Interceptor

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FOR THE MEN RESPONSIBLE FOR AEROSPACE DEFENSE

Interceptor

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spotlight

The only time you mustn't fail is the last time you try.

Charles F. Kettering

departments

special features

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OUR COVER

The backbone of Aerospace Defense Command's fighter inventory hold hands in a salute to the United States Air Force Academy. Photo by Kenneth Hackman, AAVS.

memo
from the CHIEF OF SAFETY

"KEEP YOUR COOL"

ADC has experienced two major accidents recently that may well have been prevented had the crewmembers involved taken more time in coping with their respective situations. In both cases weather, fuel remaining, and the initial problem itself did not dictate an immediate landing. In the first mishap a landing gear malfunction could have been resolved through a more thorough investigation by the crew or use of technical advice from the ground. The gear collapsed after landing. The crew elected to land and turn off the runway with an unsafe gear indication twelve minutes after discovering the problem, even though there were six hours of fuel on board and the weather within 1,000 miles was VFR. The second accident began with a comm radio failure right after takeoff and terminated with an immediate heavyweight landing (including full external tank) followed by a barrier engagement and fire.

Over-reaction to a simple malfunction with a "get it on the ground ASAP" philosophy can be an expensive trap. ADCR 55-57 spells out the responsibilities of those who are directly concerned with an aircraft in distress, and the IFR Supplement, Emergency Procedures, Section VII outlines the communication facilities available for those airborne emergencies requiring technical assistance. Only the aircraft commander can make the final decision regarding the plight of his bird, but if advice and time are available why not put them to good use and "keep your cool"?

COL H. C. GIBSON

HOT LINE

NEAR MISS

After checking in with ground environment, two F-102s were split up for individual data link control. Lead and wing were given a series of zigs and zags for positioning. Command altitude for both aircraft was 41,000 feet. During a port turn, wing spotted a rotating beacon on the inside of the turn. He climbed a thousand feet and passed right over lead. Neither aircraft received a warning from the controller.

The moral is: rotating beacons are good; so are pilot eyeballs; so are alert weapon teams.

The question is: can the beacon always attract the attention of the eyeball while an inert weapon team sleeps?

The answer is: it had better be able to do so, or the latter may splatter the former.

CANOPY LOSSES

A few of the gray-haired types may remember the days when a fur-lined pot or some other appropriate trophy was passed around to those who earned questionable fame by joining the Royal Order of Lid Losers. Some compassion was in evidence because, after all, there were a lot of pilots who had received their training in lid-less airplanes and it took time to break long-standing habit patterns.

We think all of the fresh air trainers are out of the inventory now, but the Plexiglas stockpile is still going down. New generations bring new problems, one of which is design difference. To close this model canopy, you go—push . . . pull . . . click, click. To close that model, you go—pull . . . push . . . cluck, cluck. It makes transition to another bird pretty tricky, because if you push and cluck when you should pull and click, then clunk goes the canopy and clank goes the boss.

So, remember, it's a cinch job in some birds; a switch job in others; and you have to get a feel for the handle in combinations of the above.

P.S. Don't forget to check the idiot light since he may turn it on. If you can't locate it, look under the rudder pedals. It may have been re-positioned.

NO-CHUTE LANDINGS

There is growing suspicion, supported by incidents and recent an accident, that we may have a frightening number of pilots in the Command who won't be able to stop their machines on the runway if they experience a drag chute failure. That ain't good, no how.

Let's take it from the top. Without a crystal ball, you can't predict when the bag will fail to deploy. So what? If the bird is landed in the proper spot and in the proper manner on a normal size runway, rain or shine, the drag bag doesn't mean the difference between taking the barrier or the taxiway; technique does (B-52 drivers excepted). The solution to the problem is an "either-or." Either land it properly every time, *or*, if you can't guarantee that, practice no-chute landings on a regular basis, like at least once a month. Smoking past the 1,000 foot marker, 20 feet above a slick runway, in the cold gray light of dawn can make a believer out of you if the bag fails. Then try to take it around and see what happens.

Although you can never be sure, there are several occasions when a chute failure is most likely to occur. If you fly through heavy rain and climb to altitude, the chute may freeze. It probably won't thaw out before you have to use it. Another time to be cautious is after the chute has been packed at a base where transient alert doesn't handle your type aircraft on a daily basis. The last shaky situation is when you are forced to pack it yourself.

One final point, if you come steaming down final at 200 plus because of a heavyweight condition, don't cry "foul" if the chute doesn't deploy. You really needed an anchor anyway.

a salute

. . . in recognition of outstanding achievement in accident free operation.

Over 6 Years

162 Ftr Gp, Tucson
112 Ftr Gp, Greater Pitt

Over 5 Years

141 Ftr Gp, Spokane
48 FIS, Langley

Over 4 Years

148 Ftr Gp, Duluth

Over 3 Years

4603 AB Gp, Stewart

Over 2 Years

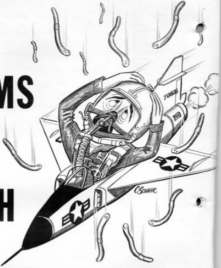
147 Ftr Gp, Ellington
4758 DSES, Holloman
142 Ftr Gp, Portland
75 FIS, Wurtsmith
169 Ftr Gp, McEntire
103 Ftr Gp, Bradley
551 AEW&C, Otis
124 Ftr Gp, Boise

Over 1 Year

343 Ftr Gp, Duluth
57 FIS, Keflavik
119 Ftr Gp, Hector
78 Ftr Wg, Hamilton
158 Ftr Gp, Burlington
144 Ftr Gp, Fresno
27 FIS, Loring
49 FIS Griffiss
163 Ftr Gp, Ontario
71 FIS, Malmstrom

as of 31 May 1969

OF WORMS & SUCH



For many years, jet pilots in general were reluctant to punch the mike button and declare what they felt in their britches was an Honest Abe emergency. Personal pride, thick-headedness, unwillingness to give in—call it whatever seems right—they insisted on playing the Cool One until the moment of truth arrived, sometimes known as the spin, crash, burn phase. Typical of the silent breed was the cat who allowed himself to get aced out of the GCA pattern so many times that when he finally got the OK to land, he ran out of gas and crashed short of you know what. He flew right through minimum and emergency fuel limits without even breathing hard. Dinky-dow! (Loose spelling.) "I think I'm going to cra . . ." is a tad late to be asking for help.

There are still some Silent Sams around, mainly the ones who try to tiptoe out of a tight spot they caused for themselves. Most jocks, though, are pretty gabby when it comes to letting somebody know they have troubles. So, the preaching looks like it has paid off.

Now that pilots are with the program on a regular basis, we find that some problems are making the scene on the traffic control side of the house. Many great "saves" have resulted because of the tremendous skill and cooperation of people in the traffic control business and we don't intend to withhold credit where credit it due. But a couple of worms have crept into the system and we wouldn't want aircrews to lose confidence or their lives because of something th ily be corrected. Accident prevention is the name of the game.

Of late, there's growing evidence that some air traffic controllers are making personal interpretations as to just how bad an airborne emergency really is and taking action accordingly. That is bad. It's been especially noticeable in the approach control, GCA, and tower operations. Sometimes, circumstances make it difficult to visualize how big a sweat puddle is forming in the cockpit. All pilots don't turn soprano when they are in or about to be in deep serious. For this reason alone, we suggest that the puddle be considered Texas size in all cases. What has proven to be a routine precautionary landing for most aviators can, in fact, develop into a catastrophe for others. The point is—you never know for sure.

Not so long ago, we came close to losing a bird because two control agency types decided that minimum fuel and a sick radio didn't add up to a red hot emergency. They sat back and relaxed while the pilot was thrashing around in the murk at night, trying to find the field. He made it by the skin of his teeth, no thanks to them. The message should come in loud and clear. When a pilot declares an emergency, he should be able to depend on everyone sticking with it and giving all possible assistance, at least until he puts the rollers on pavement safely. We don't think that's too much to ask.

A 180° variation of the above takes place when a pilot is allowed to drive around fat, dumb, and happy, thinking everything is under Rosy control. Meanwhile, down on the ranch, the wind is up, the clouds down, the scope bent, and the "idea" tank dry. Several cockpit executives have recently had the painful experience of learning, piece by piece, that they were flying into Grimsville. No one was willing to give them the straight skinny on how bad the situation was. They had to find out for themselves and then it was too late to put the pieces back together again. The more breathing space a pilot has available to him, the more likely he is to make a good decision. He needs to know, right now and not at the last minute, how many chips are stacked against him. Then, he can take a decent crack at making the decision which will save himself and the airplane. The longer the delay, the fewer the alternatives.

Another situation, isolated but nevertheless potentially dangerous, is the one in which an emergency is declared to an air traffic control agency and, during the transition to another agency, the word is not passed. Things go along smoothly until the pilot realizes that he is not receiving emergency attention. When he asks the inevitable question, everybody gets shook up and more precious minutes fly by while the situation is being resolved. It can mean the difference between reaching a field safely or not at all. Generally, this type occurrence initially involves aircraft difficulties of a minor nature, but leads to more serious problems further down the road.

As in the case of the word not getting passed down the line, this last worm also eats up precious time. A serious emergency develops, the pilot declares and asks for immediate vectors to the nearest suitable airport for landing. There follows a series of time-consuming questions concerning the nature of the emergency before the requested vectors are given. Whizzing along at 6 to 10 miles per, a lot of terra firma is covered before the aircraft gets pointed in the right direction. The pilot gets confused, excited, and then irritable—an unhealthy frame of mind especially when cockpit action requires intense concentration. In the absence of serious traffic conflict, immediate recovery assistance and time to square away emergency procedures are the most important needs of the pilot. The worst thing he can engage in is a question and answer session. It creates an additional, undesirable burden.

No system is perfect, mainly because everyone is human. As we mentioned in the beginning, there are a lot of satisfied pilots walking around today only because of the outstanding service given by all kinds of people who keep the flow of air traffic moving smoothly. The problems discussed in this article occur infrequently, but when they do, they present serious safety hazards. Some are probably occasioned by improper communication techniques on the part of pilots. A dry throat is not unusual when the cabin in the sky begins to come apart. Others may be caused by the inability of ground controllers to grasp the urgency of a particular situation. This too is understandable from the viewpoint that a tight shoe pinches only the guy wearing it. But sympathy with system limitations doesn't eliminate the possibility that some pilot is liable to drop a multi-ton hunk of metal into a housing area and break his neck in the process. It is not the sole responsibility of ground controllers to "bring 'em back alive." However, we suggest that they anticipate the worst condition possible and take positive action. Pilots, on the other hand, should leave no doubt as to what assistance is required. And under no circumstances should they throw away their hole card. More on the hole card bit in a future issue. ★

have a heart

. . . a healthy one, that is

by **LT COL ROYCE MOSER, JR. USAF MC**
Office of the Command Surgeon, ADC

Recently a T-33 on final made a normal approach until it slowly rolled to the left and impacted in an inverted, nose low position. The pilot was highly experienced and there had not been any indication of mechanical problems during the flight. The first thought of the inspection board was material failure of some type. However, subsequent findings disclosed the cause was malfunction of the pilot's physiological equipment—in this case his heart. On post-mortem examination, it was found one of the main arteries supplying blood to the heart, a coronary artery, was completely occluded and another vessel was over 2/3 closed. The final conclusion of the board was abrupt pilot incapacitation due to heart disease.

How old was this experienced pilot with such serious and widespread heart disease? 55? 50? 45? At the time of the accident, the pilot was only 39 years old!

What about his annual physical examinations? After all, isn't the physical designed to detect this type of condition? Indeed, the pilot had had annual electrocardiograms for the 9 years preceding the accident. At the time they were obtained they had been interpreted as normal. Review of the series of electrocardiograms after the accident revealed no finding even suggestive of heart disease, not even with hindsight. All other aspects of the physical examinations had also been within normal limits.

This accident dramatically demonstrates two facts well known to physicians. First, serious heart disease can occur in young individuals. While unusual, heart attacks have occurred in people in their 20s! Second, utilization of the most precise medical evaluation techniques routinely available will fail to demonstrate significant disease in some individuals.

At this point, let's define what we mean when we refer to heart disease in this case and the subsequent discussion. While there are many different types of heart disease, the one with which we are concerned is that known as coronary heart disease. This is simply "hardening of the arteries" of the heart and may occur elsewhere in the body as well. We don't know the final details of just why this disease occurs, but we do know that a "soap" of fat, calcium, and cholesterol is formed out of these chemicals in the bloodstream and deposited in the walls of blood vessels.

The main blood vessels supplying the heart are two small vessels called the coronary arteries. They are about 3/16 of an inch in diameter, and they branch and rebranch, becoming continuously smaller, supplying all the heart tissue with oxygenated blood.

In coronary heart disease the internal diameter (lumen) of these vessels becomes progressively narrowed as fatty material is deposited on the interior walls of the vessels. As the disease progresses, blood flow is diminished until finally there is no longer a sufficient blood supply to some of the tissue to keep it alive. When this happens, a heart attack occurs. This means a portion of the heart tissue has died. If this portion is a relatively small area not in a critical portion of the heart, the victim will usually survive. If the area involved is

...r in a critical area of the heart, ...ch as surrounding the nerve tissue that carries impulses to the heart to keep it beating, the patient may not survive. In some cases involving a coronary artery near its origin, death is instantaneous.

At present, we do not have a method routinely available which will detect the presence of coronary artery disease unless there has already been damage to the muscle of the heart. The routine electrocardiogram will not tell us the degree of occlusion present in the heart blood vessels; it shows only damage to heart muscles or to nerve conduction within the heart. Of course the medical profession is constantly trying to improve testing procedures. One procedure, coronary angiography, is sometimes used. This provides information about partial occlusion of the coronary arteries. However, this procedure is complex, slightly dangerous, and requires the services of specialists available at relatively few locations. Therefore, it is not feasible for routine use.

Until more precise diagnostic procedures are routinely available, the physician must continue to rely strongly on history to detect incipient or early disease. In order to avoid being the subject of an accident investigation, it behooves every air crew member to report any unusual pain or pressure sensation about the chest, neck, arm, upper abdomen, or even face to his friendly flight surgeon. You should not be afraid of being grounded unnecessarily since your flight surgeon can obtain the evaluation required to determine the cause of the symptoms in most cases. If necessary, he can obtain the assistance of experts at special aeromedical evaluation center such as the USAF School of Aerospace Medicine.

If you do have recognizable heart disease, you should not be flying; the mild hypoxia even while on oxygen at altitude, as well as the other physiological stresses of flying, may precipitate a heart attack. Since a heart attack may be abruptly incapacitating if not fatal, its occurrence in flight in a single seat aircraft usually precludes subsequent application of medical therapy. (Heart attacks also lie behind some fatal one car crashes.) Occurrence during a critical phase of flight can have the same disastrous results even in a multiplace aircraft, as occurred in the American Flyers' crash in Oklahoma. In this crash, the probable cause was abrupt pilot incapacitation during the approach due to heart disease. Although the copilot had taken over control of the aircraft and was flying it when it crashed, he was unable to apply corrective action in time. Since the landing phase of the flight produces the greatest physiological stress, it is not surprising the attack may occur at this critical time. Such occurrences are part of the reason the Air Force will not allow a pilot with heart disease to fly even if a copilot is present. By the time he recognizes the pilot is incapacitated, the copilot may not be able to prevent the crash.

On the other hand, a thorough evaluation may not disclose any heart disease. In this case, you will be kept flying. After the evaluation, however, you will probably have an increased interest in preventing heart disease. The rest of this discussion will help you in such preventive efforts.

While we have difficulty in determining the existence and degree of early coronary artery disease and still do not know the cause, we do have better knowledge of those conditions which greatly enhance the risk of developing heart disease. With this knowledge, it is possible to apply preventive maintenance to lower your risk of having cardiac disease.

What are the factors that increase the risk of coronary heart disease? What can we do about them? As is often the case in chronic diseases, several factors are involved. Some of these we can do something about and some we cannot. For interest only, we can briefly consider the group we can do little about; then let's look more closely at those items we can attempt to influence.

Numerous studies have demonstrated the importance of *heredity* in developing coronary heart disease. Unfortunately we do not have any choice of our ancestors. You should be aware, however, that the presence of heart disease in family members does increase your risk of developing the same condition. This may sharpen your interest in taking some of the preventive measures to be discussed later.

We know coronary heart disease is much more frequent in males than females in most age groups. It appears this difference is due at least in part to the presence of *hormonal differences* between males and females. While it is possible to eliminate male sex hormones, the procedure does not appear to have much appeal to most of our male personnel. Certainly we in the medical service do not recommend such drastic therapy!

We *can* control some of the other factors. One is *smoking*. Men who habitually consume 20 or more cigarettes per day have *three times* the heart attack risk of nonsmokers or pipe or cigar smokers. Of particular interest, this risk decreases to that of nonsmokers two years after cessation of smoking. So you do have some control over your risk in this area. The pilot of the T-bird had been a heavy cigarette smoker.

Your *diet* can play a role. The higher the level of cholesterol in the blood, the greater the risk of coronary artery disease. Studies have shown that saturated fats and cholesterol in the diet raise blood cholesterol; if you decrease these substances in the diet and substitute polyunsaturated fats, the risk appears to be lower.

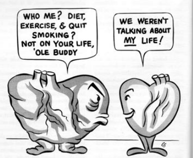
High blood pressure increases your risk of a heart attack due to coronary artery disease 4 to 5 times. Also, the attack tends to occur at an earlier age. Frequently, mild degrees of high blood pressure can be completely controlled by a program of weight loss and exercise. In other cases, medication may be required.

Obesity carries an increased risk of heart disease. This area is complicated by the fact obese people tend to have higher cholesterol levels. Also, they often do not properly utilize sugar in the blood and a pre-diabetic or actual diabetic state results. Additionally, high blood pressure is more common in obese inidviduals. Since high cholesterol, diabetic states, and high blood pressure raise the risk of heart disease, it has been difficult to demonstrate an increased risk with obesity by itself. It has been proved, though, that weight reduction will aid in restoring cholesterol, blood sugar levels, and blood pressure to normal. So you can lower your risk with loss of weight. Remember that obesity can exist even if you are within the maximum Air Force weight limits. Usually it does not require great medical skill to determine if you have excess fat on your frame. A critical appraisal in front of a full-length mirror while stripped will give you a clue. Pinch the skin on your flanks; if you can gather over an inch, you *know* you're fat!

Lack of exercise plays a role in heart disease. *Regular* exercise to the point the cardiovascular system is stressed, such as in the new Air Force aerobic program, will decrease your chance of dying from a heart attack. One method by which exercise accomplishes this feat is by increasing the number of smaller blood vessels supplying the heart muscle. If a main blood vessel is blocked, these by-pass channels (or collaterals) are available so the tissue will still be supplied with blood. Additionally, exercise will aid in keeping your weight under control with the benefits previously noted.

Remember that prevention is of prime importance in this condition. Keep the excess weight off, exercise regularly, and stay away from cigarettes. Not only will these measures decrease your risk of heart disease, but you will find you feel better and enjoy life more. You get a bonus: these same steps will help prevent the development of other conditions just as dangerous, such as diabetes and lung cancer.

What if you develop symptoms in spite of your preventive efforts? Numerous symptoms can be the first sign of heart disease: dizziness; chest, arm, neck or jaw pain; pressure sensation in those areas; or shortness of breath with mild exertion. When your plane or equipment malfunctions, you get an expert to diagnose the trouble and repair it. When your body shows evidence of malfunction, consult your body expert — your friendly flight surgeon. He can help you—early in the game. If you keep putting it off, he may see you for the first time when you have a frank heart attack. If the major episode occure in the cockpit, he may not even have that opportunity. ★



T-33 Directional Control

The aircraft was to be flown as target for a radar intercept training mission. Preflight phases were normal and pilot experienced no difficulties during initial taxiing. The main gear struts apparently had not been reduced to normal extension following previous refueling. As the aircraft approached number one position for taking the active runway, the right wing dropped slightly as the strut fell to proper extension and the left strut remained overextended. This required additional left braking as the aircraft moved into position for takeoff.

The pilot released the brakes from centerline position and initiated his takeoff roll. Low right wing produced a tendency to drift toward the right side, and left brake was used to maintain directional control up to 50 knots. Then the rudder was used to counteract drift, but was not completely effective. At line speed check point, the aircraft was accelerating properly, but continuing to drift right.

At 100 knots, the pilot states that he was using full left aileron and full left rudder, but was still drifting to the right. As the right wing approached the runway edge, a decision was made to abort the takeoff. As abort procedures were accomplished, the aircraft began recovering to the center of the runway and the MA-1A arresting barrier was engaged squarely, with a straight rollout of 350 feet.

Damage to the aircraft was confined to breaking off the pitot tube, denting and gouging of the main gear fairing doors. The left strut remained extended some nine inches, while the right strut was measured at 4½ inches. Both were found to be properly serviced; however, the left strut was extremely difficult to return to proper extension once it became overextended. The brake disassembly revealed no significant discrepancies. Some indications of overheating were evident and were most likely the result of braking during aborted takeoff. No gouges, cracks, or other discrepancies that would have caused binding, dragging, or locking were in evidence. Flight controls were also examined for signs of restriction and none were found. Light winds were considered not to have been a factor in this incident.

There are two possibilities which may have caused this incident. First, the pilot did not use the controls as he believed. Flight tests after the incident, which were conducted by instructor pilots revealed that with full aileron movement, the wing will start to lift and fly at approximately 80 knots. The aircraft, therefore, should have responded and alignment with the runway maintained. Second, it is possible that the pilot inadvertently actuated the right brake. This could have occurred when the left pedal was depressed and the right pedal moved aft. If the pilot should leave his foot up on the brake pedal, he could have depressed the right brake. This would have negated the control movement to the left. There are incidents which have occurred in the F-102 which have been caused for this reason. For example, a pilot blew a tire during a formation takeoff because he did not drop his heels to the floorboard after brake release. During takeoff roll, he used rudder for directional control and because the ankle will bend only so far, he inadvertently depressed the brake on the aft rudder. Result, a blown tire.

It was difficult to understand why a barrier engagement was necessary. The airspeed reportedly was 100 knots with 5000 to 6000 feet of runway remaining; therefore, it would appear the aircraft could have been stopped normally. During the post incident flight check, the flight examiner required the pilot to perform a minimum run landing using maximum braking. In the opinion of the flight examiner, the pilot used only moderate braking when he thought he was using maximum. This is a frequent fault of aircrews who fly modern aircraft with a more sensitive brake system than the T-33. They are reluctant to apply the brake pressure required for maximum T-33 braking.

The rear seat pilot confirmed that full rudder and aileron were used by the front seat pilot. This fact would tend to point toward the most probable cause of loss of directional control to be inadvertent braking of the right wheel caused by the extreme aft movement of the right rudder. The most probable cause of barrier engagement was that the pilot was not familiar with proper T-33 braking techniques. ★

Bucky keeps the Dagger Sharp

by **MAJOR "BUD" JENSEN** *Flying Safety Officer, Wisconsin ANG*

It's Friday morning in Madison, Wisconsin, and at Truax Field, the home of the 115th Fighter Group, Wisconsin Air National Guard, preparations for operation "RXs OFF" are getting under way. Every Friday and Saturday, weather permitting, four F-102s are scheduled for live rocket (FFAR 2.75s) firing on R6903 located over Lake Michigan. The program was designed to put a sharp edge on the Delta Daggers, i.e., to make sure all rocket systems get a good check similar to missile rails with WSEMs and to add that little touch of realism for aircrew training. To say the least, the program has stirred the enthusiasm of all members of the unit, especially those personnel directly involved, such as Operations, A/C Maintenance, Weapons Release, and Missile sections. It gives them visual proof of their labors.

With the aircrews, it's a weekly fight to get on the schedule for "High Noon" on Fridays and Saturdays. It commands the utmost in diplomacy from the operations scheduling officer and possibly may cost him a free one or two at "Happy Hour," but he retains the final decision on operation "RXs OFF." It may cause local business to suffer a bit on Fridays and Saturdays because the local insurance executive calls in sick, a lawyer cancels all appointments, a gentleman farmer puts the plowing off till Monday, a drug salesman has no luck on his call at the airport???, but they all made the schedule for that day at the "Guard"!!!

At 1100 hours the briefing is started in the Ops briefing room and is handled masterfully by Lt Colonel Ron Skinvik, Flying Training Supervisor and Commander of the 176th Fighter Interceptor Squadron. In the meantime, 102s are being readied on the flight line with eager precision and possibly a few wagers on the side by crew chiefs as to whose aircraft will fire and consequently get the Del Mar in the process. The briefing is complete with graphic presentation of range R6903, geometry of the intercept, target headings, fighter headings, HCA, ATA, and altitude separation. Mandatory radio calls are being memorized by the aircrews: (1) Contact, range, and azimuth. (2) Reno (T-33 and Del Mar 1 mile behind), (3) Judy, (4) 20 seconds, (5) fighter heading, and (6) MA and armament safety check complete. At the "Judy" call, the radio belongs to the interceptor and target pilots. This so the fighter can get his "Standand "clear" from the target pilots who have the final decision as to whether it is a firing pass or not. The lake must be checked for boats which may have strayed into the restricted area; if so, "break it off" and try again.

Briefing continues with each pilot taking his "turn in the barrel." An emergency procedure, taken from a little barrel, is given to each pilot to answer and discuss. And, finally, preflight items for radar/rocket mode are reviewed to insure each pilot has a good operational radar. F pole check for "miss distance" is compulsory. Pilots will be controlled and directed on firing range in pairs. While #1 and 2 are on the range, #3 and 4 are in a saunter orbit over what was once "Lombardi Town" (Green Bay, Wisconsin). The first pass by each fighter is dry with armament safety check completed, second pass is "hot," if . . . you're cleared by the target pilots!! Briefing complete, it's Hard Hat, Chute, Nadar can, and out to the awaiting Deuces.

Meanwhile at 34th Air Division, "Moonbeam" control, the eyes for the action have coordinated the airborne orders with Chicago Center. The controllers eagerly await the blips of the "Echo Papa" target and fighters which should appear just after "High Noon." Special praise should go to Lt Joseph G. Hortenstine and Sgt Lynn E. Turner, controllers at 34th, who have run or supervised all the live firing intercepts for the 115th's Deuces. They have done a magnificent job in getting fighters in position for 110° beam rocket passes, the majority of which need little correction or conversion by the pilots.

Once the aircraft are airborne, many of the ground crews head for the radio shop. It's here they can listen to the action which will soon take place up at R6903 about 100 miles to the northeast. It's here, also, that the final hand shakes are made on any wager made on the flight line. Nothing to do now but wait and hope Maintenance Control doesn't call down with a work order . . . but they're on listening watch with the fighters, too!!!

"Echo Papa 16" is element lead for the second two aircraft and is all checked in with "Moonbeam" and orbiting over "Packer Land" waiting his turn. Radar looks good . . . sure hope set-ups are in the ball park . . . "Echo Papa 16," Moonbeam Control, turn port to 070 . . .

Who's firing who??!!

Set speed 270 and confirm angels 15 . . . target now 35 starboard at 26 miles . . . Roger, contact 40 starboard at 24 miles . . . (the radar specialists in the radio shop look at each other and gleam, their extra effort has paid off in a good radar set and given pilot a 24-mile contact on that little T-bird) . . . "Reno" . . . Judy, heading 075 . . . now, it's just the target pilots and EP16 who can use the UHF radio . . . "20 seconds" (those INDs have positioned EP16 on a perfect 110° beam again and now it's up to pilot and the F-102 to finish the job).

Target pilots have an eyeball now, and call "Standby" . . . Deuce is drifting back . . . he's got the Del Mar for sure now . . . "16, you're clear" . . . "OK, center the dot and ride it just a skosh hot . . . squeeze the trigger . . . WHOOSH ! ! . . . the 6 FFAR 2.75 bracket the Del Mar . . . EP16 off, M.A. . . . Armament switches safe." "Roger, EP16, break 270° for RTB."

After their firing passes, the four F-102s join up for their return to Truax. It's standard procedure to give all the people at home base a 4-ship "fly by" to let them know that another rocket mission has been completed. As everyone watches the 4-ship diamond pass the field, it gives all members a full sense of accomplishment that they're doing the job . . . and doing it well. A little added enthusiasm is given the ground crews in repairing minor write-ups, cleaning rocket tubes, tuning radar sets, and getting ready for Saturday's mission.

Pilots are vibrant in their debriefing with the 34th Air Division controllers. The set-ups were great and hardly any corrections were necessary . . . "Good show, Moonbeam." Thus the poor controller who regularly receives his drab briefings is finding his job a very important link in the ADC chain. They, too, are eager for the next day's mission.

Thus operation RX's OFF has put zest and enthusiasm into the job the 115th and 176th units are doing every day in support of their country's national defense. ★

The Eyes

The briefing

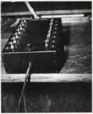
Bucky Badger

classroom tanker

The 87 Fighter Interceptor Squadron uses a locally manufactured training aid to assist in briefing for In Flight Refueling missions. It was designed to give aircrews an understanding of the director lights during aerial refueling with a KC-135. Previous indoctrination on the director lights was limited to photos or Tech Order illustrations. With this aid, aircrews are presented an overhead view of the director lights as they would appear during actual refueling operation.

"Classroom Tanker"

Director lights on ceiling



Director lights control box

19 SAFETY

Chief of Staff Individual Safety Award

CHIEF OF STAFF INDIVIDUAL SAFETY AWARD

Mr. Roger G. Crewse, Chief, Analysis Division, Office of the Chief of Safety, ADC

The Chief of Staff Individual Safety Award is presented to Mr. Roger G. Crewse, Chief, Analysis Division, Office of the Chief of Safety, Headquarters Aerospace Defense Command, in recognition of his contributions to the effectiveness of the accident prevention programs of the Aerospace Defense Command and the United States Air Force.

Mr. Crewse's extraordinary accomplishments perpetuate the high standards of the Chief of Staff Individual Safety Award, and reflect credit upon himself, the command, and the United States Air Force.

(Citation excerpts)

FLIGHT SAFETY PLAQUE

4780 Air Defense Wing, Perrin
119 Fighter Group, Fargo (ANG)

AWARDS 68

MISSILE SAFETY PLAQUE
78 Fighter Wing, Hamilton
46 Air Defense Missile Sq, McGuire
10 Air Defense Group, Vandenberg
142 Fighter Group, Portland (ANG)

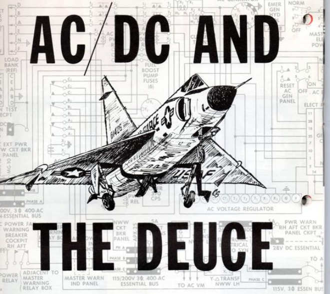
NUCLEAR SAFETY PLAQUE
78 Fighter Wing, Hamilton
46 Air Defense Missile Sq, McGuire
PM-1 Nuclear Power Plant, Sundance

GROUND SAFETY PLAQUES (NATIONAL SAFETY COUNCIL)

AWARD OF HONOR
Aerospace Defense Command
14 Aerospace Force, Ent
Air Defense Weapons Center, Tyndall

AWARD OF MERIT
First Air Force, Stewart
551 AEW & Con Wing, Otis
4603 Air Base Group, Stewart
4609 Air Base Group, Kincheloe
414 Fighter Group, Oxnard
4780 Air Defense Wing, Perrin

AC/DC AND THE DEUCE



BY MAJOR LYLE DARROW / *Academic Branch • Perrin AFB, Texas*

The Deuce electrical system is a result of many modifications over the years. Although misunderstood by some and ignored by others, it is not an overly complex system when approached from a design standpoint.

DC POWER: The DC generator is designed to power all of the DC equipment and charge the battery, but how is this accomplished? It powers the essential bus directly, and through the nonessential bus tie relay, the nonessential bus. A wire from the nonessential bus energizes and holds the emergency DC bus changeover relay in position to allow power to flow from the essential bus to the emergency bus. The battery, in ON, is also connected to the essential bus, therefore, it is charged by the generator.

Provisions have been made to reduce the load on the battery when the generator fails, so let's see what happens when the generator fails.

The nonessential bus tie relay which was held closed by the generator) now opens, causing the nonessential bus to lose power. Since the nonessential bus lost power, holding power to the emergency DC bus changeover relay is lost, therefore, this relay now connects the TR unit to the emergency bus. The battery was ON, so the essential bus continues to have power until battery depletion. Net result: Loss of the nonessential bus.

If for some reason there is no power available from the TR unit, the battery can be used to power the emergency bus. To accomplish this, we place the battery switch in TR FAIL. This returns the emergency DC bus changeover relay to its original position with battery power, allowing essential bus (battery powered now) to again flow to the emergency bus.

The common area of confusion in the DC system seems to be the operation of the emergency DC bus changeover relay (it's not exactly a relay, but diodes that serve the same function). This "relay" will connect the emergency bus to the TR unit *unless* the generator is ON or the battery switch is in the TR FAIL position.

If the DC system still seems a little foggy to you, try applying these two rules:

1. If the DC generator is operating, all the DC equipment is available.

2. If the DC generator is inoperative, the battery will power the essential bus in ON, or the essential bus and the emergency bus in TR FAIL.

AC POWER: The design of the AC system is less complicated than the DC system, however, it also is sometimes misunderstood. We have two generators, the main being designed to power all of the AC equipment, and the emergency designed to power all but the nonessential bus.

The key to this system is the AC bus switch. In the NOR position, it allows the emergency AC power control relay to connect the nonessential and essential buses. If the main generator is operating, it can then power all the equipment. When we move the switch out of the normal position, we pull the relay down, connecting the essential equipment to the emergency generator. If the emergency generator is operating, it now powers the essential equipment.

While it's true that both the ON and the RESET positions pull the relay down, they get their power to do so from different sources. The ON position uses emergency DC bus power to pull the relay down (and open the secondary hydraulic valve to the generator), whereas the RESET pulls the relay down with essential DC bus power.

Still hazy? Let's try a few rules for the AC system:

1. The main generator will power all the equipment providing the bus switch is in NOR.

2. The emergency generator will power all but the nonessential equipment

a. In ON if emergency DC bus power is available.

b. In RESET if essential DC bus power is available.

ELECTRICAL CHECKS: The current electrical system check is designed to check the operation of each power source and the function of each relay. Most of the steps are self-explanatory, however some of the steps may need a little explaining.

After turning the battery on, we place the AC bus switch ON and check for 0 voltage. If we received voltage at this point, it indicates that the emergency DC bus changeover relay is stuck in its original position, i.e., connecting the essential bus to the emergency bus.

After placing the AC bus switch to RESET, then ON, we receive a voltage indication. This one short step checks the connection between RESET and the essential DC bus, the TR unit, the fact that the emergency DC bus changeover relay is connecting the TR unit to the emergency bus, and the connection between the ON position and the emergency DC bus.

After placing the battery switch to TR FAIL, we turn on the main AC generator. In addition to checking the operation of the generator, we are verifying that TR FAIL will enable the battery to return the changeover relay to a position that connects the essential and emergency DC buses.

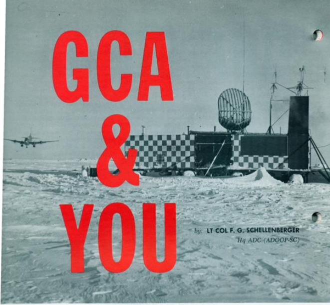
During engine shutdown, we place the battery switch to TR FAIL to check UHF radio operation by the battery until we turn it off, and placing the AC bus switch to ON allows us to check emergency AC generator operation down to the minimum windmill in a glide—15% rpm. ★

ABOUT THE AUTHOR

Major Lyle Darrow was commissioned upon completing aviation cadet training in 1956. He served as an F-86 instructor pilot until 1960 when he completed F-102 CCTS. He remained at the Perrin CCTS as an F-102 instructor pilot until 1962. During 1963, 1964, and 1965 he served in SEA with the 509th Ftr Inctp Sq as an F-102 pilot and training officer. In 1966 he returned to the Perrin CCTS as an F-102 instructor pilot. His present job is F-102 engineering instructor, Academic Branch, Perrin AFB.

GCA & YOU

by: LT COL F. G. SCHELLENBERGER
Hq ADC (ADOOP-SC)



Ed. Comment: Better read this one carefully and spread the word. It forewarns of a potentially hazardous dilemma. Before-the-fact preparation might not be a bad idea for certain locations.

In August 1968, Air Force Communications Service (AFCS) requested all commands to analyze their requirements to identify possible operational areas in USAF operated towers, RAPCONs and the GCA units which might be curtailed to alleviate AFCS manning problems. The Aerospace Defense Command (ADC) reply indicated this command could accept a reduction in the hours of GCA operations at certain dispersal bases. It was also indicated that, if required, we could abandon our requirement for a multiple approach capability at main operating bases during the hours of darkness, providing a single approach capability would be maintained. (NOTE: A word of explanation is in order here. AFM 60-5 defines a mulapproach as follows: "Radar approaches that involve the control of more than one aircraft on the final approach at the same time."

Conversely, a single approach capability provides for the control of not more than one aircraft at a time on the final approach.) It naturally follows that fewer GCA controllers are required to provide a single approach capability. For the studious reader, we hasten to point out that ADC also indicated a requirement for a recall capability to handle emergency situations and to provide normal services for our routine exercises during the "dogwatch hours."

By April 1969 the situation had come to a head. The "Head Shed" duly notified all commands that AFCS had reached an untenable situation and that corrective action was being taken; however, due to the long lead time involved in training additional 272XO personnel, the get well date will extend for two years. A quote from the USAF message is enlightening. "Eleven air traffic control facilities have already curtailed services with 40 others operating at emergency manning levels. They (AFCS) forecast that during the next 12 months approximately 50 air traffic control facilities will be forced to curtail services and 40 will be operating one skilled controller above a curtailment situation . . . a preliminary listing indicates that air traffic control services, primarily radar, may be curtailed at as many as 52 CONUS bases." To the really eager among you, this may represent a challenge —at the Springs we call it a first class problem.

In recognition of the criticality of the problem the Air Staff formed a study group. This group put their heads together and came up with a proposed solution. Extracts from the USAF follow on staff action indicate that "mid shift (normally 0000 to 0800 LOCAL) GCA operations may be reduced to an ILS vectoring service and/or ASR/PAR single approach capability . . . . where a PAR final approach is required, ILS vectoring service or control of other aircraft must be discontinued during the PAR phase. . . . this can be performed by one skilled controller." Further, it was noted that at USAF RAPCONs, reduction of personnel on the mid shift, where ADC has an alert commitment, will be limited to a minimum of two skilled personnel to provide approach control service and ILS vectoring and/or single approach ASR/PAR service. USAF PAR service at joint RAPCONs supporting ADC alert commitments can be deleted during mid shifts at locations where FAA has the capability and will agree to provide PAR service, if requested, during marginal weather and aircraft emergency conditions.

The situation then remained dormant for about as long as it takes to read back an abbreviated flight plan. AFCS followed with a message to all their unit commanders. The message asked AFCS commanders to coordinate with their host commanders to inform them of forthcoming curtailments in GCA operations. Curtailments are to go into effect as controller personnel are lost due to normal attrition. In addition, AFCS wisely pointed out the need for supporting NOTAM action. "For ADC bases, NOTAM information should include that except for emergencies, pilots should expect at least 30 minute delay for radar approach service during the appropriate time period and the facility will be limited to a single aircraft approach capability. At joint FAA/AFCS RAPCONs the NOTAM will indicate that PAR service will not be available during the mid shift." AFCS has also indicated that "GCA minimum manning will be reduced to that authorized in paragraph 222 of AFM 60-5. GCA units will be reduced to one senior controller (7-level) and one nonrated controller (3 or 5-level) qualified to perform assistance controller duties. It should be clearly understood that USAF radar facilities will be limited to single aircraft approach capability when PAR approaches are required." A check of paragraph 222.2 of AFM 60-5 indicates that "facilities operating under . . . the manning described above . . . will limit traffic handling to one aircraft at a time, under radar control."

Rest assured reclamas are reverberating around the appropriate sheds; however, it occurs to us that reasonable prudence dictates that both aircrew and supervisory personnel should take a long hard look at the ramifications involved in this one prior to the time it happens. We anticipate that the average bear will be thoroughly brainwashed with the situation as it exists at home plate. However, we ask you to consider, for a minute, the situation where you have been nominated to take part in an exercise or an active air defense mission and home plate goes WOXOF. How about a suitable alternate . . . what is the recovery capability at X base? Do you have sufficient fuel to hold a possible 30 minutes while another aircraft is being recovered? Does the intended or alternate base have an ILS runway which is suitable? How proficient are you on ILS? In other words, it is incumbent upon the pilot, the mission supervisor and the mission planner to be totally aware of the recovery capability existing where a single or mass recovery is intended. ★

EOD Personnel – Prima Donnas? Or?

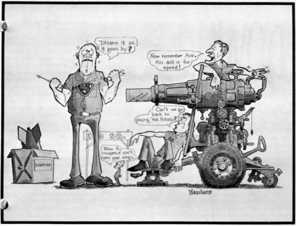
How many times in ADC have you heard the statement: "Explosive Ordnance Disposal troops? Those prima donnas? They don't do anything but sit on their wallets all day, and get extra money for doing it! In fact, they can show you all kinds of regulations and manuals that keep you from giving them any job to do except taking care of dangerous munitions!" This is not only unfair to ADC EOD personnel, but it also shows that the person making the statement obviously doesn't understand what an EOD element's responsibilities are, and what they have to do to maintain an on-base EOD capability.

EOD personnel have much more to do than just sit on their paycheck all day. Granted, a lot of their time is spent "on standby alert," or training to cope with accidents or incidents. But this is only because we have few accidents and incidents. EOD personnel in ADC are well-trained professionals who know their job and know how to handle hazardous munitions. They don't like spending all their time in training and "on standby alert" any more than anyone else. They would much prefer to be out doing munitions disposal work. However, AFR 136-10, Air Force Explosive Ordnance Disposal Program, states: "All major commands will establish *on-base* EOD capabilities as required to support the mission of their respective commands. An installation with an assigned munitions, tactical or storage mission or engaged in special activities warranting an EOD capability . . . will maintain an EOD capability."

In ADC, EOD elements are usually authorized five personnel and have at least two assigned. The entire program is outlined in ADCM 136-7. Simply stated, this manual required that an element be well equipped, manned and trained to handle accidents or incidents involving munitions. Accomplishing this gives the people plenty to do. Publications, common hand tools, radiation detection instruments, protective clothing, communications equipment, and special rendering safe procedure (RSP) tools must be maintained, and then inspected bi-weekly or monthly. To be well trained, the element must conduct a comprehensive proficiency training program. Thirty-two hours of training per man per month (classroom and practical) are required. Most elements get 40 to 60 hours, depending on how much time is available. Since EOD personnel are responsible for handling any hazardous or even possibly hazardous munitions, the training encompasses those both foreign and domestic. Most elements have a demolition range, at least one vehicle, and their own nuclear training weapon.

As far as inspections and evaluations go, EOD elements get their fair share. Numbered air force and command IG teams; tactical evaluations, standardization evaluation visits, MUNASTS and Safety Survey Teams all have a whack at EOD elements. Some elements have dual roles and may support as many as two or three different weapon systems. Others provide EOD support to lateral commands. Those with dual roles may get two or three times as many inspections a year as the base to which they are assigned.

As far as "not being able to do anything but w



on dangerous munitions," ADCM 136-7 specifically states that personnel of an element may be assigned additional duties or responsibilities, provided these are related to the munitions field, and do not conflict with the primary EOD mission and training requirements. It goes on to give some examples of additional duties such as: Monthly explosive safety inspections, assisting munitions personnel with annual inspections, function testing, destruction of munitions (which can be a full time job in itself at some bases), and many others. At Phase III dispersal bases (under certain conditions), EOD specialists can be used as augmentee weapons loaders.

EOD personnel, since they probably have the broadest general knowledge of conventional munitions and nuclear weapons, can be used to assist in many areas of training. Two examples are: helping disaster preparedness specialists train unit personnel in monitoring techniques and broken arrow procedures, and training fire department personnel in identification of weapons, munitions, and their associated hazards.

Incidentally, EOD personnel aren't getting that "extra money" anymore. They have been recently removed from the pro-pay lists. They do get $55.00 a month hazardous duty pay, but that is because of the basic hazards involved in the performance of their duties.

Anyone even remotely familiar with EOD requirements knows that there is a lot of work and training for them to do. If the element is well supervised and the talents of the assigned personnel are being properly used, the assigned technicians can't possibly be just "sitting on their dignity." If they are, you can be sure that it's not all the fault of the EOD technicians.

BILL NORRIS, Colonel, USAF
Team Captain, ADC ORI Team

DOWN and out

EB-57B ABORTED TAKEOFF

The crew filed a flight plan at base operations for a target deployment mission. Preflight, start and taxi were normal with the exception of some communications difficulties in receiving clearance. Takeoff was subsequently approved and the pilot began his roll. At the 2000 foot marker, both crewmembers observed that the line speed was 19 knots below the computed speed for proper aircraft acceleration. The second acceleration check was computed as 119 knots for the 4000 foot marker. The airspeed at this point was 100 knots, again 19 knots low, so the pilot made the decision to abort the takeoff. Throttles were retarded and brakes applied. Rollout was made using the full length of the runway.

While taxiing back, the crew evaluated the first attempted takeoff and did not consider that excessive braking had been used. The decision to try another takeoff was made. Takeoff data was recomputed to eliminate the possibility of errors.

Arriving at the end of the runway, the pilot did not stop for another last-chance inspection because he assumed the team would not be available. When the inspection team, which in fact was available, saw the aircraft take the number one position for the runway, they did not attempt to interfere. After receiving an amended ATC clearance, the pilot began the second takeoff roll. Again, the crew observed the same low airspeed readings at the 2000 and 4000 foot markers. The only difference noted in aircraft response was that as airspeed increased, the aircraft began to drift to the right side of the runway and almost full left rudder was required to keep on the runway centerline. The pilot aborted, and, during deceleration, left rudder and brake had to be used to maintain directional control.

With 4000 feet remaining, additional braking force was applied to slow the aircraft for a turn off the runway. Little or no deceleration was noticeable. At approximately 1500 feet from the end of the runway, maximum braking was applied to prevent the aircraft from entering the overrun. Greater efficiency on the left brake was evident as the aircraft began a drift to the left side of the runway. The aircraft came to a stop 27 feet into the overrun and 33 feet left of centerline.

The crew checked the aircraft over and found nothing serious enough to shut down. The tower asked the pilot if he needed assistance and the pilot replied that he wanted a tug. The pilot then taxied the aircraft forward and executed a sharp right turn of approximately 120 degrees to exit the overrun. After coming to a stop in the run-up area, the crew felt the right wing drop and thought that the right main tire had blown. Personnel in the area saw the wheel catch on fire and signalled the crew to abandon the aircraft. As the pilot opened the canopy, he observed smoke coming from the right wheel well area. Both engines were shut down and the crew evacuated the aircraft. The fire department responded to a crash alarm and extinguished the fire but not before the aircraft sustained major damage.

Examination of the runway and overrun revealed small droplets of melted magnesium 300 feet from the point where the aircraft stopped on the overrun. Tire braking marks were left by both main wheel tires for the last 1500 feet of roll with the right wheel marks being the darker. The right brake left a trail of melted magnesium as the aircraft was taxied to the run-up area. Here, the right main wheel brake continued to melt. The left main tire and right main tire deflated completely and hydraulic fluid leaking from the right brake ignited, causing an intense fire which was continuously fed by fluid under pressure. The flame pattern was directed toward the aft section of the right engine nacelle, fuselage and undersurface of the wing, resulting in extensive damage. The heat warped the right inboard flaps and upper wing surfaces. All aircraft systems were investigated and found in good operating condition, except the right gear indicator system, the hydraulic system with a line failure in the right brake area, and the pitot static system.

The cause for low airspeed readings during both takeoff attempts was positively determined. A TDR revealed that the pitot tube assembly was bent eight degrees out of alignment by an unidentiforeign object. This was substantiated by a small dent on the bottom side of the pitot tube. To the rear of this dent were olive drab pigments. The blow caused stretching and rupture of the heating element tube allowing air to enter the ram air tube, resulting in a 19 knot low reading.

Investigation and analysis of the brake system showed that the energy received by both brakes prior to the second takeoff attempt was not sufficient to exceed the structural design or heat limitations of either brake. However, the energy generated during the taxi back and the second rejected takeoff at about 118 knots did exceed design limits. The right brake had received 270,000 more feet/pounds of energy than the left, because more right turns were executed, and this probably caused the right brake to melt and burn. The minor difficulty which the pilot experienced in maintaining directional control during the second takeoff attempt was more than likely caused by the right brake dragging slightly or failing to release fully. Had both brakes failed, the aircraft would have run off the far end of the runway.

Both crewmembers were fully qualified in the aircraft and capable of performing the mission. Records indicated that on previous occasions the pilot handled emergency situations skillfully. In this instance, he did not consider it unsafe or hazardous to attempt a second takeoff and there was no existing guidance to prohibit him from doing so. His intent was to make sure that his procedures were not the cause for low line speeds during the first attempt.

The primary cause of the accident, though not fully staffed, is thus far considered to be pilot factor in that he attempted a second takeoff without determining the cause of the low acceleration check speed on the first attempted takeoff.

The malfunction of the pitot system would not have caused this accident had the pilot followed normal procedures and aborted the mission after the first try.

Although existing directives did not specifically spell out what action should be taken after an aborted takeoff, it goes without saying that a pilot is expected to use good judgment in a situation where aircraft acceleration is excessively low. Too many aircraft have been lost because pilots have tried to second guess obvious malfunctions of one system or another. It should be clear by now that anytime a pilot chooses to forego the chocks and takes his own action concerning known malfunctions, he thereby assumes full responsibility for that action and in the process jeopardizes the aircraft, himself, and his flying career. This lesson has been written in blood, sweat, and tears time and time again. Functional check flights properly belong to the maintenance activity. Let the experts find out what the problem is. You might just save your own skin.

safety officers'

FIELD REPORTS

F-106A FLAMEOUT. Engine flamed out on normal fuel control at 33,000 feet. Engine began to surge at 24,000 feet with fuel flow fluctuation of 400 to 500 pounds per hour. Throttle was advanced to full military for climb to 33,000 feet. Engine ceased to surge, accelerated normally. After leveling at 33,000 feet for 20 minutes, fuel flow 3200 pounds per hour, mach .88, RPM approximate 87%, engine began to surge again. This time fuel flow, EGT, and RPM fluctuated simultaneously; engine then quit. Emergency fuel system was selected, ignition button was depressed, and engine started, with 70% RPM indicated at 290° temperature. No other incident occurred after this and engine operation was good. A visual inspection revealed no known contributing factor for cause of flameout. Audio observation of engine coast down after engine shut-down revealed no indicating factors. Review of aircraft and engine records was accomplished; no known deficiencies existed. Changed main fuel control and aircraft was released for flight.

F-102 SPARKS IN COCKPIT. After the landing gear was lowered, blue sparks were observed above the rudder pedals. The electrical arcing occurred numerous times in three minutes. Rudder pedals seemed to be chafing loose wiring. Loose electrical wiring was tied and chafed wires repaired.

F-102A MULTIPLE PROBLEMS. Pilot noted that the speed brakes would not extend even though switch was out and hydraulic pressure on both systems showed 3000 pounds. On lowering gear, the right main showed unsafe. It showed safe as soon as emergency gear lowering procedure was used. On landing there was no nose wheel steering. Corrective action: Tightened loose terminal to S/B switch. Replaced bad right hand main landing gear door open switch. Reset emergency gear handle and bled hydraulic system. The secondary system failed after blowing down gear and blowing open speed brakes.

F-106A FLAMEOUT. The pilot noted lower than normal EGT on takeoff and cruise. At 40,000 as he was retarding the throttle from full mil, the engine flamed out. Airstart and recover in the emergency fuel system was uneventful. The fuel control was changed and the aircraft has flown OK since.

F-106A GEAR DOOR. After gear retraction, the gear unsafe light remained on and vibration and noise were evident. Visual inspection by another aircraft revealed all gear up. The gear was lowered normally and an uneventful landing made. The nose landing gear door linkage was found out of adjustment. As a result, the door was fluttering between closed and open. Each time it started open it would get a new signal to close.

F-101B ENGINE PROBLEM. During a practice GCA, number 1 engine RPM was noted to slowly decrease and would not respond to throttle movement. Emergency engine fuel control was selected, and after a slight compressor stall, engine RPM responded properly to throttle movement. An emergency was declared, and ground troubleshooting showed that the PB-4 line which senses burner can pressure and transmits it to the fuel control had failed due to fatigue.

F-101B NOSE GEAR. When the landing gear was retracted after takeoff, a loud noise was heard and all landing gear indicators were unsafe. The landing gear handle was placed in the down position and all three gear indicated down and locked. A visual check revealed that part of the retracting linkage was hanging loose in the nose gear well. A precautionary landing was made and a brace was installed a prevent collapse of the nose gear. The large locking link of the nose gear drag brace assembly was broken in four places. There were no obvious indications of fatigue.

F-106B SMOKE IN COCKPIT. On takeoff roll, the cockpit temperature became very hot, the electronic cooling light came on, and light bluish smoke entered the cockpit. Immediate precautionary landing was accomplished. Cause of the occurrence was a defective cabin temperature control valve. The defective valve was removed and replaced with a serviceable item and completely checked in accordance with 1F-106A-2-6. Aircraft has flown to date without a like type malfunction.

COCKPIT LIGHTS, F-101B. Pilot was returning to land after a night exercise intercept mission. The warning lights were in the dim position. When the pilot lowered the landing gear, the horn and red light went out, but the green gear down lights failed to come on. The emergency gear lowering system was used, but the green lights remained out. An emergency was declared and the mobile officer verified that the gear appeared to be down. The aircraft was landed and downlocks installed on the runway. When the pilot switched the warning lights to bright, the three green lights came on. When he dimmed them, the green lights went out. Investigation revealed that the relay in the warning lights control box that controls the dimming of the gear down lights was inoperative.

F-101B CONTROL PROBLEM. During straight and level flight at 320 KIAS, the aircraft suddenly entered a left roll which required near full right stick to right it. The AFCS was not engaged at the time. The yaw damper was disengaged and aircraft control regained for approximately ten seconds when the aircraft again entered a sudden left roll. Troubleshooting after an emergency landing failed to reveal any discrepancy thought to be directly related to the malfunction. The left aileron was, however, determined to be out of rig approximately three degrees and was corrected. The aircraft flew a successful FCF and several subsequent flights without recurrence of the problem.

F-102 LOW PRESSURE. Aircraft had the pneumatic pressure low warning light come on near the end of the mission without operating the armament doors. A precautionary landing was made, a good drag chute was observed, and the pilot was advised to stop at the end of the landing roll to be towed in. Aircrews were reminded again of the fact that this occurrence **can** result in loss of one or both brakes under certain conditions and should be treated accordingly. Corrective action: Replaced the number one armament rail actuator cylinder.

F-101B GENERATOR. After approximately one hour of flight, the right hand generator dropped off the line. Engine oil pressure was normal and no other malfunctions were noted. Inspection of the aircraft following a precautionary landing revealed that the Constant Speed Drive case was ruptured at the trunnion pump wobbler on the pressure switch mount bracket side. The CSD outlet charge filter was noted to be contaminated with pieces of ferrous and nonferrous metallic particles, and the main engine oil filter and number one bearing sump were contaminated with metal flakes.

F-106 RUDDER PROBLEM. After takeoff, aircraft tended to roll to the right. Pilot corrected problem with trim and then placed damper system to pitch selection. During climbout, rudder went full left. Pilot retrimmed rudder, then rudder went to full right. Pilot selected "yaw" position and rudder continued cycling from full right to full left. The same condition occurred in direct manual setting at all airspeeds and altitudes. Aircraft was landed successfully. Removed and replaced damper amplifier.

F-106B STUCK THROTTLE. Upon leveloff at 5,000 feet, pilot retarded throttle, but throttle hung up at 89-90% RPM and could not be further retarded. The throttle would advance OK. Airspeed was controlled with speed brakes, a straight-in approach and landing was made. Fuel shut-off valves were closed when the landing was assured and flameout occurred approximately four seconds later. Normal landing rollout was made and aircraft coasted to a stop approximately 2,000 feet from the end of the runway. Pins were installed and aircraft towed to the line. Investigation showed that the FOD curtain on the left side console was improperly installed in that the curtain was snapped around the throttle teleflex instead of around a conduit for which the snap was designed. When the throttle was reduced, the collar on the teleflex caught on the curtain.

F-101B SPLIT FLAP. After landing gear and wing flaps were retracted following a practice GCA, the landing gear warning buzzer would sound anytime the throttles were retarded below military power. The landing gear were extended for landing, and as the flaps were extended, the aircraft entered a roll to the right. The flaps were retracted and a no-flap landing completed after a declared emergency. Inspection of the flap system revealed a defective left hand flap sequence valve.

safety officers'

FIELD REPORTS

F-101B ENGINE NOISE. Aircraft experienced abnormal engine noise on right engine. Power was retarded to idle and noise ceased. The pilot elected to burn down fuel prior to landing. Engine noise increased followed by vibrations at idle. Pilot shut down right engine and declared emergency. Engine was restarted on final and left in idle. Uneventful landing was accomplished. Investigation revealed a portion of the N-1 compressor rotor tie rod nut cover protruding from between front accessory case and first stage rotor blades. Engine was removed and in-shop teardown revealed a portion of the cover missing and extensive damage to the inlet guide vane case, N-1 rotor assembly and shrouds, N-2 rotor assembly, numbers one, two, and three turbine wheels and exhaust nozzles.

F-102 FUEL/OIL. While on a missed approach from a practice formation approach, the AC power light illuminated. A pull-up to a downwind was made followed by an immediate landing. The pilot was able to reset AC on the ground. Cause was attributed to contamination of the oil by JP-4. Investigation revealed a ruptured fuel/oil cooler and analysis revealed oil was 80% contaminated with JP-4. Engine was removed and sent for overhaul.

T-33A OVERHEAT LIGHT. Immediately after takeoff the overheat warning light illuminated. Throttle was retarded to minimum necessary for flight, emergency was declared, and precautionary landing performed. Investigation revealed a worn tailpipe which was replaced. Aircraft has flown to date without further engine malfunction.

T-33A GENERATOR LIGHT. After one hour and fifteen minutes of flight the pilot noted the generator out warning light flickering and load meter jumped to .8 and then back to .4. The attitude indicator "OFF" flag also was displayed. A normal recovery and landing was accomplished. Investigation: Aircraft voltage regulator contacts were corroded.

F-106B CRACKED WINDSCREEN. After approximately 40 minutes of flight, the outer layer of the right windscreen cracked. Mission was aborted and an uneventful precautionary landing was performed. No positive cause for the failure could be determined. Suspect arcing NESA.

F-106A THROTTLE AGAIN. While in GCA pattern, pilot noted that throttle was binding between 80 and 85 percent RPM. A straight-in approach and landing were accomplished with no other problems noted. Investigation: Found throttle control telescope bent between throttle quadrant and cockpit pressure seal. Corrective Action: Throttle telescope repaired and lubricated.

F-101B LOW FUEL. During recovery from a functional check flight, the feed tank fuel low light illuminated. The total fuel quantity indicator read 6000 pounds and tank number two read 3000 pounds. An emergency was declared and the aircraft was landed immediately. Upon servicing the aircraft it was determined that 158 gallons of fuel were remaining at shut down. Investigation revealed a faulty fuel probe caused the fuel quantity gauge to be in error.

T-33 UNSAFE GEAR. After several low approaches the gear was lowered for full stop landing. An unsafe nose gear was indicated by the horn, warning light, and barber poles. At this time an emergency was declared and the pilot attempted to recycle the gear; however, the landing gear handle would not move. A visual check revealed the gear to be safe and landing was made with no further incident. Upon contacting the runway, the nose gear indicated safe. Investigation revealed that the nose gear down lock switch was out of adjusmtent.

F-102A THROTTLE RESPONSE. After throttling back because he was overtaking lead, the number two man in the flight advanced the throttle. No response, the rpm was hung at 83%. The pilot elected to recover at the nearest base, and could get no throttle response until he had descended through 15,000 feet. Even though the rpm was now responding, the pilot still elected to land. An engine maintenance man was sent to investigate. The engine was inspected in accordance with 1F-102A-6. The aircraft was ground checked and released for a one-time flight to home base. Further checks were made and although nothing could be found, a decision was made to change the engine.

THE WAY THE BALL Bounces

ON TOP OF THE HEAP

MO	ADC	MO	ADC	MO	ANG
61	48 FIS	22	343 Ftr Gp	76	162 Ftr Gp
36	4603 AB Gp	20	49 FIS	74	112 Ftr Gp
28	75 FIS	15	71 FIS	64	141 Ftr Gp
26	4758 DSES	14	78 Ftr Wg	55	148 Ftr Gp

ACCIDENT FREE

ACCIDENT RATE

1 JAN THRU 31 MAY 1969

	ADC	ANG
Thru May 1969	6.7	6.4*

MAJOR — ALL AIRCRAFT

BOX SCORE

ACCIDENTS FOR May / CUM TOTAL

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

MINOR ACCIDENTS THIS PERIOD — 0
MINOR ACCIDENTS CUMULATIVE — 3

CUMULATIVE RATE

1 JAN THRU 31 MAY 1969

	ADC	ANG
JET	8.4	7.0*
CONVENTIONAL	2.4	0.0

BY AIRCRAFT

	ADC	ANG
T-33	2.6	27.0*
F-89		0
F-100	0	
F-101	13.7	
F TF-102	0	3.2*
F-104	0	
F-106	15.4	
B-57	24.9	
EC-121	4.6	

RATE: MAJOR ACCIDENTS PER 100,000 FLYING HOURS

*Estimated

we point with PRIDE

Major Harold E. Pemberton
95 Ftr Intcp Sq
Dover AFB, Delaware

FUEL VALVE MALFUNCTION, F-106

Major Pemberton was an instructor pilot flying as number two in a four ship F-106 aerial combat tactics training mission from Dover AFB to Byrd Field, Virginia, using the Patuxent River NAS operating area.

After the second engagement, Major Pemberton checked fuel and found an imbalance of 1600 pounds, 2800 pounds on the left side and 1200 pounds on the right. Believing he had a fuel flow equalizer malfunction, he shut off the right side boost pumps to allow the left side to feed. The right low level lights illuminated and he then realized that fuel was not feeding from the left side, and had insufficient fuel to perform a normal recovery at Patuxent River NAS. Major Pemberton declared an emergency and contacted Patuxent Tower, and received landing instructions.

With fuel quantity indicating 2800 pounds on the left side and 800 pounds on the right side, the fuel flow began to fluctuate. Since indications to the pilot were now no fuel on the right side due to fuel flow fluctuations, 2800 pounds on the left side, and believing he had a fuel flow equalizer malfunction, he turned off the right fuel shutoff switch. The fuel flow immediately went to zero and the engine started to unwind. Major Pemberton then turned on the right fuel shutoff switch and fuel boost pump switches, retarded the throttle to idle and accomplished the airstart procedure. He then turned onto the low key and extended the landing gear. Power was at idle and there were slight fuel flow fluctuations.

At 6,000 feet MSL, and less than half way around the base leg, the fuel flow went to zero and RPM decreased to 20 percent. Major Pemberton continued the flameout pattern and landed the aircraft without further difficulty.

Investigation revealed the right side completely dry of fuel. The left fuel shutoff valve was nearly closed even though it should have been open. Analysis of the valve revealed a binding condition of the valve actuator limit switch arm which caused the malfunction.

Major Pemberton's calm display of professional flying ability when faced with this serious emergency which could have resulted in the loss of an expensive aircraft certainly earns him the recognition of the "We Point with Pride" awa

"HOW HIGH IS UP?"

You should be pleased to learn of the fine reception your INTERCEPTOR, Volume 10 dated October 1968 received in civilian circles, not only here but in South America as well.

We in the Operation Section of the Central Investigation Division, Bureau of Aviation Safety, National Transportation Safety Board in Washington, D.C. have been receiving and enjoying the articles in the INTERCEPTOR for years. The article in the October 1968 issue pertaining to "How High is UP" was of particular interest and timely from my standpoint at least as I was sent to Venezuela on December 13, 1968 as the [illegible]d States accredited representative on the Pan American B-707 accident. I just happened to have our office copy of the INTERCEPTOR with me and brought it to the attention of the Venezuelan Investigator-in-Charge, Dr. Jose A. Salas Parra. He read the article and immediately called a meeting for all Viaso (Venezuelan International Airlines) pilots to bring it to their attention as most of their approaches are made from over the water toward different type slopes of lighted terrain. Needless to say, they found the quiz at the beginning of the article most thought-provoking. Immediately following the meeting the Chief Pilot put in a request for the company to change some of their crew duty procedures.

It is so seldom that people in our business get credit for a job well done that I wanted to bring the above to your attention and extend my personal congratulations first to Boeing for having conducted the research in this area and to you for seeing the need for immediately disseminating the results of their research. There are so many important research projects that never become noticed by publishers of articles read by pilots that it is heartwarming to find a publisher or editor that does take note of pilot needs and acts when in receipt of such information.

[illegible]anks also for your immediate response [illegible]nding me the fifty copies of the article. Forty copies are being sent to Dr. Salas in Caracas, Venezuela, two to Captain Richard Vinal, Chief Pilot for Pan American in Miami, and the other copies are for investigators in my office.

If I can ever be of assistance in obtaining civilian accident information for you, please feel free to call upon me.

Corwin C. Grimes
Air Safety Investigator
National Transportation
Safety Board
Washington, D.C.

***Additional copies of this article are available for those of you involved in night visual approach problems. Many thanks to DOT.**

FROM THE EAGLE SQUADRON

On behalf of the Eagle Squadron Association, thank you for the copies of the INTERCEPTOR Magazine's Tenth Anniversary edition.

It is a great issue and a fitting culmination to ten extremely interesting and useful years of presenting the "safety" picture to units of the Aerospace Defense Command and the Air Force.

Keep up the good work, and may the INTERCEPTOR's next ten years be as successful in the fight for greater safety as it has been in the past.

Maj Gen Carroll W. McColpin
USAF (Ret)
President, Eagle Squadron
Association

BACK TO PARACHUTE TRAINING

May I take this opportunity to thank Major James T. Doran for the interest he extended in his letter to the Editor, December 1968.

It is most gratifying to an instructor when an air crew member expresses such enthusiasm and interest as he displayed. It affords that little extra boost which all of us need occasionally.

There are thousands of outstanding instructors in all fields dealing with air crews whose goal is to prepare these men for that unexpected emergency by giving them the very best training possible. And we will use any method possible to insure that our jocks are the best trained of them all.

We shall continue to "throw a nickel on the grass."

MSgt Glendon B. Dustin
4600 Operations Squadron
Ent AFB, Colorado

***The mission owes a lot to its dedicated instructors.**

RE "OPERATION COOL RIDE"

A pat on the back to our Air National Guard friends from California who flew their shiny Deuces all the way to Alaska and back without a hitch!

While not wanting to detract from this admirable performance, after reading of it, I did feel compelled to write and mention another gang of fearless (if not infamous) Deuce drivers from the "first team." They're known as "Black Knights" and live (or have lived) in a distant northern land called Iceland.

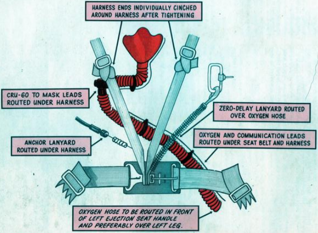
Over the years a lot of us have made the long (about 3,000 NM), hairy (no alternates at Keflavik, Sondestrom, or Goose — and lousy weather most of the year) haul from Iceland to the depot at Donaldson Center, South Carolina—and the return trip. We didn't have computerized weather analysis or any other special attention—just good sense and good birds—and, as far as I know, the Black Knights have never bent a bird.

Capt. Don Echelberger
Det 3, 32 Air Div
Key West, Florida

***We are justifiably proud of our ANG friends who deployed and returned their entire unit over some very rugged terrain without a hitch. We are equally proud of the "Black Knights" of Keflavik, of our F-106 units who deploy, and, last but not least, of the units stationed on our coasts who are constantly exposed to the hazards of overwater flying.**

the Cold Hard Facts..

On many days, in m[illegible] different ways—pilots have been observed strapping into the T-bird.



T-33 STRAP-IN CONFIGURATION SA-20 PARACHUTE