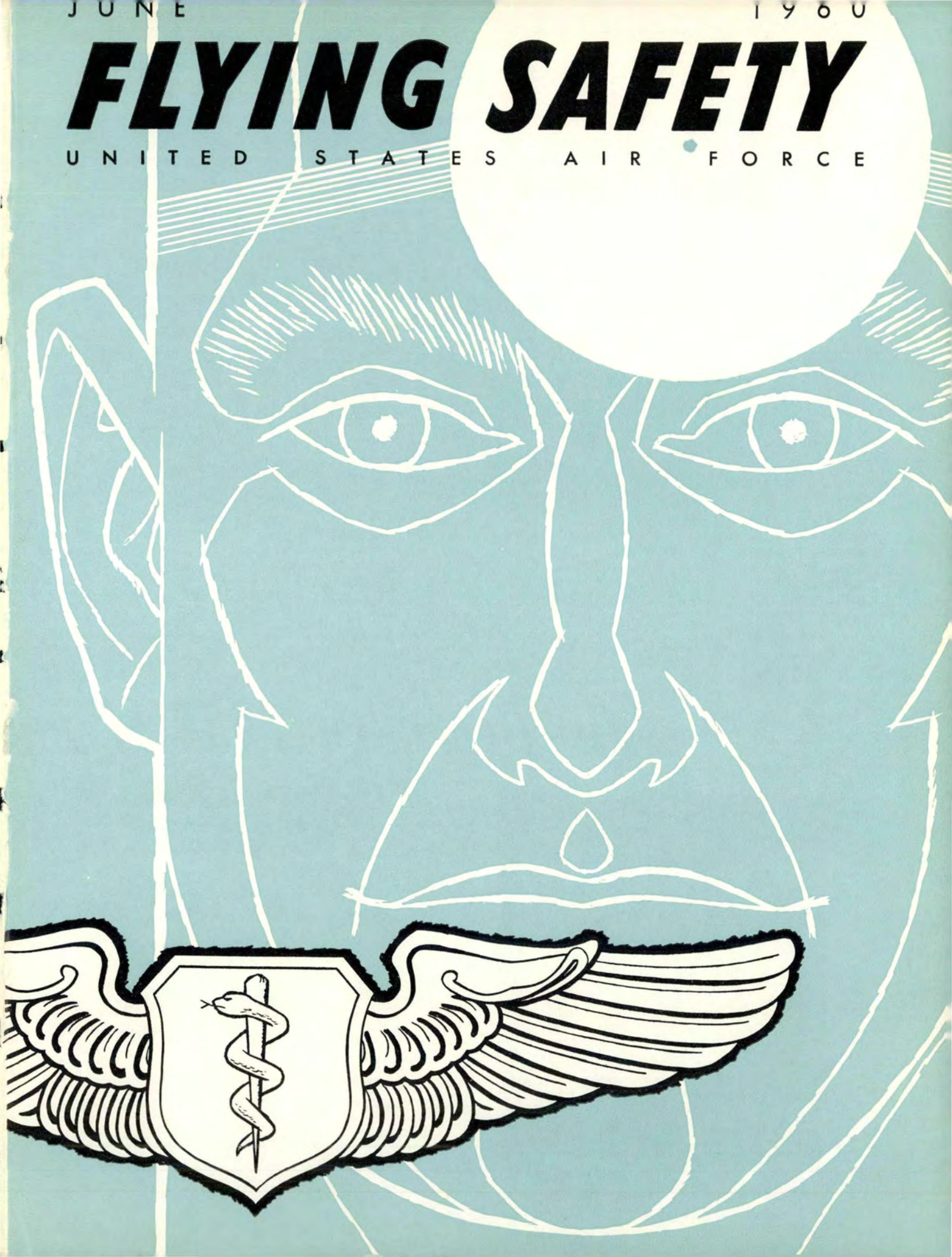
JUNE 1960

FLYING SAFETY

UNITED STATES AIR FORCE



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July-December 1959 Flying

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3505th Pilot Training Wing
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1100th Air Base Wing
Bolling AFB 25, D. C., HQC

GUEST EDITORIAL

Colonel Kenneth E. Pletcher, USAF, MC, Chief, Aero Medical Safety Division, DFMSR

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This month's theme, "Man and the Flight Surgeon," emphasizes a relationship which contributes directly and materially to safety of flight. It should be at once a professional and personal relationship between aircraft operators, maintenance men, supervisors, and the physician trained in aerospace medicine. As a team they all point toward the same goal: mission accomplishment with maximum safety.

Over the past five years, 63% of cause-determined aircraft accidents were the result of human errors. Of the total, 50% were the result of operator error and 13% were the result of maintenance and/or supervisory error. Here is a rich field and a great opportunity for accident prevention. How best to approach it?

Command understanding and support of the Flight Surgeon's function is a primary requirement. Without it even the best intentioned aeromedical efforts will be seriously impaired. Given this *sine qua non* the Flight Surgeon must exert every effort to know the unit mission and to know, individually and collectively, the men on whom mission accomplishment depends. Indeed, one may go further and say that he must know also the women and children on whom mission accomplishment depends. No one operates with complete efficiency when preoccupied with family trouble or illness. The Flight Surgeon must tailor his professional efforts not only to employ the techniques of medical science but he must also temper and apply these techniques with broad humanity. Intellect, training, and human understanding combine to produce the complete physician.

Recognition of accident pattern behavior in an individual or a group based on intimate knowledge of that individual or group can lead to appropriate corrective action and forestall errors which lead to accidents. This is just one of many examples that might be given to show why understanding and cooperation between "the Man and the Flight Surgeon" is necessary if accidents are to be prevented.

In the accident prevention program the objectives of the Flight Surgeon are two:

- To prevent accidents from human cause factors.
- To prevent or minimize injury, should an accident occur.

They are simple, direct objectives and their attainment depends on the interest, industry, and understanding of the Flight Surgeon backed by command support. The effort is well worthwhile in lives and dollars saved and gratitude earned.

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Safety Award Winners

55th Weather Reconnaissance Squadron
McClellan AFB, California, MATS

1608th Air Transport Wing
Charleston AFB, S. C., MATS

68th Fighter Interceptor Squadron
Itazuke AB, Japan, PACAF

47th Air Division
Castle AFB, California, SAC

380th Bombardment Wing
Plattsburgh AFB, New York, SAC

801st Air Division
Lockbourne AFB, Ohio, SAC

Laughlin AFB, Texas
SAC

4th Tactical Fighter Wing
Seymour Johnson AFB, N. C., TAC

481st Tactical Fighter Squadron
Cannon AFB, New Mexico, TAC

20th Tactical Fighter Wing
RAF Wethersfield, England, USAFE

322d Air Division
Evreux AB, France, USAFE

8th Tactical Fighter Squadron
Spangdahlem AB, Germany, USAFE

125th Fighter Interceptor Squadron
Tulsa Municipal Airport, Okla., ANG

112th Tactical Fighter Squadron
Toledo Express Airport, Ohio, ANG

445th Troop Carrier Wing
Dobbins AFB, Georgia, CONAC

435th Troop Carrier Wing
Miami International Airport, Florida, CONAC

The Man and the Flight Surgeon have a relationship which is in the nature of a contract. To fulfill the contract both parties must realize that cooperation is . . .

A TWO WAY STREET

Lt. Col. Eugene R. K. Leiter, USAF, MC, Office of The Surgeon General, Hqs USAF, Washington, D.C.

The effective activities of the Flight Surgeon are for the most part obscure and often unseen. Like the perfect Flying Safety Officer, he may be performing most efficiently when it would seem there is no need for him at all, namely, when there are no accidents and apparently no danger of an accident occurring. But so long as there are manned aircraft—and it seems there always will be manned aircraft—the Flight Surgeon will play a major role in accident prevention.

Years of association with aircrew members gives one a sense of identity with them and a feeling of sharing in the hazards and satisfactions of flying. Each pilot and crewmember is envisioned as a capable, dedicated, courageous airman, who is carefully selected for his qualities of physical coordination, strength, and endurance. He is one who has been highly trained to a peak of knowledge and efficiency in the handling of his aircraft. However, analysis of specific aircraft accidents and a study of the human elements concerned has revealed that sometimes these qualities for which the airman has been selected may be lost or temporarily impaired. When this occurs the loss of ability or the impairment of response may be one of the causes in the chain of events which lead to an aircraft accident. In some cases the judgment or action of the airman is the primary cause of an accident. One requirement of the Flight Surgeon is to know the airman so as to be able to detect changes in his physical or mental status which might impair his capability to withstand all the stresses of flying.

There is sometimes a tendency to cover up for the pilot. Flight leaders, ops officers, squadron commanders, and sometimes even the Flight Surgeon have a desire to withhold information which may reflect adversely upon an individual or unit or which may cause inconvenience or personal loss, as in any case of prolonged grounding. But when lives and combat capability are involved, considerations of friendship and pride should always be tempered with good sound judgment.

Here are some cases in which the Doc might have helped had he not been passively or actively excluded from the situation by well-meaning but thoughtless observers. Each of these incidents is selected because warnings of trouble were actually observed by some individual before the accident; thus steps might have been taken to prevent the mishaps from occurring.

- A pilot had been noted by other crewmembers to have lost some of his stability. He tried to avoid flights, and was prone to miss parts of radio transmissions. Postmortem examination after an accident revealed a serious degree of heart disease.
- Two pilots were indifferent to the mechanics of flight and were bored with details of flight planning and aircraft preflight inspection. At routine physiological refresher training they slept through lectures, and scored poorly on the examination. Shortly thereafter, at altitude, these two had a mid-air collision, fatal to both.
- A pilot was faced with an unwarranted and unjustified court action. The story had not yet broken, and it was known that he could conceive of no way to avoid notoriety and defamation of character. He was, moreover, soon to be married. Although it was noted that he had been sleepless, worried, distracted and harried, he maintained his normal flight duties. Soon afterward, poor judgment—pilot error—during an inflight emergency resulted in a fatal accident.
- In this case the pilot landed short. The aircraft was destroyed but he escaped without injury. He confided later that within a week there had been these upsetting occurrences: deaths in his wife's family and in his family; the deed for his home questioned in litigation; and a substantial financial loss. He mentioned that he was think-

ing about these things during his final approach and suddenly realized he was too low, but it was then too late for correction.

• One young pilot had customarily been jovial, friendly, outspoken, a member of the crowd. Then he changed and became morose, withdrawn, worried. After his fatal accident it was learned that he had been apprehended by police on two recent occasions, for reasons unknown.

• A senior pilot certified that he was checked out in a given aircraft. This was not true. Others who knew better compounded the error. During a serious inflight emergency this senior pilot did not know the procedures for fuel management and had to bail out.

• A certain pilot frequently exceeded the stress limits of his aircraft and habitually took unnecessary chances and risks. He would stretch fuel reserves and compromise good judgment to RON at a favorite base rather than land at a closer, safer destination or alternate. He had been reprimanded for this once. Shortly after this reprimand he took off on a routine flight and flamed out, due to fuel exhaustion.

• This case history proves that "braggadocio" can be a pilot's undoing. Self assurance and confidence are essential to good flying, and it is not this quality which is meant. The subject pilot claimed he never needed oxygen until 18,000 feet, never experienced spatial disorientation, and could drink more and sleep less than anyone else. On one predawn flight, he refused to wait for his wingman and radioed, "I'll meet you at 20,000." He blasted off—down a taxi strip oblique to the runway, and into a clump of trees.

• This particular pilot had a series of ground and vehicle accidents. He cut himself at home, fell from a ladder, and had two recent, serious automobile accidents. His flying accident was one of those "cause undetermined" kind, because he didn't live to explain it. But the evidence shows he was preoccupied with something other than flying.

• Two examples of extreme emotional reaction under stress are cited. The first concerns an experienced, capable pilot rated "excellent" by his superiors. However, in several inflight emergencies he became very excitable and had difficulty following instructions. On one occasion, during an inflight refueling, he became almost maniacal when his radio contact with the refueling craft was poor. He had three major accidents. At least two of them might have been prevented had the pilot been more calm and stable. The other example of extreme emotional reaction to stress is that of the quiet and unresponsive pilot who appeared very calm but who froze and crashed when he had a fire-indicator light on takeoff. When faced with stress he became almost paralyzed and incapable of corrective action.

• Loss of proficiency or decreased interest in flying can be a tipoff that something is amiss. A pilot with over 5000 hours flying time was barely making his minimums, and got his night time in a series of short local flights at dusk. He had become very poor on instruments. He crashed one night while penetrating a thunderhead on a local VFR transition flight.

• A senior pilot flying copilot with an old friend noticed his irregular, jerky, inconstant reactions to unexpected stimuli of varying kinds and remarked to himself how the pilot had seemed to age since their last flight together. His friend had lost the smooth and precise physical movements which are characteristic of a well-coordinated pilot in good physical condition. After the copilot "saved" a near collision he decided to speak to his friend about the matter. He proved grateful and later willingly accepted indefinite suspension. Within two years he had several strokes and developed heart disease from advanced hardening of the arteries.

The science of medicine, including aviation medicine, is not so exact as we would like. There are many functions which are difficult to define. Nonetheless, there are activities which may be pinpointed as crucial, functions in which the Flight Surgeon and the crewmember, working together, can combine their efforts to prevent accidents. It is the purpose of this article to discuss some of the ways in which the Doc may be of assistance.

Some of the functions of the Flight Surgeon, such as initial examination and selection of candidates for pilot training, are obvious and need no underlining. Applicants are excluded who have any limitation, defect, or disease which might cause them to have an accident or which might increase the hazards to others around them. The physician observes, tests certain reactions, and performs laboratory studies. He evaluates the information given him by the applicant. This must be done carefully and critically.

An example of what can result from a deficient exami-

The Flight Surgeon may be performing most efficiently when it would seem there is no need for him at all.

The Flight Surgeon must know the language of the pilot and be able to converse in it.

nation is this case: A pilot who should have been excluded because of epilepsy nonetheless managed to finish his training. After a fatal accident, medications for his condition were found in the pilot's flying clothing, in his car, and in his room. They had been provided by his family physician for years before his entry into pilot training, and during his short career.

During the training period and for the rest of a flying career, the relationship between the pilot and physician often needs to become more personal. It is part of the Flight Surgeon's duty to help explain to the pilot the nature of his body, its limitations, and the protective measures which may be applied to extend the natural limitations of man.

Hypoxia and oxygen systems may seem old hat, but incidents and accidents continue to occur because the basic lessons have been forgotten or neglected. A faulty pressurization system combined with a poorly fitting mask and a leaky hose have caused many aircraft accidents. Spatial disorientation also has been recognized as a hazard since before there were books on aviation medicine, yet in annual refresher courses it is evident that many pilots have not yet experienced or come to respect the possibility of total disorientation, especially in high performance aircraft. Fatal accidents have occurred because pilots have forgotten how to recognize true spatial disorientation and how to cope with it by depending on instruments and by ignoring the physical sensations of motion.

Often the language of instruction is too technical. The implications of spatial disorientation may be understood by the professionally trained physician and not by the pilot. In this case, as in many others, the Flight Surgeon must know the language of the pilot and must be able to converse in it until he knows indubitably that the crewmember understands. Talks like this may be far more effective in the ready room, at coffee, on the golf course or at the club, than they are in a classroom.

Close liaison with the Flight Surgeon remains an ever-present need. Transitions to new aircraft, new squadrons, new bases, and new missions are all accompanied with stresses peculiar to the event. It is important for the Doc to be available and to know the particular stresses involved. A Flight Surgeon, for example, may detect a loss of depth perception by observing landings—the hard ones, the high and stalling ones, the inconsistent ones.

Here is a case in which a pilot was suspected of becoming neurotic and afraid of his aircraft. His Flight Surgeon followed him through his preflight routine and stood with him as he strapped into the cockpit. Then Doc realized that the configuration of the new aircraft was such that this man, having a long torso, could not sit erect with the canopy closed. Moreover, his feet were so big that he had to sit with heels cocked for the total duration of any flight or he would have trouble getting his toes back onto the rudder pedals. To make matters worse, he flew with head bent, peering as it were through his eyebrows. He was a big man and had been so accustomed to jamming himself into small automobiles that he had never thought to mention the tight-fitting cockpit.

Aside from other contributions at the flight line, the doctor may by his presence and availability be sought out for questions or consultation when the barriers of natural restraint or a conviction of unimportance may keep the pilot away from a formal visit to the hospital. A negative example is that of a 1600-hour pilot who seldom saw a Flight Surgeon on the line. He prided himself that he had never been on sick call in his life. In the course of a few months he began having headaches of increasing frequency and severity. He died in his aircraft from a brain tumor. He had talked to his wife and to others about the headaches, and spoke of them as trivial, but had started carrying aspirin and using it frequently.

On the subject of drugs, no pilot should ever take medications of any kind without the express knowledge and permission of his Flight Surgeon. Generally speaking, no drugs of any kind should ever be taken when the effect may carry over into a period of flying duty. All crewmembers should be sensitive to the fact that physicians who have not had training in aviation medicine may not be aware of or may have forgotten the fact that some drugs which are ordinarily harmless can be truly hazardous when used under the physical and mental stresses of flying.

The availability and approachability of the Flight Surgeon goes beyond the flight line and the office. In the Air Force Clinic he should try when possible to care for the families of his crewmembers. This is effective beyond the kinship and friendliness which goes with integrity of the unit. The pilot who knows that his family is well cared for while he is TDY or otherwise absent is able to approach his flying duties with relaxation and freedom from worry.

Moreover, such knowledge of the family by the Flight Surgeon may enable him to detect signs of emotional stress or conflict which could culminate at times in real crises and cause an otherwise stable pilot to make errors of judgment or try short cuts in planning or checking his flight. Aircrewmen, especially the more experienced ones, are usually very well-adapted, stable citizens. Exceptions occur, but the selection process has excluded those more likely to have emotional or mental defects. However, in the life of every man, crises do occur. When these are catastrophic or when a lot of them pile up, it may be that personal counsel, discreet discussion with the squadron or wing commander, or referral to a chaplain, could be a real service in the interests of flying safety.

Accident investigation is a must for the Flight Surgeon. The knowledge gained, however, is useless unless translated into prevention of another. An equally critical but informal discussion of incidents, or of near accidents, may be far more effective. Indeed, one command pilot, a former squadron commander and wing operations offi-

As long as there are manned aircraft the Flight Surgeon will play a major role in accident prevention.

cer, feels that this is perhaps the greatest single contribution which can be made by the Flight Surgeon.

It is obvious that here, more than ever, it is essential that the Flight Surgeon know his men, and be able to discuss with them, in their language, the mishaps to which they are exposed. He should also know the aircraft and its peculiarities and be able to perceive when human emotions or misunderstanding or forgetfulness may have contributed to a near accident.

Such discussions require active and uninhibited participation by crewmembers as well as the surgeon. Although such meetings must be so informal that there is no hesitancy on the part of the crewman who may fear a blight on his record, still they are most effective when conducted with regularity at a given time and place.

Accident proneness is an interesting subject and is a challenge to all who are concerned with flying safety. Such a condition is thought to exist in automobile drivers and in industry, and may prevail among pilots. Those who clearly fall in such a category have been weeded out in the selection process and in the initial periods of training. But from a review of aircraft accident investigations, and in reading the many excellent articles which appear in *Flying Safety* Magazine, the thought sometimes occurs that certain persons since their initial selection may have developed habits and work trends which make it more likely for them to have accidents.

If such trends exist and could be recognized and corrected, a great service would be rendered. Every wing and squadron commander, every Flying Safety Officer, every flight leader, and every instructor pilot knows or senses this need. Just as some pilots are the best qualified or most reliable, there are others who are less so. It is our job to help analyze the less qualified personnel in all career fields which contribute to accidents and, by constantly lifting up the boot straps, keep the whole man-and-machine flying.

It is often difficult to be precise about reasons why a certain man is not quite measuring up. This is especially true as one deals with crews of more and more experience. As noted before, the Flight Surgeon, because of his training in observation and early detection of disease, and in psychology and emotional disturbances, may be qualified to identify some of these reasons. Many squadron and wing commanders have much natural "common sense" about these matters, and many of them are formal or informal students of human behavior. For this reason, a close rapport between the commander and the surgeon may be very fruitful indeed.

The man and the Flight Surgeon have a relationship which is in the nature of a contract. This is a two-way street. The crewmember and those in positions of responsibility have an obligation to use the Flight Surgeon as they do all other members of the flying community. The Flight Surgeon's effectiveness is measured by the extent to which he is able to keep crewmembers on full flying duty for a full career. In a sense, aviation medicine has failed when it is necessary to cause grounding for medical reasons. There is no satisfaction from suspensions, unless it is from the reflection that it is better to have prevented an accident than to act as member of an accident investigating board.

The identification of hazards or of situations which may contribute to accidents often involve problems not related to aviation medicine. Thus the Flight Surgeon may be able to help in ways other than giving medication. His counsel or professional opinion may help to avert some of the factors which could otherwise be one of a series of events which eventually end in a wasteful aircraft accident. ▲

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TWO DIFFERENT POINTS OF VIEW

"So I eased on the brakes and turned off at the second intersection —no sweat."

"So this clown salvoed his drag chute and stomped on his brakes. Sarge, where can I get two new tires?"

R for Rescue

Major Roy J. Broughton, Jr.
3300th Support Sq, Hqs Air Training Command

Above, the H-43 on alert and ready to scramble. Below, hooked up and ready. When ground crewman lowers positioning pole (in front of H-43), pilot is clear to go.

Rotary wing pilots will remember the years of effort devoted to increasing the rescue capabilities of the helicopter, while pilots in general will remember stories of survival or almost-survival. Experienced crash rescue men will recall the frustration of being blocked from a crashed bird by impassable terrain.

Everyone agreed some time back that a very definite need existed for a rescue means that could span terrain blocks, extend the area of potential rescue beyond the field perimeter, and reduce the time interval from crash to rescue. The means had to include firefighting as well as rescue capability. The recent history of the helicopter in rescue operations made it easy to select it as a vehicle.

The Navy HOK-1, built by Kaman and redesignated the H-43, was selected and fire suppression tests were encouraging. A means of rescue was developed to meet a need. In early 1959, a helicopter crash rescue system was an existing fact. We finally had a system for survival.

Helicopter rescue is one thing, but fire suppression! The first reaction to such an idea boiled down to a polite "no thank you." The thought that a helicopter could effectively attack a fire was wild, at least. To say that it would combat a large scale fuel-fed fire was to be foolhardy.

But against the odds of disbelief, the H-43 system was integrated into crash rescue activities at eight Air Training Command bases. Then doubts disappeared as if scattered by the intermeshing rotor blades of the H-43. Those who had to be lured or tricked into firsthand observation of helicopter fire suppression had to be held back after seeing the results! "The idea may have merit after all."

Above, the H-43 arrives at a fire drill with the "Sputnik." Below, when the H-43 first approaches, the fire parts and opens a rescue path to the burning aircraft.

was the least favorable remark. Even an untrained eye could see the advantages.

What the doubters saw is worth seeing. It has been said that when the helicopter first approaches a blaze, the fire opens up like the Red Sea. The fire parts, lays down out of the way, and a rescue path to and including the aircraft is free and open. Temperatures in the heart of a fire are bearable, even without protective clothing. Rescue is a definite possibility—probability is a better word. If a crew survives impact, rescue under protection of the H-43 approaches "sure thing" proportions.

How does all this come about? It's more simple than it seems. The helicopter rotor wash parts the fire by velocity air moving through the counter-rotating rotor system. This same air protects and cools the crew area and the rescue men, providing breathing room. In essence, the H-43 fights a fire from the inside out, rather than from outside in. This has obvious advantages to a trapped aircrew.

When the inherent capability of the H-43 to combat and suppress fire is combined with its ability to span distance and obstacles, we have the answer: a rescue system extended to cover the area around the airfield where a large proportion of accidents occur.

Will it work, in practice? As it says in the ads, "It's best by proof test." Actual crash rescue operations

Rx for Rescue (cont.)

Above, helicopter moves in to insure protection of fire fighters as rescue is accomplished. Below, rescued pilot is loaded in H-43 for a quick flight to base hospital and the doctor for medical attention.

Above, A/1C Ray Owen, crew chief, shows hazard of rotor blades. The only safe place the aircraft can be approached from is the front. Below, the H-43B is shown for comparison. Note tailpipe on booms.

have proved the theory under actual conditions. The answer is plain and positive. It HAS worked; it will again!

The H-43 comes in two sexes, "A" and "B." The "A" model is now in service at Laredo, Randolph, James Connally, Perrin, Vance, Craig, Greenville, and Moody Air Force Bases. Powered by an R-1340 *(T-6 type)* engine, it carries a normal crew of three: a pilot and two firefighter-rescue men. With two litter spaces, the H-43 is capable of fast transport to medical facilities after rescue operations are completed. The sexier member of the team is the "B." Dubbed the "Huskie," this bird is powered by a Lycoming T-53 gas turbine engine, with more power and more room—room for a medic on the crew, for instance. The "B" model is far superior in most respects, although the fire suppression capability of the two models is the same.

The helicopter and its rotor wash are aided, if need be, by a fire suppression kit called the "Sputnik." One look at the photo of the kit gives a clue to its name. The Sputnik is carried below the helicopter and can be used wherever necessary. A 100-foot fire hose allows flexibility in use. The Sputnik carries water and foam under nitrogen pressure, all designed to give the most results with the least weight.

Operationally, a helicopter pilot and firefighters are on alert during all recurrent flying activities. At the first indication of troubles the crew is scrambled, to be on airborne alert. Here is a basic difference between the "A" and "B" models. The "A," with a reciprocating engine, requires approximately three minutes to become airborne. The "B" model can scramble safely in less than a minute. Since time is critical, the "B" has obvious advantages.

Once scrambled, the H-43 is an airborne fire suppression/rescue station. As such, it can maneuver to be of the most service. If you're trying for the base with a malfunction, the helicopter meets you half way, so to speak. Whether it's a free ride home if you eject, fire suppression if needed, or just moral support, it's all part of the system.

See the key to the system? If you're in trouble, say so in a hurry. Every minute counts if survival's your goal. And don't feel bad if it was all a mistake and the 'copter wasn't really necessary.

In a recent period, Air Training Command helicopters made over 700 flights to perform two fire suppression missions. Even this is good odds since the two actual missions could not have been accomplished without the helicopter.

New H-43B helicopters are being delivered to many Air Force bases at a rapid rate. 'Copter pilots are going to college at Stead Air Force Base, Nevada, to learn the fine art of fire suppression and crash rescue. As the number of birds on scramble alert increases throughout the Air Force, our odds of being beyond rescue range will decrease.

Here, then, is the prescription for rescue—a system for survival with YOU in mind. ▲

WEATHER ROULETTE

1st Lt Richard K. McMillan, Information Division, Hqs Air Weather Service, Scott AFB, Illinois

Directions: Load one shell into a six-shooter. Spin the magazine. Place the muzzle against your temple and pull the trigger. The odds are five to one that you will be alive a second later. But what sane person would consider doing this?

Trying to outguess the weatherman is a bit like playing this game, except that the odds are much worse. Latest statistics show that severe weather advisories, issued by the Air Weather Service Severe Weather Warning Facility in Kansas City, Mo., are followed by some kind of severe weather 94% of the time—only 6% are complete busts.

That is like playing the roulette game with a machine gun with only six shells missing in a 100-shell cartridge belt. You've got a pretty fair chance of losing in that sort of game. Of course, flying through severe weather doesn't always kill you—but it might.

A closer look at the statistics shows that 845 severe weather advisories were issued in the continental US in 1959. In 793 of the forecast areas, severe weather occurred, ranging from mild thunderstorms to tornadoes. Taking tornado and/or damaging windstorm warning areas, 61% of 189 such areas were verified—that is, tornadic activity and/or damaging windstorms were reported in the areas for which they were forecast. Tornadoes and damaging windstorms can tear an airplane apart.

Here are more specific facts for the hard-to-convince. During 1959, AWS forecasters used an average area about the size of Maryland—11,000 square miles—for tornado warnings. For other types of severe weather, the area was about 14,500 square miles, almost half the size of Tennessee. *(The objective is to keep the area below 20,000 square miles.)* Would you try to save a few hours by flying through one of these areas, when the odds are 15 to 1 that you will encounter some type of severe weather?

You say you've flown through severe weather forecast areas with nary a cloud? You were fortunate. The best explanation for your luck lies in the span of the warning's time period—the length of time severe conditions will probably exist. Tornado warnings cover an average of 5½ hours; severe weather warnings, 7 hours. The severe weather could have been in another part of the forecast area, or it could have dissipated before you arrived—these storms develop and dissipate rapidly. Perhaps you beat the storm across the area, or maybe it did not develop—this happens 6% of the time—because of a lack of triggering action or because something in the atmosphere changed. Remember, Air Force weathermen forecast areas for potential development.

Wouldn't you rather be warned about severe weather and not encounter it than have it hit when you didn't expect it? Anyhow, these fellows verify 15 out of 16 forecasts with the occurrence of some type of severe weather.

Air Weather Service is constantly striving to improve its accuracy in severe weather forecasting. As an example of improvements already made, the forecast area for severe weather in 1958 was twice the size used today. The goal, of course, is 100% accuracy, using the smallest possible area with the most accurate valid time period. Achieving this is difficult when dealing with an ocean of air miles deep and full of currents and eddies.

Air Force weathermen are trying to solve the problem. In the meantime, the odds for outguessing them are pretty slim. Take their advice—don't play weather roulette. ▲

Accident by Practice

Maj. William V. Owen, 90th Air Refueling Sq, Forbes AFB, Kansas

The big bird was taxied around for another takeoff. I was standing behind the student pilot, who was in the left seat, and listening as the instructor pilot explained the techniques and procedures, the do's and don'ts, the good points and bad of our new interest—the C-97. A student engineer was seated at the panel, his instructor standing by.

I was the fifth man on the flight deck, a student copilot, watching and waiting my turn to show these people *how it should be done*, not realizing I was about to be shown how it should *not* be done. At the same time I was given a lesson which has made me a safer and, I hope, better instructor pilot in these years since.

As we took the runway for the next takeoff, the IP remarked, "You'll find good performance and no particular problem on partial engine work—traffic pattern with two out should be no sweat at this weight." The stage was set for an "accident by practice."

We took off. Shortly after breaking ground the IP signaled the engineer to cut one engine. The student pilot went through his newly learned emergency procedure and continued to climb. Prior to reaching traffic pattern altitude the IP signaled for another engine to be cut—no problem, same procedure. As he turned on crosswind the pilot found that he was having trouble holding airspeed and reaching the traffic pattern altitude; he was still a few hundred feet short. The IP, observing the difficulty, turned to the engineer: "Bring those engines back in to 18 inches; we'll simulate there."

The IP went on to explain technique to the student as the aircraft was turned downwind. It soon became apparent that 18 inches was not going to cut it and the IP confidently told the engineer to bring the two simulated dead engines up to 22 inches. The instruction continued with little thought that Rome was burning. Another remark from the IP to the engineer, "Better make it 24 inches." Then, "Better make it 26."

At this point the student pilot was having considerable difficulty holding a safe airspeed, and altitude was being compromised in an effort to pick up the lagging airspeed. It became apparent that all was not well. In rapid succession came the orders from the IP: "Rated power, all four." Then, "Max power!"

We were still losing altitude and holding just above a stall. A frantic check by all on the flight deck. Impossible! With our power settings the aircraft should have been heaven bent! The feeling in the cockpit was one of disbelief—2- to 300 feet above the ground and in a rapidly deteriorating situation. Flaps were milked down to buy a few extra seconds. A crash in a populated area seemed certain. Then, a flash of hands—the instructor engineer's—a movement rivaling the fastest gun in the West. A moment of silence during which the airplane seemed to hang in the air, then a surge of power followed by what can only be described as THE climb of the homesick angel.

What made the bird act like the reluctant dragon? You knew all along? Mixtures! An experienced crew didn't. They came close to ghostwriting a condemning accident investigation statement: "Two mixtures were found in the idle cutoff position." Yes, the airplane could have made it despite two dead engines, but not with two dead windmilling engines absorbing much of the output of the two operating engines.

This practice-induced emergency situation involved a transport, but it can happen to any of them—fighters, bombers, whatever we fly. The words are different but all too often the tune is the same.

A B-52 crashed when instrumentation differences, unfamiliar to the student pilot, compounded a practice unusual-position recovery to the point that aircraft limitations were exceeded and control was lost.

In the same category, a four-engine radar aircraft was lost recently when practicing emergency procedures at low level. A simulated electrical fire—a wrong switch and too late to recover—an airplane in the drink.

Here's one from another accident report: "The IP was overconfident of the aircraft commander's ability to make a practice no-flap landing." Too low an approach—too late—scratch one bomber.

Still another: A T-33 on a simulated flameout approach, too low, too slow, and the instructor too late on the power—a bent T-Bird.

All these incidents or accidents have one thing in common: In each instance, the emergency procedure practice plus an additional factor or factors have led to trouble. Known accident causes in this category are numerous and many unexplained accidents undoubtedly fall in this same category. It is ironical that many accidents happen while crews practice procedures designed to prevent accidents.

At first thought, we might take either the "we should have stood in bed" attitude or the "perhaps we could do better from the flying safety standpoint if we refrained from emergency procedure practice" point of view. However, I think we'll all agree that practice under controlled conditions should be a better, or at least a safer, way to gain experience than the old familiar school of hard knocks.

Emergency procedure practice *is* necessary. Therefore, if we are to reduce the accident potential present during this activity we must remove the additional factor or factors which I mentioned before as adding up to trouble. From my own experience and the study of many accidents in this area, I believe the additional factors which when added to our practice situations result in unnecessary risk are these:

- Complacency.
- Lack of adequate margin of safety.
- Working beyond experience level.
- The instructor-student relationship.

It is ironical that many accidents happen while crews practice procedures designed to prevent accidents.

Of course, the short fix for these risk magnifiers is alertness, judgment, knowledge, and understanding. But let's delve deeper.

First, let's talk about complacency. This old bugaboo always seems to be close at hand. The more time we log in a particular bird, the easier the maneuver; and the greater the simplicity of the equipment, the less alert we tend to become. It seems that often the most hazardous pursuits are accomplished in the safest manner because everyone is on his toes. You can't be too alert in this flying business.

My answer to the complacency problem is a check and doublecheck attitude. Following the thought pattern of a student demands a check and recheck on the part of an instructor. A second look would have prevented that wheels-up landing. A second look would have caught that fuel selector on the low front tank before a critical point in the penetration.

Now, for lack of adequate margin of safety. This factor falls in the judgment area. The instructor must allow leeway for student error if the student is to learn; however, limitations must be established if risk is to be minimized. To let a student go too far is being outmaneuvered by fate.

The possibility of a real emergency compounding a simulated situation into double trouble is always present and should be taken into account in the choice of adequate margins of safety.

Getting into dangerous positions to practice extracting yourself from the difficulty is, I believe, like practicing parachute jumps or other pursuits which must be done right the first time. It is always nice to have safely experienced in practice any difficulty you find yourself in; however, "safely" is the keyword and, judging from the statistics, all our training-induced situations cannot be put in the safely experienced category. Let's use good judgment.

Next, there is the beyond-experience-level factor. Too often the student is forced to run long before he has learned to walk. He is performing the complicated maneuvers before he has completed the fundamentals. The student should have ample time for familiarization and should receive adequate experience on normal procedures before being subjected to unusual situations. When he is at home in the cockpit environment the emergency procedures may be started. He can understand them and will not be just going through the motions.

An instructor should make a point of knowing the skill level of those he is instructing. Working in areas too far advanced for a student's experience level is often both dangerous and a waste of time.

The value of ground instruction in the actual equipment or in simulators cannot be overemphasized. To have that "lost in the gages, levers and switches" feeling minimized prior to flying and to be able to crash in safety in a simulator are both experience extras we should take advantage of.

And last, the instructor-student relationship. We must understand that there are factors present in this relationship which are often potential sources of trouble. The factors are complex in that they have to do with frame of mind, conflicting areas of understanding, and the fact that things often appear differently to an expert than they do to a novice.

An excellent pilot—during a standardization check—takes an unexplained action. Why? Psychologists are still trying to reason this kind of problem out, but I do think most of us have experienced this phenomenon. If the instructor pilot does not understand that even an experienced and competent hand may get "checkitis" and react illogically, again—trouble!

That "I thought he had it" situation frequently arises when an IP is present. It is just one of many areas of misunderstanding. Another is, the student pilot too often believes the instructor will keep him out of trouble, and the instructor too often gives the student credit for being able to keep out of trouble.

Often the most obvious facts to the instructor are points of complete confusion to the student. No matter how simple a maneuver or procedure is to the instructor, he must be sure that the student has complete understanding.

Shall we control these "additional factors" which—when added to emergency procedure practice—result in risk? Or shall we keep on breaking up our aircraft in practice, practice undertaken to prevent accidents?

Let's add alertness, judgment, knowledge, and understanding to our emergency procedure practice. Let's get the flying safety results we're practicing for! ▲

REX Says . . .

The new rocket catapults for ejection seats increase the chances for a safe ejection, especially when there is very little terrain clearance—*but* not when ejecting from an inverted position, as two recent F-102 accidents have shown. In one case the pilot experienced control difficulties and elected to make an emergency landing. At 1400 feet on a straight-in approach the controls froze and the aircraft rolled to an inverted position. The pilot ejected. His zero lanyard was hooked up and his parachute opened 100 feet above the ground. In the second accident, the pilot lost all communications at the end of a night mission; the weather at destination was 5000 feet overcast and 2 miles visibility. During the subsequent landing attempts the engine flamed out at very low altitude while the pilot was turning for another approach. He ejected immediately but was killed. There wasn't enough time for the chute to deploy even though he had separated from the seat and his zero lanyard was hooked up. The accident board concluded that he would have made it had he righted his plane to straight and level before ejecting.

Rex Says—*The most natural question that comes to mind is, "How about the time it takes to roll the aircraft back to an upright position; aren't you eating up precious altitude?" Sure you are, but the time and altitude you take to get back upright probably will mean the difference between making it or not making it. The most important point to remember in any ejection is the "decision altitude." The Dash One of your aircraft will show minimum altitudes at which you can expect to eject safely. The higher you are above the minimums—within reason of course—the better chance you have. In 1959 the ejection success rate was 89%. A large proportion of the unsuccessful ejections were caused by ejections from too low an altitude. Establish your "decision altitude." If you're not relighted, or your flameout pattern isn't right, or what have you, when you reach the decision altitude—go, and go quickly.*

• • •

Last summer an F-84F was involved in a major accident approximately three minutes after takeoff. The operator noticed engine vibration and subsequent power failure. During the investigation it was determined that the power failure was caused by gross burnoff of the turbine rotor blades. The TDR for the engine states in part: "Inspection of the engine did not reveal any discrepancies in the fuel system or airflow sections which would be considered contributing to this type failure. There was no evidence of internal engine failure other than the turbine. Damage to the fuel control made it impossible to make a flow check; however, disassembly inspection of the various components gave no indication of malfunction. In light of the above and the experience gained through investigation of previous failures of this type, whereas it was concluded that transient overheating of the turbine caused by overfueling of the engine resulting from compressor stall or inadvertent use of the emergency fuel system was responsible for the turbine failure and subsequent power loss, it is concluded that the subject engine had been overfueled." A 5- to 6-foot portion of the tailpipe was found 5 miles from the crash area. Fire in the aft section is assumed to be the cause of tailpipe failure.

Rex Says—*Did the pilot turn the emergency fuel switch on when he actually intended to turn on the pylon tank air pressure switch? If he did, this could have caused turbine wheel blade failure and the subsequent major accident. The emergency fuel switch has a rigid guard on each side. The pylon tank air pressure switches do not have a guard by them. All operators should become thoroughly familiar with the location of each of these switches so that he will not turn the wrong one on. D/FMSR's position on this matter was to put a cover over the emergency fuel switch. The prime depot wouldn't go along with the idea. So—let's be sure that all '84F pilots know which switch is where and what each one does.* ▲

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From time to time I've expressed concern about the number of reports of near-accidents, unreportable incidents, safety tips, and suggestions for new methods received from the field. They're falling off again and if it's because there are fewer such reports to make, all well and good. But are there, really? Bet you know of a close one which, if reported, might help other crewmembers to avoid a similar situation. How about sending it to me in care of this, your magazine? Sign it if you wish; if not, I'll settle for an anonymous report.

REX SPECIAL

Three Century Series aircraft left their home base and landed at another base for fuel. After servicing, the flight taxied to the runway for takeoff. As the No. 3 pilot pushed the throttle to the afterburner range, the engine flamed out. The aircraft was towed back to the ramp. The flight commander and No. 2 pilot returned to the base and landed. The engine was checked but nothing unusual was noted. The flight commander called the squadron maintenance officer at home base. He advised to run the engine and check to see if it flamed out only when selecting afterburner. The next day, after operating 6 to 8 minutes, the engine flamed out again. The pressure fuel filter was checked but no deficiencies were found. The aircraft was operated at 90% for 15 minutes without any trouble but as the flight commander taxied to a runup area it flamed out for the third time. Upon being advised of the latest events the home base decided to send a test pilot and an engine specialist to see what could be done. The test pilot was instructed to find the cause of the flameouts, test hop the bird, and bring it home.

After their arrival the flight test officer and the engine specialist checked the fuel filters and again installed pressure gages on the aircraft fuel system. The engine runup was normal except that the anti-icing light came on. The fuel filters were checked again and the engine was operated a second time for about 50 minutes without flaming out. The pilot called the home base for permission to fly the aircraft back home. He was advised to run the engine through two or three additional loads of fuel to see if the engine would flame out again, inasmuch as it had already flamed out three times and the reason for the flameouts had not been found. For some unexplained reason the pilot decided to test hop the airplane without any additional ground runs.

A local flight plan was filed and the pilot was briefed on the local maintenance test flying area. Engine start and taxi to takeoff were normal but after 3 or 4 minutes in the takeoff position the pilot advised the tower he was aborting. He was cleared down the active and returned to the ramp where he ran the engine for about 10 minutes. Then he called the tower to advise he was continuing the mission. Witnesses observed a normal afterburner takeoff and left climbing turn. At approximately 12,000 feet the aircraft was seen in a steep nose-down attitude. The pilot declared an emergency and stated he was making a deadstick landing. The flameout pattern looked good and on final approach the pilot was in an excellent position for a landing.Then the gear was retracted and the aircraft flew over the runway at a height between 5 to 8 feet. Touchdown was first made 7700 feet down the runway. The airplane became airborne again and flew through the arresting barrier, cutting the webbing. The aircraft finally stopped 3182 feet from the barrier; it burst into flames and the flight test officer was killed.

REX SAYS — *As might be expected, the investigators were not able to discover why the aircraft flamed out. It's almost certain the same malfunction occurred that caused the flameouts on the ground. It was determined, however, that on impact the engine was not rotating and the tachometer was reading zero rpm. The gear handle was UP and the landing gear was locked in the UP position.*

There are some more questions that couldn't be answered. Why, for example, did the pilot abandon an apparently successful approach when everything looked just right for a landing? Why was the throttle in the 100% cruise position?

Supervisory personnel stated that the flight test officer was an exceptionally well qualified pilot and was considered an outstanding officer by his commander. He was quiet, intelligent, had good judgment, and no known personal problems that might have distracted him or caused "get-homeitis." Why, then, would this type officer attempt to fly an aircraft that either was or should have been on a red cross? Why would he go against the advice of the engine specialist not to fly the airplane until the cause of previous flameouts had been ascertained? There is no reason to believe he had found the malfunction that was causing the flameouts.

The accident board found operator error in that the pilot displayed faulty judgment in electing to fly an aircraft in an unsafe condition and in violation of Pars. 1-24 and 1-25 of T.O. 00-20A-1. Other findings were: materiel failure of the fuel system; poor technique and judgment on the part of the pilot in abandoning a successful flameout pattern; and trying to sustain flight in an emergency condition. I wonder if the board considered that the pilot had become thoroughly confused as to just what he should do and what authority he had? He had talked to three different people at his home base on three long distance calls. Generally, he was told "Don't fly the bird until it's safe." But what was "safe?" Obviously, to him, it was "safe" to fly on the day he was killed. Supervision didn't cause the accident but would closer supervision have prevented it?

A Day with Doc

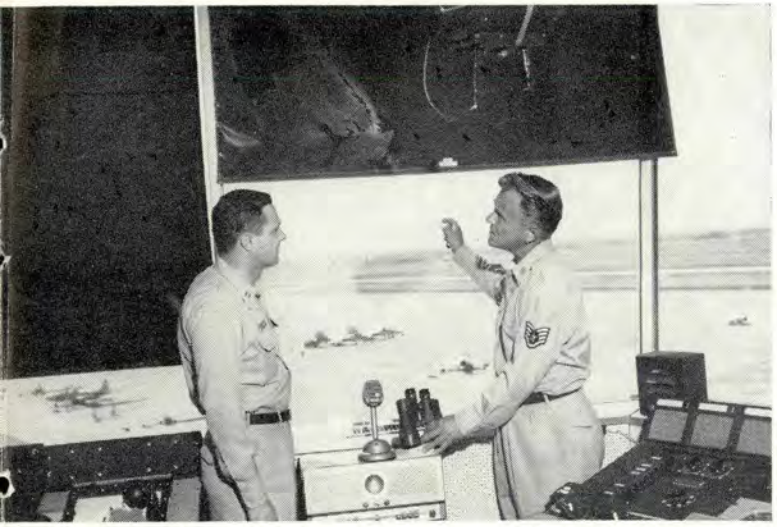
Above left, Doc begins his long day at 0730 by giving checkups to squadron personnel. When possible, flight crews are seen first, before the day's operations get fully underway. Above right, by 0930 Doc is on the line. He makes the squadron commander's office his first port of call.

Above left, Doc uses the ready room as an informal consulting clinic. He observes, diagnoses, prescribes, all while mixing with the troops. Above right, Dr. DeBruin is briefed on a new mask valve by PE Officer, 1st Lt T. E. Reitmann. Busy working are A/2C R. A. Byland and SSgt Gene Long.

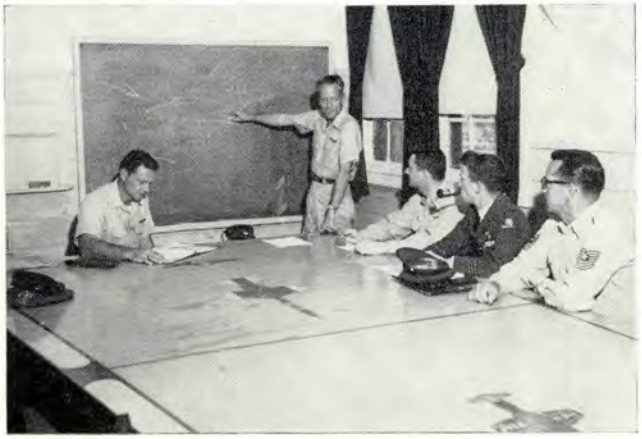
Below, 436th FSO Capt. W. J. Warren, schedules Doc for a later flight. Safety plaque is for more than 15,000 accident-free flying hours in Centuries. Right, 1st Lt Duane Kleopfer makes a date for a physical.

Capt. John A. DeBruin, Jr., Flight Surgeon and career medical officer, played host to *Flying Safety* as he made his rounds of the 436th and 476th Tac Ftr Sqs, George AFB, Calif. Dr. DeBruin summed up his philosophy as a Flight Surgeon with the phrase "I never want to wonder if there was something I could have done that might have prevented a man's ill health or his death." Here's how the Doc lives up to that statement.

Above left, Doc feels that no phase of the flying operation should escape the Flight Surgeon's attention. Here he checks Capt. R. K. Dundas for ejection seat fit. Above right, Doc flies regularly. Crew Chief A/2C Dan Bridges explains an entry to Capt. "Sam" Houston, Doc's pilot today.



Above left. After lunch, Dr. DeBruin continues his rounds. He stops in at the tower to check on working conditions. Shift supervisor SSgt Hubert J. Syfrig shows Doc how much the glare is cut by the heavy green shades. Above right. The troops who aren't flying gather for informal lecture.



Left, Doc attends accident board conducted by Maj. Crenshaw, Comdr of the 435th. Maj. R. R. Twijsel, Netherlands AF, observes. Below, MSgt Dixon, NCOIC, Flt Surg's office, checks emergency gear.

Check List

In the March issue of McDonnell's publication, *Field Service Digest,* Don Stuck has come up with another fine article about pitch-up problems in the F-101. This time he discusses the Pitch-up and Spin Test Program in the F-101B, and for all those flying it now or who expect to enter the aircraft in the near future, this is *must* reading. Mr. Stuck's account of his experience is both interesting and highly informative.

✔

Here's another tip for '101 drivers. "Two Air Force pilots recently had trouble with the ejection trigger on the Weber seat installed in the F-101. When one of the pilots did not eject he looked down and saw that he was not squeezing the trigger. He then grasped it and continued the ejection sequence. As the other pilot encountered flames in the cockpit after the canopy jettisoned and the seat did not fire, he immediately climbed over the side without checking the cockpit further. It is possible that he too did not have the trigger in his grasp. When the handgrip is raised, you can reach and squeeze the trigger with your fingers without moving your hand from the handgrip. It is well worthwhile to get familiar with this motion on an unarmed seat or a mobile trainer."

✔

Evaluation of a new radar intended to extend coverage in the terminal area to 120 nautical miles has been started by the Federal Aviation Agency. The first experimental radar has been sited at the FAA's National Aviation Facilities Experimental Center, Atlantic City, N. J. This radar is a fixed-installation surveillance system specifically designed for air traffic control in terminal areas and enroute sectors where traffic density requires closer than normal spacing of air route surveillance radars.

✔

One of the most colorful aircraft in the Air Force will fly into semiretirement following a recent decision to withdraw all but 18 of a force of 65 SA-16B "Albatrosses" assigned to the Air Rescue Service. Present plans call for the ARS to be organized into 3 squadrons of 18 planes each. These squadrons will have 12 SC-54s and 6 SA-16Bs, and will be further broken down into three detachments, each having four C-54s and two SA-16Bs.

✔

The information about holding patterns, quoted below, has been extracted from Section II, Air Traffic Control Procedures of the United States Area of the FLIP. It is recommended that you study this information the next time you're in Dispatch and prior to your next flight.

- "The standard flight path of an aircraft, while holding, is described as an elliptical configuration, i.e., a 'race track pattern.' Aircraft in a holding pattern will follow the specified course inbound to the holding fix, make a 180° turn to the right, fly a parallel straight course outbound from the holding fix for two minutes, make another 180 to the right and again follow the specified course inbound. 'Inbound to the fix' means the magnetic direction inbound to the holding fix while in the holding pattern regardless of the relative direction of the facility *(or facilities)* forming the fix.
- "Pilots are always expected to hold in a standard two minute right-hand pattern unless specifically advised otherwise by ATC. Because of the location of facilities in congested areas, proximity to other routes and so on, nonstandard holdings may be utilized. When it is desired by ATC that a nonstandard holding pattern be flown, ATC will provide adequate information to describe the holding pattern." The direction to hold with relation to the holding fix will always be specified by ATC.
- From the ground up to but not including 15,000 feet, the holding pattern is based on a maximum indicated airspeed of 180 knots with a rate of turn of 3° per second. From 15,000 feet to flight level 290 inclusive, the holding pattern airspace area is doubled, and above flight level 290 it is tripled to allow for higher airspeed required by aircraft operating at these altitudes.
- The holding pattern at 15,000 feet and above is based on a maximum indicated airspeed of 250 knots with a rate of turn of 1½° per second. Pilots are expected to adhere as closely as possible to the assigned holding patterns due to the existence of adjacent holding patterns and departure/arrival routes which may be occupied at the same altitude. Pilots are therefore expected to adjust time, speed and/or rate of turn if necessary and feasible to stay within the prescribed holding patterns. If it is determined that the boundaries of the prescribed holding pattern will be exceeded, air traffic shall be notified in order that appropriate separation may be applied.
- After clearing you to hold, the controlling agency considers you to be in the holding pattern at the time of *initial station passage.*

✔

The Federal Aviation Agency is considering a proposal to amend the air traffic rules to clarify the distinction between "clearances" and "instructions." The amendment will add a new definition to the language of air traffic control to clarify a controller's authority in situations where air safety is in immediate jeopardy. The word being defined is "instructions."

The proposed rule makes the distinction by pointing out that the clearance is in the nature of an arrangement or an agreement between the pilot and controller with regard to a particular course the pilot is to fly. The instruction, on the other hand, requires immediate and mandatory action by the pilot. Both are vital to the safe, expeditious and orderly movement of air traffic. ▲

THE DAEDALIAN AWARD

The father of military aviation, the Commander of the Strategic Air Command, and an heroic airline pilot were honored at the Order of Daedalians Annual Meeting held on 9 April 1960 at Kelly AFB, Texas.

Major Gen. Benjamin D. Foulois, USAF *(Ret.)*, was awarded a plaque commemorating the 50th Anniversary of his historic flight made on 2 March 1910 at Fort Sam Houston, Tex. The presentation was made by Lt. Gen. Harold Lee George, USAF *(Ret.)*, founder member and first commander of The Order of Daedalians.

Gen. Foulois, who served as Chief of the Army Air Corps from 1931-35, was at the controls of "Aeroplane No. 1" which saw the birth of military aviation in the United States.

Gen. Thomas S. Power, Commander of SAC, accepted the silver cup of the Daedalians for achieving the greatest progress in flying safety by an Air Force Command during the past year. During the period of this award, the Strategic Air Command established the lowest aircraft accident rate in its history. Lt. Gen. Joseph F. Carroll, Inspector General of the Air Force, representing Gen. Thomas D. White, USAF Chief of Staff, made the presentation.

Personnel of the Strategic Air Command were highly commended for their excellent flight safety achievement record accomplished in numerous types of aircraft which were often flown in adverse weather conditions during the performance of their missions.

Tribute was also paid at the meeting to Capt. Daniel L. Boone, American Airlines Pilot, for his outstanding ability in the line of duty. Boone was cited for his skill in safely landing a seriously disabled DC-7 on an unlighted emergency landing field at Akron, Colo., on 7 April 1959.

The Order of Daedalians, a group of World War I pilots and their descendents, was organized in 1934 for the purpose of promoting flying safety. More than 150 members from all parts of the country were at the meeting at Kelly Air Force Base on 9 April.

. . . to the Strategic Air Command

THE HARD SELL

"Hard sell" in salesmanship language is the process of repeating so long and so often the name of a product or manufacturer that it is retained in a person's mind. When you hear it often enough and long enough you automatically pick that particular product over others.

In educating Air Force personnel to protect their own lives and equipment this process of the hard sell through repetition is used quite extensively. It works some of the time as is proved by the accident rate going steadily down, less people killed and fewer bashed airplanes. But too many times the hard sell doesn't take. This is also proved by the same type accidents recurring each year.

How come? Why don't our pilots and their supervisors, maintenance personnel, tower operators, alert troops and the like take notice of the thousands of words of life-saving advice which are written specifically for them? Maybe the troops that need it the most don't get the word —lack of dissemination; maybe they are so distracted that they forget the word—failure to hard sell; suppose they are so in the habit of doing things *one* way they can't or won't change—lack of supervision. Whatever the reasons are it is a fact that a lot of hard work by a lot of people is going to waste.

I'd like to tell you about an accident that proves that the hard sell doesn't always work. By telling you this story another attempt is being made, once again, to hard sell you the very things that killed our pilot and ruined another of our fast-disappearing T-Birds.

First, let me tell you what happened and then we'll see *why* it happened. Late on a November afternoon, Joe *(as we'll call the pilot)* got a phone call from flight operations asking if he would take a T-Bird to Madrock AFB. It was pretty late in the day to go tooling off that far south, but he was short on 60-2 time, particularly the night variety, so he agreed to take the trip. The first leg was to Falcon AFB, just outside of New City. The weather wasn't too bad (Falcon's forecast—800 overcast with 3 miles in fog), and the alternate *(18 minutes away)* was in good shape. About 1930 hours Joe leaped off. He was cleared at 37,000 feet instead of the 35,000 feet he had requested.

For reasons we don't know, it took Joe 2 hours and 48 minutes to go the 552 NM instead of the 2+11 minutes he had estimated. We can't ask Joe why he had only 14 gallons left in the tanks after he stopcocked at Falcon and yet had never declared "minimum fuel" to anybody. We do know that he told the alert crew that he was "sweating fuel"!

Joe had touched down at 2214 EST and *1 hour and 6 minutes* later he pushed off for Madrock. You'll notice that I've made a point of the fact that it took Joe only 1+06 from touchdown to takeoff. That's moving pretty fast for any jet jock. Especially when you consider taxiing in, refueling, preflight, flight planning, weather from Flight Service, ATC clearance, fire up and taxi out. But Joe made it in 1+06. In fact, *50 minutes after touchdown* at Falcon, he asked the tower for his IFR clearance. When the tower operator told him his clearance was coming in from ARTC Joe fired up and started taxiing. En route to runway 10 he was given clearance as follows: "ATC clears AF Jet 37654 to the Retriever Radio Beacon, direct Madrock, direct Retriever, Big Stone departure to 13,000. Upon reaching 13,000 proceed direct Madrock climbing to flight level 250. Report reaching flight level 250 to New City Center on 360.6. Contact New City Center on *360.6 as soon as possible after takeoff*. Read back your clearance and the Big Stone departure." *(Taking off from runway 10 to the Big Stone departure would be a left turn to approximately 270°, climb to 3000 feet, cross Big Stone homing beacon at 3000.)*

The transcript of the tower tape showed that Joe copied and read back his clearance correctly on the *sixth try*, that his knowledge of the Big Stone departure was sketchy and it took *13 minutes* to copy and read back correctly the ARTC clearance.

At 2320 EST Joe leaped off into a dark 1600-foot overcast. Light rain was falling. At 2322 Joe and AF Jet 37654 splattered over the rolling hills eight miles northeast of Falcon Air Force Base.

Maybe you've already spotted some of the factors that helped to turn Joe's administrative flight into a very tragic accident. They aren't new. If you've kept your eyes and ears open you've heard them many times before. Joe had heard them. Joe had been an Air Force pilot since 1954. He was a physiological training officer. It just was not possible that he hadn't heard again and again of the very causes that probably killed him. Evidently the hard sell didn't take.

Before we go on let me tell you the Accident Board's finding was "undetermined," and rightly so. The aircraft hit the ground at 390 knots *(black light reading of airspeed indicator)* with near *maximum* power at impact. The angle of tree shear showed the aircraft to be in a left wing low attitude on a heading of 352° when it crashed. Complete fragmentation of the T-33 made it impossible to determine if an inflight failure or malfunction occurred. A lot of factors *could have* been the primary cause. So, we have "undetermined."

The *most probable* cause, which you have probably guessed, was *pilot disorientation*. How many times have you heard of this killer? I wonder how many times Joe had heard of it? Remember earlier in the story that Joe's clearance was to contact New City Center "as soon as possible after takeoff on 360.6 mcs"? It's been proved time after time that getting your head in the cockpit, turning it 90° to the left or right and downward while accelerating and/or turning, is the best way in the world to get a jumping-up-and-down case of spatial disorientation.

If you've ever had a good case of it you need no convincing that it can ruin your whole day—or lifetime. If you've never experienced it—please, please just believe that it's as dangerous as a loaded gun. This one factor is the reason T. O. 1T-33A-573 was published; it reached the field during March. It directs the installation of the Quick Manual Tuner and relocation of the control to the instrument panel pedestal. The only hitch is that the work won't be done on the aircraft until it goes through cyclic mod.

Another point of the clearance was the frequency of 360.6 mcs. While the Big Stone departure was a standard departure for Falcon, 360.6 is a nonstandard frequency. By nonstandard I mean it is not published in planning publications. Since Joe didn't know about this local procedure and didn't make any changes to preselected frequencies, it is probable that 360.6 was not available. Why Joe didn't refuse the frequency is not known but he didn't.

Before I leave this frequency change bit, for those who may not have gotten the word, here again is the Air Force position: you don't change communications frequencies, IFF modes, or try to copy revised clearances when the aircraft is in a critical attitude or at a critical altitude. *(Critical altitude and attitude: below 1000 feet, including climb or turn that requires constant attention to flight instruments to control the aircraft.)* Very simply, you get the bird in a stable attitude, *then* you comply with the change instructions or revisions to clearance. Once again —it may be important to change frequencies or modes but not one-hundredth as important as keeping the bird right side up.

Essentially, you know the reasons Joe is no longer with us, but there are some underlying factors that you should know. Like, should he have even attempted this night weather takeoff? Joe had 262 hours in the T-33 of which 12 hours were weather and 3 hours were night weather. In the previous 6 months he had flown only 2 hours of weather, 2 hours night and no night weather at all. The month before the accident he had flown 5 hours in the T-33 *(30 minutes weather)*; the month of the accident he had flown 6 hours *(20 minutes weather)*. Now, in my book, Joe was "dangerously current" *(mind you, I didn't say proficient)* for a night weather flight such as he attempted. The accident board felt this way; maybe Joe thought this way too and was apprehensive about the flight. Remember, he shut down with 14 gallons in his tanks? Something happened on the way down to cause him to be 37 minutes late on a 552 mile flight.

I can just imagine the comments of some of you reading this. Like, how can this joker say Joe's marginal experience was a factor when you don't even know the cause. I can say this because I've read too many accident reports that prove that lack of proficiency is deadly. How good are you with the golf clubs when you play a few rounds on an infrequent basis? You're lousy. Same thing with flying. Only difference is you'll lose more than a few beers on the same type gamble. So, Buster, the next time you line up for a dark night, weather takeoff—maybe, just maybe, you'll remember this story about Joe. If you felt real good, safe, secure, proficient, with no apprehension during your climbout, let me know who you are. I'd like to meet *you*.

Another aspect of this accident is *self-medication*. Scattered along the ground path of the wreckage were several packages of drugs. They were physician's sample packs of Dramamine, Titralac, and Dextroamphetamine. Whether or not these drugs played *any* part in the accident is strictly conjectural. As a Physiological Training Officer, Joe might have received them as samples, or they may have been lost by the chemist-owner of the mountain cabin near which the aircraft crashed. If they were Joe's we don't know that he had been taking them. Finally, there is a difference of opinion among doctors as to how much of these drugs a pilot can take before it will affect his judgment or senses. *(Dramamine is used widely for motion sickness but it acts as a sedative on some people. Dextroamphetamine is a stimulant that could influence behavior and judgment. Titralac combats gastric distress.)* Personally, I doubt that Joe was taking any of the drugs the day of the flight, but I brought it to light for the express purpose of emphasizing again that, unless you are a Flight Surgeon, rated aircrewmembers *must not* attempt self-medication. This is your Flight Surgeon's job. Let him prescribe for you.

There's just one more point to discuss and that is fatigue. Do you suppose Joe was tired at 2300 hours that night? Could he have been less sharp than he would have been the next morning? He'd been up all day, had flown almost three hours and at the time most of us were going to bed here he was heading out again. You've all been in the same boat and you know very well that physically and mentally you weren't in near as good shape as you'd been in the morning. In fact, haven't you been driving a bird when you were so tired that you just barely

cared whether you got there or not? Let's cut that nonsense out—now!

It's been a long time since I've been on a flight that was so important that if I'd waited until the following morning it would have stopped the Air Force mission. Give it some thought the next time you're about to stooge around all night when you're far from your best.

If you remember, you read in the beginning that there was nothing new in this story and you've found out I was right. But for the purpose of retention and repetition, let's go back briefly and look at the lessons. We saw that spatial disorientation was probably the big factor. Departure control helped this along by "as soon as possible after takeoff" and a nonstandard frequency. Of course Joe didn't have to comply that quickly but most likely he tried. Next we have Joe himself—he just wasn't up to the job he tried to do. Not that he couldn't have been proficient but the old saying "practice makes perfect" was proved again.

Self-medication and fatigue can't really be called a lesson of this accident as both factors are conjectural. But both have shown up as primary and contributing cause factors in other accidents.

Well that's the end of Joe's story. It didn't have to happen, but it did. It's happened before—let's see that it doesn't happen again. For your own sake and those that care about you, give it some good hard thought. ▲

JLT

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STEER CLEER, MY DEER

Captain C. O. Cummins, Director of Safety, 392d Combat Support Gp (SAC), Vandenberg AFB, Calif.

It hardly seems possible in this day of man-made satellites in orbit, nuclear weapons, antihistamines and filter cigarettes that man's activities could still be interrupted by delinquent members of the animal kingdom. But that's what has happened out here at Vandenberg AFB. We can get an Atlas off into space on demand but we can't land an airplane on our runway just anytime because of the herds of deer grazing in the vicinity.

As is often the case when no one else knows the answer, the matter of "deer on the runway" was referred to the Flying Safety Officer, Captain Duane E. Robinson. He tried to sell the idea of an airfield perimeter fence. After researching the idea he learned that a fence—to be deerproof—would have to be a fence within a fence, the theory being that the lower outer one would prevent the deer from backing off enough to leap the higher inner one. It didn't take too long to find out that "funds are not available."

He wrote to other Flying Safety Officers who might be faced with the same problem. Among the more coherent suggestions: "Wire Paladin, San Francisco." This was considered briefly, then rejected.

Someone suggested that we record the mating call of a hungry mountain lion and broadcast it at intervals from base operations. This was rejected, there already being a high incidence of ulcers.

Quasi-official hunting parties were organized but operated without materially reducing the deer population. A NOTAM on Vandenberg's problem had long since been published but since deer are notoriously illiterate they didn't take the hint that they were unwanted.

The matter was discussed and rediscussed at Safety Committee meetings. One newly arrived member suggested salt licks to be placed at strategic intervals. An older member advised him that had been done two years previously with the only result being a twofold increase in the deer problem.

One possibility remained untried, and it was at the Safety Committee meeting that a decision was made to go ahead with it as soon as possible. Months before, the Base Vet had queried a mountain lion scent-producer down in the southwest. No answer had yet been received as to price, availability, or practicality. A call to the Vet turned up another outfit in California *(name on request)* which specializes in animal scents.

A telephone call to the company brought literature, prices, and testimonials. Enough of the mountain lion scent, known commercially as deer repellent, was ordered to provide a test pattern in an attempt to establish its effectiveness. This was done because the company, while willing to guarantee its product in Mrs. Van Dam's rose garden, was hesitant to stick its neck out on Vandenberg's pea patch.

For those of you who might be interested, the following technical *(?)* details are offered:

Two areas 500 feet x 100 feet, adjacent to the runway, were selected. The areas chosen were those in which deer were commonly seen and areas which could be more or less continuously observed. Wooden stakes scrounged from the carpenter shop, topped with rags scrounged from Roads and Grounds, were placed at 100-foot intervals by manpower scrounged from the base safety office and base ops. The rags were treated with deer repellent every day for the first two weeks, as prescribed by the manufacturer. *(After the first bottle of repellent was opened it was obvious that the man doing the application would have to stand upwind or run the risk of repelling his own dear.)*

The observation of the areas became part of the Airdrome Officer's duties. During the test no deer was reported within 300 yards of the staked areas. The work order for staking and maintaining the perimeter of the runway has been submitted. Careful calculations of the amount of repellent used indicates that it will cost approximately $4000 per year to keep the deer away. If that seems exorbitant, consider the price of one T-Bird or one Gooney. And if you visit Vandenberg, don't worry about the zoo odor in the vicinity of the runway. That's the way we planned it. ▲

Let the Right Hand know...

Maj. Donald J. Forsythe, Bomber Branch, DFMSR

Although only late afternoon, the broad expanse of the Midwest darkened as the pale sun sank in the wintry sky. Lights came on in cities, towns and hamlets, sparkling on the fresh-fallen snow that blanketed the land from Lansing to Omaha. Grey, full-bellied clouds scudded relentlessly eastward; another storm was brewing.

Children returning from school trudged through the white drifts and, once home, piled boots, sleds and skates on the porch steps like booby traps. Mothers hastened through their endless tasks and rushed to prepare dinner for winter-whetted appetites. Another routine, uneventful day was nearing an end for a million average families.

Well, maybe "routine" is too broad a term, because for one of these families, this was an extra special day. Their dad was in the Air Force and he'd be home tonight after a long trip. The children remembered with delicious anticipation the last time he'd come home and awakened them in the middle of the night with hot chocolate. And Mother, looking forward to a domestic holiday if Dad got the next day off, turned down a bridge invitation, promising to make it the following week.

At an airbase a thousand miles westward, the noontime sun was obscured by swirling fog. Snow lay everywhere and the air crackled with cold. The man whose arrival was so anxiously awaited by his family in the midwestern town several flying hours away sat in the chilly cockpit of a B-47 studying his engine instruments. Despite the 3/4-mile runway visibility and poor destination conditions, he had decided to make for home. If all went well, he could be there late that night for a welcome by his wife and a hot-chocolate party with the children. Back with his family, warm, comfortable, secure. . . .

He and his copilot decided to request GCA monitor for takeoff and departure because of the poor visibility. The takeoff was normal until gear retraction when the forward main indicator showed intermediate. They reduced power to keep from exceeding placard speeds, stopped flaps at 50%, and requested GCA to bring them around and line them up for a tower flyby so the gear could be checked. In the meantime they recycled the gear and checked the circuit breakers but still the emergency landing gear extension indication and the gear handle light were red.

After a right turn to base at 1000 msl, the wing flaps were fully extended and the gear recycled. With the handle in "down" the indicator showed the gear fully extended, but when the handle was put to "up" the forward indicator still showed "intermediate."

At this point GCA came in with the first instruction, a right turn to 130°, the runway heading. The pilot turned too late, however, and overshot. GCA then called to continue turning to 170° and be prepared to execute a sharp left turn back to 130. When the pilot rolled out on 170 he was advised by GCA to turn left immediately to 120 and descend to 800 feet. He roger'd "Turning left to one-two-zero degrees, 800 feet." It was his last transmission.

Seconds later the aircraft crashed in a slightly nose-high, right wing low attitude on a heading of approximately 140°, and well within the perimeter of the base. Both pilots survived, but the navigator and the fourth crewmember were killed.

What happened? Let's look. The only mechanical fault found with the gear was a heavy coating of grease on the governor pack and screw area. This grease is a type that becomes quite heavy, almost solid, when subjected to extremely low temperatures. In this case it could have slowed gear retraction and extension considerably.

The flaps were found fully extended. A detailed examination of the flight control system revealed no malfunctions, nor was there any evidence of engine failure. Obviously, the airplane had simply run out of lift.

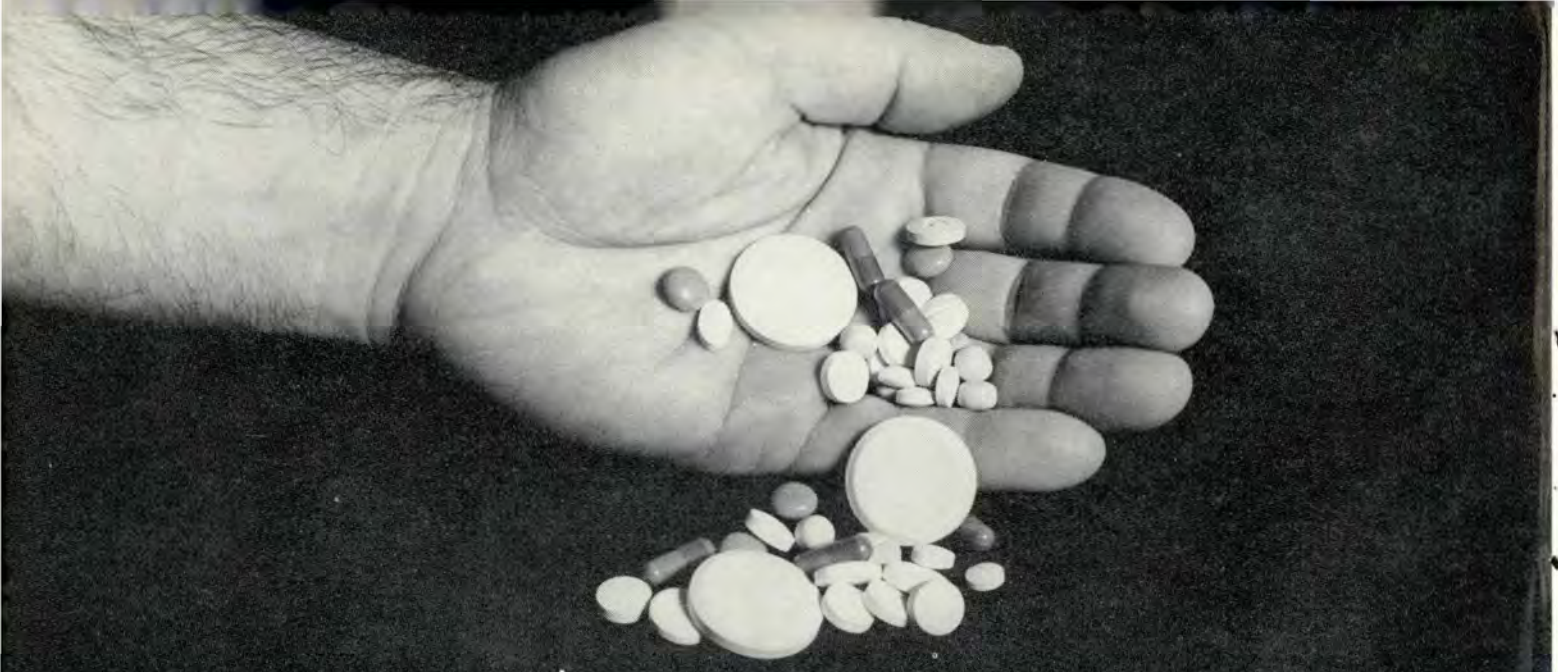
The copilot stated later that it was he who recycled the landing gear. Apparently he had done this several times during the flight without the pilot's knowledge. This might have helped induce a stall, since the pilot was not forewarned to add power to compensate for the additional drag produced.

In fact, a number of factors were introduced which severely compounded an already complicated problem of maintaining safe flight. The pilot's initial decision was certainly questionable—that of flying a heavy aircraft at low altitude in an unorthodox pattern down an invisible runway. To maintain sufficient lift during a maneuver such as this demands a delicate touch to say the least, particularly when you're limited on the topside by a low flap placard speed and on the bottom side by a high one-G stall speed, with maneuvering load limits thrown in between. If you add a dash of aircraft configuration variance, such as the gear going up and down, with changes in power/drag requirements, you have a problem.

The hackneyed term "crew coordination" means all things to some of us and nothing to others. It couldn't mean as much to an F-100 pilot, for example, as it does to a bomber crew. But no matter how divergent their views, the least that two pilots working together to fly the same machine can do is just that—work together. Each man should know what the other is doing at all times in relation to any given phase of flight. The right hand should know what the left is doing.

In an accident like the one described, involving an aircraft having two sets of controls, you might wonder how something like this could happen. How could two pilots helping each other fly the same airplane be so ignorant of what the other was doing? Yet, this kind of accident has happened and continues to happen in nearly all types of aircraft. You wonder, and draw your own conclusions. Possibly you're even saying to yourself: "There but for the Grace of God go I."

Needless to say, dad didn't get home that evening nor for many evenings to come. Some of the crew never got home at all. How different the flight might have been, how many hearts would have been happier, if the men involved had only let the right hand know. . . . ▲



The Flight Surgeon must spend a large portion of his time with his airmen, pilots and crews if he is to be . . .

MORE THAN A PILL MERCHANT

Colonel Maurice G. Long, Fighter Branch, DFMSR

In World War II each squadron of the 9th Air Force Fighter Group was assigned a Flight Surgeon as an integral part of the unit. He was as much a part of the squadron as was the adjutant, or the operations or maintenance officers. He had his quarters with the squadron pilots; he ate in the squadron mess; and he sat in with us on the briefings for each mission.

At takeoff time the Doc sweated it out with the crew chiefs, then held sick call up and down the line, wherever required. When it was time for the aircraft to return, Doc would jump in his ambulance and drive out to the landing strip to await the arrival of the planes with the flak holes, the dangling gear, or the just plain shook-up birdmen. He beat the crash crew to most of the prangs.

Then after he'd patched up the pilot concerned—physically with his iodine and tape, and mentally with reassurance and a shot of mission whiskey—he joined us for the evening's activities. Or maybe he'd go back to the flight line if all hands were needed to ready the birds for a max effort mission next morning. In other words, the Doc lived, ate and worked with us and, when the time came, played just as hard as the rest of the squadron.

At that time I couldn't think of a better way in which the Flight Surgeon might have been employed. And I still can't, except that changing times, budget limitations, personnel ceilings, and perhaps the induction of *some* short-time Flight Surgeons who are not really "motivated to the cause" have all conspired to change drastically this modus operandi.

Yes, these changing conditions have dictated that some of the old concepts be revised. It would be inconvenient for the Doc to live with the squadron today. He can still drop in at the mess for chow occasionally, but he probably has his own family by now so he won't want to join in the festivities of the evening very often.

If time permits, he may still sit in on the mission briefings. If he's truly motivated, he even tears himself away from the base hospital and straps himself into the right seat of a TF-102, or into the jump seat of a B-47. And we even have a few who do mighty well for themselves in the front seat of a T-33, or even a Century Bird, or in a supersonic rocket sled, or in a balloon designed for the stratosphere.

Of course, the typical Air Force pilot has changed too. During World War II he was perhaps slightly over 20 years of age, unmarried, and a first lieutenant. Today, he's much closer to 40, has 1.2 wives and 3.8 children. With any luck at all, he's even had a promotion or two. Now, he's just as concerned with the health and happiness of his family as he is with his own.

So the odds are pretty good today that, at just about the time the morning mission roars off, a good portion of those 1.2 wives and 3.8 children will be lined up in the dependent's clinic waiting to have their throats swabbed, their arteries sutured, or their shot records brought up to date. It's quite probable that many understaffed hospital sections need the Flight Surgeon's help in looking after some of these dependents, after he's run through his quota of annual flying physicals, entrance exams, discharge papers, voluminous other paper work and held his own sick call for the airmen on the base.

In an abstract way, the Flight Surgeon in this manner does help me in the prevention of aircraft accidents.

Have you ever seen a young airman second class absent-mindedly try to preflight an F-100 when he's worried about his wife in the hospital for her first baby, or watched a first lieutenant gaze out the window during briefing when he knows his two-year-old is at home with a temperature of 103? The Doc does prevent an unknown number of possible accidents by insuring the mental and physical health of the whole Air Force family, not just that of the airman alone.

For the above reasons, I, as a commander, have come to accept the peacetime concept of Flight Surgeons' employment. I suspect that most commanders, like myself, accept it grudgingly, but nonetheless accept it.

However, there are many specific requirements outside of the hospital for the Flight Surgeon's help in accident prevention. The term prevention implies "before the fact," or, what can we do before we need the tape and iodine—and mission whiskey?

We all know that pilots bring many of their woes upon themselves. In this mach 2 Air Force there may be a very fine line between those who can hack the program, and those who can't, or don't really want to. A well-trained Flight Surgeon can help me recognize this individual before he gets into trouble, and we can take some remedial action. Perhaps a rest may be indicated, or maybe leave, change of assignment, less flying and more relaxation *(or vice versa)*, or possibly better physical conditioning is required. In some cases, an indefinite grounding may be required. Usually, the Flight Surgeon must have a personal acquaintance with the pilots in order to diagnose the problem before it becomes serious.

At this point I refer you back to our status of nearly 20 years ago. If the Flight Surgeon can possibly afford to, *he must still spend a large portion of his time with the pilots, with the airmen, and with all personnel who support or maintain the flying operations. And he must spend it in their environment*, for it's doubtful that he will pick up any symptoms of impending "skipthelecture-itis" at the morning sick call period.

On the subject of environment, how efficient is the crew who is trying to perform an inspection on an aircraft in an unsheltered area when it is below freezing, or for that matter when it is 110° in the shade? Unfavorable working conditions such as these have been proven factors in maintenance error involved accidents.

The Flight Surgeon can pack a lot of wallop in obtaining better working conditions, thus securing better maintenance—the key step in anybody's flying safety program. I recall a case when the Flight Surgeon's demands were the only thing that swayed the supply section into getting adequate winter clothing for flight line mechanics. The supply officer kept pointing out what the book said: "This is a temperate zone and only lightweight clothing is authorized." Turned out the Flight Surgeon carried the bigger stick.

Earlier I mentioned that the Doc used to eat with the squadron personnel at their mess. Good food and a well-balanced diet are mandatory for healthy and happy airmen, be they ground crew, aircrew, or support personnel. Good morale across the board is mandatory in any really successful flying safety program. Again, the Doc carries more weight than any other person when it comes to insuring that the mess is well run, the food is properly served, and the working areas are kept clean and efficient.

The Flight Surgeon is needed in the flying safety program to emphasize various human factors particularly pertinent to military aviation. Our Doc turned up periodically as a guest speaker at our unit flying safety meetings. Airmen who fly airplanes and those who maintain and support them respect what the Doc tells them. Our Doc made it quite clear as to the need for oxygen at altitude, the requirement to maintain the systems in top condition, what happens when the supply becomes scant, and what to do about it.

After a few meetings with him, most of the boys knew more than a first year medical student about their anatomy, first aid, circulation, frostbite, decompression, JP-4 vs. dermatitis, love and marriage, parachute landings, and the reasons for getting a good night's sleep.

The Flight Surgeon's help is essential in fields relating to personal equipment and cockpit design. His help at higher Air Force levels is necessary to design and test new gear. In the field he must insure that the gear is cared for properly, is used and fitted correctly, and that all personnel are indoctrinated in its use. The Flight Surgeon may point out cockpit deficiencies from a human factors standpoint that the flyboys have missed: inadequate night lighting, hard-to-reach switches, uncomfortable seats or parachutes, poor ventilation systems, or controls that require abnormal movements to operate.

Finally, adequate accident investigation is in fact a part of any well-run flying safety program. Whether it is a fatal accident requiring a pathological specimens examination, or the case of the novice and a gear-up landing because of an interrupted habit pattern, I want the Doc "Johnny-on-the-spot." He is needed at the scene of the accident as well as at the board meeting.

As proof of my contentions, may I suggest a review of the records of any tactical unit on TDY from its parent base for gunnery training, for maneuvers, or for any other purpose wherein the unit operated as an entity with its *own* Flight Surgeon, and the Flight Surgeon's office was in the tent next to the supply shack. You'll find that the Flight Surgeon's biggest task is dispensing a little paregoric for the first few days. After that he will get as much flying time as the operations officer.

This unit, while on TDY to the boondocks, will do more flying, shoot more gunnery, drop more bombs, and have harder working maintenance personnel and pilots—with less griping—than the unit back at home base. Also, the odds are good that the flying safety record will be much better than it was back at home. Ask any commander of such a unit if he doesn't sincerely believe that the Flight Surgeon's presence *right with the unit* added greatly to the success of the mission.

When I had roughed out this article, I passed it around for comment. A fellow staff officer pointed out to me that it didn't really say anything that AF Regulation 160-69 didn't already say. I then refreshed myself with the regulation to see if this were true. *(By the way, I recommend that every Flight Surgeon and commander do the same.)* And I agree that the reg says even more—with the exception that it does not really emphasize the personal contact airman/Flight Surgeon relationship that must exist in a truly effective flight safety program. I've tried to bring out that emphasis in this article.

The Flight Surgeon *must* operate primarily in the environment of the airman and this is not at the base hospital. ▲

Tips for T-Bird Drivers

Major Wallace W. Dawson, Fighter Branch, DFMSR

The traffic laws of California are written in such a manner that an automobile accident should not happen unless somebody goofs. California seems to have its share of highway accidents yearly so quite a few drivers must be goofing.

On the other sweaty hand we can say that every aircraft accident happens because somebody goofed. To mention some examples: that time the pilot allowed his aircraft to strike the ground 100 feet short of the runway, or when maintenance personnel failed to torque the main fuel line properly and it came apart in flight and a fire resulted. Another pretty familiar story is the one about an inexperienced pilot who was allowed to conduct a flight into a weather situation that was beyond his capabilities. Any goof committed directly by a person or persons is easy to identify as such, but how can *every* aircraft accident happen because somebody goofs?

Let's look at it this way. An airplane is flying along and one part fails through no fault of the crew involved. These accidents we are prone to call "materiel failure," meaning that "something busted." But, *why* did it bust? Maybe it wasn't designed strong enough to begin with. In that case it certainly wasn't the fault of that poor little part, but the fault of the guy who designed it. Suppose the part was designed correctly but the guys who made it let the lathe bite into it a little too deep, weakened it, and caused it to fail later.

Or, let's suppose that the part just plain wore out because the people who wrote the tech orders estimated its useful life longer than it actually was. See how these are goofs? See how the faults of people keep on creeping in? This, we call the "human element."

What in the world would the "human element" be? We are all humans, and element means ". . . one of the simple substances or principles." So what is this so-called "human element?"

We might paraphrase it and say simply that "humans —being human—are not infallible and are likely to do less than their best and may make mistakes now and then. In other words, sometimes they just don't do their jobs the way they should, and it isn't always their fault. Our civilization has become so complex that mere existence anymore has raised the tempo to little less than frantic. Small wonder, then, that an engineer could read a slipstick wrong or a machinist might let the tool bite just a little too deep. No wonder Joe Blow forgot to tighten that fuel line.

But wait! That's nothing new. We have known all these things for a great deal longer than somewhat and that's why we have mess checkers, reviewers, inspectors —call 'em what you will. Their job is to see that the work is done right. In some cases we even have checkers who check the checkers! This is real good and certainly a step in the right direction. The one small hitch that keeps it from being the answer to all of our problems is the fact that the checkers are human too, and therefore vulnerable to all of the "human element" factors of the very people they are checking. This is really enough to make a grown man cry! So what are we gonna' do?

Let's get ridiculous for a moment. The Chief of the Air Force called in the Deputy for Operations and ordered that all aircraft be grounded immediately because of the accident rate. He then sat down with his experts and analyzed every aircraft accident that had ever happened since the Wright Brothers' first bash. By correlating all this data and presenting the results pictorially in graph form, he determined that all aircraft accidents are caused by the failure of some human being, or a group of human beings, to do their jobs for one reason or another. He theorized then that if one flight could safely be made, that particular flight could be dissected and duplicated and from this model could emerge absolutely accident-free operation from this day on. Thereupon he ordered specifications to be written for an air machine, each part of which would be so strong that it would be practically indestructible. This machine should surely last for one flight and that's all that would be required. A new one would be built for each subsequent flight to preclude the danger of wear on parts.

To construct an absolutely safe airfield, the State of Texas was paved over and a runway one mile wide marked across the middle. Control towers were spaced every thousand feet. It took so long to build the airplane that the pilot was trained from the cradle up to perform this one flight. About this time somebody suddenly realized that everything—but everything—had been abandoned for safety.

This is impossible, because safety—for safety's sake—is unrealistic. Our excuse for being is to accomplish the Air Force mission. Safety—although a close second—must come second. So where does this leave one and all? Is everything really over? Are the chips really down? No! Here's how we can operate and be reasonably safe.

Everything in life is a compromise. We can't all be born rich and/or good looking, so we compromise. We can't all be President of the United States, so we compromise. We can't abandon everything else to absolute safety, so we compromise. We do this by asking our engineers to build us the safest airplanes possible considering the missions they must perform. We compromise by giving our crews and maintenance people the best training possible, stretched over a realistic time period. We compromise by writing the inspection tech orders with a time increment that should give us an adequate margin of safety. So where does all this put us? We wind up with a bird that can perform the mission and perform it safely. Sure, it's not indestructible and its parts will wear out. It's complicated and the mechanics who keep it flyable have to know their onions. The pilots who fly it have to keep their heads up because even though it's a good bird, it won't do their thinking for them. In other words, every person connected with the bird and its operation has to stay on his toes and do his job right. This surely isn't asking too much—and just stop and think of the money we'd make if everybody did this!

So, he does his job and you do yours. You check him and he'll check you. "They" will check on all of us. If you do find something wrong, let somebody know about it. An Unsatisfactory Report maybe? By the way, how

long has it been since you've written a UR?

We can operate and be workably safe without sacrificing the mission. Drive carefully. ▲

• • •

Oh, you trusty T-Bird drivers, take heed! 1959 has come and gone; so has the first half of 1960 and the third quarter is staring us straight in our bloodshot eyeballs. As usual the resolutions that we made last New Years Day have long since been broken and we're back to normal living again.

There is something I'd like to discuss with you and although it is not a resolution we might call it a goal for 1960. It's about the number of T-33 major accidents that have occurred each year, say for the past five. For that period, the record reads like this: 1955, 340; '56, 293; '57, 244; '58, 164; '59, 133. Now, it doesn't take much brainwork or time to realize that, although the total is going down, we've never had a year with less than 100 major accidents in T-33s.

Pilot factor accounted for 40% of the accidents in 1959, so if we could just halve the number in 1960 to 20%—or about 27 total—we would have it made. That in itself would not pull us down below 100 majors for 1960 but with the improvements that have been made to the engine and the anticipated reduction in materiel failure accidents, the combination would. That's the goal I have in mind for 1960.

Let's ogle these *pilot factor* accidents a bit and try to see *why* they happened. Here's the breakdown: 29 were during the landing phase; 17 during takeoff, 4 midairs and 2 lost.

Landing accidents were—as you might suppose—undershoot, overshoot, porpoise, hard, stall in pattern, veer, landed on closed runway, forgot gear, and inadvertently retracted gear. What's to say about these? We all know how to land the airplane; there are adequate facilities available on which to land. *Pilot factor.*

Takeoff accidents also were as you might suppose: premature gear retraction, stall after takeoff, hooded, into weather, late abort, and failure to lock nose doors. What to say about these? We all know how to take the airplane off, lock the doors, fly weather. *Pilot factor.*

For the first time since the airplane got into full operation we had a month with less than 10 majors; that was January 1958, with 8. Since then we've had three months with 8; five with 9, and one month with only 4 —December 1959. Now you might ask "So what?" Or, "What does all this have to do with me?"

It's real simple because 8 times 12 equals 96, and 96 is less than 100, and less than 100 is the goal we hope to make in 1960. We might express this as $\frac{100:}{60}$ under 100 in '60. So if we can average 8 or over each month this year we will do it. How we doin' now, as of, say, the 31st of March: 9 in January; 8 in February; 8 in March—need a 7 month now to balance that 9.

Funny thing about accidents. Would you believe it—out of the 25 majors in the "T" that we've had up to 31 March 1960, 8 were on Thursday; 5 on both Tuesday and Wednesday; 3 on Monday; 2 on Friday and 1 each on Saturday and Sunday. We brainstormed this after laying it out for easier analysis:

S	M	T	W	T	F	S	
1	3	5	5	8	2	1	= 25.

Thursday follows Wednesday; Wednesday is bingo night at many bases, and bingo night means staying up a little later than usual and maybe having a few more than usual. I don't know. Another guy explained it this way: Nobody—who can help it—flys on Monday. A few hardy souls brave the elements on Tuesday and Wednesday. By Thursday the administrative trips are set up; some people fly to get out of the office and some fly so they can play golf on Friday afternoon. I don't know.

Seriously, here are briefs of the bashes we've had during the first 25 cents worth of 1960:

- Test hop; fuel system difficulty, flameout; two ejected okay.
- Taxied bird into construction area at night *(sigh!).*
- Midair; two destroyed. Pilots okay.
- Lost control during crosswind landing; aileron boost out.
- Overtorqued bolt caused elevators to bind; ejected okay.
- IP driving from rear seat taxied into other bird waiting to cross active *(sigh!).*
- Landed short.
- Hit power pole 2 + miles from end of takeoff runway—night—weather; ejected okay.
- Hard and short on a no flapper.
- Couldn't get gear down; ejected okay.
- Midair—violation of briefed procedures; one destroyed.
- Forgot to lower gear on SFO. *(sigh again!).*
- Fuel siphoning trouble in touch and go pattern; two ejected NOT okay.
- Nose gear collapsed on landing; pilots didn't check it down.
- Hit 3/4 mile short on a no flapper.
- Plenum chamber explosion in takeoff position *(lucky).*
- Crashed immediately after takeoff into night IFR. Fatal.
- Hit 260 feet short, fuel heavy.
- Crashed immediately after takeoff into weather. RAPCON told to make SIF change. Fatal.
- Lost—out of gas: two ejected NOT okay.
- Overstress in flight, bird came unglued. Two ejected; only one okay.
- Let airspeed get too high in descent; lost control. Two ejected okay.
- Flameout in GCA pattern *(VFR);* only one ejected okay.
- Stooged around until low on juice at dusk. Had to hold momentarily; ran out of gas in GCA pattern; two ejected NOT okay.
- Midair, violation of briefed procedures; two destroyed. Identical to previous accident except one was day, one night.

And that is that—25 bashes; 18 birds that will never fly again, and worst of all, 10 pilots gone. I'm not going to moralize on this. What's the use? You all know the answers as well as I do—violations, proficiency, poor planning, overconfidence, carelessness. One maintenance error; two design deficiency; three materiel failure; five supervisory *(IP),* and a whoppin' 14 pilot factors. Some of these things we can do something about and we are doing something about them. Some of them we can not; some of them can only be *done something about by YOU.*

How about it, golfers, are we gonna' bust a hundred in '60? ▲

A pilot might have his ego smashed but it makes good sense most of the time to make him take along . . .

. . . A BACK SEAT DRIVER

"Johnny, did you hear the latest rumor goin' around the headquarters?"

Lt. Col. Johnson looked up from his paper covered desk. "Which rumor, Franklin? There are several hot ones floating around. The best one I've heard lately is about that cute little blond in the next office. The way I heard it. . . ."

"No, no, not that one," said Franklin. "Besides it isn't true. I'm talking about this ugly rumor that we're going to have two pilots every time we go on a cross-country in a T-Bird."

When this little bomb dropped, fighter jock Johnny gave his undivided attention to fighter jock Lt. Col. Frank Stone.

"Where did you pick up that charming little gem of information?"

"I was down at flight ops this morning talking to the scheduling officer and he said it's coming out soon."

Johnny slumped dejectedly in his chair. "Who in the world dreamed up a crazy idea like that, Frank?"

"It seems like the Old Man thought of it himself."

"Well, maybe it's just a rumor. Besides it would never work. We're staff officers and we've got to get out into the field and visit the units and troops. We're not manned fat enough that we can put two of our pilots in a bird every time it goes out on a trip. One of the main advantages of having T-33s is that you don't have to haul along a crowd of people when you have to go some place. Besides, suppose I have a meeting to make at Offutt and can't find a pilot to go with me. What do I do, cancel the trip and then have my boss romp all over me for missing the conference? It just never would work."

During the next two weeks the subject of "two in a T-Bird" came up almost every time two pilots got together. It was cussed and discussed, and pros and cons were weighed. Would the Old Man really do this or wouldn't he?

On Tuesday, it happened! Everyone had been waiting for the flying safety meeting to really let loose and speak his piece. Nobody got a chance.

"Tens-hut!"

"Be seated, gentlemen." The Old Man spoke softly. "Before Major Rider goes on with the flying safety meeting I intend to straighten out a number of rumors that have been widely and wildly spread about. As of now there will be two pilots in all T-33s departing this base."

Despite the Old Man's presence, groans were more than audible. Imagine this edict coming from the Old Man himself, a dyed-in-the-wool fighter pilot, and an outstanding WW II and Korean fracas commander.

His face softened a little as he continued. "Believe me, gentlemen, this decision has not been made without a great deal of serious thought and study.

"Before I tell you *why* this decision was made, let me give you the ungarbled word. Flying under VFR conditions will not require a second pilot. However, when a flight is planned that *will* or *may* require actual weather flying, there will be two qualified T-33 pilots aboard. Are there any questions?"

"Yes, sir! What happens if I go out by myself, VFR, and when I get ready to come home two days later, I'm faced with an IFR flight?"

"You have two choices, Major: either wait until you have VFR conditions or come on back in violation of my orders and hope I don't find out.

"I know the problems that will come up and they were carefully considered before I made my decision. Maybe you haven't thought of some of them. For example, most of the time you'll have to find a second pilot to go with you. That shouldn't be too difficult. We all have the same units to visit, only in different capacities. Plan ahead. If you can't find another pilot, you'll make arrangements with flight operations to be dropped off by C-47 or U-3A and picked up later. In certain cases commercial transportation may be used.

"Per diem costs may go up slightly, it's true. My staff studied this and has already budgeted for this relatively small amount. I say relatively small because it is a minute amount compared to losing another pilot and another airplane."

At this point the Old Man's voice lowered and he spoke almost gently. "All of you remember when Colonel Wolcott was killed three months ago in a T-33 at Indianapolis. This was a great personal loss to me. Jerry was not only a brilliant staff officer but a close personal friend. One of the hardest things I've ever had to do was to tell his wife, Barbara, of his death. It was after I read the accident report that I decided no more of my pilots would be involved in the same type accident.

"Let me refresh your memories. A year ago, when I brought Jerry into the headquarters, he was a fully qualified single-engine jet pilot and an outstanding wing commander.

"During the next nine months Jerry was busy learning his new job and his razor-edge proficiency was lost. The night he was killed, coming out of Indianapolis, he just wasn't sharp enough to compete with the weather, a frequency change, and altered airborne departure instructions. When he went out of control he didn't have the altitude to recover."

There was no gentleness in the Old Man's voice as he continued: "There is no doubt in my mind that had a second pilot been aboard that night, Colonel Wolcott would be here today. In fact, my friends at the Directorate of Flight and Missile Safety Research at Norton AFB tell me that since January 1959, we've lost eight pilots and eight T-33s under almost identical circumstances.

"In each case the pilot was maneuvering at low altitudes and making either a UHF frequency change or an IFF mode change, or he was trying to comply with altered departure instructions. It's not hard to figure out what happens. The pilot sticks his head in the cockpit. When he goes back to his instruments he's already out of control or has spatial disorientation and ends up the same way. Maybe poor proficiency had nothing to do with some of the accidents. Maybe it was just too much to do, too low, in too short a time.

"I've heard many of you gripe about the long and complicated clearances you've been getting out of this base. I've heard you fuss about trying to copy changes in night weather when it was all you could do to keep right side up. You are going to find out, and quickly, that the back seat pilot is going to be like money in the bank. He'll copy the new clearance, change the mode and frequencies for you, and talk to departure control while you fly the bird. When you get a change in departure, Mr. Back Seat Pilot can have the charts ready and tell you how to get to "Podunk" intersection. When you get ready to come home, you can take the back seat and do the same for him.

"In reaching my decision I looked at your flight records and the 60-2 charts. Some of you have had to fly a lot of time during June and December to get your 60-2 requirements. There were reasons for this: first, we had to transfer three T-33s, which hurt. And while you needed flying time, 95% of the T-33 flights went out with only one pilot aboard.

"Second, some of you are lazy. You want to stay current in the T-33 and you want to be home every night by 1700. So you fly around the flagpole and then suddenly wake up to find you're short of your minimums. With the two in a T-Bird policy, I assure you that 60-2 will be no problem from here on.

"To those of you who are thinking this plan will not work because it will deter our mission, let me say this: this is not an original plan. It was first put into effect by another command. It worked. Several other commands tried it and it worked for them. I have personally spoken with each commander and learned that their particular mission was not affected.

"And now for the personal affront on your ability as an airplane driver." He was almost gentle again.

"I'm sure each of you feel that I have doubts as to your ability as a pilot. Let me assure you, this is not true. If there were doubts of your capabilities as a pilot, you would fly no longer. But face it, you and I, we're CRT pilots now. Our primary jobs are supervising our tactical units. We don't have the time or the airplanes to be as proficient as we were when our only job was flying. You must realize that you are only as proficient in flying as the time and effort you can devote to it.

"This measure I have taken has but one purpose: to protect you. I don't ever want to have to tell your wife that she is no longer a wife but a widow."

Well, two in a T-Bird has been in effect for nine months now and just as the boss predicted, it's working real good. In fact, a lot of our bases have commented that they are getting more help from the staff because they have talked out their problems on an eyeball to eyeball basis.

Frank Stone went out with Johnny to two units that he had never visited before. Somehow, one pilot always finds another to go with him. Twice, flight operations has just snipped up the two low men on the 60-2 totem pole and said "Go." A couple of trips had to be made by commercial airline.

It wasn't easy at first and occasionally you still hear a couple of the diehards grumbling. And sure enough, one of the troops went out VFR by himself and came back IFR. He didn't plan to *log* any weather, so how could he get caught? It came to official attention—the Old Man's—when the pilot was violated by ATC for failure to follow instructions during his IFR departure.

If you hear the same rumors about two in a "T" rattling around your place of business, don't panic. Flying like that's not nearly as bad as you think it will be. In fact, it's real comforting to have company on a dark murky night when you hear, "AF Jet 80636, ATC has changed your departure clearance to read: after crossing Hector homer, maintain 1500 feet until 10 miles south of V-16. . . ."

Care to try for Two? ▲

Major Jimmie L. Tissue, Safety Education Division, DFMSR

WELL DONE

1st Lieutenant Clair G. Katris

839th Air Division, 314 Troop Carrier Wing, 62nd Troop Carrier Squadron, TAC

Lt. Katris and his copilot, with a crew of two, took off from George AFB, California, in their C-130 for a flight to Langley AFB, Virginia. 1st Lt. Joseph L. Reed flew as copilot, TSgt Wallace E. Person was flight engineer, and SSgt Leroy M. Williams' duty was loadmaster. On this routine logistics mission the big bird bored along at 25,000 carrying 23 passengers and 8400 pounds of cargo.

At Walnut Ridge, Arkansas, Katris was advised to land at Little Rock because the Langley weather had deteriorated. Lt. Reed took over while Katris studied the Radio Fac Charts for the flight to Little Rock. Suddenly the huge craft nosed down. Lt. Reed instantly actuated the elevator trim tab towards nose up and, when this failed to produce results, followed established emergency procedures and placed the elevator trim tab power switch in the "emergency" position. The nose down movement stopped and the aircraft returned to level flight. Lieutenants Katris and Reed had a council of war and decided that, since the emergency system was functioning normally, the flight could be safely continued to Little Rock. The '130 droned on with no further hint of trouble.

Upon receiving his clearance at Little Rock, Katris left 20,000 and began his penetration. Going through 18,000 he noticed the pitch attitude was excessively nose down and tried to pull the nose up. The control columns would not move! He actuated the elevator trim tab towards nose up, without effect. The trim tab indicator showed a full-scale nose down deflection of the elevator trim tab.

Katris immediately got Reed on the controls with him, and instructed Sgt. Wallace, the flight engineer, to place a cargo strap around the copilot's control column so that both Wallace and Sgt. Williams, the loadmaster, could help pull back on the controls in an attempt to right the runaway aircraft. In the meantime, all three control switches for the elevator trim tab were actuated in the emergency and normal positions, without effect.

Even with all four men pulling on the column, the '130 could not be brought under control, so Katris had the loadmaster move the 23 passengers and as much cargo as possible to the rear of the cabin. An estimated 7000 pounds of weight was moved aft.

At approximately 5000 feet the aircraft was brought out of the dive and held between level flight and a 300 fpm rate of descent. When airspeed permitted, Katris lowered the flaps and soon found the 50% position most effective. With the airfield in sight and an emergency clearance long since granted, the passengers were moved back to their seats and strapped in securely, preparatory to landing. Much to their relief, the four men in the cockpit found that the slowed aircraft could be controlled by their combined efforts.

Several simulated landings were made, with the pilot calling for coordinated forces through the intercom. The crew began to feel confident that a safe landing could be accomplished and indeed, a few minutes later, set the huge machine down without a bounce or jolt.

The high degree of competence and cool-headed professionalism displayed by Lt. Katris and his crew averted an accident that might have cost 28 lives and a three million dollar aircraft. Well Done! Lt. Katris and crew. ▲

CROSS·FEED

LETTERS TO THE EDITORS

The Best Seat

The article, "The Best Seat in the House" published in the March issue, has been read with great interest and found to be accurate and factual and in no way exaggerated.

For many years Frankford Arsenal has been developing escape system components in cooperation with Hqs Wright Air Development Division and the airframe industry. We believe the XM10 rocket catapult is the greatest single advance in these devices since the inception of the program. The success of this program has led to development projects for three similar devices to be used in operational and developmental type aircraft. In addition, a development on devices for use with capsules, as opposed to seats, is in existence and promises an equal stride forward in high performance aircraft escape.

Captain Brockman visited the Frankford Arsenal after his successful escape last October and discussed his experience with our engineers. We learned that at the time of his escape, even though he was well aware that he was the *first man* to use the new F-104 upward system, he had no hesitation in using it. Also, he stated that in a similar emergency he would use it again, with confidence. His comments, naturally, were both gratifying and helpful as they bore out our conviction as to the reliability and capability of the catapult and our other devices in the system. Saving one man's life is adequate compensation for all the problems and work that have gone into the program.

As a matter of interest, we've developed 15 of the 19 propellant actuated devices *(PAD)* in the F-104A/C upward escape system. Altogether, we've worked on nearly 200 PAD development projects for the Air Force during the past 14 years. Our program has one goal to which we wholeheartedly subscribe: saving lives and promoting flight safety. A harmonious and gratifying working relationship has marked this vital interservice effort over the years and has produced continual improvements in this important field. This might be of particular interest to some of the readers of "Flying Safety" as it affects their survival in many instances.

R. F. LeVino
Ordnance Corps, Frankford Arsenal
Philadelphia, Pennsylvania

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We Stand Corrected

The picture caption on page 7 of the March issue, which featured the article "Project Narrow Gauge," is in error. The transverse roll guidance bars in the *right* picture are not operating.

A correct caption, using the same two pictures, would be as follows:

• Left, showing complete system. "The complete test system, Configuration 'A' with transverse roll guidance bars and 'Narrow Gauge' is shown below. Limited testing in weather above one mile visibility showed the transverse roll guidance bars were laterally located too far from the approach light centerline on this 300-foot-wide runway for full effectiveness."

• Right, showing the basic Configuration 'A' without roll guidance bars. "The test system used was the basic centerline system without roll guidance bars with the test objective being the operational suitability of the 'Narrow Gauge' touchdown zone lighting." The test system without roll guidance bars in approximately one mile visibility is shown below.

This article, with the above exception, is excellent and very timely since it coincided with the USAF all major command policy letter dated 27 January 1960, concerning familiarization training on visual approach and landing aids systems. Request an appropriate correction be inserted in the next magazine edition.

Colonel Charles R. Meyer
Directorate of Operations, Hq USAF

Thank you, Colonel, for the correction.

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Living with the '100

I've read with a great deal of interest the article entitled "Living a Century With The Hundred" in the April issue. Although I am presently a B-47 and C-130 driver with AMC at a contract facility, this article—like so many others in "Flying Safety"—was read with much enthusiasm. I am certain that other X-Fighter jocks enjoy this type of literature as much as I do and, like myself, would like to see more of it in print. Who knows from month to month just what type aircraft one will be flying next? Articles like this save accidents.

1st Lt. Rex A. White, USAF
Warner-Robins Air Materiel Area
AF Plant Rep. Office,
Lockheed Acft Corp
Marietta, Georgia

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Safety . . . anytime . . . anywhere

Have never failed to enjoy reading and rereading "Flying Safety."

As the article entitled "Hang Together" in the April issue deals largely with safety, shouldn't the three men watching the arc-welding operations on page 6 be hung together? Tch, tch! Watching an electric arc without benefit of adequate eye protection even though the picture might have been posed!

Yours for safety—anytime—anywhere.

Byron S. Aldrich, DAFC
Ground Safety Director
Stead AFB, Nevada

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Sign In, Please—

One of the problems of Flying Safety meetings is to make certain that everyone gets the word, and a 100% attendance is a rare occasion. Also, it is easy enough for a supervisor to forget or not realize that certain pilots were not at an otherwise well-attended meeting and therefore haven't been told of some new policy.

The operations personnel of the 101st Tactical Fighter Squadron *(Mass. ANG)* have an acute form of this problem, having the Group, Wing, State Staff and other attached pilots to account for. It is not difficult to overlook one or more absentees at its Flying Safety meetings but we have an easy way of detecting every one of 'em. Granted, it's not new, but the plan works here.

The squadron has made up an attendance form which gives the name of every pilot assigned or attached, listed by flights. Opposite the name is a space for the pilot to sign, indicating he was present at the meeting. The supervisor can glance at the form and know immediately which pilots will have to be contacted individually and given the word of what was covered at the meeting.

Perhaps other units will find it worth a trial.

Col. Robert C. Brown
AF Sr. Adviser, Mass. ANG
Logan Int'l Airport
East Boston 28, Mass.

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Cigarette Lighter

Your recent item about unsafe cigarette lighters brought to mind a hassle we had to get another unsafe lighter out of the local BX. This is the type with the clear plastic fuel storage unit attached to the bottom. Raw lighter fluid is stored in the plastic container and automatically fed into the cotton packing in the upper portion. This design apparently results in many miles between refills and a visual indication of fuel level; however, because of the non-compressibility of fluids it is also guaranteed to leak at altitude.

The Fire Marshal brought this to our attention with several recorded incidents to back it up. The most serious occurrence was on a civil airliner when one of these lighters soaked a coat pocket and was touched off by the gent across the aisle lighting a cigarette. A couple of passengers were burned, the upholstery suffered considerable damage, and a whole load of air travelers now go by train.

Capt. Robert D. Taggart
Chief, Flying Safety Branch
2710th AB Wg, APO 323
San Francisco

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ATC and Feedback

As you know by now, if you've read "Feedback" in our January issue, one letter to the Editor of *FLYING SAFETY* is better than any medium Confucius ever dreamed of.

After you published our letter about an exchange of magazines—because of our mutual interest in aviation safety—we've heard from private pilots, student pilots, and airline pilots; colleges and universities; the *ADC INTERCEPTOR;* the *ARMY AVIATION DIGEST,* and from an instructor at the US NAS at Corpus Christi, Texas.

Congratulations on your wide readership—and thanks for the terrific boost you gave to ATCA and our JOURNAL.

Betty Winspear
Managing Editor
Journal of Air Traffic Control
Washington 6, D. C.

Glad to help spread the word!

MAL FUNCTION

Along comes Mal the astronaut
To take a flight that's danger fraught.
Surgeons probe his inner man
Checking him from hand to gland.

They wrap him up in shiny suit
And drop a fishbowl 'round his snoot.

Profile calls for yo-yo jump
Mal's supposed to switch off pump.

But Mal plays late the night before
And on the climbout starts to snore.

When fuel burns out the bird is free
Now Mal is checked each perigee.

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