Interceptor

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FOR THE MEN RESPONSIBLE FOR AEROSPACE DEFENSE

Interceptor

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spotlight

The safety of people shall be the highest law. Cicero

departments

special features

Aerospace Defense Command
Lt Gen Arthur C. Agan
Commander

Published by the Chief of Safety
Col H. C. Gibson

Editor
Maj Edward G. Cleary, Jr.

Research Editor
Maj Richard P. Coulter

Engineering Editor
Maj Philip A. Tague, III

Editorial Assistant
Mary W. Conover

Art Director
Craig T. Schafer

Illustrator
MSgt Kenneth L. Gray

Hq ADC Field Printing Plant
Ent AFB, Colorado

OUR COVER

Mr. Craig Schafer's portrayal of one of our current interceptors of the 319th FIS — the Lockheed F-104A — the missile with a man in it.

memo
from the CHIEF OF SAFETY

LIKE A BABY RATTLESNAKE

This month the Flight Surgeon talks about hypoxia and complacency. Recent incident experiences in the Command point up the awful truth of the matter. Let's face it – how long since *you* have personally, thoroughly checked your own equipment? You live with it every day until it becomes almost second nature and as comfortable as an old pair of hunting boots. The personal equipment that you wear and use daily can become your most insidious enemy. Simply, it wears out, and while this equipment is wearing, it becomes more and more comfortable to use – familiarity also breeds a false confidence which allows us to become complacent. An old familiar gun may be more comfortable to handle in the field but can become extremely dangerous in the wearing out of *its* safety parts and the "wearing out" of its owner's safe handling practices. The cockpit checklist. Who needs it? We know it like we know the back of our hand, like an old pair of shoes. And like an old gun or like a "cute little baby" rattlesnake, if you allow through complacency, it can kill you so insidiously quick. I've been personally involved in a formation or in a two-place aircraft in at least five different instances where pilots have experienced O_2 problems ranging from "inconvenient" to fatal – how about you, and who's next?

COL H. C. GIBSON

HOT LINE

RADAR MONITORING OF FUNCTIONAL FLIGHT CHECKS

AFM 60-16/ADC Sup 1, 17 Jul 67, is amended as follows: Commanders of flying organizations will implement procedures to insure radar monitoring of functional check flights by an air defense control facility (ADCF) or air traffic control facility if radar is available. (Functional check flights under the provisions of paragraph 5e(2), T.O. 1-1-300 are not authorized in this command except as allowed by paragraph 7-8, ADC Sup 1/AFM 66-1, 5 July 1968.)

a. Functional check flight (FCF) pilots will coordinate the proposed flight itinerary, through the combat alert center (CAC), with the appropriate air traffic control and ADCFs to insure that an understanding exists with respect to the requirement for radar monitoring.

b. If no immediate assistance will be available to an FCF pilot from 5-minute alert aircraft or airborne training missions, there must be a standby aircraft and crew available to meet 5-minute scramble criteria.

c. Should a malfunction of an aircraft system create a condition wherein an escort could be of real or potential assistance, the FCF pilot will immediately request a chase aircraft.

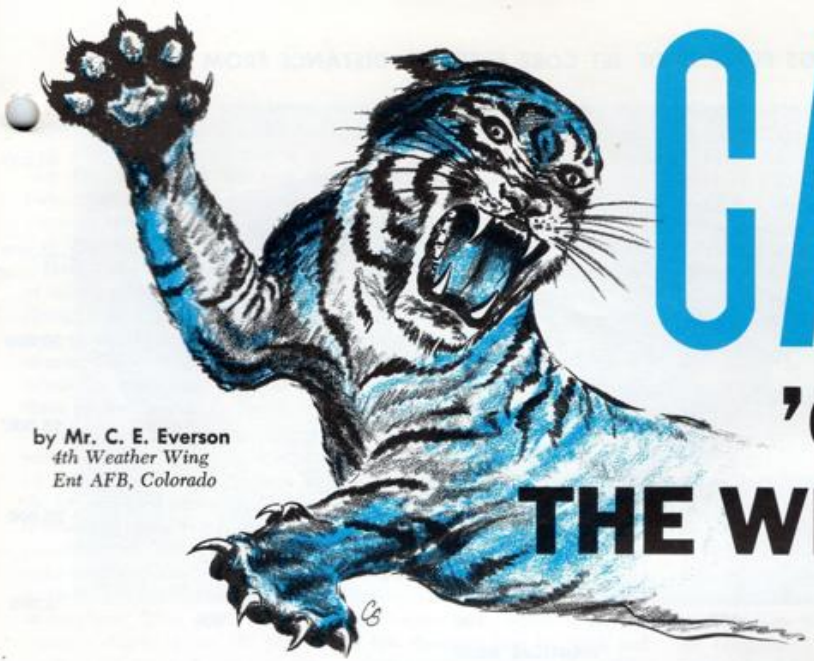
TECH ORDER 14D1-2-1, PERSONNEL PARACHUTES

A completely new tech order governing personnel parachutes and related procedures was issued 15 April 1968 and distributed during July 1968. The new T.O. resulted from a conference held at Wright-Patterson AFB during February 1967. The conferees consisted of parachuting genii from all USAF Major Air Commands. Procedures have been revised or, in some cases, deleted to make the publication a streamlined reference for all concerned. Life support continuation training instructors are urged to assure they have this new publication, so that training outlines can be updated and all aircrews can be given the latest parachuting training as required by the appropriate attachment to ADCR 501-5.

GROUND CHECKED OK

There is nothing more discouraging to a pilot than to walk out to an airplane and find a write-up in the 781 signed off as "Ground checked OK" or "Malfunction could not be duplicated." You just know it's going to happen again. Before you blow your stack, have a second look at the write-up. It may contain just enough information to mislead the trouble shooters. Stuff like, "Tacan unreliable," "Radio out," "Engine sounds funny," and "Flight controls erratic," doesn't give maintenance a clue where to start or finish. But if that's the way it reads and is signed off OK, what follows may depend on how seriously the next pilot checks the "hoss" out. If it snorts wrong, the average jock will probably bring it back in. But there are some hotshots who will fly anything and eventually end up planting an aluminum flowerpot in some cornfield. Somehow it doesn't seem worth it.

Another twist to the pencil fix is the write-up which causes disagreement between the aircrew and the maintenance types as to whether or not a malfunction actually exists. A classic example of this is the case where a pilot aborted because he experienced an intermittent resistance during the flight control check. A specialist arrived on the scene and proceeded to demonstrate that there wasn't anything wrong. Although he was beginning to look like a candidate for the funny farm, the pilot insisted that three possible problem areas be examined before he took the aircraft. The first area he recommended produced a screwdriver which must have appeared six feet long. It was in the control stick well. Sometimes there's nothing like perseverance and knowing the machine like the back of your hand.



CAT 'O THE WINDS

by **Mr. C. E. Everson**
4th Weather Wing
Ent AFB, Colorado

The sun treks southward; the polar regions cool quickly and a cold air mass builds up and begins to move. The polar front at the leading edge moves into the States and marks the debut of the cold season.

High above and trailing the polar front is a band of intense winds which has become popularly known as the Jet Stream, or more specifically in this case the Polar Front Jet (PFJ). Farther south over the Gulf and southeastern states is another band of intense winds. This band is not associated with a frontal system and it is higher in altitude than the Polar Front Jet. It is known as the Subtropical Jet (STJ) or occasionally called the Southern Jet.

The Polar Front Jet is typically found at about 30,000 feet, sometimes lower, and sometimes higher. The Subtropical Jet is generally in the vicinity of 35 to 40,000 feet, and sometimes higher.

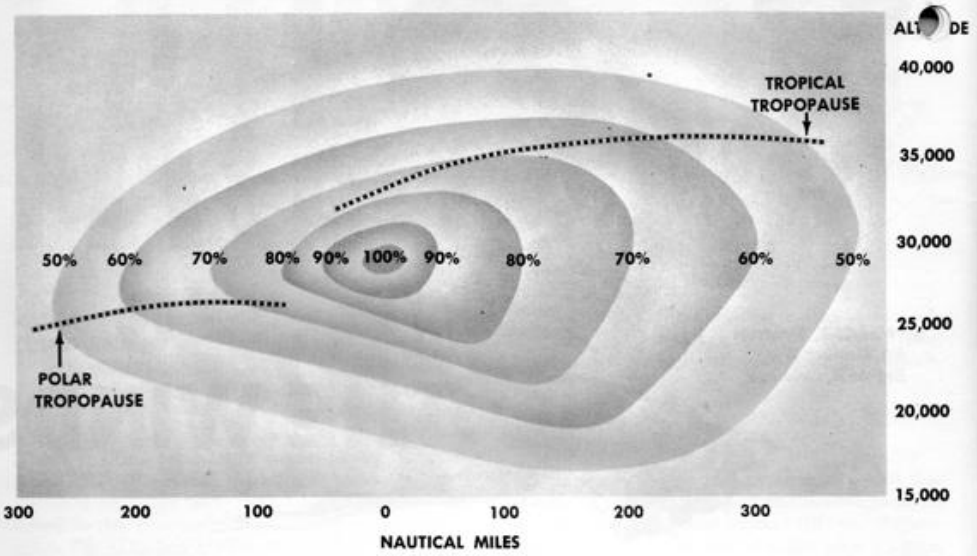
As the Polar Front Jet moves southward its altitude tends to increase. And it may merge with an existing Subtropical Jet or it may become a Subtropical Jet after the associated polar front has run its course.

But the polar front is not a one time thing. One polar front follows another at intervals of a few days or so, and more than one may exist at the same time. Likewise, one Polar Front Jet follows another and two or more may exist simultaneously. There is hardly a day in the colder months without at least one jet stream and often two or more meandering over the United States.

The existence of Jet Streams at operational altitudes means that their consideration in flight planning is essential. With wind speeds often in the 100 to 200 knot range and occasionally between 200 and 300 knots, it makes a big difference whether they're with you or against you.

And an added feature of Jet Streams is turbulence. It is called Clear Air Turbulence (CAT), but is not restricted to cloud-free air. It occurs in cirrus cloud and haze layers as well and visual warnings are the same as in clear air—there are none. Now, not all CAT is associated with Jet Streams, but the most likely location of CAT, and especially the more severe cases is considered to be with Jet Stream situations.

CAT differs from the convective turbulence such as found in thunderstorms and the so-called mechanical turbulence near the surface in that it is of a more rhythmic nature rather than random. It is somewhat analogous to riding a speed boat over choppy waters or driving a vehicle over cobblestones. In fact, it is often called Chop because of this characteristic. But



whether CAT or Chop, it can take on all degrees of intensity from light to moderate to severe and can even cause structural damage. And although not common, the gust frequencies in the turbulence can be in resonance with the oscillation frequencies of an aircraft wing, and as with the little dog running across the bridge — the oscillations grow and grow. So it is additionally important to consider Jet Streams in flight planning from the turbulence aspect as well as wind speed and direction. But in order to make Jet Stream consideration more meaningful and more useful, let's review some of its characteristics.

The maximum winds in a jet stream extend but a few miles across and a few hundred feet in depth and this is called the core of the jet. Generally, the speeds decrease more rapidly on the poleward side (or on your left with a tailwind since jets are not always oriented from west to east) than on the tropical side (or to your right with a tailwind). Also they decrease a little more rapidly with height above the core than below it. The accompanying figure relates wind speed with distance from the core in terms of percentage of speed in the core. For example, a 200 knot maximum in the jet core would drop off to about 140 knots (70%) at 125 nautical mile to the north and 200 south of the core. Fifty percent of the maximum is found on the average approximately 250 nautical miles on the polar side compared to 400 on the tropical side.

This can be useful in various ways. For example, if you are roughly 250 nautical miles north or 400 south of the jet and get a reading on your wind, then by doubling that, you get an estimate of the maximum wind in the jet stream. Or if you are flying against the jet, then by going north (or to your right) you'll find weaker winds in the shortest distance.

Sometimes the wind speed change can be very large on approaching a jet stream from the side, and especially from the polar side. This will be noticeable in a rapid drift change which may be as much as 15 or 20 degrees in one hundred miles or less which would indicate your approach to a very strong jet.

Although wind speeds decrease above and below and on either side of the jet core, the wind direction usually does not vary more than a few degrees. This means that the wind component normal to the jet is relatively small on the average. But sometimes a jet stream will curve rather sharply as happens occasionally in the southwest part of the U. S. The jet may be from the north or northeast and curve sharply and become southerly or south-westerly a short distance

the east. So an east or west bound flight would experience a 180 degree shift in wind direction in a very short time. But this sort of thing shows up well on weather maps so you'll be aware of it before departure.

Static Air Temperature can be of considerable value in Jet Stream flying. Pilots have used temperature as an aid in locating the jet stream, either to get into the jet winds on eastbound or to avoid them on westbound.

The biggest temperature change with distance is usually on the polar side of a jet stream (except at the jet core level where the change is small on either side). So if approaching for example from the polar side and the temperature is increasing, you are in the polar stratosphere. Then, when the temperature change levels off, you've reached the tropical side and the vertical axis of the maximum winds. So, if below the tropopause, seek out the warm side, and if above the tropopause, find the cold (tropical stratosphere) side to get into the maximum winds.

Large and rapid temperature change appears to be a significant feature around the periphery of CAT and especially of moderate to severe intensities. Changes of 3 to 10° C in just a few minutes preceding encounters with CAT are not unusual and an average has been estimated at between 4 and 6° C for moderate or greater CAT. These changes may be either drops or rises in temperature. For example, in one case a drop of 10° C (-45 to -55° C) was experienced, whereas in another case the temperature increased 7° C in two minutes just before hitting turbulence.

One investigation found that a rate of change of at least 0.7° C per minute (at about mach 0.8) until a total change of 3.5° C occurred in 5 minutes or less indicated that moderate or greater turbulence could be expected in 1½ to 2 minutes. Turbulence was encountered in a majority of cases when these temperature criteria were met. On the other hand, some turbulence encounters were experienced without these criteria being met. And in another investigation, there was a case of an abrupt drop of 12° C without experiencing turbulence. But evidence is in favor of large, rapid temperature change, either plus or minus, preceding the first bump or two. This tends to be followed by a return to normal temperature upon leaving the turbulent zone.

Cloudiness of the cirrus type is frequently associated with jet streams. It is found most often on the tropical side, where it may be a few thousand feet in depth and cover an extensive area. Clear skies and excellent visibility are typical of the polar side of the Polar Front Jet. And clear skies on both sides are often found in the trough zone, that is, where looking downwind the direction of the wind changes from northwesterly to westerly and southwesterly.

Cirrus associated with the Polar Front Jet usually tops out at about the jet core level. But with the subtropical jet, the cirrus tops average about 4000 feet below the height of the jet core.

Moderate to severe turbulence may be encountered in Jet Stream cirrus, and especially in the dense part of an overcast. A deep layer with a sharp well-defined edge may provide sudden encounter with moderate or greater turbulence rather than a gradual increase in intensity.

Turbulence is more likely to be encountered in the upper two-thirds of cirrus associated with the Polar Front Jet. But with the Subtropical Jet the lower two-thirds of the cirrus deck favors turbulence.

Clear Air Turbulence often occurs in patches averaging about 2,000 feet deep, 20 miles wide, and 50 miles long, with its length parallel to the wind direction. The size of the patches vary considerably with some being several times the average.

As previously mentioned, high percentage of CAT is associated with Jet Streams. About two-thirds of it in winter has been found to occur within 150 miles on either side of the jet and the majority of these were with winds exceeding 100 knots. CAT occurrences are found most often in a broad zone from Montana southward along the Colorado Rockies, then eastward to the Appalachians, and northeastward to New England. The highest frequency is over mountain ranges, brought about by the added influence of mountain waves. Most cases occur between 25 and 40 thousand feet with altitudes 30 to 35 thousand showing a decided preference. But it would be wishful thinking to expect CAT to disappear as operational levels go up in the stratosphere. Because there are already indications that turbulence is found as high as 60 and even 70 thousand feet.

Research on Jet Streams and Clear Air Turbulence continues. And the words with which Captain Bernard C. Frost of BOAC concluded his very interesting article on Flying Jet Stream Winds published in the November 1953 issue of Shell Aviation News are appropriate today as they were then. His words were as follows: "It is said that one learns something new every voyage. This is still true, and much research in this matter remains to be done, particularly farther aloft, and much more, no doubt, remains to be discovered." ★

INSTANT COMMUNICATIONS

The 124th Fighter Group of the Idaho Air National Guard has completed installation of a closed circuit television system designed to speed communication among Operations, Maintenance, and the Flight Line. The Idaho unit becomes the first Air Guard unit to establish such a system.

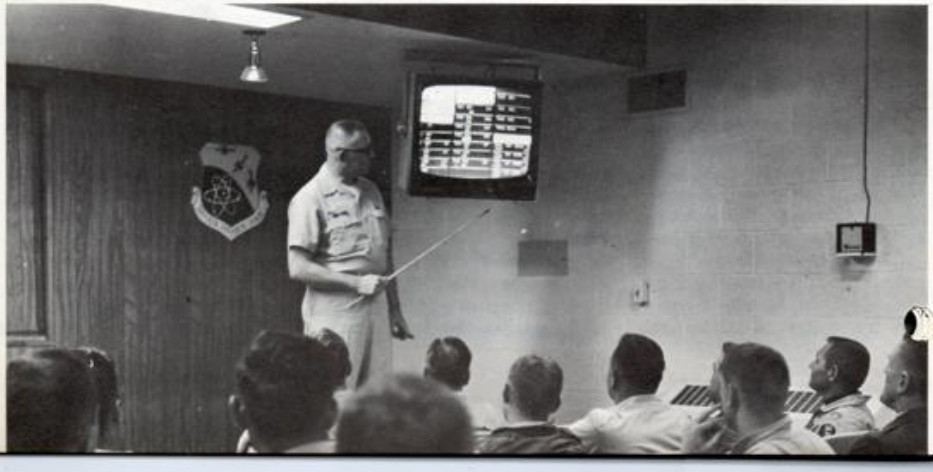
Thanks to the new closed circuit TV, mechanics and pilots are now immediately informed of changes of flight schedules and fighter aircraft conditions. Before the installation of television, this information was transferred from one chart to another by means of telephones and intercoms.

Cameras now transmit information on the condition of each F-102, the reason it is out of commission, and its estimated time of return to flying status. This information is then transmitted to monitors in the Engineering area.

Flight schedule information is relayed to monitors in the briefing, five minute alert, and hangar areas for immediate communication to pilots.

The system was first conceived nearly five years ago when Idaho Air Guard personnel were investi-

Lt Col Sam Corn, Director of Operations for the 124th Fighter Group, directs the attention of a group of Idaho Air Guard Pilots to the closed circuit TV mounted in the Pilot Briefing Room. Information displayed on the screen includes: weather, airborne order time and/or scramble number, the number of the aircraft to which a pilot is assigned, location of the aircraft on the line, and WSEM details.



TSgt Roger Smith, 190th Fighter Interceptor Squadron NCOIC, views the monitor in Maintenance Control as he prepares a strip board to be viewed by the pilots in other locations on base.

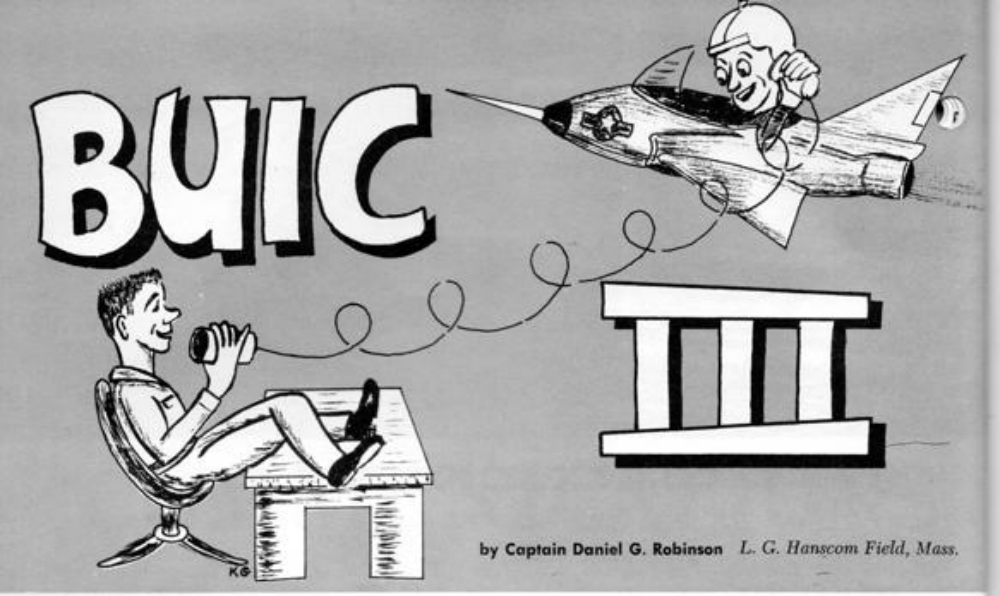
gating methods to simplify and speed up communication procedures. The necessity of having a number of telephones in one duty area in order to relay all of the essential message often resulted in a certain amount of confusion and delay — especially during a flight exercise.

Plans are now underway by the Idaho unit to extend the program's effectiveness by installing additional monitors at key locations and the Command Post in the Group Headquarters Building located nearly a half mile from the Maintenance Section.

The National Guard Bureau made the TV funds available last year for use as a pilot project. Results of the system are now being analyzed for possible use by other Air Guard units throughout the United States.

Colonel Kenneth E. Nordling, 124th Fighter Group Commander, pointed out that this is one more step in the constant effort to keep the Idaho ANG at its peak fighting efficiency. ★

Lt Col Jack Flaherty, Chief of Maintenance for the Idaho Air Guard, monitors a receiver located on his desk. He is viewing information being transmitted from Maintenance Control on the maintenance status of all aircraft.



by Captain Daniel G. Robinson *L. G. Hanscom Field, Mass.*

The third coming is near. The Back-Up Interceptor Control (BUIC) system is entering its third phase in a continuing air defense drama. The evolution of BUIC from a manual back-up for the SAGE system, through an austere automated system capable of duplicating portions of the SAGE function, to an expanded, semi-austere system able to handle a greater load than its predecessor is nearly complete. BUIC III lives and breathes. It is a little wobbly yet, but shows signs of growing into an acceptable system that will get the job done better than the previous models.

The BUIC concept was proposed and adopted in 1961 to provide for the conduct of air defense in the event that SAGE control capability is lost. The first system, BUIC I, provided an immediate manual back-up control capability similar to that provided by the earlier manual air defense system. There were 27 manual NORAD Control Centers (NCCs), each located at a long-range radar site. Next came the BUIC II system, consisting of 13 NCCs each computerized and capable of taking over the air defense responsibilities of a SAGE DC. As back-up system elements, BUIC NCCs do not have the same capabilities as SAGE DCs, but they are capable of performing similar functions in a similar, computer assisted manner. The BUIC II system is being replaced by the BUIC III system, which provides improved and expanded capabilities.

The BUIC Evaluation Facility (BEF), L. G. Hanscom Field, Massachusetts, has been conducting system tests of BUIC III since October 1967. The Category I Program System Test was finished in February 1968 when the BUIC III computer program's Formal Qualifying Test was successfully completed. The Category II test began in April and was scheduled to continue through August.

Category II testing consists of a series of live and simulated air defense exercises with an increasing target load to evaluate the system's effectiveness. These exercises provide the system analysts with the data they need to insure the system is operating according to ADC specifications. The BEF test personnel evaluate the system in terms of operational effectiveness and recommend changes through the System Program Office.

BUIC III is basically an enlarged, improved version of BUIC II. The same basic equipment is used in BUIC III, but the computer has been expanded considerably, and the consoles have been redesigned to allow the operator nearly unlimited flexibility in determining the displays he wants on his scope. The number of radar sites that can be tied to the BUIC III computer has been increased significantly, increasing the possible area of coverage for each NCC.

The number of consoles in the operations room has been increased to eleven for those units with a U. S. Army Air Defense Artillery (ADA) capability and ten for th...

nuts without ADA. These extra consoles (there are only six in BUIC II) give the Senior Director (SD) much greater flexibility in mission planning. The addition of the ADA console increases the ADAD's capabilities and frees the SD and Weapons Directors (WDs) from ADA-related actions. The added consoles also make one available for the Radar Inputs Countermeasure Officer / Air Surveillance Officer (RICMO/ASO).

A Weapons Assignment Officer (WAO) capability has been added to BUIC III to relieve the workload on the SD and free him for more effective supervision of the overall battle. The SD can designate one of the WDs as a WAO by switch action. This gives the WAO the same switch action capability as the SD with regard to making track assignments and weapons commitment.

Surveillance capability has been considerably increased. The major additions here are a console and a Random Access Plan Position Indicator (RAPPI) for the RICMO/ASO and a semi-automated identification capability. The RAPPI will enable the RICMO/ASO to monitor radar inputs more effecticely. The Identification Operator (IDOper) will have his own console and the ability to have flight plans inserted into the computer to assist him in identifying aircraft.

The modifications to the data display consoles were extensive. In BUIC II there were no feature selection switches and only fifteen category selection switches. BUIC III has six feature selection and forty category selection switches. This allows the operator to select only that information which he needs and reduces the symbology clutter that was such a nuisance in BUIC II.

The number of scope expansions available to the operator has been increased to four, and the number of off-centering buttons has been doubled. This increases display area/coverage and allows displays to overlap from one expansion to the next as in SAGE.

The tabular display (TD) size has been nearly tripled, giving it space for four mission TDs or two track TDs. A unique feature in BUIC III is that each tabular display has been titled and each item, where possible, has been given a three-letter tag defining the information displayed. This will minimize the need to memorize a large number of display formats and will be especially helpful in reading infrequently seen displays.

Finally, the light pen has been replaced by a very convenient light gun. The light gun is much easier to handle and the sensor light is smaller than the one in the light pen, making it easier to activate on the desired data or point feature on a cluttered scope.

The positive Target Control function may be similar to that function in BUIC II. Some new features that have been added are: A special SIF code (Exercise Unsafe Code) controlled by ADC to aid the target monitor (TgM) in identification and emergency situations; the capability to automatically identify Exercise tracks as BEE tracks, which cannot be reidentified. The information needed by the TgM to track and control Exercise tracks will continue to be presented to the designated TM console only.

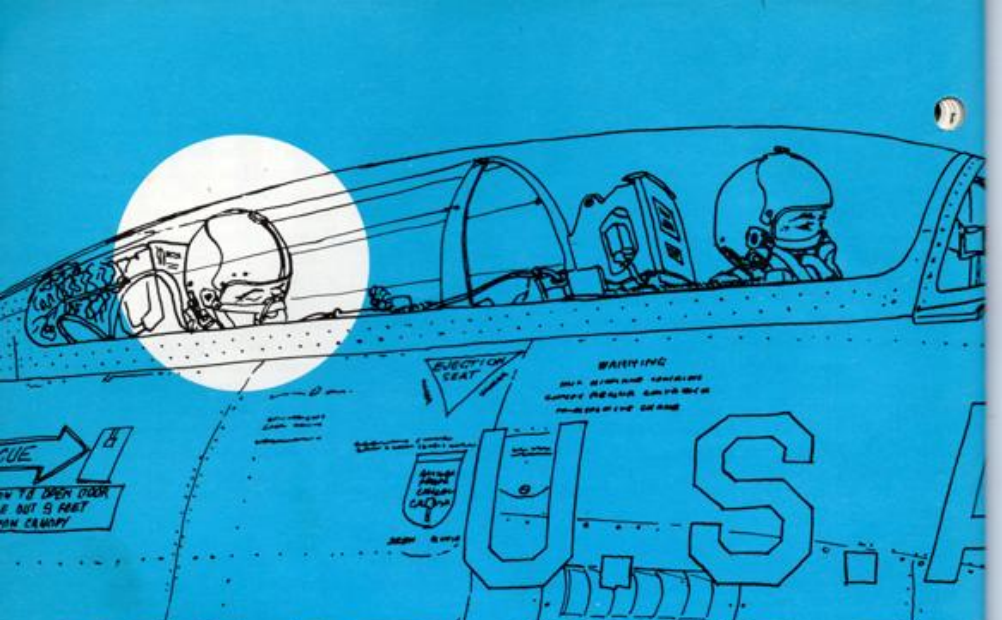
Improvements have been made in the simulation function of BUIC III. It is now possible to select and alter many operational parameters such as kill probabilities and umpiring options through manual input cards. Debriefing printouts can be made available dynamically noting kill information and dead Simulation Reference Numbers (SRNs). The height and ECM simulation functions are expanded, and umpiring will not include fuel monitoring, armament bookkeeping, and missed intercept logic.

An additional training device that will be available in BUIC III is Automated Programmed Instruction (API). API is being developed to teach BUIC personnel how to operate the system. It interfaces with the operational data base and computer programs, including the display and guidance systems, and uses the operations room consoles as the teaching medium. Training is automated, and courses can be run concurrently with live operations.

The key to the success of BUIC III lies in a large part on an understanding by both ground environment and aircrew personnel of the capabilities and limitations of the system. In this light, a common interchange of information regarding training/mission results and problems is essential to insure optimum system utilization. ★

ABOUT THE AUTHOR

Captain Daniel G. Robinson was an honor graduate from SAGE School at Keesler AFB, Mississippi in November 1963. He was controller and instructor Weapons Controller at Detroit ADS from 1963 to 1965; manual controller at Wallace AS in the Philippines from 1965 to 1966; and controller at Blaine AFS, Washington from March 1966 to October 1967. At Blaine Capt Robinson attained expert skill rating and was the second controller in BUIC II to receive that rating. He has been controller and training officer at BUIC Evaluation Facility, L. G. Hanscom Field, Mass., from October 1967 to the end of Category II testing.



HYPOXIA

by **MAJOR ROBERT M. PAULL, USAF MC** / *Office of the Command Surgeon, Hq ADC*

Complacent? Who, me? Of course not. Hypoxia? It won't happen to me. *Don't bet on it!*

Hypoxia is recognized by most flying personnel to be an insidious killer. However, with many hours of uneventful flying and with the onset of that old "it can't happen to me" feeling, we tend to forget the possible consequences.

Three recent A D C incidents point out what *can* happen.

In the first incident, a T-33 pilot developed definite symptoms of hypoxia after being at FL300 for 20 minutes. A rapid descent was initiated and the regulator was switched to 100% with relief of symptoms. Equipment inspection revealed a missing screw on the M100 microphone which allowed a ⅛ inch hole to exist at the mask and microphone interface.

The second incident also involved a T-33 pilot who climbed out to FL390 and leveled off maintaining a cabin altitude of 25,000 feet. After approximately 35 minutes, the pilot noted the onset of generalized tingling, lightheadedness, and blurred vision. He noted that the oxygen regulator blinker was not functioning and made an immediate descent to 15,000 feet, at which time his symptoms cleared completely. An oxygen system check disclosed that the quick connect of his breastplate was not

connected.

The last incident involved an RIO who developed hypoxia symptoms after being at altitude for 15 minutes. The RIO reported his symptoms to the pilot who made a rapid descent which resulted in clearing of symptoms. Subsequent examination revealed a disconnected oxygen lead beside the seat.

Two common factors are present in all three incidents. The most obvious is that they all involve some type of equipment malfunction, but were they preventable malfunctions? The missing screw could have been picked up by a thorough equipment inspection. The disconnects certainly could have occurred in flight, but did they? Or were they neglected during the preflight oxygen checks?

The second factor is that all of the individuals involved recognized their symptoms and took immediate steps to relieve them.

What is hypoxia? What are its symptoms? How can we prevent it?

Hypoxia has long been recognized to be one of the major limiting factors of high altitude survival. Although there are several types of hypoxia, that of most concern to the aviator can be defined as a decrease in the amount of O_2 present in the blood, secondary to a relative decrease in the oxygen pressure of the ambient atmosphere.

The human body is capable of storing many substances, but O_2 unfortunately is not one of them. We must, therefore, rely on an accessory source of oxygen at altitude.

The personal equipment and oxygen systems used by Air Force flyers have been modified and improved through the years to the point where we now have dependable, efficient systems. Therefore, although we all recognize that mechanical failure can and does occur, it is primarily that old bugaboo, "the human factor," that we must be aware of and guard against.

The rapidity of the appearance of the signs and symptoms of hypoxia, as well as their severity, depends on many factors. Among these are:

- The absolute altitude
- The rate of ascent
- Duration at altitude
- Physical activity at altitude
- Individual factors such as the inherent tolerance of the individual, the degree of physical fitness, emotional factors, and acclimatization.

The majority of the above are easily understood, but those listed as individual factors deserve further comment.

Inherent tolerance varies widely and is not well understood in all cases; it is usually directly related to the degree of physical fitness. Emotional factors play a part in hypoxia when considered in terms of anxiety and hyperventilation, which can greatly increase the severity of hypoxia symptoms. Acclimatization takes place only in those individuals who spend a considerable time at altitude. Merely flying in excess of 10,000 feet several times a week is not sufficient to produce any degree of acclimatization.

As previously mentioned, early recognition of hypoxia is extremely important in preventing severe and even fatal consequences. For this reason, let us briefly review the signs and symptoms.

Although individual tolerances do vary, the earliest symptoms usually are the desire to take a deep breath, followed by feelings of restlessness and apprehension, and mild dizziness. These may progress to indifference, euphoria, irritability, and visual and auditory disturbances such as darkening of surroundings or decrease in engine noise or pitch. More advanced symptoms include numbness, particularly of extremities, paralysis, convulsions, and unconsciousness. It should be realized that the progression of symptoms as indicated above are those which would take place during a prolonged episode of unrecognized hypoxia. In the event of failure at an altitude in excess of 22,000 feet, severe symptoms will occur in a matter of minutes.

The treatment of early hypoxia is simple, usually self-initiated, and consists of reconnecting a disconnect, switching to 100% oxygen if possible, or making a rapid descent to a "safe altitude" below 15,000 feet).

Once adequate oxygen is obtained, there will be a rapid clearing of symptoms, usually leaving only a feeling much like a hangover. It should also be noted, however, that when going to 100% oxygen, a very short period of apparent worsening of symptoms may occur, but recovery is rapid.

Prevention of severe or even fatal hypoxia depends on many things, a number of which can be controlled by the individual. Frequently asked are the questions: "Why do we have to update our 'Tiger Cards' every three years?" "Why repeat hypoxia demonstrations?" The answers are quite simple and may well be lifesaving. Since the best defense against hypoxia is early recognition and correction before irreparable damage or even death, you need to frequently review and experience your own symptoms of hypoxia. Other safeguards include thorough personal equipment inspections and the use of pre-flight oxygen checks. It doesn't make sense to perform a painstaking inspection of our birds and mission equipment, then gloss over or omit the same careful look at the oxygen equipment that is going to keep us alive and alert. And, finally, we must be on guard against complacency, that "it can't happen to me" feeling, *because it can*..... ★

Fire Building

by MSGT GLENDON B. DUSTIN / 4600 Operations Sq • Peterson Field, Colorado

Another of the more difficult problems which an aircrew encounters during a survival situation is that of starting a fire. Fire plays an important part in survival comfort. There are many cases where individuals found it extremely difficult to get a fire going, either because of a lack of knowledge or absence of convenient materials. In the summertime in temperate zones, there shouldn't be much of a problem. But it's amazing how many people can't build a fire even though matches, dry paper, and wood are available. The situation is compounded, however, when you find yourself in the desert, arctic, or tropical regions, where the true woodsman might run into some difficulties.

Getting down to the mechanics of fire starting, a good place to begin is with the SRU-16/P Survival Kit which is sewed into the parachute pack. It isn't really much of a kit, but it could save your life because this little jewel will always contain fire starters and matches. There are ten wooden matches in this kit, two packages of five each. The packages will contain a match striker. Don't throw it away. This striker is also used to ignite the fire starters. Many people are under the impression that fire starters must be ignited with a match. Not true. They are ignited in the same way as a match, by using the striker provided. Another good tidbit to know is that these fire starters can be cut lengthwise, making two useful pieces.

In our survival training program, we advocate and emphasize starting fires by primitive means, primarily using the flint and steel method. It's amazing how many different ways a fire can be started with this method. All ADC crew members are required to carry the five mandatory items when flying. One of the items is the plastic match container. The bottom of the container has a piece of flint attached to it. Sparks can be produced by scraping a knife blade or other sharp metal object across the face of the flint.

Another handy-dandy is the Zippo-type cigarette lighter. Whether you smoke or not, this lightweig

sily stored item is a reliable fire starter. The task is easier if fluid is in it, but in the event it runs dry, you can still make a fire. An extra flint or two in the case will provide long term potential. To start a fire by flint only, open the case and pull out some of the cotton. Shred it to a very fine fuzz. Reverse the spin of the lighter wheel so that the sparks jump out away from the wick. Aim the sparks directly into the cotton and it will ignite. If you aren't getting a good spark, use a knife blade to spin the wheel or stretch the spring which holds the flint in place, thereby putting more pressure on the flint. Normally it only takes a few attempts to get the cotton to burn. Other items beside cotton from the lighter will work. A handkerchief, part of a T-shirt, toilet paper, soft napkins, newspaper, checklist sheets, etc. will ignite after only a few attempts. Remember, though, that it is very important to take a knife and scrape the material until a small pile of fuzz is accumulated, into which the sparks must be directed. The fire starters contained in the SRU-16/P survival kit can also be ignited in this fashion. Take a knife and scrape part of the fire starter into small flakes. Then direct sparks into the accumulation.

If a candle is available, it, too, can be lit by the flint method. Scrape wax off the wick, fuzz the end, and apply spark. If the candle wick has been burned before, then the burned portion must be trimmed off before it will ignite.

An active imagination can produce many more methods in fire starting and therefore you will be that much more prepared for an emergency. Practice on the above methods won't hurt, either.

Once flame is obtained, the next problem is keeping it going. Many times a survival student has prepared a fire by shaving small sticks, getting bits of cotton or other materials ready, and then the only other thing he has available for burning is cellophane from a cigarette wrapper. This results in starting the whole prodecure over again. Always prepare materials for burning, first. Collect tinders, kindling, and other fuels and have them readily available so that when you get that flame started, the rest is easy.

When materials are abundant, there isn't much trouble involved. The individual who finds himself above the tree line, in the desert, or in extremely wet areas, is the one who will have to use the most ingenuity and toil hard in order to collect flammable materials.

Some useful general hints are as follows:

- Never overlook fuel and oil which may be unburned in the aircraft. In a cold region, drain the oil as soon as possible and let it accumulate on the ground. You may not be able to drain it if you wait too long.
- In snow country, it's recommended that a fire be built on a platform of wood, rocks, or aircraft parts to prevent it from burning down through the snow. This also holds true for wet tropical regions where a fire needs plenty of ventilation.
- A helmet will burn as well as most of the hard-pack survival kits. They take a little more time to get started, but most of them are fiberglas and will burn hot. A caution here is that the helmet and kits give off a black smoke and fumes, so make sure there is plenty of ventilation available.
- When considering using the emergency flares as a starting device, be sure all other methods have been tried. The flares are designed for another very important purpose.
- Never use the aircraft as a shelter and further do not attempt to build fires in the aircraft. Fuel fumes may still be present.
- Build the fire in front of your shelter and then construct some type of reflector background behind the fire using logs, white parachute material, aircraft parts, or rocks. This will serve to reflect heat and light back toward the shelter opening. This will provide an additional benefit from the fire.
- Once a fire has been started and is burning hot, place green logs on it. They will burn for a long time and make excellent coals for cooking. In the morning, roll over a half-burned green log, and you will find a bed of live coals beneath it. Add a little tinder and the fire is going again.
- Regardless of the situation, attempt to make a fire circle. It will prevent causing a forest fire and save your shelter and equipment. A circle at least five feet in diameter, dug down to mineral soil will suffice.
- Keep in mind the old proverb, "Indian makes small fire and stays warm standing around same. White man makes big fire and stays warm gathering wood for it." When building a fire, make it small, since wood may have to be gathered and broken by hand. Use the fire only when you need it. It doesn't take a bonfire to heat a cup of coffee.
- Standing dead wood is the best source of fuel.
- In desolate areas (desert), you can try animal dung for fuel.
- Last, but not least, on a camping trip, try some of these methods. The wife and kids can chop the wood. If you practice now, you may be grateful later. Shredding napkins at the bar is not recommended. The place could burn down. ★

This is a program conceived at the Military Personnel Center (MPC) and its main function is to identify all pilots who have not served a tour in SEA. It places these officers in a freeze status and will eliminate the possibility of anyone going back for a second tour before all of us go once. The philosophy behind this program is sound and attests to the constant concern of the people at MPC to provide the earliest notification possible for those pilots going to SEA. The plan is feasible because of the information gained in the past few years through experience of known requirements and established CCTS outputs.

The month that you have been selected is the date you can expect to begin training and not the in-country reporting date. If no training is required as in the case of 1416 or 1435, then the port date will probably be within the month. It must be emphasized that these selected dates are not all that firm; however, this is not the fault of the program. Let me explain. ADC has a quota for 39 in January: 29 Jet, 10 Conventional. If one of these officers becomes ineligible for some reason, then it becomes obvious someone must take his place, and the logical replacement would come from one of those SEA eligible pilots who did not make the initial list.

The list was compiled by using Oversea Duty Selection Date (ODSD), time on station, number of SEA eligible per unit, life expectancy of the unit, projected unit manning, and a few others. If your squadron is one of those programmed to move or deactivate, and you have not been to SEA, then you will probably find your name on the list. It becomes impractical for the USAF and actually unfair to the officer to move him to another unit for only six months. For this reason, you may find that you appear on the list for January with a return date of '65, yet you know of someone with an ODSD of say '63 who is after you. Another reason for this is the number of SEA eligible per any one unit. When Palace Cobra, or "Snake Pit" as we call it, was first conceived, ADC had 1231 pilots who had not been to SEA and our quota for one year for 440, or about 1/3. With the average Squadron having about 24 pilots including overhead aboard, it was decided they could lose to SEA a maximum of 8 per year, or 1/3 programmed through the year. So, theoretically, if any unit was manned with 100% with SEA eligible pilots, all would be selected in 3 years and ADC would have supplied some 1200+ pilots to this program and MPC would have to look elsewhere. If your ODSD is in '63 and there are only 3 or 4 people in your unit with earlier return dates and there is another unit with 9 pilots with '62 ODSDs, then one of these cats will still be sitting in the Alert Hangar when you are on the way. No fair, perhaps, however it makes sense. It certainly cuts down on the turmoil within ADC, and rest easy, because he will get his turn.

Aircraft Selection. This is done now by the people at MPC and is another excellent aspect of Palace Cobra. It has increased the workload at MPC by at least 100%. These troops don't mind the workload if they feel it will help the jocks and is a better system, and Palace Cobra does and is. As stated earlier, the requirements for any one month are known, and the Commands have been levied to fill these requirements. About 3 or 4 months ahead, MPC gets the Career Brief of each one of these officers whose names have been supplied by the various commands. The[y] are placed in two piles, volunteers and nonvolunteers, and they proceed to fill the requirements, obviously starting with the volunteers (will bring this up later if you don't get the 9"x 12" glossy here).

The benefits derived are obvious. MPC knows *all* of the requirements and has *all* of the availables, thus eliminating an F-101 pilot from ADC going to C-130s, and a MAC C-130 pilot going to RF-101s. This does not eliminate the possibilit[y]

this C-130 pilot going to RF-101 however, if he is a volunteer and meets all of the prerequisites for RF-101 CCTS. The same for the F-101 pilot if he wants C-130s, and he is not needed to fill the fighter requirements for that month.

Now about the volunteer bit. Don't let the old axiom about "don't volunteer for anything" cloud the issue, because in this case you aren't really volunteering for anything. You have already been selected. When you sign "volunteer," you accomplish two very important things. 1: You get in the pile that is selected first . 2. You have the opportunity to select the weapons system you want to fly in SEA.

This can only be accomplished at the CBPO so don't call us or MPC. The CBPO must put it in the computer system for us to get the proper printout here at ADC Headquarters. If there is more information you want to supply, like bases of choice for training, the best way is to drop us a note. Send it to ADPDA-OR (PC). When we get the information, we will put it into the system and it will be printed out on your Career Brief when MPC asks for it. The troops at MPC can't possibly put up with 10,000 little pieces of paper attached to 500 Career Briefs, so if we do it the right way it helps them, and all will benefit.

Why Jet and Conventional? The aircraft you are presently flying or last qualified in was used to select which group you go into. Just because ADC selected you for this group doesn't mean that you will go in that type aircraft. The MPC still has requirements for Ops Staff, Air Ops, and Safety Officers. If you are over 40 years old, your Career Brief must go before a board and they decide if you can go to one of the fighter CCTS. So again let us know. If you are a Safety Officer and want to go as one, say so, and we will see that it gets into the system. Any information you give us we will see that it gets to MPC; however, if you are selected for January, don't write us in January and expect it to work. We also can't say for sure you will get what you want, but the chances are obviously better.

Even though ADC will supply 440 pilots to SEA from September 1968 to August 1969, this is by no means all of the levies ADC will receive. We will still have requirements for accompanied tours throughout the world. If you have not been to SEA you are ineligible for anyone of these. ADC will also be required to fill some remote assignments other than SEA. These we will attempt to fill from those officers who have completed their SEA tour in a TDY status and their last tour accompanied. So the troops at McClellan and from Clark should not feel that they have been forgotten.

Palace Cobra is solely for pilots; however I understand that the same type program is being contemplated for Navigators and RIOs as well. We have also been working on a plan to enhance the career progression for RIOs within ADC and have just obtained permission, after two years of trying, to begin an RIO school at Tyndall. This will enable ADC to withdraw some of the Lieutenant Colonels and senior Majors, and place them in other staff functions. As the program now stands, we plan to train 36 Undergraduate Navigator Trainees or young SEA returnees a year. We don't expect miracles for some time, but it is a giant step in the right direction. The AFSC of all RIOs will also be changed shortly to 1555. This will enable Personnel Weenies to identify all the RIOs, Navigators, system operators, etc., who are qualified in the rear seat of fighter type aircraft.

By the time this article is printed, I will already be sitting behind the Mayor's desk in Saigon. So to all those whom we have helped we are glad; to those who went where we sent them and didn't gripe — thanks; to the rest — sorry! If you think you have it bad, always remember that a Personnel Officer/NCO is like the . . . (censored).

OPERATIONAL READINESS INSPECTION TEAM

HQ, ADC

FK SUPPLY, WHAT'S THAT???

"Yes, Sir! I'm Airman Eager and I'm in charge of the FK account . . . Gee, I wish you hadn't asked that, sir, I've only been out here a month and, ah, well, I guess the FK account is to support the, ah, umm, hey Joe, what are those things out in the cells called again?"

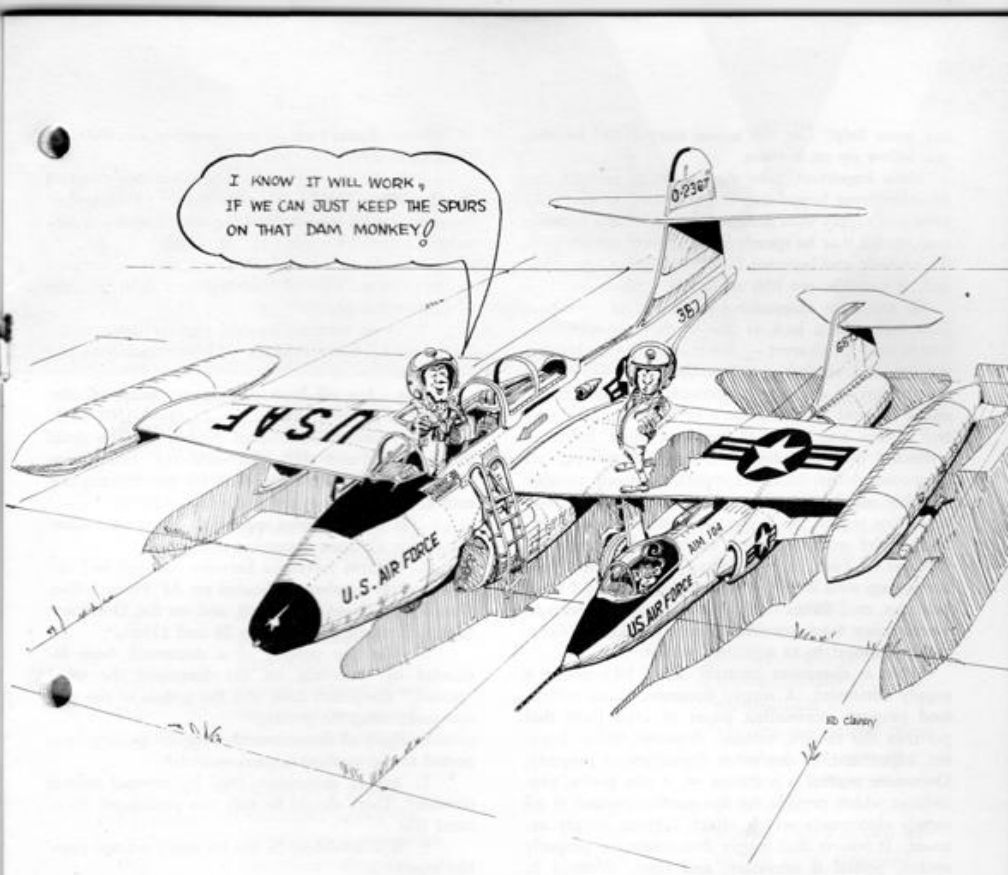
Unbelievable — unfortunately, the CI inspectors come across this type of situation all too frequently.

Before you make any hasty conclusions, let's make one thing clear — Airman Eager isn't at fault. He is the victim of poor management. Sergeant Whiz, the former NCOIC of the "K" account had everything under control. True, he was the only supply man on board, but he had everything running smoothly and the account received a satisfactory on the last inspection. Sure the last inspection report stated that a back-up man was needed, but then what do those headquarters weenies know about our unit operation? Why it would be a waste of man-hours to have had someone help Sergeant Whiz, even for a couple of hours a week.

Then it happened! Sergeant Whiz got one of those short notice transfers that Personnel has become famous for. He was getting his family moved, clearing, etc., and the NOSO was trying to figure out who was going to run the "K" account. End result — Airman Eager was brought down from the MSL, given two days OJT, and inherited the whole ball of wax.

Now there's nothing wrong with an airman in charge of the "K" account or, in this case, with Airman Eager. However, he's got two strikes against him from the start. First, no training, and second, he has to run a *manual* stock record account. He attended basic supply school and he knows that the computer does most of the work for you under a computerized system, but he didn't know what an AF Form 105f-6, Stock Record (Manual), looked like until four weeks ago. Sergeant Whiz hit some of the high spots in his two-day briefing and mentioned Chapter 18, Part One, Volume I, AFM 67-1, several times. So Airman Eager has waded through Chapter 18 and the many references it gave him. He is now thoroughly confused with ownership codes, minimum levels, ammunition reports, controlled item reports, custody issues, reparable shipments, and on and on.

Airman Eager has some things figured out; however, on other matters he's quite hazy, so he turns to the maintenance people and asks if they know how certain things are to be done. They tell him what they recall on issues and turn-ins and he decides to use those methods. He makes it through his first month okay. The NOSO hasn't heard mail.



nance screaming for parts so Airman Eager must be doing okay.

Enter the CI Team. The supply inspector looks the account over, finds a few minor discrepancies and a couple not so minor. However, he notes that most of the errors have been made in the past two to four weeks. He gives Eager the written exam — he gets a 60 on it. Not bad considering, but not good either. The inspector talks to the accountable officer, pointing out that the account is satisfactory overall but indications are that it is deteriorating. Airman Eager needs training. "But, sir, he's the only supply man authorized out here — there's no one to train him." Now, isn't that just lovely!

Help is available but *you're* going to have to be a little aggressive to get it. First, it may be available right in the unit at your MSL section — they're supply people too. Or, if your unit is a tenant on another command's base, check with the host's FK account. A little coordination with them may provide you with an excellent training setup for Airman Eager.

Also, practically every base supply in existence has some old heads around who are familiar with manual accounting. The forms have changed but the basics are still the same.

If all this is fruitless, contact your numbered air force and see if they can provide some help. The whole point is, don't sit back and hope, go get your-

self some help. Get the action started and be sure you follow up on it *often*.

More important, take steps now to prevent this situation from happening at your unit. If you only have one supply man assigned, arrange for a back-up man, insure that he spends several hours a week with the account and becomes familiar with the operation, and, if possible, get him off to FK school.

So much for maintaining continuity of operation. Now let's take a look at one of the key operations within the "K" account — one that has been plaguing the accounts recently — *DOCUMENT CONTROL*. It's the key to any supply account and it effects the entire account. A breakdown of the document control system can result in incorrect stock balances, erroneous quantities indicated on hand receipt, loss of accountability, incorrect reports, and any number of other supply sins. It's also a guarantee of a bad inspection report. So if you really want a bad write-up, just let your document control ride along until the next CI Team arrives. When that inspector starts coming up with loss of accountability, incorrect stock balances, etc., things can get stickier than a weapons maintenance inspector with a new checklist. (Commonly referred to as a "sticky wicket.")

What is document control? First, let's define a supply document. A supply document is an authorized property accounting paper or card form that portrays the receipt, release, shipment, issue, transfer, adjustment, or any other disposition of property. Document control is a system or, if you prefer, procedures which provide for the positive control of all supply documents which effect a given supply account. It insures that supply documents are properly routed, posted if necessary, and filed. Without it, the history of the account and the audit trail will be lost.

A letter to the field from the munitions staff (ADMME) here at HQ ADC dated March 1968, clarifies and specifies the document control system to be used by ADC FK accounts.

Here's a quick checklist to help you determine if your document control lines up with the new procedures and is giving you what it was designed to accomplish.

1. Has a centralized document number system been implemented?

2. Is a formal (auditable) internal control register being maintained on AF Form 36, Supply Document Register?

a. Are internal control numbers constructed as follows: Fiscal year — serial number, i.e., 68-00001 through 68-99999.

b. Is an internal document number assigned to all internal (on-base) transactions? (Transactions between the FK account and the detachment are considered internal.)

c. Is an internal document number assigned to the paperwork for off-base transactions at the time of shipment or receipt?

3. Is an informal control register being maintained on AF Form 115a for off-base requisitions and shipments?

a. Are off-base document numbers constructed as follows: FK/_____/8182/1001 (FK/Account Number/Date/Serial Number). The serial number starts over with 1001 each day. Serial numbers 0001 to 0999 are reserved for priority requirements.

b. Is a suspense copy of the document maintained for all open document numbers?

4. Is cross reference between internal and off-base control numbers indicated on AF Form 105f-4, Due-In and Due-Out Record, and on the Document Control Registers, AF Forms 36 and 115a?

5. Has the posting of a document been indicated by recording on the document the word "posted," the Julian date, and the initials of the person performing the posting?

6. Have all documents that require posting been posted to the applicable stock records?

7. Are all documents filed by internal control number? There should be only one permanent document file.

8. Is a document in file for every control number used?

9. Are classified documents provided proper security?

10. For each classified document, does the document file contain a plain piece of paper on which is recorded the document number, the word "CLASSIFIED" and the classified storage location?

If you can answer each of these "yes" then you may have a good account. How about keeping it that way. If you find that these questions are revealing some grey areas then someone has some work to do. If you don't believe it — wait until the CI supply inspector calls these things to your attention. He'll do it politely — true, but it could be embarrassing. Why not plan now not to let that happen later?

TOM WILLE, Colonel, USAF
Team Captain, ADC ORI Team

KNOW YOUR V'S

Do you know all your Vs? All this may appear purely academic, but there are times when pilots are not certain of the precise meaning of some of the V terms or abbreviations that make up the current terminology as issued by the FAA. Try these on for size . . . and as memory joggers:

V_a — design maneuvering speed
V_b — design speed for maximum gust intensity
V_c — design cruising speed
V_d — design diving speed
V_{df}/M_{df} — demonstrated flight diving speed
V_f — design flap speed
V_{fc}/M_{fc} — Maximum speed for stability characteristics
V_{fe} — maximum flap extended speed
VFR — Visual Flight Rules
V_h — maximum speed in level flight with rated rpm and power
VHF — Very High Frequency
V_{le} — maximum landing gear extended speed
V_{lo} — maximum landing gear operating speed
V_{lof} — lift-off speed
V_{mc} — minimum control speed with critical engine inoperative
V_{mo}/M_{mo} — maximum operating limit speed
V_{mu} — minimum unstick speed
V_{ne} — never-exceed speed
VOR — very high frequency omnirange station
VORTAC — collocated VOR and TACAN
V_r — rotation speed
V_s — stall speed, or minimum steady flight speed at which aircraft is controllable
V_{so} — stall speed or minimum steady flight speed in landing configuration
V_{sl} — stall speed or minimum steady flight speed obtained in a specified configuration
V_x — speed for best angle of climb
V_y — speed for best rate of climb
V_1 — critical engine-failure speed
V_2 — takeoff safety speed
$V_{2\ min}$ — minimum takeoff safety speed

For an even more thorough brushup, we suggest you request "Change 14, Part 1 — Definitions and Abbreviations from the FAA. It includes TERPS as well. (Flight Safety Foundation)

AMERICAN FIGHTER ACES ASSOCIATION

annual convention '68

HISTORY OF THE FIGHTER ACE

During the first World War, the airplane became a primary weapon system. True, the earliest flights were strictly observation missions, but it was inevitable that English and French aircrews would sight German aircraft. Eventually they flew close enough to exchange a friendly wave. The knights of medieval days had progressed to become knights of the air. It wasn't long, however, until during one of these airborne meetings that a pistol was drawn and shots actually fired. The contest had begun, and some 50 years later the limits have still not been reached.

The French were the first to recognize the most successful pilots of aerial combat in World War I. They bestowed the "Ace" designation upon their pilots when a tenth aerial kill was accomplished. It was in the form of a "knighthood" and was considered perhaps the most glamorous distinction an aviator could achieve.

The British also recognized 10 aerial victories as qualifying for "acedom", but informally, and nothing official ever developed. When the Americans entered combat in that war, much enthusiasm was exhibited over the designation of "Ace" to a successful combat flier. The American Expeditionary Forces arbitrarily established five aerial victories to qualify one as an "Ace". The Germans were serious warriors of the skies, but at that time gave little thought toward establishing the term of "Ace" as a form of recognition. However, they did bestow a form of knighthood upon their more successful pilots.

Between World War I and the outbreak of World War II in 1939, the world had come to tacitly accept the figure of 5 aerial kills as qualifying one for "Acedom". This figure, which remained the standard during World War II and Korea, still stands and is generally recognized although no country has a hard and fast method of decorating or otherwise recognizing the fifth kill for each pilot. The USAF sometimes awarded a Distinguished Flying Cross or Air Medal, sometimes nothing. The German Air Force gave the Iron Cross at times, and at other times nothing. On the Russian front in 1943-44, the German pilot had to achieve 100 aerial victories to win the Knight's Cross.

THE ASSOCIATION

The American Fighter Aces Association was organized during the month of September 1960, in San Francisco, California. The purpose was to preserve the spirit of loyalty, fellowship, and responsibility that motivates Fighter Aces, and to work toward achieving in peace those principles for which they fought in war. The Association was founded to embody all of the United States of America recognized fighter Aces; who at that time numbered over seven hundred.

An interesting sidelight to this subject is that in the early 60s the recognition policy for an American Ace was modified. This change allowed a flier who had accumulated a sum total of 5 aerial victories in World War II and Korea to achieve "Ace" status. Thirty some odd names were thereby added to the American Ace list.

AWARDS AND INCENTIVES

Since its inception the Association has sought to encourage and stimulate young men and women to enter the aerospace field and has sponsored educational and awards programs designed to broaden public knowledge of and increase

terest in aviation and aerospace technology.

For the past several years the Fighter Aces have honored distinguished Air Force ROTC college and university graduates with plaques to recognize excellence in aerospace studies. A new plan soon to go into effect will honor distinguished Navy and Marine flight training graduates.

Two scholarship grants were made to the daughter of a deceased fighter ace whose education was successfully completed in 1967, and this past year two further grants were made to the daughter and son of other aces.

The consideration of establishing a safety award may be on the agenda of future meetings which would help to inspire military aerospace activities towards improving their safety record.

Untold numbers of speeches and film presentations have been given by Fighter Aces to civic organizations and schools to further American Aerospace and Patriotism.

CONVENTION

The American Fighter Aces Association convenes annually to renew friendships, discuss future plans and programs, and to honor individuals who have distinguished themselves in the aerospace field.

The annual gathering for this year was held in Dallas, Texas, in June. The Association awarded citations and plaques for valor to six Southeast Asia returnees, whose number included one of its own members, Brigadier General Robin Olds. General Olds increased his World War II score with the addition of four MIG victories in Southeast Asia. Other pilots cited for valor were Colonel Bob Titus, USAF; Captain Billy Phillips and Cdr. Harold Marr, USN; and Major Ronald Heald and Captain Richard Tickner, USMC. A seventh recipient, Cdr. James Hill, USN, who

led the first A-7A squadron into action, received a plaque and citation for professional excellence.

Three veteran industry test pilots who have contributed so much towards the furthering of Fighter Aviation were awarded citations and plaques for professional excellence. The recipients were Mr. Tony LeVier, of Lockheed Aircraft, Mr. Richard Johnson, of General Dynamics, and Mr. John Konrad, of Ling-Temco-Vought.

A FITTING TRIBUTE

There is no doubt that the four hundred plus elite "Fighter Aces" do, indeed, continue to serve their country not only from positions of high command, but also in their everyday lives and through The American Fighter Aces Association.

Traditionally, men involved in the "romance of the skies" have not hesitated to show respect and admiration for others engaged in their profession, regardless of their nationality or background. On a world-wide basis throughout all conflicts, the "Ace" has come from all walks of life with contrasting backgrounds and varying personality types. Some have risen to great heights of leadership and success, both in civilian life and in the military; others have quietly pursued careers out of the public eye; and a few have just faded from view. While it would be most difficult to describe a stereotype of the "Fighter Ace", it can be said with a degree of certainty that when their respective countries needed them to fight in those few brief moments of their lives when they were locked in mortal combat with the enemy, they exhibited to a high degree the qualities of courage and aggressiveness.

What greater tribute could be paid to the "Fighter Ace" than when the Chief of Staff of the United States Air Force, General Thomas White, said in an address before the initial gathering of the American Fighter Aces on 23 September 1960, "As a young boy dreaming of becoming an Airman —if I had a choice between becoming Chief of Staff of the Air Force or becoming a Fighter Ace, I would have chosen to become a Fighter Ace". ★

DOWN and out

F-102, LEFT RUNWAY

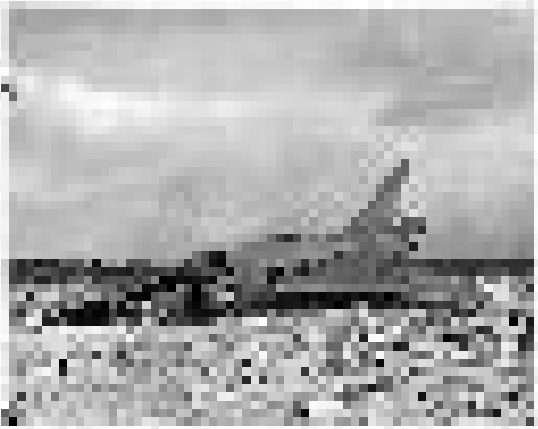
A flight of two F-102s was launched on a night mission involving interception and identification of an unknown aircraft. After being airborne for 1.4 hours, the wingman effected a recovery using GCI/GCA. Although the runway was sighted at 4 to 5 miles, GCA was continued to minimums and a normal landing made. Touchdown was made approximately 1,000 feet down a 10,000 foot runway. The drag chute failed to deploy and the pilot experienced difficulty in stopping the airplane. He shut the engine down and the airplane continued to roll onto the overrun where it travelled 620 feet and down a two-foot embankment off the left edge. The left main landing gear upper cylinder ruptured and the nose gear strut broke off. There was also structural damage to the nose of the aircraft aft of the radome.

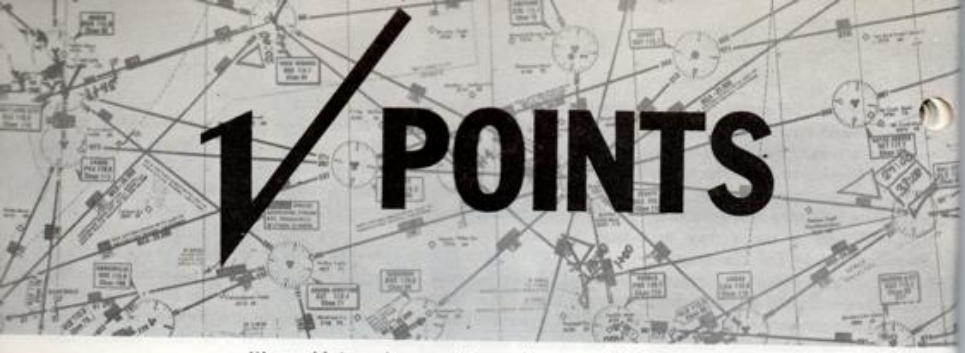
Forecast weather for the flight period was 2000' broken, 7000' broken, 7 miles visibility, winds 260 degrees, 20 knots gusts to 40; temporarily 1000' overcast, 5 miles visibility in rain and snow showers, winds 290 degrees, 25 knots gusts to 40. During the night, ceiling and visibility were temporarily below the forecast. Snow showers were of fairly short duration. The temperature was 30 degrees and snow did not melt, but remained loose on the runway or was blown away by the wind. The ceiling and visibility were good when the pilot landed. It is believed that the wind velocity was about 12 knots pretty much down the runway.

The official RCR at the time of the accident was 17. The runway had patches of ice and snow, but it was 85% clear. While the flight was airborne, several snow showers had passed, but checks were made and little deterioration noted. A runway condition of "fair to poor" was passed to the pilots and was based on additional snow accumulation in the vicinity of the hangars. The second aircraft landed shortly after the accident and although the pilot had no difficulty in stopping, he thought the RCR was poor.

During the investigation, the pilot involved in the accident stated that he flew his final approach planning for a slippery runway landing. He pulled the drag chute handle after touchdown, but the pilot chute deployed and pulled the main chute out of the cannister. It was found in its bag 1500 feet down the runway. When the drag chute failed, the pilot did not select the emergency fuel system to reduce thrust as recommended for a slippery runway landing. He attempted aerodynamic braking by holding the nose off the ground as long as possible, which is a recommended procedure. The runway distance markers were lit, but he did not remember seeing them and does not know at what point the nose wheel was lowered. He did not engage nose wheel steering to aid in directional control, but used wheel brakes intermittently. When he felt he could not stop the aircraft in the remaining runway, he shut the engine down. The pilot continued braking but to no avail as the aircraft entered unprepared surface left of centerline.

Post-accident investigation disclosed that under the circumstances the landing distance should have been less than 6,000 feet. The drag chute failed because it had been installed improperly. Wheel brakes were not faulty and the ice grip tires were in good condition. Cockpit and runway lighting were satisfactory. A no-drag chute test was conducted and showed that if maximum angle of attack is used, the nose can be held off the runway for approximately 5,000 feet of roll. When the nose dropped, speed was slow enough to where the aircraft could easily be braked to a stop. If a lesser angle of attack (less than 15 degrees) is used, aerodynamic drag is reduced, deceleration is less, and the nose can be held off for a much greater distance. The use of aerodynamic braking is the best method for maximum initial deceleration on a slippery runway immediately after touchdown. However, aerodynamic drag is applicable for deceleration only to 60 or 70 percent of touchdown speed. When the nose is held off as long as possible, indicated airspeed reads zero while the nose is still up. The true speed at which the nose drops is not known at this time, but induced drag is not significant during the last part of the nose-up roll and may be less than main wheel braking force if the





V POINTS

We would sincerely appreciate your inputs mailed directly to: The Editor, INTERCEPTOR, Box 46, Ent AFB, Colorado 80912.

V SOAP. Commanders, Maintenance Officers, and Safety Officers: your attention is invited to the contents of ADCL 127-2, 1 August 1968. Paragraph 2a is quoted for your information. "The loss of two USAF aircraft could have been prevented by more timely compliance with the Spectrometric Oil Analysis Program. In both of these cases, the central laboratory called the operating base to warn them of the engine problems. The answer was the same in both cases, "Sorry, we just lost that aircraft yesterday with in-flight engine failure." In other instances, accidents have been prevented through the SOAP by removal of defective engines from service.
(ADCSA)

V In case you think the wild blue yonder is vacant, at the end of 1967 there were 618,000 active U. S. civil pilots as compared to 378,000 at the end of 1963. And you ain't seen nuthin' yet.
(FAA/NAAIS)

V Maintenance troops. DON'T! use high pressure air to inflate tires. Reference T.O. 4T-1-3. (ADCSA)

V AIRCRAFT TIRES, reference T.O. 4T-1-3, maintenance or flight personnel should not become alarmed when tread reinforcing cords are exposed or worn through. The main cord body (carcass) does not rely in any way on the strength of tread reinforcing fabric. (ADCSA)

Beware! especially light aircraft, of taxiing or landing behind a turboprop powered aircraft. While awaiting takeoff clearance, certain turboprop aircraft have the power levers ahead of the start position to keep positive thrust for adequate oil cooling. The **turbulent** air which results from this procedure extends a considerable distance aft of the aircraft. (Flight Safety Foundation)

V "The hurtingest gun that ever exploded was the innocent one that **wasn't loaded.**"
(ADCSA)

V Reference "Check Points", July 1968 Interceptor; a correction is in order. The VC attack on Tan Son Nhut AB, RVN, which wounded 10 members of the ADC Big Eye detachment occurred on 12 April 1966, not 1965. (ADC-I)

In mid-March 1956, the initial version of the radar-controlled air-to-air missile (GAR-1) became operational with the 445 Fighter Interceptor Squadron at Wurtsmith AFB, Mich. (ADC-PS)

The advent of cold weather is not far away. We should be seriously preparing ourselves and our automobiles for this season, especially those who will be spending their first winter at a cold weather base. In addition to winter oil, anti-freeze, and snow tires, consideration should be given to the possibility of having engine failure, or running out of gas during a blinding snowstorm in a remote location. A suggested emergency kit to be carried in the trunk of your car could consist of extra blankets, matches, candles to heat the inside of the car, a flashlight, canned food, and emergency road flares. (ADCSA)

"Missed Approach" is the segment of the approach procedure between the missed-approach point, or point of arrival at decision height, and the missed-approach fix at the prescribed altitude. (FAR Part 97) (FAA/NAAIS)

On 9 February 1961, General Thomas D. White, Chief of Staff, USAF, transferred space surveillance functions from the Air Research and Development Command to the Air Defense Command, which established SPADATS (space detection and tracking system). (ADC-PS)

April 1959. Rocketry training of ADC interceptor crews stopped at the Vincent AFB, Ariz., Weapons Employment Center in preparation for moving the function to Florida. (ADC-PS)

April 1951. ADC first proposed an Airborne Early Warning and Control (AEW & C) capability. (ADC-PS)

On 21 March 1946, Aerospace Defense Command (then Air Defense Command) was organized at Mitchel Field, N. Y. The command observed its 22nd anniversary this year. (ADC-PS)

Hunters, are you a true sportsman or a participant? Whether you are new or old to the sport, read or review the Ten Commandments of Hunting Safety. These rules may be just the ticket to keep you or your buddy from getting hurt. You can get a copy of this valuable document from your safety officer, or most any sporting goods store. Happy hunting. (ADCSA)

BLUE ZOO

"OK, so it's only one day — but date of rank is date of rank!"

safety officers' FIELD REPORTS

F-102A AC POWER FAILURE. After one hour and fifteen minutes of flight, the pilot was recovering from a 5,000 foot front attack at 12,000 feet, when the AC generator failed. Multiple attempts to reset the generator were unsuccessful, and a return to the base was initiated. Oil pressure was good throughout the recovery, the emergency AC bus functioned properly, and a safe landing was made. An oil leak was then observed by the emergency vehicles and the aircraft was shut down after clearing the runway. An examination of the system revealed the engine mounted gear box had failed internally. Metal filings had passed through the system, contaminating and failing the CSD governor, and an operational check of the system revealed no further discrepancies.

F-102A, ENGINE VIBRATIONS. As the pilot came out of afterburner after takeoff, he noted the oil pressure drop from 50 to 40 psi. He began to feel a vibration or roughness, but thought it might have been rough air. As the flight climbed, he became certain he had a vibration. All engine instruments were reading normal, including the oil pressure, which remained at 40 psi. For this reason, emergency fuel was not selected. A precautionary landing was made from a high wide pattern. Power had to be added on final and the pilot felt a definite roughness then. The engine was shut down at the end of the runway. A run at the trim pad indicated a 9 mil vibration at 75% power. (The top allowable is 4.5 mils.) The engine was removed for a run on the test cell to isolate the vibration source and to facilitate corrective action.

F-102A, INSTRUMENTS INOP. During a weather penetration all pitot-static instruments froze. A hole was discovered in the clouds and descent continued VFR. A request was made for another aircraft to lead the approach and landing. The instruments broke loose during join-up. Airspeed and altimeter readings were checked and a normal landing was accomplished. Suspected cause was water in pitot and static line. The aircraft had spent the night in a heavy rain storm without a nose cover.

TF-102A, CANOPY UNLOCKED LIGHT. The aircraft was on GCA final approach when the canopy unlocked light illuminated. The locking handle and overcenter indicators were visually checked as being properly positioned and there were no indications that the canopy was actually unlocked. Following a full stop landing, maintenance personnel found the right hand canopy lock switch out of adjustment.

F-102A, FLUCTUATING FUEL FLOW, RPM, AND EPR. At 18,500 feet, 20 minutes after takeoff, the pilot observed fuel flow fluctuations of 1,000 psi. Slight but corresponding fluctuations of RPM and EPR were also noticed and a return to the base was initiated. Selection of the emergency fuel control had no apparent effect on the problem. The normal fuel control was reselected and a precautionary landing was accomplished without incident or further difficulty. A visual inspection of the engine revealed no discrepancies; however, the tachometer was replaced. The malfunction could not be duplicated during a ground run, but the bleed air valve did not operate properly and was replaced. Further ground operation was conducted following the valve change and the malfunction could not be duplicated. Six flights have been flown with no engine malfunctions experienced.

F-101B HYDRAULIC LEAK. The aircraft air aborted shortly following departure while in formation. The pilot noticed difficulty in trimming the aircraft and also stiffness in aileron control. After performing a simulated landing approach at 200 KIAS the pilot came in for an uneventful landing. After parking the aircraft the right aileron actuator was leaking hydraulic fluid.

F-101B, HYDRAULIC FLUCTUATIONS. A precautionary landing was made due to fluctuating utility hydraulic pressure on the LH engine. Investigation revealed that the reservoir cap seal was worn and would not hold pressure. The cap was replaced and the system checked okay on run-up. No further problems have been encountered.

THE WAY THE BALL Bounces

ACCIDENT RATE

1 JAN THRU 31 JULY 1968

	ADC	ANG
Thru July 1968	3.2	3.9

MAJOR — ALL AIRCRAFT

ON TOP OF THE HEAP

MO	ADC	MO	ADC	MO	ANG
58	62 FIS	40	18 FIS	79	132 Ftr Gp
51	48 FIS	39	408 Ftr Gp	66	162 Ftr Gp
49	4600 AB Wg	39	4677 DSES	64	112 Ftr Gp
49	87 FIS	31	95 FIS	54	141 Ftr Gp

ACCIDENT FREE

BOX SCORE

ACCIDENTS FOR July / CUM TOTAL	1st AF	4th AF	10th AF	ADWC	4600	ANG
CONV	1 / 1					
T-33		1				
F-100						
F-101	1	1				
F TF-102	2					3
F-104						
F-106	1			1		
B-57						
F-89						
EC-121						

MINOR ACCIDENTS THIS PERIOD — 0

MINOR ACCIDENTS CUMULATIVE — 4

CUMULATIVE RATE

1 JAN THRU 31 JULY 1968

	ADC	ANG
JET	4.0	4.3
CONVENTIONAL	1.4	0

BY AIRCRAFT	ADC	ANG
T-33	1.6	0
F-89		0
F-100	0	
F-101	5.2	
F TF-102	10.6	5.7
F-104	0	
F-106	6.3	
B-57	0	
EC-121	0	

RATE = MAJOR ACCIDENTS PER 100,000 FLYING HOURS

we point with PRIDE

Captain Lawrence D. Haight
318 Fighter Interceptor Squadron
McChord AFB, Washington

F-106, ENGINE FIRE ON TAKEOFF

Captain Haight was scheduled to fly an F-106A from McChord AFB, Washington, to Richards-Gebaur AFB, Missouri. The aircraft was configured with two full 360-gallon drop tanks and a full load of secondary armament. At liftoff during the takeoff roll, the pilot heard a "mild explosion" and felt a loss of thrust. Simultaneously the control tower advised that the aircraft was on fire. Then the fire warning light illuminated. At this time the aircraft was approximately 50 feet in the air with the landing gear still extended.

Rapidly assessing the situation, Captain Haight retarded the throttle to idle and landed the aircraft at about the 4000-foot remaining marker. He then deployed the drag chute, released the tailhook, placed the idle thrust switch to the on position, and began maximum braking. He considered jettisoning the external tanks, but felt it was not necessary. The maximum braking was continued until the BAK-6 barrier was approached. A successful engagement was made near the center of the barrier. After the aircraft had stopped, Captain Haight raised the canopy, disconnected his personal leads and seat kit, pulled the ditching handle, and evacuated the aircraft. The fire extinguished itself prior to the arrival of the fire trucks. The barrier engagement caused no damage to the aircraft and Captain Haight was unharmed.

Investigation revealed that the engine had failed internally, causing the afterburner flame to deflect onto the side of the engine, burning through the engine and side of the aircraft. The afterburner eyelids were rendered inoperative and were stuck in the open position.

Captain Haight's immediate reaction to this emergency reflects professional airmanship, and excellent judgment on his part. By saving a valuable fighter aircraft, he is worthy of the ADC "We Point with Pride" award.

AFTER BURNING

Address your letters to The Editor, INTERCEPTOR, Hq ADC (ADCSA-E) Ent AFB CO 80912
To be published, your letters must be signed,
but names will be withheld upon request.

101 CRITICAL DAYS

Your "101 Critical Days" article on page 3 of the June 1968 ADC INTERCEPTOR was most refreshing. If we could divert the time and energy that is used to fill in the baskets with ground safety posters, "harangues," guidance, and what have you, we'd probably make some progress.

Safety is an attitude, be it ground or flight safety. Safety is the safety-oriented NCO supervisor, reaching and rubbing off his safety attitude on his new young heads. Safety is personal contact from commanders down to the lowest airman. Safety is the positive viewpoint of working daily on prevention. There are no "101 Critical Days." I personally despise that slogan. Every day is critical. "365" critical days—annually—would be more meaningful.

Your last paragraph on who you'll lose in ADC is accurate, and most likely is the world-wide Air Force statistical picture. It's the world-wide civilian picture, particularly in the USA, isn't it?

As you can see I'm safety minded. I don't particularly care about the statistics, the drum beating, etc. I do care about my people and my family. I'll do anything possible in the squadron and in my family that might prevent the needless tragedies that can, and do, occur.

So, I admire your article. You are speaking to the troops, not down to them. You are calling a spade a spade and they will appreciate you for it. So far, I've never met anyone who intended to commit suicide in an airplane or a car. If we face facts, lean less on reams of paper and more on personal contact, we'll sell this needed safety attitude.

Lt Col George H. Tully
Commander
1868 Facility Checking Sq
APO New York 09332

***Thanks for the encouragement, and we agree that every day of the year is critical to the safety business. Relax your safety attitude for a minute, and you're dead!**

MORE ON 101 CRITICAL DAYS

We just received the June issue of INTERCEPTOR in Geneva and on opening it I was struck with the subject article that sounded unbelievably realistic. We like your approach to this safety game. Keep that rate going downhill.

P. K. Higgins
Lockheed-California Co.
Geneva Office
1 Place Longemalle, 6me
1204 Geneva, Switzerland

***'Nuff said.**

FROM NAAIS

Personally, I want to thank you heartily and congratulate you on the NAAIS article in August's INTERCEPTOR. Your presentation of the meaning of the School and what we're trying to do is incisive and clear. Your interpretation of the School's purpose is entirely correct and excellently portrayed.

The thoughts expressed in your article should have value for anyone concerned with aviation safety, and it should be read by all with attention.

Speaking for the NAAIS staff, I would like to say simply: thanks to you and the editors of INTERCEPTOR for an excellent job on our behalf.

Rudolph A. Doering
Dean
National Aircraft Accident
Investigation School
Oklahoma City, Oklahoma

***The Aviation Safety family is a big family.**

WHY NOT TO OSAN?

To begin with, how are you and good old ADC these days? A-OK, I hope.

Now to get to the nitty-gritty. Sir, if it is at all possible, we here at Osan would like to be added to your distribution list for INTERCEPTOR. I have talked with two of our safety people in the Division and they are both ex-ADC types, and they said they had written to ADC requesting copies, but had no answer.

As you know we have an ADC Fighter Interceptor Squadron here at Osan, the 48th from Langley, and we are quite sure they would like to be able to read INTERCEPTOR and keep up to date on items/events back in ADC.

Of course, personally, I, as an old ADC type (ex-member ADC ORI team) like to keep up to date also, as I am hoping to get back to the Springs.

Any consideration you might give to this request would greatly be appreciated. One last item: If possible we would like to get 25 copies per month, and you can mail them to the following:

Hq 314th Air Division (BSA)
APO San Francisco 96570
SSgt E. W. Kinnecom
NCOIC Admin, Commander's Office
Hq 314th Air Division

***The copies are on their way. We are sorry for the delay.**

ON THE HIGH SEAS

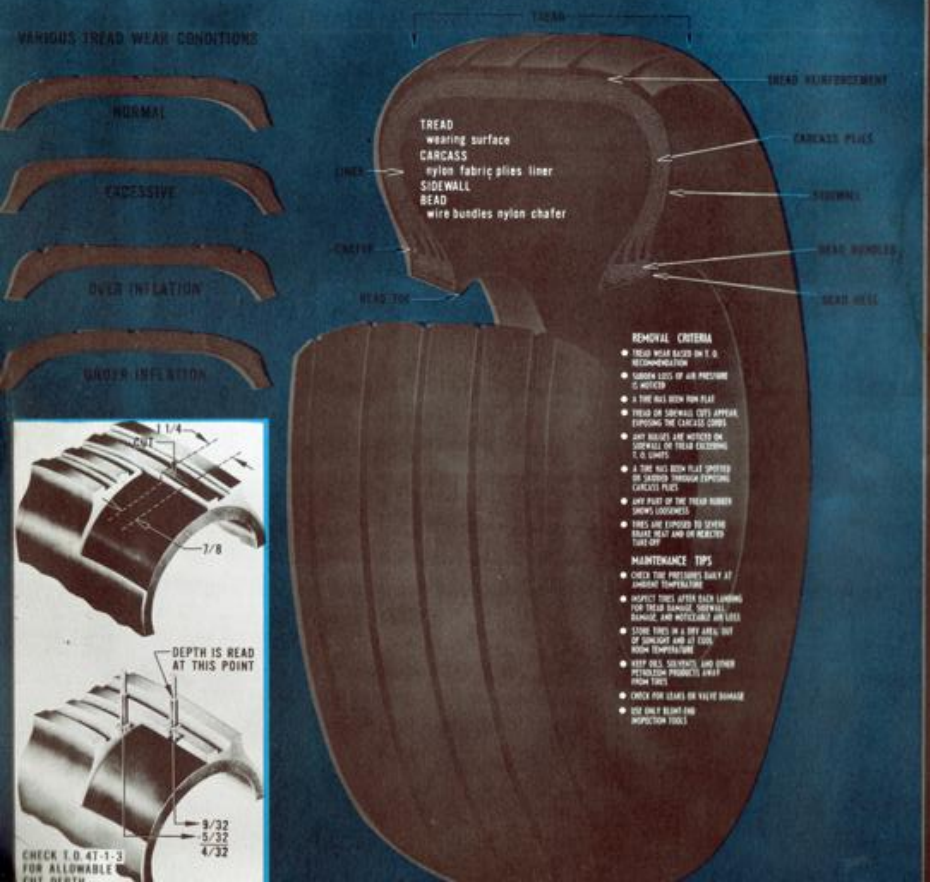
Commander Brown has been providing me with his copy of INTERCEPTOR for use in the Aviation Safety Program aboard USS Intrepid. Recently he suggested that it would be better to mail them directly to the Aviation Safety Officer.

Rest assured that your fine safety magazine is widely read aboard Intrepid.

Cdr R. A. Wigent, USN
USS INTREPID (CVS-11)
FPO New York 09501

***Safety on land, sea, and in the air is our motto.**

AIRCRAFT TIRE MAINTENANCE CHART



Did you know?

THAT AIRCRAFT TIRES AND TUBES ARE MADE FROM NATURAL RUBBER AND NATURAL RUBBER WILL LEAK AIR. ALLOWABLE LEAKAGE IS 5 PERCENT IN 12 HOURS. WHEN LEAKAGE EXCEEDS 5 PERCENT DETERMINE CAUSE.

THAT MOST ALL AIRCRAFT TIRE BLOWOUTS ARE CAUSED FROM UNDER-INFLATION WHICH GENERATES HEAT THAT DESTROYS THE NYLON MATERIAL IN TIRES.

THAT TIRE MAINTENANCE PERSONNEL ARE KILLED AND INJURED EVERY YEAR USING HIGH PRESSURE AIR SOURCES (OVER 500 PSI), ALSO THAT MOST AIRCRAFT WHEELS WILL BURST BEFORE THE TIRE, FROM HIGH PRESSURE AIR.

THAT AIRCRAFT TIRES ARE DESIGNED TO CARRY ENORMOUS LOADS ON INTERMITTENT SERVICE BECAUSE THE TIRE DEVELOPS AN INTERNAL TEMPERATURE RISE AS IT ROLLS ALONG THE GROUND UNDER LOAD. CONTINUED OPERATION OF AIRCRAFT TIRES UNDER HIGH LOAD WILL CAUSE HIGH TEMPERATURE RISE THAT WILL WEAKEN THE TIRE CARCASS. IT IS ESSENTIAL THAT SERVICE BE INTERMITTENT TO PROVIDE COOLING PERIODS. A NORMAL SERVICE CYCLE IS APPROXIMATELY 12,000 FEET TAXI AND TAKEOFF ROLL OR LANDING AND 12,000 FEET TAXI.