary, to obtain indication.	[080] Reference circle: Centered in Azimuth	. . .
4	[595] HORIZ ATTACK DEFLECTION GAIN: Adjust, if necessary, to obtain indication.	Firing bar 2.8 in. long extends to horizontal and vertical scale marks.	Repeat steps 3 and 4, both indications are correct
	NOTE If any of the adjustments in steps 1, 2, 3, or 4 were necessary, perform 395 Hor Ampl Gain Control, Hor Ampl Ctr Cont, Vert Ampl Gain Control, and Vert Ampl Ctr Cont Adjustments in accordance with paragraph 3-18g.		
5	[305] NOSE-TAIL: TAIL [796] SELECTOR TEST: 7, then OFF [196] MOD TEST: Down (off) [905] POWER: OFF	Adjustments complete	. . .

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3-18i. SNAPSHOOT SYSTEM ADJUSTMENTS. The purpose of this procedure is to ensure that the SnapShoot system display is properly aligned.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURES

1. Table 1-1
2. Para 3-18a thru 3-18h

PROBABLE FAULTY UNIT

52450

FUNCTIONAL DIAGRAM

Displays
(T.O. 27-5/Fig. 3-7)

Attack Displays
(T.O. 27-5/Fig. 3-18)

SnapShoot System
(T.O. 27-5/Fig. 10-1)

REFERENCES

FAULT ISOLATION

SnapShoot System (T.O. 27-3/ Fig. 3-12.1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: SPL WPN [52800] MODE: 6 (CALIBRATE) [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: ~~377~~ 277 [52800] MODE: 7 (REFERENCE) [140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000	[080] Display: Three pippers are superimposed on the three bezel dots.	If incorrect, perform steps 2 through 3 until proper indication is obtained.
2	[52450] VERT BIAS and VERT GAIN: Adjust each control alternately to obtain indication.	[080] Display: Three pippers are positioned at the same vertical level as the three bezel dots.	
3	[52450] HORIZ BIAS and HORIZ GAIN: Adjust each control alternately to obtain indication.	[080] Display: Three pippers are superimposed on the three bezel dots.	It may be necessary to repeat steps 2 and 3 until the proper indication is obtained.
4	[52800] MODE: 5 (Ground Boresight) [52450] SIZE: Adjust to obtain indication.	[080] Pipper size: 50 milliradians	Adjust for 1/16 inch between the inner extensions of the two lower pippers, this should produce the indicated pipper size. (See fig. 3-10).
5	[905] POWER: OFF	Adjustments complete.	

3-19. SEARCH DISPLAY CHECKS

3-19a. JIZZLE CHECK. The purpose of this procedure is to ensure that the B-sweep jizzle will appear in hand control and track and disappear when C-time occurs.

EQUIPMENT REQUIRED	EQUIPMENT HOOKUP	PRELIMINARY PROCEDURE
None	None	Table 1-1

PROBABLE FAULTY UNIT

003
195

REFERENCES

FUNCTIONAL DIAGRAM	FAULT ISOLATION
B-Sweep (T.O. 27-5/Fig. 3-19)	Radar Scan Pattern (T.O. 27-3/Fig. 3-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY	[080] B-sweep: Appears as a fine line	. . . .
2	[083] Action switch: Press to 2nd detent and hold	[080] B-sweep: Widens as jizzle appears	. . .
3	[083] Action switch: Release	[080] B-sweep: No change	. . .
4	[195] VIDEO TEST: Press and hold	[080] B-sweep: Jizzle disappears	195 VIDEO TEST simulates C-time
5	[195] VIDEO TEST: Release [905] POWER: OFF	Check complete	. . .

3-19b. EL MARKER CHECK. The purpose of this procedure is to ensure that the el marker positioning is correct as the system is switched between lead collision and pursuit modes of operation.

EQUIPMENT REQUIRED

VTVM

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 6-29
3. Paragraph 3-18g

PROBABLE FAULTY UNIT

083
241
523

REFERENCES

FUNCTIONAL DIAGRAM

Attack Displays
(T.O. 27-5/Fig. 3-18)

FAULT ISOLATION

Radar Scan Pattern
(T.O. 27-3/Fig. 3-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [ACP] Selector: MISSILES ALL [855] EL SCAN: 1 BAR [083] ANT ELEV: Detent RDR IR EXP-LC/PUR: Press to LC/PUR and release	[080] El marker: Straight	System operating in pursuit mode
2	[083] RDR IR EXP-LC/PUR: Press to LC/PUR and release	[080] El marker: Straight	System operating in not pursuit mode
3	[083] Action switch: Press to 2nd detent and release	[080] El marker: Straight	. . .
4	**NOTE** If any of steps 1, 2, or 3 failed, perform step 4. Otherwise, perform step 5.		
	[241] TP3 and [523] TP17: Monitor using VTVM	[VTVM] D-c voltage: 0 ±1.0 vdc	If indication is correct, replace 523 unit. If indication is incorrect, replace 241 unit, then 083 unit.
5	[ACP] Selector: VIS IDENT [855] EL SCAN: NORM [905] POWER: OFF [VTVM] Disconnect	Check complete	. . .

3-20. SEARCH DISPLAY ADJUSTMENTS

3-20a. 389 SWEEP CENTERING AND SWEEP LENGTH ADJUSTMENTS. The purpose of this procedure is to ensure that the B-sweep is centered in elevation on the 080 unit MMST and is the correct length.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1

PROBABLE FAULTY UNIT

389

REFERENCES

FUNCTIONAL DIAGRAM

B-Sweep
(T.O. 27-5/Fig. 3-19)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 4 SP [389] SWEEP LENGTH: Adjust to obtain indication SWEEP CENTERING: Adjust to obtain indication.	[080] B-sweep: Extends from top of lower Az. scale marks to bottom of upper Hz. scale marks.	. . .
2	[305] RANGE: 16SP	[080] B-sweep: Same as step 1 ± 1/4 in.	. . .
3	[305] RANGE: 40SP	[080] B-sweep: Same as step 1 ± 1/4 in.	. . .
4	[305] RANGE: 80LP	[080] B-sweep: Same as step 1 ± 3/8 in.	. . .
5	[305] RANGE: 200LP	[080] B-sweep: Same as step 1 ± 3/8 in.	. . .
6	[305] RANGE: 4SP [196] MOD TEST: Up (on) REC. TEST: Up (on)	[080] Ensure 8th Rec. Test Tgt is at top of B-sweep	Checks 389 unit adj. to ensure that a a 2.8 in. B-sweep represents 4 mi.
7	[305] NOSE/TAIL: NOSE [955] HOMING POINT SELECTOR: D [796] SELECTOR TEST: 3 GND TEST INTER: Press and release.	[080] FIRING BAR: Positioned on 8th Rec Test Tgt	If firing bar is positioned incorrectly, perform paragraph 3-18g.
8	[196] MOD TEST: Down (off) REC TEST: Down (off) [796] SELECTOR TEST: 7, then off [905] Power: Off	Adjustment complete	. . .

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3-20b. 195 AZ SW CENTER AND AZ SW GAIN ADJUSTMENTS. The purpose of this procedure is to ensure that the B-sweep is centered in azimuth on the 080 unit MMST and sweeps 53° to either side of center.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

195

REFERENCES

FUNCTIONAL DIAGRAM

B-Sweep
(T.O. 27-5/Fig. 3-19)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [195] AZ SW CENTER switch: Press and hold AZ SW CENTER control: Adjust, if necessary, to obtain indication	[080] B-sweep: Centered	Optimum results can be obtained if the aircraft engine is operating for other maintenance
2	[195] AZ SW CENTER switch: Release [163] DISP/AUTO MODE: ILS [106] A2 DRIVE MOTOR: TEST	[080] B-sweep: Centered	If indication is incorrect, perform 241 Az Bal Adjustment iaw para 3-12b, then repeat step 1
3	[163] DISP/AUTO MODE: DL MIN TIME [506] MOTOR REF: TEST [195] AZ SW GAIN: Adjust, if necessary, to obtain indication	[080] B-sweep: Searches from 53° left to 53° right	. . .
-4	[106] AZ DRIVE MOTOR: NORM [506] MOTOR REF: NORMAL [905] POWER: OFF	Adjustment complete	. . .

3-20c. 195 RANGE GATE AM. ADJUSTMENT. The purpose of this procedure is to ensure the range gate is clearly visible and well defined on the B-sweep.

EQUIPMENT REQUIRED

Oscilloscope

EQUIPMENT HOOKUP

Connect oscilloscope to 195 IND VIDEO.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

195

REFERENCES

FUNCTIONAL DIAGRAM

B-Sweep
(T.O. 27-5/Fig. 3-19)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action Switch: Press to 2nd detent and hold Hand Control: Move forward until range gate appears on oscilloscope	[Oscilloscope] Range gate: Appears	Note amplitude of range gate
2	[083] Hand Control: Move slowly back and forth	[Oscilloscope] Range gate: Amplitude remains constant	. . .
3	[083] Hand control: Move quickly back and forth	[Oscilloscope] Range gate: Amplitude increases	. . .
4	[195] RANGE GATE AM.: Adjust, if necessary, to obtain indication	[080] Range gate: Clearly defined during fast 083 hand control movements and min smearing during slow 083 hand control movements	. . .
5	[083] Action switch: Release	[080] Range gate: Clearly defined and stationary	Note intensity of range gate
6	[196] REC TEST: Up (on)	[080] Range gate: Intensity equivalent to receiver test targets (less than 8 miles)	. . .
7	[196] REC TEST: Down (off) [905] POWER: OFF [Oscilloscope] Disconnect	Adjustment complete	. . .

3-20d. 080 UNIT ADJUSTMENTS. The purpose of this procedure is to ensure that the 080 unit displays are at an optimum level.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1
2. Start aircraft engine iaw T.O. 1F-106A-2-2
3. Paragraph 7-4a
4. Paragraph 7-4b
5. Paragraph 7-6d
6. Paragraph 7-6f
7. Paragraph 3-18a thru 3-18g
8. Paragraph 3-20a thru 3-20c

PROBABLE FAULTY UNIT

080

REFERENCES

FUNCTIONAL DIAGRAM

B-Sweep
(T.O. 27-5/Fig. 3-19)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	**CAUTION** To prevent damage to MMST due to 080 R5 being set too high, observe MMST in area of main bang. If blooming occurs, press 080 OFF and adjust R5 ccw before pressing 080 ON.		
	[905] POWER: ON [080] DIMMER: Fully ccw ON: After system times in to standby, press and release	[080] MMST: Comes on in 25 to 45 sec	. . .
2	[080] IF GAIN: Fully ccw VIDEO GAIN: Fully ccw ERASE INTENSITY: 90° cw from fully ccw	[080] Erase sweep: Clearly focused —— Search square: Just visible	Do not maladjust ERASE INTENSITY
3	[083] Action switch: Press to 2nd detent and hold	[080] B-sweep: Faint outline	. . .
4	[083] Action switch: Release	[080] B-sweep: Faint outline	. . .
5	[080] IF GAIN: Fully cw VIDEO GAIN: Fully cw [855] EL SCAN: 1 BAR [083] AUTO SEARCH: Press and release	[080] MMST: Targets store lightly in area between erase sweep and B-sweep	. . .
6	**NOTE** The following steps (6 thru 33) are intended to furnish a general check of display quality and are not intended to provide a pass/fail indication. The adjustments (steps 34 thru 51) must be performed in the sequence listed to ensure correct alignment of the 080 unit.		
	[080] ERASE INTENSITY: Rotate cw and ccw and return to 90° from fully ccw	[080] Targets: Clear and sharp. Background has a slightly peppery appearance	Optimum level of 080 ERASE INTENSITY is 90° from fully ccw
7	[305] RANGE: 4SP	[080] Background: No change	. . .
8	[305] RANGE: 40SP	[080] Background: No change	. . .
9	[305] RANGE: 40LP	[080] Background: No change	. . .
10	[305] RANGE: 80LP	[080] Background: No change	. . .
11	[305] RANGE: 200LP	[080] Background: No change	. . .
12	[305] RANGE: 4SP [083] Action switch: Press to 1st detent and hold	[080] Targets: Do not fade completely for one sweep. Background remains constant for complete sweep	. . .
13	[305] RANGE: 16SP	[080] Targets and background: No change	. . .
14	[305] RANGE: 40SP	[080] Targets and background: No change	. . .
15	[305] RANGE: 40LP	[080] Targets and background: No change	. . .
16	[305] RANGE: 80LP	[080] Targets and background: No change	. . .
17	[305] RANGE: 200LP	[080] Targets and background: No change	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
18	[083] Action switch: Release [305] RANGE: 4SP [083] Action switch: Press to 2nd detent and hold	[080] B-sweep: Noise is noticeable but B-sweep is not black	Within 305 RANGE set to 4SP, the B-sweep may be slightly different than other ranges
19	[305] RANGE: 16SP	[080] B-sweep: No change	. . .
20	[305] RANGE: 40SP	[080] B-sweep: No change	. . .
21	[305] RANGE: 40LP	[080] B-sweep: No change	. . .
22	[305] RANGE: 80LP	[080] B-sweep: No change	. . .
23	[305] RANGE: 200LP	[080] B-sweep: No change	. . .
24	[083] Action switch: Release	[080] B-sweep: Searches	. . .
25	[305] RANGE: 80LP [083] Action Switch: Press to 2nd detent and release	[080] B-sweep: Same as step 23	. . .
26	[305] RANGE: 40LP	[080] B-sweep: No change	. . .
27	[305] RANGE: 40SP	[080] B-sweep: No change	. . .
28	[305] RANGE: 16SP	[080] B-sweep: No change	. . .
29	[305] RANGE: 4SP	[080] B-sweep: No change	. . .
30	**CAUTION** If 080 az-el dot intensity is too high, press 080 OFF and perform 663 Int Adjustment iaw para 4-8b to prevent damage to 080 MMST.		
	[ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain IR dominant mode	[080] Az-el dot: Searches, has a clearly visible tail approx 3 in. long	Do not adjust 080 ERASE INTENSITY
31	**WARNING** Ensure canopy jack is installed. [080] OFF: Press and release [Cockpit] Canopy latch: Lock	[080] Displays: Appear in 25 to 45 sec	**When adjusting 080 Unit displays on the F-106B ensure Canopy Jack is removed; then, close and lock canopy.**
32	[Cockpit] Canopy latch: Unlock	[080] Displays: Disappear in approx 3 minutes	. . .
33	[083] AUTO SEARCH: Press and release [Cockpit] Canopy latch: Lock	[080] MMST: Comes on in 25 to 45 sec	. . .
34	**NOTE** Perform steps 34 thru 51 only if any one of step 1 thru 33 indications were improper. Otherwise, perform step 52.		
	[305] RANGE: 16SP [083] RDR IR SELECT: Press and release to obtain radar dominant mode [080] R21 (vertical erase gain) and R26 (vertical erase center): Adjust, if necessary, to obtain proper indication	[080] Erase sweep: Extends approx 1/4 in. above and below search sweep and is centered	Adjusting R21 cw lengthens the erase sweep and adjusting R26 cw moves the erase sweep down

STEP	INSTRUCTION	INDICATION	REMARKS
35	[305] RANGE: 4SP [855] AZ SCAN: B [083] AUTO SEARCH: Press and release [080] ATTACK INTENSITY: Fully ccw VIDEO GAIN: Fully ccw IF GAIN: Fully ccw R5 (search bias): Adjust, if necessary, to obtain indication	[080] B-sweep: Just becomes visible	. . .
36	[080] VIDEO GAIN: Fully cw IF GAIN: Fully cw [196] REC TEST: Up (on) [080] R23 (backing electrode): Adjust, if necessary, to obtain indication	[080] Receiver test targets: Begin to store black	Ignore any light vertical lines visible in receiver test targets
37	[080] VIDEO GAIN: Fully ccw IF GAIN: Fully ccw R27 (video amplitude): Fully cw VIDEO GAIN and IF GAIN: Adjust, to obtain indication	[080] Receiver test targets: Just visible with no blooming	. . .
38	[080] R24 (search focus): Adjust to obtain indication	[080] Receiver test targets: Clear and sharp	Do not attempt to focus the black lines stored behind the receiver test targets
39	[080] VIDEO GAIN: Fully cw IF GAIN: Fully cw	[080] Receiver test targets: Partially store between the B-sweep and erase sweep	. . .
40	[080] IF GAIN: Fully ccw quickly	[080] Receiver test targets: Fully erased after 3 sweeps	. . .
41	[080] R6 (erase focus): Adjust, if necessary, to obtain indication	[080] Erase sweep: As narrow as possible	If R6 adjustment is required, repeat steps 36 thru 41
42	[080] VIDEO GAIN: Fully ccw ERASE INTENSITY: Adjust to obtain indication	[080] Receiver test targets: Not completely erased before next sweep occurs	This provides a target fade rate of one sweep
43	[305] RANGE: 4SP, 16SP, 40SP, 40LP, 80LP, and 200LP in sequence [080] R2 (search compensation): Adjust to obtain indication	[080] B-sweep: Optimum in all positions of 305 RANGE (40LP, 80LP, and 200LP may be slightly darker)	Adjusting R2 cw darkens the B-sweep
44	[305] RANGE: 16SP [083] Action switch: Press to 1st detent and hold [080] R4 (supersearch compensation): Adjust to obtain indication	[080] B-sweep: Area slightly darker than rest of MMST	. . .
45	[305] RANGE: 4SP, 40SP, 40LP, 80LP, 200LP, and 16SP	[080] B-sweep: Same as step 44	If incorrect, repeat steps 44 and 45
46	[083] Action switch: Press to 2nd detent and hold [080] R1 (hand control compensation): Fully cw R3 (hand control bias): Adjust, if necessary, to obtain indication	[080] B-sweep: Clearly visible but not black	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
47	[305] RANGE: 4SP, 40SP, 40LP, 80LP, 200LP, and 16SP	[080] B-sweep: Same as step 46	If incorrect, repeat steps 46 and 47
	NOTE Adjusting R1 (hand control compensation) cw makes the B-sweep darker in 4-mile range and lighter in all other ranges. The B-sweep in hand control with 305 RANGE set to 4SP will be lighter with R1 fully cw. Adjusting R1 ccw makes the B-sweep darker, therefore R1 should remain fully cw.		
48	**NOTE** If any adjustments are performed in steps 43 thru 47, repeat steps 43 thru 47 until no adjustments are required.		
	[083] Action switch: Release AUTO SEARCH: Press and release [305] RANGE: 40SP [083] RDR-IR SELECT: Press and release to obtain IR dominant mode [080] R7 (IR compensation): Adjust, if necessary, to obtain indication	[080] Az-el dot: Sweeps 1-bar before fade out occurs	It may be necessary to perform 663 Int Adjustment iaw para 4-8b
49	[083] Action switch: Press to 1st detent and hold	[080] Az-el dot: Same as step 48	If incorrect, repeat step 48
50	[083] Action switch: Release [905] POWER: RADAR STBY [523] ATTACK DISPLAY: ON [080] ATTACK INTENSITY: Adjust as required for a visible attack display R25 (attack focus): Adjust to obtain indication	[080] Attack display: Clear and sharp focus	. . .
51	[083] RDR-IR SELECT: Press and release to obtain radar dominant mode [083] ACTION switch: Press to 1st detent and hold. [305] RANGE: 16SP [080] ERASE INTENSITY: As required for a visible erase sweep with white edges at top and bottom R22 (horizontal raster erase gain): Adjust to obtain indication [083] Action switch: Release	[080] Raster erase pattern: Extends approx 3/8 in. beyond ends of artificial horizon	. . .
52	**NOTE** Perform Pursuit Firing Bar Check iaw para 3-17b.		
	[Cockpit] Canopy latch: Unlock [080] ERASE INTENSITY: Approx 10 o'clock [855] EL SCAN: NORM [905] POWER: OFF	Adjustment complete	In F-106B, unlock and raise canopy and install canopy hold-open support

3-20e. 595 SEARCH AZIMUTH CENTER AND SEARCH AZIMUTH GAIN ADJUSTMENTS. The purpose of this procedure is to ensure that the B-sweep in the rear cockpit of the F-106B is centered in azimuth and searches from 53° left to 53° right.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-20b

PROBABLE FAULTY UNIT

595

REFERENCES

FUNCTIONAL DIAGRAM

B-Model Display
(T.O. 27-5/Fig. 3-8)

FAULTY ISOLATION

Radar Scan Pattern
(T.O. 27-3/Fig. 3-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [106] AZ DRIVE MOTOR: TEST [506] MOTOR REF: TEST [195] AZ SW CENTER switch: Press and hold [595] SEARCH AZIMUTH CENTER: Adjust, if necessary, to obtain indication	[080] B-sweep: Centered	The 595 unit adjusts the 080 unit in the rear cockpit only
2	[195] AZ SW CENTER switch: Release [595] SEARCH AZIMUTH GAIN: Adjust, if necessary, to obtain indication	[080] B-sweep: Searches from 53° left to 53° right	. . .
3	[106] AZ DRIVE MOTOR: NORM [506] MOTOR REF: NORMAL [905] POWER: OFF	Adjustment complete	. . .

3-20f. 595 RANGE SWEEP CENTER AND RANGE SWEEP LENGTH ADJUSTMENTS. The purpose of this procedure is to ensure that the B-sweep on the 080 unit in the rear cockpit of the F-106B is centered in elevation and of the proper length.

EQUIPMENT REQUIRED

EQUIPMENT HOOKUP

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-20a
3. Paragraph 3-18a thru 3-18g

PROBABLE FAULTY UNIT

595

REFERENCES

FUNCTIONAL DIAGRAM

B-Model Display
(T.O. 27-5/Fig. 3-8)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 4SP [523] ATTACK DISPLAY: ON [223] TIME CIRCLE TEST: 20-SEC	[080] B-sweep: Centered and length of time-to-go circle diameter ±1/16 in.	If incorrect, perform adjustment iaw step 6
2	[305] RANGE: 16SP	[080] B-sweep: Centered and length of time-to-go circle diameter ±1/4 in.	Same as step 1

STEP	INSTRUCTION	INDICATION	REMARKS
3	[305] RANGE: 40SP	[080] B-sweep: Centered and length of time-to-go circle diameter ±1/4 in.	Same as step 1
4	[305] RANGE: 80LP	[080] B-sweep: Centered and length of time-to-go circle diameter ±3/8 in.	Same as step 1
5	[305] RANGE: 200LP	[080] B-sweep: Centered and length of time-to-go circle diameter ±3/8 in.	Same as step 1
6	**NOTE** Perform this step only if any indication in any of steps 1 thru 5 were incorrect.		
	[305] RANGE: 4SP [595] RANGE SWEEP CENTER: Adjust to obtain indication RANGE SWEEP LENGTH: Adjust to obtain indication	[080] B-sweep: Centered and of length specified in step 1	When properly adjusted, the B-sweep will extend from lower az scale marks to upper az scale marks on 080 unit MMST
7	[523] ATTACK DISPLAY: OFF [223] TIME CIRCLE TEST: OPERATE [305] RANGE: 16SP [905] POWER: OFF	Adjustment complete	. . .

3-21. SYSTEM ANGLE TRACK CHECK. The purpose of this check is to verify the complete angle tracking loop using an external moving target.

EQUIPMENT REQUIRED

1. UPM-141

EQUIPMENT HOOKUP

Connect AN/UPM-141 for space configuration in accordance with paragraph 11-3h. Set controls for pulse target of 86 DB total attenuation at 20,000 YDS range. Zero rate.

PRELIMINARY PROCEDURE

PROBABLE FAULTY UNIT

FAULT ISOLATION

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [305] RANGE: 16 MI [305] TUNE: NORM [ACP] SELECT: VI		
2	[083] ACTION SW: SEARCH.	Target dead ahead at 10 MI.	
3	[083] ACT. SW: Press to second detent. Lockon to UPM-141 target and release.	Normal attack display and antenna tracks target.	
4	[UPM-141] ANT CONTROL POS/DEG: 0 POS/RATE: RATE MEAS SEL: ANT RATE (°/s) RATE DEG/SEC: To desired tracking rate as indicated by digital display. If system breaks lockon, place POSITION/RATE switch (UPM-141) to POSITION to relock.	B-sweep should move from left to right and "Z" marker moves up and down at rate selected. Steering dot will move in CW direction same as antenna. Lockon should be maintained.	RDR antenna should continue to track as high as 6.3°/sec (110 mr/sec).

STEP	INSTRUCTION	INDICATION	REMARKS
5	[UPM-141] POS RATE: POS TEST MODE: Transponder JAM RF PWR OUTPUT-DBM: 65 db total. [ACP] SELECT: MIS RAD [305] RADAR: HOME	Noise saturation appears for full length of range sweep at the dead ahead position.	
6	[083] Action sw. to 2nd detent, lockon to signal source and release	In Pursuit bar appears. B-sweep dims and no range gate is present.	
7	[UPM-141] POS RATE: RATE RAGE DEG/SEC: To desired tracking rate as indicated on digital display.	Same as step 4. Angle lockon should be maintained.	
8	[305] RANGE: 4 & 40 MI	Same as steps 6 and 7.	

CHAPTER 4. IR SUBSYSTEM
SECTION I. GENERAL

4-1. INTRODUCTION.

4-1a. This chapter contains check and adjustment procedures for the IR subsystem. These procedures are performed after a unit has been replaced or when a malfunction is suspected.

4-1b. Each procedure provides the purpose of the procedure, equipment required, equipment hook up, preliminary procedure, probable faulty unit, and references to functional diagrams and fault isolation procedures.

NOTE

Wherever the 080 unit panel controls are indicated, they now apply to the 080 unit, 52800 unit (ODU), or the Filter and Control Assembly and Information panel, depending upon the system configuration.

4-1c. The purpose of the procedures in this chapter is to provide for the checking and adjusting of the IR receiving and tracking subsystem. To verify proper IR subsystem operation, prescribed check and adjustment procedures are performed on the IR cooling system, IR receiving function, search and tracking loop functions and display functions.

4-1d. During hourly inspections, the radar procedures shall have been completed prior to performing the IR procedures. The radar antenna shall be boresighted and the target board shall be left in place.

4-1e. The 080 unit displays should be turned off when they are not required for a long period of time.

CAUTION

Keep the 080 ATTACK INTENSITY set fully ccw when not observing the attack display and set for minimum acceptable viewing level when viewing the display. Excessive attack intensity will cause damage to the MMST. Setting 905 POWER to WARM or OFF while in an IR dominant mode (search, or track during the initial 8.5 seconds) or placing system in IR trade mode with the IR head cable disconnected may cause spot burning.

4-1f. The closed cycle cryogenic refrigerator system uses gaseous nitrogen as the working fluid in a conventional Joule-Thompson cycle in which the nitrogen gas is compressed in three stages from one to 145 atmospheres (approximately 2150 psig) of pressure. Air cooled intercoolers and aftercoolers remove the heat of compression. Compressed nitrogen liquifies as it expands through a heat exchanger in the infrared (IR) receiver cell where the nitrogen absorbs heat from an infrared detector, vaporizing and returning to the compressor.

4-1g. A discharge pressure control valve limits compressor discharge pressure to 2,600 psia and removes entrained oil droplets, which are continuously returned to the compressor crankcase by a small flow of gas through the discharge pressure control valve. High pressure nitrogen gas from the compressor enters the nitrogen adsorber. In the nitrogen adsorber gaseous and minute solid contaminants are removed, preventing foreign material from entering the heat exchanger where it may freeze and cause restriction of gas flow. The high purity gaseous nitrogen then passes through flexible lines to the heat exchanger, which is a minature counterflow recuperator, located entirely within the infrared detector cell. Gaseous nitrogen enters the heat exchanger at ambient temperature and a pressure of approximately 2150 psia. In the high pressure side of the heat

exchanger, gaseous nitrogen reaches approximately 160°K (172°F) because of the cooling effect of the returning cold low pressure gas. Liquefaction of the cooled, high-pressure gaseous nitrogen occurs at a temperature of approximately 80°K (316°F) as the nitrogen expands through a capillary tube in the heat exchanger. At the tip of the heat exchanger, liquefied nitrogen comes into close contact with the bottom of the infrared detector cell, which conducts heat from the detector to the liquid nitrogen, vaporizing the nitrogen. A thermal grease increases thermal conductivity between the detector cell and the heat exchanger. Cold gaseous nitrogen then enters the heat exchanger sheath and cools the gaseous nitrogen entering the heat exchanger before returning through the low pressure side of the system to the compressor.

4-2. PRELIMINARY INSTRUCTIONS.

WARNING

Prior to cracking or disconnecting tubing or flexible hose connections in cooling system, disconnect or turn off electrical power and pull IR cooling circuit breaker located in nose wheel well to avoid possibility of electrical shock. Allow system pressure to bleed off for a minimum time of 10 minutes to reduce compressor and system pressure.

4-2a. Because of the critical use of this system, perform service procedures in the cleanest area available and observe proper precautions to prevent dirt and moisture from contaminating system components and lines. In addition, observe the following precautions:

4-2b. During system checkout, and removal and replacement of system components, maintain cleanliness to exclude impurities from the system.

4-2c. Do not allow contaminants or airborne moisture to enter the system (alcohols, cleaning compounds, and leak-test fluids are contaminants).

4-2d. Do not allow lines or fittings to remain open.

4-2e. Do not remove caps or plugs from lines until immediately before installation to mating parts.

4-2f. Do not use liquid solutions to leak-check the system.

4-2g. Do not separate quick disconnect couplings unnecessarily.

4-2h. Allow 10 minutes minimum after shutting system off before breaking any pneumatic connections.

4-2i. Replace dust caps or protective covers when the fittings are not in use.

4-2j. Use only high purity dry nitrogen, Specification MIL-P-27401C, Type I or Federal Specification BB-N-411C, Type I, Class I, Grade A.

4-2k. Ensure that cooling air blows out at the fan end of the compressor.

4-2l. When installing copper conical seals in flared fittings, avoid cocking seals when tightening the fittings.

4-2m. To prevent shock hazard, remove all electrical power to the system before disconnecting the power connections.

4-2n. High pressure line on manifold assembly is easily damaged. Use care when working in this area.

4-3. CHECKS AND ADJUSTMENTS AFTER UNIT REPLACEMENT.

4-3a. Replacement or reinstallation of certain units requires performance of check or adjustment procedures described in this chapter. Due to interaction between units, it may be necessary to perform a number of check or adjustment procedures when only one unit has been replaced.

4-3b. Refer to table 4-1 whenever a unit of the IR subsystem is replaced to determine if check or adjustment procedures are required.

Table 4-1. Checks and Adjustments After Unit Replacement (IR)

CHECK OR ADJUSTMENT	PARA NO.	040	281	441	746	767	COM-PRESSOR
281 Meter Zero Check	4-4a		X				
Operating Pressure Check	4-4b					X	X
Nitrogen Servicing Procedure	4-4c					X	X
Purging Procedure	4-4d					X	X
IR High Pressure Leak Check	4-4e					X	X
IR Leak Check	4-4f					X	X
Flow and Pressure Check	4-4g				X		
767 Cell Cool Down Check	4-4h					X	
746 IR Power Supply Check	4-4i				X		
767 Nutation Motor Check	4-4j	X				X	
IR Video Sensitivity Check	4-5a	X				X	
IR Acquisition and Lock On Sensitivity Check	4-5b			X		X	
663 Tone Null and 040 Aural Tone Balance Adjustments	4-6	X					
Tachometer Null Check	4-7a			X		X	
Manual Search Check	4-7c					X	
Search Pattern Stabilization Check	4-7d			X			
767 Search Rate Check	4-7f					X	
Search Pattern Overlap Check	4-7g					X	
746 Coinc Adjustment	4-12a				X		
040 Elevation Error Balance and Azimuth Error Balance Adjustments	4-13a	X					
441 E1 Amp PD and Az Amp PD Adjustments	4-13b			X			
441 E1 Gyro PD and Az Gyro PD Adjustments	4-13c			X			
040 Elevation Lin Log Att and Azimuth Lin Log Att Adjustments	4-13d	X					
040 Elevation Phase and Azimuth Phase Adjustments	4-13e	X					

SECTION II. CHECKS AND ADJSUTMENTS

4-4. COOLING CHECKS.

4-4a. 281 METER ZERO CHECK. The purpose of this procedure is to calibrate the 281 unit self test meter. ZERO ADJUST potentiometer R1 is adjusted for a zero meter indication with the IR detectors at ambient temperature.

EQUIPMENT REQUIRED
None

EQUIPMENT HOOKUP
None

PRELIMINARY PROCEDURE
Table 1-1

PROBABLE FAULTY UNIT
281

REFERENCES

FUNCTIONAL DIAGRAM
IR Receiver and Tract
(T.O. 27-5/Figure 4-2)

FAULT ISOLATION
None

STEP	INSTRUCTION	INDICATION	REMARKS
1	(905) POWER: RADAR STBY (281) Switch: CELL COOL DOWN and hold ZERO ADJUST: Adjust to obtain indication	(281) Meter: Moves to zero	. . .
2	(281) Switch: Release	Check complete	. . .

4-4b. OPERATING PRESSURE CHECK. The purpose of this check is to check the IR cooling system for proper system pressure.

EQUIPMENT REQUIRED
901754-1 nitrogen service unit

EQUIPMENT HOOKUP
Remove dust cap from system service port and connect service unit to system.

PRELIMINARY PROCEDURE
Table 1-1

NOTE
This check applies only to operational systems. New systems, systems which are suspected of malfunction, and systems which have been opened for repair must be charged in accordance with paragraph 4-4c.

STEP	INSTRUCTION	INDICATION	REMARKS
1	(Radar compt) IR Cooling Inflk: CLOSE	Operate system for 5 minutes and observe pressure indication on service unit low pressure gage. Pressure shall be 0 to 2 psig.	If pressure is too high, slowly open service unit BLEED valve until pressure is within specified tolerance. If pressure is too low, slowly open service unit,FILL valve until pressure is within specified tolerance.

STEP	INSTRUCTION	INDICATION	REMARKS
2	(Radar compt) IR Cooling Intlk: OPEN Disconnect service unit. Replace dust cap.	Pressure complete	. . .

NOTE

Final pressure must be checked with system operating and with both BLEED VALVE and FILL VALVE closed.

4-4c. NITROGEN SERVICING PROCEDURE. The purpose of this procedure is to service the coolant in the closed cycle cooling system.

WARNING

- Nitrogen can dilute and displace oxygen in a confined space or pit to unsafe levels and create a danger of suffocation. Nitrogen shall therefore be used only in well ventilated areas or where personnel are using auxiliary self contained breathing apparatus.

- At least two persons shall be present when servicing nitrogen. Safety glass or approved face shield shall be worn by nitrogen servicing personnel.

NOTE

- The nitrogen service unit stores approximately 60 cubic inches of gaseous nitrogen, and charges the system twice on one filling. A standard K or T bottle of high purity dry nitrogen, Specification MIL-P-27401C, Type I or Federal Specification BB-N-411C, Type I, Class I, Grade A, connects to an adapter on the service unit for refilling.

- Perform System Purging Procedure as specified in paragraph 4-4d.

EQUIPMENT REQUIRED

901754-1-1 nitrogen service unit

EQUIPMENT HOOKUP

CAUTION

- Ensure that both disconnects are clean and free of all contaminants.

- Connect nitrogen service unit hose to IR fill valve in computer compartment.

- Nitrogen servicing units or bottles shall be positioned to prevent accidental damage to the aircraft or equipment. Nitrogen servicing equipment shall not be left unattended after being attached to the input or filler line.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

767
Compressor

REFERENCES

FUNCTIONAL DIAGRAM

IR Receiver and Track
(T.O. 27-5/Figure 4-2)

FAULT ISOLATION

IR Video (T.O. 27-3/
Figure 4-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	(Radar compt) IR COOL'G INTLK: Open (905) POWER: RADAR STBY (Nitrogen service unit) BLEED valve: Close FILL valve: Close	(Nitrogen service unit) Gage: Indication dependent upon ambient temp (see figure 4-1).	Charge the system by slowly opening the FILL valve or bleed the system by opening the BLEED valve to achieve the required pressure listed in figure 4-1.
2	(Radar compt) IR COOL'G INTLK: Close	(Nitrogen service unit) Gage: Indicates 0-2 psig within 5 minutes	If pressure is not within 0-2 psig, adjust with nitrogen service unit FILL valve (if pressure is less than 0) or BLEED valve (if pressure is greater than 2) for proper pressure.
3	(Radar compt) IR COOL'G INTLK: Open, disconnect nitrogen service unit, and close (Computer compt) IR fill valve: Replace dust cover (905) POWER: OFF	Procedure complete	. . .

4-4d. PURGING PROCEDURE. The purpose of this procedure is to eliminate contaminants from the IR closed cycle cooling system. Perform this procedure after any compenent of the IR closed cycle cooling system is replaced.

EQUIPMENT REQUIRED

901754-1-1 nitrogen service unit

EQUIPMENT HOOKUP

CAUTION

Ensure that both disconnects are clean and free of all contaminants.

NOTE

In nitrogen service unit gage does not indicate 0-2 psig, close FILL valve, open BLEED valve, then close BLEED valve.

Connect nitrogen service unit hose to IR fill valve in computer compartment.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

767
Compressor

REFERENCES

FUNCTIONAL DIAGRAM

None

FAULT ISOLATION

IR Video (T.O. 27-3/ Figure 4-3.

STEP	INSTRUCTION	INDICATION	REMARKS
	NOTE If a contaminated cooling system is suspected, an open fitting can be attached to the high side pressure line that connects to the IR head. This purging procedure can than be followed to eliminate contaminants from the system. If the open fitting is used, remove the fitting and reconnect the high side pressure line to the IR head and perform the purging procedure three times.		
1	(Radar compt) IR COOL'G INTLK: Open (Nitrogen service unit) BLEED valve: Close FILL valve: Open until proper pressure obtained	(Nitrogen service unit) Gage: 80 psig	. . .
2	(Nitrogen service unit) BLEED valve: Open until proper pressure obtained	(Nitrogen service unit) Gage: Approximately 2.0 psig	Repeat steps 2 and 3 three times
3	(Nitrogen service unit) FILL valve: Open until proper pressure obtained	(Nitrogen service unit) Gage: 80 psig	. . .
	NOTE Perform IR High Pressure Leak Check in accordance with paragraph 4-4e. If low pressure section of system appears to be holding pressure, the IR Leak Procedure may be postponed. If postponed, ensure that system is charged at required pressure (see paragraph 4-4c). If necessary, perform IR Lead Check in accordance with paragraph 4-4f.		
4	(Nitrogen service unit) FILL valve: Open until proper pressure obtained	(Nitrogen service unit) Gage: 60 psig Perform operating pressure check	. . .

4-4e. IR HIGH PRESSURE LEAK CHECK. The purpose of this procedure is to check for high pressure leaks in the IR closed cycle cooling system.

EQUIPMENT REQUIRED

901754-1-1 nitrogen service unit
904836-1-1 helium service unit
SA63 helium leak detector

EQUIPMENT HOOKUP

CAUTION

Ensure that both disconnects are clean and free of all contaminants

Connect nitrogen service unit to IR fill valve.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

767

FUNCTIONAL DIAGRAM

None

REFERENCES

FAULT ISOLATION

IR Video (T.O. 27-3/ Figure 4-3).

STEP	INSTRUCTION	INDICATION	REMARKS
1	(Radar compt) IR COOL'G INTLK: Open (905) POWER: RADAR STBY (Nitrogen service unit) BLEED valve: Close FILL valve: Open until proper pressure obtained	(Nitrogen service unit) Gage: Indication dependent upon ambient temperature (see figure 4-1)	. . .
2	(Radar compt) IR COOL'G INTLK: Close	(Nitrogen service unit) Gage: Indicates 0-2 psig within 5 minutes	If pressure is not within 0-2 psig, adjust with nitrogen service unit FILL valve or BLEED valve for proper pressure. If pressure continues to drop below 0-2 psig range, there is a leak in the high pressure section of the system.
3	(Radar compt) IR COOL'G INTLK: Open disconnect nitrogen service unit and close (Computer compt) IR fill valve: Replace dust cover (905) POWER: OFF	Check complete	. . .

NOTE

HIGH PRESSURE LEAKAGE.

Leakage in the high pressure side of the system may be evident only when the system is operating. A continual decrease in pressure at the low pressure side of the system during operation indicates that high pressure leakage probably exists. High pressure leakage may cause pressure in the low pressure side of the system to decrease to less than ambient pressure. High pressure leakage is difficult to detect when the system is not operating, unless the leak is large. The following procedures describe methods used to detect high pressure leakage.

(1) Helium Leak Detector Method (System Operating).

(a) Use of the helium leak detector method for checking for high pressure leakage with the system operating requires a partial charge of helium in the system. After the source of leakage has been located and repaired, the system nust be evacuated and recharged.

(b) Bleed system non-operating pressure to 25-to-30 psig and fill with gaseous helium, FSN 6830-263-9842, to pressure specified in Figure 4-1, using helium service unit.

(c) Start compressor and pass probe of gas/vapor leak detector slowly along each high pressure line, connector, and component. Move probe slowly to allow time for gas from leak to reach probe.

NOTE

Cooling does not occur in the IR receiver when there is helium in the system.

(d) Shutoff compressor to stop air blast from fan, and quickly check compressor for leakage as high pressure decays.

(e) Repair leakage source; then charge system as outlined in paragraph 4-4c.

4-4f. IR LEAK CHECK. The purpose of this procedure is to check for low pressure leaks in the IR closed cycle cooling system.

EQUIPMENT REQUIRED

901754-1-1 nitrogen service unit

EQUIPMENT HOOKUP

CAUTION

Ensure that both disconnects are clean and free of all contaminants.

Connect nitrogen service unit hose to IR fill valve in computer compartment.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

767

REFERENCES

FUNCTIONAL DIAGRAM

None

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	(Radar compt) IR COOL'G INTLK: Open (905) POWER: RADAR STBY (Nitrogen service unit) FILL valve: Open until proper pressure obtained	(Nitrogen service unit) Gage: Indication dependent upon ambient temperature (see figure 4-1)	. . .
2	(905) POWER: OFF, record the time of day and wait 24 hours	(Nitrogen service unit) Gage: The same pressure as step 1 + 0 psi, -1 psi	. . .
3	(Nitrogen service unit) Disconnect (Radar Compt) IR COOL'G INTLK: Close	Check complete	. . .

NOTE

LOW PRESSURE LEAKAGE.

- Low pressure leakage may be isolated by separating the system into three sections, and pressurizing these sections independently to observe pressure decay. If the leak is large, pressure may decay in just a few minutes while the service unit is still connected to the section. Generally, leakage requires more time to locate.

- Substantial changes in ambient temperature can noticeably alter system pressure. A system or section charged while exposed to direct sunlight, and later checked for leakage during the cool evening will provide an erroneous indication of leakage. A system charge to 70 psig at 70°F will increase or decrease in pressure by approximately 1.5 psi for an increase or decrease of 10°F.

(1) Low Pressure Leakage Isolation Procedure.

(a) Separate the system into three independent sections; the IR receiver, the compressor and adsorber, and the accumulator and low pressure lines.

(b) Charge each section to approximately 70 psig, using nitrogen service unit. Record exact charge pressure for later comparison.

(c) Allow sufficient time for leakage to occur; then connect nitrogen service unit to each section, first pressurizing nitrogen service unit gage and line to the exact pressure to which each section was pressurized. Tap service unit gage with forefinger to remove gage friction error.

NOTE

Observe nitrogen service unit for an indication of pressure decay before connecting service unit to section. Leakage in service unit will provide erroneous indication.

(d) Compare pressure readings in steps b and c to locate source of leakage.

(e) Repair source of leakage and service cooling system in accordance with paragraph 4-4c.

CAUTION

The pressures listed in Figure 4-1 are the approximate power off non-operating system pressures used only for initial charging of system. The proper system charge should then be established only by running the system for 5 minutes and setting the low side system pressure at 0-to-2 psig with the service unit. The 0-to-2 psig reading should normally be obtained with an ambient reading of between 50-to-70 psig. If reading in excess of 75 psig is required to obtain 0-to-2 psig, system blockage should be suspected.

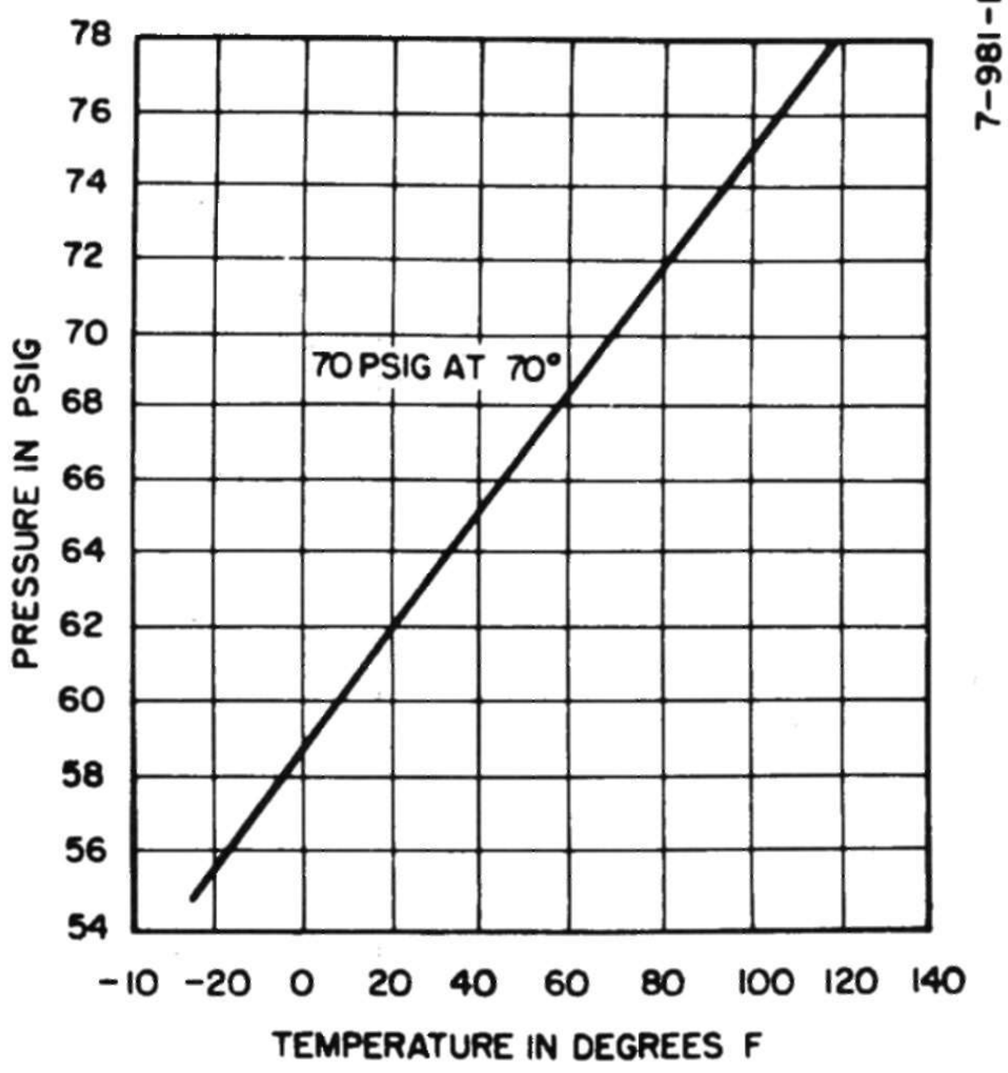


Figure 4-1. System Charging Pressure vs Ambient Temperature.

4-4g. FLOW AND PRESSURE CHECK. The purpose of this test is to check for restrictions on the high pressure side of the IR cooling system.

NOTE

This check is required only when a malfunction is indicated during servicing.

EQUIPMENT REQUIRED

67C34017 - Pressure and Flow meter

EQUIPMENT HOOKUP

CAUTION

Insure that quick disconnects are free of all contaminants.

Hook up pressure meter on adsorber end of high pressure line from compressor.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

Compressor 767
Unit Adsorber

STEP	INSTRUCTION	INDICATION	REMARKS
1	(905) Power: RADAR STBY (Radar compt) IR COOL'G INTLK: Closed connect high pressure gage	Gage: 2000 psig Minimum **NOTE** If pressure is greater than 2600 psig there is a restriction in the high pressure side of cooling system.	If pressure is less than 2000 psig, replace compressor. If pressure is less than 2000 psig after compressor replacement, replace 767 unit.
2	(905) Power: OFF (Radar compt) IR INTLK: Open **NOTE** Wait 10 minutes before disconnecting pressure gage.	. . . .	. . . .
3	(905) Power: STBY (Radar compt) IR INTLK: Closed Connect flow meter between low pressure return line from IR receiver and low pressure return line to compressor.	Flow meter: Following initial surge on meter a reading of 4-to-6 liters per minute. Then increase to 6-to-11 liters per minute within 5 minutes.	If flow does not stabilize at 6-to-11 liters per minute, replace IR receiver and/or adsorber
4	(905) Power: OFF (Radar compt) IR INTLK: OPEN disconnect flowmeter	Procedure complete	. . . .

4-4h. 767 CELL COOL DOWN CHECK. The purpose of this procedure is to verify that the proper d-c bias voltage is applied to the IR detector cells.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

767

REFERENCES

FUNCTIONAL DIAGRAM

IR Receiver and Track
(T.O. 27-5/Figure 4-2)

FAULTY ISOLATION

IR Video
(T.O. 27-3/Figure 4-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	(905) POWER: RADAR STBY and wait 4 minutes (281) Switch: CELL COOL DOWN and hold	(281) Meter: Indicates between 7 and 70 microamps	. . .
2	(281) Switch: Release (905) POWER: OFF	Test complete	. . .

4-4i. 50V IR POWER SUPPLY CHECK. The purpose of this procedure is to check the ± 50 vdc power supplies in the 926 unit.

EQUIPMENT REQUIRED

486126 infrared test set

EQUIPMENT HOOKUP

Connect 486126 as described in paragraph 11-15.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

746

REFERENCES

FUNCTIONAL DIAGRAM

IR Range Computer
(T.O. 27-5/Figure 4-5)

FAULT ISOLATION

IR Video
(T.O. 27-3/Figure 4-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	(905) POWER: RADAR STBY (305) IR: RDR SLVD (083) RDR IR SELECT: Press and release to obtain radar dominant mode (486126) Roll chart: B1 & B2	(486126) Roll chart: Indication is as described on roll chart	If a 486126 is not available, the 096 unit and an oscilloscope may be used. Monitor 096 unit positions 9E(+50v) and 9F (-50v) for 4.5 to 5.5 units. Monitor +50 VDC and -50 VDC for less than 200 mv noise.
2	(304) IR: STOW (905) POWER: OFF (486126) Disconnect	Check complete	. . . .

4-4j. 767 NUTATION MOTOR CHECK. The purpose of this procedure it to verify the operation of the nutation motor of the IR head and to check the dynamic braking of the IR head lens assembly. The dynamic braking prevents rotary movement of the optical assembly during search mode.

EQUIPMENT REQUIRED
Oscilloscope

EQUIPMENT HOOKUP
Connect oscilloscope to
040 AZIMUTH AC REF

PRELIMINARY PROCEDURE
Table 1-1

PROBABLE FAULTY UNIT
040
767

REFERENCES

FUNCTIONAL DIAGRAM
IR Receiver and Track
(T.O. 27-5/Figure 4-2)

FAULT ISOLATION
None

STEP	INSTRUCTION	INDICATION	REMARKS
1	(905) POWER: RADAR STBY (305) IR: RDR SLVD (083) Action switch: Press to 2nd detent and release	(Oscilloscope) Sine ware: 9.8 ±0.9 volts peak amplitude with period of 26.5 (+3.5, -3.4) msec.	. . .
2	(083) AUTO SEARCH: Press and release	(Oscilloscope) Sine wave: Decreases to less than 840 mvp-p within 5 sec	. . .
3	(040) ELEVATION AC REF: Monitor using oscilloscope and repeat steps 1 and 2	(Oscilloscope) Sine wave: Same as in steps 1 and 2	. . .
4	(305) IR: STOW (905) POWER: OFF (Oscilloscope) Disconnect	Check complete	. . .

4-5. IR RECEIVING FUNCTION CHECKS.

4-5a. IR VIDEO SENSITIVITY CHECK. The purpose of this procedure is to verify IR receiver sensitivity using a calibrated test target.

EQUIPMENT REQUIRED
486138 IR target simulator

EQUIPMENT HOOKUP

CAUTION

Do not install the 486138 IR target simulator unless the IR MANUAL VALVE is set to LOCK.

Set IR MANUAL VALVE in computer compartment to LOCK. Connect 486138 to IR head as described in chapter 11.

PRELIMINARY PROCEDURE
Table 1-1

PROBABLE FAULTY UNIT
040
663
767

REFERENCES

FUNCTIONAL DIAGRAM
1. IR Receiver and Track (T.O. 27-5/Fig. 4-2)
2. IR Display (T.O. 27-5/Fig. 4-3)

FAULT ISOLATION
IR Video (T.O. 27-3/Fig. 4-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain IR dominant mode [486138] Aperture selector: SENS	[080] IR target: Appears	IR receiver sensitivity and IR target sensitivity are in tolerance

STEP	INSTRUCTION	INDICATION	REMARKS
		NOTE	
	If proceeding to step b, do not remove 486138 IR target simulator or return IR MANUAL VALVE in computer compartment to FLIGHT.		
2	[083] RDR IR SELECT: Press and release to obtain radar dominant mode [305] IR: STOW [905] POWER: OFF [486138] Remove [Computer compt] IR MANUAL VALVE: FLIGHT	Check complete	. . .

4-5b. IR ACQUISITION AND LOCK-ON SENSITIVITY CHECK. The purpose of this procedure is to verify that the IR subsystem can lock on to a calibrated IR target.

EQUIPMENT REQUIRED

486138 IR target simulator

EQUIPMENT HOOKUP

CAUTION

Do not install the 486138 IR target simulator unless the IR MANUAL VALVE is set to LOCK.

Set IR MANUAL VALVE in computer compartment to LOCK. Connect 486138 to the IR head as described in chapter 11.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

083	663
241	767
441	

REFERENCES

FUNCTIONAL DIAGRAM

IR Receiver and Track
(T.O. 27-5/Fig. 4-2)

FAULT ISOLATION

IR Lock On
(T.O. 27-3/Fig. 4-5)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] IR: RDR SLVD [486138] Aperture control: SENS [083] RDR IR SELECT: Press and release to obtain IR dominant mode	[080] IR target: Appears at center of MMST	. . .
2	[083] Action switch: Press to 2nd detent and hold	[080] Az-el dot: Position can be controlled by hand control on 083 unit	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3	[083] Hand control: Position az-el dot on IR target	[080] Firing bar: Expands to 2.8 in. in length	. . .
4	[083] Action switch: Release	[080] IR target: Expanded C-scan appears for 8.5 sec	There should be no difficulty in maintaining lock on to IR target
5	[305] IR: STOW [905] POWER: OFF [486138] Remove [Computer compt] IR MANUAL VALVE: FLIGHT	Check complete	. . .

4-6. 663 TONE NULL AND 040 AURAL TONE BALANCE ADJUSTMENTS.

The purpose of this procedure is to adjust the IR audio tone and volume for proper audio signals to the headset. The aural tone circuitry provides an audible indication of the IR signal strength when the IR head is not stowed.

EQUIPMENT REQUIRED

1. 486138 IR target simulator
2. Headset

EQUIPMENT HOOKUP

CAUTION

Do not install 486138 unless IR MANUAL VALVE is set to LOCK.

Set IR MANUAL VALVE in computer compartment to LOCK. Install 486138 to the IR head as described in paragraph 11-15. Connect headset to aircraft communications lead jack.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

040
663
855

REFERENCES

FUNCTIONAL DIAGRAM

1. IR Receiver and Track (T.O. 27-5/Fig. 4-2)
2. IR Display (T.O. 27-5/Fig. 4-3)

FAULT ISOLATION

IR Tone
(T.O. 27-3/Fig. 4-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [855] EL SCAN: 2 BAR AZ SCAN: C [083] RDR IR SELECT: Press and release to obtain IR dominant mode [486138] Aperture selector: #4	[080] C-scan: Appears in a 2 bar pattern —— IR target: Appears	. . .
2	[083] ANT ELEV: Move up until indicator is observed	[080] IR target: Disappears	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3	[855] IR VOLUME: Midpoint or above IR THRESHOLD TONE: Fully cw to obtain indication	[Headset] Audio: Continuous high pitched tone	The 505 VOL must be cw to provide tone in headset
4	[855] IR VOLUME: Adjust in either direction and then set for comfortable tone	[Headset] Audio: Volume changes	. . .
5	[855] IR THRESHOLD TONE: Slowly adjust ccw to obtain indication	[Headset] Audio: Tone decreases in pitch	. . .
6	[855] IR THRESHOLD TONE: Adjust ccw until indication is observed	[Headset] Audio: Tone null	IR THRESHOLD TONE control should be at midpoint. If it is at midpoint proceed to step 8, if not at midpoint, proceed to step 7.
7	[855] IR THRESHOLD TONE: Midpoint [663] TONE NULL: Adjust to obtain indication	[Headset] Audio: Tone null	. . .
.8	[083] Action switch: Press to 2nd detent and hold [040] AURAL TONE BALANCE: Adjust to obtain indication	[Headset] Audio: Tone null	. . .
9	[083] Action switch: Release AUTO SEARCH: Press and release ANT ELEV: Detent	[080] IR target: Appears at center of MMST [Headset] Audio: Audible when target appears	. . .
10	[083] ANT ELEV: Adjust for best target pulse [855] IR THRESHOLD VIDEO: Slowly adjust ccw to obtain indication	[080] IR Target: Decrease in size [Headset] Audio: Tone and volume do not change	. . .
11	[905] POWER: ON [083] RDR IR SELECT: Press and release to obtain radar dominant mode	[Headset] Audio: Tone and volume do not change	IR aural tone is present if the IR head is not stowed
12	[855] IR THRESHOLD VIDEO: Fully ccw EL SCAN: NORM AZ SCAN: B [ACP] Selector: VIS IDENT [305] IR: STOW [905] POWER: OFF [486138] Remove [Computer compt] IR MANUAL VALVE: FLIGHT	Adjustment complete	. . .

4-7. IR SEARCH CHECKS.

4-7a. TACHOMETER NULL CHECK. The purpose of this procedure is to check for null voltage output from the azimuth and elevation tachometer with no tracking error signal present.

EQUIPMENT REQUIRED

ME30A/U multimeter

EQUIPMENT HOOKUP

Connect multimeter between 441 EL TACH GEN and 400 ~ RETURN. Set to 0.03 volt scale.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

441
767

REFERENCES

FUNCTIONAL DIAGRAM

IR Drive
(T.O. 27-5/Fig. 4-4)

FAULT ISOLATION

Az-El Dot/IR Head Search
(T.O. 27-3/Fig. 4-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain radar dominant mode	[Multimeter] A-c volts: Indicates 0.026v or less	. . .
2	[441] AZ TACH GEN and 400 ~ RETURN: Monitor using multimeter	[Multimeter] A-c volts: Indicates 0.026v or less	. . .
3	[ACP] Selector: VIS IDENT [305] IR: STOW [905] POWER: OFF [Multimeter] Disconnect	Check complete	. . .

4-7b. AUTOMATIC SEARCH PATTERN CHECK. The purpose of this procedure is to check for proper scan patterns with various scan mode selections.

EQUIPMENT REQUIRED

486126 infrared test set

EQUIPMENT HOOKUP

Connect the 486126 as described in chapter 11.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

241
663
855

REFERENCES

FUNCTIONAL DIAGRAM

Radar/IR Search, Supersearch, and Hand Control
(T.O. 27-5/Fig. 3-11)

FAULT ISOLATION

Az-El Dot/IR Head Search
(T.O. 27-3/Fig. 4-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain radar dominant mode ANT ELEV: Detent [855] EL SCAN: 2 BAR [486126] Roll chart: Follow B23 MA1 SEARCH ERROR CHECK	[486126] Roll chart: Indication is as described on roll chart	. . .
2	[486126] Selector switch: 1 [083] RDR IR SELECT: Press and release to obtain IR dominant mode	[080] Az-el dot: Moves in a 2 bar C-scan from 53° left to 53° right [767] Scan: Same as C-scan	. . .
3	[083] ANT ELEV: UP	[080] C-scan: 1 1/2 in. up, centered, and narrows	IR head scan also moves up
4	[083] ANT ELEV: DN	[080] C-scan: 1 1/4 in. down, centered, and narrows	IR head scan also moves down
5	[083] ANT ELEV: Detent [855] EL SCAN: NORM AZ SCAN: As indicated in table 4-2	[080] C-scan: As indicated in table 4-2 [767] Scan: The as C-scan	. . .
6	[305] IR: STOW RANGE: 16SP [ACP] Selector: VIS IDENT [905] POWER: OFF [486126] Disconnect	Check complete	. . .

Table 4-2. IR Search Limit Check

855 AZ SCAN	C-SCAN	
	ELEVATION	*AZIMUTH
B	4 bar	-53 to +53 degrees
L	4 bar	-53 to +6 degrees
C	4 bar	-30 to +30 degrees
R	4 bar	-6 to +53 degrees
* Left is -, right is +		

4-7c. MANUAL SEARCH CHECK. The purpose of this procedure is to check the hand control resolver output.

EQUIPMENT REQUIRED

Oscilloscope

EQUIPMENT HOOKUP

Connect channel A of the oscilloscope to 441 AZ RES ERROR. Set mode to A only.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

083 663
241 767

REFERENCES

FUNCTIONAL DIAGRAM

Radar/IR Search,
Supersearch, and
Hand Control
(T.O. 27-5/Fig. 3-11)

FAULT ISOLATION

IR Lock On
(T.O. 27-3/Fig. 4-5)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain IR dominant mode Action switch: Press to 2nd detent and hold Hand control: Move to full right and full left positions to obtain indication	[Oscilloscope] Waveform: Small amplitude sine wave [080] Az-el dot: Follows az hand control movements, moving max 1 1/2 in. to right and left on MMST	Large amplitude sine wave indicates IR head binding
2	[441] EL RES ERROR: Monitor using oscilloscope [083] Hand control: Center and hold ANT ELEV: Move to UP and DN limits	[Oscilloscope] Waveform: Small amplitude sine wave [080] Az-el dot: Moves max 1 1/2 in. up and 1 1/4 in. down on MMST	Large amplitude sine wave indicates IR head binding
3	[083] Action switch: Release Hand control: Release ANT ELEV: Detent [305] IR: STOW [ACP] Selector: VIS IDENT [905] POWER: OFF [Oscilloscope] Disconnect	Check complete	. . .

4-7d. SEARCH PATTERN STABILIZATION CHECK. The purpose of this procedure is to verify proper IR scan with EL SCAN settings and different aircraft roll angles.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

346
441

REFERENCES

FUNCTIONAL DIAGRAM

IR Drive
(T.O. 27-5/Fig. 4-4)

FAULT ISOLATION

Az-El Dot/IR Head Search
(T.O. 27-3/Fig. 4-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain IR dominant mode [855] EL SCAN: 2 BAR	[767] El scan: 2 bar Az scan: 53° left to 53° right	. . .
2	[346] 90° ROLL: Press and hold	[767] El scan: 53° up to 53° down Az scan: 2 bar	. . .
3	[346] 90° ROLL: Release [305] IR: STOW [ACP] Selector: VIS IDENT [855] EL SCAN: NORM [905] POWER: OFF	Check complete	. . .

4-7e. SUPERSEARCH CHECK. The purpose of this procedure is to verify the correct scan pattern in supersearch mode. The IR head az search pattern is ± 16.5° and el search pattern is a 1 bar scan during supersearch mode.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

241

REFERENCES

FUNCTIONAL DIAGRAM

IR Drive
(T.O. 27-5/Fig. 4-4)

FAULT ISOLATION

IR Video
(T.O. 27-3/Fig. 4-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain IR dominant mode [855] EL SCAN: 2 BAR [083] Action switch: Press to 1st detent and hold Hand control: Center	[080] C-scan: One bar scan pattern from 16.5° left to 16.5° right [767] Scan: Same as C-scan	. . .
2	[083] Hand control: Move slightly to right and left	[080] C-scan: Pattern moves in az to follow hand control position [767] Scan: Same as C-scan	. . .
3	[083] ANT ELEV: Move up and down	[080] C-scan: Moves up or down to follow ANT ELEV position [767] Scan: Same as C-scan	. . .
4	[083] Action switch: Release	[080] C-scan: 2 bar pattern resumes [767] Scan: Same as C-scan	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
5	[305] IR: STOW [855] EL SCAN: NORM [ACP] Selector: VIS IDENT [905] POWER: OFF	Check complete	. . .

4-7f. 767 SEARCH RATE CHECK. The purpose of this procedure is to verify the scan rate of the IR head in the available search modes.

NOTE

The IR head (767) and the antenna (017) normal search rates are the same. Supersearch rates are different. The IR head and the antenna search rates are both controlled by the azimuth controller rate potentiometer in the 241 unit.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

241

REFERENCES

FUNCTIONAL DIAGRAM

IR Drive
(T.O. 27-5/Fig. 4-4)

FAULT ISOLATION

Az-El Dot/IR Head Search
(T.O. 27-3/Fig. 4-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain IR dominant mode ANT ELEV: Detent	[767] SCAN: Makes 10 sweeps in 11.7 ±1.0 sec	Use stopwatch to time 10 sweeps. One sweep is movement from one extreme in az to other extreme in az
2	[083] Hand Control: Center Action switch: Press to 1st detent and hold	[767] SCAN: Makes 10 sweeps in 6.3 ± 1.0 sec	Supersearch mode limits az travel to ±16.5°
3	[083] Action switch: Release Hand control: Release [ACP] Selector: VIS IDENT [305] IR: STOW [905] POWER: OFF	Check complete	. . .

4-7g. SEARCH PATTERN OVERLAP CHECK. The purpose of this procedure is to verify proper overlap of the IR head scan pattern to assure IR target detection.

EQUIPMENT REQUIRED

486138 IR target simulator

EQUIPMENT HOOKUP

CAUTION

Do not install 486138 IR target simulator unless IR MANUAL VALVE is set to LOCK.

Set IR MANUAL VALVE in computer compartment to LOCK.

Install IR target simulator as described in chapter 11.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

663
767

REFERENCES

FUNCTIONAL DIAGRAM

IR Drive
(T.O. 27-5/Fig. 4-4)

FAULT ISOLATION

Az-El Dot/IR Head Search
(T.O. 27-3/Fig. 4-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [486138] Aperture selector: #4 [855] AZ SCAN: C [083] RDR IR SELECT: Press and release to obtain IR dominant mode ANT ELEV: Adjust until IR target appears on lower bar of 4 bar scan then slowly adjust downward to obtain indication	[080] IR target: Appears simultaneously on 1st and 2nd bars, then 2nd and 3rd bars, finally on 3rd and 4th bars	If this step fails, perform 663 El Steps Adj, Vert Center, and ϵ_s Gain adjustments iaw para 4-8a, then return to this procedure
2	[083] ANT ELEV: Detent [855] AZ SCAN: B [305] IR: STOW [ACP] Selector: VIS IDENT [905] POWER: OFF [486138] Remove [Computer compt] IR MANUAL VALVE: FLIGHT	Check complete	. . .

4-8. IR SEARCH DISPLAY ADJUSTMENTS

4-8a. 663 EL STEPS ADJ, VERT CENTER, AND ϵ_s GAIN ADJUSTMENTS. The purpose of this procedure is to calibrate the step voltage for the IR 4 bar elevation scan pattern, to center the C-scan on the 080 unit, and to adjust the ϵ_s gain.

EQUIPMENT REQUIRED

Oscilloscope

EQUIPMENT HOOKUP

Connect oscilloscope (10:1 attenuator probe) to 663 ϵ_s DEFL.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

663

REFERENCES

FUNCTIONAL DIAGRAMS

1. IR Display (T.O. 27-5/Fig. 4-3)
2. Radar/IR Search, Supersearch, and Hand Control (T.O. 27-5/Fig. 3-11)

FAULT ISOLATION

Az-El Dot/IR Head Search (T.O. 27-3/Fig. 4-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain IR dominant mode [663] EL STEPS ADJ: Adjust to obtain indication	[Oscilloscope] D-c voltage; Changes +1.11 ±0.22v as IR head moves from bottom bar to top bar	Voltage changes 0.37 ±0.04v as IR head moves to an adjacent scan bar
2	[855] EL SCAN: 2 BAR [083] ANT ELEV: Detent [663] VERT CENTER: Adjust to obtain indication	[080] C-scan: 2 bar pattern centered in el	663 ϵ_s GAIN and VERT CENTER adjustments interact and may have to be adjusted simultaneously to properly center C-scan
3	[083] RDR IR SELECT: Press and release to obtain radar dominant mode ANT ELEV: UP	[080] El marker: 1 1/2 in. up from center	. . .
4	[083] RDR IR SELECT: Press and release to obtain IR dominant mode [663] ϵ_s GAIN: Adjust if necessary to obtain indication	[080] C-scan: Appears 1 1/2 in. up from center	. . .
5	[083] ANT ELEV: DN	[080] C-scan: 0.6 in. below center	Repeat step 2 and, if necessary, readjust 663 VERT CENTER
6	[083] ANT ELEV: Detent [305] IR: STOW [855] EL SCAN: NORM [ACP] Selector: VIS IDENT [905] POWER: OFF [Oscilloscope] Disconnect	Adjustment complete	. . .

4-8b. 663 INT ADJUSTMENT. The purpose of this procedure is to adjust the 663 display video signal gain for proper 080 video display.

EQUIPMENT REQUIRED

486138 IR target simulator

EQUIPMENT HOOKUP

CAUTION

Do not install 486138 unless IR MANUAL VALVE is set to LOCK.

Set IR MANUAL VALVE in computer compartment to LOCK.

Connect 486138 to IR head as described in chapter 11.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

663

REFERENCES

FUNCTIONAL DIAGRAM

IR Display
(T.O. 27-5/Fig. 4-3)

FAULT ISOLATION

IR Video
(T.O. 27-3/Fig. 4-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[486138] Aperture selector: #4 [905] POWER: ON [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [855] IR THRESHOLD VIDEO: Fully cw [080] VIDEO GAIN: Adjust for best contrast IF GAIN: Adjust for best contrast [083] RDR IR SELECT: Press and release to obtain IR dominant mode [663] INT ADJ: Adjust to obtain indication	[080] IR target: Appears, IR target and C-scan brightness have best contrast.	. . .
2	**NOTE** If proceeding to para c, do not remove 486138 IR target simulator or set IR MANUAL VALVE in computer compartment to FLIGHT. [305] IR: STOW [ACP] Selector: VIS IDENT [905] POWER: OFF [486138] Remove [Computer compt] IR MANUAL VALVE: FLIGHT	Adjustment complete	. . .

4-8c. 663 VIDEO AMP ADJUSTMENT. The purpose of this procedure is to adjust the size of the IR target on the 080 unit.

EQUIPMENT REQUIRED

486138 IR target simulator

EQUIPMENT HOOKUP

CAUTION

Do not install 486138 unless IR MANUAL VALVE is set to LOCK

Set IR MANUAL VALVE in computer compartment to LOCK.

Connect 486138 to IR head as described in paragraph 11-15.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

663

REFERENCES

FUNCTIONAL DIAGRAM

IR Display
(T.O. 27-5/Fig. 4-3)

FAULT ISOLATION

1. IR Video (T.O. 27-3/Fig. 4-3)
2. Expanded C-scan (T.O. 27-3/Fig. 4-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain IR dominant mode Action switch: Press to 1st detent and hold for supersearch mode ANT ELEV: Adjust for max IR target amplitude [663] VIDEO AMP: Adjust to obtain indication	[080] IR target: 3/4 in. amplitude	. . .
2	[083] Action switch: Release [305] IR: STOW [ACP] Selector: VIS IDENT [905] POWER: OFF [486138] Remove [Computer compt] IR MANUAL VALVE: FLIGHT	Adjustment complete	. . .

4-8d. 595 IR GAIN AND IR CENTER ADJUSTMENTS. The purpose of this procedure is to align the C-scan on the 080 unit in the rear cockpit of the F-106B.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 3-20a

PROBABLE FAULTY UNIT

595

REFERENCES

FUNCTIONAL DIAGRAM

B-model Display
(T.O. 27-5/Fig. 3-8)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] ANT ELEV: Detent RDR IR SELECT: Press and release to obtain IR dominant mode [595] IR CENTER: Adjust to obtain indication	[080] C-scan: Sweeps a 4 bar pattern with 1 bar below center and 2 bars above center	. . .
2	[855] EL SCAN: 2 BAR [595] IR GAIN: Adjust to obtain indication	[080] C-scan: Top bar is at same position on both 080 units	Repeat steps 1 and 2, if necessary, to obtain normal indication
3	[855] EL SCAN: NORM [305] IR: STOW [ACP] Selector: VIS IDENT [905] POWER: OFF	Adjustment complete	. . .

4-9. IR ATTACK DISPLAY CHECKS.

The IR attack display checks are identical to the radar attack display checks contained in paragraph 3-17.

4-10. IR ATTACK DISPLAY ADJUSTMENTS.

The IR attack display adjustments are identical to the radar attack display adjustments contained in paragraph 3-18.

4-11. EXPANDED SWEEP PRESENTATION CHECK.

The purpose of this procedure is to check the expanded C-scan display in the IR track mode.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

663

REFERENCES

FUNCTIONAL DIAGRAM

IR Display
(T.O. 27-5/Fig. 4-3)

FAULT ISOLATION

None

NOTE

In IR dominant, radar slaved mode, the expanded sweep is positioned in pitch by ϵ_s and will move up and down on the 080 unit as the IR head is moved up or down.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD RDR IR SELECT: Press and release to obtain IR dominant mode [083] Action switch: Press to 2nd detent and release	[080] C-scan: Expanded C-scan appears. After approx. 8.5 sec, B-sweep appears and C-scan disappears	The B-sweep can be called up to replace C-scan prior to end of the 8.5 sec delay if 083 RDR IR EXP-LC/PUR switch is pressed to RDR IR EXP and released

STEP	INSTRUCTION	INDICATION	REMARKS
2	[083] RDR IR EXP-LC/PUR: RDR IR EXP and hold	[080] C-scan: Expanded C-scan replaces B-sweep	Expanded C-scan can be recalled at any time after it has been replaced by B-sweep
3	[083] RDR IR EXP-LC/PUR: Release	[080] B-sweep: Reappears	. . .
4	[305] IR: STOW [ACP] Selector: VIS IDENT [905] POWER: OFF	Check complete	. . .

4-12. IR RANGE ADJUSTMENTS.

4-12a. Deleted.

4-12b. 663 FIR THRESHOLD ADJUSTMENT. The purpose of this procedure is to adjust the FIR threshold with the use of a calibrated IR signal strength (range). The FIR circuit provides an indication on the 080 unit that the target is within the tracking capability of the AIM-4G IR missile.

EQUIPMENT REQUIRED

1. 486138 IR target simulator
2. Oscilloscope
3. Multimeter

EQUIPMENT HOOKUP

CAUTION

Do not install 486138 unless IR MANUAL VALVE is set to LOCK.

Set IR MANUAL VALVE in computer compartment to LOCK.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

663

EQUIPMENT REQUIRED

(cont)

EQUIPMENT HOOKUP

Install 486138 to IR head as described in paragraph 11-15. Connect channel A of oscilloscope to 040 ELEVATION PRE AMP OUT. Connect multimeter set to 50 vdc scale to 663 28V FIR.

PRELIMINARY PROCEDURE

REFERENCES

FUNCTIONAL DIAGRAM

IR Display
(T.O. 27-5/Fig. 4-3)

FAULT ISOLATION

Attack Display Improper
(T.O. 27-3/Fig. 3-12)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[486138] Aperture selector: #4 [905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain IR dominant mode Action switch: Press to 2nd detent, lock on to IR target, and release [Radar compt] IR AZ & EL INTLK: Open	[080] IR attack display: Appears	. . .
2	[663] FIR THRESHOLD: Fully cw [Oscilloscope] WAVEFORM: Record peak amplitude of IR pulses [040] ELEVATION LIN LOG ATT: Check setting. Adjust until peak amplitude of IR pulses is 440 mv [663] FIR THRESHOLD: Slowly adjust ccw to obtain indication	[Multimeter] D-c voltage: Jumps to +28 v [080] FIR marker: Doubles in length	. . .
3	[040] ELEVATION LIN LOG ATT: Return to previous setting [Radar compt] IR AZ & EL INTLK: Close [305] IR: STOW [ACP] Selector: VIS IDENT [905] POWER: OFF [Test equipment] Disconnect [Computer compt] IR MANUAL VALVE: FLIGHT	Adjustment complete	. . .

4-13. IR ANGLE TRACK ADJUSTMENTS.

NOTE

Accomplish all steps of paragraph 4-13.

4-13a. Deleted.

EQUIPMENT REQUIRED

VTVM

EQUIPMENT HOOKUP

Connect VTVM set on 10 vdc scale to 040 AZIMUTH TRACK ERROR

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

040

REFERENCES

FUNCTIONAL DIAGRAM

IR Receiver and Track (T.O. 27-5/Fig. 4-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1.	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain IR dominant mode [Radar compt] IR AZ & EL INTLK: Open [040] AZIMUTH LIN LOG ATT: Fully ccw ELEVATION LIN LOG ATT: Fully ccw [441] DC RET: Use jumper leads and connect to 441 AZ RES ERROR and EL RES ERROR [040] AZIMUTH ERROR BALANCE: Adjust to obtain indication	[VTVM] D-c voltage: Indicates min	. . .
2	[VTVM] Leads: Connect between 040 ELEVATION TRACK ERROR and ground [040] ELEVATION ERROR BALANCE: Adjust to obtain indication	[VTVM] D-c voltage: Indicates min	. . .
3	[Radar compt] IR AZ & EL INTLK: Close [ACP] Selector: VIS IDENT [305] IR: STOW [905] POWER: OFF [VTVM] Disconnect [441] Jumper leads: Remove	Adjustment complete	. . .

4-13b. 441 EL AMP PD AND AZ AMP PD ADJUSTMENTS. The purpose of this procedure is to null the azimuth and elevation phase detector outputs with the tracking error input grounded.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

441

REFERENCES

FUNCTIONAL DIAGRAM

IR Drive
(T.O. 27-5/Fig. 4-4)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain radar dominant mode [083] AUTO SEARCH: Press and release [441] DC RET: Using jumper lead, connect to 441 AZ RES ERROR AZ AMP PD: Adjust to obtain indication. Remove jumper	[767] No jump in 767 Unit when jumper is removed	
2	[441] DC RET: Using jumper wire connect to 441 EL RES ERROR. EL AMP PD: Adjust to obtain indication. Remove jumper.	No jump in 767 unit when jumper is removed.	. . .
3	[305] IR: STOW [ACP] Selector: VIS IDENT [905] POWER: OFF	Adjustment complete	. . .

4-13c. 441 EL GYRO PD AND AZ GYRO PD ADJUSTMENTS. The purpose of this procedure is to null the gyro phase detector circuits with the track error inputs grounded.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

441

REFERENCES

FUNCTIONAL DIAGRAM

IR Drive
(T.O. 27-5/Fig. 4-4)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [083] RDR IR SELECT: Press and release to obtain IR dominant mode Action switch: Press to 2nd detent and release to obtain IR track mode **[040]** DC RET: Using jumper lead, connect to 040 AZIMUTH TRACK ERROR and 040 ELEVATION TRACK ERROR **[441]** AZ GYRO PD: Adjust to obtain indication	[767] Az movement: Steady with no drift	Due to interaction between az and el channels, steps 1 and 2 must be repeated until the 767 unit does not drift in either az or el
2	[441] EL GYRO PD: Adjust to obtain indication	[767] El movement: Steady with no drift	. . .
3	[305] IR: STOW [ACP] Selector: VIS IDENT [905] POWER: OFF **[040]** Jumper lead: Remove	Adjustment complete	. . .

4-13d. 040 Azimuth and ELEVATION ERROR BALANCE ADJUSTMENTS. The purpose of this procedure is to adjust the IR Drive Signal for minimum drift of the 767.

EQUIPMENT REQUIRED

Multimeter

EQUIPMENT HOOKUP

Connect for DC voltage at 040 Azimuth Track Error

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

040
767

FUNCTIONAL DIAGRAM

IR Receiver & Track (T.O. 27-5/Fig. 4-2)

REFERENCES

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[90S] POWER: Standby [ACP] Selector: Missiles all [30S] IR: RDR SLAVED [083] RDR IR SELECT: Press and release to obtain IR dom. Action Switch: Press to 2nd detent and release. [040] Azimuth Lin Log Att: Fully CCW Elevation Lin Log Att: Fully CCW Azimuth ERROR Balance: Adjust to obtain indication	[Multimeter[: 0.0 ± 5VDC	Accomplished course adjustment
2	[Multimeter] Connect to Elevation Track Error on [040] [040] Elevation Error Balance Adjust to obtain indication	[Multimeter]: 0.0 ± .5 VDC	

STEP	INSTRUCTION	INDICATION	REMARKS
3	[083] AUTO SEARCH: Press and release [040] AZIMUTH LIN LOG ATT: Fully cw ELEVATION LIN LOG ATT: Fully cw	[767] Scan: 4 bar pattern	. . .
4	[305] IR: STOW [ACP] Selector: VIS IDENT [905] POWER: OFF	Adjustment complete	. . .

4-13e. 040 ELEVATION PHASE AND AZIMUTH PHASE ADJUSTMENTS. The purpose of this procedure is to adjust the reference phase voltage for IR tracking.

EQUIPMENT REQUIRED

1. 486138 IR target simulator
2. Oscilloscope

EQUIPMENT HOOKUP

CAUTION

Do not install 486138 unless IR MANUAL VALVE is set to LOCK.

Set IR MANUAL VALVE in computer compartment to LOCK.

Connect 486138 to IR head as described in chapter 11. Connect channel A of oscilloscope to 040 AZIMUTH BLOCK OSC. Set HORIZONTAL DISPLAY to EXT SWEEP and connect HORIZ-INPUT of oscilloscope to 040 AZIMUTH AC REF.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

040

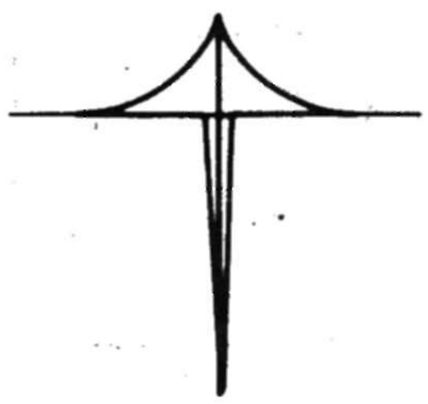
REFERENCES

FUNCTIONAL DIAGRAM

IR Receiver and Track
(T.O. 27-5/Fig. 4-2)

FAULT ISOLATION

IR Lock-On
(T.O. 27-3/Fig. 4-5)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [ACP] Selector: MISSILES ALL [305] IR: RDR SLVD [486138] Aperture selector: #4 [083] RDR IR SELECT: Press and release to obtain IR dominant mode Action switch: Press to 2nd detent, lock on to IR target and then release [040] AZIMUTH PHASE: Adjust to obtain indication	[Oscilloscope] Waveform: 	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
2	[040] ELEVATION BLOCK OSC: Connect to oscilloscope channel A ELEVATION AC REF: Connect to oscilloscope HORIZ-INPUT ELEVATION PHASE: Adjust to obtain indication	[Oscilloscope] Waveform: Same as step 1	. . .
3	[305] IR: STOW [ACP] Selector: VIS IDENT [905] POWER: OFF [Oscilloscope] Disconnect [486138] Remove [Computer compt] IR MANUAL VALVE: FLIGHT	Adjustment complete	. . .

4-14. COMPRESSOR OILING PROCEDURE.

EQUIPMENT REQUIRED

1. Nitrogen Servicing Unit
2. Oil Servicing Unit (Part No. 905034-1-1)
3. One bottle of oil (Part No. 905000-1)

4-14a. Add 10 GMS of oil to the compressor after every 100 hours.

a. Connect nitrogen servicing unit to low side line of compressor. Bleed to 40 lbs.

b. Fill oil servicing unit with 10 grams of oil.

c. Connect oil servicing unit to low side line of compressor and connect nitrogen servicing unit to the other end of the oil servicing unit.

d. Hold the nitrogen servicing unit and oil servicing unit above the compressor and slowly increase nitrogen pressure until all the oil is drained into the compressor.

e. While everything is still connected push in IR circuit breaker for 5 to 10 seconds. After pulling out circuit breaker, wait 1 to 2 minutes for the pressure to stabilize.

f. Disconnect the oil and nitrogen servicing units and reconnect the low side line to the IR compressor. Connect the nitrogen servicing unit to the filler valve and purge the system twice in accordance with T.O. 1F-106A-2-27-2. Reservice the system to 60 lbs. and run the system for at least 20 minutes.

NOTE

Adjust the nitrogen pressure for 2 lbs. after approximately 5 minutes of running.

g. After shut-down change the adsorber in accordance with T.O. 1F-106A-2-27-2.

h. If the static pressure is above 75 lbs after you have serviced the system to 2 lbs while the compressor was running there is an obstruction in the lines.

CHAPTER 5. ARMAMENT SUBSYSTEM

SECTION I. GENERAL

5-1. INTRODUCTION.

5-1a. This chapter contains check procedures for the armament subsystem. These procedures are performed after a unit has been replaced or when a malfunction is suspected.

5-1b. Each procedure provides the purpose of the procedure, equipment required, equipment hookup, preliminary procedure, probable faulty unit, and references to functional diagrams and fault isolation procedures.

5-1c. Table 5-1 lists the armament subsystem units and the checks required when these units are replaced.

5-2. TEST CONSIDERATIONS.

5-2a. The purpose of the procedures in this chapter is to provide for checking of the armament subsystem. To verify proper armament subsystem operation, prescribed checks are performed.

CAUTION

Use the lowest setting of the 080 ATTACK INTENSITY control required to obtain a minimum acceptable viewing level while observing the attack display. Excessive attack intensity will cause damage to the MMST.

NOTE

- The 080 ON and OFF switches are bypassed when the aircraft canopy is closed or when the canopy lock lever (F-106A only) is in the locked position.
- **Wherever the 080 unit panel controls are indicated, they now apply to the 080 unit, 52800 unit (ODU), or the Filter and Control Assembly and Information panel, depending upon the system configuration.**

5-2b. When an 080 unit display is required during the following checks, the MMST must be turned on by pressing and releasing 080 ON. After approximately 35 seconds, the 080 unit will present all displays other than attack. If the attack display is required, press and hold 080 ON for a minimum of 3 seconds and release. If the displays are not required for a period of time, the 080 unit should be turned off by pressing and releasing 080 OFF. The 080 unit use time should be held down to conserve the MMST.

CAUTION

Excessive attack intensity may damage the 080 unit MMST. Set the 080 ATTACK INTENSITY fully ccw when not observing the attack display, and set for a minimum acceptable viewing level when observing the attack display. The 080 unit attack display gun turns off after approximately 3 minutes. Press and hold the 080 ON for a minimum of 3 seconds, and release to obtain the attack display for another cycle. This procedure must be repeated for each additional cycle required.

5-3. CHECKS AFTER UNIT REPLACEMENT.

5-3a. Replacement or reinstallation of certain units requires performance of check procedure described in this chapter. Due to interaction between units, it may be necessary to perform a number of check procedures when only one unit has been replaced.

5-3b. Refer to table 5-1 whenever a unit of the armament subsystem is replaced to determine if checks are required.

Table 5-1. Checks After Unit Replacement (Armament)

CHECK	PARA NO.	008	054	087	264	364	464	496
Displaced Missile Check	5-4a		X				X	
Armament Safe for Test Check	5-4b				X		X	X
Bay Select Check	5-4c				X			
ATS Check	5-4d	X	X		X	X	X	X
Rocket Voltage Check	5-5a			X		X		
Pursuit Mode Check	5-5b			X		X		
Special Weapon Firing, CVAC Power Check	5-5c			X				
MSR Check	5-5d			X	X	X	X	X
MSR Time of Flight Check	5-5e			X		X		

SECTION II. CHECKS

5-4. MISSILE CHECKS.

5-4a. DISPLACED MISSILE CHECK. The purpose of this procedure is to ensure that the cockpit warning circuits are operational if a displaced missile condition exists.

EQUIPMENT REQUIRED	EQUIPMENT HOOKUP	PRELIMINARY PROCEDURE
1. 486117 Armament Test Set	Remove flight plug (RH armament bay) and install ATS plug.	1. Table 1-1
2. ATS plug		2. Open armament bay doors and lower launchers iaw T.O. 1F-106A-2-12.

PROBABLE FAULTY UNIT

054 (missile gone switch)

464

REFERENCES

FUNCTIONAL DIAGRAM

Displaced Missile/Misfire (T.O. 27-5/Fig. 5-23)

FAULT ISOLATION

None

NOTE

Ensure that AMCP ARMT PWR fuse is removed and RESET PWR fuse is installed. The 905 POWER switch can remain in OFF while this procedure is performed.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[RH console] WARN LIGHT TEST: Press and hold	[MWP] All lights: Come on	. . .
2	[RH console] WARN LIGHT TEST: Release	[MWP] MISSILE DISPLACED: Off	Other lights on the MWP have no significance in this check
3	[054, rail 1] Missile gone switch: Press up (on) and hold	[MWP] MISSILE DISPLACED: Comes on	. . .
4	[054, rail 1] Missile Simulator: Install	[MWP] MISSILE DISPLACED: Goes off	The missile simulator is part of the 486117 Armament Test Set
5	[054, rail 1] Launcher release handle: Pull out and hold	[MWP] MISSILE DISPLACED: Comes on	. . .
6	[054, rail 1] Launcher release handle: Release	[MWP] MISSILE DISPLACED: Goes off	. . .
7	**NOTE** If proceeding to para 5-4b, do not remove missile simulators or ATS plug. [054, rail 1] Missile gone switch: Release [054, rails 2, 3, and 4] Repeat steps 3 thru 7	[MWP] MISSILE DISPLACED: Same as steps 3 thru 6	. . .
8	[Missile simulators] Remove [ATS plug] Remove [Flight plug] Install	Check complete	. . .

5-4b. ARMAMENT SAFE FOR TEST CHECK. The purpose of this procedure is to ensure that the test circuits in the 264, 464, and 496 units are operational.

EQUIPMENT REQUIRED

1. 486117 Armament Test Set
2. ATS plug

EQUIPMENT HOOKUP

1. Remove flight plug (RH armament bay) and install ATS plug.
2. Install missile simulators (part of 486117 Armament Test Set) on all four rails.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Open armament bay doors and lower launchers iaw T.O. 1F-106A-2-12.

PROBABLE FAULTY UNIT

264
464
496

REFERENCES

FUNCTIONAL DIAGRAM

SSGC (T.O. 27-5/Fig. 2-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY	[796] TEST: Comes on [596] SAFE FOR TEST: Comes on [Missile simulators] ISOLATION CIRCUITS SAFE/PWR SUP START and FIRE: Come on ___ FIL. CONT VOLT.: Comes on ___ 28V FIRST MOTION: Comes on ___ CHANNEL SELECTED F: Comes on ___ AFC HOME: Comes on ___ All other lights: Off	. . .
2	[054, rail 1] Missile gone switch: Press up (on) and hold	[796] TEST: Goes off [596] SAFE FOR TEST: Goes off	. . .
3	[054, rail 1] Missile gone switch: Release	[796] TEST: Comes on [596] SAFE FOR TEST: Comes on	. . .
4	[054, rail 2, 3, and 4] Repeat steps 2 and 3	[596] and [796] Same as steps 2 and 3	. . .
5	[RH armament bay] ATS plug: Remove	[796] TEST: Goes off [596] SAFE FOR TEST: Goes off	. . .
6	[796] SELECTOR TEST: 1	[796] TEST: Comes on [596] SAFE FOR TEST: Comes on	. . .
7	[NWW] Door closed switch: Press to up (closed) and hold [ACP] ARM-SAFE: ARM	[796] TEST: Goes off [596] SAFE FOR TEST: Goes off	. . .
8	[ACP] ARM-SAFE: SAFE [796] SELECTOR TEST: 2 thru 7, observing indication at each position	[796] TEST: Comes on at each SELECTOR TEST position [596] SAFE FOR TEST: Comes on at each SELECTOR TEST position	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
9	[796] SELECTOR TEST: OFF	[796] TEST: Goes off [596] SAFE FOR TEST: Goes off	. . .
	NOTE If proceeding to para 5-4c, do not remove missile simulators or reinstall flight plug.		
10	[NWW] Door closed switch: Release [905] POWER: OFF [Missile simulators] Remove [Flight plug] Install	Check complete	. . .

5-4c. BAY SELECT CHECK. The purpose of this procedure is to ensure that the bay select circuits in the 264 unit are operational.

EQUIPMENT REQUIRED

1. 486117 Armament Test Set
2. ATS plug

EQUIPMENT HOOKUP

1. Remove flight plug (RH armament bay) and install ATS plug.
2. Install missile simulators (part of 486117 Armament Test Set) on all four rails. Set MISSILE TYPE on all four missile simulators to 3A.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Open armament bay doors and lower launchers iaw T.O. 1F-106A-2-12.

PROBABLE FAULTY UNIT

264

REFERENCES

FUNCTIONAL DIAGRAM

Bay Select (T.O. 27-5/Fig. 5-7)

FAULT ISOLATION

WSEM Channel Select Indication (T.O. 27-3/Fig. 2-6)

NOTE

Ensure that AMCP ARMT PWR and RESET PWR fuses are installed.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [NWW] Door closed switch: Press to up (closed) and hold [796] SELECTOR TEST: 5 [596] TEST SELECTOR: AATS [ACP] ARM-SAFE: ARM [LH console] ARMT RECYCLE: Press and hold	[AMCP] RESET light: Comes on	. . .
2	[LH console] ARMT RECYCLE: Release	[AMCP] RESET light: Goes off	. . .
3	[ACP] Selector: MISSILE RAD	[596] FWD SEL: Comes on —— AFT SEL: Off [ACP] SELECT: OK	. . .
4	[ACP] Selector: MISSILES ALL	[596] FWD SEL: On —— AFT SEL: Comes on [ACP] SELECT: OK	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
5	[ACP] Selector: MISSILE IR	[596] FWD SEL: Goes off —— AFT SEL: Goes off [ACP] SELECT: NO	. . .
6	[Missile simulators] MISSILE TYPE: 4A	[596] FWD SEL: Off —— AFT SEL: Comes on [ACP] SELECT: OK	. . .
7	[ACP] Selector: MISSILES ALL	[596] FWD SEL: Comes on —— AFT SEL: On [ACP] SELECT: OK	. . .
8	[ACP] Selector: MISSILES RAD	[596] FWD SEL: Goes off —— AFT SEL: Goes off [ACP] SELECT: NO	. . .
	NOTE If proceeding to para 5-4d, do not remove missile simulators or ATS plug.		
9	[ACP] Selector: VIS IDENT ARM-SAFE: SAFE [796] SELECTOR TEST: 7, then OFF [NWW] Door closed switch: Release [596] TEST SELECTOR: OPEN LOOP [905] POWER: OFF [Missile simulators] Remove [ATS plug] Remove [Flight plug] Remove	Check complete	. . .

5-4d. ATS CHECK. The purpose of this procedure is to ensure the armament timing signals are being properly generated and delivered to the missile rails.

WARNING

Follow all safety precautions in T.O. 1F-106A-2-12 when armament bay doors or launchers are operated.

EQUIPMENT REQUIRED

1. 486117 Armament Test Set
2. ATS plug

EQUIPMENT HOOKUP

1. Remove flight plug (RH armament bay) and install ATS plug.
2. Install missile simulators (part of 486117 Armament Test Set) on all four rails and connect to rails. Reset all circuit breakers to the up (on) position. Set MISSILE POSITION to M1 on all missile simulators. Set MISSILE SIMULATE to PRESENT. Set mode switch to LOCK. Set MISSILE TYPE on rails 1 and 2 to 3A and rails 3 and 4 to 4A.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Open armament bay doors and lower launchers iaw T.O. 1F-106A-2-12

PROBABLE FAULTY UNIT

008
054
264
364
464
496

REFERENCES

FUNCTIONAL DIAGRAM

1. Gyro Power (T.O. 27-5/Fig. 5-15)
2. Filament Power (T.O. 27-5/Fig. 5-16)
3. Channel Select (T.O. 27-5/Fig. 5-19)
4. Parameters and CCM (T.O. 27-5/Fig. 5-20)
5. Power Supply Start/G-Weight Release (T.O. 27-5/Fig. 5-21)
6. Fire Signal (T.O. 27-5/Fig. 5-22)

FAULT ISOLATION

1. Filament Power Indication (T.O. 27-3/Fig 2-1)
2. WSEM Gyro Power Indication (T.O. 27-3/Fig. 2-2)
3. WSEM Power Supply Start Indication (T.O. 27-3/Fig. 2-3)
4. WSEM Igniter Signal Indication (T.O. 27-3/Fig. 2-5)
5. WSEM Channel Select Indication (T.O. 27-3/Fig. 2-6)
6. WSEM G-Weight Release Indication (T.O. 27-3/Fig. 2-7)
7. WSEM Analogs and Timing Lines Missing (T.O. 27-3/Fig. 2-11)
8. Door Operation Missile Selection (T.O. 27-3/Fig. 5-2)
9. Launcher Operation (T.O. 27-3/Fig. 5-3)
10. Misfire Occured During Secondary Weapon Firing (T.O. 27-3/Fig. 5-6)

WARNING

Before operating armament bay doors or launchers, ensure that armament bay area is clear and post personnel to warn others that armament bay doors and launchers are to be operated.

If any armament is loaded, unload iaw T.O. 1F-106A-16-1.

CAUTION

Ensure that no test cables are positioned so they might be damaged during launcher or armament bay door operation.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: WARM [NWW] Door closed switch: Press to up (closed) and hold	**FIL CONTROL - 28V: ON** —— **28V FIRST MOTION: Comes on** —— RATE SENSOR/POWER and NORMAL PHASE: Comes on —— ISOLATION CIRCUITS SAFE/PWR SUP START and FIRE: On	. . .
2	[NWW] Door closed switch: Release	[Missile simulators] 28V FIRST MOTION: On —— RATE SENSOR/POWER and NORMAL PHASE: Go off	. . .
2.1	**[905] POWER: STBY** **NWW DOOR CLOSED SWITCH: Press to up (closed) and hold**	**ISOLATION CIRCUITS: SAFE/PWR SUP START and FIRE. On**	. . .
3	**NOTE** Observe WARNINGS and CAUTIONS preceding this procedure. Raise launchers and close armament bay doors iaw T.O. 1F-106A-2-12.		

STEP	INSTRUCTION	INDICATION	REMARKS
3 (Cont)	[NWW] Door closed switch: Press to up (closed) and hold [AMCP] INTERVALOMETER RESET: Press to RESET and release	[AMCP] RESET light: Comes on, then goes off	. . .
4	[866] MISSILE RF CHANNELS: C	[043] CHANNEL SELECT (DS1): Off	. . .
5	[905] POWER: ON [ACP] Selector: MISSILES ALL ARM-SAFE: ARM [796] SELECTOR TEST: 5	[596] CCM: Comes on —— COMPUTER PARAMETER (All lights): Come on —— SAFE FOR TEST: Comes on [043] HOME (DS2): Comes on [796] TEST: Comes on [AMI] Mach: 1.775 to 1.825M MSM: 1.73 to 1.79M [AVVI] Altitude: 56,000 to 58,000 ft [Inst panel] MAX MANEUVER: Comes on [880] Mach: 1.77 to 1.83M MSM: 1.73 to 1.79M [080] VI WARN: Comes on [596] SYSTEM TEST NO. 5: Comes on	. . . If VI WARN is flashing see table 2-6.1 for incorrect switch position
6	[596] TEST SELECTOR: AATS NOSE-TAIL: NOSE PURSUIT-LEAD COLL: LEAD COLL	[596] NOSE: Comes on	. . .
7	[796] GND TEST INTER: Press and release [305] CHAFF: ALL NOSE-TAIL: TAIL [096] S1:3 S2:E [083] Trigger: Press to 2nd detent and hold [083] Action switch: Press to 2nd detent, position range gate to approx 16 miles, and release action switch	[080] VI WARN: Goes off [ACP] SELECT: OK [043] HOME (DS]): Goes off —— CHANNEL SELECT (DS1): Comes on [596] AFC OK: Comes on —— FWD SEL: Comes on —— AFT SEL: Comes on [080] Time-to-go circle: Appears with 2.8 in. diameter —— Range rate gap: 950 to 1200 [596] 20 SEC GYRO BOOST: Comes on —— A: Comes on [464] A: Comes on [008] GYRO BOOST ON: Comes on	. . .

NOTE

The following indications occur approx 10 seconds after 008 GYRO BOOST ON comes on.

STEP	INSTRUCTION	INDICATION	REMARKS
7 (Cont)		[596] A': Comes on —— CONFIRM TO COMP: Comes on —— FIL: Comes on —— FIL CONTROL: Goes off [464] A': Comes on —— UNIT TEST OK: Comes on	
	NOTE The following indications occur approx 10 seconds after 464 UNIT TEST OK comes on.		
		[080] Time-to-go circle: Starts to shrink [596] 20 SEC GYRO BOOST: Goes off —— A': Goes off —— FIL CONTROL: Comes on [008] GYRO BOOST ON: Goes off [464] UNIT TEST OK: Goes off	
	NOTE Step 8 must be performed at C-time to ensure a complete check of the misfire circuits. The indications in this step occur after the 080 time-to-go circle starts to shrink.		
	[083] Trigger: Press to 2nd detent and hold	[596] FIL CONTROL: Goes off [464] UNIT TEST OK: Comes on	596 A' will cycle on for 10 sec and off for 20 sec until E-time.
	NOTE The following indications occur approx 11 seconds after 080 time-to-go circle starts to shrink.		
		[596] B: Comes on [264] B: Comes on	
	NOTE The following indications occur when the time-to-go circle shrinks to approx 1/4 full size.		
		[596] EXTEND: Comes on —— C: Comes on —— XMTR TUNE: Comes on [264] C: Comes on [096] SELF TEST METER: Indication changes [866] SERVO ON: Comes on [080] B-sweep: Jizzle disappears [796] RADAR: Comes on	
8	[596] FWD TEST MISFIRE: Up (on) AFT TEST MISFIRE: Up (on)	[596] DOORS OPEN: Comes on [Armament bay] Doors: Open —— Aft launchers: Extend	Must be accomplished at C-time
	NOTE The following indications occur approx 3 1/2 seconds after 596 C comes on.		

STEP	INSTRUCTION	INDICATION	REMARKS
8 (Cont)		[596] D: Comes on —— CCM: Goes off [364] UNIT OK: Comes on	The 596 COMPUTER PARAMETER lights may be on but have no significance
	NOTE The following indications occur approx 1 1/2 seconds after 596 D comes on.		
		[596] TIMING OK: Comes on —— FIRE: Comes on —— E: Comes on [264] E: Comes on TEST OK: Comes on [080] Time-to-go circle: Shrinks to zero and is replaced by fire signal "X" [ACP] SELECT: NO [MWP] MISFIRE: Comes on	A, A' remain on. Technician in cockpit should say "misfire on"
9	[596] AFT TEST MISFIRE: Down (off)	[MWP] MISFIRE: Goes off [Armament bay] Aft launchers: Retract —— Fwd launchers: Extend [MWP] MISFIRE: Comes on	Technician in cockpit should say "misfire off" Technician in cockpit should say "misfire on"
10	[596] FWD TEST MISFIRE: Down (off)	[MWP] MISFIRE: Goes off [Armament bay] Fwd launchers: Retract —— Doors: Close [596] DOORS OPEN: Goes off	Technician in cockpit should say "misfire off"
11	**NOTE** The following indications occur approx 6 1/2 seconds after 596 E comes on.		
	[083] Trigger: Release	[596] COMPUTER PARAMETER (even): Come on —— COMPUTER PARAMETER (odd)! Off —— TF PARA: Comes on [087] UNIT TEST OK: Comes on	
	NOTE The following indications occur approx 9 3/4 seconds after 596 E comes on.		
		[596] E: Goes off [080] Fire signal "X": Disappears, and is replaced by pullout "8"	Pullout "8" may replace fire signal "X" before 9 3/4 sec after E-time

STEP	INSTRUCTION	INDICATION	REMARKS
		25 seconds after E time	. . .
12	[083] AUTO SEARCH: Press and release	[596] FIL CONTROL: Cycles on and off —— A': Cycles on and off —— TIMING OK: Goes off —— T_F PARA: Goes off —— FWD SEL: Goes off —— AFT SEL: Goes off —— XMTR TUNE: Goes off —— B: Goes off —— C: Goes off —— D: Goes off —— FIRE: Goes off [464] UNIT TEST OK: Cycles on and off [264] B: Goes off —— C: Goes off —— E: Goes off —— TEST OK: Goes off [364] UNIT OK: Goes off [087] UNIT TEST OK: Goes off [866] SERVO ON: Goes off	
	NOTE The following indications should be checked approx 40 seconds after 083 AUTO SEARCH is released.		
		[596] FIL CONTROL: On —— CONFIRM TO COMP: Off —— FIL: Off —— A: Off —— A': Off [464] A: Off A': Off UNIT TEST OK: Off	
13	[ACP] Selector: VIS IDENT ARM-SAFE: SAFE	[ACP] SELECT: Blank	. . .
14	[Armament bay] Doors: Open iaw T.O. 1F-106A-2-12 Aft launchers: Extend iaw T.O. 1F-106A-2-12 Fwd launchers: Extend iaw T.O. 1F-106A-2-12	[Missile simulators] CHANNEL SELECTED A: Off —— CHANNEL SELECTED B: Off —— CHANNEL SELECTED D: Off —— CHANNEL SELECTED E: Off —— CHANNEL SELECTED F: Off —— AFC HOME: Off —— ANT NULL: Off —— PITCH ANT SATURATION: Off —— YAW ANT SATURATION: Off —— All other lights: On —— CCM-A: Up (on) —— All other circuit breakers: Down (off)	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
15	[Missile simulators] 28V RESET: Press down (on) and release All circuit breakers: Set up (on)	[Missile simulators] RATE SENSOR/POWER and NORMAL PHASE: On — CHANNEL SELECTED C: On — ISOLATION CIRCUITS SAFE/PWR SUP START and FIRE: On — 28V FIRST MOTION: On — FIL. CONT VOLT.: On — All other lights: Off — All circuit breakers: Remain up (on)	. . .
16	[096] S1:1 S2:A [305] CHAFF: OFF [796] SELECTOR TEST: 7, then OFF [596] TEST SELECTOR: OPEN LOOP [905] POWER: OFF [NWW] Door closed switch: Release [ATS plug] Remove [Flight plug] Install [Missile simulators] Remove	Check complete	. . .

5-4e. Continuity and Feedback Test (LS-1 Routine). The purpose of this procedure is to check the pitch and yaw missile antenna position circuit cabling between the computer and the rails.

WARNING

Follow all safety precautions in T.O. 1F-106A-2-12 when armament bay doors or launchers are operated.

EQUIPMENT REQUIRED

1. 486117 Armament Test Set
2. Eight jumper wires

EQUIPMENT HOOKUP

CAUTION

Prior to placing jumper wires in test points, ensure 905 POWER is OFF

Install missile simulators (part of 486117 Armament Test Set) on all four rails and connect to rails. Place jumper wires from TP11 to TP18 and from TP24 to TP30 on all four missile simulators.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Open armament bay doors and lower launchers iaw T.O. 1F-106A-2-12

PROBABLE FAULTY UNIT

Aircraft wiring between 140 unit and 054 units

REFERENCES

FUNCTIONAL DIAGRAM

Pitch and Yaw Slaving (T.O. 27-5/Fig. 5-18)

FAULT ISOLATION

WSEM Pitch and Yaw Slaving Indication (T.O. 27-3/Fig. 2-12)

WARNING

Before operating armament bay doors or launchers, ensure that armament bay area is clear and post personnel to warn others that armament bay doors and launchers are to be operated.

If any armament is loaded, unload iaw T.O. 1F-106A-16-1.

CAUTION

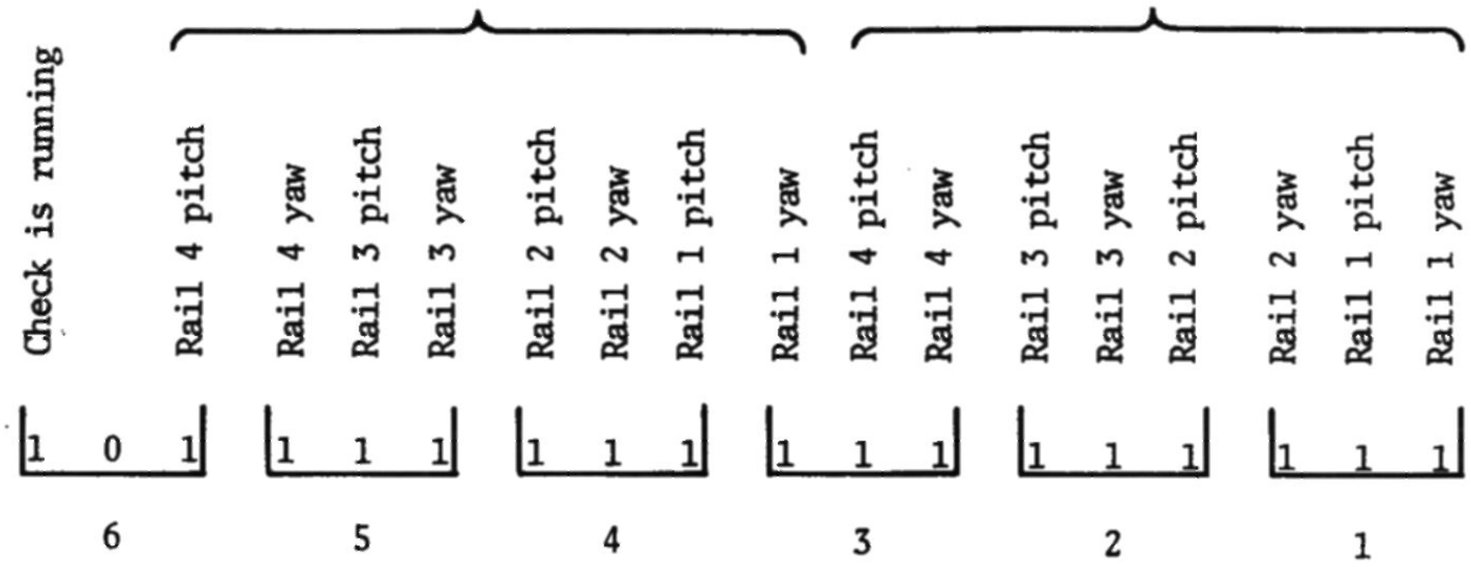
Ensure that no test cables are positioned so they might be damaged during launcher or armament bay door operation.

NOTE

If desired, the launchers can be operated while the routine is running to check for open or shorted wires in the rail harnesses.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [796] SELECTOR TEST: 5 [Computer] Channel 8: Load iaw para. 6-4 [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 463 DIGITAL INPUTS ENTER: Up (on) [846] ENTER START ADDRESS: Press and release	[846] DISPLAY REGISTER lights: Bits 1 thru 16 and 18 on (see fig. 5-1 for light significance)	Checks continuity between 140 unit and 054 units and 140 unit conversion circuits.
2	[Armament bay] Launchers: Retract and repeat step 1	Same as step 1	Provides additional check of rail harnesses
3	[140] DIGITAL INPUTS ENTER: Down (off) DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 [846] TEST-NORMAL: NORMAL START ADDRESS: 00 [796] SELECTOR TEST: 7, then OFF [905] POWER: OFF	Check complete	
	CAUTION Ensure 905 POWER is OFF before removing jumper wires from missile simulators.		
	[Missile simulators] Jumper wires: Remove		

See pg 56 Sup 41



1. Status word is stored in DRO location 1777.

Figure 5-1. Continuity and Feedback Test Status Word

5-5. SPECIAL WEAPON CHECKS

5-5a. SPECIAL WEAPON ARM/DISARM CHECK. The purpose of this procedure is to ensure that the armament special weapon Arm/Disarm circuits will not apply damaging currents to the AIR-2A rocket.

EQUIPMENT REQUIRED	EQUIPMENT HOOKUP	PRELIMINARY PROCEDURE
486117 Armament Test Set	Connect rocket simulator in accordance with figure 5-2(A)	1. Table 1-1 2. Open armament bay doors in accordance with T.O. 1F-106A-2-12-2-1.

PROBABLE FAULTY UNIT

464

FUNCTIONAL DIAGRAM	REFERENCES	FAULT ISOLATION
Special Weapon Arm/Disarm (T.O. 27-5/Fig. 5-10)		None

NOTE

Ensure that AMCP ARMT PWR and RESET PWR fuses are installed.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY (Rocket Simulator) Circuit Breakers: UP	[Rocket Simulator] ARM FAILURE: OUT DISARM FAILURE: OUT DISARM MONITOR: ON	. . .
2	[Rocket Simulator] ARM FAILURE: Press and release DISARM FAILURE: Press and release.	[Rocket Simulator] ARM FAILURE: On when pressed. DISARM FAILURE: On when pressed	. . .
3	[NWW] DOOR CLOSED switch: Press to up (closed) and hold. [ACP] Selector: SPL WPN ARM-SAFE: ARM	[Rocket Simulator] ARM Received: Down (tripped) ARM Failure: Out DISARM FAILURE: Out DISARM MONITOR: Out	. . .
4	[ACP] Selector: VI ARM-SAFE: SAFE	[Rocket Simulator] DISARM Received: Down (tripped) ARM FAILURE: Out DISARM FAILURE: Out DISARM MONITOR: On	. . .
5	[LH Console] AIR-2A circuit breaker : Pull	[Rocket Simulator] DISARM Monitor: Out	. . .
6	[905] POWER: OFF (Rocket Simulator) Disconnect	Check complete	. . .

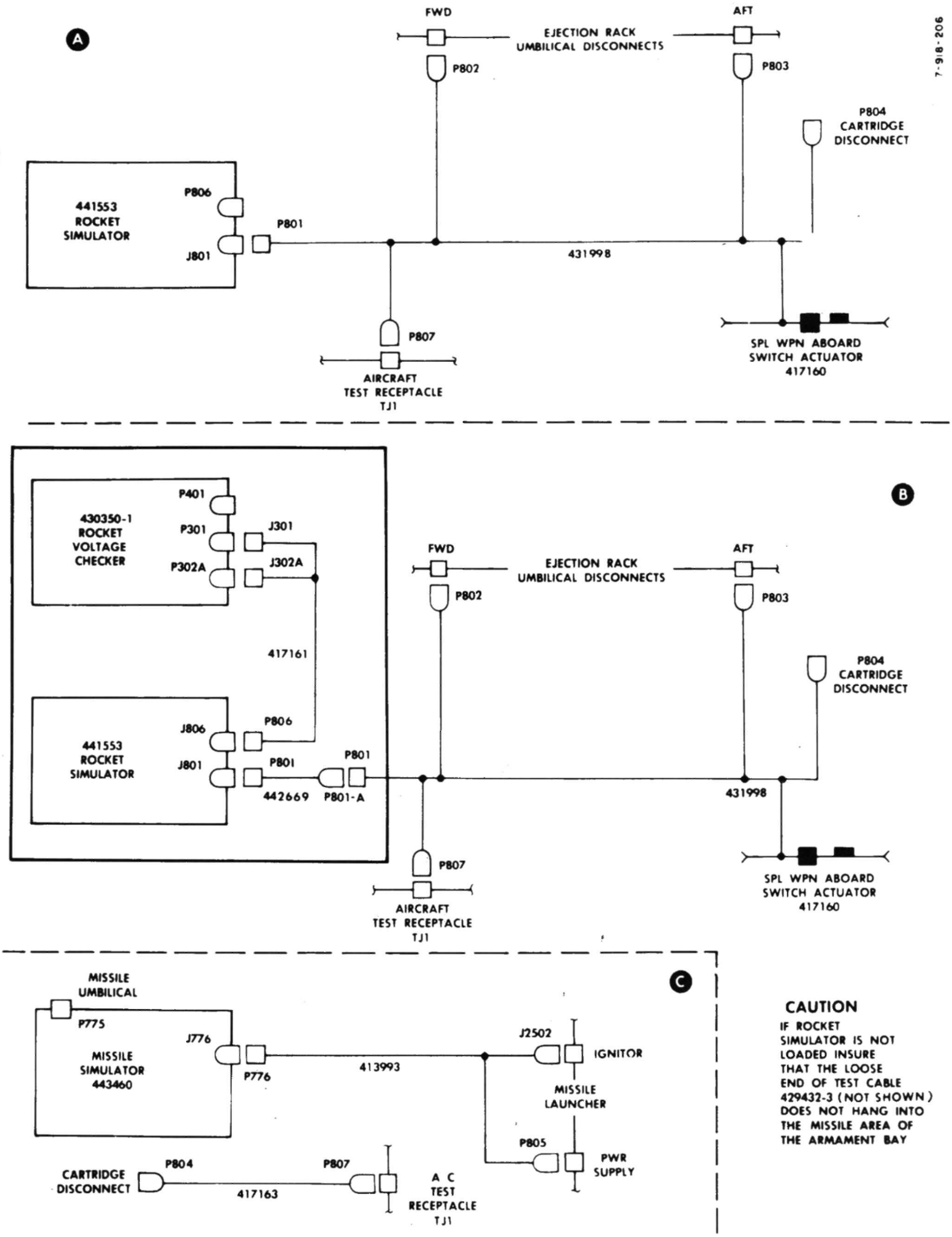


Figure 5-2. ATS Interconnection Diagram

STEP	INSTRUCTION	INDICATION	REMARKS
	NOTE If proceeding to para 5-5b, do not disconnect rocket simulator and rocket voltage checker or reinstall flight plug.		
10	[RVC] FUNCTION: 1 [796] SELECTOR TEST: 7, then OFF [ACP] Selector: VIS IDENT [905] POWER: OFF [Rocket simulator] Disconnect [Rocket voltage checker] Disconnect [Flight plug] Install	Check complete	. . .

5-5b. PURSUIT MODE CHECK. The purpose of this procedure is to ensure correct time of flight signals are provided with different altitudes selected by the ALTITUDE BAND SELECTOR.

EQUIPMENT REQUIRED

486117 Armament Test Set

EQUIPMENT HOOKUP

Connect rocket simulator and rocket voltage checker (RVC) iaw figure 5-2(B).

PRELIMINARY PROCEDURE

1. Table 1-1
2. Open armament bay doors and lower launchers iaw T.O. 1F-106A-2-12.

PROBABLE FAULTY UNIT

087
364

REFERENCES

FUNCTIONAL DIAGRAM

LC/PUR Switching (T.O. 27-5/Fig. 5-9)

FAULT ISOLATION

None

NOTE

Ensure that AMCP ARMT PWR and RESET PWR fuses are installed.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [083] Action switch: Press to 2nd detent and release [ACP] Selector: MISSILES ALL [796] SELECTOR TEST: 5 [596] TIMING PROG: MANUAL PURSUIT - LEAD COLL: PURSUIT	[596] SYSTEM TEST NO. 5: Comes on —— CONFIRM TO COMP: Comes on [063] PURSUIT: Comes on [080] Firing bar: Appears at 8200 yards	. . .
2	[596] A-NORMAL: A	[464] A: Comes on	. . .
3	[596] A'-NORMAL: A'	[464] A': Comes on —— UNIT TEST OK: Comes on	. . .
4	[596] A'-NORMAL: NORMAL	[464] UNIT TEST OK: Goes off	. . .
5	[596] B-NORMAL: B C-NORMAL: C	[464] UNIT TEST OK: Comes on [264] B: Comes on —— C: Comes on	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
6	[596] A-NORMAL: NORMAL B-NORMAL: NORMAL C-NORMAL: NORMAL TIMING PROG: NORMAL PURSUIT-LEAD COLL: LEAD COLL [796] SELECTOR TEST: 7, then OFF [ACP] Selector: VIS IDENT [NWW] Door closed switch: Press to up (closed) and hold [ACP] LOCK-UNLOCK: UNLOCK	[ACP] Special weapon annunciator: UNLOCK	Ensure that LH cockpit fuse panel SPL WPN RELEASE LOCK is installed
7	[ACP] Selector: SPL WPN ARM-SAFE: ARM	[ACP] SPL WPN ARMED: Comes on SELECT: OK [Rocket simulator] ARM RECEIVED: Down (tripped) —— ARM FAILURE: Off —— DISARM MONITOR: Off	. . .
8	[LH console] ALTITUDE BAND SELECTOR: +47 [083] RDR IR EXP-LC/PUR: Press to LC/PUR and release Trigger: Press to 2nd detend and hold	[ACP] SPL WPN ARMED: on —— SELECT: OK [063] PURSUIT: On [596] CONFIRM TO COMP: On —— B: On [264] B: On [080] Firing bar: Appears [Rocket simulator] FILAMENT A: Comes on Filament B: Comes on	Ensure that NWW ANGLE OF ATTACK 5A fuse is installed
9	[083] Trigger: Release [RVC] TIME OF FLIGHT: OFF FUNCTION: 2	[RVC] Meter: Indicates within center 1/3 of green scale	. . .
10	[RVC] FUNCTION: 6 PRESS TO ZERO ADJ: Press and hold ZERO ADJ: Adjust to obtain indication	[RVC] Meter: Indicates exactly at center of yellow scale	. . .
11	[RVC] PRESS TO ZERO ADJ: Release TIME OF FLIGHT: 7	[RVC] Meter: Indicates within yellow scale	. . .
12	[LH console] ALTITUDE BAND SELECTOR: 36-47 [RVC] TIME OF FLIGHT: 6	[RVC] Meter: Indicates within yellow scale	As ALTITUDE BAND SELECTOR position is changed, RVC meter should indicate off scale (pegged)
13	[LH console] ALTITUDE BAND SELECTOR: 18-36 [RVC] TIME OF FLIGHT: 2	[RVC] Meter: Indicates within yellow scale	. . .
14	[LH console] ALTITUDE BAND SELECTOR: 0-18 [RVC] TIME OF FLIGHT: 1	[RVC] Meter: Indicates within yellow scale	. . .
15	[ACP] ARM-SAFE: SAFE	[ACP] SPL WPN ARMED: Goes off	. . .
16	[LH console] ALTITUDE BAND SELECTOR: OFF [ACP] Selector: VIS IDENT	[ACP] SELECT: Blank	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
17	[RVC] TIME OF FLIGHT: OFF FUNCTION: 1 [ACP] LOCK-UNLOCK: LOCK [NWW] Door closed switch: Release [083] RDR IR EXP-LC/PUR: Press to LC/PUR and release [905] POWER: OFF [Rocket simulator] Disconnect [Rocket voltage checker] Disconnect [Flight plug] Install	Check complete	. . .

5-5c. SPECIAL WEAPON FIRING, CVAC POWER CHECK. The purpose of this procedure is to ensure that the special weapon can be properly launched if MA-1 power is not available.

EQUIPMENT REQUIRED

McDonnell Simulator Recorder (MSR)

EQUIPMENT HOOKUP

Install MSR iaw T.O. 1F-106A-2-12

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

087

REFERENCES

FUNCTIONAL DIAGRAM

Rocket Optics (T.O. 27-5/Fig. 5-11)

FAULT ISOLATION

Door Operation, Special Weapon Selection (T.O. 27-3/Fig. 5-1)

NOTE

Ensure that AMCP ARMT PWR and RESET PWR fuses are installed.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[NWW] Door closed switch: Press to up (closed) and hold **[905] Power: EMER** **[ACP] Selector: SPL WPN** **ARM-SAFE: ARM** **LOCK-UNLOCK: UNLOCK** **[LH console]** **ALTITUDE BAND SELECTOR: Any position other than OFF** **Reset AIR-2A circuit breaker** [083] Trigger: Press to 2nd detend and hold, wait until armament bay doors close, then release [NWW] Door closed switch: Release after armament bay doors close	[MSR Analyzer] NO FAULT: ON TIME OF FLIGHT: Dependent on ALTITUDE BAND SELECTOR IAW Table 5-2.	Refer to table 5-3 for MSR light numbers and signal names
2	**[LH console]** **ALTITUDE BAND SELECTOR: OFF** **Pull AIR-2A circuit breaker** [ACP] Selector: VIS IDENT ARM-SAFE: SAFE LOCK-UNLOCK: LOCK [905] POWER: OFF	Check complete	. . .

Table 5-2. Manual MSR Time of Flights

ALTITUDE BAND SELECTOR Position	MSR Analyzer, TIME OF FLIGHT
0-18	6 to 8
18-36	16 to 18
36-47	52 to 54
+47	60 to 62

Table 5-3. Deleted

5-5d. MSR CHECK. The purpose of this procedure is to verify that the special weapon circuits perform correctly under conditions which duplicate the airborne test environment.

EQUIPMENT REQUIRED

1. McDonnell Simulator Recorder (MSR)
2. ATS plug

EQUIPMENT HOOKUP

1. Install MSR iaw T.O. 1F-106A-2-12
2. Remove flight plug (RH armament bay) and install ATS plug.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

087 464
264 496
364

REFERENCES

FUNCTIONAL DIAGRAM

1. Special Weapon Arm/Disarm (T.O. 27-5/Fig. 5-10)
2. Thermal Battery M_t (T.O. 27-5/Fig. 5-12)
3. Eject F1 and F2 (T.O. 27-5/Fig. 5-13)
4. T_f and T_f Power Supply (T.O. 27-5/Fig. 5-14)

FAULT ISOLATION

1. Door Operation, Special Weapon Selection (T.O. 27-3/Fig. 5-1)
2. Special Weapon Arming (T.O. 27-3/Fig. 5-4)
3. Misfire Occured During Special Weapon Firing (T.O. 27-3/Fig. 5-5)

NOTE

Ensure that AMCP ARMT PWR and RESET PWR fuses are installed.

WARNING

Before operating armament bay doors, ensure that armament bay area is clear and post personnel to warn others that doors are to be operated.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [596] TEST SELECTOR: AATS [796] SELECTOR TEST: 6 [ACP] Selector: SPL WPN ARM-SAFE: ARM LOCK-UNLOCK: UNLOCK **[LH console]** **Reset AIR-2A circuit breaker** [NWW] Door closed switch: Press to up (closed) and hold	[080] VI WARN: Comes on [ACP] SPL WPN ARMED: Comes on	If VI WARN is flashing see table 2-6.1 for incorrect switch position
	NOTE Additional MSR times of flight can be checked by performing para. 5-5e.		
2	[796] GND TEST INTER: Press and release [083] Action switch: Press to 2nd detent, position range gate to approx 16 miles, and release action switch Trigger: Press to 2nd detent and hold until armament bay doors close, then release [NWW] Door closed switch: Release after armament bay door close	[080] VI WARN: Goes off —— Time-to-go circle: Appears, shrinks to zero, and is replaced by pullout "8" [Armament bay] Doors: Open, then close **[MSR Analyzer]** **NO FAULT: ON** **TIME OF FLIGHT: 90 to 92**	
3	[ACP] ARM-SAFE: SAFE LOCK-UNLOCK: LOCK Selector: VIS IDENT **[LH console]** **Pull AIR-2A circuit breaker** [796] SELECTOR TEST: 7, then OFF [905] POWER: OFF [596] TEST SELECTOR: OPEN LOOP [ATS plug] Remove [Flight plug] Install [MSR] Remove iaw T.O. 1F-106A-2-12	Check complete	. . .

5-5e. MSR TIME OF FLIGHT CHECK. The purpose of this procedure is to check all possible MSR times of flight by utilizing different settings of the 140 DIGITAL INPUT SWITCHES.

WARNING

Before operating armament bay doors, ensure that armament bay area is clear and post personnel to warn others that doors are to be operated.

EQUIPMENT REQUIRED

1. McDonnell Simulator Recorder (MSR)
2. ATS plug

EQUIPMENT HOOKUP

1. Install MSR iaw T.O. 1F-106A-2-12
2. Remove flight plug (RH armament bay) and install ATS plug.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

087 364
140 596

REFERENCES

FUNCTIONAL DIAGRAM

1. T_f and T_f Power Supply (T.O. 27-5/Fig. 5-14)
2. Parameters and CCM (T.O. 27-5/Fig. 5-20)

FAULT ISOLATION

1. WSEM Parameters Operation (T.O. 27-3/Fig. 2-4)
2. MSR Time of Flight Indication (T.O. 27-3/Fig. 2-15)

NOTE

Ensure that AMCP ARMT PWR and RESET PWR fuses are installed.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [ACP] Selector: SPL WPN [796] SELECTOR TEST: 6 [083] Action switch: Press to 2nd detent and hold	[080] VI WARN: Comes on	If VI WARN is flashing, see table 2-6.1 for incorrect switch position
2	[796] GND TEST INTER: Press and release [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: Iaw table 5-4 DIGITAL INPUTS ENTER: Up (on)	[080] VI WARN: Goes off [596] COMPUTER PARAMETERS T1 thru T4: Iaw table 5-4 (a 1 indicates lamp on)	. . .
3	[596] TEST SELECTOR: AATS [ACP] ARM-SAFE: ARM LOCK-UNLOCK: UNLOCK **[LH console]** **Reset AIR-2A circuit breaker** [NWW] Door closed switch: Press to up (closed) and hold	[ACP] SPL WPN ARMED: Comes on	. . .
4	[083] Action switch: Position range gate to approx 16 miles, and release action switch Trigger: Press to 2nd detent and hold until armament bay doors close, then release [NWW] Door closed switch: Release after armament bay doors close	[080] Time-to-go circle: Appears, shrinks to zero, and is replaced by pullout "8" [Armament bay] Doors: Open, then close **[MSR Analyzer]** **NO FAULT: ON** **TIME OF FLIGHT: IAW Table 5-4.**	Refer to table 5-3 for MSR light numbers and signal names
5	[ACP] ARM-SAFE: SAFE LOCK-UNLOCK: LOCK Selector: VIS IDENT **[LH console]** **Pull AIR-2A circuit breaker** [796] SELECTOR TEST: 7, then OFF [905] POWER: OFF [596] TEST SELECTOR: OPEN LOOP [ATS plug] Remove [Flight plug] Install [MSR] Remove iaw T.O. 1F-106A-2-12	Check complete	. . .

5-6. SALVO CHECK

The purpose of this procedure is to ensure that the armament bay doors and launcher systems are operational.

EQUIPMENT REQUIRED
None

EQUIPMENT HOOKUP
None

PRELIMINARY PROCEDURE
None

PROBABLE FAULTY UNIT
Refer to T.O. 1F-106A-2-12

FUNCTIONAL DIAGRAM

Salvo (T.O. 27-5/Fig. 5-8)

REFERENCES

FAULT ISOLATION

1. Door Operation, Special Weapon Selection (T.O. 27-3/Fig. 5-1)
2. Door Operation, Missile Selection (T.O. 27-3/Fig. 5-2)

WARNING

Before operating armament bay doors and launchers, ensure that armament bay area is clear and post personnel to warn others that doors are to be operated.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[NWW] Door closed switch: Press to up (closed) and hold [ACP] Selector: VIS Ident [LH Console] Armament RECYCLE: Press for 5 seconds then release	[Armament bay] Doors: Open —— Aft launchers: Extend and retract —— Fwd launchers: Extend and retract —— Doors: Close	. . .
2	[ACP] Selector: VIS IDENT, to SALVO [ACP] ARM SAFE: ARM [083] Trigger: Press to 1st detent and hold	[Armament bay] Doors: Open —— Aft launchers: Extend (only if MB-1 rack is not loaded).	. . .
3	[083] Trigger: Press to 2nd detent and hold	[MWP] Door OPEN light: ON [MWP] Missfire Light: Flashes on then off [Armament bay] Aft launchers: Retract Fwd launchers: Extend [MWP] Missfire light: Flashes on then off [Armament bay] Fwd launchers: Retract Doors: Close [MWP] Door OPEN light: OFF	. . .
4	[083] Trigger: Release [ACP] Arm-Safe: SAFE [ACP] Selector: VIS Ident [LH Console] Armament recycle: Press for 5 seconds and release [NWW] Door Close Switch: Release	Check Complete	. . .

Table 5-4. Time of Flight/Tau Parameter Indications

140 DIGITAL INPUTS SWITCHES	MSR TIME OF FLIGHT	596 COMPUTER PARAMETERS			
		T4	T3	T2	T1
760	6 to 8	1	1	1	1
761	16 to 18	1	1	1	0
762	25 to 27	1	1	0	1
763	34 to 36	1	1	0	0
764	43 to 45	1	0	1	1
765	52 to 54	1	0	1	0
766	60 to 62	1	0	0	1
767	68 to 70	1	0	0	0
770	76 to 78	0	1	1	1
771	83 to 85	0	1	1	0
772	90 to 92	0	1	0	1
773	97 to 99	0	1	0	0
774	104 to 106	0	0	1	1
775	111 to 113	0	0	1	0
776	118 to 120	0	0	0	1
777	125 to 127	0	0	0	0

CHAPTER 6. COMPUTER SUBSYSTEM

SECTION I. GENERAL

6-1. INTRODUCTION.

6-1a. This chapter contains check procedures for the computer subsystem. These procedures are computer routines which check the computer as well as other subsystem components. These procedures are performed after a unit has been replaced or when a malfunction is suspected.

6-1b. Each procedure provides the purpose of the procedure, equipment required, equipment hookup, preliminary procedure, probable faulty unit, and references to functional diagrams and fault isolation procedures.

6-2. TEST CONSIDERATIONS.

NOTE

Wherever the 080 unit panel controls are indicated, they now apply to the 080 unit, 52800 unit (ODU), or the Filter and Control Assembly and Information panel, depending upon the system configuration.

6-2a. The purpose of the procedures in this chapter is to provide for checking of the computer subsystem. To verify proper computer subsystem operation, prescribed computer routines are performed.

CAUTION

Use the lowest setting of the 080 ATTACK INTENSITY control required to obtain a minimum acceptable viewing level while observing the attack display. Excessive attack intensity will cause damage to the MMST.

NOTE

The 080 ON and OFF switches are bypassed when the aircraft canopy is closed or when the canopy lock lever (F-106A only) is in the locked position.

6-2b. When the 080 displays are required, the 080 must be turned on by pressing and releasing the 080 ON switch. After a 35 ±10 second time-in period the 080 will present the search display. If the attack display is also desired, press and hold the 080 ON switch for at least 3 seconds. The attack display turns off automatically after a 3 ±1 minute interval. To obtain another interval, the 080 ON switch must be pressed and held for at least 3 seconds.

6-2c. All 846 DISPLAY REGISTER lights indications are octal unless otherwise indicated.

6-3. CHECKS AFTER UNIT REPLACEMENT.

6-3a. Replacement or reinstallation of certain units requires performance of check procedures described in this chapter. Due to interaction between units, it may be necessary to perform a number of check procedures when only one unit has been replaced.

6-3b. Refer to table 6-1 whenever a unit of the computer subsystem is replaced to determine which checks are required.

Table 6-1. Checks After Unit Replacement

COMPUTER ROUTINE	PARA NO.	140	526	846	857	COMPUTER ROUTINE	PARA NO.	140	526	846	857
Load Channel 8	6-4			X	X	TL Routine	6-16			X	
Computer Voltage Check	6-5		X			TD Routine	6-17	X		X	X
Barometer Setting Control Check	6-6	X				TN Routine	6-18	X		X	X
						TV Routine	6-19	X		X	X
Air Data Computer and Cockpit Instrument Static Check	6-7	X				TH Routine	6-20			X	
						LA Routine	6-24	X		X	X
TF Routine	6-8	X		X	X	LWR Routine	6-27	X		X	X
TR Routine	6-9	X		X	X	LQ Routine	6-30	X		X	
TG Routine	6-10	X		X	X	LE-1 Routine	6-31	X			
TC Routine	6-11	X		X	X	LE-2 Routine	6-31.1	X			
TS Routine	6-12			X	X	LE-3 Routine	6-32	X		X	
TM Routine	6-13				X	LP Routine	6-37	X			
TA Routine	6-14	X		X	X	Pursuit Firing Bar Check	3-17b	X			
TP Routine	6-15	X									

SECTION II. CHECKS

6-4. LOAD CHANNEL 8.

It is necessary to load channel 8 from the 857 unit into DRO in order to run any of the test routines.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

846

857

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [846] RUN-STOP: STOP TEST-NORMAL: TEST DISPLAY REGISTER switch: ON [857] TEST PROGRAM TRANSFER: Press and release [846] RUN-STOP: RUN, then to STOP	[846] DISPLAY REGISTER lights: 000001	. . .

6-5. COMPUTER VOLTAGE CHECK.

The purpose of this procedure is to ensure that the voltages generated by the 526 unit are of the proper amplitude and that the noise level of each voltage is within tolerance. The noise voltage includes ripple noise, noise pick up (including spikes); and load modulation voltages.

EQUIPMENT REQUIRED

1. Digital multimeter
2. Oscilloscope
3. P410 probe

EQUIPMENT HOOKUP

Connect digital multimeter ground lead to 526 DC VOLTAGES RET. Set digital voltmeter to monitor DC voltages and oscilloscope to monitor noise level

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

526

REFERENCES

FUNCTIONAL DIAGRAM

Power Supply
(T.O. 27-5/Fig. 6-6)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [526] +25: Monitor using digital multimeter	[Digital multimeter] Voltage: +23.75 to +26.25 v	It takes approx 3.5 minutes for system to time in
2	[526] -25: Monitor using digital multimeter	[Digital multimeter] Voltage: -23.75 to -26.25 v	. . .
3	[526] +16: Monitor using digital multimeter	[Digital multimeter] Voltage: +15.2 to +16.8 v	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
4	[526] -16: Monitor using digital multimeter	[Digital multimeter] Voltage: -15.2 to -16.8 v	. . .
5	[526] +12: Monitor using digital multimeter	[Digital multimeter] Voltage: +11.4 to +12.6 v	. . .
6	[526] -12: Monitor using digital multimeter	[Digital multimeter] Voltage: -11.4 to -12.6 v	. . .
7	[526] +8: Monitor using digital multimeter	[Digital multimeter] Voltage: +7.2 to +8.8 v	. . .
8	[526] -6: Monitor using digital multimeter	[Digital multimeter] Voltage: -5.4 to -6.6 v	. . .
9	[526] +5: Monitor using digital multimeter	[Digital multimeter] Voltage: +4.5 to +5.5 v	. . .
10	**NOTE** Digital multimeter ground lead must be removed from 526 DC VOLTAGES RET.		
	[526] FLOATING +16 and FLOATING +16 RET: Monitor using digital multimeter	[Digital multimeter] Voltage: +15.2 to +16.8 v	. . .
11	[526] FLOATING +12 and FLOATING +12 RET: Monitor using digital multimeter	[Digital multimeter] Voltage: +11.4 to +12.6 v	. . .
12	[526] FLOATING +8 and FLOATING +8 RET: Monitor using digital multimeter	[Digital multimeter] Voltage: +8.0 to +9.9 v	. . .
13	**CAUTION** Do not connect 526 FLOATING +7 RET to 526 DC VOLTAGES RET.		
	[526] FLOATING +7 and FLOATING +7 RET: Monitor using digital multimeter	[Digital multimeter] Voltage: +6.3 to +7.7 v	. . .
14	[Digital multimeter] Disconnect [P410 probe] Ground lead: Connect to 526 DC VOLTAGES RET [526] +25: Monitor using oscilloscope	[Oscilloscope] Noise level: Less than 500 mvp-p —— Ripple level: Less than 200 mvp-p	. . .
15	[526] -25: Monitor using oscilloscope	[Oscilloscope] Noise level: Less than 500 mvp-p —— Ripple level: Less than 250 mvp-p	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
16	[526] +16: Monitor using oscilloscope	[Oscilloscope] Noise level: Less than 500 mvp-p —— Ripple level: Less than 80 mvp-p	. . .
17	[526] -16: Monitor using oscilloscope	[Oscilloscope] Noise level: Less than 500 mvp-p —— Ripple level: Less than 120 mvp-p	. . .
18	[526] +12: Monitor using oscilloscope	[Oscilloscope] Noise level: Less than 500 mvp-p —— Ripple level: Less than 80 mvp-p	. . .
19	[526] -12: Monitor using oscilloscope	[Oscilloscope] Noise level: Less than 500 mvp-p —— Ripple level: Less than 80 mvp-p	. . .
20	[526] +8: Monitor using oscilloscope	[Oscilloscope] Noise level: Less than 500 mvp-p —— Ripple level: Less than 100 mvp-p	. . .
21	[526] -6: Monitor using oscilloscope	[Oscilloscope] Noise level: Less than 500 mvp-p —— Ripple level: Less than 45 mvp-p	. . .
22	[526] +5: Monitor using oscilloscope	[Oscilloscope] Noise level: Less than 500 mvp-p —— Ripple level: Less than 50 mvp-p	. . .
23	**NOTE** P410 probe ground lead must be removed from 526 DC VOLTAGES RET.		
	[526] FLOATING +16 and FLOATING +16 RET: Monitor using oscilloscope	[Oscilloscope] Noise level: Less than 500 mvp-p —— Ripple level: Less than 80 mvp-p	. . .
24	[526] FLOATING +12 and FLOATING +12 RET: Monitor using oscilloscope	[Oscilloscope] Noise level: Less than 750 mvp-p —— Ripple level: Less than 50 mvp-p	. . .
25	[526] FLOATING +8 and FLOATING +8 RET: Monitor using oscilloscope	[Oscilloscope] Noise level: Less than 750 mvp-p —— Ripple level: Less than 50 mvp-p	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
26	**CAUTION** Do not connect 526 FLOATING +7 RET to 526 DC VOLTAGES RET. [526] FLOATING +7 and FLOATING +7 RET: Monitor using oscilloscope	[Oscilloscope] Noise level: Less than 3000 mvp-p ___ Ripple level: Less than 150 mvp-p	. . .
27	[905] POWER: OFF [Oscilloscope] Disconnect	Check complete	. . .

6-6. BAROMETER SETTING CONTROL CHECK.

The purpose of this procedure is to check the barometer inputs to the computer with known barometric pressure inputs from the cockpit.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140
259
AVVI

REFERENCES

FUNCTIONAL DIAGRAM

Air Data/Cockpit
(T.O. 27-5/Fig. 8-3)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [846] START ADDRESS: 11 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 210 [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS ENTER: Up (on) ▯ [AVVI] BARO: 28.30 ○ [259] BARO. SET: 28.30	[846] DISPLAY REGISTER lights: +9.7 to +11.9 v (BCD)	. . .
2	▯ [AVVI] BARO: 29.50 ○ [259] BARO. SET: 29.50	[846] DISPLAY REGISTER lights: +48.4 to +50.6 v (BCD)	. . .
3	▯ [AVVI] BARO: 30.70 ○ [259] BARO. SET: 30.70	[846] DISPLAY REGISTER lights: +80.0 to +90.3 v (BCD)	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
4	**NOTE** If performing this procedure in an F-106B aircraft, transfer AFCS ILS AUTO NAV function to rear cockpit and repeat steps 1, 2, and 3.		
	[846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUT ENTER: Down (off) [905] POWER: OFF ▯ [AVVI] BARO: 29.92 ○ [259] BARO. SET: 29.92	Check complete	. . .

6-7. AIR DATA COMPUTER AND COCKPIT INSTRUMENT STATIC CHECK. The purpose of this procedure is to ensure that cockpit instrument indications are correct with known inputs.

EQUIPMENT REQUIRED

TTU-205

EQUIPMENT HOOKUP

Prepare the TTU-205 for operation as follows:

1. Attach cable assembly 609551-1 between TTU-205 J2 and CPU111J4.
2. Remove the covers from P_s and P_t ports on test set and attach appropriately marked pressure hoses (normally stored in cover of test set) to these ports.
3. Attach the free ends of the TTU-205 test set hoses to the respective P_s and P_t ports on the CPU-111.

CAUTION

Do not apply power to the test set unless there is a pressure load securely connected to the P_s and P_t ports. Allowing the test set to operate with one or both lines open could result in possible overpressure of the unit.

4. Attach FDT angle of attack vane in accordance with T.O. 1F-106A-2-27-7 (calibrate position).
5. Perform TTU-205 preliminary set up procedure, paragraph 11-19.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140

CPU-111

FUNCTIONAL DIAGRAM

Air Data/Cockpit (T.O. 27-5/ Fig. 8-3)

REFERENCES

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[TTU-205] ALTITUDE COUNTER: 3,010 ft AIRSPEED COUNTER: 220 knots TEMPERATURE POT.: 53.0 ohms [405] PRESET: 1 [846] RUN-STOP: STOP START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 503 [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS ENTER: (on) **NOTE** For F-106B aircraft, perform adjustments in both forward and rear cockpits. ☐ [AVVI] BARO: Adjust to obtain indication ○ [Altimeter] Barometric pressure control: Adjust to obtain indication	[846] DISPLAY REGISTER LIGHTS: $(000077)_8$ [Cockpit] Instruments: as indicated in Table 6-2. ☐ [AVVI] Barometric pressure indicator: 29.92 ○ [Altimeter] Barometric pressure indicator: 29.92	A failure is indicated by a light off. Bit 6 will be on if the test has been run.
2	[TTU-205] Tests 2 thru 9: Adjust in accordance with Table 6-2. [405] Tests 2 thru 9: Set in accordance with Table 6-2	[846] DISPLAY REGISTER LIGHTS: $(000077)_8$ [Cockpit] Instruments: as indicated in Table 6-2	. . .
3	[TTU-205] Follow turn off procedure paragraph 11-19 Hoses and cables: Disconnect [140] DIGITAL DISPLAY: Normal [846] TEST-NORMAL: Normal	. . .	. . .

6-8. TF ROUTINE.

The TF routine is run as part of SSGC 1. The routine is a combination of the TC, TM, TA, TN, and TV routines and takes approximately 45 seconds to complete. When the TF routine is run, it performs a check of the 140, 846, and 857 units. There are no provisions to run the TF routine from the computer compartment. If the TF routine fails, refer to T.O. 1F-106A-2-27-3, figure 6-3 for fault isolation procedures.

6-9. TR ROUTINE.

The TR is a manual routine used for separate display of the following on the 846 DISPLAY REGISTER: a location in the 846 DRO section, a location in the 857 unit, analog inputs, analog outputs, or digital inputs.

NOTE

The TR routine is entered from the following L routine and SSGC's.
SSGC 1 after first 45 seconds
SSGC 2 except during display of results at completion
SSGC 3-7
LB, LC, LE-1, LE-2, LQ, LS-2, LSA, and LZ.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140
846
857

REFERENCES

FUNCTIONAL DIAGRAM

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

None

NOTE

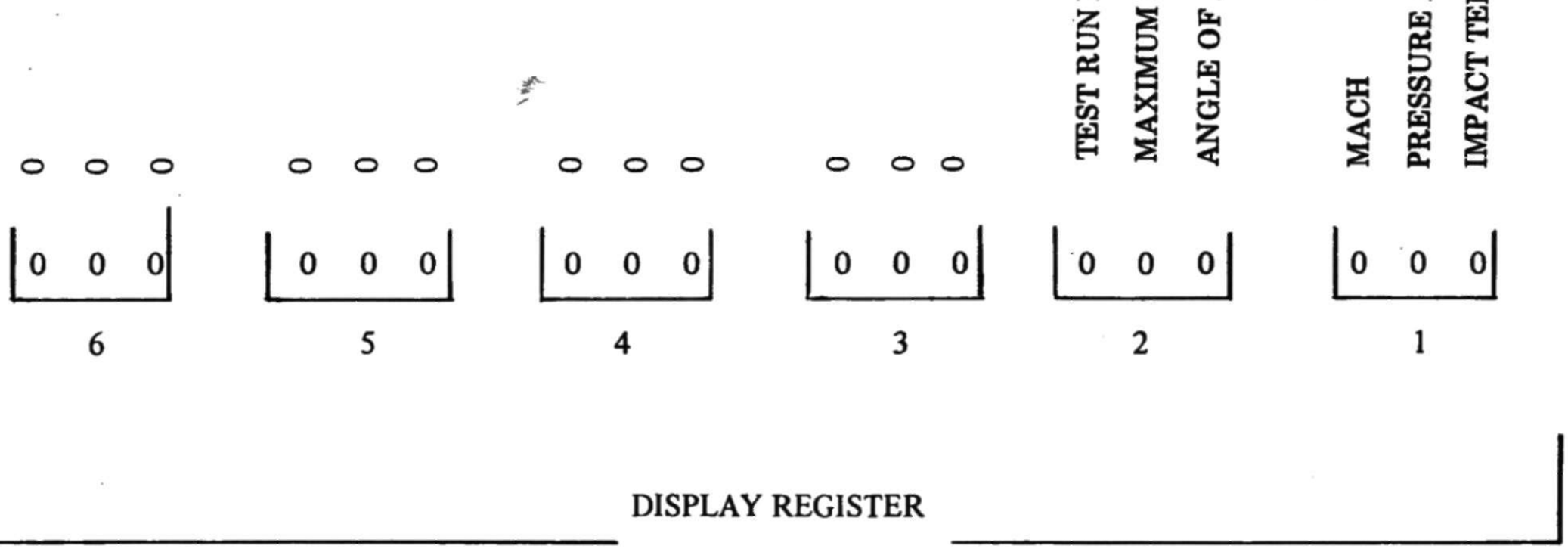
The digital voltmeter capability of the digital computer is initiated by the TR routine. The analog inputs can be measured by performing step 1, analog outputs and 846 DRO locations can be measured by performing step 2 and 13 bit digital inputs can be measured by performing step 3. The state of the digital inputs can be displayed by performing step 4. The tactical TR routine is performed by setting the 140 DIGITAL INPUTS and DIGITAL INPUTS ENTER as indicated in steps 1 thru 4. Do not load channel 8. Set 846 DISPLAY REGISTER switch ON. The voltage sign and magnitude of the function selected is displayed in BCD form on the 846 DISPLAY REGISTER.

Table 6-2. Cockpit Instrument Check

TEST	[405] PRESET TACON CHAN-NEL	TTU-205 CONTROL SETTINGS			[846] DISPLAY REGISTER LAMPS ON	ARDC AND INTEGRATED COCKPIT INSTRUMENT INDICATIONS[1]				
		ALTITUDE COUNTER (FT)	AIR SPEED COUNTER (KNOTS)	TEMP. POT. (OHMS)		MACH	MSM[2]	IAS (KNOTS)	ALTITUDE (FEET X 1,000)	
									SENSITIVE	GROSS
1	1	3,010	220	53.0	$(000077)_8$	0.331-0.371	(1.156-1.220)	206.0-234.0	2.83-3.17	2.3-3.7
2	2	3,030	340	55,0	$(000077)_8$	0.524-0.562	(1.156 1.220)	327.0-353.0	2.86-3.20	2.3-3.7
3	3	3,090	525	60.0	$(000077)_8$	0.815-0.855	(1.157-1.221)	513.0-537.0	2.92-3.26	2.6 3.8
4	4	30,030	220	45.0	$(000077)_8$	0.573-0.617	(1.826-1.906)	206.0-236.0	29.83-30.23	29.3-30.7
5	5	30,090	340	48.0	$(000077)_8$	0.868-0.910	(1.858-1.946)	327.0-355.0	29.89-30.29	29.4-30.8
6	6	30,190	525	58.0	$(000077)_8$	1.279-1.349	(1.816-1.896	514.0-538.0	29.99-30.39	29.5 30.9
7	7	50,090	220	46.0	$(000077)_8$	0.878-0.936	(1.970-2.052)	207.0-235.0	49.65-50.43	49.3-50.9
8	8	50,180	340	50.0	$(000077)_8$	1.274-1.348	(2.117-2.207)	327.0-355.0	49.84-50.52	49.4-51.0
9	9	50,470	525	75.0	$(000077)_8$	1.957-2.039	1.911-2.001)	514.0-538	50.13-50.81	50.13-50.81

[1] Instrument indications related to air data inputs. Tolerances include input, system and instrument. Indications and tolerances are not those of the digital computer LH routine.

[2] Due to indicator mechanical limits in ARDC cockpit instruments, MSM will indicate off scale unless MSM value is less than ±0.2 different than Mach value. Indication will be on scale for Test 9 only. Values in parenthesis are included for fault-isolation reference only and 880 unit (round instrument) indications.



NOTES:

1. Display is meaningful only after the TTU-205 ALTITUDE and AIRSPEED COUNTERS have stabilized.

2. 846 DISPLAY REGISTER light on indicates pass, flashing indicates failure. (Disregard lamps 2 and 3)

3. **Lamps 10 through 1 on indicates that a TACAN selector switch position other than 1 through 9 has been selected.**

Figure 6-1. LH Display (static)

All data on page 6-10 deleted.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS ENTER: Down (off) [846] START ADDRESS: 11 ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS: 2XX (where X's indicate octal address of a-c or d-c analog input as selected from table 6-3 or 6-4) DIGITAL INPUTS ENTER: Up (on)	[846] DISPLAY REGISTER lights: Voltage magnitude of selected function	Measures analog inputs. Various analog inputs can be displayed by changing settings of 140 DIGITAL INPUTS to corresponding voltage function
2	[Computer] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS ENTER: Down (off) [846] START ADDRESS: 11 ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS: 0XX/5XX DIGITAL INPUTS ENTER: Up (on), then down (off) DIGITAL INPUTS: 4YY (where X's indicate the two most significant digits and Y's indicate the two least significant digits in the octal address as selected from table 6-5 or 6-7.1) DIGITAL INPUTS ENTER: Up (on)	[846] DISPLAY REGISTER lights: Voltage magnitude of selected function	Additional analog outputs can be displayed by setting 140 DIGITAL INPUTS to new 4YY setting. If 140 DIGITAL INPUTS is set to 0XX, the 846 DISPLAY REGISTER lights will show the BCD value of the voltage magnitude. If set to 5XX the display will be in binary value.
3	[Computer] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS ENTER: Down (off) [846] START ADDRESS: 11 ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS: 1XX (where X's indicate the octal address as selected from table 6-6) DIGITAL INPUTS ENTER: Up (on), if necessary	[846] DISPLAY REGISTER lights: Voltage magnitude of selected function (disregard bits other than 2 thru 14)	Additional 13 bit digital input can be displayed by changing settings of 140 DIGITAL INPUTS to corresponding voltage function. For a description of the display, refer to para 6-42.
4	[Computer] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS ENTER: Down (off) [846] START ADDRESS: 11 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: State of digital inputs iaw table 6-7. A lighted bit indicates digital input is high	Additional digital inputs can be displayed by changing settings of 140 DIGITAL INPUTS. 140 DIGITAL INPUTS ENTER does not have to be changed.

STEP	INSTRUCTION	INDICATION	REMARKS
4 (cont)	[140] DIGITAL INPUTS: 1XX (where X's indicate the address of the single or multiple bit digital input iaw table 6-7) DIGITAL INPUTS ENTER: Up (on)		
5	[Computer] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: NORMAL [846] START ADDRESS: 10 ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL DISPLAY: DIGITAL OUTPUT: Groups 1, 2, 3, 4 or 5 as required	[846] DISPLAY REGISTER lights: State of digital outputs iaw table 6-9. A lighted bit indicates digital output is high	Use table 6-9 only for location of digital outputs
6	[140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS ENTER: Down (off) DIGITAL INPUTS: 000 DISPLAY REGISTER switch: OFF [846] START ADDRESS: 00 TEST-NORMAL: NORMAL [905] POWER: OFF	Routine complete	. . .

Table 6-3. AC Analog Inputs

SYSTEM DESIGNATION	OCTAL ADDRESS	NOMENCLATURE	PHYSICAL RANGE VOLTAGE RANGE
E15A	51	Sine of Radar Azimuth Angle	-1 to +1 (See para. 4.4.7, T.O. 1F-106A-8-1)
*E15N	41	Delta D	-32.143 to +32.143 mrad/second -5 to +5 Vdc
*E16A	52	ILS Heading Error/Missile Antenna Driver Test	-1 to +1 -5 to +5 Vdc
*E16N	42	Delta E	-32.143 to +32.143 Mrad/Second -5 to +5 Vdc
E17A	53	Sine of Radar Elevation Angle	-1 to +1 (See para. 4.4.7, T.O. 1F-106A-8-1)
*E18A	54	Roll Rate	-50 to +50 Degrees/Second -5 to +5 Vdc
E19	45	Sine of Interceptor Pitch Angle	-0.99389 to +0.99389 -56.12 to +56.12 Vac
*E20	46	Lift Acceleration	+5 to -5 g -5 to +5 Vdc
E21	47	Sine of Interceptor Roll Angle	-0.99389 to +0.99389 -56.12 to +56.12 Vac
E22	40	Cosine of Interceptor Roll Angle	0 to +0.99389 0 to +56.12
E23	43	Sine of Interceptor Heading Angle	-0.99389 to +0.99389 -56.12 to +56.12 Vac
E24	44	Cosine of Interceptor Heading Angle	-0.99389 to +0.99389 -56.12 to +56.12 Vac

*The decimal point is located between bits 9 and 10 when observing these inputs instead of between bits 5 and 6.

SYSTEM DESIGNATION	OCTAL ADDRESS	NOMENCLATURE	PHYSICAL RANGE VOLTAGE RANGE
*E25	50	Pitch Rate	-15 to +15 Degrees/Second -5 to +5 Vdc
*E26	55	Propellant Temperature	-20 to +140 Degrees F, Non-Linear -4.06 to -5.00 Vdc
P50 P51	56	115V, 1600 Hz Amplitude Test	
P51	57	115V, 400 Hz Amplitude Test	
P52	60	+300 VDC Amplitude Test	
P53	61	+150 VDC Amplitude Test	
P54	62	-250 VDC Amplitude Test	
P55	63	-140 VDC Amplitude Test	
P56	64	+300 VDC Noise Test	
P57	65	+150 VDC Noise Test	
P58	66	-250 VDC Noise Test	
P59	67	-140 VDC Noise Test	

Table 6-4. DC Analog Inputs

SYSTEM DESIGNATION	OCTAL ADDRESS	NOMENCLATURE	PHYSICAL RANGE VOLTAGE RANGE
A1N	1	Lift Acceleration (ASIP)	-5 to +7g 0 to 100 Vdc
A2A	12	Spare	0 to 100 Vdc
A2N	2	AHRG Test Parameter A	0 to 100 Vdc 50 Vdc nominal zero
A3A	13	Missile Potentiometer Excitation	48 to 52 Vdc 48 to 52 Vdc
A3N	3	Maximum Safe Mach	0.95 to 2.20 Mach 0 to 100 Vdc
A4	26	Missile 2 Position (Pitch)	-50 to +50 Degrees 0 to 50 Vdc
A5A	15	Space Stabilized Radar Elevation Angle	
A6N	10	Sea Level Pressure	28 to 31 Inches Hg 0 to 100 Vdc
A7	27	Missile 2 Position (Yaw)	-50 to +50 Degrees 0 to 50 Vdc
A8	6	Missile 3 Position (Pitch)	-50 to +50 Degrees 0 to 50 Vdc
A9	21	Interceptor Angle of Attack	0 to 0.43633 Radians 0 to 100 Vdc
A10	22	Impact Temperature	365.4 to 779.4 Degrees, Rankine 0 to 100 Vdc
A11	23	Glide Slope Degrees	-0.833 to 0.833 Degrees 0 to 100 Vdc
A12	0	Differential Pressure (Test)	49 to 2600 lbs/it^2 0 to 50 Vdc

Table 6-4. DC Analog Inputs

SYSTEM DESIGNATION	OCTAL ADDRESS	NOMENCLATURE	PHYSICAL RANGE VOLTAGE RANGE
A13A	31	Space Stabilized Radar Azimuth Angle	+1.5708 to -1.5708 Radians 0 to 100 Vdc
A14	7	Missile 3 Position (Yaw)	-50 to +50 Degrees 0 to 50 Vdc
A15	17	Missile 4 Position (Yaw)	-50 to +50 Degrees 0 to 50 Vdc
A16	4	Pilot Warn Altitude	0 to 20,000 ft.
A17	5	AHRG Test Parameter B	0 to 100 Vdc 50 Vdc nominal zero
A18	11	Spare	0 to 100 Vdc
A19	30	Spare	0 to 100 Vdc
A20	20	DVM	0 to 100 Vdc 0 to 100 Vdc
A21	24	Left Elevon Position	+33.5 to -16.5 Degrees 0 to 100 Vdc
A22	25	Right Elevon Position	+33.5 to - 16.5 Degrees 0 to 100 Vdc
A23	33	Self Test (High Standard)	
A24	34	Self Test (Low Standard)	
A25	14	Self Test (Analog Output)	0 - 100 Vdc 0 - 100 Vdc
A26	16	Missile 4 Position (Pitch)	-50 to +50 Degrees 0 to 50 Vdc
A27	32	+28 VDC Power Supply Amplitude Test	0 - 100 Vdc 0 - 100 Vdc
A28	35	Localizer Degrees	-4.166 to +4.166 Degrees 0 - 100 Vdc
A29	36	Missile 1 Position (Pitch)	-50 to +50 Degrees 0 to 50 Vdc
A30	37	Missile 1 Position (Yaw)	-50 to +50 Degrees 0 to 50 Vdc

Table 6-5. Analog Outputs

SYSTEM DESIGNATION	OCTAL ADDRESS	NOMENCLATURE
A51A	3711	Attack Program Sequence
A51N	3701	Sine of Command Heading Error
A52A	3712	Computed Antenna Elevation Rate
A52N	3702	Target Position (Y)
A53A	3713	Time Circle Size
A53N	3703	Target Position (X)
A54A	3714	Computed Antenna Elevation Rate
A54N	3704	Left Elevon Command
A55A	3715	Computed Antenna Azimuth Rate
A55N	3705	Right Elevon Command

Table 6-5. Analog Outputs (Cont)

SYSTEM DESIGNATION	OCTAL ADDRESS	NOMENCLATURE
A56A	3740	Horizontal Steering Dot
A56N	3734	Command Altitude
A57	3735	Horizontal Reference Circle
A58	3720	Vertical Reference Circle/Target Bearing
A59A	3731	Sine Latitude
A59N	3721	Cosine of Command Heading Error
A60A	3710	Computed Antenna Azimuth Rate
A60N	3700	Interceptor Position (X)
A61	3723	Target Range/Firing Bar Range
A62	3724	Target Elevation Angle
A63N	3725	Target Altitude
A64N	3742	Target Heading
A65N	3743	Command Mach
A66N	3722	Interceptor Position (Y)
A67	3741	Vertical Steering Dot
A68	3730	Spare
A69	3732	Spare
A70	3733	Missile 1 Drive (Pitch)
A71	3706	Missile 1 Drive (Yaw)
A72	3707	Missile 3 Drive (Pitch)
A73	3736	Missile 3 Drive (Yaw)
A74	3737	Missile 2 Drive (Pitch)
A75	3716	Missile 4 Drive (Yaw)
A76	3717	Missile 4 Drive (Pitch)
A77	3726	Missile 2 Drive (Yaw)
A78	3727	Spare
A79	3746	Spare
A80	3745	Spare
A81	3744	Self-Test

Table 6-6. 13-Bit Digital Inputs

SYSTEM DESIGNATION	OCTAL ADDRESS	NOMENCLATURE
D361 thru D373	56	Mach Digitizer
D381 thru D393	57	Altitude Digitizer

Table 6-7. Digital Inputs

SYSTEM DESIGNATION	OCTAL ADDRESS	BIT	NOMENCLATURE
D101	5	4	Trigger
D102	6	4	Auto Engage
D103	7	4	IR Track
D104	10	4	System Test C
D105	11	4	Not Search
D106	12	4	VI Selected
D107	13	4	System Test A
D108	14	4	TACAN Station Select
D109	5	3	AIM-4F Selected
D110	6	3	Gun Aboard
D111	7	3	Assist Engage
D112	10	3	Computer Interrogate
D113	11	3	ROT
D114	12	3	Manual Pursuit
D115	13	3	System Test B
D116	14	3	Homing Point
D117	5	2	Missiles All Selected
D118	6	2	COD 1 Snapshoot Mode
D119	7	2	Altitude Hold/ILS Valid
D120	10	2	COD 2 Snapshoot
D121	11	2	DROT
D122	12	2	Armed
D123	13	2	TACAN Reliable
D124	14	2	Data Link Station Select
D125	5	1	Confirm
D126	6	1	Nose
D127	7	1	Heading Hold
D128	10	1	Data Link Address Select
D129	11	1	ATOT
D130	12	1	Special Weapon Selected
D131	13	1	Computer Test
D132	14	1	AFCS Uncage
D133	0	4	Navigation Mode 1
D134	0	3	Navigation Mode 2
D135	0	2	Map Scale 1
D136	0	1	Map Scale 2
D137	1	4	Data Link Address Select
D138	1	3	Data Link Address Select
D139	1	2	Data Link Address Select
D140	1	1	Data Link Address Select
D141	2	4	AGE Operation Only
D142	2	3	Binary/BCD Display
D143	2	2	Spare
D144	2	1	Drum Pressure
D145	16	4	Trim Up
D146	16	3	Trim Down

Table 6-7. Digital Inputs (Cont)

SYSTEM DESIGNATION	OCTAL ADDRESS	BIT	NOMENCLATURE
D147	16	2	Trim Right
D148	16	1	Trim Left
D150	3	1	TACAN Station Select
D151	3	4	TACAN Station Select
D152	3	3	TACAN Station Select
D153	3	2	TACAN Station Select
D155	4	1	Data Link Station Select
D156	4	4	Data Link Station Select
D157	4	3	Data Link Station Select
D158	4	2	Data Link Station Select
D160 thru D163	3612 (DRO location)		TACAN Range
D160 thru D163	3613 (DRO location)		TACAN Bearing
D165	20	4	Self-Test (Digital Display Switch)
D166	20	3	Self-Test (Digital Display Switch)
D167	20	2	Self-Test (Digital Display Switch)
D168	20	1	Self-Test (Digital Display Switch)
D170	21	4	Self-Test (Digital Display Switch)
D171	21	3	Self-Test (Digital Display Switch)
D172	21	2	Self-Test (Digital Display Switch)
D173	21	1	Self-Test (Digital Display Switch)
D175	15	1	Homing Point Select
D176	15	4	Homing Point Select
D177	15	3	Homing Point Select
D178	15	2	Homing Point Select
D180	22	4	Self-Test (Display Lights On)
D181	22	3	Self-Test (Digital Display Switch)
D182	22	2	Self-Test (Digital Display Switch)
D183	22	1	Self-Test (Digital Display Switch)
D185	23	4	Tanks Installed
D186	23	3	Assist OK
D187	23	2	Chaff
D188	23	1	Gun Sight Selected (Snapshoot)

6-10. TG ROUTINE

The TG routine is a sequential combination of the TC, TS, TM, TA, TP, and TL routines. Fail halts to isolate to a specific routine are contained in table 6-8.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140
846
857

Table 6-7.1. Computer DRO Locations

DRO LOCATION	NOMENCLATURE
2633	AFCS Attack Valid
2737	AFCS Computer Valid
3016	Range Rate When DROT Unavailable
3021	Smoothed Delta Range
3023	Angle of Attack Last Program Cycle
3027	A51A - 60 vdc
3030	A51A - Zero
3031	A51A - Cosine Sigma
	- Delta F1 with SPECIAL WEAPON Selected
3032	A51A - Differential Altitude
3033	A51A - Missile Velocity
	- Drop with SPECIAL WEAPON Selected
3034	A51A - Alpha True
3035	A51A - Lift Acceleration
3036	A51A - ~~Sine~~ Phi
3037	A51A - ~~Sine~~ Theta
3040	A51A - Stabilized ~~Sine~~ Epsilon
3041	A51A - ~~Sine~~ Eta
3042	A51A - ~~Sine~~ Epsilon
3043	A51A - Launch Range
3044	A51A - Pursuit Range
3045	A51A - Adjust F Pole
3046	A51A - Coarse Altitude
3047	A51A - Fine Altitude
3050	A51A - Missile RHO Parameter
	- Jump with SPECIAL WEAPON Selected
3051	A51A - Missile R Parameter
	- Horizontal Steering with SPECIAL WEAPON Selected
3052	A51A - Missile Tau Parameter
	- Vertical Steering with SPECIAL WEAPON Selected
3053	A51A - Closing Range Rate
3054	A51A - Time of Flight
	- Time of Flight with SPECIAL WEAPON Selected
3055	A51A - Interceptor Velocity
3056	A51A - Interceptor Mach

Table 6-7.1 Computer DRO (Cont)

DRO LOCATION	NOMENCLATURE
3057	A51A - 60 vdc
3060	Range at the time B-signal occurred with FDT operation
3061	Range at the time C-signal occurred with FDT operation
3062	Range at the time D-signal occurred with FDT operation
3063	Range at the time E-signal occurred with FDT operation
3064	Range Rate at the time B-signal occurred with FDT operation
3065	Range Rate at the time C-signal occurred with FDT operation
3066	Range Rate at the time D-signal occurred with FDT operation
3067	Range Rate at the time E-signal occurred with FDT operation
3100	Interceptor Altitude at Lock-On
3101	State of Min-time, Max range Switch last cycle.
3102	Lag Predicted Range
3103	Radar Range (multiply BCD value times 262144 feet to compute range, decimal point is between bits 17 and 18)
3104	Opening Range Rate
3105	Time to Impact
3106	Time-to-Imapct/2**7 Seconds, Indexed Only
3107	FDT Test Results
3110	Failed Range
3111	Failed Range Rate
3113	Interceptor Velocity
3122	Differential Altitude
3123	Angle of Attack
3131	D Time Occurred
3132	E Time Occurred
3135	Interceptor Mach (last cycle)
3137	Interceptor Mach (this cycle)
3141	A51A - Same as location 3031 with DL MIN TIME Selected
3142	A51A - Same as location 3032 with DL MIN TIME Selected
3143	A51A - Same as location 3033 with DL MIN TIME Selected
3144	A51A - Same as location 3034 with DL MIN TIME Selected
3145	A51A - Same as location 3035 with DL MIN TIME Selected
3146	A51A - Same as location 3036 with DL MIN TIME Selected
3147	A51A - Same as location 3037 with DL MIN TIME Selected
3150	A51A - Same as location 3040 with DL MIN TIME Selected
3151	A51A - Same as location 3041 with DL MIN TIME Selected
3152	A51A - Same as location 3042 with DL MIN TIME Selected
3153	A51A - Same as location 3043 with DL MIN TIME Selected
3154	A51A - Same as location 3044 with DL MIN TIME Selected

Table 6-7.1 Computer DRO (Cont)

DRO LOCATION	NOMENCLATURE
3155	**A51A - Same as location 3045 with DL MIN TIME Selected**
3156	**A51A - Same as location 3046 with DL MIN TIME Selected**
3157	**A51A - Same as location 3047 with DL MIN TIME Selected**
3160	**A51A - Same as location 3050 with DL MIN TIME Selected**
3161	**A51A - Same as location 3051 with DL MIN TIME Selected**
3162	**A51A - Same as location 3052 with DL MIN TIME Selected**
3163	**A51A - Same as location 3053 with DL MIN TIME Selected**
3163	**A51A - Same as location 3054 with DL MIN TIME Selected**
3164	**A51A - Same as location 3055 with DL MIN TIME Selected**
3166	**A51A - Same as location 3056 with DL MIN TIME Selected**
3167	1/2 Sine Pitch
3170	1/2 Cosine Pitch
3171	1/2 Sine Roll
3172	1/2 Cosine Roll
3173	1/2 Sine Heading
3174	1/2 Cosine Heading
3175	1/2 Sine Antenna Azimuth
3176	1/2 Cosine Antenna Azimuth
3177	1/2 Sine Antenna Elevation
3200	1/2 Cosine Antenna Elevation
3202	1/2 Sine Space Stabilized Elevation Angle
3203	1/2 Cosine Space Stabilized Elevation Angle
3205	Time Since MCC 2 Message
3206	Time Since CC 1 Message
3207	Time Since CC 2 Message
3210	Time Since MCC 1 Message
3211	True Angle of Attack
3212	Maximum Acceleration
3217	AFCS Pitch Rate
3220	AFCS Roll Rate
3221	AFCS Roll Surface Command
3224	AFCS Roll Error
3225	AFCS Pitch Command
3226	AFCS Scaled Pitch Surface Command
3227	AFCS Scaled Roll Surface Command
3230	AFCS Mach Scheduled Altitude Error
3231	AFCS Auto Nav Pitch Command
3232	AFCS Reference Altitude
3233	AFCS Pitch Reference
3234	AFCS Roll Command
3235	AFCS Sine Roll Reference
3236	AFCS Heading Error

Table 6-7.1 Computer DRO (Cont)

DRO LOCATION	NOMENCLATURE
3237	AFCS Sine Heading Reference
3240	AFCS Cosine Heading Reference
3241	AFCS Left Elevon Origin
3242	AFCS Right Elevon Origin
3243	ARM Has Been Selected
3244	AFCS ILS Roll Angle Command
3245	AFCS Pitch Error
3246	AFCS Azimuth Steering Error
3247	AFCS Elevation Steering Error
3250	AFCS Attack and Trim Fader
3251	AFCS Scheduled Steering Error
3252	AFCS Lift Acceleration Command
3253	AFCS Azimuth Steering Error Last Time
3254	AFCS Elevation Steering Error Last Time
3255	AFCS Filtered Lift Acceleration Command
3256	AFCS Scheduled Azimuth Steering Error
3257	AFCS Filtered Elevation Steering Error
3260	AFCS Gain Control
3261	AFCS Filter Control
3262	DMS Filter Control
3265	DMS A_H
3266	DMS A_V
3267	DMS Filtered A_H
3270	DMS Filtered A_V
3301	**A51A - Same as location 3031 for last ARM pass without DL MIN TIME**
3302	**A51A - Same as location 3032 for last ARM pass without DL MIN TIME**
3303	**A51A - Same as location 3033 for last ARM pass without DL MIN TIME**
3304	**A51A - Same as location 3034 for last ARM pass without DL MIN TIME**
3305	**A51A - Same as location 3035 for last ARM pass without DL MIN TIME**
3306	**A51A - Same as location 3036 for last ARM pass without DL MIN TIME**
3307	**A51A - Same as location 3037 for last ARM pass without DL MIN TIME**
3310	**A51A - Same as location 3040 for last ARM pass without DL MIN TIME**
3311	**A51A - Same as location 3041 for last ARM pass without DL MIN TIME**
3312	**A51A - Same as location 3042 for last ARM pass without DL MIN TIME**
3313	**A51A - Same as location 3043 for last ARM pass without DL MIN TIME**
3314	**A51A - Same as location 3044 for last ARM pass without DL MIN TIME**
3315	**A51A - Same as location 3045 for last ARM pass without DL MIN TIME**
3316	**A51A - Same as location 3046 for last ARM pass without DL MIN TIME**
3317	**A51A - Same as location 3047 for last ARM pass without DL MIN TIME**
3320	**A51A - Same as location 3050 for last ARM pass without DL MIN TIME**

Table 6-7.1 Computer DRO (Cont)

DRO LOCATION	NOMENCLATURE
3321	**A51A - Same as location 3051 for last ARM pass without DL MIN TIME**
3322	**A51A - Same as location 3052 for last ARM pass without DL MIN TIME**
3323	**A51A - Same as location 3053 for last ARM pass without DL MIN TIME**
3324	**A51A - Same as location 3054 for last ARM pass without DL MIN TIME**
3325	**A51A - Same as location 3055 for last ARM pass without DL MIN TIME**
3326	**A51A - Same as location 3056 for last ARM pass without DL MIN TIME**
3330	Desired Altitude
3340	C Time Has Occurred
3362	Tactic Selected
3363	Target Altitude
3377	Attack Mach
3400	Command Mach
3401	AFCS Mach
3402	Dive Mach
3403	Maximum Safe Mach
3413	Interceptor Velocity
3414	Average Velocity
3415	Velocity of Sound at Interceptor
3416	Predicted Velocity
3464	Sine of Attack Heading
3465	Cosine of Attack Heading
3466	Sine of Command Heading
3467	Cosine of Command Heading
3470	Sine of Desired Heading
3471	Cosine of Desired Heading
3472	Sine of Heading Error
3473	Cosine of Heading Error
3474	Map Scale Selection
3511	Time of Flight
3514	Target Mach
3515	Target Velocity
3520	Sine of Target Heading
3521	Cosine of Target Heading
3522	Sine of Target Bearing
3523	Cosine of Target Bearing
3526	Distance to Target
3536	MCC Primary
3537	Navigation Invalid
3540	MCC Data Valid
3544	MCC 2 Message
3545	CC1 Message
3546	CC2 Message
3547	MCC 1 Message

Table 6-7.1. Computer DRO (Cont)

DRO LOCATION	NOMENCLATURE
3577	AFCS Pitch Attitude
3612	TACAN Range to Station
3613	TACAN Bearing to Station
3620	Minimum Safe Altitude
3621	Low Altitude Reference
3622	1600 Hz Failures
3623	400 Hz Failures
3624	+300 vdc Failures
3625	+150 vdc Failures
3626	-250 vdc Failures
3627	-140 vdc Failures
3630	+300 vdc Noise Failures
3631	+150 vdc Noise Failures
3632	-250 vdc Noise Failures
3633	-140 vdc Noise Failures
3634	+28 vdc Failures
3635	Mach Digitizer Input
3636	Log Rho Digitizer Input
3645	SSGC 2 Status Word
3646	Status of LW Fails
3647	1600 Hz Amplitude
3650	400 Hz Amplitude
3651	+300 vdc Amplitude
3652	+150 vdc Amplitude
3653	-250 vdc Amplitude
3654	-140 vdc Amplitude
3655	+300 vdc Noise
3656	+150 vdc Noise
3657	-250 vdc Noise
3660	-140 vdc Noise
3661	+28 vdc Amplitude
3662	Number of LW Routines Performed
3761	Del D Correction
3762	Del E Correction
3763	A_L Correction
3764	Count for Acceleration Band Below -2.5G
3765	Count for Acceleration Band Below -1.5G Including -2.5G
3766	Count for Acceleration Band Below 0G Including -1.5G
3767	Count for Acceleration Band Including 2.0G and Below 2.5G
3770	Count for Acceleration Band Including 2.5G and Below 3.5G
3771	Count for Acceleration Band Including 3.5G and Below 4.5G
3772	Count for Acceleration Band Including 4.5G and Below 5.5G
3773	Count for Acceleration Band Including 5.5G and Below 6.0G
3776	SSGC 5 Status Word

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

See pg 60 Sup 41

FAULT ISOLATION

TG Routine
(T.O. 27-3/Fig. 6-4)

NOTE

Prior to performing this routine, retrieve LW routine failure data and LDI-1, 2, 3, 4 routine A51A and acceleration count data.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [140] MACH & LOG P_S/TDDL DATA SIMULATE: PATTERN 1 FEEDBACK TEST: TEST [846] START ADDRESS: 05 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: 001334	The total running time is approx 1 minute 30 seconds
	NOTE If a halt in the TG routine occurs prior to indication of 001334 on 846 DISPLAY REGISTER lights, note 846 DISPLAY REGISTER LIGHTS. Continue routine by setting 846 RUN-STOP to STOP and then to RUN. After the 846 DISPLAY REGISTER lights indicate 001334, refer to T.O. 1F-106A-2-27-3. If an interruption occurs during the TS part of the routine, it will be necessary to perform step 2 below. Otherwise, continue directly to step 3.		
2	[Computer] LWR routine: Perform iaw para 6-27 LQ routine: Perform iaw para 6-30 LE-3 routine: Perform iaw para 6-32	. . .	Reestablish calibration constants required for system operation
3	[140] FEEDBACK TEST: NORMAL MACH & LOG P_S/TDDL DATA SIMULATE: NORMAL [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

Table 6-8. TG Routine Fail Halts

FAIL HALT	ROUTINE	FAIL HALT	ROUTINE	FAIL HALT	ROUTINE	FAIL HALT	ROUTINE	FAIL HALT	ROUTINE
000145	TC	000265	TC	001360	TP	001605	TA	001701	TA
000147	TC	000267	TC	001361	TC	001607	TA	001703	TA
000151	TC	000271	TC	001363	TC	001611	TA	001705	TA
000153	TC	000273	TC	001373	TH	001613	TA	001707	TA
000155	TC	000275	TC	001521	TA	001615	TA	001711	TA
000157	TC	000277	TC	001525	TA	001617	TA	001713	TA
000165	TC	000305	TC	001527	TA	001621	TA	001715	TA
000167	TC	000307	TC	001531	TA	001623	TA	001717	TA
000171	TC	000311	TC	001533	TA	001625	TA	001721	TA
000173	TC	000313	TC	001535	TA	001627	TA	001723	TA
000175	TC	000317	TC	001537	TA	001631	TA	001731	TA
000177	TC	000361	TS	001541	TA	001633	TA	001733	TA
000205	TC	000365	TH	001543	TA	001635	TA	001737	TA
000207	TC	000372	TS	001551	TA	001637	TA	001741	TA
000211	TC	000751	TM	001553	TA	001641	TA	001743	TA
000213	TC	000755	TM	001555	TA	001643	TA	001745	TA
000215	TC	000757	TS	001557	TA	001645	TA	001747	TA
000217	TC	000764	TS	001561	TA	001647	TA	001751	TA
000225	TC	001264	TA	001563	TA	001651	TA	001753	TA
000227	TC	001273	TH	001565	TA	001653	TA	001755	TA
000231	TC	001353	TC	001567	TA	001655	TA	001757	TA
000233	TC	001355	TC	001571	TA	001657	TA	001761	TA
000235	TC	001357	TC	001573	TA	001661	TA	001763	TA
000237	TC			001575	TA	001663	TA	001765	TA
000245	TC			001577	TA	001665	TA	001767	TA
000247	TC			001601	TA	001667	TA	001771	TA
000251	TC			001603	TA	001671	TA		
000253	TC					001673	TA		
000255	TC					001675	TA		
000257	TC					001677	TA		

6-11. TC ROUTINE.

This routine checks the instructions necessary to execute the TS and TM routines.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140
846
857

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

TG Routine
(T.O. 27-3/Fig. 6-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [846] START ADDRESS: 01 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: Flash on and off continuously at 1.3 sec intervals (once for each computer cycle)	If the TC routine is run as a part of the TG routine, 846 DISPLAY REGISTER lights will come on for 1.3 sec, followed by the TS routine
2	[846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

6-12. TS ROUTINE.

The TS routine checks 846 unit DRO memory.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

846
857

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

TG Routine
(T.O. 27-3/Fig. 6-4)

NOTE

Prior to performing this routine, retrieve LW routine failure data and LDI-1, 2, 3, 4 routine A51A and acceleration count data.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [846] START ADDRESS: 02 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: Five least significant bits count down for 12 seconds, then a quick dynamic pattern of full display, then 000745.	Test completion halt at 000745

STEP	INSTRUCTION	INDICATION	REMARKS
	NOTE Step 1 is the complete TS routine. Step 2 needs to be performed only if the TS routine was interrupted before the normal completion time. If the routine ran normally and was properly completed, there is no need to perform step 2.		
2	[Computer] LWR routine: Perform iaw para 6-27 LQ routine: Perform iaw para 6-30 LE-3 routine: Perform iaw para 6-32	. . .	Reestablish calibration constants required for system operation
	NOTE Running LWR Routine will detroys ASIP Data.		
3	[140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUTS ENTER: Down (off) [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

6-13. TM ROUTINE.

The TM routine checks the 857 unit drum memory.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

857

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

TG Routine
(T.O. 27-3/Fig. 6-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [846] START ADDRESS: 03 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: Bits 13-18 indicate 76, while remaining bits display dynamic pattern, bit 12 is low for 4 sec, then high for 1.5 sec during each test cycle	When bit 12 goes low after 5.5 sec, the routine is repeating
2	[846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

6-14. TA ROUTINE

The TA routine checks general arithmetic operations in the computer.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140
846
857

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

TG Routine
(T.O. 27-3/Fig. 6-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [846] START ADDRESS: 04 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: Bits 1-9 and bits 10-18 simultaneously count up for approx 12 sec until all bits are high	Fail halts are indicated by stopping of count-up and display of some octal number
2	[846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

6-15. TP ROUTINE

The TP routine checks the analog output circuits within the computer.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

TG Routine
(T.O. 27-3/Fig. 6-4)

NOTE

Invalid fail halts will occur if a missile simulator is loaded.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [846] START ADDRESS: 14 [140] FEEDBACK TEST: TEST DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS ENTER: Up (on) DIGITAL INPUTS: 006 [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: Bits 10-17 count up and then 9-17 count down in approx 28 sec.	**The routine will repeat unless a failure is encountered in which case the number of failures and the failed A1/A0 pairs can be displayed. If no failure occurs, proceed to step 2.**

STEP	INSTRUCTION	INDICATION	REMARKS
	NOTE **If routine fails and displays a 001360 stop, disconnect P14002 and repeat routine. If routine fails again, fault is in the computer. If routine passes, reconnect P14002 and perform steps 1 and 1.1.**		
1.1	[846] RUN-STOP: STOP then RUN	[846] DISPLAY REGISTER: Display number of failed A1/A0 pairs	. . .
1.2	[140] DIGITAL INPUTS ENTER: Down (off)	[846] DISPLAY REGISTER lights; Bits 6 thru 1 indicate analog input address of failed analog input in accordance with Table 6-8.1. Bits 8 thru 17 indicate the value of the failed input.	. . .
1.3	[140] DIGITAL INPUTS ENTER: Up (on)	[846] DISPLAY REGISTER lights: Bits 9 thru 18 indicate the value of the analog output associated with the failed input in step 1.2.	Steps 1.2 and 1.3 should be repeated until all failed inputs have been displayed, repeating steps 1.2 results in a test completion display of 000044. The routine may be repeated at that point by performing the instruction in step 1.3.
2	[140] FEEDBACK TEST: NORMAL DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUTS ENTER: Down (off) [846] TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

Table 6-8.1. Analog Input/Output Conversion

ANALOG INPUT ADDRESS	FAILED ANALOG OUTPUT	NOMENCLATURE
00	A60N	Interceptor position (X)
01	A51N	Sine of Command Heading Error
02	A52N	Target Position (Y)
03	A53N	Target Position (X)
04	A54N	Left Elevon Command
05	A55N	Right Elevon Command
06	A71	Missile 1 Drive (Yaw)
07	A72	Missile 3 Drive (Pitch)

Table 6-8.1. Analog Input/Output Conversion (Cont)

ANALOG INPUT ADDRESS	FAILED ANALOG OUTPUT	NOMENCLATURE
10	A60A	Computed Antenna Azimuth Rate
11	A51A	Attack Program Sequence
12	A52A	Computed Antenna Elevation Rate
13	A53A	Time Circle Size
14	A54A	Computed Antenna Elevation Rate
15	A55A	Computed Antenna Azimuth Rate
16	A75	Missile 4 Drive (Yaw)
17	A76	Missile 4 Drive (Pitch)
20	A58	Vertical Reference Circle
21	A59N	Cosine of Command Heading Error
22	A66N	Interceptor Position (Y)
23	A61	Target Range
24	A62	Target Elevation Angle
25	A63N	Target Altitude
26	A77	Missile 2 Drive (Yaw)
31	A59A	Sine Latitude
33	A70	Missile 1 Drive (Pitch)
34	A56N	Command Altitude
35	A57	Horizontal Reference Circle
36	A73	Missile 3 Drive (Yaw)
37	A74	Missile 2 Drive (Pitch)
40	A56A	Horizontal Steering Dot
41	A67	Vertical Steering Dot
42	A64N	Target Heading
43	A65N	Command Mach
44	A81	Self-Test

6-16. TL ROUTINE.

The TL routine checks the data link clock pulse circuit and the data link receiving circuit in the 846 unit.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

846

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

TG Routine
(T.O. 27-3/Fig. 6-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [140] MACH & LOG P_S/TDDL DATA SIMULATE: PATTERN 1 or PATTERN 2 [846] START ADDRESS: 06 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: If PATTERN 1 is selected, bits 17 thru 1 come on sequentially from left to right. If PATTERN 2 is selected, bits 17 thru 1 go off sequentially from left to right	. . .
2	[140] MACH & LOG P_S/TDDL DATA SIMULATE: NORMAL [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

6-17. TD ROUTINE.

The TD routine checks each digital output, ensures that they are addressable and that the selection logic is functioning properly. A list of digital outputs and nomenclature is contained in table 6-10.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140
846
857

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

TD Routine
(T.O. 27-3/Fig. 6-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[405] Function switch: REC [Computer] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: NORMAL [846] START ADDRESS: 07 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: Bits 10-1 come on and go off individually and in sequence (total time approx 5 sec). For approx 30 sec, bits are off (above indications will repeat until step 2 is performed)	To monitor the state of the DIGITAL INPUT SWITCHES, the DIGITAL DISPLAY switch must be placed in the DIGITAL INPUT SWITCHES position. The DISPLAY REGISTER will show the state of each DIGITAL INPUT switch. See table 6-9.
2	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 1	[846] DISPLAY REGISTER lights: Same as step 1	. . .
3	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 2	[846] DISPLAY REGISTER lights: Same as step 2	. . .
4	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 3	[846] DISPLAY REGISTER lights: Same as step 1, except bit 10 remains off and bit 9 is on twice as long as bits 8 thru 1	. . .
5	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 4	[846] DISPLAY REGISTER lights: Same as step 1	. . .
6	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 5	[846] DISPLAY REGISTER lights: Bits 10 thru 8 come on and go off individually and in sequence, bit 8 remains on for 5 sec while bit 7 thru 1 remain off. Above indications are repeated until step 7 is performed	. . .
6.1	[140] DIGITAL DISPLAY: DIGITAL INPUTS DIGITAL INPUTS ENTER: Up (on) DIGITAL INPUTS: Up (on)	[846] DISPLAY REGISTER lights: Bits 10-1 come on as DIGITAL INPUTS ENTER and DIGITAL INPUTS are set up	. . .
7	[140] DIGITAL DISPLAY: NORMAL [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [405] Function switch: OFF [905] POWER: OFF	Routine complete	. . .

Table 6-9. TD Routine Displays

DIGITAL DISPLAY SWITCH POSITION	DISPLAY REGISTER BIT NUMBER									
	10	9	8	7	6	5	4	3	2	1
NORMAL	D225N	D224N	D215A	D226A	D218A	D202	D216A	D208	D221A	D201
1	DP206*	DP204*	D227A	D217A	D210	D209	D225A	D207	D205	D203
2	DP223A	D219A	D218N	D217N	D216N	D200	D215N	D214	D213	D212
3	NONE	DP211*	DM254*	DM253*	DM252*	DM251*	DM244*	DM243*	DM242*	DM241*
4	D229A	D228A	DM234*	DM233*	DM232*	DM231*	D229N	D228N	D227N	D226N
5	D262*	D261*	D260*	**	**	**	**	**	D224A*	**
DIGITAL INPUT SWITCHES	D165	D166	D167	D168	D182	D183	D170	D171	D172	D173

*These digital outputs are inverted; i.e., when DP206 is set high, the DISPLAY REGISTER light will be out.

**Spare digital outputs.

Table 6-10. Digital Outputs

SYSTEM DESIGNATION	NOMENCLATURE	SYSTEM DESIGNATION	NOMENCLATURE
D200	AFCS OK	D223N	Spare
D201	A Prime Signal	D224A	IFF Test
D202	A Signal	D224N	AHRG Test Sequence A
D203	Test/Lat Valid	D225A	PTF Fail
DP204	Antenna Rate Increase	D225N	AHRG Test Sequence B
D205	Altitude Hold OK	D226A	Left Antenna Position
DP206	CCM Energize	D226N	Pass Fail 1
D207	Navigation Mode	D227A	System Test A
D208	Nose	D227N	Pass Fail 2/High Alpha
D209	Track	D228A	System Test C/Optimum Alpha
D210	Attack	D228N	Dead Reckon (MCC Valid)
DP211	Antenna Rate Decrease	D229A	Altitude Warn
D212	Pursuit	D229N	Data Link Valid (CC Valid)
D213	Time-to-Go Circle Blank	D230	MART Cart Interrogation
D214	ILS Approach	DM231	Rho Parameter 1
D215A	VI Warn	DM232	Rho Parameter 2
D215N	Automatic Mode (AFCS) OK	DM233	Rho Parameter 3
D216A	B Signal	DM234	Rho Parameter 4
D216N	HSI Range Valid	DM241	Tau Parameter 1/Special Weapon Fuse Time
D217A	C Signal	DM242	Tau Parameter 2/Special Weapon Fuse Time
D217N	TACAN Annunciator	DM243	Tau Parameter 3/Special Weapon Fuse Time
D218A	D Signal	DM244	Tau Parameter 4/Special Weapon Fuse Time
D218N	Target Marker Circle Display	DM251	r Parameter 1
D219A	E Signal	DM252	r Parameter 2
D220A	Spare	DM253	r Parameter 3
D220N	Spare	DM254	r Parameter 4
D221A	Abort	D260	Shift TACAN Bearing
D221N	Spare	D261	Shift TACAN Range
D222A	Spare	D262	Shift Clock
DP222N	Spare	D263	Digital Range Test
D223A	Lead Collision		

6-18. TN ROUTINE.

The TN routine provides a test for most of the analog inputs (AI's) and digital outputs (DO's). The test includes a check for open AI's to the computer and also checks the real time counter.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140
846
857

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

TN Routine
(T.O. 27-3/Fig. 6-1)

NOTE

- If 450 unit and HUD are installed in the aircraft, select SW/GUN (ACP) and any gun mode (HUD). If a MSR is loaded, select SW/GUN (ACP). If none of the above, select VI (ACP).
- If a 001662 fail halt is obtained, call DRO location 0775 using TR routine (paragraph 6-9) to display octal address of failed analog inputs. Analog inputs are listed in tables 6-3 and 6-4. If 450 unit and HUD are installed in the aircraft (SW/GUN and any gun mode are selected), a 001565 fail halt indicates E26 (Beta Vane input) is equal to -5V or +5V. If a special weapon or MSR is aboard (SW is selected), a 001565 fail halt indicates E26 is less than -4.8V or greater than -4.375V. If nothing is loaded, and VI is selected a 001565 fail halt indicates E26 is not equal to -5V. If a 001571 fail halt is obtained, the TV routine has failed.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [846] START ADDRESS: 13 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights; Bit 9 lights and bits 10 thru 17 count rapidly up, then down for approximately 17 seconds; then bits 9 and 11 light; then 001177 is displayed.	Fail halts are 000657, 000661, 000663, 000665, 000667, 000671, 000673, 000675, 000702, 001565, 001571 001651, 001662, 001664
1.1	Do not reload Channel 8 [846] RUN-STOP: STOP [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUT ENTER: Down (off) [846] START ADDRESS: 11 ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS: 507 DIGITAL INPUTS ENTER: Up (on), Then down (off) DIGITAL INPUTS: 475 DIGITAL INPUTS ENTER: Up (on)	Bits 1 and 2 of 846 indicate address of failed analog input.	
2	**NOTE** To continue TN routine if a fail halt occurs, set 846 RUN-STOP to STOP and then to RUN. [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

6-19. TV ROUTINE.

The TV routine reads in the values for the sine and cosine of interceptor heading angle and interceptor roll angle (4 AC analog inputs). It then checks if $K \sin^2 X + K \cos^2 X = K$, where X equals each of the 2 angles.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140

509
846
857
DGA
ECA

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

None

NOTE

If a 001571 fail halt is encountered, set the RUN/STOP switch to STOP, then to RUN. A display of 000000 indicates a faulty interceptor heading (E23 or E24) input. A display of 000001 indicates a faulty interceptor roll input (E21 or E22).

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS ENTER: Up (on) DIGITAL INPUTS: 002 [846] START ADDRESS: 14 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: LSB flashes on and off approx every 1 sec	Fail halt is 001571
2	[140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUTS ENTER: Down (off) [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

NOTE

Prior to performing this routine, retrieve LW routine failure data and LDI-1, 2, 3, 4 routine A51A and acceleration count data.

6-20. TH ROUTINE.

The TH routine is comprised of three routines each with their own requirements and designated as the TH-1, TH-2 and TH-3. The TH-1 checks that the DRO can retain all of its information if a power transient occurs. The TH-2 checks to see that all the DO's are set to their zero state by the master reset signal generated when a transient occurs. The TH-3 checks that channel 0 is loaded into the DRO and program control is transfered to the Tactical Origin after a transient occurs.

NOTE

The LWR (paragraph 6-27), LQ (paragraph 6-30), LAR (paragraph 6-33A) and LE-3 (paragraph 6-32) routines should be performed after the TH routine only if an interruption of the normal sequence occurred. Otherwise, there is no requirement to perform these recalibration routines.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

846

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[405] Function switch: REC [Computer] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS ENTER: Up (on) DIGITAL INPUTS: 003 [846] START ADDRESS: 14 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: A quick dynamic pattern ending with 643376	TH-1 routine initiated.
2	[526] +150 VDC: OFF, then to ON	[846] DISPLAY REGISTER lights: 000070	**If any other number appears, set the RUN/STOP switch (846) unit to STOP, then to RUN. A PASS or FAIL indication will then be displayed.**

STEP	INSTRUCTION	INDICATION	REMARKS
3	[140] DIGITAL DISPLAY: NORMAL	[846] DISPLAY REGISTER lights: 000000	. . .
4	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 1	[846] DISPLAY REGISTER lights: 001400	. . .
5	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 2	[846] DISPLAY REGISTER lights: 000000	. . .
6	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 3	[846] DISPLAY REGISTER lights: 000777	. . .
7	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 4	[846] DISPLAY REGISTER lights: 000360	. . .
8	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 5	[846] DISPLAY REGISTER lights: 001600	. . .
9	[Computer] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 004 DIGITAL INPUTS ENTER: Up (on) [846] START ADDRESS: 14 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: A quick dynamic pattern ending with 643376	TH-2 routine initiated
10	[526] +150 VDC: OFF, then to ON	[846] DISPLAY REGISTER lights: 000110	If any other number appears, set the RUN/STOP switch (846) unit to STOP, then to RUN. A PASS or FAIL indication will then be displayed.

STEP	INSTRUCTION	INDICATION	REMARKS
11	[140] DIGITAL DISPLAY: NORMAL	[846] DISPLAY REGISTER lights: 000000	. . .
12	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 1	[846] DISPLAY REGISTER lights: 001400	. . .
13	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 2	[846] DISPLAY REGISTER lights: 000000	. . .
14	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 3	[846] DISPLAY REGISTER lights: 000777	. . .
15	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 4	[846] DISPLAY REGISTER lights: 000360	. . .
16	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 5	[846] DISPLAY REGISTER lights: 001600	. . .
17	[Computer] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 005 DIGITAL INPUTS ENTER: Up (on) [846] START ADDRESS: 14 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: A quick dynamic pattern ending with 643377	TH-3 routine initiated
18	[526] +150 VDC: OFF, then to ON	[846] DISPLAY REGISTER lights: 000130	If any other number appears, set the RUN/STOP switch (846) unit to STOP, then to RUN. A PASS or FAIL indication will then be displayed.

STEP	INSTRUCTION	INDICATION	REMARKS
19	[140] DIGITAL DISPLAY: NORMAL	[846] DISPLAY REGISTER lights: 000000	. . .
20	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 1	[846] DISPLAY REGISTER lights: 001400	. . .
21	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 2	[846] DISPLAY REGISTER lights: 000000	. . .
22	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 3	[846] DISPLAY REGISTER lights: 000777	. . .
23	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 4	[846] DISPLAY REGISTER lights: 000360	. . .
24	[140] DIGITAL DISPLAY: DIGITAL OUTPUT GROUPS 5	[846] DISPLAY REGISTER lights: 001600	. . .
25	[140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUTS ENTER: Down (off) [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF [405] Function switch: OFF	Routine complete	. . .

6-21. Deleted.

6-22. Deleted.

6-23. Deleted.

6-24. LA ROUTINE

The LA routine is a more extensive check of the general arithmetic operations checked by the TA routine.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140
846
857

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [846] START ADDRESS: 17 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: Counts up and counts down twice and then displays 002006 (takes approx 4 minutes)	Fail halt is indicated when count ceases and octal number other than 002006 is displayed
2	[846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

6-25. LW ROUTINE

The LW routine provides a close tolerance amplitude and noise check for the MA-1 power forms. Specific amplitude checks are made on 115 v 400 Hz, 115 v 1600 Hz, +300 v, +150 v, -140 v, -250 v and +28 v. Specific noise checks are made on +300 v, +150 v, -140 v, and -250 v.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

989
926

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

PTF Light On or Power Erratic
(T.O. 27-3/Fig. 7-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [905] POWER: ON [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 500 [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS ENTER: Up (on)	[846] DISPLAY REGISTER lights: 001764 [080] PTF: Off (if no power fails)	The LWD routine can be entered at this time by setting 140 DIGITAL INPUTS ENTER down (off) and 846 RUN-STOP to STOP, then RUN. The LWD routine is contained in paragraph 6-26
2	[140] DIGITAL INPUTS: 000 DIGITAL DISPLAY: NORMAL DIGITAL INPUTS ENTER: Down (off) [846] TEST-NORMAL: NORMAL START ADDRESS: 00 DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

6-25.1. LWV ROUTINE.

The LWV Routine allows the LW Routine to be run at reduced tolerance ranges (reduced to zero if desired) for the purpose of verifying that all the power input cards are operating correctly.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

989
926

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

PTF Light On or
Power Erratic
(T.O. 27-3/Fig. 7-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load in accordance with paragraph 6-4 [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 706 [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS ENTER: Up (on)	[846] DISPLAY REGISTER lights: Power forms in accordance with figure 6-2	LWV is initiated and waiting for input of tolerance reducing multiplier from the 4 least significant DIGITAL INPUT switches.
2	[140] DIGITAL INPUTS: 0XX (4 Least Significant)		Set 4 Least significant D.I. switches according to tolerances desired in table 6-XX (LW and LWV Routine Limits)
3	[140] DIGITAL INPUTS: 0YX (5th Least Significant -Up) DIGITAL INPUTS ENTER: Down	[846] DISPLAY REGISTER lights: Power forms in accordance with figure 6-2 **NOTE** LWD Routine is entered.	The LW Routine will be run with the reduced tolerances each time the condition of the 5th switch is changed. When the DIGITAL INPUTS ENTER switch is set in the down position, the LWD Routine will be entered.

LW and LWV Routine Power Form Limits

	115V 1600 HZ		115V 400 HZ		+300 VDC		+150 VDC		-250 VDC		-140 VDC		+28 VDC	
LWV DI SW.	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER	UPPER	LOWER
0000	115.00	115.00	115.00	115.00	300.00	300.00	150.00	150.00	-250.00	-250.00	-140.00	-140.00	28.00	28.00
0001	115.27	114.71	115.16	114.74	300.23	299.53	150.12	149.74	-249.75	-250.35	-139.86	-140.19	28.19	27.64
0010	115.55	114.42	115.33	114.49	300.47	299.06	150.23	149.48	-249.49	-250.70	-139.71	-140.37	28.37	27.29
0011	115.82	114.14	115.49	114.23	300.70	298.59	150.35	149.22	-249.24	-251.05	-139.57	-140.56	28.56	26.93
0100	116.09	113.85	115.66	113.97	300.94	298.12	150.47	148.97	-248.98	-251.40	-139.43	-140.74	28.75	26.57
0101	116.37	113.56	115.82	113.72	301.17	297.66	150.58	148.71	-248.73	-251.75	-139.28	-140.93	28.94	26.22
0110	116.64	113.27	115.99	113.46	301.41	297.19	150.70	148.45	-248.47	-252.10	-139.14	-141.11	29.12	25.86
0111	116.92	112.99	116.15	113.21	301.64	296.72	150.82	148.19	-248.22	-252.45	-138.99	-141.30	29.31	25.51
1000	117.19	112.70	116.31	112.95	301.87	296.25	150.93	147.93	-247.97	-252.80	-138.85	-141.49	29.50	25.15
1001	117.46	112.41	116.48	112.69	302.11	295.78	151.05	147.67	-247.71	-253.15	-138.71	-141.67	29.69	24.79
1010	117.74	112.12	116.64	112.44	302.34	295.31	151.17	147.41	-247.46	-253.50	-138.56	-141.86	29.87	24.44
1011	118.01	111.84	116.81	112.18	302.58	294.84	151.29	147.15	-247.20	-253.85	-138.42	-142.04	30.06	24.08
1100	118.28	111.55	116.97	111.92	302.81	294.37	141.40	146.90	-246.95	-254.20	-138.28	-142.23	30.25	23.72
1101	118.56	111.26	117.14	111.67	303.05	293.91	151.52	146.64	-246.69	-254.55	-138.13	-142.41	30.44	23.37
1110	118.83	110.97	117.30	111.41	303.28	293.44	151.64	146.38	-246.44	-254.90	-137.99	-142.60	30.62	23.01
1111	119.11	110.69	117.47	111.16	303.52	292.97	151.75	146.12	-246.18	-255.25	-137.84	-142.78	30.81	22.66
LW	119.38	110.40	117.63	110.90	303.75	292.50	151.87	145.86	-245.93	-255.60	-137.70	-142.97	31.00	22.30

LW and LWV Routine Noise Limits

	+300 VDC MILLIVOLTS NOISE	+150 VDC MILLIVOLTS NOISE	+150 VDC MILLIVOLTS AGE NOISE	-250 VDC MILLIVOLTS NOISE	-250 VDC MILLIVOLTS AGE NOISE	-140 VDC MILLIVOLTS NOISE	-140 VDC MILLIVOLTS AGE NOISE
LWV DI SW.	MAXIMUM	MAXIMUM	MAXIMUM	MAXIMUM	MAXIMUM	MAXIMUM	MAXIMUM
0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0001	18.75	18.75	28.12	12.50	18.75	12.50	18.75
0010	37.50	37.50	56.25	25.00	37.50	25.00	37.50
0011	56.25	56.25	84.37	37.50	56.25	37.50	56.25
0100	75.00	75.00	112.50	50.00	75.00	50.00	75.00
0101	93.75	93.75	140.62	62.50	93.75	62.50	93.75
0110	112.50	112.50	168.75	75.00	112.50	75.00	112.50
0111	131.25	131.25	196.87	87.50	131.25	87.50	131.25
1000	150.00	150.00	225.00	100.00	150.00	100.00	150.00
1001	168.75	168.75	253.12	112.50	168.75	112.50	168.75
1010	187.50	187.50	281.25	125.00	187.50	125.00	187.50
1011	206.25	206.25	309.37	137.50	206.25	137.50	206.25
1100	225.00	225.00	337.50	150.00	225.00	150.00	225.00
1101	243.75	243.75	365.62	162.50	243.75	162.50	243.75
1110	262.50	262.50	393.75	175.00	262.50	175.00	262.50
1111	281.25	281.25	421.87	187.50	281.25	187.50	281.25
LW	300.00	300.00	450.00	200.00	300.00	200.00	300.00

Table 6-10.1 LW and LWV Routine Limits

6-26. LWD ROUTINE.

The LWD routine is used immediately after a flight to isolate system power supply problems when the 080 PTF comes on.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

989
926

REFERENCES

FUNCTIONAL DIAGRAMS

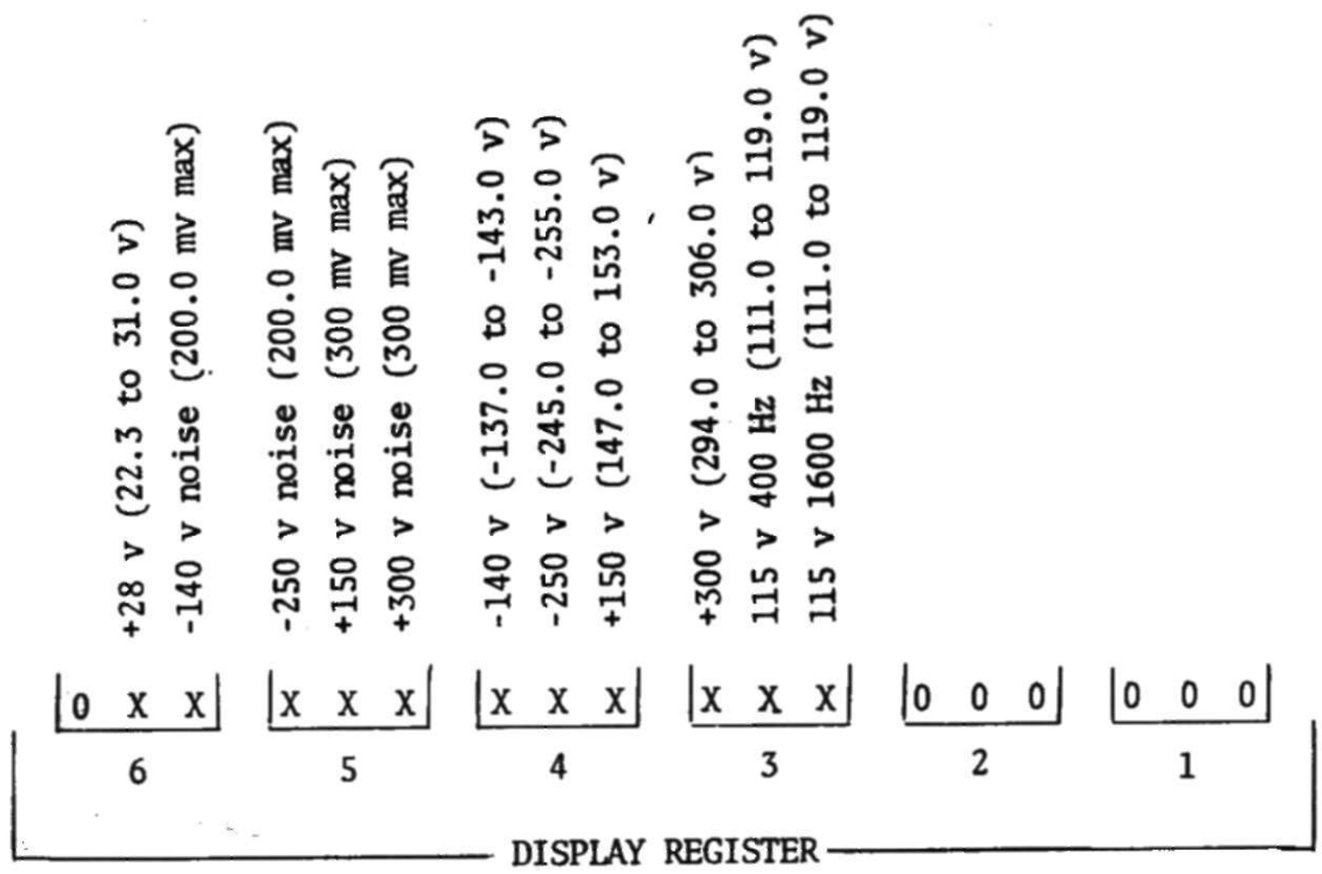
Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

PTF Light On or Power Erratic
(T.O. 27-3/Fig. 7-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 505 [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS ENTER: Up (on)	[846] DISPLAY REGISTER lights: Displays in BCD the number of times LW routine was entered during the flight	. . .
2	[140] DIGITAL INPUTS ENTER: Down (off)	[846] DISPLAY REGISTER lights: Power forms iaw figure 6-2	If any of the power forms have failed, perform step 3; otherwise, perform turn-off procedure iaw step 4
3	**NOTE** If the 846 TEST-NORMAL is set to NORMAL prior to completion of the display in the following step, the computer will exit to the navigation routine. The next sequentially failed power form can be displayed by changing the position of 140 DIGITAL INPUTS ENTER before previous display sequence is completed. [140] DIGITAL INPUTS ENTER: Up (on)	[846] DISPLAY REGISTER lights: (1) Two quick flashes of all-display lights; (2) BCD value of failed power form; (3) Two quick flashes of bits 18 and 17; (4) BCD out of tolerance value of failed power form; (5) Two quick flashes of bits 18 thru 15; (6) Number of times in BCD that power form failed; (7) Two quick flashes of bits 18 thru 13; (8) Ratio in BCD of total number of failures for failed power form to total number of times LW routine was run	If no further power form failures remain, 846 DISPLAY REGISTER lights will display 001375 when 140 DIGITAL INPUTS ENTER position is changed. Computer will then halt. When bit 1 is on, voltage noise is being checked and when bit 1 is off, voltage amplitude is being checked

STEP	INSTRUCTION	INDICATION	REMARKS
4	[140] DIGITAL INPUTS: 000 DIGITAL DISPLAY: NORMAL DIGITAL INPUTS ENTER: Down (off) [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine completed	. . . . .



NOTES: 1. Bit on indicates power form failure.
2. Bits 1 thru 6 have no significance.

Figure 6-2. LWD Display

6-27. LWR ROUTINE.

The LWR routine sets the pass/fail state of all power forms in LW power state word to pass, turns the 080 PTF light off and sets all power form words to zero.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140
846
857

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [905] POWER: ON [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 501 [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS ENTER: Up (on)	[846] DISPLAY REGISTER lights: 001766	. . .
2	[140] DIGITAL INPUTS: 000 DIGITAL DISPLAY: NORMAL DIGITAL INPUTS ENTER: Down (off) [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

6-28. LS-2 ROUTINE.

The LS-2 routine checks the position of the antenna in boresight mode to ensure that the antenna elevation is between -4.3 and -4.7 degrees.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1
2. Para. 3-19b

PROBABLE FAULTY UNIT

017
241

REFERENCES

FUNCTIONAL DIAGRAMS

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

Composite Boresight
(T.O. 27-3/Fig. 3-5)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [506] MOTOR REF: TEST [106] AZ DRIVE MOTOR: TEST [083] RDR IR SELECT: Press and release to obtain radar dominant mode ANT ELEV: Detent Boresight switch: BORS [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 423 DIGITAL INPUTS ENTER: Up (on) [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN [096] S1: 5 S2: E SELF TEST METER: If indication is 0 units, adjust 241 EL BAL ccw until 5 units is obtained. If indication is 10 units, adjust 241 EL BAL cw until 5 units is obtained	[096] SELF TEST METER: 5 units	The 083 ANT ELEV must be set as nearly as possible to the detent position

STEP	INSTRUCTION	INDICATION	REMARKS
2	[140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUTS ENTER: Down (off) [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [083] Boresight switch: NORM/TRACK [Computer] LS routine: Perform iaw para 6-29	Routine complete	. . .

6-29. LS ROUTINE.

The LS routine checks the position of the antenna in the not boresight mode to ensure that the antenna elevation position is between -2 and +2 degrees.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017	241
083	509
DGA	ECA

REFERENCES

FUNCTIONAL DIAGRAMS

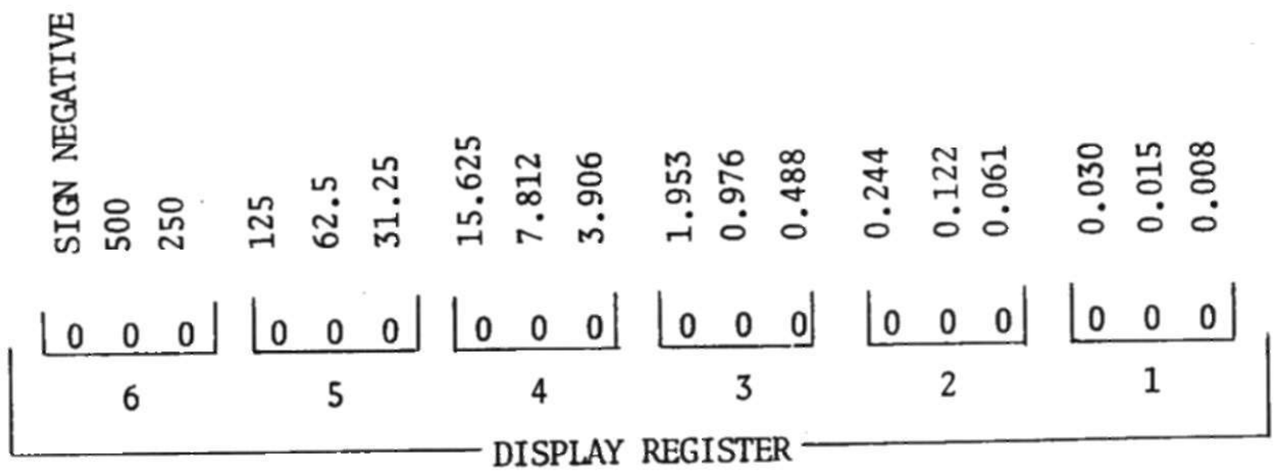
Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

Angle Tracking
(T.O. 27-3/Fig. 3-7)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[ACP] Selector: MISSILES ALL [CSC] HDG/PUSH TO SYNC: Press and release, wait until annunciator indicates OK. [Computer] Channel 8: Load iaw para 6-4. [083] Action switch: Press to 2nd detent and release ANT ELEV: Detent [506] MOTOR REF: TEST [106] AZ DRIVE MOTOR: TEST [796] SELECTOR TEST: 2 [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 403 [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN **NOTE** When 140 DIGITAL INPUTS ENTER is set to up (on) iaw next instruction, the 846 DISPLAY REGISTER lights will come on. If it is desired to maintain the display, set 846 RUN-STOP to STOP. Within 4 seconds after DISPLAY REGISTER lights come on. [140] DIGITAL INPUTS ENTER: Up (on) [846] RUN-STOP: STOP	[846] DISPLAY REGISTER lights: Less than 010736 (sign and magnitude of $\sin \epsilon'_s - \sin \epsilon_s$ error displayed iaw figure 6-3)	If error is excessive, perform step 2. If error is within tolerance, perform step 3

STEP	INSTRUCTION	INDICATION	REMARKS
2	[241] EL BAL: Adjust ccw if indication is negative or cw if indication is positive	[846] DISPLAY REGISTER lights: Less than 010736	Adjustment of EL BAL 10° will change error angle approximately 0.5°. If EL BAL is adjusted, perform LS-2 routine iaw para 6-28
	NOTE **If correct adjustment cannot be made that will satisfy pass conditions for both the LS and LS-2 routines, remove 241 unit and perform bench alignment of azimuth and elevation resolvers iaw T.O. 11F1-MA1-12-10. If both routines still cannot be satisfied, perform 017 resolver alignments iaw paragraph 3-12e of this manual.**		
3	[140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUTS ENTER: Down (off) [106] AZ DRIVE MOTOR: NORMAL [506] MOTOR REF: NORMAL [846] START ADDRESS: 00 TEST-NORMAL: NORMAL RUN-STOP: RUN DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .



NOTES:

1. Refer to table below for meaning of display.
2. Do not include the sign bit when determining octal value of group 6.
3. The numbers above the lights indicate milliradians.

	ERROR (MILLIRADIANS)	OCTAL DISPLAY
P	LESS THAN 8.7	LESS THAN 002170
A	8.7 to 17.4	002170 - 004357
S		
S	17.4 to 26.1	004357 - 006547
	26.1 to 34.8	006547 - 010736
	34.8 to 43.5	010736 - 013125
F	43.5 to 52.2	013125 - 015314
A	52.2 to 60.9	015314 - 017502
I	60.9 to 69.6	017502 - 021666
L	69.6 to 87.0	021666 - 026240
	GREATER THAN 87.0	GREATER THAN 026240

Figure 6-3. LS Display

6-29.1 LSA ROUTINE.

The purpose of the LSA Routine is to position the elements of the attack display on the 080 unit to certain pre-determined locations. This permits the operator to verify the operation of the attack display circuits and facilitates their adjustment.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140	395
223	523

REFERENCES

FUNCTIONAL DIAGRAMS

Attack Displays
(T.O. 27-5/Fig. 3-18)

FAULT ISOLATION

Attack Displays
(T.O. 27-3/Fig. 3-12)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] RANGE: 4SP [196] MOD TEST: Up (on) [305] NOSE-TAIL Switch: NOSE [955] HOMING POINT SELECTOR: A [796] SELECTOR TEST: 3 [796] GND TEST INTER: PRESS & RELEASE [083] Lock on Self-Test Target (Then position in accordance with Table 6-10.1 to obtain desired display.)	[080] Attack Display: Time-to-go circle, reference circle, and firing bar position in accordance with Table 6-10.1.	The display may be selected in any sequence and may be repeated as desired.
2	[305] NOSE-TAIL Switch: TAIL [796] SELECTOR TEST: 7, then OFF [905] POWER: OFF	Routine complete	. . .

Table 6-10.1. LSA Routine Display Selection

955 HOMING POINT SELECTOR	080 ATTACK DISPLAY
A	Displays 1 thru 6 in sequence, repetitive.
B	Display 1. 2.8 in. diameter time-to-go circle, touching the main bang and 8th receiver test target.
C	Display 2. 1.4 in. diameter time-to-go circle, touching the 2nd and 6th receiver test targets.
D	Display 3. 2.8 in. firing bar, positioned on 8th receiver test target. Reference circle, centered in azimuth, above and touching the 5th reviewer test target.
E	Display 4. 2.8 in. firing bar, positioned over main bang. Reference circle below and touching the 3rd receiver test target.
F	Display 5. 2.8 in. firing bar, positioned over 5th receiver test target. Reference circle at same elevation as, outside of, and just touching left end of the elevation center scribe mark.
G	Display 6. 2.8 in. firing bar positioned over 3rd receiver test target. Reference circle at same elevation as, outside of and just touching right end of the elevation center scribe mark.
Any other	Same display as HOMING POINT A.

6-30. LQ ROUTINE.

The LQ routine is a confidence check of the various inputs to and outputs from the 821 unit in both automatic and manual flight control modes.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

141
821

REFERENCES

FUNCTIONAL DIAGRAMS

AFCS
(T.O. 27-5/Fig. 8-4)

FAULT ISOLATION

Pilot Assist or
Auto Mode Operation
(T.O. 27-3/Fig. 8-6)

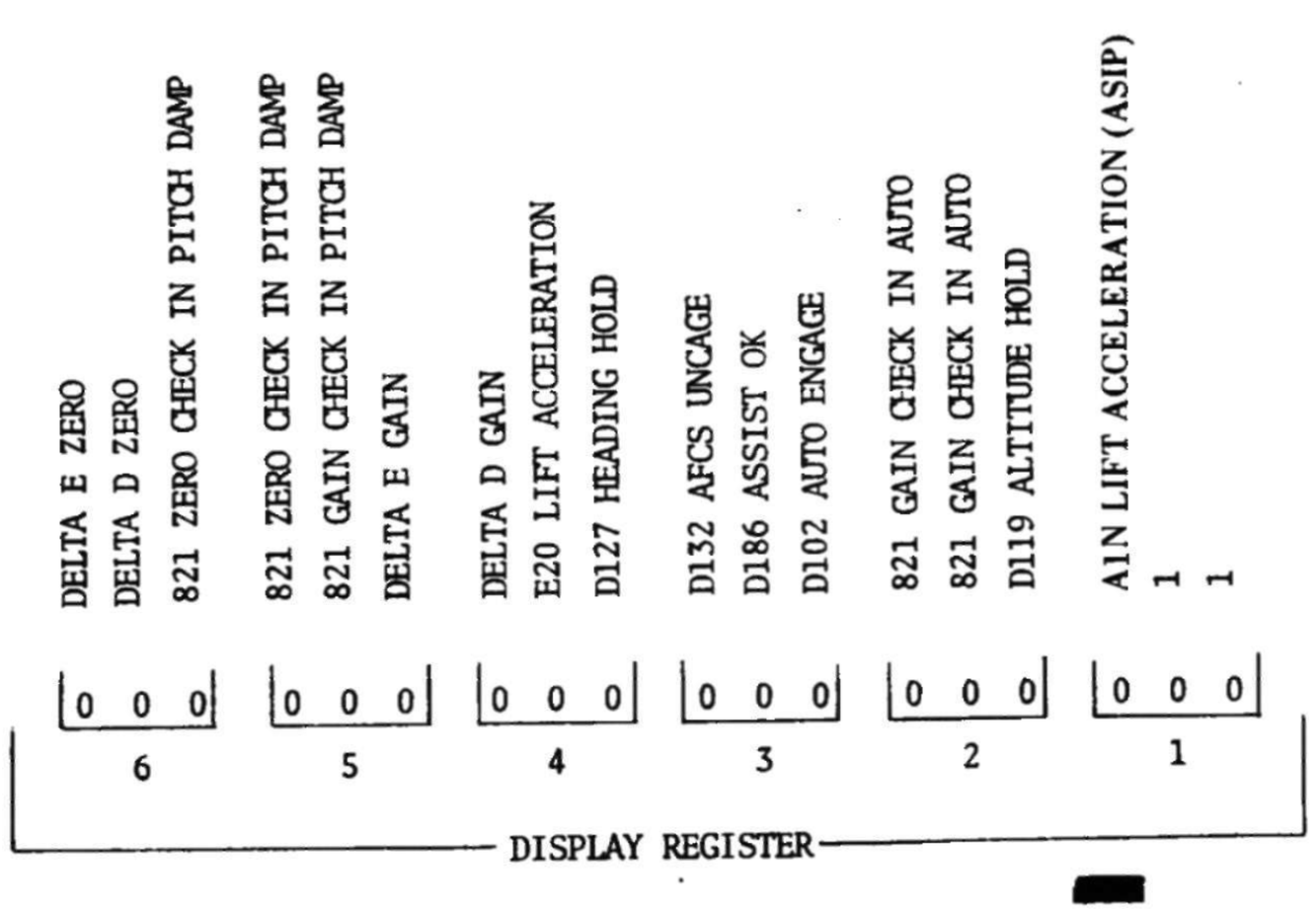
NOTE

The LQ routine will not pass with hydraulic pressure applied.

STEP	INSTRUCTION	INDICATION	REMARKS
1	**NOTE** Step 2 must be performed within 10 seconds of down and right movement of steering dot and reference circle. [Computer] Channel 8: Load iaw para 6-4 [ACP] Selector: MISSILES ALL [796] SELECTOR TEST: 2 [163] FLT MODE: PITCH DAMP [083] Action switch: Press to 2nd detent and release [163] OFF-HDG HOLD: HDG HOLD [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 601 [846] ENTER START ADDRESS: Press and release [140] DIGITAL INPUTS ENTER: Up (on) [846] RUN-STOP: RUN	[063] DS1 LEAD COLLISION: Comes on [080] Steering dot and reference circle: Move up and left, waits 23 sec and move down and right	096 SELF TEST METER indicates 5 units at positions 8A and 8B. The not AFCS portion of the 821 unit is tested at this time
2	**NOTE** Step 3 must be performed within 10 seconds of centering of steering dot and reference circle. [163] FLT MODE: AUTO	[080] Mode lamp 1: Comes on —— Steering dot and reference circle: Centered after approx 15 sec [163] FLT MODE: Drops to ASSIST	The AFCS portion of the 821 unit is tested at this time
3	[163] OFF-ALT HOLD: ALT HOLD	[846] DISPLAY REGISTER lights: 001760 [163] FLT MODE: Drops to PITCH DAMP —— OFF-ALT HOLD: Drops to OFF [080] Mode lamp 1: Goes off	. . .
4	[140] DIGITAL INPUTS ENTER: Off (down) [846] RUN-STOP: STOP, then RUN	[846] DISPLAY REGISTER lights: 777777	Failure indications iaw figure 6-4

See p965 Sup 41

STEP	INSTRUCTION	INDICATION	REMARKS
5	[140] DIGITAL INPUTS: 000 DIGITAL DISPLAY: NORMAL [083] EMER MANUAL: Press and release [163] OFF-HDG HOLD: OFF [846] START ADDRESS: 00 DISPLAY REGISTER switch: OFF TEST-NORMAL: NORMAL [905] POWER: OFF	Routine complete	. . .



NOTES:

1. 846 DISPLAY REGISTER light on indicates pass, off indicates failure.
2. If bit 5, 6, 14, 15, or 16 is off, ensure 083 flight control stick is centered.
3. Bits 4 thru 10 signals are monitored in AUTO and bits 11 thru 18 signals are monitored in PITCH DAMP.

Figure 6-4. LQ Display

6-31. LE-1 ROUTINE.

The purpose of this routine is to move the antenna in a programmed manner and check the time required for this movement.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017 140
041 206
106 506

REFERENCES

FUNCTIONAL DIAGRAM

Radar Track Resolver Chain
(T.O. 27-5/Fig. 3-12)

FAULT ISOLATION

Radar Scan Pattern
(T.O. 27-3/Fig. 3-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [106] AZ DRIVE MOTOR: TEST [506] MOTOR REF: TEST [796] SELECTOR TEST: 2 [ACP] Selector: MISSILES ALL [Computer] Channel 8: Load iaw para 6-4 [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 400 [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN [083] Action switch: Press to 2nd detent and release ANT ELEV: Detent [140] DIGITAL INPUTS ENTER: Up (on)	[080] B-sweep: Centers, then moves to 16.4° right, then moves to 16.4° left, then moves to 16.4° right, then centers —— El marker: Centers, then moves to 16.4° up, then 16.4° down, then 16.4° up [846] DISPLAY REGISTER lights: 001772	The el marker does not move until the B-sweep movement is complete. The 846 DISPLAY REGISTER lights come on after the el marker movement is completed
2	[140] DIGITAL INPUTS ENTER: Down (off) [846] RUN-STOP: STOP, then RUN	[846] DISPLAY REGISTER lights: Compare to figure 6-5 to determine pass or fail indications	. . .
3	[796] SELECTOR TEST: 7, then OFF [106] AZ DRIVE MOTOR: NORM [506] MOTOR REF: NORMAL [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 [905] POWER: OFF [ACP] Selector: VIS IDENT	Routine complete	. . .

6-31.1. LE-2 ROUTINE.

The purpose of this routine is to move the antenna in a programmed manner and check the time required for this movement. The two cycles of this routine check the antenna movement at a slow and a fast slewing rate.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

017	140
041	206
106	506

REFERENCES

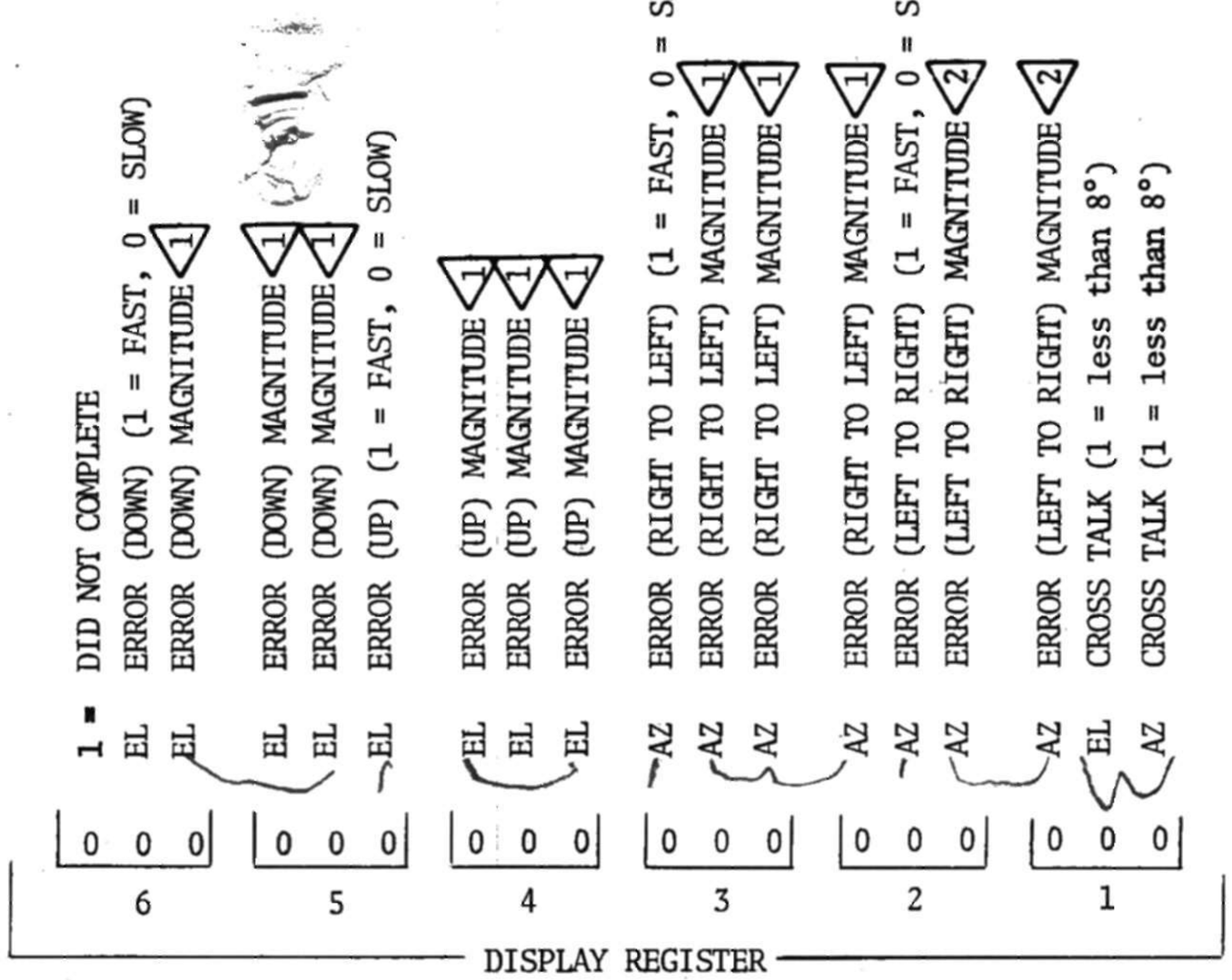
FUNCTIONAL DIAGRAM

Radar Track Resolver Chain
(T.O. 27-5/Fig. 3-12)

FAULT ISOLATION

Radar Scan Pattern
(T.O. 27-3/Fig. 3-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [106] AZ DRIVE MOTOR: TEST [506] MOTOR REF: TEST [796] SELECTOR TEST: 2 [ACP] Selector: MISSILES ALL [Computer] Channel 8: Load iaw para 6-4 [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 420 [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN [083] Action switch: Press to 2nd detent and release ANT ELEV: Detent [140] DIGITAL INPUTS ENTER: Up (on)	[080] B-sweep: Centers, then moves to 16.4° right, then moves to 16.4° left, then moves to 16.4° right, then centers —— El marker: Centers, then moves to 16.4° up, then 16.4° down, then 16.4° up [846] DISPLAY REGISTER lights: 001772	The el marker does not move until the B-sweep movement is complete. The 846 DISPLAY REGISTER lights come on after the el marker movement is completed
2	[140] DIGITAL INPUTS ENTER: Down (off) [846] RUN-STOP: STOP, then RUN	[846] DISPLAY REGISTER lights: Compare to figure 6-5 to determine pass or fail indications	. . .
2.1	[140] DIGITAL INPUTS ENTER: Up (on)	Same as step 1	Same as step 1
2.2	[140] DIGITAL INPUTS ENTER: Down (off) [846] RUN-STOP: STOP, then RUN	Same as step 2	. . .
3	[796] SELECTOR TEST: 7, then OFF [106] AZ DRIVE MOTOR: NORM [506] MOTOR REF: NORMAL [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 [905] POWER: OFF [ACP] Selector: VIS IDENT	Routine complete	. . .



NOTES:

1. The error magnitude code and percent error are shown in the table

2. Only two most significant digits of error magnitude code are displayed. See table for pass or fail status.

3. If routine fails, perform tracking loop adjustment iaw para. 3-16b.

	ERROR MAGNITUDE CODE	% ERROR
P	000	Less than 1.56
A	001	1.56 - 3.12
S	010	3.12 - 4.69
S	011	4.69 - 6.25
F	100	6.25 - 7.81
A	101	7.81 - 9.37
I	110	9.37 - 10.94
L	111	Greater Than 10.94

Figure 6-5. LE-1 Display

6-32. LE-3 ROUTINE.

The purpose of this routine is to check the digital range circuitry by setting all counter bits high, then low, and checking the 20 MH_Z oscillator frequency. The Mx PRF (see T.O. 27-6, Classified Codes) is used as a standard for the oscillator frequency check.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULT UNIT

103
140
641

REFERENCES

FUNCTIONAL DIAGRAM

Range Track
(T.O. 27-5/Fig. 3-17)

FAULT ISOLATION

Lock-On and Range Tracking
(T.O. 27-3/Fig. 3-6)

CAUTION

Normally a pass or fail indication will be obtained within two seconds. Do not hold 195 VIDEO TEST longer than 15 seconds to prevent damage to the 080 MMST.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [305] NOSE-TAIL: NOSE [083] AUTO SEARCH: Press and release [ACP] Selector: MISSILE ALL [196] MOD TEST: Up (on) [Computer] Channel 8: Load iaw para 6-4 [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 401 DIGITAL INPUTS ENTER: Up (on) [195] VIDEO TEST: Press and hold [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN [195] VIDEO TEST: Release when indication is obtained	[846] DISPLAY REGISTER lights: 000761 (pass)	If the 846 DISPLAY REGISTER lights indicate fail of 000772, call up DRO locations in table 6-11 using TR routine iaw para 6-9
2	**NOTE** To perform the LE-3 calibration, perform steps 2 thru 4. These steps check known ranges and stores the information to compensate for system delay times. Step 1 must pass before step 3 can be successfully accomplished. [846] RUN-STOP: STOP, then RUN	[080] VI WARN: Comes on	. . .
3	[305] RANGE: 4SP [196] REC TEST: Up (on) [083] Action switch: Press to 2nd detent and hold. Lock on to 2nd receiver test target, and release action switch	[080] VI WARN: Goes off when range gate is positioned over target and comes on 20 sec after action switch is released	If 080 VI WARN does not go off, computer is not receiving a range gate
4	[305] RANGE: 16 SP [083] Action switch: Press to 2nd detent and hold. Lock on to 22nd receiver test target, and release action switch	[080] VI WARN: Goes off when range gate is positioned over target and comes on 20 sec after action switch is released [846] DISPLAY REGISTER lights: 000763 (pass)	If 080 abort A is displayed, loss of DROT has occured. 846 DISPLAY REGISTER lights indicate fail of 000774, call up DRO locations in table 6-12 using TR routine in accordance with paragraph 6-9.
5	[196] MOD TEST: Down (off) REC TEST: Down (off) [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [140] DIGITAL INPUTS ENTER: Down (off) DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 [ACP[Selector: VIS IDENT [905] POWER: OFF	Routine complete	. . .

See pg 66 Sup 41

Table 6-11. LE-3 Failure Data

DRO LOCATION	846 DISPLAY REGISTER LIGHTS	PROBABLE FAULT
3164	037777	Normal display
	Any other	140 unit faulty
3165	000000	Normal display
	Any other	140 unit faulty
3166	023420 ±000012	Normal display
	000000	Modulator sweep trigger missing
	027040 ±000040	M_X PRF not selected
	00xxxx	Radar not in search
	02xxxx	M_X PRF incorrect
	Any other	140 unit faulty

Table 6-12. LE-3 Calibration Failure Data

DRO LOCATION	846 DISPLAY REGISTER LIGHTS	PROBABLE FAULT
3164	200000 ±000101	Normal display
	Any other	140 unit faulty
3165	000024 ±000012	Normal display
	Any other	System delay incorrect (should be less than 50 nsec/bit) A reading of zero indicates loss of DROT
3166	001142 ± = 6.1 µs ± 000012 ± = 0.1 µs	641 unit delay, 10 nsec/bit

See pg 67 Sup 41

6-33. LDI-1, 2, 3, 4 ROUTINE.

The LDI routines are used for display of the following on the 846 DISPLAY REGISTER: A51A ARM, MIN TIME and LAST TIME data and ASIP acceleration count data.

EQUIPMENT REQUIRED	EQUIPMENT HOOKUP	PRELIMINARY PROCEDURE
None	None	Table 1-1

PROBABLE FAULTY UNIT

140
846
857

FUNCTIONAL DIAGRAMS	REFERENCES	FAULT ISOLATION
Computer Tie-in (T.O. 27-5/Figure 6-7)		None

STEP	INSTRUCTION	INDICATION	REMARKS
1	Computer Channel 8: Load in accordance with paragraph 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES 846 START ADDRESS: 15 ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS: 701 for A51A ARM 702 for A51A MIN TIME 703 for A51A LAST TIME 704 for ASIP COUNTS DIGITAL INPUTS ENTER: Up (on) (See Remarks)	[846] DISPLAY REGISTER lights: RAM A51A ARM - 000701 A51A MIN TIME - 000702 A51A LAST PASS - 000703 ASIP (See Remarks)	. . . The ASIP count display routine begins at step 3 (Skip step 2) Last pass information is destroyed after returning to Nav.
2	[140] DIGITAL INPUTS ENTER: down (off)	[846] DISPLAY REGISTER lights: A51A mode data (See figure 6-XX A51A Mode Data)	. . .
3	[140] DIGITAL INPUTS ENTER: Up (on)	[846] DISPLAY REGISTER lights: Indicates RAM location of first item to be displayed	. . .
4	[140] DIGITAL INPUTS ENTER: down (off)	[846] DISPLAY REGISTER lights: Indicates value of first item	A51A data is displayed in BCD format, ASIP data is displayed in Binary (See table 6-XX LDI-1, 2, 3, 4 Display)

STEP	INSTRUCTION	INDICATION	REMARKS
5	[140] DIGITAL INPUTS ENTER: up (on)	[846] DISPLAY REGISTER lights: Indicates RAM location of next Item to be displayed	. . .
6	[140] DIGITAL INPUTS ENTER: down (off)	[846] DISPLAY REGISTER lights: Indicates value of Item whose RAM location is displayed in step 3	. . .
7	[140] DIGITAL INPUTS ENTER: Repeat steps 5 and 6 until completion halt is displayed	[846] DISPLAY REGISTER lights: Completion halt is displayed 000701 for A51A ARM 000702 for A51A MIN TIME 000703 for A51A LAST TIME 000704 for ASIP Counts	. . .
8	[140] DIGITAL INPUTS: 000 DIGITAL DISPLAY: NORMAL DIGITAL INPUTS ENTER: Down (off) [846] TEST-NORMAL: NORMAL START ADDRESS: 00 DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine Complete	. . .

18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
0	0	Angle Track (ATOT)**	Delayed Range (DROT)**	IR Track	Lead Collision Mode	Pursuit Mode	Proportional Steering Mode	0	0	Trigger	Radar Missiles Selected*	All Bays Selected*		Abort	Pilot Assist	Auto Attack	Special Weapon Selected

DISPLAY LIGHTS

*Both lights 6 and 7 off indicates IR missiles selected

**Both lights 15 and 16 on indicates EXTRAPOLATE

Figure 6-5.1. A51A Mode Data

6-33A. LAR ROUTINE.

The LAR routine initializes ASIP acceleration count data to zero.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140
846
857

FUNCTIONAL DIAGRAMS

Computer Tie-in
(T.O. 27-5/Figure 6-7)

REFERENCES

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	Computer Channel 8: Load in accordance with paragraph 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES [846] START ADDRESS: 15 ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS: 705 DIGITAL INPUTS ENTER: Up (on)	[846] DISPLAY REGISTER lights: Indicate completion halt 000705	. . .
2	[140] DIGITAL INPUTS: 000 DIGITAL DISPLAY: NORMAL DIGITAL INPUTS ENTER: Down (off) [846] TEST-NORMAL: NORMAL START ADDRESS: 00 DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine Complete	. . .

TABLE 6-12.1. LDI-1, 2, 3, 4 DISPLAY

ADDRESS DISPLAYED			ITEM DISPLAYED		ADDRESS	VALUES DISPLAYED
A51ARM (15-701)	A51AMT (15-702)	A51AST‡ (15-703)	A51A (BCD)		ASIP (15-704)	ASIP (OCTAL)
003326	003166	003056	$M_I/10$	Mach	*003773	5.5 to 6.0g Count
003325	003165	003055	$V_I/10,000$	Feet/Second	003772	4.5 to 5.5g Count
003324	003164	003054	$T_F/100$	Seconds	003771	3.5 to 4.5g Count
003325	003163	003053	$-\dot{R}/10,000$	Feet/Second	003770	2.5 to 3.5g Count
003322	003162	003052	$S_T/100$	(0-15)	003767	2.0 to 2.5g Count
003322	003162	003052	†$\tilde{A}_V/10$	Inches	003766	0.0 to -1.5g Count
003321	003161	003051	$S_R/100$	(0-15)	003765	-1.5 to -2.5g Count
003321	003161	003051	†$\tilde{A}_H/10$	Inches	003764	-2.5 to -3.0g Count
003320	003160	003050	$S_D/100$	(0-15)		
003320	003160	003050	†J	Radians		
003317	003157	003047	††$H_F/10,000$	Feet		
003316	003156	003046	††$H_C/100,000$	Feet		
003315	003155	003045	$F_{ADJ}/100,000$	Feet		
003314	003154	003044	**Rp/100,000	Feet		
003313	003153	003043	$R_L/100,000$	Feet		
003312	003152	003042	Sin ϵ			
003311	003151	003041	Sin η			
003310	003150	003040	Sin ϵ_T			
003307	003147	003037	Sin θ			
003306	003146	003036	Sin ϕ			
003305	003145	003035	$A_L/10$	g		
003304	003144	003034	α	Radians		
003303	003143	003033	$V_M/1,000$	Feet/Second		
003303	003143	003033	†D/10,000	Feet		
003302	003142	003032	$\Delta H/100,000$	Feet		
003301	003141	003031	Cos η Cos ϵ /10			
003301	003141	003031	†$\Delta F_1/10,000$	Feet		

†These items are displayed when Special Weapon has been Selected.

††$H_I = H_C + H_F$

*Count is stored in bits 0-9, Accelerometer correction factor is stored in bits 11-18.

**T at launch/100 seconds in AIM-4G lead collision mode.

‡These addresses are shared with other signals during tactical use so that the last pass information may be destroyed after returning to Nav.

6-34. LC ROUTINE (SHORT).

The LC Routine (Short) checks only the multiplexed validity signals from the 509 (SCC) and the ECA units. The LC Routine (Short) is run when the 296 unit is not installed.

NOTE

- Ensure TRT/GYRO switch (LMWW) is ON.
- Artificial horizon will not precess with LC Routine (Short).

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

ECA
SCC (509)
905

REFERENCES

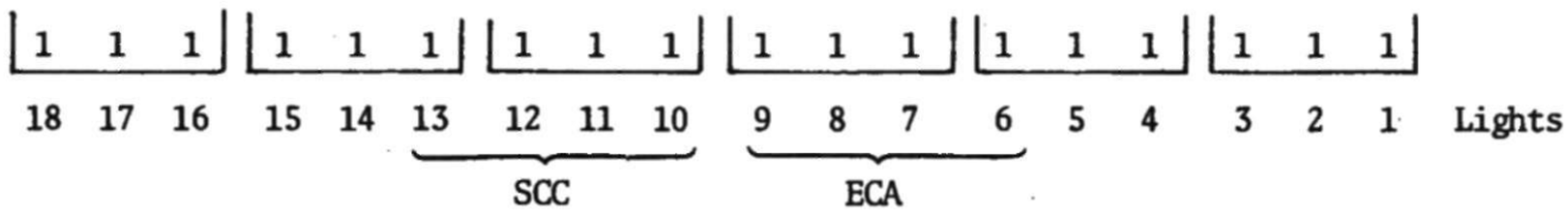
FUNCTIONAL DIAGRAM

1. Input/Output (T.O. 27-5/Fig. 6-2)
2. AHRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

1. Artificial Horizon Drifts or Tumbles (T.O. 27-3/ Fig. 8-1)
2. Artificial Horizon Does Not Erect (T.O. 27-3/ Fig. 8-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[796] SELECTOR TEST: 2 [163] DISP/AUTO MODE: AUTO NAV [CSC] HDG/PUSH TO SYNC: Press and hold for 5 seconds, then release	. . .	. . .
2	[Computer] Channel 8: Load iaw para 6-4 [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 600 [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS ENTER: Up (on)	[846] Display Register Lights: All lights off at start of test, then lights 1-6 turn on in sequence. At end of test, 001762 is displayed.	Routine time for short LC is 5 seconds
3	[140] DIGITAL INPUTS ENTER: Down (off) [846] RUN-STOP: STOP then to RUN [140] DIGITAL INPUTS ENTER: Up	[846] Display Register lights: Lights 1 thru 18 should all be on, though only light 6-13 will indicate valid fails.	For fault isolation, see table 6-13
	NOTE If LC Routine is to be run again, proceed to step 4, otherwise proceed to step 5.		
4	[140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES ENTER: Down, up, down, then up	[846] Display Register Lights: same as step 2.	

STEP	INSTRUCTION	INDICATION	REMARKS
5	[796] SELECTOR TEST: OFF [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [140] DIGITAL DISPLAY: NORMAL DIGITAL INPUT: 000 DIGITAL INPUTS ENTER: Down	Routine complete	
	 Lights 6-9 indicate a validity fail on the ECA Lights 10-13 indicate a validity fail in the SCC (509) **NOTE** For further fault isolation of the 10 specific validity signals see T.O. 1F-106A-2-27-8, para. 10-5 step 4, for LC display (short).		
6	[CSC] HDG/PUSH TO SYNC: Press and adjust for 0° heading on TSD [905] GRID REFERENCE: 0°	[TSD] Heading Indicator 0°	. . .
7	[905] PRESS TO ERECT: Press and hold for approximately 5 seconds, then release	[TSD] Grid Overlay: Slews to 0° ± 2° in approximately 5 seconds	. . .
8	[905] GRID REFERENCE: 45° PRESS TO ERECT: Press and hold for approximately 5 seconds, then release	[TSD] Heading Indicator: 45° Grid Overlay: Slews to 45° ± 2° in approximately 5 seconds	
9	[905] POWER: OFF	. . .	. . .

6-34A. LC ROUTINE (EXTENDED)

The LC Routine (Extended) performs the following: validity checks, MAD checks, ECA/SCC(509) static tests, DGA pitch and roll torquing tests, DGA pitch and roll erection tests, ECA oscillating motor check, and DGA heading torquing tests.

WARNING

Remove and install 296 unit only when electrical power is not applied to aircraft. Install; remove before flight flag on 296.

EQUIPMENT REQUIRED

AHRG Test Programmer (3452296)

EQUIPMENT HOOKUP

Place AHRG Test Programmer (3452296) on LH aft equip rack (7839890); disconnect P29601 from J29601 on rack and connect to J29601 on AHRG Test Programmer

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

DGA	CSC
ECA	MAD
SCC	905

REFERENCES

FUNCTIONAL DIAGRAMS

1. INPUT/OUTPUT (T.O. 27-5/Fig. 6-2)
2. AHRG (T.O. 27-5/Fig. 8-2)

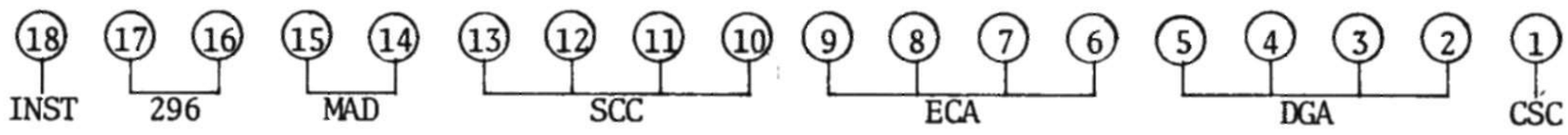
FAULT ISOLATION

1. Artificial Horizon Drifts or Tumbles (T.O. 37-3/Fig. 8-1)
2. Artificial Horizon Does Not Erect (T.O. 27-3/Fig. 8-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[796] SELECTOR TEST: 2 [163] DISP/AUTO MODE: AUTO NAV [CSC] HDG/PUSH TO SYNC: Press and hold for 5 seconds, then release.	. . .	. . .
2	[COMPUTER] CHANNEL B: Load iaw para. 6-4. [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: Digital input switches. DIGITAL INPUTS: 600 [846] ENTER START ADDRESS: Press and release. RUN-STOP: RUN [140] DIGITAL INPUTS ENTER: Up	[846] Display Register Lights: All lights off at start of test. Each light (1-18) turns on in sequence, then off in sequence (1-14). Artificial horizon precesses up and clockwise approximately 8^{o} in pitch and roll. Then, 001762.	Running time for routine is 2.25 minutes.
3	[140] DIGITAL INPUTS ENTER: Down [846] RUN-STOP: STOP, then RUN [140] DIGITAL INPUTS ENTER: Up	[846] Display Register Lights: Lights 1 through 17 ON indicate no failure. Light 18 OUT indicates test programmer (3452296) is installed. See Table 6-13A if any other light is out.	. . .

Table 6-13A. Unit Fault Isolation Failword (DRO Location 3640)

Display Register [846 Unit]



NOTES: (1) The Display Register (846 Unit) will display only the most probable failed unit with the Unit Fault Isolation Failword (DRO 3640).

(2) Bit 13 is off when the AHRF Test Programmer (3452296) is installed. Bit 18 is on when the AHRG Test Programmer (3452296) is not installed.

(3) Bits 1 thru 17 are all on to indicate no detected failures. If a unit is represented by more than one bit, all bits in that unit's group must be off to indicate a valid fail.

(4) Begin at far right of Display Register and look for first bit or group of bits that is out. Replace that unit and repeat LC Routine (Extended). Ignore all indications to the left of first failed bit or group of bits.

NOTE: For further fault isolation, proceed to step 4.

NOTE

When Digital Input Switch 1 is put in the up position, DRO location 3601 is displayed.

4	[140] DIGITAL INPUT SWITCH 1: Up	[846] Display Register Lights: A light out indicates a failed subassembly. See Fig. 6-13B.	Displays most probable failed subassembly in failed unit.

STEP	INSTRUCTION	INDICATION	REMARKS
	NOTE If LC Routine (Extended) is to be rerun, proceed to step 5, otherwise proceed to step 6.		
5	[140] DIGITAL INPUT SWITCH 1: Down [CSC] SLAVE/DG: SLAVE HDG/PUSH TO SYNC: 5 seconds SLAVE/DG: DG [140] DIGITAL INPUTS ENTER: Down Up, Down, then Up.	[846] Display Register Lights: Same as step 2.	
6	[796] SELECTOR TEST: OFF [846] START ADDRESS: 00 TEST NORMAL: NORMAL DISPLAY REGISTER SWITCH: OFF [140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUT ENTER: Down [905 POWER: OFF	Routine Complete	
	CAUTION Remove power from aircraft before disconnecting P29601 from AHRG Test Programmer J29601 and reconnecting to aircraft J29601.		
7	(AHRG Rack] Remove 296 unit from aircraft. Connect P29601 to aircraft J29601.		

Table 6-13B. PCB/Subassembly Fault Isolation Failword (DRO Location 3601)

Display Register [846 Unit]

18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

Subassemblies of DGA Unit

														N/A	DG	VG	

Subassemblies of ECA Unit

														N/A	A6	A5	A4	A3	A2	A1

Subassemblies of SCC Unit

														N/A	A8	A7	A6	A5	A4	A3	A2	A1

NOTE

1. The Display Register will display only the most probable failed subassembly with the PCB/Subassembly Fault Isolation Failword (DRO 3601).
2. The failed subassembly for the failed unit will be displayed as a light off.

6-35. LD ROUTINES.

a. The LD routines check the proper operation of all digital inputs to the computer, except spare digital inputs D118, D120, and D188 two separate routines are used to exercise all the digital inputs. These are the LD-1 and the LD-2 routines. The LD-1 routine tests the inputs which originate from switches in the aircraft cockpit. The LD-2 routine tests the remaining inputs. These two routines are preformed separately. The LD-1 routine is given in paragraph 6-35.1. The LD-2 routine is in paragraph 6-35.2.

6-35.1. LD-1 ROUTINE.

a. The LD-1 routine is accomplished using switches which are located in the cockpit in an aircraft installation. It is not necessary to perform any actions involving the use of switches on the computer subsystem units, such as would normally be required to execute a computer routine.

b. The LD-1 is composed of a test of the digital inputs from single-contact switches and a test of digital inputs from multiple-contact switches. The single-contact switch being tested is indicated by K-feet target altitude corresponding to the step being performed. The computer will first check the off state and then the on state of each digital input. Whenever a pass occurs while testing either single-contact switches or multiple-contact switches, target altitude will be incremented by 1000 feet and the computer will begin checking the next switch. If changing the switch does not cause target altitude to increase by 1000 feet a failure (or incorrect switch position indication) has occurred. If a failure occurs, the PTF lamp ON will indicate that the switch under test has not been set OFF and the VI WARN lamp will indicate that the switch has not been set ON. If a failure occurs the operator may go to the next step by pressing and releasing the trigger switch (083). The operator may discontinue testing single contact switches by pressing and releasing the GND TEST INTER switch (796) which initiates the test of the first multiple position switch. If the LD-1 test is to be discontinued, the operator may set the SELECTOR TEST switch (796) to OFF and the program will return to the tactical executive routine after five (5) seconds delay.

c. There are 28 single-contact switches tested during the first part of the LD-1 routine. The indication in step 28 signifies that the single-contact switch testing is complete. The action in step 29 initiates the testing of the first of the multiple input switches. A pass indication for each step is a 1000 ft. incrementation of target altitude or, for the last position of each multiple switch, an increase of 1000 feet in command altitude and a reinitialization of target altitude for the next multiple switch. Command altitude indicates which multiple switch is under test and target altitude indicates the switch position under test. If target altitude does not change when the proper switch position has been selected a failure has occurred. The target heading (181) in accordance with table 6-14 will indicate which particular input failed. If more than one input is faulty the target headings for those inputs will be added together and the result displayed.

d. During the multiple input switch testing portion of the LD-1 routine the operator may at any time proceed to the next switch to be tested. This can be accomplished by performing (796) GND TEST INTER: Press and release. The routine will proceed to test the first position of the next multiple input switch in sequence. The command altitude in K feet indicates the multiple switch being tested.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1

PROBABLE FAULTY UNIT

Unit on which switch is located that is being checked in each step

REFERENCES

FUNCTIONAL DIAGRAM

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [405] Function sw: REC PRESET: Inoperative TACAN station [163] DISP/AUTO MODE: MIN TIME [ACP] Selector: SPL WPN [NWW] Door closed switch: Closed [083] AUTO SEARCH: Press and release [796] SELECTOR TEST: 7 [083] Trigger: 2nd detend and release (D101) [796] GND TEST INTER: Press and release	[796] COMP: On [080] VI WARN: On [080] PTF: Off □ [AVVI] or ○ [980] Target altitude: Increases from 1,000 ft to 2,000 ft.	The following is an explanation of the indication in step 1. An equivalent explanation applies to each step thru step 28 of this procedure. 1. Increase of target altitude from 1000 ft to 2000 ft indicates that the test of the digital input tested in this step (D112) has passed, and that the test of the digital input in the next step (D101) has started. If the target altitude has remained at 1000 ft, a failure of the test of D112 is indicated. 2. The VI WARN light indicates that the switch under test should be set ON. 3. The PTF light indicates that the switch under test should be set OFF.
2	[083] Trigger: 2nd detent and release (D101)	Same as step 1, except target altitude goes to 3000 ft.	. . .
3	[ACP] ARM-SAFE: ARM, then SAFE (D122)	Same as step 1, except target altitude goes to 4000 ft.	. . .
4	[305] RDR/IR: SCAN [083] Boresight: NORM/TRK [083] RDR-IR SELECT: Press and release to obtain IR dominant mode Action sw: 2nd detent and release (D114)	Same as step 1, except target altitude goes to 5000 ft.	. . .
5	[109] DATA LINK ADDRESS TEST: Push for TEST ADDRESS, then Normal (D128)	Same as step 1, except target altitude goes to 6000 ft.	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
6	[ACP] Armament Selector: VIS IDENT (D125), then RAD	Same as step 1, except target altitude goes to 7000 ft.	. . .
7	[083] Boresight sw: BORS, then NORM/TRK (D114)	Same as step 1, except target altitude goes to 8000 ft.	. . .
8	[305] NOSE-TAIL: NOSE, then TAIL (D126)	Same as step 1, except target altitude goes to 9000 ft.	. . .
9	[083] AUTO SEARCH; Press and release LC/PUR and release (D114)	Same as step 1, except target altitude goes to 10000 ft.	. . .
10	[405] Function sw: T/R System Test: Press and hold until valid TACAN is indicated ("OK" on 181 Annun.). Then release.	Same as step 1, except target altitude goes to 11,000 ft.	Ensure valid TACAN is being received
11	[163] OFF-ALT HOLD: ALT HOLD (D119) [796] SELECTOR TEST: OFF for less than 5 seconds then 4	Same as step 1, except target altitude goes to 12,000 ft.	. . .
12	[163] AUTO MODES: MIN TIME [163] FLT MODE: DIR MAN, then PITCH (D186)	Same as step 1, except target altitude goes to 13,000 ft.	. . .
13	[163] FLT MODE: PITCH DAMP, then ASSIST (D132)	Same as step 1, except target altitude goes to 14,000 ft.	. . .
14	[083] MMT: Press and release (D132)	Same as step 1, except target altitude goes to 15,000 ft.	. . .
15	[163] OFF-HDG HOLD: HDG HOLD, (D127)	Same as step 1, except target altitude goes to 16,000 ft.	. . .
16	[163] FLT MODE: PITCH DAMP, then ASSIST (D111)	Same as step 1, except target altitude goes to 17,000 ft.	. . .
17	[163] FLT MODE: AUTO (D102)	Same as step 1, except target altitude goes to 18,000 ft.	PTF and VI WARN will be off if D111 = 0
18	[163] FLT MODE: ASSIST [083] EMER MANUAL: Press and release [163] FLT MODE: ASSIST (D132)	Same as step 1, except target altitude goes to 19.000 ft.	. . .
19	[083] Trim button: LWD and release (D148)	Same as step 1, except target altitude goes to 20,000 ft.	. . .
20	[083] Trim button: RWD and release (D147)	Same as step 1, except target altitude goes to 21,000 ft.	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
21	[083] Trim button: NOSE DOWN and release (D146)	Same as step 1, except target altitude goes to 22000 ft.	. . .
22	[083] Trim button: NOSE UP and release (D145)	Same as step 1, except target altitude goes to 23000 ft.	. . .
23	[083] RDR IR SELECT: Press and release AUTO SEARCH: Press and release ACTION: Press to second detent and release AUTO SEARCH: Press and release (D105)	Same as step 1, except target altitude goes to 24000 ft.	. . .
24	[305] IR: SLVD [083] RDR-IR SELECT: Press and release to obtain IR dominant mode. ACTION sw: 2nd detent and release (D103)	Same as step 1, except target altitude goes to 25000 ft.	. . .
25	[083] AUTO SEARCH: Press and release RDR-IR SELECT: Press and release to obtain radar dominant mode. [083] ACTION sw: 2nd detent and hold. Lock on to any receiver test target (D113, D121)	Same as step 1, except target altitude goes to 26000 ft.	Press 080 on, if necessary to obtain displays
26	[305] RDR: HOM ACTION sw: 2nd detent and hold. Position range gate so that it is not coincident with any target. ACTION sw: Release (129) [083] AUTO SEARCH: Press and release [305] RDR: NORM	Same as step 1, except target altitude goes to 27000 ft.	Checks ATOT capability
27	[305] CHAFF: ALL (D187)	VI WARN: ON PTF: ON Target altitude goes to 1000 ft. Command altitude goes to 1000 ft.	. . .
28	Deleted		

STEP	INSTRUCTION	INDICATION	REMARKS
29	[019] ADDRESS SELECT: 1	[080] VI WARN: ON PTF: ON If Tgt. Alt. does not change, note target heading and refer to Table 6-14 to determine failed input. □ [AVVI] or ○ [980] Target altitude: Indicates, in thousands of feet, one more then number of the switch position being tested.	The switch under test in this step is 019 ADDRESS SELECT, position 1.
30	[019] ADDRESS SELECT: 2 thru 32 sequentially.	Same as step 29. Command altitude goes to 2000 ft. after last position is tested.	. . .
31	[019] CHANNEL: 1 thru 26 and M sequentially.	Same as step 29. Command altitude goes to 3000 ft. after last position is tested.	. . .
32	[405] PRESET: 1 thru 23 and M sequentially	Same as step 29. Command altitude goes to 4000 ft. after last position is tested.	. . .
33	[955] HOMING POINT SELECTOR: A thru U sequentially.	Same as step 29. Command altitude goes to 5000 ft. after last position is tested.	Target altitude relates to the letter position of the switch, eg 1000 ft. for position A, 2000 ft. for position B, etc.
34	[163] DISP/AUTO MODE: AUTO NAV	Same as step 29, except target altitude goes to 2000 ft.	. . .
35	[163] DISP/AUTO MODE: MAX RNG	Same as step 29, except target altitude goes to 3000 ft.	. . .
36	[163] DISP/AUTO MODE: MIN TIME	Same as step 29, except target altitude goes to 4000 ft.	. . .
37	□ [163] DISP/AUTO MODE: ILS APCH ○ [163] DISP/AUTO MODE: ILS [163] DISP/AUTO MODE: MIN TIME	Same as step 29, command altitude goes to 6000 ft.	Selecting ILS or ILS APCH causes target altitude to be 0 ft. Selection of MIN TIME causes target altitude to go to 1000 ft.
38	[181] RADIUS MILES: 50	Same as step 29, except target altitude goes to 2000 ft.	. . .
39	[181] RADIUS MILES: 200	Same as step 29, except target altitude goes to 3000 ft.	. . .

See pg 70 Sup 41

STEP	INSTRUCTION	INDICATION	REMARKS
40	[181] RADIUS MILES: 400	Same as step 29, except target altitude goes to 1000 ft. Command altitude goes to 7000 ft.	. . .
41	[ACP] Selector: SPL WPN	Same as step 29, except target altitude goes to 2000 ft.	. . .
42	[ACP] Selector: VIS IDENT	Same as step 29, except target altitude goes to 3000 ft.	. . .
43	[ACP] Selector: MISSILES IR (or MISSILES RAD and no ATS on board) See Sup-25-38	Same as step 29, except target altitude goes to 1000 ft. Command altitude goes to 8000 ft.	. . .
44	[796] SELECTOR TEST: OFF for less than 5 seconds then 1 thru 7, sequentially.	Same as step 29.	. . .
45	[796] SELECTOR TEST: OFF	[796] COMP: Goes off [080] VI WARN: Off PTF: Off	. . .
46	[405] PRESET: Operational TACAN station [163] AUTO MODES/AUTO NAV [181] OFF/BRT: BRT RADIUS MILES: 50 MODE: AUTO (D160, D161, D162, D163)	Observe that interceptor bug is set to correct range and bearing for TACAN Station selected.	. . .

Table 6-14. LD-1 Routine Target Heading Identification

SWITCH UNDER TEST	[181] Target Heading * (Degrees)				
	160	80	40	20	10
[019] ADDRESS SELECT	D128	D137	D138	D139	D140
[019] CHANNEL	D124	D156	D157	D158	D155
[405] PRESET	D108	D151	D152	D153	D150
[955] HOMING POINT SELECTOR	D116	D176	D177	D178	D175
[163] DISP/AUTO MODE	–	D133	D134	–	–
[181] RADIUS MILES	–	–	–	D135	D136
[ACP] Selector See Sup -25-38	–	D106	D109	D177	D130
[796] SELECTOR TEST	D104	D107	D115	–	–

*On vertical instrument aircraft HSI may be used except when AUTONAV of ILS is selected.
ACP selector must be in SPL/WPN/GUN position.

6-35.2. LD-2 ROUTINE.

a. The LD-2 routine tests the digital inputs not checked by the LD-1 routine. The digital inputs involved are those generated by switches on the computer subsystem units, and those controlled by switches in the aircraft not accessible from the cockpit.

b. The LD-2 routine does not involve fail halts. As the routine runs, the status of various inputs is displayed on the (846) DIGITAL DISPLAY lights.

c. After checking the inputs of table 6-14.1, the program enters the TD routine so that the inputs of table 6-14.2 can be checked.

EQUIPMENT REQUIRED

486117 Armament Test Set

EQUIPMENT HOOKUP

Install one missile simulator in forward bay and set MISSILE TYPE to 3A. Install one missile simulator in aft bay and set MISSILE TYPE to 4A.

PRELIMINARY PROCEDURE

1. Table 1-1
2. Remove flight plug and install ATS test cable (417163) between TJ-1 and special weapon cartridge disconnect.
3. Disconnect P123 (PH pylon) if applicable.

PROBABLE FAULTY UNIT

Units on which switch is located that is being checked in each step.

REFERENCES

FUNCTIONAL DIAGRAM

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	Computer Channel 8: Load iaw para. 6-4 [140] DIGITAL INPUTS: 011 DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS ENTER: Up (on) [846] START ADDRESS: 14 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: 18 on Lights 1, 2, 7 on initially	Indicates that lights 1-9 are displaying digital inputs iaw 6-14.1

STEP	INSTRUCTION	INDICATION	REMARKS
2	Refer to table 6-14.1. Operate switches which are the source of of the digital inputs under test to set each input high and low	[846] DISPLAY REGISTER lights: 1 thru 9 indicate the state of the digital inputs under test iaw table 6-14.1	. . .
3	[140] DIGITAL INPUTS ENTER: Down (off)	[846] DISPLAY REGISTER TD ROUTINE digital inputs (table 6-14.2)	The TD ROUTINE is automatically initiated. Follow TD procedures.
4	[796] SELECTOR TEST: OFF [ACP] Selector: VIS IDENT [140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUT ENTER: Down (off) [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF [Missile simulators] Remove [ATS test cable] Remove [Flight plug] Install [RH pylon] P113: Connect (if disconnected)	Routine complete	. . .

Table 6-14.1. LD-2 Routine Individual Switch Display

846 DISPLAY REGISTER LIGHT	DIGITAL INPUT	SOURCE
1*	D180 Self Test (Display Lights on)	[846] DISPLAY REGISTER switch, ON = high
2**	D131 Computer Test	[846] TEST-NORMAL TEST = high
3	D110 Gun Aboard	Connected to 28V WARM thru pins R and S of gun jumper connector A-P5
4	D185 Tanks Installed	a. For aircraft without pylons and without tanks, source is RH Pylon P123, jumper pins F and G = high b. For aircraft with pylons, with right pylon tank switch, without tanks, source is tank switch, press and hold = high

Table 6-14.1. LD-2 Routine Individual Switch Display (Cont'd)

846 DISPLAY REGISTER LIGHT	DIGITAL INPUT	SOURCE
		c. For aircraft with pylons, with right pylon tank switch, with tanks, source is tank switch, connect P123 = high d. For all other configurations, this input is not tested.
5	D141 COD 3 Snapshoot	Spare, Normally low
6	D142 Binary/BCD Display (Always off in Aircraft)	Spare, Normally low
7	D144 Drum Pressure	[857] Normally high
8***	D117 ALL SELECT	[ACP] Selector: ALL
9***	D109 RAD SELECT	[ACP] Selector: MISSILES RAD or ALL

*Set ON/OFF (846) to OFF, then ON, Lamp 1 will be off for the remainder of the test.
**Set TEST/NORMAL (846) to NORMAL (less than 5 seconds) then back to TEST. Lamp 2 (846) will now remain off for the remainder of the test.
***Lamps 8 and 9 will be off when IR is selected.

Table 6-14.2. Display Register Bit Meanings

SWITCH POSITION	DISPLAY REGISTER BIT LOCATIONS									
	10	9	8	7	6	5	4	3	2	1
NORMAL	D225N	D224N	D215A	D226A	D218A	D202	D216A	D208	D221A	D201
DO GROUP 1	DP206*	DP204*	D227A	D217A	D210	D209	D225A	D207	D205	D203
DO GROUP 2	D223A	D219A	D218N	D217N	D216N	D200	D215N	D214	D213	D212
DO GROUP 3	None	DP211*	DM254*	DM253*	DM252*	DM251*	DM244*	DM243*	DM242*	DM241*
DO GROUP 4	D229A	D228A	DM234*	DM233*	DM232*	DM231*	D229N	D228N	D227N	D226N
DO GROUP 5	D262*	D261*	D260*	D223N**	D222N**	D221N**	D220N**	D222A**	D224A*	D220A**
Corresponding D1 for above switch positions	D182	D183	D170	D171	D172	D173	D165	D166	D167	D168
Corresponding "DIGITAL INPUT SWITCHES" position	D165 (Enter)	D166 (MSB)	D167 (2)	D168 (1)	D182 (4)	D183 (2)	D170 (1)	D171 (4)	D172 (2)	D173 (LSB)

*These digital outputs are inverted; i.e., when DP206 is set high, the DISPLAY REGISTER light will be out.

**Spare digital output which will remain low.

All data on pages 6-54 and 6-55 deleted.

6-36. LX ROUTINE.

The LX routine checks the state of several digital inputs as listed in tables 6-15, 6-16, 6-17, and 6-18.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

019
405
955

REFERENCES

FUNCTIONAL DIAGRAM

1. Input/Output (T.O. 27-5/Fig. 6-2)
2. TACAN (T.O. 27-5/Fig. 9-2)
3. Command Communications Group (T.O. 27-5/Fig. 9-3)

FAULT ISOLATION

Data Link Reception (T.O. 27-3/Fig. 9-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [Computer] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 012 DIGITAL INPUTS ENTER: Up (on) [846] START ADDRESS: 14 ENTER START ADDRESS: Press and release RUN-STOP: RUN [796] SELECTOR TEST: 1 [019] CHANNEL, and [955] HOMING POINT SELECTOR, and [405] PRESET: Position in sequence iaw steps in table 6-15	[080] VI WARN: Comes on —— PTF: Off [846] DISPLAY REGISTER lights: Two words are displayed alternately for 4 sec each (refer to table 6-15). These words are read as follows: Word 1 Bits 18-10: 000 identifies word 1 Bits 9-1: xxx indicates the step identification number in table 6-15	If check passes, the 080 VI WARN will come on for approx 2 sec If check fails, the 080 PTF will come on for approx 3 sec Word 1 is the step identification word and word 2 is the digital inputs states word. Refer to tables 6-16, 6-17, and 6-18 for digital input states with different switch settings

STEP	INSTRUCTION	INDICATION	REMARKS
1 (Cont)	[796] GND TEST INTER: Press after each step in table 6-15 and release when indication is obtained	Word 2 Bits 18-16: 010 identifies word 2 Bits 15-1: xxxxx indicates state of digital inputs 15 D156 14 D157 13 D158 12 D155 11 D124 10 D176 9 D177 8 D178 7 D175 6 D116 5 D151 4 D152 3 D153 2 D150 1 D108	
2	[796] GND TEST INTER: Press and release after all steps of table 6-15 are completed	[796] COMP: Comes on [846] DISPLAY REGISTER lights: 000076	. . .
3	[796] SELECTOR TEST: 7, then OFF [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUTS ENTER: Down (off) [905] POWER: OFF		

Table 6-15. LX Displays

019 CHANNEL	955 HOMING POINT SELECTOR	405 PRESET	WORD 1 STEP IDENTIFICATION	WORD 2 DIGITAL INPUT STATES
1	A	1	000001	205235
2	A	1	000002	245235
3	A	1	000003	265235
4	A	1	000004	275235
5	A	1	000005	273235
6	A	1	000006	233235
7	A	1	000007	217235
8	A	1	000010	247235
9	A	1	000011	261235
10	A	1	000012	235235
11	A	1	000013	253235
12	A	1	000014	227235
13	A	1	000015	251235
14	A	1	000016	223235
15	A	1	000017	215235
16	A	1	000020	243235

Table 6-15. LX Displays (Cont)

019 CHANNEL	955 HOMING POINT SELECTOR	405 PRESET	WORD 1 STEP IDENTIFICATION	WORD 2 DIGITAL INPUT STATES
17	A	1	000021	225235
18	A	1	000022	255235
19	A	1	000023	267235
20	A	1	000024	271235
21	A	1	000025	237235
22	A	1	000026	257235
23	A	1	000027	263235
24	A	1	000030	231235
25	A	1	000031	213235
26	A	1	000032	203235
M	A	1	000033	201235
M	B	1	000034	200535
M	C	1	000035	201035
M	D	1	000036	200175
M	E	1	000037	200275
M	F	1	000040	200635
M	G	1	000041	201475
M	H	1	000042	201375
M	J	1	000043	200735
M	K	1	000044	201435
M	L	1	000045	201175
M	M	1	000046	200335
M	N	1	000047	200435
M	O	1	000050	201075
M	P	1	000051	200375
M	Q	1	000052	200675
M	R	1	000053	201635
M	S	1	000054	201575
M	T	1	000055	201335
M	U	1	000056	200575
M	U	2	000057	200576
M	U	3	000060	200573
M	U	4	000061	200566
M	U	5	000062	200552
M	U	6	000063	200561
M	U	7	000064	200546
M	U	8	000065	200551
M	U	9	000066	200565
M	U	10	000067	200556
M	U	11	000070	200570
M	U	12	000071	200563
M	U	13	000072	200547
M	U	14	000073	200554
M	U	15	000074	200571

Table 6-15. LX Displays (Cont)

019 CHANNEL	955 HOMING POINT SELECTOR	405 PRESET	WORD 1 STEP IDENTIFICATION	WORD 2 DIGITAL INPUT STATES
M	U	16	000075	200567
M	U	17	000076	200557
M	U	18	000077	200574
M	U	19	000100	200572
M	U	20	000101	200562
M	U	21	000102	200542
M	U	22	000103	200541
M	U	23	000104	200545
M	U	M	000105	200555

Table 6-16. Data Link Channel Settings

019 CHANNEL	D156	D157	D158	D155	D124
1	0	0	0	1	0
2	1	0	0	1	0
3	1	1	0	1	0
4	1	1	1	1	0
5	1	1	1	0	1
6	0	1	1	0	1
7	0	0	1	1	1
8	1	0	0	1	1
9	1	1	0	0	0
10	0	1	1	1	0
11	1	0	1	0	1
12	0	1	0	1	1
13	1	0	1	0	0
14	0	1	0	0	1
15	0	0	1	1	0
16	1	0	0	0	1
17	0	1	0	1	0
18	1	0	1	1	0
19	1	1	0	1	1
20	1	1	1	0	0
21	0	1	1	1	1
22	1	0	1	1	1
23	1	1	0	0	1
24	0	1	1	0	0
25	0	0	1	0	1
26	0	0	0	0	1
M	0	0	0	0	0

Table 6-17. Homing Point, Digit Settings

955 HOMING POINT SELECTOR	D176	D177	D178	D175	D116
A	1	0	1	0	0
B	0	1	0	1	0
C	1	0	0	0	0
D	0	0	0	1	1
E	0	0	1	0	1
F	0	1	1	0	0
G	1	1	0	0	1
H	1	0	1	1	1
J	0	1	1	1	0
K	1	1	0	0	0
L	1	0	0	1	1
M	0	0	1	1	0
N	0	1	0	0	0
O	1	0	0	0	1
P	0	0	1	1	1
Q	0	1	1	0	1
R	1	1	1	0	0
S	1	1	0	1	1
T	1	0	1	1	0
U	0	1	0	1	1

Table 6-18. TACAN Digit Settings

405 PRESET	D151	D152	D153	D150	D108
1	1	1	1	0	1
2	1	1	1	1	0
3	1	1	0	1	1
4	1	0	1	1	0
5	0	1	0	1	0
6	1	0	0	0	1
7	0	0	1	1	0
8	0	1	0	0	1
9	1	0	1	0	1
10	0	1	1	1	0
11	1	1	0	0	0
12	1	0	0	1	1
13	0	0	1	1	1
14	0	1	1	0	0
15	1	1	0	0	1
16	1	0	1	1	1
17	0	1	1	1	1
18	1	1	1	0	0
19	1	1	0	1	0

Table 6-18. TACAN Digit Settings (Cont)

405 PRESET	D151	D152	D153	D150	D108
20	1	0	0	1	0
21	0	0	0	1	0
22	0	0	0	0	1
23	0	0	1	0	1
M	0	1	1	0	1

6-37. LP ROUTINE.

The purpose of this procedure is to check analog inputs and outputs.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140

REFERENCES

FUNCTIONAL DIAGRAM

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [ ][163] DISP/AUTO MODE: MAN NAV O[163] DISP/AUTO MODE: AUTO NAV [140] FEEDBACK TEST: TEST DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 007 DIGITAL INPUTS ENTER: Up (on) [846] START ADDRESS: 14 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: After 2 sec, display is 6437XX for approx 45 sec, while bits 1 thru 6 count up. Then, bits 10 thru 17 count up and 17 thru 9 count down (takes approx 28 sec), then, display is 001315 (pass halt)	Fail halts are 002177 or 002207
2	[163] DISP/AUTO MODE: DL MIN TIME [140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUTS ENTER: Down (off) FEEDBACK TEST: NORMAL [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

6-38. LH ROUTINE.

This procedure is used to check the operation of the CPU-111 and consists of a static check of six CPU-111 outputs (computer inputs). These six outputs are Mach, MSM, angle of attack, impact temperature, differential pressure, and altitude.

To perform the LH routine, perform the following procedures:

a. Barometer Setting Control Check iaw para 6-6.

b. Air Data Computer and Cockpit Instrument Static Check iaw para 6-7.

c. Zero Altitude Check iaw para 8-5a.

d. Landing Region IAS Check iaw para 8-5b.

e. MSM Check iaw para 8-5c.

6-39. Deleted.

Table 6-18. TACAN Digit Settings (Cont)

405 PRESET	D151	D152	D153	D150	D108
20	1	0	0	1	0
21	0	0	0	1	0
22	0	0	0	0	1
23	0	0	1	0	1
M	0	1	1	0	1

6-37. LP ROUTINE.

The purpose of this procedure is to check analog inputs and outputs.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140

REFERENCES

FUNCTIONAL DIAGRAM

Input/Output
(T.O. 27-5/Fig. 6-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 ▯[163] DISP/AUTO MODE: MAN NAV ●[RH CONSOLE] TACAN RANGE-COMMAND ALTITUDE: TACAN RANGE [140] FEEDBACK TEST: TEST DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 007 DIGITAL INPUTS ENTER: Up (on) [846] START ADDRESS: 14 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: After 2 sec, display is 6437XX for approx 45 sec, while bits 1 thru 6 count up. Then, bits 10 thru 17 count up and 17 thru 9 count down (takes approx 28 sec), then, display is 001315 (pass halt)	Fail halts are 002177 or 002207
2	▯[163] DISP/AUTO MODE: DL MIN TIME [140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUTS ENTER: Down (off) FEEDBACK TEST: NORMAL [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [905] POWER: OFF	Routine complete	. . .

6-38. LH ROUTINE.

This procedure is used to check the operation of the CPU-111 and consists of a static check of six CPU-111 outputs (computer inputs). These six outputs are Mach, MSM, angle of attack, impact temperature, differential pressure, and altitude.

To perform the LH routine, perform the following procedures:

a. Barometer Setting Control Check iaw para 6-6.

b. Air Data Computer and Cockpit Instrument Static Check iaw para 6-7.

c. Zero Altitude Check iaw para 8-5a.

d. Landing Region IAS Check iaw para 8-5b.

e. MSM Check iaw para 8-5c.

6-39. LV ROUTINE.

The purpose of this procedure is to check the sine and cosine of interceptor heading angle and interceptor roll angle. These 4 signals (2 pairs) are checked for $\sin^2 x + \cos^2 x = 1$, and are checked against programmed values for dynamic range of movement.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Perform 486118 preliminary set-up procedure iaw para 11-11. Position all 486118 controls iaw table 8-2.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

289

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Does Not Erect (T.O. 27-3/Fig. 8-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[486118] SIGNAL TEST: AZ SIGNAL CONTROL: Adjust carefully to obtain indication SIGNAL TEST: OFF	[486118] AZIMUTH: 000 ±002°	. . .
2	[486118] INITIAL MODE SIGNAL: Up (on) to obtain indication, then down (off)	[486118] ROLL: 0 ±0.5° PITCH: 0 ±0.5°	. . .
3	[486118] AZIMUTH OUTPUT - GIMBAL: AZIMUTH OUTPUT	[486118] AZIMUTH: 358 to 002°	. . .
4	[COMPUTER] Channel 8: Load iaw para 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 010 DIGITAL INPUTS ENTER: Up (on) [846] START ADDRESS: 14 ENTER START ADDRESS: Press and release RUN-STOP: RUN [486118] SIGNAL CONTROL: Center SIGNAL TEST: AZ and Note indication	[486118] AZIMUTH: Changes	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
5	**NOTE** Steps 5 and 7 should be performed very slowly to avoid saturation of circuits which position the gimbals of the stable table. Do not allow indicator movement to exceed 5° per second.		
	[486118] SIGNAL CONTROL: Adjust carefully to obtain indication	[486118] AZIMUTH: Rotates through 360°, stops at indication noted in preceding step	. . .
6	[486118] SIGNAL CONTROL: Center SIGNAL TEST: ROLL ROLL: Note indication SIGNAL CONTROL: Adjust carefully to obtain indication	[486118] ROLL: Rotates through 360°, stops at indication noted	. . .
7	[486118] SIGNAL TEST: OFF	[846] DISPLAY REGISTER lights: 000076 [796] COMP: On	. . .
8	[140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 DIGITAL INPUTS ENTER: Down (off) [846] START ADDRESS: 00 TEST-NORMAL: NORMAL [905] POWER: OFF [486118] Disconnect	Routine complete	. . .

6-40. LZ ROUTINE.

The LZ routine provides a gross error check of the CPU-111 Mach and altitude digitizers when slewed from ambient altitude and 0.13M to 57,000 ft and 1.8M.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

CPU-111

REFERENCES

FUNCTIONAL DIAGRAMS

Air Data/Cockpit
(T.O. 27-5/Fig. 8-3)

FAULT ISOLATION

1. Mach Indication (T.O. 27-3/Fig. 8-9)
2. Altitude Indication (T.O. 27-3/Fig. 8-12)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [796] SELECTOR TEST: 1 [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 502 [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS ENTER: Up (on)	[846] DISPLAY REGISTER lights: 001770	. . .

See pg 4 Sup #2

STEP	INSTRUCTION	INDICATION	REMARKS
2	[140] DIGITAL INPUTS ENTER: Down (off) [846] RUN-STOP: STOP, then RUN	[846] DISPLAY REGISTER lights: Display iaw table 6-19	To re-enter routine at step 1 indication, wait until Mach and altitude tapes have completed slewing and set 140 DIGITAL INPUTS ENTER on (up)

See O.S. 25-42 PG 4.

Table 6-19. LZ Display

BIT	SIGNAL	READOUT	
		PASS	FAIL
1		-	-
2	ALTITUDE MAX DIFFERENCE	ALTITUDE MAX DIFFER-	
3	ALTITUDE MAX DIFFERENCE	ENCE shall not exceed	
4	ALTITUDE MAX DIFFERENCE	0011 reading from	
5	ALTITUDE MAX DIFFERENCE	left to right.	
6	ALTITUDE CONTINUOUS	1	0
7	ALTITUDE RANGE	1	0
8	ALTITUDE INITIAL CONDITIONS	1	0
9	- - -	-	-
10	- - -	-	-
11	MACH MAX DIFFERENCE	MACH MAX DIFFERENCE	
12	MACH MAX DIFFERENCE	shall not exceed	
13	MACH MAX DIFFERENCE	0011 reading from	
14	MACH MAX DIFFERENCE	left to right.	
15	MACH CONTINUOUS	1	0
16	MACH RANGE	1	0
17	MACH INITIAL CONDITIONS	1	0
18	- - -	-	-

STEP	INSTRUCTION	INDICATION	REMARKS
3	**CAUTION** Ensure that angle of attack transducer vane heat is not on prior to performing steps 3 and 4. [RH console] PITOT HEAT: OFF [Radar compt door] Angle of attack transducer vane: Move ccw	☐ [AVVI] Minimum safe speed tape: Moves downward	. . .
4	[Radar compt door] Angle of attack transducer vane: Move cw	☐ [AVVI] Minimum safe speed tape: Moves upward	. . .
5	[140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [796] SELECTOR TEST: 7, then OFF [905] POWER: OFF	Routine complete	. . .

6-41. KZ ROUTINE.

This routine checks the CPU-111 AIMS encoder as the altitude is slewed from ambient altitude to 57,000 feet.

EQUIPMENT REQUIRED

KZ routine adapter cable (may be fabricated iaw fig. 6-6 and T.O. 00-25-234)

EQUIPMENT HOOKUP

Connect adapter cable between CPU-111 P3 and CPU-111 J3

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

CPU-111

REFERENCES

FUNCTIONAL DIAGRAM

Air Data/Cockpit (T.O. 27-5/Fig. 8-3)

FAULT ISOLATION

Altitude Indication (T.O. 27-3/Fig. 8-12)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Load iaw para 6-4 [796] SELECTOR TEST: 1 [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 506 [846] ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL INPUTS ENTER: On (up)	[846] DISPLAY REGISTER lights: Indicate altitude at each step (appears as a rapidly changing binary count). A pass indication is an altitude (BCD number X1000) of 56,100 to 57,900 feet	The last correct altitude checked is displayed by the 846 DISPLAY REGISTER lights. If the DISPLAY REGISTER lights do not change, the altitude difference between the AIMS encoder and the altitude digitizer is greater than 180 feet and a failure exists at the start altitude.
2	**NOTE** To rerun the KZ routine, set 140 DIGITAL INPUTS ENTER off (down), then on (up). If the altitude from the AIMS encoder is not below 7,000 feet, it will be slewed to below 7,000 feet before the test is begun. If a failure occurs, the display routine may be entered by setting 796 SELECTOR TEST to OFF and setting 140 DIGITAL INPUTS ENTER switch off (down), then on (up). The Pressure-Temperature Test Set (TTU-205) may then be used to simulate the failed altitude for verification. [796] SELECTOR TEST: 7, then OFF [846] START ADDRESS: 00 TEST-NORMAL: NORMAL DISPLAY REGISTER switch: OFF [140] DIGITAL DISPLAY: NORMAL DIGITAL INPUTS: 000 [905] POWER: OFF [KZ routine adapter cable] Remove [CPU-111P3] Reconnect to CPU-111 J3	Routine complete	. . .

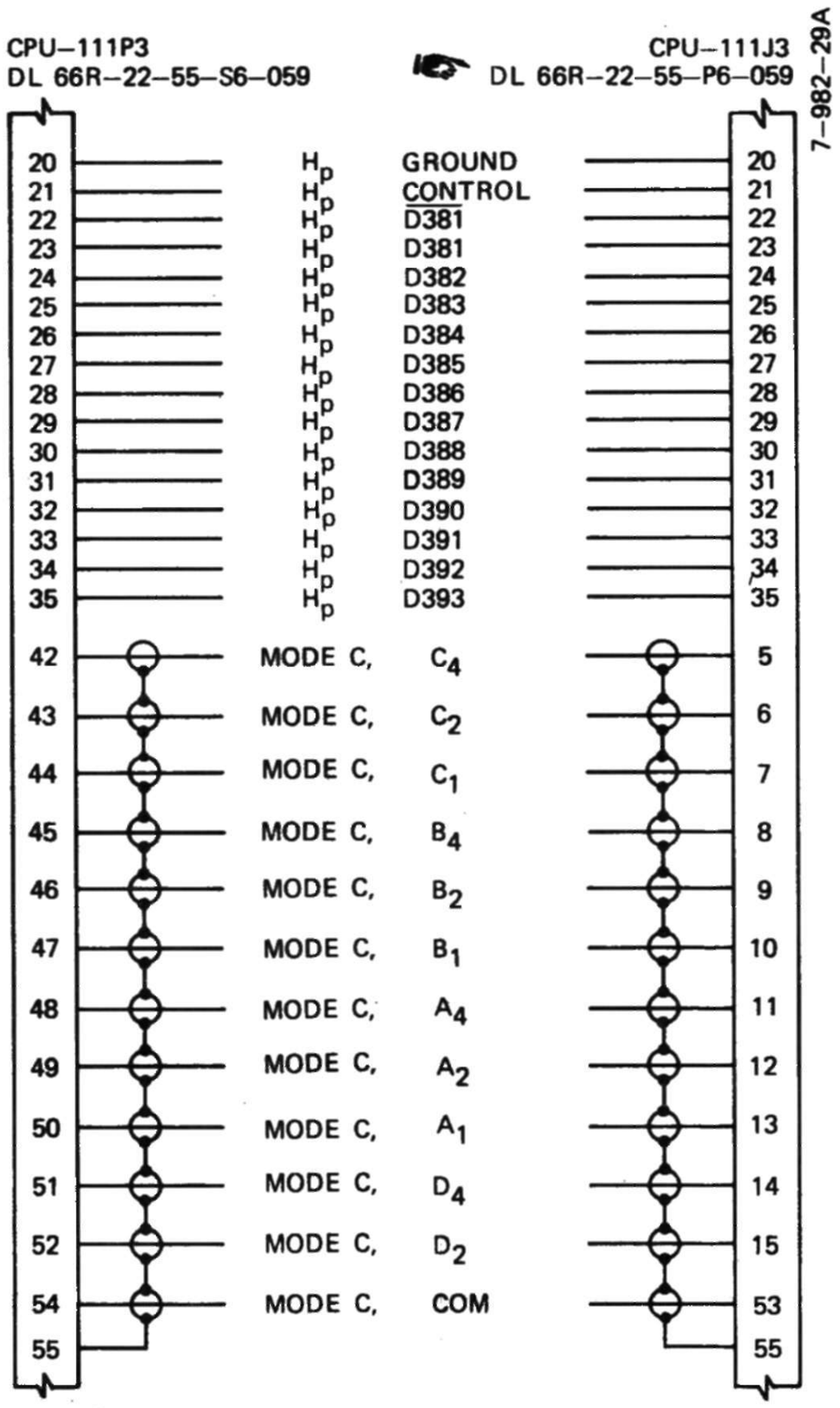


Figure 6-6. KZ Routine Adapter Cable

6-42. MULTIDIGITAL INPUT TEST

The Mach and static pressure multidigit inputs are generated in the CPU-111 and may be observed by performing the tactical TR routine (para 6-9). Figure 6-7 illustrates the process of converting from binary to octal. Table 6-20 lists the octal to Mach conversion table. Table 6-21 lists the octal to altitude conversion table. Table 6-22 lists the value of Mach, MSM, Hp, and T_t °R seen during SSGC.

	MSD													LSD	
DIGIT	D18-D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1
BINARY	XXXX	0	1	0	1	0	0	1	1	0	0	0	0	X	X
OCTAL			2			4			6						

Figure 6-7. Modified Binary to Octal Conversion

Table 6-20. Octal to Mach Conversion Table

N	0	1	2	3	4	5	6	7
00	0.1300	0.1357	0.1414	0.1470	0.1527	0.1584	0.1641	0.1698
01	0.1755	0.1811	0.1868	0.1925	0.1982	0.2039	0.2096	0.2152
02	0.2209	0.2266	0.2323	0.2380	0.2437	0.2493	0.2550	0.2607
03	0.2664	0.2721	0.2778	0.2834	0.2891	0.2948	0.3005	0.3062
04	0.3119	0.3175	0.3232	0.3289	0.3346	0.3403	0.3460	0.3516
05	0.3573	0.3630	0.3687	0.3744	0.3801	0.3857	0.3914	0.3971
06	0.4028	0.4085	0.4142	0.4198	0.4255	0.4312	0.4369	0.4426
07	0.4483	0.4539	0.4596	0.4653	0.4710	0.4767	0.4824	0.4880
10	0.4937	0.4994	0.5051	0.5108	0.5165	0.5221	0.5278	0.5335
11	0.5392	0.5449	0.5506	0.5562	0.5619	0.5676	0.5733	0.5790
12	0.5847	0.5903	0.5960	0.6017	0.6074	0.6131	0.6188	0.6244
13	0.6301	0.6358	0.6415	0.6472	0.6529	0.6585	0.6642	0.6699
14	0.6756	0.6813	0.6870	0.6926	0.6983	0.7040	0.7097	0.7154
15	0.7211	0.7267	0.7324	0.7381	0.7438	0.7495	0.7552	0.7608
16	0.7665	0.7722	0.7779	0.7836	0.7893	0.7949	0.8006	0.8063
17	0.8120	0.8177	0.8234	0.8290	0.8347	0.8404	0.8461	0.8518
20	0.8575	0.8631	0.8688	0.8745	0.8802	0.8859	0.8916	0.8972
21	0.9029	0.9086	0.9143	0.9200	0.9257	0.9313	0.9370	0.9427
22	0.9484	0.9541	0.9598	0.9654	0.9711	0.9768	0.9825	0.9882
23	0.9938	0.9995	1.0052	1.0109	1.0166	1.0223	1.0279	1.0336
24	1.0393	1.0450	1.0507	1.0564	1.0620	1.0677	1.0734	1.0791
25	1.0848	1.0905	1.0961	1.1018	1.1075	1.1132	1.1189	1.1246
26	1.1302	1.1359	1.1416	1.1473	1.1530	1.1587	1.1643	1.1700
27	1.1757	1.1814	1.1871	1.1928	1.1984	1.2041	1.2098	1.2155
30	1.2212	1.2269	1.2325	1.2382	1.2439	1.2496	1.2553	1.2610
31	1.2666	1.2723	1.2780	1.2837	1.2894	1.2951	1.3007	1.3064
32	1.3121	1.3178	1.3235	1.3292	1.3348	1.3405	1.3462	1.3519
33	1.3576	1.3633	1.3689	1.3746	1.3803	1.3860	1.3917	1.3974
34	1.4030	1.4087	1.4144	1.4201	1.4258	1.4315	1.4371	1.4428
35	1.4485	1.4542	1.4599	1.4656	1.4712	1.4769	1.4826	1.4883
36	1.4940	1.4997	1.5053	1.5110	1.5167	1.5224	1.5281	1.5338
37	1.5394	1.5451	1.5508	1.5565	1.5622	1.5679	1.5735	1.5792
40	1.5849	1.5906	1.5963	1.6020	1.6076	1.6133	1.6190	1.6247
41	1.6304	1.6361	1.6417	1.6474	1.6531	1.6588	1.6645	1.6702
42	1.6758	1.6815	1.6872	1.6929	1.6986	1.7043	1.7099	1.7156
43	1.7213	1.7270	1.7327	1.7384	1.7440	1.7497	1.7554	1.7611
44	1.7668	1.7725	1.7781	1.7838	1.7895	1.7952	1.8009	1.8066
45	1.8122	1.8179	1.8236	1.8293	1.8350	1.8407	1.8463	1.8520
46	1.8577	1.8634	1.8691	1.8747	1.8804	1.8861	1.8918	1.8975
47	1.9032	1.9088	1.9145	1.9202	1.9259	1.9316	1.9373	1.9429
50	1.9486	1.9543	1.9600	1.9657	1.9714	1.9770	1.9827	1.9884
51	1.9941	1.9998	2.0055	2.0111	2.0168	2.0225	2.0282	2.0339
52	2.0396	2.0452	2.0509	2.0566	2.0623	2.0680	2.0737	2.0793
53	2.0850	2.0907	2.0964	2.1021	2.1078	2.1134	2.1191	2.1248
54	2.1305	2.1362	2.1419	2.1475	2.1532	2.1589	2.1646	2.1703
55	2.1760	2.1816	2.1873	2.1930	2.1987	2.2044	2.2101	2.2157
56	2.2214	2.2271	2.2328	2.2385	2.2442	2.2498	2.2555	2.2612

Table 6-20. Octal to Mach Conversion Table (Cont)

N	0	1	2	3	4	5	6	7
57	2.2669	2.2726	2.2783	2.2839	2.2896	2.2953	2.3010	2.3067
60	2.3124	2.3180	2.3237	2.3294	2.3351	2.3408	2.3465	2.3521
61	2.3578	2.3635	2.3692	2.3749	2.3806	2.3862	2.3919	2.3976
62	2.4033	2.4090	2.4147	2.4203	2.4260	2.4317	2.4374	2.4431
63	2.4488	2.4544	2.4601	2.4658	2.4715	2.4772	2.4829	2.4885
64	2.4942	2.4999	2.5056	2.5113	2.5170	2.5226	2.5283	2.5340
65	2.5397	2.5454	2.5511	2.5567	2.5624	2.5681	2.5738	2.5795
66	2.5852	2.5908	2.5965	2.6022	2.6079	2.6136	2.6193	2.6249
67	2.6306	2.6363	2.6420	2.6477	2.6534	2.6590	2.6647	2.6704
70	2.6761	2.6818	2.6875	2.6931	2.6988	2,7045	2.7102	2.7159
71	2.7215	2.7272	2.7329	2.7386	2.7443	2.7500	2.7556	2.7613
72	2.7670	2.7727	2.7784	2.7841	2.7897	2.7954	2.8011	2.8068
73	2.8125	2.8182	2.8238	2.8295	2.8352	2.8409	2.8466	2.8523
74	2.8579	2.8636	2.8693	2.8750	2.8807	2.8864	2.8920	2.8977
75	2.9034	2.9091	2.9148	2.9205	2.9261	2.9318	2.9375	2.9432
76	2.9489	2.9546	2.9602	2.9659	2.9716	2.9773	2.9830	2.9887
77	2.9943	3.0000	3.0057	3.0114	3.0171	3.0228	3.0284	3.0341

Table 6-21. Octal to Altitude Conversion Table

N	0	1	2	3	4	5	6	7
00	-1,100	-940	-780	-620	-460	-300	-140	20
01	180	340	500	660	820	980	1,140	1,300
02	1,460	1,620	1,780	1,940	2,100	2,260	2,420	2,580
03	2,740	2,900	3,060	3,220	3,380	3,540	3,700	3,860
04	4,040	4,180	4,340	4,500	4,660	4,820	4,980	5,140
05	5,300	5,460	5,620	5,780	5,940	6,100	6,260	6,420
06	6,580	6,740	6,900	7,060	7,220	7,380	7,540	7,700
07	7,860	8,020	8,180	8,340	8,500	8,660	8,820	8,980
10	9,140	9,300	9,460	9,620	9,780	9,940	10,100	10,260
11	10,420	10,580	10,740	10,900	11,060	11,220	11,380	11,540
12	11,700	11,860	12,020	12,180	12,340	12,500	12,660	12,820
13	12,980	13,140	13,300	13,460	13,620	13,780	13,940	14,100
14	14,260	14,420	14,580	14,740	14,900	15,060	15,220	15,380
15	15,540	15,700	15,860	16,020	16,180	16,340	16,500	16,660
16	16,820	16,980	17,140	17,300	17,460	17,620	17,780	17,940
17	18,100	18,260	18,420	18,580	18,740	18,900	19,060	19,220
20	19,380	19,540	19,700	19,860	20,020	20,180	20,340	20,500
21	20,660	20,820	20,980	21,140	21,300	21,460	21,620	21,780
22	21,940	22,100	22,260	22,420	22,580	22,740	22,900	23,060
23	23,220	23,380	23,540	23,700	23,860	24,020	24,180	24,340
24	24,500	24,660	24,820	24,980	25,140	25,300	25,460	25,620
25	25,780	25,940	26,100	26,260	26,420	26,580	26,740	26,900
26	27,060	27,220	27,380	27,540	27,700	27,860	28,020	28,180
27	28,340	28,500	28,660	28,820	28,980	29,140	29,300	29,460

Table 6-21. Octal to Altitude Conversion Table (Cont)

N	0	1	2	3	4	5	6	7
30	29,620	29,780	29,940	30,100	30,260	30,420	30,580	30,740
31	30,900	31,060	31,220	31,380	31,540	31,700	31,860	32,020
32	32,180	32,340	32,500	32,660	32,820	32,980	33,140	33,300
33	33,460	33,620	33,780	33,940	34,100	34,260	34,420	34,580
34	34,740	34,900	35,060	35,220	35,380	35,540	35,700	35,860
35	36,020	36,180	36,340	36,500	36,660	36,820	36,980	37,140
36	37,300	37,460	37,620	37,780	37,940	38,100	38,260	38,420
37	38,580	38,740	38,900	39,060	39,220	39,380	39,540	39,700
40	39,860	40,020	40,180	40,340	40,500	40,660	40,820	40,980
41	41,140	41,300	41,460	41,620	41,780	41,940	42,100	42,260
42	42,420	42,580	42,740	42,900	43,060	43,220	43,380	43,540
43	43,700	43,860	44,020	44,180	44,340	44,500	44,660	44,820
44	44,980	45,140	45,300	45,460	45,620	45,780	45,940	46,100
45	46,260	46,420	46,580	46,740	46,900	47,060	47,220	47,380
46	47,540	47,700	47,860	48,020	48,180	48,340	48,500	48,660
47	48,820	48,980	49,140	49,300	49,460	49,620	49,780	49,940
50	50,100	50,260	50,420	50,580	50,740	50,900	51,060	51,220
51	51,380	51,540	51,700	51,860	52,020	52,180	52,340	52,500
52	52,660	52,820	52,980	53,140	53,300	53,460	53,620	53,780
53	53,940	54,100	54,260	54,420	54,580	54,740	54,900	55,060
54	55,220	55,380	55,540	55,700	55,860	56,020	56,180	56,340
55	56,500	56,660	56,820	56,980	57,140	57,300	57,460	57,620
56	57,780	57,940	58,100	58,260	58,420	58,580	58,740	58,900
57	59,060	59,220	59,380	59,540	59,700	59,860	60,020	60,180
60	60,340	60,500	60,660	60,820	60,980	61,140	61,300	61,460
61	61,620	61,780	61,940	62,100	62,260	62,420	62,580	62,740
62	62,900	63,060	63,220	63,380	63,540	63,700	63,860	64,020
63	64,180	64,340	64,500	64,660	64,820	64,980	65,140	65,300
64	65,460	65,620	65,780	65,940	66,100	66,260	66,420	66,580
65	66,740	66,900	67,060	67,220	67,380	67,540	67,700	67,860
66	68,020	68,180	68,340	68,500	68,660	68,820	68,980	69,140
67	69,300	69,460	69,620	69,780	69,940	70,100	70,260	70,420
70	70,580	70,740	70,900	71,060	71,220	71,380	71,540	71,700
71	71,860	72,020	72,180	72,340	72,500	72,660	72,820	72,980
72	73,140	73,300	73,460	73,620	73,780	73,940	74,100	74,260
73	74,420	74,580	74,740	74,900	75,060	75,220	75,380	75,540
74	75,700	75,860	76,020	76,180	76,340	76,500	76,660	76,820
75	76,980	77,140	77,300	77,460	77,620	77,780	77,940	78,100
76	78,260	78,420	78,580	78,740	78,900	79,060	79,220	79,380
77	79,540	79,700	79,860	80,020	80,180	80,340	80,500	80,660

Table 6-22. SSGC Interpretation of Multidigital Input Displays

SSGC 2, 3, 4, 5 Function	Value	846 Unit Display
M.S.M. (A3N)	1.732 to 1.792	X0000 0110 0010 1001 X to X 0000 0110 0111 0110 X
MACH	1.776 to 1.824	XXXX 100 100 001 101 XX to XXXX 100 101 010 001 XX
H_p	56,316 to 57,684	XXXX 101 100 110 111 XX to XXXX 101 101 111 011 XX
T_t °R(A10)	710.1 to 729.3	X0000 1000 0011 0010 X to X0000 1000 0111 1001 X
SSGC6		
Function	**Value**	**846 Unit Display**
M.S.M. (A3N)	1.730 to 1.790	X0000 0110 0010 1001 X to X 0000 0110 0111 0110 X
MACH	0.773 to 0.797	XXXX 001 110 001 001 XX to XXXX 001 110 101 010 XX
H_p	32,779 to 33,571	XXXX 011 010 011 101 XX to XXXX 011 011 000 101 XX
T_t °R(A10)	483.6 to 497.4	X0000 0010 1000 0101 X to X0000 0011 0001 1001 X

All data on page 6-71, deleted.

Table 6-23. DRO Locations for ASIP Data

DRO LOCATION	ACCELERATION BAND
3764	Count for acceleration below -2.5G
3765	Count for acceleration below -1.5 G including -2.5 G
3766	Count for acceleration below 0 G including -1.5 G
3767	Count for acceleration including 2.0 G and below 2.5 G
3770	Count for acceleration including 2.5 G and below 3.5 G
3771	Count for acceleration including 3.5 G and below 4.5 G
3772	Count for acceleration including 4.5 G and below 5.5 G
3773 (Bits 0 - 9)	Count for acceleration including 5.5 G and below 6.0 G

6-44. US ROUTINE.

The US Routine is used to display the tape identification number. The display includes the number of channels programmed to each different tape number. The first displayed word is the highest binary count word, the second is the next highest, and so forth. When bit 18 is high, it indicates a hand change (a program change not part of a published tape) has been made. To display the tape number of a specific channel or the aux data number, go directly to step 3.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

140
846
857

FUNCTIONAL DIAGRAMS

DRUM Memory
(T.O. 27-5/Fig. 6-4)

REFERENCES

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[Computer] Channel 8: Local iaw para. 6-4 [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS: 000 DIGITAL INPUTS ENTER: Up (on) [846] START ADDRESS: 12 ENTER START ADDRESS: Press and release RUN-STOP: RUN	[846] DISPLAY REGISTER lights: Tape identification word in octal. The word format is XXXXYY, where XXXX is the tape identification number, and YY is the number of channels programmed with that tape.	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
2	Continue with this step only if the number of channels displayed in step 1 was less than 54. [140] DIGITAL INPUTS: Increase by one (example: from 000 to 001) Repeat step 2 as many times as necessary to display all tape identification numbers loaded in the 857 unit under test. The total channel numbers will be 54. Due to limits of the US Routine, step 2 cannot be performed more than 15 times.	[846] DISPLAY REGISTER lights: Next highest tape identification word	. . .
3	[Computer] Channel 8: Load iaw para. 6-4 [846] START ADDRESS: 12 ENTER START ADDRESS: Press and release RUN-STOP: RUN [140] DIGITAL DISPLAY: DIGITAL INPUT SWITCHES DIGITAL INPUTS ENTER: Up (on) DIGITAL INPUTS: 1XX, where XX is the octal equivalent of the decimal number of the channel to be observed (maximum is 53, equal to channel 43), or 154, to observe the aux data number.	[846] DISPLAY REGISTER lights: Channel identification word. The word format is XXXXYY, where XXXX is the tape identification word for the selected channel, and YY is the channel number selected. If 154 was selected, the display is the aux data number in B.C.D.	. . .
4	[140] DIGITAL DISPLAY: NORMAL FEED BACK TEST: NORMAL [846] TEST-NORMAL: NORMAL	Routine complete	. . .

6-45. FAULT DETECTION TESTER CHECKS (~~EWFDT~~)(F DTOL)

6-45a. OUTPUTS AND INPUTS

see Sup -25-38

This routine is run as a part of the tactical routine and, therefore, has no special outputs or inputs.

6-45b. DEFINITION.

see Sup-25-38

The IRAM Computer decides which FDT test is to be performed, by screening the test selections of armament type, range rate, and Time-of-Flight (TOF). For each FDT test performed, FDT-programmed values of Range, Range Rate, and TOF, and their associated missile timing signals, have previously been stored in the IRAM Computer. As a specific FDT check progresses, IRAM-computed values of the parameters are compared at each timing milestone with the pertinent stored values to determine whether a proper value for a parameter has been IRAM-computed.

6-45c. INITIATION

See Sup-25-38

This test routine requires no operator initiation. It is performed automatically when the attack routines are performed.

6-45d. MECHANIZATION

See sup-25-38

The IRAM Computer determines first which test is to be run by the FDT, by observing the cockpit armament selection and the FDT selection of Range, Range Rate, and Time-of-Flight (TOF). The FDT test to be performed is defined as follows:

Source MA-1	Source FDT	FDT Test
IR Mx	$\dot{R}$>500 fps	AIM-1
RDR Mx	$\dot{R}$>500 fps	AIM-2
IR Mx	$\dot{R}$<500 fps	AIM-3
SW	$\dot{R}$>500 fps	AIR-1
SW	$\dot{R}$<500 fps & TOF>9.68 secs.	AIR-2a
SW	$\dot{R}$<500 fps & TOF>10.04 secs.	AIR-2b
SW	$\dot{R}$<500 fps & TOF>10.40 secs.	AIR-2c

The several parameters are computed, compared for pass/fail, and appropriate BITS stored in the three locations, "FDT" (03107), "FDTR" (03110), and "FDTRR" (03111). See displays below for parameters, storage locations, and values.

6-45e. DISPLAYS

See sup -25-38

If the FDT, using its own test criteria, indicates to the operator that a fail has occurred, the stored results of the IRAM "EWFDT" routine can then be used for detailed trouble-shooting of the MA-1 system. An out-of-tolerance parameter would be indicative of the most likely problem area in the system. The following RAM locations can be called up for display and will yield the information shown.

6-45f. RAM LOCATION FDT (03107)

Bits	Meaning when High
1	Range rate low at E-time
2	Range rate high at E-time
3	Range low at E-time
4	Range high at E-time
5	Range rate low at D-time
6	Range rate high at D-time
7	Range low at D-time
8	Range high at D-time
9	Range rate low at C-time
10	Range rate high at C-time
11	Range low at C-time
12	Range high at C-time
13	Range rate low at B-time
14	Range rate high at B-time
15	Range low at B-time
16	Range high at B-time
17	Interceptor Mach in tolerance

Test	Mach
AIM-1	1.8 ±0.024
AIM-2	0.785 ± 0.012
AIM-3	1.8 ± 0.024
AIR-1	0.785 ±0.012
AIR-2	1.8 ±0.024

18 Interceptor altitude in tolerance

Test	Mach
AIM-1	57,000 ±684
AIM-2	33,200 ±396
AIM-3	57,000 ±684
AIR-1	33,200 ±396
AIR-2	57,000 ±684

6-45g. RAM LOCATION FDTR (03110)

Bits	Meaning
1	E-time not in tolerance (C + 4.0 ±0.1 seconds)
2	D-time not in tolerance (C + 3.3 ±0.1 seconds)
3	No meaning
4,5	00 - Range failure occurred first at B-time 01– Range failure occurred first at C-time 10 - Range failure occurred first at D-time 11 - Range failure occurred first at E-time
6	No meaning
7 - 18	Error in range when first detected (bits 4, 5) Scaling of range errors is 1 foot error in bit 7. Bits 7 - 18 scaling is 0 - 2048 feet error.

RANGE (FEET) AT FIRING SIGNALS

FDT TEST	B	C	D	E
AIM-1	39529 ± 1398	34766 ± 1256	31219 ± 1149	29699 ± 1103
AIM-2	32533 ± 1212	26183 ± 1019	21454 ± 876	19428 ± 814
AIR-1	—	18465 ± 644	—	16598 ± 567
AIR-2a	—	58984 ± 1874	—	52435 ± 1611
AIR-2b	—	60930 ± 1927	—	54380 ± 1664
AIR-2c	—	62876 ± 1979	—	56325 ± 1717

6-45h. RAM LOCATION FDTRR (03111)

Bits	Meaning
1, 2	11 - Time of flight less than 9.68 seconds 10 - Time of flight less than 10.04 seconds

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1, 2 (cont)	01 - Time of flight less than 10.40 seconds 00 - Time of flight greater than 10.40 seconds
3	Range rate greater than 500 feet per second
4, 5	00 - Range rate failure occurred first at B-time 01 - Range rate failure occurred first at C-time 10 - Range rate failure occurred first at D-time 11 - Range rate failure occurred first at E-time
6	No meaning
7 - 18	Error in range rate when first detected (Bits 4, 5) Scaling of range rate error one foot/second error in bit 7. Bits 7 - 18 scaling is 0 - 2048 feet/second error.

Test	Range Rate (feet/second)
AIM-1	1013.4 ± 0.1%
AIM-2	1351.2 ± 0.1%
AIM-8	307.0 ± 0.1%
AIR-1	675.6 ± 0.1%
AIR-2	2364.6 ± 0.1%

6-45i. RAM LOCATIONS - RANGE SCALED TO 0 - 262 FEET FULL SCALE.

03060 – Range at B signal
03061 – Range at C signal
03062 – Range at D signal
03063 – Range at E signal

6-45j. RAM LOCATIONS - RANGE RATE SCALED 0 TO 4096 FEET/SECOND.

03064 – Range rate at B signal
03065 – Range rate at C signal
03066 – Range rate at D signal
03067 – Range rate at E signal

CHAPTER 7. POWER SUBSYSTEM

SECTION I. GENERAL

7-1. INTRODUCTION.

7-1a. This chapter contains check procedures for the power subsystem. These procedures are performed after a unit has been replaced or when a malfunction is suspected.

7-1b. Each procedure provides the purpose of the procedure, equipment required, equipment hookup, preliminary procedure, probable faulty unit, and references to functional diagrams and fault isolation procedures.

7-2. TEST CONSIDERATIONS.

NOTE

Wherever the 080 unit panel controls are indicated, they now apply to the 080 unit, 52800 unit (ODU), or the Filter and Control Assembly and Information panel, depending upon the system configuration.

7-2a. The purpose of the procedures in this chapter is to provide for checking of the power subsystem. To verify proper power subsystem operation, prescribed checks are performed using aircraft power or Ground Power Unit (GPU) power.

7-2b. Throughout this procedure, it is assumed that no power dump condition exists. If a power dump is noted, troubleshoot the system using T.O. 1F-106A-2-27-3, Figure 7-1. After the system is operational, the checks required by table 7-1 can be performed.

CAUTION

Use the lowest setting of the 080 ATTACK INTENSITY control required to obtain a minimum acceptable viewing level while observing the attack display. Excessive attack intensity will cause damage to the MMST.

NOTE

The 080 ON and OFF switches are bypassed when the aircraft canopy is closed or when the canopy lock lever (F-106A only) is in the locked position.

7-2c. When the 080 displays are required, the 080 must be turned on by pressing and releasing the 080 ON switch. After a 35 ±10 second time-in period the 080 will present the search display. If the attack display is also desired, press and hold the 080 ON switch for at least 3 seconds. The attack display turns off automatically after a 3 ±1 minute interval. To obtain another interval, the 080 ON switch must be pressed and held for at least 3 seconds.

7-3. CHECKS AFTER UNIT REPLACEMENT.

7-3a. Replacement or reinstallation of certain units requires performance of check procedures described in this chapter. Due to interaction between units, it may be necessary to perform a number of check procedures when only one unit has been replaced. Table 7-1 indicates which procedure or procedures are to be performed after replacement of one or more of the listed units.

7-3b. Refer to table 7-1 whenever a unit of the power subsystem is replaced to determine if checks are required.

Table 7-1. Checks After Unit Replacement (Power)

CHECK	PARA NO.	518	926	989
LW Routine	6-25	X	X	X
LWR Routine	6-26	X	X	X
Time-In Sequence (Primary Procedure-Aircraft Power)	7-5c	X*		
Time-In Sequence (Alternate Procedure-Ground Power)	7-5d	X*		
Dc Voltage and Noise	7-5e		X	
1600 Hz	7-5f	X		X
Power Dump	7-5g	X	X	

*Perform Primary Procedure when possible.

SECTION II. CHECKS

7-4. INPUT POWER CHECK.

7-4a. INPUT VOLTAGE, NOISE AND FREQUENCY CHECK. The purpose of this procedure is to check for proper input voltages, 115 v 400 Hz three phase voltage and +28 v, to the power subsystem. This check may be accomplished on either aircraft or ground power.

EQUIPMENT REQUIRED

1. Frequency counter
2. Digital multimeter
3. Oscilloscope

EQUIPMENT HOOKUP

Connect frequency counter to 989 TB1-1

PRELIMINARY PROCEDURE

None

PROBABLE FAULTY UNIT

None

REFERENCES

FUNCTIONAL DIAGRAM

MA-1 Control, Time In and +28 v Distribution (T.O. 27-5/Fig. 7-3)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [989] 989TB1-1: Monitor using frequency counter	[Frequency counter] Frequency: 392 to 408 Hz*	400 Hz Ø A Non-essential
2	[989] 989TB1-1: Monitor using digital multimeter	[Digital multimeter) A-c volts: 112 to 117 v*	. . .
3	[989] 989TB1-2: Monitor using digital multimeter	[Digital multimeter] A-c volts: 112 to 117 v*	400 Hz Ø B Non-essential
4	[989] 989TB1-3: Monitor using digital multimeter	[Digital multimeter] A-c volts: 112 to 117 v*	400 Hz Ø C Non-essential
5	[518] 518TB1-3: Monitor using digital multimeter	[Digital multimeter] D-c volts: 25.5 to 29.7 v	+28 v Non-essential
6	[518] 518TB1-3: Monitor using oscilloscope	[Oscilloscope] Noise level: 4.0 v p-p	. . .
7	[518] 518TB1-3: Disconnect oscilloscope [905] POWER: OFF	Check complete	. . .

*On aircraft power the generator output is not transfered to the load unless the frequency is between 390 to 410 Hz and the voltage is between 100 to 126 volts. On ground power the ground power unit output is not transfered to the aircraft load unless the frequency is between 380 to 420 Hz and the voltage is between 105 to 120 volts.

7-5. MA-1 POWER CHECKS.

7-5a. TEST METER INDICATIONS. Table 7-2 contains a listing of the signals and voltage that may be monitored on the 065 unit MOD TEST METER and the 096 unit SELF TEST METER. These signals and voltages are available at the same interval during the power subsystem time-in sequence on aircraft or ground power. Table 7-3 contains a listing of voltages that may be monitored on the 096 unit SELF TEST METER. These voltages are available at different intervals during the power subsystem time-in sequence. The availability of these voltages are determined by the source of the input power, aircraft or ground, to the power subsystem. Reference is made to these tables from the procedures in paragraphs 7-5c and d. When required, the information in these tables may also be used to make specific checks of individual signals and/or voltages.

7.5b. Deleted

7-5c. TIME-IN SEQUENCE CHECK (PRIMARY PROCEDURE-AIRCRAFT POWER). The purpose of this procedure is to check for the proper operation of the 518 unit time delay circuits and the transfer functions of the 518 and 926 units on aircraft power. Power is transferred to the navigation equipment at different intervals depending upon the source of the input power to the power system. When input power is supplied from the aircraft generator, power is transferred to the navigation equipment during the warm interval of the time-in sequence. When the AHRG test programmer (3452296) is connected, 115 v, 400 Hz, three-phase warm power from the 518 unit is applied to the AHRG subsystem. When the AHRG test programmer (3452296) is not connected, 115 v, 400 Hz, three-phase essential power from the aircraft generator or the GPU is applied to the AHRG subsystem. In the following procedure reference is made to Tables 7-2 and 7-3 for those signals and voltages which can be directly monitored on the test meters. For those voltages which cannot be monitored on the test meters, an indirect indication of the presence of the voltage is included in the procedure. The alternate procedure, paragraph 7-5d, may be performed when conditions prevent aircraft engine generation.

EQUIPMENT REQUIRED

Headset

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1
2. Start aircraft engine iaw T.O. 1F-106A-2-2

PROBABLE FAULTY UNIT

518
926

REFERENCES

FUNCTIONAL DIAGRAM

MA-1 Control, Time In and +28 v Distribution (T.O. 27-5/Fig. 7-3)

FAULT ISOLATION

Power Dumps to Warm or Off (T.O. 27-3/Fig. 7-1)

NOTE

A check of the +28 v On Essential voltage, transferred from the 518 unit to SW1-2 and the AIR-2A/ARM/DISARM MONITOR POWER circuit breaker, is not included in this procedure. When required, accomplish step 1 of paragraph 5-5d for a specific check of this voltage. On aircraft power the voltage is available when the 905 POWER is set to WARM.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[405] PRESET: Local TACAN station [905] POWER: ON	[080] 16 lamp: On	+28 v Range Scale Light voltage present
	NOTE Monitor the At Warm Time Indications in Tables 7-2 and 7-3 within 30 seconds after performing step 1; if required set 905 POWER to OFF and then back to ON.		
2	[181] OFF-BRT: Adjust cw to 1st detent	[181] Screen: On dim	+28 v and 115 v Nav voltages present
3	[866] SERVO ON lamp: Press to test	[866] SERVO ON lamp: On while press to test function is held	+28 v Warm voltage present
	NOTE The following indication, normal or abnormal, does not ensure the presence of the +28 v Warm +30 voltage that is transferred from the 518 unit to the 506. The purpose of this voltage is to remove the fast heat from the 017 unit AZ and EL HIG gyros. When required, monitor this voltage at J50601-15 with a multimeter. The voltage is present 30 seconds after 905 POWER set to ON in step 1.		

STEP	INSTRUCTION	INDICATION	REMOTE
3 (cont)		[Radar compt door] AZ and EL gyro heat lamps: On	+28 v and 115 v 1600 Hz Warm voltages present. Lamps subsequently begin cycling off and on
	NOTE The following indications denote the presence of 115 v 400 Hz Ø C On Essential voltage from the 518 unit. The ◯ 880 unit indication is applicable to either A or B model aircraft. The ▯ 181 unit indication is applicable to only A model aircraft. When required, monitor the voltage in a ▯ B model aircraft at P1474P1-A of the IFF antenna switch unit in the NWW.		
		◯ [880] Power off flag: Drops from view	. . .
		▯ [181] Interceptor heading and interceptor bug heading: Agree with HSI compass card	. . .
	NOTE Monitor the At Warm +30 Time Indications in Table 7-3.		
4	[505] Power switch: MAIN [C-6280] MASTER: NORM [405] Function switch: T/R TEST switch: Press to LAMPS, hold for indication, release	[405] SYSTEM TEST and ECM lamps: On while switch is held	+28 v Warm Essential voltage present
	NOTE Accomplish steps 5 thru 9 within approximately 120 seconds after 905 POWER set to ON in step 1.		
5	[755] CHANNEL SELECTOR: Other than local ILS station [163] DISP/AUTO MODE: ILS	▯ [ADI] Course and glide slope warning flags: Present ◯ [AHI] GS and LOC flags: Present	. . .
6	[755] CHANNEL SELECTOR: Local ILS station	▯ [ADI] Course and/or glide slope warning flag(s): Drop from view ◯ [AHI] GS and/or LOC flag(s): Drop from view	+150 v Nav +30 voltage present
7	[505] Function switch: MAN and select unused frequency between 225.00 and 275.00 MHz	[780] Channel: Selected frequency	Do not select Guard frequency on 243.00 MHz
8	[505] TONE: Press, hold for indication, release	[Headset] Sidetone: Present	115 v 400 Hz three phase Warm Essential voltages present
9	[C-6280] M1: Press to TEST, hold for indication, release	[C-6280] TEST lamp: On while switch is held [181] TACAN annunciator: OK	115 v 400 Hz Ø B On Essential voltage present 115 v 400 Hz Ø C Nav voltage present
10	[905] Annunciator: Monitor	[905] Annunciator: OK approx 120 sec after 905 POWER to ON in step 1	+28 v Nav voltage present

STEP	INSTRUCTION	INDICATION	REMARKS
	NOTE Monitor At Stby Time Indications in Table 7-2 180 seconds after 905 POWER set to ON in step 1.		
11	[163] DISP/AUTO MODE: AUTO NAV	. . .	. . .
	NOTE Monitor At Stby +30 Time Indications in Table 7-2 210 seconds after 905 POWER set to ON in step 1.		
12	[065] HV ON DS301 lamp: Monitor [017] AZ and EL drive: Monitor	[065] HV ON DS301 lamp: On 210 see after 905 POWER to ON in step 1 [017] AZ and EL drive: Applied, dish searches 210 see after 905 POWER to ON in step 1	+28 v On voltage present AZ drive indicates presence of 115 v 1600 Hz On voltage. EL drive indicates presence of 115 v 400 Hz Ø A On voltage
13	[955] HOMING POINT SELECTOR: Select nearest homing point to local TACAN station	[181] Target bug: Position valid —— Interceptor bug: Position valid	+150 v Stby +30 to Computer voltage present +50 v and -50 v Warm voltages present
14	**NOTE** Proper position of the artificial horizon in the following step indicates the presence of the voltages to the AHRG. When the position of the artificial horizon is incorrect, see 27-3, Fig. 8-1.		
	[CSC] HDG/PUSH TO SYNC: Press and hold until artificial horizon is leveled	[905] Annunciator: WAIT until HDG/PUSH TO SYNC is released. Then OK [080] Artificial horizon: Centered in roll and pitch —— Steering bar: Present and proper size	. . . . . . Vertical size of steering bar indicates presence of 55 v 1600 Hz Reference voltage
15	[905] POWER: RADAR STBY	[065] HV ON DS301 lamp: Goes off	+28 v On voltage removed
16	[163] DISP/AUTO MODE: ILS	[017] AZ and EL drive: Applied, dish centered and down	AZ drive indicates presence of 115 v 1600 Hz On voltage in standby. EL drive indicates presence of 115 v 400 Hz Ø A On voltage in standby
17	[905] POWER: RADIO SILENCE	[181] TACAN annunciator: BV	+28 v MCS Radio Silence voltage present
18	[C-6280] M1: Press to TEST, hold for indication, release	[C-6280] TEST lamp: Remains off	IFF Stby Control interlock path open
19	[755] CHANNEL SELECTOR: Other than local ILS station [905] POWER: EMER	[080] 16 lamp: Goes off [181] TACAN annunciator: OK	Removal of voltages to MA-1 system 115 v 400 Hz Ø C voltage from aircraft emergency bus and +28 v Warm Essential voltage present

STEP	INSTRUCTION	INDICATION	REMARKS
20	[505] TONE: Press, hold for indication, release	[Headset] Sidetone: Present	115 v 400 Hz three phase Warm Essential voltage present
21	[C-6280] ML: Press to TEST, hold for indication, release	[C-6280] TEST lamp: On while switch is held	115 v 400 Hz Ø B On Essential voltage present
	NOTE See NOTE contained in step 3 to determine the presence of the 115 v 400 Hz Ø C On Essential voltage.		
22	**NOTE** Ensure REFER UNIT ON-OFF switch, RH cockpit console, is in the OFF position.		
	[905] POWER: OFF [505] TONE: Press, hold for indication, release	[Headset] Sidetone: Present	115 v 400 Hz three phase Essential voltage from aircraft bus present
23	[505] Power switch: OFF [405] Function switch: OFF [C-6280] MASTER: OFF [181] OFF-BRT: OFF [163] DISP/AUTO MODE: DL MIN TIME [065] S3: OFF [096] S1: 1 S2: A	Check complete	. . .

7-5d. TIME-IN SEQUENCE CHECK (ALTERNATE PROCEDURE - GROUND POWER). The purpose of this procedure is to check for the proper operation of the 518 unit time delay circuits and the transfer functions of the 518 and 926 units on ground power. Power is transfered to the navigation equipment at different intervals depending upon the source of the input power to the power subsystem. When input power is supplied from the ground power unit, power is transferred to the navigation equipment during the standby interval of the time-in sequence. In the following procedure reference is made to Tables 7-2 and 7-3 for those signals and voltages which can be directly monitored on the test meters. For those voltages which cannot be monitored on the test meters, an indirect indication of the presence of the voltage is included in the procedure.

EQUIPMENT REQUIRED

Headset

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

518
926

REFERENCES

FUNCTIONAL DIAGRAM

MA-1 Control, Time In and +28 v Distribution
(T.O. 27-5/Fig. 7-3)

FAULT ISOLATION

Power Dumps to Warm or Off
(T.O. 27-3/Fig. 7-1)

NOTE

A check of the +28 v On Essential voltage, transferred from the 518 unit to SW1-2 and the AIR-2A/ARM/DISARM MONITOR POWER circuit breaker, is not included in this procedure. When required, accomplish step 1 of paragraph 5-5d for a specific check of this voltage. On ground power the voltage is available when the 905 POWER is set to RADAR STBY.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON	[080] 16 lamp: On	+28 v Range Scale Light voltage present
	NOTE Monitor the At Warm Time Indications in Table 7-2.		
2	[866] SERVO ON lamp: Press to test	[866] SERVO ON lamp: On while press to test function is held	+28 v Warm voltage present
	NOTE The following indication, normal or abnormal, does not ensure the presence of the +28 v Warm +30 voltage that is transfered from the 518 unit to the 506 unit. The sole purpose of this voltage is to remove the fast heat from the 017 unit AZ and EL HIG gyros. When required, monitor this voltage a J50601-15 with a multimeter. The voltage is present 30 seconds after 905 POWER set to ON in step 1.		
		[Radar compt door] AZ and EL gyro heat lamps: On	+28 v and 115 v 1600 Hz Warm voltages present
3	[505] Power switch: MAIN [C-6280] MASTER: NORM [405] PRESET: Local TACAN station Function switch: T/R TEST switch: Press to LAMPS, hold for indication, release	[405] SYSTEM TEST and ECM lamps: On while switch is held	+28 v Warm Essential voltage present
	NOTE Approximately sixty seconds after 905 POWER set to ON in step 1 the ▯ ADI and the ○ AI power OFF flags drop from view. +28 v MCS Warm and Above voltage is applied to energize the aircraft gyro cut-off relay. The relay routes input power to the applicable instrument amplifier which determines the time-in delay interval.		
4	[505] Function switch: MAN and select unused frequency between 225.00 and 275.00 MHz	[780] Channel: Selected frequency	Do not select Guard frequency on 243.00 MHz
5	[505] TONE: Press, hold for indication, release	[Headset] Sidetone: Present	115 v 400 Hz three phase Warm Essential voltage present
	NOTE Monitor the At Stby Time Indications in Tables 7-2 and 7-3 180 seconds after 905 POWER set to ON in step 1.		
6	[181] OFF-BRT: Adjust cw to 1st detent	[181] Screen: On dim 180 sec after 905 POWER to ON in step 1 TACAN annunciator: OK	+28 v and 115 v 1600 Hz Nav voltages present 115 v 400 Hz Ø C Nav voltage present
7	[C-6280] M1: Press to TEST, hold for indication, release	[C-6280] TEST lamp: On while switch is held	115 v 400 Hz Ø B On Essential voltage present

STEP	INSTRUCTION	INDICATION	REMARKS
7 (cont)	**NOTE** The following indications denote the presence of 115 v 400 Hz Ø C On Essential voltage from the 518 unit. The ◯ 880 unit indication is applicable to either A or B model aircraft. The ▯ 181 unit indication is applicable to only A model aircraft. When required, monitor the voltage in a ▯ B model aircraft at P1474P1-A of the IFF antenna switch unit in the NWW.	◯ [880] Power OFF flag: Drops from view ▯ [181] Interceptor heading and interceptor bug headings: Agree with HSI compass card	. . . . . .
	NOTE Monitor the At Stby +30 Time Indications in Tables 7-2 and 7-3 210 seconds after 905 POWER set to ON in step 1.		
8	[065] HV ON DS301 lamp: Monitor [017] AZ and EL drive: Monitor	[065] HV ON DS301 lamp: On 210 sec after 905 POWER to ON in step 1 [017] AZ and EL drive: Applied, dish searches 210 sec after 905 POWER to ON in step 1	+28 v On voltage present AZ drive indicates presence of 115 v 1600 Hz On voltage. EL drive indicates presence of 115 v 400 Hz Ø A On voltage
9	[755] CHANNEL SELECTOR: Other than local ILS station [905] POWER: RADAR STBY [163] DISP/AUTO MODE: ILS	[065] HV ON DS301 lamp: Goes off [017] AZ and EL drive: Applied, dish centered and down ▯ [ADI] Course and glide slope warning flags: Present ◯ [ADI] GS and LOC flags: Present	+28 v On voltage removed AZ drive indicates presence of 115 v 1600 Hz On voltage in standby. EL drive indicates presence of 115 v 400 Hz Ø A On voltage in standby . . .
10	[755] CHANNEL SELECTOR: Local ILS station	▯ [ADI] Course and/or glide slope warning flag(s): Drop from view ◯ [ADI] GS and/or LOC flag(s): Drop from view	+150 v Nav +30 voltage present
11	**NOTE** Proper position of the artificial horizon in the following step indicates the presence of the voltages to the AHRG. When the position of the artificial horizon is incorrect, see 27-3, Fig. 8-1.		
	[163] DISP/AUTO MODE: AUTO NAV	[080] Artificial horizon: Centered in roll and pitch —— Steering bar: Present and proper size	. . . Vertical size of steering bar indicates presence of 55 v 1600 Hz Reference voltage

STEP	INSTRUCTION	INDICATION	REMARKS
12	[955] HOMING POINT SELECTOR: Select nearest homing point to local TACAN station	[181] Target bug: Position valid —— Interceptor bug: Position valid	+150 v Stby +30 to Computer voltage present +50 v and -50 v Warm voltages present
13	[905] POWER: RADIO SILENCE	[181] TACAN annunciator: BV	+28 v MCS Radio Silence voltage present
14	[C-6280] M1: Press to TEST, hold for indication, release	[C-6280] TEST lamp: Remains off	IFF Stby Control interlock path open
15	[905] Annunciator: Monitor	[905] Annunciator: OK approx 300 sec after 905 POWER to ON in step 1	+28 v Nav voltage 180 sec after 905 POWER to ON in step 1
16	[905] POWER: EMER	[080] 16 lamp: Goes off [181] TACAN annunciator: OK	MA-1 system voltages removed 115 v 400 Hz Ø C voltage from aircraft emergency bus and +28 v Warm Essential voltage present
17	[505] TONE: Press, hold for indication, release	[Headset] Sidetone: Present	115 v 400 Hz three phase Warm Essential voltage present
18	[C-6280] M1: Press to TEST, hold for indication, release	[C-6280] TEST lamp: On while switch is held	115 v 400 Hz Ø B On Essential voltage present
	NOTE See NOTE contained in step 7 to determine the presence of the 115 v 400 Hz Ø C On Essential voltage.		
19	**NOTE** Ensure REFER UNIT ON-OFF switch, RH cockpit console, is in the OFF position.		
	[905] POWER: OFF [505] TONE: Press, hold for indication, release	[Headset] Sidetone: Present	115 v 400 Hz three phase voltage from aircraft Essential bus present
20	[505] Power switch: OFF [405] Function switch: OFF [C-6280] MASTER: OFF [181] OFF-BRT: OFF [163] DISP/AUTO MODE: DL MIN TIME [065] S3: OFF [096] S1: 1 S2: A	Check complete	. . .

Table 7-2. Signals and Voltages by Availability

VOLTAGE	LOCATION	SETTING	INDICATION	TIME
Multi-dc Temp Ok	096 Self Test Meter	S1: 9 S2: G	0 Units	
115 v 400 Hz Ø A	096 Self Test Meter	S1: 2 S2: A	4.5 to 5.5 Units	
Multi-dc Power Ok	096 Self Test Meter	S1: 1 S2: E	2.0 to 3.0 Units*	
Multi-dc Not OC	096 Self Test Meter	S1: 8 S2: E	6.0 to 3.5 Units	AT WARM
115 v 1600 Hz Power Ok	096 Self Test Meter	S1: 6 S2: D	6.0 to 8.5 Units	
115 v 1600 Hz Not OC	096 Self Test Meter	S1: 6 S2: C	6.0 to 8.5 Units	
58 v 1600 Hz Mag Fil	065 Mod Test Meter	S3: 9 Mag Fil 1	1.5 to 5.5 Units	
+28 v Stby	096 Self Test Meter	S1: 1 S2: A	5.0 to 6.0 Units	
115 v 400 Hz Ø B Stby	096 Self Test Meter	S1: 2 S2: B	4.5 to 5.5 Units	
115 v 400 Hz Ø C Stby	096 Self Test Meter	S1: 2 S2: C	4.5 to 5.5 Units	AT STBY
115 v 1600 Hz Stby	096 Self Test Meter	S1: 2 S2: D	4.5 to 5.5 Units	
115 v 1600 Hz Mag Fil	065 Mod Test Meter	S3: 9 Mag Fil 1	4.5 to 8.5 Units	
+50 v Stby + 30	096 Self Test Meter	S1: 8 or 9 S2: D or E	4.5 to 5.5 Units	
-50 v Stby + 30	096 Self Test Meter	S1: 8 or 9 S2: C or F	4.5 or 5.5 Units	
-140 v Stby + 30	096 Self Test Meter	S1: 1 S2: F	4.0 to 5.0 Units	AT STBY + 30
+150 v Stby + 30	096 Self Test Meter	S1: 1 S2: C	4.5 to 5.5 Units	
-250 v Stby + 30	096 Self Test Meter	S1: 1 S2: G	4.0 to 5.0 Units	
+300 v Stby + 30	096 Self Test Meter	S1: 1 S2: B	4.5 to 5.5 Units	

*096 unit METER POLARITY switch pressed to - (minus).

STEP	INSTRUCTION	INDICATION	REMARKS
12	[955] HOMING POINT SELECTOR: Select nearest homing point to local TACAN station	[181] Target bug: Position valid —— Interceptor bug: Position valid	+150 v Stby +30 to Computer voltage present +50 v and -50 v Warm voltages present
13	[905] POWER: RADIO SILENCE	[181] TACAN annunciator: BV	+28 v MCS Radio Silence voltage present
14	[C-6280] M1: Press to TEST, hold for indication, release	[C-6280] TEST lamp: Remains off	IFF Stby Control interlock path open
15	[905] Annunciator: Monitor	[905] Annunciator: OK approx 300 sec after 905 POWER to ON in step 1	+28 v Nav voltage 180 sec after 905 POWER to ON in step 1
16	[905] POWER: EMER	[080] 16 lamp: Goes off [181] TACAN annunciator: OK	MA-1 system voltages removed 115 v 400 Hz Ø C voltage from aircraft emergency bus and +28 v Warm Essential voltage present
17	[505] TONE: Press, hold for indication, release	[Headset] Sidetone: Present	115 v 400 Hz three phase Warm Essential voltage present
18	[C-6280] M1: Press to TEST, hold for indication, release	[C-6280] TEST lamp: On while switch is held	115 v 400 Hz Ø B On Essential voltage present
	NOTE See NOTE contained in step 7 to determine the presence of the 115 v 400 Hz Ø C On Essential voltage.		
19	**NOTE** Ensure REFER UNIT ON-OFF switch, RH cockpit console, is in the OFF position.		
	[905] POWER: OFF [505] TONE: Press, hold for indication, release	[Headset] Sidetone: Present	115 v 400 Hz three phase voltage from aircraft Essential bus present
20	[505] Power switch: OFF [405] Function switch: OFF [C-6280] MASTER: OFF [181] OFF-BRT: OFF [163] DISP/AUTO MODE: DL MIN TIME [065] S3: OFF [096] S1: 1 S2: A	Check complete	. . .

Table 7-2. Signals and Voltages by Availability

VOLTAGE	LOCATION	SETTING	INDICATION	TIME
Multi-dc Temp Ok	096 Self Test Meter	S1: 9 S2: G	0 Units	
115 v 400 Hz Ø A	096 Self Test Meter	S1: 2 S2: A	4.5 to 5.5 Units	
Multi-dc Power Ok	096 Self Test Meter	S1: 1 S2: E	2.0 to 3.0 Units*	
Multi-dc Not OC	096 Self Test Meter	S1: 8 S2: E	6.0 to 3.5 Units	AT WARM
115 v 1600 Hz Power Ok	096 Self Test Meter	S1: 6 S2: D	6.0 to 8.5 Units	
115 v 1600 Hz Not OC	096 Self Test Meter	S1: 6 S2: C	6.0 to 8.5 Units	
58 v 1600 Hz Mag Fil	065 Mod Test Meter	S3: 9 Mag Fil 1	1.5 to 5.5 Units	
+28 v Stby	096 Self Test Meter	S1: 1 S2: A	5.0 to 6.0 Units	
115 v 400 Hz Ø B Stby	096 Self Test Meter	S1: 2 S2: B	4.5 to 5.5 Units	
115 v 400 Hz Ø C Stby	096 Self Test Meter	S1: 2 S2: C	4.5 to 5.5 Units	AT STBY
115 v 1600 Hz Stby	096 Self Test Meter	S1: 2 S2: D	4.5 to 5.5 Units	
115 v 1600 Hz Mag Fil	065 Mod Test Meter	S3: 9 Mag Fil 1	4.5 to 8.5 Units	
+50 v Stby + 30	096 Self Test Meter	S1: 8 or 9 S2: D or E	4.5 to 5.5 Units	
-50 v Stby + 30	096 Self Test Meter	S1: 8 or 9 S2: C or F	4.5 or 5.5 Units	
-140 v Stby + 30	096 Self Test Meter	S1: 1 S2: F	4.0 to 5.0 Units	AT STBY + 30
+150 v Stby + 30	096 Self Test Meter	S1: 1 S2: C	4.5 to 5.5 Units	
-250 v Stby + 30	096 Self Test Meter	S1: 1 S2: G	4.0 to 5.0 Units	
+300 v Stby + 30	096 Self Test Meter	S1: 1 S2: B	4.5 to 5.5 Units	

*096 unit METER POLARITY switch pressed to - (minus).

Table 7-3. Voltages with Variable Availability

VOLTAGE	096 SELF TEST METER SETTING	INDICATION	TIME	
			AIRCRAFT POWER	GROUND POWER
115 v 1600 Hz Reference	S1: 2 S2: E	4.5 to 5.5 Units	At Warm	At Stby
+50 v On Reference	S1: 1 S2: D	4.5 to 5.5 Units	At Warm + 30	At Stby + 30
+100 Nav + 30	S1: 2 S2: G	2.5 to 4.5 Units		
-140 Nav + 30	S1: 2 S2: F	4.0 to 5.0 Units		

Table 7-4. Deleted.

7-5e. DC VOLTAGE AND NOISE CHECK. The purpose of this procedure is to check for proper output voltages from the 926 unit and the 140 unit. The 926 unit voltages; +300 v, -250 v, +150 v, -140 v, +100 v, +50 v, -50 v; and the 140 unit +50 v On Reference voltage, derived in the 140 unit, are checked for amplitude and noise levels. This procedure is accomplished utilizing the test points on the Multi DC Power Supply Test Adaptor (Breakout Box)-HAC P/N 3327810 or on the 140 unit.

EQUIPMENT REQUIRED

1. Oscilloscope
2. Digital multimeter
3. Breakout Box

EQUIPMENT HOOKUP

Connect Breakout Box to J92603. Connect digital multimeter between 300 VDC and GND test points on Breakout Box

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

926
140

REFERENCES

FUNCTIONAL DIAGRAM

1600 Hz and Multi-dc Power Supplies (T.O. 27-5/Fig. 7-4)

FAULT ISOLATION

PTF Light On or Power Erratic (T.O. 27-3/Fig. 7-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON	[Digital multimeter] D-c volts: +298.5 to +301.5v	. . .
2	[Breakout Box] Test points: Monitor applicable test points using digital multimeter for indications	[Digital multimeter] D-c volts: +149.25 to +150.75v — D-c volts: +99.5 to +100.5 v — D-c volts: +49.75 to +50.25 v — D-c volts: -49.75 to -50.25 v — D-c volts: -139.3 to -140.7v — D-c volts: -248.75 to 251.25v	. . .
3	[Breakout Box] Test points: Monitor applicable test points using oscilloscope for indications	[Oscilloscope] +300 v noise: ≤150mv — +150 v noise: ≤100mv — +100 v noise: ≤70 mv — +50 v noise: ≤100 mv — -50 v noise: ≤100 mv — -140 v noise: ≤100mv — -250 v noise: ≤150mv	. . .
4	[140] +50 REF to GND: Monitor using digital multimeter	[Digital multimeter] D-c volts: +49.5 to +50.5 v	. . .
5	[905] POWER: OFF [Test equipment] Disconnect	Check complete	. . .

7-5f. 1600 Hz CHECK. The purpose of this procedure is to check for the proper amplitude values of the 1600 Hz voltages. The 989 unit 115 v 1600 Hz voltage, the 518 unit 58/115 v 1600 Hz Mag Fil and the 55/115 v 1600 Hz Reference voltages are checked in this procedure. The procedure is accomplished utilizing the Multi DC Power Supply Test Adaptor (Breakout Box)-HAC P/N 3327810 or applicable unit test points and terminal boards.

EQUIPMENT REQUIRED

1. Digital multimeter
2. Breakout Box

EQUIPMENT HOOKUP

Connect Breakout Box to J92603. Connect digital multimeter between MAG FIL 1600 Hz and GND test points on Breakout Box.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

989
518

REFERENCES

FUNCTIONAL DIAGRAM

1600 Hz Distribution
(T.O. 27-5/Fig. 7-6)

FAULT ISOLATION

PTF Light On or Power Erratic
(T.O. 27-3/Fig. 7-2)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: WARM	[Digital multimeter] A-c volts: 112 to 117 v for 180 sec then drops to 55 to 61 v	Mag Fil voltage is reduced unless 905 POWER is set to RADAR STBY or above
2	[905] POWER: ON	[Digital multimeter] A-c volts: 112 to 117 v	. . .
3	[Breakout Box] 55 v 1600 HZ REF to 1600 HZ REF RTN: Monitor using digital multimeter	[Digital multimeter] A-c volts: 52.5 to 57.5 v	55 v to 1600 Hz Reference voltage
4	[140] 115 V 1600 to REF RET: Monitor using digital multimeter	[Digital multimeter] A-c volts: 110 to 120 v	115 v 1600 Hz Reference voltage
5	[989] TB2-1 to TB2-2: Monitor using digital voltmeter	[Digital multimeter] A-c volts: 112 to 117 v	115 v 1600 Hz output voltage from 989 unit
6	[905] POWER: OFF [Test equipment] Disconnect	Check complete	. . .

7-5g. 1600 Hz FILTER P/N 7243046-10 CHECK

CAUTION

The 1600 Hz Referenced Filter is not designed to operate into a "short circuit," therefore power should be removed immediately upon first indication of a short circuit during accomplishment of the following procedures:

(1) Remove the fuse from the filter and reinstall the fuse cap and reapply power. When the system times into standby, measure the ac voltage between the fuse cap and 989TB2-2 (RET).

(a) If ≈ 145vac, the filter is good.

(b) If ≈ 340vac, the filter is bad.

(c) If 0vac, the filter input is miswired.

(2) Reinstall the fuse and fuse cap in the filter. Measure the ac voltage between the fuse cap and 989TB2-2 (RET).

(a) If 4 - 12vac, a short is present on the 1600 Hz REF and power should be removed immediately, then proceed to step c.

(3) Remove the following connectors to remove all loads from the 1600 Hz REF line (Ref: T.O. 1F-106A-2-27-5, Chg 2, Figure 7-6, Sheet 2 of 2).

J01709	J82101
J01710	J07302
J06101	464441 Unit (B)

(4) Add a wire from the REF RET (TP 18) test point of the 464926 unit breakout box to aircraft ground.

(5) Monitor the 55v 1600 Hz REF test points at the 464926 breakout box or between the filter fuse cap and 989TB2-2 and apply power. At standby, the reference voltage should be present indicating the short has been removed.*

(6) Install the removed connectors one at a time to determine the shorted leg, remove power, and proceed with normal troubleshooting.

see O.S. 25-42 Pg. 5

NOTE

All personnel should be cautioned that the short should be removed prior to the application of power to insure that the filter is not damaged. During troubleshooting, all affected units or connectors should be removed and then reinstalled to determine the faulty unit.

7-5h. POWER DUMP CHECK. The purpose of this procedure is to check for proper operation of the sensing circuits in the 926 unit and the dump logic in the 518 unit. The Multi DC Power Supply Adaptor (Breakout Box)-HAC P/N 3327810 is utilized to introduce a momentary short circuit condition in the +50 v Stby +30 voltage. The sensing circuits in the 926 unit detect the condition and provide an indication to the 518 unit which activates the dump logic. During the second portion of the procedure the normal indication from the 926 unit to the 518 unit is interrupted and results in the activation of the dump logic.

EQUIPMENT REQUIRED

Breakout Box

EQUIPMENT HOOKUP

Connect Breakout Box to J92603

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

926
518

REFERENCES

FUNCTIONAL DIAGRAM

MA-1 Control, Time In and +28 v Distribution (T.O. 27-5/Fig. 7-3)

FAULT ISOLATION

Power Dumps to Warm or Off (T.O. 27-3/Fig. 7-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[096] S1: 8 S2: D [905] POWER: RADAR STBY	[096] SELF TEST METER: 4.5 to 5.5 units 210 sec after 905 POWER to RADAR STBY	+50 v Stby +30 voltage present
2	[096] S1: 1 S2: E METER POLARITY: - [Breakout Box] DUMP TEST: Press to WARM DUMP and release immediately	[096] SELF TEST METER: 2 to 3 units except when switch is in WARM DUMP [080] 16 lamp: Goes off	If switch is held in WARM DUMP ≥ 0.7 sec, off dump logic is activated
3	[905] POWER: WARM	[080] 16 lamp: On	. . .
4	[905] POWER: RADAR STBY [906] S1: 8 S2: E [Breakout Box] DUMP TEST: Press to PWR DUMP, hold for approx 1 sec, release	[096] SELF TEST METER: 6 to 8.5 units then 0 units when switch is set to PWR DUMP [080] 16 lamp: Goes off	Simulates a multi-dc over current condition which activates off dump logic
5	[905] POWER: WARM then OFF	[080] 16 lamp: Remains off	. . .
6	[905] POWER: RADAR STBY	[080] 16 lamp: On	. . .
7	[905] POWER: OFF [Test equipment] Disconnect [096] S1: 1 S2: A	Check complete	. . .

7-6. Deleted.

7-7. Deleted.

CHAPTER 8. FLIGHT CONTROL AND MEASUREMENT SUBSYSTEM

SECTION I. GENERAL

8-1. INTRODUCTION.

8-1a. This chapter contains check procedures for the flight control and measurements (FC&M) subsystem.

8-1b. This section includes a table listing the FC&M subsystem units and which check procedures are to be performed when a unit is replaced.

8-1c. Each procedure provides the purpose of the procedure, equipment required, equipment hookup, preliminary preparation, probable faulty unit, and references to functional diagrams and fault isolation procedures.

8-2. TEST CONSIDERATIONS.

NOTE

Wherever the 080 unit panel controls are indicated, they now apply to the 080 unit, 52800 unit (ODU), or the Filter and Control Assembly and Information panel, depending upon the system configuration.

8-2a. The purpose of the procedures in this chapter is to provide for testing of the FC&M subsystem. To verify proper FC&M subsystem operation prescribed checks are performed on the attitude heading reference group (AHRG) and automatic flight control system (AFCS).

CAUTION

Use the lowest setting of the 080 ATTACK INTENSITY control required to obtain a minimum acceptable viewing level while observing the attack display. Excessive attack intensity will cause damage to the MMST.

NOTE

The 080 ON and OFF switches are bypassed when the aircraft canopy is closed or when the canopy lock lever (F-106A only) is in the locked position.

8-2b. When the 080 displays are required, the 080 must be turned on by pressing and releasing the 080 ON switch. After a 35 ±10 second time-in period the 080 will present the search display. If the attack display is also desired, press and hold the 080 ON switch for at least 3 seconds. The attack display turns off automatically after a 3 ±1 minute interval. To obtain another interval, the 080 ON switch must be pressed and held for at least 3 seconds.

8-3. CHECKS AFTER UNIT REPLACEMENT.

8-3a. Replacement or reinstallation of certain units requires performance of check procedures described in this chapter. Due to interaction between units, it may be necessary to perform a number of check procedures when only one unit has been replaced. Table 8-1 indicates which procedure or procedures are to be performed after replacement of one or more of the listed units.

8-3b. Refer to table 8-1 whenever a unit of the FC&M subsystem is replaced to determine if checks are required.

Table 8-1. Checks After Unit Replacement (FC&M)

CHECK	PARA NO.	ECA	CSC	DGA	163	○259	509				821	905	□AMI	□AVVI	□AVVI AMPLIFIER	CPU-111	PITCH G LIMITER	472664
Barometer Setting Control Check	6-6					X								X				
Air Data Computer and Cockpit Instrument Static Check	6-7															X		
TV Routine	6-19			X			X											
LQ Routine	6-30										X							
LC Routine (Short)	6-34	X	X	X			X					X						
LZ Routine	6-40															X		
KZ Routine	6-41															X		

Table 8-1. Checks After Unit Replacement (FC&M) (Cont)

CHECK	PARA NO.	009	109	163	209	○259	289	309	396	409	821	905	□AMI	□AVVI	□AVVI AMPLI-FIER	CPU-111	PITCH G LIMITER	472664
Short Period Schuler Check	8-4ad	X	X		X		X	X										
Zero Altitude Check	8-5a													X	X	X		
□ Landing Region IAS Check	8-5b													X	X	X		
MSM Check	8-5c													X	X	X		
Operational Check	8-6a										X							
Flight Control System Check	8-6b										X							
Rudder Channel Check	8-6c										X							
Elevon Channel Check	8-6d										X							
Yaw and Pitch Phasing Check	8-6e										X							
Disengage Check	8-6f										X							
Assist Checks	8-6g										X							
Full Authority Response Check	8-6h										X							
Trim Check	8-6i										X							
Lockout Override Check	8-6j										X							
Structural Protection Checks	8-6k																X	
Structural Protection Checks, F-106B	8-61																X	
Transfer Control Checks, F-106B	8-6m																	X
Altitude Hold Check	8-6n										X							
Automatic Attack Check	8-6o										X							
Automatic Navigation Check	8-6p										X							
Mode C (Altitude Reporting) Check	9-4c															X		
Switching Control Check (ILS & NAV)	9-5f			X														
Functional Switching Check (Vertical Instruments)	9-5g												X	X				

SECTION II. STABLE COORDINATE REFERENCE GROUP

8-4. SCRG CHECKS.

NOTE

Perform the LC routine in accordance with paragraph 6-34. If the LC routine passes, the SCRG is operational. If the LC routine fails, proceed to paragraph 8-4a.

8-4a. POWER SEQUENCE CHECK. The purpose of this procedure is to ensure that the voltages required for operation of the SCRG are present and are within the allowable tolerances.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

409

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

905 Unit Annunciator Operation (T.O. 27-3/Fig. 8-4)

Table 8-2. Stabilization Data Generator Initial Switch Positions

CIRCUIT BREAKER, CONTROL, SWITCH	POSITION	CONTROL, SWITCH	POSITION
+28 VDC	OFF		
+50 VDC	OFF	HEADING-PITCH	PITCH
-50 VDC	OFF	FUNCTION SELECTOR	OFF
115 V 400~ØC	OFF	RANGE SELECTOR	OFF
115 V 400~ØB	OFF	MAN TIMER	STOP
115 V 400~ØA	OFF		
POWER	OFF	ACCELEROMETER TEST	OFF
INITIAL MODE SIGNAL	down	INTEGRATOR TEST	OFF
SELF TEST	center (off)	TORQUER TEST	OFF
RESOLVER SELECTOR	PITCH "A"	ERECTION VOLTMETER SELECTOR	OFF
WINDING SELECTOR	R2	INT TEST SIG.	center
EARTH RATE	READ	TORQ TEST SIG.	center
INT. SET	READ	INT SCALE FACTOR SIGNAL	ccw
EARTH RATE VOLTMETER	VERT.	TORQ. SCALE FACTOR SIGNAL	ccw
EARTH RATE DEGREES LATITUDE	0	AZ TORQ ADJ	center

Table 8-1. Checks After Unit Replacement (FC&M) (Cont)

CHECK	PARA NO.	ECA	CSC	DGA	163	○259	509				821	905	□AMI	□AVVI	□AVVI AMPLI-FIER	CPU-111	PITCH G LIMITER	472664
Zero Altitude Check	8-5a													X	X	X		
□ Landing Region IAS Check	8-5b													X	X	X		
MSM Check	8-5c													X	X	X		
Operational Check	8-6a										X							
Flight Control System Check	8-6b										X							
Rudder Channel Check	8-6c										X							
Elevon Channel Check	8-6d										X							
Yaw and Pitch Phasing Check	8-6e										X							
Disengage Check	8-6f										X							
Assist Checks	8-6g										X							
Full Authority Response Check	8-6h										X							
Trim Check	8-6i										X							
Lockout Override Check	8-6j										X							
Structural Protection Checks	8-6k																X	
Structural Protection Checks, F-106B	8-61																X	
Transfer Control Checks, F-106B	8-6m																	X
Altitude Hold Check	8-6n										X							
Automatic Attack Check	8-6o										X							
Automatic Navigation Check	8-6p										X							
Mode C (Altitude Reporting) Check	9-4c															X		
Switching Control Check (ILS & NAV)	9-5f				X													
Functional Switching Check (Vertical Instruments)	9-5g												X	X				

SECTION II. ATTITUDE HEADING REFERENCE GROUP

8-4. AHRG CHECKS.

Perform the LC routine (extended) in accordance with paragraph 6-34A. If the LC routine (extended) passes, the AHRG is operational. If the LC routine (extended) fails, use fail words of para. 6-34A to determine faulty unit.

8-4a. COMMAND HEADING/GRID REFERENCE CHECK. Checks capability of command heading indicators on the HSI and TSD (181) to slew to the GRID REFERENCE, 0 to 360°and slave to within ±2 degrees of GRID OPERATION setting.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNITS

905	HSI
TSD	509
620	920
140	

REFERENCES

FUNCTIONAL DIAGRAMS

1. AHRG (T.O. 27-5/Fig. 8-2)
2. Input output/tie-in (T.O. 27-5/Fig. 6-2, 6-7)
3. Air Data/Cockpit (T.O. 27-5/Fig. 8-3)

FAULT ISOLATION

1. Grid Reference Indication (T.O. 1F-106A-2-27-3/Fig. 8-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	Computer: Load Channel 8 iaw para. 6-4 [846] START ADDRESS: 15 [140] DIGITAL DISPLAY: DIGITAL INPUT switches DIGITAL INPUTS: 732 [846] ENTER START ADDRESS: Press and release RUN-STOP: Run	. . .	. . .
2	[163] DISP/AUTO MODE: Verify/Audito Mode [CSC] SLAVE/DG: Verify DG [796] SELECTOR TEST: 7	[181] Command Heading: ±2 degrees from that set on 905 unit Grid Reference [HSI] Command Heading: Same as 181 indicator ±2 degrees	. . .
3	[905] GRID REFERENCE: Rotate thru 360 degrees at 30-degree increments	[181] Command Heading: ±2 degrees from each setting of the 905 Grid Reference [HSI] Command Heading Same as 181 indication ±2 degrees	. . .
4	[Computer]: Set all switches for NORMAL operation [796] SELECTOR TEST: OFF	End of check	. . .

Table 8-2. Deleted

8-4 Pages 8-5 through 8-44 Deleted. Change 12

Table 8-2. Stabilization Data Generator Initial Switch Positions (Cont)

CIRCUIT BREAKER, CONTROL, SWITCH	POSITION	CONTROL, SWITCH	POSITION
LATITUDE CORRECTION	OFF	PRECESS	OFF
LATITUDE COUNTER	down	SCHULER	NORMAL
AZIMUTH CLUTCH	down	TORQUER REVERSE	CW
TIMER	MAN	SIGNAL CONTROL	center
POWER SUPPLY TEST	OFF	SIGNAL TEST	OFF
SERVOMILLIAMMETER RANGE	X1	VOLTMETER	OFF
SERVOMILLIAMMETER SELECTOR	OFF		
AZIMUTH OUTPUT-GIMBAL	GIMBAL		
HDG SERVO INITIAL-OUTPUT	OUTPUT		
AZIMUTH-SERVOMILLIAMMETER	AZIMUTH		

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115 V 400 ~ØA, 115V 400 ~ØB, and 115V 400 ~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
	NOTE If power has been off for 30 minutes prior to the start of this test, gyro rotation speed will be reduced sufficiently to assure that if no erection circuit malfunction exists, the stable table will be erect at the conclusion of the two minute initial mode. If power has been off less than 30 minutes it may be necessary to erect the stable table by setting the 486118 INITIAL MODE SIGNAL switch up until erection is completed; then set 486118 INITIAL MODE SIGNAL switch down.		
3	**NOTE** To check the +300 v indication, set 486118 SELF TEST switch to either NAV or COMP while the 486118 POWER SUPPLY TEST switch is set to +300 VDC.		
	[486118] POWER SUPPLY TEST: Set to each position	[486118] POWER SUPPLY: All indications for d-c voltages must be in the red (±10%) zone. All indications for a-c voltages must be in the blue (±20%) zone.	The 486118 POWER SUPPLY TEST checks 17 different voltages

STEP	INSTRUCTION	INDICATION	REMARKS
4	[486118] AZIMUTH OUTPUT-GIMBAL: AZIMUTH OUTPUT	[486118] AZIMUTH: Indication agrees with indication in 905 GRID REFERENCE window	. . .
	NOTE If the test in paragraph 8-4b is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of the procedure in paragraph 8-4b.		
5	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4b. AZIMUTH ALIGNMENT CHECK. The purpose of this procedure is to ensure that the SCRG will compensate for aircraft and/or command heading changes.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

109
289

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

905 Unit Annunciator Operation (T.O. 27-3/Fig. 8-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3	[486118] SIGNAL TEST: AZ SIGNAL CONTROL: Adjust cw to obtain indication	[486118] AZIMUTH: Rotates in cw direction	. . .
4	[486118] SIGNAL CONTROL: Adjust ccw to obtain indication	[486118] AZIMUTH: Rotates in ccw direction	. . .
	NOTE If the check in paragraph 8-4c is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4c.		
5	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4c. ROLL ALIGNMENT CHECK. The purpose of this procedure is to ensure that the SCRG will compensate for aircraft changes in roll.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

109
289

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Grid Reference Indication (T.O. 27-3/Fig. 8-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3	[486118] SIGNAL TEST: ROLL SIGNAL CONTROL: Adjust cw to obtain indication	[486118] ROLL: Rotates in cw direction	. . .
4	[486118] SIGNAL CONTROL: Adjust ccw to obtain indication	[486118] ROLL: Rotates in ccw direction	. . .
	NOTE If the check in paragraph 8-4d is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4d.		
5	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4d. PITCH ALIGNMENT CHECK. The purpose of this procedure is to ensure that the SCRG will compensate for aircraft changes in pitch.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

109
289

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ ØA, 115V 400~ ØB, and 115V 400 ~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) — ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode Annunciator: WAIT, then OK in approx 2 minutes	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3	**CAUTION** Do not position the pitch gimbal higher than +75° or lower than -75°.		
	[486118] SIGNAL TEST: PITCH PITCH SLEW: Press and hold SIGNAL CONTROL: Adjust cw to obtain indication	[486118] PITCH: Rotates in ccw direction	Pitch gimbal motion stops instantaneously when 486118 PITCH SLEW is released
4	[486118] SIGNAL CONTROL: Adjust ccw to obtain indication	[486118] PITCH: Rotates in cw direction	. . .
5	[486118] PITCH SLEW: Release	[486118] PITCH: Stops moving	. . .
	NOTE If the check in paragraph 8-4e is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4e.		
6	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4e. INITIAL MODE CHECK. The purpose of this procedure is to ensure that the initial mode circuitry of the SCRG is operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

109 289
209 409

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

905 Unit Annunciator Operation (T.O. 27-3/Fig. 8-4)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] SIGNAL TEST: ROLL SIGNAL CONTROL: Adjust to obtain indication	[486118] ROLL: 20 ±5°	. . .
4	**CAUTION** Do not position the pitch gimbal higher than +75° or lower than -75°.		
	[486118] SIGNAL TEST: PITCH PITCH SLEW: Press and hold SIGNAL CONTROL: Adjust to obtain indication	[486118] PITCH: 20 ±5°	Pitch gimbal motion stops instantaneously when 486118 PITCH SLEW is released
5	**NOTE** Observe indications in step 5 when 486118 timer indicates 2 minutes.		
	[486118] PITCH SLEW: Release SIGNAL CONTROL: Center TIMER RESET: Press and release INITIAL MODE SIGNAL AND MAN TIMER: Simultaneously set to up (on) and START respectively	[486118] PITCH: -0.5 to +0.5° ROLL: -0.5 to +0.5°	. . .
6	[486118] MAN TIMER: STOP TIMER RESET: Press and release	[486118] Timer: 0	. . .
	NOTE If the check in paragraph 8-4f is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4f.		
7	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4f. RESOLVER CHECK. The purpose of this procedure is to ensure that the resolver chain in the stable table is operational.

EQUIPMENT REQUIRED	EQUIPMENT HOOKUP	PRELIMINARY PROCEDURE
486118 stabilization data generator test set	Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows: (1) From connector J11802 to connector J37405 (374 rack) (2) From connector J11801 to connector J37404 (374 rack) (3) From connector J11803 to connector J37403 (374 rack) (4) From connector J11804 to connector J28903 (289)	Table 1-1 PROBABLE FAULTY UNIT 109 289

REFERENCES

FUNCTIONAL DIAGRAM	FAULT ISOLATION
SCRG (T.O. 27-5/Fig. 8-2)	Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] SIGNAL TEST: ROLL SIGNAL CONTROL: Adjust to obtain indication	[486118] ROLL: 45 ±1°	. . .
4	[486118] SIGNAL TEST: OFF SIGNAL CONTROL: Center FUNCTION SELECTOR: RESOLVER RESOLVER SELECTOR: ROLL "C" WINDING SELECTOR: Set to positions indicated and read corresponding voltage on 486118 VOLTS (red scale) RANGE SELECTOR: Set to appropriate range	WINDING SELECTOR / VOLTAGE (vdc) R1 110 to 120 R2 0 S1 38 to 42 S2 38 to 42	. . .
5	[486118] SIGNAL TEST: ROLL SIGNAL CONTROL: Adjust to obtain indication	[486118] ROLL: 0 ±5°	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
6	**CAUTION** Do not position the pitch gimbal higher than +75° or lower than -75°.		
	[486118] SIGNAL TEST: PITCH PITCH SLEW: Press and hold SIGNAL CONTROL: Adjust to obtain indication	[486118] PITCH: 45 ±1°	Pitch gimbal motion stops instantaneously when 486118 PITCH SLEW is released
7	[486118] PITCH SLEW: Release SIGNAL TEST: OFF SIGNAL CONTROL: Center RESOLVER SELECTOR: PITCH "C" WINDING SELECTOR: Set to positions indicated and read corresponding voltage on 486118 VOLTS (red scale) RANGE SELECTOR: Set to appropriate range	WINDING SELECTOR / VOLTAGE (vdc) R1: 110 to 120 R2: 0 S1: 38 to 42 S2: 38 to 42	. . .
8	**CAUTION** Do not position the pitch gimbal higher than +75° or lower than -75°.		
	[486118] SIGNAL TEST: PITCH PITCH SLEW: Press and hold SIGNAL CONTROL: Adjust to obtain indication	[486118] PITCH: 0 ±5°	Pitch gimbal motion stops instantaneously when 486118 PITCH SLEW is released
9	[486118] PITCH SLEW: Release AZIMUTH OUTPUT-GIMBAL: AZIMUTH OUTPUT SIGNAL TEST: AZ SIGNAL CONTROL: Adjust to obtain indication	[486118] AZIMUTH: 45 ±1°	. . .
10	[486118] SIGNAL TEST: OFF SIGNAL CONTROL: Center RESOLVER SELECTOR: AZ "C" WINDING SELECTOR: Set to positions indicated and read corresponding voltage on 486118 VOLTS (red scale) RANGE SELECTOR: Set to appropriate range	WINDING SELECTOR / VOLTAGE (vdc) R1: 110 to 120 R2: 0 S1: 38 to 42 S2: 38 to 42	. . .
	NOTE If the check in paragraph 8-4g is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4g.		
11	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	

8-4g. VERTICAL EARTH RATE CHECK. The purpose of the procedure is to ensure that the SCRG will compensate for changes of aircraft latitude.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

396
409

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE Control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ ØA, 115V 400~ ØB, and 115V 400~ ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] FUNCTION SELECTOR: EARTH RATE EARTH RATE VOLTMETER: VERT. LATITUDE COUNTER: Up (ON) [409] DEGREES LATITUDE control: Press and adjust to degrees (displayed on DEGREES LATITUDE counter) indicated and read corresponding voltage on 486118 VOLTS (red scale) [486118] RANGE SELECTOR: Set to appropriate range	DEGREES / VOLTAGE (vdc) 0 — 11.9 to 13.1 10 — 11.7 to 12.9 20 — 11.3 to 12.3 30 — 10.4 to 11.2 40 — 9.2 to 10.0 45 — 8.5 to 9.3 50 — 7.7 to 8.5 60 — 6.0 to 6.6 70 — 4.0 to 4.6 80 — 2.0 to 2.4 90 — less than 0.15	. . .
4	[409] DEGREES LATITUDE control: Set to local latitude [486118] DEGREES LATITUDE control: Set dial to local latitude EARTH RATE: TEST and hold DEGREES LATITUDE control: Adjust dial for min voltage on 486118 VOLTS	[486118] DEGREES LATITUDE scale: Agrees (±2°) with indication on 409 DEGREES LATITUDE counter	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
	NOTE If the check in paragraph 8-4h is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4h.		
5	[486118] EARTH RATE: Release [905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4h. AZIMUTH EARTH RATE CHECK. The purpose of this procedure is to ensure that the SCRG will compensate for changes of aircraft latitude.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3	[486118] FUNCTION SELECTOR: EARTH RATE EARTH RATE VOLTMETER: AZ LATITUDE COUNTER: Up (on) [409] DEGREES LATITUDE control: Press and adjust to degrees (displayed on DEGREES LATITUDE counter) indicated and read corresponding voltage on 486118 VOLTS (red scale) [486118] RANGE SELECTOR: Set to appropriate range	DEGREES / VOLTAGE (vdc) 0 — less than 0.15 10 — 1.6 to 2.0 20 — 3.3 to 3.7 30 — 5.0 to 5.4 40 — 6.4 to 6.8 45 — 7.0 to 7.6 50 — 7.6 to 8.2 60 — 8.5 to 9.3 70 — 9.3 to 10.1 80 — 9.7 to 10.5 90 — 9.9 to 10.7	. . .
4	[409] DEGREES LATITUDE control: Set to local latitude [486118] DEGREES LATITUDE control: Set dial to local latitude EARTH RATE: TEST and hold DEGREES LATITUDE control: Adjust dial for min voltage on 486118 VOLTS	[486118] DEGREES LATITUDE scale: Agrees (±2°) with indication on 409 DEGREES LATITUDE counter	. . .
	NOTE If paragraph 8-4i is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4i.		
5	[486118] EARTH RATE: Release [905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4i. LATITUDE CORRECTION CHECK. The purpose of this procedure is to ensure that the SCRG will compensate for changes of aircraft latitude in increments of one degree.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

409

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] LATITUDE CORRECTION: +1°	[409] DEGREES LATITUDE counter: Advances 1° north	. . .
4	[486118] LATITUDE CORRECTION: -1°	[409] DEGREES LATITUDE counter: Advances 1° south	. . .
	NOTE If procedure in paragraph 8-4j is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4j. Check 486118 AZIMUTH indication before performing step 3.		
5	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4j. AZIMUTH LATITUDE SERVO CHECK. The purpose of this procedure is to ensure that the SCRG latitude circuits are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405, (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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289
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REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ ØA, 115V 400~ ØB, and 115V 400~ ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY [486118] AZIMUTH: Record indication	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] AZIMUTH OUTPUT-GIMBAL: AZIMUTH OUTPUT AZIMUTH: Record indication PRECESS: CW, then OFF when proper indication is obtained, record value	[486118] AZIMUTH: Indicator moves approx 15°	. . .
4	[486118] AZIMUTH OUTPUT-GIMBAL: GIMBAL AZIMUTH: Record indication	[486118] AZIMUTH: Per the following relationship $D_1 - D_2 = D_3 - D_4$ D_1 = Indication recorded in step 2 D_2 = 1st indication recorded in step 3 D_3 = 2nd indication recorded in step 3 D_4 = Indication recorded in step 4	. . .
5	[486118] PRECESS: CCW, then OFF when proper indication is obtained, record value	[486118] AZIMUTH: Indicator moves approx 15°	. . .
6	[486118] AZIMUTH OUTPUT-GIMBAL: AZIMUTH OUTPUT AZIMUTH: Record indication	[486118] Per the following relationship $D_1 - D_2 = D_3 - D_4 = D_5 - D_6$ D_1, D_2, D_3, and D_4 are as defined in step 4 D_5 = Indication recorded in step 5 D_6 = Indication recorded in step 6	. . .
	NOTE If procedure in paragraph 8-4k is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4k.		
7	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4k. HEADING CORRECTION SERVO CHECK. The purpose of this procedure is to ensure that the SCRG will compensate for aircraft heading changes.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Grid Reference Indication (T.O. 27-3/Fig. 8-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] AZIMUTH OUTPUT-GIMBAL: AZIMUTH OUTPUT INITIAL MODE SIGNAL: Up (on) for 20 sec then down (off) AZIMUTH: Record indication [905] GRID REFERENCE: Set 30° from original setting [486118] INITIAL MODE SIGNAL: Up (on) for 20 sec then down (off)	[486118] AZIMUTH: Agrees (±0.5°) with GRID REFERENCE setting	. . .
4	[486118] HEADING - PITCH: Set and hold to HEADING for 20 sec then release	[486118] PITCH: Agrees (±0.5°) with 905 GRID REFERENCE setting	. . .
	NOTE If procedure in paragraph 8-41 is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-41.		
5	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-41. HEADING CORRECTION SERVO CALIBRATION CHECK. The purpose of this procedure is to ensure that the timing sequence is correct for changes of aircraft heading.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Grid Reference Indication (T.O. 27-3/Fig. 8-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: N 20	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ ØA, 115V 400~ ØB, and 115V 400~ ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] TIMER RESET: Press and release LATITUDE COUNTER: Up (on) AZIMUTH OUTPUT-GIMBAL: AZIMUTH OUTPUT INITIAL MODE SIGNAL: Up (on) for 20 sec then down (off) AZIMUTH CLUTCH: Up (on) MAN TIMER: START when AZIMUTH indicator turns through zero degrees; STOP at the end of 2 complete revolutions of AZIMUTH indicator AZIMUTH CLUTCH: Down (off)	[486118] Timer: 43 ±9 sec	. . .

NOTE

If procedure in paragraph 8-4m is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4m.

STEP	INSTRUCTION	INDICATION	REMARKS
4	[486118] TIMER RESET: Press and release [905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4m. AZIMUTH ALIGNMENT AMPLIFIER CHECK. The purpose of this procedure is to ensure that the heading correction circuits in the 109 unit are operational.

EQUIPMENT REQUIRED

1. 486118 stabilization data generator test set
2. Digital voltmeter

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289). Connect digital voltmeter (set to 0.1 v range) to 486118 VM.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Grid Reference Indication (T.O. 27-3/Fig. 8-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) — ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	**CAUTION** Care must be exercised when performing steps 3 and 4 to ensure that 486118 PITCH indicator does not exceed 75°. If 486118 PITCH indicator exceeds 75°, set 486118 SIGNAL TEST to PITCH and then return gimbal to zero degrees by pressing 486118 PITCH SLEW and adjusting 486118 SIGNAL CONTROL.		

STEP	INSTRUCTION	INDICATION	REMARKS
3 (Cont)	[486118] FUNCTION SELECTOR: ALIGNMENT VOLTMETER: AZIMUTH INPUT SIGNAL TEST: AZ SIGNAL CONTROL: Adjust to obtain indication	[Digital voltmeter] Millivolts: +50 mv	. . .
4	[486118] VOLTMETER: AZIMUTH OUTPUT	[486118] VOLTS: +6.3 to +8.7 v (on red scale)	. . .
	NOTE If procedure in paragraph 8-4n is to be performed, do not disconnect 486118 or digital voltmeter. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4n.		
5	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup [Digital voltmeter] Leads: Disconnect	Check complete	. . .

8-4n. PITCH ALIGNMENT AMPLIFIER CHECK. The purpose of this procedure is to ensure that the pitch correction circuits in the 109 unit are operational.

EQUIPMENT REQUIRED

1. 486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289). Connect digital voltmeter (set to 0.1 v range) to 486118 VM.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	**CAUTION** Care must be exercised when performing steps 3 and 4 to ensure that 486118 PITCH indicator does not exceed ±75°. If 486118 PITCH indicator exceeds 75°, set 486118 SIGNAL TEST to PITCH and then return gimbal to zero degrees by pressing 486118 PITCH SLEW and adjusting 486118 SIGNAL CONTROL.		
	[486118] FUNCTION SELECTOR: ALIGNMENT VOLTMETER: PITCH INPUT SIGNAL TEST: PITCH PITCH SLEW: Press and hold while adjusting SIGNAL CONTROL then release SIGNAL CONTROL: Adjust to obtain indication	[Digital voltmeter] Millivolts: +50 mv	Pitch gimbal motion stops instantaneously when 486118 PITCH SLEW is released
4	[486118] VOLTMETER: PITCH OUTPUT PITCH SLEW: Press and hold until proper indication is obtained then release	[486118] VOLTS: +6.3 to 8.7 v (red scale)	. . .
	NOTE If procedure in paragraph 8-4o is to be performed, do not disconnect 486118 or digital voltmeter. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4o.		
5	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup [Digital voltmeter] Leads: Disconnect	Check complete	. . .

8-4o. ROLL AMPLIFIER ALIGNMENT CHECK. The purpose of this procedure is to ensure that the roll correction circuits in the 109 unit are operational.

EQUIPMENT REQUIRED

1. 486118 stabilization data generator test set
2. Digital voltmeter

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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EQUIPMENT HOOKUP

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289). Connect digital voltmeter (set to 0.1 v range) to 486118 VM.

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	**CAUTION** Care must be exercised when performing steps 3 and 4 to ensure that 486118 PITCH indicator does not exceed ±75°. If 486118 PITCH indicator exceeds 75°, set 486118 SIGNAL TEST to PITCH and then return gimbal to zero degrees by pressing 486118 PITCH SLEW and adjusting 486118 SIGNAL CONTROL. [486118] FUNCTION SELECTOR: ALIGNMENT VOLTMETER: ROLL INPUT SIGNAL TEST: ROLL SIGNAL CONTROL: Adjust to obtain indication	[Digital voltmeter] Millivolts: +50 mv	. . .
4	[486118] VOLTMETER: ROLL OUTPUT	[486118] VOLTS: +75.25 to +101.75 v	. . .
5	**NOTE** If procedure in paragraph 8-4p is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4p. [905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4p. X INTEGRATOR SETTING CHECK. The purpose of this procedure is to ensure that the azimuth positioning circuits of the SCRG are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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289
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REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] EARTH RATE VOLTMETER: X INT. SETTING FUNCTION SELECTOR: EARTH RATE RANGE SELECTOR: 12V	[486118] VOLTS: 0 to +10.3 v (on red scale)	. . .
4	[409] DEGREES LATITUDE control: N 45 [486118] LATITUDE COUNTER: Up (on) SIGNAL TEST: AZ SIGNAL CONTROL: Adjust PRECESS: Set to CW or CCW for fine control adjustment	[486118] AZIMUTH: 0°	. . .
5	[486118] SIGNAL TEST: OFF SIGNAL CONTROL: Center AZIMUTH OUTPUT-GIMBAL: AZIMUTH OUTPUT INITIAL MODE SIGNAL: Up (on) for 20 sec then down (off) INT. SET: TEST and hold	[486118] VOLTS: Less than +1 v (on red scale)	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
6	[486118] SIGNAL TEST: AZ SIGNAL CONTROL: Adjust PRECESS: Set to CW or CCW for fine control adjustment	[486118] VOLTS: Less than +1 v (on red scale)	. . .
7	[486118] SIGNAL TEST: OFF INT. SET: Release SIGNAL CONTROL: Center AZIMUTH OUTPUT-GIMBAL: GIMBAL	[486118] AZIMUTH: 0 ±2°	. . .
	NOTE If procedure in paragraph 8-4q is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4q.		
8	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4q. Y INTEGRATOR SETTING CHECK. The purpose of this procedure is to ensure that the pitch positioning circuits of the SCRG are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode Annunciator: Wait, then OK in approx 2 minutes	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3	[486118] EARTH RATE VOLTMETER: Y INT. SETTING FUNCTION SELECTOR: EARTH RATE RANGE SELECTOR: 12 V	[486118] VOLTS: 0 to +10.3 v (on red scale)	. . .
4	[409] DEGREES LATITUDE control: N 45 [486118] LATITUDE COUNTER: Up (on) SIGNAL TEST: AZ SIGNAL CONTROL: Adjust PRECESS: Set to CW or CCW for fine control adjustment	[486118] AZIMUTH: 0°	. . .
5	[486118] SIGNAL TEST: OFF SIGNAL CONTROL: Center AZIMUTH OUTPUT-GIMBAL: AZIMUTH OUTPUT [905] GRID REFERENCE: 090 [486118] INITIAL MODE SIGNAL: Up (on) for 20 sec then down (off) INT. SET: TEST and hold	[486118] VOLTS: Less than +1 v (on red scale)	. . .
6	[486118] SIGNAL TEST: AZ SIGNAL CONTROL: Adjust PRECESS: Set to CW or CCW for fine control adjustment	[486118] VOLTS: Less than +1 v (on red scale)	. . .
7	[486118] SIGNAL TEST: OFF INT. SET: Release SIGNAL CONTROL: Center AZIMUTH OUTPUT-GIMBAL: GIMBAL	[486118] AZIMUTH: 0 ±2°	. . .
	NOTE If procedure in paragraph 8-4r is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 procedure in paragraph 8-4r.		
8	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4r. X GYRO TORQUER CHECK. The purpose of this procedure is to ensure that the azimuth gyro in the stable table is operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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EQUIPMENT HOOKUP

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] SIGNAL TEST: AZ SIGNAL CONTROL: Adjust to obtain indication	[486118] AZIMUTH: 0°	. . .
4	**CAUTION** Do not position gimbal higher than +75° or lower than -75°. After performing step 5, set TORQ. TEST SIG. to center and set TORQUER TEST to OFF to prevent any further motion of the pitch gimbal.		
	[486118] SIGNAL TEST: OFF SIGNAL CONTROL: Center TORQUER TEST: X TORQ TORQ. TEST SIG.: Max cw	[486118] PITCH: Indicator turns in + PITCH (ccw) direction at approx 2° per minute	. . .
5	[486118] TORQ. TEST SIG.: Adjust max ccw	[486118] PITCH: Indicator turns in - PITCH (cw) direction at approx 2° per minute	. . .
	NOTE Set TORQ. TEST SIG. to center and set TORQUER TEST to OFF. If procedure in paragraph 8-4s is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4s.		
6	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4s. X GYRO TORQUER SCALE FACTOR CHECK. The purpose of this procedure is to ensure that the gain of the azimuth gyro circuits of the SCRG are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] SIGNAL TEST: AZ SIGNAL CONTROL: Adjust to obtain indication	[486118] AZIMUTH: 0°	. . .
4	[486118] SIGNAL TEST: OFF SIGNAL CONTROL: Center AZ. TORQ. ADJ.: Adjust, if necessary, to obtain indication	[486118] AZIMUTH: Min indicator rotation	. . .
	CAUTION In the following steps, do not position the pitch gimbal higher than +75° or lower than -75°.		
5	[486118] PRECESS: HOLD AZIMUTH-SERVOMILLIAMMETER: SERVOMILLIAMMETER SERVOMILLIAMMETER SELECTOR: X TORQ. INPUT	[486118] SERVOMILLIAMMETER: +0.8 ma (on TORQ. INPUT scale)	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
5 (Cont)	[486118] (Cont) TORQUER TEST: X TORQ. S.F. TORQUER REVERSE: CW TORQ. SCALE FACTOR SIGNAL: Adjust to obtain indication		
6	[486118] TIMER RESET: Press and release TORQ. SCALE FACTOR SIGNAL: Adjust as necessary during this step to maintain SERVO-MILLIAMMETER indication of +0.8 ma MAN TIMER: START when PITCH indicator reaches a convenient value, record value Timer: Monitor and perform step 7 when indication is 3 minutes	[486118] SERVOMILLIAMMETER: +0.8 ma	. . .
7	[486118] TORQUER REVERSE: CCW when timer indicates 3 minutes and record PITCH indication at this time TORQ. SCALE FACTOR SIGNAL: Adjust as necessary during this step to maintain SERVO-MILLIAMMETER indication of -0.8 ma PITCH: Record indication when timer indicates 3 minutes and again when timer indicates 6 minutes	[486118] SERVOMILLIAMMETER: -0.8 ma	. . .
8	[486118] MAN TIMER: STOP TORQUER TEST: OFF PRECESS: OFF TIMER RESET: Press and release [X gyro scale factor] Compute as follows: $\frac{a + b}{\left(\frac{6}{60}\right) \text{X } 0.8 \text{ ma}}$ where a = number of degrees PITCH indicator moved cw in 3 minutes b = number of degrees PITCH indicator moved ccw in 3 minutes 0.8 ma = scale factor signal current 6 = total time of test in minutes	[X gyro scale factor] Value: 47.7 to 58.3° per ma hour	. . .

NOTE

If procedure in paragraph 8-4t is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4t.

STEP	INSTRUCTION	INDICATION	REMARKS
9	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4t. Y GYRO TORQUER CHECK. The purpose of this procedure is to ensure that the pitch gyro in the stable table is operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] SIGNAL TEST: AZ SIGNAL CONTROL: Adjust to obtain indication	[486118] AZIMUTH: 0°	. . .
4	[486118] SIGNAL TEST: OFF SIGNAL CONTROL: Center TORQUER TEST: Y TORQ. TORQ. TEST SIG.: Adjust max cw ROLL: Record indication	[486118] ROLL: Indicator turns at approx 2° per minute	. . .
5	[486118] TORQ. TEST SIG.: Adjust max ccw	[486118] ROLL: Indicator turns at approx 2° per minute in an opposite direction of that recorded in step 4	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
5 (Cont)	**NOTE** If procedure in paragraph 8-4u is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4u.		
6	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4u. Y GYRO TORQUER SCALE FACTOR CHECK. The purpose of this procedure is to ensure that the gain of the pitch gyro circuits of the SCRG are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400 ØA, 115V 400 ØB, and 115V 400 ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] SIGNAL TEST: AZ SIGNAL CONTROL: Adjust to obtain indication	[486118] AZIMUTH: 0°	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
4	[486118] SIGNAL TEST: OFF SIGNAL CONTROL: Center AZ. TORQ. ADJ.: Adjust, if necessary, to obtain indication	[486118] AZIMUTH: Min indicator rotation	. . .
5	[486118] PRECESS: HOLD AZIMUTH-SERVOMILLIAMMETER: SERVOMILLIAMMETER SERVOMILLIAMMETER SELECTOR: Y TORQ. INPUT TORQUER TEST: Y TORQ. S.F. TORQ. SCALE FACTOR SIGNAL: Adjust to obtain indication	[486118] SERVOMILLIAMMETER: +0.8 ma (on TORQ. INPUT scale)	. . .
6	[486118] TIMER RESET: Press and release TORQ. SCALE FACTOR SIGNAL: Adjust as necessary during this step to maintain SERVO-MILLIAMMETER indication of +0.8 ma MAN TIMER: START when ROLL indicator reaches a convenient value, record value Timer: Monitor and perform step 7 when indication is 3 minutes	[486118] SERVOMILLIAMMETER: +0.8 ma	. . .
7	[486118] TORQUER REVERSE: CCW when timer indicates 3 minutes and record roll indication at this time TORQ. SCALE FACTOR SIGNAL: Adjust as necessary during this step to maintain SERVO-MILLIAMMETER indication of -0.8 ma ROLL: Record indication when timer indicates 3 minutes and again when timer indicates 6 minutes	[486118] SERVOMILLIAMMETER: -0.8 ma	. . .
8	[486118] MAN TIMER: STOP TORQUER TEST: OFF PRECESS: OFF TIMER RESET: Press and release [Y gyro scale factor] Compute as follows: $\frac{a + b}{\left(\frac{6}{60}\right) \times 0.8 \text{ ma}}$ where a = number of degrees ROLL indicator moved cw in 3 minutes b = number of degrees ROLL indicator moved ccw in 3 minutes	[Y gyro scale factor] Value: 47.7 to 58.3° per ma hour	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
8 (Cont)	[Y gyro scale factor] (Cont) 0.8 ma = scale factor signal current 6 = total time of test in minutes		
	NOTE If procedure in paragraph 8-4v is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4v.		
9	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4v. X ACCELEROMETER CHECK. The purpose of this procedure is to ensure that the azimuth acceleration circuits of the SCRG are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes)	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
2 (Cont)	[905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	—— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	
3	[486118] INITIAL MODE SIGNAL: Up (on)	[486118] PITCH: -0.5 to +0.5° —— ROLL: -0.5 to +0.5°	. . .
4	[486118] INITIAL MODE SIGNAL: Down (off) SIGNAL TEST: AZ SIGNAL CONTROL: Adjust to obtain indication	[486118] AZIMUTH: 0°	. . .
	CAUTION Do not position pitch gimbal higher than +75° or lower than -75°.		
	NOTE Perform steps 5 thru 8 with PITCH positioned at +5° and then at -5° from position of step 3. 486118 VOLTS will be positive when PITCH is at +5°, and negative when PITCH is at -5°.		
5	[486118] SIGNAL TEST: OFF SIGNAL CONTROL: Center TORQUER TEST: X TORQ. TORQ. TEST SIG.: Adjust to obtain PITCH indication	[486118] PITCH: +5 and -5° from position of step 3	. . .
6	[486118] TORQUER TEST: OFF TORQ. TEST SIG.: Center FUNCTION SELECTOR: ERECTION ERECTION VOLTMETER SELECTOR: X INT. INPUT RANGE SELECTOR: 3V	[486118] VOLTS: ±0.54 ±0.1 v (on black scale)	. . .
7	[486118] ACCELEROMETER TEST: X ACC. S.F. ERECTION VOLTMETER SELECTOR: ACC. OUT	[486118] VOLTS: ±0.87 ±0.1 v (on black scale)	. . .
8	[486118] ACCELEROMETER TEST: X ACC	[486118] VOLTS: ±0.87 ±0.1 v (on black scale)	. . .
	NOTE If procedure in paragraph 8-4w is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4w.		

STEP	INSTRUCTION	INDICATION	REMARKS
9	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4w. X ACCELEROMETER SCALE FACTOR CHECK. The purpose of this procedure is to ensure that the gain of the azimuth acceleration circuits of the SCRG are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] INITIAL MODE SIGNAL: Up (on)	[486118] PITCH: -0.5 to +0.5° —— ROLL: -0.5 to +0.5°	. . .

<table>
<tr><th>STEP</th><th>INSTRUCTION</th><th>INDICATION</th><th>REMARKS</th></tr>
<tr><td>4</td><td>[486118]
INITIAL MODE SIGNAL: Down (off)
SIGNAL TEST: AZ
SIGNAL CONTROL: Adjust to obtain indication</td><td>[486118]
AZIMUTH: 0°</td><td>. . .</td></tr>
<tr><td>5</td><td colspan="3">CAUTION
Do not position the pitch gimbal higher than +75° or lower than -75°.

[486118]
SIGNAL TEST: OFF
SIGNAL CONTROL: Center
AZIMUTH-SERVOMILLIAMMETER: SERVOMILLIAMMETER
SERVOMILLIAMMETER SELECTOR: X INT. INPUT
SERVOMILLIAMMETER RANGE: Set to X1 or X 1/10 as required by indication servomilliammeter column
TORQUER TEST: X TORQ.
TORQ. TEST SIG.: Adjust to obtain proper plus and minus PITCH degree indications

<table>
<tr><th>PITCH (plus and minus)</th><th>SERVOMILLIAMMETER (positive and negative ma on INTEGRATOR INPUT scale)</th></tr>
<tr><td>5°</td><td>0.436 ±0.009</td></tr>
<tr><td>10°</td><td>0.868 ±0.017</td></tr>
<tr><td>20°</td><td>1.710 ±0.034</td></tr>
<tr><td>30°</td><td>2.500 ±0.050</td></tr>
<tr><td>40°</td><td>3.210 ±0.064</td></tr>
<tr><td>50°</td><td>3.830 ±0.077</td></tr>
<tr><td>60°</td><td>4.330 ±0.087</td></tr>
<tr><td>70°</td><td>4.700 ±0.094</td></tr>
</table>
For quick coarse setting of PITCH indicator set SIGNAL TEST to PITCH, press and hold PITCH SLEW while adjusting SIGNAL CONTROL to position PITCH indicator, then set SIGNAL TEST to OFF and return SIGNAL CONTROL to center. The pitch gimbal motion stops instantaneously when PITCH SLEW is released.</td></tr>
<tr><td></td><td colspan="3">NOTE
If procedure in paragraph 8-4x is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4x.</td></tr>
<tr><td>6</td><td>[905] POWER: OFF
[486118]
Cables: Disconnect those previously connected in equipment hookup</td><td>Check complete</td><td>. . .</td></tr>
</table>

8-4x. Y ACCELEROMETER CHECK. The purpose of this procedure is to ensure that the pitch acceleration circuits of the SCRG are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

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EQUIPMENT HOOKUP

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] INITIAL MODE SIGNAL: Up (on)	[486118] PITCH: -0.5° to +0.5° —— ROLL: -0.5° to +0.5°	. . .
4	[486118] INITIAL MODE SIGNAL: Down (off) SIGNAL TEST: AZ SIGNAL CONTROL: Adjust to obtain indication	[486118] AZIMUTH: 0°	. . .
5	**NOTE** Perform steps 5 thru 8 with ROLL positioned at +5° and then at -5° from position of step 3. 486118 VOLTS will be positive when ROLL is at +5°, and negative when ROLL is at -5°.		
	[486118] SIGNAL TEST: OFF SIGNAL CONTROL: Center TORQUER TEST: Y TORQ. TORQ. TEST SIG.: Adjust to obtain ROLL indication	[486118] ROLL: +5° and -5° from position of step 3	. . .
6	[486118] TORQUER TEST: OFF TORQ. TEST SIG.: Center FUNCTION SELECTOR: ERECTION ERECTION VOLTMETER SELECTOR: Y INT. INPUT RANGE SELECTOR: 3V	[486118] VOLTS: ±0.54 ±0.1 v (on black scale)	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
7	[486118] ACCELEROMETER TEST: Y ACC. S.F. ERECTION VOLTMETER SELECTOR: ACC. OUT	[486118] VOLTS: ±0.87 ±0.1 v (on black scale)	. . .
8	[486118] ACCELEROMETER TEST: Y ACC	[486118] VOLTS: ±0.87 ±0.1 v (on black scale)	. . .
	NOTE If procedure in paragraph 8-4y is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4y.		
9	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4y. Y ACCELEROMETER SCALE FACTOR CHECK. The purpose of this procedure is to ensure that the gain of the pitch acceleration circuits of the SCRG are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

109 289
209 409

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3	[486118] INITIAL MODE SIGNAL: Up (on)	[486118] PITCH: -0.5 to +0.5° —— ROLL: -0.5 to +0.5°	. . .
4	[486118] INITIAL MODE SIGNAL: Down (off) SIGNAL TEST: AZ SIGNAL CONTROL: Adjust to obtain indication	[486118] AZIMUTH: 0°	. . .
5	[486118] SIGNAL TEST: OFF SIGNAL CONTROL: Center AZIMUTH-SERVOMILLIAMMETER: SERVOMILLIAMMETER SERVOMILLIAMMETER SELECTOR: Y INT. INPUT SERVOMILLIAMMETER RANGE: X1 or X 1/10 as required by indication servomilliammeter column TORQ. TEST SIG.: Adjust to obtain indicated plus and minus ROLL positions from indications in step 3 TORQUER TEST: Y TORQ	ROLL (plus and minus) / SERVOMILLIAMMETER (positive and negative ma on INTEGRATOR INPUT scale) 5° 0.436 ±0.009 10° 0.868 ±0.017 20° 1.710 ±0.034 30° 2.500 ±0.050 40° 3.210 ±0.064 50° 3.830 ±0.077 60° 4.330 ±0.087 70° 4.700 ±0.094 80° 4.920 ±0.098	For quick coarse setting of ROLL indicator set SIGNAL TEST to ROLL, adjust SIGNAL CONTROL to position ROLL indicator, then set SIGNAL TEST to OFF and return SIGNAL CONTROL to center.
	NOTE If procedure in paragraph 8-4z is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4z.		
6	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4z. X INTEGRATOR CHECK. The purpose of this procedure is to ensure that the azimuth integration circuits of the SCRG are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

009
289

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ ØA, 115V 400~ ØB, and 115V 400~ ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] INITIAL MODE SIGNAL: Up (on) for 20 sec then down (off) FUNCTION SELECTOR: ERECTION ERECTION VOLTMETER SELECTOR: X INT. INPUT INTEGRATOR TEST: X INT. RANGE SELECTOR: 12V INT. TEST SIG.: Adjust max cw	[486118] VOLTS: +8 ±1 v (on black scale)	. . .
4	[486118] RANGE SELECTOR: OFF ERECTION VOLTMETER SELECTOR: X TORQ. INPUT RANGE SELECTOR: 12V	[486118] VOLTS: Changes at a rate of 3.5 ±2 v per minute (on black scale)	. . .
5	[486118] RANGE SELECTOR: 60V ERECTION VOLTMETER SELECTOR: X INT. OUT	[486118] VOLTS: Changes at a rate of 25 ±5 v per minute (on black scale)	. . .
6	[486118] INT. TEST SIG.: Adjust max ccw	[486118] VOLTS: Changes at a rate of -25 ±5 v per minute (on black scale)	. . .
7	[486118] ERECTION VOLTMETER SELECTOR: X TORQ. INPUT RANGE SELECTOR: 12V	[486118] VOLTS: Changes at a rate of -3.5 ±2 v per minute (on black scale)	. . .
8	[486118] RANGE SELECTOR: OFF ERECTION VOLTMETER SELECTOR: X INT. INPUT RANGE SELECTOR: 12V	[486118] VOLTS: -8 ±1 v (on black scale)	. . .
	NOTE If procedure in paragraph 8-4aa is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4aa.		
9	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4aa. X INTEGRATOR SCALE FACTOR CHECK. The purpose of this procedure is to ensure that the gain of the azimuth integration circuits of the SCRG are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

009
289

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode	. . .
3	[486118] INITIAL MODE SIGNAL: Up (on) for 20 sec then down (off) AZIMUTH-SERVOMILLIAMMETER: SERVOMILLIAMMETER SERVOMILLIAMMETER SELECTOR: X INT. INPUT TIMER RESET: Press and release INTEGRATOR TEST: X INT. S.F. INT. SCALE FACTOR SIGNAL: Adjust to obtain indication	[486118] SERVOMILLIAMMETER: +3.65 ma (INTEGRATOR INPUT scale)	. . .
4	[486118] INTEGRATOR TEST: X INT. SERVOMILLIAMMETER SELECTOR: X TORQ. INPUT INT. TEST SIG.: Adjust ccw to obtain indication	[486118] SERVOMILLIAMMETER: -0.1 ma (TORQ. INPUT scale)	. . .
5	[486118] INT. TEST SIG.: Center TIMER: AUTO INTEGRATOR TEST: X INT. S.F.	[486118] SERVOMILLIAMMETER: Turns cw —— Timer: Starts when SERVOMILLIAMMETER indicator passes through 0 and stops when indicator reaches 0.760 ma (TORQ. INPUT scale). Timer indication is 162 ±16 sec	Timer indication is 591 divided by integrator input current (+3.65 ma) as obtained in step 3

STEP	INSTRUCTION	INDICATION	REMARKS
	NOTE If procedure in paragraph 8-4ab is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4ab.		
6	[486118] TIMER RESET: Press and release [905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4ab. Y INTEGRATOR CHECK. The purpose of this procedure is to ensure that the pitch integration circuits of the SCRG are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

009
289

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] INITIAL MODE SIGNAL: Up (on) for 20 sec then down (off) FUNCTION SELECTOR: ERECTION ERECTION VOLTMETER SELECTOR: Y INT. INPUT	[486118] VOLTS: +8 ±1 v (on black scale)	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3 (Cont)	[486118] (Cont) INTEGRATOR TEST: Y INT. RANGE SELECTOR: 12V INT. TEST SIG.: Adjust max ccw to obtain indication		
4	[486118] RANGE SELECTOR: OFF ERECTION VOLTMETER SELECTOR: Y TORQ. INPUT RANGE SELECTOR: 12V	[486118] VOLTS: Indication changes at a rate of +3.5 ±2 v per minute (on black scale)	. . .
5	[486118] RANGE SELECTOR: 60V ERECTION VOLTMETER SELECTOR: Y INT. OUT	[486118] VOLTS: Indication changes at a rate of +25 ±5 v per minute (on black scale)	. . .
6	[486118] INT. TEST SIG.: Adjust max ccw to obtain indication	[486118] VOLTS: Indication changes at a rate of -25 ±5 v per minute (on black scale)	. . .
7	[486118] ERECTION VOLTMETER SELECTOR: Y TORQ. INPUT RANGE SELECTOR: 12V	[486118] VOLTS: Indication changes at a rate of +3.5 2 v per minute (on black scale)	. . .
8	[486118] RANGE SELECTOR: OFF ERECTION VOLTMETER SELECTOR: Y INT. INPUT RANGE SELECTOR: 12V	[486118] VOLTS: -8 ±1 v (on black scale)	. . .
	NOTE If procedure in paragraph 8-4ac is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4ac.		
9	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4ac. Y INTEGRATOR SCALE FACTOR CHECK. The purpose of this procedure is to ensure that the gain of the pitch integration circuits of the SCRG are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

009
289

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ ØA, 115V 400~ ØB, and 115V 400~ ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] INITIAL MODE SIGNAL: Up (on) for 20 sec then down (off) AZIMUTH-SERVOMILLIAMMETER: SERVOMILLIAMMETER SERVOMILLIAMMETER SELECTOR: Y INT. INPUT TIMER RESET: Press and release INTEGRATOR TEST: Y INT. S.F. INT. SCALE FACTOR SIGNAL: Adjust to obtain indication	[486118] SERVOMILLIAMMETER: +3.65 ma (INTEGRATOR INPUT scale)	. . .
4	[486118] INTEGRATOR TEST: Y INT. SERVOMILLIAMMETER SELECTOR: Y TORQ. INPUT INT. TEST SIG.: Adjust to obtain indication	[486118] SERVOMILLIAMMETER: -0.1 ma (TORQ. INPUT scale)	. . .
5	[486118] INT. TEST SIG.: Center TIMER: AUTO INTEGRATOR TEST: Y INT. S.F.	[486118] SERVOMILLIAMMETER: Turns cw —— Timer: Starts when SERVOMILLIAMMETER indicator passes through 0 and stops when indicator reaches 0.760 ma (TORQ. INPUT scale). Timer indication then is 162 ±16 sec	Timer indication is 591 divided by integrator input current (3.65 ma) as obtained in step 3
	NOTE If procedure in paragraph 8-4ad is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4ad.		
6	[486118] TIMER RESET: Press and release [905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3 (Cont)	[486118] (Cont) INTEGRATOR TEST: Y INT. RANGE SELECTOR: 12V INT. TEST SIG.: Adjust max ccw to obtain indication		
4	[486118] RANGE SELECTOR: OFF ERECTION VOLTMETER SELECTOR: Y TORQ. INPUT RANGE SELECTOR: 12V	[486118] VOLTS: Indication changes at a rate of +3.5 ±2 v per minute (on black scale)	. . .
5	[486118] RANGE SELECTOR: 60V ERECTION VOLTMETER SELECTOR: Y INT. OUT	[486118] VOLTS: Indication changes at a rate of +25 ±5 v per minute (on black scale)	. . .
6	[486118] INT. TEST SIG.: Adjust max ccw to obtain indication	[486118] VOLTS: Indication changes at a rate of -25 ±5 v per minute (on black scale)	. . .
7	[486118] ERECTION VOLTMETER SELECTOR: Y TORQ. INPUT RANGE SELECTOR: 12V	[486118] VOLTS: Indication changes at a rate of +3.5 2 v per minute (on black scale)	. . .
8	[486118] RANGE SELECTOR: OFF ERECTION VOLTMETER SELECTOR: Y INT. INPUT RANGE SELECTOR: 12V	[486118] VOLTS: -8 ±1 v (on black scale)	. . .
	NOTE If procedure in paragraph 8-4ac is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4ac.		
9	[905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

8-4ac. Y INTEGRATOR SCALE FACTOR CHECK. The purpose of this procedure is to ensure that the gain of the pitch integration circuits of the SCRG are operational.

EQUIPMENT REQUIRED

486118 stabilization data generator test set

EQUIPMENT HOOKUP

Ensure that 905 POWER switch is set to OFF and that all power supplied to the aircraft and 486118 is off. Set controls on front panel of 486118 to positions indicated by table 8-2. Connect four cables from 486118 to aircraft as follows:

(1) From connector J11802 to connector J37405 (374 rack)

(2) From connector J11801 to connector J37404 (374 rack)

(3) From connector J11803 to connector J37403 (374 rack)

(4) From connector J11804 to connector J28903 (289)

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

009
289

REFERENCES

FUNCTIONAL DIAGRAM

SCRG (T.O. 27-5/Fig. 8-2)

FAULT ISOLATION

Artificial Horizon Drifts or Tumbles (T.O. 27-3/Fig. 8-1)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[409] DEGREES LATITUDE control: Press, if necessary, and adjust to obtain indication	[409] DEGREES LATITUDE counter: Corresponds to local latitude	. . .
2	[486118] +28V DC, +50V DC, -50V DC, 115V 400~ØA, 115V 400~ØB, and 115V 400~ØC circuit breakers: ON POWER: ON [905] GRID REFERENCE: Set to true heading of aircraft POWER: RADAR STBY	[486118] INITIAL MODE: Comes on and then goes off at completion of initial mode (2 minutes) —— ROLL and PITCH: Move smoothly and are steady on aircraft attitude at completion of initial mode [905] Annunciator: WAIT, then OK in approx 2 minutes	. . .
3	[486118] INITIAL MODE SIGNAL: Up (on) for 20 sec then down (off) AZIMUTH-SERVOMILLIAMMETER: SERVOMILLIAMMETER SERVOMILLIAMMETER SELECTOR: Y INT. INPUT TIMER RESET: Press and release INTEGRATOR TEST: Y INT. S.F. INT. SCALE FACTOR SIGNAL: Adjust to obtain indication	[486118] SERVOMILLIAMMETER: +3.65 ma (INTEGRATOR INPUT scale)	. . .
4	[486118] INTEGRATOR TEST: Y INT. SERVOMILLIAMMETER SELECTOR: Y TORQ. INPUT INT. TEST SIG.: Adjust to obtain indication	[486118] SERVOMILLIAMMETER: -0.1 ma (TORQ. INPUT scale)	. . .
5	[486118] INT. TEST SIG.: Center TIMER: AUTO INTEGRATOR TEST: Y INT. S.F.	[486118] SERVOMILLIAMMETER: Turns cw —— Timer: Starts when SERVOMILLIAMMETER indicator passes through 0 and stops when indicator reaches 0.760 ma (TORQ. INPUT scale). Timer indication then is 162 ±16 sec	Timer indication is 591 divided by integrator input current (3.65 ma) as obtained in step 3
	NOTE If procedure in paragraph 8-4ad is to be performed, do not disconnect 486118. Set controls on front panel of 486118 to positions indicated by table 8-2 (except POWER and circuit breakers) and proceed to step 3 of procedure in paragraph 8-4ad.		
6	[486118] TIMER RESET: Press and release [905] POWER: OFF [486118] Cables: Disconnect those previously connected in equipment hookup	Check complete	. . .

SECTION III. AIR DATA COMPUTER

8-5. AIR DATA COMPUTER CHECKS

NOTE

Perform the LZ and KZ routine in accordance with paragraphs 6-38, 6-40 and 6-41 respectively. If the routines pass, proceed to paragraph 8-5a.

8-5a. ZERO ALTITUDE CHECK. The purpose of this procedure is to ensure that the vertical speed tape of the AVVI altimeter (on round instrument aircraft) is operational at zero altitude.

EQUIPMENT REQUIRED

486109 air data computer test set

EQUIPMENT HOOKUP

a. Set 905 POWER to RADAR STBY.
b. Prepare TTU-205 for operation as follows:

1. Attach cable assembly 609551-1 between TTU-205 J2 and CPU111J4.
2. Remove the covers from P_s and P_t ports on test set and attach appropriately marked pressure hoses (normally stored in cover of test set) to these ports.
3. Attach the free ends of the TTU-205 test set hoses to the respective P_s and P_t ports on the CPU111.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

CPU-111
[] AVVI
[] AVVI amplifier
O Altimeter

CAUTION

Do not apply power to the test set unless there is a pressure load securely connected to the P_s and P_t ports. Allowing the test set to operate with one or both lines open could result in possible overpressure of the unit.

4. Attach FDT angle of attck vane position in accordance with T.O. 1F-106A-2-27-7 (calibrate position).

5. Perform TTU-205 preliminary set up procedure, paragraph 11-19.

REFERENCES

FUNCTIONAL DIAGRAM

Air Data/Cockpit (T.O. 27-5/ Fig. 8-3)

FAULT ISOLATION

Altitude Indication (T.O. 27-3/Fig. 8-12)

STEP	INSTRUCTION	INDICATION	REMARKS
	NOTE For F-106B aircraft, perform adjustments in both forward and rear cockpits.		
1	□ [AVVI] BARO: Adjust to obtain indication ○ [Altimeter] Barometric pressure control: Adjust to obtain indication	□ [AVVI] Barometric pressure indicator: 29.92 ○ [Altimeter] Barometric pressure indicator: 29.92	. . .
2	[TTU-205] ALTITUDE COUNTER: ZERO ft	. . .	. . .
3	□ [AVVI] Barometric pressure adjustment: Adjust, if necessary, to obtain indication ○ [Altimeter] Barometric pressure adjustment: Adjust, if necessary, to obtain indication	□ [AVVI] Gross altitude scale: 0 ——— Sensitive altitude scale: 0 ○ [Altimeter] Indicator: 0	. . .
4	□ [AVVI amplifier] VERTICAL SPEED DAMPING control R1202: Set to midposition VERTICAL SPEED CONTROL: Adjust, if necessary, to obtain indication ○ [Vertical velocity indicator] VERTICAL SPEED DAMPING control: Set to midposition VERTICAL SPEED control: Adjust, if necessary, to obtain indication	□ [AVVI] Vertical velocity indicator: 0 ○ [Vertical velocity indicator] Pointer: 0	Setting VERTICAL SPEED DAMPING control to midposition should provide adequate damping for all flight conditions. However this may vary with individual pilot preference.
	NOTE If the test in paragraph 8-5b is to be performed, do not disconnect TTU-205 test set. Proceed to step 1 of the test in paragraph 8-5b.		
5	[TTU-205] POWER: OFF Hoses and cable: Disconnect	Check complete	. . .

☐8-5b. LANDING REGION IAS CHECK. The purpose of this procedure is to check the indicated airspeed of the AVVI using the TTU-205 test set to simulate inputs.

EQUIPMENT REQUIRED

TTU-205 Pressure test set

EQUIPMENT HOOKUP

Same as in paragraph 8-5a

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

CPU-111
AVVI
AVVI amplifier

REFERENCES

FUNCTIONAL DIAGRAM

Air Data/Cockpit (T.O. 27-5/ Fig. 8-3)

FAULT ISOLATION

Airspeed Indication (T.O. 27-3/Fig. 8-3)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[TTU-205] ALTITUDE COUNTER: 850 ft. AIRSPEED COUNTER: set corresponding positions listed in the indication column and check for proper IAS indications	[AVVI] IAS: Check that values are in accordance with the following: **NOTE** Check values in decreasing direction only. TTU-205 AIRSPEED COUNTER / IAS (knots) 230 — 220.2 to 240.2 210 — 196.4 to 216.4 190 — 183.4 to 203.4 175 — 169.4 to 189.4 160 — 153.9 to 173.9 145 — 136.8 to 156.8	. . .
	NOTE If the test in paragraph 8-5c is to be performed, do not disconnect the TTU-205 test set. Proceed to step 1 of the test in paragraph 8-5c.		
2	[TTU-205] Follow turn-off procedure, paragraph 11-19. Hoses and Cable: Disconnect	Check complete	. . .

8-5c. MSM CHECK. The purpose of this procedure is to check the maximum safe Mach indication with a known input from the TTU-205 test set.

EQUIPMENT REQUIRED

TTU-205 Pressure test set

EQUIPMENT HOOKUP

Same as in paragraph 8-5a

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

CPU-111
- □ AVVI
- □ AVVI amplifier
- ○ Altimeter

REFERENCES

FUNCTIONAL DIAGRAM

Air Data/Cockpit (T.O. 27-5/ Fig. 8-3)

FAULT ISOLATION

Mach Indication (T.O. 27-3/ Fig. 8-9)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[TTU-205] TEMP: 46.04 ALTITUDE: 30,000 ft.	. . .	. . .
2	[TTU-205] ALTITUDE TRIM: Adjust for indication	□ [AVVI] Altitude: 30,000 ft. ○ [Altimeter] Altitude: 30,000 ft	. . .
3	[TTU-205] AIRSPEED: 750 knots	. . .	. . .
4	[TTU-205] AIRSPEED TRIM: Adjust for indication	□ [AMI] Mach: 1.90 M —— Maximum safe Mach: 1.862 to 1.938 M ○ [880] Mach: 1.90 M —— Maximum safe Mach: 1.862 to 1.938 M	. . .
5	[TTU-205] Follow turn-off procedure, paragraph 11-19 Hoses and Cable: Disconnect	Check complete	. . .

SECTION IV. AUTOMATIC FLIGHT CONTROL SYSTEM

8-6. AFCS TESTS.

8-6a. OPERATIONAL CHECK. The purpose of this procedure is to perform a general electrical check of the AFCS system. A complete check of the AFCS system (without hydraulic power being applied) is accomplished in SSGC 1 and 2. When a malfunction is suspected, these procedures must be performed as instructed in paragraphs 2-6 and 2-7.

8-6b. FLIGHT CONTROL SYSTEM CHECK, PRELIMINARY. The purpose of this procedure is to set up the aircraft in a configuration which will be required for the remaining AFCS tests in paragraphs 8-6c through 8-6p.

EQUIPMENT REQUIRED

1. Hydraulic power cart (mule)
2. Oscilloscope

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1
2. Remove RH console HYDRAULIC PRESS WARN fuse

PROBABLE FAULTY UNIT

None

REFERENCES

FUNCTIONAL DIAGRAM

None

FAULT ISOLATION

None

WARNING

The aircraft shall be on its landing gear not on jacks. Remove speed brake fuse (NWW) and install speed brake door locks before application of electric or hydraulic power. Notify all presonnel working on or about the aircraft that flight control system operation is commencing.

CAUTION

Do not operate hydraulic system with HYDRAULIC PRESS WARN fuse installed. Damage to the vari-ramps could occur.

NOTE

Rigging of the direct manual and manual modes of the flight control system shall have been previously checked.

STEP	INSTRUCTION	INDICATION	REMARKS
	NOTE For F-106B aircraft, ensure that front cockpit is in control. To successfully transfer flight control functions, the 163 FLT MODE and DISP/AUTO MODE switches in both cockpits must be in the same positions. Verification of common selections is indicated by a YES in the WILL TRANSFER panel. Uncommon selections are indicated by a NO in the WILL TRANSFER panel.		
1	[NWW] Fuses: Ensure that the following are installed - MA-1 PWR (DC), MA-1 PWR (AC) ØA, ØB, ØC, ELEVON TRIM, AILERON TRIM, TAKE OFF TRIM, PITCH "G" LIMITER TEST, and FLIGHT CONTROL DAMPER [MWW] Fuses: Ensure that the following are installed - TURN RATE XMTR ØA, ØB, ØC and PITCH "G" LIMITER	[Throttle quadrant] TAKEOFF TRIMMED: Comes on	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
1 (Cont)	[Hydraulic power cart] Pressure: Apply to aircraft primary and secondary systems iaw applicable procedures in T.O. 1F-106A-2-3. The aircraft shall be resting on its landing gear and not on jacks. Observe all recommended precautionary procedures [905] POWER: RADAR STBY [Throttle quadrant] T.O. TRIM: Press and hold		
2	[Throttle quadrant] T.O. TRIM: Release	[Throttle quadrant] TAKEOFF TRIMMED: Goes off [Aircraft] Rudder and elevons: Position to take-off trim	. . .
3	[821] AIL POSN and [140] GRD: Monitor using oscilloscope	[Oscilloscope] D-c voltage: 0 ±100 mv	. . .
	NOTE If voltage in step 3 is incorrect, use pitot static tester to ensure zero airspeed and repeat steps 2 and 3. If voltage is still incorrect, align aileron position pot iaw T.O. 1F-106A-2-7.		
4	[083] Flight control stick: Move left and right slowly at a constant rate	[Oscilloscope] D-c voltage: Voltage fluctuation should not exceed 300 mv using 5 millisec/cm scale	If voltage exceeds 300 mv, replace aileron position potentiometer iaw T.O. 1F-106A-2-7

8-6c. RUDDER CHANNEL CHECK. The purpose of this procedure is to check the operation of the rudder.

EQUIPMENT REQUIRED

Hydraulic power cart

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Paragraph 8-6b

PROBABLE FAULTY UNIT

821

REFERENCES

FUNCTIONAL DIAGRAM

AFCS (T.O. 27-5/ Fig. 8-4)

FAULT ISOLATION

Damper Mode Operation (T.O. 27-3/Fig. 8-5)

NOTE

For F-106B aircraft, perform this check from front cockpit.

821 PITCH ENGA and YAW ENGA may be used instead of 163 FLT MODE switch, however, 163 FLT MODE must be set to YAW DAMP once to energize the pitch G limit interlock relay. Ensure that 083 flight control stick is not moved laterally during 821 RUDDER NULL and RUDDER GAIN checks.

STEP	INSTRUCTION	INDICATION	REMARKS
	NOTE Check rudder position before performing step 1.		

STEP	INSTRUCTION	INDICATION	REMARKS
1	[163] FLT MODE: YAW DAMP [821] RUDDER NULL: Adjust, if necessary, to obtain indication then note rudder position	[Aircraft] Rudder: Shall be within 0.05 in. of original position	Rudder movement is measured at the trailing edge
2	[821] VALVE GAIN ADJ: Press and hold RUDDER GAIN: Adjust, if necessary, to obtain indication	[Aircraft] Rudder: Moves 2.0 to 2.1 in. right of position noted in step 1	. . .
3	[821] VALVE GAIN ADJ: Release	[Aircraft] Rudder: Returns to within 0.05 in. of position noted in step 1	. . .
4	If an adjustment was made in step 1 or 2, repeat steps 1, 2, and 3 to verify calibration [905] POWER: OFF	Check complete	. . .

8-6d. ELEVON CHANNEL CHECK. The purpose of this procedure is to check the operation of the elevons.

EQUIPMENT REQUIRED

Hydraulic power cart

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Paragraph 8-6b

PROBABLE FAULTY UNIT

821

REFERENCES

FUNCTIONAL DIAGRAM

AFCS (T.O. 27-5/Fig. 8-4)

FAULT ISOLATION

Damper Mode Operation (T.O. 27-3/Fig. 8-5)

NOTE

For F-106B aircraft, transfer controls to the rear cockpit, and perform this check from the rear cockpit.

821 PITCH ENGA and YAW ENGA may be used instead of 163 FLT MODE switch, however, 163 FLT MODE must be set to YAW DAMP once to energize the pitch G limit interlock relay. Ensure that 083 flight control stick is not moved laterally during 821 RUDDER NULL and RUDDER GAIN checks.

STEP	INSTRUCTION	INDICATION	REMARKS
	NOTE Check the position of both elevons.		
1	[163] FLT MODE: PITCH DAMP [821] RIGHT ELEVON NULL: Adjust, if necessary, to obtain indication LEFT ELEVON NULL: Adjust, if necessary, to obtain indication. Note this position	[Aircraft] Elevons: Shall be within 0.03 in. of original position	Elevon movement is measured at the trailing edge
2	[821] VALVE GAIN ADJ: Press and hold RIGHT ELEVON GAIN: Adjust, if necessary, to obtain indication LEFT ELEVON GAIN: Adjust, if necessary, to obtain indication	[Aircraft] Elevons: Move down 0.43 to 0.47 in. from position noted in step 1	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3	[821] VALVE GAIN ADJ: Release	[Aircraft] Elevons: Return to within 0.02 in. of position noted in step 1	. . .
4	If an adjustment was made in step 1 or step 2, repeat steps 1, 2, and 3 to verify calibration [796] SELECTOR TEST: 6 ___ GND TEST INTER: Press and release [083] MMT: Press and hold [163] FLT MODE: ASSIST [083] MMT: Release	[080] VI WARN: Goes off [Aircraft] Right elevon: moves down ~~1.65~~ 1.50 +0.1 in. ___ Left elevon: Moves up ~~1.65~~ 1.50 +0.1 in.	Sets up a 2.5 degree left roll through elevon commands A54N, A55N and elevon position feedback signals A21, A22
5	[796] SELECTOR TEST: 7, then OFF [905] POWER: OFF	Check complete	. . .

8-6e. YAW AND PITCH PHASING CHECK. The purpose of this procedure is to check the operation of the rudder and the elevons as the aircraft is put into various configurations and the airspeed is changed.

EQUIPMENT REQUIRED

1. Hydraulic power cart
2. Pitot Static Tester
3. TRT Switch box (Fabricate box per figure 8-1.)

EQUIPMENT HOOKUP

Indicated in the procedure

PRELIMINARY PROCEDURE

Paragraph 8-6b

PROBABLE FAULTY UNIT

821

REFERENCES

FUNCTIONAL DIAGRAM

AFCS (T.O. 27-5/Fig. 8-4)

FAULT ISOLATION

Damper Mode Operation (T.O. 27-3/Fig. 8-5)

NOTE

Ensure that CPU-111 is not in any test condition and that it is producing ground condition parameters.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: OFF [Aircraft] TRT: Loosen nuts on three mounting bolts holding TRT to airframe and cut safety wires from connector on TRT	. . .	. . .
2	[Aircraft] TRT: Install TRT switch box between aircraft harness and TRT	. . .	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
3	[905] POWER: ON [163] FLT MODE: PITCH DAMP [Aircraft] TRT: While holding TRT firmly in place remove mounting bolts from TRT	. . .	. . .
4	[TRT Switch Box] PITCH RATE: OFF ROLL RATE: OFF YAW RATE: ON [Aircraft] TRT: Move to right in azimuth	[Aircraft] Rudder: Moves right while TRT is moved right	. . .
5	[TRT Switch Box] YAW RATE: OFF PITCH RATE: ON [Aircraft] TRT: Lower aft end of TRT approx one inch	[Aircraft] Elevons: Move down while aft end of TRT is lowered	. . .
6	[TRT Switch Box] PITCH RATE: OFF ROLL RATE: ON [Aircraft] TRT: Tilt TRT so that upper edge is approx one inch from mounting plate and lower edge is on mounting plate. Hold in this position momentarily then quickly return upper edge to mounting plate	[Aircraft] Rudder: First motion of rudder trailing edge is left of center	. . .
7	[Aircraft] TRT: Return TRT to its normal position	[Aircraft] Rudder: Returns to center	. . .
8	[Aircraft] TRT: Tilt TRT so that lower edge is approx one inch from mounting plate. Hold in this position momentarily and then quickly return lower edge to mounting plate	[Aircraft] Rudder: First motion of rudder trailing edge is right of center	. . .
9	[Aircraft] TRT: Return TRT to its normal position	[Aircraft] Rudder: Centered	. . .
10	[Aircraft] TRT: Reinstall three bolts, washers and nuts removed in step 1 (do not tighten)	. . .	. . .
11	[083] Flight control stick: Move to left and observe rudder	[Aircraft] Rudder: Moves left	. . .
12	[083] Flight control stick: Release and observe rudder	[Aircraft] Rudder: Returns to center	. . .
13	[083] Flight control stick: Move to right and observe rudder	[Aircraft] Rudder: Moves right	. . .
14	[083] Flight control stick: Release and observe rudder	[Aircraft] Rudder: Returns to center	. . .

See pg 76 Sup 41

STEP	INSTRUCTION	INDICATION	REMARKS
15	[Aircraft] Pitot boom: Connect pitot static tester and simulate 650 knots airspeed and repeat steps 11 thru 14	[Aircraft] Rudder: Moves opposite direction of indication of steps 11 and 13	Rudder movement reverses at high airspeeds
16	[163] FLT MODE: DIR MAN [905] POWER: OFF [Aircraft] TRT: Tighten three nuts on bolts on TRT installed in step 10. Remove TRT switch box. Install wiring harness on to TRT and safety wire connector	Check complete	. . .

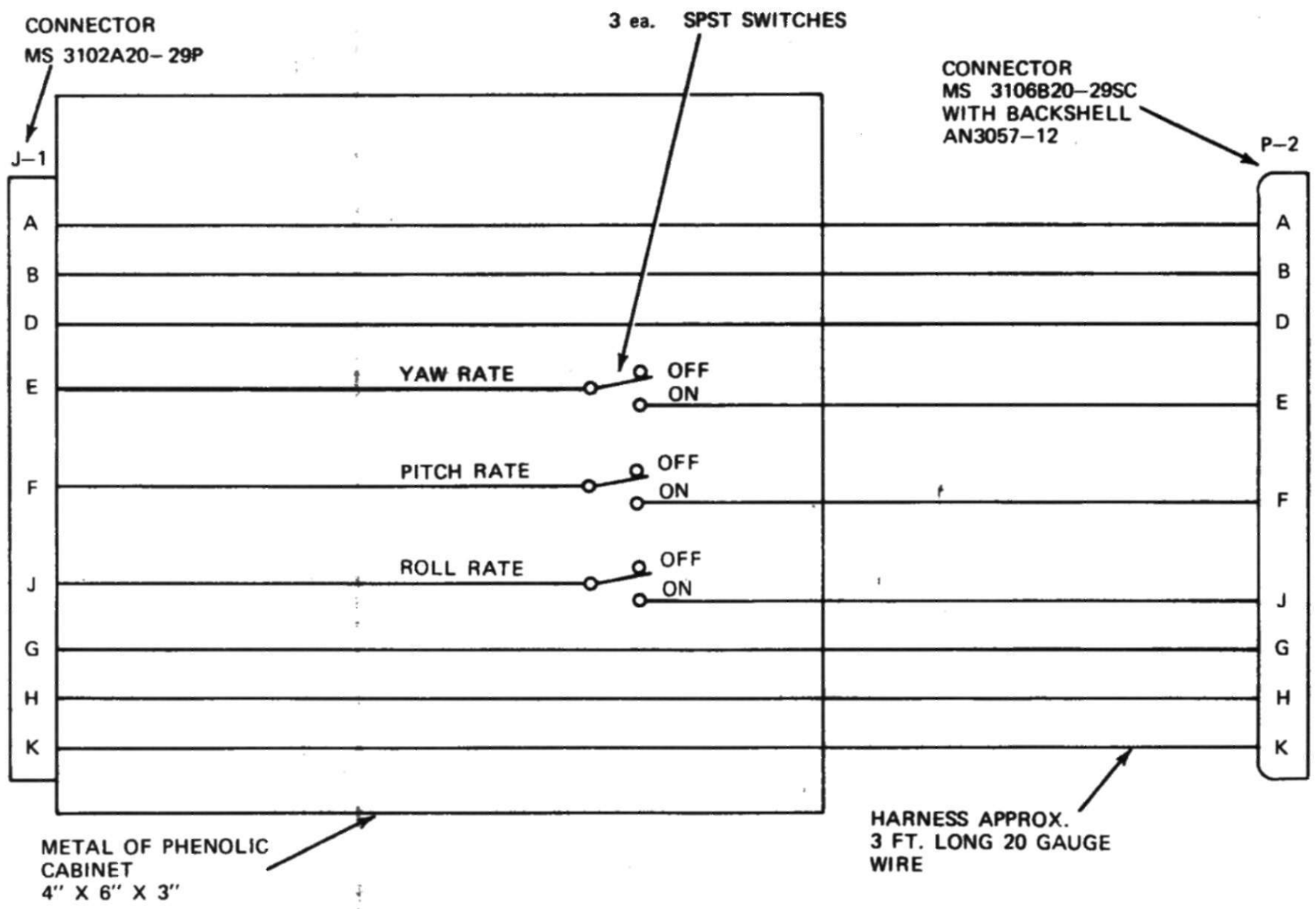


Figure 8-1. Yaw and Pitch Rate Switch Box Fabrication

8-6f. DISENGAGE CHECK. The purpose of this procedure is to ensure that the automatic flight control system can be disengaged when required.

EQUIPMENT REQUIRED

Hydraulic power cart

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Paragraph 8-6b

PROBABLE FAULTY UNIT

163
821

REFERENCES

FUNCTIONAL DIAGRAM

AFCS (T.O. 27-5/Fig. 8-4)

FAULT ISOLATION

Damper Mode Operation
(T.O. 27-3/Fig. 8-5)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[163] FLT MODE: PITCH DAMP [NWW] FLT CONT DAMPER fuse: Remove	[163] FLT MODE: DIR MAN [Inst panel] FLIGHT MODE FAIL: Comes on	. . .
2	[083] Manual mode trigger: Press and release	[Inst panel] FLIGHT MODE FAIL: Goes off while manual mode trigger is held	. . .
3	[NWW] FLT CONT DAMPER fuse: Replace [163] FLT MODE: PITCH DAMP [083] Manual mode trigger: Press and release [MWW] TURN RATE XMTR ØA fuse: Remove TURN RATE XMTR ØB fuse: Remove	[163] FLT MODE: DIR MAN [Inst panel] FLIGHT MODE FAIL: Comes on	. . .
4	[083] Manual mode trigger: Press and release	[Inst panel] FLIGHT MODE FAIL: Goes off while manual mode trigger is held	. . .

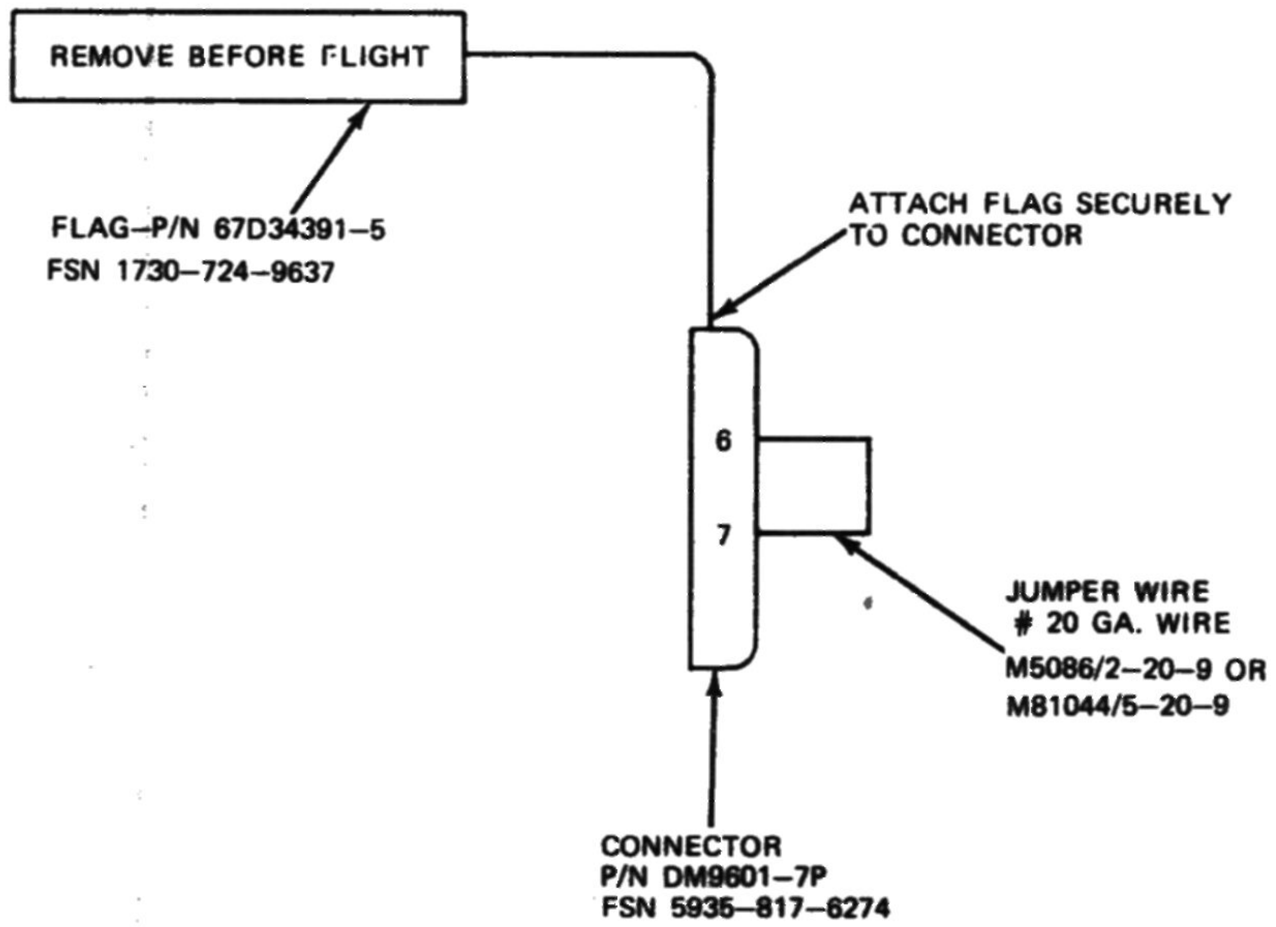


Figure 8-2. AFCS Test Plug

STEP	INSTRUCTION	INDICATION	REMARKS
2 (Cont)	[083] Manual mode trigger: Press and hold [163] FLT MODE: ASSIST [083] Manual mode trigger: Release	[Aircraft] Elevons: Movement does not exceed 0.03 in. from the position noted in step 1 —— HEP valves: Lockout plungers extend [163] FLT MODE: Stays in ASSIST [083] Flight control stick: Rigid and difficult to move	If elevon movement exceeds 0.03 in as indicated, perform step 3; otherwise proceed to step 4. Elevon movement is measured at the trailing edge
3	[Computer] Tactical TR routine: Perform iaw paragraph 6-9	[846] DISPLAY REGISTER: E25 and E18A (AFCS pitch and roll rates respectively) inputs are -0.5 to +0.5 v	. . .
4	[083] EMER MANUAL: Press and release	[163] FLT MODE: DIR MAN [Inst panel] MASTER WARNING: Comes on [MWP] FLIGHT MODE FAIL: Comes on	. . .
5	[163] FLT MODE: ASSIST	[Aircraft] HEP valves: Lockout plungers extend [Inst panel] MASTER WARNING: Remains on [MWP] FLIGHT MODE FAIL: Remains on	. . .
6	[083] Manual mode trigger: Press and release	[163] FLT MODE: Stays in ASSIST [Aircraft] HEP valves: Lockout plungers retract [Inst panel] MASTER WARNING: Goes off [MWP] FLIGHT MODE FAIL: Goes off	. . .
7	[163] FLT MODE: PITCH DAMP [Throttle quadrant] T.O. TRIM: Press and hold	[Throttle quadrant] TAKEOFF TRIMMED: Comes on	. . .
8	[Throttle quadrant] T.O. TRIM: Release [163] FLT MODE: ASSIST [083] Manual mode trigger: Press and hold, position flight control stick to full nose up, and release; wait 10 sec, then press and hold manual mode trigger and allow flight control stick to seek a neutral position then release manual mode trigger	[083] Flight control stick: Moves less than 1-1/2 in. in a nose down direction	Measure from center of handgrip (reference T.O. 1F-106A/B-2-7-1).
9	[163] FLT MODE: PITCH DAMP [Throttle quadrant] T.O. TRIM: Press and hold	[Throttle quadrant] TAKEOFF TRIMMED: Comes on	. . .
10	[Throttle quadrant] T.O. TRIM: Release [163] FLT MODE: ASSIST [083] Manual mode trigger: Press and hold, position flight	[083] Flight control stick: Moves less than 1-1/2 in. in a nose up direction	Measure from center of handgrip (reference T.O. 1F-106A/B-2-7-1).

STEP	INSTRUCTION	INDICATION	REMARKS
10 (Cont)	[083] (Cont) control stick to full nose down, and release; wait 10 sec, then press and hold manual mode trigger and allow flight control stick to seek a neutral position, then release manual mode trigger		
11	[083] EMER MANUAL: Press and release [Throttle quadrant] T.O. TRIM: Press and hold	[Throttle quadrant] TAKEOFF TRIMMED: Comes on	. . .
12	[Throttle quadrant] T.O. TRIM: Release [Computer] Tactical TR routine: Perform iaw para 6-9	[846] DISPLAY REGISTER lights: A21 and A22 are +59 to +61 v	**If indication is incorrect, adjust left or right elevon position pot for +60 ±1V**
13	[796] SELECTOR TEST: OFF [905] POWER: OFF	Check complete	. . .

8-6h. FULL AUTHORITY RESPONSE CHECK. The purpose of this procedure is to check response of the elevons when the pilot assist function is engaged from the take off trim position. This check will confirm HEP valve response to a step input. A properly functioning HEP valve will have no tendency to overshoot or oscillate during the procedure.

EQUIPMENT REQUIRED

Hydraulic power cart

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Paragraph 8-6b

PROBABLE FAULTY UNIT

821

REFERENCES

FUNCTIONAL DIAGRAM

AFCS (T.O. 27-5/Fig. 8-4)

FAULT ISOLATION

Pilot Assist or Auto Mode Operation (T.O. 27-3/Fig. 8-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[163] FLT MODE: DIR MAN [Throttle quadrant] T.O. TRIM: Press and hold	[Thruttle quadrant] TAKEOFF TRIMMED: Comes on	. . .
2	[Throttle quadrant] T.O. TRIM: Release [796] SELECTOR TEST: 6 GND TEST INTER: Press and release [Aircraft] Elevons: Check position [083] Manual mode trigger: Press and hold [163] FLT MODE: ASSIST [083] Manual mode trigger: Release	[080] VI WARN: Goes off [Aircraft] Elevons: Rapidly and firmly position to 2.5° roll left position. As noted at the inboard trailing edge, right elevon moves down 1.65 ±0.10 in. and left elevon moves up 1.65 ±0.10 in.	. . .
3	[083] Manual mode trigger: Press and hold [163] FLT MODE: DIR MAN [083] Manual mode trigger: Release [Throttle quadrant] T.O. TRIM: Press and hold	[Throttle quadrant] TAKEOFF TRIMMED: Comes on	. . .
4	[Throttle quadrant] T.O. TRIM: Release [796] SELECTOR TEST: 7, then off [905] POWER: OFF	Check complete	. . .

8-6i. TRIM CHECK. The purpose of this procedure is to check the response of the flight control system when the aircraft is trimmed up, down, left, and right.

EQUIPMENT REQUIRED

Hydraulic power cart

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Paragraph 8-6b

PROBABLE FAULTY UNIT

140
821

REFERENCES

FUNCTIONAL DIAGRAM

AFCS (T.O. 27-5/Fig. 8-4)

FAULT ISOLATION

Pilot Assist or Auto Mode Operation (T.O. 27-3/Fig. 8-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[163] FLT MODE: ASSIST [083] Manual mode trigger: Press and hold Flight control stick: Position to approx takeoff trim for 10 sec Manual mode trigger: Release Trim button: NOSE UP for 2 sec	[083] Flight control stick: Moves aft at a slow rate	Flight control stick will continue to move when released
2	[083] MANUAL mode trigger: Press and release Trim button: NOSE DOWN for 2 sec	[083] Flight control stick: Moves forward at a slow rate	Flight control stick will continue to move when released
3	[083] Trim button: RWD for 2 sec, then release	[083] Flight control stick: Moves right at a slow rate and is constant when trim button is released or continues right drift	. . .
4	[083] Trim button: LWD for 2 sec, then release	[083] Flight control stick: Moves left at a slow rate and is constant when trim button is released or continues left drift	. . .
5	[163] FLT MODE: PITCH DAMP [796] SELECTOR TEST: 7 [Throttle quadrant] T.O. TRIM: Press and hold	[Throttle quadrant] TAKEOFF TRIMMED: Comes on	. . .
6	[Throttle quadrant] T.O. TRIM: Release [163] FLT MODE: ASSIST HDG HOLD: ON	[083] Flight control stick: Remains centered	. . .
7	[905] GRID REFERENCE control: Rotate cw	[083] Flight control stick: Moves left	
8	[905] GRID REFERENCE control: Rotate ccw	[083] Flight control stick: Moves right	. . .
9	[905] GRID REFERENCE control: Rotate to original position [796] SELECTOR TEST: OFF [163] FLT MODE: DIR MAN HDG HOLD: OFF [905] POWER: OFF	Check complete	. . .

8-6j. LOCKOUT OVERRIDE CHECK. The purpose of this procedure is to ensure that excessive movement of the 083 unit in pilot assist mode will cause the flight control system to revert to the pitch damper mode.

EQUIPMENT REQUIRED

Hydraulic power cart

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Paragraph 8-6b

PROBABLE FAULTY UNIT

821

REFERENCES

FUNCTIONAL DIAGRAM

AFCS (T.O. 27-5/Fig. 8-4)

FAULT ISOLATION

Pilot Assist or Auto Mode Operation (T.O. 27-3/Fig. 8-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[083] Manual mode trigger: Press and hold [163] FLT MODE: ASSIST [083] Hand control: Position approx to takeoff trim for 10 sec Manual mode trigger: Release Hand control: Pull aft rapidly to override lockout plungers in HEP valves	[083] Hand control: Increased force required to move elevons up [163] FLT MODE: PITCH DAMP [Inst panel] MASTER WARNING: Comes on [MWP] FLIGHT MODE FAIL: Comes on	. . .
2	[083] EMER MANUAL: Press and release	[163] FLT MODE: DIR MAN	. . .
3	[083] Manual mode trigger: Press and hold	[Inst panel] MASTER WARNING: Goes off [MWP] FLIGHT MODE FAIL: Goes off	. . .
4	[083] Manual mode trigger: Release [905] POWER: OFF	Check complete	. . .

8-6k. STRUCTURAL PROTECTION CHECKS. The purpose of this procedure is to ensure that the flight control system will revert from the pilot assist mode to the yaw damper mode if an excessive G limit (in either a positive or negative direction) is reached.

EQUIPMENT REQUIRED

Hydraulic power cart

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Paragraph 8-6b

PROBABLE FAULTY UNIT

Pitch G Limiter

REFERENCES

FUNCTIONAL DIAGRAM

AFCS (T.O. 27-5/Fig. 8-4)

FAULT ISOLATION

Pilot Assist or Auto Mode Operation (T.O. 27-3/Fig. 8-6)

NOTE

For F-106B aircraft, perform this test from the forward cockpit.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[796] SELECTOR TEST: 7 [083] Manual mode trigger: Press and hold [163] FLT MODE: ASSIST [083] Manual mode trigger: Release EMER MANUAL: Press and release	[163] FLT MODE: DIR MAN [INST PANEL] MASTER WARNING: Comes on [MWP] FLIGHT MODE FAIL: Comes on	. . .
2	[083] Manual mode trigger: Press and hold	[Inst panel] MASTER WARNING: Goes off [MWP] FLIGHT MODE FAIL: Goes off	. . .
3	[163] FLT MODE: ASSIST [083] Manual mode trigger: Release [LH console] PITCH G LIMITER: +G and release	[163] FLT MODE: YAW DAMP [Inst panel] MASTER WARNING: Comes on [MWP] FLIGHT MODE FAIL: Comes on	. . .
4	[083] Manual mode trigger: Press and hold	[Inst panel] MASTER WARNING: Goes off [MWP] FLIGHT MODE FAIL: Goes off	. . .
5	[163] FLT MODE: ASSIST [083] Manual mode trigger: Release [LH console] PITCH G LIMITER: -G and release	[163] FLT MODE: YAW DAMP [Inst panel] MASTER WARNING: Comes on [MWP] FLIGHT MODE FAIL: Comes on	. . .
6	[083] Manual mode trigger: Press and hold	[Inst panel] MASTER WARNING: Goes off [MWP] FLIGHT MODE FAIL: Goes off	. . .
7	[163] FLT MODE: ASSIST Manual mode trigger: Release [Cockpit] Left-hand seat: Disconnect the disconnect plug	[163] FLT MODE: ASSIST [083] Flight control stick: Moves freely	System reverts to PITCH DAMP but switch remains in ASSIST
8	Deleted		
9	[Cockpit] Left-hand seat: Reconnect disconnect plug [163] FLT MODE: DIR MAN [796] SELECTOR TEST: OFF [083] Manual mode trigger: Press and hold [163] FLT MODE: ASSIST [083] Manual mode trigger: Release [905] PRESS TO ERECT: Press and release	[163] FLT MODE: PITCH DAMP [Inst panel] MASTER WARNING: Comes on [MWP] FLIGHT MODE FAIL: Comes on	. . .
10	[083] Manual mode trigger: Press and release	[Inst panel] MASTER WARNING: Goes off [MWP] FLIGHT MODE FAIL: Goes off	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
1	[083, front cockpit] Manual mode trigger: Press and hold [163, front cockpit] FLT MODE: ASSIST [083, front cockpit] Manual mode trigger: Release [083, rear cockpit] EMER MANUAL: Press and release	[163, both cockpits] FLT MODE: DIR MAN [Inst panel] MASTER WARNING: Comes on [MWP] FLIGHT MODE FAIL: Comes on	. . .
2	[083, front cockpit] Manual mode trigger: Press and release	[Inst panel] MASTER WARNING: Goes off [MWP] FLIGHT MODE FAIL: Goes off	. . .
	NOTE The remaining steps in this test apply only to aircraft 57-2508 thru 57-2515, 572520 and subsequent.		
3	[083, front cockpit] Manual mode trigger: Press and hold [163, front cockpit] FLT MODE: ASSIST [083, front cockpit] Manual mode trigger: Release [Rear cockpit] LH SEAT DISCONNECT plug: Disconnect, then reconnect	[163, front cockpit] FLT MODE: ASSIST [083] Flight control stick: Moves freely	System reverts to PITCH DAMP but switch remains in ASSIST
4	[083, both cockpits] Manual mode trigger: Press and hold	[Inst panel] MASTER WARNING: Goes off [MWP] FLIGHT MODE FAIL: Goes off	. . .
5	[163, front cockpit] FLT MODE: ASSIST [083, front cockpit] Manual mode trigger: Release [083, rear cockpit] Manual mode trigger: Press	[163, front cockpit] FLT MODE: Remains in ASSIST	. . .
6	[083, rear cockpit] Manual mode trigger: Release [905] POWER: OFF	Check complete	. . .

8-6m. TRANSFER CONTROL CHECKS, F-106B. The purpose of this procedure is to check that the operational control will properly switch from one cockpit to another in the F-106B aircraft.

EQUIPMENT REQUIRED

Hydraulic power cart

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Paragraph 8-6b

PROBABLE FAULTY UNIT

472664

REFERENCES

FUNCTIONAL DIAGRAM

B Model Control Transfer (T.O. 27-5/Fig. 2-4)

FAULT ISOLATION

None

NOTE

Ensure that forward cockpit is in control. To successfully transfer flight control functions, the 163 FLT MODE and DISP/AUTO MODE switches in both cockpits must be in the same positions. Verification of common selections is indicated by a YES in the WILL TRANSFER panel. Uncommon selections are indicated by a NO in the WILL TRANSFER panel.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[163, both cockpits] DISP/AUTO MODE: AUTO NAV FLT MODE: Perform control transfers for the YAW DAMP, PITCH DAMP, ASSIST, and AUTO positions	[Controlling cockpit] Transfer panel lamp: Comes on [Other cockpit] Transfer panel lamp: Off	. . .
2	[Front cockpit] Control: Transfer control to front cockpit [163, rear cockpit] FLT MODE: Any position [163, front cockpit] FLT MODE: Position different from setting in rear cockpit	[Both cockpits] WILL TRANSFER panel: NO	. . .
3	[163, both cockpits] FLT MODE: YAW DAMP [Rear cockpit] Control: Transfer control to the rear cockpit [163, front cockpit] DISP/AUTO MODE: Any position [163, rear cockpit] DISP/AUTO MODE: Position different from setting in front cockpit	[Both cockpits] WILL TRANSFER panel: NO	. . .
4	[083, front cockpit] EMER MANUAL: Press and release [083, rear cockpit] Manual mode trigger: Press and release [905] POWER: OFF	Check complete	. . .

8-6n. ALTITUDE HOLD CHECK. The purpose of this procedure is to ensure that the altitude hold function of the pilot assist mode will maintain the aircraft at the same altitude.

EQUIPMENT REQUIRED

1. Hydraulic power cart (mule)
2. TTU-205B/E

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

1. Table 1-1
2. Paragraph 8-6b

PROBABLE FAULTY UNIT

821
CPU-111

REFERENCES

FUNCTIONAL DIAGRAM

AFCS (T.O. 27-5/Fig. 8-4)

FAULT ISOLATION

Pilot Assist or Auto Mode Operation (T.O. 27-3/Fig. 8-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[TTU-205] Controls: Adjust for an altitude of 10,000 ft	▯[AVVI] Altitude: 10,000 ft ○[Altimeter] Indicator: 10,000 ft	. . .
2	[796] SELECTOR TEST: 7 [083] Manual mode trigger: Press and hold [163] FLT MODE: ASSIST [083] Manual mode trigger: Release [163] OFF-ALT HOLD: ALT HOLD	[163] OFF-ALT HOLD: Stays in ALT HOLD [Aircraft] Elevons: Check position [083] Flight control stick: Check position	. . .
3	[TTU-205] Controls: Adjust for slowly increasing altitude	▯[AVVI] Altitude: 10,500 ft ○[Altimeter] Indicator: 10,500 ft [Aircraft] Elevons: Move downward [083] Flight control stick: Moves forward	. . .
4	[TTU-205] Controls: Adjust for slowly decreasing altitude	▯[AVVI] Altitude: 9,500 ft ○[Altimeter] Indicator: 9,500 ft [Aircraft] Elevons: Move upward [083] Hand control: Moves aft	. . .
5	[TTU-205] Controls: Adjust for an altitude of 10,000 ft	▯[AVVI] Altitude: 10,000 ft ○[Altimeter] Indicator: 10,000 ft [Aircraft] Elevons: Return to position noted in step 2 [083] Flight control stick: Returns to position noted in step 2	. . .
6	[083] Trim button: NOSE UP for 2 sec	[163] OFF - ALT HOLD: OFF	. . .
7	[163] OFF - ALT HOLD: ALT HOLD	[163] OFF - ALT HOLD: Remains in ALT HOLD	. . .
8	[083] Trim button: NOSE DOWN for 2 sec	[163] OFF - ALT HOLD: OFF	. . .
9	[163] FLT MODE: DIR MAN [796] SELECTOR TEST: OFF [905] POWER: OFF [TTU-205] Controls: Adjust for ambient conditions Hoses: Disconnect	Check complete	. . .

8-6o. AUTOMATIC ATTACK CHECK. The purpose of this procedure is to ensure that the automatic flight control system will respond to steering changes provided by the radar and computer subsystems when the automatic mode is being used.

EQUIPMENT REQUIRED

Hydraulic power cart

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Paragraph 8-6b

PROBABLE FAULTY UNIT

821

REFERENCES

FUNCTIONAL DIAGRAM

AFCS (T.O. 27-5/Fig. 8-4)

FAULT ISOLATION

Pilot Assist or Auto Mode Operation (T.O. 27-3/Fig. 8-6)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: ON [ACP] Selector: MISSILES RAD	[080] Firing bar: Not present	. . .
2	[NWW] AIR DATA COMPUTER fuse: Check that fuse is installed [796] SELECTOR TEST: 2	▯ [AMI] Mach: 1.77 to 1.83 M ◯ [880] Mach: 1.77 to 1.83 M	. . .
3	[NWW] AIR DATA COMPUTER fuse: Remove [796] SELECTOR TEST: 7 [083] Action switch: Press to 2nd detent and lock on to isolated, well-defined ground target Manual mode trigger: Press and hold [163] DISP/AUTO MODE: AUTO NAV FLT MODE: AUTO [083] Manual mode trigger: Release	[083] Flight control stick: Moves coincident with 080 steering dot. Amplitude of movement corresponds with amplitude of 080 steering dot movement. When the steering dot moves up, down, left, and right, flight control stick moves aft, forward, left and right respectively	System is in auto attack mode
4	[083] RDR IR EXP-LC/PUR: LC/PUR and release	Same as step 3.	. . .
5	[163] FLT MODE: DIR MAN ▯ [163] DISP/AUTO MODE: MAN NAV [905] POWER: RADAR STBY [083] RDR IR EXP-LC/PUR: LC/PUR and release [NWW] AIR DATA COMPUTER fuse: Install	▯ [AMI] Mach: Min ◯ [880] Mach: Min	. . .
6	[796] SELECTOR TEST: OFF [905] POWER: OFF	Check complete	. . .

8-6p. AUTOMATIC NAVIGATION CHECK. The purpose of this procedure is to ensure that the automatic flight control system is capable of flying a correct navigation course when the automatic mode is being used.

EQUIPMENT REQUIRED

Hydraulic power cart (mule)

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Paragraph 8-6b

PROBABLE FAULTY UNIT

821

REFERENCES

FUNCTIONAL DIAGRAM

AFCS (T.O. 27-5/Fig. 8-4)

FAULT ISOLATION

Pilot Assist or Auto Mode Operation (T.O. 27-3/Fig. 8-6)

NOTE

On AN/ASQ-25 system aircraft, two men are required to perform the procedure in both cockpits.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [405] PRESET: Any position [955] HOMING POINT SELECTOR: Any position [163] DISP/AUTO MODE: ILS for approx 10 sec then to AUTO NAV	[080] Time-to-go circle: Appears in approx 20 sec	If the time-to-go circle is not present, set 796 SELECTOR TEST to 2 and back to OFF and perform step 1 again

STEP	INSTRUCTION	INDICATION	REMARKS
2	[NWW] AIR DATA COMPUTER fuse: Remove [796] SELECTOR TEST: 7 [CSC] HDG/PUSH TO SYNC: Push and adjust for indication, then release	[HSI] Compass card: 0° [CI] Compass card: 0° [181] Interceptor heading: 0°	. . .
3	[905] GRID REFERENCE control: Adjust	[181] Interceptor heading: 0°	905 GRID REFERENCE control changes should not change aircraft heading indication
4	[083] Manual mode trigger: Press and hold [163] FLT MODE: AUTO [083] Manual mode trigger: Release	[083] Flight control stick: Drifts forward and straight	083 flight control stick may go to the limit and cause 163 FLT MODE to go to PITCH DAMP. A faulty CPU-111 would result in a high Mach indication to the digital computer and this would cause 083 flight control stick to drift back. Normal Mach read-in is less than 0.25 Mach (less than command Mach)
5	[CSC] HDG/PUSH TO SYNC: Push and adjust for indication, then release	[HSI] Compass card: 20° [181] Interceptor heading: 20°	. . .
6	[083] Manual mode trigger: Press and hold [Throttle quadrant] T.O. TRIM: Press and hold	[Throttle quadrant] TAKEOFF TRIMMED: Comes on	. . .
7	[Throttle quadrant] T.O. TRIM: Release [163] FLT MODE: AUTO [083] Manual mode trigger: Release	[083] Flight control stick: Drifts forward and right	. . .
8	[CSC] HDG/PUSH TO SYNC: Push and adjust for indication, then release	[HSI] Compass card: 340° [181] Heading: 340°	. . .
9	[083] Manual mode trigger: Press and hold [Throttle quadrant] T.O. TRIM: Press and hold	[Throttle quadrant] TAKEOFF TRIMMED: Comes on	. . .
10	[Throttle quadrant] T.O. TRIM: Release [163] FLT MODE: AUTO [083] Manual mode trigger: Release	[083] Flight control stick: Drifts forward and left	. . .
11	[083] EMER MANUAL: Press and release [796] SELECTOR TEST: OFF [905] POWER: OFF [NWW] AIR DATA COMPUTER fuse: Install [Hydraulic mule] Disconnect	Check complete	. . .

CHAPTER 9. CN&L SUBSYSTEM

SECTION I. GENERAL

9-1. INTRODUCTION.

9-1a. This chapter contains check procedures for the CN&L subsystem. These procedures are performed after a unit has been replaced or when a malfunction is suspected.

9-1b. Each procedure provides the purpose of the procedure, equipment required, equipment hook up, preliminary procedure, probable faulty unit, and reference to functional diagrams and fault isolation procedures.

9-2. TEST CONSIDERATIONS.

NOTE

Wherever the 080 unit panel controls are indicated, they now apply to the 080 unit, 52800 unit (ODU), or the Filter and Control Assembly and Information panel, depending upon the system configuration.

9-2a. The purpose of the procedures in this chapter is to provide for the checking of the CN&L subsystem. To verify proper CN&L subsystem operation, prescribed checks are performed.

CAUTION

Use the lowest setting of the 080 ATTACK INTENSITY control required to obtain a minimum acceptable viewing level while observing the attack display. Excessive attack intensity will cause damage to the MMST.

NOTE

The 080 ON and OFF switches are bypassed when the aircraft canopy is closed or when the canopy lock lever (F-106A only) is in the locked position.

9-2b. When the 080 displays are required, the 080 must be turned on by pressing and releasing the 080 ON switch. After a 35 +10 second time-in period the 080 will present the search display. If the attack display is also desired, press and hold the 080 ON switch for at least 3 seconds. The attack display turns off automatically after a 3 +1 minute interval. To obtain another interval, the 080 ON switch must be pressed and held for at least 3 seconds.

9-2c. After applying electrical power to aircraft and prior to energizing TACAN system, place TRT/GYRO switch located in the left main wheel well (forward bulkhead) to ON. This switch will engage only if power is applied to aircraft, and will revert to OFF if power is interrupted.

9-3. CHECKS AND ADJUSTMENT AFTER UNIT REPLACEMENT.

9-3a. Replacement or reinstallation of certain units requires performance of check or adjustment procedures described in this chapter. Due to interactions between units, it may be necessary to perform a number of check or adjustment procedures when only one unit has been replaced.

9-3b. Refer to table 9-1 whenever a unit of the CN&L subsystem is replaced to determine which check or adjustment procedures are required

9-3.1. MART OPERATION.

The MART operation is based on specific switch settings at the MART and Table 9-1.1 provides suggested settings and are used in the following procedures. Any setting can be used as dictated by local practice. A complete list of available MART tests is shown in Table 9-1.2, it provides a brief description of each test.

While all tests can be accomplished automically, the tests can be manually operated from the MART as described in T.O. 33D5-12-214-1. A communications link between the aircraft and MART can be established by using the MART UHF test frequency, however, communications cannot be established during MART transmissions since a UHF carrier is present during the test.

MART INTERROGATION.

Mart interrogation is accomplished by one of three ways:

1. 505 unit TONE button - The MART will provide System Test 1 when the 505 unit TONE button is pressed for at least 3 seconds but not more than 6 seconds. The 505 unit need only to be set to the MART UHF test frequency and the TONE button pressed to interrogate the MART. During interrogation, the UHF 1080 Hz tone will be heard for the time that the TONE is pressed. When the button is released, a single 1 second 1080 Hz tone will be heard indicating that the MART has been interrogated. Interrogation cannot be accomplished during MART transmissions.

2. SSGC 3 - MART interrogation is accomplished by the selection of SSGC 3, the appropriate Homing Point, and squadron address for the desired test, after which the GND TEST INTER is pressed for at least 10 seconds but not more than 15 seconds. This allows the IRAM computer to enter the interrogation routine and provide the proper sequence of 4 and 5 KHz tones to the UHF modulator circuits. By observing the COMP lamp (796 unit), the interrogation cycle can be determined. In SSGC 3, the COMP lamp is normally out and remains out until the computer outputs the 14 interrogation tones at which time it stays on until the tones cease and then goes out. The GND TEST INTER should be released when the lamp goes out. The single one second 1080 Hz tone will be heard to indicate that the MART has been interrogated. Interrogation cannot be accomplished during MART transmissions.

3. SSGC 7 - MART interrogations is accomplished in the same manner as SSGC 3 except for the COMP lamp display; In SSGC 7, the COMP lamp is normally on and turns off during the interrogation tones. It should be noted the 019 unit DISPLAY switch must be set to ON or else the wrong interrogation tones will be sent to the MART and will be rejected.

CAUTION

Operation will key the ARC-109 transmitter and repeated test operations can cause an excessive duty cycle. Observe the prescribed duty cycle for the ARC-109 (for 5 min transmit allow 10 min receive). Set the 505 unit control switch to OFF if UHF is not required.

Table 9-1. Checks and Adjustments After Unit Replacement (CN&L)

CHECK OR ADJUSTMENT	PARA NO.	005	**019**	117	181	220	**267**	306	367	405	505	520	529	564	606	620	629	664	667	764	864	920	BLOWER MOTOR	C-6280	RT-749	RT-859	TS-1843A
Time-In Sequence check (Primary Procedure-Aircraft Power)	7-5c								X								X										
APX-72 Self Check	9-4a																							X		X	X
Sensitivity, Frequency, Power Output, and Coder Check	9-4b																							X		X	
UHF Operational Check	9-5a										X				X										X		
UHF Emergency Blower and Valve Check	9-5b																						X				
UHF Preset Channel Adjustment	**9-5.c.**										X																
Mode Lamp Switching Check	9-5d											X				X											
Intercom Control Check	9-5h	X																									
Transfer Control Check	9-5i													X				X		X	X						
Operational Check	9-6a									X			X				X										
Identity Tone Check	9-6b									X																	
Output Power Function Check	9-6c									X			X				X										
Receiver Sensitivity Function Check	9-6d									X			X				X										
TACAN Preset Channel Adjustment	**9-6.e.**									**X**																	
Operation Check	9-7a				X																	X					
Self Check	9-7b				X																	X					
UHF ADF Check	9-8			X											X												
Data Link Check	9-9					X													X								
Data Link Preset Frequency Adjustment	**9-9.a.**		**X**																								
306 Unit Adjustments	9-12							X																			
Marker Beacon Operational Check for LOW SENSITIVITY only	**9-15**						X																				
Alternate Marker Beacon Operational Checks	**9-16**						X																				

Table 9-1.1. Switch Settings Required for MART Operation

FUNCTION	SETTING
TACAN	RANGE: 90 MILEs
	BEARING: 330 degrees
	CHANNEL: 126 or local test
IFF	MODE 1: 43
	MODE 2: 4324
	MODE 3/A: 4324
	MODE C: LOCAL FIELD ALTITUDE
ILS	CHANNEL: 11 or local test
UHF	FREQ: local test
DL	FREQ: local test

Table 9-1.2. Available MART Tests

FUNCTION	955 HP	019 HP	DESCRIPTION
SYSTEM 1	A	*10	SSGC 3 CN&L system test, Sqdn address A, IFF Mode 3/A
SYSTEM 2	B	*14	SSGC 3, CN&L system test, Sqdn Address B, IFF MODE C
SYSTEM 3	C	T/A	SSGC 3, CN&L system test, Sqdn Address A - B, IFF MODE 3/A
SYSTEM 1	A	*10	SSGC 7, CN&L system test, Sqdn Address A, IFF MODE 3/A
SYSTEM 2	B	*14	SSGC 7, CN&L system test, Sqdn Address B, IFF MODE 3/A
SYSTEM 3	C	T/A	SSGC 7, CN&L system test, Sqdn Address A-B, IFF MODE 3/A
DL 1	D	*10	SSGC 7, Sqdn Address A
DL 2	E	*14	SSQC 7, Sqdn Address B
DL 3	F	T/A	SSGC 7, Sqdn Address A-B
IFF 1	G	1	Test mode
IFF 2	G	2	MODE 1
IFF 3	G	3	MODE 2
IFF 4	G	4	MODE 3/A
IFF 5	G	5	MODE C
IFF 6	G	6	MODE 4 (Test unavailable)
IFF 7	G	7	MODE 1 I/P
IFF 8	G	8	MODE 2 I/P
IFF 9	G	9	MODE 3/A I/P
IFF 10	G	10	MODE 1 EMERGENCY
IFF 11	G	11	MODE 2 EMERGENCY
IFF 12	G	12	MODE 3/A EMERGENCY
ILS 1	H	1	Cycling - UP/left, center/center, down/right
ILS 2	H	2	Up/left
ILS 3	H	3	Center/center
ILS 4	H	4	Down/right
ILS 4	H	5	ILS Voice
TACAN 1	J	1	Ground-to-air, X mode
TACAN 2	J	2	Ground-to-air, Y mode
TACAN 3	J	3	Air-to-air, X mode
TACAN 4	J	4	Air-to-air, Y mode
TACAN 5	J	5	Ground-to-air, X mode, 70 mile limit
TACAN 6	J	6	Ground to air, Y mode, 70 mile limit
TACAN 7	J	7	Air-to-air, X mode, 70 mile limit
TACAN 8	J	8	Air-to-air, Y mode, 70 mile limit
TACAN 9	J	9	Ground-to-air, ID tone, X mode
TACAN 10	J	10	Ground-to-air, Y mode, ID tone

*Any ADDRESS SELECT can be used and not restricted to these

SECTION II. CHECKS AND ADJUSTMENTS

9-4. IFF CHECKS.

9-4a. APX-72 SELF CHECK. The purpose of this procedure is to verify proper function and mode operation of the APX-72 IFF system.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURES

Table 1-1

PROBABLE FAULTY UNIT

TS-1843A
RT-859
C-6280

REFERENCES

FUNCTIONAL DIAGRAM

IFF (T.O. 27-5/Fig. 9-5)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [C-6280] MASTER: NORM M1: OUT M2: OUT M-C: OUT M3/A: OUT MODE 1: 73 MODE 3/A: 0077 [RT-859] MODE 2: Reply code assigned to aircraft [C-6280] M1: Press to TEST and release	[C-6280] TEST: Comes on while M1 is in TEST	. . .
2	[C-6280] M1: OUT M2: Press to TEST and release	[C-6280] TEST: Comes on while M2 is in TEST	. . .
3	[C-6280] M2: OUT M3/A: Press to TEST and release	[C-6280] TEST: Comes on while M3/A is in TEST	. . .
4	[C-6280] MASTER: OFF [905] POWER: OFF	Check complete	. . .

9-4b. SENSITIVITY, FREQUENCY, POWER OUTPUT, AND CODER CHECK. The purpose of this procedure is to verify receiver transmitter operation, antenna system and component operation, system performance of the airborne test set and the operation of the coding and decoding function. An alternate method utilizing the MART is provided in paragraph 9-4e.

EQUIPMENT REQUIRED

AN/APM-123 transponder test set.

EQUIPMENT HOOKUP

Perform preliminary set up procedures in paragraph 11-18.

Disconnect aircraft antenna cable from RT-859 receiver-transmitter and connect the fixed atten. CN-1088 to R.T. 859 ant. connector J5. Connect CG-409G/U from fixed atten. to AN/APM-123 T.S.

NOTE

CG-409G/U cable has attenuation of 4.5 db. The CN-1088 attenuator has 50 db.

CAUTION

Do not connect AN/APM-123 to RT-859 receiver-transmitter with less than a total of 50 db of attenuation including cables.

PRELIMINARY PROCEDURES

Table 1-1
Par. 11-18

PROBABLE FAULTY UNIT

C-6280
RT-859

FUNCTIONAL DIAGRAM

IFF (T.O. 27-5/Fig. 9-5)

REFERENCES

FAULTY ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] C-6280 POWER: RADAR STBY MASTER: STBY RAD TEST - OUT - MON: OUT M1: OUT M2: OUT M-C: OUT M3/A: ON MODE 1: 73 MODE 3/A: 0077 RT-859 MODE 2: Reply code assigned to aircraft C-6280 MASTER: NORM	AN/APM-123 ACCEPT: Comes on REJECT: Stays off	It takes approx. 5 minutes for system to time-in. RT-859 operation is acceptable; perform step 3. If reject light stays on proceed to step 2.
2	**NOTE** When the FUNCTION switch is set to FREQ-POWER, the AN/APM-123 evaluates the overall AN/APX-72 performance excluding the coder function.		
	AN/APM-123 FUNCTION: FREQ POWER	AN/APM-123 ACCEPT: Comes on	AN/APX-72 associated coder is probably causing the reject. Replacement of the RT-859 will be necessary.
3	C-6280 MASTER: STBY		

STEP		INSTRUCTION	INDICATION	REMARKS
		NOTE Disconnect CG-409G/U cable from RT-859 and connect aircraft cable to RT-859.		
4	C-6280	MASTER: NORM TEST lamp: Press and release	Test lamp: Comes on while pressed	
5	C-6280	M3/A: OUT M1: Press to TEST and release	C-6280 TEST: Comes on while M1 is in TEST	When C-6280 TEST comes on, TS-1843 airborne test set is interrogating RT-859 receiver-transmitter and has responded with a "go" evaluation for a system performance, including receiver-sensitivity frequency transmitter power output and frequency, decoding, reply framing pulse spacing and antenna system VSWR. If TEST does not come on, airborne test set is probably faulty since previous tests would have detected a defective receiver-transmitter.
6	C-6280	M1: OUT M2: Press to TEST and release	C-6280 TEST: Comes on while M2 is in TEST	. . .
7	C-6280	M2: OUT M3/A: Press to TEST and release	C-6280 TEST: Comes on while M3/A is in TEST	. . .
7A	C-6280	MASTER: STBY		
		NOTE Disconnect A/C antenna cable from TS-1843. Connect 50 db attenuator to TS-1843 connector. Connect CG-409G/U cable from attenuator to AN/APM-123 T.S.		
8	C-6280	MASTER: NORMAL		
		NOTE The two selector switches of C-6280 MODE 1 correspond to CODE switch settings of A and B on AN/APM-123, and the four selector switches of C-6280 MODE 3/A and RT-859 MODE 2 correspond to CODE switch settings of A, B, C, and D reading from left to right. The A, B, C, and D code numbers are the sum of the respective pulses; i.e., A1 + A2 + A4 pulses are generated when code A7 is selected. Set codes C and D on AN/APM-123 to 00 for mode 1 code selections.		
	AN/APM-123	FUNCTION: SELF TEST	AN/APM-123 ACCEPT: Comes on	AN/APM-123 is operating properly
		NOTE During the remaining steps, conduct the self test of the AN/APM-123 periodically and whenever necessary to verify an indicated AN/APM-123 failure.		

STEP	INSTRUCTION	INDICATION	REMARKS
9	C-6280 M3/A: OUT RAD TEST-OUT-MON: MON AN/APM-123 FUNCTION: SYSTEM A and B CODE: 73 C and D CODE: 00 C-6280 M1: ON AN/APM-123 MODE: 1	C-6280 TEST: Comes on AN/APM-123 ACCEPT: Comes on	TEST will not come on when C-6280 RAD TEST OUT-MON is set to RAD TEST TEST may blink off at a slow steady rate while RAD TEST-OUT-MON is set to MON. This is normal and does not indicate failure. Random flickering of TEST or if TEST does not come on indicates failure. When not conducing a test for an extended period, set RAD TEST-OUT-MON to OUT.
	NOTE Do not set C-6280 MODE 3/A selector switch to 7600 or 7700 for a radiated test. Confine these settings to closed loop testing. CODE 7600 signifies a communications failure and code 7700 signifies an aircraft in distress.		
10	AN/APM-123 ISLS SIDE LOBE SUPPRESSION: ON and then OFF	AN/APM-123 ACCEPT: Goes off while SIDE LOBE SUPPRESSION is ON	. . .
11	C-6280 M1: OUT AN/APM-123 A, B, C, D CODES: Correspond to RT-859 MODE 2 C-6280 M2: ON AN/APM-123 MODE: 2	AN/APM-123 ACCEPT: Comes on	. . .
12	AN/APM-123 ISLS SIDE LOBE SUPPRESSION: ON	AN/APM-123 ACCEPT: Goes off while SIDE LOBE SUPPRESSION is ON	. . .
13	C-6280 M2: OUT AN/APM-123 A, B, C, D CODES: Correspond to C-6280 MODE 3/A C-6280 M3/A: ON AN/APM-123 MODE: 3/A	AN/APM-123 ACCEPT: Comes on	. . .
14	AN/APM-123 ISLS SIDE LOBE SUPPRESSION: ON and then OFF	AN/APM-123 ACCEPT: Goes off while SIDE LOBE SUPPRESSION is ON	. . .
15	C-6280 MODE: 3/A: 7777 AN/APM-123 FUNCTION: I/P (IDENT) A & B CODE: 77 C & D CODE: 77 C-6280 IDENT-OUT-MIC: Press to IDENT, hold for one sec and release	AN/APM-123 ACCEPT: Comes on for 15 to 30 sec after release of IDENT-OUT-MIC	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
16	C-6280 IDENT-OUT-MIC: MIC press MIC switch ON throttle for 1 sec. and release	AN/APM-123 ACCEPT: Comes on for 15 to 30 sec after release of MIC SW	F106B: Perform this step in both cockpits, one at a time
17	C-6280 M3/A: OUT IDENT-OUT-MIC: OUT MCDE 1: 73 AN/APM-123 FUNCTION: EMER MODE: 1 A & B CODE: 73 C & D CODE: 00 C-6280 MASTER: EMER	AN/APM-123 ACCEPT: Comes on	. . .
18	RT-859 MODE 2: 7777 AN/APM-123 MODE: 2 A & B CODE: 77 C & D CODE: 77	AN/APM-123 ACCEPT: Stays on	. . .
19	C-6280 MODE 3/A: 7700 AN/APM-123 MODE: 3/A A & B CODE: 77 C & D CODE: 00	AN/APM-123 ACCEPT: Stays on	. . .
20	C-6280 MODE 3/A: Any code except 7700	AN/APM-123 ACCEPT: Stays on	
21	C-6280 MASTER: STBY		. . .
	NOTE Disconnect CN-1088 attenuator and CG-409G/U cable from TS-1843. Connect A/C cable to TS-1843. **CAUTION** Do not place C-6280 master switch in the emergency position for any reason for the remainder of the test. **NOTE** Connect built in antenna on AN/APM-123 to probe jack on AN/APM-123. Raise antenna and point arrow toward A/C antenna. Move AN/APM-123 approximately 10 to 15 feet away from aircraft.		
22	C-6280 MASTER: NORM M1: ON AN/APM-123 FUNCTION: System MODE: 1 A & B CODES: 73 C / D CODES: 00	AN/APM-123 ACCEPT: Comes on	If accept does not come on, change position of AN/APM-123 in reference to IFF antenna. If accept light still does not come on the IFF ant. switch (SA-1474) or associated wiring or cables are probably bad.
23	C-6280 MASTER: OFF [905] POWER: OFF AN/APM-123 FUNCTION: OFF and disconnect	Check complete	. . .

9-4c. MODE C (ALTITUDE REPORTING) CHECK. The purpose of this procedure is to check the capability of the IFF to operate in the MODE C state. Alternate methods utilizing MART, SHORTING CONNECTOR and ADAPTER CABLE are provided in paragraphs 9-4f, 9-4g and 9-4h respectively.

EQUIPMENT REQUIRED

TTU-205B/E pressure-temperature test set

EQUIPMENT HOOKUP

CAUTION

Pressure hoses are marked with the name of the part to which they are to be connected, and should always be so connected. Severe damage to the CPU-111 may result if the hoses are improperly connected.

Connect TTU-205B/E pressure-temperature test set PITOT and STATIC pressure lines to P and S ports on CPU-111 air data computer.

Connect TTU-205B/E power cable to 115-v, 400-Hz power source and connect a grounding wire between TTU-205B/E case and CPU-111 air data computer.

PRELIMINARY PROCEDURES

Table 1-1

PROBABLE FAULTY UNIT

CPU-111

STEP	INSTRUCTION	INDICATION	REMARKS
3	[C-6280] MASTER: OFF [AN/APM-123] FUNCTION: OFF and disconnect	Check complete	

9-4d. EMERGENCY IFF CHECK. The purpose of this procedure is to check the capability of the IFF to operate in the emergency mode.

EQUIPMENT REQUIRED

AN/APM-123 transponder test set

EQUIPMENT HOOKUP

Disconnect r-f cable from PROBE connector on AN/APM-123 transponder test set and connect 1 db cable to jack.

Disconnect aircraft antenna cable from RT-859 receiver-transmitter and connect the fixed attenuator CN-1088 to RT 859 antenna connector J5. Connect CG-409G/U to AN/APM-123 Test Set.

CAUTION

Do not connect AN/APM-123 to RT-859 receiver-transmitter with less than a total of 50 db of attenuation including cables.

NOTE

CG-409G/U cable has attenuation of 4.5 db.

The CN-1088 has attenuation of 50 db.

PRELIMINARY PROCEDURE

Table 1-1
Par 11-18

PROBABLE FAULTY UNIT

C-6280
RT-859
Canopy closed SW.

REFERENCES

FUNCTIONAL DIAGRAM

IFF (T.O. 27-5/Fig. 9-5)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: EMER [C-6280] MASTER: STBY [AN/APM-123] FUNCTION: EMER MODE: 3/A A & B Code: 77 C & D Code: 00	[AN/APM-123] Reject: Comes on	Canopy closed

STEP	INSTRUCTION	INDICATION	REMARKS
2	Engage and hold NLG steering limit SW. Raise canopy.	[AN/APM-123] F-106A Accept: Comes on when canopy is raised 6 inches ± 1 inch as measured from forward corner of canopy. F-106B Accept: Comes on when canopy is unlocked.	If out of tolerance realign canopy closed switch in accordance with T.O. 1F-106A-2-2, Fig. 8-14.
3	[905] POWER: OFF [C-6280] MASTER: OFF Release NLG steering limit SW.	Check complete	. . .

9-4e. IFF GROUP CHECK (MART). The purpose of this procedure is to verify APX receiver-transmitter operation, antenna system and component operation, and the operation of the coding and decoding function. Each MART transmit cycle is 112 seconds. To reduce the check time, the MART can be operated manually per T.O. 33D5-12-214-1 and using the MART test frequency to provide a communication link between the aircraft and MART.

EQUIPMENT REQUIRED

Headsets

EQUIPMENT HOOKUP

Connect headsets

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

CPU-111

REFERENCES

FUNCTIONAL DIAGRAMS

IFF (T.O. 27-5/Fig. 9-5)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [C-6280] MASTER: NORM M3/A: ON MODE 1: 43 MODE 3/A: 4324 [RT-859] MODE 2: 4324 [955] HOMING POINT SELECTOR: 0 [019] ADDRESS SELECT: 1 DISPLAY: ON [796] SELECTOR TEST: 7 GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[Headsets] Tone: MART interrogation, followed by a 1 sec 1080Hz tone, and then 1200Hz tones	Proceed to step 2 after first 1200Hz tone is heard

STEP	INSTRUCTION	INDICATION	REMARKS
2.	[C-6280] RAD TEST/OUT: Hold to RAD TEST and release after indication	[Headsets] Tones Steady 1200Hz tone while RAD TEST is held.	A 1200Hz 1 sec tone occurring every 4 sec indicates a fail
3.	[C-6280] M3/A: OUT M1: ON [019] ADDRESS SELECT: 2 [796] GND TEST INTER: Press and hold for at least 10 sec but than 15 sec	[Headsets] Tone: Steady 1200Hz tone	Cycling tone indicates a fail of MODE 1
4.	[C-6280] M1: OUT M2: ON [019] ADDRESS SELECT: 3 [796] GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[Headsets] Tone: Steady 1200Hz tone	Cycling tone indicates a fail of MODE 2

NOTE

Do not radiate 3/A codes 7700, 7600 and 7500. These are emergency codes for emergency purposes only.

5.	[C-6280] M2: OUT M3/A: ON [019] ADDRESS SELECT: [796] GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[Headsets] Tone: Steady 1200Hz	Cycling tone indicates a fail of MODE 3/A Other codes can be checked by setting the MART IFF/SIF switches to the desired code and the corresponding code set on the C-6280 or RT-859; for MODE 1, the corresponding code is set with switches A and B at the MART

STEP	INSTRUCTION	INDICATION	REMARKS
6.	[C-6280] IDENT/OUT/MIC: MIC [019] GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[Headsets] Tone: MART interrogation tones	Proceed to step 7 after the 1200Hz tone is heard
7.	[Throttle] MIC: Press and release	[Headsets] Tone: Steady 1200Hz tone for 15 to 30 sec after pressing MIC switch	Cycling tone indicates a fail of MODE 3 I/P F-106B: Press MIC switch in rear cockpit for indication prior to the end of the MART transmit cycle
8.	[C-6280] M3/A: OUT M1: ON [019] ADDRESS SELECT: 7 [796] GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[Headsets] Tone: MART interrogation tones	Proceed to step 9 after the 1200Hz tone is heard
9.	[Throttle] MIC: Press and release	[Headsets] Tone: Steady 1200Hz tone for 15 to 30 sec after pressing MIC switch	Cycling tone indicates a fail of MODE 1 I/P F-106B: Press MIC switch in rear cockpit for indication prior to the end of the MART transmit cycle
10.	[C-6280] M1: OUT M2: ON [019] ADDRESS SELECT: 8 [796] GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[Headsets] Tone: MART interrogation tones	Proceed to step 11 after the 1200Hz tone is heard
11.	[Throttle] MIC: Press and release	[Headsets] Tone: Steady 1200Hz tone for 15 to 30 sec after pressing MIC switch	Cycling tone indicates a fail of MODE 2 I/P F-106B: Press MIC switch in rear cockpit for indication prior to the end of the MART transmit cycle
12.	[796] SELECTOR TEST: OFF [C-6280] M2: OUT MASTER: OFF [905] POWER: OFF	Test complete	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
1.	[TACAN/IFF Panel] IFF/SIF: AIMS Grey Code for local field altitude **CAUTION** Severe damage to CPU-111 may result if the following precautions are not observed; never introduce an altitude lower than -1500 feet or higher than 80,000 feet into the computer; never introduce an airspeed greater than 950 knots; never allow static pressure to exceed the pitot pressure; and always make all pressure changes gradually (never pull hoses off when there is a differential pressure). Severe damage to the CPU-111 may result if the PITOT port on the the test set is connected to the S port on the CPU-111. Hoses are marked with the name of the port to which they are to be connected, and should always be so connected. Severe damage to the CPU-111 may result if the pitot adapter works loose or is removed during testing. Ensure that protective caps on adapter are removed prior to installation.		
	[905] POWER: RADAR STBY [C-6280] MASTER: NORM M-C: ON RAD TEST/OUT/MON: MON [955] HOMING POINT SELECTOR: G [019] DISPLAY: ON ADDRESS SELECT: 5 [796] TEST SELECTOR: 7 GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[Headsets] Tone: MART interrogation followed by a 1 sec 1080Hz tone and then a 1200Hz tone	Checks that the APX-72 is capable of processing the Mode C function
2.	[MART] IFF/SIF: 7760 [TTU-205B/E] POWER: ON ALTITUDE X 1000 FEET: 19900 [796] SELECTOR TEST: 7 GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[Headsets] Tone: MART interrogation, followed by a 1080 Hz tone and then a steady 1200Hz tone	. . .
3.	[MART] IFF/SIF: 0016 [TTU-205B/E]: ALTITUDE X 1000 FEET: 63200 [796] GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[Headsets] Same as step 2	. . .
4	[C-6280] M-C: OUT MASTER: OFF [905] POWER: OFF	Test complete	. . .

9-4g. MODE C (ALTITUDE REPORTING) CHECK UTLIZING SHORTING CONNECTOR. The purpose of this procedure is to provide a manual check of the capability of the IFF to operate in the mode C state.

EQUIPMENT REQUIRED

AN/APM-123 transponder test set (Fabricate shorting connector per figure 9-2)

EQUIPMENT HOOKUP

Disconnect r-f cable from PROBE connector on AN/AMP-123 transponder test set and connect 1 db cable to jack.

Disconnect aircraft antenna cable from RT-859 receiver-transmitter and connect the fixed attenuator CN-1088 to RT 859 antenna connector J5. Connect CG-409G/U to AN/APM-123 Test Set.

CAUTION

Do not connect AN/APM-123 to RT-859 receiver-transmitter with less than a total of 50 db of attenuation including cables.

NOTE

CG-409G/U cable has attenuation of 4.5 db.

The CN-1088 has attenuation of 50 db.

PRELIMINARY PROCEDURES

Table 1-1
Para. 11-18

PROBABLE FAULTY UNIT

C-6280
RT-859

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: EMERGENCY [C-6280] MASTER: NORM M-C: ON [CPU-111] P3: DISCONNECT		MODE C transmission will be Code 0000.
2	[AN/APM-123] FUNCTION: SYSTEM A, B, C, D CODES: 0000 PRESS TO TEST: Press and release	[AN/APM-123] ACCEPT: Comes on	If abnormal continue procedure
3	[CPU-111] P3: CONNECT SHORTING CONNECTOR [AN/APM-123] A, B, C, D CODES: 7776	[AN/APM-123] ACCEPT: Comes on	If normal go to step 8 If abnormal replace C-6280 and continue
4	REPEAT STEP 3	[AN/APM-123] ACCEPT: Comes on	If abnormal replace RT-859
5	REPEAT STEP 3	[AN/APM-123] ACCEPT: Comes on	If abnormal repair wiring between RT-859 and C-6280
6	REPEAT STEP 3	[AN/APM-123] ACCEPT: Comes on	Remove shoring connector from P3
7	REPEAT STEP 2	[AN/APM-123] ACCEPT: Comes on	
8	[C-6280] MASTER: OFF CPU-111 P3: CONNECT [E905] POWER: OFF	Check complete	

9-4h. MODE C (ALTITUDE REPORTING) ALTERNATE CHECK UTILIZING ADAPTER CABLE. (Included for activities authorized TTU-229E Automatic Altitude Reporting Encoder Test Set.) The purpose of this procedure is to provide an alternate manual check of the capability of the IFF to operate in the MODE C state.

EQUIPMENT REQUIRED	EQUIPMENT HOOKUP	PRELIMINARY PROCEDURES
TTU-229E Automatic Altitude Reporting Encoder Test Set (Fabricate Test cable per figure 9-3)	Connect test cable between TTU-229E Automatic Altitude Reporting Encoder Test Set Connector J-4 and CPU-111 Air Data Computer Test Connector TJ-7 in nose wheel well. Connect TTU-229E power cable to 115-V, 400 Hz single phase power source.	Table 1-1 PROBABLE FAULTY UNIT RT-859

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [C-6280] MASTER: NORM [TTU-229E] POWER: ON ENCODER READOUT: NORM ALTITUDE X1000 FEET: 19900	[TTU-229E] CODE LIGHTS A1, A2, A4, B1, B2, B4, C2 and C4: Comes on.	
2	[TTU-229E] ALTITUDE READOUT: 63200	[TTU-229E] CODE LIGHTS C1, D2 and D4: Comes on.	
3	[905] POWER: OFF [C-6280] MASTER: OFF	Check complete	

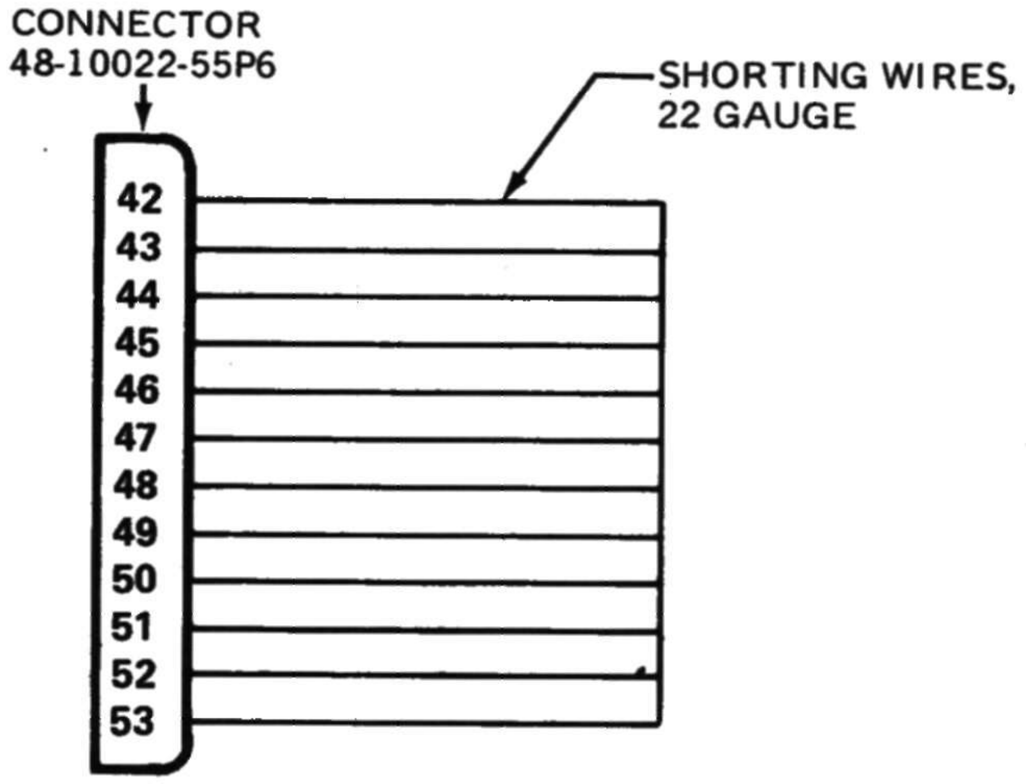


Figure 9-2. Shorting Connector for IFF Mode "C" Test

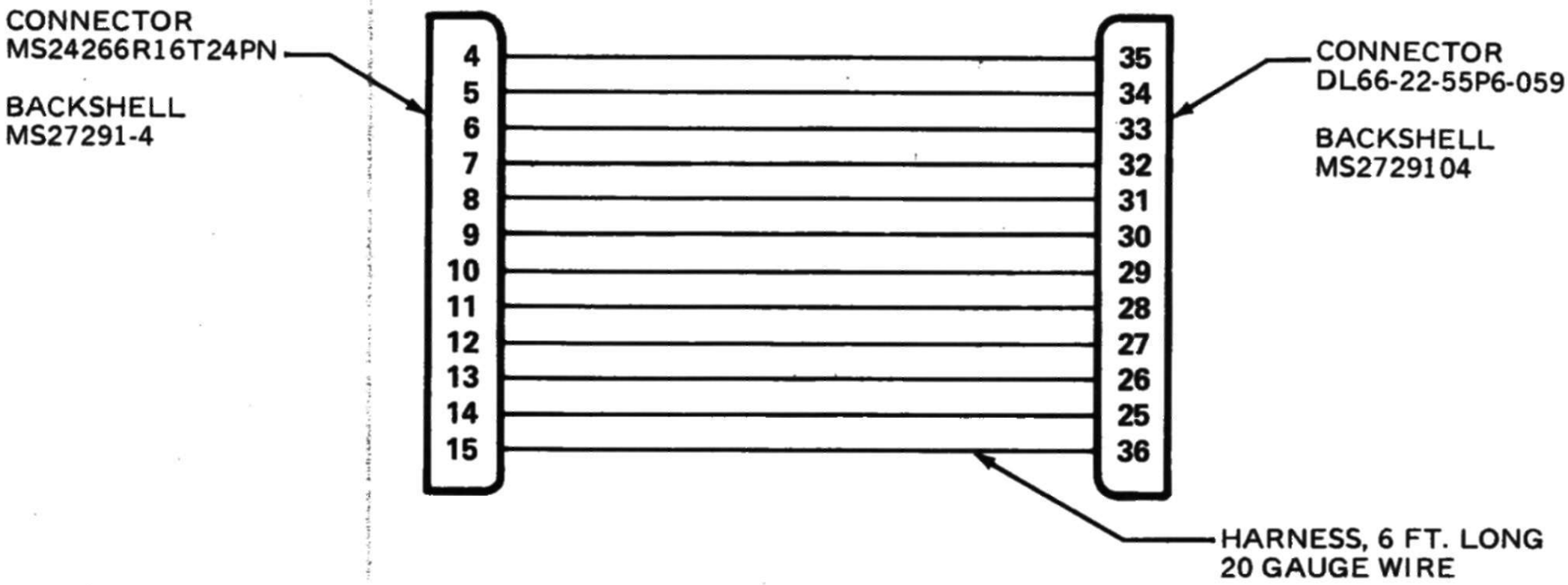


Figure 9-3. Test Cable for Alternate IFF Mode "C" Test

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9-5. COCKPIT AND NAVIGATION EQUIPMENT CHECKS.

9-5a. UHF OPERATIONAL CHECK. The purpose of this porcedure is to check the power output of the receiver-transmitter and the reflected power of the antenna and adjustment procedure when the 960P-1 auxiliary squelch is installed on an operating RT 749.

EQUIPMENT REQUIRED

BIRD MODEL 43 thruline wattmeter
HP410B Voltmeter
(or equivalent)

EQUIPMENT HOOKUP

Connect RG-8A/U or equivalent (maximum length 18 inches) from RT-749 J3 to thruline wattmeter input.

Disconnect P60605 from J60605 and using adapter, connect P60605 to wattmeter output.

Install D-50 element in wattmeter with arrow pointing toward antenna coax.

Ensure that RT-749 pressure indicator is projecting outward.

PRELIMINARY PROCEDURES

Table 1-1

PROBABLE FAULTY UNIT

RT-749
505
606
960P-1
780

REFERENCES

FUNCTIONAL DIAGRAM

Command Communications Group
(T.O. 27-5/Fig. 9-3)

FAULT ISOLATION

CN & L Subsystem
(T.O. 27-3/Fig. 9-5)

STEP	INSTRUCTION	INDICATION	REMARKS
1	**CAUTION** **The following test will be accomplished with no external cooling air applied to the aircraft. Do not operate the ARC-109 for longer than 60 minutes without cooling air (the transmitter must not be operated for more than 2.5 minutes in any 15 minute period) or damage may occur.**		
	[905] POWER: EMER **[505] Power switch: MAIN** **Function switch: PRESET** **SQ DISABLE: Press and hold** **[Cockpit]** REFR UNIT ON-OFF: OFF	**[Headphones] Noise level: Increases** **[Rackblower] MOTOR: Operates**	
2	[505] SQ DISABLE: Release	[Headphones] Noise: Ceases	. . .
3	**NOTE** In the following steps, listen to each channel prior to pressing the mike switch to ensure test transmissions do not interfere with normal communications traffic. No tone transmissions will be made on the emergency distress frequency (GUARD 243.00 MHz).		
	[505] CHAN SEL: Alternate to each preset channel, checking for communications traffic	[780] Channel: Same as 505 CHAN SEL	. . .
4	[Throttle] Mike switch: Momentarily press while observing power output on wattmeter	[Wattmeter] Power output: Greater than 30 watts on each channel	. . .

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STEP	INSTRUCTION	INDICATION	REMARKS
5	[505] Function switch: MAN and select unused frequency between 225.00 and 275.00 MHz	[780] Channel: Selected frequency	Do not select frequency 243.00
6	[Throttle] Mike switch: Press and talk into microphone, then release	[Headset] Sidetone: Clear and undistorted	Preform step 6 while plugged into normal PE leads, then repeat INSTRUCTION while headset is plugged into Interphone bypass connectors.
7	[505] Function switch: PRESET CHAN SEL: 1 TONE: Press and release	[Headset] Tone: Approx 1020 Hz	. . .
8	[Throttle] Mike switch: Press and release [Wattmeter] Power output: Observe while mike switch is pressed and record [Wattmeter] D-50 element: Reverse with arrow pointing toward test cable connected to RT-749 [Throttle] Mike switch: Press and release [Wattmeter] Reflected power: Observe while mike switch is pressed and record	[Power ratio] Compute: 7 or greater Compute by dividing recorded power output by recorded reflected power. The power ratio must be 7 or greater. For example: If the power output is 35 watts, the reflected power must be not be greater than 5 watts.	. . .
9	[Wattmeter] D-50 element: Install with arrow pointing toward antenna coax [505] CHAN SEL: 1 thru 20 and repeating step 8 at each position	[780] Channel: Same as 505 CHAN SEL	Check for communications traffic prior to transmitting
10	[505] Function SW: MAN and select unused frequency that is approximately in the middle of the RT frequency range SQ DISABLE: NORM POWER SW: MAIN	[780] Channel: Selected frequency	. . .
11	[UHF Antenna] Disconnect to perform following checks. [Voltmeter] Connect positive lead to TP2 and common lead to ground on the 960P-1 auxiliary squelch.	Quiescent AGC Voltage: Should be 3.5 + 0.2 V dc. Adjust if not in this range	. .
12	[Voltmeter] Connect positive lead to TP1 and the common lead to GND on the 960P-1 Aulixiary Squelch	Adjust R1 for a Voltage of 0.60 ± 0.05 Vdc less than TP2 measured in step 11.	
	NOTE Module adjustment in the shop and on the aircraft is required. The same procedure and test equipment as given above is to be used for adjustment on the aircraft. The antenna should be connected and the radio tuned to a quiet frequency for aircraft adjustment.		
13	[505] Disconnect wattmeter and voltmeter. Reconnect antenna. Establish several locally assigned freq. (both manual and preset). Press throttle mike switch and establish communication with control tower, ground control, etc.	Determine quality of voice modulation, receiver audio, side tone, presence of tune tone, mike tone quality and whether a strong signal on the main receiver will break the guard receiver squelch.	
14	[905] POWER: OFF [505] Power switch: OFF [Wattmeter] Disconnect [Votlmeter] Disconnect [UHF Antenna] Reconnect	Check complete	

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9-5b. UHF EMERGENCY BLOWER AND VALVE CHECK. The purpose of this procedure is to check the functional operation of the rack blower motor and valve.

EQUIPMENT REQUIRED
None

EQUIPMENT HOOKUP
None

PRELIMINARY PROCEDURES
Table 1-1

PROBABLE FAULTY UNIT
Blower Motor

REFERENCES

FUNCTIONAL DIAGRAM
None

FAULT ISOLATION
None

STEP	INSTRUCTION	INDICATION	REMARKS
1	**CAUTION** The following test will be accomplished with no external cooling air applied to the aircraft. Do not operate the ARC-109 for longer than 60 minutes without cooling air (the transmitter must not be operated for more than 2.5 minutes in any 15 minute period) or damage may occur. [905] POWER: OFF [505] Power switch: OFF [Cockpit] REFR UNIT ON-OFF: OFF	[Valve] Direction indicator arrow: Horizontal [Rack blower] Motor: Operates	Direction indicator arrow is viewed through an inspection hole
2	[905] POWER: WARM	[Valve] Direction indicator arrow: Down [Rack blower] Motor: Does not operate	. . .
3	[905] POWER: OFF [Cockpit] REFR UNIT ON-OFF: ON	[Valve] Direction indicator arrow: Down [Rack blower] Motor: Does not operate	Check complete

9-5c. UHF PRESET CHANNEL ADJUSTMENT. The purpose of this procedure is to preset a channel to a desired frequency.

EQUIPMENT REQUIRED

None.

FUNCTIONAL DIAGRAM

T.O. 27-5, figure 9-3

FAULT ISOLATION

None.

EQUIPMENT HOOKUP

None.

REFERENCES

None.

PRELIMINARY PROCEDURES

None.

PROBABLE FAULTY UNIT

505

See pg 82 sup 41

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] Power: OFF		
2	[505] UHF Control Box: Open door in front of control box to expose a group of numbers and letters. Set channel number to desired channel.	[505] Channel is preset to desired frequency.	. . .
	NOTE The channel number being preset is indicated under door on the right hand side. This number is not the same as the channel number appearing in the window on the front of the unit. The channel number desired is selected with the wheel on the left. Preset channel frequency using indicator setting tool to desired frequency in accordance with Code Chart on the inside of the door.		The desired frequency is set by using the code on the inside of the door. The numbers "3" and "2" on the left, set either 300 or 200 magahertz. The first group of letters (ABCDE) on the left, set the tens in accordance with the code on the door. The middle group of letters set the units, and the last group on the right set the first decimal place. The "0" and "5" on the right set the second decimal. Example: To set the frequency 324.25 megahertz on any channel proceed as follows: Set the first indicator over "3." Set the second and third indicators over "A" and "C". Set the fourth and fifth indicators over "A" and "C." Set the eighth indicator over "5."
3	Perform UHF operational, paragraph 9-5.a., steps 1 through 3.	Check complete.	

9-5d. MODE LAMP SWITCHING CHECK. The purpose of this procedure is to ensure that HSI mode lamp indications correspond to appropriate 163 DISP/AUTO MODE, 463 BRG SEL, and HDG SEL switch positions.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

520
620
HSI

REFERENCES

FUNCTIONAL DIAGRAM

Air Data/Cockpit
(T.O. 27-5/Fig.8-3)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [163] DISP/AUTO MODE: Set to positions indicated in table 9-2 [463] BRG SEL: Set to positions indicated in table 9-2 [Inst panel] HDG SEL: Set to positions indicated in table 9-2	[HSI] Mode lamps: Come on as indicated in table 9-2	Verify all switch settings as indicated in table 9-2
2	[163] DISP/AUTO MODE: DL MIN TIME [463] BRG SEL: NORM [905] POWER: OFF	Check complete	. . .

Table 9-2. HSI Switching Indications

163 DISP/AUTO MODE	463 BRG SEL	HDG SEL	HSI Mode Lamps	
			LH	RH
AUTO NAV	NORM	MAN	NAV MAN	TAC
		NORM	NAV	TAC
	TAC	MAN	NAV MAN	TAC
		NORM	NAV	TAC
	UHF-ADF	MAN	NAV MAN	UHF
		NORM	NAV	UHF
	DL-ADF	MAN	NAV MAN	DL
		NORM	NAV	DL
MAN NAV	NORM	MAN	NAV MAN	TAC
		NORM	NAV MAN	TAC
	TAC	MAN	NAV MAN	TAC
		NORM	NAV MAN	TAC
	UHF-ADF	MAN	NAV MAN	UHF
		NORM	NAV MAN	UHF
	DL-ADF	MAN	NAV MAN	DL
		NORM	NAV MAN	DL
DL MAX RNG OR DL MIN TIME	NORM	MAN	DL MAN	TGT
		NORM	DL	TGT
	TAC	MAN	DL MAN	TAC
		NORM	DL	TAC
	UHF-ADF	MAN	DL MAN	UHF
		NORM	DL	UHF
	DL-ADF	MAN	DL MAN	DL
		NORM	DL	DL

Table 9-2. Switching Indications (Cont)

163 DISP/AUTO MODE	463 BRG SEL	HDG SEL	HSI Mode Lamps	
			LH	RH
ILS or ILS APCH	NORM	MAN	ILS MAN	NONE
		NORM	ILS	NONE
	TAC	MAN	ILS MAN	TAC
		NORM	ILS	TAC
	UHF-ADF	MAN	ILS MAN	UHF
		NORM	ILS	UHF
	DL-ADF	MAN	ILS MAN	DL
		NORM	ILS	DL

9-5e. FUNCTIONAL SWITCHING CHECK (AFCS). The purpose of this procedure is to check indications on the ADI with the 163 DISP/AUTO MODE switch set to different positions.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

ADI
163

REFERENCES

FUNCTIONAL DIAGRAM

Air Data/Cockpit
(T.O. 27-5/Fig. 8-3)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [163] OFF - HDG HOLD: OFF OFF - ALT HOLD: OFF FLT MODE: DIR MAN DISP/AUTO MODE: AUTO NAV	[ADI] Glide slope indicator, course warning flag, glide slope warning flag, and pitch steering bar: Out of view	. . .
2	[163] DISP/AUTO MODE: MAN NAV, DL MAX RNG, and DL MIN TIME noting indications for each setting	[ADI] Glide slope indicator, course warning flag, glide slope warning flag, and pitch steering bar: Out of view	. . .
3	[163] DISP/AUTO MODE: ILS	[ADI] Glide slope indicator: In view — Bank steering bar: In view — Glide slope warning flag: In view if glide slope signal is not present — Course warning flag: In view if localizer signal is not present — Pitch steering bar: Out of view	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
4	[Inst Panel] HDG SEL: MAN	[ADI] Pitch steering bar: Out of view	. . .
5	[163] DISP/AUTO MODE: ILS APCH	[ADI] Glide slope indicator: In view —— Bank steering bar: In view —— Glide slope warning flag: In view if glide slope signal is not present —— Course warning flag: In view if localizer signal is not present —— Pitch steering bar: In view	. . .
6	[Inst Panel] HDG SEL: MAN	[ADI] Pitch steering bar: Out of view	. . .
7	[163] DISP/AUTO MODE: DL MIN TIME [905] POWER: OFF	Check complete	. . .

9-5f. SWITCHING CONTROL CHECK (ILS AND NAV). The purpose of this procedure is to check the operation of the ADI and HSI with different cockpit setups selected.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

ADI
HSI
163

REFERENCES

FUNCTIONAL DIAGRAM

Air Data/Cockpit
(T.O. 27-5/Fig. 8-3)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [163] OFF-ALT HOLD: OFF OFF-HDG HOLD: OFF FLT MODE: DIR MAN DISP/AUTO MODE: MAN NAV [Inst panel] HDG SEL: MAN [463] BRG SEL: TAC [HSI] HEADING SET and COURSE SET: Adjust to obtain indication	[HSI] Heading marker: Moves about compass card as HDG SET is adjusted —— Course arrow: Moves as COURSE SET is adjusted [ADI] Bank steering bar: Deflects to right as heading marker moves cw from lubber line —— Pitch steering bar: Out of view	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
2	[Inst panel] HDG SEL: NORM	[ADI] Pitch and bank steering bars: Out of view	
3	[Inst panel] HDG SEL: MAN [163] Disp/AUTO MODE: AUTO NAV [HSI] HEADING SET and COURSE SET: Adjust to obtain indication	[HSI] Heading marker: Moves about compass card as HEADING SET is adjusted —— Course arrow: Moves as COURSE SET is adjusted [ADI] Bank steering bar: Deflects to right as heading marker moves cw from lubber line	463 BRG SEL switch should remain in TAC and inst panel HDG SEL switch should remain in MAN
4	[163] DISP/AUTO MODE: DL MAX RNG [HSI] HEADING SET and COURSE SET: Adjust to obtain indication	[HSI] Heading marker: Should not move as HEADING SEL is adjusted —— Course arrow: Should not move as COURSE SET is adjusted [ADI] Bank steering bar: In view —— Pitch steering bar: Out of view	463 BRG SEL switch and inst panel HDG SEL switch automatically return to NORM
5	[463] BRG SEL: UHF - ADF [Inst panel] HDG SEL: MAN [HSI] HEADING SET: Adjust to obtain indication	[HSI] Heading marker: Moves about compass card as HEADING SET is adjusted [ADI] Bank steering bar: Deflects to left as heading marker moves cw from lubber line — Pitch steering bar: Out of view	. . .
6	[163] DISP/AUTO MODE: DL MIN TIME [HSI] HEADING SET and COURSE SET: Adjust to obtain indication	[HSI] Heading marker: Moves about compass card as HEADING SET is adjusted —— Course arrow: Should not move as COURSE SET is adjusted [ADI] Bank steering bar: Deflects to right as heading marker moves cw from lubber line —— Pitch steering bar: Out of view	463 BRG SEL switch should remain in UHF - ADF and inst panel HDG SEL switch should remain in MAN
7	[163] DISP/AUTO MODE: ILS APCH [HSI] HEADING SET and COURSE SET: Adjust to obtain indication	[HSI] Heading marker: Appears under lubber line and and does not move as HEADING SET is adjusted —— Bearing pointer: Appears under lubber line —— Course arrow: Moves about compass card as COURSE SET is adjusted [ADI] Bank steering bar: Deflects to right as course arrow moves cw from lubber line —— Pitch steering bar: In view	463 BRG SEL switch and inst panel HDG SEL switch automatically return to NORM
8	[463] BRG SEL: DL - ADF [Inst panel] HDG SEL: MAN	[HSI] Heading marker: Moves about compass card as HEADING SET is rotated	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
8 (Cont)	[HSI] HEADING SET: Adjust to obtain indication.	[ADI] Bank steering bar: Deflects to right as heading marker moves cw from lubber line —— Pitch steering bar: Out of view	
9	[163] DISP/AUTO MODE: ILS [HSI] HEADING SET and COURSE SET: Adjust to obtain indication	[HSI] Heading marker: Appears under lubber line and does not move as HEADING SET is adjusted —— Course arrow: Moves about compass card as COURSE SET is adjusted [ADI] Bank steering bar: Deflects to right as course arrow moves cw from lubber line —— Pitch steering bar: Out of view	463 BRG SEL switch should remain in DL - ADF and inst panel HDG SEL switch should automatically return to NORM
10	[Inst panel] HDG SEL: MAN	[Inst panel] HDG SEL: Holds in MAN	. . .
11	[163] FLT MODE: AUTO	[Inst panel] HDG SEL: NORM	. . .
12	[Inst panel] HDG SEL: MAN	[Inst panel] HDG SEL: Reverts to NORM	. . .
13	[163] DISP/AUTO MODE: MAN NAV	[Inst panel] HDG SEL: NORM	. . .
14	[163] FLT MODE: AUTO	[163] FLT MODE: ASSIST	. . .
15	[Inst panel] HDG SEL: MAN [HSI] HEADING SET: Adjust to obtain indication	[HSI] Heading marker: Should turn about compass card as HEADING SET is adjusted [ADI] Bank steering bar: Deflects to right as heading marker moves cw from lubber line —— Pitch steering bar: Out of view	. . .
16	[905] POWER: OFF [163] FLT MODE: DIR MAN DISP/AUTO MODE: DL MIN TIME [Inst panel] HDG SEL: NORM [463] BRG SEL: NORM	Check complete	. . .

9-5g. FUNCTIONAL SWITCHING CHECK (VERTICAL INSTRUMENTS). The purpose of this procedure is to check the operation of the AMI and AVVI with different cockpit setups selected.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

AMI
AVVI

REFERENCES

FUNCTIONAL DIAGRAM

Air Data/Cockpit
(T.O. 27-5/Fig. 8-3)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [163] DISP/AUTO MODE: MAN NAV [463] BRG SEL: NORM [Inst panel] HDG SEL: NORM	[AVVI] Altitude warning flag: Out of view [AMI] Airspeed warning flag: Out of view	. . .
2	**CAUTION** Do not drive command readouts (altitude, Mach, and IAS) to their limits at full slew speed. Readouts should be slewed to their limits only to the extent necessary to perform the following tests.		
	[AVVI] Command altitude slewing switch: Press and hold	[AVVI] Command altitude marker on gross scale, command altitude marker on sensitive scale, and COMMAND: Move in an increasing altitude direction. When markers reach top of respective scales, markers should stop and remain in view although slewing switch is still in up position — COMMAND: Should continue to increase to 70,000 ft if slewing switch is not released	Slewing rate should be proportional to the distance the slewing switch is displaced
3	[AVVI] Command altitude slewing switch: Press down and hold	[AVVI] Command altitude marker on gross scale, command altitude marker on sensitive scale, and COMMAND: Move in a decreasing altitude direction — COMMAND: Should continue to decrease to 0 ft if slewing switch is not released	Same as step 2
4	[163] DISP/AUTO MODE: ILS [AVVI] Command altitude slewing switch: Press and hold	[AVVI] Same as step 2	Same as step 2
5	[AVVI] Command altitude slewing switch: Press down and hold	[AVVI] Same as step 3	Same as step 2
6	[163] DISP/AUTO MODE: ILS APCH [AVVI] Command altitude slewing switch: Press up and hold	[AVVI] Same as step 2	Same as step 2

STEP	INSTRUCTION	INDICATION	REMARKS
7	[AVVI] Command altitude slewing switch: Press down and hold	[AVVI] Same as step 3	Same as step 2
8	[163] DISP/AUTO MODE: AUTO NAV [AVVI] Command altitude slewing switch: Press up and hold	[AVVI] Command altitude marker and COMMAND: Do not move	. . .
9	[AVVI] Command altitude slewing switch: Press down and hold	[AVVI] Same as step 8	. . .
10	[163] DISP/AUTO MODE: DL MAX RNG [AVVI] Command altitude slewing switch: Press up and hold	[AVVI] Same as step 8	. . .
11	[AVVI] Command altitude slewing switch: Press down and hold	[AVVI] Same as step 8	. . .
12	[163] DISP/ATUO MODE: DL MIN TIME [AVVI] Command altitude slewing switch: Press up and hold	[AVVI] Same as step 8	. . .
13	[AVVI] Command altitude slewing switch: Press down and hold	[AVVI] Same as step 8	. . .
14	[163] DISP/AUTO MODE: MAN NAV [AMI] Command airspeed slewing switch: Press up and hold	[AMI] Command airspeed marker and COMMAND KNOTS: Move in an increasing airspeed direction. When marker reaches bottom of scale, marker should stop and remain in view although slewing switch is still in up position —— COMMAND KNOTS: Should continue to increase until counter indicates 999 knots if slewing switch is not released	. . .
15	[AMI] Command airspeed slewing switch: Press down and hold	[AMI] Command airspeed marker and COMMAND KNOTS: Move in a decreasing airspeed direction —— COMMAND KNOTS: Should continue to decrease to 50 knots if slewing switch is not released	. . .
16	[163] DISP/AUTO MODE: AUTO NAV [AMI] Command airspeed slewing switch: Up	[AMI] Command airspeed marker and COMMAND KNOTS: Should move in an increasing direction	. . .
17	[AMI] Command airspeed slewing switch: Down	[AMI] Command airspeed marker and COMMAND KNOTS: Should move in a decreasing direction	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
18	[163] DISP/AUTO MODE: DL MAX RNG [AMI] Command airspeed slewing switch: Up	[AMI] Command airspeed marker and COMMAND KNOTS: Should move in an increasing direction	. . .
19	[AMI] Command airspeed slewing switch: Down	[AMI] Command airspeed marker and COMMAND KNOTS: Should move in a decreasing direction	. . .
20	[163] DISP/AUTO MODE: DL MIN TIME [AMI] Command airspeed slewing switch: Up	[AMI] Command airspeed marker and COMMAND KNOTS: Should move in an increasing direction	. . .
21	[AMI] Command airspeed slewing switch: Down	[AMI] Command airspeed marker and COMMAND KNOTS: Should move in a decreasing direction	. . .
22	[163] DISP/AUTO MODE: ILS [AMI] Command airspeed slewing switch: Up	[AMI] Command airspeed marker and COMMAND KNOTS: Should move in an increasing direction	. . .
23	[AMI] Command airspeed slewing switch: Down	[AMI] Command airspeed marker and COMMAND KNOTS: Should move in a decreasing direction	. . .
24	[163] DISP/AUTO MODE: ILS APCH [AMI] Command airspeed slewing switch: Up	[AMI] Command airspeed marker and COMMAND KNOTS: Should move in an increasing direction	. . .
25	[AMI] Command airspeed slewing switch: Down	[AMI] Command airspeed marker and COMMAND KNOTS: Should move in a decreasing direction	. . .
26	[AMI] Command airspeed slewing switch: Release, then right	[AMI] Command airspeed marker: Moves under lubber line —— COMMAND KNOTS: Indicated airspeed agrees with value under lubber line on indicated airspeed scale —— Command airspeed slewing switch: Remains right	Under normal ground conditions, reading will be 35 to 65 knots
27	[AMI] Command Mach slewing switch: Left, then press up and hold	[AMI] Command Mach marker and COMMAND MACH: Move in an increasing Mach direction. When marker reaches top of scale, marker should stop and remain in view although slewing switch is still in up position —— COMMAND MACH: Should continue to increase to 2.2 if slewing switch is not released	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
28	[AMI] Command Mach slewing switch: Press down and hold	[AMI] Command Mach marker and COMMAND MACH: Move in a decreasing Mach direction —— COMMAND MACH: Should continue to decrease to 0.4	. . .
29	[163] DISP/AUTO MODE: MAN NAV [AMI] Command Mach slewing switch: Up	[AMI] Command Mach marker and COMMAND MACH: Should move in an increasing direction	. . .
30	[AMI] Command Mach slewing switch: Down	[AMI] Command Mach marker and COMMAND MACH: Should move in a decreasing direction	. . .
31	[163] DISP/AUTO MODE: AUTO NAV [AMI] Command Mach slewing switch: Up	[AMI] Command Mach marker and COMMAND MACH: Do not move	. . .
32	[AMI] Command Mach slewing switch: Down	[AMI] Command Mach marker and COMMAND MACH: Do not move	. . .
33	[163] DISP/AUTO MODE: DL MAX RNG [AMI] Command Mach slewing switch: Up	[AMI] Command Mach marker and COMMAND MACH: Do not move	. . .
34	[AMI] Command Mach slewing switch: Down	[AMI] Command Mach marker and COMMAND MACH: Do not move	. . .
35	[163] DISP/AUTO MODE: DL MIN TIME [AMI] Command Mach slewing switch: Up	[AMI] Command Mach marker and COMMAND MACH: Do not move	. . .
36	[AMI] Command Mach slewing switch: Down	[AMI] Command Mach marker and COMMAND MACH: Do not move	. . .
37	[163] DISP/AUTO MODE: ILS [AMI] Command Mach slewing switch: Up	[AMI] Command Mach marker and COMMAND MACH: Do not move	. . .
38	[AMI] Command Mach slewing switch: Down	[AMI] Command Mach marker and COMMAND MACH: Do not move	. . .
39	[163] DISP/AUTO MODE: AUTO NAV	[AVVI] Target altitude marker and TARGET: 0 ft	. . .
40	[163] DISP/AUTO MODE: MAN NAV	[AVVI] Target altitude marker and target: 0 ft	. . .
41	[163] DISP/AUTO MODE: ILS	[AVVI] Target altitude marker and TARGET: 0 ft	. . .
42	[163] DISP/AUTO MODE: ILS APCH	[AVVI] Target altitude marker and TARGET: 0 ft	. . .

see pg 83 sup41

STEP	INSTRUCTION	INDICATION	REMARKS
43	**NOTE** For F-106B aircraft, transfer controls to rear cockpit and repeat steps 1 thru 42. While making these checks, observe that course arrow and command function markers (heading, altitude, Mach and indicated airspeed) in cockpit not in control are slaved to their counterparts in cockpit in control; and further that course set and heading set controls and command slewing switches (altitude, Mach and indicated airspeed) in cockpit not in control are not effective.		
	[905] POWER: OFF [163] DISP/AUTO MODE: DL MIN TIME	Check complete	. . .

9-5h. INTERCOM CONTROL CHECK. The purpose of this procedure is to ensure that range of audio control between the front and rear cockpits is satisfactory in the F-106B.

EQUIPMENT REQUIRED

Headset

EQUIPMENT HOOKUP

Connect headset to aircraft communications lead jack.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

005

REFERENCES

FUNCTIONAL DIAGRAM

Command Communications Group (T.O. 27-5/Fig. 9-3)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[505, both cockpits] Power switch: OFF [LH console, front cockpit] MASTER ELEC PWR: ON [005, both cockpits] VOLUME control: While performing a brief conversational check, adjust control to determine that range of control is satisfactory	[Headset] Audio: Range of volume control is satisfactory	Do not apply CVAC power for steps 1 or 2
2	[005, both cockpits] VOLUME: Fully ccw to obtain indication	[Headset] Audio: Disappears	. . .
3	[LH console, front cockpit] MASTER ELEC PWR: OFF [005, both cockpits] VOLUME control: While performing a brief conversational check, adjust control to determine that range of control is satisfactory	[Headset] Audio: Range of volume control is satisfactory	Apply CVAC power for steps 3 thru 6
4	[005, both cockpits] VOLUME: Fully ccw to obtain indication	[Headset] Audio: Disappears	. . .
5	[905] POWER: RADAR STBY [005, both cockpits] VOLUME Control: While performing a brief conversational check, adjust control to determine	[Headset] Audio: Range of volume control is satisfactory	. . .

See pg 84 Sup 41

STEP	INSTRUCTION	INDICATION	REMARKS
5 (Cont)	that range of control is satisfactory		
6	[005, both cockpits] VOLUME: OFF	[Headset] Audio: Disappears	. . .
7	[905] POWER: OFF [Headset] Disconnect	Check complete	. . .

9-5i. TRANSFER CONTROL CHECK. The purpose of this procedure is to verify satisfactory operation of the transfer control circuits between the front and rear cockpits in the F-106B. It is assumed that the system functions which are being transferred are checked in other procedures of this manual.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

564 764
664 864

REFERENCES

FUNCTIONAL DIAGRAM

B-Model Control
Transfer
(T.O. 27-5/Fig. 2-4)

FAULT ISOLATION

None

NOTE

To successfully transfer flight control functions, the 163 FLT MODE and DISP/AUTO MODE switches in both cockpits must be in the same positions. Verification of common selections is indicated by a YES in the WILL TRANS annunciator. Uncommon selections are indicated by a NO in the WILL TRANSFER annunciator.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [505, both cockpits] Function switch: PRESET Power switch: MAIN	[LH console, front cockpit] AFCS ILS AUTO NAV TRANS: On AFCS ILS AUTO NAV: UHF COMM TACAN: On RADAR POWER: On [LH console, both cockpits] WILL TRANSFER annunciator: YES (this should remain throughout the entire procedure)	Control is now in front cockpit
2	[LH console, rear cockpit] RADAR POWER: Press and release	[LH console, rear cockpit] RADAR POWER: Comes on	Indicates transfer of radar function control to rear cockpit
3	[LH console, rear cockpit] AFCS ILS AUTO NAV TRANS: Press and release	[LH console, rear cockpit] AFCS ILS AUTO NAV TRANS: Comes on	Indicates transfer of navigation function control to rear cockpit
4	[LH console, rear cockpit] UHF COMM TACAN: Press and release	[LH console, rear cockpit] UHF COMM TACAN: Comes on	Indicates transfer of uhf and TACAN function control to rear cockpit. All controls are now transferred to the rear cockpit.
5	[LH console, front cockpit] RADAR POWER: Press and release	[LH console, front cockpit] RADAR POWER: Comes on	Indicates transfer of radar function control to front cockpit

See pg 85 Sup 41

STEP	INSTRUCTION	INDICATION	REMARKS
6	[LH console, front cockpit] AFCS ILS AUTO NAV TRANS: Press and release	[LH console, front cockpit] AFCS ILS AUTO NAV TRANS: Comes on	Indicates transfer of navigation function control to front cockpit
7	[LH console, front cockpit] UHF COMM TACAN: Comes on	[LH console, front cockpit] UHF COMM TACAN: Comes on	Indicates transfer of uhf and TACAN function control to front cockpit. All controls are now transferred to front cockpit
8	[505, both cockpits] Power switch: OFF [905] POWER: OFF	Check complete	. . .

9-6. TACAN CHECKS.

9-6a. OPERATIONAL CHECK. The purpose of this procedure is to provide TACAN system verification utilizing the MART or AN/ARM-25A Radio Test Set. The AN/ARM-25 is equipped to operate in a direct connection mode or a radiating transponder mode.

EQUIPMENT REQUIRED

AN/ARM-25A radio test set

EQUIPMENT HOOKUP

For direct connection mode, raise test set cover CW-391 from case.

Remove TACAN antenna.

Remove cable CG-1387 from cover and, using adapter, connect between antenna coax. cable and connector on bottom right of test set.

Connect power cable CX 3786 to POWER INPUT receptacle on AN/ARM-25A and plug in to 115 vac, 400 Hz power source.

For radiating transponder mode, raise test set cover CW-391 from case.

NOTE

When the cover is raised, the antenna provides a unidirectional test signal. When the case is removed, the antenna provides an omnidirectional test signal.

Attach Antenna HLD-149, after removal from cover, to front panel mounting bracket and secure by tightening knurled collar.

Connect antenna plug, Type TNC to antenna receptacle.

Connect power cable CX 3786 to POWER INPUT receptacle on AN/ARM-25A and plug in to 115 v, 400 Hz power source.

The AN/ARM-25A will not transmit accurate, stable signals prior to reaching operating temperature. Fifteen to fifty minutes before use, connect set to power source with ON-OFF switch set to OFF. Allow ten to thirty minutes in STANDBY condition, then set

PRELIMINARY PROCEDURES

Table 1-1

PROBABLE FAULTY UNIT

405
529
629

switch to ON and allow test set to warm up in OPERATE condition for an additional five to twenty minutes. Both warm-up times depend on ambient temperature.

REFERENCES

FUNCTIONAL DIAGRAM

TACAN (T.O. 27-5/ Fig. 9-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: Radar Standby [405] VOL: Fully ccw MODE: X RANGE: 300 PRESET: M Function switch: T/R MAN: 126 [181] OFF BRT: Adjust CW to BRT [163] DISP/Auto Mode: Auto NAV [ACP] Selector: VIS IDENT [083] Boresight: NORM/TRACK Auto Search: Press and release [AN/ARM-25A] POWER-TUNE-OPERATE: OPERATE IDENTITY: RANDOM AZIMUTH: OFF RANGE MILES: 150 OUTPUT ATTENUATION: MINUS 10 ON-OFF: ON PHASE switch: OFF	[AN/ARM-25A] OPERATE lamp: On	If test is made utilizing the MART, perform step 1 aircraft switch settings and proceed to step 7
2	[AN/ARM-25A] CHANNEL switch: Preset low channel (left) LEVEL SET: Adjust if necessary, to obtain indication	[AN/ARM-25A] POWER LEVEL meter: Zero DBM	. . .
3	[405] MAN: Preset low Channel (left)	[HSI] MILES: 999.5 to 000.5 [181] TACAN: VR	. . .
	NOTE Station an operator in the cockpit to check HSI and TSD indications and another operator to make necessary switch settings on AN/ARM-25A. [AN/ARM-25A] OUTPUT ATTENUATION: 10 db RANGE MILES: 0 **NOTE** Position AN/ARM-25A less than 100 feet from aircraft TACAN antenna.		
4	[AN/ARM-25A] RANGE MILES: 150	[HSI] MILES: 148.5 to 151.5 [181] TACAN: VR	. . .
5	[AN/ARM-25] OUTPUT ATTENUATION: 10 db AZIMUTH: 90° Radius Miles: 200 [163] DISP/Auto Mode: ILS ☐ [463] BRG SEL: TAC	[HSI] Bearing pointer: 90° [181] TACAN: OK. Interceptor bug indicates a position of 150 miles from and a bearing of 090 degrees to the TACAN station.	. . .
	[AN/ARM-25A] AZIMUTH: 180°	[HSI] Bearing pointer: 180° and locks on to test signal [181] TACAN: OK. Interceptor bug indicates a position of 150 miles from and a bearing of 180 degrees to the TACAN station.	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
7	Deleted.		
8	[CSC] SLAVE/DG: DG HDG/PUSH TO SYNC: Press and adjust for indication [163] ALT HOLD: OFF HDG HOLD: OFF FLT MODE: DIR MAN DISP/AUTO MODE: ILS [405] VOL: Approx midrange NOTE Connect headset to pilot's headset jack. O[RH console] TACAN/ADF Switch: TACAN	[HSI] Compass card: 000	Compass controller is located on the right hand side of cockpit
	NOTE **If cable had been connected directly from J52905 to RF Connector on the AN/ARM-25A, the NORMAL Antenna, P52905, should now be reconnected. The Function Switch [405] should be OFF during this time. The ARM-25A should be shut down and the Function Switch [405] set back to T/R.**		
9	[405] Test switch: Press to LAMPS, hold, then release	[405] SYSTEM TEST and ECM: On while LAMPS is pressed	. . .
10	[405] MAN: Unused TACAN channel Test switch: Press to SYSTEM TEST and hold	[Headset] Audio tone: Approx 1350 Hz for 1.5 to 2.5 sec [HSI] Bearing pointer: 67° to 71° —— MILES: 000 to 000.5 [405] SYSTEM TEST: Off during test	. . .
11	[405] Test switch: Release Function switch: A/A	[HSI] SEARCHES	. . .
12	[405] Test switch: Press to SYSTEM TEST and hold	[HSI] MILES: 000 to 000.5 and will periodically oscillate	. . .
13	[405] Test switch: Release [796] SELECTOR TEST: 7 [955] HOMING POINT SELECTOR: J [405] MAN: 126 [019] ADDRESS SELECT: 1 —— DISPLAY: ON [405] FUNCTION switch: T/R [796] GND TEST INTER: Press and hold at least 10 sec but not longer than 15 sec	[HSI] MILES: 88 to 92 —— Bearing pointer: 328° to 332° [181] TACAN: OK —— Intercepter bug: Positioned at approx 90 miles at 328° to 332° bearing with 000° heading	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
14	[405] RANGE: 70	[181] TACAN: BV [HSI] MILES: Searches and shutter pulled	. . .
15	[405] RANGE: 300	[181] TACAN: OK [HSI] MILES: 088 to 092	. . .
16	[905] POWER: RADIO SILENCE	[HSI] MILES: Shutter closed [181] TACAN: BV	. . .
17	[905] POWER: RADAR STBY	[HSI] MILES: 088 to 092 Bearing pointer: 328 to 332° [181] TACAN: OK until end of MART transmission, then VR for approx 10 sec, then OFF	
18	[405] Function switch: A/A [019] ADDRESS SELECT: 3 [796] GND TEST INTER: Press and hold at least 10 sec but not longer than 15 sec	[HSI] MILES: 088 to 092 [181] TACAN annunciator: VR [Headset] Audio: 1080 Steady tone	. . .
	NOTE Steps 18 through 28 are to be performed during the MART transmit cycle. If unable to complete during one cycle, interrogate MART. Press and hold GND TEST INTER for at least 10 seconds but not longer than 15 seconds.		
19	[405] Function switch: T/R [019] ADDRESS SELECT: 1 [796] GND TEST INTER: Press and hold at least 10 sec but not longer than 15 sec	[181] TACAN: OK [HSI] MILES: 088 to 092 Bearing pointer: 328 to 332°	. . .
20	**NOTE** If this procedure is being performed in a round instrument aircraft, proceed to step 35. [HSI] COURSE: Adjust until course arrow moves thru 360°	[HSI] Deviation bar: Shall not deflect from center position	. . .
21	[163] DISP/AUTO MODE: ILS APCH [HSI] COURSE: Adjust until course arrow moves thru 360°	[HSI] Deviation bar: shall not deflect from center position	
22	[163] DISP/AUTO MODE: DL MIN TIME	[463] BRG SEL switch: Returns to NORM	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
23	[163] DISP/AUTO MODE: DL MAX RNG [463] BRG SEL: TAC	[HSI] MILES: 088 to 092 —— Bearing pointer: 328° to 332°	Check that manual control of course arrow is not possible in either DL position of 163 DISP/ AUTO MODE switch
24	[163] DISP/AUTO MODE: AUTO NAV and then MAN NAV	[463] BRG SEL switch: Returns to NORM [HSI] MILES: 088 to 092 —— Bearing pointer: 328° to 332°	. . .
25	[HSI] COURSE: Adjust until course arrow moves 240 to 246°	[HSI] Deviation bar: Centered —— To-From Arrow: Points to head of course arrow	. . .
26	[HSI] COURSE: Course arrow moves 60 to 62°	[HSI] Deviation bar: Deflects during course arrow rotation then re-centers —— To-From arrow: Points to tail of course arrow	. . .
27	[163] DISP/AUTO MODE: ILS	[HSI] MILES: Shutter closed	. . .
28	[163] DISP/AUTO MODE: ILS APCH	[HSI] MILES: Shutter closed	. . .
29	[463] BRG SEL: UHF-ADF then DL-ADF	[HSI] MILES: Shutter closed	. . .
30	[163] DISP/AUTO MODE: MAN NAV	[HSI] MILES: Shutter closed	. . .
31	[163] DISP/AUTO MODE: AUTO NAV	[HSI] MILES: Shutter closed	. . .
32	[163] DISP/AUTO MODE: DL MAX RNG	[HSI] MILES: Shutter closed	. . .
33	[163] DISP/AUTO MODE: DL MIN TIME	[HSI] MILES: Shutter closed	. . .
34	[163] DISP/AUTO MODE: ILS	[HSI] MILES: Shutter closed	. . .
35	[405] Function switch: OFF [505] Function switch: OFF [905] POWER: OFF [463] BRG SEL: NORM [163] DISP/AUTO MODE: DL MIN TIME [955] HOMING POINT SELECTOR: A [796] SELECTOR TEST: OFF [Test equipment] Disconnect [MART] RANGE SELECTOR: 0-180 miles RANGE NAUT MILES: 40 BEARING 1: 320° BEARING 2: 320°	Check complete	. . .

9-6b. IDENTITY TONE CHECK. The purpose of this procedure is to check the TACAN identity tone for proper operation.

EQUIPMENT REQUIRED

Headsets

EQUIPMENT HOOKUP

Connect headsets

PRELIMINARY PROCEDURES

Table 1-1

PROBABLE FAULTY UNIT

405
529

REFERENCES

FUNCTIONAL DIAGRAM

TACAN (T.O. 27-5/ Fig 9-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: STBY [405] PRESET: M —— Function switch: T/R —— MAN: 126 —— VOL: As required [955] HOMING POINT SELECTOR: J [019] ADDRESS SELECT: 9 —— DISPLAY: ON [796] SELECTOR TEST: 7 —— GND TEST INTER: Press and hold for at least 10 sec but not longer than 15 sec	[Headset] Tone: 1350Hz and 1080Hz tones at 4 sec intervals for 112 sec	. . .
2	[905] POWER: OFF [405] Function switch: OFF	Check complete	

9-6c. OUTPUT POWER FUNCTION CHECK. The purpose of this procedure is to ensure that the TACAN output power is correct.

EQUIPMENT REQUIRED

AN/ARM-25A radio test set

EQUIPMENT HOOKUP

Same as para. 9-6a

PRELIMINARY PROCEDURES

Table 1-1

PROBABLE FAULTY UNIT

405
529
629

REFERENCES

FUNCTIONAL DIAGRAM

TACAN (T.O. 27-5/ Fig. 9-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	**NOTE** Station an operator in aircraft to operate airborne TACAN equipment and another to operate switch settings on AN/ARM-25A.		
	[905] **POWER: Radar stby** [AN/ARM-25A] PEAK POWER INPUT-TUNE-OPERATE: **PEAK POWER INPUT** IDENTITY: **KEY** CHANNEL switch: Preset low channel (left) [405] MODE: X RANGE: 300 PRESET: M Function switch: T/R MAN: Preset low channel (left)	[AN/ARM-25A] **POWER LEVEL METER:** **F-106A minimum- 500 watts** **F-106B minimum- 400 watts**	POWER LEVEL meter on AN/ARM-25A indicates power output directly in kilowatts or decibels. Zero db on meter indicates 2 kilowatts

STEP	INSTRUCTION	INDICATION	REMARKS
2	[AN/ARM-25A] CHANNEL switch: Preset high channel [405] MAN: Preset high channel	[AN/ARM-25A] POWER LEVEL meter: Zero	If for any reason POWER LEVEL meter is set at other than zero, then sensitivity is equal to algebraic sum of meter and dial indication
3	[905] POWER: OFF [405] Function switch: OFF [Test equipment] Disconnect	Check complete	

9-6d. RECEIVER SENSITIVITY FUNCTION CHECK. The purpose of this procedure is to ensure the TACAN receiver sensitivity is correct. This is accomplished by setting the TACAN to the lowest possible receiver signal strength and then checking the TACAN output power.

EQUIPMENT REQUIRED

AN/ARM-25A radio test set

EQUIPMENT HOOKUP

Same as para 9-6a

PRELIMINARY PROCEDURES

Table 1-1

PROBABLE FAULTY UNIT

405
529
629

REFERENCES

FUNCTIONAL DIAGRAM

TACAN (T.O. 27-5/ Fig. 9-2)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] **POWER: Radar Stby** [AN/ARM-25A] PEAK POWER INPUT-TUNE-OPERATE: PEAK POWER INPUT IDENTITY: KEY OUTPUT ATTENUATION: MINUS 70 CHANNEL switch: Preset low channel (left) O [**RH Console**] **TACAN/ADF Switch to TACAN** [405] MODE: X RANGE: 300 PRESET: M Function switch: T/R MAN: Preset low channel (left) ☐ [463] BRG SEL: TAC	[HSI] MILES and bearing pointer: Indicate TACAN lockon	. . .
2	[AN/ARM-25A] OUTPUT ATTENUATION: Increases approx 2 dbm	[AN/ARM-25A] OUTPUT ATTENUATION: TACAN receiver sensitivity directly in DBM	Threshold of receiver sensitivity is reached when TACAN is just able to lock on in range and bearing

STEP	INSTRUCTION	INDICATION	REMARKS
3	[AN/ARM-25A] CHANNEL switch: Preset high channel [405] MAN: Preset high channel and perform Output Power Function Check iaw para 9-6c	Same as indicated in para 9-6c	If for any reason POWER LEVEL is set at other than zero, then receiver sensitivity is equal to algebraic sum of meter and dial indication
4	[905] POWER: OFF [405] Function switch: OFF [163] BRG SEL: NORM [RH console] TACAN RANGE-COMM ALT: COMM ALT [Test equipment] Disconnect	Check complete	. . .

9-6e. TACAN PRESET CHANNEL ADJUSTMENT. The purpose of this procedure is to preset a TACAN CHANNEL NUMBER.

EQUIPMENT REQUIRED

None.

EQUIPMENT HOOKUP

None.

PRELIMINARY PROCEDURES

None.

FUNCTIONAL DIAGRAM

TACAN (T.O. 27-5, figure 9-2)

REFERENCES

11F1-MAI-12-8

PROBABLE FAULTY UNIT

405

FAULT ISOLATION

None.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] Power: OFF [405] Power: OFF		
2	[405] TACAN CONTROL BOX: Remove Control Box from RH console. Remove cover to expose channel select drum on side of control box. Turn preset knob to desired drum channel, and preset to desired TACAN channel number by pulling the small tabs on the drum in accordance with NOTE and table 9-2.1.	[405] TACAN CHANNEL NUMBER PRESET	Drum channel being preset is designated by a number to the right of the drum.

NOTE

Locate the rod just below the drum on which the letters A thru J appear (reading from right to left).

The letters represent in BCD (binary coded decimal) which tabs are to be pulled out. The letters ABCD represent the units, the letters EFGH represent the tens, and letters I and J represent the hundreds.

Example: To set TACAN channel 83 on any of the drum channels, pull out the tabs above the letters H, B and A. Pull tab "J" outward for a preset Y mode and push tab "J" inwards for a preset X mode.

Table 9-2.1. Binary Coded Decimal TACAN Channel Number

		Hundreds	Tens				Units			
BCD Number for logical 1	X/Y	100	80	40	20	10	8	4	2	1
Tab designation	J	I	H	G	F	E	D	C	B	A

9-7. TSD CHECKS

9-7a. OPERATIONAL CHECK. The purpose of this procedure is to ensure that the TSD is operational with inputs from other subysystems.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURES

Table 1-1

PROBABLE FAULY UNIT

181
920

REFERENCES

FUNCTIONAL DIAGRAM

Air Data/Cockpit
(T.O. 27-5/Fig. 8-3)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] [405] [163] **POWER: RADAR STBY** **PRESET: Local TACAN station** **Function switch: T/R** **DISP/Auto Mode: Auto NAV**	[181] TACAN: OK	. . .
2	[181] OFF-BRT: Adjust cw to 1st detent	[181] Blower: Starts to operate —— Screen: On dim	It takes 30 sec for projection lamp to warm up
3	[CSC] HDG/PUSH TO SYNC: Press and turn towards -- and hold for indication, then release	[HSI] Azimuth ring: slews thru 360° to 000° Interceptor heading: Slews thru 360° to 000° [181] Interceptor heading and interceptor bug: Move same as HSI azimuth ring	. . .
4	[181] MODE: MAN MAN COURSE control: Adjust to obtain indication	[181] Grid overlay lines: Moves thru 360°	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
5	[181] MODE: AUTO [CSC] SLAVE/DG: SLAVE HDG/PUSH TO SYNC: Press and release	[181] Interceptor heading and interceptor bug: Aircraft magnetic heading ±4° [HSI] Azimuth ring: Aircraft magnetic heading ±4°	. . .
6	[CSC] SLAVE/DG: DG	[181] Interceptor heading: Remains at Aircraft magnetic heading	. . .
7	[181] OFF-BRT: Adjust cw to BRT	[181] Screen: Brightens to full intensity	. . .
8	[181] RADIUS MILES: 200, then 400	[181] TSD map: Correct map centered quickly	. . .
9	[181] RED FILTER: IN	[181] Screen: Red	. . .
10	[181] RED FILTER: OUT	[181] Screen: Normal	. . .
11	[181] OFF-BRT: Adjust ccw to 1st detent from OFF LAMP: 2	[181] Screen: On dim	. . .
12	[181] OFF-BRT: Adjust cw to BRT	[181] Screen: Brightens to to full intensity	. . .
13	[RI console] CONSOLE LIGHTS control: Adjust through entire range while observing indication	[181] Panel lights: Vary from dim to bright	. . .
14	[RI console] CONSOLE LIGHTS control: Adjust for suitable intensity level [181] OFF-BRT: Adjust for suitable intensity level	[181] Screen: Intensity level suitable —— Panel lights: intensity level suitable	. . .
15	[405] Function switch: OFF	[181] TACAN: DR	. . .
16	[796] SELECTOR TEST: 6 [083] Return to search [905] PRESS TO ERECT: Press and release [796] INTERR. Switch: Press and release	[181] Grid overlay moves as the 905 GRID REFERENCE heading is changed	. . .
17	[796] SELECTOR TEST: OFF [905] Grid Reference: Rotate to aircraft heading. PRESS TO ERECT: Press and release. [955] HOMING POINT SELECTOR: Set to each homing point.	[TSD map] Target bug: Within 0.1 in. of center of homing point on map display	Check that TSD command heading indicates heading interceptor should turn to, in order to fly to selected homing point. . . .
18	[163] DISP/AUTO MODE: ILS for at least 5 sec, then AUTO NAV	[181] Interceptor bug: Centers on display	. . .
19	[405] PRESET: Channel corresponding to TACAN station less than 200 miles distant	[181] Interceptor bug: Geographic location same as selected TACAN station	. . .
20	[905] POWER: OFF [181] OFF-BRT: OFF RADIUS MILES: 50 [796] SELECTOR TEST: OFF [955] HOMING POINT SELECTOR: A [163] DISP/AUTO MODE: DL MIN TIME	Check complete	. . .

9-7b. SELF CHECK. The purpose of this procedure is to ensure that the TSD is operational using only the TSD without inputs from other subsystems. This procedure should be performed only if the Operational Check in paragraph 9-7a fails.

EQUIPMENT REQUIRED	EQUIPMENT HOOKUP	PRELIMINARY PROCEDURES
None	None	Table 1-1

PROBABLE FAULTY UNIT

181
920

REFERENCES

FUNCTIONAL DIAGRAM	FAULT ISOLATION
Air Data/Cockpit (T.O. 27-5/Fig. 8-3)	None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [181] OFF-BRT: OFF [405] PRESET: Select any channel	[181] TACAN: OFF	. . .
2	[181] OFF-BRT: Adjust for suitable intensity level	[181] Screen: Intensity level suitable	. . .
3	[920] SELF TEST: Press and release	[181] Film: Automatically cycles to channel 24	. . .
4	[920] SELF TEST: 1	[181] TACAN: OK —— Target and interceptor bugs: Position to ±0.05 in. on number 4 circle at 225° bearing from chart center —— Interceptor heading and interceptor bug heading: 45 ±1.0° —— Course indicator grid: Coincides with interceptor heading to ±1.0° —— Max range circle: Passes through chart center within 0.1 in. —— Target heading: 45 ±3°	. . .
5	[920] SELF TEST: 2	[181] TACAN: VR —— Target and interceptor bugs: Position to ±0.05 in. on number 4 circle at 45° bearing from chart center —— Interceptor heading and interceptor bug heading: 45 ±1.0° —— Target bug: Indicates 225 ±3.0° —— Max range circle: Tangent to number 4 circle ±0.1 in. —— Course indicator grid: 135 ±3°	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
6	[920] SELF TEST: 3	[181] TACAN: BV —— Target bug: Invalid position at bottom center of TSD map with heading of 0 ±2.0° —— Interceptor bug: Positions ±0.05 in. on 45° bearing line on number 2 circle —— Interceptor heading and interceptor bug heading: 225 ±1.0° —— Course indicator grid: 135 ±3.0° —— Max range circle: Not present	. . .
7	[920] SELF TEST: 4	[181] TACAN: DR —— Interceptor bug: Positions to 225° bearing line at a range beyond number 2 circle —— Course indicator grid: 45 ±1.5° ccw from interceptor heading	. . .
8	[181] SELF TEST: 1 OFF-BRT: OFF and then BRT	[181] Film: Automatically cycles to channel selected by 405 PRESET, step 1	. . .
9	[181] OFF-BRT: OFF [905] POWER: OFF	Check complete	

9-8. UHF ADF CHECK

The purpose of this procedure is to ensure the UHF ADF is operational.

EQUIPMENT REQUIRED

None

EQUIPMENT HOOKUP

None

PRELIMINARY PROCEDURES

Table 1-1

PROBABLE FAULTY UNIT

117
606

REFERENCES

FUNCTIONAL DIAGRAM

Command Communications Group
(T.O. 27-5/Fig. 9-3)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1.	[905] POWER: RADAR STBY [019] CHANNEL: M MANUAL FREQUENCY: MART UHF test frequency DISPLAY: ON [463] BRG SEL: UHF-ADF [505] TONE: Press and hold for 3 sec but not more than 6 sec	[Headsets] Tone: 1080Hz and 1200Hz MART busy signal [HSI] Bearing pointer: Points at bearing to the MART UHF antenna	. . .
2.	[463] BRG SEL: DL-ADF [606] ADF TEST: Press and hold	[HSI] Bearing pointer: Points at bearing to the MART UHF antenna	. . .
3.	Deleted		
4.	[463] BRG SEL: NORM [796] SELECTOR TEST: OFF [405] Function switch: OFF [905] POWER: OFF	Check complete	. . .

9-9. DATA LINK CHECK

The purpose of this procedure is to ensure that the data link is operational.

NOTE

If a data link test pattern can be received, the 019 display switch can be set to TEST ADDRESS and the data link test pattern used instead of the MART cart.

STEP	INSTRUCTION	INDICATION	REMARKS
	NOTE Cockpit displays in step 1 will be based on 16 data link messages generated by signal generator (sec T.O. 33A1-8-150-2 Figure 4-9).		
1.	[905] POWER: RADAR STBY [019] DISPLAY: ON ADDRESS SELECT: 10 CHANNEL: M MANUAL FREQUENCY: MART DL test frequency [955] HOMING POINT: D [163] DISP/AUTO MODE: DL MIN TIME [796] SELECTOR TEST: 7 GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[034] Annunciator: DL	Checks SQDN ADD A
2.	[019] ADDRESS SELECT: 14 [955] HOMING POINT: E [796] GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[034] Annunciator: DL [Cockpit] Displays: See step 1	Checks SQDN ADD B

STEP	INSTRUCTION	INDICATION	REMARKS
3.	[955] HOMING POINT SELECTOR: F [019] TEST ADDRESS: Select [296] GND TEST INTER: Press and hold for 10 sec but not more than 15 sec	[034] Annunciator: DL [Cockpit] Displays: See step 1	Checks test address Sqdn A & B

9-9a. DATA LINK PRESET FREQUENCY. The purpose of this procedure is to preset the data link channel to a desired frequency.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] Power: OFF		
2	[019] Data Link Control Box: Open door on front of unit to expose a vertical column of numbers. Select desired channel number.	[019] Channel is preset to desired frequency.	
	NOTE The channel number being preset is located at the bottom of the column of numbers and is selected with the knurled wheel. The channel selected for use is at the top.		
	With the selection indicator setting tool, set four indicators to desired frequency.		The desired frequency is set by moving the four indicators up or down to position them opposite the numbers desired. At the bottom of the column are the numerals "2" and "3" which select either 200 or 300 megahertz. The first group of numbers from "0" through "9" located above the "2" and "3" set the tens, the second group set the units, and the top group set the first decimal. As an example to set the frequency 326.4 megahertz, set the bottom indicator on "3," set the next indicator opposite "2," set the next indicator opposite "6" and set the top indicator opposite "4."

9-10. SSGC 3 PROCEDURE (CN&L, VERTICAL AND ROUND INSTRUMENT AIRCRAFT)

For procedure refer to table 9-3 and 9-4 for procedure.

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [019] DISPLAY: ON ADDRESS SELECT: 10 CHANNEL: M MANUAL FREQUENCY: MART DL test frequency [955] HOMING POINT: B [163] DISP/AUTO NAV: AUTO NAV [C6280] MASTER: NORMAL M-3/A: ON Mode 3: 4324 [796] SELECTOR TEST: 3 **[505] POWER: MAIN. Tune to MART FUNCTION: MAN. COMM. FREQ.**	[HSI] NAV: On [796] COMP: On RADAR: On TEST: On FLT SENSE: On	Sets up System Test 1 from the MART
2	[HSI] COURSE SET: Adjust to any position, note position	[HSI] COURSE: Steady	. . .
3	[163] DISP/AUTO MODE: While observing lamps on HSI, set to ILS	[HSI] DL mode lamp on left-hand side: Does not come on while 163 DISP/AUTO MODE switch passes through DL positions —— ILS: Comes on 1.8 ±0.5 sec after setting 163 DISP/AUTO MODE switch to ILS —— COURSE: Does not change from setting noted in step 2	. . .
4	[163] DISP/AUTO MODE: ILS APCH	[ADI] **Course warning flag:** Appears —— Glide slope warning flag: Appears [080] Steering line: Moves to top of scope and then returns to slightly above center —— B-sweep: Centered —— El marker: Moves down and may disappear from view	. . .
5	[ADI] Pitch trim control: Adjust through entire range	[ADI] Ball: Moves above and below center line	. . .
6	[ADI] Pitch trim control: Adjust to obtain indication	[ADI] Ball: Centered in pitch	This step assumes that the aircraft is level
7	[HSI] COURSE SET: Adjust to obtain indication	[HSI] Course arrow: Points to lubber line	. . .
8	[AMI] Command airspeed slewing switch: Hold to up position, then to down position	[AMI] Command airspeed marker: Indicates increasing then decreasing air speeds —— COMMAND KNOTS: Indicates increasing then decreasing air speeds	. . .
9	[AVVI] Command altitude slewing switch: Hold to up position, then to down position	[AVVI] Command altitude marker: Indicates increasing altitude then decreasing altitude —— COMMAND: Indicates increasing altitude then decreasing altitude	. . .

Table 9-3. SSGC 3 (CN&L, Vertical) (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
10	[405] Test switch: LAMPS	[405] ECM: Comes on —— SYSTEM TEST lamp: Comes on	. . .
11	**NOTE** Put headset on.		
	[463] BRG SEL: TAC [405] Function switch: A/A MAN: Set to unused channel Test switch: Press to SYSTEM TEST and hold	[405] SYSTEM TEST lamp: Goes off [HSI] TAC: Comes on —— MILES: 000 —— Bearing pointer: Searches	. . .
12	[405] Test switch: Release Function switch: T/R Test switch: Press to SYSTEM TEST and hold	[405] SYSTEM TEST lamp: Off [Headset] Audio: Approx 1350 Hz for 1.5 to 2.5 sec [HSI] Bearing pointer: 067 to 071° —— TAC: Comes on —— MILES: 000	. . .
13	[405] Test switch: Release PRESET: M MAN: 126 [463] BRG SEL: UHF-ADF **[163] FLT MODE: AUTO** [796] GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec then release, note the time when Mart transmission begins	[796] COMP: On and then turns off during MART interrogation [Headset] 11 audio tones during MART interrogation. After the MART has been keyed, there will be a single 1080Hz tone and 4 sec later a 1200Hz steady IFF confirm will be heard for 24 sec. The 1080 Hz busy will start at the end of the IFF confirm and at the start of the TACAN transmission 4 to 28 seconds [ADI] Glide slope warning flag: Drops out of view —— Localizer warning flag: Drops out of view —— Glide slope indicator: Moves up, centers, down and then back to center, each displacement lasting 8 sec —— Pitch steering bar: Moves with glide slope indicator —— Bank steering bar: Deflects left or right and drifts toward center after each displacement, each displacement lasting 8 sec	RT routine begins within 1.2 seconds after pressing 796 GND TEST INTER. Proceed to step 14 when the 1200Hz IFF confirm stops

See p9 90 Sub 41

Table 9-3. SSGC 3 (CN&L, Vertical) (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
13	[796] GND TEST INTER: (Cont)	[HSI] Course deviation indicator: Moves left, centers, right and then back to center, each displacement lasting 8 sec	
	[796] COMP LAMP: On after course deviation moves right - AUTO drops to assist after ADI warning flags come into view.	If COMP LAMP does not come on at the 5th busy tone, leave the FLT mode SW in AUTO and with the tactical TR routine display DRO location 3076 in binary. Bit 15 = localizer right, bit 16 = glide slope down, bit 17 = localizer left and bit 18 = glide slope up. A missing bit indicates that the computer did not receive a proper deviation signal on A28 or All. If all bits are on, ILS VALID, D119 was not received.	
		Bearing pointer: Points at bearing to the MART UHF antenna	
	NOTE If, in the following step, DL is not displayed, the TR routine may be used to display DRO location 3045, bits 1 thru 4. Bit 1 = CC1, bit 2 = CC2, bit 3 = MCC1, and bit 4 = MCC2. Missing bit indicates DL failure. Refer to the system portion of SSGC 3 Procedure (para 2-8) if DL is not displayed.		
14	[163] DISP/AUTO MODE: DL MIN [463] BRG SEL: Reset to TAC	28 to 56 seconds [HSI] Bearing pointer: 328 to 332° —— MILES: 088 to 092 [181] TACAN: OK —— Interceptor bug: Positioned at approx 90 miles at a bearing of 328 to 332° and a heading of 044 to 046 40 to 50 seconds [034] Annunciator: DL	Proceed to step 15 as soon as TACAN displays are verified to process Data Link
15	Deleted		
16	Deleted		
17	[796] SELECTOR TEST: 7, then OFF [505] Power switch: OFF [405] Function switch: OFF [905] POWER: OFF	Check complete	. . .

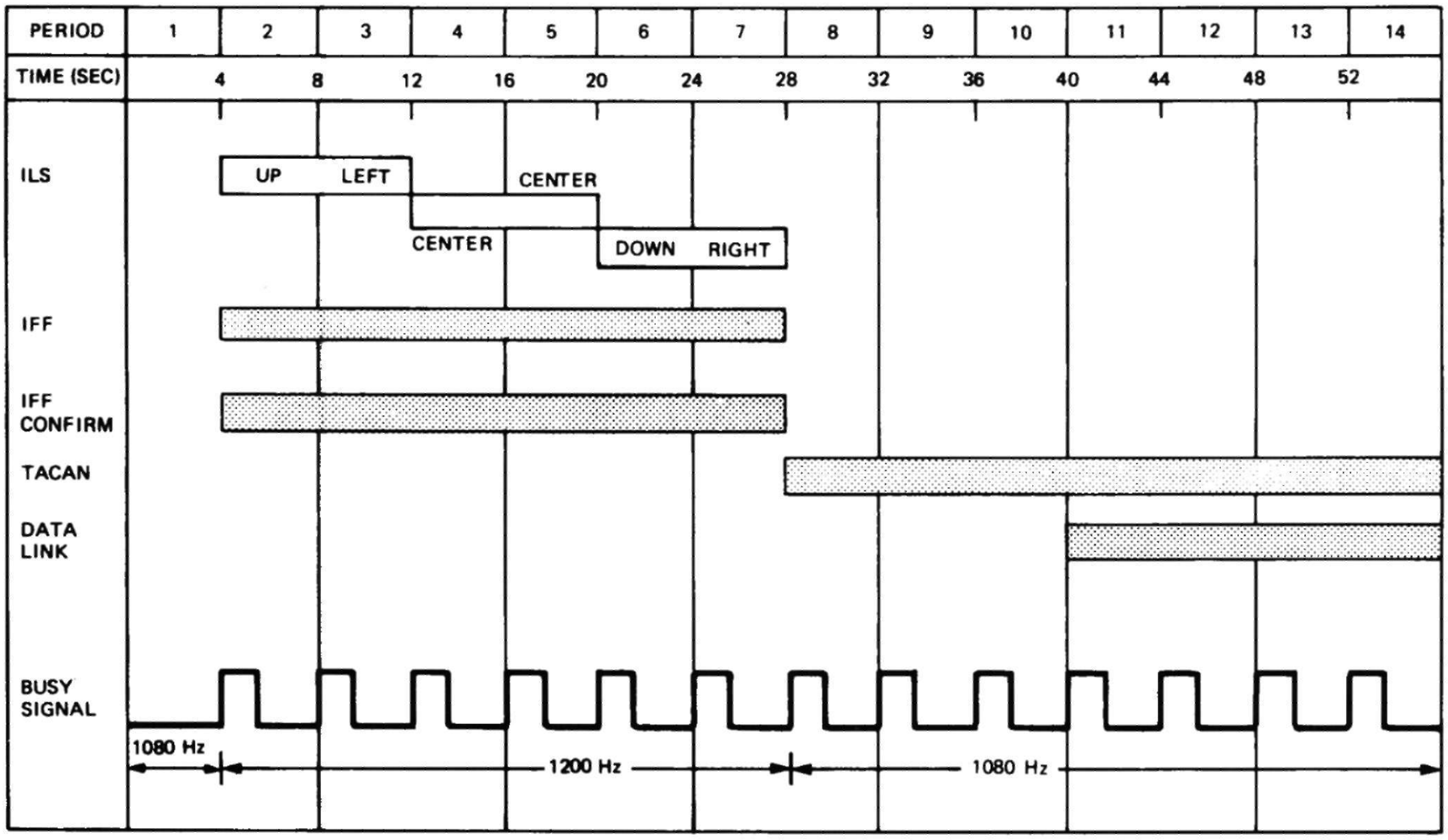


Figure 9-1. SSGC 3 Test Sequence

Table 9-4. SSGC3 (CN&L Round)

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [019] DISPLAY ON: ADDRESS SELECT: 10 CHANNEL: M MANUAL FREQUENCY: MART DL test frequency [955] HOMING POINT: B [163] DISP/AUTO NAV: AUTO NAV **[C6280]** MASTER: NORMAL MS/A: ON MODE 3: 4324 [796] SELECTOR TEST: 3 GND TEST INTER: Press and release	[796] COMP: ON RADAR: ON	Sets up System Test 2 from the MART
2	[HSI] HDG: Adjust to obtain HSI indication	[HSI] Heading marker: Lines up with lubber line	. . .
3	[ADI] Pitch trim control: Adjust through entire range	[ADI] Ball: Moves above and below center line	. . .
4	[ADI] Pitch trim control: Adjust to obtain ADI indication	[ADI] Ball: Centered in pitch	This step assumes that the aircraft is level
5	[HSI] CRS: Adjust to obtain indication	[HSI] Course arrow: Points to lubber line	. . .
			. . .
6	[163] DISP/AUTO MODE: ILS	[080] Steering dot: Deflects up and then returns to center — B-sweep: Centered — E1 marker: Moves down [ADI] GS flag: Appears LOC flag: Appears [HSI] Course deviation bar flag: Appears	. . .

Table 9-4. SSGC 3 (CN&L, Round) (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
7	[405] Test switch: Press to LAMPS and hold	[405] ECM: Comes on —— SYSTEM TEST lamp: Comes on	. . .
8	**NOTE** Put headset on. [405] Function switch: A/A MAN: Set to unused channel Test switch: Press to SYSTEM TEST and hold	**[HSI] MILES: 000** [405] SYSTEM TEST lamp: OFF [181] Grid overlay lines: Rotate **[HSI] BEARING POINTER: SEARCHES**	. . .
9	[405] Test switch: Release Function switch: T/R Test switch: Press to SYSTEM TEST and hold	[405] SYSTEM TEST lamp: OFF [Headset] Audio: Approx 1350 Hz tone received for 1.5 to 2.5 sec **[HSI] MILES: 000** **BEARING POINTER: 067° to 071°** [181] Grid overlay lines: 67° to 71° heading	. . .
10	[405] Test switch: Release PRESET: M MAN: Set to MART high frequency band channel **[181] MODE: ADF-CMD** [796] GND TEST INTER: Press hold for at least 10 sec but not more than 15 sec, then release	[796] COMP: On and then turns off during MART interrogation [Headset] 14 audio tones during MART interrogation. After the MART has been keyed, there will be a single 1080Hz tone and 4 sec later a 1200Hz steady IFF confirm will be heard for 24 sec. The 1080Hz busy will start at the end of the IFF confirm and at the start of the TACAN transmission 4 to 28 seconds **[ADI]** Glide slope warning flag: Drops out of view —— Localizer warning flag: Drops out of view —— Glide slope indicator: Moves up, centers, down and then back to center each displacement lasting 8 sec —— Localizer bar: Deflects left or right and drifts toward center after each displacement, each displacement lasting 8 sec **[HSI] Course bar: Deflects left or right and drifts toward center after each displacement, each displacement lasting 8 sec**	TR routine begins within 1.2 seconds after pressing 796 GND TEST INTER. Proceed to step **11 when** the 1200 Hz IFF confirm stops

Table 9-4. SSGC 3 (CN&L, Round) (Cont)

STEP	INSTRUCTION	INDICATION	REMARKS
10 (cont)		**[HSI] MILES: 380 to 420** [181] Grid overlay lines: Points at bearing to the MART UHF antenna 28 to 56 sec —— TACAN: OK	
11	[RH console] **TACAN/ADF SWITCH: TACAN** [163] DISP/AUTO MODE: AUTO NAV **[HSI]** COURSE: Adjust to obtain indication	**[HSI]** Course deviation indicator: Centers —— Course arrow: Points to 330° (if to-from arrow points toward head of course arrow) or 150° (if to-from arrow points to tail of course arrow)	**Step 12** must be performed after TACAN readouts are verified and prior to data link transmission or 40 sec after MART interrogation
12	**NOTE** If, in the following step, DL is not displayed, the TR routine may be used to display DRO location **3540**, bits 1 thru 4. Bit 1 - CC1, bit 2 = CC2, bit 3 = MCC1, bit 4 = MCC2. Missing bit indicates DL failure. Refer to the system portion of SSGC 3 Procedure (para. 2-8) if DL is not displayed. [163] DISP/AUTO MODE: DL MIN TIME	[034] Annunciator: DL	. . .
13	[796] SELECTOR TEST: 7, then OFF [405] Function switch: OFF [505] Power switch: OFF [905] POWER: OFF	Check complete	. . .
14 thru 16, deleted			

Page deleted

9-12. 306 UNIT ADJUSTMENTS.

The purpose of this procedure is to adjust the 306 unit for correct cockpit displays.

EQUIPMENT REQUIRED

AN/ARM-25A radio test set

EQUIPMENT HOOKUP

Raise radio test set cover CW-391 from case. Set radio test set for zero range. Remove cable CG-1387 from cover and connect between 529 ANT. J52905 and RF connector on bottom right of test set. Connect power cable CX 3786 to POWER INPUT receptacle on AN/ARM-25A and plug into 115 vac, 380 to 420-Hz power source.

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

306

REFERENCES

FUNCTIONAL DIAGRAM

Air Data/Cockpit
(T.O. 27-5/Fig 8-3)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [955] HOMING POINT SELECTOR: D [796] SELECTOR TEST: 3 [RH console] TACAN RANGE-COMMAND ALTITUDE: COMMAND ALTITUDE [405] Function switch: T/R [306] R312: Adjust to obtain indication	[880] Command Mach: 0.85 ± 0.01 M	. . .
2	[163] DISP/AUTO MODE: DL MAX RNG [306] R313: Adjust to obtain indication	[880] Command Mach: 1.75 ± 0.01 M	Steps 1 and 2 may have to be repeated to provide correct indicaions.
3	[163] DISP/AUTO MODE: DL MIN TIME [306] R212: Adjust to obtain indication	[980] TARGET ALTITUDE: 17000 ± 1000	. . .
4	[163] DISP/AUTO MODE: DL MAX RNG [306] R213: Adjust to obatin indication	[980] TARGET ALTITUDE: 52000 ± 1000 ft	Steps 3 and 4 may have to be repeated to provide correct indications.
5	[163] DISP/AUTO MODE: DL MIN TIME [306] R112: Adjust to obatin indication	[980] COMMAND ALTITUDE: 17500 ± 100	. . .
6	[163] DISP/AUTO MODE: DL MAX RNG [306] R113: Adjust to obtain indication	[980] COMMAND ALTITUDE: 52500 ± 100	Steps 5 and 6 may have to be repeated to provide correct indications.

STEP	INSTRUCTION	INDICATION	REMARKS
7	**NOTE** Because TACAN range readouts are more critical, the final alignment of 306 R112 and R113 is made as in the following steps.		
	[163] DISP/AUTO MODE: DL MIN TIME [796] SELECTOR TEST: 7, then OFF [RH console] TACAN RANGE-COMMAND ALTITUDE: TACAN RANGE [306] R112: Adjust to obtain indication	[980] COMMAND ALTITUDE: 00000 (Ensure that 00000 is approached from above so indication is not below zero)	If in F-106B, a slight readjustment of 306 R113 may be required to make 980 COMMAND ALTITUDE agree in both cockpits
8	[405] PRESET: M MAN: 126 [019] ADDRESS SELECT: 1 [955] HOMING POINT SELECTION: J [796] SELECTOR TEST: 7 GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[796] COMP: On, then off during MART interrogation and then back on	TACAN 1 selected from MART MART range must be set for 150 MILES Test lasts 112 sec, if more time is required, press GND TEST INTER per instruction
	[RH console, R4 board] RANGE ZERO: Adjust to obtain indication	[980] COMMAND ALTITUDE: 15000	If in F-106B, a slight readjustment of 306 R113 may be required to make 980 COMMAND ALTITUDE agree in both cockpits
	NOTE Due to interaction of R112, R113, and RANGE ZERO, Steps 5, 6, 7, and 8 may have to be repeated to provide correct indications.		
9	[405] Function switch: OFF [905] POWER: OFF	Adjust complete	. . .
	Disconnect AN/ARM-25A radio test set.		

9-13. IFF MODE 4 CHECK

The purpose of this procedure is to check that the Mode 4 capability of the IFF units is operational.

EQUIPMENT REQUIRED

1. AN/APM-123 transponder test set
2. Headset

EQUIPMENT HOOKUP

CAUTION

- Do not connect AN/APM-123 to RT-859 receiver-transmitter with less than a total of 50 db of attenuation including cables.
- Connect AN/APM-123 to TS-1843/A 1J3 ANTENNA thru a 50 db attenuator using a CG-409/U coax cable.
- Connect K1R-1A test computer to AN/APM-123 MODE 4 using CS-12216/APM-123 cable.
- **Do not radiate the maintenance code; use direct connection method only.**

PRELIMINARY PROCEDURE

Table 1-1

PROBABLE FAULTY UNIT

K1T-1A
TS-1843/A

REFERENCES

FUNCTIONAL DIAGRAM

IFF (T.O. 27-S/Fig. 9-5)

FAULT ISOLATION

None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[C-6280] MASTER: STBY [AN/APM-123] FUNCTION: SELF TEST and wait 15 sec [C-6280] MASTER: NORM M1, M2, M3A, and M-C: OUT AUDIO-OUT-LIGHT: AUDIO CODE: A MODE 4: OUT [AN/APM-123] FUNCTION: SYSTEM MODE: 4 ISLS: OFF CODE A/B: A PUSH TO TEST: LOCK MODE 4 VIR BIT 1: OFF MODE 4 VIR BIT 2: OFF DIR-RAD: DIR	[AN/APM-123] ZEROIZE: Comes on	Ensure that K1T-1A computer is installed
2	[K1R-1A] Code: Key using K1K-18 code key and close access door	[AN/APM-123] ZEROIZE: Goes off REJECT: Comes on [Headset] Audio tone: Received [RH console] IFF CAUTION: Comes on	. . .
3	[K1T-1A] Code: Key using K1K-18 code key and close access door	Same as step 2	. . .
4	[AN/APM-123] PUSH TO TEST: Release from LOCK MODE 4: ON PUSH TO TEST: Press and hold	[AN/APM-123] ACCEPT: Comes on [Headset] Audio: Received [C-6280] REPLY: Comes on [RH console] IFF CAUTION: Goes off	PUSH TO TEST may require 4 or 5 cycles of pressing and releasing before ACCEPT comes on
5	[C-6280] AUDIO-OUT-LIGHT: LIGHT and repeat step 4	Same as step 4, but no audio is received	. . .
6	[AN/APM-123] PUSH TO TEST: Release CODE A/B: B PUSH TO TEST: Press and release	[AN/APM-123] REJECT: Comes on	. . .
7	[C-6280] CODE: B [AN/APM-123] PUSH TO TEST: Press and release	[AN/APM-123] REJECT: Goes off ACCEPT: Comes on	. . .
8	[C-6280] CODE: A [AN/APM-123] CODE A/B: A MODE 4 VIR BIT 1: 1 PUSH TO TEST: Press and release	[AN/APM-123] REJECT: Comes on while PUSH TO TEST is pressed	. . .

STEP	INSTRUCTION	INDICATION	REMARKS
9	[AN/APM-123] MODE 4 VIR BIT 1: OFF MODE 4 VIR BIT 2: 1 PUSH TO TEST: Press and release	[AN/APM-123] REJECT: Comes on while PUSH TO TEST is pressed	. . .
10	[AN/APM-123] MODE 4 VIR BIT 2: OFF ISLS: ON PUSH TO TEST: Press and release	[AN/APM-123] REJECT: Comes on while PUSH TO TEST is pressed	. . .
11	[AN/APM-123] ISLS: OFF [NWW] Door closed switch: Press for at least 15 sec then release [C-6280] CODE: HOLD for at least 2 sec, then to A MASTER: Wait 15 sec, then to OFF wait 15 sec, then to STBY, wait 15 sec, then to NORM [AN/APM-123] PUSH TO TEST: Press and release	[AN/APM-123] ACCEPT: Comes on while PUSH TO TEST is pressed	. . .
12	[NWW] Door closed switch: Press for at least 15 sec then release [C-6280] MASTER: Wait 15 sec, then to OFF, wait 15 sec, then to STBY, wait 15 sec, then to NORM [AN/APM-123] PUSH TO TEST: Press and hold	[AN/APM-123] REJECT: Comes on [Headset] Audio: Received [RH console] IFF CAUTION: Comes on	. . .
13	[AN/APM-123] PUSH TO TEST: Release [K1T-1A] Code: Key using K1K-18 code key and close access door [AN/APM-123] PUSH TO TEST: Press and hold	[AN/APM-123] ACCEPT: Comes on [C-6280] REPLY: Comes on [RH console] IFF CAUTION: Off	. . .
14	[AN/APM-123] PUSH TO TEST: Release [C-6280] CODE: ZERO AUDIO-OUT-LIGHT: AUDIO [AN/APM-123] PUSH TO TEST: Press and hold	[AN/APM-123] REJECT: Comes on [Headset] Audio: Received [RH console] IFF CAUTION: Comes on [C-6280] REPLY: Off	. . .
15	[AN/APM-123] PUSH TO TEST: Release FUNCTION: OFF [C-6280] MASTER: OFF AUDIO-OUT-LIGHT: OUT [AN/APM-123] Disconnect	Check complete	

9-14. ILS CHECKS

The purpose of this procedure is to ensure that the ILS units are operational, that the system is processing the ILS information. that the displays are correct and that the ILS voice is operating.

EQUIPMENT REQUIRED	EQUIPMENT HOOKUP	PRELIMINARY PROCEDURES
Headsets	Connect headsets	Table 1-1

REFERENCES

FUNCTIONAL DIAGRAM	FAULT ISOLATION
ILS (T.O. 27-5/Fig. 9-4)	None

STEP	INSTRUCTION	INDICATION	REMARKS
1	[905] POWER: RADAR STBY [955] HOMING POINT SELECTOR: H [019] ADDRESS SELECT: 1 DISPLAY: ON ▯ [163] DISP/AUTO MODE: ILS ARCH ○ [163] DISP/AUTO MODE: ILS [796] SELECTOR TEST: 7 GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[Headsets] Tone: Interrogation tones ▯ [ADI] Glide Slope Flag: Not present ○ [AHI] —— Localizer flag: Not present —— Horizontal Steering bar and displacement pointer: Center for 4 sec; Up for 8 sec; Center for 8 sec; Down for 8 sec; Center for 32 sec; Up for 8 sec; Center for 8 sec; Down for 8 sec; Center for 28 sec; —— Vertical steering bar: Moves left or right with each command and drifts toward center after each displacement ▯ [HSI] Course deviation bar : ○ [CI] Center for 4 sec; Left for 8 sec; Center for 8 sec; Right for 8 sec; Center for 32 sec; Left for 8 sec; Center for 8 sec; Right for 8 sec; Center for 28 sec	. . .
2	[019] ADDRESS SELECT: 5 [755] VOL: As desired [796] GND TEST INTER: Press and hold for at least 10 sec but not more than 15 sec	[Headsets] Tone: Interrogation tones, a single 1080Hz tone and four sec later, a 450Hz tone	. . .
3	[796] SELECTOR TEST: OFF [905] POWER: OFF	Test complete	. . .

9-15. MARKER BEACON OPERATIONAL CHECK. The purpose of this procedure is to ensure proper operation of the MARKER BEACON LOW SENSITIVITY function of the Instrument Landing System.

EQUIPMENT REQUIRED

BC-376H Test Oscillator

EQUIPMENT HOOKUP

None

NOTE

Place test set under Marker Beacon Antenna to accomplish test. Reference figure 10-19 for antenna location.

PRELIMINARY PROCEDURES

Table 1-1

PROBABLE FAULTY UNIT

267

FUNCTIONAL DIAGRAMS

(T.O. 27-5/Fig. 9-4)

REFERENCES

NOTE

If High Sensitivity check is required, refer to paragraph 9-16.

FAULT ISOLATION

None

STEP	INSTRUCTIONS	INDICATION	REMARKS
1	Perform operating and test instructions on back of front cover of test set prior to use on the aircraft.		
2	[905] POWER: STBY. [163] DISP/AUTO MODE to ILS [BC-376H] Select 400HZ MOD.	Marker Beacon light in the cockpit comes on. In F106B check AFT cockpit lamp also.	Checks Low Sensitivity only. 1A8K1 is deenergized.
3	[BC-376H] Select 1300HZ MOD.	Same as step 2.	Same as step 2.
4	[163] DISP/AUTO MODE to DL MIN TIME [BC-376H] POWER: OFF. [905] POWER: OFF	Test complete	

9-16. ALTERNATE MARKER BEACON OPERATIONAL CHECK. The purpose of this procedure is to ensure the proper operation of the MARKER BEACON HIGH and LOW SENSITIVITY functions of the Instrument Landing System.

NOTE

This procedure requires aircraft power to accomplish.

EQUIPMENT REQUIRED

BC-376H Test Oscillator

EQUIPMENT HOOKUP

None

NOTE

Place test set under Marker Beacon antenna to accomplish test. Refer to figure 10-19 for antenna location.

PRELIMINARY PROCEDURES

Table 1-1

PROBABLE FAULTY UNIT

267

FUNCTIONAL DIAGRAMS

(T.O. 27-5/fig. 9-4)

REFERENCES

FAULT ISOLATION

STEP	INSTRUCTION	INDICATION	REMARKS
1	Perform operating and test instruc-tions on back of front cover of test set prior to use on the aircraft.		
2	[905] POWER: STBY. [163] DISP/AUTO MODE to DL MIN TIME. [BC-376H] POWER: ON Select 400HZ MOD.	Marker Beacon light comes on in the cockpit. In F106B check AFT cockpit lamp also.	Checks HIGH SENSITIVITY. 1A8K1 energized.
3	[BC-376H] Select 1300HZ MOD.	Same as step 2.	Same as step 2.
4	[163] DISP/AUTO MODE to ILS. [BC-376H] Select 400HZ MOD.	Marker Beacon light in the cockpit comes on. Light could be dimmer than in step 2 and 3.	Checks LOW SENSITIVITY. 1A8K1 deenergized.
5	[BC-376H] Select 1300HZ MOD	Same as step 4	Same as step 4
6	[BC-376H] POWER: OFF. [163] DISP/AUTO MODE to MIN TIME. [905] POWER: OFF.	Test complete	

See O.S 25-42 Pg 6

CHAPTER 10. REPLACEMENT

SECTION I. GENERAL

10-1. INTRODUCTION.

This chapter contains replacement procedures for units of the MA-1 and AN/ASQ-25 systems. Common units are covered in paragraph 10-4a. Other units are covered in individual subparagraphs by subsystem. A list of system units and their locations is contained in table 10-1.

10-2. LIST OF UNITS.

Refer to table 10-1 for a list of all units of the MA-1 and AN/ASQ-25 systems. All three digit part numbers are preceded by 464.

10-3. LOCATION OF UNITS.

Refer to table 10-1 for the location of all units of the MA-1 and AN/ASQ-25 systems.

Table 10-1. List of MA-1 and AN/ASQ-25 Units

PART NO.	NOMENCLATURE	SUBSYSTEM	LOCATION
002	Electrical Equipment Rack-Indicator	Radar	Cockpit
003	Master Timer Electrical Synchronizer	Radar	Radar rack
472005	Intercommunications Set Control	CN&L	Cockpit
008	GAR Gyro Power Control Unit	Armament	Armament rack (F-106A); Coffin rack (F-106B)
016	Transmission Line Waveguide Assembly	Radar	Radar compt
017	Radar Antenna	Radar	Radome compt
019	Converter-Receiver Control (C-2588/ARR)	CN&L	Cockpit
020	AGC and Angle Track Waveform Converter	Radar	Radar rack
024	Pressure Indicator	Radar	Radar compt
026	PA/RT Power Supply	Radar	Radar rack
034	Computer Annunciator	Computer	Cockpit
040	IR Signal Data Converter	IR	Radar rack
041	Rate Gyro Torque Generator Amplifier	Radar	Radar rack
043	Missile ARC Channel Control	Armament	Armament rack (F-106A); Coffin rack (F-106B)
045	Reciprocating Power Driven Air Compressor	Radar	05 compt (F-106A); Nose wheel well (F-106B)
054	Model LE-6 Airborne Rocket Launcher	Armament	Armament bay
061	Normal Aircraft Accelerometer	FC&M	Engine compt
063	Radar Relay-Switch Assembly	Radar	Radar rack
065	Radar Receiver-Transmitter	Radar	Radar compt

See O.S. 25-42 Pg 6

Table 10-1. List of MA-1 and AN/ASQ-25 Units (Cont)

PART NO.	NOMENCLATURE	SUBSYSTEM	LOCATION
073	Electrical Equipment Rack-LH Fwd Compt	Radar	Radar compt
074	Electrical Equipment Rack-Aft Compt Left	CN&L	CN&L compt
472074	Electrical Equipment Rack-Elect Missile Bay	CN&L	Coffin bay
080	Search & Attack Flight Command Indicator	Radar	Cockpit
082	Clutter Electronic Gate	Radar	Radar rack
083	Manual Aircraft & Radar Control	Radar	Cockpit
084	Radar Directional Coupler	Radar	Radar compt
087	Rocket Control Power Supply	Armament	Armament rack (F-106A); Coffin rack (F-106B)
095	Tracking Preamplifier Video Amplifier	Radar	Radar rack
096	Radar Self Test Meter	Radar	Radar rack
463097	Dehydrator	Radar	05 compt (F-106A); Nose wheel well (F-106B)
102	Electrical Equipment Rack - Converter, Signal Data-TSD	CN&L	Cockpit
103	Range Tracking Electrical Synchronizer	Radar	Radar rack
106	Azimuth Dr Electronic Control Amplifier	Radar	Radar rack
107	Pressure Regulating Valve	Radar	05 compt (F-106A); Nose wheel well (F-106B)
117	Automatic Direction Finder Antenna	CN&L	Lower fuselage
140	Input/Output Signal Data Converter	Computer	Computer rack
141	Antenna Tracking Electronic Control Amplifier	Radar	Radar rack
149	Search-Attack Display Photographic Recorder	Radar	Cockpit
163	AFCS Flight Mode Control	FC&M	Cockpit
173	Electrical Equipment Rack	Radar	Radome compt
174	Electrical Equipment Rack - RH Aft Compt	Armament	Armament compt
181	Tactical Display Horizontal Situation Indicator	CN&L	Cockpit
190	Receiver-Modulator Cooling Duct Assembly	Radar	Computer compt
195	Ind Vid Az Sweep & Range Voltage Amplifier Assembly	Radar	Radar rack

Table 10-1. List of MA-1 and AN/ASQ-25 Units (Cont)

PART NO.	NOMENCLATURE	SUBSYSTEM	LOCATION
196	Radar Self Test Relay-Switch Assembly	Radar	Radar rack
206	Antenna Servo Electronic Control Amplifier	Radar	Radar rack
216	Radar Waveguide Assembly	Radar	Radar compt
220	Digital-Digital Converter (CV-703/ARR-61)	CN&L	05 Compt
223	Attack Display Signal Data Converter	Radar	Radar rack
241	Antenna Control Amplifier Computer	Radar	Radar rack
○ 259	Bar Setting Analog Signal Control	FC&M	Cockpit
264	Armament Selection Relay Assembly	Armament	Armament rack (F-106A); Coffin rack (F-106B)
267	ILAS Glide Slope & Marker Beacon Radio Receiver	CN&L	CN&L rack (F-106A); Coffin rack (F-106B)
273	Electrical Equipment Rack RH Fwd Compt	Computer	Computer compt
281	Liquid Level Indicator	IR	Computer compt
163292	Gyro Mounting Base	FC&M	05 compt
925	Intermediate Frequency Amplifier	Radar	Radar rack
**3452296	AHRG Programmer	FC&M	05 compt
305	Mode Selection Radar Set Control	Radar	Cockpit
○ 306	Vertical Situation Amplifier Assembly	FC&M	Cockpit
346	Steering Signal Computer	Radar	Radar rack
364	Parameter Setting Relay Assembly	Armament	Armament rack (F-106A); Coffin rack (F-106B)
367	ILAS Localizer Radio Receiver	CN&L	CN&L rack (F-106A); Coffin rack (F-106B)
389	Indicator Sweep Generator	Radar	Radar rack
395	Attack Display Amplifier Assembly	Radar	Radar rack
405	TACAN Channel Selector Control	CN&L	Cockpit
432	X_L Four Port Circulator Wave Guide Assembly	Radar	Radar compt
441	Passive Detection Synchro Signal Amplifier	IR	Armament rack (F-106A); Saddle rack (F-106B)
□ 463	Bearing Select Converter Control	CN&L	Cockpit

**3452296 programmer is part of console 2 of the FC&M stand. It can be removed and used in the aircraft for ground test only.

Table 10-1. List of MA-1 and AN/ASQ-25 Units (Cont)

PART NO.	NOMENCLATURE	SUBSYSTEM	LOCATION
464	Mode Selection Relay Assembly	Armament	Armament rack (F-106A); Coffin rack (F-106B)
472473	TACAN & IR Electrical Equipment Rack	CN&L	Saddle compt
474	Electrical Equipment Rack-Stable Platform Generator	FC&M	05 compt
484	Waveguide Directional Coupler	Radar	Radar compt
496	Armament Test Relay Assembly	Armament	Armament rack (F-106A); Coffin rack (F-106B)
499	Special Purpose Electrical Cable	IR	IR head compt
505	Communication Frequency Selector Control	CN&L	Cockpit
506	Elevation Drive Electronic Control Amplifier	Radar	Radar Rack
509	Stable Coordinate Converter	FC&M	05 compt
511	Rack, Electrical Equipment-Flight Director	CN&L	05 compt
516	Transmission Line Waveguide Assembly	Radar	Radar compt
518	Logic and Switching	Power	Power rack
520	Cockpit Display Signal Data Converter No. 1	CN&L	05 compt
523	Electronic Time Sharing Signal Data Converter	Radar	Radar compt
526	Regulated Direct Current Computer Power Supply	Computer	Computer rack
529	Receiver Transmitter TACAN	CN&L	CN&L rack (F-106A); Saddle rack (F-106B)
541	Computer-Programmer	Radar	Computer compt
472564	Control Transfer Relay Assembly Group 1	CN&L	Rear cockpit
472595	Auxiliary Deflection Direct Current Amplifier	Radar	Coffin rack
596	Armament Electrical Test Panel	Armament	Right MWW
602	Cockpit Signal Data Converter Electrical Equipment Rack	CN&L	05 compt
606	Audio & ADF Electronic Control Amplifier	CN&L	CN&L rack (F-106A); Coffin rack (F-106B)
620	Cockpit Display Signal Data Converter No. 2	CN&L	05 compt
629	Converter, Signal Data, TACAN	CN&L	CN&L rack (F-106A); Saddle rack (F-106B)
641	AFC High Voltage Power Supply Group Amplifier	Radar	Radar rack
663	Infrared Relay Switch Assembly	Radar	Radar rack
472664	Control Transfer Relay Assembly - Group II	CN&L	Rear cockpit
667	Data Link Receiver (R-884/ARR-61)	CN&L	CN&L rack (F-106A); Coffin rack (F-106B)
674	Dehydrator Rack	Radar	05 compt

Table 10-1. List of MA-1 and AN/ASQ-25 Units (Cont)

PART NO.	NOMENCLATURE	SUBSYSTEM	LOCATION
○720	Flight Director Signal Data Converter	CN&L	05 compt
741	Low Voltage Power Supply	Radar	Radar rack
755	ILS Receiver Control	CN&L	Cockpit
472764	Control Transfer Relay Assembly Group IIIA	CN&L	Rear cockpit
767	Infrared Receiver	IR	IR head compt
774	Dehydrator & Filter Rack	Radar	05 compt
780	Remote Indicator, UHF Channel & Frequency	CN&L	Cockpit
796	AWCIS Self Test Panel	Radar	Cockpit
802	IR Receiver Electrical Equipment Rack	IR	IR head compt
811	Electrical Equipment Rack-Time Division Data Link Converter	CN&L	05 compt
821	Amplifier, Interface	FC&M	Computer compt
841	Hydraulic Drive Electronic Control Amplifier	Radar	Radar rack
846	RAM Arithmetic Control Computer	Computer	Computer rack
855	Azimuth Scan & Horizon Adjustment Radar Set Control	Radar	Cockpit
857	Magnetic Drum Data Storage-Memory Electronics	Computer	Computer rack
472864	Control Transfer Relay Assembly - Group IIIB	CN&L	Rear cockpit
866	Xmtr Tune Electronic Control Amplifier	Radar	Radar rack
873	Electrical Equipment Rack, Power	Power	05 compt
○880	Mach Number Indicator Assembly	FC&M	Cockpit
7839890	LH Aft Electrical Equipment Rack	FC&M	05 compt
896	Infrared Self Test Transmitter	IR	Radar compt
905	System Power Control	FC&M	Cockpit
920	Tactical Display Horiz Situation Signal Data Converter	CN&L	Cockpit
926	Multi-Dc Power	Power	Radar rack
955	Auto-Navigation Selector Control	CN&L	Cockpit
○980	Com & Target Alt Indicator Assembly	FC&M	Cockpit
989	1600 Hz Power Supply	Power	Power rack

Table 10-1. List of MA-1 and AN/ASQ-25 Units (Cont)

PART NO.	NOMENCLATURE	SUBSYSTEM	LOCATION
*	Accelerometer Transmitter AN Type TRU-3/A	FC&M	Engine compt
*	Accumulator	IR	Fuselage, above radar compt
*156558	Electronic Control Amplifier (ECA), AN type AM-6851/ASN-129	FC&M	05 compt
*	Adsorber	IR	Computer compt
□ *	Aircraft Flight Director Computer, AN Type CPU-4/A	FC&M	05 compt
*	Air Data Computer, CPU-111	FC&M	Nose wheel well
□ *	Altitude-Vertical Speed Amplifier, AN Type AAU-1/A	FC&M	Cockpit
□ *	Altitude-Vertical Speed Indicator, AN Type AAU-1/A	FC&M	Cockpit
□ *	Amplifier Component of Horizontal Situation Indicator Group AN Type AF/A24J-1	FC&M	Cockpit
*156555	Displacement Gyroscope Assembly (DGA), AN type CN-1466/ASN-129	FC&M	05 compt
*	Antenna Switching Unit SA-1474/A	CN&L	Nose wheel well
○ *	Indicator, Attitude Director, 77200000-2	FC&M	Cockpit
*	Capacitor-Relay	IR	Nose wheel well
*	Compressor	IR	Computer compt
*156561	Compass System Controller (CSC), AN type C-10005/ASN-129	FC&M	Cockpit
*	Control Transponder C-6280(P) (APX-72)	CN&L	Cockpit
○ *	Indicator, Horizontal Situation, 77000000-2	FC&M	Cockpit
*	Desiccant Container	IR	Computer compt
*	Detector, Magnetic Azimuth, AN Type DT-173/AJN	FC&M	Right wing
*	Ejection Relay (K40)	CN&L	Computer rack
*	Hourmeter	IR	Computer compt
□ *	Indicator, Attitude Director, AN Type ARU-2/A	FC&M	Cockpit
□ *	Indicator Component of Horizontal Situation Indicator Group, AN Type AF/A24J-1	FC&M	Cockpit
□ *	Mach Number Safe Speed Airspeed Amplifier, AN Type AVU-1/A	FC&M	Cockpit
□ *	Mach Safe Speed Airspeed Indicator, AN Type AVU-1/A	FC&M	Cockpit
*	N_2 Fill Fitting	IR	Computer compt

*Government-furnished equipment

Table 10-1. List of MA-1 and AN/ASQ-25 Units (Cont)

PART NO.	NOMENCLATURE	SUBSYSTEM	LOCATION
*	Receiver-Transmitter, Radio RT-749/ARC-109	CN&L	CN&L rack (F-106A); Saddle rack (F-106B)
*	Receiver-Transmitter RT-859/APX-72	CN&L	Computer rack
*	Test Set-Transponder Set TS-1843A/APX	CN&L	Computer rack
*	Transmitter, Rate Gyroscope, AN Type TRU-2/A	FC&M	05 compt
*	Transponder Computer KIT-1A/TSEC	CN&L	Computer rack

*Government-furnished equipment

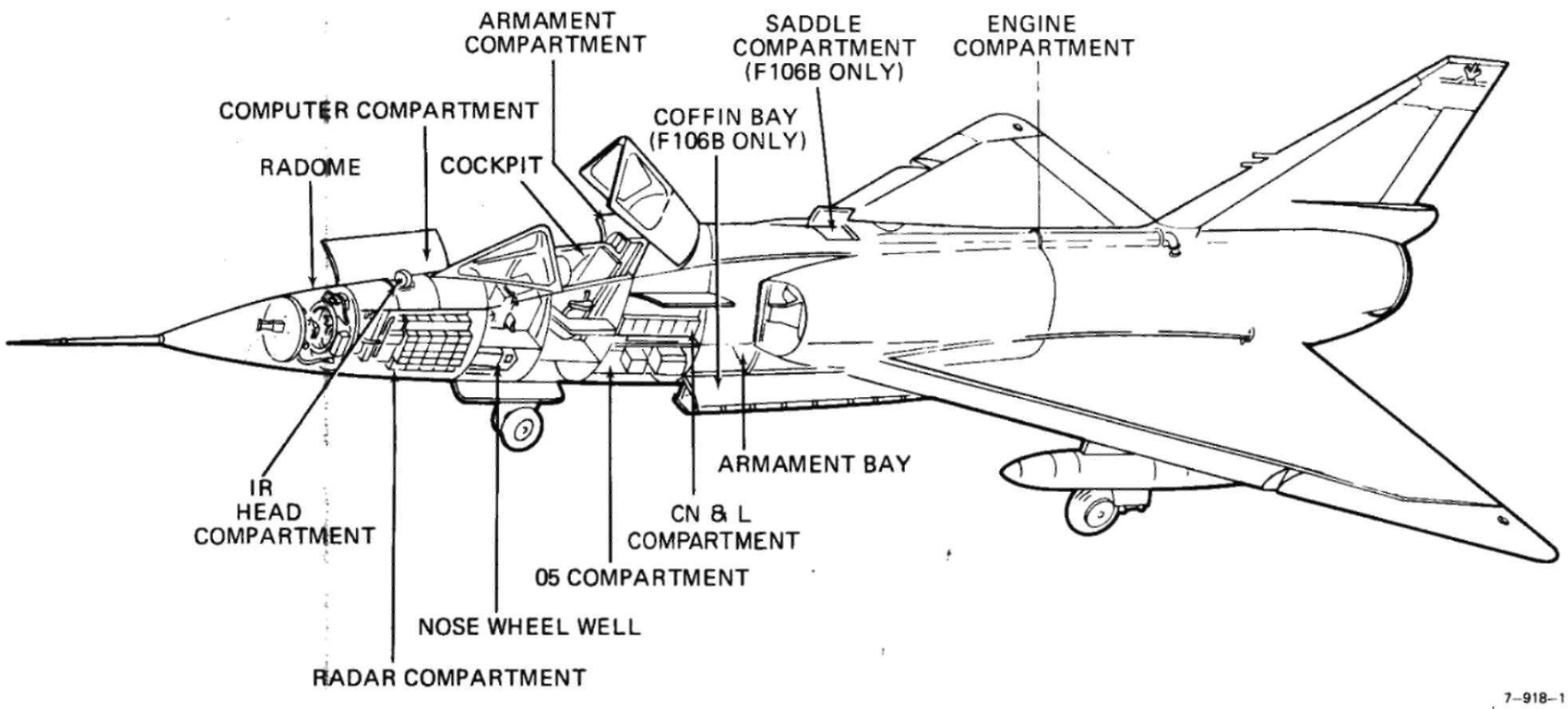


Figure 10-1. Location Diagram, Electronic Equipment

SECTION II. REPLACEMENT

NOTE

Safety-wire knurled nuts used to mount electronic units in accordance with T.O. 1-1A-8. It is not necessary to safety-wire mounting nuts that use ratchet-type locking mechanism or lock washers.

10-4. RADAR UNIT REPLACEMENT.

10-4a. COMMON UNITS.

(1) Spintite Secured Units

WARNING

Ensure that all aircraft power has been removed.

(a) Set 905 POWER to OFF and remove all aircraft power.

(b) Disconnect all electrical connectors from unit.

(c) Using 3/8 inch spintite, rotate fastener counterclockwise until unit is free of rack.

(d) Remove unit from rack.

NOTE

Installation procedure is essentially the reverse of removal.

(2) Knurl Nut Secured Units

WARNING

Ensure that all aircraft power has been removed.

(a) Set 905 POWER to OFF and remove all aircraft power.

(b) Disconnect all electrical connectors from unit

(c) Loosen knurl nut(s) until they are free of stud.

(d) Remove unit from rack.

NOTE

Installation procedure is essentially the reverse of removal.

10-4b. 002, 080, and 149 UNITS. Set 905 POWER to OFF and remove all aircraft power. Refer to figure 10-2 for procedures to remove and replace the 002, 080, and 149 units.

10-4c. 017 AND 173 UNITS. Set 905 POWER to OFF and remove all aircraft power. Refer to figure 10-3 for procedures to remove and replace the 017 and 173 units.

10-4d. 024 UNIT.

WARNING

Ensure that all aircraft power has been removed.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Disconnect 2 pressure lines located at aft end on rear of unit.

(3) Disconnect P02401.

(4) Remove 4 bolts from 024 unit.

(5) Remove 024 unit.

NOTE

Installation procedure is essentially the reverse of removal. Remove 2 pressure lines from meters on 024 unit and transfer to new 024 unit if unit is being changed.

10-4e. 045 UNIT.

WARNING

Ensure that all aircraft power has been removed.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Remove 7839890 rack if necessary for accessability to the 045 unit in accordance with paragraph 10-10b.

(3) Disconnect P04501.

(4) Disconnect 3 pressure lines from 045 unit.

(5) Remove 4 bolts from 045 unit.

(6) Remove 045 unit.

NOTE

- Installation procedure is essentially the reverse of removal. Fittings for pressure lines must be removed from 045 unit and transferred to new 045 unit if unit is being changed.
- Perform radar high pressure and interlock check in accordance with paragraph 3-4q.

10-4f. 065 UNIT. Set 905 POWER to OFF and remove all aircraft power. Refer to figure 10-4 for procedures to remove and replace the 065 unit.

10-4g. 073 UNIT. Set 905 POWER to OFF and remove all aircraft power. Refer to figure 10-5 for procedures to remove and replace the 073 unit.

10-4h. 083 UNIT. Set 905 POWER to OFF and remove all aircraft power. Refer to figure 10-6 for procedures to remove and replace the 083 unit.

10-4i. 463097 UNIT.

WARNING

Ensure that all aircraft power has been removed.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Loosen bolt in 463097 unit rack.

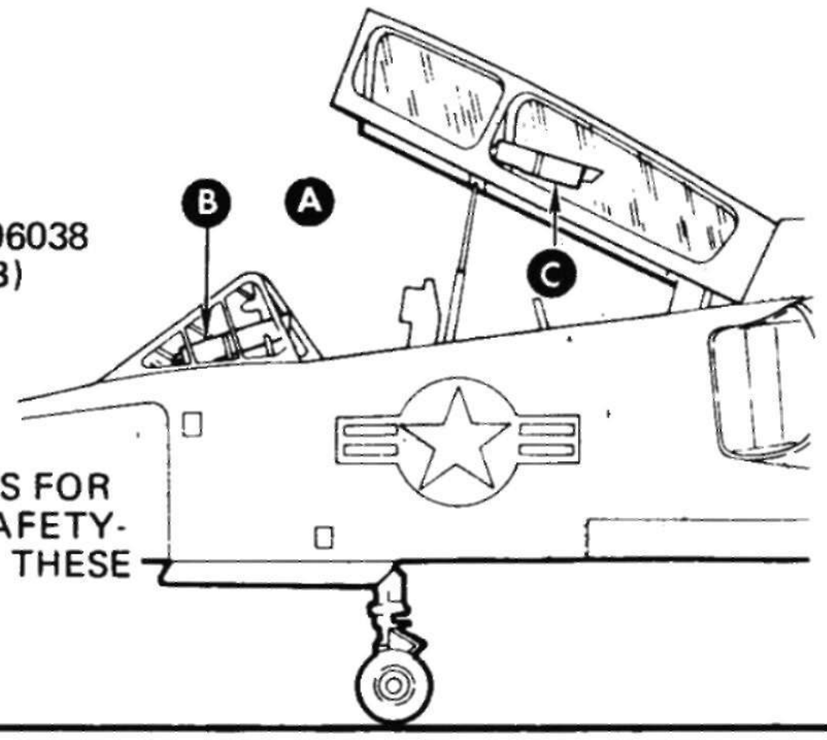
(3) Remove 463097 unit.

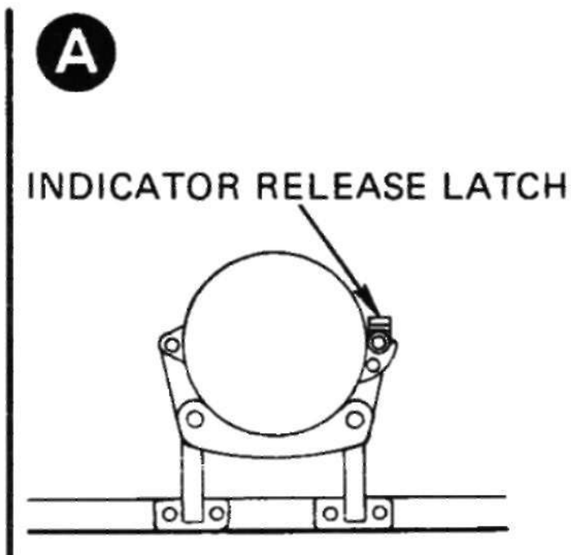
PREPARATION

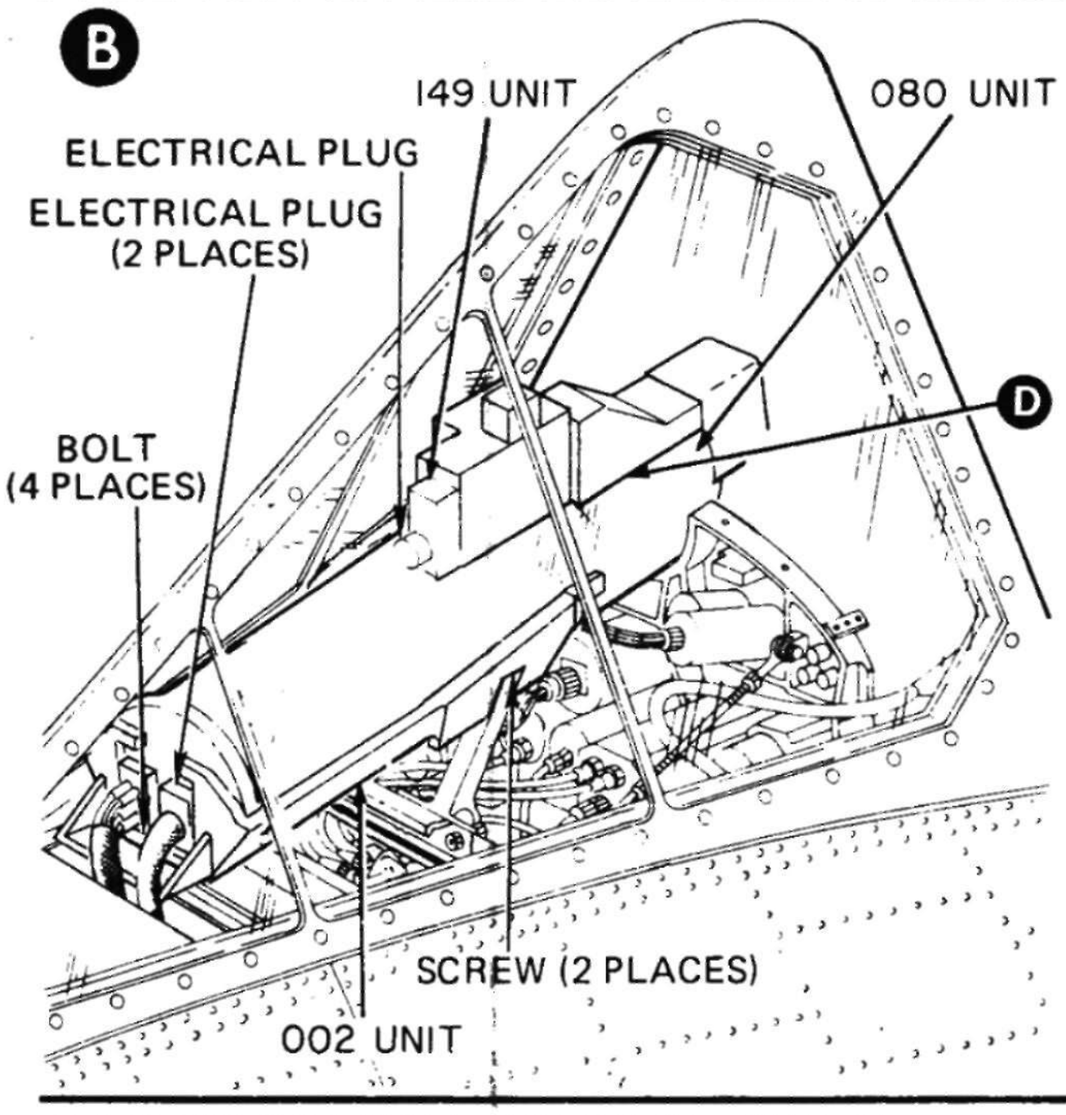
a. Raise canopy to up position.
b. Install canopy hold open support 8-96038 (F-106A aircraft) or 8-96137 (F106B) aircraft.

WARNING

PERFORM ALL SAFETY PROCEDURES FOR JETTISON AND EJECTION SYSTEM SAFETY-ING. REFER TO T.O. 1F-106A-2-2 FOR THESE MANDATORY PROCEDURES.







F-106A COCKPIT AND F-106B FRONT COCKPIT REMOVAL, 080 UNIT.
APPLICABLE TO F-106A AIRPLANES AND FRONT COCKPIT, F-106B AIRPLANES.

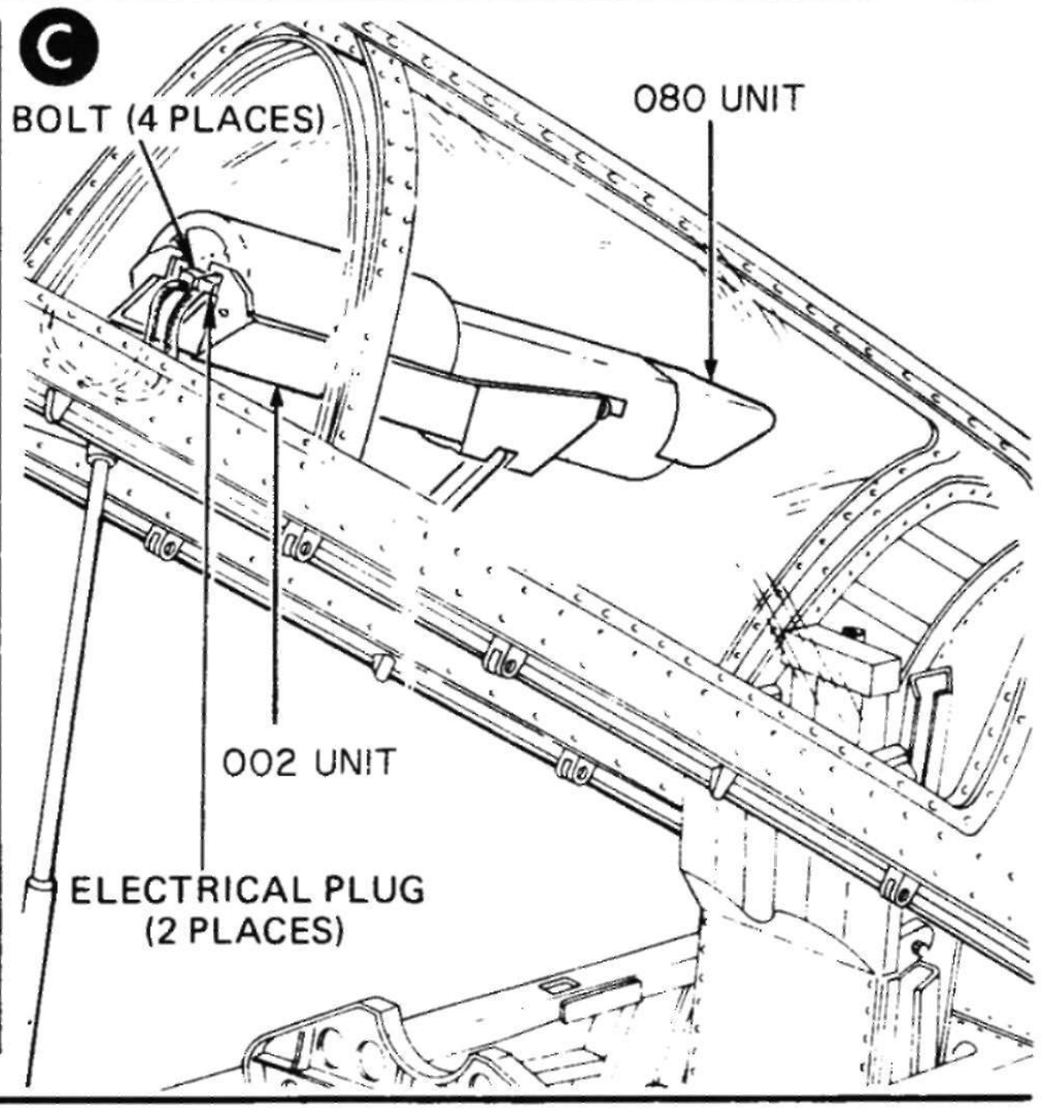
a. Disconnect electrical plug at rear of 149 unit.
b. Using spintite, loosen and raise 080 unit to release 080 unit from 002 unit.
c. Move indicator outward from mounting rack.

REMOVAL, 002 UNIT. APPLICABLE TO F-106A AIRCRAFT AND FRONT COCKPIT, F-106B AIRCRAFT.

a. Remove 080 unit.
b. Using extension-type ratchet wrench, remove four bolts at inside forward end of 002 unit, accessible from inside of rack.
c. Remove two screws holding 002 unit to rear support and pull 002 unit back to gain access to forward end of rack.
d. Remove two electrical plugs from forward end of 002 unit.
e. Remove 002 unit.

INSTALLATION

Installation is essentially the reverse of removal.



F-106B REAR COCKPIT REMOVAL, 080 UNIT
APPLICABLE TO REAR COCKPIT OF 106B AIRPLANES

a. Loosen and raise 080 unit release latch to release 080 unit from 002 unit.
b. Move 080 unit aft from 002 unit.

REMOVAL, 002 UNIT
APPLICABLE TO F106B AIRCRAFT REAR COCKPIT.

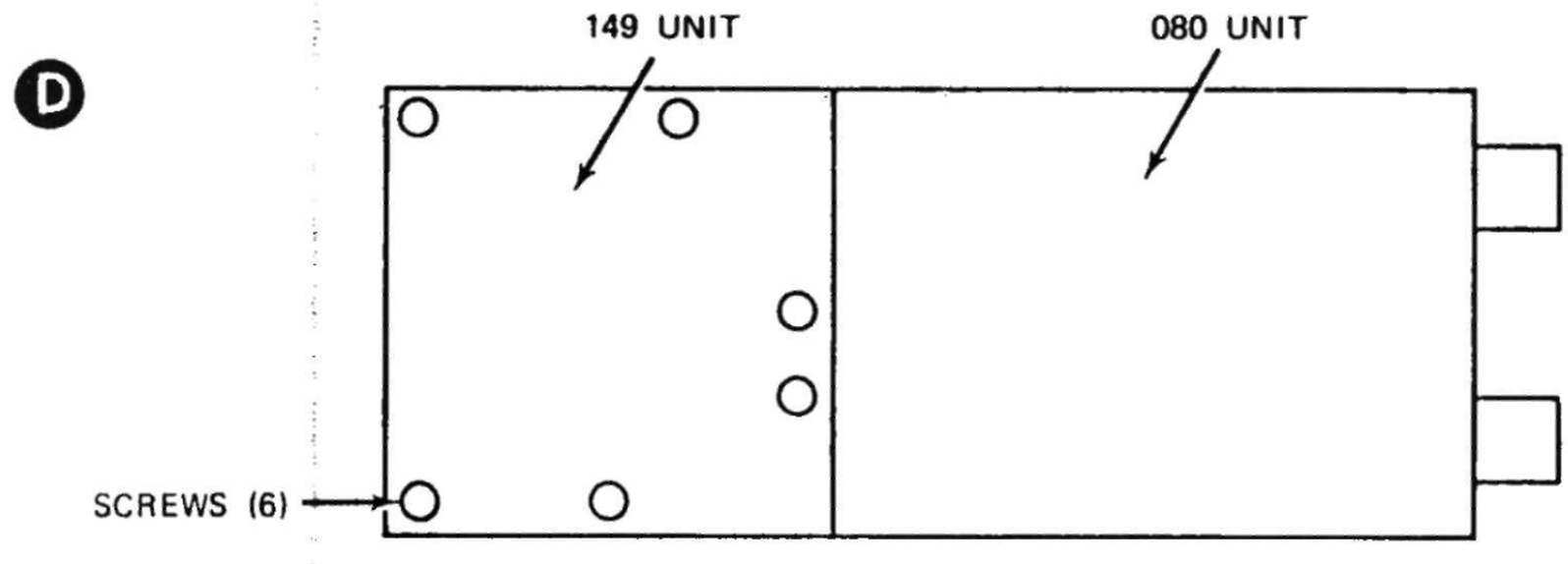
a. Remove 080 unit.
b. Remove protective cover from forward end of 002 unit.
c. Remove two electrical plugs from forward end of 002 unit.
d. Using extension-type ratchet wrench, remove four bolts at inside forward end of 002 unit accessible from inside of rack.
e. Remove two screws holding 002 unit to rear supports and remove 002 unit.

INSTALLATION

Installation is essentially the reverse of removal.

Figure 10-2. 002, 080, and 149 Unit Replacement (Sheet 1 of 2)

FLIGHT COMMAND INDICATOR
(AS SEEN FROM TOP)



7-982-111A

REMOVAL, 149 UNIT

a. Remove and disconnect electrical plug at rear of 149 unit.

b. Loosen 6 screws.

c. Remove 149 unit.

INSTALLATION

Installation is essentially the reverse of removal.

Figure 10-2. 002, 080, and 149 Unit Replacement (Sheet 2 of 2)

NOTE

Installation procedure is essentially the reverse of removal. When performing installation, ensure that two O-rings are properly installed.

10-4j. 107 UNIT.

WARNING

Ensure that all aircraft power has been removed.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Remove 7839890 rack if necessary for accessibility to the 107 unit in accordance with paragraph 10-10b.

(3) Disconnect P10701 and P10702.

(4) Disconnect 4 pressure lines from 107 unit.

(5) Remove 3 bolts from 107 unit.

(6) Remove 107 unit.

NOTE

- Installation procedure is essentially the reverse of removal. Fittings for pressure lines must be removed from 107 unit and transferred to new 107 unit if unit is being changed.

- Perform radar high pressure and interlock check in accordance with paragraph 3-4q.

10-4k. 281 UNIT.

WARNING

Ensure that all aircraft power has been removed.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Disconnect P28101.

(3) Remove 4 screws from 281 unit.

(4) Remove 281 unit.

NOTE

Installation procedure is essentially the reverse of removal.

F106A COCKPIT REMOVAL, 52800 UNIT APPLICABLE TO F106A VERTICAL AIRPLANES.

a. Disconnect electrical connector at rear of 52300 unit.
b. Using an open-end wrench, remove the two screws on top of the 52800 unit.
c. Using an allen wrench and holding the 52800 unit, remove the two allen screws that secure the 52800 unit to the 080 unit.
d. Remove the 52800 unit.

INSTALLATION

Installation is essentially the reverse of removal.

REMOVAL, 52300 UNIT.

NOTE

Perform step a. only if the camera is to be removed without removing the 52800 unit.

a. Disconnect electrical connector at rear of 52300 unit.
b. Hold the 52300 unit and loosen the three captive screws that secure the unit to the 52800 unit.
c. Remove the 52300 unit.

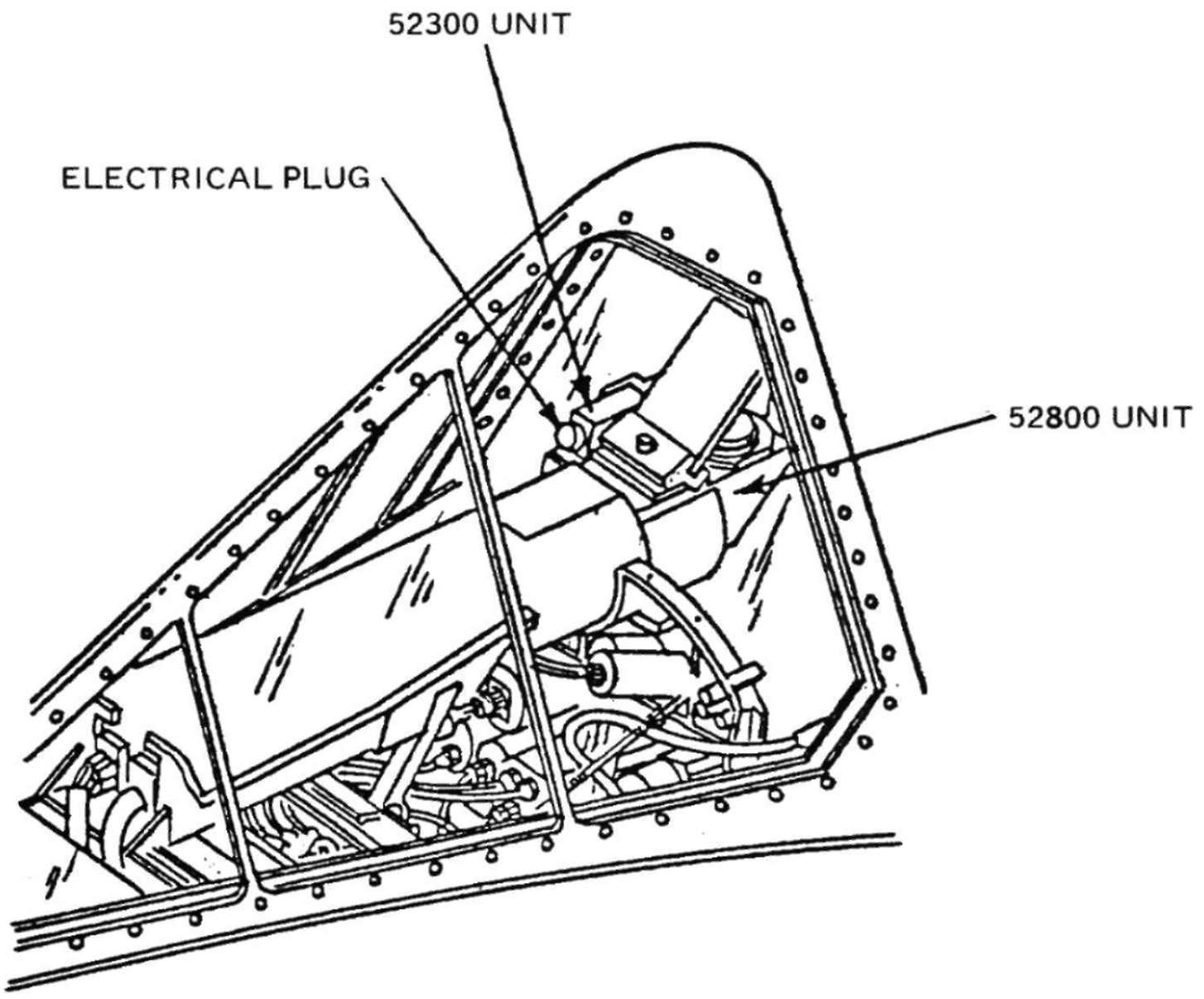
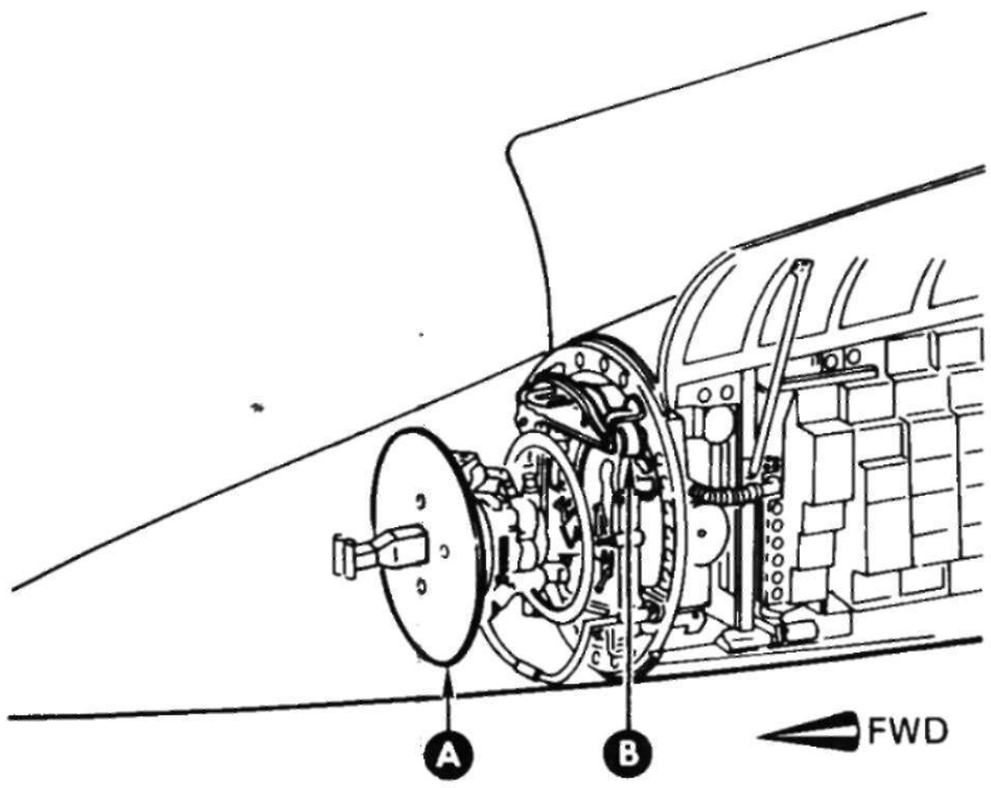


Figure 10-2.1. 52300 and 52800 Replacement



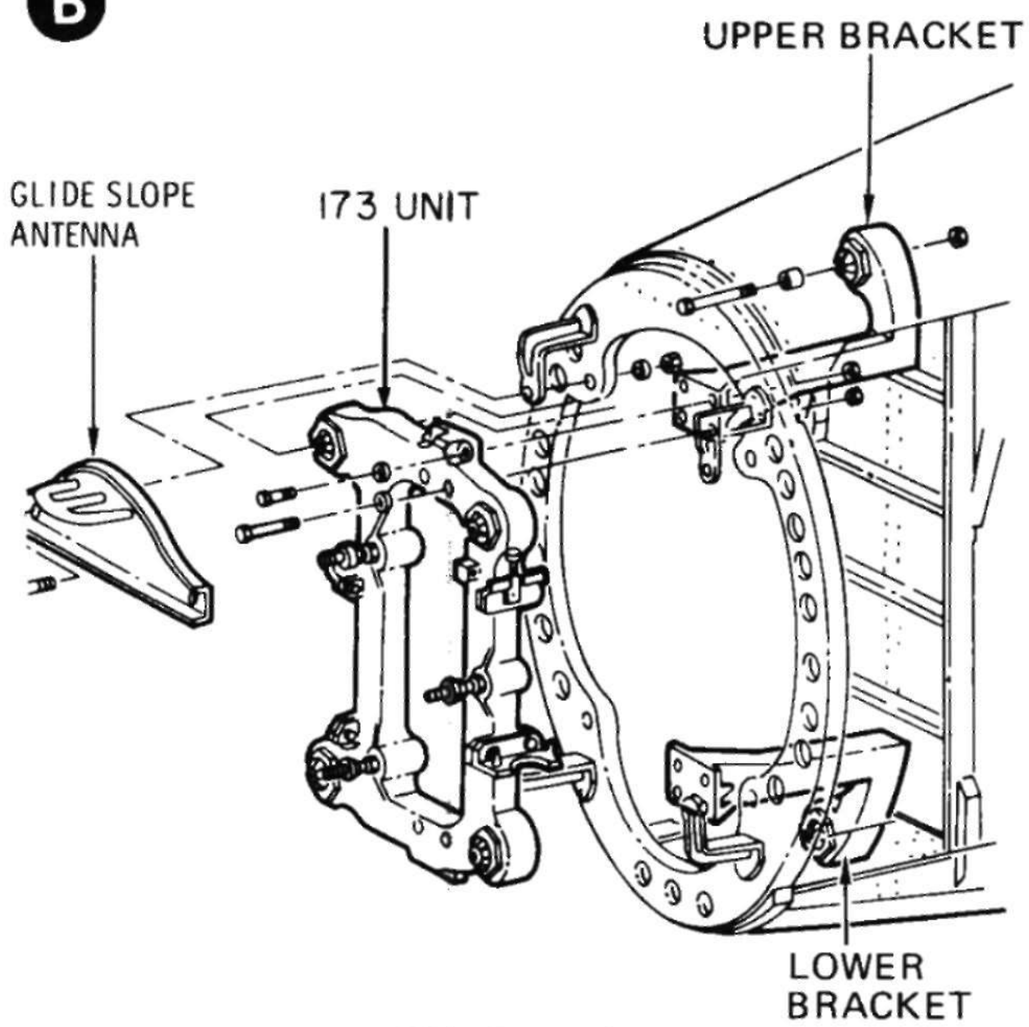
PREPARATION

a. Open left- and right-hand forward electronics compartment doors.
b. Remove radome iaw para 10-4m.

WARNING

CHECK THAT ALL AIRCRAFT POWER IS OFF. HIGH VOLTAGE IS PRESENT IN RADAR RECEIVER-TRANSMITTER.

B

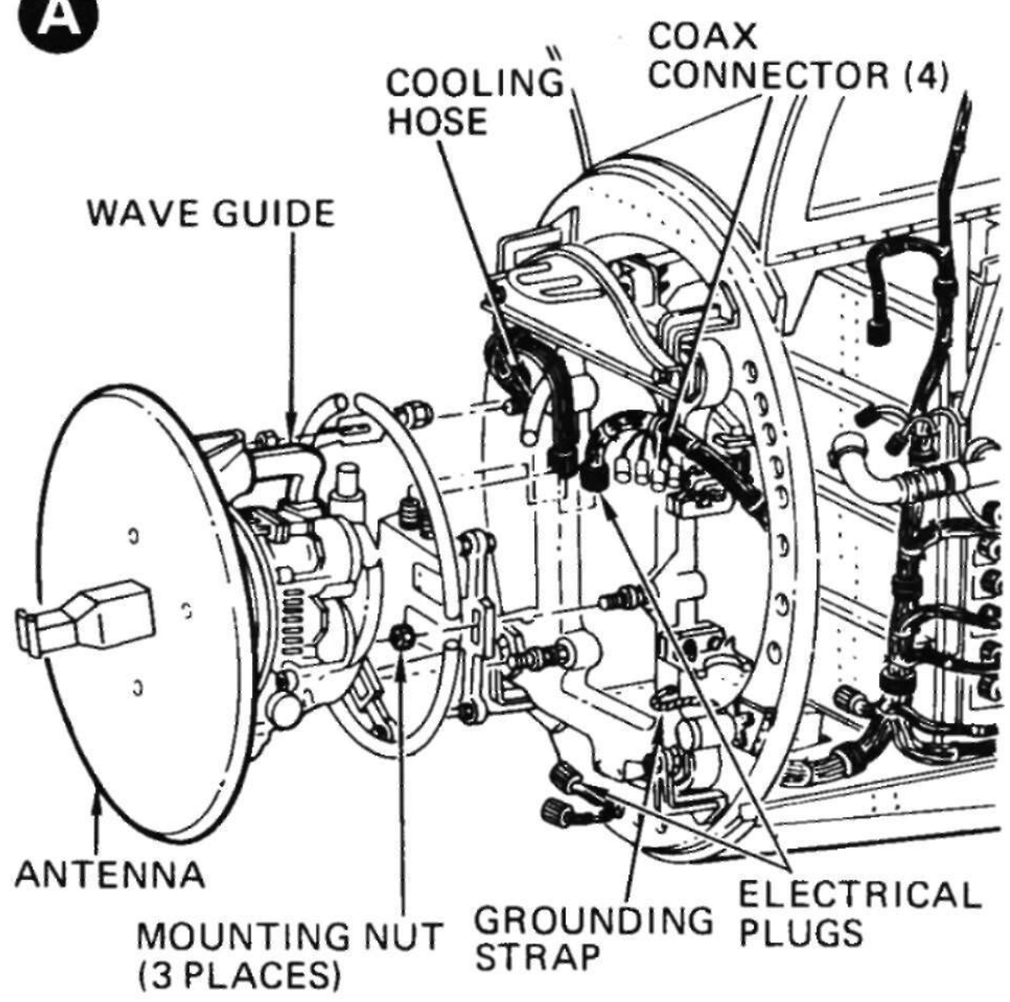


REMOVAL OF ELECTRICAL EQUIPMENT RACK

a. Remove 017, 065, 425 and 541 units iaw para 10-4f, and para 10-4a.

b. Remove glide slope antenna, 173 unit, and upper and lower brackets by removing eight bracket bolts and six isolator bolts.

A



REMOVAL OF ANTENNA PROCEDURE

a. Disconnect waveguide from antenna.
b. Disconnect electrical plugs and coax connectors from antenna.
c. Disconnect grounding strap.
d. Disconnect cooling hose.
e. Remove antenna by removing mounting nuts.

INSTALLATION PROCEDURE --ANTENNA

CAUTION

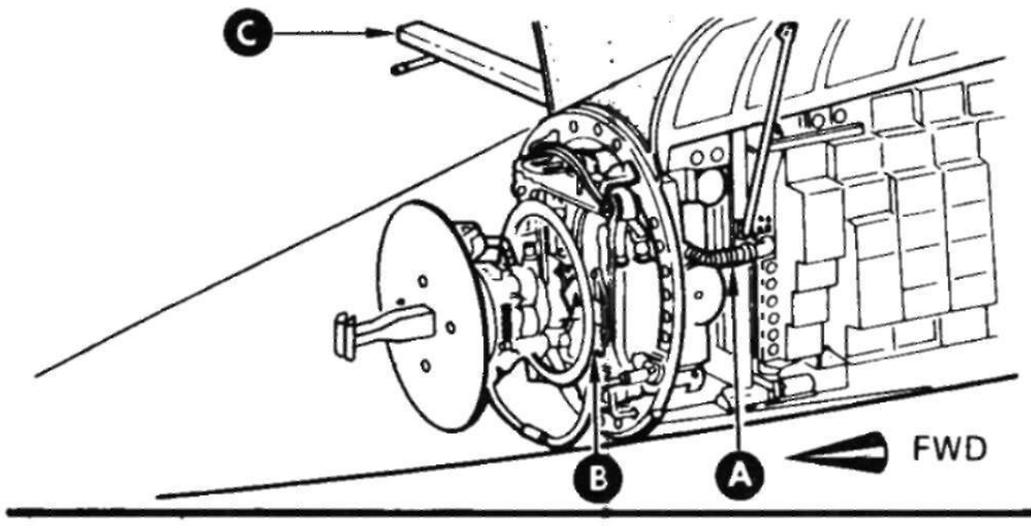
ENSURE COOLING HOSE IS CONNECTED TO PREVENT DAMAGE TO THE AZIMUTH DRIVE MOTOR.

The antenna installation procedure is essentially the reverse of the removal procedure. However, in installing antenna mounting nuts observe the following torques values. Torque each nut against the antenna base to 660 to 710 inch-pounds at 75°F. For high temperatures increase torque 2 inch-pounds for each degree F above 75°. For temperatures below 75°F, decrease torque on each nut 2 inch-pounds for each degree F below 75°. Boresight antenna iaw paragraph 13-2.

NOTE

AFTER INSTALLATION IS COMPLETE, PERFORM RADAR HIGH PRESSURE AND INTERLOCK CHECK IAW PARA 3-4Q AND INSTALL RADOME IAW PARA 10-4M.

Figure 10-3. 017 and 173 Unit Replacement

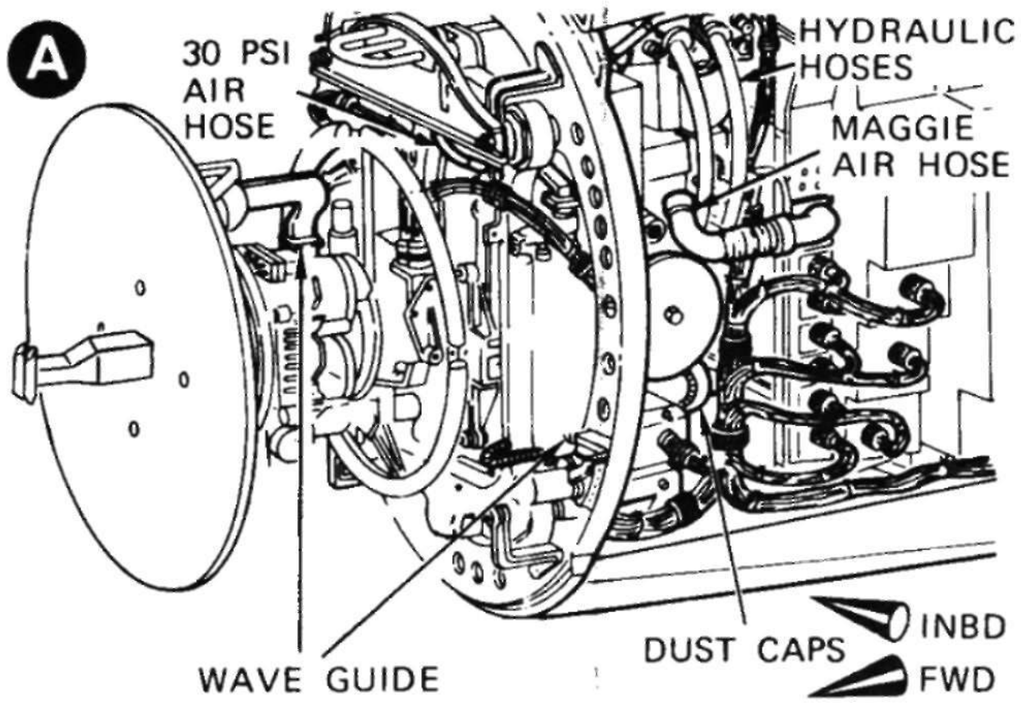


7-918-761F

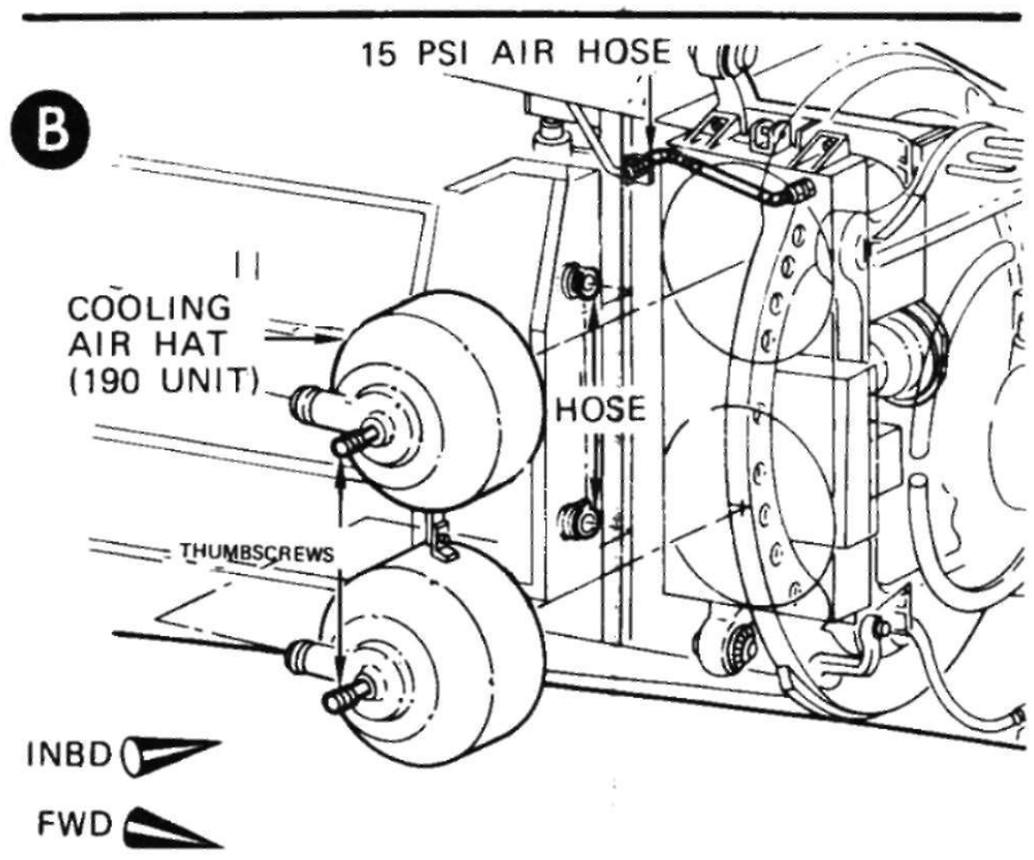
a. Open radar and computer compartment doors.

WARNING

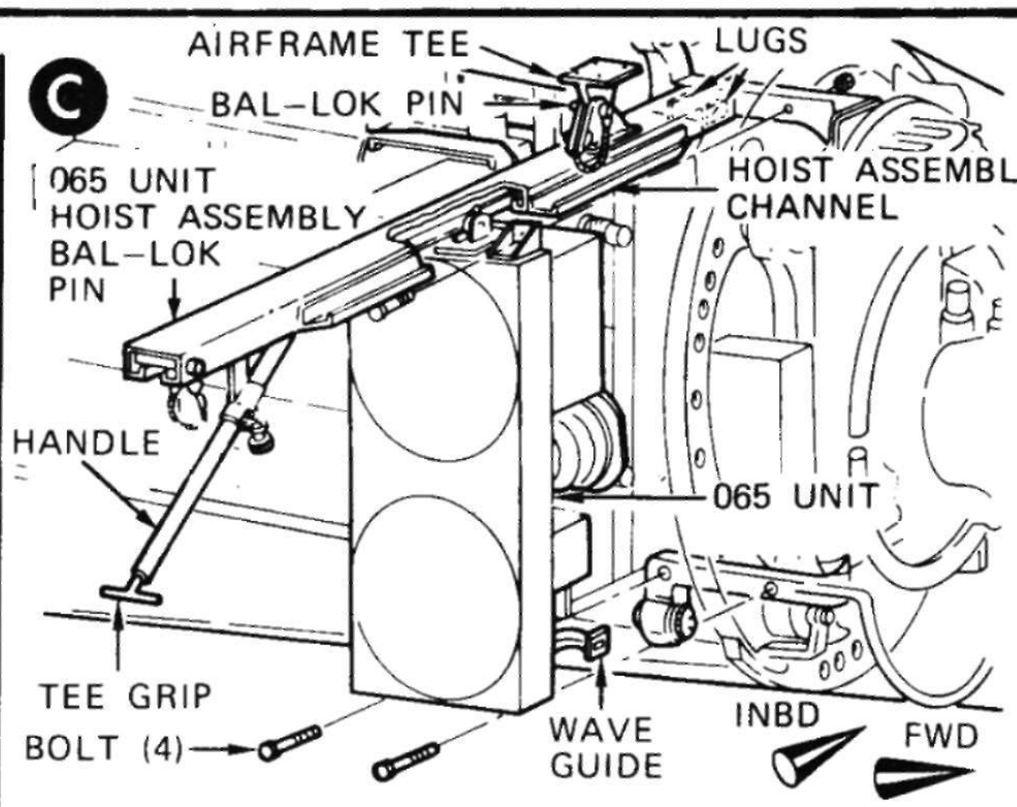
CHECK THAT ALL AIRCRAFT ELECTRICAL POWER IS OFF. HIGH VOLTAGES ARE PRESENT AROUND RADAR RECEIVER–TRANSMITTER UNIT.



b. Deleted.



c. Disconnect cooling air hoses from cooling air hat.
d. Cut safety wire and loosen thumb nuts on cooling air hat and remove hat.
e. Press 024 BLEED VALUES to bleed pressure from 065 unit.
f. Disconnect 15 psi air hose at radar receiver–transmitter unit.



g. Install receiver–transmitter hoist assembly by slipping end of hoist assembly channel over lugs.
h. Attach hoist assembly channel to airframe tee with Bal–Lok pin.
i. Fit hoist assembly handle into hoist channel and insert Bal–Lok pin in outboard end of channel.
j. Roll handle inboard until inboard end contacts pin at top of receiver–transmitter.
k. Pull back tee grip on handle to open end lock.
l. Engage end lock with pin on top of 065 unit and release tee grip to close lock.

CAUTION

INSURE THE 065 UNIT REMOVAL BAR IS LOCKED TO HOIST CHANNEL.

m. Disconnect maggie air hose.
n. Disconnect and remove wave guide and wiring from receiver–transmitter. Disconnect the maggie drain line from maggie fitting.
o. Remove four bolts from 065 unit.
p. Roll 065 unit out of compartment using handle assembly. Connect hydraulic lines to dust caps on 065 unit.

CAUTION

DO NOT PULL ON TEE GRIP AT END OF HANDLE.

q. When clear of fuselage, 065 unit can be transferred to stand or cart.

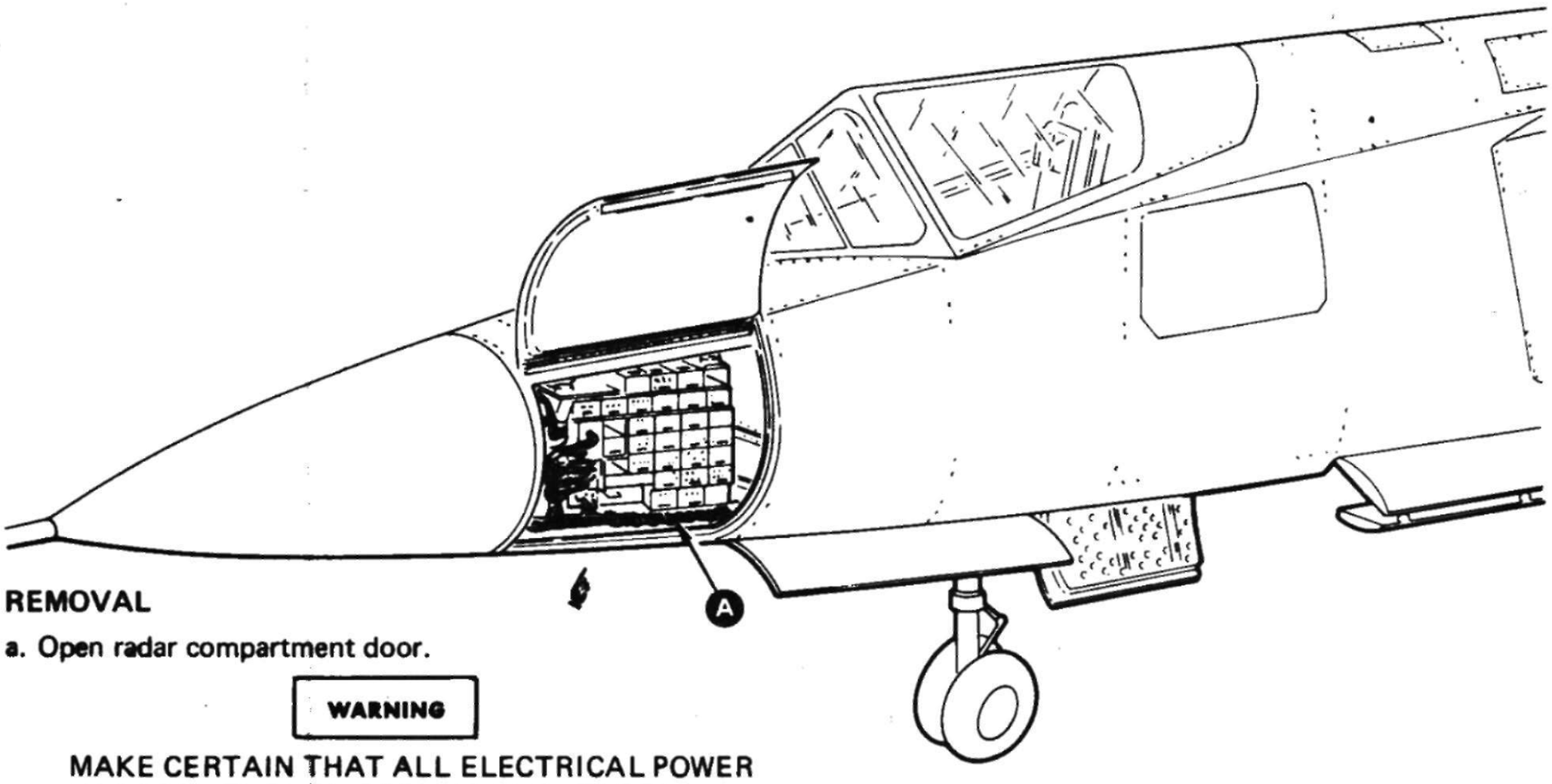
INSTALLATION PROCEDURE, RECEIVER–TRANSMITTER UNIT.

Installation is essentially the reverse of removal. However, in installing the unit, the four installation bolts should be torqued as follows: 150 to 160 inch–pounds at 75° F; for higher temperatures, increase torque on each bolt 0.5 inch–pounds for each increase of 1° F. For lower temperatures, decrease torque on each bolt 0.5 inch–pounds for each decrease of 1° F.

NOTE

WHEN THIS PROCEDURE IS COMPLETE, PER FORM RADAR HIGH PRESSURE AND LEAKAGE INTERLOCK CHECK IAW PARA 3–4Q.

Figure 10-4. 065 Unit Replacement



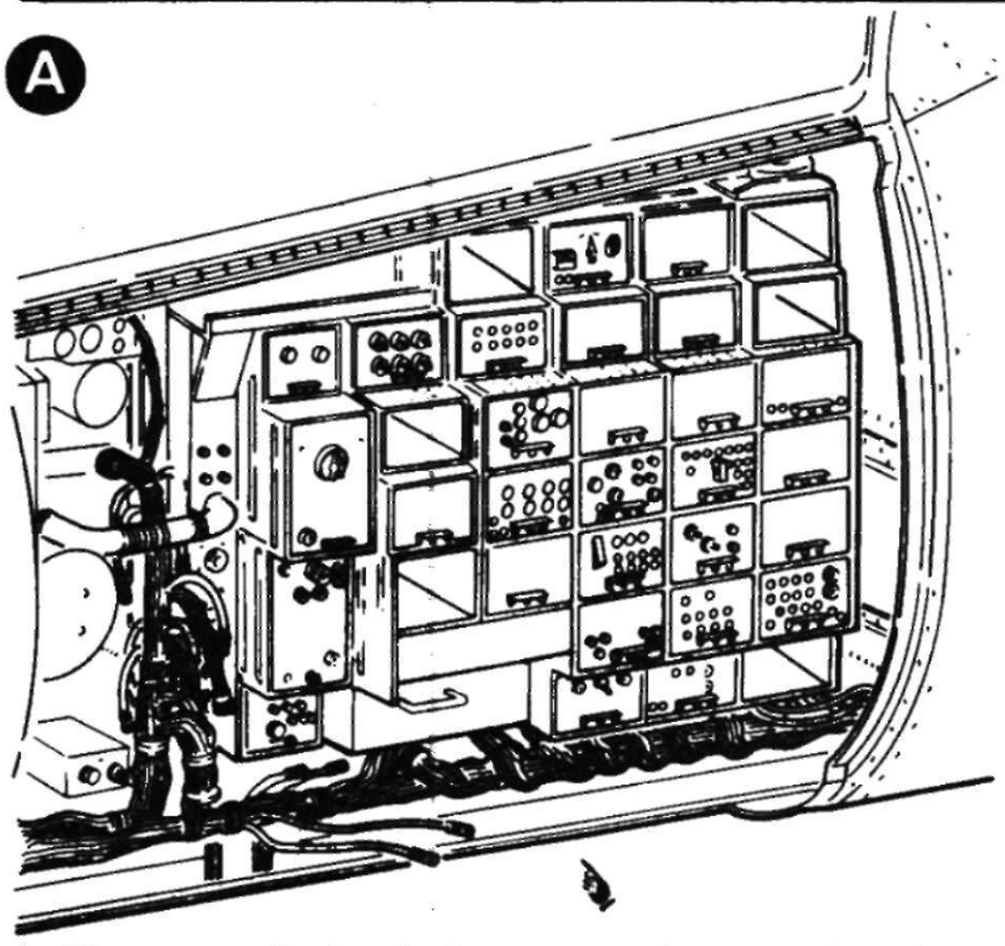
REMOVAL

a. Open radar compartment door.

WARNING

MAKE CERTAIN THAT ALL ELECTRICAL POWER HAS BEEN TURNED OFF. HIGH VOLTAGES ARE PRESENT IN THIS COMPARTMENT WHEN POWER IS ON.

A



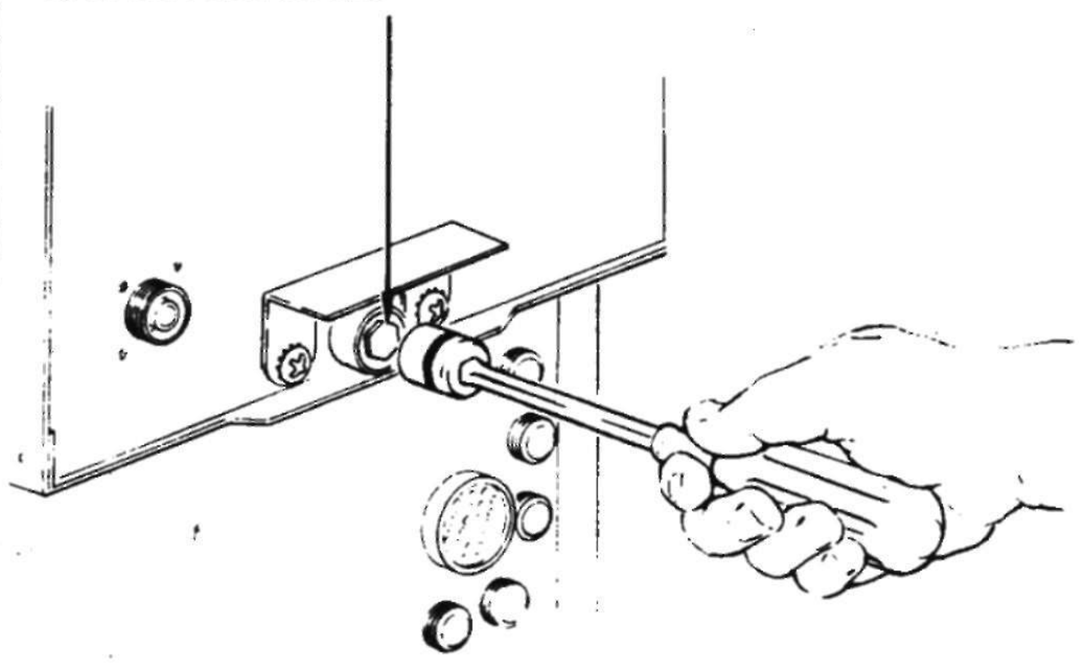
b. Disconnect all electrical connectors in compartment.

NOTE

TAG ALL PLUGS TO PROVIDE CORRECT AND CONVENIENT RECONNECTIONS.

B

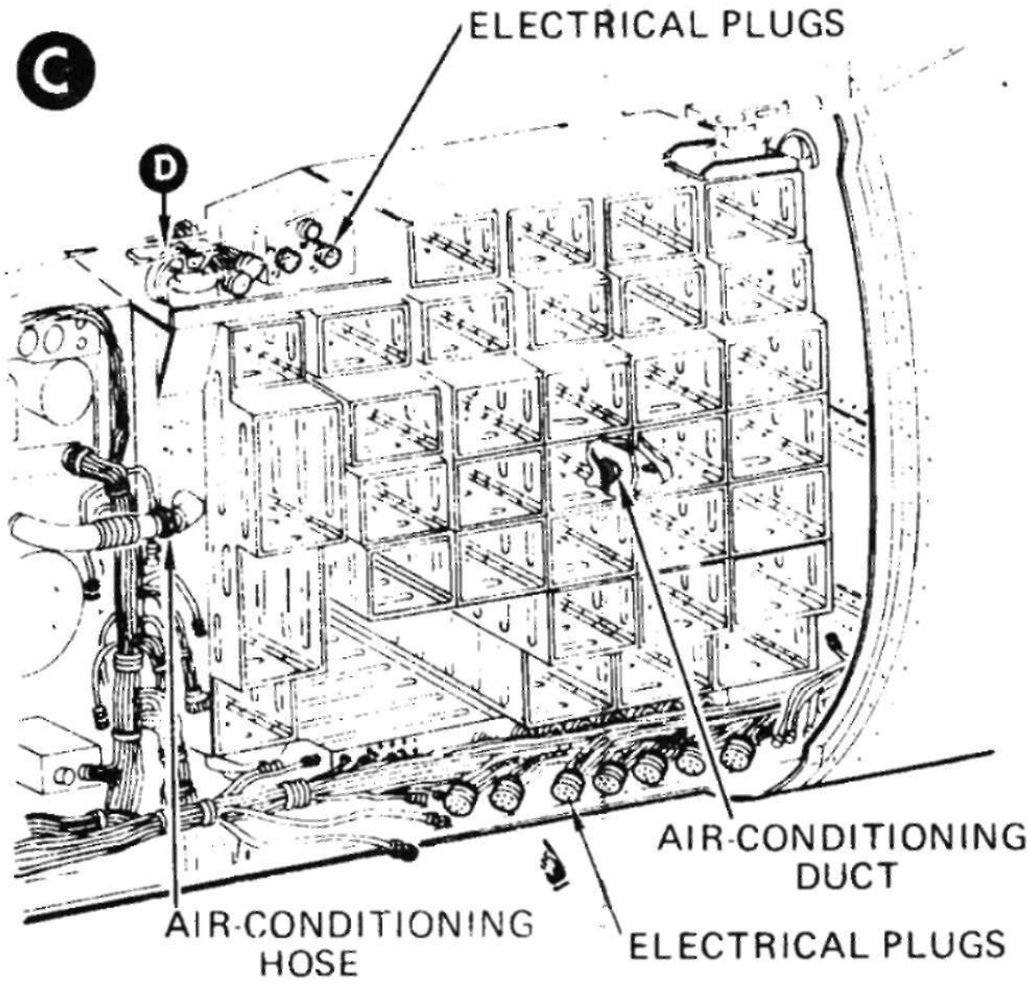
LATCH ASSEMBLY



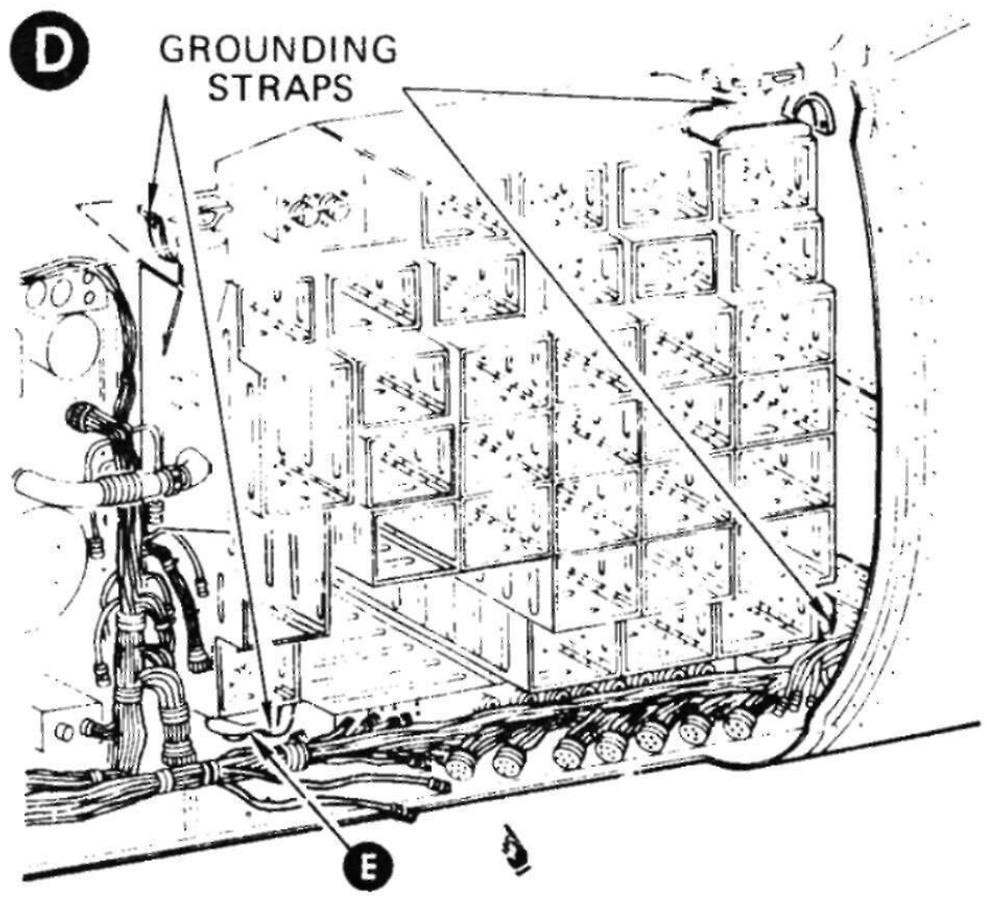
c. Using spintite, press the latch assembly in and unscrew latch retaining screw two or three turns on unit to be removed.
d. Slowly pull out unit from rack, using care to prevent plug and receptacle contacts at rear of unit from being damaged.
e. Remove all other units in rack, following the procedures of steps c and d.
f. Remove all units that are secured by knurled nuts by loosening knurled nut and slowly pulling units from rack.

7-907-26C

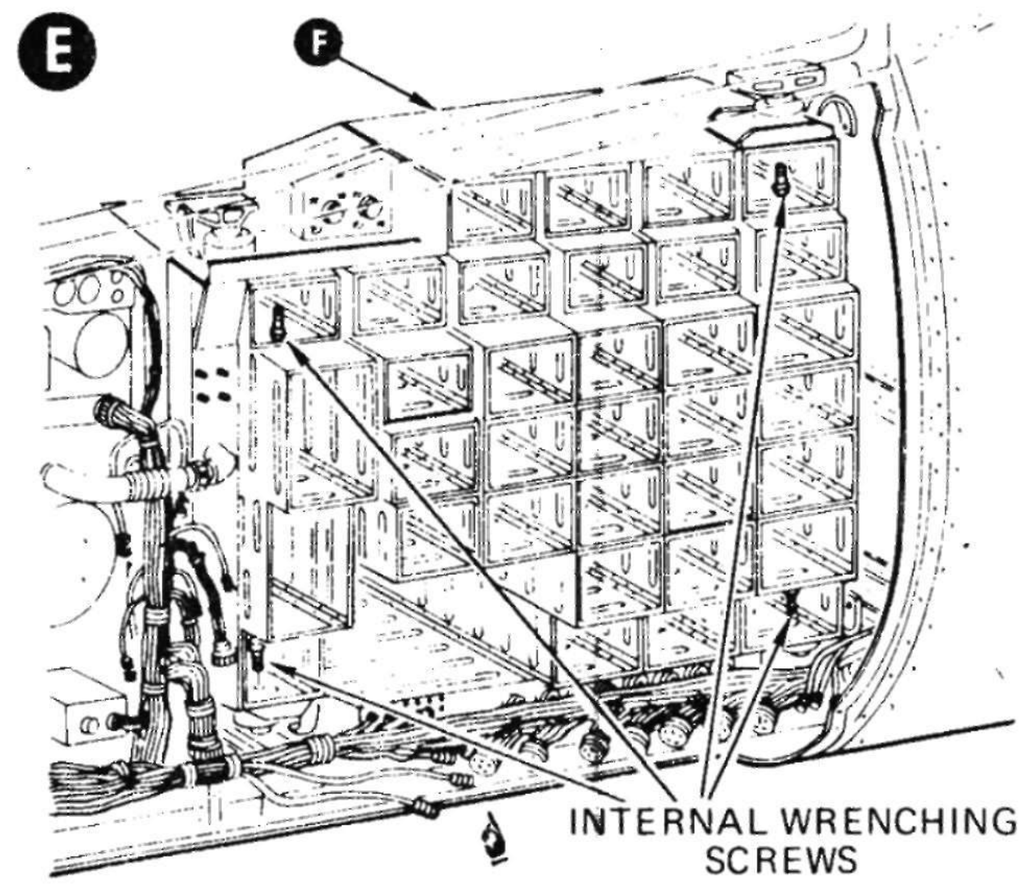
Figure 10-5. 073 Unit Replacement (Sheet 1 of 2)



g. Remove screws in nww that secure air conditioning duct.
h. Unscrew clamp from air conditioning hose.
i. Arrange all electrical wiring so that it will not be damaged during rack removal.

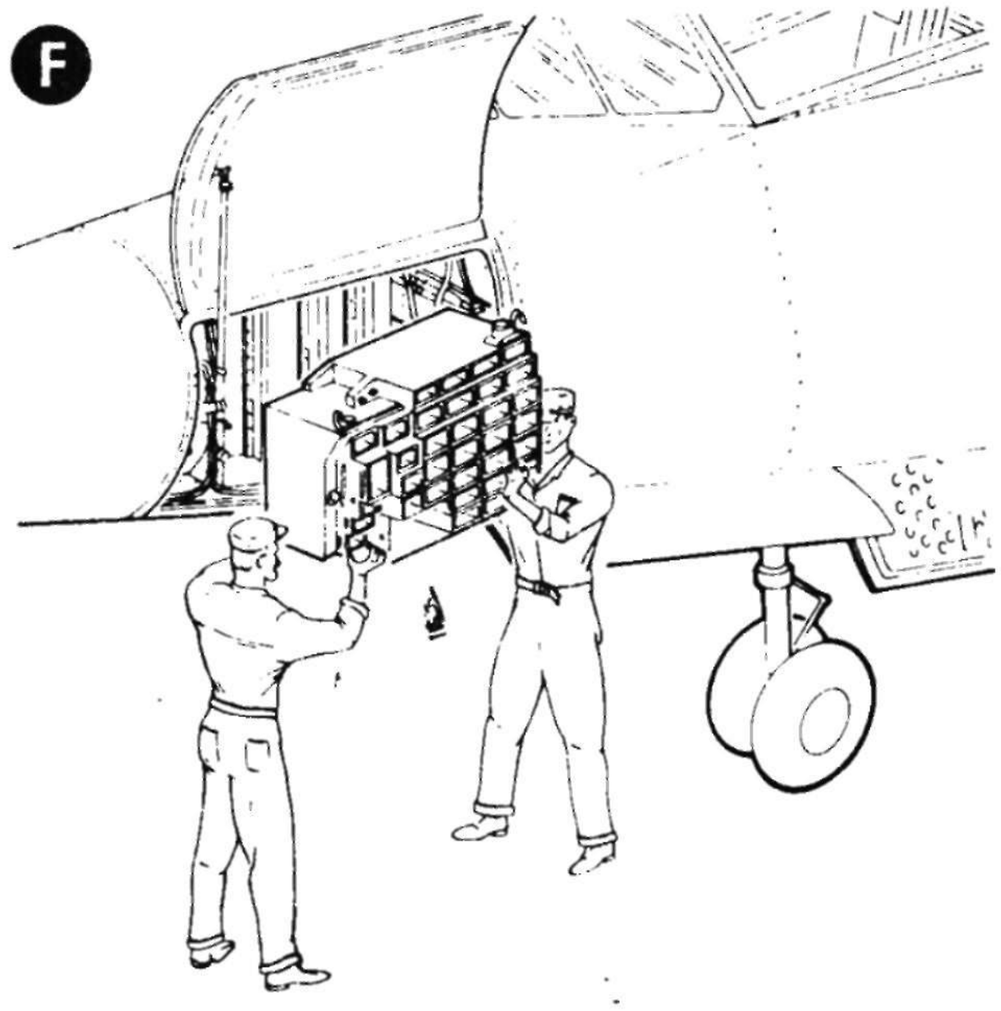


j. Disconnect grounding straps from airframe.



k. Remove two internal wrenching screws that secure lower shock mounts and rack to airframe.
l. Remove two internal wrenching screws that secure upper shock mounts and rack to airframe.

7-907 27B

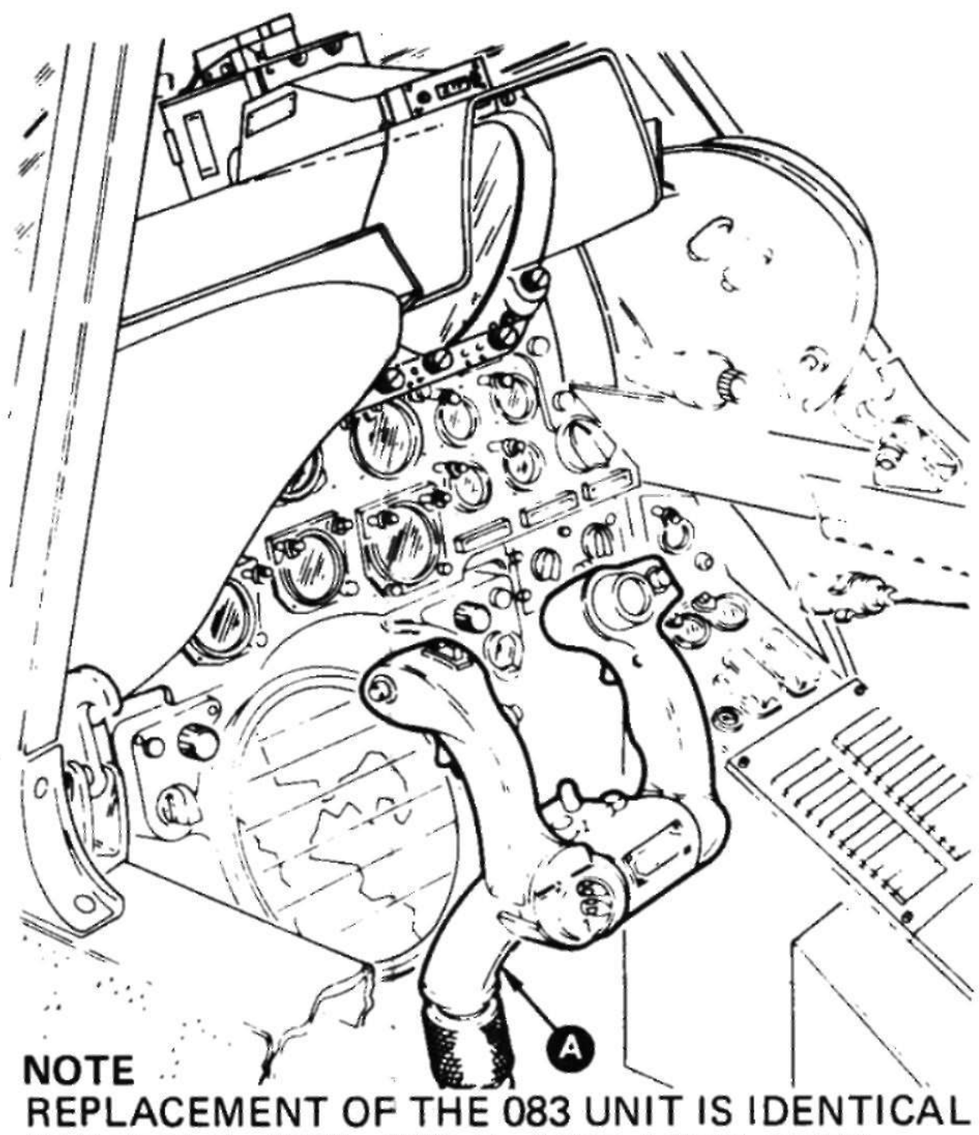


m. Lift rack upward and outboard until clear of compartment.

INSTALLATION

Installation is essentially the reverse of removal.

Figure 10-5. 073 Unit Replacement (Sheet 2 of 2)



NOTE
REPLACEMENT OF THE 083 UNIT IS IDENTICAL IN BOTH F–106A AND F–106B AIRPLANES (BOTH COCKPITS).

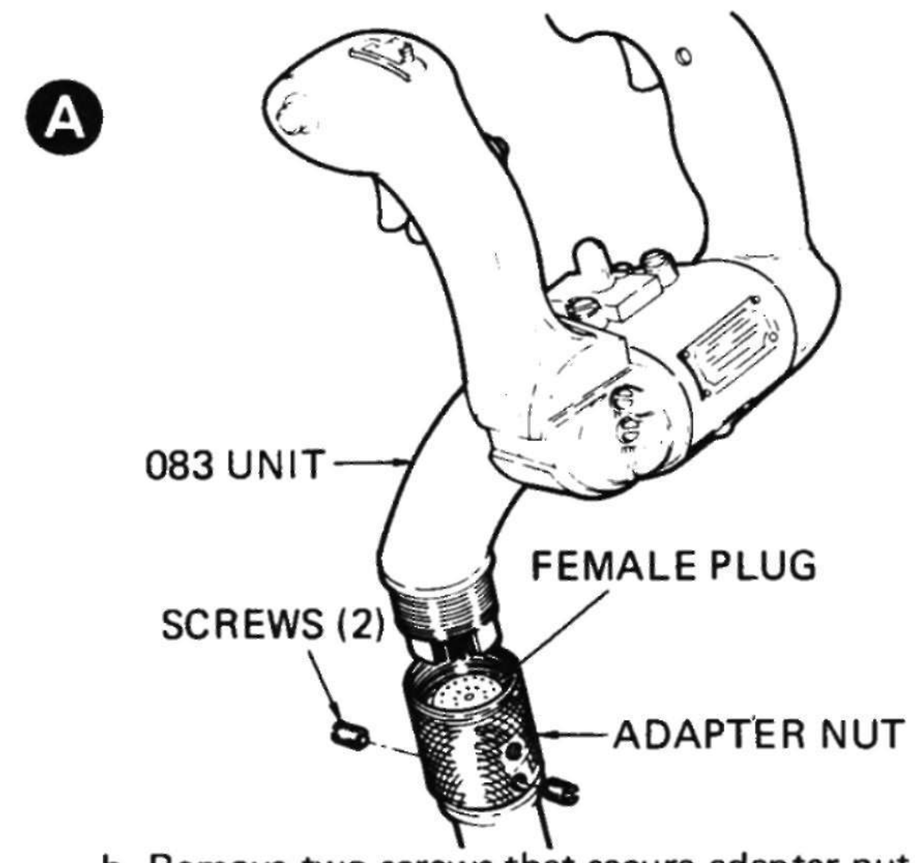
REMOVAL

a. Open canopy and install canopy hold-open support.

WARNING

MAKE CERTAIN THAT ALL AIRCRAFT POWER HAS BEEN TURNED OFF.

7–907–16C



b. Remove two screws that secure adapter nut.
c. Loosen adapter nut by hand until 083 unit is free.
d. Lift 083 unit carefully to prevent damage to electrical connector.
e. Cap the exposed ends of the adapter nut to prevent contamination to the electrical plug.

INSTALLATION

Installation is essentially the reverse of removal. Apply Teflon anti-seize tape, MIL–T–27730A, to the threads according to the manufacturer's instructions or refer to paragraph 3.8 of MIL–T–27730A.

NOTE

Teflon anti-seize tape, FSN 8030–057–8048 or 8030–889–3534, will waterproof the threads and prevent seizing during removal.

Figure 10-6. 083 Unit Replacement

10-41. 641 UNIT. Refer to paragraph 10-4a for procedures to remove and replace the 641 unit.

CAUTION

Keep 641 unit shielded and away from the maggie when removed from aircraft. Damage to the 641 unit could occur from magnetism.

Do not place 641 unit near 080 unit when it is removed. Damage to the 080 unit MMST could occur.

10-4m. RADOME. Refer to figure 10-7 for procedures to remove and replace the radome.

10-4n. 463045 UNIT ADAPTER BRACKET.

NOTE

The 463045 unit may be installed in any F-106 aircraft in place of the 464045 unit by use of the following instructions.

(1) Manufacture compressor bracket (part number 67C45432) in accordance with figure 10-8.

(2) Remove bracket (part number 204-684) and mounting hardware from 463045 unit and retain.

(3) Mount bracket (part number 67C45432) on 463045 unit using four screws (part number MS51959-63). Install assembly on aircraft iaw para. 10-4e.

10-4o. 017 AZIMUTH DRIVE MOTOR AND RESOLVERS.

WARNING

Ensure that all aircraft power has been turned off.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Remove radome iaw para. 10-4m.

NOTE

To remove azimuth drive motor, perform steps (3) thru (6). To remove a resolver, perform steps (7) thru (9).

(3) Disconnect cooling hose from azimuth drive motor.

NOTE

Tag all wires on the azimuth drive motor before disconnecting to ensure proper connection during installation.

(4) Remove all electrical connections from the azimuth drive motor.

(5) Remove 3 clamping screws from the azimuth drive motor.

(6) Remove azimuth drive motor.

NOTE

Tag all wires on the resolver before disconnecting to ensure proper connection during installation.

(7) Remove all electrical connections from the resolver.

(8) Remove 3 clamping screws from the resolver.

(9) Remove desired resolver (B1, B2, B3, B6, B7, or B8).

NOTE

Installation procedure is essentially the reverse of removal.

CAUTION

Ensure that cooling hose is connected to azimuth drive motor.

10-4p. 017 GYRO HEAT RELAY PACKAGE.

WARNING

Ensure that all aircraft power has been turned off.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Remove radome iaw para. 10-4m.

CAUTION

To prevent damage to the cable harness connector, simultaneously remove the two screws mentioned in step (3).

(3) Simultaneously remove 2 screws from cable harness connector.

(4) Remove clamps from cable harness assembly.

(5) Remove 5 screws.

(6) Remove gyro heat relay package.

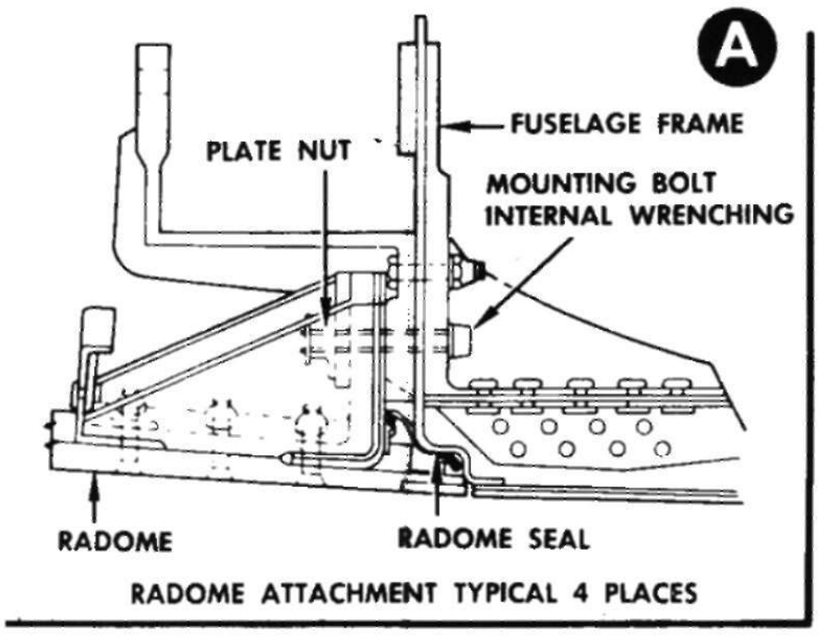
NOTE

Installation procedure is essentially the reverse of removal.

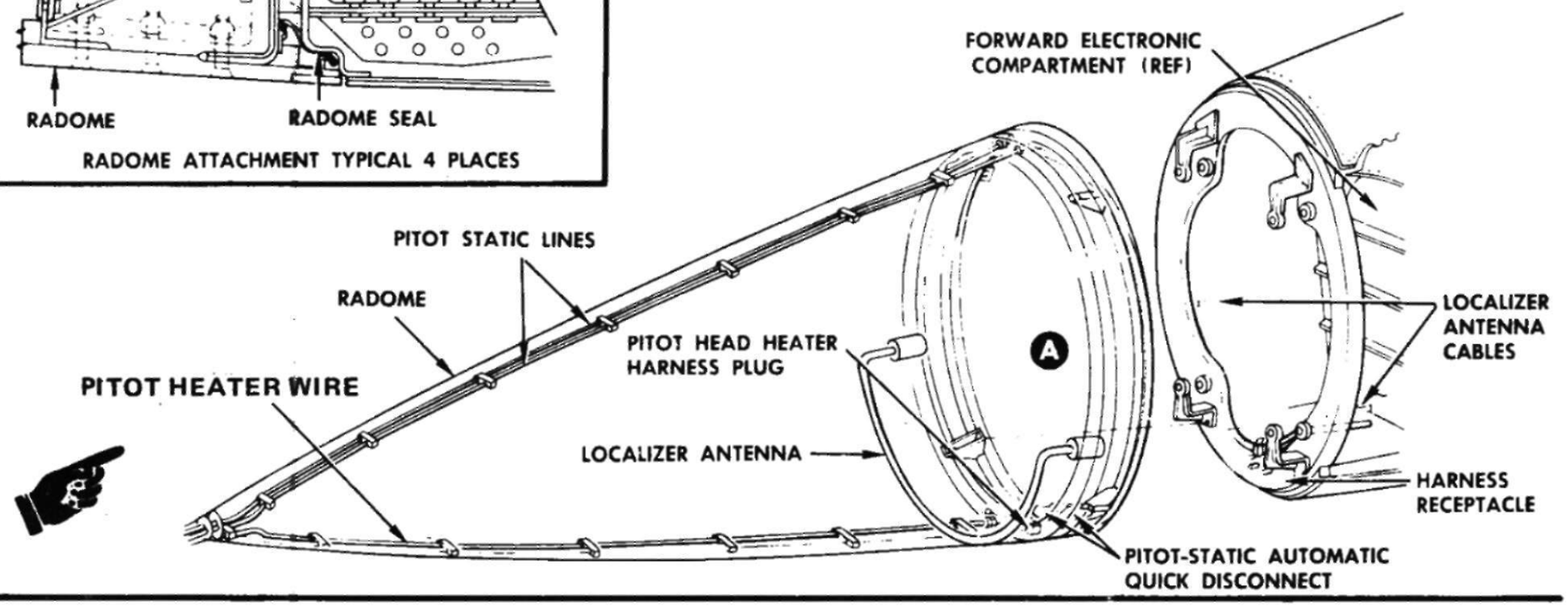
10-4q. 017 HIG GYROS.

WARNING

Ensure that all aircraft power has been turned off.







REMOVAL, RADOME

a. Open radar and computer compartment doors.

NOTE

If radome lights are installed, disconnect wiring before removing radome.

b. Disconnect localizer antenna cable at each side.
c. With radome removal adapter set SE-1052 (8220-233731-45). installed on Lockheed truck (8220-780800). ppsition truck and support radome.

CAUTION

USE CARE WHEN MOVING RADOME FORWARD TO PREVENT DAMAGE TO THE PITOT TUBE HEATER HARNESS.

d. Remove four radome mounting bolts then pull truck straight forward until radome is clear.
e. Disconnect pitot heater harness plug at aft end of radome.
f. Place radome on SE-0918 (1730-691-9835) storage support.

INSTALLATION

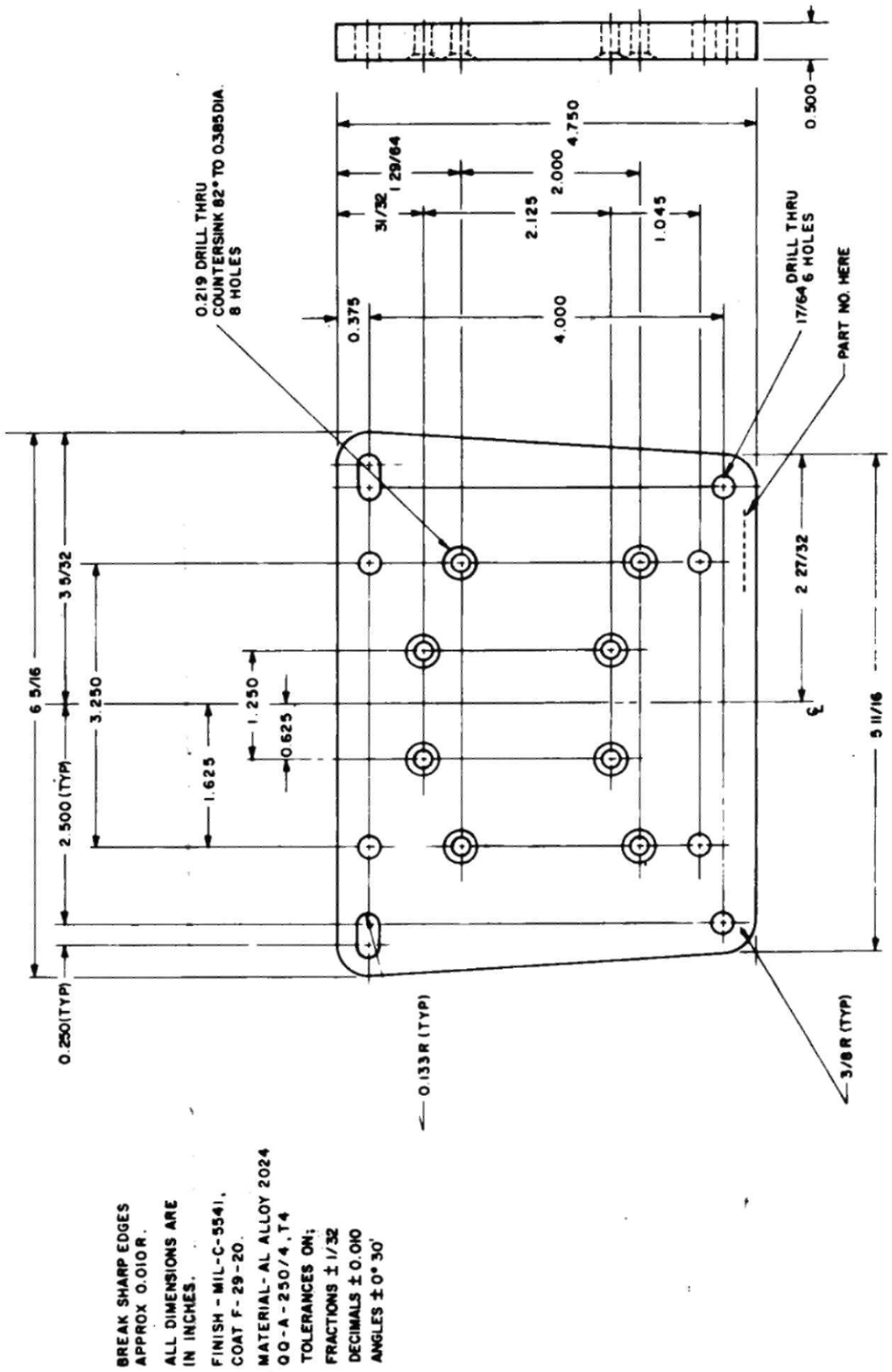
CAUTION

THE RADOME WEIGHS APPROXIMATELY 145 POUNDS AND MUST NOT BE SUPPORTED BY THE PITOT BOOM DURING REMOVAL. BE CAREFUL NOT TO DAMAGE RADOME COATING. COATING REPAIRS MADE ON RADOME MUST CONFORM TO SPECIFICATION MIL-C-7439A.

a. Place radome on Lockheed truck (8220-780800), equipped with radome removal adapter set SE-1052 (8220-233721-45).
b. Position truck to align radome mounting holes. Before rolling radome against fuselage, connect pitot heater harness plug at aft end of radome and safety wire. Align pitot static automatic quick disconnect. Check that radome seal makes contact with periphery angle on fuselage frame. Check pitot heat by placing pitot heat switch to ON position until pitot tube begins to heat. Then place pitot switch to OFF position.
c. Install four mounting bolts and tighten to torque value of 225 to 250 inch-pounds.
d. Connect localizer antenna cable at each side.
e. Close and secure doors.
f. Pull truck clear of airplane.

7-907-38E

Figure 10-7. Radome Replacement



7-981-20A

Figure 10-8. Adapter Bracket for 463045 Compressor

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Remove radome iaw para. 10-4m.

(3) Remove 3 allen screws that secure counterweight and remove counterweight.

(4) Disconnect HIG gyro cable.

(5) Remove 3 clamping screws from HIG gyro.

(6) Remove HIG gyro.

NOTE

- Installation procedure is essentially the reverse of removal.

- **Ensure fiber spacers are installed between antenna gyro mount cavity and gyro at three allen screw attaching clamp points.**

CAUTION

After installation of HIG gyro, tie HIG gyro cables so they cannot be damaged when antenna searches.

10-4r. 065 DELAY TRIGGER AMPLIFIER.

WARNING

Ensure that all aircraft power has been turned off.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Remove 4 coax cables.

(3) Remove 4 screws.

(4) Remove delay trigger amplifier.

NOTE

Installation procedure is essentially the reverse of removal.

10-4s. 065 MOD BOARD.

WARNING

Ensure that all aircraft power has been turned off.

Prior to removing 065 transmitter hat, press 024 BLEED VALVES until pressurization is reduced to local atmospheric pressure..

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Press 024 BLEED VALVES to reduce pressurization to local atmospheric pressure.

(3) Cut safety wire that secures outer cooling hat and loosen knurl knob. Remove outer cooling hat and then loosen inner hat mount bolt that secures pressure hat to the 065 unit.

(4) Remove transmitter hat.

WARNING

Short thyratron and disconnect diodes to ground.

(5) Disconnect caps from disconnect diodes.

(6) Remove one coax cable.

(7) Remove mod board.

NOTE

- Installation procedure is essentially the reverse of removal. When performing installation, ensure that O-ring and r-f shield are properly installed.

- **Insure white lines on the 065 unit and the mod board pressure hat are aligned. Perform radar high pressure and leakage check iaw paragraph 3-4q.**

10-4t. 065 MAGGIE.

WARNING

Ensure that all aircraft power has been turned off.

Prior to removal, press 024 BLEED VALVES until pressurization is reduced to local atmospheric pressure.

CAUTION

Use care to keep the maggie away from 641 unit. Damage to the 641 unit could occur from magnetism.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Press 024 BLEED VALVES to reduce pressurization to local atmospheric pressure.

(3) Disconnect cooling hose.

(4) Disconnect 2 hydraulic lines.

(5) Disconnect coax cable.

(6) Disconnect waveguide. Disconnect maggie drain line at maggie fitting.

(7) Remove 4 bolts.

(8) Remove maggie.

NOTE

- Installation procedure is the reverse of removal.
- **To insure proper installation of drain line, remove panel number 215 beneath nose of aircraft and ensure drain line is connected to the nipple leading to exterior surface of aircraft. Insure "O" ring is properly installed. Perform radar high pressure and leakage interlock check iaw paragraph 3-4q.**

10-4u. 065 PFN.

WARNING

Ensure that all aircraft power has been turned off.

Prior to removing 065 transmitter hat, press 024 BLEED VALVES until pressurization is reduced to local atmospheric pressure.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Press 024 BLEED VALVES to reduce pressurization to local atmospheric pressure.

(3) Remove 065 transmitter hat.

(4) Remove mod board iaw para. 10-4s.

(5) Remove all electrical connections from PFN.

(6) Remove 6 screws from PFN MOD BOARD side; then remove 2 screws from PFN relay rack side.

(7) Remove PFN.

NOTE

Installation procedure is the reverse of removal. Perform radar high pressure and interlock check iaw paragraph 3-4q.

10-4v. 065 RECEIVER BARREL.

WARNING

Ensure that all aircraft power has been turned off.

Prior to removing 065 receiver hat, press 024 BLEED VALVES until pressurization is reduced to local atmospheric pressure.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Press 024 BLEED VALVES to reduce pressurization to local atmospheric pressure.

(3) Loosen 4 bolts on receiver hat.

(4) Remove receiver hat.

(5) Remove 2 coax cables.

(6) Remove nut and washers on receiver barrel.

CAUTION

Use care not to damage coax cable when pulling receiver barrel forward.

(7) Loosen three screws on receiver barrel and pull receiver barrel forward.

(8) Remove remaining coax cable on receiver barrel.

(9) Remove receiver barrel.

NOTE

Installation procedure is essentially the reverse of removal. When performing installation, ensure that O-ring and r-f shield are properly installed.

10-4w. 065 RELAY RACK.

WARNING

Ensure that all aircraft power has been turned off.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Remove nut and washers.

(3) Loosen bolt.

(4) Remove relay rack.

NOTE

Installation procedure is essentially the reverse of removal.

10-5. IR UNIT REPLACEMENT.

CAUTION

Pull IR cooling circuit breaker located in nose wheel well. Comply with preliminary instructions in paragraph 4-2 prior to performing work on IR System.

10-5a. 499 AND 767 UNITS.

WARNING

Ensure that all aircraft power has been turned off.

Do not attempt to work in area of 767 unless computer compartment IR MANUAL VALVE is set to LOCK.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Set computer compartment IR MANUAL VALVE to LOCK.

(3) Disconnect 2 nitrogen lines from 767 unit.

(4) Disconnect connector that attaches 499 unit to aircraft bulkhead.

(5) Remove 4 allen screws that secure 767 unit.

CAUTION

Exercise care when removing 767 and 499 units. Snagging of quick disconnect lines can easily damage high pressure line on manifold assembly.

(6) Remove 767 and 499 units.

(7) Disconnect 2 connectors that attach 499 unit to 767 unit.

Installation procedure is essentially the reverse of removal.

10-5b. ACCUMULATOR.

WARNING

Ensure that all aircraft power has been turned off.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Removal

(a) Disconnect 2 nitrogen lines from tee.

(b) Remove 4 bolts that secure accumulator.

(c) Remove accumulator.

(d) Install caps and plugs in accumulator to prevent contamination.

NOTE

Tee must be removed from accumulator and transferred to new accumulator as unit is being changed.

(3) Installation

CAUTION

To lessen possibility of contamination, do not remove caps or plugs from accumulator until immediately prior to final connection.

(a) Lightly coat tee using Dow Corning DC510 compound and install tee in accumulator. Do not tighten nut on tee.

(b) Install accumulator and 4 bolts.

(c) Connect 2 nitrogen lines to tee. Rotate tee as required to connect nitrogen lines.

(d) Tighten nut on tee to 40 to 65 in-lbs and safety wire nut iaw MIL-SPEC MD33540.

(e) Tighten nitrogen lines to 40 to 65 in-lbs.

10-5c. ADSORBER.

WARNING

Ensure that all aircraft power has been turned off.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Disconnect 2 nitrogen lines from adsorber.

(3) Remove 6 screws that secure adsorber.

(4) Remove adsorber.

NOTE

Installation procedure is essentially the reverse of removal.

10-5d. COMPRESSOR.

WARNING

Ensure that all aircraft power has been turned off.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Disconnect low pressure quick disconnect from bulkhead above compressor.

(3) Disconnect high pressure quick disconnect from compressor.

(4) Disconnect electrical plug from bulkhead.

CAUTION

Use care not to damage nitrogen servicing line when removing compressor.

(5) Loosen two knurl nuts and slide compressor from mount.

NOTE

Installation procedure is essentially the reverse of removal.

10-5e. DESICCANT CONTAINER.

(1) Disconnect pressure line from desiccant container.

(2) Loosen 2 clamps that secure desiccant container.

(3) Remove desiccant container.

NOTE

Installation procedure is essentially the reverse of removal.

10-5f. 896 UNIT.

(1) No special instructions are required to remove or replace the 896 unit.

(2) When the 896 unit is replaced or reinstalled, perform 896 Alignment Procedure iaw para. 13-3c.

10-6. ARMAMENT UNIT REPLACEMENT.

10-6a. 174 UNIT. Set 905 POWER to OFF and remove all aircraft power. Refer to figure 10-9 for procedures to remoye and replace the 174 unit.

10-6b. 596 UNIT.

WARNING

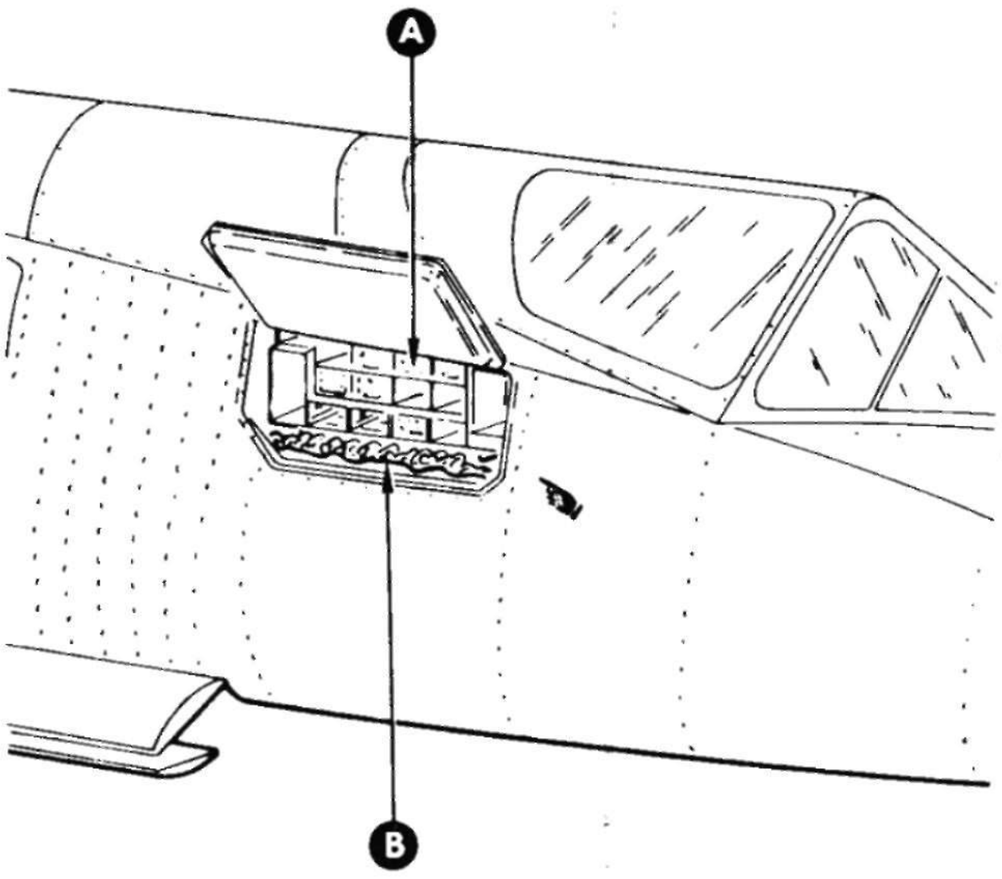
Ensure that all aircraft power has been removed.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Remove 4 screws that secure 596 unit.

(3) Pull 596 unit toward rear of aircraft and disconnect electrical connectors.

(4) Remove 596 unit.



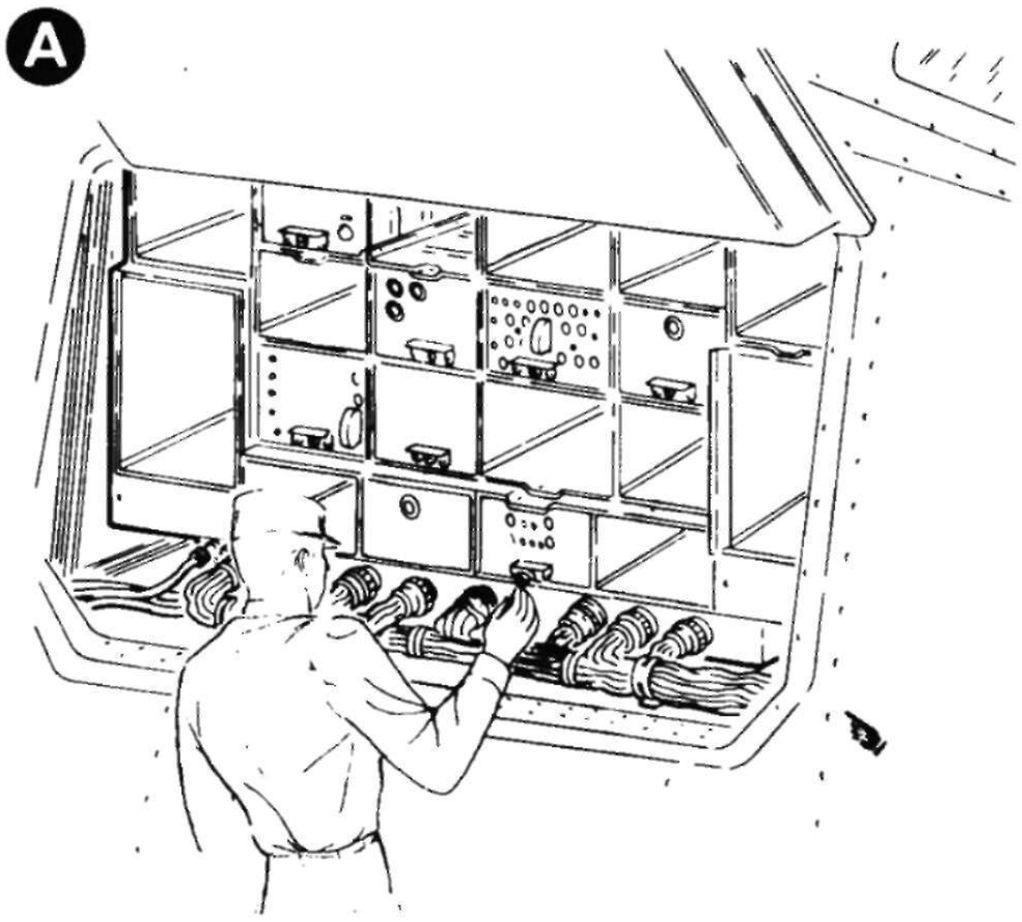
REMOVAL

a. Open door for armament compartment.

WARNING

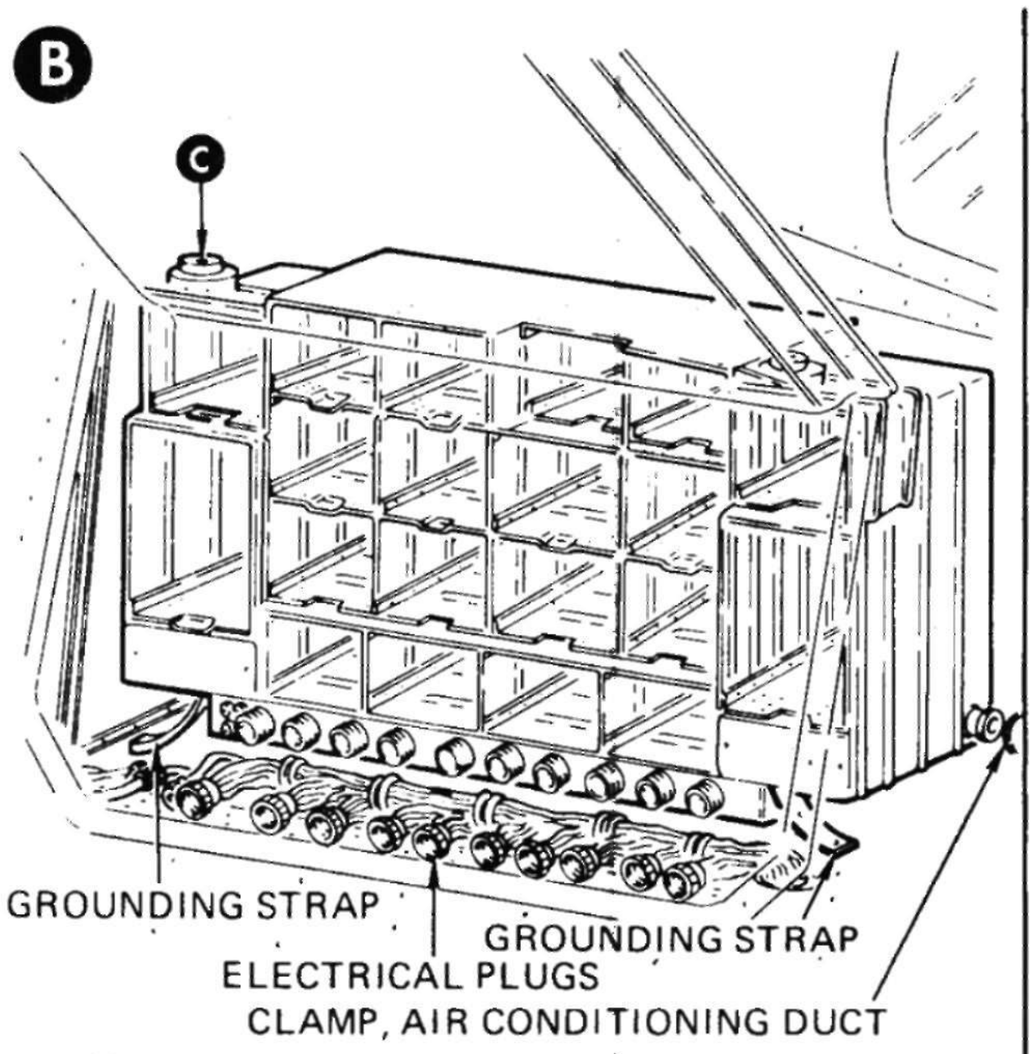
MAKE CERTAIN THAT ALL AIRCRAFT ELECTRICAL POWER HAS BEEN TURNED OFF.

A



b. Using spintite, press the latch assembly in and unscrew latch retaining screw two or three turns on unit being removed.
c. Slowly pull unit out from rack, using care to prevent plug and receptacle contacts from being damaged during unit removal.
d. Remove other units, following the procedure of steps b and c.

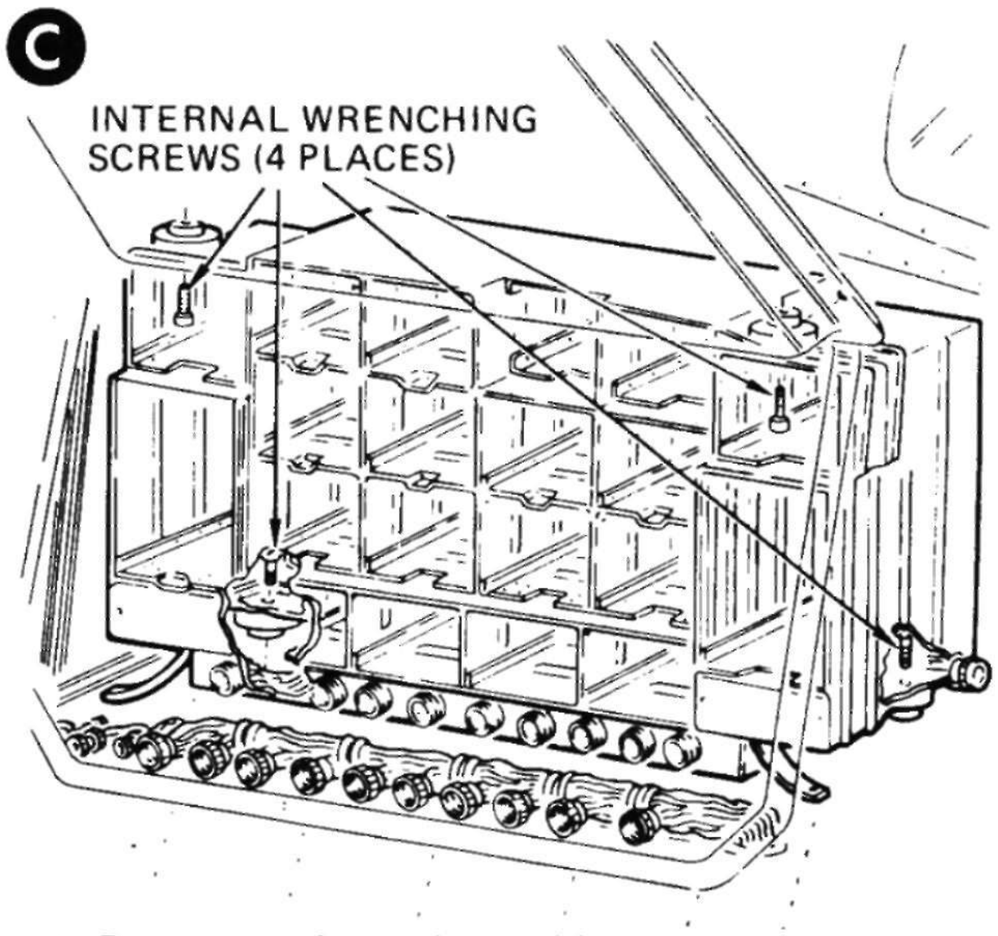
B



e. Unscrew clamp from air-conditioning duct.
f. Disconnect electrical plugs.
g. Disconnect electrical plugs located on bottom of rack (access from data link compartment).
h. Lay plugs and wiring flat to prevent possible damage when rack is removed.
i. Disconnect two rack grounding straps from airframe structure.

7 907 28D

C



j. Remove two internal wrenching screws. that secure rack to lower shock mount.
k. Remove two internal wrenching screws that secure rack to upper shock mount.
l. Lift rack up and outboard until clear of access opening.

INSTALLATION

Installation is essentially the reverse of removal.

Figure 10-9. 174 Unit Replacement

See pg 7 Sup 42

NOTE

Installation of procedure is essentially the reverse of removal.

10-7. COMPUTER UNIT REPLACEMENT.

10-7a. 140 UNIT. Set 905 POWER to OFF and remove all aircraft power. Refer to figure 10-10 for procedures to remove and replace the 140 unit.

10-7b. 273 UNIT. Set 905 POWER to OFF and remove all aircraft power. Refer to figure 10-10 for procedures to remove and replace the 273 unit.

CAUTION

Keep magnets away from the 857 unit.

10-7c. 857 UNIT. Set 905 POWER to OFF and remove all aircraft power. Refer to paragraph 10-4a for procedures to remove and replace the 857 unit.

10-7d. 846 UNIT. Before removing the 846 unit, retrieve the LW routine failure data and the TR routine A51A and acceleration count data.

10-8. POWER UNIT REPLACEMENT

10-8a. 518 UNIT. Refer to paragraph 10-4a for procedures to remove and replace the 518 unit.

10-8b. 873 UNIT. Set 905 POWER to OFF and remove all aircraft power. Refer to figure 10-11 for procedures to remove and replace the 873 unit.

10-8c. 905 UNIT.

WARNING

Ensure that all aircraft power has been turned off.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Loosen 4 Dzus fasteners that secure 905 unit.

(3) Pull 905 unit up and disconnect electrical connector.

(4) Remove 905 unit.

NOTE

Installation procedure is essentially the reverse of removal.

10-8d. 926 AND 989 UNITS.

WARNING

Ensure that all aircraft power has been removed.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Disconnect all electrical connectors from unit and disconnect cables from terminal boards.

(3) Loosen knurl nuts until they are free of stud.

WARNING

The 989 unit weighs in excess of 60 pounds. Exercise care in removing the unit.

(4) Remove unit from rack.

NOTE

Installation procedure is essentially the reverse of removal.

10-9. CN&L UNIT REPLACEMENT.

10-9a. 074 UNIT. Set 905 POWER to OFF and remove all aircraft power. Refer to figure 10-13 for procedures to remove and replace the 074 unit.

10-9b. 472074 UNIT. Set 905 POWER to OFF and remove all aircraft power. Refer to figure 10-14 for procedures to remove and replace the 472074 unit.

10-9c. 102 UNIT.

WARNING

Ensure that all aircraft power has been turned off.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Remove 181 and 920 units iaw para. 19-9d.

(3) Remove 3 screws that secure 102 unit.

(4) Remove 102 unit.

NOTE

Installation procedure is essentially the reverse of removal.

10-9d. 181 AND 920 UNITS (Fig. 10-15).

(1) Removal

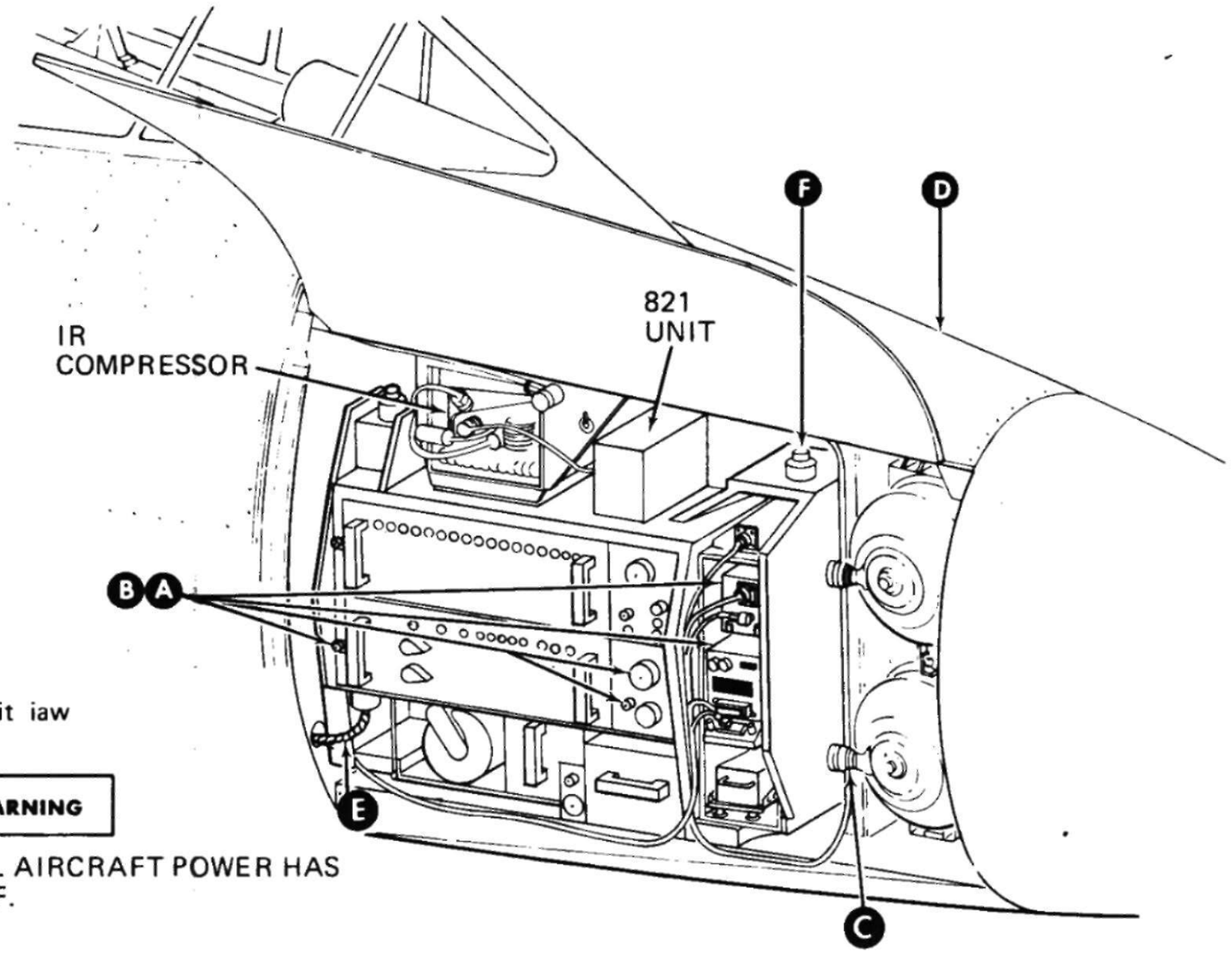
(a) Position rudder pedals fully forward.

WARNING

Ensure that all aircraft power has been turned off.

(b) Set 905 POWER to OFF and remove all aircraft power.

(c) Remove 083 unit iaw para. 10-4h.



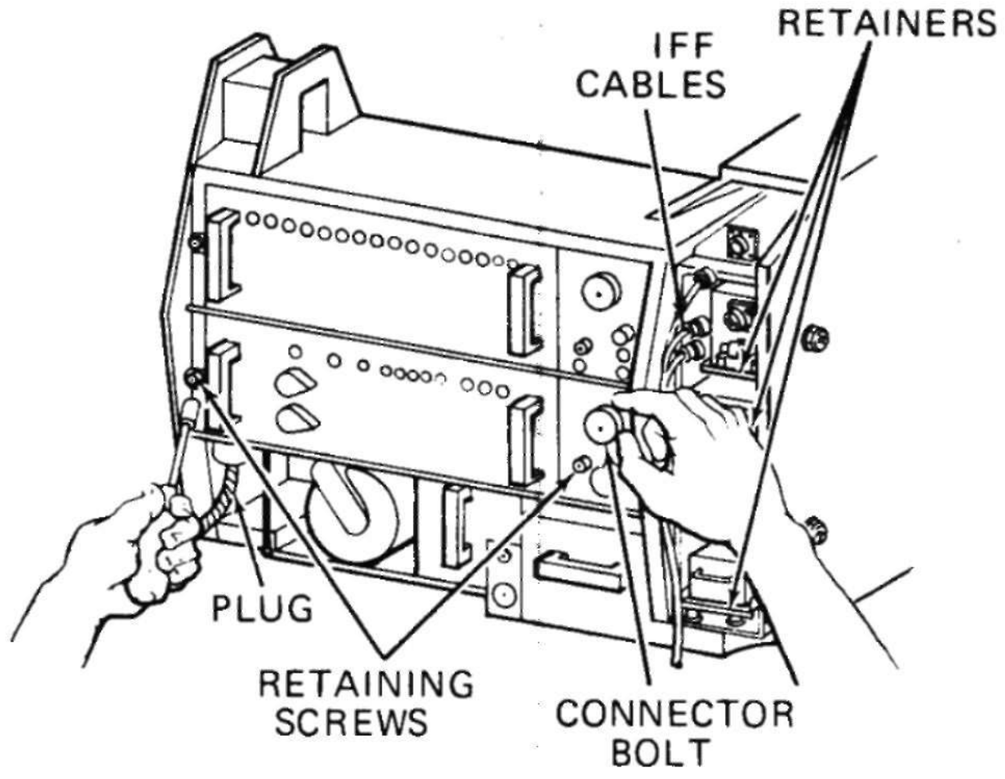
REMOVAL

a. Remove 821 unit iaw para 10–4a.

WARNING

ENSURE THAT ALL AIRCRAFT POWER HAS BEEN TURNED OFF.

A



b. Using a 3/8 spintite wrench, press the latch assembly in and turn retaining screw two or three complete turns ccw.

c. Disengage connector bolt.

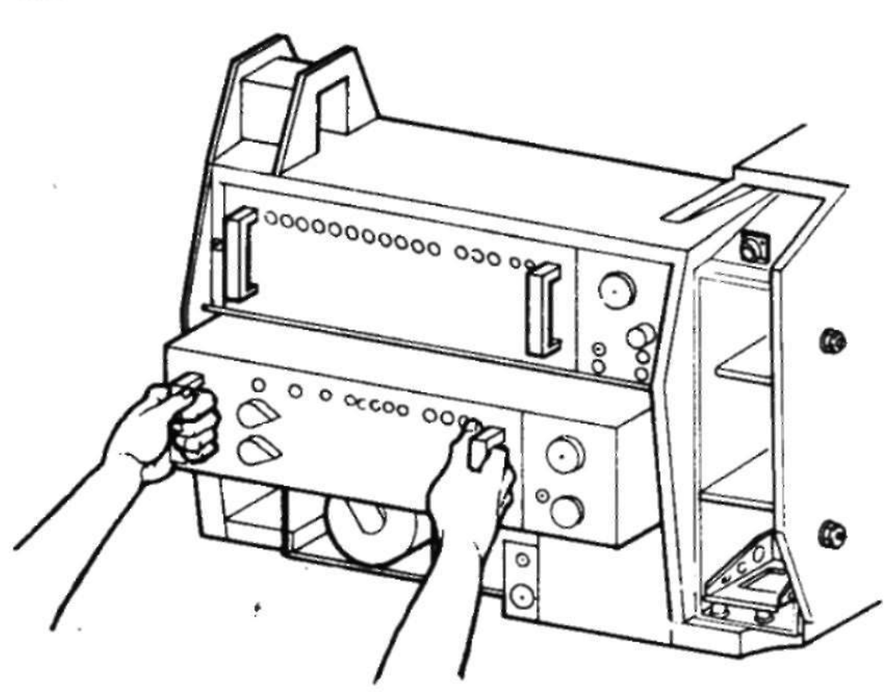
d. Disconnect plug from the unit.

e. Disconnect cables from IFF units and rack.

f. Losen IFF unit retainers.

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B



g. Loosen retaining screws on 526, 846, and 857 units.

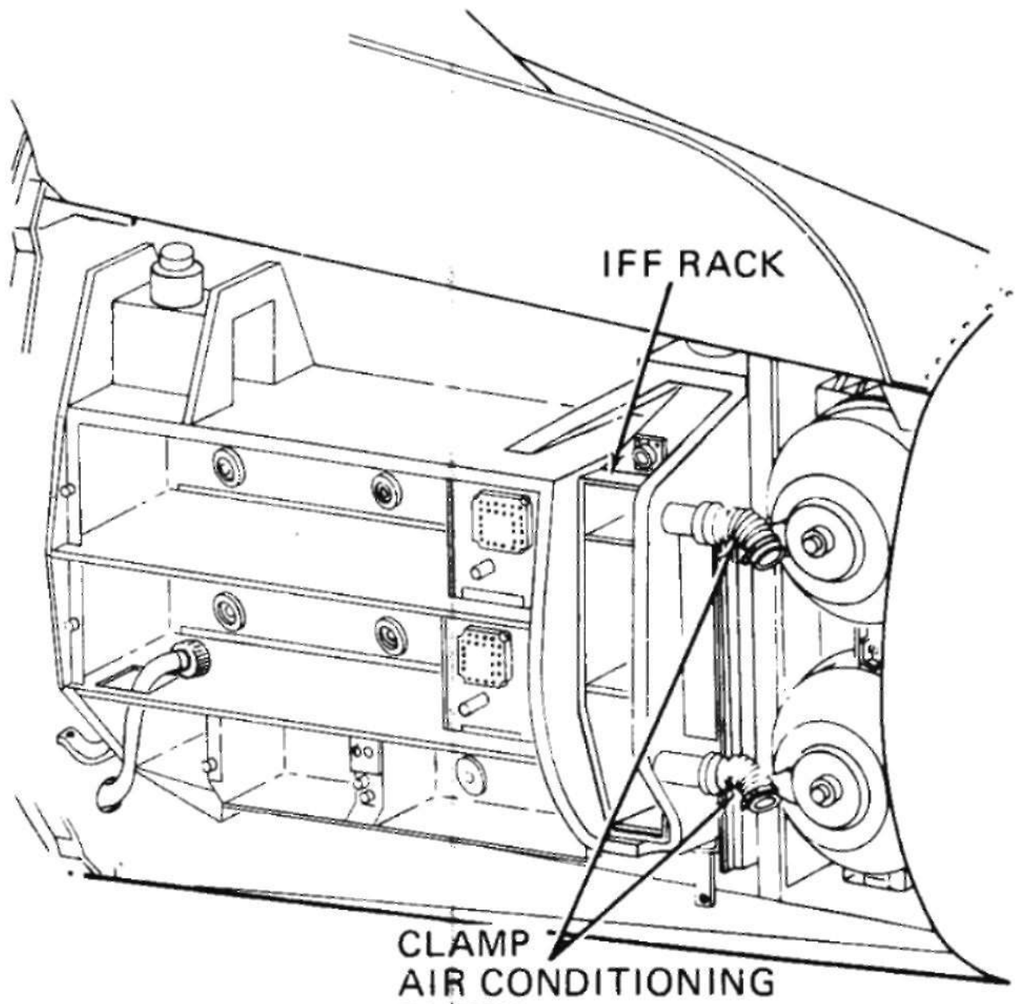
h. Slowly pull units out from rack.

CAUTION

USE CARE IN REMOVING UNITS FROM RACK TO PREVENT DAMAGE TO PLUGS AND CONTACTS.

Figure 10-10. Computer Unit Replacement (Sheet 1 of 2)

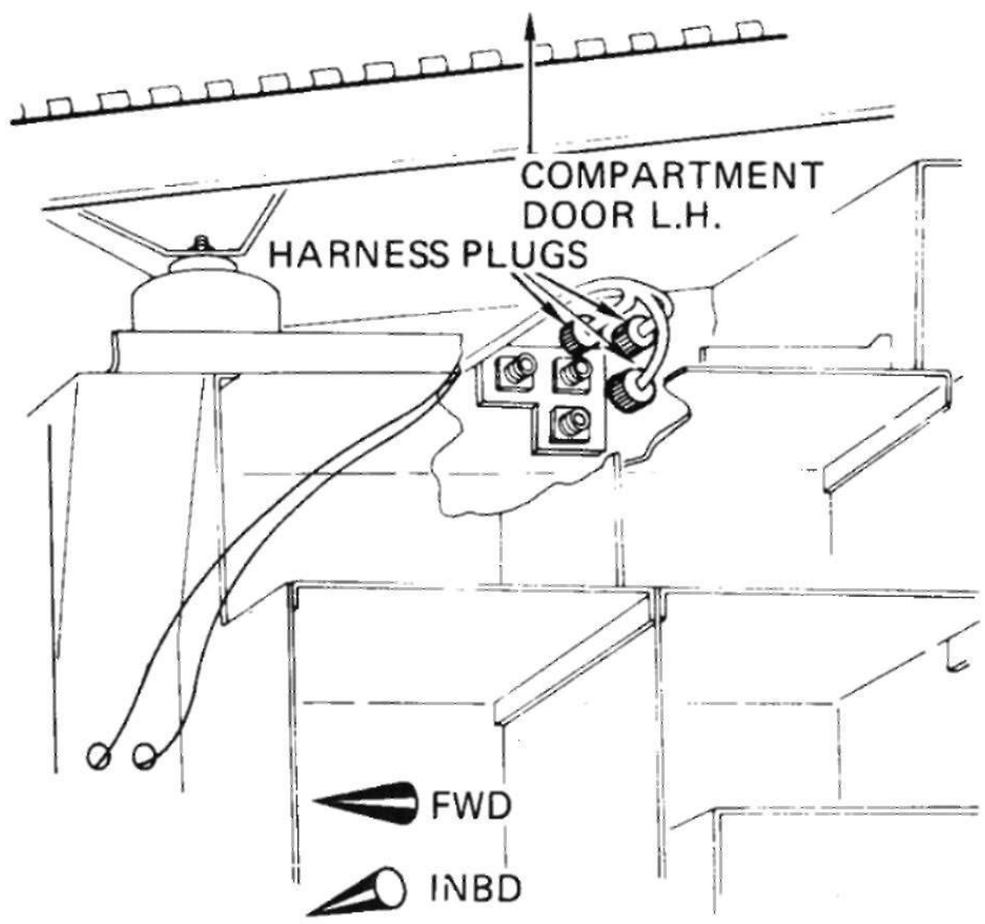
C



RACK REMOVAL

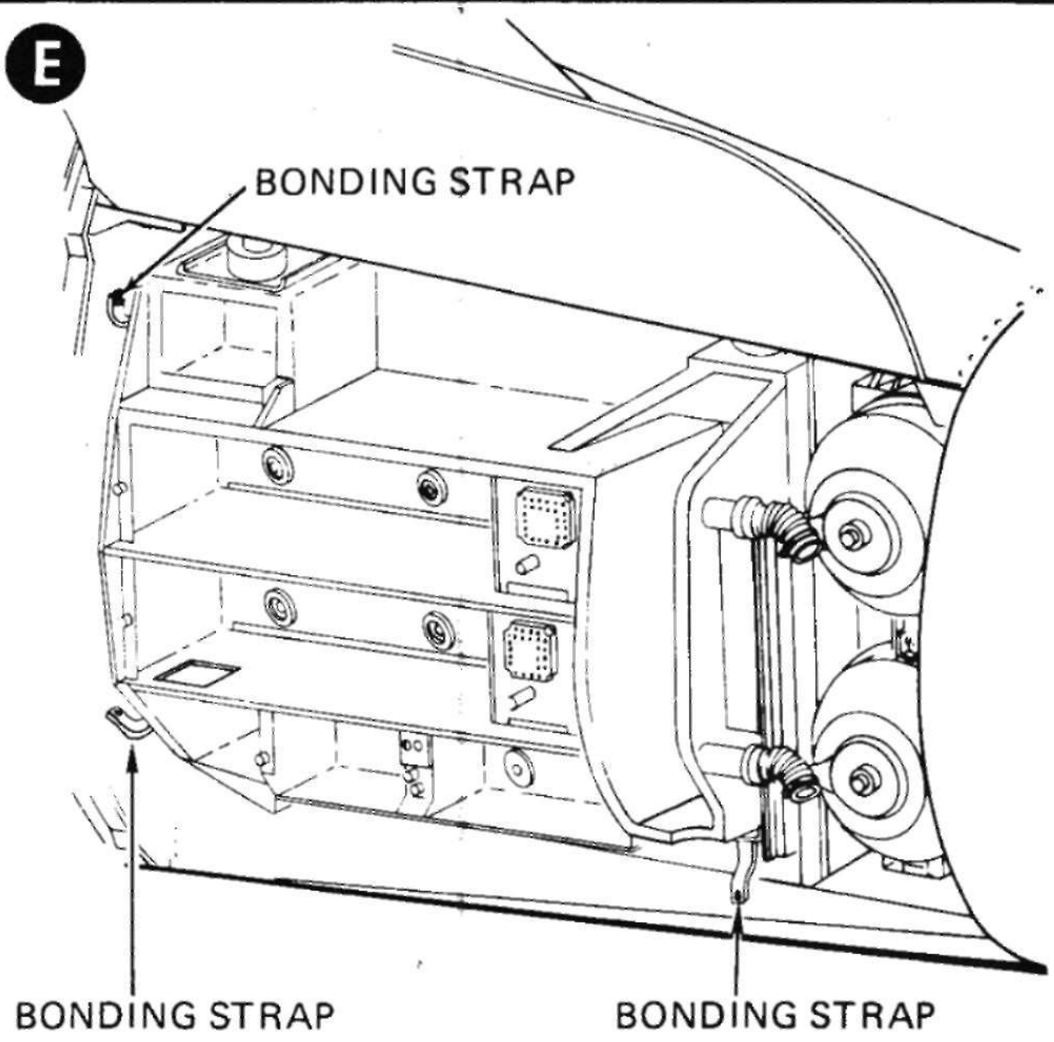
a. Remove IFF rack mounting screws and remove IFF rack.
b. Unscrew clamp from air-conditioning ducts.

D



c. Disconnect electrical harness plugs from top of radar rack and disconnect ground strap near plugs. Push plugs through structure opening toward computer rack.
d. Disconnect 07334 and 07335 coax connectors.

E

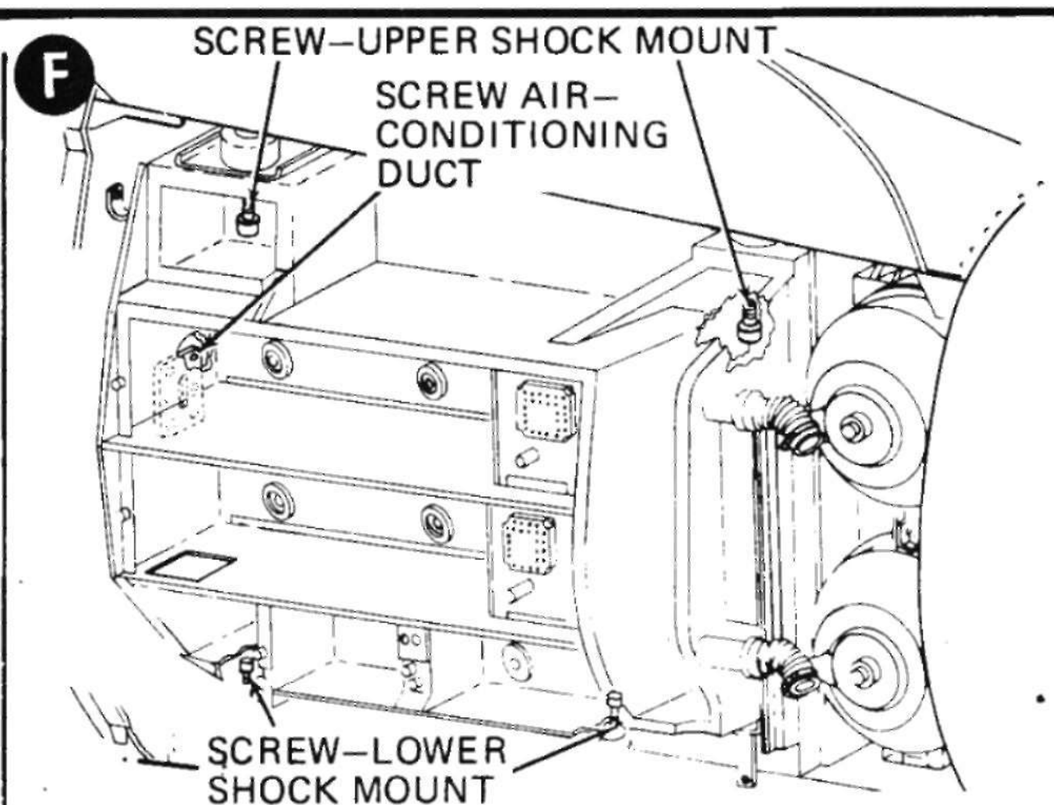


e. Disconnect four rack bonding straps from structure.

NOTE

Ensure that aft cooling duct is positioned properly; high for round instrument aircraft or low for vertical instrument aircraft.

F



f. Remove screws that secure rack air-conditioning duct to structure. Gain access to air-conditioning duct screws from nose wheel well.
g. Remove two screws that secure rack to upper shock mount.
h. Remove two screws that secure rack to lower shock mounts.

NOTE

TWO MEN WILL BE REQUIRED TO HANDLE THIS RACK

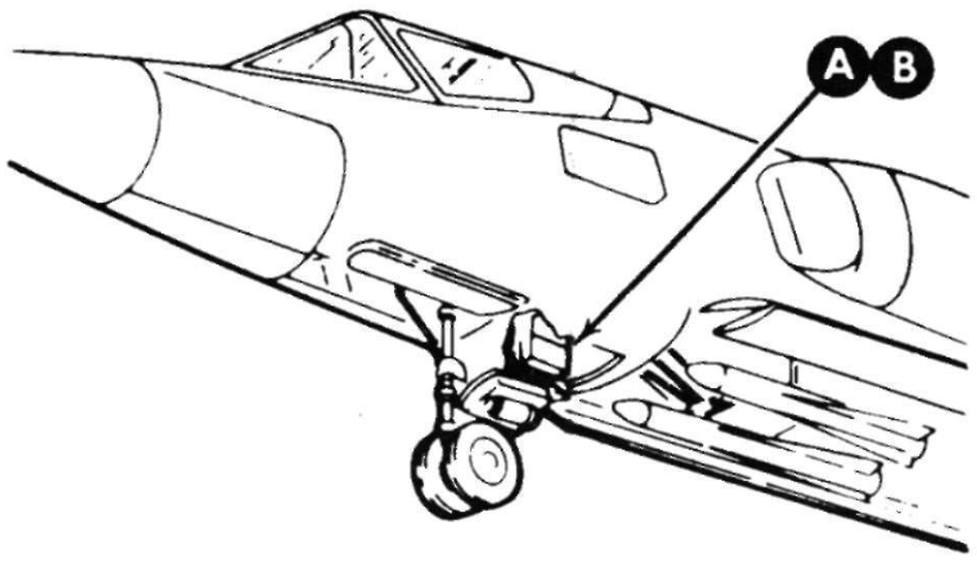
h. Lift rack up and outward until clear of aircraft.

INSTALLATION FORWARD RIGHT-HAND ELECTRONICS RACK AND EQUIPMENT.

Installation is essentially the reverse of removal.

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Figure 10-10. Computer Unit Replacement (Sheet 2 of 2)

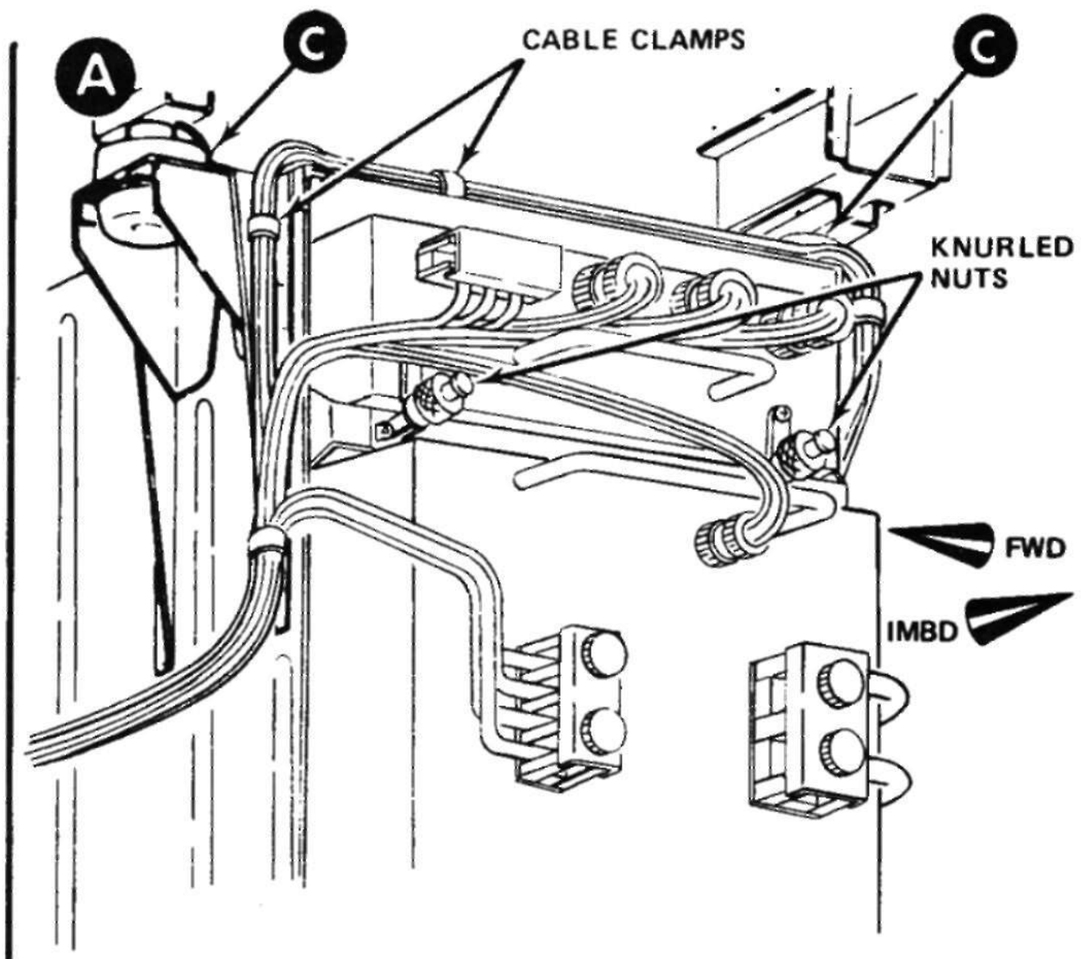


REMOVAL

a. Open 05 compartment door.

WARNING

ENSURE THAT ALL AIRCRAFT ELECTRICAL POWER HAS BEEN TURNED OFF.



b. Disconnect all electrical connectors from mounted units.

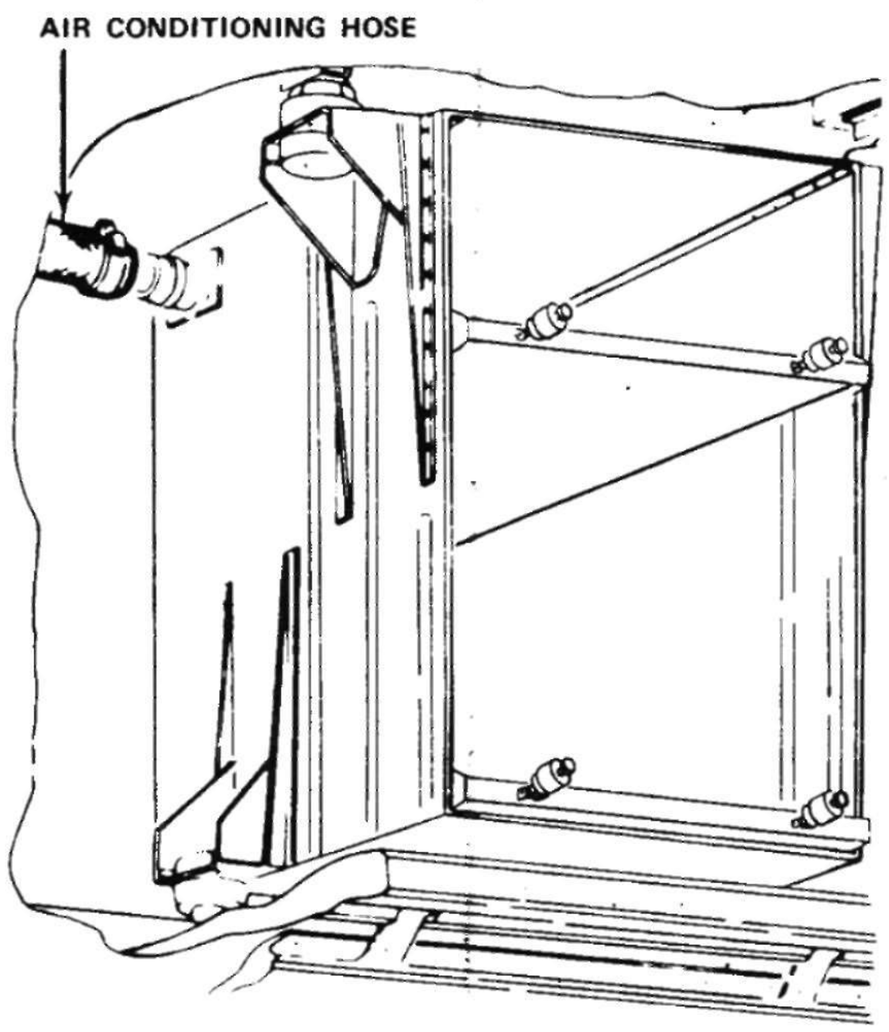
c. Disconnect all cable clamps and lay cables aside so that they will not be damaged during rack removal.

WARNING

The 989 unit weighs in excess of 60 pounds. Exercise care in removing the unit.

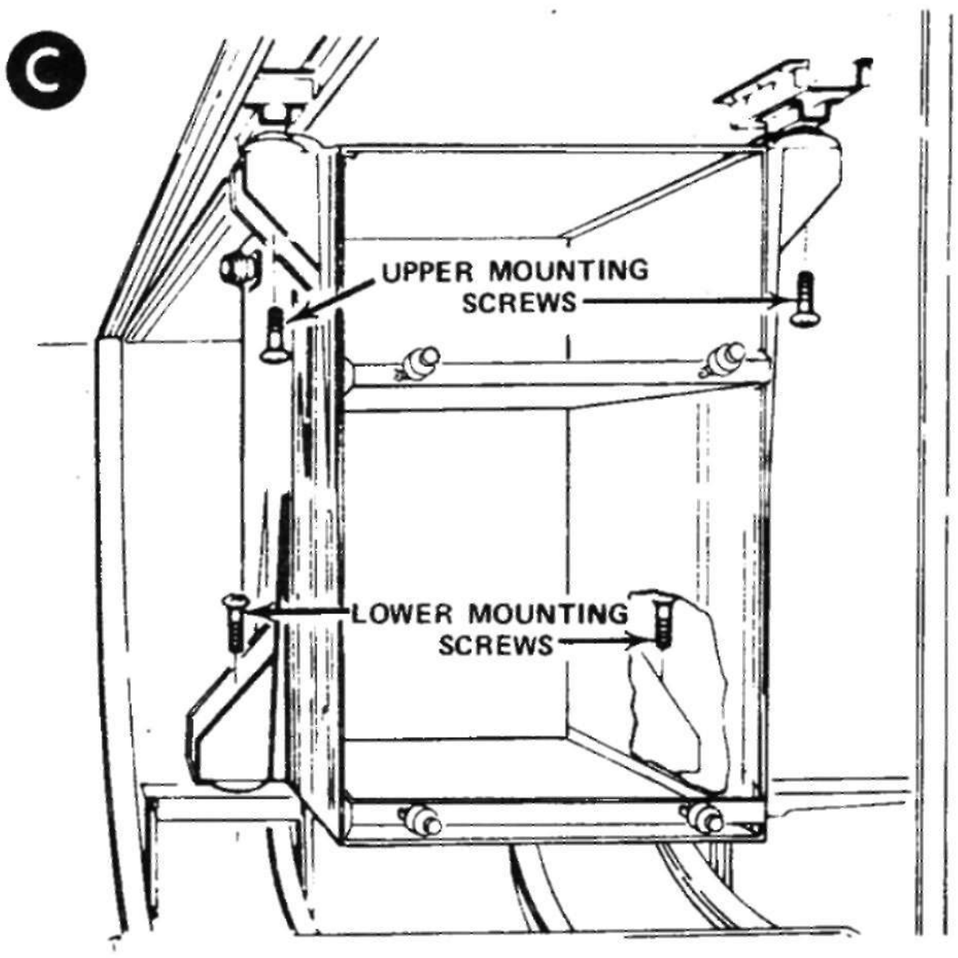
d. Loosen knurled nuts and remove units from rack.

B



e. Disconnect air conditioning hose at forward end of rack.

C



f. Remove four Phillips–head mounting screws that secure rack and shock mount to air–frame; retain mounting screws and associated spacers for reinstallation.

g. Lift rack slightly to clear supporting structure and remove rack through access door opening.

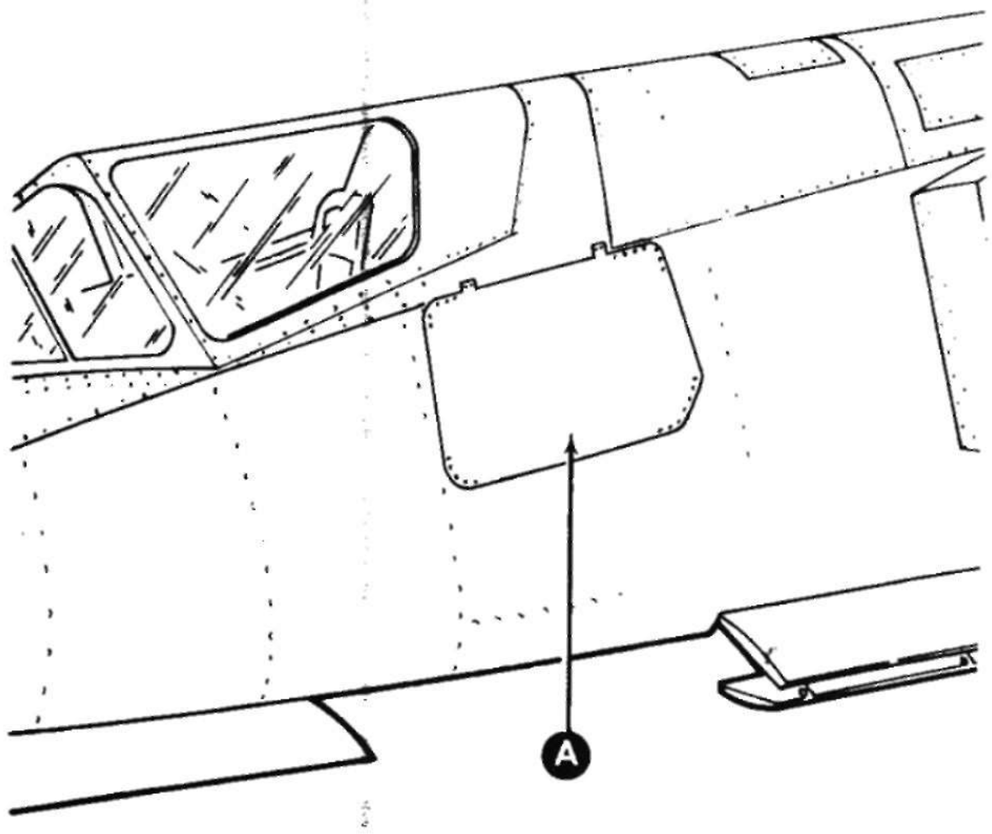
INSTALLATION

Installation is essentially the reverse of removal.

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Figure 10-11. 873 Unit Replacement

"Figure 10-12 deleted."

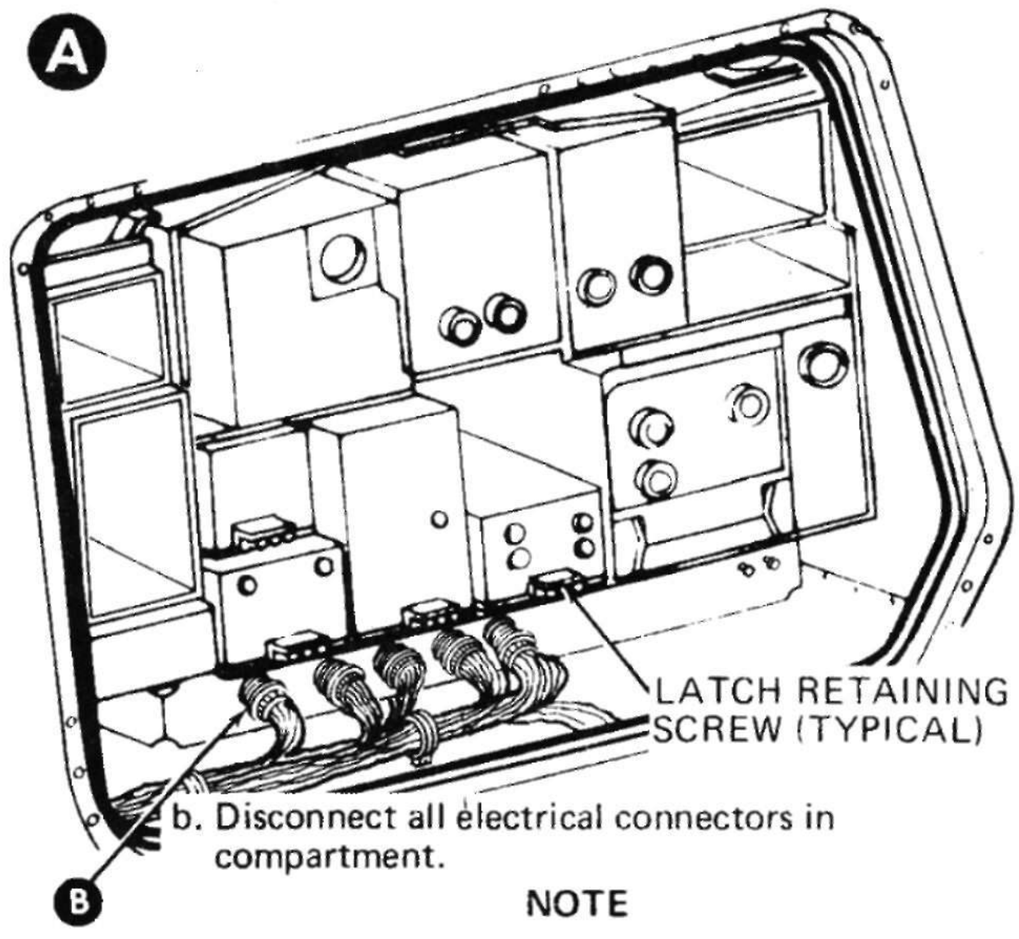


REMOVAL

a. Open door for CN&L compartment.

WARNING

MAKE CERTAIN THAT ALL ELECTRICAL POWER HAS BEEN TURNED OFF.

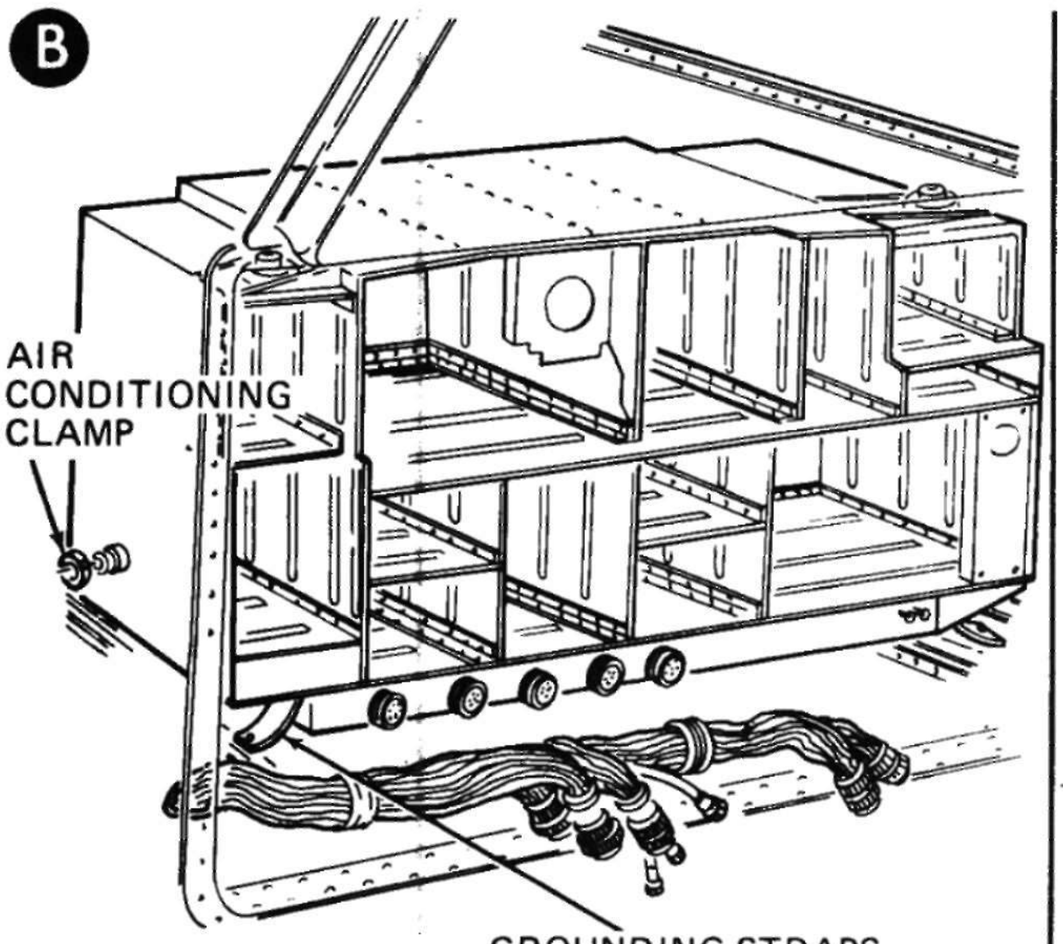


b. Disconnect all electrical connectors in compartment.

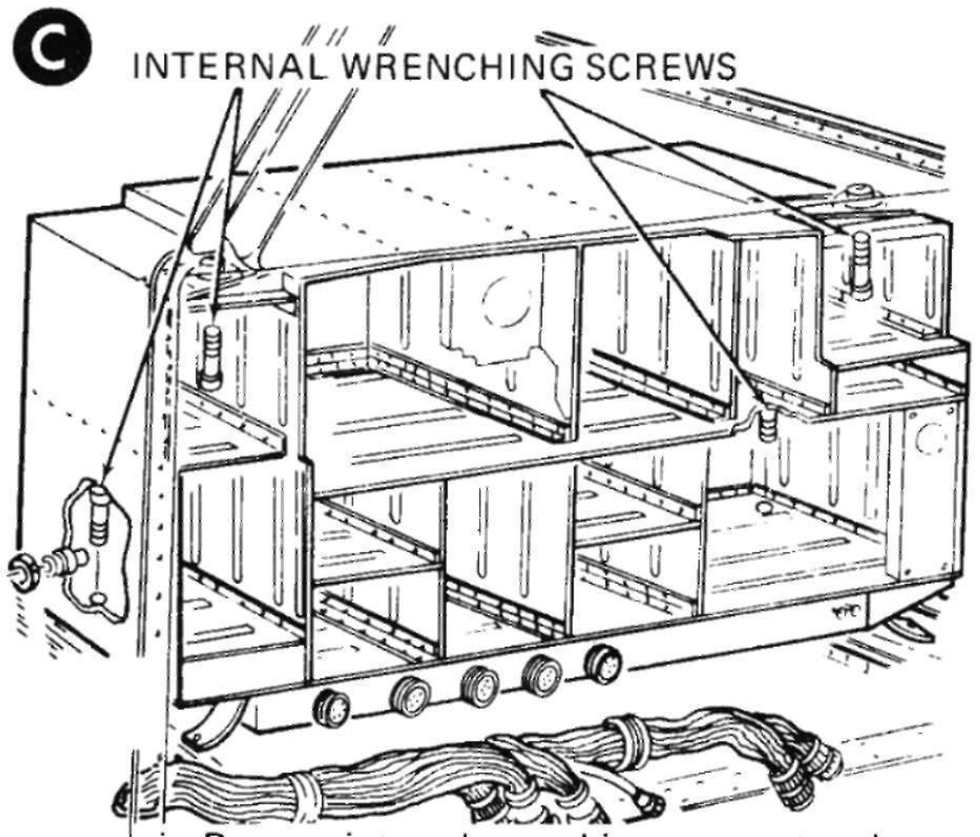
NOTE

TAG ALL PLUGS TO PROVIDE CORRECT AND CONVENIENT RECONNECTIONS.

c. Using spintite, press the latch assembly in and unscrew latch retaining screw two or three turns on unit to be removed.
d. Slowly pull out unit from rack, using care to prevent plug and receptacle contacts at rear of unit from being damaged.
e. Remove all other units in rack, following the procedures of steps c and d.



f. Unscrew clamp from air conditioning duct.
g. Arrange all electrical wiring so that it will not be damaged during rack removal.
h. Disconnect two racks grounding straps from aircraft structure.



i. Remove internal wrenching screws at each lower shock mount.
j. Remove two internal wrenching screws that secure upper shock mounts and rack to airframe.
k. Lift rack upward and outboard until clear of access opening.

INSTALLATION

Installation is essentially the reverse of removal.

Safety wire all connectors in accordance with instructions contained in T.O. 1-1A-14.

CAUTION

DO NOT FORCEABLY MATE CONNECTORS; IF RESISTANCE IS ENCOUNTERED, REMOVE AND INSPECT MALE AND FEMALE CONNECTORS FOR BENT OR DEFORMED CONTACTS.

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Figure 10-13. 074 Unit Replacement

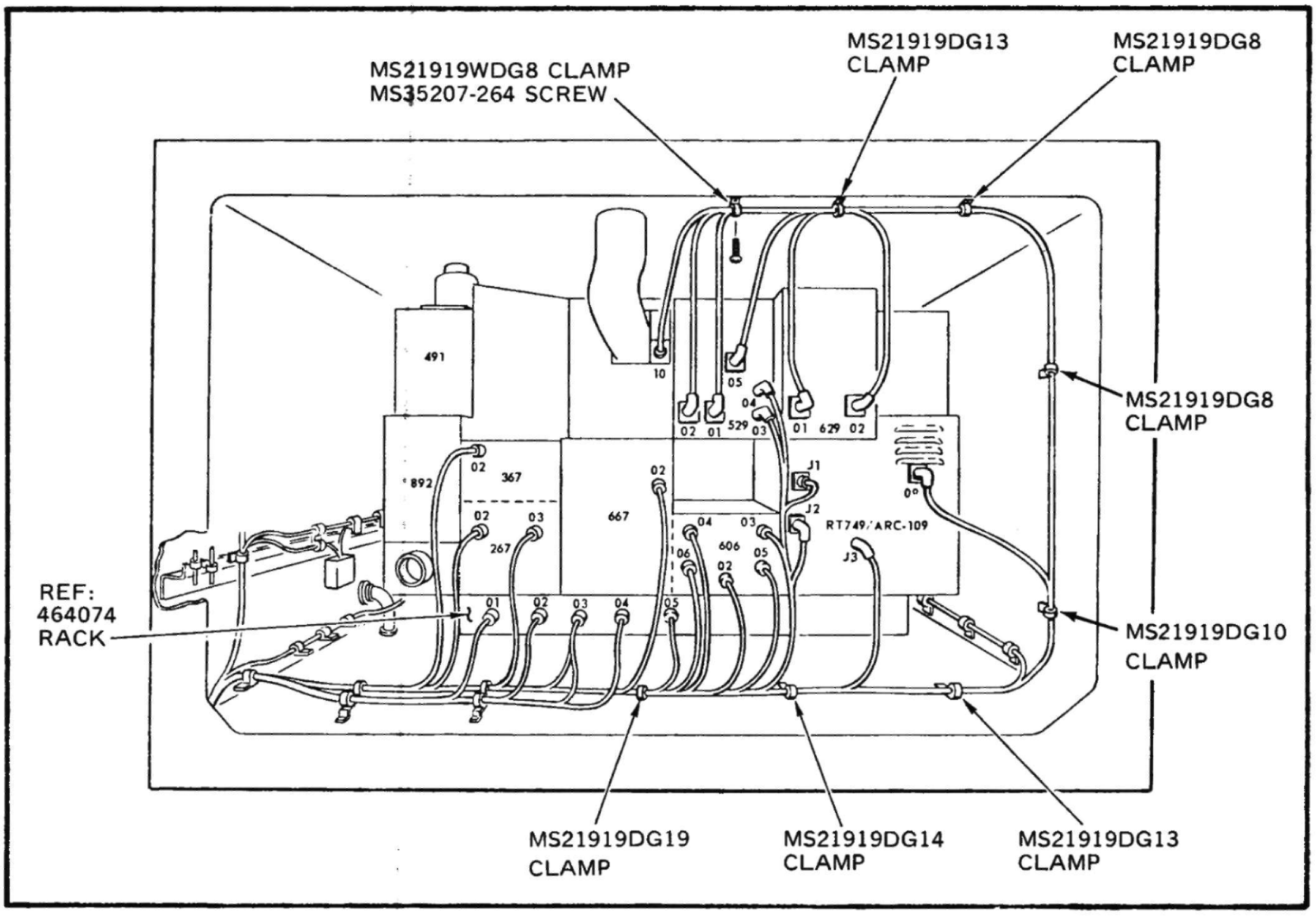
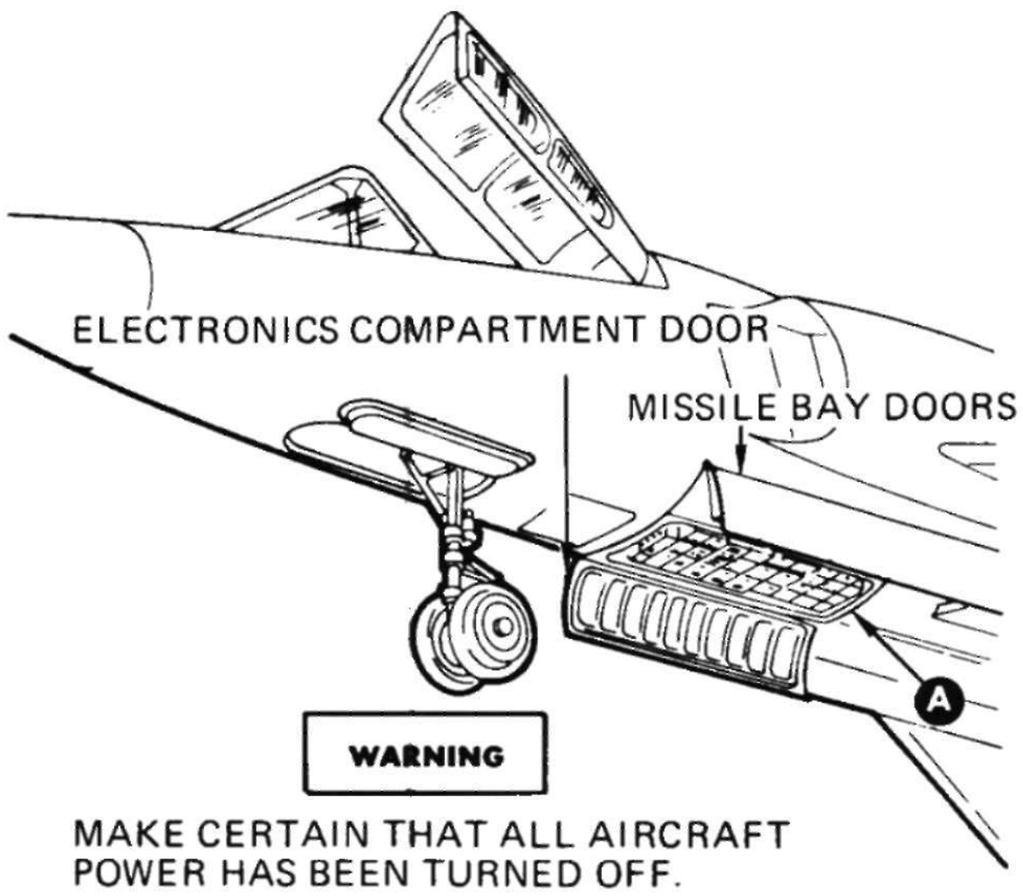


Figure 10-13.1. Upper Aft Electronics Compartment F-106A Harness Routing

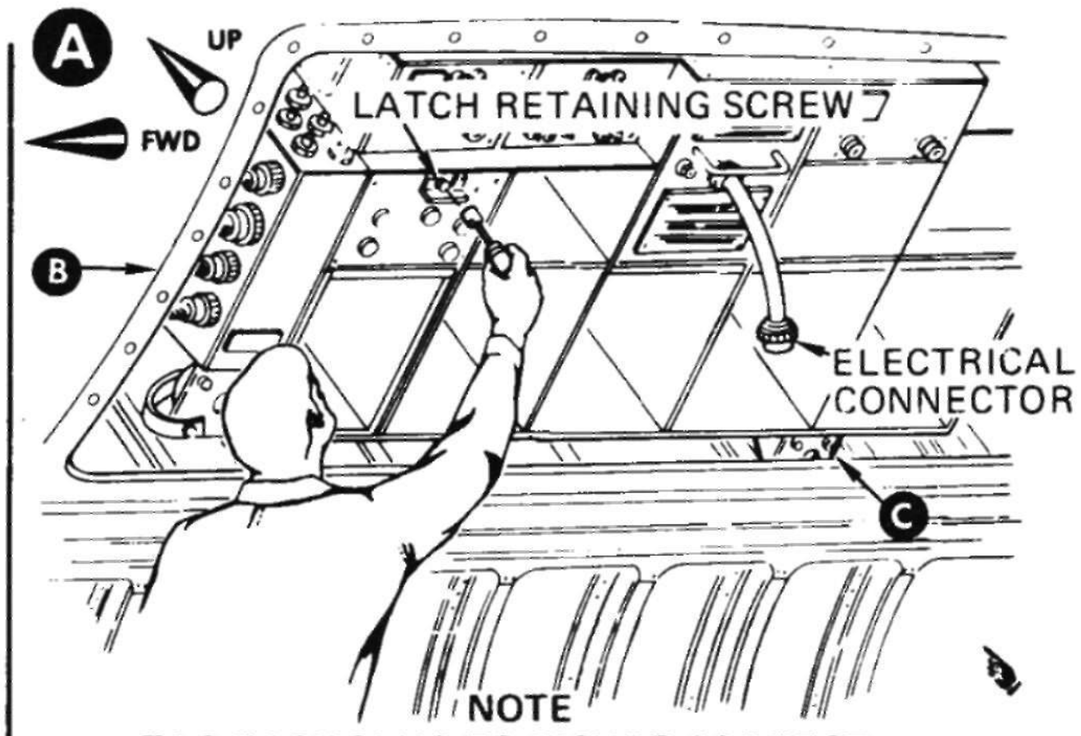
See pg 103 Sup 41



WARNING

MAKE CERTAIN THAT ALL AIRCRAFT POWER HAS BEEN TURNED OFF.

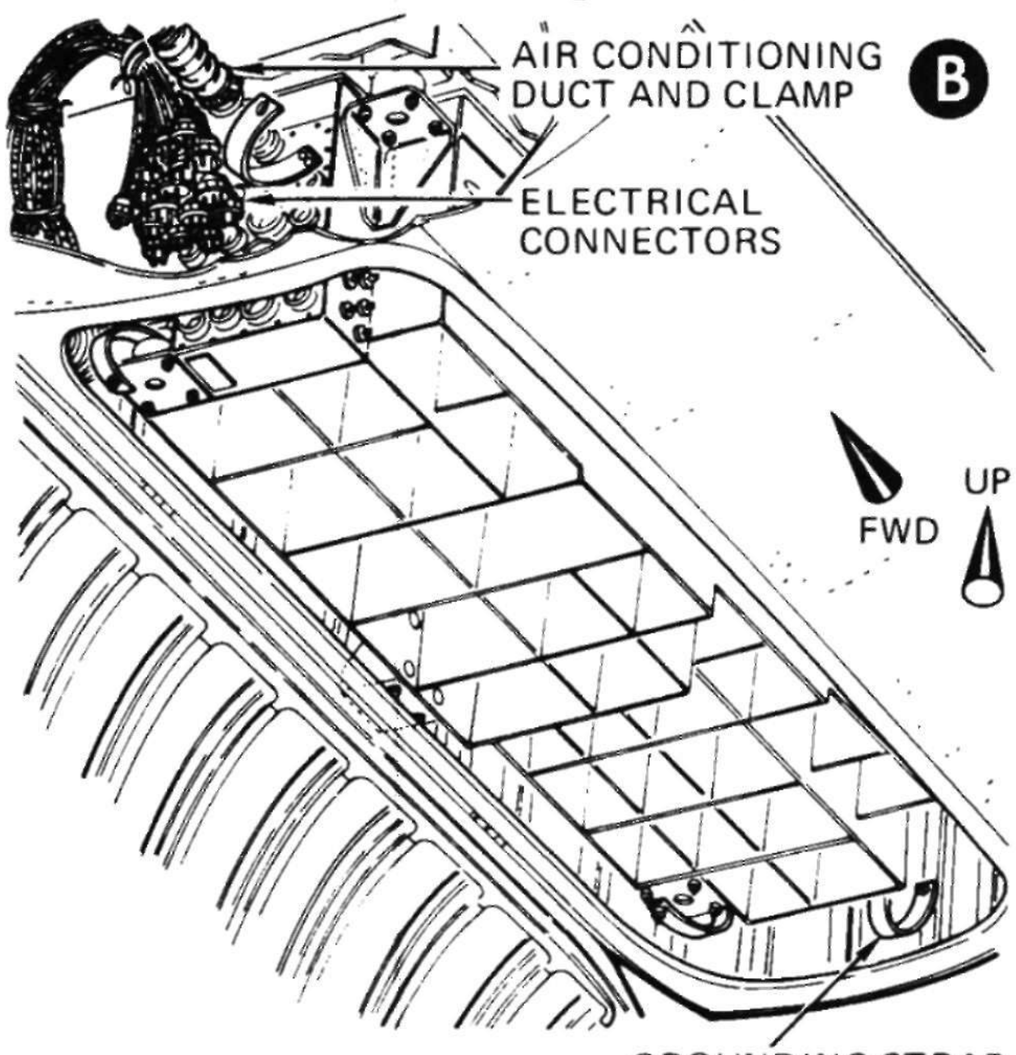
a. Open coffin bay door.



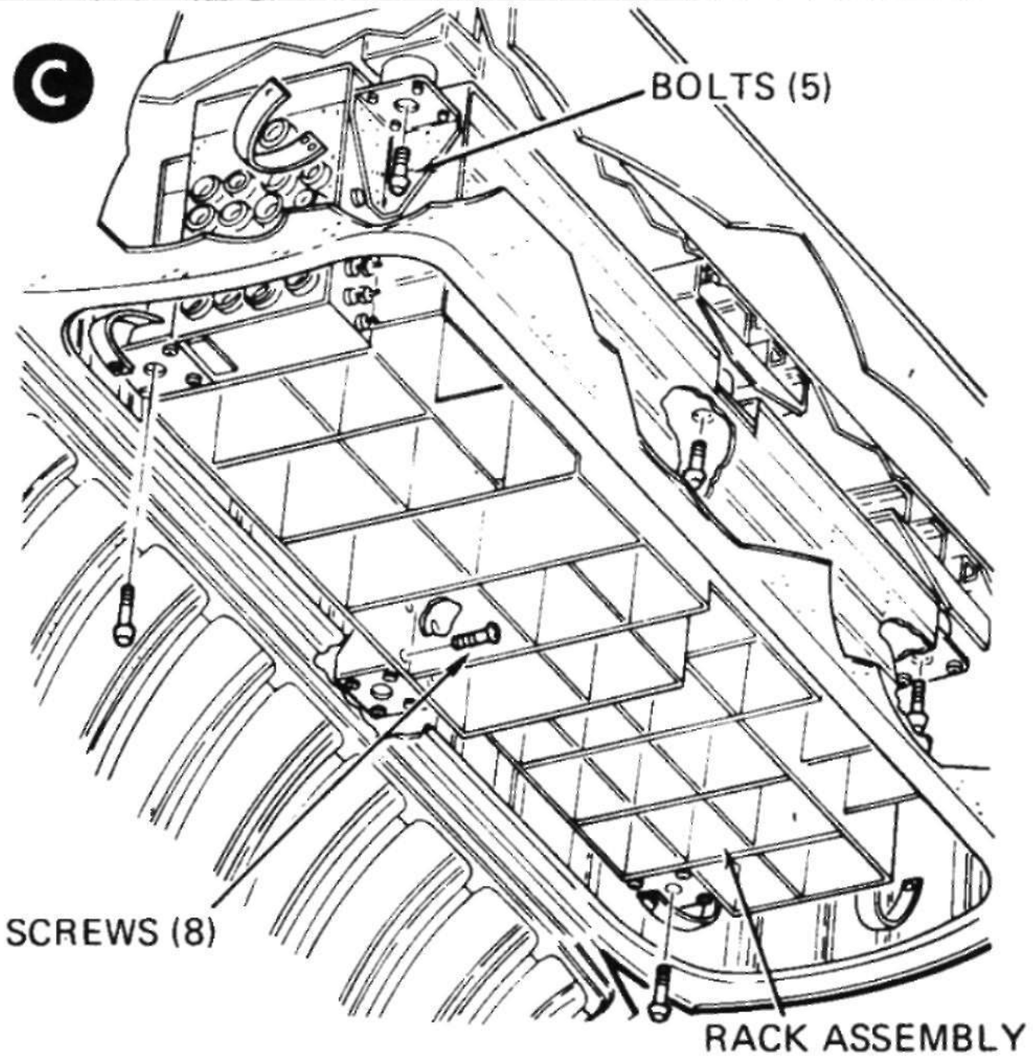
NOTE

TAG EACH PLUG TO INSURE CORRECT AND CONVENIENT RECONNECTION.

b. Disconnect all electrical connectors
c. Using spintite, push the latch assembly in and turn latch retaining screw on unit to be removed three complete turns.
d. Slowly pull unit from rack, using care to prevent damage to plug and receptacle contacts on unit and rack.
e. Remove other units in rack, using the procedure of steps c and d.



f. Remove screws from grounding straps.
g. Remove hose assembly from air-conditioning duct by unscrewing clamp.
h. Tie back wire harnesses and position all cables so that they will not be damaged when rack is removed.



i. Remove five bolts and eight screws from rack assembly; retain bolts, screws, and washers for reinstallation of rack.

INSTALLATION

Installation is essentially the reverse of removal .

7-907-24D

Figure 10-14. 472074 Unit Replacement

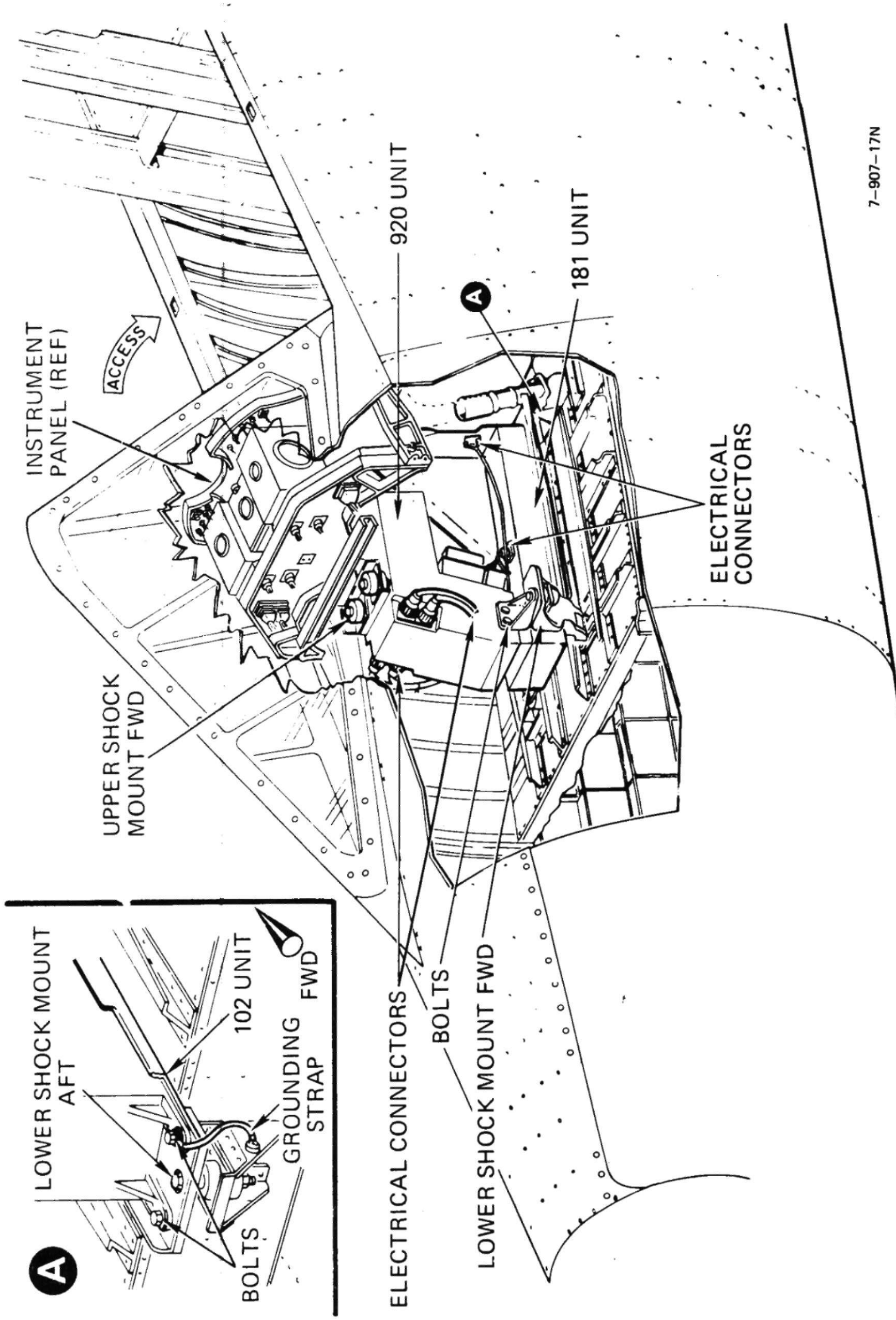


Figure 10-15. 181 and 920 Unit Replacement

NOTE

The ejection seat must be removed and the flight control stick must be layed back to complete this procedure. In some aircraft, the floorboards may have to be removed.

(d) Disconnect 3 electrical connectors from 181 unit.

(e) Remove 2 bolts that secure 181 unit (grounding strap will be disconnected).

(f) Pull 181 unit aft until it is free of the guide pins and remove 181 unit.

(g) Disconnect 4 electrical connectors from 920 unit (1 connector may be a jumper plug).

NOTE

In round instrument aircraft, the 920 unit may be secured with Allen screws.

(h) Remove 4 bolts that secure 920 unit to 102 unit.

(i) Loosen Dzus fastener on 920 unit.

(j) Remove 920 unit.

(2) Installation. Installation procedure is essentially the reverse of removal; however, the following precautions must be observed.

WARNING

Ensure that 920 unit module cover is safety wired to both latches to prevent loosening of module cover.

Ensure that new self-locking nut is used to install elevator control linkage bolt and check flight control system iaw procedures in chapter 8, section IV.

After 181 unit is installed, adjust rudder pedals fully forward and check for unobstructed full range of travel. Use lacing cord to secure cables as far from rudder pedals as possible.

CAUTION

Do not install 181 unit in rear cockpit of F-106B unless both are 464181-16X (464181-15X for round instrument aircraft). Install only the forward 181 unit if other than above dash numbers are used.

NOTE

Ensure that grounding strap is connected to right hand bolt that secures 181 unit.

10-9e. 181 PROJECTION LAMPS (Fig. 10-16).

WARNING

Ensure that 181 OFF-BRT is set to OFF.

(1) Set 181 OFF-BRT to OFF.

(2) Release two Dzus fasteners and remove lamp access door.

(3) Move 181 LAMP to position faulty projection lamp for easy access.

WARNING

Avoid touching the projection lamp with bare fingers. The lamp becomes extremely hot during operation and takes several minutes to cool to a safe temperature. In addition to waiting for the lamp to cool, use a thick soft cloth for handling. Observe care when removing the lamp from its socket; the glass may be defective and crumble under strain.

(4) Lift retainer spring from upper portion of defective projection lamp.

(5) Press down and twist projection lamp ccw to remove.

(6) Prepare new projection lamp by cleaning it free of dust, lint, and finger marks with a soft lint-free cloth. Remove any oxidation or corrosion that may be present.

(7) Insert new projection lamp in socket and turn cw.

(8) Replace retainer spring on upper portion of projection lamp.

(9) Replace lamp access door and secure using two Dzus fasteners.

CAUTION

Do not apply full power to a new or cold projection lamp.

(10) Set 181 OFF-BRT cw to first detent from OFF.

CAUTION

Allow projection lamp to heat at low power for five minutes before setting 181 OFF-BRT to BRT.

(11) Observe TSD map to check projection.

10-9f. 181 FILM MAGAZINE (Fig. 10-17)

(1) Set 405 PRESET to 24, 181 RADIUS MILES to 400, and 181 OFF-BRT one detent cw from OFF.

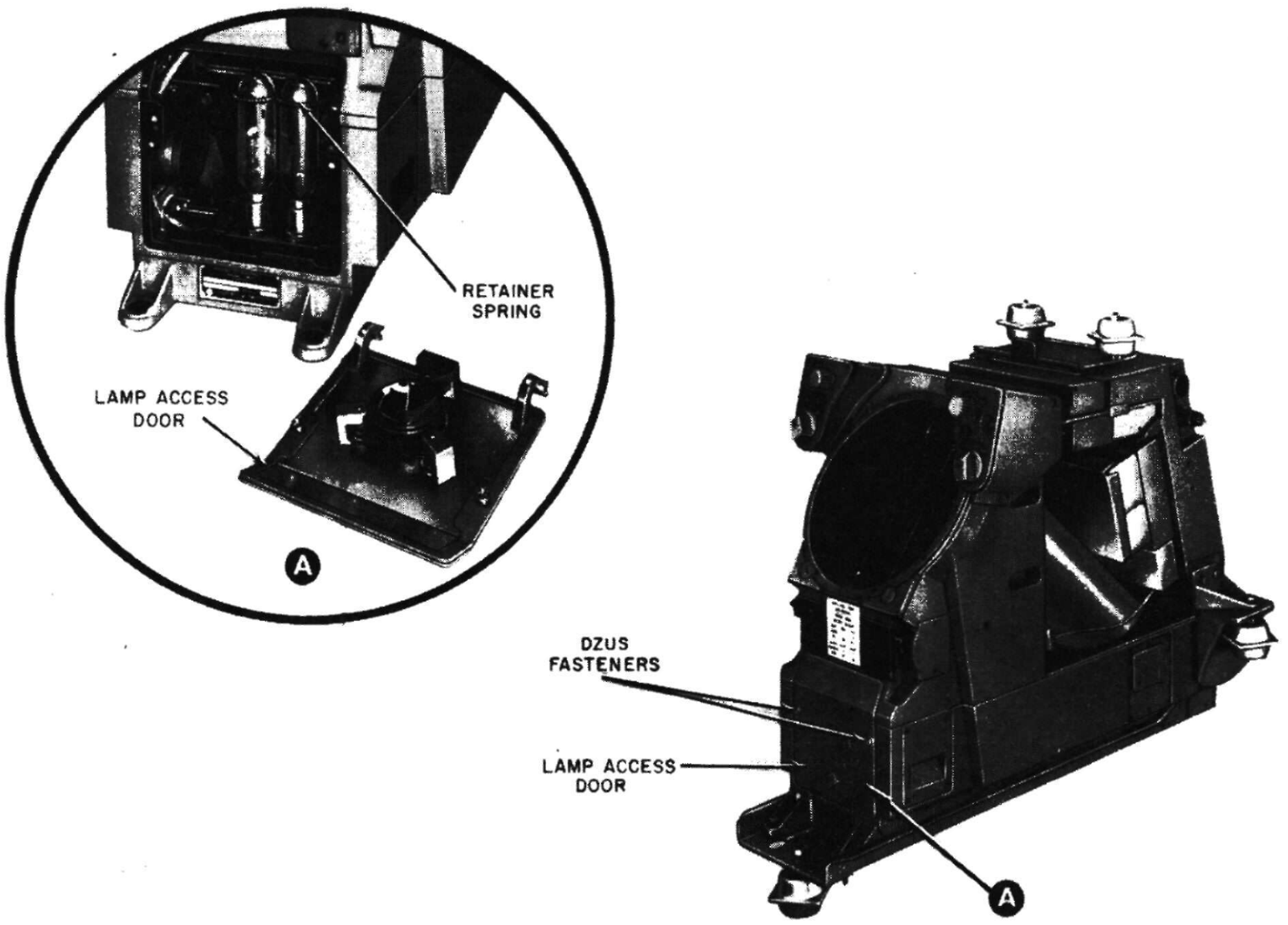


Figure 10-16. 181 Projection Lamp Replacement

(2) Set 181 OFF-BRT to OFF.

(3) Remove left forward floorboard from cockpit.

(4) Loosen four thumbscrews on film magazine access plate and remove access plate.

(5) Turn magazine locking knob 3/4 turn ccw to release.

(6) Grasp film magazine handle and pull out film magazine.

CAUTION

Replace film magazine access plate so that magazine compartment remains dust free.

(7) Replace film magazine access plate using four thumbscrews.

NOTE

Hold film magazine so that handle is at the left and the two film spool knobs are at the top.

(8) Press and hold indexing pin in.

(9) Turn right hand film spool knob ccw until film is all on right hand spool.

(10) Release indexing pin.

(11) Pull right hand film spool knob out approximately 1/4 inch to detent position.

(12) Open film magazine front cover and remove film spool.

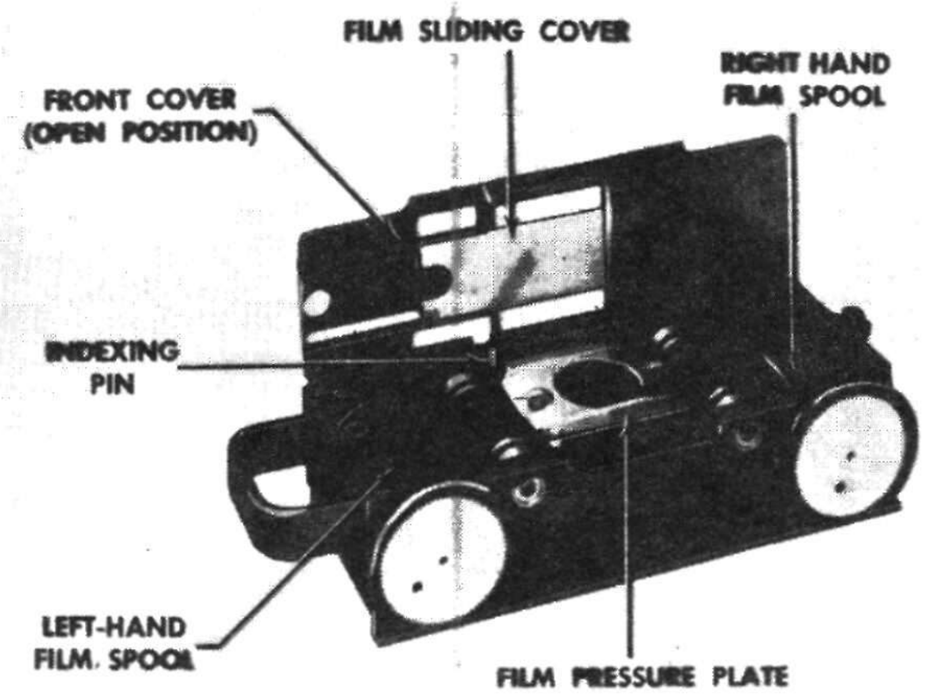
(13) Unwind sufficient film for threading purposes and insert new film spool under right hand film spool knob.

(14) Press right hand film spool knob to normal position to engage new film spool.

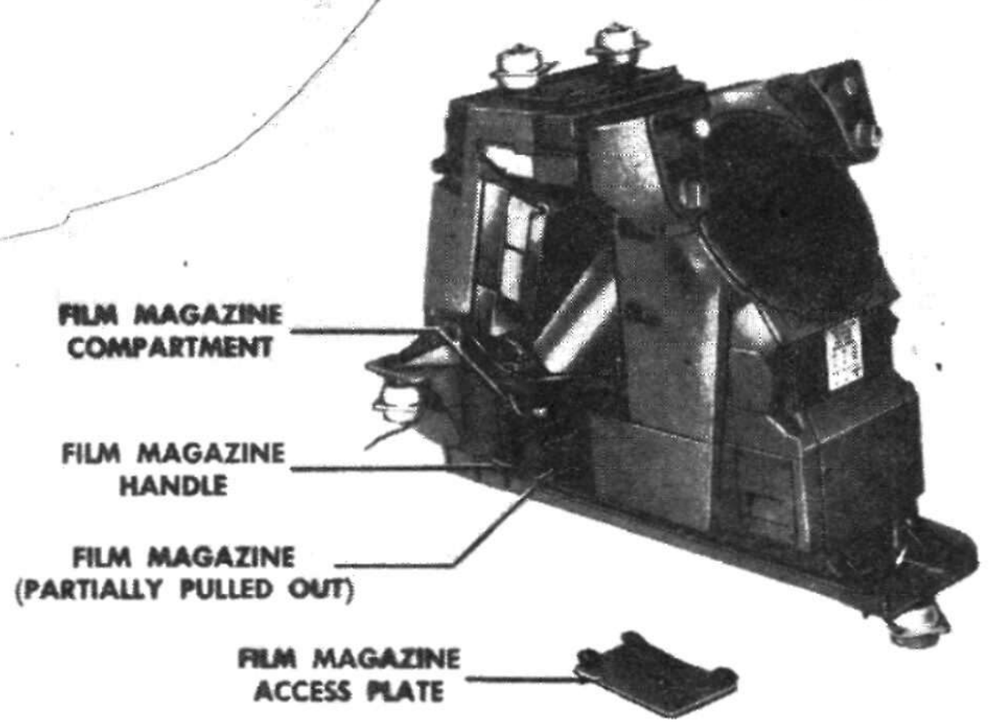
(15) Thread approximately 3/8 inch film into slot of left hand film spool.

(16) Close film magazine front cover.

(17) Press and hold indexing pin. Wind film to position channel 24 radius 400 mile map in center and release indexing pin.



FILM MAGAZINE – BOTTOM VIEW



FILM DRIVE AND INDEX MECHANISM

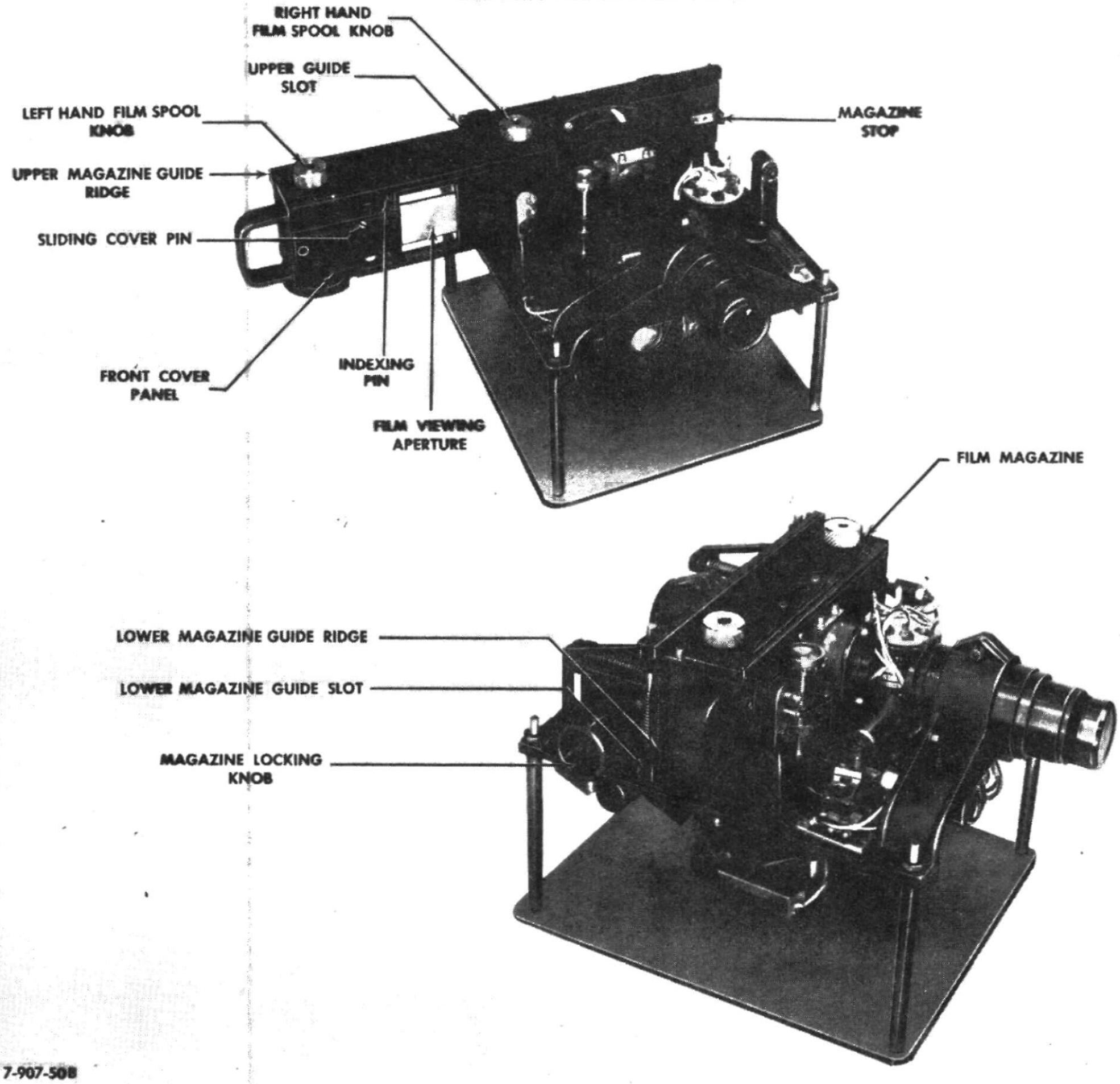


Figure 10-17. 181 Film Magazine Replacement

See pg 104 Sup 41

NOTE

View film position through film viewing aperture on front of film magazine.

(18) Engage right hand film spool knob sprocket lock.

(19) Remove film magazine access plate.

(20) Ensure that magazine locking knob is fully ccw.

(21) Install film magazine in film drive and index mechanism by aligning film magazine guide ridges with film drive and index mechanism guide slots and pushing film magazine gently until it rests against magazine stop.

(22) Turn magazine locking knob cw.

(23) Set 181 OFF-BRT to a comfortable viewing level and check that proper TSD map is displayed.

(24) Check film magazine operation by changing 405 PRESET position and 181 RADIUS MILES position.

(25) Set 181 OFF-BRT to OFF.

(26) Reinstall left forward floorboard in cockpit.

10-9g. 181 EARS.

WARNING

Ensure 181 OFF-BRT is set to OFF.

(1) Set 181 OFF-BRT to OFF.

(2) Remove 3 screws that secure 181 ear.

(3) Remove 181 ear.

NOTE

Installation procedure is essentially the reverse of removal.

10-9h. 472473 UNIT. Refer to figure 10-18 for procedures to remove and replace the 472473 unit.

10-9i. 505 UNIT.

WARNING

Ensure that all aircraft power has been removed.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Loosen 8 Dzus fasteners that secure 505 unit.

CAUTION

Movement of the throttle operates the fuel control. Operation of the fuel control without pressure or without the engine operating must be kept to an absolute minimum. The fuel control must not be moved through its operating range more than five times without damage to fuel seals and mechanisms. If the number of times the throttle has been moved is unknown, the throttle must be disconnected iaw T.O. 1F-106A-2-4.

(3) Move throttle forward as necessary and pull 505 unit up to gain access to electrical connectors.

(4) Disconnect electrical connectors and remove 505 unit.

10-9j. 472564, 472664, 472764 AND 472864 UNITS.

WARNING

Ensure that all aircraft power is removed.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Loosen 4 Dzus fasteners that secure unit.

(3) Pull unit up to gain access to electrical connectors.

(4) Disconnect electrical connectors and remove unit.

10-9k. GLIDE SLOPE ANTENNA. Refer to figure 10-19 (sheet 1) for procedures to remove and replace the glide slope antenna.

10-91. UHF ANTENNA. Refer to figure 10-19 (sheet 2) for procedures to remove and replace the UHF antenna.

10-9m. DATA LINK ANTENNA. Refer to figure 10-19 (A, sheet 3) for procedures to remove and replace the data link antenna.

10-9n. LOCALIZER ANTENNA. Refer to figure 10-19 (sheet 2) for procedures to remove and replace the localizer antenna.

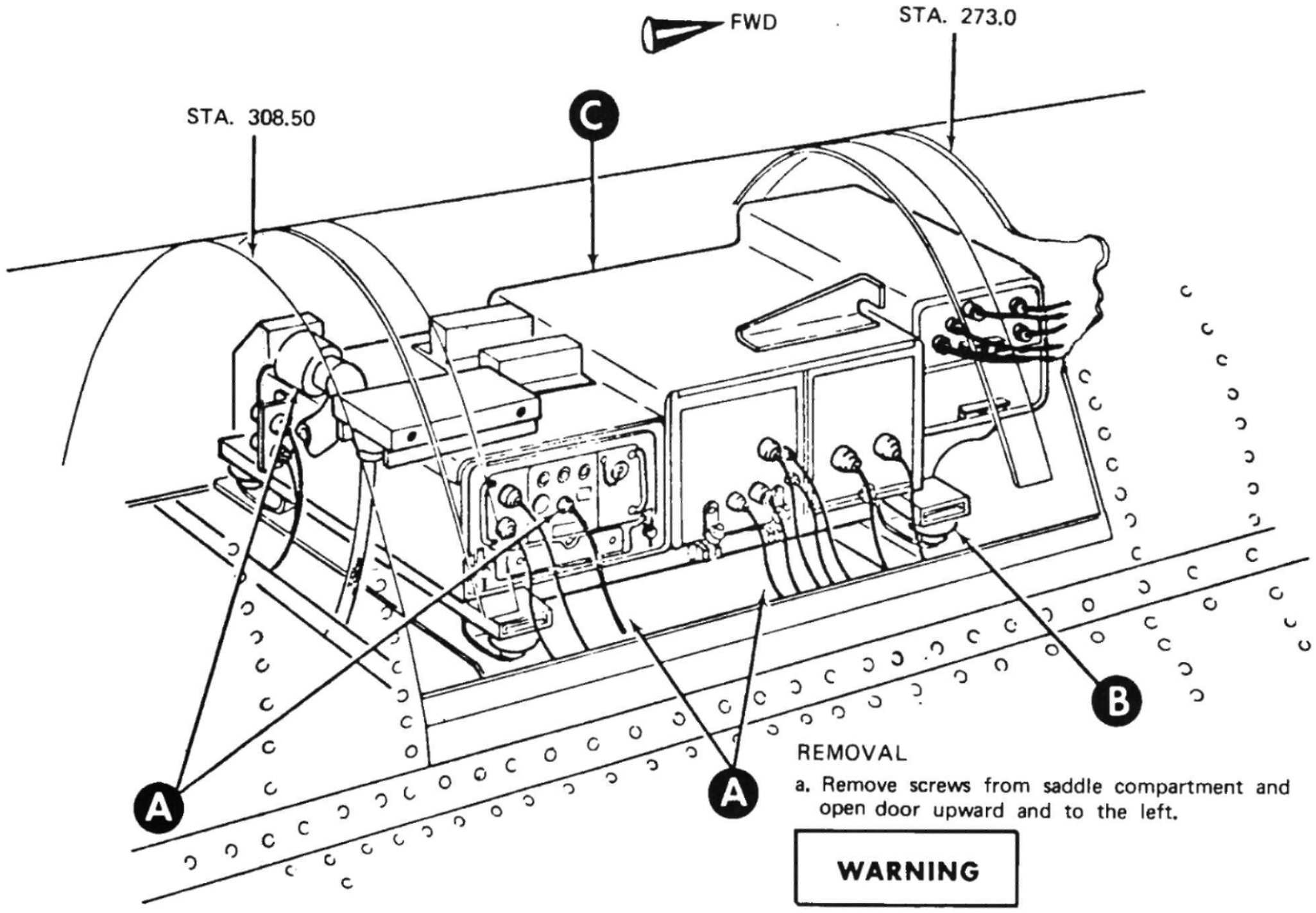
10-9o. TACAN ANTENNA. Refer to figure 10-19 (B, sheet 3) for procedures to remove and replace the TACAN antenna.

10-9p. LOWER IFF ANTENNA. Refer to figure 10-19 (sheet 2) for procedures to remove and replace the lower IFF antenna.

10-9q. UPPER IFF ANTENNA. Refer to figure 10-19 (sheet 1) for procedures to remove and replace the upper IFF antenna.

10-9r. EMERGENCY RELAY K40.

(1) Remove 273 unit iaw para. 10-7b.



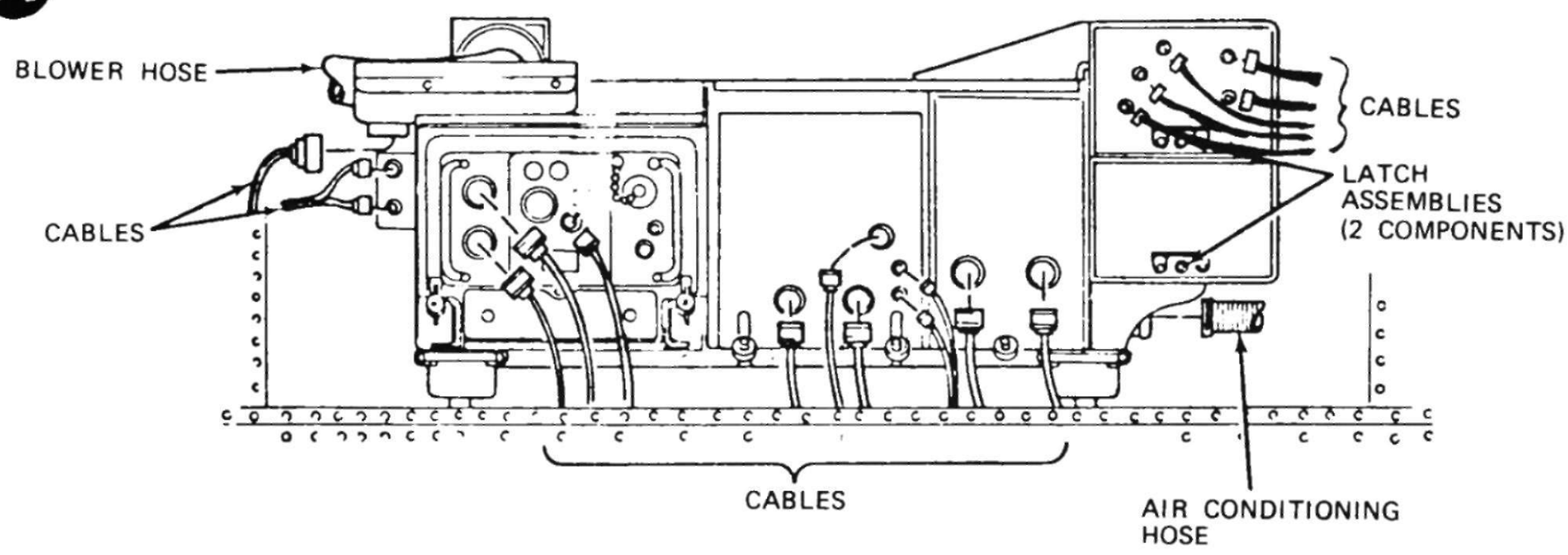
REMOVAL

a. Remove screws from saddle compartment and open door upward and to the left.

WARNING

ENSURE THAT ALL AIRCRAFT POWER HAS BEEN TURNED OFF

A



b. Disconnect cables from units.

c. Unlock latch assemblies securing 606 and 441 units and slowly pull units from rack.

d. Remove other units by loosening knurled nuts and slowly pulling units from rack.

e. Disconnect air conditioning hose.

f. Disconnect blower hose from blower hose fittings.

NOTE

Leave adapter 7839853–1 on P60601 and adapter 7839853–2 on P60602.

g. Disconnect connectors from 606 and 441 unit slots in rack.

Figure 10-18. 472473 Unit Replacement (Sheet 1 of 2)

See pg 105 Sup 4)

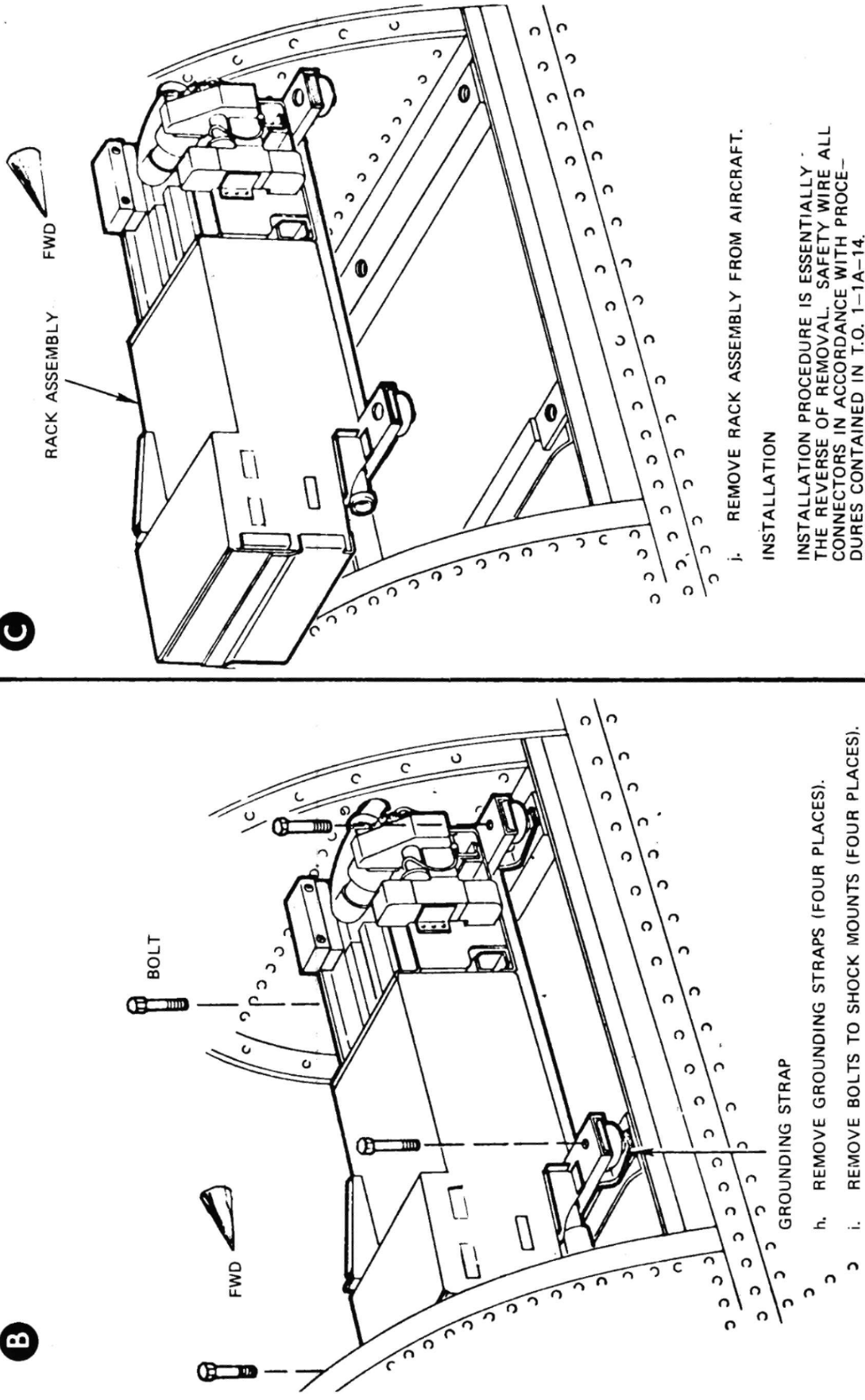


Figure 10-18. 472473 Unit Replacement (Sheet 2 of 2)

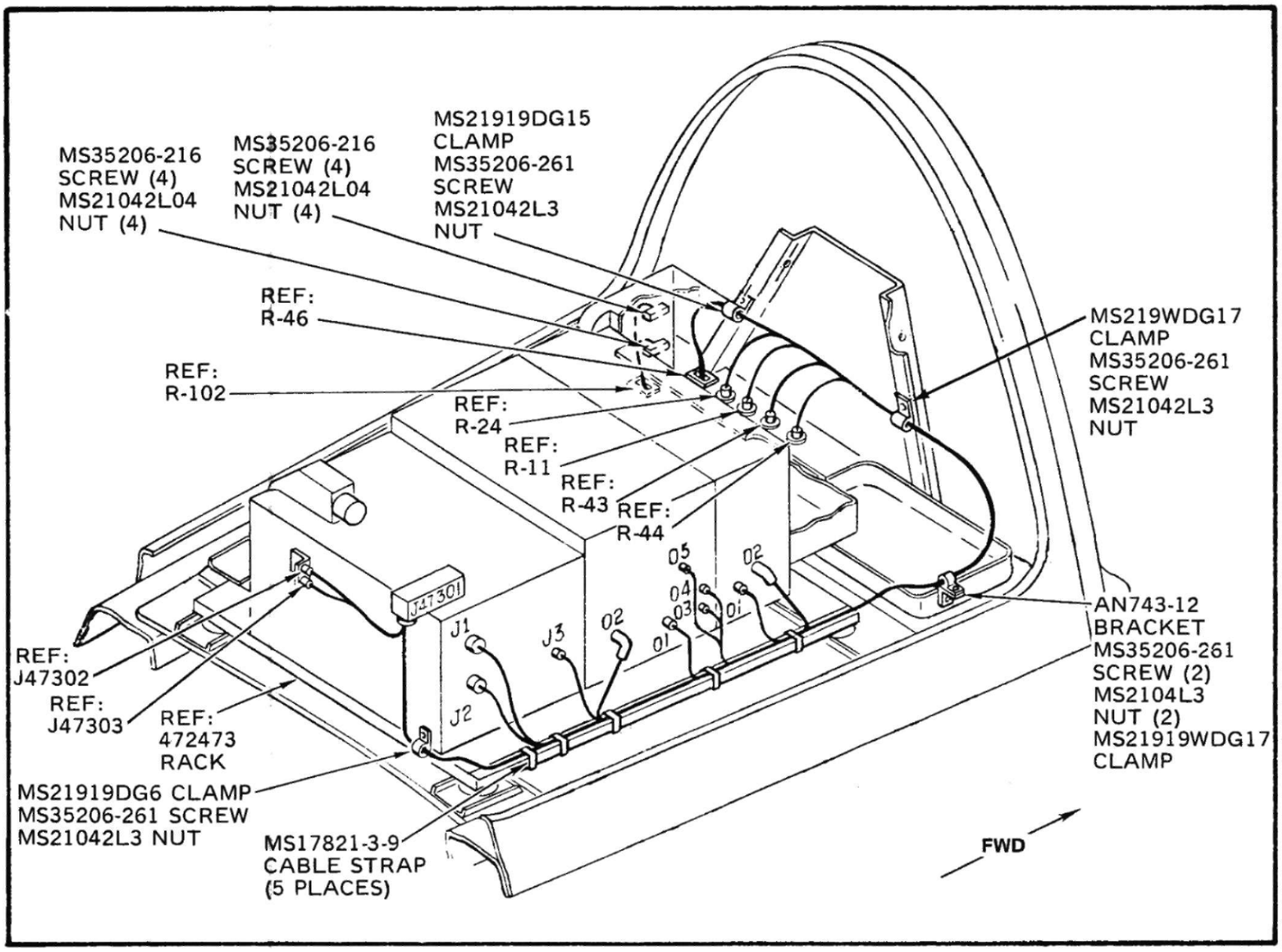
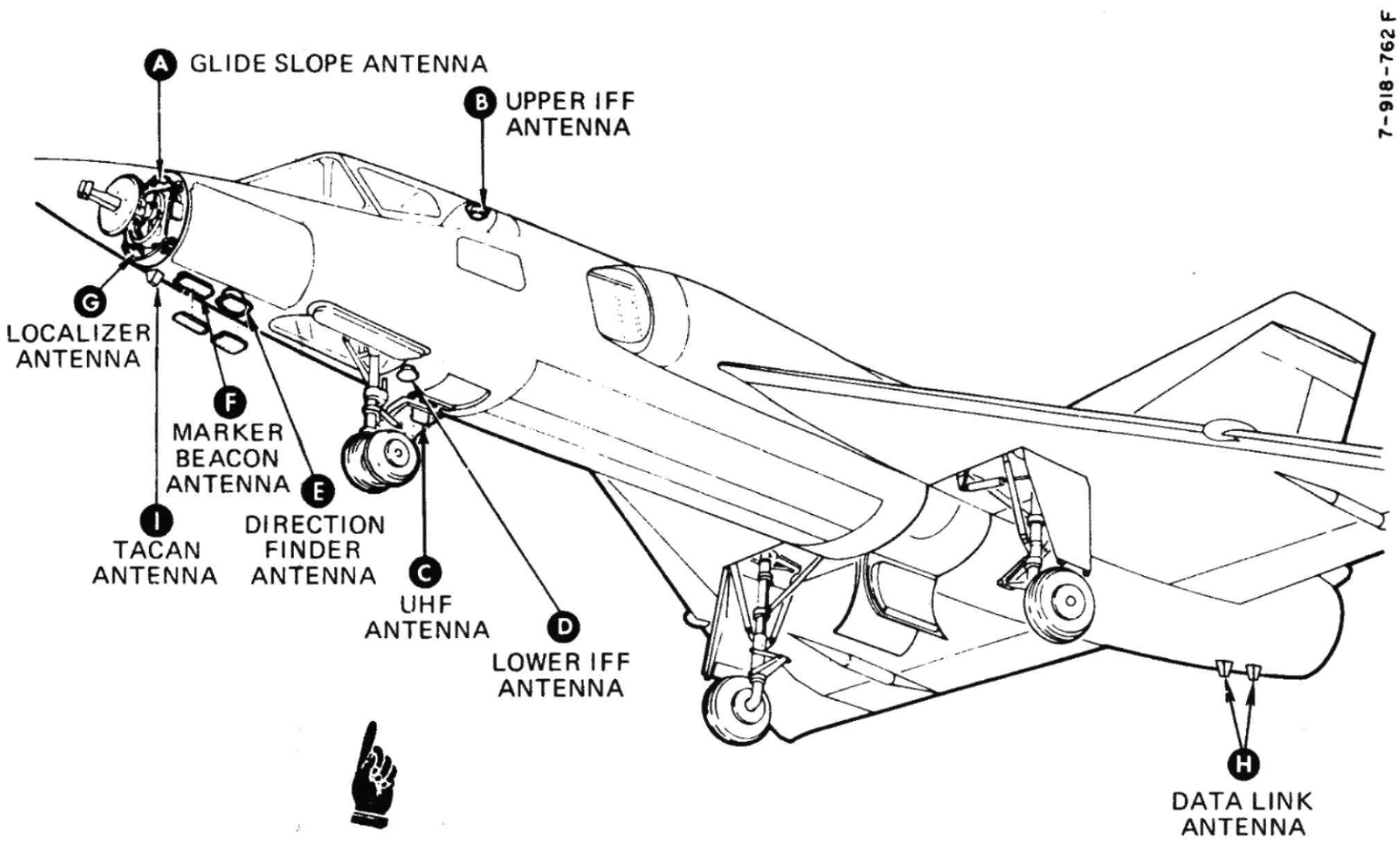
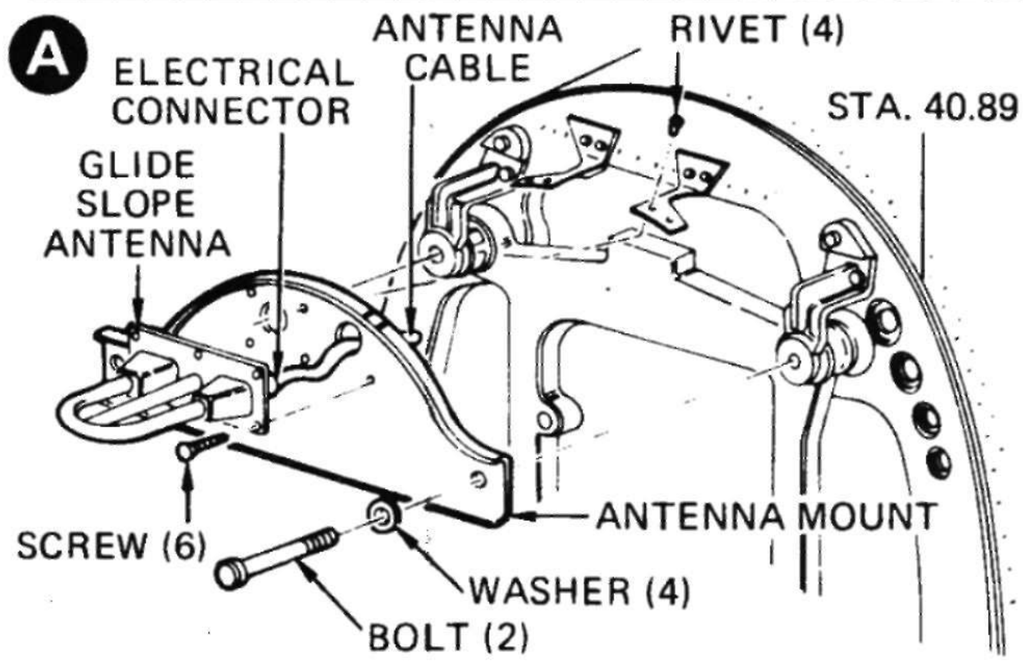


Figure 10-18.1. Refrigeration Compartment and Dorsal Area F-106B Harness Routing





REMOVAL, GLIDE-SLOPE ANTENNA.

a. Remove radome iaw para 4–10m.
b. Disconnect electrical connector.
c. Remove six screws that attach antenna mount.

NOTE

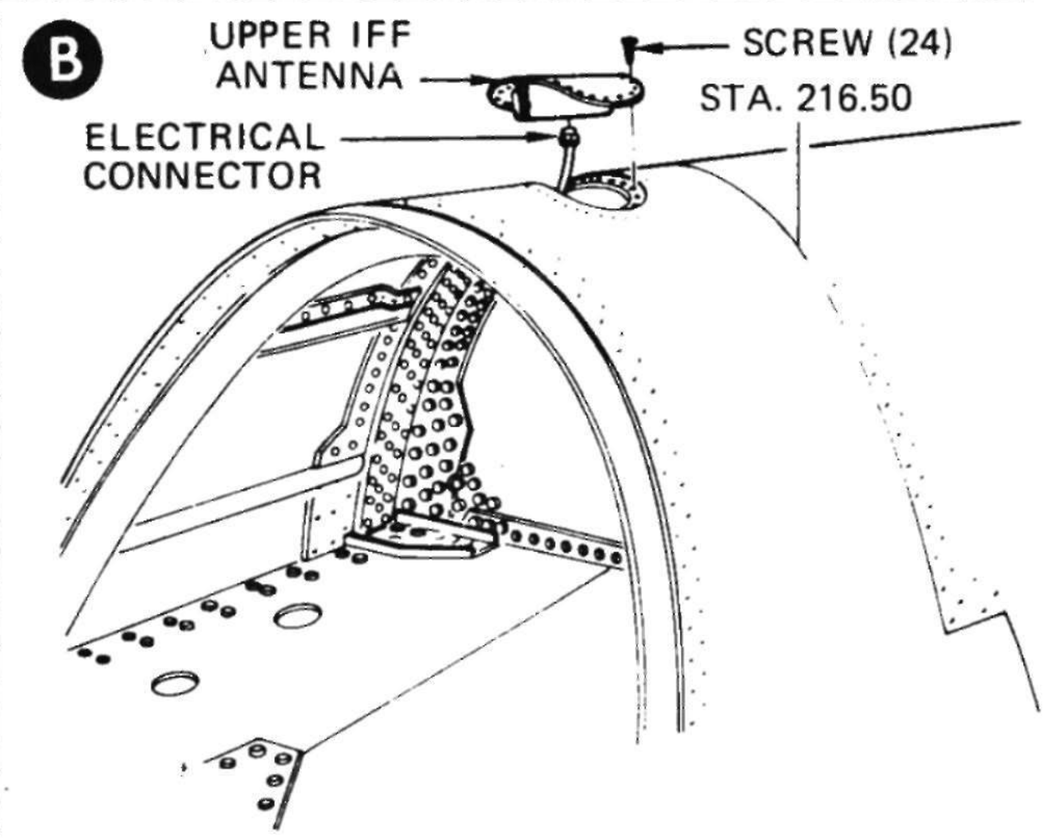
IF IT BECOMES NECESSARY TO REMOVE THE ANTENNA MOUNT, UNSCREW THE TWO BOLTS (WITH WASHER) AND REMOVE THE FOUR RIVETS THAT SECURE THE MOUNT TO THE AIRFRAME.

INSTALLATION, GLIDE-SLOPE ANTENNA.

Installation is essentially the reverse of removal.

NOTE

REFER TO T.O. 16C1–10–8–2 FOR INSTALLATION, SERVICING AND TESTING PROCEDURES.



REMOVAL, UPPER IFF ANTENNA.

a. Remove screws from antenna.
b. Raise antenna and disconnect antenna cable.
c. Remove antenna.

INSTALLATION, UPPER IFF ANTENNA

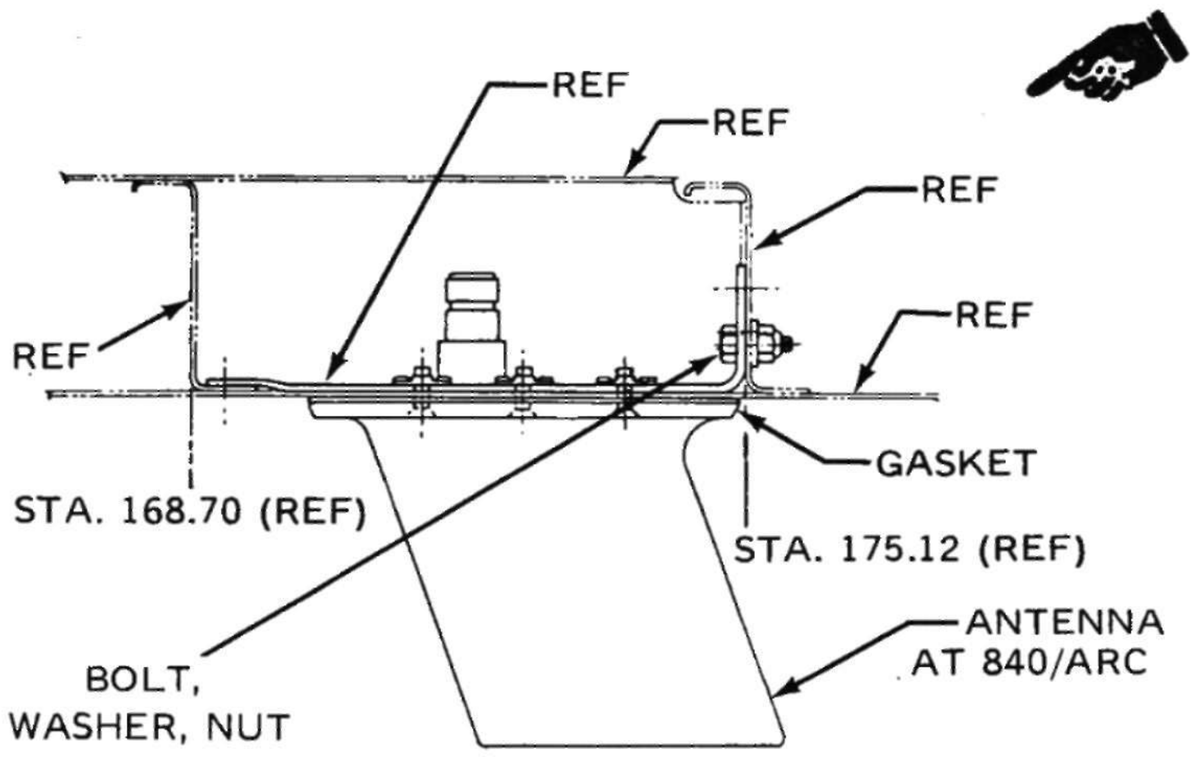
Installation procedure is essentially the reverse of removal.

NOTE

REFER TO T.O. 16C1–10–8–2 FOR INSTALLATION, SERVICING AND TESTING PROCEDURES.

Figure 10-19. Communications Antenna Replacement (Sheet 1 of 3)

C



REMOVAL, UHF ANTENNA

a. Remove six mounting screws.
b. Disconnect antenna cable.

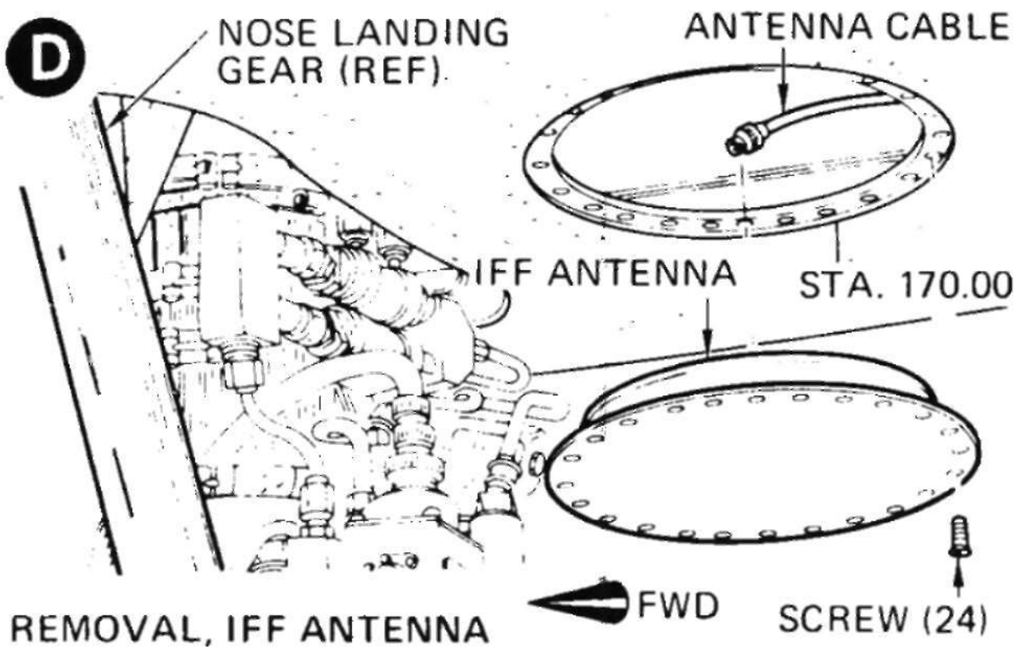
INSTALLATION

Installation is essentially the reverse of removal.

NOTE

- REFER TO T.O. 16C1-10-8-2 FOR INSTALLATION, SERVICING AND TESTING PROCEDURES. WHEN REPAINTING IS REQUIRED, REPAINT ANTENNA PER INSTRUCTIONS CONTAINED IN T.O. 1F-106-23, USING EPOXY PRIMER (8010-00-082-2450) SPEC. MIL-P-23377 AND POLYURETHANE TOP-COAT SPEC. MIL-C-83286, COLOR WHITE (FSN 8010-00-181-8281).
- DO NOT USE CHEMICAL STRIPPERS TO REMOVE COATING AND DO NOT PAINT UNDERSIDE OF ANTENNA. COAT UNDERSIDE OF ANTENNA WITH SPEC. MIL-C-5541.

D



REMOVAL, IFF ANTENNA

a. Remove screws attaching antenna to aircraft structure; support antenna before last screws are removed to prevent damage to antenna cable.
b. Disconnect antenna cable.
c. Remove antenna.

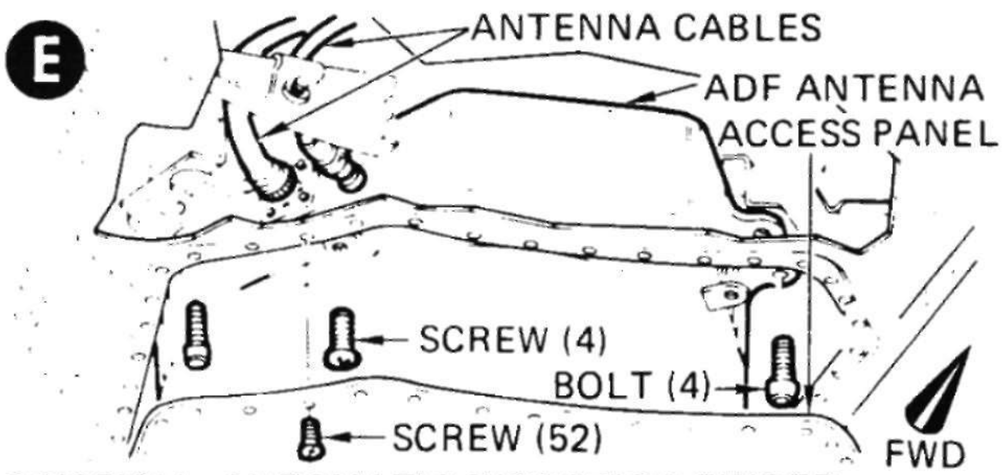
INSTALLATION

Installation is essentially the reverse of removal.

NOTE

REFER TO T.O. 16C1-10-8-2 FOR INSTALLATION, SERVICING AND TESTING PROCEDURES.

E



REMOVAL, AUTOMATIC DIRECTION FINDER (ADF) ANTENNA

a. Remove screws from access panel; support antenna before last screws are removed to prevent damage to antenna cable.
b. Disconnect two antenna cables.
c. Remove bolts and screws that secure antenna to aircraft structure.
d. Remove antenna.

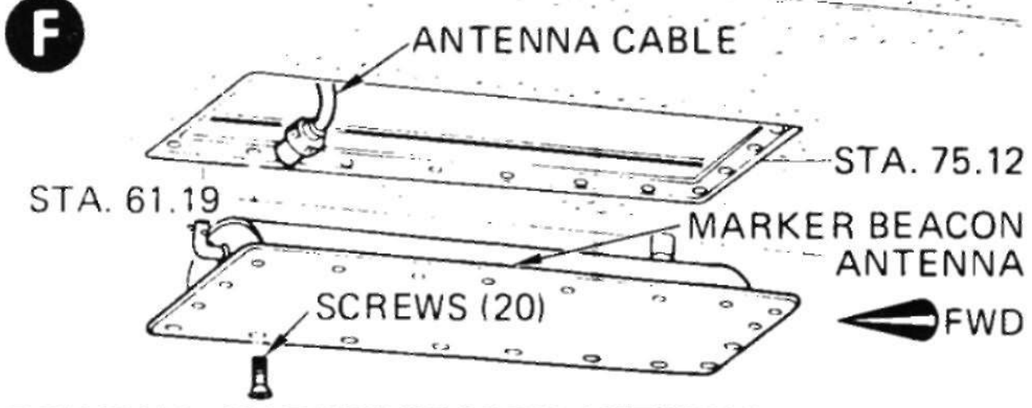
INSTALLATION

Installation is essentially the reverse of removal.

NOTE

REFER TO T.O. 12R1-2-ARA25-1, -2 AND -3 FOR INSTALLATION, OVERHAUL AND TESTING PROCEDURES.

F



REMOVAL, MARKER BEACON ANTENNA

a. Remove screws attaching antenna to aircraft structure; support antenna before last screws are removed to prevent damage to antenna cable.
b. Disconnect antenna cable.
c. Remove antenna.

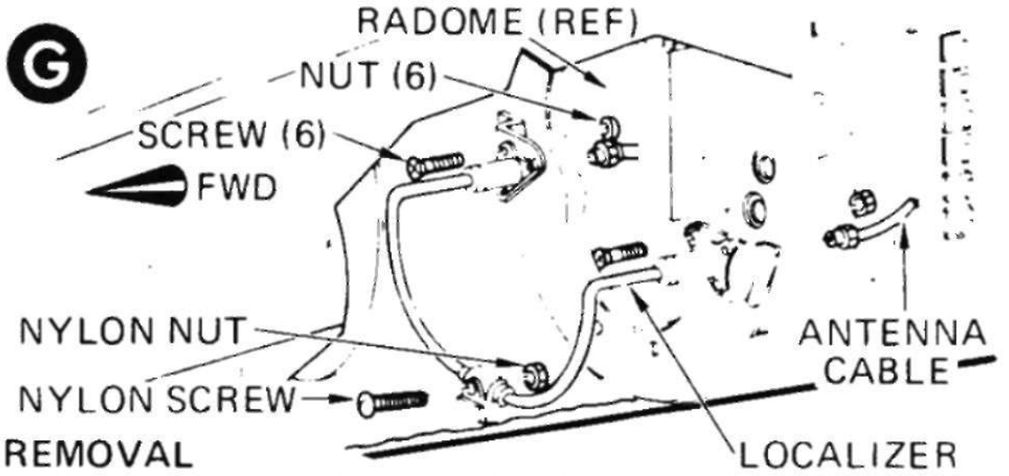
INSTALLATION

Installation is essentially the reverse of removal.

NOTE

REFER TO T.O. 16C1-10-8-2 FOR INSTALLATION, SERVICING AND TESTING PROCEDURES.

G



REMOVAL

a. Remove radome iaw para 4-10m.
b. Disconnect antenna cable at two places.
c. Remove six screws, and six nuts that secure antenna to airframe.
d. Remove nylon screw and nylon nut.
e. Remove antenna.

INSTALLATION

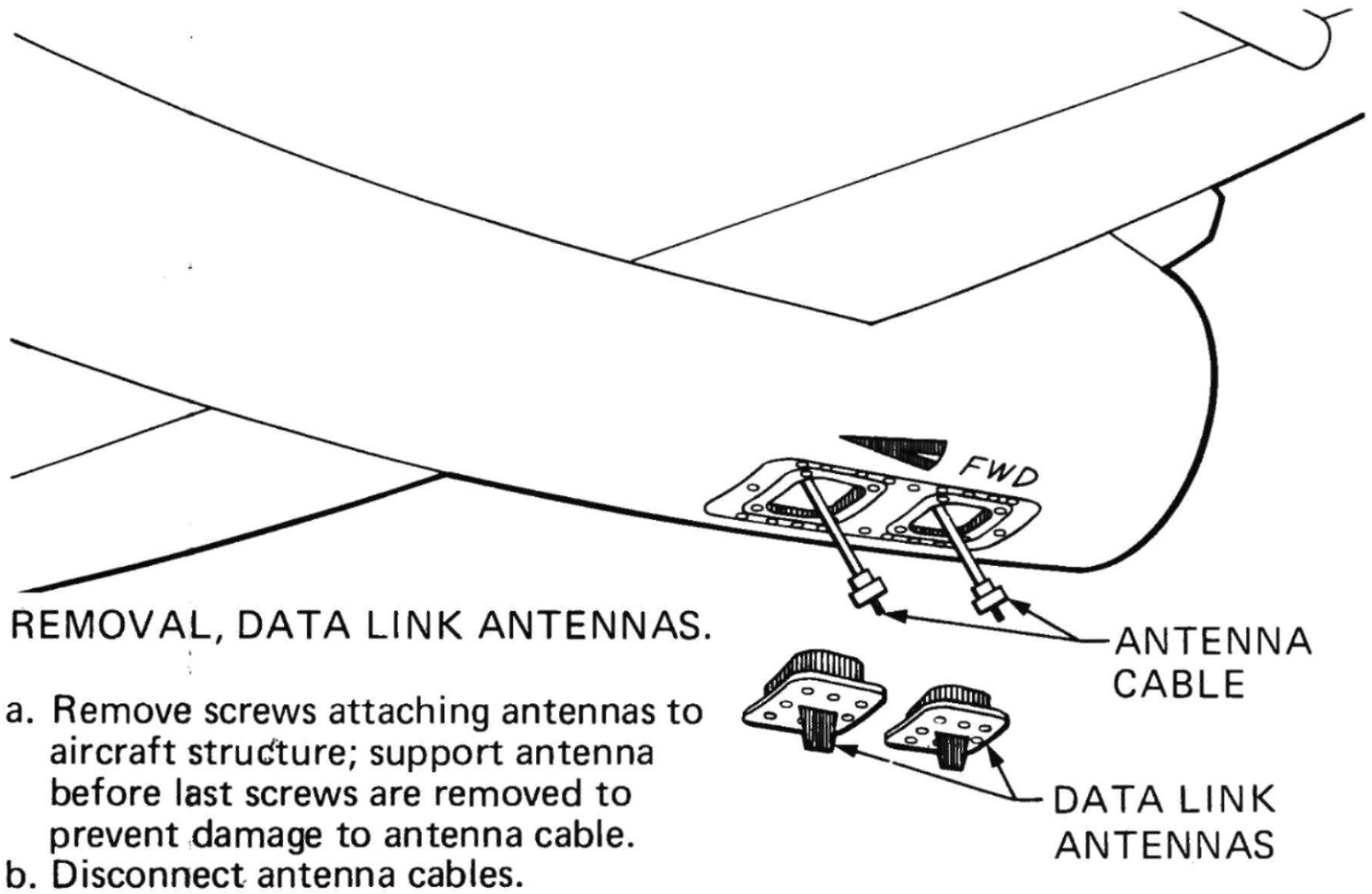
Installation is essentially the reverse of removal.

NOTE

REFER TO T.O. 12R5-4-24-3 FOR INSTALLATION, OVERHAUL, AND TESTING PROCEDURES.

Figure 10-19. Communications Antenna Replacement (Sheet 2 of 3)

H



7-981-15B

REMOVAL, DATA LINK ANTENNAS.

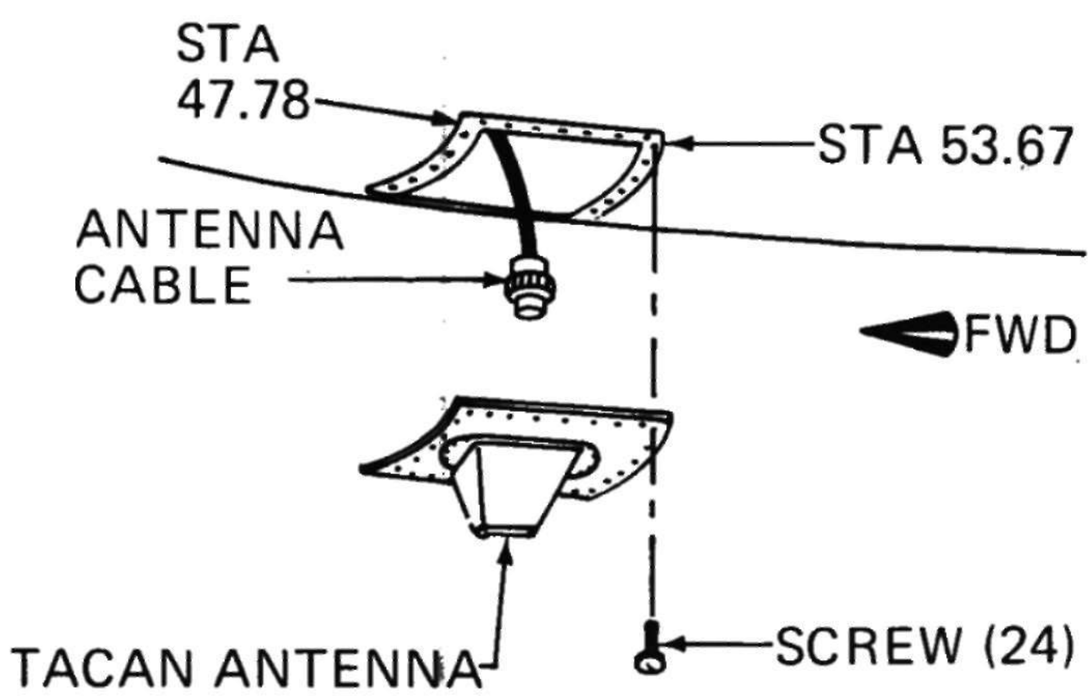
a. Remove screws attaching antennas to aircraft structure; support antenna before last screws are removed to prevent damage to antenna cable.
b. Disconnect antenna cables.
c. Remove antennas.

INSTALLATION

Installation is essentially the reverse of removal.

A

I



7-981-29A

REMOVAL, TACAN ANTENNA.

a. Remove screws attaching antenna to aircraft structure; support antenna before last screws are removed to prevent damage to antenna cable.
b. Disconnect antenna cable.
c. Remove antenna.

INSTALLATION TACAN ANTENNA.

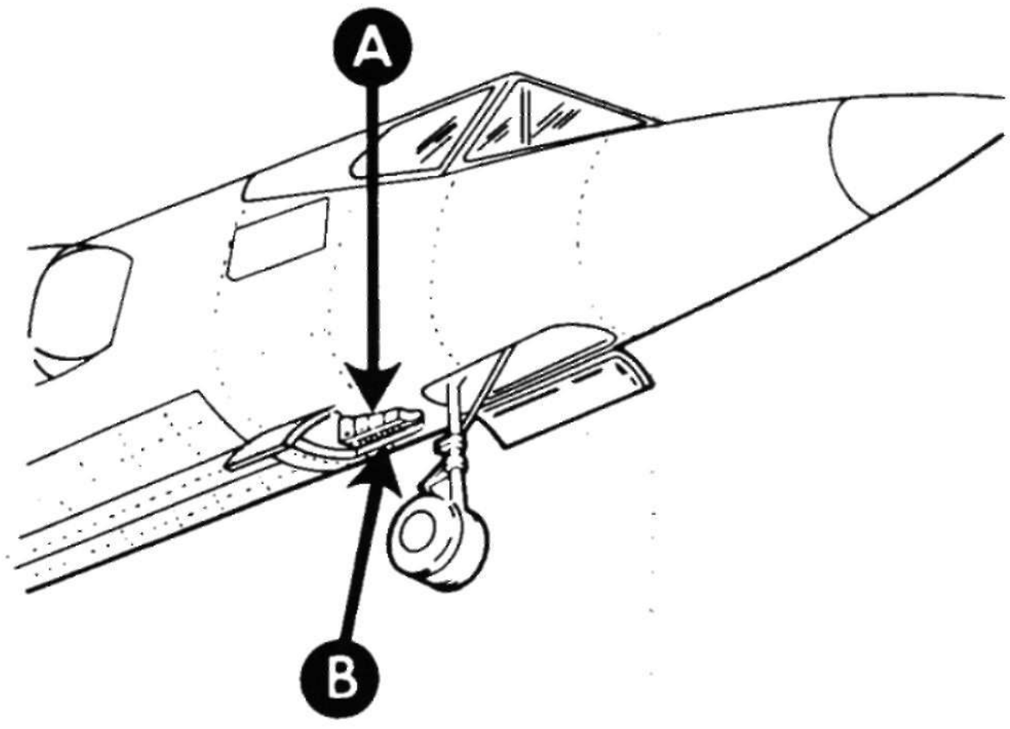
Installation is essentially the reverse of removal.

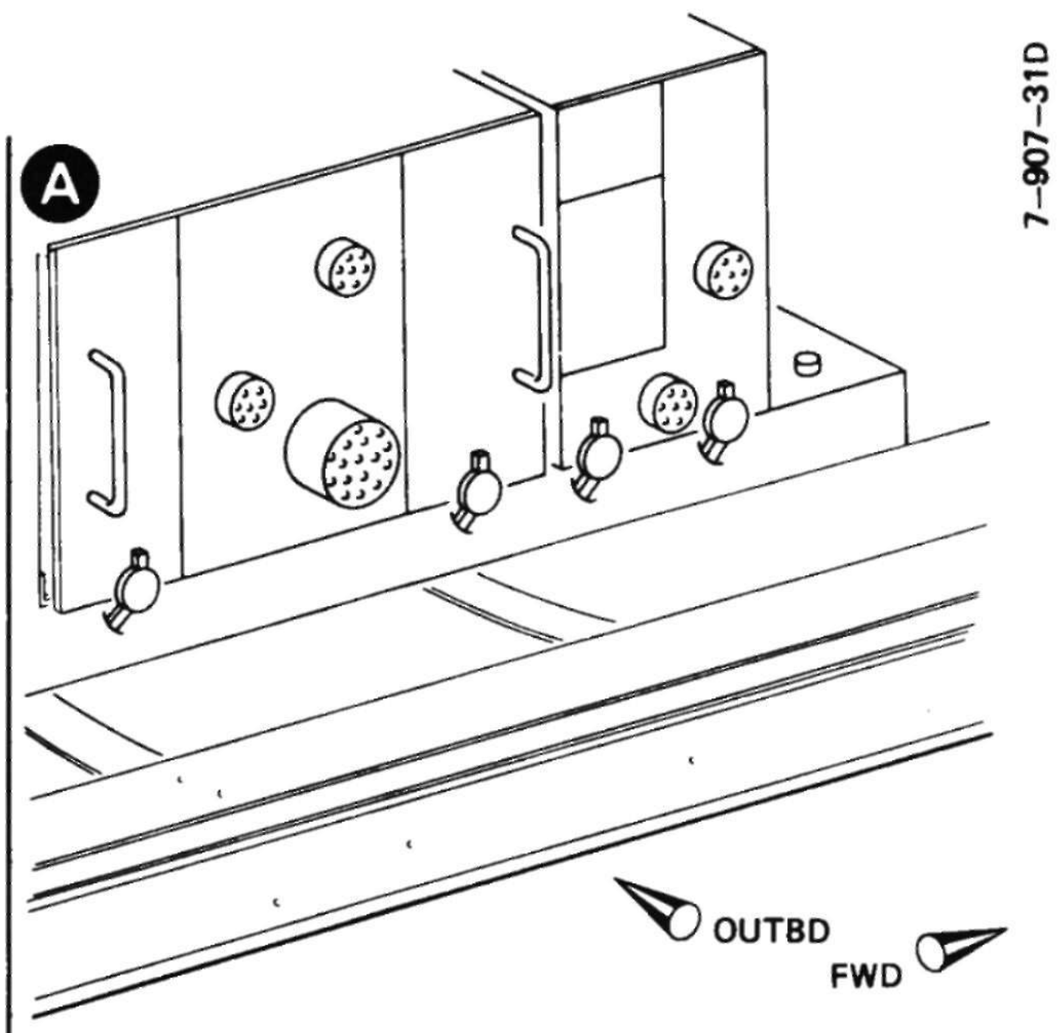
NOTE

REFER TO T.O. 16CI-10-8-2 FOR INSTALLATION, OVERHAUL, AND TESTING PROCEDURES.

B

Figure 10-19. Communications Antenna Replacement (Sheet 3 of 3)





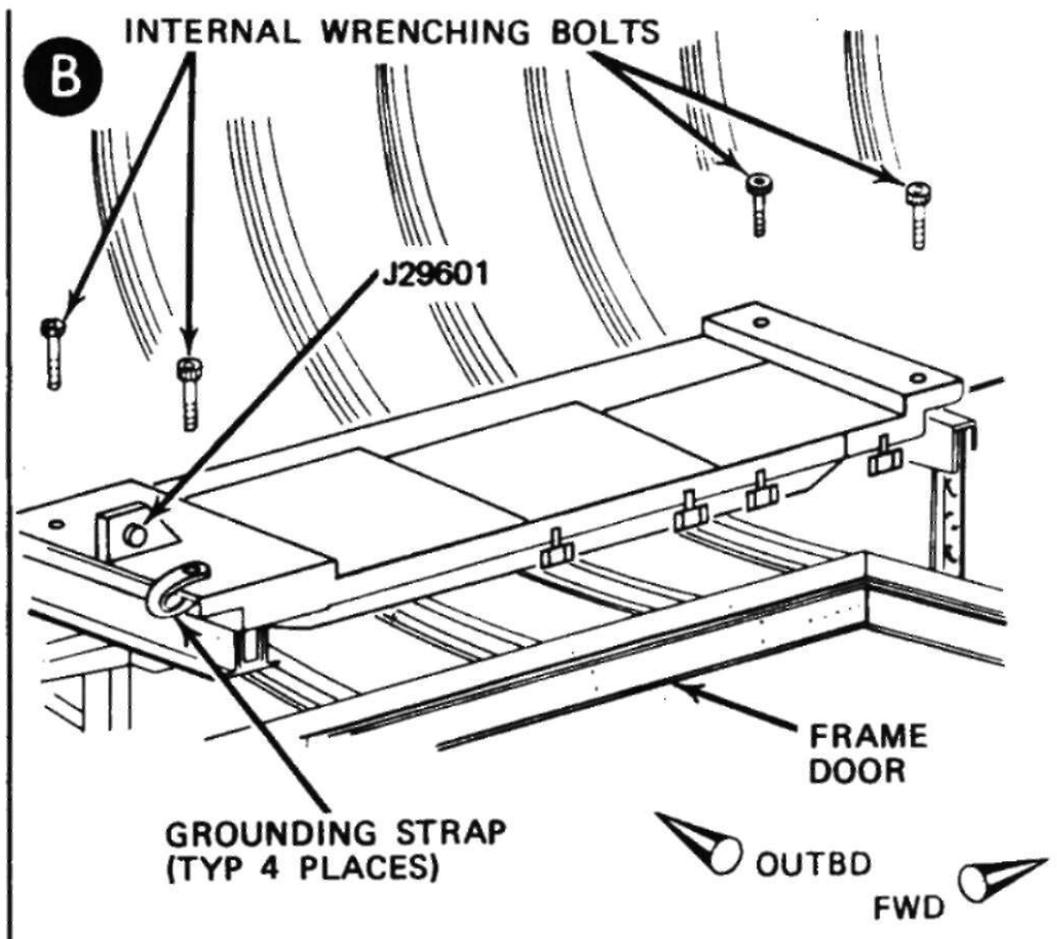
7-907-31D

REMOVAL

WARNING

ENSURE THAT ALL AIRCRAFT POWER HAS BEEN TURNED OFF.

a. Loosen knurl nut(s) and swing bolts down. Disconnect cables from 509 and ECA units.
b. Remove 509 and ECA units.
c. Disconnect P29601 from J29601.



d. Remove four internal wrenching bolts that secure rack to airframe structure. Retain bolts and associated washers for reinstallation of rack.
e. Lift rack slightly to clear rack supporting structure and remove rack through access door opening.

INSTALLATION

Installation procedure is essentially the reverse of removal.

Ensure that 4 grounding straps are secured when internal wrenching bolts are installed.

Figure 10-20. 7839890 Rack Replacement

(2) Remove 2 screws and 2 nuts that secure K40 to the 273 unit.

(3) Remove K40.

NOTE

Installation procedure is essentially the reverse of removal.

10-9s. ADF ANTENNA. Refer to figure 10-19 (sheet 2) for procedures to remove and replace the ADF antenna.

19-9t. MARKER BEACON ANTENNA. Refer to figure 10-19 (sheet 2) for procedures to remove and replace the marker beacon antenna.

10-10. FC&M UNIT REPLACEMENT.

10-19a. 289 UNIT.

WARNING

Ensure all aircraft power has been turned off.

(1) Set 905 POWER to OFF and remove all aircraft power.

(2) Loosen clamp and disconnect cooling hose on top of 289 unit.

(3) Disconnect 2 electrical connectors from 289 unit.

(4) Remove 4 bolts that secure 289 unit.

(5) Lift 289 unit up and aft to remove.

NOTE

Installation procedure is essentially the reverse of removal. Ensure that guide pin holes in 289 unit mate with guide pins on stable table rack.

10-10b. 374 UNIT. Set 905 POWER to OFF and remove all aircraft power. Refer to figure 10-20 for procedures to remove and replace the 374 unit.

See pg 107 Sup 41

CHAPTER 11

TEST EQUIPMENT

11-1. GENERAL.

This chapter contains preliminary set-up procedures for the major test equipment used when performing maintenance on the MA-1 or AN/ASQ-25 system. The preliminary set-up procedures present only information for proper cable connection, switch settings, and other non-operational steps. Refer to the check procedures for the actual operational usage of each piece of test equipment.

NOTE

Throughout this chapter, unless otherwise stated, all switches, indicators, connectors, etc. are part of the specific test equipment being set up.

11-2. Deleted

See pg 108 Sup 4

11-3. AN/UPM-141 RADAR TEST SET, PRELIMINARY SET-UP PROCEDURE.

a. Refer to T.O. 33D7-44-197-1 for preliminary set-up and self test procedures.

b. Perform the following to set up the UPM-141 for CW operation at transmitter frequency. Unless otherwise indicated, all controls are located on the UPM-141.

(1) Connect RF IN/OUT (J7) to J48401.

(2) MEASUREMENT SELECT to RDR FREQ (MHZ).

(3) TEST MODE to ACFT-XPONDER PULSE.

(4) TRIG SELECT-INPUT TRIG to RF.

(5) FREQUENCY HOLD/OFF to HOLD.

(6) Set the self test switch (841 unit) to MAN SLOW, adjust FREQ SET (841 unit) to the desired frequency as indicated on the digital display and record.

(7) TEST MODE to SELF TEST.

(8) FREQUENCY HOLD/OFF to OFF.

(9) FREQUENCY COARSE and FINE adjust to the desired frequency or to the recorded frequency ± 5 MHz.

(10) FREQUENCY HOLD/OFF to HOLD.

(11) RF POWER CAL/UNCAL to CAL.

(12) RF POWER OUTPUT-DBM to 000.

(13) MEASUREMENT SELECT to RET POWER.

(14) RF POWER SET, adjust to CAL line on MEASUREMENT (M1) meter.

(15) TEST MODE to SIG GEN-CW.

(16) MEASUREMENT SELECT to BWO FREQ (MHZ).

11-4. AN/UPM-33 SPECTRUM ANALYZER RADAR TEST SET, PRELIMINARY SET-UP PROCEDURE.

a. Remove TS-148/UP spectrum analyzer from AN/UPM-33 case.

b. Connect CX-337/U power cable between ac power receptacle on the spectrum analyzer and a 105-125 v, 50-1000 Hz single-phase power source.

c. Set POWER to ON and allow at least 1 minute for warm up.

d. Attach UG-183/U waveguide coaxial adapter to waveguide, accessible through the door on the side of the spectrum analyzer.

e. Attach CG-92/U coaxial cable to adapter.

f. Rotate MIXER AMPLIFIER fully ccw.

11-5. TKX-545-S4 and 53/54C DUAL TRACE OSCILLOSCOPE, PRELIMINARY SET-UP PROCEDURE.

a. Set POWER to off position and connect power cord to 115 v, 60 Hz single-phase power source.

b. Rotate INTENSITY ccw.

c. Rotate FOCUS to center position.

d. Rotate ASTIGMATISM to center position.

e. Set POWER to ON.

f. Set MAIN SWEEP TRIGGERING LEVEL to 0.

g. Set MAIN SWEEP STABILITY (red knob) to PRESET.

h. Set MAIN SWEEP TRIGGER SLOPE to +INT.

i. Set MAIN SWEEP TRIGGERING MODE to AUTOMATIC.

j. Set HORIZONTAL DISPLAY to MAIN SWEEP NORMAL.

k. Rotate DELAYING SWEEP STABILITY fully ccw.

l. Rotate HORIZONTAL POSITION to center position.

m. Set VOLTS-MILLIVOLTS-OFF to OFF.

n. Set both AC-DC switches to AC.

o. Set both POLARITY switches to NORMAL.

p. After connecting signal(s) to be observed to the CHANNEL A and/or CHANNEL B inputs, adjust MAIN SWEEP TIME CM, MAIN SWEEP MULTIPLIER, FOCUS, INTENSITY, and positioning controls for the desired display.

11-6. MILI-17C, ELECTRONIC MULTIMETER, PRELIMINARY SET-UP PROCEDURE.

a. Check for broken parts or dented case.

b. Check to see that meter pointer swings freely.

c. Connect power cable to the electronic multimeter and to a 115 v, 60 Hz single-phase power source.

d. Allow 25 seconds for warmup.

11-7. ME30A/U VTVM (AC), PRELIMINARY SET-UP PROCEDURE.

a. Check for broken parts or dented case.

b. Check to see that meter pointer swings freely.

c. Connect power cable to the VTVM and to a 115 v, 60 Hz single-phase power source.

d. Allow 25 minutes for warmup.

11-8. TS-505 D/U VTVM, PRELIMINARY SET-UP PROCEDURE.

a. Check for broken parts or dented case.

b. Check to see that meter pointer swings freely.

c. Connect power cable to the VTVM and to a source of 115 v, 60 Hz single-phase power source.

d. Allow 25 seconds for warmup.

CAUTION

When ambient temperature is above -4°F (-20°C), insure that both the side doors are open before applying power to the unit.

(4) Place POWER switch ON.

(5) Place the following switches and controls to their indicated position:

SWITCH OR CONTROL	POSITION
TEST MODE	SELF TEST
MEASUREMENT SELECT	OFF
TRIG SELECT	
INPUT TRIG	INT
TRIG OUT	POS
FREQUENCY	
HOLD/OFF	OFF
COARSE	10.0
FINE	CENTER
RF POWER	
OUTPUT-DBM	000
POWER SET	CENTER
CAL/UNCAL	CAL
ANTENNA CONTROL	
POSITION DEG	0
POS/RATE	POS
RATE DEG/SEC	CENTER
RANGE	
INITIAL RANGE YDS	00100
RATE KNS	0

d. PRELIMINARY CHECKOUT PROCEDURES. The following paragraph contains the preliminary checkout procedures used by the operator to determine the operational status of the Radar Test Set.

STEP	INSTRUCTION	INDICATION
1	Perform Radar Test Set initial conditions of paragraph 11-3d.	
2	MEASUREMENT SELECT to POWER SUPPLIES +5, +15, +28, ANODE, HELIX, -6 and -15.	MEASUREMENT meter indicates in green zone for each position. (Helix and anode indications are delayed approximately 40 to 80 seconds after application of power.)
3	MEASUREMENT SELECT TO SELF TEST CLOCK.	Digital Display indicates 409800 ± 100.
4	PULSE WIDTH MICROSEC TO SHORT PULSE WIDTH in accordance with classified information codes (T.O. 27-6, figure 1-2). MEASUREMENT SELECT to SELF TEST PULSE MOD. TEST MODE to FM PULSE, SQW, and then SIG GEN PULSE.	 MEASUREMENT meter indicates to right of MOD marking for each position.
5	PULSE WIDTH MICROSEC to 00.	MEASUREMENT meter indicates to left of MOD marking.

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STEP	INSTRUCTION	INDICATION
6	MEASUREMENT SELECT to SELF TEST COMB.	MEASUREMENT meter indicates to right of MOD marking. Digital Display indicates a five- or six-digit number. It is normal for the numbers to change as the system warms up.
7	MEASUREMENT SELECT to RF PWR. TEST MODE to SELF TEST. RF POWER CAL/UNCAL to CAL. RF POWER OUTPUT-DBM to 000. Adjust RF POWER POWER SET for CAL line indication. RF POWER OUTPUT-DBM to 001. RF POWER OUTPUT-DBM to 002. RF POWER OUTPUT-DBM to 003. RF POWER OUTPUT-DBM to 004. RF POWER OUTPUT-DBM to 005.	 MEASUREMENT meter indicates on CAL line. MEASUREMENT meter indicates 45 ±0.2 dbm. MEASUREMENT meter indicates 44 ±0.4 dbm. MEASUREMENT meter indicates 43 ±0.6 dbm. MEASUREMENT meter indicates 42 ±0.8 dbm. MEASUREMENT meter indicates 41 ±1.0 dbm.
8	TEST MODE to SIG GEN CW. MEASUREMENT SELECT to BWO FREQ (MHz). FREQUENCY HOLD/OFF to OFF. Slowly adjsut FREQUENCY COARSE and FINE from fully counterclockwise to fully clockwise. Adjust FREQUENCY COARSE and FINE for an indication of 10000.0 ±10.0 MHz. FREQUENCY HOLD/OFF to HOLD.	 Digital Display indicates smoothly increasing frequency from less than 8400.0 to greater than 1200.00 MHz. Digital Display indicates 10000.0 ±10.0 MHz. The five most significant digits of the Digital Display indicates the frequency obtained above. The least significant digit of Digital Display indicates 5 ±2.

STEP	INSTRUCTION	INDICATION
9	TEST MODE to SIG GEN PULSE. MEASUREMENT SELECT to RANGE (YDS). RANGE RATE KNS to 0. RANGE INITIAL RANGE YDS TO 88888. Momentarily press RANGE RESET. RANGE INITIAL RANGE YDS to 77777. Momentarily press RANGE RESET. Rotate RANGE RATE KNS to 50, 100, 200, 400, 800, 1200, 2400 and 3000. RANGE RATE KNS to 2400. RANGE INITIAL RANGE YDS to 1333. Place RANGE RESET to down position and hold. Release RANGE RESET.	Digital Display indicates 888880. Digital Display indicates 777770. Digital Display indicates a rate change and smooth count for each RANGE RATE KNS position. Digital Display indicates 13330. Digital Display decrements to 000000. Total elapsed time is 10 ±0.5 seconds.
10	Step 10 contains the procedure for verifying the proper operation of the Test Antenna. This step may be omitted if Test Antenna is not to be utilized. TEST MODE to SELF TEST. MEASUREMENT SELECT to ANT RATE (°/SEC). ANTENNA CONTROL POS/RATE to RATE. Slowly rotate ANTENNA CONTROL RATE DEG/SEC from fully ccw to fully cw. MEASUREMENT SELECT to SELF TEST SERVO. ANTENNA CONTROL POSITION DEG. to 0.	Digital Display varies from less than 1° to greater than 30°/sec. Test Antenna rotates smoothly as indicated on Digital Display. MEASUREMENT meter indicates to right of MOD marking.

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STEP	INSTRUCTION	INDICATION
10 (cont'd)	ANTENNA CONTROL POS/RATE to POS.	Test Set antenna rotates to 0 degrees (12 o'clock) position and stops. MEASUREMENT meter indicates full scale after antenna stops.
	ANTENNA CONTROL POSITION DEG to 90, 180, and 270.	Test Antenna rotates to the respective position and stops.
	NOTE Steps 11 through 13 contain the procedures for calibrating the return target power level at radar operating frequency. This procedure must be performed prior to testing Minimum Discernible Signal (MDS) to insure power accuracy of ± 1db at the operating frequency.	
11	Connect cable W5 and W6 in series between J7 of AN/UPM-141 and J2 of Test Antenna for space configuration. Refer to figure 11-1 for positioning the test antenna relative to the MA-1 antenna. For RF cable link configuration, connect W5P2 to J7 of AN/UPM-141 and W5P1 to J84801 (848 unit).	
12	a. TRIG SELECT INPUT TRIG to RF.	
	b. TEST MODE TO ACFT XPONDER PULSE	FREQ LOCK Lamp illuminates
	c. MEASUREMENT SELECT to RF. Adjust radar operating frequency to center of paramp band. Record digital display.	Digital Display indicates transmitter frequency.
	d. TEST MODE TO SELF TEST.	
	e. Adjust FREQUENCY COURSE and FINE controls for frequency indication obtained in step 12c ± 5MHz.	Digital Display indicates frequency obtained in step 12c ± 5MHz.
13	RF POWER CAL/UNCAL to CAL RF POWER OUTPUT-DBM to 000 MEASUREMENT SELECT to RET PWR Adjust RF POWER SET for a CAL LINE indication on MEASUREMENT meter.	MEASUREMENT meter indicates on CAL line.

e. TYPICAL EXAMPLES OF USE. Paragraphs 11-3f through 11-3m contain examples of the Radar Test Set usage. These examples provide the operator with the necessary instructions to perform the following measurement and checkout procedures:

WARNING

Dangerous radiation levels exist in an area in front of and to the sides of the aircraft radar antenna when the radar system is operating. Insure radar system is not radiating when aligning the Test Set Antenna Unit to the aircraft antenna. Contact ground safety office for minimum safe distance during aircraft radar operations when Test Set Antenna Unit is used.

NOTE

Momentarily press RANGE RESET switch each time POWER ON/OFF switch is placed to ON. Also

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insure that the range indicated on INITIAL RANGE YDS switches is compatible with prf rate.

When measuring radar frequency, the Digital Display indication may be random if the radar transmitter under test has a frequency jitter greater than ±1.0 MHz.

f. MEASUREMENT OF POWER AND FREQUENCY OF RADAR TRANSMITTER. To measure power and frequency of radar transmitter, perform the following procedure:

(1) Perform the procedures of paragraphs 11-3c and 11-3d.

(2) Connect connector W5P2 to connector J7 of Radar Signal Simulator and connector W5P1 to aircraft directional compler (484).

(3) Place TEST MODE switch to ACFT XPONDR PULSE.

(4) Place MEASUREMENT SELECT switch to RF PWR.

(5) Observe the upper DB scale (+39 to +51 dbm) of the MEASUREMENT meter for peak power indication in db. Add cable W5 attenuation and directional coupler attenuation for correct transmitter power.

NOTE

If a higher input power is required, cable W6 can be substituted for cable W5. This provides an increase of approximately 3 db.

(6) Place MEASUREMENT SELECT switch to RDR FREQ (MHz).

(7) Observe FREQ LOCK lamp is illuminated.

(8) Observe Digital Display for an indication of transmitter frequency.

g. MEASUREMENT OF PULSE WIDTH (PW) MODE AND PULSE REPETITION FREQUENCY (PRF). To measure pulse width mode and pulse repetition frequency of the RADAR transmitter, perform the following procedure:

(1) Perform the procedures of paragraphs 11-3c and 11-3d.

(2) Connect connector W5P2 to connector J7 of Radar Signal Simulator and connector W5P1 to aircraft directional coupler (484).

(3) Place TEST MODE switch to ACFT XPONDR PULSE.

(4) Place TRIG SELECT INPUT TRIG switch to RF.

(5) Observe FREQ LOCK Lamp is illuminated.

(6) Place MEASUREMENT SELECT switch to PRF (KHz).

(7) Observe the Digital Display for the correct indication of PRF.

(8) Observe PULSE WIDTH SP and SP lamps for an indication of pulse width mode.

h. RETURN OF FIXED OR MOVING TARGET. To return a fixed or moving target, perform the following procedure:

(1) Perform the procedure of paragraphs 11-3c and 11-3d.

NOTE

For some tests, cable W5 can be connected in two different configurations. For the space path configuration, connect cables W5 and W6 in series between connector J7 of Radar Signal Simulator and connector J2 of Test Antenna. For the RF cable link configurations, connect connector W5P2

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to connector J7 of Radar Signal Simulator and connect connector W5P1 to the aircraft directional coupler.

(2) Connect cables in either the space path of RF cable link configurations.

NOTE

When cable W5 is connected in the RF cable link configuration, Steps 3 and 4 can be omitted.

(3) Using figure 11-1 as a guide, position the Test Antenna to the correct distance from the aircraft.

(4) Insure the feed horn pivot axis is aligned horizontally to aircraft antenna boresight axis to within ± 6 inches.

(5) Perform the procedures of paragraph 11-3d, steps 11 through 13.

(6) Place TEST MODE switch to ACFT XPONDR PULSE.

NOTE

Target attenuation level as received by the receiver under test can be determined by the following procedure. When the space configuration is used, add cable attenuation, space path attenuation (feed horn to aircraft antenna - approximately 26 db), and the RF POWER OUTPUT-DBM switch settings. When the RF cable link configuration is used, add cable W5 attenuation, directional coupler attenuation and the RF POWER OUTPUT-DBM switch settings.

(7) Place RF POWER OUTPUT-DBM switches to the desired settings for received power level.

(8) Place INITIAL RANGE YDS switches to desired target range.

(9) Place MEASUREMENT SELECT switch to RANGE YDS.

(10) Press and release RANGE RESET switch.

(11) Observe Digital Display for the correct range indication.

(12) Place RANGE RATE KNS switch to desired closing rate. The observed target will start at initial range and close to zero range, then reset to initial range, and repeat the closing rate cycle.

i. RETURN OF JAM (CW) TARGET IN ACFT XPONDR JAM MODE. To return a jam (CW) target in the ACFT XPONDR JAM mode, perform the following procedure:

(1) Perform the procedures of paragraph 11-3h, steps (1) through (5).

(2) Place TEST MODE switch to ACFT XPONDR JAM.

(3) Perform the procedures of paragraph 11-3h, step (7).

j. MEASUREMENT OF ANTENNA ANGLE TRACKING CAPABILITY. To measure angle tracking and antenna performance, perform the following procedure:

(1) Perform the procedures of paragraph 11-3a.

(2) Perform the procedures of paragraphs 11-3c and 11-3d.

(3) Perform the procedures of paragraph 11-3h, steps (3) through (12).

(4) Place ANTENNA CONTROL POSITION/DEG switch to desired position (angular positions are as viewed from the cockpit).

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(5) Set ANTENNA CONTROL RATE DEG/SEC fully CCW.

(6) Lock radar on to target.

(7) Place MEASUREMENT SELECT switch to ANT RAGE (°/sec).

(8) Place ANTENNA CONTROL POS/RATE switch to RATE.

(9) Observe Digital Display while adjusting ANTENNA CONTROL RATE DEG/SEC control for desired angular rate (1°/sec = 17.45 mr/sec)

(10) Insure radar will track target at specified rate.

k. USE OF SIG GEN CW MODE. To generate an x-band CW signal in the signal generator mode. perform the following procedures:

(1) Perform procedures of paragraphs 11-3c and 11-3d.

(2) Perform the procedures of paragraph 11-3d, steps 11 through 14.

(3) Place RF POWER OUTPUT-DBM switches to minimum attenuation level.

(4) Place TEST MODE switch to SIG GEN CW.

(5) Place MEASUREMENT SELECT switch to BWO FREQ (MHz).

(6) While observing Digital Display adjust FREQUENCY COARSE and FINE controls for desired frequency.

(7) Perform procedures of paragraph 11-3h, steps (2) through (3) if desired to transmit to aircraft receiver.

11-4. AN/UPM-33 SPECTRUM ANALYZER RADAR TEST SET, PRELIMINARY SET-UP PROCEDURE.

a. Remove TS-148/UP spectrum analyzer from AN/UPM-33 case.

b. Connect CX-337/U power cable between ac power receptacle on the spectrum analyzer and a 105-125 v, 50-1000 Hz single-phase power source.

c. Set POWER to ON and allow at least 1 minute for warm up.

d. Attach UG-183/U waveguide coaxial adapter to waveguide, accessible through the door on the side of the spectrum analyzer.

e. Attach CG-92/U coaxial cable to adapter.

f. Rotate MIXER AMPLIFIER fully ccw.

11-5. TKX-545-S4 and 53/54C DUAL TRACE OSCILLOSCOPE, PRELIMINARY SET-UP PROCEDURE.

a. Set POWER to off position and connect power cord to 115 v, 60 Hz single-phase power source.

b. Rotate INTENSITY ccw.

c. Rotate FOCUS to center position.

d. Rotate ASTIGMATISM to center position.

e. Set POWER to ON.

f. Set MAIN SWEEP TRIGGERING LEVEL to 0.

g. Set MAIN SWEEP STABILITY (red knob) to PRESET.

h. Set MAIN SWEEP TRIGGER SLOPE to +INT.

i. Set MAIN SWEEP TRIGGERING MODE to AUTOMATIC.

j. Set HORIZONTAL DISPLAY to MAIN SWEEP NORMAL.

k. Rotate DELAYING SWEEP STABILITY fully ccw.

l. Rotate HORIZONTAL POSITION to center position.

m. Set VOLTS-MILLIVOLTS-OFF to OFF.

n. Set both AC-DC switches to AC.

o. Set both POLARITY switches to NORMAL.

p. After connecting signal(s) to be observed to the CHANNEL A and/or CHANNEL B inputs, adjust MAIN SWEEP TIME CM, MAIN SWEEP MULTIPLIER, FOCUS, INTENSITY, and positioning controls for the desired display.

11-6. MILI-17C, ELECTRONIC MULTIMETER, PRELIMINARY SET-UP PROCEDURE.

a. Check for broken parts or dented case.

b. Check to see that meter pointer swings freely.

c. Connect power cable to the electronic multimeter and to a 115 v, 60 Hz single-phase power source.

d. Allow 25 seconds for warmup.

11-7. ME30A/U VTVM (AC), PRELIMINARY SET-UP PROCEDURE.

a. Check for broken parts or dented case.

b. Check to see that meter pointer swings freely.

c. Connect power cable to the VTVM and to a 115 v, 60 Hz single-phase power source.

d. Allow 25 minutes for warmup.

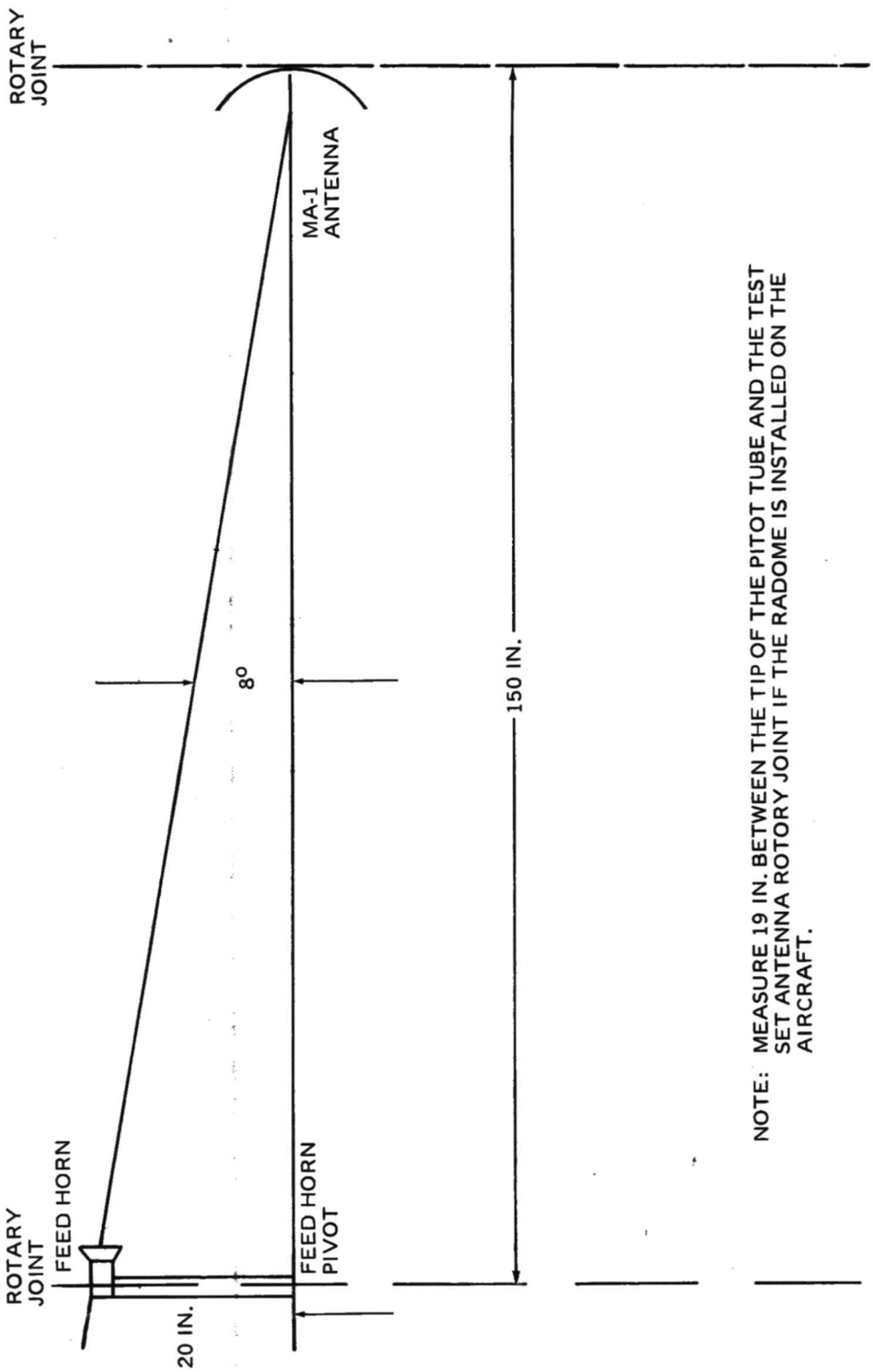
11-8. TS-505 D/U VTVM, PRELIMINARY SET-UP PROCEDURE.

a. Check for broken parts or dented case.

b. Check to see that meter pointer swings freely.

c. Connect power cable to the VTVM and to a source of 115 v, 60 Hz single-phase power source.

d. Allow 25 seconds for warmup.



NOTE: MEASURE 19 IN. BETWEEN THE TIP OF THE PITOT TUBE AND THE TEST SET ANTENNA ROTORY JOINT IF THE RADOME IS INSTALLED ON THE AIRCRAFT.

Figure 11-1. Relationship of MA-1 Antenna to AN/UPM-141 Test Antenna

11-9. TS-460 D/U IMPEDANCE BRIDGE, PRELIMINARY SET-UP PROCEDURE.

a. Check for broken parts or dented case.

b. Check to see that meter pointer swings freely.

c. Connect power cable to the impedance bridge and to a 115 v, 60 Hz single-phase power source.

11-10. AN/GIC-3 INTERCOMMUNICATIONS SET, PRELIMINARY SET-UP PROCEDURE.

a. Connect amplifier (part of intercommunications set) to aircraft intercommunications system by connecting supplied cable to amplifier and connector J09 in RH main wheel well.

CAUTION

Do not attempt to power the AN/GIC-3 with an external power source. The 28 vdc power from the aircraft is internally reduced in the aircraft to the operating voltage of the AN/GIC-3. Any attempt to operate the set from an externally supplied 28 vdc source may damage the equipment.

b. Connect supplied H-133/AIC headset to amplifier.

11-11. Deleted

11-12. Deleted.

11-13. 486117 ARMAMENT TEST SET (ATS), PRELIMINARY SET-UP PROCEDURE.

a. Step on the two brake levers to lock the rear wheels.

b. Unlatch and open cover which fits over rocket simulator and rocket voltage checker panels located on top of ATS.

NOTE

Check that all armament is removed from the aircraft prior to testing.

c. Set ACP ARM-SAFE to SAFE.

d. Set 905 POWER to OFF.

e. ACP selector to VIS IDENT.

f. Set 596 A-NORMAL, A'-NORMAL, B-NORMAL, C-NORMAL, D-NORMAL, and E-NORMAL to NORMAL.

g. Set 596 TIMING PROG to NORMAL.

h. Set 596 TEST SELECTOR to AATS.

i. Set 596 TEST MISFIRE FWD and TEST MISFIRE AFT to down (off).

j. Set 596 PURSUIT-LEAD COLL to LEAD COLL.

k. Set 596 NOSE-TAIL to NOSE.

l. Set ANT-RG CONF (596) to RG CONF.

m. Set 596 MISS LOCK-ON switch to down (off).

n. Connect ground strap 441588 to aircraft ground.

11-14. 486126 INFRARED TEST SET, PRELIMINARY SET-UP PROCEDURE.

a. Connect power cable between 486126 receptacle and 115 v, 400 Hz, single-phase power source.

b. Connect test cable from J12601 to TJ5 in radar compartment.

c. Set TEST SELECT to 1.

d. Set POWER to ON. POWER ON comes on.

e. Allow five minutes for warmup.

f. Follow instructions on 486126 roll chart.

11-15. 486138 IR TARGET SIMULATOR, PRELIMINARY SET-UP PROCEDURE.

a. Set IR MANUAL VALVE in computer compartment to LOCK.

b. Pull out fasteners on sides of 486138 and turn to lock them out.

CAUTION

Carefully place 486138 over IR head and turn fasteners to allow them to snap into locking holes.

c. Connect power cable between connector on 486138 and 115 v, 400 Hz, single-phase power source.

d. Set power switch to ON. ON comes on.

e. Connect 222192 range controller assembly to the 486138. Wait for READY to come on.

CAUTION

Do not select 796 SSGC #4, or set 305 IR to STOW when the 486138 is attached to the IR receiver. To do so will cause the IR receiver to retract causing damage to both units.

NOTE

When the 486138 is connected to the 767 unit, and turned on, but not in use, aperture #4 should be selected.

11-16. TS-382 D/U AUDIO OSCILLATOR, PRELIMINARY SET-UP PROCEDURE.

a. Connect power cable from TS-382 D/U to 115 V, 60 Hz power supply.

b. Set POWER to ON.

11-17. JOHN FLUKE MODEL 803B VOLTMETER, PRELIMINARY SET-UP PROCEDURE.

a. Check voltmeter for broken parts or dented case.

b. Check for presence of shorting clip between lower and middle posts.

c. Connect power cable to the voltmeter and to 115 V, 60 Hz single-phase power.

d. Turn voltmeter on and allow at least 30 minutes for warmup.

NOTE

Maintain the voltmeter upright at all times and do not shake violently. If the voltmeter is inverted for any reason, allow 3 hours to stabilize with power applied before making precision measurements.

e. Connect test leads between upper and middle binding posts.

11-18. AN/APM-123 TRANSPONDER TEST SET, PRELIMINARY SET-UP PROCEDURE.

a. Set power switch to 115 VAC. POWER comes on. Allow 15 minutes for warmup.

b. Set FUNCTION to SELF TEST.

c. Set PRESS TO TEST to LOCK; ACCEPT comes on and REJECT remains off, indicating proper operation.

d. Set ISLS (SIDELOBE SUPPRESSION) to ON. ACCEPT remains on. Set ISLS (SIDELOBE SUPPRESSION) to OFF.

e. Set CODE selector switches to 0077.

f. Set MODE to 3/A.

g. Set FUNCTION to SYSTEM.

11-19. TTU-205B/E PRESSURE-TEMPERATURE TEST SET, PRELIMINARY SET-UP AND SHUTDOWN PROCEDURE.

a. Set POWER to OFF; connect power cord to 115 v, 400 Hz power source.

b. Set P_s and P_t equalizer controls fully closed (cw).

c. Set MACH LIMIT to 2.2.

d. Set FREQUENCY to OFF.

e. Set ALTITUDE and AIRSPEED AMPLITUDE to zero

f. Set ALTITUDE X 1000 FEET to 0 - SEA LEVEL.

g. Set ALTITUDE RATE X 1000 FEET/MIN to 35 (fully cw).

h. Set AIRSPEED KNOTS to 50 (fully ccw).

i. Set AS RATE KNOTS to 350 (fully cw).

j. Set TEMP SIMULATOR to 50.0.

k. Set POWER to ON; PUMP and CONTROL come on; allow one minute for warmup.

l. Set altitude TRIM control for 00000 altitude indication.

m. Set airspeed TRIM control for 50 knots indication.

CAUTION

It is necessary that the following steps be accomplished prior to removing power from the TTU-205B/E to prevent damage to the TTU-205B/E when it is turned back on and to prevent permanent damage to the air data computer in the event the pressure lines are inadvertently disconnected.

n. Set AIRSPEED to an indication of 50 knots.

o. Set ALTITUDE to an indication of 0 - SEA LEVEL.

p. After the above indications are observed, set POWER to OFF.

CAUTION

In the event of a disruption of power to the test set, first open (ccw) the P_s equalizer control and then the P_t equalizer control to prevent damage to the air data computer.

11-20. TTU-229E AUTOMATIC ALTITUDE REPORTING ENCODER TEST SET PRELIMINARY SET-UP AND SHUTDOWN PROCEDURES.

a. Prior to unlatching the combination carrying case cover, press the red button on the side of the case to release the pressure relief valve.

WARNING

Failure to release the pressure relief valve before removing the case cover may cause possible damage to both the test set and personnel as a result of pressure differential.

b. Set the switches and controls of the test set to the following positions:

Switch/Control	Position
POWER ON/OFF	OFF
INDUCED ERROR	0
ALTIMETER LIGHTING	OFF
ALTIMETER SERVO	NORMAL
COMPUTER NORMAL/FAILURE WARNING	NORMAL
ALTIMETER VIBRATOR	DISABLE
SYNCHRO RESET	NORMAL
SYNCHRO SELECTOR	SELF TEST
Encoder Readout Selector Switch	OFF
LAMP TEST	Down
1000 FT INDICATOR VOLUME	Mid Range

c. Connect Cable Assembly 17960010070 to J1 on the test set and to 115V, 400 Hz, single phase power.

WARNING

Insure Hi (Hot) and Lo (Return) lines of external power source are compatible with Hi(Hot) and Lo (Return) lines of TTU-229/E Input power cable Part No. 17960010070, (W1).

d. Set POWER ON/OFF switch to ON; POWER TEST SET and PILOT and CO-PILOT indicators shall light.

e. Set SYNCHRO SELECTOR to SELF TEST, and with INDUCED ERROR control set to 0 feet, check that Servo Repeater indicates a reading of 0 $\pm$ 10 feet.

f. Set Encoder Readout selector switch to NORMAL; ALTITUDE 1000 FEET decimal display shall indicate -01.0.

g. Set LAMP TEST switch to up position and hold; all binary display lamps D2 through C4 shall light.

h. Release LAMP TEST switch; all binary display lamps shall extinguish.

i. Set Encoder Readout selector switch to SELF TEST; ALTITUDE 1000 FEET decimal display shall indicate +40.0 and binary display lamps D4, A1, A2, A4, B2, B4 and C2 shall light.

j. Set Encoder Readout selector switch to OFF and POWER ON/OFF switch to OFF.

11-21. MODEL 8300A DIGITAL VOLTMETER, PRELIMINARY SET-UP PROCEDURES.

a. Connect to a source of 50 Hz to 440 Hz ac power and press the POWER-ON switch.

b. Set the controls and connect the INPUT terminals as shown in figure 11-2. Tne readout should be as indicated.

c. Additional setting on specific measurements applicable to the power region are as follows:

DC VOLTAGE MEASUREMENT.

(1) Select dc voltage mode by pressing either the VDC function switch or, if the Millivolt/Ohms converter or Millivolt Converter is installed, the MVDC function switch.

(2) Select the desired range by pressing the corresponding range switch or, if autoranging is desired, press the AUTO RANGE switch. In autorange, the instrument will automatically accomodate any voltage within the range of the selected function. In MVDC function, the instrument will autorange between the 100 and 1000 millivolt ranges; and in VDC function, the instrument will autorange between the 10, 100, and 1000 volt ranges.

(3) Select increased noise rejection by operating the FILTER switch.

(4) Connect the GUARD terminal to the LO input terminal or, if desired, disconnect the GUARD terminal from the LO terminal and drive the GUARD by applying a separate GUARD potential, reference T.O. 33A1-12-964-1 for GUARD information.

(5) Connect the voltage to be measured to the HI, LO INPUT terminals. The readout will correspond to the input voltage with the decimal point positioned according to the range. The polarity indicator will register DC+ if the HI terminal is positive with respect to the LO terminal and DC- if the HI terminal is negative with respect to the LO terminal.

(6) Adjust the SAMPLE RATE control for the desired sample rate.

AC VOLTAGE MEASUREMENTS

(1) Select the ac voltage mode by pressing the VAC function switch.

(2) Select the desired range by pressing the corresponding RANGE switch or if autoranging is desired, press the AUTO switch. In autorange, the instrument will automatically accomodate any voltage within the range of the selected function.

(3) Connect the GUARD terminal to the LO input terminal or, if desired, disconnect the GUARD terminal from the LO terminal and drive the GUARD by applying a separate GUARD potential.

(4) Connect the voltage to be measured to the HI, LO INPUT terminals. The readout will correspond to the input voltage, with the decimal point positioned according to the range.

FUNCTION	RANGE	INPUT TERMINALS	READOUT
VDC	10	Open	DVM measures changing voltage on input stray capacitance as it is being charged by the small input bias current.
VDC	100	Open	00.000 ± 5 digits
VDC	1000	Open	000.00 ± 5 digits
MVDC	100	Open	DVM measures changing voltage on input stray capacitance as it is being charged by the small input bias current.
VAC	1000	Shorted	000.00 $^{+30}_{-0}$ digits
VAC	1	Shorted	.00000 ±20 digits of above.
VAC	AUTO	Shorted	Same as above.
KΩ	AUTO	Open	1199.99 OVERload indicator lights.
KΩ	AUTO	Shorted	.00000 $^{+5}_{-0}$ digits
10 MΩ		Open	11.9999 OVERload indicator lights.
10 MΩ		Shorted	0.0000 $^{+5}_{-0}$ digits

NOTE: In VAC function, shorted input, the digits evident in the readout are a result of residual noise in the instrument. This noise signal will cause an insignificant error as long as ac input signals of 1 millivolt or larger are present at the input. Although the instrument is usuable below 1 millivolt, the noise may cause significant errors.

Figure 11-2. Model 8300A Operational Check

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CHAPTER 12

CONNECTOR REPAIR

12-1. PIN AND SOCKET REMOVAL.

CAUTION

Extreme care should be used in the handling and repair of the connectors. If a pin or socket is damaged so that removal is not possible, a new connector should be installed. All the TACAN subminiature connectors are of the rear insertion/rear removal type.

NOTE

A female socket which is out of round or a bent male pin cannot be removed unless it is straightened. A scribe can be used to straighten the female socket since the damage usually occurs at the opening. In most cases, straightening with a scribe will repair the female socket and will not require replacement. Check size and fit with a gauge fabricated with a male pin. A male pin also will not require replacement if it can be straightened without damage. Connectors should be visually inspected prior to mating to prevent damage to the connectors. If resistance is felt when mating connectors, remove and inspect for bent pins and sockets. If the connector is forced, the pin or socket retainers may be broken and the entire connector must be replaced.

CAUTION

When inserting the extract end (white) of the insertion/extraction tool, do not twist or bend the tool since it may break or split inside the connector. The extract end of the insertion/extraction tool slides over the shoulder of the pin and disables the locking device. Always examine the extract end for damage before inserting for contact removal. The contact cannot be removed without damaging the connector or contact unless the locking device is disabled and a broken tool is ineffective.

a. To remove a pin or socket with a wire connected, proceed to step b. To remove a pin or socket with the wire broken off, proceed to step f.

b. With the rear of connector facing you, lay the wire of contact to be removed along the slot of extract end (white) of the insertion/extraction tool (Deutsch M15570-22-1), leaving about 1/2 inch from the end of the tool to the rear of the connector.

c. Squeeze the wire hard into the tool between the thumb and forefinger about 1/4 inch from the tip and at the same time quickly pull the connector away from the tool with the other hand to snap the wire into place.

d. Slide the tool down over the wire and into the rear seal and push it slowly into the connector until a positive resistance is felt. At this time, the contact retaining slip is in the unlock position.

e. Press the wire of the contact to be removed against the serrations of the plastic tool and pull both the tool and the contact-wire assembly out of the connector.

f. To remove a pin or socket contact with the wire broken off or missing, insert probe tool (Deutsch 2875-3-0000) into the extract end (white) of the insertion/extraction tool with the point of the probe toward the extract end of the insertion/extraction tool.

CAUTION

If the contact or wire is badly frayed or bent, the extract tool may not slip over the pin easily and too much force or pressure will cause the tool to break or split. To remove a piece of broken extract tool from the connector, a fine pair of tweezers or scribe can sometimes be used; however, extreme caution must be used so as not to chip or scratch the pin hole of the connector. A piece of extract tool left in the connector will prevent successful removal of a contact since the locking device will not be disabled with a new tool and the new tool will be broken.

g. Insert extract end of insertion/extraction tool into rear of connector at contact to be removed until tool is seated against the stop. While holding the tool in place, push the probe tool firmly into the end of the contact to set the point in the end of the contact.

h. Firmly grasp the sides of the insertion/extraction tool and slowly pull outward so that the probe, extract tool, and contact are removed together.

12-2. PIN AND SOCKET INSERTION.

NOTE

The insert end (yellow) of the insertion/extraction tool should rest on the end of the contact and should not go over the shoulder. This end of the tool does nothing more than push the contact into place. The locking device in the connector prevents the pin from coming out from the rear and will be pushed aside as the contract is inserted.

a. Strip the wire being used 1/8 inch for wire with insulation outside diameter of 0.028 to 0.038 inch, and 5/32 to 3/16 inch for wire with insulation outside diameter of 0.039 to 0.054 inch.

b. If a Daniel's crimping tool (MH800-P127) is available, set the dial of the crimp tool to 4 for size 22 AWG, 3 for size 24 AWG and 2 for size 26 AWG wire. Drop either a pin or socket contact into the crimping tool with the contact crimp barrel facing up.

c. Insert the bare wire end in to the open end of the contact and squeeze the handles of the tool together. The crimping tool will not release the contact until the full crimping cycle has been performed. Remove crimped contact and wire from tool.

d. If the crimping tool is not available, tin the end of the wire and solder it into the end of the contact.

e. Hold the insertion half (yellow) of the insertion/extraction tool (Deutsch M15570-22-1) between the thumb and forefinger and lay the wire to be inserted along the slot, leaving about 1/2 inch protruding from the end of the tool to the crimp barrel of the contact.

f. Squeeze the wire hard into the tool at the tip between the thumb and forefinger and at the same time quickly pull the protruding wire with the other hand away from the tool to snap it into place

g. Pull the wire back through tool until the tip seats on the back end of the crimp barrel.

h. Hold the connector with the rear seal facing you and slowly push the contact straight into the connector seal. A firm stop will be evident when the contact positively seats in the connector. Remove insertion/extraction tool.

12-3. REPAIR OF SERIES "C" CONNECTORS.

Refer to figure 12-1.

12-4. REPAIR OF SERIES "N" CONNECTORS.

Refer to figure 12-2.

12-5. REPAIR OF SERIES "HN" CONNECTORS.

Refer to figure 12-3.

12-6. REPAIR OF SERIES "SM" CONNECTORS.

Refer to figure 12-4.

7-908-364A

SERIES "C" CONNECTORS

TYPE UG573A/U, UG710A/U, UG571/U



CONTACT PIN PREPARATION

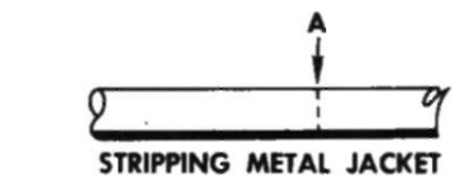
a. Cut aluminum jacket diagonally at end just enough to grip with pliers and spiral peel removing jacket and exposing dielectric a length equal to dimension A.

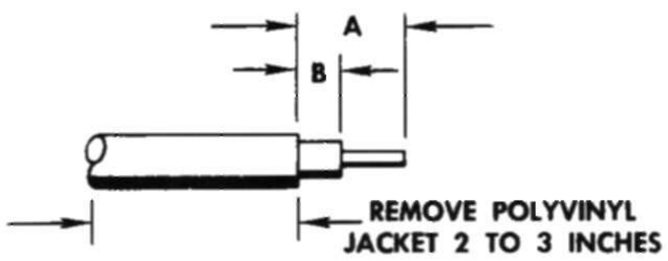
b. Remove burrs from outer jacket without damaging dielectric.

c. Strip dielectric, exposing dielectric a length equal to dimension B as follows: ring dielectric at dimension B with a knife, do not complete cut; complete cut with nylon string and remove stripped dielectric leaving exposed dielectric equal to dimension B; remaining dielectric shall not have been distorted, cut shall be sharp and square; center conductor shall not be distorted.

d. Tin center conductor.

TYPE	DIMENSION A	DIMENSION B
UG573A/U	13/64 INCH	3/64 INCH
UG710A/U	11/64 INCH	3/64 INCH
UG571/U	13/64 INCH	3/64 INCH





PREPARE END OF CABLE

CAUTION

DO NOT USE EXCESSIVE HEAT WHEN TINNING WIRE, AS DIELECTRIC MAY BE DAMAGED.

ADAPTER KIT ASSEMBLY PROCEDURE

NOTE

CONNECTORS ARE DESIGNED FOR USE ON REGULAR COAXIAL CABLE; TO CONVERT THEM FOR USE ON ALUMINUM JACKETED CABLES, AN ADAPTER KIT MUST BE INCORPORATED.

a. To convert connector to fit aluminum jacketed cable ascertain series designation of connector; obtain proper adapter kit required to convert that series connector.

b. Replace parts of connector assembly with corresponding parts from adapter kit; discard replaced parts of connector assembly.

ADAPTER KITS FOR R-F CONNECTORS

KIT PCN NO.	AMPHENOL NO.	FOR CONNECTOR SERIES
90-04800-001	82-871	"C"
90-04800-003	82-888	"C"

Figure 12-1. Series "C" Cable Connector Assembly (Sheet 1 of 2)

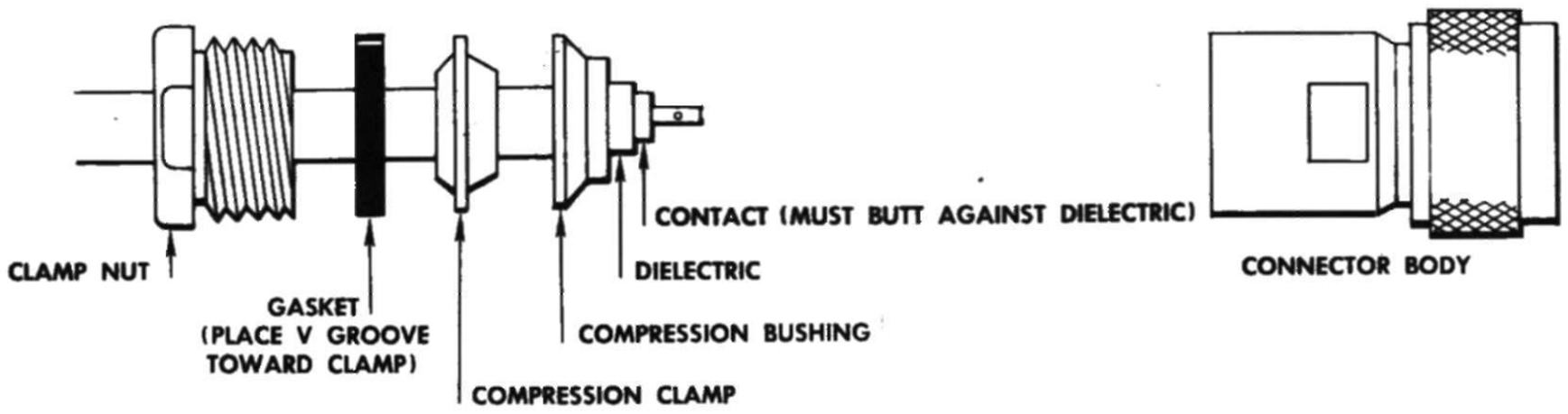
7-908-368A

CABLE ASSEMBLY PROCEDURE

a. Solder contact to conductor so contact butts against dielectric.

CAUTION

DO NOT USE EXCESSIVE HEAT WHEN SOLDERING AS DIELECTRIC MAY BE DAMAGED.



b. Remove flux and excess solder from outside of contact.
c. Slide assembly into connector body.
d. Holding connector body stationary, tighten nut to 105 ±5 inch pounds of torque.

NOTE

IF CABLE IS COPPER JACKETED, SUCH AS THAT USED BY VENDOR IN THE FIN TIP, TORQUE VALUE SHALL BE 170 ±10 INCH POUNDS.

e. Ensure sharp edge of clamp seats properly in gasket.
f. Ensure compression clamp and compression bushing do not slide off end of aluminum jacket while tightening nut.

IDENTIFICATION OF CABLE ASSEMBLY

a. Following assembly, identify cable 3 inches from each end and at 6 foot intervals with harness number printed on tape material No. 311216 or tape material No. 310828.
b. Following assembly, add following caution, printed on tape material No. 310828, applied near each connector:

CAUTION

DO NOT ROTATE CONNECTOR.

INSTALLATION OF CABLE HARNESS

a. Cable harness shall be installed with care to avoid damage to aluminum jacket.
b. Bends made while threading cable into position on aircraft shall be gradual, not less than one foot radius; cable shall not be flexed more than four times in any one place when threading.
c. Where sharp bends are required as a permanent installation feature, minimum radius of bend shall be 3½ inches; such bends shall be made using a forming block; cable bent to 3½ inches of radius shall not be straightened and re-formed more than once.
d. Using a minimum bend radius of 3½ inches, install a minimum offset of 2 inches between each connector and first clamp of each cable.
e. Coupling nuts shall be tightened ⅛ turn beyond finger tight with a strap wrench.

CAUTION

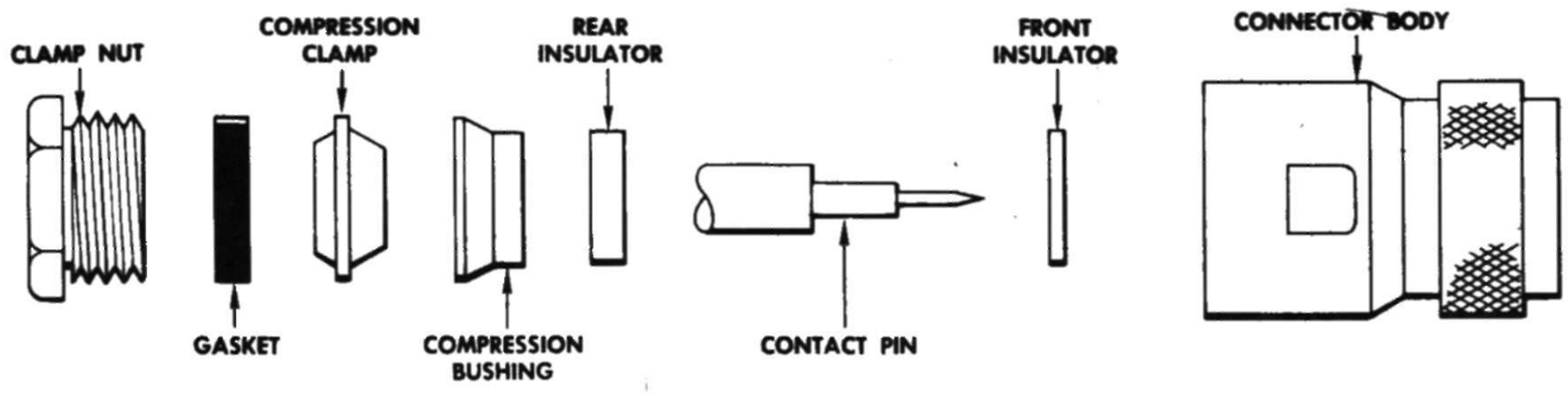
WHEN INSTALLING CONNECTOR INTO COUPLING, DO NOT ROTATE CONNECTOR. ROTATE COUPLING OR ENTIRE CABLE ASSEMBLY.

f. Cable clamps shall be spaced not more than 18 inches unless specified.

Figure 12-1. Series "C" Cable Connector Assembly (Sheet 2 of 2)

SERIES "N" CONNECTORS

TYPE UG21D/U, UG1185/U, UG1185A/U, UG160C/U, UG1187/U, UG160B/U



CONTACT PIN PREPARATION

a. Cut aluminum jacket diagonally at end just enough to grip with pliers and spiral peel removing jacket and exposing dielectric a length equal to dimension A.

b. Remove burrs from outer jacket without damaging dielectric.

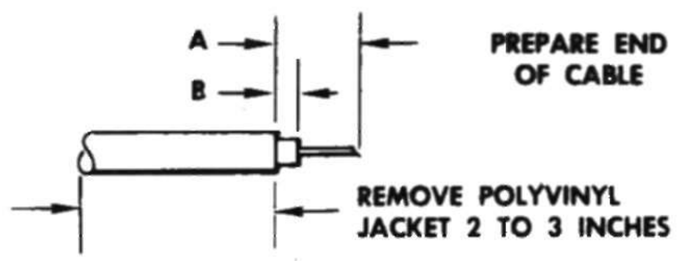
c. Strip dielectric, exposing dielectric a length equal to dimension B as follows: ring dielectric at dimension B with a knife, do not complete cut; complete cut with nylon string and remove stripped dielectric leaving exposed dielectric equal to dimension B; remaining dielectric shall not have been distorted, cut shall be sharp and square; center conductor shall not be distorted.

d. Tin center conductor.

TYPE	DIMENSION A	DIMENSION B
UG21D/U	1/4 INCH	3/64 INCH
UG1185/U	1/4 INCH	3/64 INCH
UG1185A/U	1/4 INCH	3/64 INCH
UG160C/U	21/64 INCH	9/64 INCH
UG1187/U	7/32 INCH	3/64 INCH
UG160B/U	21/64 INCH	9/64 INCH



STRIPPING METAL JACKET



CAUTION

DO NOT USE EXCESSIVE HEAT WHEN TINNING WIRE AS DIELECTRIC MAY BE DAMAGED.

ADAPTER KIT ASSEMBLY PROCEDURE

NOTE

CONNECTORS ARE DESIGNED FOR USE ON REGULAR COAXIAL CABLE; TO CONVERT THEM FOR USE ON ALUMINUM JACKETED CABLES, AN ADAPTER KIT MUST BE INCORPORATED.

ADAPTER KITS FOR R-F CONNECTORS

KIT PCN NO.	AM PHENOL NO.	FOR CONNECTOR SERIES
90-04800-001	82-871	"N"
90-04800-002	82-883	"N"
90-04800-003	82-888	"N"
90-04800-004	82-887	"N"

a. To convert connector to fit aluminum jacketed cable ascertain series designation of connector; ascertain adapter kit required to convert that series connector, and obtain adapter kit.

b. Replace parts of connector assembly with corresponding parts from adapter kit; discard replaced parts of connector assembly.

7-908-365

Figure 12-2. Series "N" Cable Connector Assembly (Sheet 1 of 2)

CABLE ASSEMBLY PROCEDURE

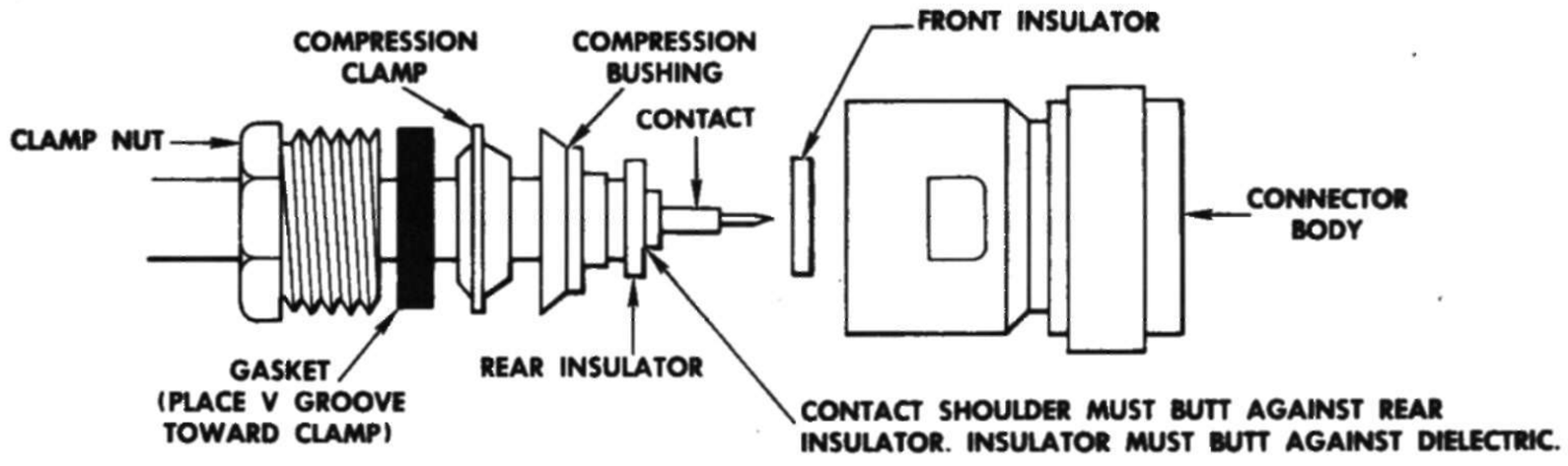
a. Place indented side of rear insulator (width ⅛ inch) toward dielectric.

b. Solder contact to conductor so contact butts against rear insulator; insulator must butt against dielectric.

CAUTION

DO NOT USE EXCESSIVE HEAT WHEN SOLDERING, AS DIELECTRIC MAY BE DAMAGED.

c. Remove flux and excess solder from outside of contact.



d. Install front insulator (width 3/32 inch) with indented side toward connector body.

e. Slide assembly into connector body; holding connector body stationary, tighten nut to 105 ±5 inch pounds torque.

NOTE

IF CABLE IS COPPER JACKETED, SUCH AS THAT USED BY VENDOR IN THE FIN TIP, TORQUE VALUE SHALL BE 170 ±10 INCH POUNDS.

f. Ensure sharp edge of clamp seats properly in gasket.

g. Ensure compression clamp and compression bushing do not slide off end of aluminum jacket while tightening nut.

IDENTIFICATION OF CABLE ASSEMBLY

a. Following assembly, identify cable 3 inches from each end and at 6 foot intervals with harness number printed on tape material No. 311216 or tape material No. 310828.

b. Following assembly, add following caution, printed on tape material No. 310828, applied near each connector.

CAUTION

DO NOT ROTATE CONNECTOR.

INSTALLATION OF CABLE HARNESS

a. Cable harness shall be installed with care to avoid damage to aluminum jacket.

b. Bends made while threading cable into position on aircraft shall be gradual, not less than one foot radius; cable shall not be flexed more than four times in any one place when threading.

c. Where sharp bends are required as a permanent installation feature, minimum radius of bend shall be 3½ inches; such bends shall be made using a forming block; cable bent to 3½ inches of radius shall not be straightened and reformed more than once.

d. Using a minimum bend radius of 3½ inches, install a minimum offset of 2 inches between each connector and first clamp of each cable.

e. Coupling nuts shall be tightened ⅛ turn beyond finger tight with a strap wrench.

CAUTION

WHEN INSTALLING CONNECTOR INTO COUPLING, DO NOT ROTATE CONNECTOR. ROTATE COUPLING OR ENTIRE CABLE ASSEMBLY.

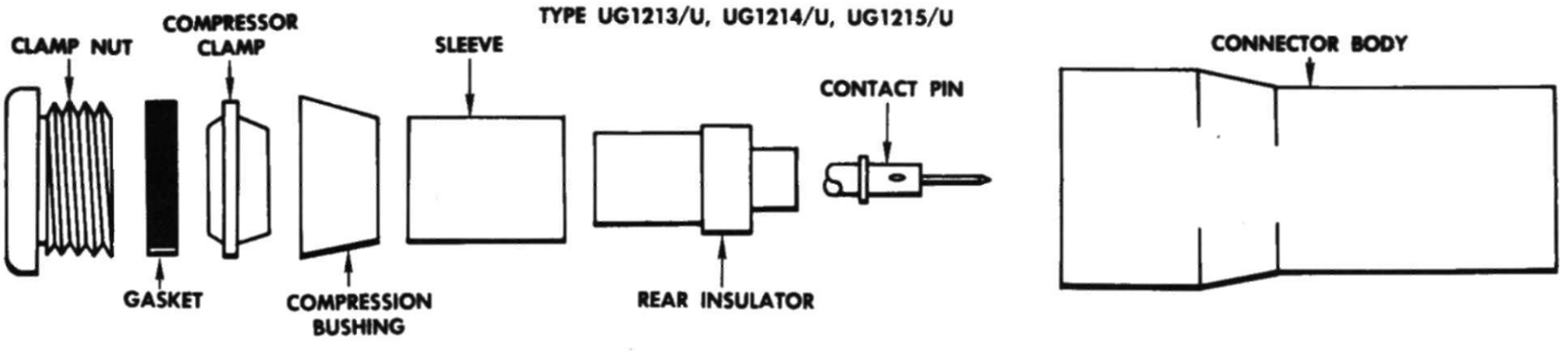
f. Cable clamps shall be spaced not more than 18 inches unless specified.

7-908-369

Figure 12-2. Series "N" Cable Connector Assembly (Sheet 2 of 2)

SERIES "HN" CONNECTORS

TYPE UG1213/U, UG1214/U, UG1215/U

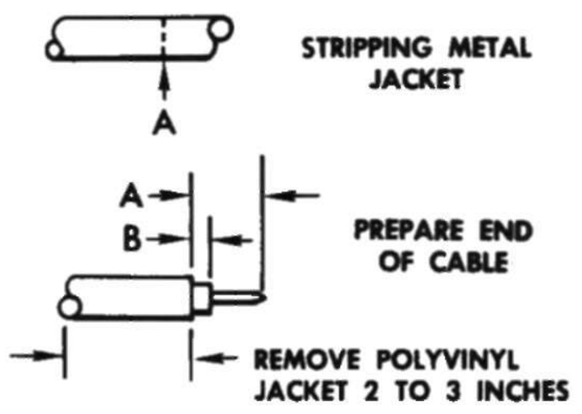


CONTACT PIN PREPARATION

a. Cut aluminum jacket diagonally at end just enough to grip with pliers and spiral peel removing jacket and exposing dielectric a length equal to dimension A.

TYPE	DIMENSION A	DIMENSION B
UG1213/U	1 15/32 INCHES	3/4 INCH
UG1214/U	1 15/32 INCHES	3/4 INCH
UG1215/U	1 15/32 INCHES	3/4 INCH

b. Remove burrs from outer jacket without damaging dielectric.



c. Strip dielectric, exposing dielectric a length equal to dimension B as follows: ring dielectric at dimension B with a knife, do not complete cut; complete cut with nylon string and remove stripped dielectric leaving exposed dielectric equal to dimension B; remaining dielectric shall not have been distorted, cut shall be sharp and square; center conductor shall not be distorted.

d. Tin center conductor.

CAUTION

DO NOT USE EXCESSIVE HEAT WHEN TINNING WIRE, AS DIELECTRIC MAY BE DAMAGED.

ADAPTER KIT ASSEMBLY PROCEDURE

NOTE

CONNECTORS ARE DESIGNED FOR USE ON REGULAR COAXIAL CABLE; TO CONVERT THEM FOR USE ON ALUMINUM JACKETED CABLES AN ADAPTER KIT MUST BE INCORPORATED.

a. To convert connector to fit aluminum jacketed cable, ascertain series designation of connector; ascertain adapter kit required to convert that series connector, and obtain adapter kit.

b. Replace parts of connector assembly with corresponding parts from adapter kit; discard replaced parts of connector assembly.

ADAPTER KITS FOR R-F CONNECTORS

KIT PCN NO.	AMPHENOL NO.	FOR CONNECTOR SERIES
90-04800-002	82-883	"HN"
90-04800-004	82-887	"HN"

7-908-366

Figure 12-3. Series "HN" Cable Connector Assembly (Sheet 1 of 2)

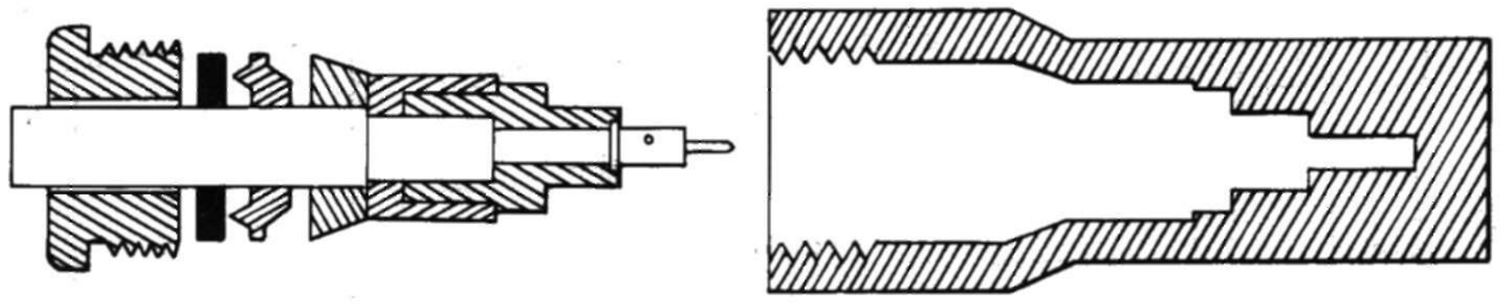
CABLE ASSEMBLY PROCEDURE

a. Solder contact to conductor so contact butts against rear insulator; insulator must butt against dielectric.

CAUTION

DO NOT USE EXCESSIVE HEAT WHEN SOLDERING AS DIELECTRIC MAY BE DAMAGED.

b. Remove flux and excess solder from outside of contact.



c. Slide assembly into connector body, holding connector body stationary; tighten nut to 105 ±5 inch pounds torque.

NOTE

IF CABLE IS COPPER JACKETED, SUCH AS THAT USED BY VENDOR IN THE FIN TIP, TORQUE VALUE SHALL BE 170 ±10 INCH POUNDS.

d. Ensure sharp edge of clamp seats properly in gasket.

e. Ensure compression clamp and compression bushing do not slide off end of aluminum jacket while tightening nut.

IDENTIFICATION OF CABLE ASSEMBLY

a. Following assembly, identify cable 3 inches from each end and at 6 foot intervals with harness number printed on tape material No. 311216 or tape material No. 310828.

b. Following assembly, add following caution, printed on tape material No. 310828, applied near each connector.

CAUTION

DO NOT ROTATE CONNECTOR.

INSTALLATION OF CABLE HARNESS

a. Cable harness shall be installed with care to avoid damage to aluminum jacket.

b. Bends made while threading cable into position on aircraft shall be gradual, not less than one foot radius; cable shall not be flexed more than four times in any one place when threading.

c. Where sharp bends are required as a permanent installation feature, minimum radius of bend shall be 3½ inches; such bends shall be made using a forming block; cable bent to 3½ inches of radius shall not be straightened and re-formed more than once.

d. Using a minimum bend radius of 3½ inches, install a minimum offset of 2 inches between each connector and first clamp of each cable.

e. Coupling nuts shall be tightened ⅛ turn beyond finger tight with a strap wrench.

CAUTION

WHEN INSTALLING CONNECTOR INTO COUPLING, DO NOT ROTATE CONNECTOR. ROTATE COUPLING OR ENTIRE CABLE ASSEMBLY.

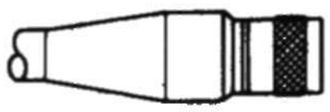
f. Cable clamps shall be spaced not more than 18 inches unless specified.

7-908-367

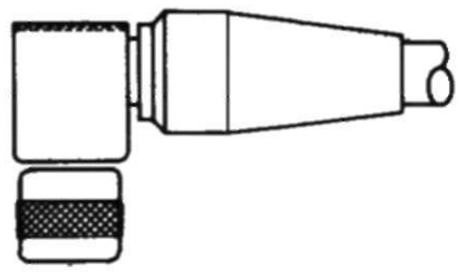
Figure 12-3. Series "HN" Cable Connector Assembly (Sheet 2 of 2)

SERIES "S M" CONNECTORS

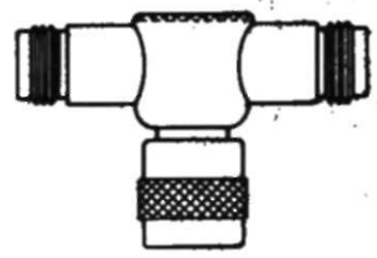
TYPE SM-PL5-F-O SM-RPL4-F-O 3SM-AT4-2MF



A



B



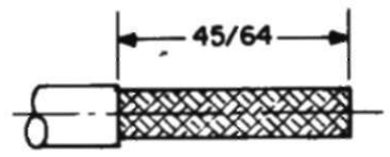
C

FIGURE	TYPE	DESCRIPTION	CABLE ACCOMMODATION
A	SM-PL5-F-O	PLUG	RAYTHERM 12-095
B	SM-PRL4-F-O	PLUG, RIGHT ANGLE	RAYTHERM 12-095
C	3SM-AT4-2MF	ADAPTER TEE	PLUGS AND JACKS

CABLE ASSEMBLY INSTRUCTIONS

FIGURE A. USE WITH MB AND SM STRAIGHT PLUGS AND JACKS

a. TRIM JACKET 45/64 BEING CAREFUL NOT TO KNICK BRAID.



b. SLIDE FERRULE OVER BRAID AND COMB BACK OVER FERRULE AS SHOWN. THEN TRIM DIELECTRIC 37/64 AND CENTER CONDUCTOR 1/8. SLIDE INSULATOR OVER END OF DIELECTRIC AND SOFT SOLDER CONTACT TO CENTER CONDUCTOR. NEXT SLIDE UNIT INTO BODY AND CRIMP BODY.

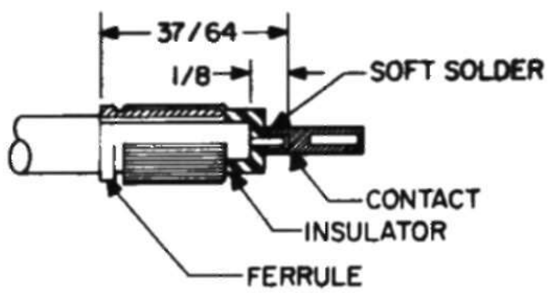
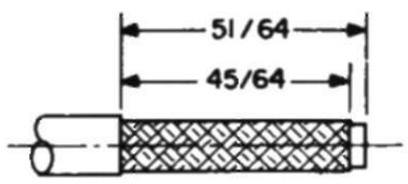
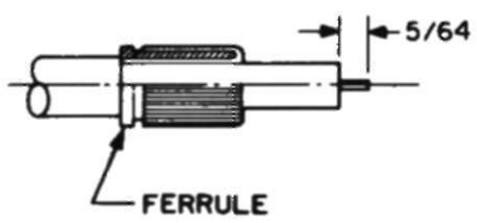


FIGURE B. USE WITH MB AND SM RIGHT ANGLE PLUGS

a. TRIM JACKET 51/64 BEING CAREFUL NOT TO KNICK BRAID. TRIM BRAID 45/64.



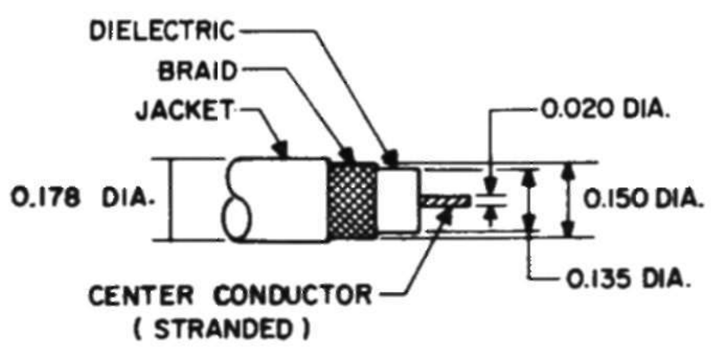
b. SLIDE FERRULE OVER BRAID AND COMB BRAID OVER FERRULE AS SHOWN. THEN TRIM CENTER CONDUCTOR 5/64. NEXT SLIDE UNIT INTO BODY AND CRIMP BODY. SOFT SOLDER CENTER CONDUCTOR TO CONTACT.



NOTE:

TO CRIMP BODY USE BURNDY HYTOOL NO. MR 8 PV-2.

RAYTHERM 12-095 CABLE (95 OHMS)



7-918-759

Figure 12-4. Series "SM" Cable Connector Assembly

CHAPTER 13

BORESIGHT

13-1. GENERAL.

This chapter contains the procedures to boresight procedures for the radar, IR, armament, and FC&M subsystems.

13-2. RADAR BORESIGHT.

13-2a. PREFERRED BORESIGHT PREPARATION PROCEDURE.

NOTE

The preferred boresight preparation procedure is applicable if M1 gunner's quadrant is available and lateral leveling lugs are located as shown in figures 13-1A1 and 13-2A1. If gunner's quadrant is not available or if lateral leveling lugs are located as shown in figures 13-1A and 13-2A, accomplish boresight preparation procedure in paragraph 13-2c.

(1) Place aircraft in hangar, if applicable, with nose toward open hangar doors. No personnel are to be on or in the aircraft during harmonization in order to prevent any aircraft movements which may cause setting of landing gear struts. If personnel are required to be on or in the aircraft during boresighting, jacks must be installed to stabilize the aircraft.

WARNING

Before removing radome or opening armament bay doors, refer to T.O. 1F-106A-2-12-1.

(2) Remove radome in accordance with paragraph 10-4m.

(3) Open armament bay doors. Leave launchers in retracted position.

WARNING

Before entering armament bay, ensure that six safety door locks are installed.

(4) Attach 7144725-10 airplane boresighting tools to nutplates on armament bay bulkheads as follows:

(a) Attach 7144725-30 sight (sight with 1 1/2 inch hole) to forward armament bay bulkhead at station 218.00, buttock line 8.15 right hand (B.L. 8.15 R.H.) with crosslines facing aft.

(b) Attach 7144725-50 sight (sight with 3/8 inch hole) to aft armament bay bulkhead at station 409.56, B.L. 8.15 R.H. with dull block side facing aft.

(5) Deleted.

(6) Hold plumb line to center of 1/4 inch stud at base of antenna azimuth rotary joint. Allow weight to nearly touch ground and mark this point on ground.

(7) Locate face of 7144726-10 target board distance of 1,000 inches directly in front of mark established in step 6. Use 100 foot steel tape to measure distance.

NOTE

To locate target board directly in front of antenna, sight through the hole in the rear boresight tool and superimpose the crosslines of the front boresight tool over the crosslines on the boresight target (point "A", figure 13-3, sheet 1 of 2).

(8) Place a steel leveling bar (machinists parallel bar) across lateral leveling lugs located on forward side of mid-bay baffle at Station 308.50 (armament bay).

(9) Place M-1 gunners quadrant on leveling bar and adjust gunners quadrant until level bubble is centered. Lock gunners quadrant in this position. Remove leveling bar and gunners quadrant.

(10) Place leveling bar across leveling lugs provided on face of target board. Ensure that gunners quadrant has not been turned end for end and place quadrant on leveling bar. Adjust target board (using target board leveling jacks or by turning target board) until bubble in gunners quadrant is centered.

(11) Check alignment of target board relative to aircraft by sighting through hole in rear boresight tool and superimpose crosslines of front boresight tool over crosslines of boresight target on target board. Adjust target board to obtain alignment. Repeat steps (9), (10), and (11) and readjust target board as necessary.

13-2b. PREFERRED ANTENNA BORESIGHT PROCEDURE.

(1) Perform Boresight Preparation Procedure iaw para. 13-2a, then pin antenna in elevation and azimuth. Install mounting bracket for A-11952 5X telescope (A-11952 telescope is contained in AN/GPM-14 boresight kit). Set boresight telescope in tapered hole provided on mounting bracket; see figure 13-3 (C, sheet 2 of 2).

(2) Check collimation of telescope by performing the following procedure:

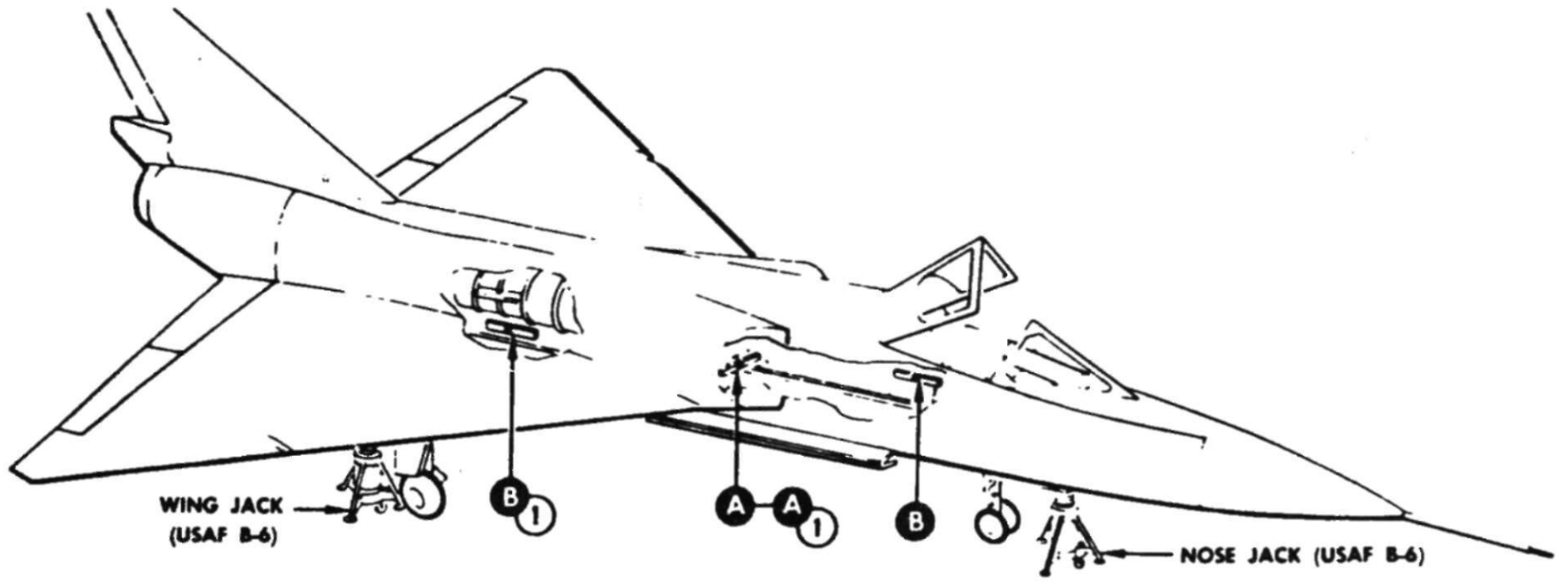
(a) Adjust eye piece until cross hairs remain fixed on target point when eye is moved from side to side in front of eye piece.

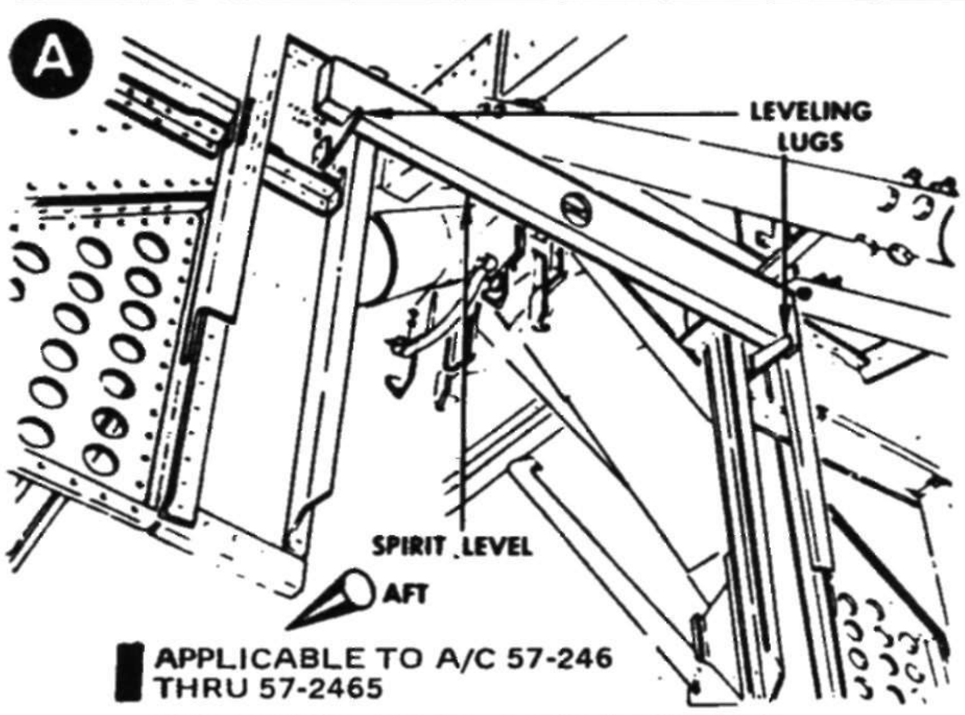
(b) Rotate telescope until eye piece is in horizontal position and then rotate to the vertical position. Center of field should not move more than 1 inch from zero reference line in either position.

(c) If movement is greater than 1 inch, use another telescope and repeat collimation check.

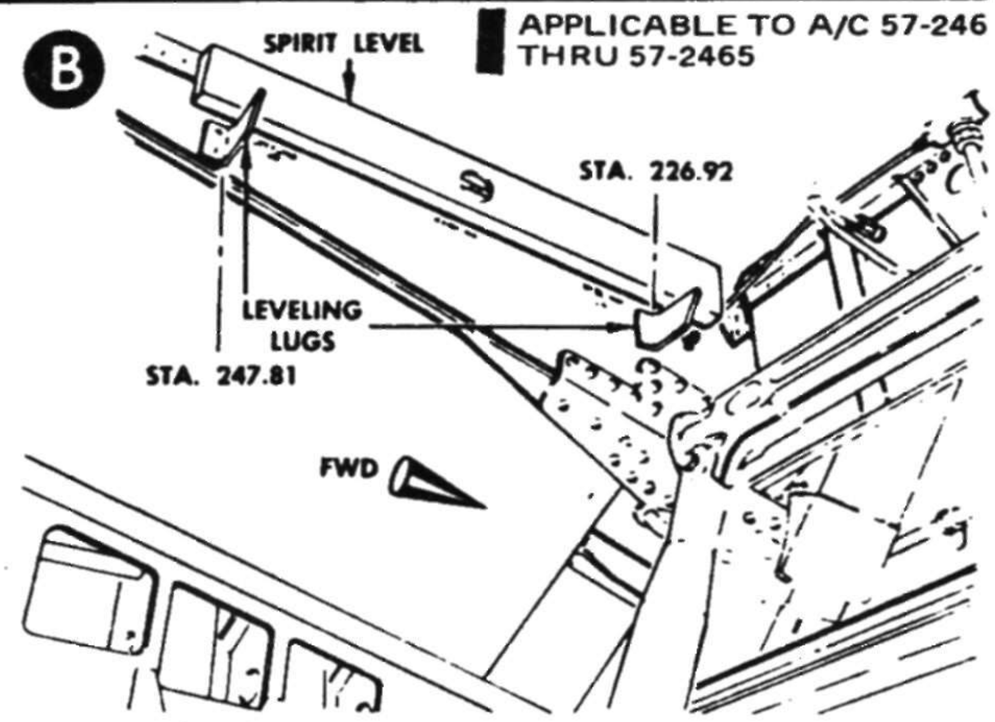
(3) Telescope crosshairs should coincide with intersection of crosslines of antenna target (point "C", figure 13-3, sheet 2 of 2) on target board.

(4) Adjust antenna in elevation and azimuth, as necessary, until telescope crosshairs align with crosslines on antenna target. Three point adjustment is provided at three mounting points of antenna base. Adjust antenna to correct position by moving antenna base forward or aft at any of three mounting points. Maintain adjustment dimension of 1.40 inches at one or more of three mounting studs when alignment adjustment is made. See detail B, figure 13-3, sheet 1 of 2.

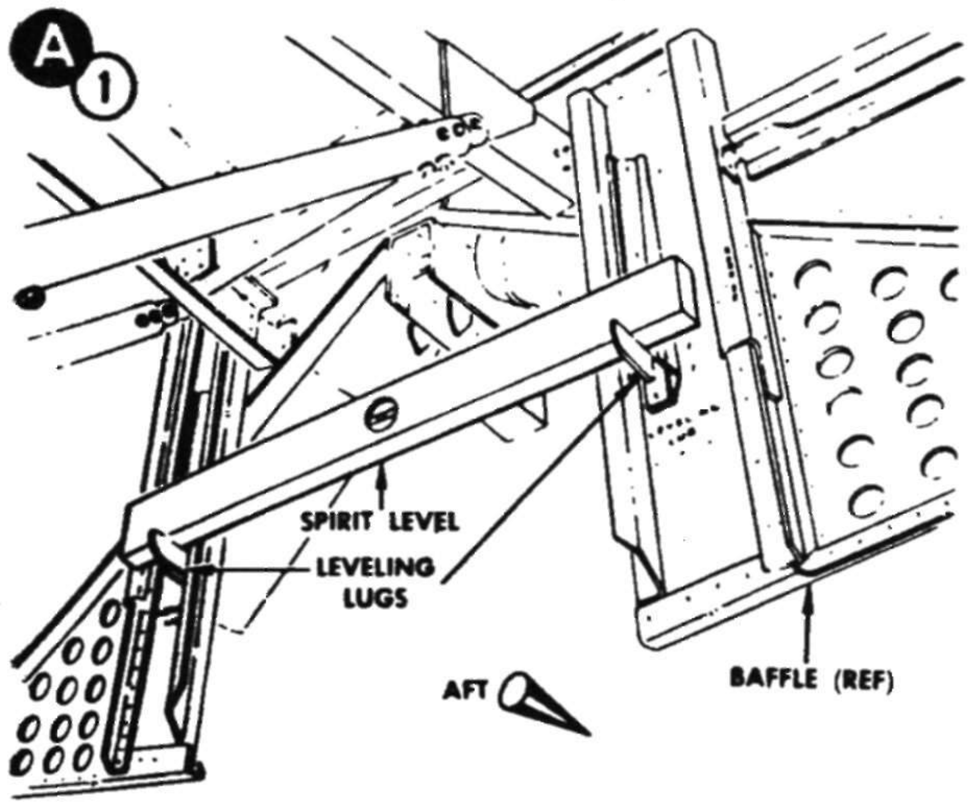




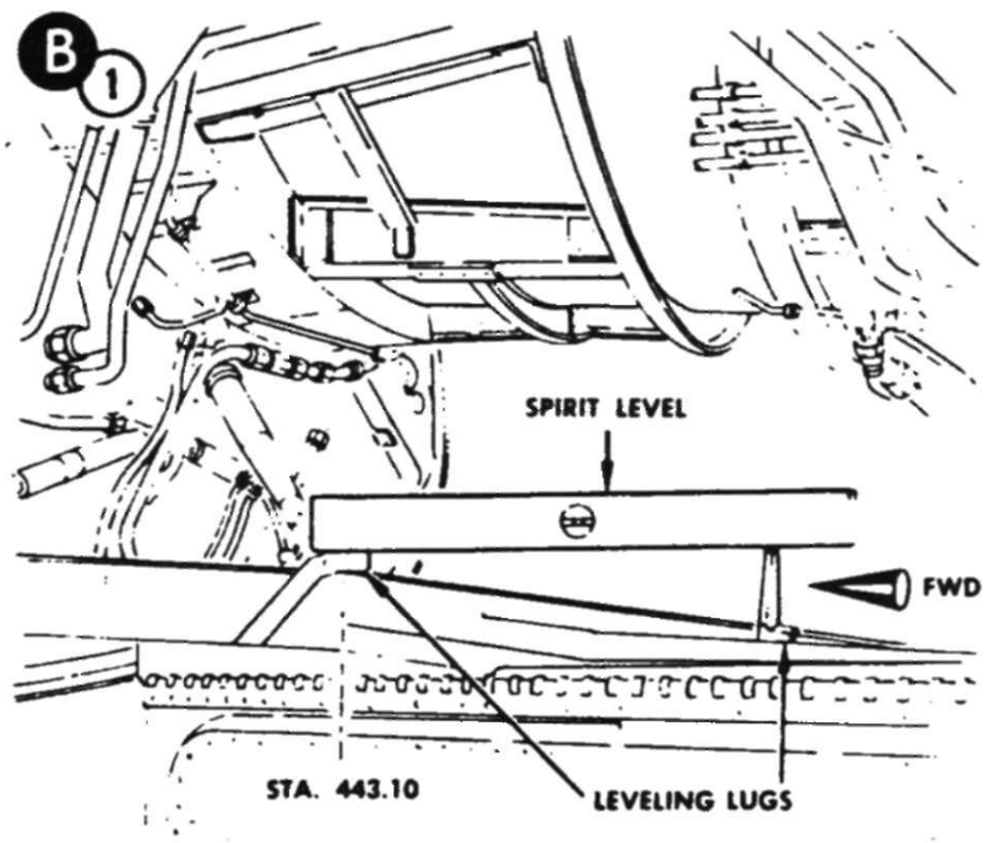
LATERAL LEVELING LUGS



LONGITUDINAL LEVELING LUGS



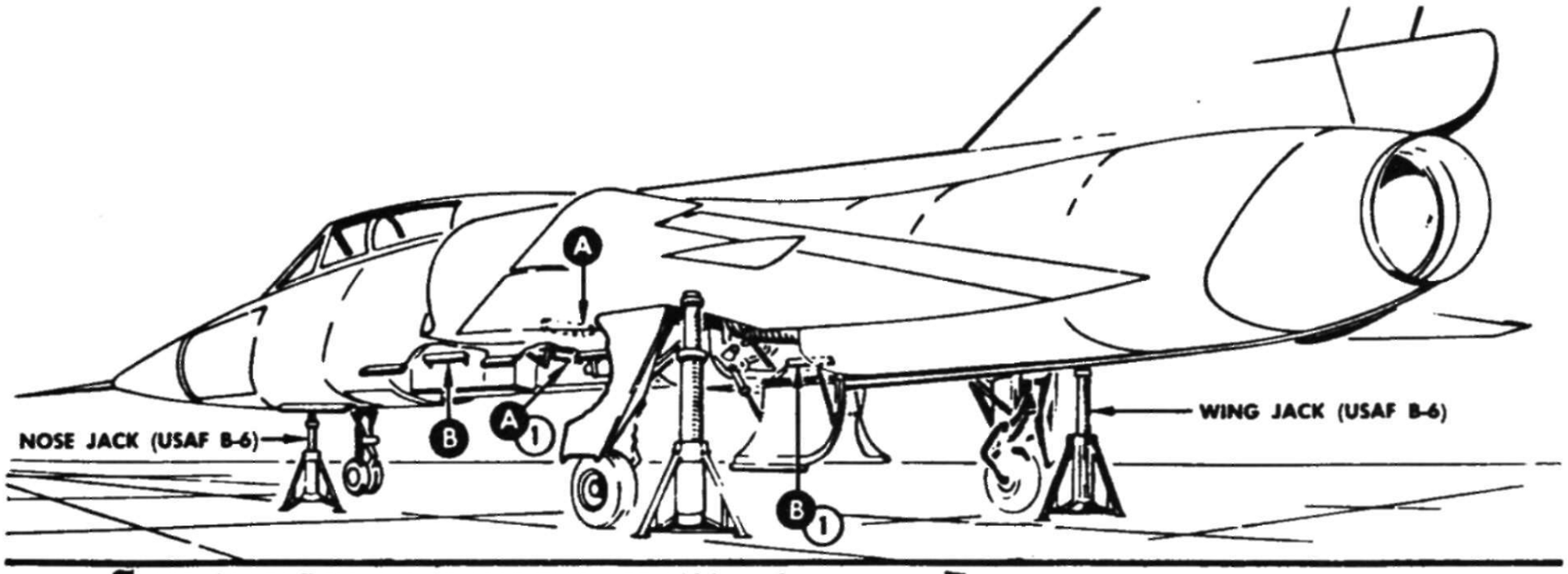
LATERAL LEVELING LUGS



LONGITUDINAL LEVELING LUGS

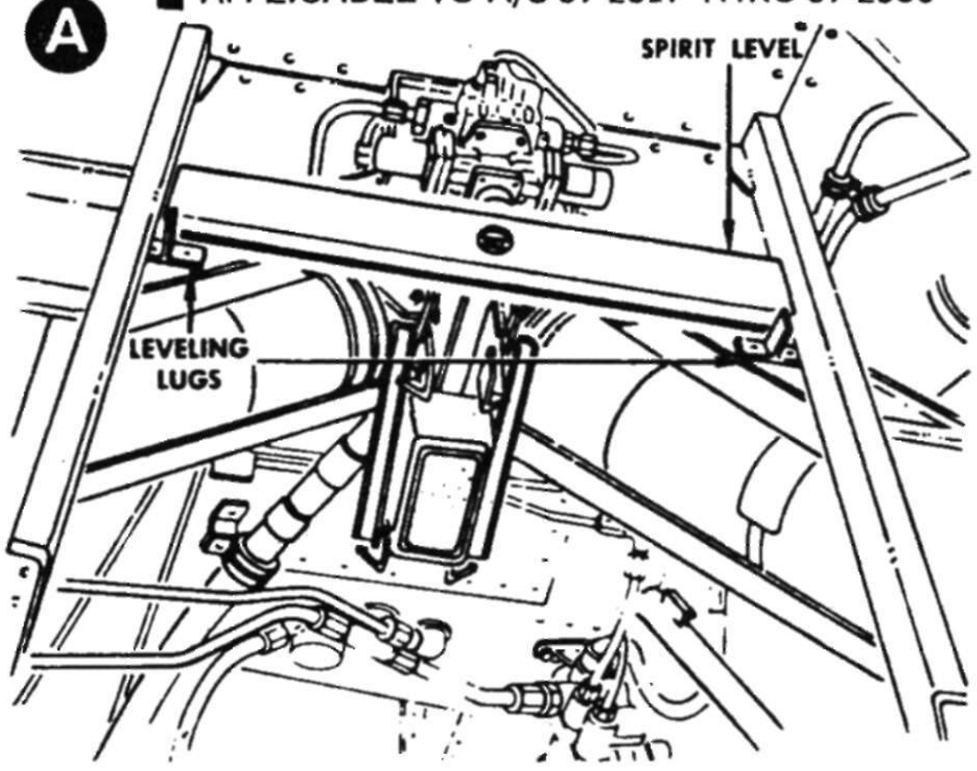
7-907-51A

Figure 13-1. Leveling Procedure, F-106A



A

APPLICABLE TO A/C 57-2517 THRU 57-2530

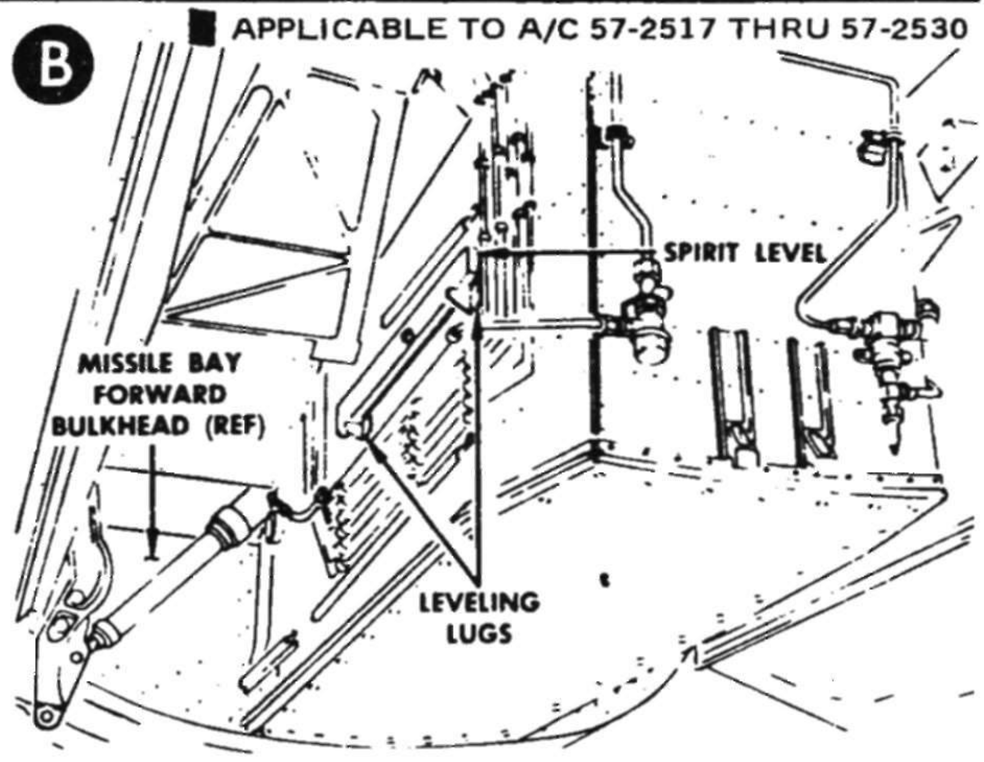


VIEW LOOKING AFT STA. 308.50 (MISSILE BAY)

LATERAL LEVELING LUGS

B

APPLICABLE TO A/C 57-2517 THRU 57-2530



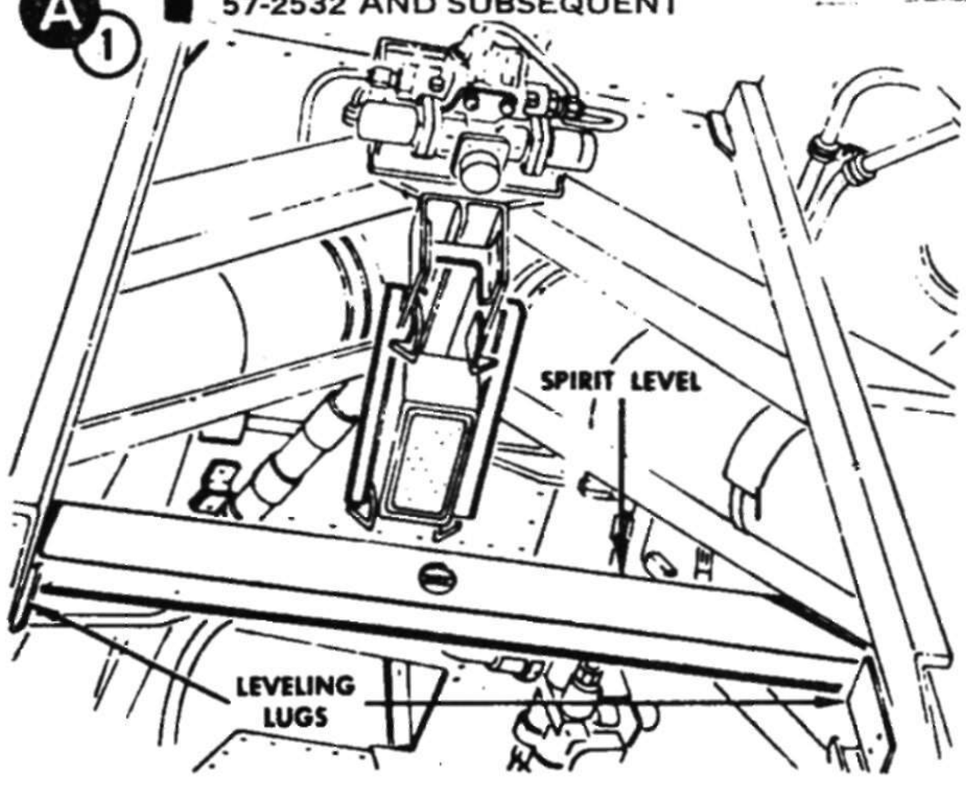
FWD

VIEW LOOKING INBOARD AT LEFT SIDE OF ELECTRONIC EQUIPMENT

LONGITUDINAL LEVELING LUGS

A 1

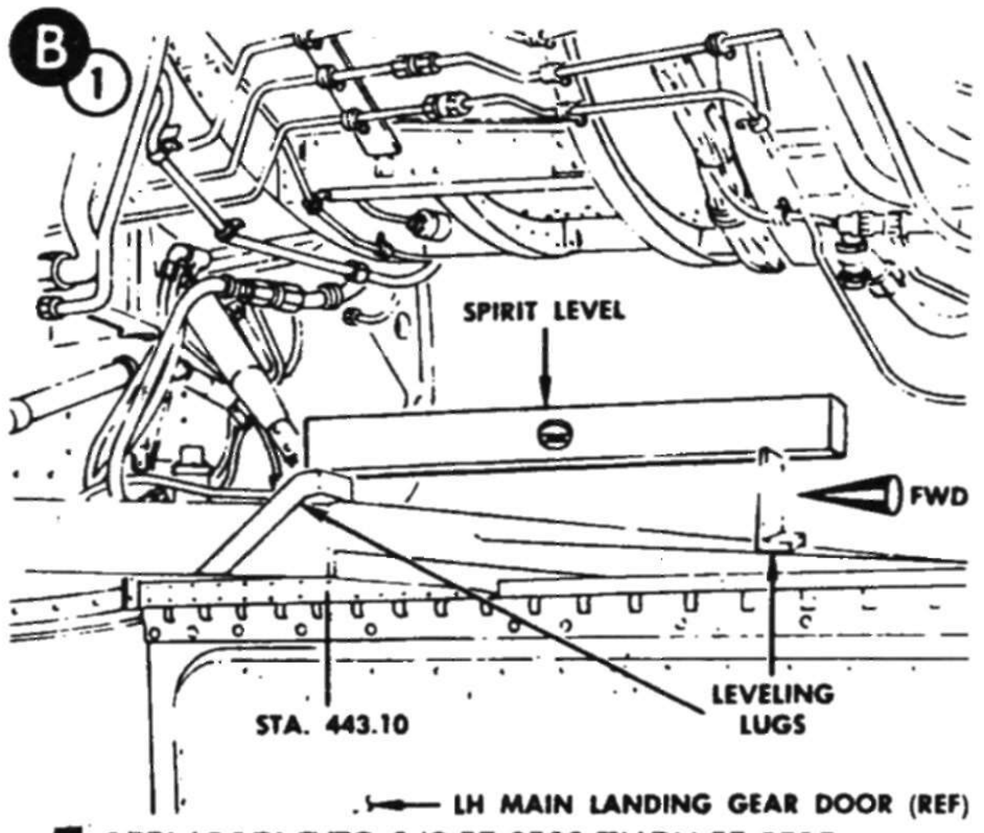
APPLICABLE TO A/C 57-2508 THRU 57-2515, 57-2532 AND SUBSEQUENT



VIEW LOOKING AFT STA. 308.50 (MISSILE BAY)

LATERAL LEVELING LUGS

B 1

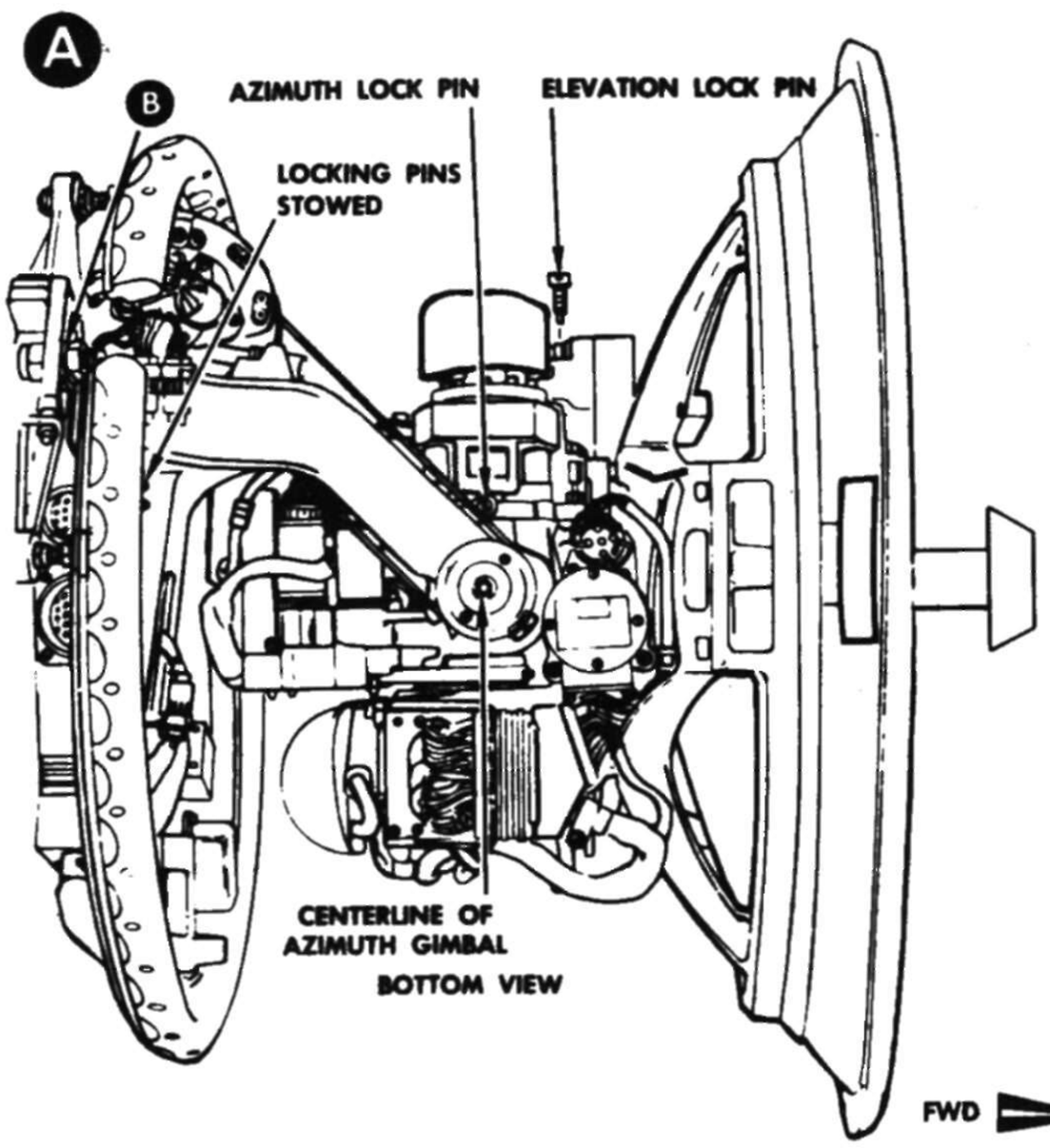


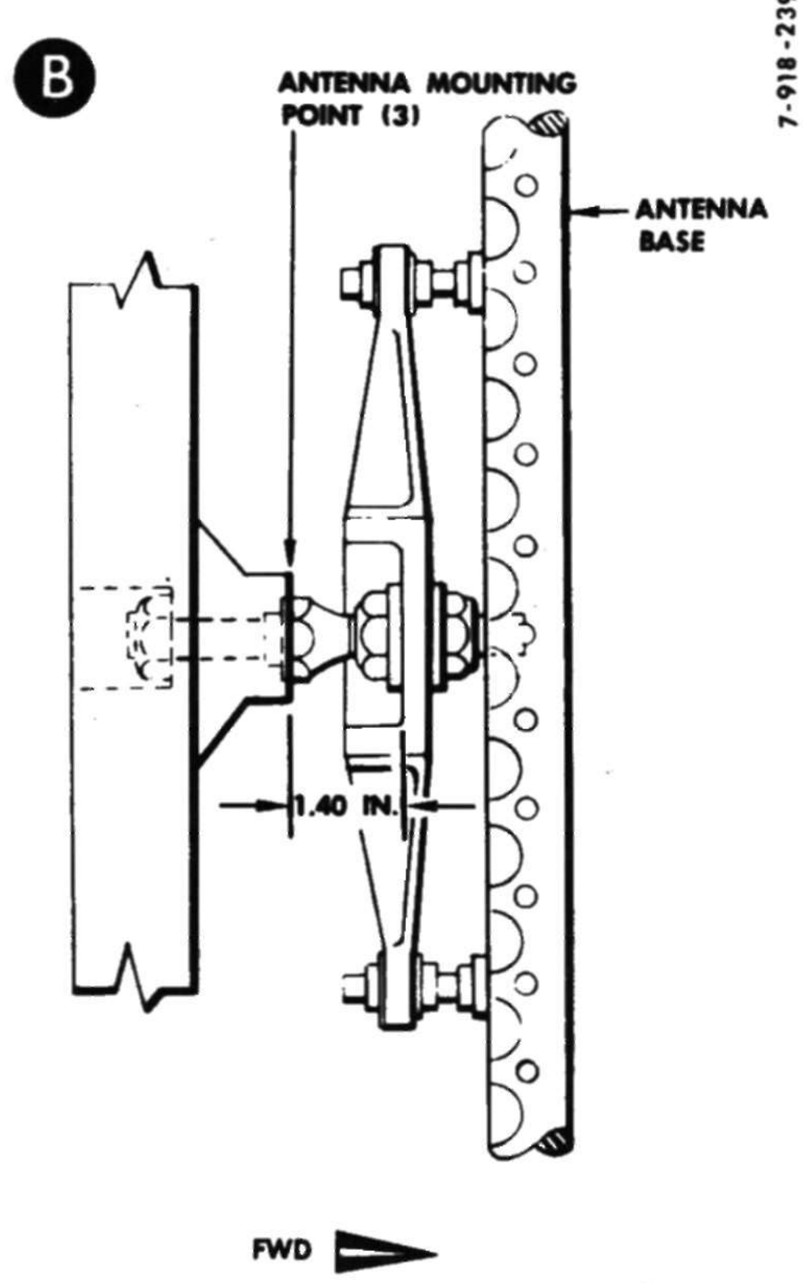
APPLICABLE TO A/C 57-2508 THRU 57-2515, 57-2532 AND SUBSEQUENT

LONGITUDINAL LEVELING LUGS

7-907-52A

Figure 13-2. Leveling Procedure, F-106B





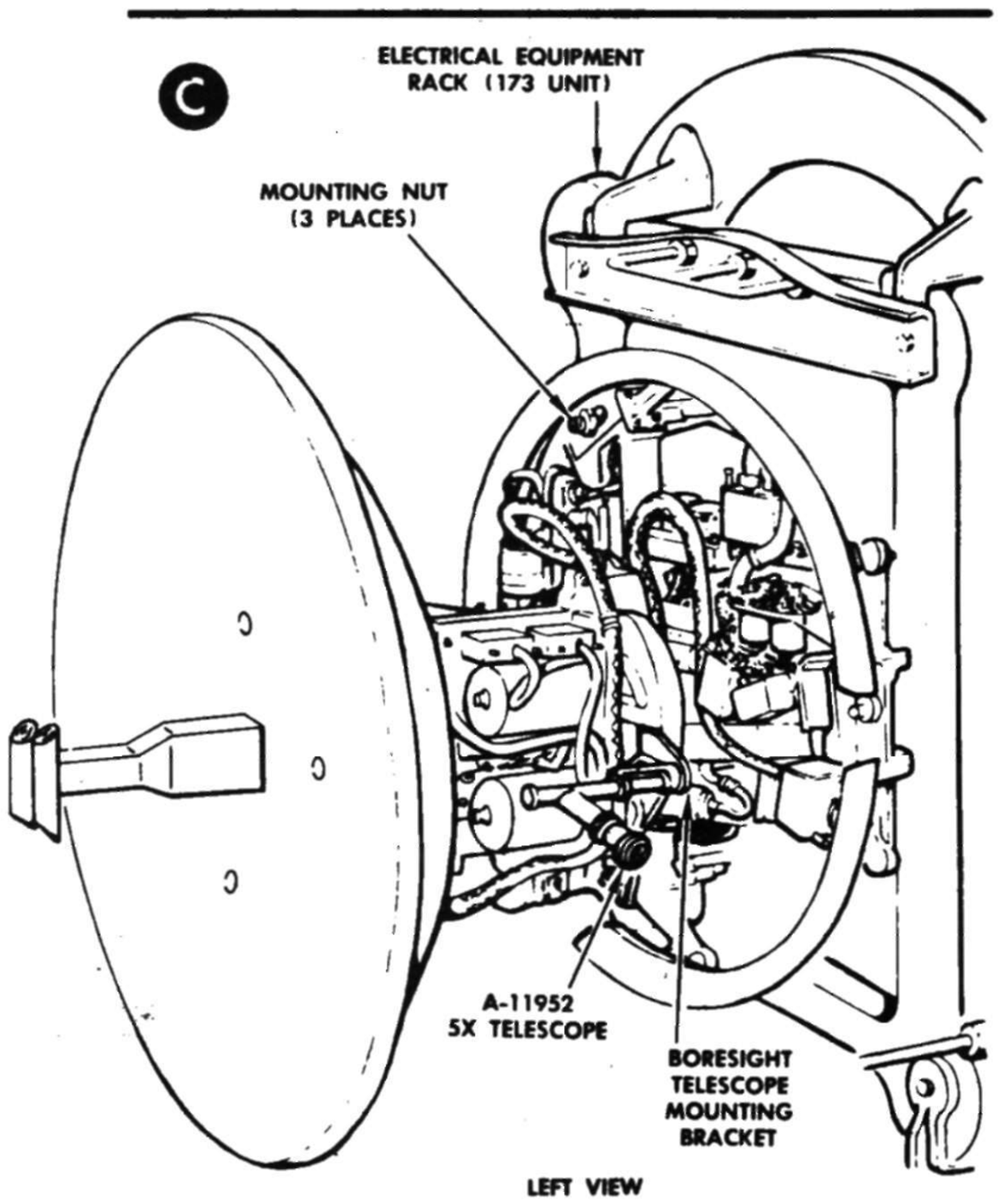


Figure 13-3. Radar Boresight Procedure (Sheet 1 of 2)

NOTE

REFER TO T.O. 1F-106A-3 FOR INFORMATION CONCERNING ALIGNMENT OF BORESIGHTING TOOL MOUNTING POINTS IF MISALIGNMENT OR STRUCTURAL DAMAGE IN TOOL MOUNTING AREA IS SUSPECTED.

1 RADAR ANTENNA TARGET ASSEMBLY TO BE USED ONLY IF GUNNERS QUADRANT IS NOT AVAILABLE. SEE ALTERNATE BORESIGHT PREPARATION PROCEDURE AND ALTERNATE ANTENNA BORESIGHT PROCEDURE.

7-918-238

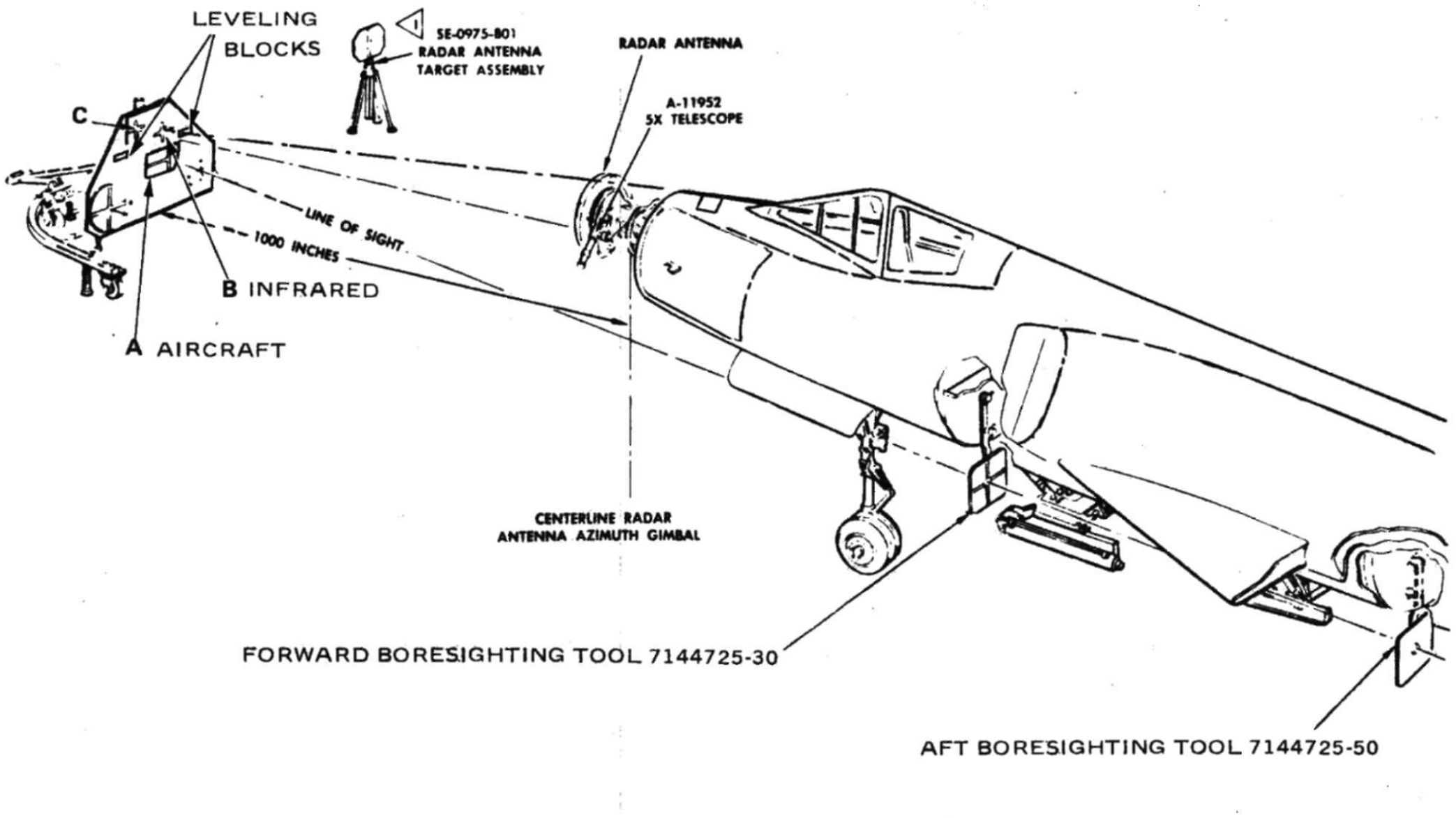


Figure 13-3. Radar Boresight Procedure (Sheet 2 of 2)

(5) Torque nuts on forward side of antenna base to 660 to 710 inch-lbs at 75 degrees Fahrenheit. For higher temperatures increase torque 2 inch-lbs per degree F. For lower temperatures decrease torque 2 inch-lbs per degree F.

(6) Recheck elevation and azimuth harmonization after nuts have been tightened to proper torque.

(7) Place leveling bar (machinists parallel bar) across lateral leveling lugs located on forward side of mid-bay baffle at Station 308.50 (armament bay). See figure 13-1 or 13-2, as applicable.

(8) Place gunners quadrant on leveling bar and adjust gunners quadrant until level bubble is centered. Lock gunners quadrant in this position. Remove gunners quadrant and leveling bar.

NOTE

Because of the physical location of the machined surfaces (pads) on the left-side of the antenna mounting casting in relation to the manner in which the gunners quadrant is constructed, the following procedures of step (9) thru (14) cannot be accomplished if the aircraft has a left roll attitude greater than four degrees. In this event, use SE-0580-7 jack pad assembly and Type B-6 Airplane Jack to jack up the left wing at Station 482.64, Buttock Line 9169 Left Hand until the roll angle is less than four degrees. Remove wheel jacks, if used. For jacking instructions, refer to T.O. 1F-106A-2-2-2-2. If it is necessary to jack the left wing up, repeat paragraph 13-2a, steps (8), (9), (10), (11) and paragraph 13-2b, steps (2) through (8).

(9) Place gunners quadrant on machined pads on left side of antenna mounting casting.

NOTE

Step (10) describes the adjustment of the quadrant to compensate for the four degree offset of the mounting pads on the antenna. Step (11) describes the adjustment of the quadrant to compensate for the four degree offset of the mounting pads on the antenna and for turning the quadrant over when moving it to the antenna.

(10) If roll attitude of aircraft is such that READ BLACK FIGURES is observed on quadrant (right wing down) during leveling of bubble, note reading on quadrant on side where READ BLACK FIGURES is engraved on bubble arm. Use coarse and vernier adjustments of quadrant to increase quadrant arm angle by 71 mils (71 mils equals four degrees) as indicated by numbers on vernier dial.

(11) If roll attitude of aircraft is such that READ RED FIGURES is observed (left wing down) during leveling of bubble, note reading on quadrant on side where READ RED FIGURES is engraved on bubble arm. Adjust arm to angle of 71 mils minus reading noted (Numbers on vernier dial indicate mils).

(12) Place machined surfaces of vertical leg (on quadrant) against machined surfaces (pads) on left side of antenna reflector mount casting, 413140. Bubble in gunners quadrant should be centered.

(13) If adjustment is necessary, loosen nuts on three studs supporting antenna mounting bracket just enough to allow movement of mounting bracket about roll axis (bracket is slotted for this purpose). Turn antenna mounting bracket until bubble in gunners quadrant is centered.

NOTE

The nuts in front, used to fasten the antenna rack or mount, must be torqued to 660 to 710 inch-lbs at 75 degrees Fahrenheit. For higher temperatures, increase torque 2 inch-lbs per degree F. For lower temperatures, decrease torque 2 inch-lbs per degree F.

(14) Tighten nuts and recheck roll harmonization (steps (8) through (12)) then recheck pitch and yaw harmonization steps (1) through (4). Recheck paragraph 13-2a, step (10), to insure alignment of target board relative to aircraft has not been disturbed.

(15) Remove azimuth and elevation antenna locking pins.

(15.1) Tie cables to HIG gyros and move antenna to ensure damage will not occur when antenna sweeps.

(16) Reinstall radome iaw para. 10-4m.

NOTE

Unless performing IR Boresight iaw para. 13-3, remove all boresighting equipment from aircraft.

13-2c. ALTERNATE BORESIGHT PREPARATION PROCEDURE.

NOTE

This procedure is to be used only if a gunner's quadrant is not available or if lateral and longitudinal leveling lugs are located as shown in figures 13-1A and 13-2A. The boresight procedure using the gunner's quadrant in paragraph 13-2a is the preferred procedure.

(1) No personnel are to be on or in aircraft during harmonization.

WARNING

Before removing radome or opening armament bay doors, refer to T.O. 1F-106A-2-2-2-2.

(2) Remove radome iaw para. 10-4m.

(3) Open armament bay doors. Leave launchers in retracted position.

WARNING

Before entering amrmament bay, ensure six safety door locks are installed.

NOTE

Before attempting to perform the following boresighting operations it is mandatory that the aircraft be raised on jacks until the shock absorbers are extended. For jacking instructions, see T.O. 1F-106A-2-2-2-2.

(4) Attach 7144725-10 airplane boresighting tools to nutplates provided on armament bay bulkhead as follows:

(a) Attach 7144725-30 sight (sight with 1 1/2 inch hole) to forward armament bay bulkhead at station 218.00, buttock line 8.15 right hand (B.L. 8.15 R.H.) with crosslines facing aft.

(b) Attach 7144725-50 sight (sight with 3/8 inch hole) to aft armament bay bulkhead at station 409.56 B.L. 8.15 R.H. with dull black side facing aft.

NOTE

Care must be exercised to accurately align each boresight tool by pinning tool to its respective locator plate. Because the steel thread on the tool mates with an aluminum thread on the bulkhead, care must be exercised to avoid cross-threading and stripping.

(5) Level aircraft longitudinally and laterally. For leveling procedures see figures 13.1, 13.2 and T.O. 106A-2-2-2-2.

(6) Raise 7144726-10 target board assembly to vertical position and pin in position.

(7) Hold plumb line to center of 1/4 inch stud at base of antenna azimuth rotary joint. Allow weight to nearly touch ground and mark this point on ground.

(8) Locate face of 7144726-10 target board distance of 1,000 inches directly in front of mark established in step (7). Use 100 foot steel tape to measure distance.

NOTE

To locate target board directly in front of antenna, sight through the hole in the rear boresight tool and superimpose the crosslines of the front boresight tool over the crosslines on the boresight target (point "A", figure 13-3, sheet 2 of 2).

(9) Place machinists level across lugs provided on target board. Adjust target board (using target board leveling jacks or by turning target board) until bubble in level is centered. Sight through hole in rear boresight tool and check that crosslines of forward boresight tool are accurately superimposed over crosslines of boresight target (point "A", figure 13-3, sheet 2 of 2). Adjust target board as necessary.

(10) Locate SE-0975-801 radar antenna target at distance of 1,000 inches from plumb bob mark on ground and approximately 45 degrees to right of target board (antenna will turn to right to look at antenna target).

(11) Use surveyors transit to check that horizontal crossline on SE-0975-801 antenna target is in same horizontal plane as horizontal crossline on antenna target (point "C", figure 13-3, sheet 2 of 2). Adjust antenna target as necessary to obtain alignment.

13-2d. ALTERNATE ANTENNA BORESIGHT PROCEDURE.

CAUTION

Do not apply power to antenna drive motors during this procedure.

(1) Pin antenna in elevation and azimuth.

(2) Remove telescope mounting bracket from stowed position on left side of antenna installation, attach to studs for boresighting and insert A-11952 boresight telescope into bracket.

NOTE

A-11952 5X boresight telescope will be found in AN/GPM-14 boresight kit.

(3) Adjust antenna in elevation and azimuth until telescope crosshairs are superimposed upon crosslines on antenna target (point "C", figure 13-3, sheet 2 of 2). Three point adjustment is provided at three mounting points of the antenna base. Adjust antenna to correct position by moving antenna base forward or aft at any of three mounting points. Maintain adjustment dimension of 1.40 inches at one or more of three mounting studs. See detail B, figure 13-3, sheet 1 of 2.

CAUTION

With the antenna pinned in elevation and the boresight telescope bracket in place for boresighting, it is very easy to damage capacitor C1 if the antenna is moved to the left. Capacitor C1 is mounted next to the telescope bracket when the bracket is in the stowed position, directly behind the HIG gyros.

(4) Remove azimuth locking pin and turn antenna to right until telescope crosshairs are superimposed over crosslines on SE-0975-801 antenna target.

(5) Adjust antenna in roll to superimpose telescope crosshairs over antenna target crosslines by loosening three mounting nuts and turning antenna assembly as necessary. Antenna mounting bracket is slotted for this purpose. Torque nuts to 660 to 710 inch-lbs at 75 degrees F. For higher temperature, increase torque 2 inch-lbs per degree F. For lower temperatures, decrease torque 2 inch-lbs per degree F.

(6) Recheck antenna alignment by repeating steps (3), (4), and (5).

(7) Remove telescope and return mounting bracket to stowed position. Return elevation and azimuth locking pins to stowed position.

(8) Tie cables to HIG gyros and move antenna to ensure damage will not occur to the cables when antenna sweeps. Reinstall radome in accordance with paragraph 10-4m.

NOTE

Unless performing IR Boresight iaw para. 13-3, remove all boresighting equipment from aircraft.

13-3. IR BORESIGHT.

13.3a. Deleted.

13-3b. IR TO RADAR SLAVING CHECK.

NOTE

Use Fault Detector Tester for IR to Radar Slaving Check.

13-3c. 896 ALIGNMENT PROCEDURE.

(1) Mount source flange over hole provided in lower IR compartment bulkhead. Insert source tube and adjusting cone assembly through hole in flange from beneath IR compartment. Clamp adjusting cone in place using U-shaped clamp. Leave aft screw loose to allow positioning of 896 unit.

(2) Connect J89601 to P89601.

(3) Set 905 POWER to ON; set 305 IR to RDR SLVD; wait 4-1/2 minutes for system to time in; set 796 SELECTOR TEST to 4; set ACP selector to MISSILES RAD; press and release 083 RDR IR SELECT to obtain IR dominant mode.

(4) Prepare TKX-545 oscilloscope for dual trace operation. Synchronize TKX-545 from 241 TP8 and connect CHANNEL A and CHANNEL B to 241 TP8; adjust TKX-545 VOLTS/CM controls to obtain same amplitude for both signals.

(5) Connect TKX-545 CHANNEL A to 663 COS E COS η IN; connect TKX-545 CHANNEL B to 663 COS E SIN η IN; set TKX-545 channel A POLARITY switch to INVERTED.

(6) Connect ME-30A/U VTVM, set on 10 volt scale, between 663 SIN ϵ IN and 241 TP7.

NOTE

VTVM may have to be set on a higher scale initially.

(7) Locate and lockon to IR source. Maintain lockon for remainder of procedure.

(8) Adjust angle of 896 unit until both sine waves on oscilloscope are of equal amplitude and phase and VTVM indicates 9.3 to 10.2 vac. It may be necessary to readjust the vertical position of the A or B trace.

(9) Lock 896 unit in position by tightening aft screw in U-shaped clamp. Make certain that indications of step (8) do not change during tightening.

(10) Press and release 083 AUTO SEARCH. Perform IR portion of SSGC 4 and check that 796 COMP comes on. If COMP does not come on repeat steps (5) thru (10).

(11) Set 796 SELECTOR TEST to 7, then OFF; disconnect oscilloscope and VTVM; set 905 POWER to OFF.

13-3d. IR RECEIVER MOUNT HARMONIZATION.

NOTE

IR harmonization mark is located as shown in figure 13-3, sheet 2 of 2, point B.

(1) Set FLIGHT-SAFE valve in right forward electronics compartment to SAFE. IR receiver will extend.

(2) Remove IR receiver from its mount.

(3) Attach IR alignment fixture (486136) to receiver mount.

(4) Place boresight telescope on alignment fixture and focus on 1000 inch target board.

(5) Adjust IR receiver mount until cross hairs of boresight telescope coincide with IR harmonization mark.

13-3e. IR RECEIVER ROLL CHECK.

(1) Place leveling bar across roll leveling lugs located on forward side of mid-bay baffle.

(2) Place gunners quadrant on leveling bar and adjust gunners quadrant until level bubble is centered. Lock the quadrant in this position.

(3) Place quadrant on IR receiver mount perpendicular to fuselage reference line. Make certain quadrant is pointed in same direction as it was on leveling bar.

(4) Adjust IR receiver mount in roll until bubble is centered.

(5) Recheck harmonization (paragraph 13-3d.).

(6) Remove 486136 from receiver mount.

(7) Replace IR receiver.

13-4. ARMAMENT BORESIGHT.

Refer to T.O. 1F-106A-2-12 for procedures to boresight the launchers.

13-5. FC&M BORESIGHT.

13-5a. ANGLE OF ATTACK TRANSDUCER BORESIGHT. The purpose of this check is the electrical null of the

angle of attack transducer is within the boresight alignment reference lines (±5/8 inch) on the left-hand main landing gear drag strut.

WARNING

Ensure that aircraft power has been turned off.

(1) Ensure that RH console PITOT HEAT is OFF.

NOTE

Steps (2) thru (5) should be performed if decal, Part No. NC0001, on left main landing gear drag strut is damaged or missing.

(2) Using plumb bob, measure vertically down 14.15 inches from center AN6-35A bolt (reference T.O. 4S1-32-24), attaching forward main landing gear pivot pin to pivot beam.

(3) Remove any other decals or reference marks from leading edge of forward drag strut.

(4) Grease pencil a horizontal reference line, coincident to plumb bob end point, on leading edge of forward drag strut.

(5) Remove adhesive cover on backside of decal part number NC 001 and carefully place decal on drag strut so that zero line on decal is directly over grease pencil line.

NOTE

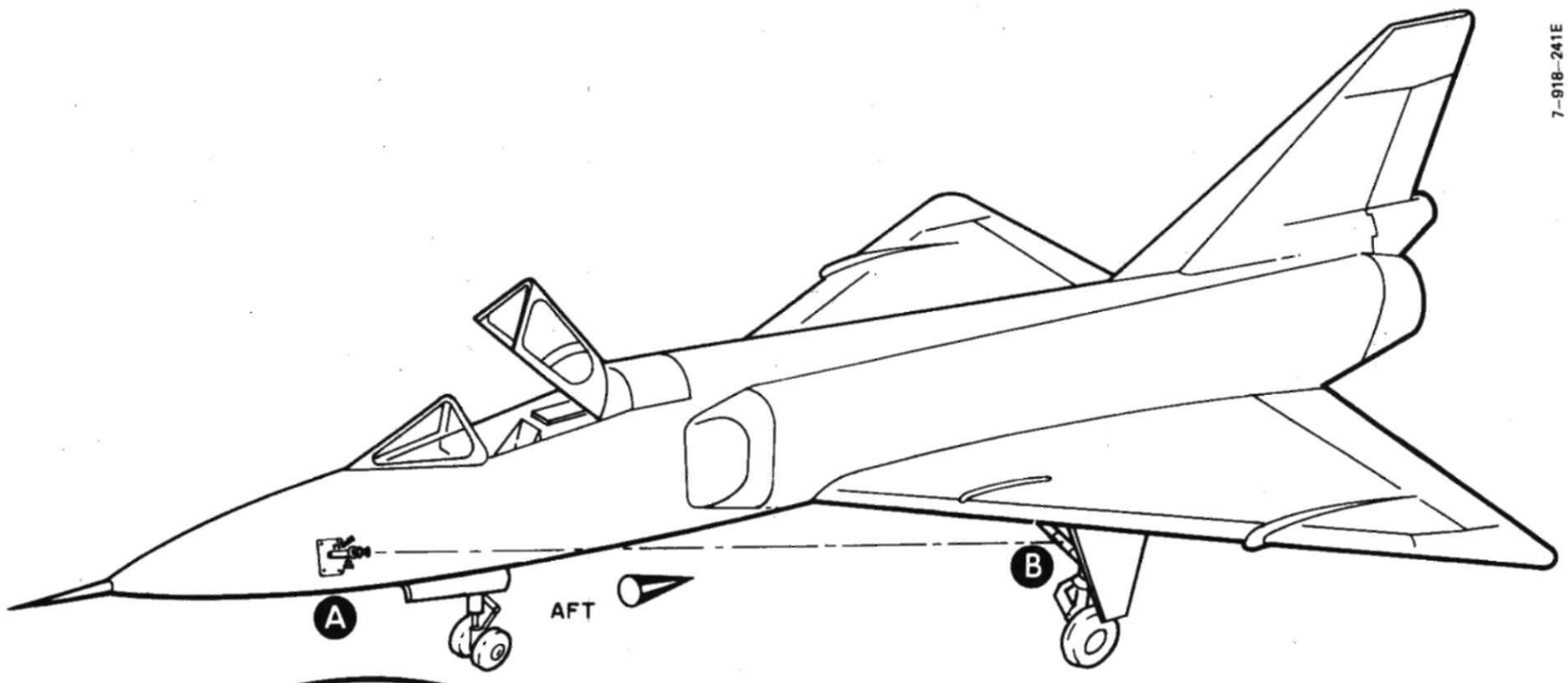
Coat area of decal installation with Specification MIL-P-21563, FSN 8010-540-5523 (or equivalent) sealer and fluorescent overlay.

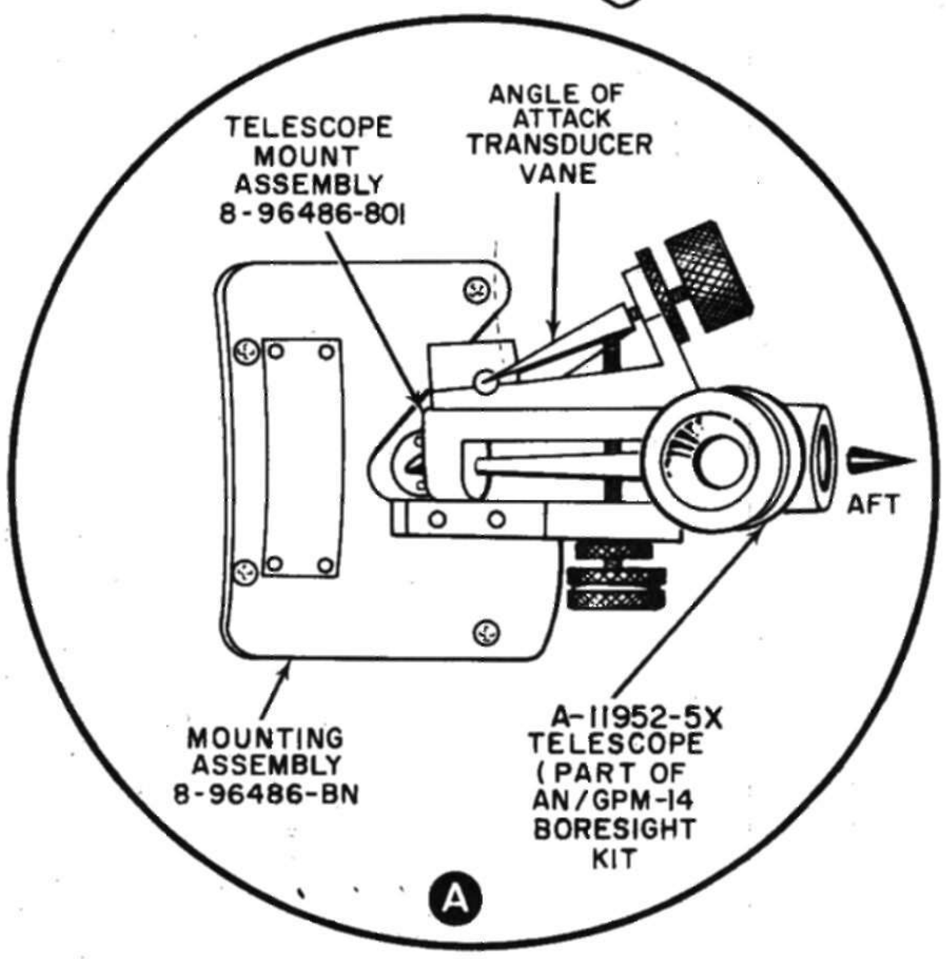
(6) Remove four screws from angle of attack transducer cover plate. Screws removed will correspond with position of four mounting holes in 8-96486-BN mounting assembly. Install mounting assembly in place over transducer cover plate (see figure 13-4).

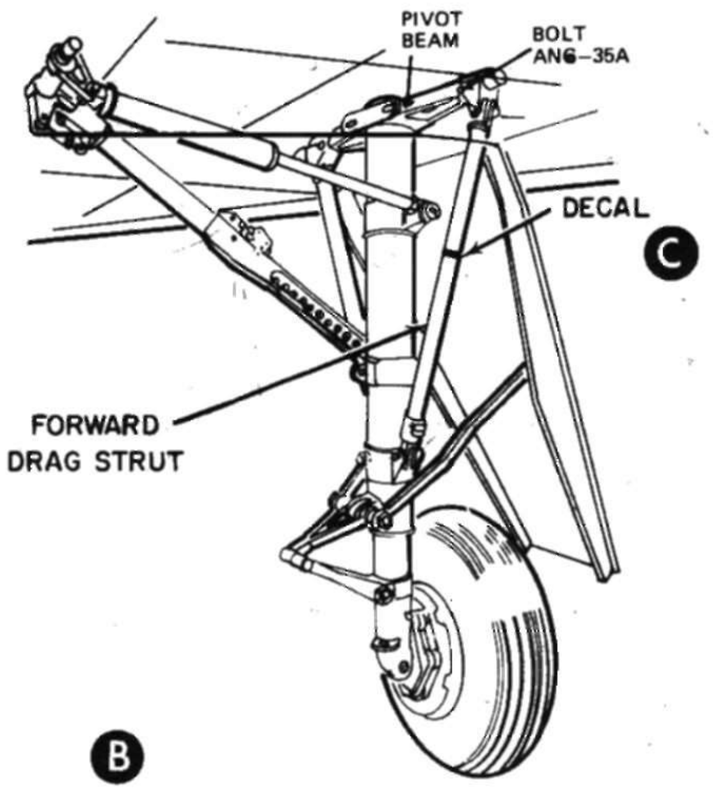
CAUTION

Use of boresight fixtures other than those listed herein, or shown on figure 13-4, is unauthorized.

(7) Attach 8-96486-801 telescope mount assembly to angle of attack transducer vane so that telescope will be situated below vane. Secure mounting assembly by







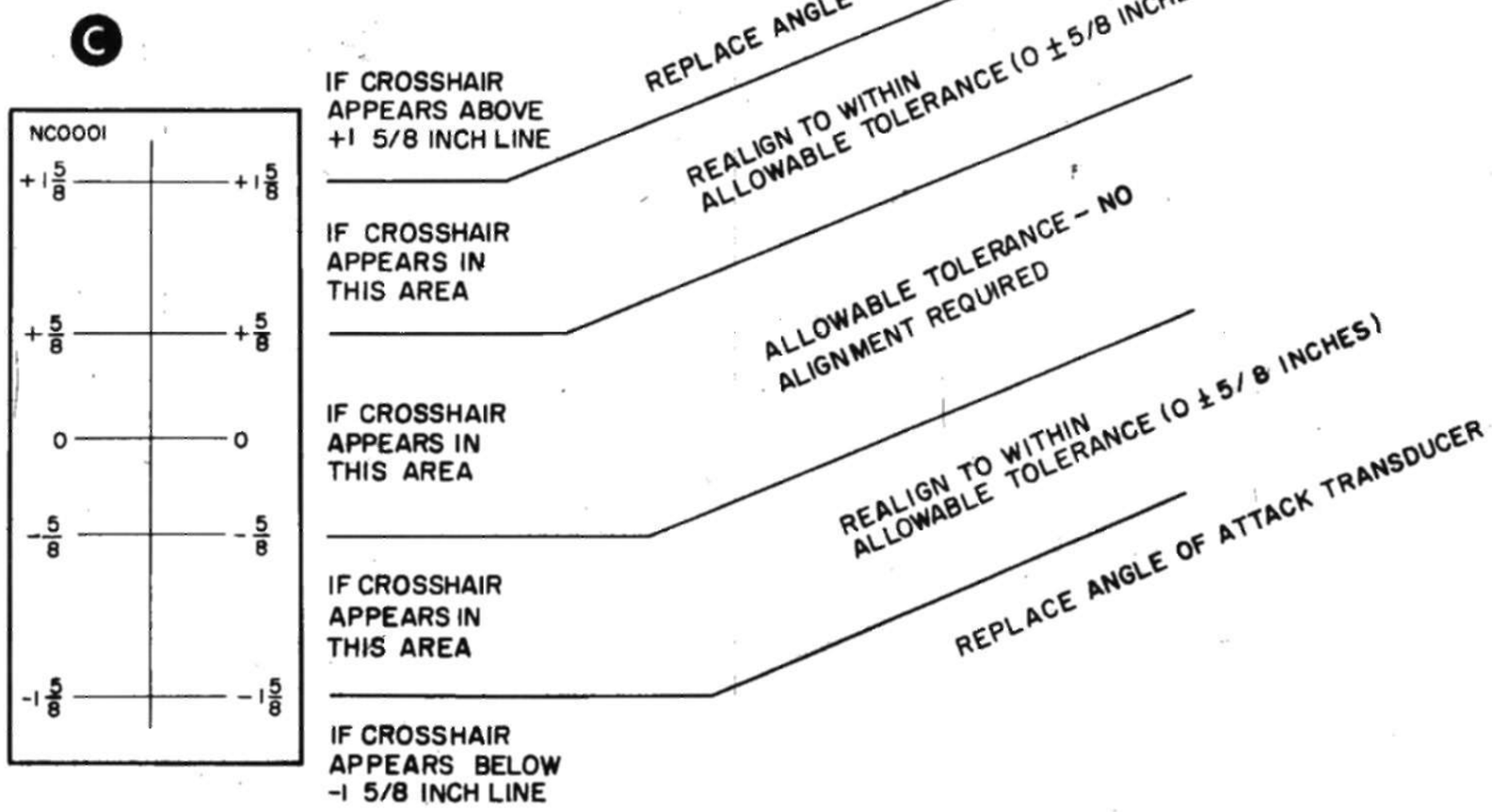


Figure 13-4. Angle of Attack Transducer, Electrical Check and Adjustment

tightening torque screw until clutching device within knob of torque screw slips. Secure lockring to prevent accidental loosening of torque screw.

(8) Insure that there is no vertical movement between angle of attack transducer vane and telescope mount assembly.

(9) Connect adapter cable to aircraft test connector TJ7 and connect 8-96486-803 or -805 test harness assembly to adapter cable in accordance with figure 13-5.

NOTE

Construct test harness for angle of attack transducer electrical check procedure as follows:

a. Cut wire into two 12-inch lengths; connect one end of wires to pins A and B of MS3101A-16S-1P connector.

b. Fix other ends of wires, from pins A and B, as test points (see suggested construction under detail B of figure 13-5). These two test points are used to check the output voltage of the angle of attack transducer.

Construct adapter cable for angle of attack transducer electrical check procedure as follows: Cut wire into two 5-foot lengths and install connectors per detail C of figure 13-5.

(10) Connect Tektronix 317-101 oscilloscope (or equivalent) to test points of 8-96486-803 or -805 test harness. If fabricated test harness is used, connect oscilloscope across test points of fabricated test harness.

NOTE

Millivac Instruments 32A Millivoltmeter (or equivalent) may be used as substitute for oscilloscope.

CAUTION

If millivoltmeter is used, exercise care to prevent damage to the meter. Voltage output of angle of attack transducer will be approximately 15 vac at full deflection. In using either oscilloscope or millivoltmeter for establishing a null position, voltage scale should be stepped down as null is obtained and final null position determined on lowest voltage scale at which null can be observed.

(11) Apply external electrical power to aircraft to provide 28 volt 400 Hz excitation voltage to transmitter synchro.

(12) Adjust telescope, using thumb screw on mounting assembly, until crosshair is centered on zero reference line on left main landing gear drag strut. Lock thumb screw with knurled lock nut.

NOTE

Error will be present in sighting horizontal reference marks unless vertical crosshair is also coincident to vertical reference line on decal.

(13) Check collimation of telescope by performing following procedure:

(a) Rotate telescope in telescope mount assembly until eyepiece is pointed down.

(b) Center field of view on zero reference line on left main landing gear forward drag strut.

(c) Rotate telescope until eyepiece is in horizontal position and then rotate to the vertical position. Center of field should not move more than 0.1 inch from zero reference line in either position.

(d) If movement is greater than 0.1 inch, use another telescope and repeat steps (8) through (13).

(14) Unlock thumb screw and adjust until null is indicated on oscilloscope or millivoltmeter. Lock thumb screw and assure that null is retained.

(15) Sight through telescope and note position of crosshairs.

(a) If horizontal crosshair is outside the plus or minus one and five-eighths inch lines, steps (16) and (17) must be accomplished.

(b) If crosshair is between the plus or minus one and five-eighths inch and five-eighths inch lines or a new angle of attack transducer is being installed, accomplish realignment beginning with step (18).

(c) If horizontal crosshair is within the plus and minus five-eighths inch lines, no alignment is required. Proceed with step (27).

(16) Remove boresight scope from mount. Open radar compartment door for access to angle of attack transducer.

NOTE

When replacement is necessary, remove alignment pins from angle of attack transducer before installing in aircraft.

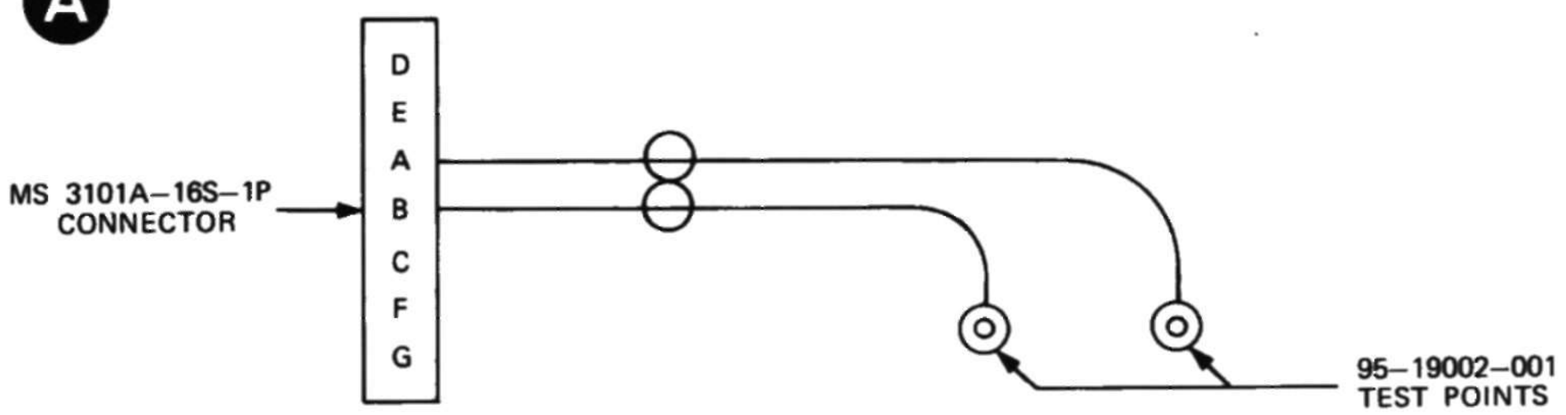
(17) Check for improper angle of attack transducer installation (i.e., missing safety wire, loose bolts, grease on friction gasket, use of screws in lieu of bolts). If no evidence of improper installation, the angle of attack transducer must be replaced. After installation of serviceable item, close radar compartment door and reinstall boresight fixtures. **Turn RH console pitot heat switch to the ON position. Ensure heater circuit for angle of attack transducer is working. Return RH console pitot heat switch to the OFF position.**

(18) Adjust vertical thumb screw until horizontal crosshair is coincident with zero reference line. Remove telescope and open radar compartment door.

(19) Remove safety wire securing four bolts which secure angle of attack transducer to support. Loosen bolts just enough to permit housing to be turned.

A

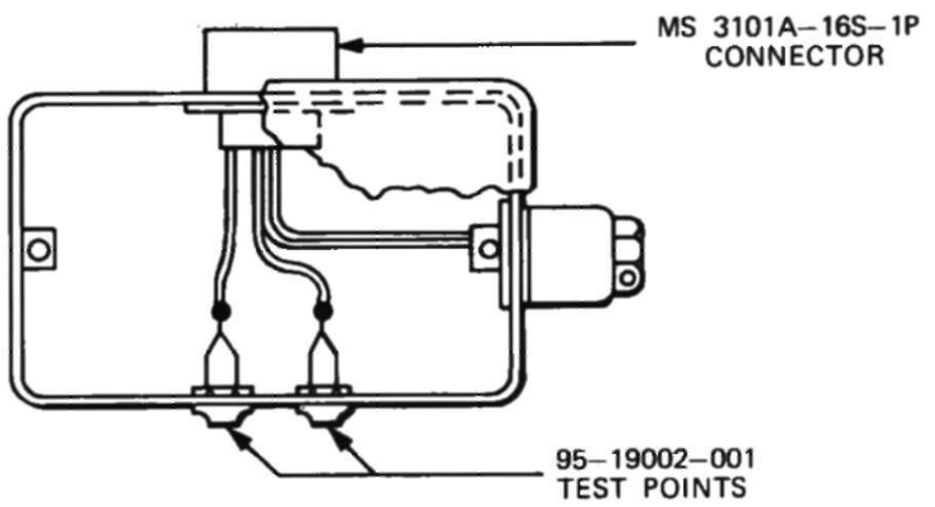
TEST HARNESS SCHEMATIC



7–918–242A

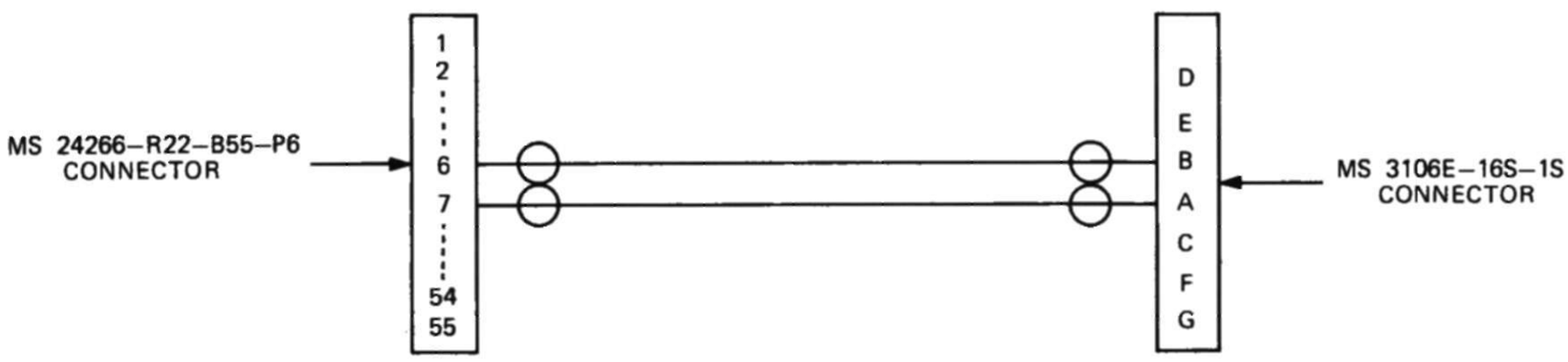
B

SUGGESTED FINISHED CONSTRUCTION OF TEST HARNESS



C

ADAPTER CABLE SCHEMATIC



D

TEST HARNESS FUNCTIONAL DIAGRAM

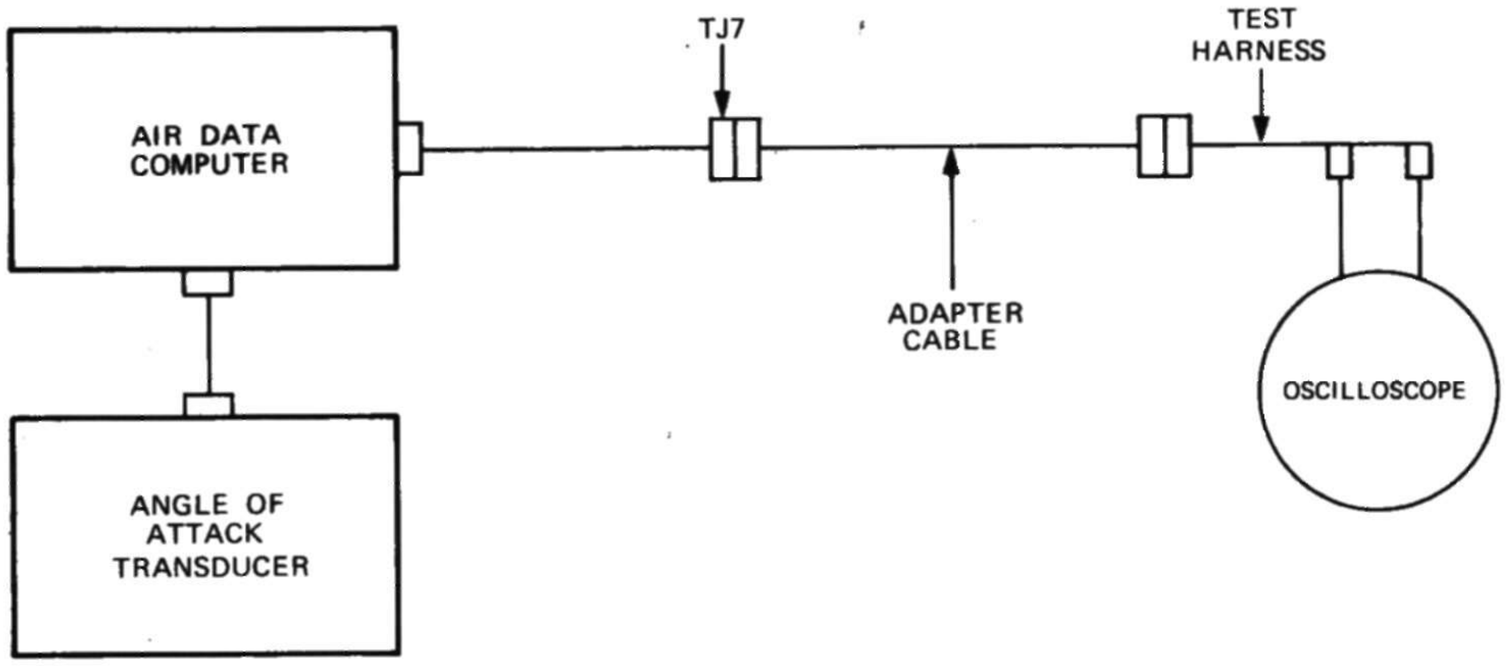


Figure 13-5. Test Harness and Adapter Cable Fabrication Diagram

(20) Hold transducer vane against thumb screw stop of mounting assembly and turn housing until electrical null is indicated on oscilloscope or millivoltmeter.

(21) Close radar compartment door and secure all fasteners. Hold telescope mount assembly free of vertical adjustment thumb screw while latching door; reinstall telescope.

(22) Sight through telescope and note position of horizontal crosshair on the drag strut. If crosshair is within the plus or minus five-eighths inch lines, proceed with step (25). If crosshair lies between the plus or minus five-eighths and one and five-eighths inch lines, adjust telescope with vertical adjustment thumb screw until crosshair is one-fourth inch away from zero reference line, but on opposite side. (Example: If crosshair was one inch above zero reference line, reposition crosshair one-quarter inch below zero reference line.)

(23) Remove telescope from telescope mount assembly. Open radar compartment door. Hold telescope mount assembly free of vertical adjustment thumb screw while opening door.

(24) Rotate angle of attack transducer until electrical null is indicated on oscilloscope or millivoltmeter.

(25) Using torque wrench, torque bolts to 50 ±1.0 inch-lbs and safety wire bolts.

(26) Close radar compartment door. Hold telescope mount assembly free of vertical adjustment thumb screw while latching door and secure all fasteners.

(27) Install telescope on telescope mount assembly and check alignment of crosshairs. If crosshairs are not within the plus and minus five-eighths inch lines on left main landing gear forward drag strut, repeat steps (22) through (27).

(28) Ensure that transducer is still at nulled position.

(29) Set 905 POWER to RADAR STBY.

(30) Set 796 SELECTOR TEST to 5. AMI or 880 unit should indicate 1.8. AVVI or altimeter should indicate 57,000 feet.

(31) Set 846 RUN-STOP to STOP; set 846 TEST-NORMAL to TEST; press and release 857 TEST PROGRAM TRANSFER. Set 846 RUN-STOP to RUN and then to STOP. 846 DISPLAY REGISTER should display 000001.

(32) Set 140 FEEDBACK TEST to NORMAL; set 140 DIGITAL DISPLAY to DIGITAL INPUT SWITCHES; set 140 DIGITAL INPUTS ENTER down (off); set 846 START ADDRESS to 11.

(33) Press and release 846 ENTER START ADDRESS; set 846 RUN-STOP to RUN.

(34) Set 140 DIGITAL INPUTS to 221.

(35) Set 140 DIGITAL INPUTS ENTER up (on). See 846 DISPLAY REGISTER lights for voltage magnitude of function selected.

(36) Record voltage indicated on 846 DISPLAY REGISTER lights. The sum of the digits which are high, represents the value in binary coded decimal (BCD) form of the dc input in volts. The voltage value should be between 47.1 and 48.5 volts.

(37) Set 796 SELECTOR TEST to 6. AMI or 880 unit indicator should indicate 0.785. AVVI or altimeter should indicate 33,000 feet.

(38) After Mach and altitude indicators stabilize, record voltage indicated on 846 DISPLAY REGISTER lights. The voltage value in binary coded decimal (BCD) should be between 37.5 and 39.7 volts.

(39) Set 796 SELECTOR TEST to 7, then OFF.

(40) Using TTU-205 B/E pressure-temperature test set, simulate a Mach number of 0.30 ±0.05 or 160-225 knots.

(41) The angle of attack voltage indicated on 846 DISPLAY REGISTER lights should be between 39.0 and 41.0 volts.

(42) Set 905 POWER to OFF.

(43) Remove test harness and adapter cable from aircraft connector TJ7.

(44) Remove boresight tools and reinstall all screws in transducer cover plate.

(45) Remove external power.

13-5b. DGA BORESIGHT.

CAUTION

Remove and replace the gyro mounting base carefully to avoid damage to the locating pins on the DGA rack (474). When transporting the DGA to and from the aircraft, care must be taken to avoid abrupt movements as such motion may cause damage to the internal gyros.

NOTE

Boresighting harmonization requires the use of a machinist's parallel bar and gunner's quadrant. Boresighting harmonization is outlined in the following procedure.

(1) Remove DGA iaw T.O. IF-106A or B-2-9-2-1. Remove gyro mounting base iaw para 10-10a.

(2) Adjust three DGA rack (474) mounting screws to height of 1-1/2 inches as shown in figure 13-6.

(3) Place machinist's parallel bar across lateral leveling lugs on aircraft (refer to figures 13-1 and 13-2 for location of lugs).

(4) Place gunner's quadrant on parallel bar and adjust quadrant until level bubble is centered. Lock quadrant in this position.

(5) Transfer gunner's quadrant from lateral leveling lugs to DGA rack (474) in same angular relationship as shown in figure 13-7. Ensure that quadrant has not been turned end-for-end during transfer.

(6) Adjust either of two DGA rack (474) aft mounting screws until gunner's quadrant level bubble is centered. Maintain at least one stud minimum of 1.19 inches and maximum of 1.63 inches.

(7) Place machinist's parallel bar across longitudinal leveling lugs in aircraft (refer to figure 13-1 and 13-2 for location of lugs).

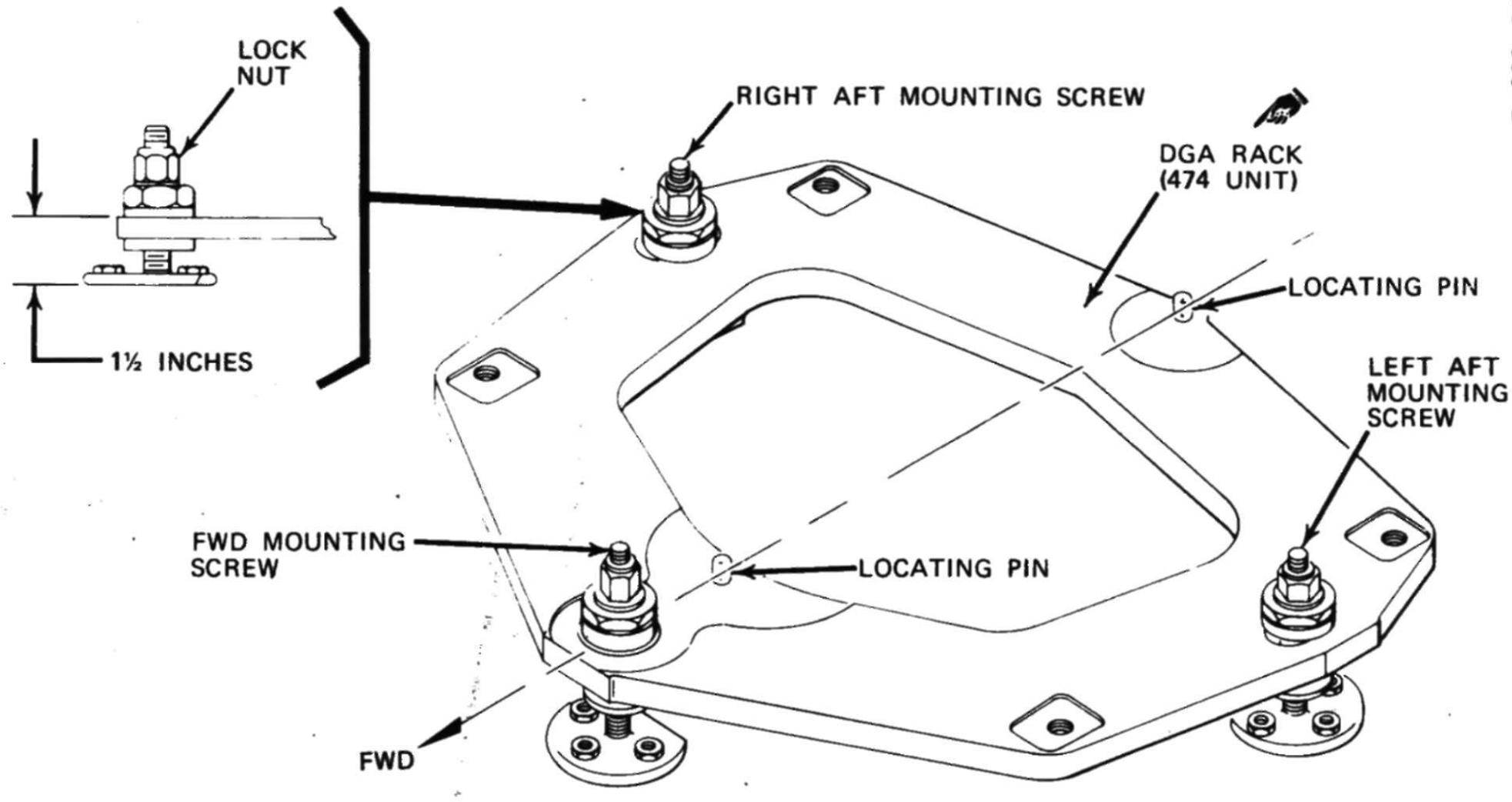


Figure 13-6. DGA Rack (474 Unit)

(8) Place gunner's quadrant on parallel bar and adjust quadrant until level bubble is centered. Lock quadrant in this position.

(9) Transfer gunner's quadrant from longitudinal leveling lugs to DGA rack (474) in same angular relationship as shown in figure 13-7.

(10) Adjust DGA rack (474) forward mounting screw until gunner's quadrant level bubble is centered.

(11) Repeat steps (3) thru (10) until no further adjustment is necessary.

(12) Install Stable Table Alignment Tool, 8-96023-23 Mounting on DGA rack (474) with locating pins engaged and cradles to right of aircraft center line as shown in figure 13-8.

(13) Place pointer assembly in cradles, and extend pointers until they almost touch reference marks located on aircraft fore and aft bulkheads as shown in figure 13-8.

NOTE

If a scribed line is observed on the alignment reference plate use the scribed line for alignment instead of the etched marks.

(14) Ensure that pointers are clear of bulkheads, and clamp pointer assembly down to cradles.

(15) Adjust DGA rack (474) in azimuth until pointers align with reference marks on bulkheads.

(16) Repeat steps (3) thru (15) until no further adjustment is necessary.

(17) Torque locknuts on DGA rack mounting screws to 860 to 900 inch pounds.

(18) Recheck alignment in pitch, roll, and azimuth.

(19) Remove pointer assembly from stable table alignment tool mounting block.

(20) Remove stable table alignment tool mounting block.

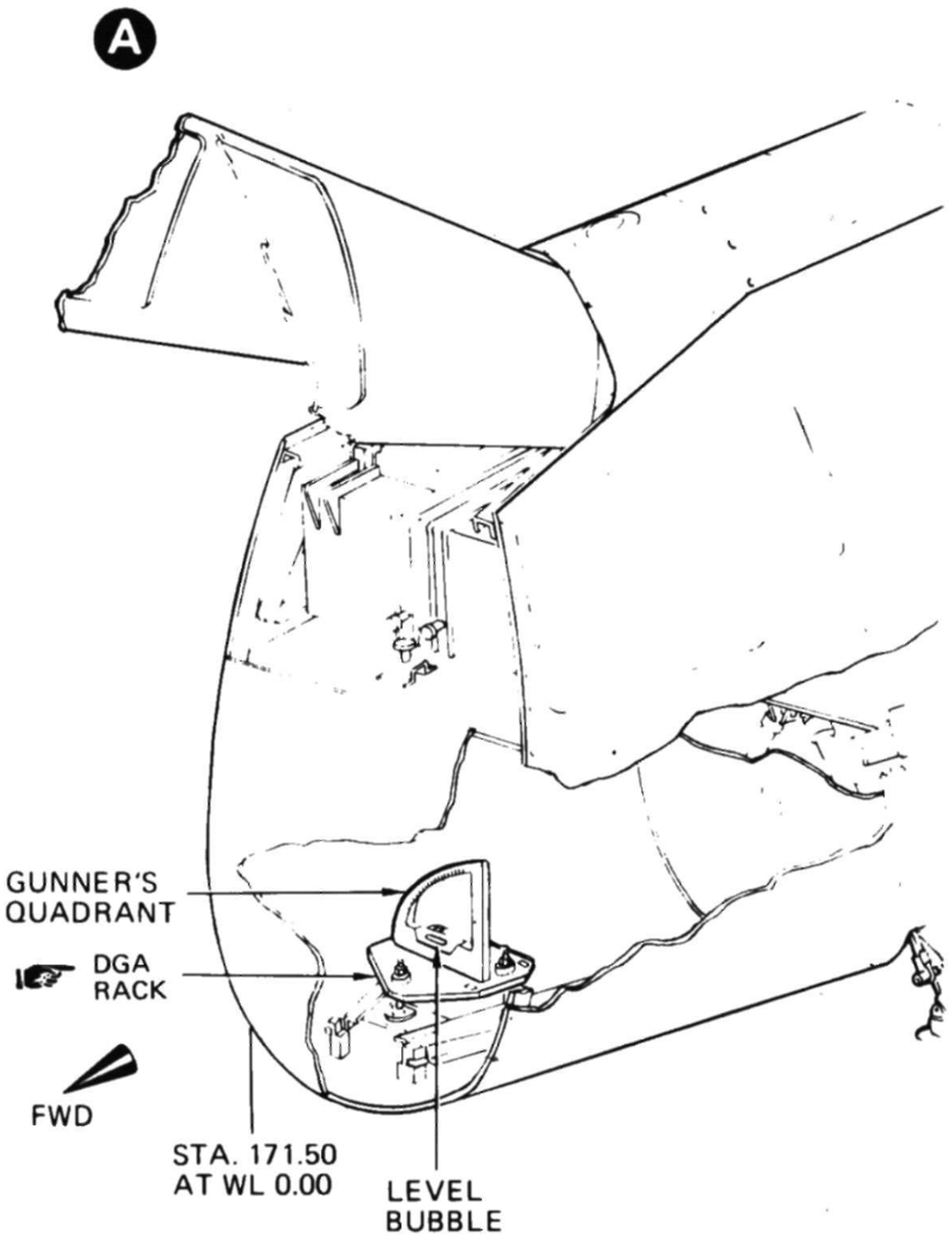


Figure 13-7. IKA Rack (474 Unit) Leveling Procedure

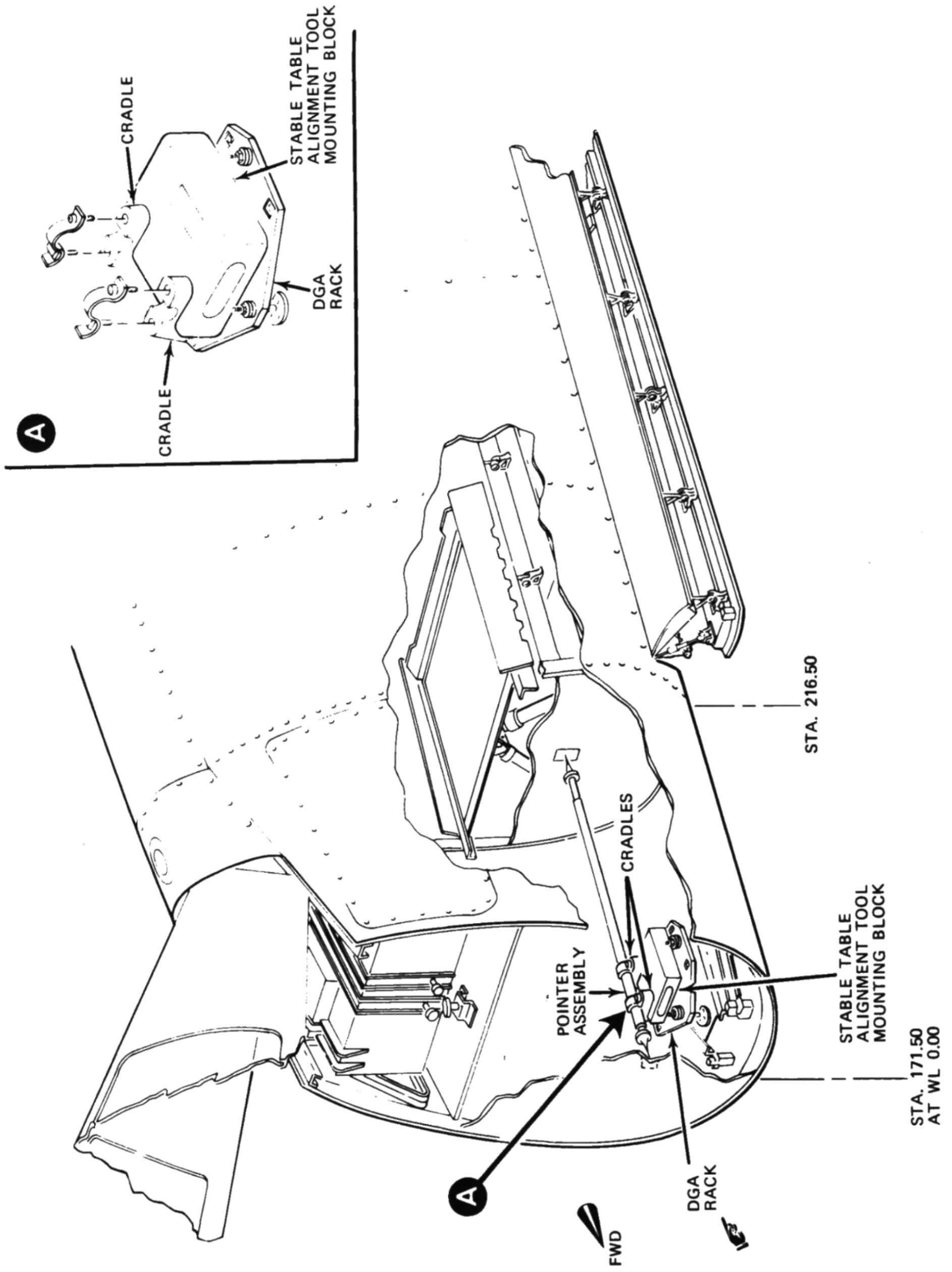


Figure 13-8. DGA Rack (474 Unit) Azimuth Alignment

13-6. SNAPSHOOT SYSTEM GROUND BORESIGHT PROCEDURE.

WARNING

Before performing the SnapShoot system ground boresight procedure, refer to T.O. 1F-106A-2-12 for all warnings and cautions relating to the gun (if installed).

NOTE

Before ground boresighting the SnapShoot system, check the display alignment in accordance with para. 3-17e, step 10. If the display is not properly aligned, perform the procedures in para. 3-18a through 3-18i.

If a broad white line appears when the 52800 mode selector switch is set to 5 (GROUND BORESIGHT) or 6 (CALIBRATE), set the mode selector switch to 1 (OFF) and then to either 5 or 6. Should this same indication appear, check the computer subsystem.

(1) Install boresight tool 52660 on the 52800 unit (Optical Display Unit).

(2) Install the gunsight and gun boresight attachment to the 8-96070 target board.

(3) Align the target board in accordance with T.O. 1F-106A-2-12, para. 5-10 and figure 13-9.

NOTE

If gun is not installed, set target board 1133 inches from nose landing gear strut.

(4) Set the 905 POWER switch to ON.

(5) Set the ACP selector switch to SPL WPN.

(6) Set the 52800 mode selector switch to 5 (GROUND BORESIGHT). Observe that three pippers, forming a triangle, are displayed.

(7) Sight through the peepsight on the 52660 boresight tool and observe that the upper pipper (apex of triangle) falls on the target board gunsight mark. If the pipper does not fall on the target board gunsight mark, perform the rest of this procedure.

(8) Set the 140 DIGITAL DISPLAY switch to DIGITAL INPUTS SWITCHES and DIGITAL INPUTS switches to 100.

(9) Set the 52800 mode selector switch to 6 (CALIBRATE).

(10) Press and release the 083 action switch to second detent, and then the AUTO SEARCH button to enable the pipper presentation. (Observe that a 17 mil pipper appears in the center of the ODU display.)

(11) Sight through thepeepsight on the 52660 boresight tool; press and hold the 083 action switch to second detent and move the pipper until it falls on the 8-96070 target board gunsight mark. Rotate 083 ANT ELEV wheel to move the pipper vertically; move the 083 hand control in azimuth to move the pipper horizontally.

(12) Set the 52800 mode selector switch to 5 (GROUND BORESIGHT). Observe that the upper pipper of the triangle now falls on the target board gunsight mark.

(13) Set the 140 DIGITAL INPUTS switches to 000 and the DIGITAL DISPLAY switch to NORMAL.

(14) Set the 52800 mode selector switch to 1 (OFF).

(15) Set the ACP selector switch to VI.

(16) Set the 905 POWER switch to OFF.

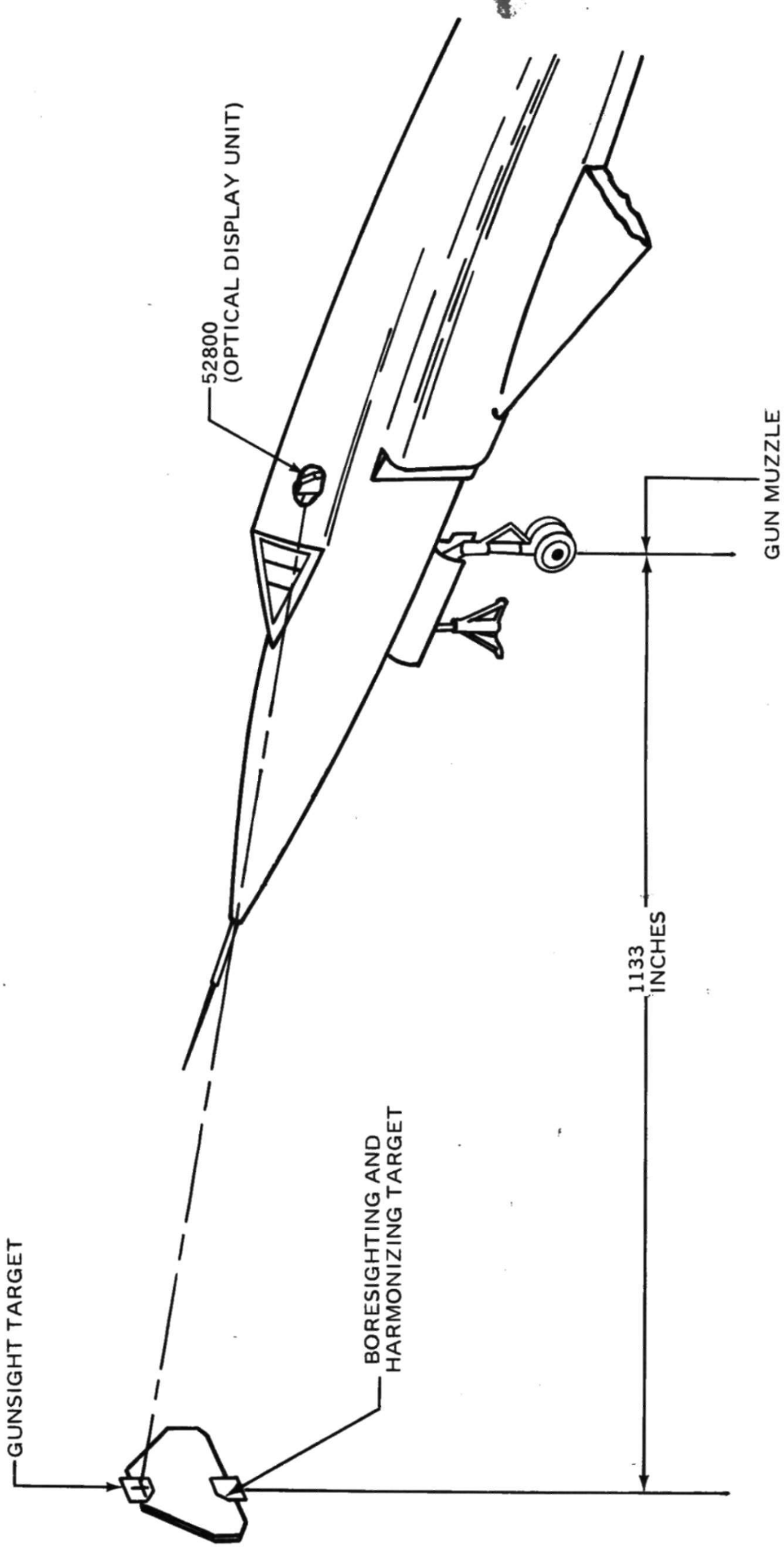


Figure 13-9. SnapShoot Ground Boresight Procedure

CHAPTER 14

MULTIPLE AIRBORNE TARGET TRAJECTORY SYSTEMS (MATTS)

14-1. GENERAL. This chapter contains the procedures for the MATTS Installation and Checkout.

14-2. MATTS PREPARATION PROCEDURES.

MULTIPLE AIRBORNE TARGET TRAJECTORY SYSTEM (MATTS) INSTALLATION AND CHECK OUT PROCEDURE, F-106 AIRCRAFT --- 17 JULY 1974.

ALL EXISTING SAFETY DIRECTIVES WILL BE FOLLOWED TO THE LETTER.

MATTS CONTROLLER AND TRANSMITTER WILL BE INSTALLED AS A MATCHED PAIR.

NOTE

INSURE AIRCRAFT COAXIAL CABLES FOR MATTS UES ARE IN OPERATIONAL CONDITION. NO ARMAMENT OF ANY TYPE WILL BE LOADED ON AIRCRAFT WHEN MAKING THIS CHECK.

14-2a. MATTS INSTALLATION AND CHECKOUT PROCEDURE. The following procedure will be used in conjunction with the MATTS GO/NO-GO TEST SET to check out the MATTS T9 Controller and Transmitter on the F-106 aircraft.

(1) Install MATTS Controller and Transmitter Assembly on midbay electronic compartment access door (see T.O. 1F-106A-4, figure 2.2-11 for installation location).

(2) Remove Marker Beacon Antenna (see T.O. 1F-106A-4, figure 2.18-6, Index 44).

(3) Connect existing coax connector to Blade Antenna and install Blade Antenna (furnished with MATTS Controller/ Transmitter Assembly) to the location where the Marker Beacon Antenna was previously installed.

(4) Insure that fuse in is place, MATTS fuse holder, right hand forward cockpit.

(5) Check and insure all unnecessary electrical switches (cockpit) are "OFF".

(6) Set MATTS control switch, right hand forward cockpit console to "OFF".

(7) Connect aircraft MATTS Plug J2 to MATTS GO/ NO-GO Test Set.

(8) Connect external power unit to aircraft and turn power "ON".

(9) Rotate MATTS control switch (cockpit) to the following positions and insure proper indications on the GO/ NO-GO Test Set:

* a. "OFF" - All test set lights OFF and no meter deflection.

* b. "STANDBY" - Test set filament light should illuminate.

* c. "TRANSMIT" - Filament and B Plus lights should be illuminated.

(10) Rotate Armament Select Switch, Armament Control Panel, LH fwd cockpit, to "SALVO".

(11) Set Arm/Safe Switch, Armament Control Panel, LH fwd cockpit to "ARM".

(12) Hold nose wheel well door close switch to closed position.

CAUTION

THE NEXT PROCEDURE WILL CAUSE ARMAMENT BAY DOORS TO OPEN. RELEASING THE NOSE WHEEL WELL DOOR SWITCH BEFORE THE CHCEK IS COMPLETED WILL CAUSE MISSILE BAY DOORS TO CLOSE.

(13) Press trigger on flight control stick (083 unit, right hand side) to second detent. Release trigger immediately upon missile bay doors opening. Meter on MATTS GO/NO-GO Test Set should indicate in the "GREEN" or 40 milliwatt area, indicating that modulation is getting from the MATTS Controller to the MATTS Transmitter.

NOTE

Modulation should be present until missile bay doors are closed or MATTS Control Switch is placed out of the "TRANSMIT" position.

(14) Set MATTS Control Switch, RH fwd console, to "RESET". The meter will no longer indicate modulation and the FIL and B Plus lights will be out.

(15) Set MATTS Control Switch to "XMIT". FIL and B Plus lights should light and there is no indication of modulation on the meter.

(16) Set MATTS Control Switch to "OFF". Press manual door close switch, armament control panel, LH fwd cockpit ("GUTS" button). Missile bay doors should close.

(17) Release nose wheel well door switch and set ARM/ SAFE Switch, armament control panel, LH fwd cockpit, to "SAFE".

(18) Disconnect MATTS GO/NO-GO Test Set from aircraft wiring, P2 and connect aircraft P2 plug to MATTS Transmitter, J2.

(19) Connect alligator clip from MATTS GO/NO-GO Test Set to Blade Antenna, installed with MATTS Transmitter in step 1.

(20) Rotate MATTS Control Switch, RH fwd cockpit, to "XMIT". Transmit light on MATTS GO/NO-GO Test Set should light within 45 seconds.

(21) Rotate MATTS Control Switch to "OFF". Remove alligator clip from Blade Antenna. Remove power from aircraft and secure all equipment.

*For any abnormal indications, refer to T.O. 1F-106A-2-27-5, Figure 2-5 or T.O. 1F-106A-2-13, Figure 3-121 for MATTS Aircarft Wiring Schematics.

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926 and 989 Units Replacement	10-8d	10-23	none	none
1600 Hz Check	7-5f	7-12	7-2	7-6

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