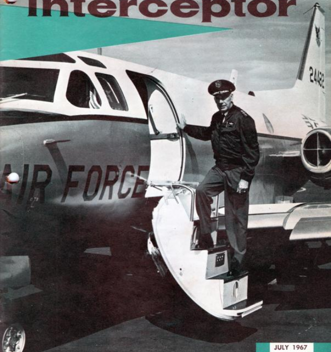
Interceptor



JULY 1967

CHANGE OF COMMAND . . see page 16

FOR THE MEN RESPONSIBLE FOR AIR DEFENSE

Interceptor

volume 9
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Air Defense Command
Lt. Gen Herbert B. Thatcher
Commander

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spotlight

A long time ago, "the good old days" were called "these trying times."

departments

special features

Hq ADC Field Printing Plant
Ent AFB, Colorado

OUR COVER

We salute Lieutenant General Herbert B. Thatcher upon his retirement. We regret that he must leave us.

memo
from the CHIEF OF SAFETY

Corrective Actions, Fact or Lip Service?

I've been in the inspection business, the materiel business, and now the safety business, not to mention having commanded five different groups and three different wings. I've seen and tried to analyze many inspection reports of all types and, specifically, the answers to these reports. Sometimes commanders and supervisors have red flags waving all around them, but, due to lip service or camouflage established by subordinates, these flags are never seen.

Inspections (or call them what you want) may be: routine, assistance, staff visit, Operational Readiness, Capability Inspection, Safety Survey, or possibly as a result of Congressional inquiry after a major aircraft accident.

The findings of an inspection team or teams, as well as certain reports, frequently flag problems and pinpoint areas of concern. These problems must be corrected and corrected now, or like a cancer, they will become enlarged. Too frequently, however, the supervisor is too engrossed with everyday headaches. He does not take the time to analyze the many indicators of trouble or the replies to the discrepancies.

When a unit has had troubles, we frequently find that various reports were answered with the widest brush possible; answers such as strong guidance, specific recommendations, increased surveillance, better supervision, centralization of controls, strong corrective action and follow-up, and positive direction.

Occasionally, after the dust has settled following a series of unsatisfactory inspections of a unit or after an aircraft accident, we grope through the seemingly endless reports in an attempt to pinpoint the cause or causes of the unit's trouble.

COL. OLIVER G. CELLINI

If your unit has received numerous write-ups by visiting firemen or has been experiencing a high abort rate, has a series of maintenance malfunctions in any one particular area, something, somewhere in your system, is radically and dangerously wrong. Here is where you apply "Increased Surveillance" and you apply it immediately at the source. It's possible that torque wrenches are being displayed, but not really used. It's possible that your high level experienced maintenance people are too far removed from the business end of the wrench, or the airplane that's going on the next mission. It's possible that the aircraft maintenance forms are being checked for neatness and compliance with Air Force writing, but not analyzed for context or continuity of long term continuous write-ups. It's possible that too much complacency exists. It's possible, then, that you're going to have a major aircraft accident within your unit in the near future.

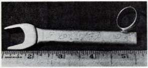
Provide the strong guidance, the increased surveillance, the corrective action, the follow-up, the positive direction, and the specific recommendations by seeing that corrections to discrepancies have, in fact, been accomplished. I can best sum this all up by saying that your Number One job is seeing that others do their job, and not just give you a lot of lip service.

HOT LINE

PARACHUTE HAZARD. During a 30-day parachute inspection, one base PE section found 42 dual housing clamp assemblies broken at the neck. The broken clamp causes two sharp edges that could prevent the rip cord pins from clearing the latching loops, during operation of the automatic release. In effect, this would negate automatic activation and could cause a fatality.

The cause was determined to be from parachute abuse by aircrews while the chutes were prepositioned in the aircraft. The abuses were listed as kneeling or sitting on the chutes. Personnel were observed dropping chutes from the aircraft during equipment on and off loading. In addition, chutes were strewn around the aircraft and mishandled during flight.

We recommend that you start an education program on chute care for both aircrews and, surprisingly, for personnel who load the equipment on and off the aircraft. It has been noted that even our own PE techs get careless in chute handling.



RING WEARERS BEWARE! AFM 127-101 issued a warning about people who wear wristwatches, rings, or identification bracelets while working around machinery. The Manual tells us that such items may make electrical contact and result in injury to the wearer. The photograph, courtesy Approach Magazine, gives pictorial proof as to what can happen to ring wearers when they disregard sound advice.

GLOVES DO HELP! During a routine cockpit check of circuit breakers in the TF-102A, this one was found in the open position; and when placed in circuit, it spit fire causing the burn shown on the glove. The fortunate wearer of the glove had only a very slight second degree burn at the base of his ring finger.

LAST CHANCE INSPECTION. The pre-takeoff check—where qualified maintenance personnel check the airplane over just before taking the runway—has paid some large dividends to the units who have adopted the system.

The INTERCEPTOR Magazine ran an article in the September issue of 1965 that outlined the application of this excellent procedure as used at Perrin AFB. A reprint of the article will be made available to those that desire it.

A recent paper by Colonel J. W. Bradford, Chief Aerospace Safety ANG Bureau, entitled "An Ounce of Prevention", expertly sums up the results to date of how the end of runway pre-takeoff inspections have "prevented aircraft in-flight emergencies, potential accidents, and in addition have instilled in the pilot added confidence in his aircraft." Some of the results were as follows:

108 Tac Ftr Gp, New Jersey ANG, flying F-105s. Have used the system over two years, had 73 rejects including 45 hydraulic leaks, 15 cut tires, and 4 fuel leaks.

539 FIS, ADC (F-106). On 21 October 1966, one F-106 was inspected just prior to taking the active. The inspection crew noted excessive smoke from the oil breather and notified the pilot to return to the flight line. Investigation revealed that the engine fuel oil cooler had ruptured allowing fuel to enter the oil system. This aircraft may well have been saved.

The Tactical Air Command has made the pre-takeoff inspection mandatory for their active fighter units. Over 1,100 "rejects" occurred last year.

Colonel Bradford's paper had this to add: "Our question to Commanders is not—How can you afford the manpower to adopt this procedure?; the real question is—How can you afford not to?"

NO old bold pilots

The flight started out as any other mission the pilot had flown. He was briefed for a local navigation flight. After one hour and forty-five minutes of flying time and at a distance of 100 nautical miles north of home plate, the pilot suddenly experienced utility hydraulic system failure. With the failure he elected to return to base. The gear was lowered by the emergency system and the jock elected to fly a precautionary landing pattern to the active runway. The aircraft touchdown was normal at about 1350 feet down from the approach end. As the nose wheel was being lowered to the runway and the drag chute was being deployed, the right main tire failed at 1500 feet. Once the tire blew, the aircraft started to veer to the right and left the runway at the 3200 foot marker. Now that the plane was rolling over unprepared surface, the nose gear failed as it crossed a three foot rise in the terrain. The aircraft continued to veer to the right and came to rest at the 5000 foot point, 375 feet right and 110 degrees from the runway heading. There it sat with its nose wheel folded back, the left main gear folded in, left tip tank crushed, pitot boom torn off, and nose section buckled. Also the right tip tank damaged, canopy blown, and right wing damaged. Yes, that's right—there lay a major aircraft accident which was only a precautionary landing a couple of minutes ago.

This scene is not too unusual except for one thing. Even at first glance one may not notice what is missing. Among all the blue cars around the aircraft there was not a fire truck anywhere around. Upon checking to see why one wasn't there, we found out they didn't know that anyone needed them. We said that that was pretty stupid since everyone knows that when an aircraft makes a precautionary landing, the field should look like a Christmas Tree with red lights flashing all over the place. The crash rescue people all nodded their heads in agreement with us. Well, of course, our next question was the obvious one — if you people all agree with us, why weren't you there on the side of the runway when the aircraft came in for its landing? We had guessed the answer before we ever heard it. The pilot didn't declare an emergency with anyone or he didn't tell anyone he was making a precautionary landing and wanted the crash people to stand by.

What's wrong with asking for some equipment to stand by for us when there is a possibility, remote or not, that we might need a fire truck? Well, that's a real difficult question to answer when the aircraft is a pile of tangled, burning wire and aluminum. It would really ruin our whole day for us if we happened to be in this mess and the only one who could get us out was sitting in the fire station playing ping pong because no one had anything for them to do.

What, then, makes pilots reluctant to declare an emergency or ask for the fire trucks to standby while they make a precautionary landing? Two things we can think of right off hand that may cause our problem are first, the pilot feels it is a sign of weakness to ask for help, and second, most people don't understand what crash rescue is for.

Let's look at these two problems, one at a time.

First comes the pilot. For some strange reason most pilots feel that it is a sign of weakness to request the tower to notify the crash people to standby for a precautionary landing. If a real, bona fide emergency exists such as an engine fire or we need a runway foamed because we can't get our gear down, then no problem exists at all. As a matter of fact we recheck several times to make sure everyone from the chaplain to airman no class knows we have an emergency.

The question still goes unanswered as to why pilots don't want to ask for a little cushion or insurance which can move the odds a little more in our favor when we are in a situation which increases the risk of a landing accident. Are we afraid that we might break up the ping pong game the old firehouse gang is playing, or that they will be miffed at us for going out of their nice warm building into the 30 below zero cold outdoors?

One thought which always crosses our minds when we talk about people who ask for help is what will the other guy say? Are we afraid that we will be kidded over a Friday night beer in the stag bar about asking for help? Especially when once we land and see that nothing did happen and we find that there was no need for the parade of fire trucks which only draws attention to us. Does not asking for help make old Joe a better pilot than the rest of us are, or is he just a little too proud (stupid) to know when to ask for assistance?

What about when the result of the board which states primary cause was pilot factor and that he should have asked for crash rescue, but didn't? Who is the brave one now when we find out that by admitting in the air we need help, we could have saved lives and property? The only thing required was a small swallow of pride and things could have been changed.

To drive a fire truck out to the runway and follow a landing aircraft are not difficult things to do. If everything goes well and we find that the trucks are not needed, all we have to do is call the tower and tell them that the emergency has been terminated and they can call off their fire truck parade. Seems to us that this is a far better approach than to not have them when you want or need them badly. Chances are you won't get them in time if they have to drive two miles to get to you.

Maybe we don't know exactly what crash rescue is or what it can do for us as pilots. First of all, let's see if we understand what the base fire department function is. It is a service organization. "Service organization" is a large name to live up to—to serve any and all—but since this is their job, they must be called or notified before they can serve.

Without going into detail of their services, briefly some of the things that they can do on the installation are as follows:

- Rescue of personnel involved in aircraft and fire incidents.
- Fuel spill control.
- Aerospace vehicle standby.
- Training to firefighters.

The list could continue on and on. If someone is really interested he can check AFM 92-1 for a full description of fire protection program procedures.

Not only are these people used in the role of fire-fighting, they are usually qualified in the ejection systems of all aircraft assigned to each particular

Crash Rescue can be a welcome sight.

base. They continue to have classes to refresh these people in the methods of getting the pilot out of his busted-up aircraft.

Maybe this doesn't impress you, but when you consider that any fire surrounding an aircraft can be expected to produce a temperature of 1300° to 1800° F. inside the aircraft within 45 seconds (based on a series of tests conducted on aircraft fires) this gets your attention in a hurry.

OK, what happens when we declare an emergency? Well, generally we will receive priority over other landing traffic. Also the crash rescue equipment should be provided automatically. If the emergency is not declared you may or may not see crash equipment located along the side of the runway.

Now, do we declare an emergency whenever something doesn't work and we abort the prebriefed mission? Not necessarily, we may have lost only a piece of mission essential equipment such as a radar scope going blank or the SIF is inoperative. Just because we can't complete the mission doesn't mean that the flight terminates in a precautionary landing. If safety of flight is not involved, of course there is no reason to call out the equipment.

However when we do make a precautionary landing of any sort, there must be something wrong with the aircraft. So since we have determined that something is wrong, why not stack the deck in our favor? Call out the crash/rescue people.

We agree that no one can write a hard and fast rule as to when we should or should not take advantage of all the help available to us. If they could, someone would have already written it and someone else would have added a supplement to it. But when we don't know if we should call the trucks out or not, give them a call.

What have we got to lose except our life if we didn't call and did need them? ★

SMILARS

by **MAJ. FRANK R. DAVIS** / *Future Developments Division • Air Force Communications Service*

SMILARS? I can hear the questions now. Is it something that you eat or rub on? What's it doing in a magazine for ADC fighter pilots? All I can say is that if the rest of you in ADC are as fast in shooting down the bad guys as your Engineering Editor is in grabbing a person to write a story for him, then we are in good shape.

I may as well strip myself of the only bit of one-upmanship that I have and tell you what SMILARS stands for. It's Standard Military Launch and Recovery System. This was the subject of a recent meeting that some of us from Air Force Communications Service (we are the ones in the Air Force who operate the nav-aids and supply the tower and GCA operators) had with some of you at HqADC. Our purpose was to talk over some of the operational needs of the flying commands that should be considered in a future landing system. I'm sure that some of you old heads are saying that it's about time, as you haven't seen much change in the last ten to fifteen years. It so happens that there is considerable activity in the Air Force directed towards trying to improve your chance of getting back on the ground after a mission when the weather is down around your socks. Your editor thought it would be worthwhile going into some of these activities, and let you in on the big picture, as they say.

It all started 30 years ago when some intrepid aviator made the first intentional unassisted solo blind landing. (It may have been that a few blind landings had been made previously — you know, close your eyes and hold what you have, or perhaps too much happy hour.) Anyway, it wasn't until WWII and the tremendous increase in military aviation that real advances were made in ground landing aids. Believe it or not, the present ILS and GCA are basically unchanged since then. I bet you believe it!

Now, how do I get myself from WWII to the present? I would li to do this by covering some of the deficiencies of the present system from the long term requirement point of view, take a look at how landing systems have developed over the years, consider what a military landing system should do, and finally, look at some of the current activities in the Air Force which are directed toward getting you back to Mamma safely. By considering these things, I hope you will have a bit more sympathy for the problems that make up the life of some desk jockeys. Or, if you like to take the dim view, what your lot might be if you don't keep up with the 5BX. One thing before I press on, SMILARS is a concept of operation, not a system, and later I will try to show how it fits into the big picture.

Getting back to our veterans from the brown shoe days, the deficiencies of the GCA and ILS as systems suitable for meeting our long term landing system requirements have been well documented (see the INTERCEPTOR for December 1965, January and April, 1966). This is reflected in our current landing minimums of 100 feet and ¼ mile for GCA and 200 feet and ½ mile for ILS. The accuracy of current radars, the human response time of controllers, and the response time associated with large aircraft make it highly improbable that these minimums will ever be lowered for GCA. On the civil side of the house, there are ILS facilities certified for Category II operations which involve a 100 feet decision height and 1200 feet RVR (Runway Visual Range). Beyond this there are plans for Category III operations where ceilings become meaningless and minimums are determined by RVRs from 1200 feet to 0. If you are good at mathematical progressions, you have already figured out that the present military ILS facilities are Category I.

While all this is swell about going to 0-0 on ILS, it requires much better equipment than we have today, and still leaves some deficiencies from the military point of view. One of these is documented very well in the INTERCEPTOR for December 1965 which discusses the GPIP (Glide Path Intercept Point) problem. The gist of the problem is that if you follow the glide path down to where you start your flare, you will touch down quite a bit past the GPIP with lots of runway behind you. And you all know that runway behind you is as useful as rank among Second Lieutenants. In order to get some more usable runway ahead of you, some pilots have been known to go through a maneuver called "duck-under", where one departs from the straight and narrow glide path when visual in order to set her down on the end of the runway. This can result in very high sink rates that can only be controlled by the rapid application of power. If the power catches up with your Safety Officer's prayers, you walk away from another one.

Because of these and other reasons, it is apparent that neither GCA nor the present ILS will be our primary approach aid for future planning. If neither of these, then some future instrument landing system will have to take their place. In order to avoid confusion between the present ILS and a future instrument landing system which is not yet defined, we, at AFCS, coined the acronym SMILARS to refer to the latter. (Have you ever wondered what would happen if some day everyone in the Air Force woke up and forgot what all the acronyms stand for?)

During the period from the last great unpleasantness to the present, the aviation and avionics industry and the military have not been unaware of the shortcomings of our standard approach systems. A recent Air Force sponsored study shows that there have been at least 43 separate and distinct landing systems proposed or developed. These have ranged from large fixed systems for permanent installations to small man pack systems for tactical deployment. In general, these systems have been developed from whatever technology was available at the time in order to meet one specific portion of the total landing system requirement. The developers of these systems, whether the military or industry, have hoped that their system would gain dominance over the others as a standard system. This was the case with the ILS and GCA, and we have been living with their deficiencies ever since. I don't mean to say that there have not been any worthwhile contributions made to the landing system technology by all these systems. In all probability the technology and techniques for meeting our future requirements are contained in some of these proposed and developed systems.

It might be well to digress for just a moment and describe one of these systems. The system that is described is called FLARESCAN, and is chosen not because it represents the ultimate in new technology, but because it illustrates a technique that is somewhat a cross between GCA and ILS. In fact it is not even the latest system worked out by its parent company. FLARESCAN is a scanning beam microwave system designed to provide flare guidance in conjunction with the present ILS. The transmitter is located beyond the normal ILS touchdown point. Its antenna radiates a fan-shaped beam which is narrow in the vertical dimension and broad in the horizontal. This beam is scanned vertically by mechanical oscillations of

Category III - "Look, Ma, no hands!"

the antenna. Pulses are coded on the beam to indicate the instantaneous elevation of the beam from 0° to 20°.

If you will think back to your high school geometry, you will recall that if you know two angles of a triangle and the length of the included side, you know all there is to know about that triangle. This is the information you would know on FLARESCAN. One angle is the fixed ILS glide path. The other angle is provided by decoding the FLARESCAN signal in the aircraft. The length of the included side is the fixed distance between the ILS GPIP and the FLARESCAN transmitter. Now that we have all this good information, what do we do with it? Simple - you just fly the ILS down to the proper height for flare initiation (determined by the intersection of the ILS glide path and a specific FLARESCAN angle) and then a programmed flare is initiated to a lesser terminal angle on the FLARESCAN (usually about 0.5°). As the receiver antenna is above the wheels of the aircraft, the touchdown will occur between the ILS GPIP and the FLARESCAN transmitter.

You probably have noticed a couple of things about this system. First, a new receiving set is required in the aircraft. In all probability this will be the case for any new system, as the only thing that does not require another receiver is GCA, and that has already been ruled out as our future standard. Secondly, the problem of touching down too far down the runway has not been solved. This is not the fault of the FLARESCAN, but of the present ILS GPIP. If a reliable guidance system is available to touchdown, then the GPIP, or perhaps it would be better to call it the initial aiming point, could be moved out towards the end of the runway or onto the overrun. Again, let me say, FLARESCAN is an early scanning beam landing system and many improvements have been made in latter ones.

Getting back to the main subject at hand, if this multitude of landing system developments has not provided one which meets all the military requirements for a standard system, just how is this going to be developed? In order to get a feel for this, I would like to discuss some of the aspects of the military landing problem.

First of all, a Public Law that went on the books in 1958 provided that the FAA would develop common items for civil and military navaids and air traffic control. Now, the standard international civil landing system is the good old ILS, and we have already stated that this will not be our future standard. This is due to the fact that we have some problems and requirements that are not shared by our friends who fly with the "Coffee, tea, or milk?" girls. This can be best seen by considering the large spectrum of aircraft types that must be recovered in a large number of different situations. These range from bringing a VTOL aircraft into a rice paddy to landing a YF-12 at Plush AFB. As the requirements for landing systems are not common to civil and military aviation, it is up to the military to develop its own standard system which will meet its peculiar requirements.

As was pointed out in the previously mentioned study, few or none of the 43 landing systems listed had any commonality of modulation schemes or frequency. While each system more or less met part of the total problem, it is impossible to have different noncompatible systems for every situation. The Air Force position is that a future system must have a standard "signal in space". In addition, this system must be "modular" both in the air and on the ground. This means that the small basic transmitter placed in the rice paddy to recover the VTOL would radiate the same basic signal into space as the big, poured-in-concrete system at Plush AFB. Granted, the signal from the small one would not be as sophisticated as that from its big brother, but at least any aircraft equipped with a compatible receiver could operate on either.

In the same way the airborne equipment would vary according to the sophistication and requirements of the aircraft. Our go-fast boys might have a receiving set which would include a high speed computer that could figure optimum approach profile depending on aircraft configuration, weight, and on the terrain in the approach area. Meanwhile, our put-put drivers might have an austere receiver which gives them a manual capability similar to that which we now have on ILS. The result of this concept is that there will be a large matrix of operational capability and minimums which will be determined by both the ground and airborne equipment. In all likelihood, the sophisticated aircraft will perform no better on the minimum ground equipment than the austere bird; nor will the austere aircraft be able to perform any better on the sophisticated ground equipment than he can on the rice paddy job. Did I hear someone say "say again"?

So far I have only mentioned the problem of getting the aircraft on the ground in lower minimums than now exist. The total problem is much greater. The relationship between the pilot and his instruments and automatic control system is an important facet. In addition, the total terminal complex, including transition from enroute navigation, approach and landing, and air traffic control communication needs to be studied. It may turn out that primary utility for a new system will not be limited to getting down in lower minimums, but will include more reliable landing under any weather conditions. This is extremely important when you consider problems of recovering a large number of aircraft in a short time when they are all screaming "minimum fuel".

Now, what is being done in the Air Force to develop this much needed new system? You can easily see that it is going to require a very large effort. In fact, one writer has compared the effort required to do this with that required to develop a new aircraft (or aerospace vehicle if you like the "in"words).

At the present time, there is much exploratory work being done by the Air Force Flight Dynamics Lab at Wright-Patterson AFB in conjunction with the Instrument Pilot Instructor School (IPIS) to define and develop the proper relationship between the pilot and his aircraft for all weather landing. One of the more significant aspects of this work is that they believe in keeping the pilot actively in the control process. They feel that the pilot can make an important contribution to the weather and visual landing process if he is given the proper instrumentation and control system. This is contrary to the philosophy of those who feel that the pilot cannot contribute anything, and his role should be relegated to that of monitoring a completely automatic system. "Hear-hear" for the Flight Dynamics Lab and Instrument Pilot Instructor School!

Hq. Air Force has also recognized the effort that will be required to develop a new system. In order to get on with the program, they have directed that a Systems Program Office (SPO) similar to that used for new aircraft development be established in Air Force Systems Command.

Now, back to SMILARS. As I previously said, this is a concept of operation at the present time. In order to develop this concept, AFCS has been visiting the flying commands in order to get a feel for the operational concepts and requirements for the users. When fully defined, this concept will provide one source of information for those people who will have the responsibility for turning concepts into hardware. As the name implies, the SMILARS concept encompasses the whole terminal problem, including transition from enroute navigation, approach with optimum spacing, various levels of landing capability, go-around, and a launch capability.

I hope that I have been able to convey to you some of the activities which are going on in the Air Force to improve our future capability to perform the mission that we have. Please remember that SMILARS is an operational concept. The next time your friendly AFCS controller asks you what type of approach you want, don't say SMILARS. It would only confuse him. ★

ABOUT THE AUTHOR

Major Frank R. Davis is the Chief, Flight Facilities Branch, Future Developments Division, at Hq. AFCS. Major Davis was born in Peking, China, and calls Glendale, California his home. He attended High School and Junior College there, prior to entering Aviation Cadets in 1955. After pilot training, he spent six years in ATC as a flight instructor in T-33s. Next, he spent four years in Electrical Engineering studies with AFIT; two at the Residence School at Wright-Patterson AFB for the BSEE, and two at the College of Aeronautics, Cranfield, England, for its diploma (D.C.Ae.) and an MSEE. Major Davis is now serving in an engineering slot at Hq. AFCS, and flys T-39s in his spare time.

Flight Surgeon,

The call came into the Combat Alert Center that an aircraft had crashed on base. In the investigation that followed, facts about the pilot were uncovered that would chill your spine. There were many statements such as "He seemed a bit strange to me from the time he arrived at the aircraft. His walkaround was the slowest I've ever seen. Going up the ladder he forgot his parachute. He missed the start twice and then jumped the chocks on his runup. By this time I was quite concerned. Then, when he pulled out of the chocks, he turned the wrong way and had to make a 180° turn to get to the runway. I told my flight chief that we should call him back. But by the time we got on the radio, he had already taken off."

The other pilots on the mission and the ground controlling agencies all had a similar story. They said that instructions had to be repeated an abnormal number of times and that the pilot's transmissions were unintelligible.

The most amazing story came from the pilot's widow. She said that her husband had passed out a number of times for no apparent reason. He told her that on one occasion he passed out in the air and had recovered the aircraft some 500 feet from the ground. On the night before the accident, he had bent over to pick up his daughter and promptly collapsed on the floor. Further conversations with his widow indicated that his reasons for not seeing the flight surgeon were probably mer-

Sick call held in the 5th FIS Ops Building provides squadron personnel quick access to medical advice when they need it.

Doctor & Aviator

cenary - recently incurred debts, loss of flight pay with no flight pay insurance. The accident took care of those problems since he had plenty of life insurance.

The above facts and many others came out of the accident investigation. One question was really difficult to answer: Why did this pilot not go to see a flight surgeon? Perhaps the answer lies in the fact that it was difficult to get off the flight line. Or that there was no personal contact with the Squadron flight surgeon. If each time we see a flight surgeon he happens to be a different person than the one we saw last month, it becomes very impersonal and everyone loses interest.

One of the squadrons within ADC has beaten the system. This is the 5th Fighter Interceptor Squadron. They have an office for their "Doc" down in the 5th Ops Building. This provides their "Doc", Captain Don R. Cowick, personal contact with all the pilots, the maintenance people, and all other members of the squadron.

Doc Cowick is a flight surgeon in the true sense of the word. He has personally flown with every member of the squadron, not just once, but a number of times. As a matter of fact, "Doc" Cowick flys approximately 30 hours per month (he is affectionately called "the fastest flight surgeon in the North"). In doing this he becomes aware of each person's ability and personality. In so doing, the detection of change in individuals is much easier.

The "Fastest Flight Surgeon in the North," Captain Don R. Cowick.

Informal talks with the aircrewmen can provide a flight surgeon information that would not be available any other way.

Personal equipment is another responsibility of the flight surgeon.

One of the comments "Doc" has about fighter pilots seems to reflect an accurate picture about them. He said, "A fighter pilot is where he is because he likes what he is doing. He's intelligent because he wouldn't be where he is if he were not."

The Doc goes on to say, "Probably the worst thing a fella can do is to go out and strap himself to a fighter aircraft two or three times a day. I know, because I do this with them. Some of the pilots medical problems are developed here, too. Because of this love of flying, the flyer many times presses his physical capabilities to the limits - I mean fatigue, lack of sleep, sometimes overindulgence - but still goes out to the cockpit for another mission."

As a result of this close contact both on the job and socially after hours, the Doc feels his association allows him to provide, in many instances, preventive medical assistance prior to it becoming a serious problem.

Neither is "Doc's" work limited to just providing medical aid. He is responsible for the "Human Reliability Program" in the squadron. He talks to every new assignee to the squadron. The personal touch, or if you will "bedside manner", aids in the feeling of here is someone who is interested in me as a person. That feeling that I can talk to him and he is interested in how I feel, and what I have to say.

The Doctor goes even one step further in that he provides a limited amount of dependent care for the squadron members' families. Again, this is another attempt at the personal touch and promotion of the feeling that someone is very interested in the health of the people in the squadron.

We can list several other areas of interest of this flight surgeon, such as Life Support, cold weather briefings, alert hangar facilities, food service in the squadron, and safety in general. It is amazing the boost a flight surgeon can give to some project which seems to bog down in the paper mill.

We all realize that because of manning, not all units are able to utilize the medical personnel as this squadron does, but we thought it interesting to note what can be done with the proper people.

It is quite possible that if the pilot we talked about in the beginning had had someone around who knew him and took a personal interest in him, he may well be among his living friends, and around to fly today.

60-16

sixty sixteen

AFM 60-16 (3 March 1967) came out recently as most of you probably know by now. We asked our Command Office of Prime Responsibility, ADOOP-SB (Operations Support), to list the more pertinent changes to the manual, along with their comments. ADC's supplement to this manual is in the printing plant.

Everyone will agree that putting 60-16 into manual form was a great innovation. The test of this is the ease of finding answers to the questions on the annual instrument exam.

It is becoming obvious that 60-16 is incorporating more and more International Civil Aviation Organization (ICAO) Standard and Recommended Practices (SARPs), Federal Aviation Regulations (FARs), and military directives covering operation of Air Force aircraft. For example, the life support portion of AFM 60-1 is now in 60-16.

2-3b NOTE: When MAJCOMs authorize holding in lieu of an alternate airfield for remote or island destinations, the prescribed holding times are not considered a part of total planned flight time for the purpose of computing fuel reserve.

Comment: This is an important change for target pilots when they head out for Bermuda.

2-3c. Minimum Fuel. This term identifies a flight condition in which the remaining useable fuel supply may be needed to insure a safe landing in normal sequence with other traffic. If at any time the remaining useable fuel supply suggests the need for traffic priority to insure a safe landing, the pilot will declare an emergency.

Comment: Remember, declaring **minimum fuel** *does not get you a more favorable traffic position, it is only an alerting notice. If you need preferential treatment, then you should declare* **an emergency** *to get it. Another important point is not to wait until the fuel gage hits the magic number to reach for the mike button. Make your declaration when you first realize you are going to arrive in a tender condition.*

2-6b(2) Navigational equipment appropriate for the type of ground facilities to be used, and IFF/SIF equipment for all flights in positive controlled airspace. In the case of an inoperative transponder, ATC may, on request, immediately approve operation within a positive control area to permit flight to final destination (including preplanned intermediate stops), or to a field where suitable repairs can be made, or both.

Comment: This could be helpful. Instead of having to return to takeoff base or descend below PCA with inoperative transponder, you **may** *be allowed to continue to destination in PCA.*

3-3b(5) Flight plans for subsequent legs are filed with an FSS or through pilot-to-dispatcher (PTD) service where appropriate. See back cover page of FLIP Supplement for format when filing a flight plan in flight.

Comment: See next item.

3-3b(6) Before or as soon as practical after takeoff from any stopover point, the pilot will notify flight service of his ETA for the next point of intended landing. Notification may be made by or through the most appropriate means available.

Comment: Many helpful tower operators will ask for this when you taxi out. However, the responsibility is still yours if they forget.

6-3b(2) A portable radio capable of transmitting on appropriate emergency frequencies and operated from an independent power source . . .

Comment: This removes the requirement that the radios had to be buoyant.

8-2d NOTE: Crossing airways is not considered within airways. Where it is necessary to conduct *volume* training along or through airways, make prior arrangements with the appropriate ATC agency.

Comment: Clarifies this paragraph.

8-4b. Weather. Weather for the ETA at destination/recovery base must be at or above the lowest minimum published for an operational approach aid suitable for use by the aircraft concerned. (MAJCOMs may waive this when operational necessity dictates the use of a destination forecast to be below minimums if an alternate recovery procedure is established, i.e., the use of two or more alternate airfields or additional holding fuel, etc.) To provide a realistic time frame, forecasts will cover a period of up to 1 hour before to 1 hour after the ETA. NOTE: Variable ceilings and visibilities shown in the remarks portion of the weather sequence are supplementary information only and need not be considered for filing purposes.

Comment: Forecasts **will** *be ETA plus or minus 1 hour rather than* **may** *be.*

8-5. When To Designate an Alternate Airfield. Designate an alternate airfield on all IFR flight plans, regardless of weather, when filing to a destination at which radar is the only available approach aid. In addition, designate an alternate airfield if during the period 1 hour before to 1 hour after the ETA for the first point of intended landing, the worst weather is forecast to be less than 3000 feet ceiling and three miles prevailing visibility.

EXCEPTION: When operational necessity dictates use of a remote or island destination for which the designation of an alternate airfield is either impractical or impossible, MAJCOMs may authorize holding for a specified time period. In such cases, commands will establish weather criteria and recovery procedures consistent with sound flight safety principles.

Comment: This was an important change, 3000 and 3 rather than 5000 and 5. Reference the exception. This could be helpful when ADC deploys a target force to Bermuda.

8-6. Weather Requirements for an Alternate Airfield. For an airfield to qualify as an alternate, the worst forecast weather for the ETA (±1 hour) must be at or above the following: . . .

Comment: Must be forecast ETA plus or minus 1 hour, rather than just ETA. ★

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR DEFENSE COMMAND
ENT AIR FORCE BASE, COLORADO 80912

SUBJECT: Dedicated Personnel

TO: All ADC Personnel

During the last three years the Air Defense Command has experienced the lowest aircraft accident rates in its history.

An accomplishment of this magnitude does not just happen. It is the consummation of the efforts of a lot of hard-working people at all levels of command. It is to these people that I address my personal thanks for a job well done.

I leave you as a Commander, after thirty-five years of service, with the deep confidence and satisfaction of knowing full well that the defense of our country is in good hands.

I know that you will give the same dedicated support to Lieutenant General Agan.

Herbert B. Thatcher
HERBERT B. THATCHER
Lieutenant General, USAF
Commander

ORI

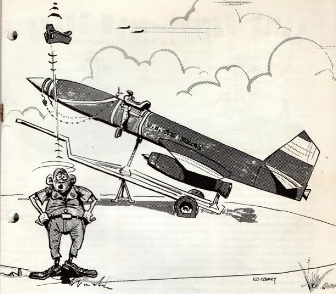
OPERATIONAL READINESS INSPECTION TEAM
HQ, ADC

TRAINING AND THE CIM-10B

Okay, you fighter jocks, sit back and relax a little because this month we're going to talk about another vital weapon system in our ADC bag of tricks, the BOMARC. We have had exceptional reliable, trouble-free operation from the BOMARC system for several years now, and we've had a multitude of very talented people with which to maintain the system. Unfortunately, time and personnel losses are taking their toll, and we have lost the versatility we once had. This brings us to the heart of a very serious problem area — TRAINING.

I would venture a guess that there isn't a commander or a maintenance chief who doesn't cringe at the thought of losing any of several key technicians, particularly in the electronics functions. However, I think part of the problem is already being solved. Headquarters personnel, operations, and materiel people are becoming very intimate with it lately. Their combined actions are resolving part of the problem, but the final goal can only be achieved in one place. That place is in each individual air defense missile squadron, and the tools will be the OJT and proficiency training programs. How good are yours? Have you analyzed your overall program lately to determine if it meets todays needs? How much actual on-the-equipment training are your troops really getting? Do they ever do any pure training on the missile, or is training just a by-product of a scheduled PE? Using a missile for training is legal, if kept within certain limits. Training isn't a glamorous thing, but it can be made interesting, and it is definitely challenging. I'm sure it will take some overtime, but the solution to the problem is well within each unit capability to achieve.

Another area of concern lately has been the employment procedures, for the BOMARC, used by our Direction Centers. TAC EVAL and other evaluation reports have shown that a lot of the troops up there in the DC don't fully understand the tactics and/or the capabilities and limitations of the BOMARC weapon. The FOM is usually expected to be a jack of all trades,

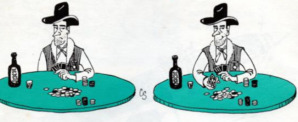


and, consequently, isn't allowed to apply his full efforts to his job. The CIM-10B is a pretty complex beast, and a good working knowledge of what it can or cannot do is not acquired overnight. If the commander is to achieve optimum use of this weapon in an air battle he must first give his FOM the time and the guidance he needs to insure that the guys in the blue room are trained to put them where they will count. Else all is for naught!

In brief, what I've been trying to get across is that training is a day-to-day, no nonsense business which insures a reliable, quality end product. It is inherent in the responsibility of each supervisor, at every level, to insure that he has an efficient, well-trained force with which to produce that end product.

TIMOTHY I. AHERN, Colonel, USAF
ADC ORI Team Captain

SAME GAME . . . NEW RULES



"King's X," cried the people, "We don't understand the rules, so we can't play the game!"

This is one of the cries from some of the people in the field about ADC Operations Plan 6-67, Operational Readiness and Capability Inspections, dated 1 April 1967. There is an annex for everyone to look at, but the one which seems to cause confusion is Annex E which deals with fighter units. To be more specific, there is a new scoring system called Airborne Weapons System Verification (Program Test). It was implemented throughout ADC on 1 April. This scoring system will be used on all future ADC ORIs.

The procedures for the scoring system are contained in ADC Ops Plan 6-67 (Operational Readiness and Capability Inspections) and ADC pamphlets 55-89, 55-101, 55-102, and 55-106.

Basically the major changes over the previous scoring systems used in ORIs are.

- To redefine the definition of an attempt (Weapons System Verification) so that ORI and daily radar sorties use the same definition.
- To score MA/MI success in conjunction with evaluator (WSEM, MSR, RME) success instead of separately.
- To establish statistically valid sample sizes and pass/fail scores for every type of weapon system and armament (primary/secondary), with the highest possible confidence in the result within the limits of available evaluators (WSEMs, MSRs, and RMEs).

This is all well and good, but why did someone decide to change the rules? Well, first of all the definition of an attempt was changed because previously ORI, Tac Eval, and routine daily radar sorties had used three different definitions of an attempt. In all three cases, the overall objective was the same, therefore the definition of an attempt should be the same.

Another change is what is meant by weapon system. This means the entire airborne interceptor system including the aircrew, electronics, AWCS, AWLS, airframe and engine. (Ground environment is not included.)

One more reason for change is the term "Weapon System Verification Attempt." This attempt identifies an interceptor loaded with evaluator(s) that has been committed to an airborne target and arrived at "first or only offset" or 10 nautical miles from the target, whichever is greater, as being considered as making a Weapon System Verification Attempt under SAGE/Data Link control. Under manual voice control, the verification attempt will be on the attack vector.

As usual, no rule holds for all cases, so we have a few exceptions that apply only when there are no other factors which would have resulted in an unsuccessful Weapon System Verification Attempt:

- The interceptor is broken off for flying safety, tactical decision, or ground environment error.
- The evaluator malfunctions and the malfunction is verified on the maintenance console or test bench.
- Evaluator tape/film is not available or is unassessable due to a malfunction in recording or processing.
- A WSEM breaks range lock because it is fired in heavy chaff or

SQUADRON A			
A/C	MA/MI	EVALUATOR	WS
A	MA	S	S
B	MA	S	S
C	MI	U	U
D	MA	U	U
E	MA	S	S
F	MI	U	U
G	MA	S	S
H	MA	S	S
I	MA	S	S
J	MA	S	S
	8/10 80%	7/10 70%	7/10 70%

SQUADRON B			
A/C	MA/MI	EVALUATOR	WS
A	MA	U	U
B	MI	S	U
C	MA	U	U
D	MA	S	S
E	MA	S	S
F	MA	U	U
G	MI	S	U
H	MA	S	S
I	MA	S	S
J	MA	S	S
	8/10 80%	7/10 70%	5/10 50%

ECM.

• A WSEM is fired without ROT in the F-101 only.

Note that only interceptors, loaded with evaluator(s), are considered attempting a Weapon system Verification, and that without evaluators the Weapon System cannot be verified.

What is a sucessful Weapon System Verification? This is an attempt which produces:

1. A WSEM tape, MSR film, or RME indicator, with all signals required for a successful evaluator result, *and*

2. A scope recorder with the steering dot assessed an MA in accordance with ADCM 51-89, 51-101, 51-102, or 51-106, as applicable.

All verifications which do not meet the above criteria will be considered unsuccessful.

As can be seen from above, evaluators (WSEMs, MSRs, RMEs) *are no longer scored in conjuction with the MA/MI* on aircraft loaded with evaluators. The basic reason for this change is that two squadrons, previously, could have the same MA rate and evaluator rate, but completely different true Weapon System capability. The chart shows only a sample of the number of WS verifications required to illustrate how MA rates and evaluator rates can be the same in two squadrons, when they really have different WS capability.

Each WS is considered to have two parts, Primary and Secondary, except on the F-89 and F-102, and separate tests are conducted for each on the F-101 and F-106.

The last major change was to establish realistic sample sizes for the number of WS verifications required for a statistically valid sample - to pass/fail, and to establish statistically valid pass/fail scores. In the past (previous ORI rules), the number of WSEMs, MSRs, and RMEs required for a pass/fail score was not statistically valid.

This change required considerable work and the final outcome was as follows: Past ORI results were reviewed and the mean (average) WS rate for each type of aircraft and evaluator was calculated. Based on the EWP, the aircraft possessed, and the type of interceptor, 90% confidence curves were drawn about the mean score for each type WS and armament. The ADC staff selected, as a pass/fail score, one standard deviation below the mean.

In order to be statistically valid, a scoring order for the aircraft to receive a WS verification must be selected at random and weapon launch systems (rails/racks) also selected at random. Random tables are provided in ADCP 55-89, 55-101, 55-102, and 55-106 for this purpose and instructions for selecting the aircraft scoring order and WLSs to be loaded are provided in the pamphlets.

Charts, representing the graph to each type interceptor and evaluator, are contained in the pamphlets. The critical sample size varies with each type interceptor, possessed aircraft, type evaluator, etc.

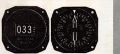
Aircraft scoring order and WLS loaded are selected prior to flying and given to the unit being tested prior to flying phase of ORI.

In most cases, the WS pass/fail scores are lower than the previous WSEM/MSR/RME pass/fail score since the WS pass/fail includes *both* MA/MI result and WSEM/MSR/RME result. Both must be successful for a successful WS Verification.

The new procedure should be a much more realistic test of squadron capability, and more valid than previous ORI tests.

The mean score and standard deviations and therefore the pass/fail scores will be adjusted accordingly, as new data comes in from ORIs conducted with the new rules. The test results will be programmed on a computer and new charts printed as required.

One standard deviation below the mean should result in the lower 16.5% of all squadrons failing to pass the WS Verification test and is therefore competitive. ★



Tacan Tips

by **TSGT. BOBBIE L. MASHBURN** *Quality Control NCOIC Test Flight Section 4600 Cam. Sq., Ent AFB, Colo.*

The Tactical Air Navigation system (TACAN) was developed to fill the gap VOR had created with improvements over earlier navigational aids. TACAN is only an aid, however, with a few precautions by the operator and knowledge of allowable tolerances, the confidence in this system can be improved.

Here are several techniques and operating procedures that can improve reliability and identify features that are often thought to be malfunctions:

• Prior to selecting transmit position on the control panel, allow for a warm-up period in the receiver position. The delay varies from 60 to 120 seconds for most of our airborne units. The transmitted aural signal of the ground station beacon identifier will indicate when delay requirements are complete. Failure to observe this precaution often results in damage to the high voltage portions of the system due to a defective time delay relay.

• Never select channels 6 or 66. These channels are identical frequencies of the IFF/SIF receiver-transmitter. Inadvertent selection of these channels may result in damaged filters and a damaged crystal detector in the receiver portion of airborne receiver-transmitter.

• All airborne TACAN systems will have an allowable tolerance for the bearing pointers and CDI. This generally will be two to three degrees. Always tune and check the set for known azimuth headings. Distance accuracy is considered to be ± 0.1 mile plus 0.2 percent of the indicated distance.

• Slight oscillations up to approximately 1/4 NM are normal for range indicators due to pulses generated by transmitter-receiver functions.

• When azimuth indications are 40 degrees or multiples of 40 degrees in error, a weak airborne receiver is indicated. Rechanneling the receiver to deliberately cause unlock gives the set another chance to lock-on properly. For a full search cycle function approximately 22 seconds are required. However, if the ground beacon identification signal is being received at time of lock-on, the set will automatically go into another search cycle.

• Antenna shadowing caused by a mountain range or other prolonged obstruction interrupts the signal. A memory circuit in the airborne receiver-transmitter can hold the indicators at their last reading for three seconds maximum for bearing and 10 seconds maximum for distance information.

• The ground system has 126 channels and will provide full service for over 100 aircraft on each channel. When the ground TACAN equipment is undergoing repairs which might cause it to transmit erroneous signals, its identification will be silenced. TACAN identifies itself aurally through International Morse Code every 37.5 seconds. Always listen for the beacon identification tone during flight.

• Station selections in flight no longer require the operator to return the function switch to "REC" from transmit-receiver position. Channelization relays within the airborne unit disables the transmitter during channel changeover.

• The majority of our airborne TACAN systems presently utilized permit full power operations up to 60,000 feet. This is accomplished by use of encapsulation of rectifiers, capacitors, and resistors in high voltage insulation. However, in conventional jet aircraft you may often find the older "B" series TACAN receiver - transmitter. The "B" unit employs a barometric relay which automatically reduces the power output by one-half at altitudes of 30,000 feet. This feature affords protection in the unit from "voltage arc-over" up to altitudes of 50,000 feet. Always check the aircraft AFTO Form 781A for entries reflecting this condition.

Say again all after 'ATC Clears'

Was it your fault or the controller's fault? It doesn't matter whose fault — it's still going to take up valuable radio time to get the clearance straight. And it has to be correctly understood and copied, or the safety of aircraft and lives is in jeopardy.

There are times when a pilot would actually believe the controllers receive a commission every time they can make the pilot plead "say again" or "please read back, but more slowly". To be candid, they do have the edge, but on the flip side of the coin is the situation where the jock scribbled his impression of the clearance, and then during the readback, finds out he can't decipher his own IFR shorthand, if he has one. And if he doesn't have one, he's already in trouble. Stenographers use Gregg or Pitman shorthand, SAGE controllers have their symbology, so why shouldn't pilots have IFR shorthand? The fact of the matter is most pilots have developed their own system of IFR shorthand, and, if it works for them, all is well and good.

However, it was recently brought to our attention that the Hamilton AFB Instrument Ground School used to teach a short course in IFR shorthand in conjuction with their Instrument Ground School. We called Mr. Al Mankedick, who runs the school, and he explained that to be effective, the symbols must be learned and then practiced until they're second nature.

To do this, he used a series of tapes with different IFR clearances on them. They were given slowly at first and towards the end of the course at, or faster (if that's possible) than, the actual clearances are delivered over the radio.

Many fine comments were received on this course from those that attended.

We thought we'd pass the symbols on to you with the hope that it may aid you in that eternal battle against the headlong IFR clearance.

IFR SHORTHAND

↑	CLIMB	A	AIRPORT
↓	DESCEND	T	TOWER
~~M~~→	MAINTAIN	V-15	VICTOR AIRWAY (NUMBER)
→	CRUISE	J-6	JET ROUTE (NUMBER)
×	CROSS	FM	FAN MARKER
+	INTERSECTION	OM	OUTER MARKER
G	COURSE	MM	MIDDLE MARKER
—	OVER	~~D~~→	DIRECT
NOT	NOT OVER	A/D	AFTER DEPARTING
V	VFR ON TOP	ADV	ADVISE
ABV	ABOVE	A/C	APPROACH CONTROL
BLO	BELOW	EAC	EXPECT APP. CLEARANCE
RS	RIGHT SIDE	Λ	NO DELAY EXPECTED
LS	LEFT SIDE	D?	DELAY INDEFINITE
@	AT	EST	ESTIMATE
@	AT OR ABOVE	FFC	FOR FURTHER CLEARANCE
&	AND	FPR	FLIGHT PLAN ROUTE
→	INTERCEPT	RR	REPORT REACHING
△	CENTER OR CONTROL	RP	REPORT PASSING
RT	RIGHT TURN	RL	REPORT LEAVING
LT	LEFT TURN	REP	REPORT
↱	RIGHT TURN & CLIMB	RAP	RAPCON
↰	LEFT TURN & CLIMB	REM	REMAIN
⬭	HOLD	UFA	UNTIL FURTHER ADVISED
⋊	ABEAM	EFR	EXPECT FURTHER ROUTING
√(LAX 2630)	CONTACT	RW	RUNWAY
↗	AFTER TAKEOFF	~~320~~	RADIAL 320
⊙	RADIOBEACON	3/10	MODE 3 CODE 10
○	VOR	2100	CODE 2100
Ⓣ	TACAN	C	ARTC CLEARS
Ⓥ	VORTAC	Ⓡ	RADAR

DOWN and out

AIRBORNE CANOPY (F-106B)

The pilot had flown the F-106B down to pick up a student who was going through the Combat Crew Training Ground School. The flight down was uneventful.

As the pilots were preparing for takeoff on the return trip they completed all items on the pretaxi checklist via the intercom. The canopy was lowered to within three inches of full closed, pins were removed, and taxi instructions were received from the tower.

The aircraft entered and departed the "Last Chance" inspection point on the taxiway. After passing this inspection point the rear seat pilot made a final adjustment on his ejection seat. While he was doing so he moved his feet and legs abruptly back toward the seat. As he did this, he felt considerable pull on the left leg of his flying suit. What had caused this pull was that his left calf pocket on his flying suit was open and it caught on the canopy jettison handle and moved it sufficiently to actuate the canopy jettison system. Immediately the canopy departed the aircraft. It struck the tunnel fairing station 472.00 and slid off the left wing, making an eight to ten inch diameter hole in the top of the number three fuel tank. The canopy remained on the wing. The aircraft was shut down and emergency equipment summoned.

The primary cause was crew member factor. The rear seat pilot did not assure that the left calf pocket of the flight suit was empty and secured prior to entering the aircraft, in compliance with T.O. 1F-106A-1 page 1-79, which states: "Caution: Do not place any articles in the left calf pocket of the flight suit or leave the zipper open. The canopy jettison handle may be caught in the pocket and the canopy inadvertently jettisoned."

Make sure the left calf pocket on your flight suit is empty and zipped, or your aircraft can be minus a canopy, also.

F-104 INGESTED SEA GULLS

Who can tell us when we are going to have an accident? Usually they happen when we least expect them. How about when we're Number Two man on formation takeoff?

A flight of two F-104s were cleared into takeoff position. The wingman lined up on the left wing of lead. The weather was 5 miles visibility with light rain. The takeoff roll was normal with the exception of considerable water spray coming from the lead aircraft main gear tires which was noticed by the wingman.

Prior to rotation speed, lead saw a flight of seagulls on the left side of the runway centerline directly in

front of his wingman's aircraft. As the aircraft approached the birds, the gulls flew into the air in a tight group, and four or five gulls struck the wingman's aircraft. Immediately a large flame trail of 30 to 50 feet long could be seen coming from the tailpipe of the plane. At this same instant the pilot felt and heard a loud explosion. The leader transmitted to his wingman to abort; simultaneously with this transmission the wingman arrived at the same decision. The drag chute was deployed, braking action was attempted, but because of the wet runway, it proved to be very ineffective in slowing down the aircraft. As it became apparent that barrier engagement was necessary, the tailhook was dropped and the pilot made an attempt to engage at a 90 degree angle. Tailhook engagement of the BAK-9 cable was successful and fifty feet further on the MA-1A web and cable were engaged.

Approximately 250 feet after barrier contact the aircraft began to yaw and roll smoothly to the right at which time the right wing tip AIM-9B missile struck the overrun surface and broke off the launcher. The missile continued straight ahead and came to rest approximately 100 feet past the point where the aircraft stopped. The aircraft continued in a right skid to approximately the runway centerline and stopped there. The right main landing gear was rotated back under the right aft lower fuselage and the wheel cocked outward.

The BAK-9 cable was engaged to the tailhook and the MA-1A cable was looped around the left main gear only and connected to the BAK-9 interconnect link.

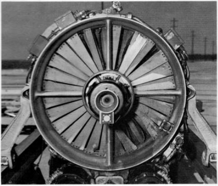
Once the aircraft had stopped, the pilot selected Guard channel, called for the crash equipment, opened the canopy normally, stopcocked the throttle, turned off the fuel switch, and evacuated the aircraft. There was no fire and the pilot was not injured.

The primary cause of the accident was high load, low cycle fatigue cracking of the right main landing gear drag strut line assembly which reduced the assembly's load-carrying ability, allowing it to fail at less than maximum design load limit.

We have to give the seagulls their due credit as a contributing cause for the accident since they initiated the events leading to barrier engagement and gear failure.

Seagulls have been a problem for years and it looks as if they will continue to fly and homestead where they please for years to come. We know what brings them: things like an adequate supply of water, fish, rodents, grasshoppers, tall bush, and garbage dumps. We know that it is not very easy to eliminate either water or fish which happen to be in the water. Things which will help are keeping grassy areas around runways and approaches mowed. Also, if the base has a dumping area nearby, have it filled with dirt each day to cover up refuse.

If someone wants to resort to shooting the gulls, he should first contact the local Game Management or Predator and Rodent Control agent of the Department of the Interior. Once in contact with this individual, explain and show him the seriousness of the problem. Invite him to the base so he can see the problem for himself and make sure that he understands what a seagull can do to a high RPM jet engine. He should be able to provide you with recommendations on how to rid the area of seagulls. These may range from a killing permit to noise devices for scaring the birds away. Nothing has been completely successful thus far. If anyone has a sure cure, we would really like to know what it is and how it works so everyone could use it.



√ POINTS

This section of the magazine has been designed for you. Be you a headquarters type at any level, a commander, safety officer, pilot - interceptor, transport, light aircraft - radar intercept officer, mechanic, a civilian in industry, weatherman, doctor, designer, or Indian Chief. This is your corner.

We solicit your ideas, items, notes, photographs, sketches, and pictures. The writing should be less than a paragraph - preferably a sentence or two.

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

DID YOU KNOW THAT

√ Severe vertigo experience is approximately five times more frequent among jet pilots than among nonjet pilots for a given equal period of flying time. (ADCSG)

√ No individual will be allowed to participate in aerial flight of **any** type during the twelve hour period following participation in self-contained underwater breathing apparatus (SCUBA) or skin diving activities wherein the diving depth exceeds fifteen feet. (ADCSA)

√ You can help to insure the latest and most accurate weather briefing for your fellow pilots by reporting all significant weather encountered. When in doubt, call PFSV (pilot to forecaster service). Be sure to include type of aircraft, position, and flight level, when giving a pilot report. (Det 9, 35 Wea Sq, MAC)

√ The U.S. may expect 5,000 deaths a year from motorcycle accidents? From 1962-65, the use of motorcycles has doubled and the increase is much accelerated. On a vehicle-mile basis, the chance of a cyclist being killed is 20 times that of a car driver; the chance of the passenger being killed is greater than that of the driver; when motorcycles collide with autos, 97% of the casualties occur to the cyclist; and lastly, cyclists with less than 6 months' experience have an accident rate double that of the more experienced. (U.S. Navy Medical News Letter, Vol 49, Friday 12 May 67, No. 9) (ADCSG)

√ A study of inflight hail encounters showed that about one-third were in clear air outside the thunderstorm cloud, but beneath the anvil or other overhanging clouds. (4WW)

Beware, drownings are on the increase! The following excerpts involve drownings that have occurred in the command through 16 June during 1967:

- Two nonswimmers were observed wading waist deep in rough surf. They had been briefed on possible undertow and were wading in violation of posted warning signs in the area. The bodies were recovered the following day.

- A nonswimmer waded into deep water in a nonauthorized area shortly after a picnic lunch. Attempts by buddies to reach him in time were futile.

- An airman and his daughter were fishing. The boat was found with a broken steering shaft shortly after recovery of the bodies. Life preservers were still in the boat.

- A nonswimmer went over the side of the boat to check the outboard motor. He lost his grip on the side of the boat, and his life. A life preserver was available in the boat.

- The old adage that a drowning person comes up three times is a fallacy. Four of these five fatalities came up once - that once was on recovery of the body. (ADCSA)

Given a particular thunderstorm and the mean wind of the environment in which the storm is imbedded, **maximum** turbulence and the **least** chance for hail are to be expected on the up-wind side of the center of the storm. Minimum turbulence and the maximum chance of hail occur on the downwind side of the center of the storm. The chance of hail increases to the right of center of the downwind side. (4WW)

If you develop a toothache shortly after takeoff and you know the dentist filled that tooth yesterday, most likely your problem is a small amount of trapped gas in the tooth. Usually this gas absorbs in a few days. Any toothache that develops in flight without recent dental work should be evaluated as soon as possible. (ADCSG)

In Culver City, California, all police squad cars are equipped with Hi-Dro bumpers. Made from 1/4-inch vinyl plastic, the bumper has two inner compartments. On the top edge there are several holes plugged with stoppers. The impact of a collision pops the stoppers, displaces the water through the holes, redirecting the impact force in an upward direction. The plugs pop out at impact at any speeds over 5 mph (thus, pushing cars slowly is possible without activating the bumper) and collisions up to 40 mph become controlled decelerations. In cold weather you use an antifreeze solution to keep the bumper pliable. Installation is usually done by a dealer-service station. The regular bumper is taken off, a steel backup plate is mounted on the chassis and the vinyl bumper is installed. (Science & Mechanics)

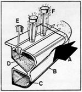


Diagram at left shows:
(A) Direction of impact against bumper. (B) Vinyl plastic wall, ¼-inch thick. (C) Two chambers filled with water or appropriate liquid.
(D) Baffles between two chambers. (E) Liquid is forced out through openings, absorbing energy of impact.
(F) Plugs pop out to allow water to escape during impact of collision.

safety officers'

FIELD REPORTS

FLIGHT CONTROLS, F-101B. During a coupled attack at .9 mach and 33,000 feet, the control stick started moving aft bringing the aircraft under heavy buffeting due to "G" load. The pilot was unable to control this rearward movement until after the AFCS circuit breaker was turned off. The pilot then using approximately 60 pounds of forward pressure on the control stick, was able to bring the aircraft under control. The flight controls, after being forced forward, operated normally during the remainder of the flight. After landing the basic autopilot had a stick force of approximately 30 pounds both fore and aft. The automatic flight control system limiter had failed.

HYDRAULIC SYSTEM, F-101B. This aircraft experienced loss of utility hydraulic system shortly after takeoff. After jettisoning full centerline drop tank immediately returned to field to land. Normal brake, wing flaps, and speed brakes are not available with this malfunction. Final was flown 15 kts above normal due to no flaps and normal touchdown accomplished. Shortly after touchdown left main tire blew out due to emergency brake use without antiskid protection and high gross weight. With blown tire, braking was minimal, pilot extended arresting hook and engaged BAK-6 barrier at approximately 45 kts to assure safe stop and to lessen possibility of damage if any. Engagement was normal and runout was about 100 feet with no damage sustained. Cause was ruptured seal in utility hydraulic pump allowing system fluid depletion.

DUTCH ROLL, F-106A. Aircraft on a routine training mission had just taken off and entered a low overcast condition. As the pilot attempted to turn on the dampers, the stick was snatched from his hand and aircraft pitched violently. Aircraft control was reestablished in direct manual, but the aircraft continued to dutch roll. Pilot declared an emergency and recovered from a GCA without further incident. Investigation revealed that the ¼ inch "Q" intake pitot tube plug was broken and had shorted causing loss of rudder feel. A new tube was installed.

FALSE FIRE LIGHT. A T-33 on a passenger and parts pickup support mission had just taken off from Sewart AFB, Tenn. At approximately 500 feet in climbout the fire warning light came on and would not extinguish. No other indications of fire were evident, so pilot elected to land and was cleared for a straight in approach. Full tips were retained due to populated area, and aircraft landed with 700 gallons of fuel on board. Touchdown and rollout were normal, but aircraft could not be stopped on the runway and with no barriers available and an overrun, that due to extreme downslope appeared too short to be effective, pilot elected to attempt to turn onto a taxiway at the end of the runway. Upon turnoff aircraft struck taxiway light damaging lower gear door fairing and hydraulic brake line. Investigation revealed a broken fire detector lead which caused a false fire warning indication.

F-106A YAW PROBLEMS. Pilot started takeoff roll on functional check flight and had hard left yaw when afterburner was lit. Yaw continued through rotation and then aircraft immediately rolled hard right after becoming airborne. Trim was ineffective. Pilot maintained directional control by holding extra force on stick and rudder and landed uneventfully. Investigation revealed rudder out ¼ degree left and also Aileron Trim Actuator intermittently inoperative.

F-102 HYPOXIC. Pilot was lead on a night high altitude mission. After climbing to 39,000 feet and handoff to GCI from Center, pilot realized he was becoming hypoxic. Advised wingman he was switching back to Center and descending. Pilot next remembers passing 24,000 feet in a steep descent. Leveloff was made at 21,000 feet. After contacting Center further descent and landing were made without incident. Inspection revealed survival kit personnel lead hose had separated at tee connector. FIX: This unit is replacing all survival kit personnel lead hoses with new hoses without the tee connector. NOTE: The tee connector is completely useless in the F-102. It is an antismother valve for use with the pressure suit. Strongly recommended all units accomplish a one-time inspection of survival kit personnel leads and replace all leads that have tee connectors. Also note, it was felt that part of the reason the hose separated from the valve was a poor clamp. Although new personnel lead hoses do not have the tee connector, clamps are used to fasten the hose to the kit and pilot's oxygen connector.

THE WAY THE BALL Bounces

ACCIDENT RATE

1 JAN THRU 31 MAY 1967

	ADC	ANG
Thru May 1967	4.6	6.0

MAJOR — ALL AIRCRAFT

ON TOP OF THE HEAP

MO	ADC	MO	ADC	MO	ANG
64	456 FIS	35	87 FIS	72	119 Ftr Gp
44	62 FIS	34	444 FIS	52	162 Ftr Gp
37	48 FIS	28	414 Ftr Gp	40	112 Ftr Gp 132 Ftr Gp 141 Ftr Gp
35	4600 AB Wg	26	18 FIS		

ACCIDENT FREE

BOX SCORE

ACCIDENTS FOR	1st AF	4th AF	10th AF	14th AF	4600	ANG
CONV						
T-33						
F-100						
F-101			1			
F TF-102						2
F-104						
F-106						
B-57						
F-89						
EC-121						

MINOR ACCIDENTS THIS PERIOD — 0

CUMULATIVE RATE

1 JAN THRU MAY 1967

		ADC	ANG
JET		5.5	6.5
CONVENTIONAL		1.9	0
BY AIRCRAFT	T-33	4	0
	F-89		0
	F-100	76	
	F-101	6	
	F TF-102	7	9
	F-104	28	
	F-106	4	
	B-57	0	
	EC-121	4	

RATE = MAJOR ACCIDENTS PER 100,000 FLYING HOURS

we point with PRIDE

Capt. William H. Benner, Jr.
75 Ftr Intcp Sq
Dow AFB, Maine

Capt. James D. McBride (USMC)
75 Ftr Intcp Sq
Dow AFB, Maine

ENGINE FIRE (F-101B)

Capt McBride, the pilot and Capt Benner, the Radar Intercept Observer, were the leaders of a flight of two F-101Bs returning to Dow AFB from a routine low level intercept mission. At approximately twenty miles from Dow under Radar control, their wingman reported fuel siphoning from their aircraft's right engine. A check of instruments and fuel indicated no difficulties, so the wingman was told to maintain a position from which he could monitor the leak throughout the approach.

The flight descended to 2,000 feet, established the landing configuration, and began final descent at approximately seven miles. Five miles from touchdown, at 1500 feet, the right fire warning light illuminated. Simultaneously the wingman reported fire coming from the right engine compartment. Immediately the right engine was shut down and they declared an emergency.

At this point the aircraft was over the populated residential area of Bangor, Maine. Capt McBride and Capt Benner, realizing that if they ejected in this area they would jeopardize the civilian population below, elected to continue their single engine approach to Dow rather than eject. Distance at this time was approximately three miles from touchdown.

Deciding that a single engine landing was assured, and that any change in configuration might compound the emergency, they elected to leave the flaps extended.

Despite repeated calls from their wingman and the Mobile Control Officer that the fire was rapidly spreading and increasing in intensity, they continued their approach, shut down the left engine on touchdown, deployed the drag chute, and jettisoned the canopy. Both men evacuated the aircraft and the crash crew extinguished the fire.

Investigation revealed that a cracked, engine mounted, fuel filter housing provided fuel for the fire. Generator brushes most likely initiated the ignition.

Capt McBride and Capt Benner's decision to stay with their burning aircraft rather than eject over a heavily populated area earns them the "We Point with Pride" award.

IP & PI

I am an instructor pilot with Continental Airlines presently flying the DC-9.

I would appreciate it very much if you would send me a few copies of your booklet "Aerodynamics of Sink Rate." In addition, if you have any literature related to Transonic/Supersonic flight, I certainly would appreciate some information in this area. Also, if you have any other material pertaining to aerodynamics of jet aircraft I would appreciate anything of this nature.

Thank you very much.

Kenneth L. Bellerue
2515 Community Drive
Dallas, Texas

***Our aerodynamics Programmed Instruction texts are on their way. The overall objectives of our Flying Safety programs are not related specifically to any particular military command, civil airline, or organization to type of aircraft, but to the maximum flying safety product we can possibly achieve. We hope that our publications will assist you to assist us in the pursuit of these objectives.**

OUR CARTOONIST!

"Major applause" for Major Edward G. Cleary, Jr.!! He has my vote as best cartoon-humorist in all of "USAF Land"! Generally speaking, humor in Air Force publications is barely worth the space it occupies. But INTERCEPTOR's Major Cleary is more than worthy of the space his drawings occupy. Let us see more of his work. As one of the more popular "snaggy-haired" singing groups says, ". . . you've got a good thing going"! (so keep it going!)

2/Lt Paul N. Sawaya
RAPCON Officer
Grand Forks AFB, NDak

***We agree with Lt Sawaya. Ed's on leave so the staff voted to run this comment in the Afterburning section. When you have talent, nothing is impossible.**

WE ERRED

Reference your article on the Hot Line page of the April issue of the INTERCEPTOR concerning safety shoes. The individual involved was a USAF TSgt instead of an RCAF Staff Sergeant.

1/Lt John L. Dellinger, USAF
Information Officer
Det 1, Muns Maint Sq
North Bay, Ontario, Canada

***Sorry, we didn't mean to step on the wrong toes.**

AN ORI ADMIRER

I enjoyed your article entitled "I Hate Anyone Who Isn't a Fighter Pilot" which appeared in your February 1967 issue of INTERCEPTOR. Colonel Rogers has expressed my views on the subject very well. I would like at this time to obtain permission to have this article reproduced locally to present to my friends, many of whom are fighter pilots.

We at 421 Squadron receive INTERCEPTOR monthly and always look forward to reading your many interesting articles. Thank you for your attention.

W/C R.H. Annis
Officer Commanding
421 ST/A Sqn
Baden-Soellingen, Germany

***Permission granted. We feel the ORI shop provides some most pertinent information. Thank you very much for your kind comments.**

CARSWELL COPIES

I am very impressed with your magazine, and would like to know if this office could receive two copies per month, if possible.

Major Edwin L. Smith
Chief of Safety
Hq 7th Bombardment Wg (SAC)
Carswell AFB, Tex.

***Your two copies are on the way and we hope they provide you with some helpful information.**

MERITORIOUS

These ADC units have been named to receive the USAF Flying Safety Plaque for accident-free operations and their outstanding contribution to Flying Safety for 1966:

- ★ 18 Ftr Intcp Sq, Grand Forks AFB, N Dak
- ★ 445 Ftr Intcp Sq, Wurtsmith AFB, Mich
- ★ 507 Ftr Wg, Kincheloe AFB, Mich

The following units received the USAF Missile Safety Award for 1966. Recipients of this award have been judged by the USAF Safety Awards Board to have made the most outstanding achievement of contribution in Missile Accident Prevention during 1966:

- ★ 4751 Air Def Sq, Eglin AF Aux Fld #9, Fla
- ★ 29 Ftr Intcp Sq, Malmstrom AFB, Mont

ACHIEVEMENT