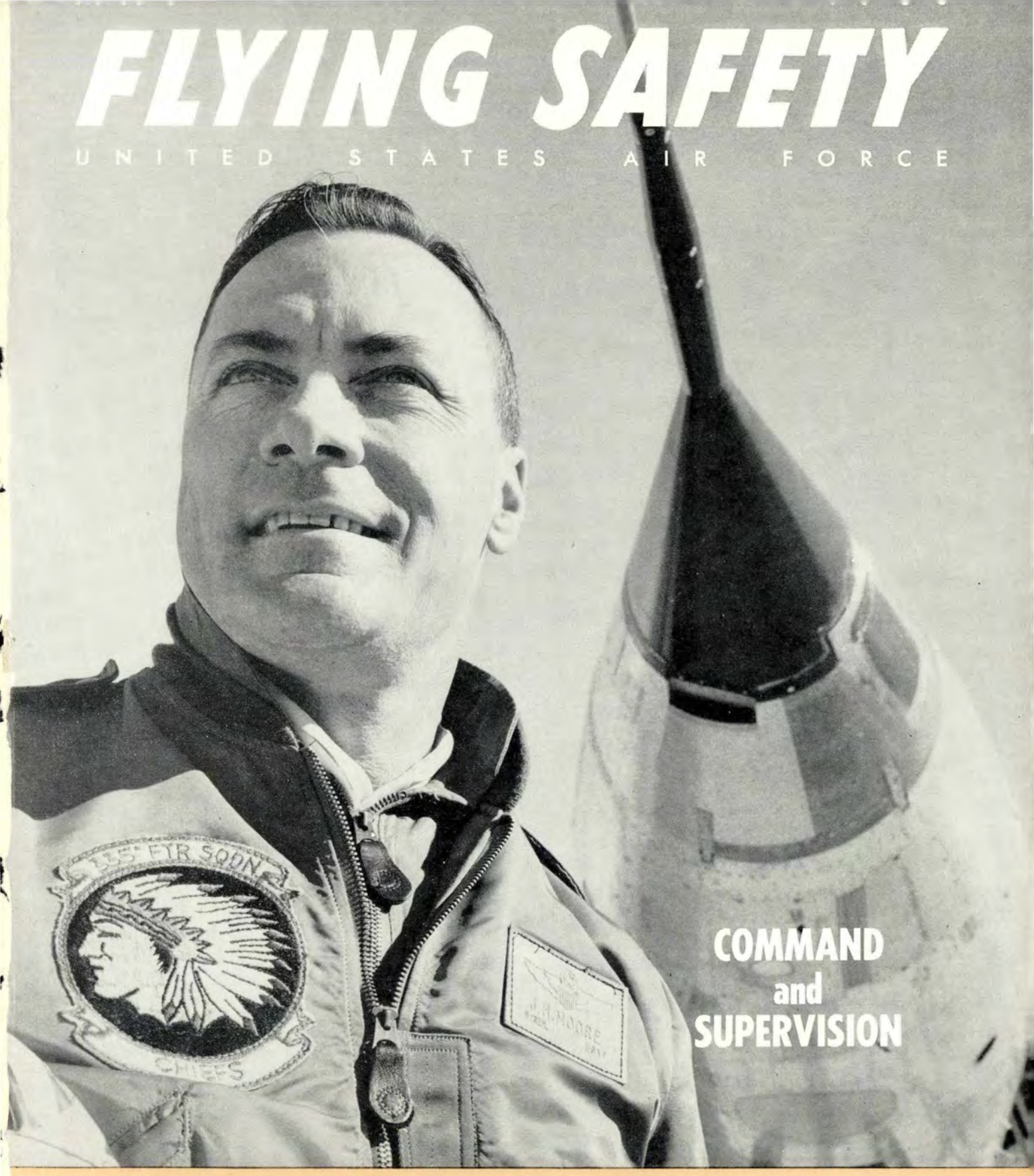
FLYING SAFETY

UNITED STATES AIR FORCE



COMMAND and SUPERVISION

IN THIS ISSUE

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VOLUME SIXTEEN NUMBER FIVE — USAF RECURRING PUBLICATION 62-1

CROSS · FEED

LETTERS TO THE EDITORS

Leadership

As a naval aviator *(USNR-R)* and a constant reader, it is a delight and pleasure to see the excellent presentation by Brig. Gen. Hoisington in the January issue. Does anyone know of a better way to start the flying New Year?

This may easily be the most complete presentation to appear in your fine magazine, for "Down The Line" does embrace all hands, from top rank to lowest grade—not usually the case.

All readers will value and appreciate what the General writes but very early in this unusually fine article I could detect his outstanding quality: *Leadership* — a talent always in rather short supply, everyplace. He's the one I'd like to have lunch with; how about you?

Cdr Lawrence J. Walsh, USNR-R
NR Composite Co. 1-36
USN & MCRTC, Burlington, Vt.

We're with you, Commander, and welcome your interest. Gen. Hoisington's article has drawn many similar fine comments and the staff appreciates his efforts in behalf of flight safety.

T-Bird Tips

I enjoy reading "Tips for T-Bird Drivers" by Major Dawson. He does a lot of research on subjects which some of us haven't even considered.

I've got a problem that you may be able to help me with—me and everyone else who flies the T-33. I know that some of the newer aircraft have been equipped with a radio control box which can be used to set UHF channels in flight. But the majority of these birds still have the old control set for the ARC-27 and in order to set up channels, the work must be done on the ground. Unless the changes are made carefully, every UHF channel could be inadvertently changed.

What we need is a T-33 tech order for unit level *(I can't find one)* to authorize a retrofit for our birds. The T. O. for the ARC-27 radio contains pictures of several control heads, any one of which looks like the answer to our problem. The Radio Set Control C-905/ARC-27 or the C-906/ARC-27 are possibilities.

As you know, it is necessary to have special radio channels for each leg of a trip. It is very frustrating to try to establish contact with agencies not having your channel. This new era of discrete frequencies and special approach control channels is very good but it does create problems in other areas.

Capt. Ernest R. Borden
FSO, 141st Tac Ftr Sq (SD)
NJ ANG, McGuire AFB, N.J.

We'd like to help you out, so to make sure that you get the latest word, your letter has been forwarded to the Sacramento Air Materiel Area. You might have your answer before this issue hits the field. If anyone has a helpful idea, FLYING SAFETY would be glad to have it. Write us again, Captain.

Radar Check

I've read the letter from Maj. Robert D. Hupp of Robins AFB, about linespeed radar check. Major Hupp's suggestion for a highway speed radar to check airspeed acceleration and linespeed on takeoff ignores one basic fact that was as true for Wilbur Wright as it will be for spaceships of the future. Aircraft take off, fly, stall, and land in relation to airspeed, not groundspeed.

Major Hupp's highway speed radar would only give a groundspeed in passing, which is totally unrelated to an aircraft's ability to get airborne in a certain length runway. It would also seem that a quick check of one's own airspeed indicator at two or three thousand feet would be simpler and certainly more economical.

My past experience with attempting to contact towers for information indicates a strong possibility that you would be long over or in the barrier before they gave you your linespeed.

Capt. William H. Ginn, Jr.
3625th Tech Tng Gp (WC)
Tyndall AFB, Florida

VOR — Anyone Else?

The test entitled "Vague on VOR?" published in January stimulated quite an interest in this office. A few of our pilots happened to be in the FSO's office at the time the January issue was received, and before the group could be herded out to wait for its favorite magazine through regular distribution channels, one of the older heads had quickly thumbed to page 20 and was in the process of marking in the answers to the test without the help of the well worded hints that were given in the article. This action prompted the FSO to remove the answers from each magazine and request each pilot to take the test and forward the results back for grading.

The results of this effort lead us to believe that the program offered by our Synthetic Training Branch has paid off. Out of 35 pilots tested, 23 passed with 100%. The scores of the remaining 34% ranged from 74 through 94%. Although the scores of the reference test indicated that the local assigned jocks were pretty well up on the ID-249, it was generally agreed that this type of spot check certainly brings to light any area of instrument misinterpretation.

Our thanks go out to A/2C James A. Stagner. Brighter horizons await this type of individual initiative.

Capt. Robert A. Miller, USAF
FSO, Brookley AFB, Alabama

General Moore's organization has no secret formula for safety. Command attention is the basis for his program outlined herein. Read the . . .

4 POINTS FOR THE FOURTH

Brig. Gen. J. H. Moore, Commander, 4th Tac Ftr Wg (TAC), Seymour Johnson AFB.

The Tactical Air Command inventory is made up of a number of different types of high performance jet aircraft, composed mainly of Century Series tactical fighters. During the past few years this category has suffered a comparatively high accident rate Air Force-wide. However, much emphasis has been placed on safe flying and the reduction of accidents and as a result, TAC's major aircraft accident rate has been reduced from 29 in 1955 to 17 in 1959. General Frank F. Everest, TAC's commander, considers this a commendable accomplishment and one that is indicative of the unit commander's interest in this vitally important function.

As an old time fighter pilot and as a wing commander in TAC for several years, I want to tell you something about our accident prevention program in the 4th Tactical Fighter Wing, particularly these 4 points:

- Commander's responsibilities toward aircraft/missile accident prevention.
- The program in the 4th Tactical Fighter Wing.
- The Flying Safety Officer: his duties.
- Problems encountered.

Although flying safety is everyone's business—as Major General Caldara has so often reminded us, accident prevention is a basic problem of command and supervision. The prevention of aircraft accidents is the responsibility of *every* member of the command, and the commander of each unit is the ultimate responsible agent, since he is charged with the effectiveness of his unit. The accident rate for any particular organization will vary in inverse ratio to the effort, emphasis and interest exercised by its commander.

A commander cannot lower an accident rate all by himself but he can play a large part in determining the rate his unit does obtain. He can foster a healthy interest and can develop a live program by taking the lead and imbuing his subordinates with the enthusiasm and will to take an active, continuous interest in flying safety.

You cannot just issue an order, appoint a Flying Safety Officer, approve a program, and then sit back to see what happens. If you do, in all probability there'll be an aircraft accident. You must give constant attention to a good program; you must give proper support and backing to your FSO and you must have the confidence of your pilots.

Personnel error continues to comprise the primary cause of aircraft accidents and this is an area which can be most directly attacked through command action.

The Fourth Wing has had a pretty good flying safety record for the past two years. In 1958, flying F-100Cs, we had a rate of 17, first place for Ninth Air Force fighter units, and for the calendar year 1959 we had an overall rate of 11.5. The 4th won the USAF Flying Safety Award for the period January to June 1958, while transitioning 47 recent flying school graduates into the F-100C, upgrading 61 pilots to a combat ready status, and flying 10,695 hours without an accident. The 4th also won the

Standardization... to be effective must be directive in nature and rigidly controlled.

Ninth Air Force Flying Safety Award in October 1958 and again in February 1959.

We received our first F-105 in the summer of 1958. We have transitioned more than 65 pilots and initiated combat readiness training—with a zero accident rate to date—and were awarded TAC's Flying Safety Award for the 6 months ending December 1959. *(At this writing the 4th Wing has been nominated as the No. 1 Unit in TAC for the USAF Flying Safety Award for the period July through December 1959.)*

The Wing is nearing the completion of its conversion program; the F-100Cs have been replaced with '105s. To date we have 3 squadrons completely equipped, one engaged in Category III testing the F-105 weapon system, 2 engaged in an intensive combat readiness training program, and the fourth squadron now converting. Our goal is to transition and become combat ready in the F-105 weapon system with no accidents. The cost of this aircraft plus the fact that its capability makes its addition to TAC's inventory an important event demand that we reach our goal. Our fly safe program is aimed that way and our experience to date leads us to believe we'll make it.

As far as our program is concerned we have no innovations, approved solutions or secret formulas. I'm sure you have a similar program. TAC and the Ninth Air Force have a very active and well-planned program which has stimulated the development of a good wing program. Many publications and a lot of good material have been provided by them. One of TAC's publications stars Princess Kecoughton Ann, a shapely member of the Algonquin tribe made famous by Pocohontas, which was located in the old days near Hampton, Virginia, and near Langley Field, the present home of TAC. Princess Ann and her bulbous-bellied little Indians from the pen of TSgt Heinz E. Hirsch do much to illustrate a specific point or emphasize a special message in TAC fly safe publications. Any picture of Princess Ann and her Indians is immediately associated with TAC's fly safe program. You all know of that public relations gimmick of image association with a product? That's our Princess Ann.

Once each month TAC's numbered Air Force commanders meet with the commander to discuss the flying safety program, its results, and any problems of flying safety. These matters receive instant action from TAC's staff or are forwarded to higher or lateral headquarters, as required. Therefore, any problems that we experience can be taken to the numbered Air Force commander and be assured of attention at the highest level of command in TAC. We take full advantage of all the help and aids provided by TAC and the Ninth Air Force.

Standardization is emphasized in the Fourth Wing. To be effective it must be directive in nature and rigidly controlled. There is one best way to do everything. The Stand Board is composed of our most qualified pilots. The best way of doing a thing is determined by this competent board and published as a wing operational directive. And once that best way is determined, it doesn't necessarily mean that it will always be the best way—for the only thing constant in this old world of ours is change. We must keep abreast of improvements, later developments, increased knowledge and better experience. Written standboard exams are performed without prior announcement and must be passed 100% or the pilot undergoes additional instruction.

Closely associated with the stand board is our wing central instrument training. All T-33s are pooled and under the operational control of the wing instrument officer. The F-100Fs are assigned to the tactical squadrons and are available for instrument checks as needed. The chief of the Instrument Training Section is especially selected for his qualifications as an instrument pilot and his instructional ability. Normally, he is a graduate of the USAF Instrument Pilot Instructor School, and has a staff of 3 to 6 IPS who are assigned to the tactical squadrons but detailed as instrument instructor pilots for 6 months at a time.

Each of these pilots is also picked for his flying ability and, insofar as possible, is a graduate of the USAF Instrument School. In addition to attending the week-long ground school and week-long flying training refresher course to renew his instrument certificate each year, the pilot must go through a refresher course 6 months later.

Usually this coincides with the time that he takes his semiannual stand board check.

We have found that such training pays off for fighter pilots, especially since all fighter aircraft are now jet powered. Most actual weather flying for us is a penetration, either up or down. We are not often faced with the requirement to fly on the gages for any prolonged length of time at the altitudes we normally fly. As a consequence, fighter pilots can develop bad habits, like developing short cuts in the precision instrument approaches and maneuvers. Reviewing the standard procedures—the Instrument Flight Rules and Regulations twice each year—pays dividends in sharper instrument ability. And you must keep sharp to fly safely on instruments in our present day fighter aircraft!

We emphasize *professionalism* in flying, in maintenance, and in supervision. General Hutchison, commander of the Ninth Air Force, has slated that the job of the 9th is to be capable of implementing emergency war plans in a professional manner. Only by doing our job in such a way can we be sure of doing it properly and expertly and safely. When we eliminate amateurism from our thinking, planning, and mission performance, we can expect careful, accident-free operations.

There can be no room for amateurish supervision and maintenance and it is certainly not safe to do anything less than professional flying in the Century Series fighter aircraft, for they are unforgiving of mistakes made by pilots or mechanics.

In emphasizing *professionalism* we discourage the flying tiger concept. We can not afford that attitude in our pilots who are flying the costly and complicated aircraft of today. As Major General Spike Momyer has so aptly described the helter-skelter every-man-a-tiger attitude: "It is an idea that has caused more trouble and created more potential sources of accidents than any one attitude. It fosters an egotistical display of disregard for sound flying practices both on the ground and in the air. It creates a false impression in young pilots that they can cope with any situation regardless of its complexity and magnitude. We believe that all young pilots must be adequately supervised and carefully brought along until such time that maturity and experience become the determinant of their judgment."

We try to recognize a job well done, both by a squadron or by an individual. A little pat on the back for a noteworthy performance goes a long way in developing a feeling of wanting to comply with flying safety rules and good practices. Nothing dampens enthusiasm more than to have one's efforts to comply or do a good job ignored. And, too, I am genuinely grateful for such a performance and I want the one responsible to know that I am aware of his efforts and appreciate them. I try to get my subordinate commanders to have the same attitude.

And we put great stress on good maintenance. We are organized under the maintenance concept in AF Manual 66-1 and have a continuing program to improve the quality of our maintenance. We have our best qualified men in Quality Control where their experience and maturity pay off in insuring that our aircraft are in the best possible condition after each inspection or major maintenance. We are especially careful with the F-105 because it is a brand new aircraft. We are gaining experience daily as to which of its systems need the most attention and we are still learning with it.

We instruct our pilots not to be hesitant in writing up gigs on aircraft and every written gig is discussed in detail with the crew chief and usually with the flight chief. We battle constantly for aircraft parts and supplies to forestall AOCPs and try to maintain rigid control over cannibalization to prevent any tendency to pass over a part that should be replaced. To combat foreign object damage we have placed extra emphasis on the importance of each mechanic's keeping his aircraft parking place free of loose items. We practically use the surgeon's "sponge count" when working on the engine or around the ducts to make sure that no tools or foreign objects are left to be swallowed on engine runup.

In the wing-base structure, under which the 4th Wing is organized, flying safety was at one time part of the Office of the Director of Safety under the Inspector on the Air Base Group Commander's staff. The Director of Safety's office was also responsible for ground safety. This setup placed the FSO too far away from the Wing Commander and did not allow the close association which I believe is necessary. The FSO has therefore been moved from the Director's office and placed directly under the Wing Commander.

The FSO—a graduate of the USAF FSO School and a qualified fighter pilot—is picked for his maturity, good judgment, experience, and his proficiency in the unit mission aircraft. He reports directly to me. He has 2 officers, an airman, and a secretary assigned to his office. He keeps them busy compiling information on accidents, developing ideas and materials for prevention programs, and disseminating material to all squadrons. He follows the point of emphasis each month as suggested in guidelines put out by the Directorate of Flight and Missile Safety Research and by TAC. For example: this month's special emphasis is on Command and Supervision *(Safety)*.

Each squadron has 1 officer—likewise handpicked—as squadron Flying Safety Officer. We have a uniform system in the tactical squadrons which varies only slightly due to personalities and individual preferences. Here are some of the duties of each squadron FSO:

- Maintains a Flying Safety Board in each squadron. This board is kept current with the display of fly safe posters, material from the FSO Kit, statistics on low altitude bailouts, survival techniques, hot poop received in TWX form, new Dash One information, or any other pertinent and interesting material that the pilot should know about before the next fly safe meeting.
- Conducts daily or weekly meetings with squadron pilots as operations permit or whenever he has material

Personnel error continues to comprise the primary cause of aircraft accidents and this is an area which can be most directly attacked through command action.

ABOUT THE AUTHOR

General Moore began his military career as a second lieutenant in the Army Air Corps in 1938. He was serving in the Philippine Islands when WW II broke out. By April of 1942 he had flown 100 combat hours in the P-40. After a stateside tour he went to Europe and took part in the Normandy, France, and Rhineland campaigns. He later served with the Army of Occupation until 1947. After various Pentagon and field assignments, Gen. Moore assumed command of the famous 4th Tac Ftr Wg in February 1959. This unit accounted for 1,016 German aircraft in WW II — 550 in the air, 466 on the ground. Flying F-86s, the 4th fought history's first all-jet battle on 22 Dec 1950 over the Yalu River. They knocked six MIG-15s out of the sky, damaged two, got one probable — without loss to themselves.

★ ★ ★

4 Points for the 4th (Cont.)

to present or discuss. Here the latest accident reports, reports of hairy incidents and new procedures are thoroughly hashed over.

- Assists pilots in making up OHRs.
- Covers at least 1 emergency procedure at pilots' briefing each morning.
- Conducts "unannounced" quizzes on emergency procedures and sets up situations requiring emergency action for discussion.
- Meets regularly with maintenance personnel in the squadron, especially the line chief and the crew chiefs, and covers all accidents with them, emphasizing those in which materiel or maintenance was a factor. Discusses squadron operating directives and sometimes develops new ones. Maintenance personnel show a keen interest in these meetings.
- Maintains the Airdrome Status Board; receives report from base ops each morning and locates hazards and construction on airdrome. This is particularly important on our base because of the large scale construction program of the past 18 months and our expectation of extensive repairs occurring in the future.
- Puts on skits at squadron meetings using special sound effects, utilizing material suggested in the FSO Kit, altered to fit the particular squadron and situation.
- Makes sure that Accident Report folders, showing corrective action taken at all echelons, are perused extensively and that critiques follow.

We have encountered problems, but none we couldn't or haven't coped with. In the past 2 years Seymour Johnson has had many built-in problems directly concerning flight safety. An extensive major construction program has been in progress—lengthening and widening the old runway and adding parking ramp, taxiways, dispersal and alert aprons, hangars, navigational aids and all the other side requirements. Operations were continued as long as possible when construction started, then we deployed to one of the Eglin satellite fields where operations were conducted for 11 months before return to Seymour Johnson. Then operations were of necessity curtailed because of delays in the construction program. That's behind us now and I'm glad to say that we experienced no accidents attributable to the hazards associated with the construction program.

We are now operating 5 different major weapon systems off Seymour Johnson AFB. It is the home of the 4th Tactical Fighter Wing, flying F-100s and '105s. Also, we are hosts to several tenant units including a SAC Wing with B-52s and KC-135s and an ADC Squadron with F-102s. In addition, we have the 19th AF Headquarters and the usual complement of support aircraft, plus some extras, like the C-54, '47, '123s, T-33s, L-20s and H-19s. Most of these require special consideration in setting up traffic patterns and approaches. When the B-52s and KC-135s arrived, we had to change our traffic pattern to a right-hand approach on one runway to prevent them from flying over the builtup area of the nearby town of Goldsboro.

We've had problems getting navigational aids established and operating and we have experienced trouble changing letdown procedures when nav-aids were changed.

The old and ever-existing problem of clearance in IFR conditions and climbouts in weather under FAA control have plagued us. We have experienced delays in obtaining clearances. We are often required to climb out in one direction, reverse, and return to base, before departing on course. Sometimes we burn 20 to 35 minutes of fuel before we leave the base area. We are given changes to flight altitude or route or other instructions that indicate unfamiliarity on the part of FAA controllers with our equipment. However, this area has improved considerably in the past few months at Seymour Johnson since the Goldsboro Control Center has been established.

I've mentioned the major problem of foreign object damage. We sweep the ramps and taxiways; taxi at a distance behind other aircraft; indoctrinate the crew chiefs to be responsible for their parking areas; and periodically, we detail a line of men to walk the ramp shoulder-to-shoulder, picking up every foreign object they see. This has resulted in a big reduction in FOD in our engines.

Commanders in TAC have a very positive approach to accident prevention. We shall continue to emphasize command supervision down to the last member of each unit, and we confidently look forward to an even lower accident rate in 1960.

Our wing's motto is "Fourth But First" and we expect to live up to it in accident prevention during 1960. ▲

Editor's Note: As we go to press we have just received word that the 4th Tactical Fighter Wing is one of the 24 winners of the USAF Flying Safety Award for the period ending 31 December 1959. Our heartiest congratulations go to General Moore and all of his men.

When we eliminate amateurism from our thinking, planning and mission performance, we can expect careful, accident-free operations.

YOU DON'T HAFTA TAKE IT

If it doesn't look good, you don't hafta take it — departure clearance, that is.

I know the inclination is to go ahead and go, because nothing is more revolting than to have to taxi back in, get all unstrapped, top off, and go all through the whole complicated clearing procedure again. However, none of these things, or all of them together for that matter, is quite as bad — or as final — as being dead!

Why does it always have to start out with, "The pilot made a normal preflight . . ." and so on? Like many others, though, in this case he did. He even drew a picture of the standard jet departure for his kneeboard. But just before takeoff, the roof fell in.

"AF Jet 12345, this is Podunk tower. I have an amendment to your climb instructions. Are you ready to copy?"

"Podunk 2345, ready to copy."

"AF Jet 12345, climb instructions amended to read: "Do not exceed 1500 'til past Ragot intersection."

It was a place he'd never heard of. Here's a T-Bird driver, strapped in, all set for the standard jet departure, in takeoff position, and the go-juice goin' by the gallons every minute. He has to fumble through reams of radio facility charts to locate this mysterious intersection. If he's like most jet jockeys he knows little or nothing about the low altitude charts because he flies the high altitude jet routes.

Well, this pilot finally found out that the intersection where they wanted him to "not climb above 1500 feet until past," was one formed by — of all things — the legs of 2 different low frequency radio ranges. These ranges were not on his flight plan because he was going high altitude. Neither were they on the standard jet departure procedure which the pilot had so painstakingly copied prior to strapping in. Even if the range stations *had* been on either of the aforementioned publications, and *had* been planned for, it is still no fun trying to tell when you're over an intersection of 2 low frequency range legs, at 1500 feet in the soup, immediately after takeoff, in a T-Bird, with only 1 low frequency receiver. Anyway, he "elected to continue."

He took off, 300 feet broken to overcast, 2 miles in haze, and tried to contact departure control like he'd been told to do. He had so blamed much to do and was so confused by the last minute change in climb instructions that he forgot to change to departure control frequency. He was calling "departure control" but still transmitting on tower frequency. When a local tower advised him of this fact he acknowledged and asked the tower to advise departure control of his position — which he gave to the tower. At this time air traffic control center called the pilot on Guard Channel and asked him to come up Channel 6. The pilot replied "OK." That's the last thing he ever said in his life.

The position of the aircraft was over water at the time. Both pilot and T-Bird are still listed as "missing" but you can sure read between the lines.

This should have been a routine jaunt, 620 NM, no sweat on fuel. Sure, the weather was a little stinkin' but the terrain was good, sea level, with the climbout over a nice flat ocean. Bet this pilot memorized that departure procedure and then, just to be sure, wrote it all down on his kneeboard. No wonder he got a little klanked when they hit him with amended climb instructions. Bet he was sore, with all that planning down the drain at the last minute! Bet he was hurrying, too, 'cause that fuel counter is settin' there sayin', "gimme 2, gimme 2, gimme 2." So what did this pilot probably do?

Well, he probably thought — so I've planned this and figured I could hack it. Can't I still hack it, with this one other little thing added? Can't I find this intersection and hold 1500 feet 'til I'm past it?

Maybe he could have, but then the channel mixup came about. This added a little more to the load the pilot was carrying. Also, it probably made him realize he had made a mistake and maybe this klanked him up that much more. Then, the center calling — on Guard — "Got to call them back — Channel 6 — sure have moved the command sets a lot farther back on these new birds."

Whenever we here at the Directorate review an accident like this one, usually 2 questions come up, like:

- What can we do to prevent this from happening again?
- What have we already done?

In this instance we had already done a lot. How many articles have been written on Get Homeitis? How many articles on not exceeding your own limitations? How many times have pilots been told they can refuse *any* clearance if it doesn't look *right*?

A lot has been done from another approach, too. Some years ago we tried to sell a modification of the whole T-33 cockpit. Moving the radios was later approved and will be done.

We fly more than 3000 T-Birds. There have been so many modifications and changes and reissues and whatnots, it is actually hard to find 2 alike. If a modification is really worthwhile, usually we're able to sell it sooner or later. The time involved to do this could easily be 2 years or more, and once the change is bought, it requires another 2½ years to get it done on all the birds if it is a contractor item. Even if it isn't it takes time to raise the dough, write the specs, design, manufacture, procure, and install the kits.

Another thing, this isn't the only bird that's clamoring for money for modernization. There are the Century types and, let's face it, they're really "first line," where the "T" isn't. So, some of these things we'll just have to live with and we can, too, if we recognize them and plan for them — in other words, know what to expect!

The word went out long ago on this business of changing channels at low altitude and we are still trying to get it stopped. We're working, too, on getting standard departure procedures published. We are also working on fewer position reports during climbout, and those will be over definite fixes, not intersections. All this stuff is in the mill but it takes time. Rome wasn't glued together in 24 hours either.

In the meantime you know what you've got to work with and you know what to expect (the worst). Just remember, if it doesn't look good, you don't have to take it! ▲

Maj. Wallace W. Dawson, Fighter Br. DFMSR

THE FSO SPEAKS

Major Glenn Crum, Fighter Branch DFMSR

The primary mission of the FSO is to provide an optimum relationship between accident-free operation and positive accomplishment of the mission.

In today's Air Force, FSOs enjoy their jobs and feel that they "belong" on the team. One of the main reasons for this feeling is that the right man has been picked for the job in the first place. The problem is, how do you go about picking the right man for the job—or what are the qualifications of a good FSO? Let's start out by deciding first who's not right for the job.

Picture a downy-cheeked junior birdman being forcibly separated from his shiny new airplane—in which he has logged 4 hours of flying time—to fill a mandatory quota for the FSO school at USC. Now, this is not the type of man that will make a "happy" FSO, nor for that matter, a qualified one. But there have been several instances of this type of "personnel action" in FSO selection—the hurriedly grabbed man to fill the mandatory quota—the reject who couldn't run the commissary or messkit repair squadron—the new man of unknown qualifications *(the CO didn't know where to put him)*—the professional desk jockey who doesn't want to fly.

Don't get me wrong about the USC bit. It's our program here at D/FMSR, and we support it to the hilt. We just don't want nominees for this course picked haphazardly. Some units fight for these quotas—others fight the quotas.

But the FSO's job is a big one: "To provide an optimum relationship between accident-free operation and positive mission accomplishment."

This is a good job description. Many people do not understand that the FSO's job does include "positive accomplishment of the mission." Since it does, what kind of man do we need to fill the bill?

The FSO must be, or become, "professionally qualified." This means an officer who knows and understands the mission of his command, and the equipment and people who perform the work. It also means a man who is himself qualified to perform the mission, is checked out in the unit aircraft, and stays that way.

This has been one of the sorest points with FSOs in the field—many who are themselves qualified are assigned to work for or with FSOs at higher levels who are not even remotely familiar with the unit-assigned aircraft at lower levels. This is not right. Commanders should make every effort to fill FSO vacancies at each level with personnel who are qualified in the mission aircraft. If you have an organization that consists of 99% fighter aircraft, then the FSOs at every level should be fighter qualified. If you have an Air Force consisting of gooney birds, then every FSO should know all about the gooney bird. Then FSOs can speak each other's language.

But there's much more to it than flying the airplane. The FSO must be a capable administrator and executive, and to fill these roles he must be experienced, mature and personable. He must also be somewhat of a diplomat—for if he is not, his relationship with the commander and other personnel may become strained.

He should have a great curiosity as to what makes aircraft and people tick. He should exhibit initiative, drive, and perseverance; yet at the same time he should have good judgment and patience with others.

If possible, the FSO should be a graduate of the FSO course at USC. However, attendance at this course alone does not necessarily qualify a man as an FSO. The right man must be picked in the first place.

There is argument about the FSO being a volunteer. Any man with the qualifications outlined who *volunteers* for any assignment less than the wing commander's job bears watching by the flight surgeon.

This should give you a picture of the ideal FSO. He will be hard to find. However, he has a big job to do, and it takes a good man to do it. Where does he fit into the picture so he can do this job?

It was not uncommon a few years ago to find the FSO —if you found such a man at all—deeply buried under or within some part of a staff section that had little interest in flight safety activities per se.

Today, in many cases, the FSO reports directly to the commander, and is a part of his personal or special staff. We at D/FMSR believe this is the ideal arrangement. There are still many instances where the FSO's function is carried out within operations or some other staff agency. Our visits to the field indicate that some of these arrangements are satisfactory; but some are not. Usually, the degree to which the FSO has access to the commander in these cases determines to a great extent the success or failure of his mission.

As late as this year, there was still at least one major command wherein the FSO function was performed by "additional duty" operations officers. The concept was that every man, commander, and ops officer was a Flying Safety Officer and functioned accordingly. However good this idea may be in itself, there is in *today's* Air Force a requirement for a specialist to perform this duty. The high cost of accidents in dollars, lives, and loss of combat potential bears this out.

But despite these loss figures I heard a commander say —I'll admit this was at the bar—"A strong flying safety program is an admission of defeat." In other words, if you had to preach safety all the time, you couldn't hack the mission.

Fortunately, this type is becoming pretty rare. But I have had FSOs tell me that although they are on the commander's special staff and report directly to him, he gives mere lip service to the flying safety program required by AFR 62-8. Apparently these commanders are merely "filling in the squares" to satisfy the letter, not the intent, of the regulation.

It's difficult for an FSO to work under these conditions. Fortunately, lip-service type flying safety programs

from commanders are eventually found out, and personnel substitutions are usually made.

FSOs need prestige from the commander and should be recognized to a greater extent. They should be afforded the degree of importance which is attached to the position. And only the good commander can do all of these things by publicly, enthusiastically, and regularly indorsing and supporting the FSO and his programs.

Just what is the FSO supposed to do to earn this support and this exalted position? We gave you a sneak preview in that one-sentence job description. But let's get down to concrete items; specifically, what does he do?

Many people, including commanders and some FSOs, think his main function is to pick up the pieces of a crashed airplane and paste them back together again to find out what happened. Along with this, he interviews countless witnesses to get their side of the story; bird dogs the photographers to get the required pictures; answers requests for supplementary information; assembles stacks of aircraft records; and then puts all of the evidence together for the Form 14. Then he briefs the accident board so they can come up with the *Official Conclusions* and *Recommendations.*

Many of you may say, "What's wrong with this? Isn't this what the FSO is for?" My reply is, if this is what the FSO is doing, he has already failed! There has been an accident which could have been prevented. Possibly the FSO could have helped prevent it had he been allowed to carry out his proper duties. This is another of the FSO's biggest gripes—they are not given enough time or authority for before-the-fact actions, or for preventing accidents. Instead, they just investigate them.

This, then, is a good key! FSOs should be utilized primarily as accident preventers, not accident investigators. Prevention activities can be many and varied; I'll discuss a few of the more important ones.

Publication and monitoring of a formal, written unit flying safety program should head the list. Along this line, the FSO might edit and/or publish the base flying safety publication and chair the local flying safety council—if the wing commander can't or won't chair it.

D/FMSR does not hold a monopoly on the right to perform Operations Safety Surveys. This should be a key function of FSOs at every level.

Constant review of local operating instructions, regulations and other regulatory media should be within the purview of the FSO along with monitoring reports of incidents, aborts, and operational hazards.

The FSO should coordinate with the standardization section, as well as with the materiel echelons, in periodic review of the URs, failure reports, and the product improvement program.

The FSO should manage the local flying safety meetings, but should not be put in the position of being the only performer. He should also insure equitable distribution of the FLYING SAFETY Magazine, *Maintenance Review* Magazine, the FSO Kit, and other educational media.

And last, he should participate actively in the unit flying activities. At this point, a little support from the commander may be necessary to insure a fair share of flying time for the FSO.

These few activities are enough to keep a good man fairly well occupied. They are before-the-fact activities, and accomplishing them will go a long way towards 100% accident-free operations. But there are several reasons why FSOs can't, or don't, perform all of them.

Typical complaints from the field include such gripes as, "Last month I spent 14 days on the West Coast investigating a bad check charge," or, "The old man had me investigate a wife-beating case," or, "My ace investigator just drew commissary inventory for 3 days," and so on.

A good example of some recent thinking along this line concerns a command that has removed all FSOs from certain duty rosters. They also are not required to participate in such things as 39-16 and 17 boards and courts-martial.

Back a few paragraphs I mentioned that some people expected the FSO to investigate all accidents, assemble the Form 14, and brief the board on what happened. I sat in on a case exactly like this less than a year ago. In addition to his other problems, the FSO had to battle to get an assembly room for the board, beg the board chairman to call his board together, then plead with the powers that be to get a recorder. At the meeting, the board president and most of his members were not even aware of the accident they were assembled to discuss. *(The base had 2 or 3 such meetings pending at the time.)* The FSO dutifully briefed the board on the situation; called in the witnesses; presented the case to his jury in the best Perry Mason style—and the jury made its decision without even looking at the wreckage.

I agree that FSOs are trained in these functions, but the point here is that FSOs should *help* accident boards in their investigation, not do it all for them. Let's put accident boards to work, and leave the FSOs time for preventing accidents, not explaining them.

These have been some examples of what the FSO should and should not do. Now, finally, what should be done for the FSO in the way of support?

The commander's personal support may be required in some cases—if the FSO is really doing his job. Let's hope the CO will proffer this type of support if it's required.

Being on the CO's personal staff will help. Along this line—or, where does the FSO fit into the picture—let's give him an office right on the flight line if possible. The FSO must be close to the line where he can monitor and participate constantly in the flying activities at first hand, if he is to be really effective. The odds are good that if the FSO is buried back behind the BX or Base Hq., the first time he is made aware of an unsafe condition will be when the crash bell rings.

On the subject of office space, give the FSOs a little priority on the board rooms. Let's face it—a part of any

"You'd think the C.O. would give him office space closer to the base."

good prevention program does include adequate investigation and reporting. If we've been unfortunate enough to have had an accident, let's get these functions over with so we can get on with preventing another one.

Let's touch on the matter of personnel support. I can't say here that an FSO activity should consist of 1 major, 2 captains, 2 blondes, and an airman technician. That all depends upon how much work is to be done. But good prevention work does include a lot of staff work, writing, reading, reviewing, and corresponding, and clerical help is mandatory. Watching a 200-lb lieutenant colonel command pilot try to take shorthand as a recorder is very humorous—but I've seen them try. Some bases could use a permanent recorder on the FSO staff.

I know one FSO in the field who has an old maintenance type master sergeant working for him. The ol' sarge knows the unit equipment aircraft better than the guy who built it. The sergeant checks all the URs submitted by the base for adequacy, and really knows the ropes when it comes to bird-dogging the answers and corrective actions. He picks up a great deal of information by making spotchecks of the maintenance activities on the line. Furthermore, should there be an accident on this base, the sergeant can pick up jagged fragments from the hole and declare that "this piece came from the fuel regulator, this is the flap actuator," or "this is the main fuel filter." This is better than the all-too-common procedure of calling on the salvage yard experts for help. Maybe a good technician in the FSO shop could be afforded.

Let's discuss material support for a while. A dozen FSOs gave me a unanimous answer to a query on this one. All clamored for an adequate crash vehicle assigned to, and under the control of, the FSO. One FSO reported an ideal setup—he had the base helicopters under his control for rescue and coordination purposes. As to vehicles, I've seen several types in my visits around the USAF. They vary from various 4-wheeled vehicles capable of penetrating swamps and mountainous terrain to the kind where the FSO is waiting for the motor pool to send a staff car and driver "as soon as one gets in."

The FSO should be allowed to beat the souvenir hunters, press, and the thrill seekers to the scene of the crime. And I heard one FSO say he had to beat the base maintenance officer to an accident before he threw gasoline on the smoldering embers.

But seriously, some type of 4-wheel drive vehicle capable of rough country navigation is needed. It should be equipped with a 2-way radio, first-aid kit, and some fire fighting and crash rescue tools.

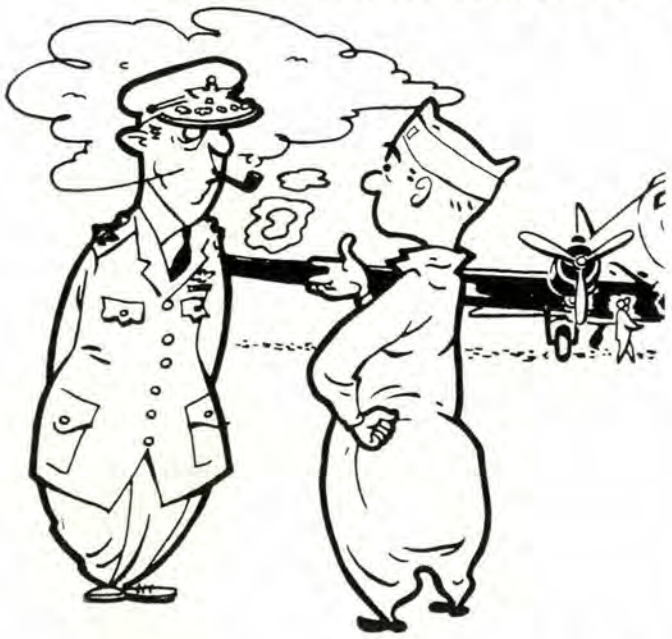
Many more words could be said about *who* should be an FSO, *where* he should work and *what* he should do. This article is intended merely as a starting point and to provoke some thought.

In summary, we want the FSO to be an experienced, interested man who is checked out in the unit aircraft. He needs some prestige in his work through being on the CO's personal staff, and he should be utilized primarily in accident prevention, not just investigation. To do his job properly, he needs support from the commander, including: space, personal as well as personnel support, and the material with which to do the job.

And for the unconvinced—for those who still think secretly or otherwise that flying safety is an admission of defeat, and that the FSOs are stumbling blocks to their getting the aircraft in the air—let's sum it up by restating that the primary mission of the FSO is to provide an optimum relationship between accident-free operation and *positive accomplishment of the mission.* ▲

★ ★ ★ ★ ★

TWO DIFFERENT POINTS OF VIEW



Not that I really thought anything would happen, but just for safety's sake I carefully briefed the copilot on all emergency procedures before we started the engines.

It would have been downright hilarious if we hadn't been in such a tight spot. When that right engine quit at 100 feet there were so many hands flying around the cockpit you couldn't tell whose hands were whose. Like C. Z. Chumley on a date with M. Monroe.

Who is responsible for the achievement of aircrew professionalism in the USAF? Colonel Schleeh believes that you are . . .

"The Prime Agent"

Colonel Russell E. Schleeh, Director of Safety
15th Air Force, March AFB, California

To me, the term "aircrew professionalism" is at once a glorious term, a desirable goal, an elusive quality, and a debatable entity. We in the Strategic Air Command place great emphasis upon aircrew professionalism. In fact, it may be that we originated the term. General Curtis E. LeMay, founder of SAC as we know it today, recognized the need for well-trained, proficient aircrews and built the strength of our strategic force around them. The concept proved valid; in no other time in the past has greater faith been placed in the ability of the individual crewmember.

Aircrew integrity, proficiency, and effectiveness are the watchwords of the Strategic Air Command. And well they might be, for each combat crew is entrusted with a destructive power equal to that exercised by legions of men in earlier conflicts.

Aircrew professionalism is, to some people, merely a glorified and somewhat debatable piece of phraseology. Adhering to the strict, old-fashioned definition of the word, they maintain that only the three "learned professions" of theology, law, and medicine embody true professionalism. Yet, even Webster recognizes that the word "profession" encompasses many livelihoods, saying: "A vocation or occupation requiring advanced training in some liberal art or science, and usually involving mental rather then manual work." A professional is defined as: "One having much experience and great skill in a specified role." And further, "Professionalism: the conduct, aims, and qualities characteristic of a profession; *opposed to amateurism.* (Italics Webster's.)

There is a group—whom I label quibblers—who maintain that Air Force personnel, because of varying assignments and career progression requirements, cannot achieve true professional status as aircrew members. I respectfully submit that these people are wrong. We *do* have professional crewmembers in our Air Force. We have people like the B-57 crew who, after an engine failure had torn away 19 feet of one wing, regained inflight control, calmly evaluated the situation, and then landed the aircraft without further incident. We have crewmembers like those aboard the KC-97 whose intimate knowledge of the aircraft enabled them to improvise a refueling system in flight and thus resupply a B-47 under adverse weather and navigation conditions. We have countless others we could point to whose skill, daring, knowledge, and thorough professionalism carried them through harrowing emergencies which might have cost lives and equipment.

These pros ranged from first lieutenants to colonels, from line pilots to wing commanders, from "slick wing" types to command pilots. In light of these examples, who can deny that Air Force crewmembers can be professionals of the highest order, that is, "individuals having much experience and great skill in a specified role." Who will say that Air Force personnel cannot attain and display professionalism in spite of varied duty assignments?

Earlier I said that aircrew professionalism is both a desirable goal and an elusive quality. Don't misunderstand me—I'm not advocating career cockpit jobs when I say that a professional force is a desirable goal. I'm firmly convinced that the desk jockey out on an administrative flight in either a Gooney or a T-Bird can and must be as professional a crewmember as the full-time SAC combat crewman.

That the quality of professionalism is an elusive one is verified all too frequently. Yes, we have nonprofessionals in our force. Like those in the B-52 who through hurried oversight, attempted takeoff without extended wing flaps. Or like those in the B-47 who attempted to land on a 10,000-foot runway although the planned stopping distance was 12,500 feet. *(Unplanned! The crew hadn't even computed it.)* Yes, we unfortunately had nonpros in the KC-97 who taxied at excessive speed and ended up sliding into a 4-foot deep excavation which had been there for months. Others of our nonprofessionals don't study their flight manuals and flunk emergency procedure examinations; some don't practice instrument flying but log it anyway; and some who fail to flight plan on the assumption that "It's another milk run, no sweat," and who then find themselves in a Hell's Canyon survival bind.

All right, so aircrew professionalism is desirable, and can be attained; and some have it and some do not. What else is new? Not much, really. The question of how aircrew professionalism is achieved is answered in the same old way: through selection, training, and supervision, among other things.

"Oh," you say, "someone else's job. I don't have anything to do with that!"

But you do, my friend, you do! Regardless of command, type of aircraft or mission, each of us is the prime agent in determining the professional status not only of ourselves but of others. The professional and nonprofessional crewmembers mentioned earlier as examples are assigned to the same command, many to the same subcommand. They were selected and trained under the rigid standards established within SAC. Their day-to-day supervision varied, but not markedly because firm command guidance standardizes operational techniques and procedures. What, then, separated those individuals into such diverse groups? To my mind, it was self-application of selection, training, and supervision techniques.

When discussing self-application, perhaps we should consider initiative and motivation. For, once selected to perform a specific function, we must find within ourselves the drive and purpose to adjust to the new task. We must ultimately look to ourselves alone for the instruction, supervision, and discipline that can make us top aircraft commanders. Such achievements cannot be imposed from without; they must come from within.

The training that hones us to a fine edge is a continuing process in the Air Force. We progress from job to job and from aircraft to aircraft as our abilities grow. Like the horse led to water, we are led to learning through attendance at many schools. But just as you cannot make the nag drink, so we cannot be made to learn. What we do learn, what use we make of it, and how we continue the vital learning process after formal training periods are over, this too is strictly up to us. If we apply ourselves halfheartedly, we may get passing exam grades

and acquire enough proficiency to satisfy a check pilot. But enthusiastic, wholehearted application will give us that degree of skill and fund of knowledge that can mean the difference between life and death when the chips are down during those moments of stark panic that punctuate our hours of airborne boredom.

A great deal is said about air discipline but what is it, in essence, but self-supervision? Believe me, a SAC bomber crew exercises a great deal of self-supervision during a jam-packed 8- or 18-hour B-47 mission or a 24-hour B-52 mission. Yet exactly the same degree of self-supervision—or discipline—is required of the T-Bird pilot or the C-47 driver to make himself conform to the seemingly trifling points of the old, familiar checklist or passenger briefing procedure. Such things may be old hat, but the old hat covers a mighty important head—your own!

Self-supervision, or discipline from within, means other things, some not immediately related to the flying job. Like giving yourself adequate rest and a proper diet; like getting enough exercise to keep your body sharp and fit; like constant review of the flight manual and doing whatever other things you know must be done to keep yourself at the peak of effectiveness.

I maintain that aircrew professionalism is not a vague, idealistic goal the Air Force is striving for, but something we have today, built right into the structure of our service. It is the very heart and guts of our effort. And in it we have wrapped up the qualities of discipline, dedication, and determination that characterize one of the world's finest combat forces. The aircrew professional is with us; he's among us; in fact, he's probably reading these pages. On him rests the conduct of the most honored profession of the United States Air Force—flight by man. ▲

TIPS FOR T-BIRD DRIVERS

Seems like recently, in the T-33 business at least, we have had far, far too many of the following experiences.

The aircraft was preflighted "normally." A "normal" start was made; taxi to takeoff position was "normal." On runup prior to releasing brakes, engine instruments were "normal." At the *(varying)* 1000-foot mark, the pilot decided to abort because the aircraft didn't seem to be accelerating "normally." With only *(varying)* 1000 feet of runway left, it was impossible to stop the aircraft, which received substantial damage when the gear folded upon contacting the sod overrun.

The pick here isn't with the pilot; the airplane probably wasn't accelerating like it should have been. The pick may not be with the engine either, at least until the brakes were released. The trouble here is one as old as time. In fact, it *is* time.

Let's say the engine was operating OK up to the brake-release point. It could have developed trouble between that point and the point where the pilot decided to abort. This would account for the slow "dig." One or both brakes might have been dragging excessively, which could also account for slow go. Other things could cause our bird to get to gettin' slowly, none recognizable before brake-release or a certain point down the runway. It follows then that what we have to do is run a check on this bird so we'll know *soon enough* if it's not going to choose to fly. In other words, there should be some point on the takeoff roll where, if the indicated isn't "such and such," it's time to stop the start — with enough runway left to do it safely. We have these checkpoints. For want of better names we call them refusal speed, refusal distance, and acceleration speed and distance checkpoints.

Let's take a look at these — an "untechnical" look, that is.

Refusal speed is the highest speed to which the aircraft can be accelerated and still be stopped on the remaining runway. Nothing complicated about this. The Dash One charts show refusal speeds for aircraft weights, altitudes, temperatures, and runway lengths.

Refusal distance is the distance at which the aircraft will reach the refusal speed, ASSUMING NORMAL ACCELERATION. *(See how we're gettin' ready to put the screws on this bird?)*

Acceleration check speed is the minimum speed that must be obtained at the second 1000-foot marker (acceleration check distance) beyond the start of the takeoff run. If the acceleration check speed is not obtained at or before this acceleration check distance, drag off the push and clamp on the binders 'cause it's time to abort.

Acceleration check speed can be figured, using the trusty flight manual, for each weight, altitude, and temperature condition. It is based on the minimum allowable aircraft acceleration and is the minimum speed necessary, corrected for wind, which will permit the aircraft to reach takeoff speed in 90% of the available runway.

OK, so what does all this mean? It means that the slide rule kids have figured out that for the T-33 aircraft there is a definite speed at which the bird should be ginning along when it passes the second 1000-foot marker. If she isn't, abort today so that ye may fly tomorrow! Any change in gross weight, pressure altitude, or temperature will affect this speed. But just remember the speed can be tied down with a little information *(from the Dash One)* and some skull work *(from you)*. And frankly now, wouldn't it be kinda' nice when you pull out "No. 1 and ready" to be able to say to her, "Honey, when you and me pass that second 1000-foot marker, if you ain't cranking out so-and-so knots, look out! Cause you're gonna' get an awful hot foot stoppin' this side of the tennis net and they'll probably bust you wide open to see why you wasn't doin' so good." ▲ ***Major Wallace W. Dawson, Fighter Br., DFMSR.***

The unbeatable maintenance organization of the 538th FIS, Larson AFB, turned the 1959 William Tell rocketry meet into . . .

THE POLKA DOT PARADE

Capt. Bert E. Bookout, Maintenance Officer 538th FIS, Larson Air Force Base, Washington

In April 1958, the first gleaming F-104 Starfighter whined to a stop on the flight line of the 538th Fighter Interceptor Squadron at Larson AFB, Washington. Our Sabres seemed suddenly antiquated. The crowd that gathered surveyed the "missile with a man in it" with some apprehension. Pilots gingerly felt the razor-sharp leading edges of the stubby wings and wondered aloud about lunar trajectories. Maintenance men peeped into access doors and scrutinized the spaghetti-like plumbing. In all minds was the question: How long will this conversion take? We knew it would be a formidable job but we had prepared for it.

The sleek new arrival kicked off an extensive training program designed to qualify the pilots and maintenance personnel in the shortest possible time, consistent with safety. It would have to be done, though, without an increase in personnel and while maintaining our alert commitment in the Sabre. To each supervisor this challenge meant long hours of study and planning, improvising and experimenting, for men's lives were at stake. Errors would be costly, could destroy pilot confidence, and might cripple our striking force. A plan had been made, however, and only time could test it.

The task broke down into 3 areas: technician training, pilot checkout, and logistic mission support. The flight line and the aircraft were logically chosen as the centerpoint of the maintenance organizational structure. The hangars, shops, specialist teams, and administrative sections provided support.

While plans and organizational charts are necessary, it's people who make things go, and we wanted the best we could get. The past maintenance performances of assigned personnel were studied. Then, the line, hangar, and shop chiefs were selected, and specialist NCOICs appointed. The 14 men who had attended F-104 training Phase VI at Edwards AFB were strategically positioned throughout the squadron to make the most of their special knowledge. With a plan and a purpose, perplexity soon gave way to confidence, and we all pushed hard to give the new fighter the best of maintenance.

Although training was the first problem to be solved, it could not be separated from other operational requirements. Formal and informal training had to be woven into the day's regular activities. Because everyone involved pitched in enthusiastically and accepted responsibility for the success of the program, results soon appeared.

General Electric and Lockheed tech reps and Field Training Detachment instructors were kept busy in the classroom and in the maintenance trainer. Supervisors prepared lectures and training drills in their specialties and found eager audiences for the material. Personnel were kept posted on problem areas as they appeared and were encouraged to submit suggestions and solutions. "Training" was the password everywhere.

To accelerate the learning process, the specialists repeatedly checked the trainer systems whether malfunctions appeared or not. Programs like "You Bet Your Life" were organized and crews challenged in their specialties. With many heads pooling their ideas, improved work methods and simplified procedures developed, raising the quality of the maintenance rapidly. The program hummed along.

Line chief, SMSgt Douglas B. Brewer, believes in getting postflight info first hand. Capt. Richard B. Hale is the pilot.

"Responsibility requires authority," the familiar maxim says. Our supervisors, responsible for producing results on the double, were delegated the authority. And they produced! Competition among them flourished as each labored to have the best-trained, smoothest-functioning unit on the base. They themselves were trained through base OJT supervisory courses. The competitive spirit of the supervisors was catching and soon spread like wildfire to personnel of all grades. As they scrambled to outdo each other, individuals began to realize the important role each one played in the overall scheme.

In our zeal for rapid training, however, ground safety and safe work habits were not forgotten. On the contrary, they were stressed through the training program

and by posters and bulletins. We made every man aware that no substitute exists for alertness and safe work practices in preventing accidents. As a result we reached the combat-ready state with few accidents to mar our progress.

But highly trained technicians alone do not give quality maintenance. They require the proper tools and efficient test equipment if today's complex aircraft are to be maintained. To be certain that our men had the proper tools, Equipment Component Lists were revised, tool boxes checked, and new tools issued as required for the big job ahead.

Responsibility for calibrating and repairing the sensitive test equipment was assigned to one supervisor. It was an important job. Only a highly qualified technician with initiative and perseverance could overcome the difficult and at times almost impossible repair requirements. The man selected did an outstanding job. The result was reliable and accurate test equipment upon which the maintenance man could rely. Much of the credit for the high performance rating of our '104s can be given to this system.

To secure vitally needed supplies quickly, many hours of T.O. searching for stock and part numbers was required. In addition, volumes of supply catalogs were scoured and part numbers cross referenced. The resulting index enabled maintenance to anticipate their requirements for keeping the aircraft systems in a high state of repair. After each work center consulted the index and determined its needs, the requests were reviewed, consolidated, and requisitioned at one time. Much lost motion was saved. Moreover, with this integrated system we could adjust quantities so that the overall stockage would be adequate but not excessive.

Finally, after 4 months of intense preparation, we were ready. Everyone was confident that the first operational aircraft due in July could be maintained in combat-ready status. Ambitious squadron goals had been set; only tiptop technicians could achieve them. But the flight line and specialist crews were undaunted. They had been selected on the basis of their demonstrated proficiency during the training period. With the Sabres transitioning out, our No. 1 objective was to become combat ready in the '104s in minimum time. Then we could resume our critical task of keeping a watchful eye over the Northwest area.

Pilots transitioning in the new bird kept maintenance crews informed of performance characteristics. Debriefings were attended by both crew chiefs and specialist NCOs. Malfunctions were recorded in detail, then exhaustively discussed with the mechanics responsible for the system. Corrections were made, of course, but more importantly, steps were taken to prevent recurrence of the difficulty. Any malfunction trends that did develop were brought to light immediately by close monitoring of pilot writeups and shop records.

The intensified training program continued, and long work days were common. Personnel voluntarily worked during weekends to overcome deficiencies in their work areas. Engine technicians spent many hours removing and installing the J-79 engine, and operation checks were repeated over and over. The Maintenance Officer set up dock and periodic schedules which allowed specialists to work on their particular functions systematically, without confusion and overlapping. Specialist

shops removed and inspected their equipment over and over, whether malfunctions existed or not. They needed the practice, they said. And as you might expect, the diligence paid off. Proficiency and professionalism increased with each passing week and confidence soared, both on the line and in the shops.

The by-the-book maintenance which we initiated meant writing checklists and procedures for all maintenance activities from the flight line to the specialist sections. The checklists proved invaluable in developing topnotch maintenance men. And the aircraft and equipment status boards we set up enabled the officers and supervisors to ride herd on the condition of every piece of equipment on the line. The new maintenance system soon won the esteem and confidence of all.

Problems that showed up during pilot transition were overcome by the hard work of the maintenance men. They revised checklists, revamped maintenance methods, and worked longer hours. Personnel were encouraged to submit any ideas or suggestions that might even remotely improve the operation. Many worthwhile ideas came in and were put to work. Some involved the fabrication of new devices which were manufactured locally, such as test stands, dollies, and wrenches. Although only a small percentage of the ideas were rewarded through Air Force incentive programs, this did not prove a damper. Everyone was stimulated by the air of enthusiasm that pervaded our activities.

The staff of Quality Control provided an unending source of training material and help. Their meticulous inspections of aircraft in all phases of flight line maintenance resulted in reams of Unsatisfactory and Failure Reports. They eliminated repititious maintenance and caught malfunctions before they became repair jobs—or accidents. The inspectors gave freely of their time and expert knowledge to any section requiring assistance. Through their cooperation we achieved standardization among all maintenance docks and training units. "Quality maintenance" became the accepted standard.

After 10 months of hard work the day finally arrived when the squadron was declared combat ready. Pilots and maintenance men were jubilant. By working in close harness they had overcome tremendous obstacles and transitioned into a new, complex weapon system in an incredibly short period. Now they could hone their skills to a fine edge in preparation for bigger things, for the

Left, Capt. Bert E. Bookout, Jr., Maintenance Officer for the 538th FIS, receives the Air Force Commendation Medal from Major Thomas H. Cribbs, new commander of the squadron. Center, SSgt. Arthur J. Smith and A/3C Raymond A. Kramer install the burner ring of the F-104 interceptor. Right, SSgt. Arthur J. Smith checks the gages during engine runup while preflighting a Starfighter.

squadron was ordered to Tyndall AFB, Florida, for combat exercises. All hands were confident; the new challenge would be met. Preparations began immediately.

Nothing was overlooked. All engines, components, and systems were operationally checked to insure the highest possible performance. Test equipment was calibrated, aligned, and packed like fine porcelain. Pre-issue and bench stocks were matched against anticipated requirements. Tool boxes were itemized and new tools issued where needed. Supplies were boxed and labeled. A mountain of equipment was stacked in the main loading area. Anticipation grew until it could be felt in the very atmosphere. And then, departure. We were off on the long haul to Tyndall and our ultimate test.

Once at Tyndall, the area assigned to the 538th became a whirlwind of hustle and bustle. Starfighters, support equipment, supplies, and personnel had to be sorted into an efficient unit that could respond to the first scramble call a few hours away. Flight line personnel, crew chiefs and specialists labored through daylight's waning hours and on into the night, feverishly preparing the birds for what lay ahead.

Right through the first launch, and day and night thereafter, preventive maintenance was matched by unscheduled maintenance in a superb display of skill. The day, the date, and weekends were forgotten while everyone toiled in the muggy weather to keep the birds aloft. No crew chief wanted his aircraft out of action, nor would specialists tolerate having a bird down because of faults in the system charged to them.

Time raced by. Before we knew it, the day to launch our 72 hours of tactical evaluation had arrived. This was the last 3 days, the toughest of all. But the troops were up to it. With the first raucous blast of the scramble horn, quick time passed into double time, day passed into night. In a wearying cycle, maintenance personnel met the planes, serviced them, doctored their ailments, and sent them back into the fray. Everyone was bone tired, but perseverance and determination carried them through. There was no relaxation until the last entry was made for the last flight.

Then it was over. The results justified our effort. In 60 hours the pilots had flown 241 sorties without an abort. Incredibly, 104 of them were carried out within 15 hours. For this outstanding performance our squadron was declared "phenomenal." The men of the 538th had emblazoned their abilities on a record for all to see.

Shortly after returning to Larson the squadron was selected to represent the Western Air Defense Force in the Category III competition—rocket firing for GAR 8-equipped aircraft—of William Tell II. *(Ed. note. The annual rocketry meet for ADC aircraft.)* Spirits ran high as the men congratulated themselves on their good fortune. The squadron's red-and-white polka dot colors began appearing like battle flags on scooters, packing crates, and tool boxes. The same meticulous preparations were repeated. The same drive, teamwork, and initiative that had scored before brought results again. The unit won first place at Tyndall.

This prize could not have been won without the prodigious job performed by maintenance. Only 18 months had elapsed since the first '104 trainer had arrived on our flight line. Yet we had succeeded in building a topnotch, unbeatable maintenance organization that brought us through to victory.

Every man deserves his share of recognition. Chief credit, however, must go to those officers and supervisors whose splendid leadership and organizational ability welded the entire maintenance activity into a coordinated, dedicated, smooth-working machine. Their one goal was building a first-rate fighter squadron. They succeeded admirably.

The magnificent esprit de corps that characterizes the 538th Fighter Interceptor Squadron is now symbolized by the Air Defense Command "A" award that floats above the Larson Fighter Alert Control Center. It is a well-deserved tribute to the 231 officers and men who made the unit a crack fighting component of the Air Force team. ▲

The author wishes to acknowledge the help of the following persons in the preparation of this article:

SMSgt Robert Wiley, NCOIC Armament-Electronics
SMSgt Douglas B. Brewer, Line Chief
MSgt Warren A. Garrett, Hangar Chief
MSgt Emmett Bassett, NCOIC Radar
MSgt Luke A. Wilfert, Flight Chief
CWO William Taylor, Chief of Armament & Electronics. 1st Lt T. W. A. Stuart, Flight Line Maintenance.

In SAC the Tower Officer acts as the "long arm of the Supervisor of Flying," and although his responsibilities are many and demanding, at least he has . .

. . . A ROOM

Maj. H. E. Stacy, B-47 aircraft commander, 443d Bomb Sq, receives a master plan of the day's flying operations from Col. Max W. Rogers, Dep Comdr for Ops, 320th Bomb Wg, before going on duty as Tower Officer (TO). Right, Major Stacy pretends to dread the whole 193-step climb but the elevator leaves him only the last few. (below)

Major Schwalier, Dir of Safety, 12th Air Div, 15AF, makes frequent inspections of tower, keeping his finger on the pulse of operations.

WITH A VIEW

The ear-popping ascent in the tiny cagelike elevator takes less than a minute. Then, after navigating a near-vertical flight that would test the agility of a gymnast, you're suddenly in the Room With A View. It is calm, quiet, unhurried. The soft tint from the greenish glass soothes and pleases the eye. Far below stretches the vast checkerboard of activity that is March Air Force Base. The huge B-47s, squatting in repose, seem like mother hens surrounded by a scurrying brood of trucks and service vehicles.

The Tower Officer, Major Stacy, excuses himself after introductions. A takeoff is scheduled in another minute. He peers through the binoculars, checks his watch.

"He should be rolling . . . now! What's the delay? No, there he goes, on the money." He marks the exact takeoff time on his totesheet. Under SAC's management plan, crews are graded on meeting schedules to the second. With a long line of bombers snaking out for takeoff and others waiting to land, split-second punctuality is a must.

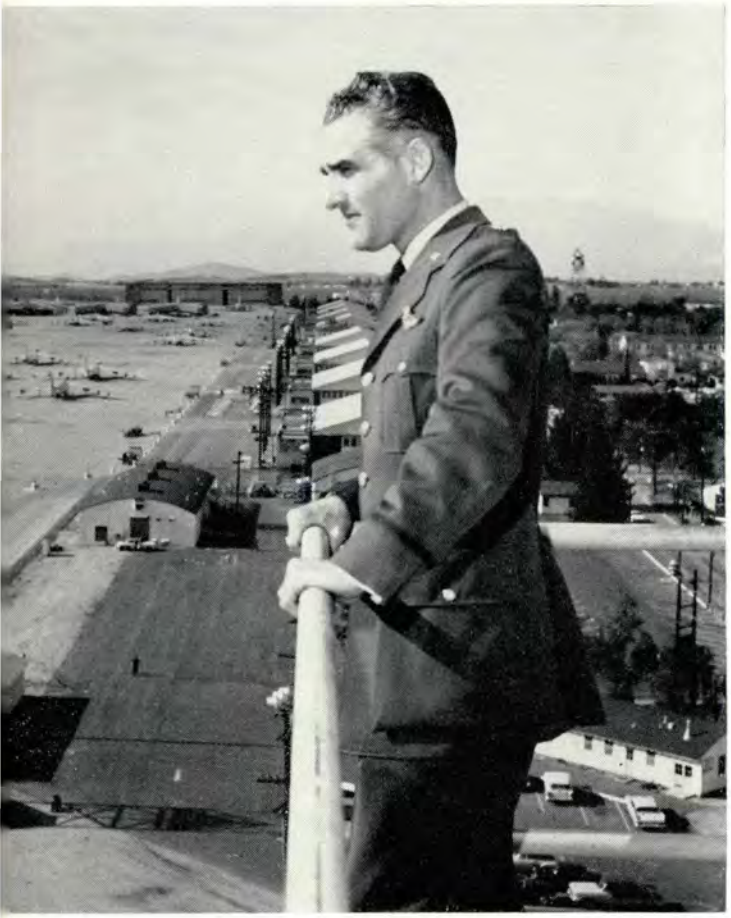
Major Stacy has the glasses on the rolling bomber ag in. To no one in particular, he coaches the takeoff. "OK, liftoff point, let's get it off. Good! Gear coming up, up, fine . . . No! The forward main is stuck. Sgt. Dominy, call and tell him to recycle."

On the omnipresent totesheet the Tower Officer notes 2345's forward main stuck down. The notation will be carried forward, from shift to shift, until 2345 enters traffic again, unless of course it has landed at another base previously. Automatically then the aircraft commander will be warned to doublecheck his gear and make a flyby. As a further safeguard, after SAC's fashion, Major Stacy calls the Supervisor of Flying in the Control Room, and the irregularity in 2345's behavior is posted on the ops board. When the plane's ETA is subsequently received, the Control Room calls the Tower Officer and reminds him

Above, TO follows each takeoff through the glasses. If an accident occurs, there will be the eyewitness testimony of at least one professional observer. Man on left, A/1C R. H. Humphrey, has local control position; center is A/1C G. Hansen, flight data position. Below, TO's dais, with comfortable chair, permits view of the entire field.

Left, TO watches a '47 taxi out just 25 minutes before takeoff time. Supervisor TSgt Dominy, center, works flight data position, while A/2C Snowden fills local control spot. Right, Dominy uses old standby, flash gun.

. . . a room with a view



Left, Major Stacy catches a breath of fresh air, and watches arrival of a VIP below. Above, this bargain-counter layout is the formidable assortment of impedimenta carried by a B-47 crewman. The TO keeps it on tap in case he is called upon for radio help to a ship in trouble. Below, Major Stacy briefs next Tower Officer, Capt. J. A. Diddle, FSO, 443d Bomb Sq.

to remind the aircraft commander to make a gear check and flyby. Nothing is left to chance.

The squawkbox shatters the quiet, announcing the approach of 2 fighters. They flash by in whisker-tight formation, peel off, and land. The Tower Officer monitors their landing configuration through the glasses, coaches a few more '47s off, then pauses for coffee during a lull. Even while explaining the Tower Officer's functions, his eyes never ceased scanning the field.

"There's a qualified aircraft commander on duty 24 hours a day — two 12-hour shifts — while tactical flying is in progress. We provide on-the-spot supervision of flying operations, monitor all startups, takeoffs, and landings, and generally act as the long arm of the Supervisor of Flying. Tower operation and responsibility still belongs to AACS, though, and we do not handle equipment or interfere with the operators. If in an emergency we did overrule an operator, we'd have to justify our actions later."

Major Stacy picked up his totesheet and glanced at his watch. "Number 7890 should be firing up right now. Yup, he's winding up on the second. If he didn't, I'd call the Control Room immediately to find out why. That way I stay ahead of any potential jam and stop it before it begins."

The hot afternoon sun glinted off the serried rows of bombers. Problems, minor crises, decisions — they filter through the skill and judgment of the Tower Officer around the clock and into the night. He has a room with a view, a magnificent view, but little time to enjoy it. ▲

WHY?

I have never yet seen an accident report which could qualify for good copy in a child's bedtime story, but occasionally there is one which outdoes all the others in terms of waste and futility. The mind gags at the thought that a human being and his aircraft can be so needlessly destroyed. When you read the account of this one I'm sure you, the reader, will agree that this type of accident is one which is the hardest to combat. When a man is fully qualified, experienced, warned, briefed, and has an easy out from a difficult and dangerous situation, why does he insist against all the dictates of reason to pursue an action which results in his death? What destroys a man's judgment at a time when he needs it most? How can he ignore the advice of his equally qualified wingman who urges him to proceed on another course of action which, followed by this same wingman, sees him through to a safe landing at another base?

☆ ☆ ☆

A flight of 2 fighter aircraft left home base on a round-robin VFR training flight expecting to return in late afternoon. Forecast weather for the ETA plus 1 hour was 1500 feet scattered, 2500 feet overcast, 5 miles visibility and light rain. The flight proceeded normally to a base about 500 miles away and the return to base was almost complete when the flight leader requested a late weather reading. He was given an observation which was 20 minutes old and contained the following: 1800 scattered, measured 3200 feet overcast, visibility 3 miles in light rain and fog, with inflight visibility at *1 mile*. When the flight was closer in, an IFR clearance was sought and granted with a confirmation that the inflight visibility was still *1 mile*. A radar approach was asked for and radar contact attempted with the IFF equipment. No contact was made by the leader so the wingman was asked to try. Still no luck.

The flight was assigned 3000 feet and the 2 fighters reported over home base omni where they received an outbound heading. All modes of IFF *except emergency* were attempted, but without results. Fuel was still no problem with either aircraft. After he had proceeded outbound for 5 minutes the leader asked for a VOR approach with GCA assist. A negative reply was given to this request because precipitation was fouling the scopes and a contact could not be expected at best until the final approach.

Failing this, the leader now asked to be allowed to turn inbound to the TVOR facility. This was granted and the pilot then gave 330 degrees as his inbound heading. The 2 fighters were now instructed to establish a standard holding pattern until expected approach time which was about 10 minutes ahead. An earlier approach time had to be denied because of other traffic.

An exchange of messages with approach control now gave the pilot the information that radar contact was not yet established and that the Moving Target Indicator *(MTI)* was not "cancelling" the heavy precipitation. Approach control at this time was working strictly with IFF returns and was successfully handling other traffic in this manner. The leader further learned that the precision portion of the GCA final approach was the only thing operationally effective at the time without IFF.

At this time the wingman suggested to the leader that a decision to go to an alternate should be made quickly. The leader rejected the suggestion although there was sufficient fuel in both aircraft to proceed to a nearby base that had better weather.

Having made his decision the leader now asked for further instructions for a VOR letdown. The instructions were given to descend to 1500 feet when on an inbound track of 035 degrees. *Again the wingman called the leader. This time he requested a fuel check. The leader still had ample fuel on board for the trip to a nearby alternate.* RAPCON now called the lead fighter and gave the information that the tower would provide a D/F steer with a handoff to the precision radar. *Now the wingman asked the leader what leader's airspeed was reading.* The leader acknowledged that he was "getting kinda' low."

When D/F contact was made, 3 good, identical steers were given and the latest weather readings were again given to the leader. Now the scattered layer was down to 1100 feet with a 3700-foot overcast; inflight visibility at 1/2 mile in moderate rain and fog. The flight leader now asked for letdown since he was on final approach. He was promptly cleared to descend.

The 2 fighters passed over the field to the left of the runway at an altitude estimated to be between 700 and 1000 feet. The flight leader made a right turn about halfway down the runway and reported that he would make a low visibility approach to land. *The wingman made another plea at this time for diversion to another base close by.* Again the flight leader ignored the plea and told his wingman to move to the left wing position. This the wingman did and reported later that he could catch occasional glimpses of the field from the downwind leg. The 2 aircraft proceeded to base and final legs but overshot the final turn toward the runway. The leader's airspeed on this final turn was more than 20 knots below recommended airspeed for this maneuver, and the wingman was forced to move out a bit to maintain his own safety margin. At this time the wingman gave up. The 2 ships passed through a small cloud and No. 2 initiated a climb and proceeded to the alternate where he landed with no difficulty. The leader was seen to make 2 more turns close to the base before crashing into a wooded area 3/4 of a mile from the edge of the field.

What can you say? All echelons agreed that this needless accident was caused by poor judgment on the part of the flight leader. Again, I ask—Why does a well-trained, fully qualified Air Force pilot sometimes choose the path to destruction? Why?

F. D. H.

GRAND

Maj. Roy J. Broughton, Jr.,

'Twas a cold, cloudy night, good only for indoor sports, and we were doing just that—we had a friendly game of bridge goin'. I had just bid 6 spades when the phone rang.

"Crash alarm," the operator said. "C-119 landed north of the field, injuries and damage unknown."

My wife took over her other-than-duty-hours job of notifying accident board members while I made tracks for the base. Somehow I managed the 15-mile trip over ice-covered roads, and as I neared the base, I observed no activity north of the field. My first stop would have to be base ops to see what was happening.

Usually, when we have an accident, base ops is sheer bedlam but tonight all was quiet. I must have shown my surprise too because the AO smiled as he said, "You'll never believe it!" How right he was.

The crew was having coffee in the snack bar, and the bird was parked neatly on the ramp as though nothing had happened. The AO quickly briefed me, then I talked it over with the crew. The more I heard, the more amazed I became, and finally went down the ramp to look at the "dollar-nineteen" just to convince myself. Two tires were in bad shape, and the struts were mud-spattered, but all else looked good. But let me tell you the story as it unfolded, and see what YOU think!

The C-119 was scheduled for a cargo job from its southeastern base to a midwestern field. The crew got up well before breakfast for an early takeoff, but as usual the load was some 3 hours later—while they stewed. Finally, they were ready and were briefed for an IFR flight with 5 hours and 55 minutes en route. To be sure, they loaded 10 hours fuel, which would give them more than 3 hours fuel after reaching their alternate. It's a good thing they did!

The takeoff and climbout were normal, but that soon changed. Forty minutes out, they entered a holding pattern while FAA tried to unravel their traffic. Things finally cleared up but only after they had agreed to a rerouting which took them just about an hour out of their way. Now some of that reserve fuel was paying off.

They were careful lads and kept a close watch on the weather. The destination stayed above minimums, so they drove on while headwinds, stronger than forecast, chewed into the fuel reserve. Finally the clearance to approach control came through, but that didn't help! Control had the current weather waiting for them in answer to their call: "Ceiling measured 172 feet, visibility 1/16." *(Did you ever hear one like that?)*

They were directed to hold while things were figured out, but since the weather was definitely below GCA minimums, the pilot requested the weather at his alternate and asked for clearance to that base. Control was happy to oblige and gave him the bad news! One hundred feet and 1/4 mile with freezing rain. They were helpful lads, though, and promptly suggested the only 2 bases "nearby" that met alternate minimums—Chicago and Denver!

About this time, the story was beginning to touch me—I could tell by the tingling sensation near my spine. For a moment I thought about how I'd feel with 3 hours of fuel remaining and the nearest satisfactory weather well beyond that range! No doubt about it, these lads were in a bit of a "tight."

This crew was sharp, though. They made known their plight and asked for help. A quick survey by Control uncovered a base with weather at least above minimums—800 feet and 3 miles visibility. A time and distance check showed 1:55 en route, or 1:05 fuel remaining after arrival. With nowhere to go from there, a few hopes for success must have made the rounds of the cockpit.

En route, they decided to burn the outboard tanks dry and proceeded to do so. As they watched the right outboard tank approach zero, the left engine sputtered and died. What was this? The left gage still showed 700 pounds! As he switched the left engine to an inboard tank, the pilot realized with a shock that he had just half the fuel reserve he had counted on. The copilot got the job of flying and watching the right engine, while the

3300th Support Sq, Air Training Command.

pilot studied the approach chart. There'd be no time for stooging around now! Finally, the right engine sputtered, indicating the outboard tank was empty. They cut in the inboard tank. Both inboards indicated a goodly supply but how correct were they? The apparent miscalculation of the quantity of the left outboard tank clouded the whole issue.

The undercast was thin now, and the lights of an occasional town glowed through. When approach control was contacted, they reported the ceiling as 500 feet, with 2 miles visibility. From that, the clouds couldn't have been very thick. The pilot made another check of the fuel and, to his surprise, found both outboards indicating empty, and a bit over 900 in each inboard! Where did that 700 pounds go? How much would show on the inboards when the engines quit? Just how long CAN we stay a-churning? Thoughts such as these were with the pilot when they approached the fix, reported, and were directed to hold 8 minutes while an airliner landed.

Right quick, the pilot declared an emergency. Eight minutes might be too long! With that, he was cleared for an omni approach and advised that the ceiling had just dropped to 300 feet, 200 below minimums. At this moment they were over the field and could see the lights of the base, the beacon, and the ceilometer through the clouds. After reporting, the pilot started down in sort of a low visibility approach. The tower acknowledged and cleared him to land, advising that the ceiling had dropped to 200 feet. This would be a low, low approach! As he dropped down into the soup, he noticed the airline pilot veer away, probably heading for his alternate in the sure belief that the '119 had had it.

The pilot reported below all clouds at 3800 feet *(the field was at 3600)* and turned for the runway, holding 3700 on his altimeter. Gear was lowered and on they churned at 105-110 knots, aiming for the beacon and the field. Things were going fine when a slight jar shook the ship. It took a moment—during which the landing lights were turned on—to realize they were on the ground and rolling! This was a moment of decision, and a decision was made: "Full throttle ADI, and let's get the !!! out of here."

The bird lumbered into the air and back into the soup. That runway was ahead though, so down they went again, this time breaking out just north of the tower on a collision course.

The lads in the glass cage, straining for sight of the ship, had alerted the crash crews. Every eye was searching, when 2 landing lights stabbed out of the over-cast and swung toward the tower. One of the operators stayed behind long enough to ring the alarm and get the crash crew on its way, then joined his comrades in a rush for the ground! The same alarm started my journey to the base.

The tower men might just as well have saved themselves the effort for at this moment the pilot saw the runway off to the right and did a fast wingover. He not only missed the tower, he hit the runway.

The airspeed was fast, the runway short and wet, but plenty of brakes and full blower reverse did the job. They came to a stop, too shook to talk and too happy to be quiet!

Well, the tower folks resumed their post in time to direct the parking operation, and the crash crews went back to the barn. I bought the coffee while I listened to the story, then looked again at the bird. I checked the altimeter settings and found both were off more than 100 feet, and high. While the C-119 was sitting on the ramp, the pilot's altimeter read 3720, the copilot's 3705. No wonder they hit the ground.

The next morning we checked further and found the tracks in a plowed field, all 540 feet of them 2½ miles from the runway. Oh yes, and the fuel gages? That *left* outboard gage was hooked to the *right* outboard gage. Confusing enough?

I got home that night to find that I'd gone down 2 tricks, doubled, on my last bid. I figure if I'd had the luck of this pilot, I'd have made a grand slam. ▲

REX Says . . .

The pilot of an F-84F experienced a flameout while flying 1000 on top on an IFR flight plan. He immediately declared an emergency and requested information concerning airfields and weather within the immediate area. The pilot decided to belly the aircraft into a field rather than to eject. The F-84 touched down at a high rate of speed, sheared several trees, skidded into a highway embankment, and finally came to rest on the side of the fuselage. The pilot was alive when extracted from the cockpit by civilians, who reached the crash within minutes after the accident, but he died en route to the hospital. The investigating board attributed the engine flameout to failure of the compressor shroud between the ninth and tenth stages. The medical officer determined that the pilot's fatal injuries resulted from striking his head on the jagged edge of the canopy which had not been released and which had broken after touchdown. The pilot lost his helmet because the chin strap was not fastened and the shoulder harness was not manually locked.

REX SAYS—*Under the circumstances the pilot would have been fully justified in ejecting. Since he didn't, had he jettisoned the canopy prior to touchdown, manually locked his shoulder harness, secured his helmet with the chin strap, and lowered the landing gear prior to the emergency landing on an unprepared surface, it is probable that he would have survived. Many pilots feel that the inertia reel will lock immediately upon impact, however, it is possible that sufficient play will be left in the shoulder harness to allow the pilot to be tossed around in the cockpit. Care should also be taken to turn off switches prior to touchdown, as it may not be possible to reach them with the shoulder harness in the locked position.*

• • •

Major R. W. Gray, Hq USAF, wrote Rex about an IFR clearance from Plattsburgh AFB for a night weather departure in a T-33: "Base ops advised this was the only IFR departure for transient jets. Locally based B-47s with 2 pilots, 2 omnis, and navigator on scope, might consider it a piece of cake, but in a single seater in the night murk, it's rough. Some 25 minutes later with over 200 gallons of fuel gone, I had stumbled through some semblance of the clearance. It read: 'Aircraft will depart Plattsburgh AFB and proceed direct to the Plattsburgh homer, not to exceed 3000 feet. Turn left and intercept the 115° radial of the Massena VOR, cross the 191° radial of the Montreal VOR at 5000 feet. Proceed on the 115° radial of Massena to the 226° radial of the Montreal VOR to cross the 150° radial of Massena VOR at 15,000 feet. Maintain 15,000 feet until past the 192° radial of Massena VOR *(unless otherwise directed by Burlington Departure Control)* then either turn right to intercept the 210° radial of the Massena VOR and proceed on the 210° radial to cross the Massena VOR at assigned altitude, or continue on 226° radial of the Montreal VOR to intercept the 090° radial of the Watertown VOR and proceed on the 090° radial to cross the Watertown VOR at assigned altitude. Burlington Control will give turn out of traffic on takeoff using runway 17.' Do you agree this violates ANC criteria and constitutes an operational hazard, or am I just plain stupid?"

REX SAYS—*No, Major, you aren't stupid—it's as rough a departure as we've seen or flown. As you said, in another part of your letter, "a touch of 'get homeitis' and the desire to be on the job the next morning prompted the attempt." Unfortunately, this type clearance is received too often and a lot of nice folks are no longer with us. There are a lot of people (USAF and FAA) who are working hard to eliminate this and associated problems. Until the "fixes" are complete, don't overestimate your capabilities or let your cross-country departure run you out of fuel before you get where you are supposed to go.*

• • •

The pilot of an F-100D was wingman on an 8-hour profile mission that included 2 inflight refuelings. Inclement weather required the flight to divert to the alternate. On arrival at the alternate a wingman in the preceding element blew a tire on landing which necessitated closing the runway. The rest of the '100s were instructed to land at a nearby joint-use airport. The pilot flew a normal pattern *but landed gear up*. The aircraft sustained major damage but fortunately the pilot was not injured.

REX SAYS—*Prior to the flight which ended in a busted F-100 the pilot had flown a similar type of long*

range profile mission involving 2 inflight refuelings for a total of 8 hours and 15 minutes. On that mission he took a 10 mg dexedrine "spansule" after the first refueling approximately 2 hours after takeoff. He experienced no abnormal fatigue during the mission but was tired after landing. He slept well that night for 10½ hours. The following day (day before the accident) was a normal duty day for the pilot. At 1930 that night, he and the other members of his flight went to the hospital and were given seconal 0.1 gm and billeted in the hospital. The pilot stated he slept fairly well. The next morning he felt in good condition for the flight. He took off at 0800 and 2 hours later, he took his dexedrine spansule. Having completed the second refueling, 5 hours after takeoff, he ate an inflight lunch of hard boiled eggs and 2 ham sandwiches. Following the diversion, a great many factors came into play that tended to confuse the pilots. The tower was transmitting very rapidly. After the wingman of the lead element had blown a tire, the second element, of which the pilot was No. 2, orbited for a few minutes and then was cleared to land. For the second time they set up a landing pattern and were on final with gear down when they were advised to proceed to the joint-use airport. After finally establishing contact with the tower, the pilot flew a good pattern but does not recall if he put his gear down or called gear down. He stated that just after the first diversion he began noticing fatigue which became more pronounced as the flight and confusion progressed. His nose was quite tender and painful where the oxygen mask had rubbed it to the point of producing a shallow abrasion. Here is another accident in which the normal landing sequence was interrupted with an embarrassing and costly result—a gear up landing. An equally important cause factor was fatigue. After flying almost 16 hours in a little over 2 days, the pilot had to be tired. Keep in mind that as body fatigue increases, mental fatigue is increasing even more. ▲

REX SPECIALS

In a recent T-33 crash landing accident, the pilot sustained third-degree burns to both hands from the ensuing fire. He was wearing type B-3A gloves, and the flash heat from the explosion caused his leather gloves to shrink and stiffen, thereby immobilizing his hands. He was unable to remove the gloves and the leather retained sufficient heat to cause severe burns.

REX SAYS — *If the pilot had not been wearing gloves, his hands would have been much more severely burned than they were. But had he been wearing the nylon-type glove inserts (S/N 8415-269-0501), very probably his hands would have been protected completely from the flash heat. At the very least he could have removed the leather outer shells much more easily and the burns would have been far less severe. Air crewmembers of the nylon flying suit days may be ready to reach for a pencil to remind us that nylon melts and clings to the skin at fairly low temperatures. Laboratory tests have proved conclusively that by using the leather outer gloves, the nylon inserts will not melt during a flash fire. If your personal equipment section doesn't have inserts, ask that they be ordered immediately.*

• • •

In the first few months of 1959, three single-engine jets were destroyed in accidents that were probably caused by loss of control at low altitudes *and* involved UHF frequency change or IFF mode changes, or *both*. You know the route — the pilot is requested to change channels and/or modes "immediately after takeoff," or "as soon as possible after takeoff," or he gets a change to his departure clearance. While still maneuvering at a low altitude he twists his body and head to make the change, goes back to the gages, and one of two things has happened: he's either out of control or has a bad case of spatial disorientation *(commonly and incorrectly called vertigo)*.

Recognizing that problem, in June 1959 USAF published a letter to all major commands pointing out the dangers of pilot distraction at low altitudes. Of particular importance to pilots are these instructions:

- When changes or revisions to IFR clearances, including instructions to change frequencies and/or modes are issued at a time when either altitude or aircraft attitude are critical, no attempt will be made to copy or change frequency or mode until at a safe altitude and until the aircraft is in a stable attitude.
- Critical altitude is any altitude below 1000 feet above terrain.
- Critical attitude is any attitude including climb and/or turn below 1000 feet that requires constant attention to flight instruments or terrain to control the aircraft properly.

REX SAYS — *Since USAF's letter was published there have been 7 more fatal accidents that were probably caused by loss of control during frequency or mode changes and revised clearances. Evidently the word isn't getting to the pilots or they are still too ready to change channels or copy clearance revisions. Pass the word around to anybody who will listen. What good is a new clearance or the right frequency if the airplane is buried in a hole in the ground?*

CHOPPER - CHATTER

Cargo Branch, DFMSR

Last year was a sad one for helicopter accidents. Their accident rate was up with that of the hottest jet aircraft. While the Air Force major accident rate declined 25%—from 10.4 in 1958 to 8.2 in 1959—the helicopter rate increased 7%.

But let's not play the numbers racket. Instead, let's discuss some specific accidents. They shouldn't have happened, but they did. For example, take the one in which the H-21, with an IP at the controls, had a partial power loss. With his engine cutting in and out, the IP decided to make a precautionary power-on landing, but failed to brief his copilot. About 75 feet off the deck the pilot called for "mixture" *(?)* and . . . yep, you guessed it. Off came the mixture and down went the chopper, but hard! Scratch one.

Here's another one involving an H-19. While searching for a missing person, the pilot flew the aircraft into high tension wires. The same type of accident happened several months later. Net loss to the government: 6 invaluable crewmembers and 2 mighty expensive helicopters. Pilot factor was the chief cause in both cases. Reason? Instead of devoting their entire attention to flying the aircraft, the pilots were searching too.

Of course we have our old standbys, the autorotation accidents, the result of practicing for the real thing. Every year, like clockwork, they show up on the reports. You've heard the pros and cons of touchdown autorotation discussed a hundred times, so no need to go into that now. But obviously, this is an area in which we can prevent a lot of accidents. It's up to each unit to take another look at practice autorotation policies.

You will agree, I think, that a properly executed autorotation to touchdown is an exacting maneuver which does not leave much room for error. But, if the practice autorotation is completed to a power recovery, the same training is accomplished while allowing room for the minor errors of judgment to which we all are prone. The only aircraft restricted from power recovery autorotations are H-21s that do not have T.O. 1H-21-610—Modification of Central Transmission Jaw Coupling—completed.

Now, let's discuss one of our most serious problem areas, that of materiel—or power plant—failure. Eight major accidents were chalked up to this cause in 1959. What can be done? There is a solution, but first. . . .

Suppose you're ginning along some clear sunny day with an engine that's purring like a well-fed kitten. There's not a cough or a murmur to betray incipient troubles. Suddenly, as you're letting down over a jungle of wires and tracks—POW!—the engine quits just when most needed. And you're in serious trouble. Was there anything you could have done to prevent this? Probably not.

At least, there was nothing you could do unless you had the magnetic chip detector device installed. If you had, the caution light in the cockpit would likely have tipped you off that pieces of metal had come loose in the engine and found their way to the magnetic sump plug. This is usually a sure sign of impending engine failure. But with plenty of warning from your perpetual inspection system, you could retain your composure, look for a suitable landing site, and set down. Then the engine could be inspected and repaired or replaced at leisure—before an accident occurred.

If you're in the H-19 business, watch for T.O. 1H-19-599. It covers the magnetic chip detector cockpit caution light installation. The T.O. will be published as soon as the kits it calls for are available. When kits are received, remember to complete the TCTO as soon as possible. If you're interested in H-21s, ditto, except this time it's T.O. 1H-21B-521 you'll be looking for. Pending publication of the T.O. and issue of the kits, H-21 users can, through major command headquarters, request authority and information from Middletown AMA to make a Class I modification in accordance with AFR 57-4. This is an interim installation using the CD-12 magnetic chip detector presently installed.

Recently, we asked all organizations with assigned helicopters to submit suggestions for preventing 'copter accidents. The response was excellent. In printing the replies, however, we have more in mind than just passing along worthwhile accident-prevention ideas. We hope also to convince commanders of 2 things: first, that helicopter operations require the same conscientious supervision as other types of aircraft operation; and second, that a close look at certain accident-potential areas will pay dividends in the elimination of dangerous conditions and practices.

Take these areas, for example. The chief accident causes stem from materiel failure, poor pilot technique, inadequate supervision, and improper maintenance. Certainly the accident potential is greatly reduced when a proficient pilot flies a mechanically sound aircraft under proper supervision. If the recommendations that follow were put into practice today, it is obvious that at one stroke the accident rate would go down markedly.

Let's see what people in the field thought were the greatest hazards to safe and efficient operation. Compare their ideas with your own. Then don't be bashful; let us know what *you* think. Your suggestions are valuable.

Recommendations

For Pilots—

- Plan your missions thoroughly, being careful to compute gross takeoff and landing weight accurately. Place particular emphasis on weight and balance figures. Remember, helicopters are flown at or near their maximum gross weights on nearly every mission.

• If your mission planning is for the H-43 operating in high temperature zones, don't forget that performance capabilities are diminished unless the aircraft is partially defueled.

• In *any* temperature zone, avoid exceeding the H-43's operating limitations during liftoff. This can readily happen even though gross weights are down to minimums.

• Don't practice autorotations unless you have an IP for copilot, or you're a qualified test pilot performing a test. Terminate all practice autorotations with a power recovery before touchdown.

• Make a precautionary landing at the first indication of trouble and have the aircraft checked before continuing flight.

• Make frequent checks on the adequacy of landing areas and their approaches.

• Maintain safe altitudes and forward speed whenever possible, especially in gusty wind conditions. Carry smoke grenades or flares for use in determining surface wind, particularly when landing on an unimproved site.

• Write up all hard landings and any strains placed on gear or helicopter.

• Brief crewmembers and passengers on emergency procedures.

• Get the most out of your helicopter time by making it yield the maximum training possible for each minute in the air.

For Maintenance Men—

• Because control cables have been failing in flight from corrosion of the internal strands, inspect cables and linkage more frequently than required by the tech order. Inspection of the inside strands is now scheduled for each *periodic inspection*—75 hours—instead of each fourth, as formerly.

• Use the engine analyzer and engine conditioning procedures more often.

• Program once a month for time change items in advance of periodic inspections and maintain close supervision over accessories overdue time changes.

• Stay on top of EURs and URs.

• Spot check during postflight to insure maintenance quality.

• Do not run up and taxi helicopters. It's the pilot's job.

• Clear pilot writeups with corrective action as quickly as possible.

• Inspect landing gear components carefully when pilots have written up a hard landing.

• Adhere to accepted ground safety rules and good maintenance practices. Help to create safety mindedness in others.

• Maintenance officers should take a more active part in flight testing, even if they are not qualified helicopter pilots. They will at least become better acquainted with the characteristics of the equipment and the demands made upon it.

And for Supervisors—

• Conduct an aggressive flying safety program featuring frequent brief meetings on air crewmembers to discuss safety matters; flight checks by IPs of all pilots; examination of pilot techniques when landing in restricted areas; and emphasis on thorough preflight inspections of aircraft.

• Plug for the assignment of enough helicopters to maintain proficiency requirements, as well as to maintain mission ready aircraft.

• Insist that helicopter operations in rough terrain or in areas questionable from a flying safety viewpoint have the OK of the 'copter OIC.

• Get qualified personnel to monitor and supervise helicopter operations and training programs. On bases having only 2 or 3 assigned 'copters, the crews are often supervised by someone having little knowledge of helicopter requirements. Supervisors cannot determine if training standards are adequate and if operations are efficient without some knowledge of the capabilities and limitations of the aircraft. It is a command function to insure that helicopter operations and training are adequately supervised.

• Establish definite monthly or quarterly crew training requirements, compatible with the assigned mission. Make them mandatory for those who are mission qualified.

• Use a minimum number of standardization pilots. Hold them responsible for checking all IPs quarterly for method of instruction, proficiency, and standardization. Small units can utilize the command standardization pilot for checking IPs.

• Commanders should take a more active interest in helicopter operations. Fly more frequently with the crews. This will help raise standards and foster a spirit of professionalism.

• Conduct frequent spot checks of crews to insure accurate knowledge of operating and emergency procedures. Spread experience around: put an old head with a new one and thus offset inexperience.

• Assign a clearance authority competent to evaluate the ability of helicopter pilots to cope with flight conditions, particularly in marginal weather. Do not rely on the pilot himself.

• Assign sufficient number of pilots to comply with the 24-hour alert requirement so that none are overworked to the point of fatigue.

• Have a flight manual for each pilot.

• See that pilots get their proficiency flying time, without impairing base search-rescue capability. This may be difficult because of too few helicopters.

• Require primary duty helicopter pilots to maintain AFR 60-2 minimums in the aircraft.

• Try and try again to get the specialized tools necessary for proper collective and azimuth rigging adjustment for the H-43. These have not been available since the H-43 was introduced into the inventory, we know, but persevere! One of these days your efforts may be rewarded.

• Lighted wind indicators are important for night operations. Do you have them?

• Check to be sure that tie-down facilities on the helicopter alert pad are adequate.

This might be the time to ask yourself how many of the above recommendations could be applied in your own operation? You've got a good checklist to work from. We'll add more items in the future; perhaps one of them will be yours. We want to hear from you, so send 'em in.

And by the way, a tip of the old green hat to all who've submitted recommendations on helicopter accident prevention. ▲

The Halloween Suit

By Major Ralph A. Secor, Chief, Personal Equipment Branch, Deputy for Materiel, Hq AMC

They call it a Halloween suit because of its color, not its purpose. And in case someone wonders why I didn't wait until October to write an article about this all-important piece of survival equipment, the curious have hounded me into doing it now. What's the value, they continue to ask?

Headquarters USAF has given approval for orange-colored flying coveralls and liners for flight jackets. The sole purpose of the orange color is to facilitate the rescue of downed crewmembers. The jacket liners—instead of a whole jacket in orange color—are a concession to crewmembers who might want concealment at one time or another; to those who complain of the glare in the instrument glass; and, of course, to economy. Orange liners can be placed in jackets already in the inventory.

The Air Defense Command is not claiming a "first" in the use of orange-colored flight clothing; this credit goes to the Navy. However, the credit for proposing a change from sage green to bright orange flight clothing for ADC rightfully belongs to Colonel George W. Orr, Chief of Safety—and this after bucking such old standbys as the SAC hide-in-the-woods concept and the natural resistance of the average man to wearing brilliant garb.

The Air Defense Command operates over terrain inhabited by friendly people but with a climate that is often extremely unfriendly to a fighter crewmember who is equipped with only the barest essentials for short-term survival. For example, the survival kit in the Century Series fighters provides only 1200 cubic inches as compared to the 1800 in earlier types. Therefore an aircraft carrying only 2/3 of the survival equipment its predecessors had, but with almost twice the range in many cases, places the pilot in such a serious situation that he must be rescued in hours—not days.

Survival situations have been discussed with Air Rescue personnel and instructors in survival schools, and they say that their ability—or inability—to spot the downed crewmember posed the biggest rescue problem, even when the bailout area was pinpointed to 2 or 3 square miles. Simulated air and ground rescue situations, including the use of colored photographs, proved that from a range of 1000 feet it is almost impossible to spot a man in a sage-green suit, while a man wearing bright orange can be located at 3 to 4 times that distance.

In a simulated ground rescue situation at the SAC survival area near Ernest Harmon AFB, I wore orange coveralls and a sage-green jacket, and was spotted immediately by personnel 2/3 of a mile away through rain and mist. None of the 4 others wearing the old sage-green suits within 30 feet of me were located until the search party was within 300 yards.

Some people, in questioning the value of the orange coverall, have pointed out that the orange-and-white parachute canopy provides a much larger and easier object to sight than does the crewmember. This argument appears indisputable until you consider the following facts:

- The canopy, when used for a parateepee, is erected either under a tree or in a sheltered ravine. It is obvious then that the ideal use of the canopy spread out in the open as a signal would be practical only on a pleasant summer day. That pleasant summer day is certainly not the problem we are confronted with.

I have discussed what the orange flight clothing offers as a rescue aid. The next logical question is *why orange?*

When orange was first mentioned I asked myself that same question, then proceeded to do some research on the subject of color. For those with an inquisitive mind or who doubt that a staff personal equipment officer must be versatile, I recommend the Munsell system of color measurement.

For the less inquisitive, here briefly is an answer to the question, "why orange?"

The visibility factor or attraction value of a color can actually be measured by a formula. The ability of a color to attract is dependent upon a couple of things:

- Its chroma, i.e., its strength measured from neutral gray *(1 chroma power)* and going to 14 chroma, which is the farthest from neutral.
- Color contrast in value, i.e., how much it is separated from neutral and from the color composition of its background. While yellow has a Munsell value of 96 *(visibility power)* compared to 91 for orange, add a green *(land)*, green-blue *(water)*, or a white *(snow or ice)* background, and your orange becomes the color with the highest visibility in the color spectrum. Using the Munsell formula we find that orange has 4 times the visibility attraction power of sage green.

All things being equal, converting this to distance means that unless the crewmember in orange flight clothing is in a field of oriental poppies, his chances of attracting the searcher's eye and the distance at which he would be sighted is up to 4 times greater than if he were wearing sage green.

For those who are still unconvinced and have neither the time nor inclination to delve into the numerous studies on vision and color, I offer as a clincher the fact that "vision is a function of nerves, as are other sensations." Just as a loud noise or one out of harmony with its surroundings distracts or attracts attention, so does a powerful color out of harmony with its surroundings excite the optical nerve, thus attracting attention.

Another thing: it may come as a surprise to learn that orange is ordinarily remarkably colorfast. This would indicate then that our bright colored flying clothing will be worn out long before the orange loses its visibility power. Thereupon rests the reason "Why we want to get 'em out of sage green and into orange—so we can put 'em back in the blue." ▲

Check List

Commander in Chief, SAC, found it necessary in late March to send out a message to all SAC units about unauthorized checklist revisions. The message is reproduced here in full for the attention of all crewmembers, Air Force-wide, for it is almost certainly not a problem of one command.

• *Numerous instances have been reported where crewmembers are making pencil entries of memory items to their condensed checklists. A considerable amount of thought and study has gone into the preparation of these condensed checklists to insure that necessary amplification of a required item has been included. Additions to the checklist by individual users should not be necessary provided the individual possesses a working knowledge of his aircraft and equipment plus a familiarity with the amplified checklist.*

Effective immediately, additions, deletions, or rearrangements of items in the checklists, except as authorized by Safety of Flight Supplements and SAC operating procedure messages, are prohibited. This is in accordance with provisions of AFR 62-2. Checklist changes will be effected only after approval by this or higher headquarters. Recommended changes to the flight manual and/or checklist will be submitted in accordance with instructions outlined in Chapter I, Section VI, SACM 51-4, dated February 1960.

✔

More about the cardboard checklists for T-33s discussed in the Checklist column of the February issue. Sacramento Air Materiel Area has advised that these checklists for T-33s *(1T-33A-1)* are to be ready for publication in June 1960. These checklists will incorporate numerous changes in operating procedures as a result of recent modifications and such projects as airstart flight tests. The procurement of these checklists will be considered in conjunction with the Dash One handbook at that time.

✔

In the March issue appeared an article entitled "Project Narrow Gauge." Here is some additional information about USAF and civil bases presently equipped with or programmed for early installation of narrow gauge lighting:

• Dow AFB: narrow gauge operational; prototype centerline not operational, permanent system in about one year. (Dow is mentioned in the article.)

• New York International Airport *(Idlewild)*: operational; both ends 4A-22L.

• These bases/airports have narrow gauge and centerline under design or construction—approximate operational date indicated:

Andrews AFB (both ends 1L-19R)	October 1960
Lockbourne AFB, Ohio	October 1960
Dulles International Airport	June 1961
McCoy AFB, Fla.	October 1961.

✔

Man's flight through life is sustained by the power of his knowledge . . .

✔

During the last 6 months of 1959 the Federal Aviation Agency submitted complaints against 54 Air Force pilots for violations of Civil Air Regulations. Investigations by the USAF revealed that the experience level of the pilots involved ranged from 3 to 20 years. Most of the violations were unintentional and resulted from a misunderstanding of instructions or unfamiliarity with the applicable Civil Air Regulations.

Violation reports and investigations support an assumption that copies of part 60, CAR, are not available to many pilots nor are they encouraged to read and understand them. It is therefore suggested that commanders make every effort to obtain sufficient copies of the Civil Air Regulations—particularly part 60—so they will be available to all pilots.

✔

The "Norfolk Search" publication of the U. S. Coast Guard has reported no instances of Guard Channel misuse in that area during January. Can this mean that pilots are at last heeding the word?

✔

Mr. E. R. Quesada, Administrator, Federal Aviation Agency, has earnestly solicited the cooperation of the nation's pilots in reporting en route weather conditions as part of an expanded weather information service covering offshore coastal routes. Mr. Quesada said "This is the pilots' own program and to make it truly successful it is essential that every pilot in every facet of aviation cooperate in the program by providing reports on inflight weather at the earliest practicable moment and as frequently as changing en route weather conditions justify."

The expanded service to obtain on-the-spot pilot reports *(PIREPS)* on hazardous weather conditions along offshore coastal routes is to be implemented by the FAA and the Weather Bureau. These up-to-the-minute PIREPS will be obtained by FAA Flight Service Stations through air-ground contact with en route aircraft and passed along to other pilots planning to enter the offshore routes. The coastal pilot weather reporting service will be an extension of the new PIREPS program that has been in effect over the land areas since 15 January 1960. The program was developed jointly by the FAA and the Weather Bureau to meet an urgent need for a greater quantity of inflight weather information than was previously available to enhance flight safety and accommodate the increasing volume of air traffic.

✔

Recently, Paragraph 40b of AFR 60-16 was deleted and an alternate airport was required on all IFR flight plans. This deletion has been rescinded and now Paragraph 40b is in effect again. An alternate airport is now required on an IFR flight plan only under the provisions of Paragraph 40a of AF Reg 60-16A, dated 8 March 1960.

Survival— IS YOUR BUSINESS

Publicity, good or bad, is an every-day word and it's an important one. Not very long ago a lot of words were printed about the death of a pilot purportedly killed when his parachute became entangled in his survival kit. As result of this publicity, many air crewmembers are not hooking up their survival kits when flying over land, while others are hooking up only one side. Whenever these people neglect to hook up their survival kits, they invite serious injury to themselves and they may defeat the efforts of the Air Force to get them back safely. Hooking up only one side of the kit can possibly be more dangerous than not hooking it up at all—like the pilot who was killed when he ejected at an estimated altitude of 100 feet and the investigators found only one side hooked, actually preventing separation.

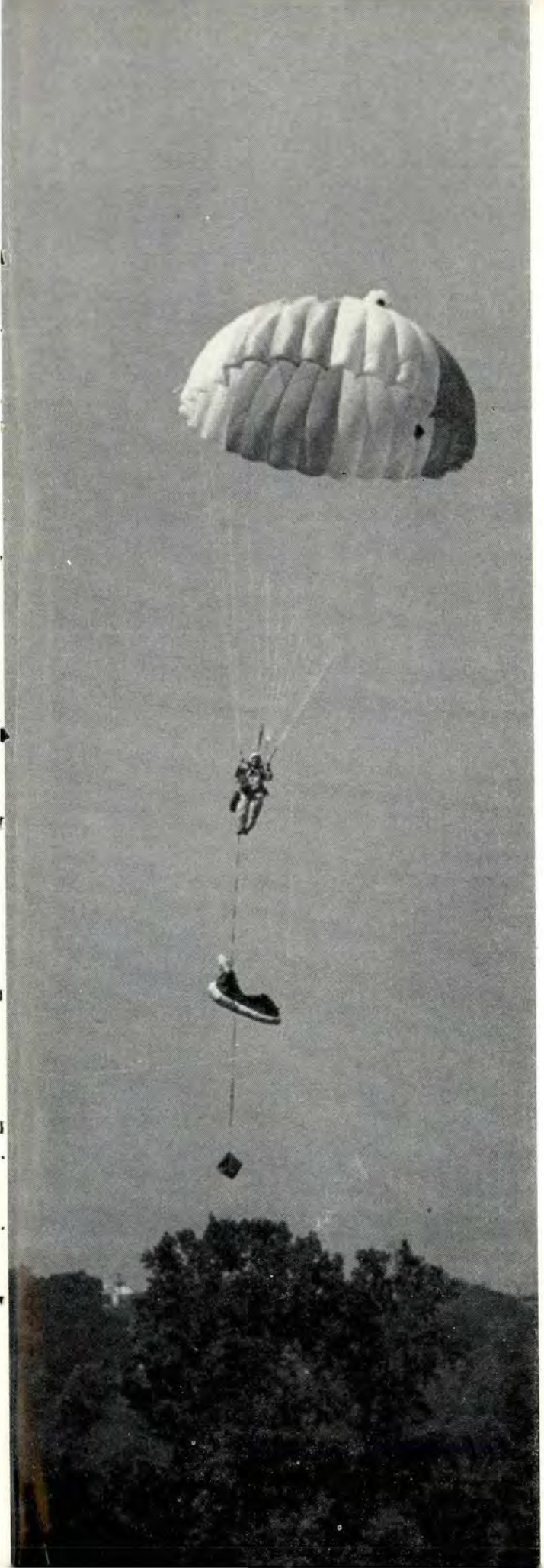
It is unfortunate, to say the least, that improper use of survival equipment has caused serious injuries and has even cost the lives of crewmembers because they lacked training in its correct usage. The Air Force is continually designing and modifying survival equipment in an all-out effort to bring you safely back—should you have to bail out—but it is up to you to learn to use it correctly.

Let's review a hypothetical situation, the one about a flameout. You've heard it before. Say you're flying at altitude and suddenly have a flameout. If it occurs at 5000 feet or more and is not accompanied by a fire, explosion, overheat condition, strong fuel fumes in the cockpit, heavy vibration or any condition indicating mechanical or materiel failure, an airstart should be successful.

You've got altitude to spare so you try several airstarts, but to no avail. Now, you have 2 choices: deadstick the bird or eject. Terrain, altitude, proficiency, weather and many other factors will influence your choice; *but* the decision is *yours* and *yours alone*. If conditions permit, your chances of a successful ejection will be increased if you:

- Set the IFF selector to send MAYDAY signal and give position report.
- Stow all loose equipment.
- Check seat belt, shoulder harness, oxygen hose attachment, and fasten your chinstrap.
- Reduce your airspeed.
- Disconnect G-suit hose and oxygen hose.
- Pull the green apple on your emergency bailout bottle if you are above 14,000 feet.
- Lower and lock your helmet visor.

J. H. KRAMER and MSGT. G. A. POST, AEROSPACE MEDICAL LABORATORY, WADD.



Now, at this point if you're over water you will certainly elect to keep your survival kit hooked to your harness; also you should check your MD-1 Survival Kit to make sure it is hooked on *both* sides of your parachute.

But since you're over land, you may think you don't have any use for the kit and unhook it from your harness. *Don't do it!* If you do, you're only asking for trouble. Your survival kit contains more than just a life raft. It has a radio, a compass, flares, survival manual, and other items of equipment which are meant to help you survive. Eject with them strapped to your posterior.

If you disconnect your survival kit from your parachute harness, you may create a situation whereby your kit may injure you as it speeds through the air with the force of a pile driver or it may become entangled in your parachute. Therefore, whether you are over land or over water, keep your survival kit hooked to your harness. It is insurance for your survival.

But let's get back to your more pressing problem. You've got to get out of that dead aircraft.

Get rid of your canopy and eject according to the procedure outlined for your particular machine.

You are now out and the seat separates from you. You are wearing an automatic *(aneroid)* parachute, so the arming lanyard is automatically pulled when you separate from the seat. The chute will automatically open at the preset altitude of 14,000 feet. This setting is made while on the ground and is set at 14,000 at all times.

If you eject below the preset altitude, your chute will open 1 or 2 seconds after deployment of the arming lanyard, depending upon the delayed timing setting of your parachute. Usually, a 1-second delayed timing is used for ejection seats, while a 5-second delay is used for nonejection bailouts.

After your parachute has deployed, look up and check your parachute canopy to see that it is fully inflated. If everything is normal, prepare to land. The rate of descent with an open parachute is approximately 1000 feet a minute, so you really don't have too many minutes to prepare for your landing. You should make wise use of the time you have and follow your landing procedures to the letter! Face obliquely downwind so the force of the landing will be on the calf, thigh, trunk, and shoulder. A drift angle of 30 to 45 degrees to your right or left is best for an ideal landing. If you happen to be facing the direction of the wind when your chute opens you can't turn your canopy so that you will face downwind. But you can turn your body by grasping the risers *(your right hand behind your head and the left hand in front) and pulling simultaneously.*

You can check your distance from the terrain by looking at the ground at a 45-degree angle. Don't look

straight down or you won't be able to judge the distance. At an altitude of 5000 feet, the earth begins to look green. When you get approximately 2000 feet from the ground, pull open your survival kit and inflate your life raft. This will take the weight off your seat and allow you more freedom of movement and less chance of injury. The MD-1 Survival Kit weighs between 30 and 40 pounds, but if it is properly adjusted, the weight will be imperceptible throughout the free fall and parachute deployment.

While it is possible to make a successful parachute landing on the ground with the survival kit still unopened, it is not recommended. If you were to land incorrectly you might fold your legs under the kit and break them. Keep your survival kit but pull it open and inflate the raft before you get to the ground.

To inflate the 1-man raft of the MD-1 Survival Kit, whether over land or water, grasp the slide fastener release knob on the right side of the raft kit, and pull sharply to your right. This force will pull the barrel keeper from the fastener and inflate the raft.

Deployment of the survival kit will not adversely affect parachute performance and a successful landing on ground or water can be achieved if proper landing techniques as outlined in T.O. 14D-1-2-1 are followed.

When landing, put your feet together, bend your knees slightly, and relax. Drunks and children are seldom hurt in falls because they are quite limp. So, make like a bowl of jello when you touch the ground.

Since you have a parachute with a canopy release, do not activate it when ejecting over land until you touch the ground. Gather up your survival accessories kit, your raft, and your parachute canopy and use them to help you survive until you are either rescued or find your way out.

Landing procedures when ejecting over water are practically the same as when ejecting over land—with a few important exceptions.

The latest standing operating procedures for overwater bailouts released by Wright Air Development Division state that immediately after parachute deployment, *if at 14,000 feet or below*, inflate your life raft and life preserver. Inflate your life raft first. The primary reason for inflating your survival equipment while airborne is to take advantage of whatever time is available to prepare for contact with the water. This is especially important in night bailouts since you cannot judge your height above the water.

If you're using a B-5 life vest, let out the parachute chest adjustment strap prior to inflating your preserver. *Do not release the chest strap.*

At 1000 feet above the water, check your J-1 canopy release. *Look at it*. Then release the safety guard. When your feet touch the water, use your canopy release to deflate the parachute.

In any water landing, do not start to release your harness until your feet touch the water. Some pilots have released their harnesses at altitudes as high as 100 feet above the water, and that's a rough fall in anybody's league.

Recover the life raft by pulling in on the life raft lanyard. After you get into the raft, pull the accessories container into the life raft and tie the accessories to the retainer straps of the raft. Keep your parachute canopy for emergencies, and throw out your sea anchor to retard the drift of the raft. Then tie the raft lanyard to your life preserver so the raft can't drift out of reach if it capsizes. If you should become entangled in the shroud lines of the parachute after a water landing, an MC-1 knife has been provided so that you may cut yourself loose. This knife has a hook blade so the lines may be cut without injury to yourself or your flotation equipment. If need be, you can easily cut the parachute riser from your right shoulder with this knife.

Once again, use your radio, compass and the rest of your equipment; either wait to be rescued or chart a course to land. Whatever you do, make good use of your survival equipment. It is designed for your protection.

The first survival kits were designed for use over land only. However, many flights which originated over land continued out over water and it became increasingly evident that a global survival kit for use over land and water was required. Experiments were also conducted to inflate the life raft during descent, since many airmen had difficulty inflating the raft while in the water. Now the raft is ready for the survivor when he hits the water. This is especially helpful in cold water and for survivors who cannot swim.

But there was a disadvantage since the survival kits became quite heavy. And the heavier the kits became, the louder the complaints. Crewmembers had a difficult time getting in and out of the aircraft. The parachute and survival kit were then separated and a separate sling with adjustors and snaps included on the kit for hookup to the parachute harness. This made an independent kit that had to be connected to the harness and adjusted to the person. Correct adjustment of the survival kit is important, otherwise the result might be injury to the crewmember, ejection seat hangup, or loss of the kit because of severe windblast.

Pilot parachute entanglement with the MD-1 Survival Kit might occur with a loose-fitting MD-1 kit if the individual falls in a back-to-earth position during deployment of the parachute.

During the first 3 months of last year, 135 operational ejections were made in which the MD-1 Survival Kit was used. Of these ejections, 126 were totally successful. There was difficulty of some type during 9 ejections, and 3 were delayed seat separations.

In other ejections 2 airmen were struck by the kit during descent; 2 crewmembers were prevented from using proper landing techniques; and in 2 cases the kit came loose from one side. In all cases where the cause could be pinpointed to design deficiencies, changes were made to prevent recurrence of the same type of difficulty.

The MD-1 Survival Kit has an excellent record when used properly. In emergency ejections the kit has been 93.3% successful, and more than 250 free-fall parachute jumps have been successfully completed to date by WADD test jumpers. This record can be attributed in a great measure to proper kit adjustment.

Although the small crewmember still presents a problem in obtaining a satisfactory fit, numerous test jumps have been successfully performed without incident. The Air Force is continually working with the survival kit to improve its record of success and its usefulness to you. The MD-1 Survival Kit will be a welcome friend if you are forced to eject over land or water. Use it wisely. It will serve you well should you ever need it. ▲

1+00

Just 30½ minutes after takeoff, the following pilot-to-tower transmission was recorded:

"123 here, I have flamed out. Turn up everything you've got."

The tower personnel replied, "23—cleared to land anywhere you can."

The last statement made by the pilot was: "I don't know where I am going to hit."

The aircraft crashed immediately thereafter and was destroyed. The pilot was fatally injured during ejection at the time of impact.

Result? Lost to the Air Force: the potential of an outstanding officer, and $180,000 worth of aircraft in the scrap yard.

The DD Form 175 listed ETE as 0 + 20, fuel on board as 1 + 00, yet a flameout from fuel exhaustion occurred 30 minutes after takeoff. WHY?

The flight, as initiated, was to be no different from the hundreds of other T-33 cross-country flights occurring over a week end. The pilot had over 1100 hours total and almost 700 in the T-33. The flight from Cannon AFB to Mahon AFB was planned, the ETE and ATE varying by only 4 minutes. At Mahon, a pilot who had been in the rear seat deplaned, stating that he hadn't planned on going any farther and that he wished to be picked up for the return flight to Cannon. The aircraft was serviced with internal fuel only at the request of the pilot and a DD 175 was submitted for a flight to an Army airfield 70 nautical miles distant. Fuel aboard the aircraft was listed as 1 + 30 with an estimated 15 minutes for the flight.

After arriving at the Army airfield, the pilot declined servicing of fuel—although 100 octane gasoline was available and could have been used for the return flight to Mahon—stating that he had 200 gallons remaining, which would be more than enough. After spending the afternoon and early evening with relatives, the pilot returned to the aircraft and made preparation for the returning flight. He checked the cockpit fuel gage and visually inspected each fuel cell. He then made the statement that he had approximately 198 gallons of fuel.

Reconstruction of the flight profile from Mahon to the Army airfield indicated that if the flight had been flown as planned, approximately 182 gallons would have been available for the return flight.

The true airspeed indicated on the DD 175, and the prevailing wind direction and velocity as listed, would have given the pilot an en route flight time of 15 minutes and would have required 144 gallons of fuel, leaving 38 gallons upon arrival at Mahon. Air Force Regulation 60-16 states that on a VFR flight, fuel required is to be destination plus 20 minutes endurance at 10,000 feet. On this flight, this would have amounted to 80 gallons. The 38 gallons estimated to have been the reserve would have allowed only 9 minutes of flight. Nine minutes . . . hardly enough to satisfy the regulation, but for only a 70 mile flight . . . well . . . it was a clear night . . . what could go wrong?

The pilot filed his flight plan by dropline . . . Name . . . aircraft . . . aircraft number . . . route . . . destination . . . ETE . . . 20 minutes . . . *Fuel on board 1 + 00.*

Statements from witnesses at the Army airfield indicated that the pilot's walk-around inspection was very thorough and that the engine start was normal. After engine start, however, the pilot was observed to leave the cockpit and visually check for the main landing gear pins. Estimated time on the ground after engine start before becoming airborne was approximately 10 minutes.

After flying his ETE and not having the field in sight, the pilot requested a DF steer. Although no declaration of an emergency was made, ground personnel, both tower and RAPCON, handled the aircraft as if an emergency had been declared. Through the combined efforts of these personnel, the pilot finally saw the runway lights.

An unconventional 360° overhead type pattern was flown instead of a normal flameout pattern; however, the turn to final approach was overshot and the pilot stated he would take it around and land downwind. The aircraft started to go around and was in the vicinity of the overrun when the flameout occurred.

The rest of the story you have already read. Is there a moral to this accident?

Fuel Reserve?

Flight Planning?

Professionalism?

Expecting the Unexpected?

You've read the story . . . you find the moral. . . . ▲

•

Archie D. Caldwell, Missile Safety Division, DFMSR

CHAIN OF COMMAND

"Have we had any Foreign Object Damage recently?"

"The General is concerned about the number of FOD incidents."

"What's this I hear about the General raising hell about ruining all those engines from FOD this month?"

"Your ramps and runways must be filthy. The General says we've lost 25 engines to FOD in the last 6 months."

"How long since your crew swept the runways? The General said we've had 5 fatal accidents as a result of your carelessness since December. Heads are going to roll."

"You murderer! Get busy on that broom and sweep up this airdrome! The General is cutting throats about FOD around here and I'm not going to be the goat for your carelessness."

*U. S. GOVERNMENT PRINTING OFFICE 520966