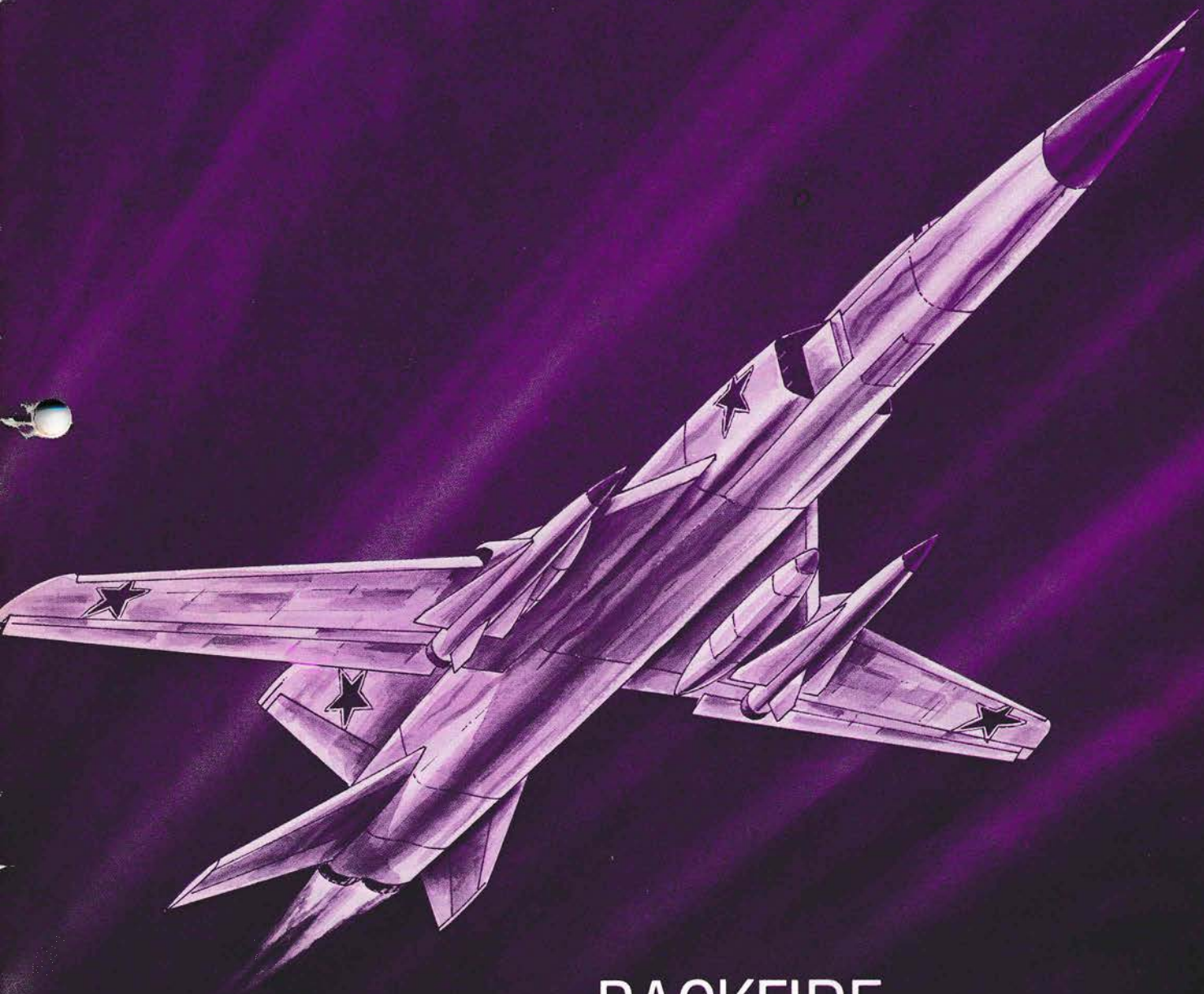
Interceptor

APRIL 1976



BACKFIRE. . . *see page 8*

C. SCHAFER

Interceptor

FOR THE MEN AND WOMEN RESPONSIBLE FOR AEROSPACE DEFENSE

VOL 18
NO 4

SPOTLIGHT

No matter how high a man rises, he needs something to look up to!

Anonymous

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OUR COVER

This month our cover and feature article is the Soviet supersonic variable-geometry bomber — NATO code name — Backfire! (See page 8.)

IN THE INTEREST OF SAFETY
PASS ME ALONG TO A FRIEND

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"The safety officer will have the most influence on the safety attitudes of the members of the command."

We have often stated that a successful safety program is based on attitudes. These are the attitudes of personnel at *all* levels from the commander on down. I don't want to downgrade the importance of a safety-minded attitude at all echelons, but there is probably one individual whose attitude is most critical to the program. This individual is the "unit" safety officer. I use the term "unit" safety officer to encompass any individual who is tasked with safety duties, whether formally assigned or not.

The "unit" safety officer may be of any rank, age, experience or background. The UDL Safety positions obviously require extensive training and experience, but many of the lower echelon safety jobs are additional duties and require no formal training whatsoever. With these factors in mind, it behooves us to select highly motivated, "go-getters" to manage our safety programs, whether at the branch or air division level. These individuals are the backbone of the Safety program. The safety officer will have the most influence on the safety attitudes of the members of the command.

The unit safety officers are in reality the difference between life and death for many of us. Their approach to safety and the energy they spend on accident prevention programs and education will have the greatest impact on the command accident rate.

We need to set our attitudes to select the right individual for the safety job and then give them our fullest support whether superior or subordinate. Only that way can we be assured of having the strongest possible Safety program throughout ADCOM.

COLONEL JAMES E. P. RANDALL
Chief of Safety

HOT LINE

MISS INTERCEPTOR. In a recent command policy change, Miss Interceptor's tenure was reduced to six months. This means we need a new gal for our June issue. We are opening the contest command-wide and we have to hurry. So come on you guys, send us a picture of your favorite gal. The contest is open to ADCOM military personnel and their dependents. We'll need to have name, rank, age, and an address and military phone number where she can be reached. Pictures (preferably a full length and a face shot, no larger than 8X10) must arrive at INTERCEPTOR office NLT 23 April 1976.

A JUMP SEAT FOR THE T-39? A proposal has been made at MAC headquarters to install a cockpit jump seat on the command's T-39 Sabreliners. The jump seat would be used by an additional crew member on training missions, functional check flights, flight evaluations, or while acting as outside safety observer. Since 1968, three crew members have been injured in flight while standing between the pilot and copilot seats. In each case, the observer fell to the floor during steep banks. Two broken ankles and one compression back fracture resulted. Swing-type jump seats are installed in the Navy CT-39E (Sabre 40) and the CT-39G (Saber 60) aircraft, but not in Air Force T-39's.

NOTE: The 366th TFW Gunfighters Association will hold its annual reunion on 21-23 May at the El Tropicano Hotel, San Antonio, Texas. Contact Captain Frank Mercy, Gunfighter Reunion Committee, Box 377, Randolph AFB, Texas 78148 or phone 1-512-653-8339. All past and present officer members of the 366th TFW since the Wing's activation in 1943 are invited to join the Gunfighters Association and attend the reunion.

LOOK OUT FOR THAT TREE!!! Many tools have been designed to cut down trees. Some are constructed with very sharp leading edges and a mechanism to cause the device to build up great speed prior to striking the tree. The great speed combined with the sharp edge cause an abrupt separation of wood cells and the tree falls over. Any similarity between the aforementioned device and an aircraft is purely coincidental, but it appears that this idea might have gotten scrambled somewhere in the translation. Recently, within a 60-day period, no less than five USAF aircraft have sustained damage after encounters with wooden objects, trees, street signs, etc. In these cases all of the crew members were able to walk away from the aircraft, get into a crew bus and ride to their separate debrief destinations. In two instances, the pilots didn't even know that the encounter had taken place until post flight inspections revealed the damage. Were these guys ever lucky!! Will the next one make it through? The odds are that he won't. "So tell us what happened so we won't make the same mistakes that those guys made." "Thought you'd never ask." You have heard all of the causes before, but maybe a reminder will keep it from happening again for awhile. They went something like this, "A deviation from a standard run-in heading with the sun as a factor"; "The AC flew a VFR approach to a field below approach and landing minimums using a visual and instrument approach that didn't provide terrain clearance, didn't utilize VASI and ignored a warning by another crew member","Failure to follow published procedures on a low level training route"; "The AC planned and flew an approach that didn't conform to written procedures, the IP allowed the pilot to fly the approach and an object projected into the landing runway clear zone"; "The cause factor of the last mishap hasn't been determined yet, but it appears that a pilot didn't use all of the nav aids available, the vasi was out and he encountered a rainshower on final." This article was written with the fervent hope that it will cause someone to think before making the same type mistake and maybe, just maybe, it will help prevent an accident.

ELIMINATING THE WIFE ERROR

by Jackie Starmer

Every flier's wife knows that keeping her everlovin' happy and content is her primary duty in life, and . . . that any additional duties thrust upon her, such as bearer of babies, pumper of bicycle tires, and dispenser of meals, medicines, and money are strictly her own puddle of mud, and fer gawd sakes don't splatter Hisself with family problems, particularly before he hits the blue. And if this were fact instead of wishful fancy, all aviation safety officers could retire to Peru and raise wart hogs.

Since it has long been the contention of aviation safety officers that preoccupation with family problems oftentimes causes upset aviators to bend or even bust their birds, which in turn causes everyone from the Commander to the guard at the gate to get in a royal snit, it is obvious that something has to be done to eliminate the chain reaction resulting in "pilot error," or if you prefer the more honest term, "wife error."

And since it is impractical to abolish existing marriages, and wives will innocently or otherwise continue to muddle up Hisself's mental state before, during, and after missions, it is suggested that a mandatory indoctrination course be held for the wives of all flying personnel, briefing them on the hazards of homelife, with particular stress placed on the importance of *Twelve Hours Twixt Fight and Flight*. Naturally, this course should be taught by a highly-qualified instructor — someone with years of intimate knowledge and experience in creating these hazards . . . me, f'r instance.

Having been a veteran bride for 17 years, I have been thoroughly orientated, indoctrinated, inoculated, and regulated in all things military . . . I wear white gloves through receiving lines; I demand crew rest after birthings; I medicate my family with the standard prescription of APCs and orange juice for every ailment from vertigo to obese ear lobes; I have never driven a *Follow-Me* jeep into a parked aircraft; and above all, I keep a calling card tray near the front door — where it seldom collects anything but cigarette butts, beer can poptops, and balls of rug fuzz. The important thing is, it's there.

It seems that in spite of this excellent training and background, as a perfect wife, I ain't much. I found this out, thanks to the snide remarks of an aviation safety bohunk whom I shall bite in the neck at the first opportunity. Now, I'm actually aware that Hisself should go beanless before a mission, but how was I to know that rutabagas are lethal? There's not one word in the aviation safety manual concerning rutabagas! It seems that rutabagas cause Hisself's gastric juices to over-gast something fierce, particularly when he's shooting landings, and the high cholesterol content riles up his fatty tissues to a farethee-well, also particularly when these two evil forces collide in or around the old gump's pituitary, well . . . all hell breaks loose. And because of this slipshod oversight by safety manual writers, one airplane is bent for a year, the runway is undergoing extensive repairs, and a mangled tire now reposes in my living room as a plastic-covered hassock.

Aside from being responsible for the home menu hazards, there's no doubt that we wives are held accountable for the daily problems of marital bliss that mayhaps miff an aviator to the point of being a potential wingbuster. Contrary to popular opinion, Hisself does not become a snarling beast only when his flaps won't flap, or his rudder won't rudd, or he wasn't promoted when he bygawd shoulda' been . . . no, these routine problems don't put our "sky kings" into an accident-prone mental state.

Actually, it's the little things that cause Hisself to come unglued . . . which is why a wife should always check the flight schedule before she indulges in an indignant account of why she turned the hose on the commanding officer's wife this morning and just who does she think she is anyway! And, say, did I mention that Junior stuffed a prune up his nose and don'cha know that he won't get that scuba diving scholarship since no one can scube with a maimed nostril and that the bank should oughta hire bookkeepers who can add because we can't possible be overdrawn *that* much.

And many a wife has been the cause of a feathered engine, or at

the very least, a kinked relief tube, because of her unguarded reactions to Hisself's blue funks, which usually develop in every normal husband at two critical periods of the day — breakfast and dinner. Although the dinner hour at our house has all the serene atmosphere of the Dempsey-Firpo fight ("git yer elbows off the table; don't eat so fast; clean yer plate; this kid will be eating with his fingers when he's 35 years old; git the cat off yer lap . . ."). I would say that of the two, the breakfast hour is the more critical period.

This is when, if we wives are to be instrumental in keeping the accident rate down, we must repress the overpowering urge to clout our roommates with their safety boots when the predawn conversation consists of "and what cooking secret do you use to make these eggs taste like Ben Hur's old sandals?" . . . and/or "my, my dear — you look about as sexy as a stopped-up sink in that flannel pup tent." Husbandly remarks such as these are usually the signal to square off and have at it. But to ensure a tranquil premission mental state in your sky-jock, remember to say absolutely nothing. Indignant rage and revenge can be subtly expressed in other ways . . . possibly you can jam all the zippers on his flight suit or go retch on the seat of his Rover.

It goes without saying that family problems occurring during an extended flight have caused more than one airplane driver to come nose-to-nose with an unexpected object — like a mountain.

This is a period in his life when he must be spared all worries other than "will he win at bingo tonight?" and "how soon can he get an R&R to Waikiki?"

Naturally, a long TDY is a bucket of worms to the wives left sitting on their hassocks, and unless Hisself pacifies the little woman with more letters than a once-a-week note (usually as romantic as the dash-1 and as short as commissary hours), she will discard all efforts at morale-building and manage to let him know that simply because he's 3000 miles away, he needn't think that kids, mumps, fights, and bills don't exist, fer heaven sakes, and a pox on your mental state and what about mine!

Although many a TDY widow is blessed with a husband who, though he reads fairly well, doesn't write, and has often wished that her roving roommate was as prompt and eloquent in writing love notes as he is in filing his per diem voucher, it is suggested that she refrain from penning any epistle to her absentee aviator that might possibly result in violent chain reactions. Since crippled aircraft beget Commanders' snits; snitted Commanders beget the nervous dizzies in pilots; the nervous dizzies is what begot Hisself into the cottonpickin' mess in the first place, and all on account of I wrote him the following letter:

Dear Pen Pal:

Will answer your note of 3 weeks ago before I get dressed for work. Oh, yes, I've taken a job to occupy my time while you're away . . . the pay isn't much, but ZOWIE!! is it interesting! I'm a BOQ Housemother, 8 p.m. to midnight shift.

By the way, did I tell you that our dog is at the vet's? No, he isn't sick; he's under quarantine. He bit that security police Honcho — the same sorehead who gave me a speeding ticket and suspended my driver's license last week when I accidentally ran through a stop sign during the change of command in front of the Admin Building and plowed into a black car sporting a monogrammed flag the size of a bedsheet. No serious injuries, except to one fella . . . he looked sorta like the CINC, but it was hard to tell with all that dirt on him. Come to think of it, it just might've been. Oh well, whoever he is, he sure has a temper!

I won't bore you with the rest of the details — except to say that the damage to our car was slight. Four hundred dollars will fix it up as good as new . . . which reminds me, the last check I wrote seems to have bounced, and I guess that's the reason your name was put on some kind of list.

In closing, let me reassure you that everything is under control here at home and no need for you to worry. Fly safe and keep in touch, pal.

Your everlovin' wife

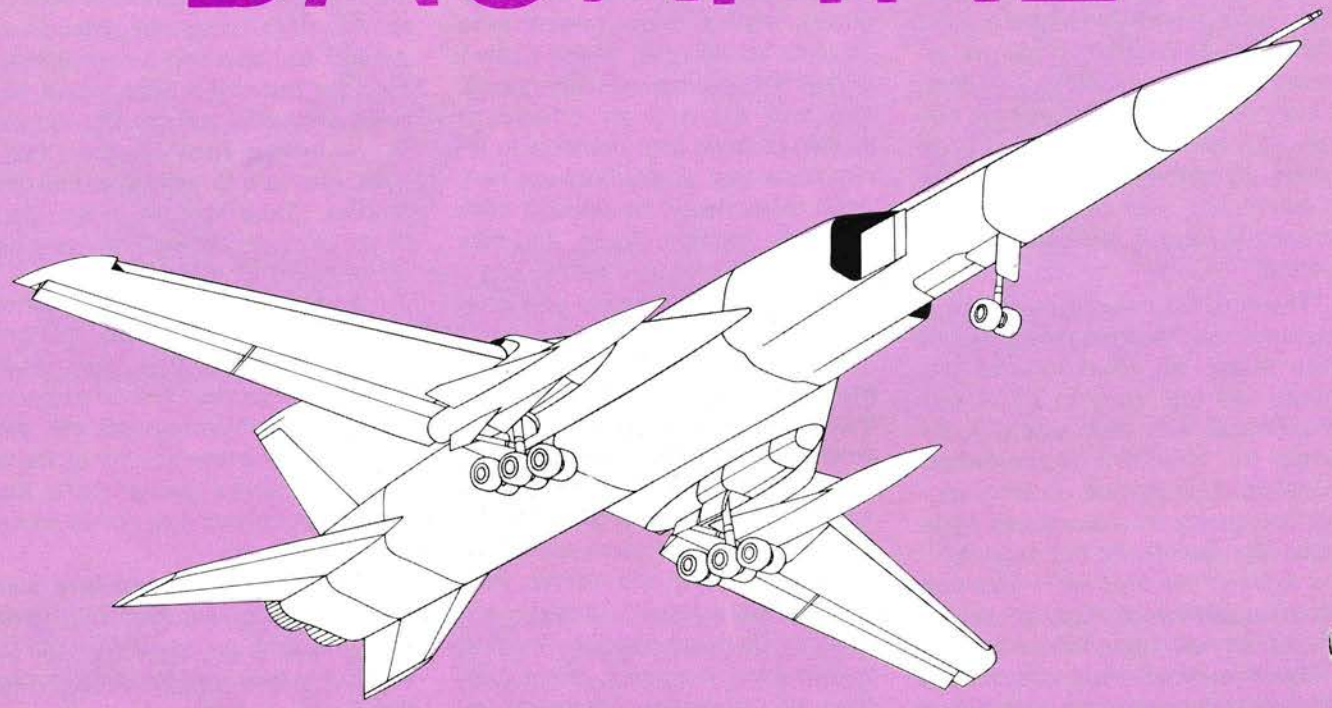
P.S. . . . Whaddya know! It was the CINC!

Like I say, something has to be done to eliminate the "wife errors" resulting in accidents. And it is to the everlasting credit of one particular aviation safety officer that he tried to do his part in preserving the accident-free record of his outfit. However, because of his own devotion to duty in attempting to erase "wife errors," the poor bohunk was medically discharged with unusual injuries . . . neck bites.

Adapted from MATS Flyer, August 1963

If you haven't seen your wife smile at a traffic cop, you haven't seen her smile her prettiest.
Kin Hubbard

BACKFIRE



"In the SALT talks, your opponent is continually deceiving you. Either he is testing radar in a way which is forbidden by agreements; or he is violating the limitation on the dimensions of missles; or he is violating the conditions on multiple warheads"

Aleksandr Solzhenitsyn, Readers Digest, 1975

Much has been said in the news media concerning the Soviet supersonic variable-geometry bomber *Backfire* and its role in the SALT talks. Although INTERCEPTOR will not remark on the political aspects of this aircraft, we do feel that our readers would like to know something about this aircraft and others that might one day constitute a threat to our pilots. Thus, *BACKFIRE* will be the first in a series of INTERCEPTOR articles that will give our readers a view of the THREAT.

BACKGROUND

In 1962, the Soviets produced a new medium-bomber (NATO code name Blinder) to replace the aging Badger. At that time, their military thinking was that strategic targets located even at the lower limit of the medium range (2500-3000 km) could only be attacked by missiles.(1) The Blinder was developed to fill the slot between the ranges of the tactical aircraft and tactical missiles

(1) International Defense Review 5/1975, pp 639

and the medium to long range strategic missiles.

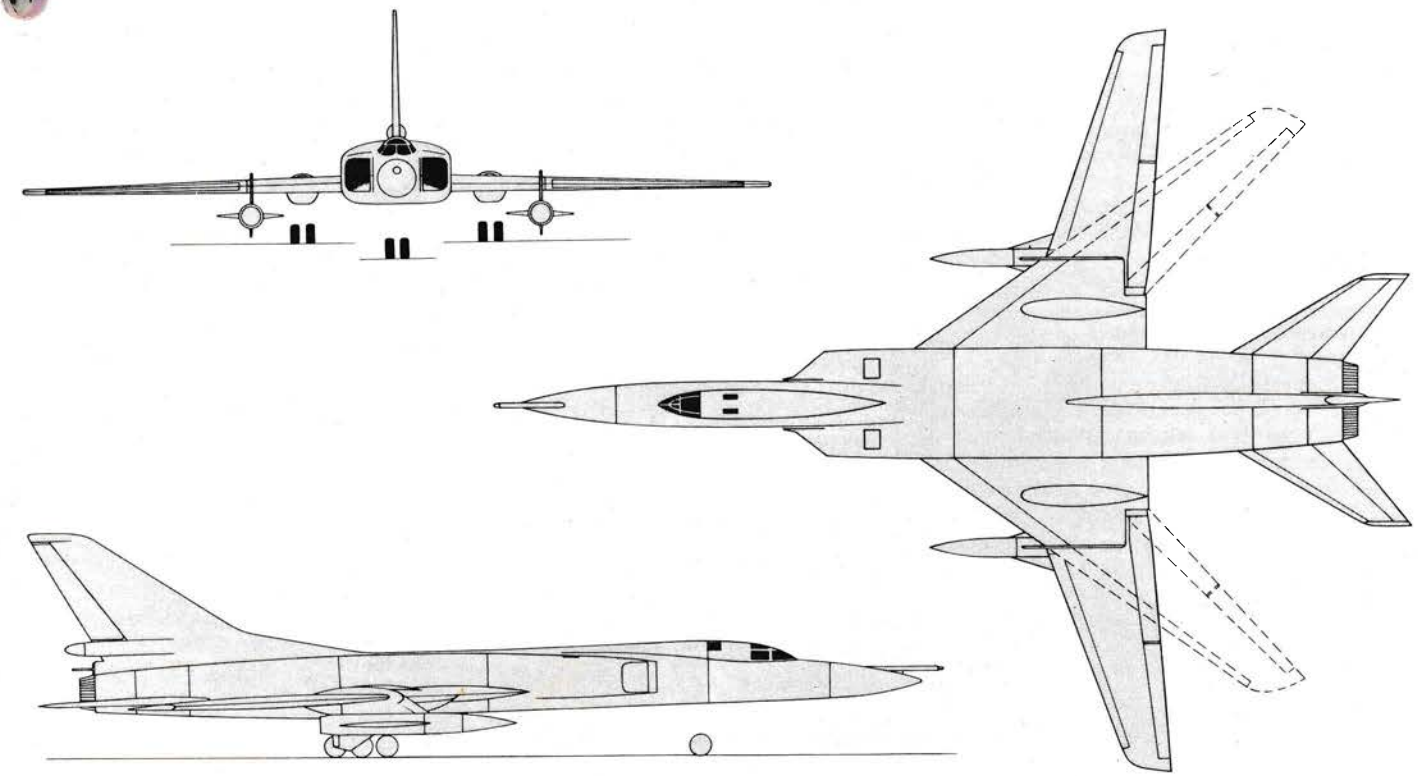
By mid 1960s, technological programs in aircraft design gave new life to the designers of heavy bombers. Such technical advances as variable-geometry wing, afterburning turbofan engines, the utilization of new materials and production techniques, the continuing progress in miniaturization and developments in the field of nuclear weapons meant that earlier concepts of heavy bomber design could be scraped.

The first word of a new Soviet prototype variable-geometry bomber came in 1969 with confirmation in mid-1970 just before the flight testing of the prototypes. (2)

(2) INTERAVIA 11/1975, pp 1193

Although first thought to be based on the Tupolev Tu-22 Blinder, the Backfire actually is an enlarged Tupolev Tu-28 (Fiddler) with the addition of variable-geometry wings and the deletion of the Fiddler's fuselage area-rule (coke shape). The variable-geometry concept employed on the Backfire appears to be a blend of the systems employed on

This three-view drawing of **Backfire** prepared by the IDR emphasizes the relatively simple fuselage design. Aft of the cabin, the fuselage cross-section is basically rectangular, tapering gently aft of the wings. From an aerodynamic viewpoint, the location of the wing pivots well outboard is not optimized, but has been dictated by the landing gear geometry.



BACKFIRE

Technical data on Backfire B*

*Under the NATO coding system, prototype aircraft are designated with the letter A and production models with the letter B.

Crew	3

Dimensions

Overall length	42.5 m
Height above ground	8.8 m
Wing span (maximum / minimum)	34.5 / 27.5 m
Wing sweep (minimum / maximum)	20 / 55°
Wing area at 20° / 55°	134.5 / 168 m²
Aspect ratio at 20° / 55°	4.5 / 8.8

Weights

Empty weight	52,000 kg
Fuel	68,000 kg
Maximum payload	10,000 kg
Maximum take-off weight	130,000

Powerplant

Number and designation of engines	2 × NK144 modified
Engine type	Two-spool turbofan
Length / Diameter	5.2 / 1.5 m
Weight	2,850 kg
By-pass ratio	1:1
Mass air flow	250 kg / sec
Pressure ratio	15:1
Turbine inlet temperature	1150° C
Static thrust without / with reheat	15,000 / 21,000 kp
SFC without / with reheat	0.64 / 2.1 kg / kph

Avionics

Radar

Terrain following radar	unknown type
Bombing / navigation radar	Down Beat
Fire control radar for 37-mm tail-mounted cannon	Fan Tail
IFF	SRZO-2
Radar warning device	Sirena 3

Navigation

Radio compass	2 × ARK-11
Radio altimeter	RU-UM / RV-17M
Beacon receiver	MRP-56P
ATC / SIF	SOD-57M
ILS	SP-50
Doppler radar-navigation computer	NJ-50BN
Short-range navigation system	RSBN-2S
Long-range navigation system	Inertial, possibly with satellite assistance

Communications

HF	RSB-70 / RPS
VHF	2 × RSIU-5
Data link	ARL-S
UHF	R-831
Intercom	SPU-10

Armament

Tail-mounted cannon	1 × 37 mm
External stores	2 × AS-6 or
In bomb-bay	15 × 500 kg bombs

Specific values

Wing loading (at 130 tonnes TOW)	775 kg / m²
Thrust / weight ratio (at 130 tonnes TOW)	0.323

Performance

Take-off run at 130 tonnes TOW	1,400 m
Take-off distance to 15 m at 130 tonnes TOW	2,400 m
Rate of climb at sea level, 130 tonnes TOW wing sweep 20°, without reheat	21 m / sec
Rate of climb at sea level, 70 tonnes TOW wing sweep 55°, with reheat	140 m / sec
Time to climb to 11,000 m (36,000 ft)	22 min
Service ceiling	18,000 m
Maximum speed at sea level	M 0.9
Maximum speed at high altitude	M 2.0
Cruising speed at sea level	M 0.65
Cruising speed at optimum altitude	M 0.82
Combat radius - hi-hi-hi (with inflight refuelling)	6,000 (8,700) km
Combat radius - hi-lo-hi	4,250 km
Combat radius - lo-lo-lo	2,500 km

the Sukhoi Su-20 Fitter-C and the Mikoyan MIG-23 Flogger.(3) Delivery of the first production models to the Soviet Long-Range Air Force was made in early 1974.

DESIGN

In addition to the design characteristics mentioned above, the Backfire has a limited degree of wing sweep dictated by the position and layout of the main landing gear. The landing gear is similar in design to that of the Tu-154 transport aircraft with two sets of six-wheels retracting backward into the center wing fairings. The twin-wheel nose unit retracts backward into the fuselage.

With wings fully swept, the leading edge sweep is a constant 55°, and with wings fully forward the trailing edge sweep is 0° inboard and 5° outboard. To improve low speed handling characteristics, the wing has a slight V-form with leading-edge and split double-slotted trailing-edge flaps on the outer wing sections. The outer portions of the double-slotted flaps can move differtially to enhance roll control. The relatively large span of the Backfire's wings provides adequate roll movement for the tail section.

The tailplanes are located at exactly the same height as the wings relative to the longitudinal axis of the aircraft. Their leading edge is swept 60° and is a single-piece all-moving elevator surface.

As on the Blinder, a flight refueling probe is located above the nose cone. (4)

POWERPLANT AND AVIONICS

The Backfire is powered by two modified Kuznetsov NK-144 turbofans. By raising the turbine inlet temperature to 1,150° C, these engines generate a static thrust of 15,000 kp dry and 21,000 kp with reheat (afterburner). At its maximum take-off weight — 130 tons — the aircraft has a thrust-to-weight ratio of 0.323, midway between that of an FB-111 and the B-1.

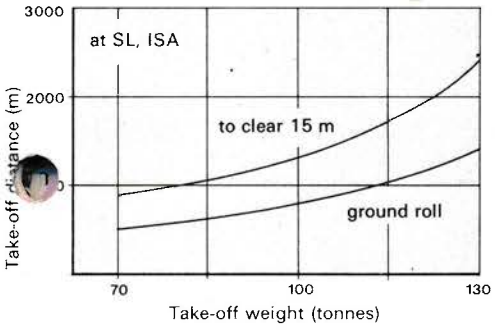
The Backfire has a newly developed terrain-following radar, and long-range inertial navigation equipment which possibly works in conjunction with Soviet military satellites.(5) In addition, the Backfire has an extensive active and passive ECM system which includes droppable electronic and infra-red (IR) countermeasures. These droppable ECM stores such as chaff, parachuted radar reflectors and IR flares can be dispensed from the underside of the fuselage, the tail fin root, or can be carried and dropped from underwing containers.

ARMAMENT

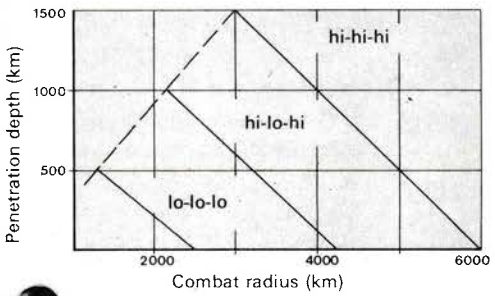
For defensive purposes, *Backfire* carries a tailmounted radar-controlled 37 mm cannon. Offensively it carries approximately 15 conventional 500 kg bombs or 9,000 kg of nuclear bombs which can be carried in the bomb bay. The principle armament consists of two externally mounted air-to-ground nuclear missiles designated AS-6 (see figure 1). (6) The AS-6 flies in level flight to the target area, which it attacks in a dive.

(3) Ibid pp 1194

▼ Since *Backfire* can be operated from airfields in the interior of the Soviet Union, take-off distance is not of paramount importance, although the variable geometry wings do enable short take-off runs to be achieved. Thus at the minimum take-off weight the aircraft needs only 900 m to clear a 15 m obstacle, and 2,400 m at the maximum TOW of 130 tonnes.



▼ This diagram shows how, in a mission flown under optimum conditions, the combat radius of *Backfire* reduces as a function of the final penetration distance, which is flown at maximum speed on the outward and return flights (as with combat radius, the actual distance covered is double the penetration depth). The hi-hi-hi combat radius of *Backfire*, which is 6,000 km at subsonic speed, is reduced to 4,000 km if the last 1,000 km to the target and back is flown at Mach 2. The reduction in range is even greater on low-level missions where a penetration distance of only 500 km flown at Mach 0.9 reduces the combat radius from 2,500 km to half this figure.



(4) op cit, International Defense Review, pp 641

(5) op cit, INTERAVIA, pp 1194

(6) op cit, International Defense Review, pp 641

FIG 1

The new Soviet AS-6 air-to-ground missile

A new air-to-ground missile with a maximum range of around 800 km has been under development for some time for the Soviet variable-geometry bomber, *Backfire*. Service introduction of the new weapon, designated AS-6, is expected to take place sometime in the first half of 1976, and *Backfire* can carry two of these missiles on underwing stations. The predecessor of the AS-6 was the AS-4 *Kitchen*, a missile weighing over six tonnes and having a similar range to the new weapon; the AS-4 constitutes the principal armament of the Tu-22 *Blind B*, and is carried recessed in the fuselage. The AS-6 differs from the AS-4 in having a shorter length, no tail surfaces and a new type of high performance solid fuel rocket motor.

Technical data

Length	9.0 m
Diameter	0.9 m
Wing span	3.2 m
Launch weight	4,800 kg
Warhead weight (nuclear)	350 kg
Maximum speed at high altitude	M 2.5 above launch speed
Maximum speed at sea level	M 1.2
Maximum range at high altitude	740 km
Maximum range at sea level	250 km
Propulsion	Solid fuel rocket motor
Guidance	Inertial, radar homing head in terminal phase

COMBAT POTENTIAL

Parameters on aircraft design such as wing loading, thrust-to-weight ratio and Mach 2 maximum speed can place *Backfire* in the category of long-range, low-level interdiction aircraft such as our F-111 and the B-1. By using the variable-geometry wing and air refueling, the Backfire can also be placed in the category of a long-range bomber with high speed penetration capabilities. With its low-level combat radius of 2500 km plus the 800 km stand off range of its AS-6 missiles, *Backfire*, flying at Mach 0.65 from a base in the western part of the Soviet Union — Lvov, for example — could attack targets in the whole of NATO Europe, with the exception of Portugal and Northern Norway, and return to base, all at low level (Fig 2).

If a subsonic hi-lo-hi mission profile is flown from the same base, *Backfire*, using its missiles, can attack targets on the North Cape, in the North Atlantic almost to the Icelandic coast, in the mid-Atlantic to about the Canary Islands. (7)

The strategic importance of *Backfire* will be greatly increased with the development of a recently introduced tanker version of the Il-76 transport aircraft. With a single in-flight refueling, the subsonic combat radius is increased from 6,000 to 8,700 km, which means that with its two AS-6 missiles, *Backfire* can attack targets on the eastern seaboard of the USA and return to base. By taking on 40 tons of fuel — the maximum payload of the Il-76 — the hi-hi-hi combat radius of *Backfire* can be increased from 6,000 km to 10,000 km, corresponding to a range increase from 12,000 km to 20,000 km. (8)

Is *Backfire* a potential threat to the United States? The Russians claim that the aircraft is to be used only in a peripheral role against areas such as Western Europe and China, and will not be used as an intercontinental weapon.

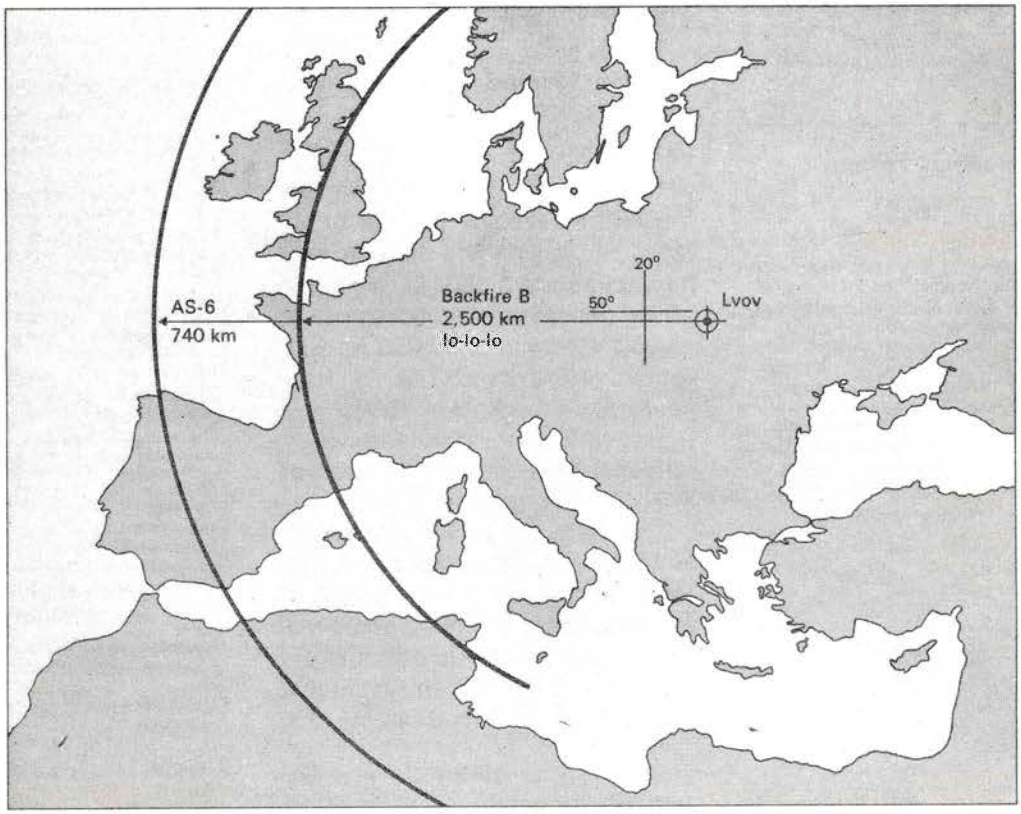
". . .when deployed with a compatible tanker force, *Backfire* constitutes a potential threat to the Continental United States." (9) ★

(7) Ibid, pp 642

(8) Ibid, pp 642

(9) Commanders' Digest, April 11, 1974

FIG 2



How to Beat the Accident Board

The following article was written by Colonel Robert W. Reeves, Deputy for Operations, HQ 23rd Air Division. Colonel Reeves presented this "briefing" at a 23rd flying safety meeting and contains some excellent food for thought.

A Compleat (sic) Guide to Carefree Parachuting. Having served as both member and president of accident boards. I've gained considerable experience in this function. As each one of you may be faced with this task at some time in your career, I would like to pass on some tips that should be useful if, through some stroke of misfortune, you are one day the witness before the board . . . investigating *your* accident.

The place to start is 36 hours before the accident takes place. The board will want a summary of all your activities including food and beverages consumed and sleep time logged. As this is kind of hard to predict it is easier to follow some general guidelines at least concerning the evening's activities before you're scheduled to fly. Go easy on the booze and get a reasonable amount of rest. A balanced diet doesn't hurt either. Anyway, partying till 2 a.m. with a 7 a.m. go isn't too swift.

The second major item is the mission briefing — primary mission, alternate if applicable. If you are the briefer make sure that you follow the mission briefing guide *to the letter,* and that you cover each and every item in detail.

Briefers occasionally skip or abbreviate items from time to time, but beware — the accident board will reconstruct the briefing in detail from "good morning" to "any questions?" Regardless of whether or not any item of the briefing was a contributing factor, if there are glaring omissions the briefer, the ops officer, and the squadron commander aren't going to get "rave" notices when the report is reviewed at higher headquarters. And it will be reviewed — thoroughly.

Third, we have the walk-around. Review the forms with the ground crew; they make dandy witnesses and are almost always interviewed by the board. Have him go with you on the walk-around; make sure he sees that little yellow-colored book in your hand and sees you look at it occasionally. If you can find something to comment on like a loose dzus, or when the tire pressure was checked or even a remark on the very few write-ups in the 781K, all the better. He will confirm that the pilot accomplished a thorough preflight.

Then, the mission. You've planned your flight; now fly the plan, accomplish things as they were briefed and don't add to the script. Any unauthorized, unbriefed maneuver jeopardizes you, your career, and some expensive machinery. The system is all on your side, until *you* make the decision to deviate from the mission as briefed. The accident files are full of this type of accident. That one wrong decision can be tragic.

So here you are, an hour into the mission. Suddenly the idiot panel lights up like a pinball machine. You go through the emergency procedures and that doesn't cure the problem so you and the aircraft part company. Keep track of how all that good life support equipment works, because the life support member and flight surgeon on the board will be very interested. But other than that, if you've done it by the book all the way, sit back and enjoy the ride — you'll survive both the crash *and* the accident board. ★

ABOUT THE AUTHOR

Colonel Robert W. Reeves, Deputy for Operations, 23d NORAD Region, has served primarily in ADCOM units amassing approximately 4,000 hours in interceptor aircraft starting with the F-86D. He is mission capable in the F-101 and current in the T-33. Previous flying assignments were with the 445 FIS, Wurtsmith AFB, MI; 57 FIS, Keflavik, Iceland; 4750 Test Sq, Tyndall AFB, FL and Commander, 14 TAC RECON Sq, Udorn, Thailand. Prior to his present tour, Colonel Reeves was Director of Operations and Training, ADWC, Tyndall AFB, FL. He composed this article shortly after serving on an accident board in 1973.

AF 209, WIND 270° *at 600Kts*

by Lt Col Roland R. Robinson, 12 Weather Squadron

Earlier this year, a hazard report (HR) was filed by an aircrew which had received an altimeter setting of 29.96 prior to arrival at destination when the actual setting was 29.42. Say "hey, where's that 540 feet?" Someone did a bad job, but worse than that, many "someones" didn't catch the error until the crew had landed. Safely?

Investigation revealed that the initial error was made by a weather observer trainee. Next on the scene was his supervisor — he let it slip by. The tower controllers had a shift change and he (they) let it slip by. Next in line was a RAPCON controller — you're right, he didn't notice it either. You know who's next — the pilot. He had been advised of an altimeter setting of 29.42 no less than three hours prior to arrival. However, upon arrival, he too failed to question what was — or should have been — an obvious error.

All those involved were trained to detect obvious errors no matter in which corner of the flying business they occur. If this be true then we ask, "how can so many professional people let what would be a change of 540 feet pressure altitude in one hour, go undetected?" Could you detect it or would you even question it?

Many of you would probably question the drastic change but not really know what was happening on the ground if such a situation were true. Equating the pressure altitude change to what we know about pressure systems and winds, the old meteorology equation of wind force would tell us that for a pressure system moving at 25 knots, a 540 foot change in pressure altitude in one hour would have our friends on the ground busy hanging on

against a *600 knot wind!* Ever experience that ??? In the Langley wind tunnel maybe, but "stormy" has never reported one like that — except in tornadoes. About this time you're probably asking, what's this guy driving at — don't leave me now, I've got something to say.

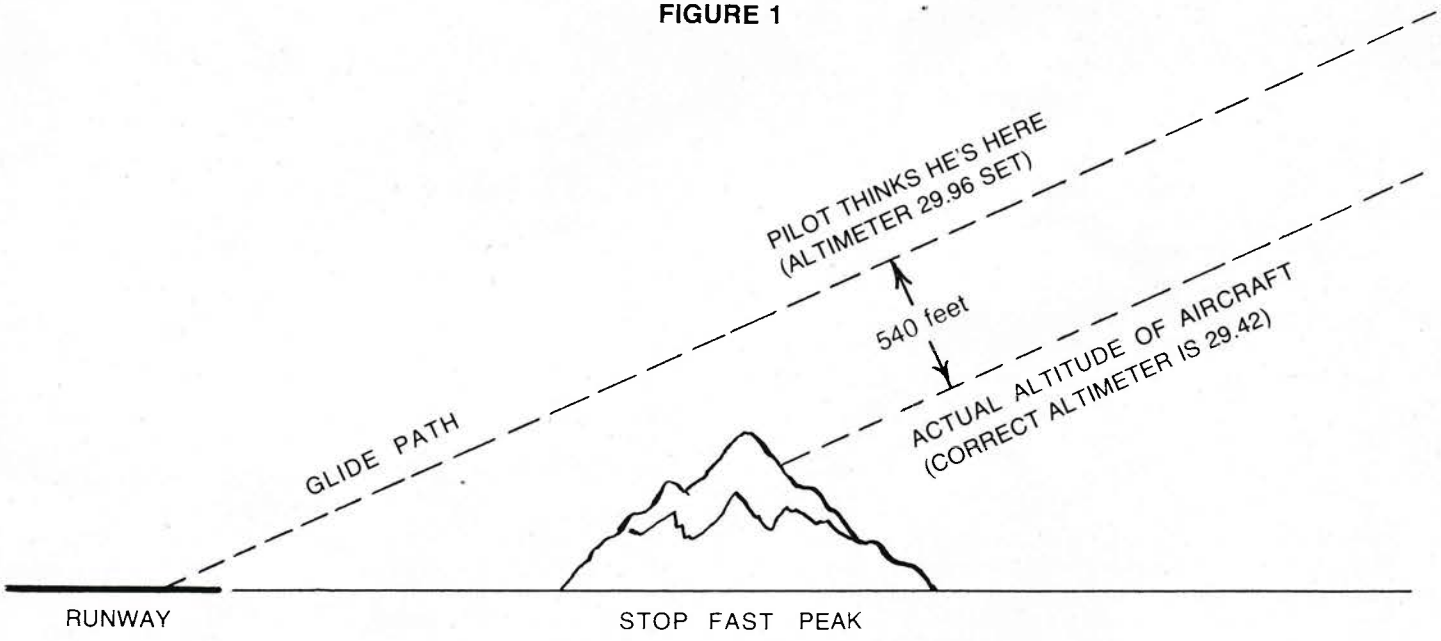
We've been receiving forecast altimeter settings for quite some time now and if you're like most others in the flying game, you look at them as useful only in the event of radio failure. Let's now look at another use for them — probably the most important use. Compare the forecast setting (DD 175-1) with the setting you receive just prior to descent or landing.

QUESTION DIFFERENCES. Ask what the previous hour report was and compare them if a significant change is evident. A simple rule of thumb which can alert you to what changes you could expect at a station experiencing the effects of a normal pressure system is, "For each 10 kts of surface wind you can expect about .01 change in altimeter setting in one hour." Example: A cyclone (low pressure system) moving toward your destination stop at 25 knots with a pressure gradient that will induce a 35 knot wind will cause the station altimeter to drop approximately 0.04 inches in one hour (29.92 to 29.88). A drop of altimeter setting from 29.96 to 29.42 at Omaha might be the result of the movement of a "Colorado low", with 30 knot winds, from the Southern Rockies to Eastern Nebraska in a 24-hour period.

Be extra cautious and inquisitive when the altimeter setting received is higher than expected. (Figure 1) Apply the rule of thumb and know (don't guess) what the pressure tendency is (high pressure moving in — altimeter setting goes up). Go to your weather manual and study pressure systems and how they affect altimeter settings.

Finally! Realize that the altimeter setting is the *only* weather information you receive in which you are unable to detect an error prior to touchdown (or impact). If the wind information were in error, your drift would alert you. If the ceiling or visibility were in error you have the option to go-around at DH or MDA. But with an erroneous altimeter setting, "a snowball in the mouth" may very well be your first clue that something was wrong. We can't log landings on Stop Fast Peak so why bother — know your altimeter — a real friend only when the altimeter setting is *right*. ★

FIGURE 1



SOPWITH F-1 CAMEL This plane is generally conceded to be the best British single-seat fighter of World War I. It was a fiery, temperamental little bi-plane that was difficult to fly, yet in the hands of an experienced pilot it was extremely maneuverable. The United States bought 143 Sopwith Camels and soon several squadrons were equipped with the versatile aircraft. The Camel was the first single-seat fighter to operate at night against German bombers and it was used by the first designated American night interceptor squadron, the 185th Aero Squadron. Our illustration depicts such a mission. The Camel had a 28 ft wing span, was 18 ft 9 in long, and had a loaded weight of 1,480 lbs. Several different rotary engines powered the plane to a top speed of 121 mph and a service ceiling of 18,000 ft. It was the first British type aircraft to carry twin Vickers machine guns; their breeches were enclosed in a hump, which gave the Camel its name.

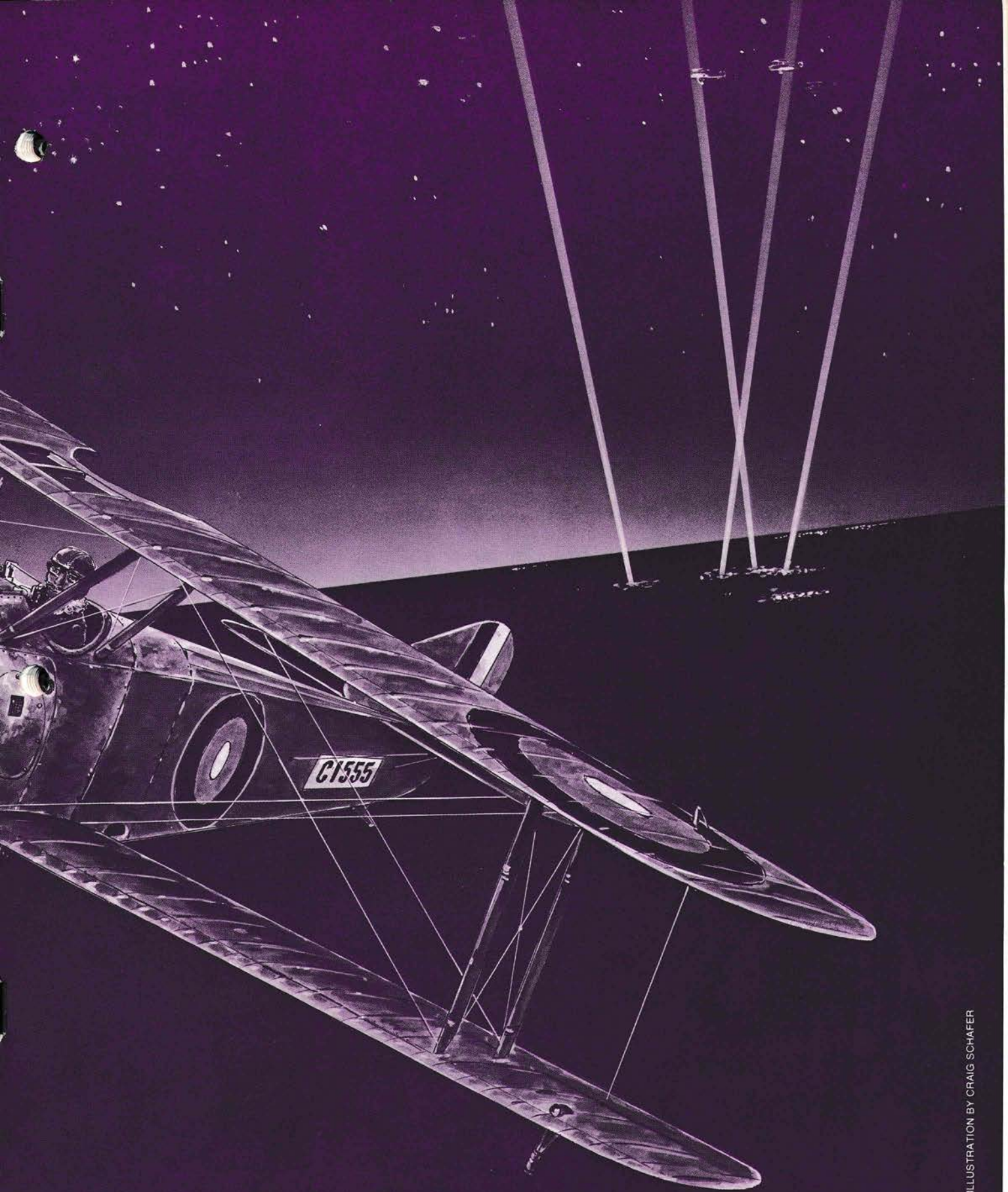


ILLUSTRATION BY CRAIG SCHAFER

VIOLATIONS, VIOLATIONS

by **ROGER G. CREWSE** • *December 1960*

COOLSTONE had been chosen because of his wide and varied flying experience to transport a two-star to a conference in a T-33.

They landed at their destination successfully, and the general then released Coolstone to return from whence they came. He was to come back in about four days to pick up the stars again.

It was on the return trip that Coolstone gained even more experience. He filed into his destination from a base about 700 miles out. His destination was reporting low ceilings and visibilities, and he knew delays would be most probable at this busy base.

He looked for the nearest alternate he could find, and came up with one about 70 miles away. However, the weather at his alternate was nothing fancy either, but he figured he would arrive at his destination with over 270 gallons of fuel, if the winds held at all. He could then hang around for 20 minutes or so, until he got down to about 200 gallons, at which time he would have to make a move.

The flight was uneventful until he reached a point about 15 minutes out from his destination. Here the Center directed him to descend to 26,000 and cleared him to the penetration TACAN. His estimate for the TACAN was 10 past the hour.

On the hour he was advised to enter the holding pattern when he arrived at the penetration TACAN, expect approach clearance at 20, and to contact the Approach Control immediately. At 12 past the hour, as Coolstone read the clock, he arrived at the TACAN on instruments in the weather. He had 264 gallons as the station swung.

He called Approach Control and told them that he was entering the holding pattern.

"Roger," said Approach Control "Your new expected appraoch time is 31. Expect clearance to a lower altitude at 25."

Using a rule of thumb — four gallons a minute — Coolstone figured he would be right at alternate fuel requirements at approach time. Really he would be below the 200 gallons he had planned as alternate fuel, but upon refiguring, he decided that 180 would be rock bottom minimum which, by great coincidence, would be about what he would have remaining at 31.

He made two circuits of the holding pattern before he solved it. This had been rather exciting. Four minutes remained until approach time. He figured 360 would just about do it.

He called Appraoch Control. "This is Coolstone One. How does the approach time of 31 look?"

"Coolstone from Approach Control. Stand by one."

This wasn't too heartening. It sounded to Coolstone like they might extend it once again. He then called Approach Control and asked them what the weather was at his alternate.

"Roger," said Approach Control. "Stand by one."

Mayber, thought Coolstone, about a third of the way through his 360, I'd better look at that alternate approach; 180 gallons might not do it if they have an involved penetration.

Flying the aircraft with his knees, he thumbed quickly through the letdown book, attempting to locate the plate for his alternate. He ruffled through the book rather quickly at first, and was unable to locate it. Then he backed up and started down page by page in the general area. At this point the aircraft had assumed a rather interesting attitude, and required Coolstone's undivided attention for a second or two.

He was about halfway through his 360, and once again he gave his attention to the letdown book.

It wouldn't surprise me one bit, he thought, not to have a plate under the field name. He didn't know what else it could be under, but he was sure the book-makers could think of something.

Then he tried the index, dividing his attention between the fine print and the instruments, without doing justice to either. He was about 40 degrees from the inbound heading, when he had made it through the index, and now he was willing to bet that the alternate just didn't have a penetration.

Then it dawned on him! He looked at the back of the book and, sure enough, his alternate was shown to be about an eighth of an inch beyond the book's coverage. He was starting to fumble for the letdown book which covered the area of his alternate, when Approach Control called.

"Coolstone One from Approach Control. You'll be cleared for a penetration at 33. Weather is reported to be 400 foot overcast, three miles, and rain."

The Approach Controller went on to tell Coolstone that his alternate weather was reported at 800 foot overcast, two miles, and rain.

"Roger, boy," said Coolstone. "Is that approach time firm?"

"Coolstone from Approach Control, it looks good now. Give us a call departing the high station."

Coolstone was at a loss to figure how he could get to the station at 33, since he was already over the station at 31, but,

game to the core, he cranked his bird up into a 45 degree bank, and around he went. He noted his fuel was 170, and accepted the fact that the alternate was out the window.

Well, he thought, at least that's one problem that's behind me. Even with the good try, it looked like he was going to be a minute late for his arrival over the station. This he was quite proud of, considering the shape he was in at the last extention.

He was about to call "Beginning penetration," when Approach Control called him.

"Coolstone from Approach Control. This is to advise you that this base is on official business only. If you land without orders, you will be violated."

But Coolstone didn't hear, for while he was attempting to roll out on the penetration heading, he noted his slave gyro had ceased turning. He increased his bank automatically, and checked the horizon. He was already over 45 degrees, but the compass wasn't budging.

Then, before his very eyes, it began rapid 360 gyrations. Quickly he checked the inverter light, and found it out, then the horizon flag, which was not showing. Then he noted his No. 2 needle, which was holding steady, although the compass card was rotating with the slave gyro.

"Er, ah, Approach Control Coolstone One here. I'm having a little trouble with my gyros. What channel is radar?"

"Coolstone One from Approach Control. Did you get the transmission about the violation?"

"Violation?" said Coolstone. "What violation? I need radar. My slave gyro is out."

"Roger, Coolstone. Operations advises that this base is for official business only, and even with orders you need prior approval for landing. You will be violated if you land here."

Coolstone had devoted every brain cell he could spare, three, to Approach Control, and the remaining millions were all busily engaged in a maximum effort trying to remember and apply the TACAN procedure to be used when the gyros were out.

"Roger, Approach Control. I need radar. Have started my penetration, but my gyros are out. What channel for radar?"

"Assume you understand the information on the violation, Tombstone. Radar is on 268.3. Over."

"Look, Approach Control, that's Coolstone One, not Tombstone. I'm going to radar now." He switched channels. "Radar, this is Coolstone One, somewhere in the penetration. I need a no gyro appraoch, but quick."

"Coolstone from Radar. I read you five square. How me?"

"Radar from Coolstone. Five by, but my gyros are out. Do you have me?"

"Coolstone from Radar. Squawk two. And this is to advise you that if you land at this base, you will be violated? Do you understand?"

"Roger, boy, I understand, but I need a gyro out approach. Do *you* understand?"

"Roger, Tombstone. Squawk three. The AO just called and said to tell you that you are directed to proceed to your alternate. You cannot land here. What are your intentions?"

"Look, Radar," said Coolstone, very deliberately and denunciating very clearly. "My compass is out. I don't know where I am in the penetration. Give me a steer and tell the AO that I'm not going to my alternate. I intend to land at your base if I don't have to bail out, and that's Tomb. . ., er Coolstone One. Have you got the message?"

"Roger, Tombstone. You intend to land here in spite of the violation, and your gyro's out."

"That's Coolstone, not Tombstone, and do you have me on your weapon?"

"Squawk two again for ID, Tomb. . .er, Coolstone, and turn right to 40 degrees. You have badly overshot the final turn. Do you wish a gyro-out approach?"

"Do I *ever?*" said Coolstone. "My gyro is out."

"Tomb. . ., er, Coolstone from Radar. Turn right now." And then, with his mike keyed, Controller added, "Roll out now. And the AO advises that there is no parking space, due to a big high-level conference involving lots of generals. Refueling will be delayed at least four hours. There is no BOQ space. What are your intentions?"

"Keep running this approach, Radar," Coolstone said, almost pleadingly. "I'm hurting. I understand the AO's message, that will be fine."

The gyro-out approach was continued to where the descent was to be started. At this point GCA had Coolstone on centerline, and called once again.

"Coolstone from GCA. The AO advises that you will not be able to take off from here until tomorrow. Start your radar descent now if you still want to land."

"That will be just fine," said Coolstone weakly, and added, "Starting descent now."

Coolstone broke out at about 400 feet with the windscreen full of rain which seemed to be freezing on contact. He finally picked up the runway lights and, looking out the side panels, he got a visual on the runway. It wasn't much of a visual, but enough to make a touchdown of sorts. He raised his flaps, gave a big sigh of relief, and tapped his brakes.

Immediately the bird did a little trick to the left.

Quickly Coolstone tromped on the right rudder.

The nose remained left, but the bird was skidding down the runway in the general direction of the runway heading.

Slowly, as he jabbed both the right brake and the right rudder, the nose began to come back. As far as braking action was concerned, he had nothing.

With about 4,000 feet to go, Coolstone in desperation stopcocked the engine, opened the canopy, and with full rudder deflections worked mightily to keep the bird any place on the runway. His braking action was just full of technique. He tapped them softly; the bird skidded and veered. He jammed them both on hard, and the bird skidded and veered. He pulled the stick back and tried it; the bird skidded and veered.

Then, as he entered the overrun, doing about 30 or 40 knots, he now began to get some deceleration on the slightly rougher surface. As the nose went off the overrun into the mud, he got the bird stopped.

Coolstone sat still for a second, quite thankful to be in a minimum number of pieces, then called GCA. He said, "I appreciate greatly all the information on the parking space, refueling delay, BOQ space, violations, the news item on the generals' conference, and the personal interest taken in my flight by the AO. But did anyone advise you today about the braking action on this runway? I'm off the end and need a tow."

"Negative, Coolstone. We have no information on braking action. However, this is a new runway, and you might expect it to be slick when wet."

"Roger, Radar. Tombstone One out."

GHOST WRITERS

IN DISGUISE

Ghost Writers is dedicated to bringing *your* anonymously shared experience, close call, war story, etc., to our readers. We encourage each of you — pilots, crew chiefs, specialists, everyone — to share your true learning experiences with us. We'll do the writing job for you. Just send a letter, a tape or make a phone call to **INTERCEPTOR Magazine/Ghost Writers, CINCAD/SED, Ent AFB, CO, 80912; GPA 692-3186, SAGE 530-3186.** You need not give your name and we guarantee *complete anonymity!*

TWAS A DARK NIGHT

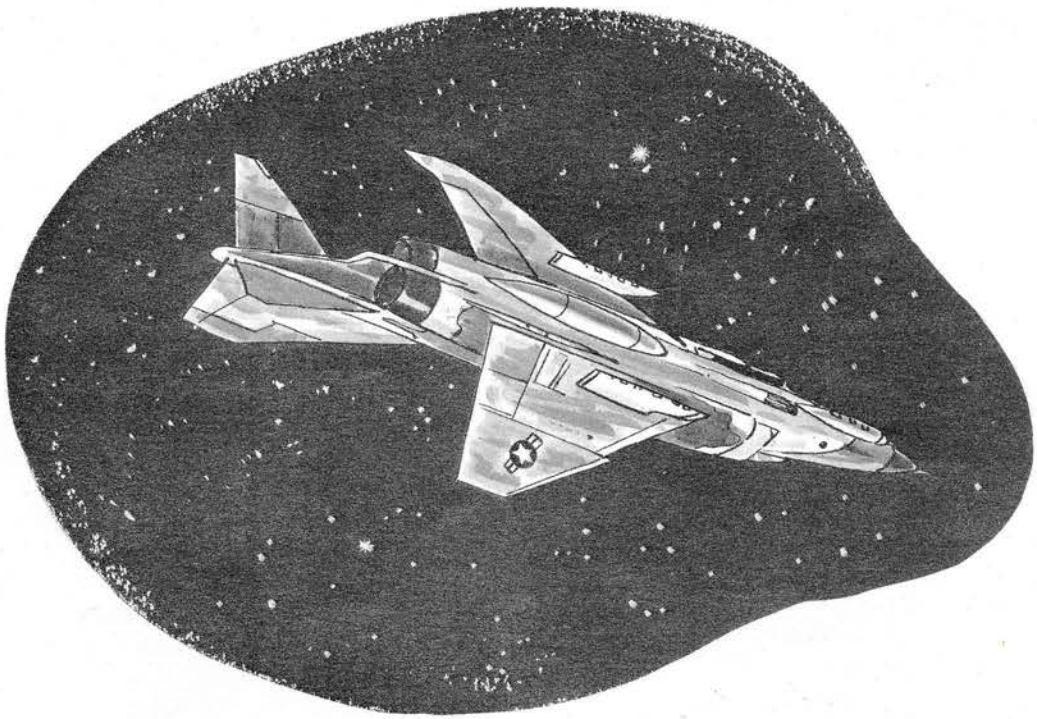
It was that kind of a flight! The bad day had begun when I spilled hot coffee in my lap during the briefing. I continued my Steve Canyon performance throughout the early evening by forgetting my checklist, mixing up the tail numbers of the aircraft, and dropping my flashlight (it smashed) during preflight. I then had several hours of relative normal-dom as we leaped into the black night, snuggled up to the tanker for gas and then dropped down on a low level radar route. Coming off the last target I began a climb back to altitude and was feeling pretty good. So good, in fact, that I lit the burners and started a little chandelle back toward home (I thought). It was a totally black night, no moon, with a thin cirrus layer at about 20,000 feet. I was so busy with my yank and bank asset-shining maneuver that I didn't notice the attitude indicators rolling over very slowly. About this time the GIB mentioned the instruments. I looked back into the cockpit, began to roll out (I thought) and unloaded the bird all at the same time. That finished me off! When I looked at the ADI and standby ADI they showed a 45° left bank. But I *felt* straight and level! I looked back outside and I saw stars and lights and stars and lights in all directions. *I* was the guy who chuckled during that "dumb" Spatial Disorientation lecture and thought the Barany chair was fun, but a waste of time. Back to the roller coaster! I focused back in the cockpit after deciding that looking outside was more harm than good. Attitude Indicator = level 45° left bank, VVI = 2500 FPM descent, Airspeed = 280 kts

increasing, Altitude = 17,000 feet decreasing. The seat of my pants told me different. Trust your instruments!! "Let's try needle, ball and airspeed." After a few hours (actually only seconds) of hard concentration on keeping the needle and ball centered, constant power setting and airspeed, the seat of my pants began to report straight and level. The GIB's voice also was back to its normal pitch and volume. "Engage the autopilot? Why not?" I tried it and the servos seemed to hold everything in pretty decent shape. Now, let's take stock. I'm at 15,000 feet, 300 KIAS and a heading of .... huh? The HSI shows 095°, no 105° no .... 115°. Damn thing's rotating! Check the standby .... it shows about 210°. What to believe? Look outside! It all looks the same. (If you've ever been in the skies over the Southeastern U.S. coast on a black night, all the little towns look alike.)

I finally decided that I had better get some help. We had been on a VFR flight plan so I needed to dig out the IFR Supp and get a Center freq. "Podunk Center, this is Goof-up 29." "Goof-up 29, this is Podunk Center, go ahead." "Rog, Podunk Center, I'm at 15,000 feet, VFR and experiencing compass and nav aid problems. Request radar vectors to Homeplate AFB." "Rog Goof-up 29, squawk 0246 for radar identification." "Goof-up 29, Rog." "Goof-up 29, Radar Contact, turn right to 245° for Homeplate." "Podunk Center, ah, negative. Can you give me gyro out vectors?" "Alright, Goof-up 29, turn right . . . Stop turn." "Goof-up 29, this is Podunk Center. Looking straight ahead you should see four small towns in kind of a line. The fourth one should have the Homeplate beacon on the far side. Let me know when you see the beacon and are ready to go over to approach." "Okay Podunk, this is 29, I've got the beacon in sight. I'll go over to approach now. Thanks a lot."

I was feeling very oriented now with the home drome under the nose and plenty of gas. I called in and requested a PAR to full stop, began my descent and ran the checklist. The full stop was uneventful and the ground never felt so good.

It's amazing how much more attention I pay to instruments, cross-checks between cockpits and standard maneuvers at night. That little bit of fooling around could easily have resulted in a chute trip home!



"Engage the autopilot?"

MAINTENANCE
ENGINEERING
HQ ADCOM

Bolts From The Blue

RESPONSIBILITIES?

It takes professionally dedicated airmen to prepare our aging force for flight and airmen of the same caliber to fly them. Every adjustment made, every bolt installed, every solder joint completed must be done as if a life depended upon its being done correctly. Someone else's life could very well depend upon your integrity.

The pilot does his part in meeting takeoff times by arriving at the airplane in sufficient time to review the forms, make his walkaround, strap in, start, and complete the prior-to-taxi checks thoroughly and critically. It is at this time that the hours of maintenance preparation, the conscientiousness of dozens of people, and the Ops briefing that "safety is paramount" are often negated.

"Red ball" is the term denoting the dispatching of technicians to an operating aircraft. The pilot has discovered a discrepancy after engine start and needs someone to evaluate the problem and repair it if necessary. There is nothing inherently wrong with the procedure, but there is a tendency on the part of technicians and pilots alike to lower their standards and accept minor discrepancies and, worse yet, unknown conditions in an attempt to meet the takeoff time and save the mission. If the discrepancy is determined to be minor or a successful "quick fix" is performed, an entry is often never made in the AFTO 781. By this neglect, historical data is lost and trends are not discovered.

A recent aircraft accident, in another command, was caused when the engine came apart in flight. The investigation revealed that three different aircrews on the three flights preceding the accident flew the airplane after experiencing engine roughness, rumble, and vibration on the ground. These pilots accepted the aircraft for flight after engine technicians dispatched on a red-ball told them that the engine was a "known rumbler" and was within limits. No AFTO 781 entry was made by any of the pilots or technicians and the history that led to accident was discovered only by the accident board.

There is nothing wrong with red ball procedures, however, the quality of maintenance must never be sacrificed and our standards must never be lowered. The composition of standby specialists, where they are located, who they work for and what they do is not uniform throughout ADCOM. We hasten to point out that standardization may not be desirable and certainly is not our aim at present. We are concerned that the most competent trouble-shooters in each technical disciplinary area make the decision to release the discrepant bird after a "quick fix" has been made. A fuse may restore an electrical circuit to temporary serviceability, but what caused the fuse to blow? Bleeding the starter may give a successful start, but if it had been bled on preflight, would it be necessary to do so at the last minute. Or do we have a fuel leak that needs to be corrected. After a "quick fix" has been made and the bird is in the air, what follow-up action is taken? Has Job Control been informed of actions taken? Have all the shop chiefs been informed? Will the Chief of Maintenance also re-

view the actions? Will this be a learning experience enabling all managers, including quality control, to avoid repeated last minute discrepancies? Last minute adjustments, if made by competent technicians, avoid aborts and increase scheduling effectiveness, but we must not do so at the expense of safety. The pressure must not be so great to get the bird in the air that decisions are made without considering all the consequences.

Once the airplane is airborne, integrity passes to a new arena, the cockpit and the pilot. His responsibilities are multiple. He must accomplish his mission. He must make a fair appraisal of the air worthiness of his aircraft so that it can be flown again safely or discrepant systems repaired prior to release for subsequent flights. This appraisal must be recorded in the proper aircraft forms and discussed thoroughly during debriefing, making certain the technicians at debriefing understand exactly what was discovered. Reconsider now before you leave debriefing, did you really report everything observed. How about that little engine rumble, that momentary vibration, that flickering warning light; that gear which required recycling; that radar that broke lock-on, had a weak pick-up, range gate drift or incorrect scope display; that hydraulic pressure off 500 pounds, and that unusual odor in the cockpit? Do not neglect to report even one which seems insignificant to you. Discuss it with the debriefer and do not backdown if you do not get a satisfactory answer. It may save the next pilot some grief and/or save an aircraft. In some instances, it may pay big dividends to visit the maintenance shop concerned and talk to the experts. In any case, do not pass on to the next fellow an unknown or uncorrected deficiency. So far, the ADCOM record is a good one. Let's keep it that way.

JAMES S. MEADOR, Col, USAF
Director Maintenance Engineering

check points

Electrical failure pattern. If you fly an electrical failure pattern, the pattern should alert the responsible people to your problem. It may not however, so keep heads up. Let me tell you what happened to me. I was radio out with electrical failure and when I returned to base, just like the book said, I dropped to 500 feet on initial, overflew RSU and pulled up into a closed downwind at the end of the runway. It was my chance to play hero and I was making the most of it! You can imagine my surprise when I suddenly found an aircraft pitching into me on the downwind. Not wishing to compound the emergency with structural damage, I broke out. This was not the most comfortable thing as I was sweating fuel, too. I made a repeat pass, rocking my wings violently, which cleared the pattern, and I proceded to land. What happened to the first attempt? RSU mistook me for a tower-controlled GCA low approach, and tower mistook me for a RSU controlled straight-in low approach! (ATC/SED)

Dig a little deeper? Accident investigation boards occasionally lose sight of the purpose of accident investigation as stated in AFM 127-2, "USAF Accident/Incident Reporting," which is to determine corrective action to prevent a similar occurrence. They focus their effort instead on determining cause factors and findings and then develop poor board recommendations as an afterthought. The results are recommendations that have limited application, are too general to apply, or do not address the identified deficiencies.

Board members should continue their investigation to root causes or to the point where recommendations become fairly obvious. The "whys" should be traced back as in this example:

Why did the aircraft crash?
Why was there a fuel leak?
Why did the o-ring fail?
Why was it improperly installed?
Why were the proper tools not available?

The investigator must think in terms of meaningful recommendations while causes are being determined. Considerable manpower and resources are expended in reviewing and implementing corrective action based on accident board recommendations. Commanders should, therefore, consider whether the direction they provide for their accident boards insures that investigative efforts are continued through the development of corrective action and that these actions are:

Consistent with the findings and causes of the accident.

Feasible and valid.

Specific in stating the desired results.

Complete in terms of addressing long term as well as short term requirements. (TIG Brief/SED)

Weapons can fly. Antihijacking checks at Military Airlift Command (MAC) aerial ports often produce "weapons" which people want to take on board aircraft. The same is true at commercial airports. Military Airlift Command headquarters terminal service officials say that most of the "weapons" are sports items or souvenirs. Preboarding checks reveal blowguns, archery gear, Kung-Fu sticks and stars, walking sticks with concealed swords, and icepicks. Among the more common items found are letter openers, knives and scissors. Because these things can be dangerous, they can't be carried on board. The best thing a person can do before going on any flight is to check with the transportation people at their duty station. They know what is legal and can save one embarrassment at check-in-time. Most sports items and souvenirs can be packed in a suitcase and ride as checked baggage. (TIG Breif/SED)

Tailwind touchdown. The aircraft was flying a PAR approach in a thunderstorm infested area with gusty crosswinds that were barely within limits for the aircraft. Approach Control directed the pilot to execute a missed approach for traffic spacing. The pilot complied. Trying to beat the thunderstorm, only a mile away, the pilot entered a VFR downwind. On final approach, a gusty tail-wind estimated at 65 knots, hit the aircraft, causing it to land well short of the runway. There were no injuries, but the aircraft was badly damaged.

The weather briefer, prior to the training flight, had warned the pilot of the thunderstorm activity and had forecast gusty winds above the design limits of the aircraft. But the pilot phoned the destination weather station to get the "real" weather conditions. The destination weather station forecast thunderstorms, but expected them after the pilot's estimated arrival time. Enroute, the pilot neglected to update his weather briefings except for receiving sketchy weather reports offered by air traffic control agencies.

Just five minutes prior to landing, the pilot was advised of severe weather at another airport, three miles west of the base. Winds were reported gusting to 45 knots. The pilot continued his approach and pranged.

This pilot learned the hard way that one can't bargain for better weather conditions, and gambling against the odds offered by severe weather forecasts can result in heavy losses. (MAC/SED)

We've had it! The IP in the lead aircraft "sort of" came on the stick with his student as they rolled out of a poorly flown echelon turn. As the IP discussed techniques for leading good echelon turns, the student rolled into a smooth descending right turn using about 60° of bank. After watching the airspeed increase for several seconds, the IP suggested that his student cross-check his airspeed/MACH and begin a smooth pullout. With no response, he suggested it again at which time his student said, "Huh?" The ever-courageous and ever-alert IP quickly analyzed the situation and took the proper action. He retarded power and began to pull out while silently congratulating the solo on the wing for his determination to hang on. It seems that neither man had had control since they rolled out from the echelon turn — the aircraft was doing its own thing! Apparently, the student assumed the IP had control after feeling him on the stick, even though the IP never said anything to that effect. And the IP assumed the student still had control since nothing had been said about taking the aircraft. In his mind, he was just following through on the controls because of a poorly flown maneuver. In any event, NEVER release the stick until:

(1) The other man has the stick in his hand, and

(2) There is verbal confirmation of the transfer of control. (ATC/SED)

OPERATIONAL READINESS INSPECTION TEAM

HQ, ADCOM

Read.

WHAT'S IN A NAME

Are all inspection names familiar to you as a member of NORAD/ADCOM? Should you be familiar with them? If you are a commander, member of a NORAD/ADCOM staff, a paper pusher or wrench turner in the command, you may have a need to know about some (or all) of these inspections or evaluations. At some time during your tour, you may be subject to one or more of them as part of the checks and balances to see how well we do our job.

Whether we like to or not, we have all come to accept the inspection system (to one degree or another). One of the things we should understand is what these inspections are and to whom they apply. So, let's review the current philosophy and concept of our inspection system — what each inspection is (by definition) and to whom it applies.

The inspection system is designed to provide the Secretary of the Air Force and all commanders: a capability to maintain surveillance over the readiness of forces; a method to measure the effectiveness and efficiency of management systems; a management technique to identify, assess and resolve significant problems and recognize exceptional managers and management practices; an evaluation of the adequacy of safety and health programs; and last but not least, factual information on which to base action if a management system is not achieving maximum effectiveness.

The concept is that inspection is an inherent responsibility of command and a proven management tool. Inspections must be factual and objective. They must identify existing problems, determine the causes of significant problems on mission accomplishment, recommend corrective action wherever possible, identify exceptionally innovative and effective personnel and management techniques or procedures, provide clear and concise reports, and evaluate adequacy of corrective actions.

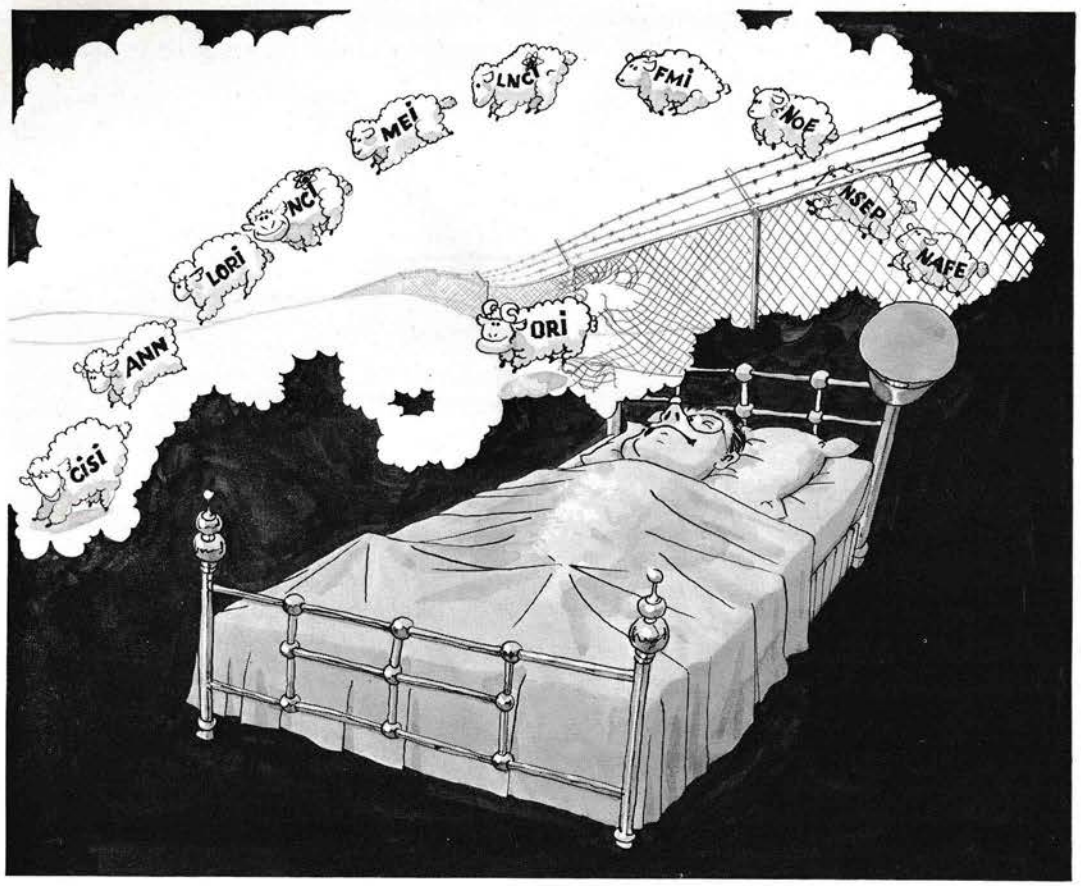
So much for the philosophy and concept. Now, to whom do inspections apply? In very basic terms they apply to each of us and are a supervisory responsibility of commanders, senior officers, and NCOs. Does this mean the Air National Guard and other reserve forces, too? You bet it does!

Next, let us look at what each of these inspections encompass by definition:

An **Annual/USP & FO Inspection (ANN)** is required by public law, must be conducted at least once each calendar year, and is required to assist the National Guard Bureau in determining whether or not Air National Guard units are meeting minimum Federal recognition requirements. It may be (and normally is) conducted in conjunction with other inspections. This inspection will insure that: the amount and condition of ANG property are satisfactory; ANG units are organized according to appropriate documents; members are meeting prescribed physical and other qualifications; units are properly uniformed, armed and equipped and are being trained and instructed for active duty; unit records are being properly kept; and funds and property are properly accounted for. All Air National Guard units are subject to this inspection.

A **Command Inspection System Inspection (CISI)** is conducted by the Headquarters USAF Inspector General to evaluate the capability and effectiveness of command inspections systems. These are the so-called "over-the-shoulder inspections" and apply to NORAD/ADCOM inspectors.

The **Functional Management Inspection (FMI)** evaluates programs, functions and activities (except medical) on a command-wide basis, and assesses their effectiveness in supporting the mission. This inspection applies to all ADCOM units and echelons of command.



The inspection with the widest application throughout the command is the **Management Effectiveness Inspection (MEI).** These inspections evaluate the management of assigned resources and assess the ability of the unit (except medical) to successfully perform its assigned mission. All units of the command are subject to this inspection.

The **Nuclear Capability Inspection (NCI)** is an inspection to determine the capability of a unit to accomplish its nuclear mission. This inspection applies to all nuclear units.

The **Limited Nuclear Capability Inspection (LNCI)** is an inspection that does not encompass all aspects of a nuclear capability inspection, but evaluates specific phases of a unit's capability to accomplish its nuclear mission. This inspection applies to all nuclear-capable units.

The **Operational Readiness Inspection (ORI)** is an inspection designed to measure a combat, or combat support, unit's performance and capability to accomplish its assigned mission under simulated combat conditions. All operational organizations of the command are subject to this inspection.

The **Limited Operational Readiness Inspection (LORI)** is an inspection which does not encompass all aspects of an operational readiness inspection but evaluates specific phases of a unit's capability to accomplish its assigned mission. All operational organizations of the command are subject to this inspection.

An **Alert Force Capability Test (AFCT)** is designed to test alert forces on their capability to perform the alert mission. It may encompass the peacetime air sovereignty mission, rules of engagement procedures or simulated combat conditions on a limited basis. This inspection applies to all ADCOM operational units maintaining day-to-day alert commitments. In the near future, this inspection will become a NORAD evaluation of all forces (except Canada which has its own system) committed to the alert mission and be renamed a **NORAD Alert Force Evaluation (NAFE).**

A NORAD **OPERATIONAL EVALUATION (NOE)** is an evaluation of NORAD command and control agencies as well as all of its operational assets to accomplish its assigned mission under simulated combat conditions. ALL NORAD units and some ADCOM supporting units are subject to this inspection.

And, a **NORAD Supplement Evaluation Program (NSEP)** is a limited evaluation of NORAD command and control agencies and to a lesser degree operational assets under its control to accomplish its assigned missions(s) under peacetime conditions through simulated combat conditions. ALL NORAD units and some ADCOM supporting units are subject to this inspection.

WOW! Inspections, evaluations, inspections, evaluations and they seem never ending. Remember, however, the reasons stated earlier for inspections and evaluations and I believe you, too, will agree that they are necessary in peacetime if we are to feel confident of our ability to do our job under combat conditions — which is what we are all being trained for.

Oh, by the way, in case you are curious as to ratings given in these inspections and evaluations and their meanings, here they are:

OUTSTANDING: Use of leadership, initiative, imagination and ingenuity is evident. Procedures in effect are of exceptional merit. Few units equal or excel this function in effictive management. Virtually significant error-free operation. No significant repeat deficiencies noted.

EXCELLENT: Activity is effectively and efficiently managing assigned resources. Significant improvement noted since last inspection. Definitely superior to satisfactory but cannot yet be classified as outstanding. No significant repeat deficiencies noted.

SATISFACTORY: Function is meeting mission requirements as identified in pertinent directives, regulations, and common sense, good management procedures. Relatively free from significant deficiencies.

MARGINAL: Activity is meeting the minimum mission requirements; however, low productivity, loose management, and avoidable significant deficiencies are common.

UNSATISFACTORY: Function is failing to fulfill basic mission requirements or meet minimum performance standards. Poor leadership and management; unsafe, unorganized, or undisciplined practices; and noncompliance with intent and guidance of directives are general.

NOTE: Overall operational inspections/evaluations are rated either SATISFACTORY or UNSATISFACTORY. However, ratings other than these, such as functions, areas, events, exercises, and examination results may receive any of the five adjectival ratings.
Where does your unit fit?

KENNETH W. OHLINGER, Colonel, USAF
Director of Inspections

TYPE OF INSPECTION/EVALUATION

Unit	ANN	CISI	FMI	MEI	NCI	LNCI	ORI	LORI	AFCT	NOE	NSEP
ADCOM		X	X								
NORAD Region										X	X
Air Division			X	X							
Region/Division Control Center							X	X	X[3]	X	X
ADWC			X	X	X[1]	X[1]				X	
FIW/FIG (ANG)	X		X	X	X[1]	X[1]	X[2]	X[2]	X[3]	X	
Support Wing			X	X							
Squadron			X	X	X[1]	X[1]	X[2]	X[2]	X[3]	X	
Detachment			X	X					X[3]	X	

Notes: 1. Nuclear capable units only. 2. Operational units only. 3. Alert mission units only.

THE WAY THE BALL Bounces

ON TOP OF THE HEAP

MO	ADC	MO	ANG	MO	ANG
57	318 FIS McChord	99	158 DSEG Burlington	35	119 FIG Hector
43	84 FIS Castle	76	141 FIG Spokane	33	101 FIG Bangor
37	57 FIS Keflavik	55	144 FIG Fresno	31	107 FIG Niagara Falls
31	552 AEWC McClellan	38	142 FIG Portland	26	125 FIG Jacksonville

ACCIDENT FREE

ACCIDENT RATE

	ADC	ANG
1 Jan - 29 Feb 76	0.0	9.6

CUMULATIVE RATE

	ADC	ANG
JET	0	0
CONV	0	0

BOX SCORE

ACCIDENTS FOR FEB / CUM TOTAL

RATE = MAJOR ACCIDENTS PER 100,000 FLYING HOURS

ALL RATES ESTIMATED

MINOR ACCIDENTS THIS PERIOD — 0

MINOR ACCIDENTS CUMULATIVE — 0

			20 AD	21 AD	23 AD	24 AD	25 AD	26 AD	ADWC	AFI	46	ANG
F-101	0	0										
F-106	0	0										
F-4	0											
T-33	0	64.1										1 / 1
T-37	0											
B-57	0	0										
EC-121	0											
OTHER	0	0										

The "I Can Hack It" Syndrome

by Major Brian C. Bernet, CF

There are on record many accidents of which the exact cause is not known with certainty. Accident boards, to the best of their ability, come up with the most probable cause. Unfortunately, the most baffling accidents are those in which the pilot cannot tell us what his mistake was and what lesson he might have learned in those last few seconds.

Some examples of this type of accident situation are where the aircraft impacted the top of a ridge during a low-level mission that was to be flown VFR through an area of snow showers; or where a pilot attemptimg a landing during a very heavy rainshower lost control of his aircraft; or where the pilot was trying to put those few extra rounds into the target on a ground attack mission, but didn't quite make the pullout.

In this type of situation, there is every possibility that one of the first thoughts in the pilot's mind was "I can hack it, I know I can." It is only natural that pride in doing a job well and the desire to succeed will cause a pilot to try and perform at the limit of his capabilities. The pressure of the "boss" may also get into the act. The result is that once in a while the pilot exceeds the limits of himself and his airplane with great finality.

Rules and regulations help to keep us on the straight and narrow, but every now and then we are called upon to use our judgement. The problem is to recognize when we should shake loose that predetermined plan and goal and take the safer way out.

Every pilot should take time to reflect and make a mature judgement of his capabilities and respect the limitations that he recognizes. Perhaps, now that spring is coming, it is a good time for the squadron jocks and those that fly LGDs (large grey desks) most of the time, to make a personal reassessment of what their capabilities are in the worst situations that they could be forced into. Don't say, "I can hack it" unless you are sure you can.

Reprint from USAF Study Kit, December 1975

The Wrong Kind of Day

It was not a good day to die. A person's last sight should be of blue sky and sunlight, but on this day fog shrouded the eye and heart with a damp grey curtain.

And it was Monday, Stan Johns, ADJ1, said goodbye to his wife and daughter, and drew his head down against the fur of his foul weather jacket as he stepped into the morning darkness. He scraped the ice from his car windows, then fired up the reluctant motor and drove carefully to the shop where he worked.

The trip through the base had chilled him, and it was pleasant to step into the warmth of the shop — even though it was the beginning of another long week. Inside, the day had begun hours before, and the maintenance chief sat at his desk sipping a cup of coffee and studying a handful of work orders.

At 0755 the chief handed one of the work orders to Johns who studied it for a moment before pulling his tool kit off the rack. Petty Officer Reed stepped up and nodded as Johns checked his tools, then together they walked out to the truck and started toward the line.

Johns had been doctoring fighter aircraft for more than 7 years, and this was his third winter of work onF-4s. It would be a simple matter for him to check the center rudder bolt for correct installation, as the work order required him to do; then they could move back into warmth and perhaps tackle a job in the hangar. But if the bolt were indeed upside down, as it was thought to be, he could forget the thoughts of comfort for awhile.

It was familiarity with the field that got them to the guard gate and around the twisting taxiway to the correct aircraft shelter without getting lost in the heavy fog. Even the numbers were hard to read from the truck.

Johns parked the vehicle, and while Reed placed chocks at its left rear wheel, he walked to the aircraft and climbed the ladder up to the vari-ramp and top of the intake ducts. He could see that there was no maintenance stand in the shelter.

The nearest one could be several hundred yards away, and it would take 15 minutes to locate and move it just to accomplish a 30-second check. Besides, even if a stand were parked beside the shelter, there was no way to move it past the wingtip to the tail of the bird. They would have to tow the aircraft out, causing another 20-minute delay and involving several men of a towing team. And if the bolt were correctly installed, that time would be wasted.

For only a moment Johns weighed the involvement, trouble, and cold against the hazards of walking the backbone of the aircraft to the drag chute compartment where he could find footing long enough to make his check. Then he stepped onto the top of the fuselage and "did his thing" in the way that was common to him and many others he had worked with.

He held tightly onto the vertical stabilator and stepped carefully along the ledge at its base. The rudder stood angled to the right. By gripping its trailing edge, Johns was able to swing himself into a crouching position on the drag chute compartment, and facing partly forward 12 feet above the concrete floor, he was level and able to see the rudder hinge.

Petty Officer Reed had placed the chocks against the truck tire, picked up the tool kit, and started toward the rear of the aircraft. As he rounded the left wingtip he heard a surprised exclamation from Johns, and looking up, saw him awkwardly out of balance, standing on the drag chute compartment with one foot, while the other foot slipped into space.

Then he watched aghast as Johns, with his memories and hopes and 7 years of maintenance experience, tumbled backwards from the plane and landed headfirst with a sickening thud onto the cement.

Stan Johns received the best of care. But 57 hours later he died from a skull fracture and irreversible brain injuries.

A needless loss? Most are. Could adherence to safety procedures have prevented it? Yes, unless one is a firm believer in fate. But maintenance personnel and aircrews have been climbing all over aircraft for years to perform simple, fast inspections and repairs. John's approach, though it was wrong, was a common approach. His hurry to get the job done, and his willingness to ignore safety procedures in order to do the job fast, led to the tragedy.

But this accident cannot be placed in the files so simply. Johns was doing his job the way he thought it had to be done under his peculiar set of circumstances. Where compliance with tech orders entails what seems to be unwarranted inconveniences, delays, and expenditure of effort, men will find an easier, and perhaps deadlier, way. And where supervisors cannot make the job simpler to perform, they must be even more forceful in achieving compliance with the rules.

It was cold, dark and foggy when Stan Johns fell. But then, there is no *good* day for that kind of death.

Adapted from Weekly Summary of Major Aircraft Accidents, US Naval Safety Center

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Winter is nearly over and the coming of spring announces the time for some people to come out of hibernation. If you have been a bit lax on your physical conditioning program during the snowy months, don't start out full speed. Work gradually into shape so the new you can fully enjoy a fun summer.

Julie

8 APR 1976

Q.C. REAL

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PHOTO BY RICHARD THOMAS