

Interceptor



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4758 DEFENSE SYSTEMS EVALUATION SQ . . . see page 16

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spotlight

Nothing can bring you peace but the triumph of principles.
 — Emerson

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OUR COVER

We salute the 4750th Defense Systems Evaluation Squadron at Holloman AFB, New Mexico. This outstanding and unique unit of the AOC is affectionately nicknamed "Our Friendly Enemies."

memo

from the **CHIEF OF SAFETY**

A RIVEDERCI!

Well, I guess this is it for me—I'll be retiring from this grand old Air Force of ours the end of May after thirty-one and a half years of active service. Accordingly this will be my last memo to all you professionals—I mean that, and can speak from my experience in the fighter business as well as any man around. You people have achieved the lowest major accident rate in the history of any fighter command, while providing the defense of our country on a 24-hour per day basis, seven days per week, in all types of weather. That's your job and you've accomplished it remarkably well.

If I could leave you with a legacy it would be this: First, I would leave each one of the young people with willingness—willingness to *listen*—if you are parents, you know what I mean. What's wrong with the young human mind that so readily rejects senior advice? Possibly there's just too much advice—I don't know. But I do know that if I had listened a little closer to my elders a few times, I wouldn't have experienced half as many unnecessary hairy escapes—I'm writing this now only because I was just plain lucky and escaped! Many of my contemporaries were not as lucky—they retired permanently a long time ago. Don't assume anything, but intelligently inhale every bit of experience you can glean from the "old heads" in the business—Listen! Whether it be at a lecture, beer call, or just plain bull session, listen! you'll probably learn something.

Then the second thing I would leave you would be, of course, my experience, if I could. If I could just print it on a handout or put it in a pill—I feel I could save a few airplanes and people that, according to statistics and the numbers games, are going to fall. They are going to be lost from pilot or aircrew error by some young, eager jock who just plain "goofed up" like I've done and you've done a few times—as I said, I was lucky. But I'm older now and I wonder just how much luck each one of us is allowed. I won't make those particular goofs again—that I know. How can I impress you that you may not be as lucky?

I believe I could easily write a book using the material from my experiences in the many various phases of flying and their safety implications, so in my last written words to you I am offering this short message of advice: Be aggressive, but don't allow false pride spawned by boasting idiots force you to ever exceed your own or your airplane's limitations. There is no peacetime requirement for a "pressing" accident.

Keep in good physical condition—this is probably the most priceless asset that you and your family can have. It pays off flying airplanes and it pays off later on. Listen carefully and learn from the older guy's experience, and finally, don't assume anything—be sure.

I would like to extend to every one of you my sincerest best wishes in your particular fields of endeavor. Fly safe!

COL. OLIVER G. CELLINI

HOT LINE



F-102 SPEED BRAKE COVER

Captain Larry L. Leach, Flying Safety Officer at Boise, Idaho, writes:

"The 124th Fighter Group has been participating in the ADC Alert Program with F-102s since late 1964. The fact that our facility does not have alert hangers has necessitated some measures to protect drag chutes from weather and our P. E. Shop designed a speed brake cover for that purpose. Following a recent drag chute failure and follow-up investigation, we found what we thought to be adequate, was not. Rain could get into the drag chute in spite of the cover.

"We have now fabricated a new cover which eliminated the possibility of any moisture in the speed brake area.

"We would appreciate a note in your 'Hot Line' to help in spreading the word to other organizations with the same problem."

It's our pleasure to pass the word along and to thank Captain Leach for his worthwhile contribution to the magazine.



Old Problem



New Cover

WE GOOFED!

In our March issue under the heading of Safety Officer Field Reports, "F-106A, Engine Fire," it was erroneously stated that "After the abort, the left engine was left running in an attempt to blow out the fire." Now this is ridiculous! — the left engine of an F-106A, indeed — the statement should be corrected to read right engine.

CAUSE DETERMINED

In last month's Hot Line an item entitled "Desec Cold Feet" discussed F-102 brake lock at touchdown. At printing the cause was unknown. Since then it has been determined that hydraulic filter units had not been adequately checked for contamination, which resulted in water (which later froze) being introduced into the brake system, resulting in brake lock at touchdown.

GEAR BLOWDOWN

From one of our unit Flying Safety Officers comes the following: "By drawing a comparison between two F-102 gear blowdowns recently and the results which followed, we believe a valuable lesson can be learned. In one case the pilot blew the gear down at least 12 miles or more from the field with the result that the secondary hydraulic system, which will invariably suffer the ingestion of some air when the gear is blown down, had time to fail. In the other gear blowdown, the pilot waited until downwind just seconds before touchdown to extend his gear by the alternate method. In this case the landing was accomplished before the secondary hydraulic had a chance to fail. It would appear that if it is necessary to blow your gear down in the F-102, it is best to do so close in on final, thus not giving the secondary hydraulic system time to fail due to air in the system. Along this same line, in the primary hydraulic failure, the pilot apparently did not take the most direct route to the field, but allowed himself to be vectored from south of the field to a position 18 miles east of the field on an extended final. As a result he was within a few scant minutes of complete hydraulic failure, and a nylon landing when the landing was made. The point here? Simple: don't doubt for a second that an emergency which appears to be a no sweat deal on the surface can be turning to a big sweat deal without the yock in the cockpit knowing it is happening. The failure of one system may be the beginning of a series of failures which may just be too much for any mortal fighter type to handle. So when the Good Book says 'Get the big bird on the ground ASAP,' that's what it means!"



Interceptor covers the

Air Force Association Convention

Vol 2-5, 1968

Atlanta, Georgia, hosted the 22nd National Convention and Air Force reunion of the 93,000 strong Air Force Association. Frequent participants in AFA conventions of the past commented that this was the most exciting and significant yet. INTERCEPTOR couldn't quarrel with the observation. The schedule of events was well planned and executed. There was never a dull moment, as the saying goes. In retrospect, two reasons stand out for the success.

The first is the long and impressive list of prominent people who attended, both military and civilian. It covered the spectrum from the Secretary of the Air Force to thirteen of the thirty living recipients of the Air Force Cross. Representatives of many aerospace industries made a lasting impression by their cordiality, understanding, and hearty support. Noticeable by their absence

were beards and beads. Obvious by their dignity and humility were the thousands who had been to foreign lands and served their country above and beyond the measure asked. General William W. Momyer, Commander, Seventh Air Force, received the H. H. Arnold Trophy as "Acro-space Man of the Year." Colonel Robin Olds accepted the David C. Schilling Trophy given for "The most outstanding contribution in the Field of Flight," not for himself, but for all those with whom he shared the burden of carrying the war to the enemy. Other awards and citations were presented, too numerous to mention here, to individuals and units which distinguished themselves in their service to the AFA, to the Air Force, and to their communities.

The second reason for the exceptional success of the convention was the irresistible, single-minded spirit of patriotism which prevailed

throughout the activities of the convention. The stage was set in part by the AFA statement of policy which opened: "The Air Force Association, in this pivotal year of 1968, continues its support of the United States commitment in Southeast Asia, and again declares: 'We must stay. We must prevail.'" What went on in between can best be summed up by the key points from an address before the Air War Symposium by Colonel Daniel James, Jr., USAF, for which he received a ground-shaking ovation. He said:

"I chose the subject 'Americanism' because I think we've never needed a dose of patriotism in this country more than we need it right now. I'm in the fighting business, it happens, so you probably know where my sympathies lie — you should anyway. I'm a fighter pilot, and that means just what it says. I believe in the country for which I

fight. I believe in her wisdom in choosing the time and the place. I believe that she only chooses to fight when all efforts to negotiate settlements of international disputes have proved fruitless. When the right of free people to stay free is challenged, and when we have received a request from nations to whom we have promised our support, we are obligated to respond. Unfortunately, at this time when it is needed so much, it has become unpopular among some Americans to be patriotic and to stand up for Americanism and the principles of democracy. On many occasions when I have spoken out on this subject, I have been repaid by being called a 'flag waver' or a 'war monger' and have received many phone calls that have made life less than comfortable for a while. However, when you have been shot at a few times in a few wars in defense of democracy, phone calls don't bother you very much. So I continue whenever I have the time, to give a listening audience a few reasons why I think the practice of patriotism and Americanism is so important now.

"The other 'isn't' that we are most concerned with and which is the cause of the present conflict, as well as the last, is Communism. It was the force behind the last shooting war we got into, and in which I was actively involved. This was the Korean conflict. I was stationed in the Philippines when we first got aimed in that direction. It was after World War II, and we had just finished the Great War that was to end them all. We were busy in the interim doing the things that military organizations do between wars, such as help firm up the peace, try to help the nations that were hardest hit get back on their feet again, and keep a show of strength abroad until things get settled somewhat. . . .

"We were having a big time with these duties until one Sunday afternoon, when our Commander called us all into the briefing room and invited us to sit down. He said, 'Gentlemen.' (We knew something was wrong right there because he had some other names he used to call us most of the time.) Anyway, he said, 'Gentlemen, it seems as though the North Koreans have decided to move on South Korea in an effort to unite the continent by force under the Red flag. . . . Now, what I would like to know is, how many of you fellows would like to volunteer to go up and get in on the shooting?' Well, naturally, the first thing we wanted to know was who was shooting back. (But they don't bother giving out these little details in a case like this when there's a rush on.) Then too, we knew we had to take some action right away because those kids we had been impressing each day on the beach now were saying, 'O.K., Rickenbacker, let's go.' So some of the harder souls scraped themselves off the rear wall and volunteered weakly, and our Commander, being a very magnanimous chap, volunteered about 150 more of us, and we were off. We went home and told our wives to keep the home fires burning (many of us had our wives there, as it was peacetime), and all the other little speeches that heroes make as they go off to war, and we said we would hustle up there and put down this little revolution and would be back in a few weeks.

"Well, you all know the story from there—you know that we *didn't* get back in a couple of weeks — you know that the most fortunate ones of us came back after a year or more of some of the toughest fighting we had ever seen. Some of us, and far too many of these, won't come back at all. Some of the men came home by a more circuitous route, after

having been exposed to one of the worst weapons that had ever been known in the history of warfare — modern or otherwise. Now this wasn't a physical weapon, mind you, but rather it was a psychological one, and the place of employment of this weapon was not on the battlefield as is usually the case, but rather in the prison camp of the enemy. The victims of this weapon were our people or our allies that had been captured and taken prisoner. Being great namers as Americans, we termed this weapon the 'Brain wash.' And we were quite concerned when we found that there were admitted 'afflictions' in the first group of prisoner repatriates who had been sold on the ideology preached and taught during this brain wash in the Communist prison camps. We were concerned because we knew we had fashioned no formal counter against such a weapon. For their physical weapons we had sufficient counters, for their infantry we had counter infantry, for their tanks we had our anti-tank guns, and so on, but we had always thought that the normal process of democracy an American kid is subject to as he is growing up in his home, and in his church, and in his school, was ample to counter any ideology that would try to overthrow his government, or worse yet, would try to shake his faith in his God.

"And so, we promised God and some other responsible people that we would not make this mistake again. We tried to fashion formal counters in the military. We have special schools, we have survival training schools, including counter indoctrination training. We may have all sorts of training, gentlemen, but I submit to you that these are still not sufficient if the normal process of democracy of which I speak are not increased two-fold in the home, and not only in the home. . . .

the streets, and in practice in our everyday lives. We should try to salvage some of our people with whom it has become popular to give comfort and solace to the enemy. These people are more numerous now than I have ever seen them in my lifetime. Never has it been so popular in so many places in America to stand up and speak publicly in defense of the enemy of the country. It is easy to employ the defense mechanism naming this as one man's war or the other, rather than seeing the 'big picture' and living up to whatever responsibilities one has to our country in these difficult times, and recognize what the consequence must be if we lose. Communists, or any other would-be world rulers, depend on disunity. They depend on their ability to drive the wedges of discontent among the peoples of free nations so skillfully that they weaken the desire of such nations to remain free. This has been true since the time of Napoleon, and before and since. Hitler's march down through so many countries was so successful, and he was able to take many without hardly firing a shot because these wedges of discontent had been so skillfully driven, and the people were so divided among themselves, that they were willing to forget the 'big wolf' at the door who was ready to devour them all. We have approached dangerously close at times to this sort of thinking in too many circles. The present enemy is an expert on exploiting minorities or any group that is not satisfied and who are willing to grasp any opportunity to improve their present lot. Their grievances are easily exploited. In this regard, look at the argument they give me. For example, they say, 'James, you are a member of a minority—you are a black man.' (I accept that—somebody took the time to count—and I came out on the short end—

that's all right.) They say, 'You should be disgusted with this American society—this so-called democracy. You are a black man, and here somebody is always going to remind you of that. You can only progress so far in any field that you choose before somebody puts his foot on your neck for no other reason than that. You are a second-class citizen, and you should be disgusted with the treatment that you get here. You should come over on our side, join us, and let us show you the greener grass here. Let us show how free men think — you should really be disgusted now.' I say, Heck, I'm not disgusted—I'm a citizen of the United States of America, and I'm no second-class citizen either, and no man is unless he thinks like one and reasons like one and performs like one. This is my country, and I believe in her, and I believe in her flag, and I'll defend her, and I'll fight for her, and I'll serve her, and I'll contribute to her welfare whenever and however I can. If she has any ills, I'll stand by her until in God's given time, through her wisdom and her consideration for the welfare of the entire nation, she will put them to rights. In the meantime, I will continue to demand superior performance of those under my supervision, as well as myself, on the job that we have to do, to contribute to her welfare, and to contribute to her strength. In this way I shall try to counter the discontent and grumblings of the fairweather patriots who are quickest to run when the going gets tough.

"It's time for strong men to stand up and be counted—no matter what their personal grievances are. The greatest weapon in the world that we have at this time is a weapon we have always possessed. It's a weapon held mainly in the hands of you, the civilian majority who make up this

country, and who are, indeed, our bosses in the military. This, too, is not a physical weapon, but rather it is a psychological one — it's a weapon called UNITY—unity in the principles of democracy. Stop finding so many ways to hate each other because of race, creed, religion, political party, section of the block, social strata, or what have you. Stop using personal grievances as an excuse to break the laws of the land. I will not join with any lawless mob at any time, no matter what the provocation is, in a disregard for law and order. A thief is a thief—I don't care what he gives as his reason or provocation for stealing. A mob is a mob, no matter what the provocation, and these things get maximum publicity on the other side and somehow smother the good things that are being done by others. We can't afford that in this great country of ours. So I ask you—try to help to unite those you touch and with whom you come in contact.

"Participate in your government and contribute more than you criticize. Though honest, constructive criticism has always been one of the major rights of free people in a democracy, make sure that your sense of values stays in line. So many people are spending so much time practicing the right to dissent that they have completely neglected the responsibility to contribute. Let your contribution to the total effort be a by-product of what you achieve through excellence in your chosen fields. In your daily lives, build for yourself your link in the chain that is the unity that has always been the strength of these United States of America, and show that unity to the world, and they won't stand against us—they wouldn't dare."

After listening to that speech, there was not much else to say or do, except try to swallow down the lump in your throat. ★



PERSONAL PREVENTIVE MAINTENANCE

by MAJOR ROYCE MOSER, JR. USAF MC
Office of the Command Surgeon • Hy ADC

Why all the sudden interest in physical conditioning? Granted, the Air Force has always had some type of exercise program, varying from the old supervised calisthenics to the current SBX program, generously loaned to us by the Canadian Armed Forces. However, such programs frequently consisted of once-a-year "maximum effort" with prompt return to our usual unexercised state after testing was completed. It's even been rumored that on occasion you could get a temporary excuse from "good old Doc" and, prior to the computer crash, your name might be lost for a full year. But lately you've heard of a new "running" program which is under development. And, even more disturbing, you've also heard testing might be on more than an annual basis. Why, they could even require you to stay in shape all year long!

Other disturbing stories are also circulating in ready rooms, base operations, or, for the few of you who visit such places, even at the O-club bar. Your friends tell you that the flight surgeons are being a

lot tougher on people over the maximum weight at the time of their physicals. Once you get back down to an acceptable level, you may still have to report for monthly weights until it is reasonably certain you're going to stay at the prescribed weight.

Of equal concern are tales of people who have been placed on diets even though their weights were in prescribed limits. Oh, sure, they might have had some little trouble with their electrocardiogram or the level of sugar in their blood, but you know lots of flyers who've had such conditions waived without spoiling their meals.

So, again, why all this interest in conditioning? Before you dismiss it as another diabolical plot by "those flight surgeons," we would like to present some of the reasons for our attitude toward physical conditioning. Hopefully, you might then consider such a program not only reasonable, but even worth adopting.

We now have adequate studies to show that people who are overweight have a higher than normal

risk of heart disease, diabetes, and high blood pressure. As a direct result, such people also have shorter lives. Additionally, studies have indicated that the individual in poor physical condition has an increased risk of developing disease. This evidence is the primary reason physicians are becoming increasingly concerned with the overweight, poorly-conditioned individual.

How do we define an overweight person? The maximum limits in AFM 160-1 are not a magic cut-off between normal and overweight levels. The limits represent a statistical curve and admitted, some of the individuals used in compiling the limits weighed more than good health would dictate. Thus, although anyone above these limits can be considered overweight, an individual under the maximum weight levels, depending on his age and health, may still actually be overweight. Consequently, weight reduction may be indicated even though a person is "within limits." Indeed, even if no weight limits were published, current medical knowledge would

care that many individuals should lose weight for the sake of their health.

"Fine," you may be thinking, "but how does all this apply to me? Why should I be concerned? After all, I'm a typical 'young' pilot and I've always passed my flying physical. I'll worry about losing weight when I get older."

For your interest, you should know that we have repeatedly been seeing reports of heart attacks in crew-members who are 30 and younger. The attack rate increases progressively with age. Consequently, many of you "young" crew-members are already in the age group where you are running the risk of a heart attack. Additionally, we have also seen disqualifying cases of both diabetes and high blood pressure develop in relatively young (25-40) crewmembers who should have had many years of flying left.

Fortunately, however, the picture is not all black. We now have evidence that weight loss combined with a regular exercise program will not only aid in preventing disease, but can even result in the return of some electrocardiograph abnormalities to normal. This is accomplished as the conditioning effort opens up new blood vessels in the heart with a resultant "healthier" heart. As another benefit, such a conditioning program, will also increase your chance of survival should you have a heart attack. The same program frequently results in the return of high blood pressure or diabetic blood sugar levels to normal. Although of benefit to the health of all, this is of particular importance to flying personnel since return of the electrocardiogram, blood pressure or blood sugar to normal may enable a crewmember to return to flying duties.

Unfortunately, once these condi-

tion responses to exercise and weight loss. It is for this reason the medical service is placing increased emphasis on early detection of the disease process, with subsequent vigorous attempts to prevent further deterioration through conditioning.

Now a few words about the type of program we're discussing. Any individual over the generous maximum limits provided in AFM 160-1 should certainly reduce to these limits. Should the individual have any evidence of heart disease, high blood pressure, or diabetes, his weight should not be greater than the standard listed in 160-1. Remember, the ideal weight for all ages is that standard listed in the age 26-30 column. The weight loss should be a gradual one (approximately 4 pounds per month), and supervised by your friendly flight surgeon. "Crash" diets are not to be undertaken while on flying status as they can pose a distinct hazard to flying safety.

The exercise program must be regular, begun at a low level, and gradually increased until it reaches a level equivalent to the 5BX level for your age. A new program is currently being evaluated in which the goal is a level of fitness equivalent to covering a mile and one-half in twelve minutes. This may sound pretty easy, but a trial should convince you that you will be in relatively good condition when you can reach the goal. You will probably get additional information on this

new program shortly.

Frequently, active participation in an exercise program will serve to keep your weight at a reasonable level without strenuous dieting. Common sense will still be required when you are offered a second piece of cream pie. By combining exercise and sensible eating habits, you should shortly reach an optimum level in your conditioning program.

In summary, we know that people with extra weight who are in poor condition have an increased risk of heart disease, high blood pressure and diabetes. These conditions are not only a hazard to your health, but can also result in suspension from flying duties. Fortunately, you can help prevent these conditions by a conscientious continuing program of weight control and exercise. Sure it requires effort, but the payoff comes with each additional healthy year. With such a conditioning program, you'll find that not only will you look better, and thus maintain the image of the dashing flyer, but you'll even feel better. This will be particularly apparent as you reach the optimum level in your conditioning program — ask your friends who have tried it.

As a parting note, we should point out that the evidence of the resulting benefits is now so convincing that even your friendly flight surgeon is probably participating in such a program. If not, you might want to lend him this copy of the INTERCEPTOR. ★





**OPERATIONAL
READINESS
INSPECTION TEAM
HQ, ADC**

RAIL/RACK REBUS

On 1 April 1967, a scoring system called the Airborne Weapon System Verification Program Test (AWSVT) was implemented throughout ADC for ORIs and Tac Evals. The new system consisted of scoring the weapons system verifications success rate by combining the MA/MI success rate with the evaluator (WSEM/MSR/RME) success rate. The procedures for the scoring system are contained in Annex E, ADC Ops Plan 6-67 (Operational Readiness and Capability Inspections) and ADC Pamphlets 55-89, 55-101, 55-102 and 55-106.

A successful weapon system verification attempt requires an assessed MA in accordance with applicable AFM/ADC 51-XXX series manuals and a WSEM/MSR/RME that has all required signals present and within specified T.O. tolerance.

Now let's see what is actually required. The easiest way is to break the test down into three phases — Planning, Execution and Evaluation.

Phase I starts when the ORI Team arrives. The unit provides the inspectors with a list of potential aircraft. Then the random number tables, in conjunction with the pass/fail criteria charts contained in ADCP 55-XXX, are used to select a scoring order, WLS loading order, and required sample size for both the primary and secondary systems (separate tests). The unit is then given the scoring order and loading requirements for planning and execution. This is where the battle begins and it does become a complicated task to meet all the requirements of the test. While not re-

quired, most units elect to fly their aircraft using the scoring order as a guide hoping that they will reach an early decision. This usually is not the case as the program test is spread out over the entire ORI flying phase. Evaluations are made as the flying progresses.

All evaluation devices are assessed as they become available. The results are recorded and the unit has a good idea of where they stand. This is part of the evaluation phase — the remainder of the phase takes place at the end of the day's flying activity when the verification attempts are correlated with the ground environment inspectors at the DC. Sometimes the picture changes because we find that some attempts were not valid or erroneously charged. Once the correlation has been completed, a comparison with the pass/fail criteria chart is accomplished to determine if a decision can be officially made. The charts contain four columns and are used as follows:

a. *Sample size* - Represents the number of verifications required to complete the test. The last number in this column is the point where a pass/fail decision must be made.

b. *Pass with at least* - Represents the lowest number of successful verifications needed to pass for the corresponding samples collected.

c. *Continue to test range* - Indicates that the number of successful verifications in relation to the number of samples is not sufficient to make a pass/fail decision.

d. *Fail with no more than* - Represents the point at which a unit fails in relation to successful verifications versus number of samples.



In the event an early decision can be made, the test terminates but the unit will continue maximum evaluator utilization to qualify the WLSs. Test data is forwarded to Hq ADC for both ORIs and Tac Evalts to continually update the program.

A NEW MANUAL is being printed and includes several changes which should help units conduct the test. Basically the changes are:

- a. Forms will be redesigned so they are easier to use.
- b. Random number tables will include only those numbers equal to the number of possessed aircraft.
- c. New pass/fail criteria charts will be printed. Biggest change is that the early breakout point for all aircraft and the pass/fail scores for the F-102 will be raised.
- d. Selection of the WLS to be loaded has been simplified for the F-102 and F-106. The WLS will be picked the first time and then the next higher or consecutive WLS will be used thereafter. If WLS #4 is initially picked then WLS #5 (F-102) or WLS # 1 (F-106) will be the next selection.

Even with the changes, the primary objective of the AWSVT is to reach a pass/fail decision. No attempt should be made by the unit to fly evaluators one at a time to obtain a sample size yielding a pass/fail determination. Time, mechanics of the test, available evaluators, and the frequency of "no-contests" dictate that the number of planned evaluations be well in excess of the minimum sample size. Those units that have been most successful with the test are the ones who have used a well organized plan. Evaluator results have been expeditiously processed and properly analyzed and both aircraft and evaluators have been turned around in a minimum time to insure meeting all test requirements. Conversely — the units who have experienced most of the trouble have been those units who have tried to "bear" the system and did not have or failed to follow a plan. One of the most important things to remember is that the AWSVT is a unit effort and requires cooperation from all in order to be successful.

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

SPATIAL DISORIENTATION

By
MAJOR ROYCE MOSER, JR., USAF, MC
Office of the Command Surgeon

Why go to all the trouble to become an astronaut to get oriented about space? You've got all the space in your daily work that you need to get oriented in these matters. In fact, you can get disoriented about it. Would you believe?

A 102 pilot lost his leader in weather shortly after a formation take-off. After searching the murky overcast for a few moments trying to visually locate the lead aircraft, he suddenly realized, as he looked at his instruments, that he was in a dive. He pulled back on the stick and, according to witnesses' statements, recovered approximately 100 feet off the ground. However, in the resultant sharp climb, the pilot felt he no longer had control of the aircraft, and he successfully ejected.

A 106 pilot attempted to descend through weather after losing a portion of his flight instruments. His attempt to eject shortly before impact was unsuccessful.

A flight of four A-4 aircraft on a VFR flight plan entered a hazy condition between cloud layers. The lead became disoriented and thought he was in right bank when his left wing was actually down. He attempted a left turn and became inverted and entered a dive. Realizing he was disoriented, he went on instruments and recovered, as did one other aircraft in the formation. The

other two aircraft impacted with fatal injuries to the pilots.

These accidents occurred during the past six months. No attempt has been made to summarize all the accidents during this period in which vertigo has played a role, nor can we know how many near accidents have been due to becoming disoriented. I'm sure some of you reading this could provide personal examples of the hazards of vertigo. The examples are listed to prove that disorientation, in spite of lectures, development of instruments, and training aids is still a killer. In this discussion, I hope to point out why the condition is such a hazard and what must be done to overcome the hazard.

Spatial disorientation — the term we flight surgeons prefer, since the medical term "vertigo" refers to one specific sensation only — occurs when one does not correctly perceive his position, attitude, or speed relative to the earth. On the earth's surface, we remain oriented through nerve impulses received from the inner ear, eyes and other sensing organs, including skin responses to pressure. In an aircraft, however, these sensing organs not only may fail to send impulses, but, of equal seriousness, may provide misinformation.

In flight, we now know that the

only method to maintain orientation is by visual reference, either to instruments within the aircraft or to outside reference points. Fortunately, through indicators as well as by cross-checks with other instruments, it is possible to rapidly determine whether the instruments are operating properly. Unfortunately, however, outside references can be either misleading (as will be discussed below) or suddenly become unavailable, as in the case of the 102 pilot discussed above. Relying solely on outside visual references can, therefore, set the stage for a fatal case of vertigo.

At some time we have all experienced visual illusions, such as the appearance of a lake due to distortion produced by heat radiating from the ground. Of much more concern to the pilot are such visual illusions as confusion of ground or ship lights with stars. Various incidents, some humorous, some tragic, have been recorded of attempts to keep surface lights above the aircraft where the "stars" belong. Another illusion, of particular concern in night formation flying, is "auto-kinesis." This means that a solitary static light, stared at for several seconds in the dark, will appear to move. You can demonstrate this in a completely dark room by staring at a lighted cigarette placed a few

SEMI CIRCULAR CANAL
CONTAINING FLUID
AND HAIR CELLS



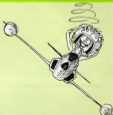
a. Straight and level.
Hair cells in canals not stimulated.



b. Slow roll - hair cells not stimulated.



c. Quick recovery - hair cells stimulated.
Hair cells bent due to inertia of fluid in the canal.



d. Resultant sensation.

Figure One

feet from you.

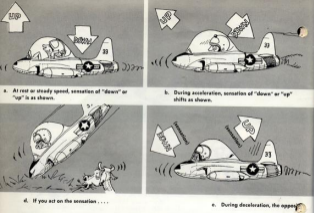
Flying VFR "on top" over a sloping cloud deck can result in a pilot attempting to align his wings with the cloud deck. The resultant aircraft turn or slip can readily produce a severe case of vertigo. For you aero-club fans, the same situation can occur as you fly along the side of a mountain to "point out a couple of deer." Due to the tendency to line up with the sloping ground, coupled with absent or inadequate instruments in the light plane, the pilot finds he is rapidly slipping or spiraling down into the valley and rapidly becomes disorientated when he is unable to deter-

mine "what's wrong with the airplane." This precise situation recently resulted in a crash with one fatality out of the two on board.

In addition to visual illusions, you can be fooled by your inner ears, which also act to maintain orientation. This apparatus usually functions very well on the earth's surface but in flight it will frequently function improperly and provide misleading information. Nerve endings in the semicircular canals of the inner ear are stimulated by movement of fluid in the canal. Such movement enables us to perceive motion and serves a very necessary function. However, with very slow move-

ments, such as a slow roll, the fluid does not move, and the pilot perceives no motion. When he suddenly realizes he is in a bank and rapidly corrects to level flight, the fluid movement stimulates the nerve endings, and the pilot feels he is flying in a bank in the opposite direction, producing the "leans" (Fig. 1).

In another condition, the canals cause trouble because they perceive motion when none exists. During prolonged coordinated turns, the fluid equilibrates and the pilot no longer feels he is turning. When he stops the turn, the fluid attempts to return to its original position, and the pilot feels he is turning in the



Figure

opposite direction. Depending on the circumstances causing the sensation, attempts to correct it will result in the appropriately named graveyard spin or spiral. Under these conditions, failure to become oriented will abruptly end the flight.

Another portion of the inner ear enables us to sense the direction and magnitude of the g vector. In other words, this apparatus tells us which way is up. Again, this sensing organ functions well on the earth's surface. But, as shown in Fig. 2, we have unfortunately become so used to these sensations that under accelerative forces other than those of gravity, we get an incorrect sensation of what is "up." Attempting to orient the aircraft to match the pilot's impression of true vertical again invites disaster.

Numerous other examples of illusions arising in the eyes or ears

could be provided, but this article is not meant to be a review of all cases and types of vertigo.⁶ However, these examples hopefully help point out the reasons we can confidently state that a pilot who loses valid visual references will rapidly become disoriented. How rapidly? One investigator found that a pilot in a jet aircraft flying at 10,000 feet can easily place the aircraft in

"Should a complete review of physiological mechanisms be desired, please see USAF SAM Aeromedical Review 4-66, "A Primer of Vestibular Function, Spatial Disorientation and Motion Sickness" (Gillingham, K.K.) and USAF SAM Aeromedical Review 7-63, "Spatial Disorientation - Current Concepts and Aero-medical Implications" (Donner, R. H.) Your friendly flight surgeon can provide these.

an unrecoverable position within 20 seconds after loss of visual references. In other words, peering through the overhead for 20 seconds looking for the lead aircraft could mean the pilot would not be able to get on instruments rapidly enough to prevent a crash.

How frequent is the condition? We know that many cases are never recorded. However, one investigator felt vertigo was probably the most common cause of fatal accidents not caused primarily by mechanical failure. In one review of major aircraft accidents, it was found 14% of all fatal accidents were caused by vertigo.

Who can be affected? Everyone. Through use of a simulator (consisting of an enclosed cockpit complete with stick and instruments) we have shown we can produce vertigo in anyone, including highly



e. Resultant sensation is as shown.



f. If you attempt to act on the sensation . . .

sensation is produced.

Two

experienced pilots who "never had a case of vertigo."

What contributes to the condition? Studies have shown that fatigue can play an important role in the development of vertigo. Stress situations such as malfunctions or flying at the limits of your capabilities may contribute. As one might expect, it also appears there is increased risk of developing vertigo at night. In such situations, the pilot frequently will begin relying more on his sensory inputs than on the instruments as he either begins to hurry his instrument cross-check or, due to other pressures, ignores them for a "moment or two." Unfortunately, these may be some of his last moments.

How do you combat vertigo? Remember that fatigue and other stress conditions will increase your chance of developing vertigo. Be aware of

predisposing factors and either eliminate them or recognize the increased hazard and maintain a closer instrument check. In this way you may prevent a vertigo situation. But remember that in spite of all your experience and extra vigilance, you can be affected. So — most important of all — remember that once you've lost visual references or when you feel confused, e.g., you find yourself skidding as you fly "straight and level," you must get on instruments immediately. Recognize that your sensory inputs will be misleading and trust your instruments. Cross-checks should convince you they are not malfunctioning.

As an aside, we can also answer the question of what to do if your instruments are lost. If you cannot immediately go VFR, the only course of action is to leave the air-

craft. No matter how rough, a parachute landing is better than a driving impact into the ground while you were flying "straight and level," trying contact center to tell them you were having a "little" instrument problem.

In summary, I want to emphasize that vertigo is frequently a cause of fatal accidents, flight provides the ideal situation for vertigo to develop, it can affect anyone, and because of misleading inputs from the ear, it will occur rapidly, once visual references are lost. Knowing these facts — and never forgetting them — is the ammunition you need to successfully combat the situation and avoid becoming the subject of some future INTERCEPTOR article on vertigo. And your flight through "space" will have a happy ending. ★

Our Friendly Enemies From Holloman



Nestled in a basin between two southern New Mexico mountain ranges in country which abounds with the legends of Billy the Kid and Geronimo, operates a distinctively unique Air Force unit which can speak of its Southwestern heritage much like an oldtimer.

This is the 4758th Defense Systems Evaluation Squadron (DSES) from Holloman AFB, New Mexico.

It is a rare occasion when a military unit remains in the same part of the country, much less to perform the same basic mission for 29 years. This is the story of the 4758th DSES.

For the 4758th DSES it began at a pioneer military airfield near El Paso, Texas. At that time the field was called "Biggs" and the first flying outfit stationed there was the 129th Observation Squadron. Little did the personnel of this pre-World

War II unit realize that they would be the first in a long lineage leading to today's 4758th. Little did they realize that their job of towing targets for Army antiaircraft trainees would evolve into what it is today.

In its 29-year history the squadron has seen many changes, not only in the type of aircraft flown, but in the types of Aerospace Defense systems employed against their exercise force. In 1939, Martin B-10s and Douglas A-20s were flown in towing targets for the antiaircraft units being trained on the U.S. Army's Fort Bliss ranges. Later the name of the outfit was changed to the 6th Tow Target Squadron, and still later, to the 4086th Base Unit. In December 1944, the squadron moved to the air base at Deming, New Mexico.

The stay at Deming was very brief and in September of the fol-

lowing year, the unit returned to Biggs Field and was redesignated the 27th Tow Target Squadron. In late 1947 the name was changed again, this time to the 1st Tow Target Squadron. The types of aircraft being flown then were B-29s, P-80s, and A-26s. By this time, the squadron missions had expanded to include tracking missions at White Sands Missile Range, and similar missions to such distant points as March Field, California, and Eglin Field, Florida.

In October 1949, the outfit was deactivated, but in May 1950, less than a month before the Korean conflict outbreak, it was reactivated, once again to fly target and tracking missions for the Army Antiaircraft Artillery School at Ft. Bliss, Texas. At this time a new jet bomber was added to the unit's roster of flying equipment, the B-45. This sleek jet

augmented by F-80, L-13, C-45, and C-47 aircraft. Later the A-26, redesignated the B-26, and the huge B-29 aircraft returned to the lineup.

A few years ago, in 1957, the squadron began to take on its present fleet of pure jet aircraft, and in doing so, another distinction. The British bomber, the Canberra, built under license in this country by the Martin Company and known as the B-57, began to fill the Southwestern skies of the United States. Later the fast North American F-100 Super Sabres were added to the squadron aircraft inventory, thus cementing the distinction of having two types of unit equipped aircraft. Since that time the unit has equipped and maintained these two types of aircraft.

By this time, the Army had changed over from the conventional World War II and postwar weapons to missiles, and the mission requirement of the squadron was upgraded to keep abreast with the training requirements of the missilemen.

In late 1960, the squadron took another new name, the 1st Aerial Tracking Squadron. Finally in 1962, when the squadron was assigned to today's Aerospace Defense Command (ADC), the present name came into being. Although aircraft and defensive systems against aircraft have changed, the primary mission of this Fourteenth Air Force unit has remained basically unchanged since 1939.

As the unit moved from the now deactivated Biggs AFB, Texas, to its new home at Holloman AFB, New Mexico, it took on the added distinction of not only being the first flying outfit at Biggs, but also the last one. Additionally the century series interceptors of ADC were screaming across the skies of the continental United States being guided and controlled by the more sophisticated electronic fire control systems and computerized SAGE sites

of ADC.

Targets are still towed by the 4758th today, but by high-speed jets. A new wrinkle has been added, however, to give added realism to the training of fledgling radar operators in the interceptors, the ground radars, and the missile outfits—Electronic Countermeasures (ECM).

Today the B-57 aircraft in the 4758th DSES carry a sophisticated payload in the form of electronic jammers and chaff. These electronic jammers, operated by one of a two-man crew called the Navigator/Electronic Warfare Officer, have a capability of directing a form of high-powered static into most radars thereby making it more difficult for a radar operator to view targets on his radar scope.

The chaff, thin strips of aluminum foil packed in pods under the aircraft's wings, will appear as false targets on a radar operator's scope when dispersed into the airstream. Together the electronic jammers and chaff make up a potent threat.

The F-100s are not idle, however. They still continue to tow targets for the Army—primarily towing the more modern "Dart." In addition, the F-100s fly as high speed, non-ECM, targets for student Hawk and Nike radar operators.

Change has visited the 4758th DSES, however. In addition to fly-

ing the many varied missions for the Army at Ft Bliss, there are many callers for the 4758th services today. Since a potential enemy is expected to use ECM the B-57 aircraft are much in demand by the many varied agencies in North American Air Defense Command (NORAD) and ADC. In fact both squadron aircraft are constantly being called upon to simulate the real enemy—thus today's popular name "The Friendly Enemy."

Being more specific the 4758th DSES deploys a B-57 aircraft to Perrin AFB, Texas, on a regular basis to fly as an ECM target for ADC fledgling interceptor aircraft pilots. Under Operation "College Dropout" Air Defense Artillery (ADA) units throughout the United States receive a B-57 aircraft from the 4758th for week-long training sessions working with the aircraft's ECM. These ADA units are composed mostly of Nike, and sometimes Hawk, Air Defense systems.

Squadron aircraft are constantly deployed throughout the United States and Canada participating in Headquarters NORAD and ADC directed Notice and No-Notice Air Defense Exercises. Under Operation "Micomaster" and "GATE" selected ADC fighter interceptor squadrons and air division radars receive ECM training periods from the B-57 air-



Friendly targets and their offensive equipment.



It all started with these.



Majors Gonzalez and Modison, the EWO and pilot, prepare to crawl into the "world's hottest cockpit on the ground!" In warm weather ground operation the B-57 cockpit is like a sauna bath.



Sgt George W. Alexander, III, a supply specialist in the 4758th DSES, updates his status board in material control.



ADC Sabe Watkins, B-57 crew chief, installs rubber molding on landing gear door during phase inspection.

craft. But despite the many variations and customers, in its most traditional sense the mission with the Army continues to receive first priority.

The unit's ability to satisfy so many customers has not gone unrecognized. Earlier this year the 4758th DSES was awarded the Air Force Outstanding Unit Award for the second consecutive period—still another distinction.

In the Zero Defects (ZD) Program the unit has always been a leader, not only in ADC but in the Air Force. The ADC Zero Defects Award and the US Air Force Zero Defects Award are just two in a long list of ZD recognitions.

Late in March of this year, Lieutenant General Arthur C. Agan, ADC Commander, personally visited the unit to present a Department of Army Plaque which represented the Army's appreciation for this unit's more than 25 years of service. But March was to be remembered as a dual award month as word gradually filtered down that the unit was also a recipient of the ADC "A" Award—recognition very similar to the Air Force Outstanding Unit Award.

Although the awards and recognitions to the unit are many and varied it all points to one fact—the 4758th's ability to efficiently satisfy many customers simultaneously. The most outstanding example of this was in the spring of 1966, when the entire unit moved from Biggs AFB to Holloman AFB without the loss of a single aircraft sortie, which included cross-country deployments.

So in the 4758th's customer list continues to grow to meet the needs of NORAD and ADC, in an almost traditional sense, its 29-year-old primary mission still reigns supreme—that of supporting the United States Army at Ft Bliss, Texas. The Army Commanding General at Ft Bliss, Major General George V. Unsworth, has jokingly referred to the

4758th as "his Air Force"—the mutual respect and admiration between these blue and brown soldiers is of the highest caliber. They continuously operate as a first rate "team" in the highest sense of the word.

Colonel "Bud" Elrod, the Commander of the 4758th, has stated that the cooperation and consideration continuously received from General Underwood's Army troops at Ft Bliss are the most outstanding that he has ever had the opportunity to observe. One of the unit's favorite type missions with the Army is the simulated low level "RED EYE" attacks to train the Army's operators in the use of the new and tiny hand-held anti-aircraft rocket. The "rocket" is impressive to say the least. The one Army man most eminently responsible for the development of "RED EYE" is "Mr. RED EYE" himself, Brigadier General Robert H. Safford of the U.S. Army Training Center at Ft Bliss. It has been said that there has never been a test firing of this vehicle that he has not observed—and there have been many.

The 4758th DSES has the distinct flying safety accomplishment of never experiencing a major accident with the B-57 aircraft. The unit's average B-57 pilot time is 1,344 hours and the average F-100 time is 572. They fly approximately 2,500 hours annually in support of the ADC and NORAD missions alone. Colonel Elrod acknowledges their safety success only by some prodding, for his policy is not one of resting on any type of laurels—especially in the accident business. He attributes much of the success of the unit to their "canned and stabilized mission" and to their "high level of experienced personnel." It's also quite apparent after a visit to the unit that our "friendly enemies from Holloman" are an outfit that the Aerospace Defense Command can be justifiably proud of. We salute you. ★



Major Albert J. Billington, a B-57 pilot assigned to the 4758th DSES, prepares for another "friendly enemy" mission.



Highly thought of B-57 crew chief, Sgt Jimmie K. Armwood, checks tire pressure, B-57A.



Tsgt Manuel Guerrero (left) performs sheet metal work as Ssgt Archer (center) and Ssgt Stranbury (right) assist.



Sgt Poe, ACE repairman, Airman of the Quarter, 2nd Quarter, FY-68.



AIC Johnston, another pro of the unit and another reason for their successes.



"But gee"



You say you ~~wasn't~~ believe the engine quit . . . Wellman, would you believe the boards stuck open?

What I was going to say was . . .
as you start your dive recovery,
you pull back on the stick . . .



Allow m

Whiz, Sir..."



I feel fine but I swear I hear birdies singing!



Pretend like you don't see him
and maybe he'll taxi back
on the runway!



Don't tell me the gears broke off!
Uh huh!
I thought I told you not to tell me!...

allow me Sir!



1 ✓ 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.

- ✓ The angle of attack indicator in the F-106 integrated flight instrument system is powered by nonessential AC power and is a reliable instrument with which to make a safe approach and landing when the pitot static system is malfunctioning. (ADCSA)
- ✓ On 1 February 1951, 15 Air National Guard fighter squadrons were federalized and assigned to Air Defense Command. Six more were assigned in early March. (ADC-PS)
- ✓ Please drive carefully; right now the government can't afford to lose even one taxpayer. (ADCSA)
- ✓ The Chanute AFB, Illinois, Safety Office distributes a folding cardboard sign with the large luminescent words SEND HELP on a bright orange background. This sign is meant to be carried in the glove compartment of an automobile, and, in case of an emergency, is placed in one of the windows so it may be easily seen by passing motorists. (ADCSA)
- ✓ Goodyear and Goodrich aircraft tires manufactured after 1 December 1967 are of the improved design and do not come under the replacement criteria of ADCR 66-1. Tire replacement for the improved tire is outlined in TO-4T-1-3. (ADCSA)
- ✓ Low and SLOW ejections:
 - Zoom and eject.
 - Never trade airspeed to merely maintain altitude. This leads to sink rates.
 - If you have enough airspeed and control to round out — you are still inside the ejection envelope, but the closer you get to the ground, the more the cards are stacked against you.
 - Sink rate is the greatest single threat in low and slow ejections. (AIRSCOOP)

On a 400-mile trip at 75 mph, the chances of a fatality are 1 in 8. At 65 mph the odds are reduced to 1 in 20. The reduction in speed will only take about an hour more on the road. [ADCSA]

Fire-loss records reveal that about one-third of all fire incidents in the Air Force occur in **family housing**. Recently there were numerous reports of minor fires in kitchens involving cooking oils. Such incidents, if not checked, could develop into catastrophes involving **loss of human life**. [TIG BRIEF]

On 30 March 1949, the President signed a bill providing for construction of a permanent radar defense network for the United States. [ADC-PS]

"Head restraints for front seat autos should be designed as an extension of the seatback (and preferably not as an attachment or an adjustable unit) and are as important to the motorist involved in a rear-end collision as the safety belt is to the motorist involved in a front-end impact" concludes the University of California's experiments involving rear-end collisions. [PCSA]

In late February 1952, the Yuma County Airport (Arizona) Target Range was selected for site of ADC's first Weapons Employment Center to provide tactical interceptor squadrons with live gunnery training. The first "William Tell" meet was also held here. It has since been moved to Tyndall AFB, Florida. [ADC-PS]

Personal equipment . . . Norton has requested widest dissemination of the following message: "Based on an engineering study and limited use, ASD waives the requirement of a nape strap on the Lom-

band Toptex (T-3) fitted helmet. This decision is based primarily on the shell design which dips lower in the back and fits around and under the occiput. This provides rear support by shell fit and chin strap to provide a sling which reduces upward and rotational movement of the helmet under high 'G' forces. Helmet described above is confused with the custom-fit kits for HGU-2A/P shells. This latter helmet must always be used with a properly fitted chin strap and nape strap." [AFIAS]

Carbon monoxide gas has no odor and kills without warning. Poisoning from this gas usually is caused by breathing motor vehicle exhaust gas. It frequently occurs when the engine is running with garage doors closed or when a person sits in a vehicle with the windows closed and the motor running, especially when the exhaust pipe becomes clogged, as with snow. The same gas is formed by stoves in poorly ventilated shelters. Symptoms may be **giddiness, weakness, headache, vomiting, and then unconsciousness**. If a person is overcome, take him to fresh air and start artificial respiration immediately. [AF 50-15-2]

On every highway the lane-hopper can be seen indulging his favorite pastime. If you ask him why he does it, he'll say he is saving time. Los Angeles officials recently conducted an experiment in which an expert driver drove a test car over an inbound freeway during peak morning traffic. He switched lanes 57 times, followed another car too closely 48 times, and exceeded the speed limit 17 times. He reached his destination exactly 25 seconds ahead of a driver who drove lawfully. [American Motorist, AAA]

DOWN and out

F-102A ENGINE FAILURE

Late in the afternoon two pilots went out to prepare their aircraft for 5-minute alert duty. During pre-flight no discrepancies were found. The flight leader then climbed into the cockpit for an interior inspection and when this was completed he called the combat alert center. He was told that he and his wingman had an airborne order and should take off as soon as possible.

taxi, takeoff, and climb were

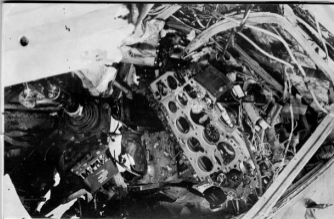
normal except that the lead aircraft had a weak transmitter and the wingman had to relay some transmissions to GCL. After level-off and approximately 150 miles from home base, the lead pilot noticed a light flash on the instrument panel, although he couldn't identify it. Several seconds later, the oil pressure light began to flash intermittently. The oil pressure gauge was fluctuating between 20 and 40 psi.

The pilot started a left turn toward home and declared an emergency. He moved the throttle from 86% to 89%, but could not get it to increase any further. After about 30° of turn, the AC generator light came on along with the left and right boost pump lights. The pilot then placed the emergency AC bus to reset, then on. It came on the line. The boost pumps, Nexa, and radar were turned off. The oil pressure gauge read zero by the time the aircraft was rolled out of the turn toward home.

The pilot requested clearance to drop his external tanks when he was over water. Shortly after a frequency change, the pilot was given clearance to drop his tanks and he pressed the tank release button. He felt something leave the plane but his wingman advised that only the right tank had departed.

During this time the pilot had been watching his EGT carefully, which was holding steady at 590°.





about 10 minutes after the emergency began, the EGT jumped to 620° and began rising rapidly. As it reached 630°, the pilot went for the throttle but before he could get his hand on it, four loud bangs occurred which seemed like compressor stalls. The rpm went to zero. The pilot stopcocked the engine and extended the RAT. He also went to the "T-R Fall" position and started a glide at about 230 KIAS.

After passing through a cirrus deck, the ground came into view. His radio came back on after a few minutes and he advised the wingman of the engine failure and that ejection was possible. Terrain was discussed and looked favorable. Before the radio failed again, the wingman reminded the pilot to check his personal loads. He tightened all his chute straps and checked all zippers on his "pospy" suit. He placed all skillets on the right console before the ejection seat and lowered

his visor. During the glide he tried four airstarts. Although he could hear ignition, the rpm did not move from zero.

The pilot made up his mind to eject at 5,000 feet. At about 7,000 feet he could see that the terrain below was fairly good. He noticed a farmhouse to the right. At 5,300 feet he started to bring the nose of the aircraft up to break the glide, and put in a little left trim so that the aircraft would turn away from the farmhouse. At approximately 220 KIAS the pilot assumed the ejection position and raised both armrests. The canopy left the aircraft immediately. He then tried to improve the ejection position and spaced both triggers. His next sensation was that of a terrific upward acceleration and he could hear the rocket motor. He was out of the seat before he knew it, and felt himself tumbling. After he brought his feet together and arms into his

chest, the chute opened with a fairly good jerk. Later, he opened his riser release covers using the arm-through-the-riser technique. The pilot stated that he believed his parasail training really helped at this time because he knew he did this before and it was no sweat now. He landed on a farmer's field moving backward. Although it was a fairly good landing, his helmet prevented him from getting a good knock on the head. When the left riser release was pulled, the chute collapsed immediately. In a short time, a helicopter picked the pilot up.

As of this time, the accident board has not completed its final report. However, it has been determined that the primary cause of this accident was material failure of the number four bearing assembly from unknown causes. Investigation so far has revealed that engine stoppage was the result of number four bearing failure.

safety officers'

FIELD REPORTS

F-106A, UNSAFE GEAR. The nose landing gear position light failed to illuminate when gear was extended for landing. The landing gear unsafe warning light and horn indicated unsafe. The control tower confirmed that all three gears appeared to be down. The landing gear was recycled up and down with a safe down indication. Investigation revealed the nose landing gear indicating switch intermittently inoperative.

THREE CASES OF FIRE WARNING, F-101B.

- The number 2 engine fire warning light came on while climbing through 5,000 feet after takeoff. The throttle was stopcocked, however the fire warning light remained on until the engine master switch was turned off. A successful single engine landing was accomplished. Cause factor was the secondary ferrule O ring seat on the distributor, where the distributor mates to the fuel manifold, was etched and worn due to high pressure fuel erosion. Leak would commence above 70% rpm and the fuel was ignited by the engine hot section.

- During GCA final, on an enroute base on a cross-country flight, the right aft fire warning light illuminated. The throttle was retarded to idle and the light remained on. The throttle was then stopcocked and after approximately 10 seconds the light went out. Cause was a broken clamp on the 16th stage bleed duct which allowed hot air to activate the aft fire warning system.

- Shortly after takeoff, on continuation of a cross-country flight, the right aft fire warning light illuminated. The throttle was first retarded to idle and then to off. The light remained on. With no other indications of fire, the pilot elected to jettison his external tanks and land the aircraft. Cause was a broken fire warning loop.

F-106A, FUEL QUANTITY. The fuel quantity indicator was observed at zero during a low altitude practice intercept. An immediate precautionary landing was accomplished. A loose wire at the fuel quantity indicator cannon plug was found.

F-101B COMPRESSOR STALL. Aircraft experienced a sharp compressor stall when afterburners were selected after approximately 45 minutes of flight. The pilot could not tell which engine had stalled and engine instruments were all normal. Shortly following this, oil fumes became apparent in the cockpit and the pressurization system seemed to vary the cockpit pressure. Both engines were throttled back and a recovery for landing was started; the pilot declared an emergency. The landing was uneventful and no unusual engine performance was experienced. The aircraft was scheduled for P.E. and preliminary investigation on engine run up showed definite oil fumes in the ventilation system. As the engines were subsequently run up on a test stand it was discovered that the left engine had broken a #1 turbine blade which had damaged the vanes forward and aft in the hot section. All turbine blades were damaged.

F-106A, PRECAUTIONARY LANDING. After approximately one hour of flight, liquid oxygen started spouting out of the oxygen shut-off switch. The switch was frozen and couldn't be shut off. The pilot pulled his vapor down to protect his face which made it difficult to read his instruments. Although his Tacan and UHF failed during recovery, he made a penetration and landing. The cause of the oxygen leak was a minute hole in the pressure suit hose of his personal leads. Leads were replaced. A suggestion has been sent forward requesting a positive means of shutting off the flow of oxygen to the cockpit when the system is frozen.

FUEL, LOW FUEL. After approximately 50 minutes of flight, the fuel low level light for the left number 3 tank came on. The pilot turned off the boost pumps on the left side, but the tank would not refill. During the STB, while descending through 4,000 feet, the tank began to fill slowly and indicated approximately 800 pounds at shutdown. Post-flight inspection revealed a malfunctioning pressure vent valve in the left number 3 tank. Failure of the valve resulted in over-pressurization and prevented normal replenishing of the number 2 and 3 tanks. The valve was replaced and has worked properly.

OVERHEATED COCKPIT, F-102A. After takeoff, the cockpit became overheated and could not be cooled by the automatic or manual positioning of the temperature control knob. The pilot declared an emergency and made a precautionary landing. Post-flight examination revealed the canopy defog switch in the "ON" position in the cockpit. The switch was turned off, the heating/cooling and pressurization system inspected and operationally checked, and no discrepancies were found. It appears that the canopy defog switch was inadvertently turned on and left on in flight, resulting in the overheating of the cockpit.

FUEL, FUEL QUANTITY ZERO. At 39,000 feet, after 50 minutes of flight, the cockpit became hot and the pilot switched to manual temperature control. Shortly thereafter, the fuel quantity gauge indicated zero and the pilot observed that the cabin pressure had risen from 16,000 feet to 20,000 feet. He decided to return to the base immediately. During descent, the pressurization appeared to return to normal, but the fuel indication was still erroneous. After an uneventful landing, maintenance personnel replaced a defective cable seal and a water-shorted fuel quantity indicator amplifier.

RUNAWAY ELEVATOR TRIM, T-33A. During a functional test flight, the pilot noticed the elevator trim was inoperative and that increasingly heavy back stick pressure was required to hold the nose level. The trim override switch did not relieve the nose heavy condition and a return to the base for a precautionary landing was initiated. During the return, stick forces would lighten for brief periods, then return to what felt like a full nose down trim condition. Following a safe landing, inspection revealed a piece of safety wire, used to secure the trim override switch, had broken off. The wire had fallen behind the facplate and made contact between two terminals of the switch, resulting in a nose down signal to the trim system. The wire was removed and the system functioned normally.

TIRE FAILURE, F-101B. On landing, after nose gear was lowered to runway, steady but easy brake pressure was applied. The pilot first felt a slight drag to the right, then heard the tire blow out. He used heavy braking on the left to maintain directional control and stopped the aircraft without difficulty on the right edge of the runway. Skid marks showed a period of locked right wheel before the tire failure. Antiskid detectors and brake control valves on both wheels were changed and new tires installed. The aircraft was taxied and checked and has flown satisfactorily since.

F-101B BARRIER ENGAGEMENT. On landing following an active air mission, aircraft engaged the BAK-5 cable on landing rollout. This cable is 600 feet from the end of the runway and the engagement speed was approximately 10 knots. Because of icy patches at the rollout end of the runway, the pilot had extremely poor braking as he attempted to turn off the active runway. The RCR was reported as 16; however that was an average of a 22 at the approach end and an 08 at the roll out end. The cable was pulled out about 30 feet. The technique of using the BAK-5 under these conditions showed excellent judgment in that a possible skid and serious aircraft damage were eliminated.

ATTITUDE INDICATOR, F-101B. While straight and level at 31,000 feet with the autopilot engaged, the attitude indicator "off" flag appeared. The instrument gave correct indication for a short time and then began to malfunction. Immediate recovery was initiated using the radar horizon and autopilot. Weather became VFR at 16,000 feet and aircraft was recovered without further difficulty. The "off" flag disappeared twice during recovery and the indicator provided some accurate information. During landing roll, indicator showed erroneous bank information and a 40 degree dive presentation. The MB-1 attitude gyro checked out bad and was replaced.

T-33A TRAVEL POD. Upon arrival at destination aircraft was delayed for approximately 25 minutes. Descent was made and GCA pattern flown. On GCA downwind speed brakes stuck in the down position. After completing GCA, closed visual pattern was flown with full stop landing. After shutdown it was discovered that the complete nose section of the travel pod was missing along with a folding clothes bag and shaving kit. Maximum speed of 300 KIAS during flight. Pilot did not feel or hear anything unusual at any time. No damage to aircraft proper. Travel pod nose section missing from hinges forward. Both latches broken. Suspect latch failure due to vibration.

safety officers'

FIELD REPORTS

F-106A, COMPRESSOR STALL. Pilot encountered compressor stalls at 42,000 feet, indicated mach of 0.98, and 45 degrees of bank decelerating from 1.03 mach. Engine instruments appeared normal and EGT did not exceed 580 degrees. Retarded throttle and lowered nose slightly to break stall and recovered to home airfield without further incident. Checked engine and systems and could not find any discrepancies.

F-106A, FIRE WARNING. Flashing fire warning light flashed and then came on steady at 96% at 12,000 feet. Light went out when power was reduced to 85%. Flashed again on landing and came on steady just before engine shutdown on taxiway. Replaced 9 each loop segments. Checked entire system and found no indications of fire or overheat leaks. Aircraft flown successfully several times since with no problems.

F-101B, NOSE-OVER. Approximately 10 minutes after takeoff at 25,000 feet and .68 mach, the AFCS and altitude hold features were selected. The flight was normal in this configuration for about five minutes when the aircraft violently nosed over. AFCS circuit breaker was disengaged with no effect on forward stick pressure. The pusher was disengaged and aircraft control was regained. An emergency was declared and an uneventful landing was accomplished. An operational check of the pusher angle of attack vane revealed that it was feeding max angle of attack signal to the computer at 7.5 degrees causing pusher engagement.

F-106, TANK LOSS. The aircraft was on an intercept mission. Altitude during most of the mission was 3,000 feet. Breakaways at intercept completion were normal, not using excessive "G" loads. All flight maneuvers were coordinated. There was no turbulence. After flight, the left external fuel tank and pylon were missing. Pilots were not aware of the loss. Fuel had fed from the tank. Cause is unknown. The tank and pylon separated cleanly from the wing. The tank had been in service on many previous flights.

F-104B, FLIGHT CONTROLS. The flight controls operated and the hydraulic pressure fluctuated between 2,500 and 3,000 PSI on both the primary and secondary systems while cruising at FL250. The dampers were disengaged and a precautionary landing completed. Investigation revealed the elevon gain potentiometer was defective.

F-101B, ENGINE FAILURE. Engine run-up and takeoff were normal; however, as the gear and flaps were coming up, at approximately 300 KIAS and 150 feet altitude, the aircrew heard a loud explosion. The left engine EGT began to rise immediately, rpm and fuel flow began to decrease. The pilot immediately shut down the left engine and the EGT went down. The pilot stopped afterburner operation on the right engine at 2,500 feet terrain clearance and 320 KIAS. The pilot jettisoned the external tank in the prescribed jettisoned area without difficulty. A straight-in recovery approach was made. The pilot experienced considerable difficulty in maintaining control of the aircraft during flare and touchdown due to direct crosswind of approximately 10 knots gusting to 15 knots. The control difficulty was attributed to a combination of the left engine out and a left gusty crosswind. Aircraft was stopped without difficulty. Cause of the incident is material failure of one N-1 rotor 3rd stage blade.

F-101B, CONTROL PROBLEMS. Approximately 10 minutes after takeoff at 35,000 feet, .83 mach, with 10,000 pounds of fuel on board, stick forces started to become light. After a 90 degree heading change pitch control became difficult. After another 5 minutes of flight, pitch control became almost impossible without the aid of the auto pilot, which, after engagement, rolled the aircraft smoothly down and to the right. An emergency was declared and the request for a lower altitude was granted immediately. At 14,000 feet the auto pilot was turned off in the belief that the low outside air temperature had been causing the pitch problems. It was believed that the low temperature was causing the malfunction because the bellows heater had been changed and the chief test pilot had requested a one-hour flight at altitude to check the heater. Again the aircraft could not be controlled without use of the auto pilot. The gear and flaps were lowered at 8,000 feet and a 7-mile descending final approach was set up. A normal touchdown was made. Cause of the malfunction was that breakout forces for the Stabilator actuator were in excess of two pounds in lieu of three-fourths pound. The AFCS malfunction which caused the aircraft to roll to the right and was caused by faulty roll amplifier.

THE WAY THE BALL

Bounces

ACCIDENT RATE

1 JAN THRU 31 MARCH 1968

ADC ANG

Thru March 1968

3.7

3.4

BASES — ALL AIRCRAFT

ON TOP OF THE HEAP

MO	ADC	MO	ADC	MO	ANG
54	62 FIS	45	87 FIS	75	122 Ftr Gp
50	414 Ftr Gp	44	444 FIS	62	182 Ftr Gp
47	48 FIS	36	18 FIS	60	112 Ftr Gp
45	4800 AB Wg	35	408 Ftr Gp 4677 OSES	50	141 Ftr Gp

ACCIDENT FREE

BOX SCORE

ACCIDENTS FOR THIS PERIOD	CUM. TOTAL	1st AF	4th AF	10th AF	14th AF	4600	ANG

CONV							
T-33							
F-100							
F-101	1	1	1				
F TF-102	1	2				1	1
F-104							
F-106							
B-57							
F-89							
EC-121							

CUMULATIVE RATE

1 JAN THRU 31 MARCH 1968 ADC ANG

JET	5.1	3.7
CONVENTIONAL	0.0	0.0

BY AIRCRAFT	T-33	0	0
	F-89		0
	F-100	0	
	F-101	11	
	F TF-102	25	5
	F-104	0	
	F-106	0	
	B-57	0	
	EC-121	0	

MINOR ACCIDENTS THIS PERIOD — 0

MINOR ACCIDENTS CUMULATIVE — 1

BASES — MAJOR ACCIDENTS
THIS PERIOD: OTHER: NONE

*Change in criteria.

we point with



Major Homer T. Bay
444 Fw Intcp Sq
Charleston AFB, SC



Major Joe L. Meyer
444 Fw Intcp Sq
Charleston AFB, SC

PRIDE

F-101 ENGINE LOSS AFTER TAKEOFF

Major Bay and Major Meyer were scheduled to fly an intercept training mission in an F-101 out of New Hanover County Airport, NC. The aircraft was equipped with a 450 gallon drop tank.

As the afterburners were terminated at 200 feet and 220 knots, a severe jolt rocked the aircraft and caused it to yaw to the right. The EGT on the right engine began rising and the tower operator reported a ball of flame coming from the engine during takeoff. Major Bay then shut the right engine down.

With military power on the left engine, a full drop tank, and level at 200-300 feet altitude, the airspeed

stabilized at 220 knots. At this time the crew elected not to jettison the drop tank as they were over a populated area. The second aircraft in the flight was used as a chase aircraft. They headed out to sea, and when the area was clear they jettisoned the tank into the ocean.

The chase pilot then made a close visual inspection of their aircraft and informed the crew that there was no smoke trailing from the engine and that the aircraft appeared to be normal.

Major Bay and Major Meyer then elected not to make a heavy-weight single engine landing at the 7,000 foot strip at New Hanover

County Airport. Major Meyer vectored the aircraft on the most direct route to Charleston AFB, SC. Major Bay then effected a successful single-engine landing.

Investigation revealed complete failure of the NI compressor of the right engine. Log jamming of the compressor blades caused sudden stoppage of the engine, breaking an engine mount, and allowing the engine to drop several inches.

For their outstanding performance during a critical phase of flight, and for their regard for the safety of the civilian populace, Major Bay and Major Meyer justly deserve the "We Point with Pride" award.

AFTER BURNING

Address your letters to The Editor, INTERCEPTION, 464 ADC (A4C464) for AFB CG 80911 to be published, your letters must be signed, but names will be withheld upon request.

PARACHUTING PROCEDURES (CONT'D)

Reference the letter from SMSGt Anthony Martin in the "Afterburning" section of your February 1968 issue.

The following letter was sent to Sgt Martin to show our support for his training and as "foibles for the camera" against those who might doubt the effectiveness of that training.

"As a fairly recent graduate (October 1964) of the ABC Life Support School at Parritz and currently the Life Support Officer for the 37 FTS, Iceland, I can appreciate some of the disagreements others might have with your procedures. But my opinion is entirely in support of what you say to me and other graduates of the school herein. To support your opinion, I would like to document, for your information, a recent ejection here in Iceland.

"The situation can best be described by the pilot who made the ejection, Captain Eugene R. Tubbs, and is as follows:

"On 21 March 1968, I was scrambled on an active air mission in an F105. Approximately 120 miles from home base I experienced loss of oil pressure and AC generator failure at 35,000 feet. I turned towards home base and about ten minutes later the engine failed. I glided about 40 miles down to an altitude of 5,000 feet. During the descent I was able to prepare for my ejection. I ejected at 5,000 feet and all systems worked as advertised. After the chute had opened and I was descending, I did all the procedures that were taught me at the Life Support School at Parritz. I actually felt real confident because I felt that I had done this before because of my personal training. I removed the release covers using the same through-the-visor technique. I looked in a rough field and did a fairly good PIV and released my left rear impact with the ground. I was not dropped a foot from my touchdown position even though the wind was about 20 knots. I was very fortunate in my ejection because I received no harm with the exception of a few bruises. I would just like to reiterate that the Life Support training I received in November, 1967, gives me the confidence I needed during my ejection and the techniques that were

taught me worked and probably saved my life."

"Some facts which may not show in the statement but are extremely important are that Iceland is almost entirely composed of rocks with little topsoil; the sea is normally rough and cold, requiring an exposure suit for survival; rescue facilities are limited to the close proximity of Keflavik, although we fly to the maximum radius radius of the F105; and there are no emergency fields where we normally fly.

"What the above facts sum up to is that our normal solution to major engine problems will almost always be station, and this in an area where ejection and survival must be accomplished under the most difficult circumstances. We feel that your school has given us the training to live and talk about it."

Capt Samuel A. Snow
Life Support Officer
37 FTS Group Sq
Keflavik, Iceland

"See "F105A Engine failure" in the News and Out Section.

WFWP AND THE CREW

In the February issue and the "Point with Pride" feature concerning the "C-130, Engine Burned Off Aircraft," I agree 100%, with the view held for Lt Colonel Macdonald but consider that captain Lt Colonel Backlund and engineer Nees are entitled to equal billing.

"Working as a flight engineer, I know it takes the skill and intelligence of all three men to do the right things in emergencies.

SMSGt Wallace J. Sander
Field Maintenance Supervisor
North Dakota Air National Guard
Fargo, ND 58102

"We recognize the fact, and we feel the criterion would show, that it requires the teamwork of an entire crew to accomplish a "save" under demanding emergency conditions. However, in the case of multi-engine support aircraft, we try to "point" to the individual who was charged with the most responsibility for the flight, and make public mention of the rest of the crew. We appreciate your interest in our magazine.

"I AM A TIRED AMERICAN"

I am writing to thank you for giving me the opportunity to read the back cover of the March 1968 issue of the INTERCEPTION.

Since "Safety" is the prime function of a magazine of this nature, I sincerely feel that the article "I Am a Tired American" has given me a sense of "safety" in my beliefs.

Please give my thanks to "G.L." for taking the time, so many of us forget we have, to write "I Am a Tired American."

Sgt Paul Friedrich
4031 1st Fw Wg
CWA Box 5493
Hawstead AFB FL 32030

"Thank you for the encouraging letter and for your interest in our magazine. The article "I Am a Tired American" is, as far as we have been able to determine, in "Public Domain" and is therefore free to all who wish to do with it as they wish. We hope as many Americans as possible have the opportunity to read the article and have the same pride and interest of country and citizenship that you have expressed.

TAC FROM ADC

If ADC does not mind helping out some TAC troops, we here at the 33th TFS would very much appreciate having your excellent ADCPI Library on hand. As an ex-ADC (and I have seen most of the early volumes) and I think they are outstanding.

We know thirty O4 pilots in the F-105C and while our primary mission is TAC, we do have a backup ADC commitment. Several of us have an ADC background and would enjoy "keeping up" on things by getting on the INTERCEPTION mailing list for two copies. If you can look these requests we would be mighty pleased.

Major James H. Gray
136 Twp Wg Sq
International Airport
Nogales Falls NY 14308

"We are happy to help you out. It is nice to know that ex-ADC troops are still interested in the command.

The Cold Hard Facts...

Maximum
PIVOT PIERS
will help us all.

Thunderstorms, with associated tornadoes, turbulences, and hail are well recognized hazards to flight. Weather radar observations and pilot reports are extremely valuable in the interest of flying safety during periods of hazardous weather. The present weather radar coverage in the United States has been expanded, and will be increased in the near future. The maximum PIVOT TO FORECASTER SERVICE facilities available today are PIVOT REPORTS. Please use them.

PIVOT REPORT (PIREP) FORMS¹ issued by METRO, if possible, otherwise by ARTC:

1. LOCATION
2. TIME (GMT)
3. PHENOMENA REPORTED TO INCLUDE:
 - a. Any hazardous weather
 - b. Marked wind changes
 - c. All turbulence with intensity, duration,
 - d. proximity to clouds,
 - e. altitude of phenomenon
 - f. Type aircraft

PILOT TO FORECASTER AND WX RADAR FACILITIES

