AEROSPACE

SAFETY

UNITED STATES AIR FORCE

OCTOBER 1961

MORE HATS • MORE SAFETY

2nd ANNUAL WORLDWIDE SAFETY CONGRESS

SEPTEMBER • 25-29

DISCIPLINE

On his return flight from a conference, the pilot of a T-33 made no attempt to contact ground stations en route. His first call was to a military tower, reporting he was low on fuel and requesting a straight-in DF. The aircraft flamed out and an emergency landing was attempted on a 4000-foot, unpaved strip. The aircraft missed the strip and crashed into a wooded area, finally stopping with the forward section underwater.

Consider the part discipline, or rather lack of discipline, played in this accident. Only internal fuel had been requested prior to departure. Two intermediate airfields were overflown. An emergency was never declared. The pilot attempted a forced landing under unfavorable conditions rather than eject.

When I note recent progress in aerospace I realize great technological advances have been made in equipment. But when I look at accidents such as this, and resolve the cause factors, I realize our personnel have not all progressed apace.

I fail to understand why.

Our aircraft accident files date back to 1908. The files are complete except for losses due to combat damage. One reason for these files is their value as a source of research material for accident prevention.

On lesson we learned, long ago, was the necessity for strict air discipline, and we learned it the hardest possible way. Buzzing, unauthorized maneuvers, flying into adverse weather conditions, failure to go-around—those tactics and many more which stud the files with preventable accidents such as the one that cost the T-33, a pilot and an injured passenger taught us this lesson.

Why do we ignore what we've learned?

I can't account for breaches of discipline of this kind. Safety publications have, over the years, repeatedly provided fact-founded reminders of the necessity of strict air discipline. We have comprehensive training programs to acquaint us with capabilities and limitations of our equipment. Throughout history *discipline* has been recognized as vital in successful conduct of military operations. Commanders are expected to reflect and require absolute adherence.

It is because this precept is so fundamental to the military man and the military operation that I am unable to accept accidents of this nature. These should be the simplest kind to prevent. We don't have to modify our aircraft systems or indoctrinate our crews with new techniques and procedures; we merely have to abide by time-proved fundamentals.

During an instrument approach an F-102 struck a perimeter fence a quarter of a mile short and 20 feet below the runway elevation. We would have had one less accident had the pilot not descended below minimums on an instrument approach. Discipline!

A T-33 was observed flying just above the tree tops when the right tiptank came off. The aircraft banked left and struck the ground in a nose low, vertical bank. Materiel failure was found to be secondary in this case due to the fact that deliberate violation of AFR 60-16 precluded any chance for recovery. Investigation disclosed, too, that seat pins had not been removed and the zero second lanyards had not been connected to the D-rings. Discipline!

The people of the United States have entrusted us with a most responsible mission. They have provided us with funds and equipment to carry out that mission. They have given us opportunities to demonstrate our capabilities, frequently for all the world to see. Each of us owes an obligation to such a trust. High standards of professional conduct and absolute adherence to principles of sound discipline are minimum requirements of this obligation.

I doubt if lessons we can learn from these accidents will offset their tremendous dollar cost, and the scars they've carved in our reputation as professional airmen. If we do benefit it will be from publicity that has focused the harsh glare of attention on our inadequacies. Even then if we are to realize benefits each individual must apply such accidents as personal lessons, and rededicate himself to precepts of sound discipline. Further, and these accidents often exemplify this aspect also, supervisory personnel and those in command positions must exemplify discipline themselves, and exact it from their subordinates. Theirs is an even greater trust; if they lack the maturity to warrant it, they are malassigned.

The lack of discipline that made these accidents possible was not condoned at the time, nor will it be condoned in the future. If inducement to prevent such breaches of discipline isn't high enough already, more stringent measures must be found.

As has been observed, it is not the unknown, but the unrespected that so often results in accidents. ★

Major General Perry B. Griffith, Deputy Inspector General for Safety, USAF

HERE WE GO AGAIN

Another year has rolled by and here it is time again for the safety types to go to work on the problems that face us in 1962. Specifically, the purpose of the Second Annual Congress is to study the problems confronting the Air Force in the areas of flight, ground, missile, and nuclear safety and to develop practical recommendations.

You would get a big lift from seeing the caliber of people who attend and the intense interest they take in this conference. Let me give you a thumbnail sketch of what goes on. This year the Congress has moved to Sandia Base at Albuquerque, New Mexico. The people at both Kirtland AFB and Sandia Base will have worked long and hard to handle the many details that go along with hosting about 300 conferees.

Monday, 25 September, is set aside as Commander's Day. If the '61 Congress is anything like last year's, there will be 25 to 30 General Officers from the major commands. Also there will be division and wing commanders in large numbers, many of whom will stay the entire week. The big safety picture for 1962 will be presented by the head man in the safety business, Major General Perry Griffith; and during the rest of the morning and afternoon of the first day, keynote speakers of major commands will give safety presentations on selected subjects that are never less than outstanding.

Tuesday morning the five seminars begin: flight, missile, nuclear, ground, and education-training. It is in these seminars that the 1962 safety programs are given in detail. The major objectives will be presented as well as the methods and responsibilities for implementation. As important, will be the discussions on the selected problem areas and the recommended actions for their resolution.

By late Thursday night the spade and shovel work will have been completed but the seminar chairmen will work even later polishing and refining their reports to be given in a general session Friday morning.

While the reports may not weigh five or six pounds each, they contain the results of dedicated conferees working like crazy for three day and some nights. From the conclusions and recommendations should come tangible results to decrease the accident potentials of the future.

Friday afternoon the goodbyes are said, and so ends another Air Force Safety Congress. See you in 1962!★

JLT

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VOLUME SEVENTEEN NUMBER TEN — USAF RECURRING PUBLICATION 62-1

Above, specialists assist during a SAC inflight emergency. Below, more help is available at the flick of a switch.

Keynote 27, a fully armed B-52 in the hands of one of SAC's select crews, thundered down the runway at a west coast base and into the evening sky at the time most area residents were having dinner. If all went well Keynote 27's tires would roll onto the same strip of concrete 24 hours later. If trouble developed she might be back sooner. In case of war she could merely alter course and be off on the actual combat mission for which SAC has rehearsed constantly for years.

Keynote was at 20,000 feet, climbing when trouble started. A red light flashed on—No. 3 alternator. Another, the No. 4 engine fire warning. No. 4 engine was shut down. Another red light—No. 3 engine. No. 3 engine was shut down. The tail gunner reported fluid loss from No. 2 nacelle. Another light, the No. 6 hydraulic pack low pressure warning light. This system was now inoperative. A moment now to assess; fuel flow, fuel feed valve control and No. 4 firewall fuel shut off valve circuit breakers were popped on the panel behind the copilot.

Now, the moment the emergency had been contained, a microphone button was pushed. News of the emergency and a brief account of what had happened and had been done was flashed from Keynote 27 to the Wing Command Post. At the home base, immediately, the Control Officer on duty, recognizing the seriousness of the emergency, picked up a phone and passed the information to the Command Post Duty Officer at 15th Air Force Headquarters, March AFB, Calif. Keynote 27's pilot, meanwhile, was advised to abort the mission, remain in the local area, and burn off fuel to normal landing gross weight.

The call to the Command Post Duty Officer at March triggered a rapid-fire procedure planned for just such a problem as Keynote 27 was experiencing. He notified the Senior Operations Duty Officer, one of 15 highly qualified senior officers who take turns pulling standby in the Command Post during other than normal duty hours. Others immediately alerted and called to the Command Post included a representative from the Standardization Division and a representative from the Directorate of Materiel—both B-52 specialists. A disaster control officer—an expert in post-crash procedures—was called in. The Director of Safety and a Boeing Tech Rep rounded out the group.

Each of these men took a designated seat at a special console in the Command Post. Each, by picking up a telephone, was in on a conference call with the Unit Commander at Keynote's home base. Banks of switches on the console made it possible to contact other key people for assistance or to pass on information. One switch was flicked and the Headquarters SAC Command Post at Offutt AFB, Nebraska, was on the line, too. People there had a need to know.

The group of specialists conferred and provided pertinent information to the Unit Command Post. Any advice that might benefit the crew was forwarded by the unit direct to Keynote 27 via UHF.

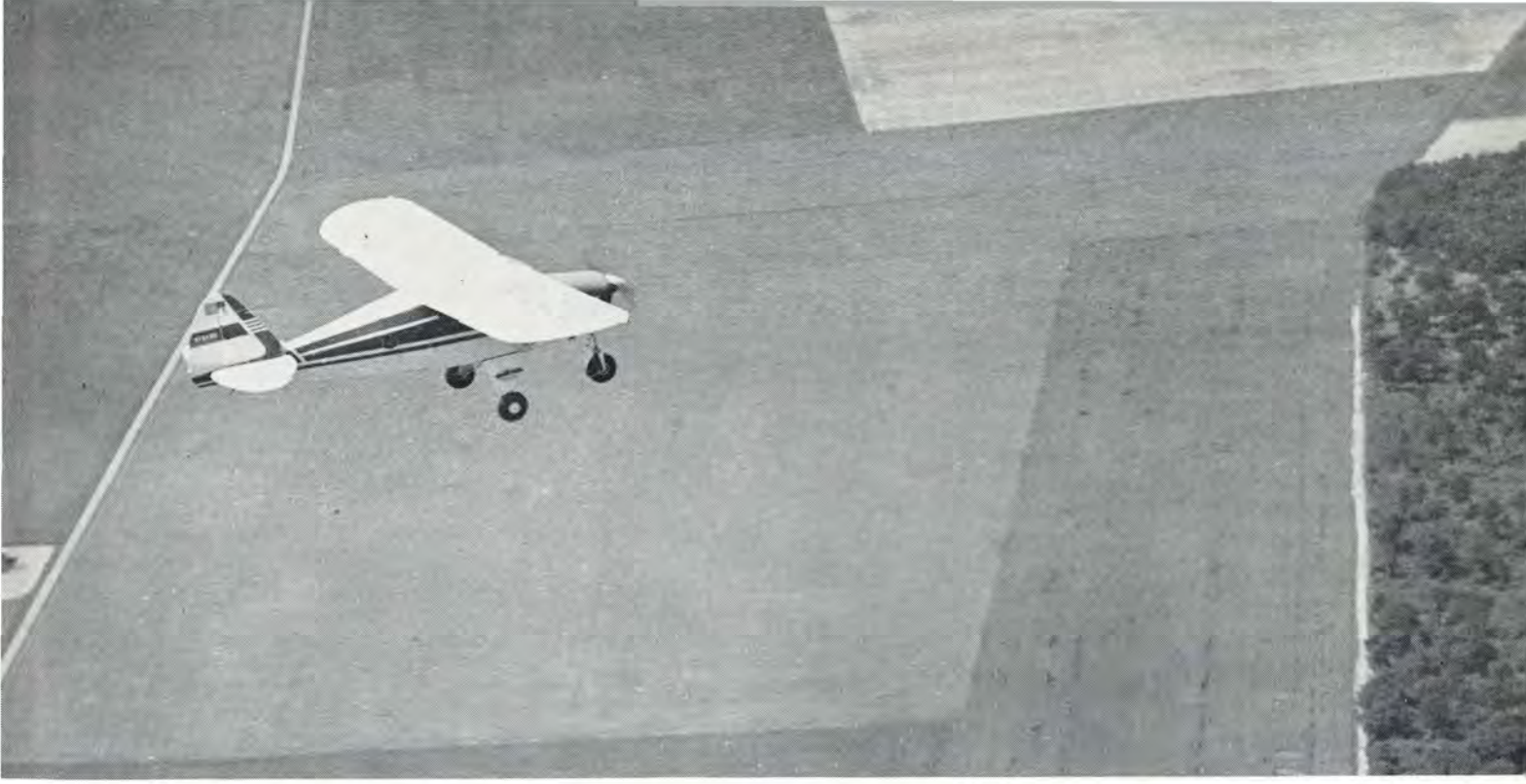
From information made available by the crew and passed on by the Unit Command Post, the team at the console carefully evaluated the emergency. Standardization and factory representatives had files of Dash Ones for all SAC aircraft at their console positions. The tech rep had an engineering manual open. Current weather at the base of intended landing was carried on a TV screen overhead.

Information was obtained as to the qualifications of the crew. Was an IP aboard? Had an IP been sent to the tower?

Nearby alternate airfields were checked by referring to a quick reference chart that lists such pertinent information as runway lengths, lighting, and so on. Another chart provided up-to-date information on all navaids at facilities where the aircraft might be recovered.

Two hours and fifteen minutes after takeoff Keynote 27, cruising on six engines and burning off fuel to get down to landing weight, experienced further difficulty. Another red light came on: the fire warning light for engine No. 5. Things were getting too much like previous mishaps which involved pneumatic duct failures. Serious structural damage could be in progress. Get him on the ground! The team at the console recom-

NEVER



LOW AND SLOW •

Air Force Aero Clubs have become major recreational activities. There are 175 of them with about 15,000 members; nearly every CONUS base has one. They are also becoming more popular overseas. These clubs operate 840 light aircraft ranging from two-seat trainers that fly at 65 miles an hour to four-place aircraft in the 180 mph class.

The size of the program has made it a flying safety factor at every base that has a club. Most clubs operate on base, which should automatically place them within the base flying safety program. But even those that operate from civilian fields should be monitored by the flying safety officer.

Organized as an Air Force non-appropriated fund activity, the Aero Club program is regulated by AFR 34-14, command supplements and FAA regulations. The guidance the clubs receive depends on the interest taken in them by the commands and the base commanders. It is the commander who is responsible for determining whether a club will operate on or off base, what kind of facilities it will have if located on base, the hours during which it may operate and many other factors that have a direct bearing on the fortunes of the club.

Because they offer military and some civilian employees the opportunity to learn to fly and to fly at rates within their income, the number of clubs and members has mushroomed. But this rapid growth has brought with it problems that other recreational activities do not have. While financial stability and good management are common problems, flying safety is a special problem of the aero clubs and cannot be divorced from the other two. A financially shaky club may not be able to provide its members with safe aircraft, thus compromising flying safety. An unsafe act by a member may result in an accident, possibly a fatal one, which can jeopardize a club's finances, or put it out of business.

Both flying safety and strong fiscal standing depend on good management, which is a problem because of the very nature of the clubs. The officers are elective and they must work on club business during off time in the evening or on weekends. As with any voluntary organization many clubs find that their members joined to fly and either can't or won't contribute the labor necessary to accomplish all that needs to be done. The club officers may find that they must do nearly all of the work and this soon becomes a chore.

Usually a club starts out with one aircraft. As the club grows it learns what kind of additional aircraft will best meet its needs. A trainer may be needed for students. As growth continues the club acquires higher performance, four place planes such as Piper Comanches, Beechcraft Bonanzas or one of several Cessna types for cross-country flying.

As users of civilian aircraft the aero clubs have become a potent source of sales for aircraft manufacturers, fixed base operators, and suppliers of equipment such as tires, radios and small parts. The clubs have approximately $2 million invested in aircraft, not to mention the amount they spend on parts, services and supplies.

Another boon to aviation is the number of private pilots created by the program. Many airmen who could not otherwise learn to fly can do so through their base aero club. Many of these have later bought planes, and the potential over several years is obvious.

It might not seem that Air Force pilots would be

Complete and neatly arranged informational files are evidence of a well managed Aero Club. Meticulous inspection pays safety dividends too.

a very good source of membership for aero clubs. However, these pilots have families and know the value of the airplane as a means of transportation. Many of them join a club in order to give their wives and children a ride or to use the aircraft for vacation trips.

As a nonappropriated fund activity, Aero Clubs are expected to pay their own way and are prohibited from using appropriated funds for club activities. When a club arrives at about the 50-member mark, with two or more aircraft, its problems can become serious. It is at about this time that the officers realize the myriad things to be done to keep the club running smoothly might require too much time and effort for after hours and weekends. Many clubs have solved this problem by hiring professional managers who instruct, maintain the aircraft and keep records. Many instructors, however, are members who are licensed FAA instructors.

An aero club is unlike any other base recreational activity. Not only is its equipment costly, but it must be maintained in top shape at all times and thoroughly inspected frequently. This is expensive, yet the club must keep its charges for flying as low as possible. Its area of potential membership is restricted far beyond a golf club or a hobby shop. Members must be able to pass a rigid physical examination, and they must have more than just a desire to fly. A lot of learning goes into obtaining even a private pilot's license and they must be willing to spend the time and effort to gain the knowledge required to pass an FAA examination.

Despite the relatively low price of aero club flying, it can still be expensive. People have joined aero clubs only to find within a short time that they do not have the financial means to continue. Then, there is another aspect to the cost. The person who cannot afford to fly frequently can be a hazard to himself and any passengers he carries, particularly if he is a new pilot with low time.

Commanders who have aero clubs on their bases, or who are asked for permission to establish one, soon realize that unless they are willing to support the club they would be better off without it. You don't have to worry too much about somebody getting killed on the golf course, or at one of the service clubs. But flying is a different thing, especially when light airplanes share the local area with military aircraft. If the decision is made to permit the club to operate on a base, then both the commander and the club members share responsibility for safe operations. The flying safety officer should be prepared to assist the club and monitor its safety program. Operations must assure that the required procedures are established and followed. Club members must realize that membership is a privilege and that they must carefully adhere to rules of safe flying.

Flying safety is probably the first question that arises when the decision is to be made as to whether the club will operate on or off base. Can light aircraft with pilots of widely varying experience safely share the runways and local airspace with bigger, faster military aircraft? With exceptions, such as some jet training bases with very heavy traffic, they can and do. Each base, however, has its own situation to consider—amount and kind of traffic, facilities—in determining how and where and when its aero club will operate. The trend has been for base commanders to put their aero clubs on base where they can better supervise their activities and thus maintain a good safety record. This safety record varies with commands. Some clubs, even some commands, have a 100 per cent safety record. Others haven't done so well.

Aero clubs have no exacting mission—they are not defending the nation. Therefore safety should at all times come before mission accomplishment. There is no reason for flying unsafe light planes. A club would be better off to go out of business than to risk the lives of its members in unsafe aircraft. There is no place in an aero club for the hot pilot who must demonstrate his ability with buzz jobs and other such hazardous escapades. He is not only a hazard to himself and others in the vicinity, but he can ruin a club by destroying an aircraft or by killing himself and others. This is stressed because of all fatalities in aero club flying last year, 75% were caused by buzzing and similar horseplay.

Recently the Air Force has been taking a close look at the aero clubs by way of a special subject inspection under AFR 121-3. The Inspector General is looking at such items as standardization procedures, flying safety programs, use of manpower, management, record keeping and financial management.

Possibly the biggest single problem many aero clubs face is lack of guidance. While AFR 34-14 provides

Instructor patiently explains the instruments to an Aero Club student pilot. After careful planning and preparation, a safe flight in the offing.

the basic dos and don'ts, it is not a complete guide to aero club operation. Realizing this the Air Force has compiled a manual covering all phases of aero club operation. When it is published and distributed it should provide the clubs with the guidance needed to solve many of their problems.

Command supplements to the basic regulation go into more detail than the basic regulation and provide a new club with more of the "how-tos" than simply the "you-musts." At least one command (MATS) has an Aero Club Rating System based on points gained on weighted factors;

- Net profit per member.
- Net worth ratio.
- Flying hours per aircraft.
- Flying hours per accident.

The club with the highest number of points for a year receives a command trophy. This idea is now under consideration Air Force-wide.

MATS is one of the commands with a fine safety record. During the past three years there has not been a casualty nor a total aircraft loss in the command.

"This splendid record is due in part to the personal attention and close supervision given by base commanders to the operation of these clubs," says Capt Frank D. Jernigan, Assistant Chief, MATS Special Services. This is reflected in the attention given the aero clubs. The MATS supplement published this year includes 28 basic points for its aero club improvement program. Some items are standardized financial control, prescribed safety program, procedure for obtaining loans and the annual MATS Aero Club Trophy.

Since the first Air Force aero club was organized in 1950 at Offutt AFB, the program has spread overseas. Within USAFE there are 24 clubs operating in nine countries. They have a total of 61 aircraft. Six of these clubs are in England, five in Germany, and there is even a small one with one aircraft at Iraklion, Crete.

There are eight Pacific Air Forces clubs with 505 members and 45 aircraft in which they have invested $86,000. At one time one of the clubs employed eight Japanese nationals to assist in maintenance and office work.

SAC has the biggest program: 45 clubs with 4300 members operating 155 club-owned aircraft plus some on loan from the Air Force. SAC clubs have about $900,000 invested in light aircraft.

The purpose of the program, as defined by regulation, is to develop skills in aero sciences useful to the Air Force and to provide authorized personnel with flying as a recreational activity. Last year the program was evaluated and found to be beneficial, desirable and in consonance with the Air Force mission. From this evaluation came a number of recommendations for improving the program. They can be summed up into two categories: self improvement and command support.

Although the program appears to be improving, some clubs have been charged with lax management, poor procedures and an excessive accident rate. If the program is to continue to grow and meet the objectives for which it was established certain requisites must be met.

Each club must examine its own management and tighten up where necessary.

Base commanders, if they are to permit aero club operation on or off base, must support the club and keep themselves informed as to how it is doing. Frequent meetings between the commander, the club president and the club advisor for discussing problems, offering advice or giving instructions can do more good than a dozen regulations telling the clubs what they must and must not do. Some clubs have a written agreement with the commander defining privileges and responsibilities.

Flying Safety officers must include the aero clubs in their safety programs and furnish them with copies of AEROSPACE SAFETY and AEROSPACE ACCIDENT AND MAINTENANCE REVIEW, posters and kits from the Deputy Inspector General, Safety.

Operations officers must help fit the club activities into the primary mission.

There should be better coordination and communications between the various clubs, commands and Air Force headquarters.

Finally, regulations and directives must be kept to a minimum consistent with safety and efficient operation. The program is a part-time recreational activity and should remain as such. Over-regulation could turn it into a full-time business and might be the very thing that could put it out of business. ★ RWH

PROFICIENCY,

Lack of proficiency in an aircraft can show up in many ways, from fumbling through a checklist to violent termination of aircrew and equipment usefulness against the face of a mountain. Of late, the lack of proficiency has been exhibited in the violent manner enough times to be cause of considerable concern in the Air Force.

At the half year point major accidents were up 14 over the previous year, fatal accidents up 12, total fatalities up 72, pilot fatilities up 11 and aircraft destroyed up 21. Studies in the Directorate of Flight Safety (which covered more than the half year) disclose that *the cause is due substantially to marginal or low operator proficiency.*

Enough of the numbers routine for now. Let's duck a little self-embarrassment here by asking that our word be taken that an analysis showed a considerable number of accidents experienced because of marginal or low proficieny. Most of these accidents were in T-33s, some in C-47s, aircraft predominantly used in proficiency flying.

Whether spelled out in numbers or not, there is irrefutable proof that we are losing lives and equipment at an alarming rate because of proficiency, *lack of.*

Predominantly these accidents fell into two categories: those occurring during ground operation or landing/takeoff (16 accidents) and those occurring when entering into or immediately subsequent to instrument flight (22 accidents).

Breakdown of the "proficiency, lack of" accidents by suspected factor in proportion to frequency of occurrence is: Vertigo (spatial disorientation), misjudgment (under shoot, overshoot, etc.), lack of capability (porpoise, loss of directional control on runway, etc), carelessness (failure to use checklist, etc.), navigational error and crew rest deficiency.

In addition to the review of accidents, a sampling of Form 5s was made in compiling this report. Although not necessarily representative, here are some findings from this sampling that disclose wide variances in how Air Force pilots do, or do not, go about maintaining their proficiency:

One pilot logged a total of 262 first pilot/copilot hours and no landings during 1960.

Four pilots did not fly at least one month of the year; two of these failed to fly four months of the year; one did not fly three months of the year and one failed to fly two months of the year. No PCS was indicated in these instances.

Landings varied from zero for a whole year to 84 by one pilot. Several forms studied indicated no landings in a 60-day period.

Ground trainer time ranged from zero hours to a high of 38. Seven showed no trainer time and six indicated less than four hours.

There is no intent in this article to spell out a training program or a specific guide to solving the ills in *your* particular case. However, a few considerations would appear to be in order. These come to mind in light of this study. You may, after honest self analysis, have more. This business of CRT proficiency, if we apply it conscientiously, boils down to individual units, supervisors and, above all, the pilots themselves who utilize, effectively or ineffectively, their CRT time.

If you don't want to get caught, as some have already, it might well pay you to analyze the CRT program on your base. For some pilots actual stick time is only half of the flying time logged. Inadequate supervision can dilute the effective use of this time even more if utilization of the CRT pilot's time aloft is left to his own ingenuity, or lack of ingenuity.

This study brought out (22 accidents due to disorientation when entering into or immediately subsequent to instrument flight) that there may be room for improvement of instrument training programs. Scheduling of synthetic training devices for maximum use and practice recoveries from unusual positions should pay off in fewer accidents from the cause factor: instrument proficiency, lack of.

Experience, lack of, is another problem area reported. Another recent study by Dr Anchard F. Zeller, Office of DIG for Safety, demonstrates that the lesser experienced jet pilots have a collective accident rate almost two times that for more experienced pilots. This is particularly true during the transition from one jet to another or during initial transition. It is logical then that the relatively young and inexperienced jet pilot be given close supervision during the early stages of his flying career.

There are indications, too, a higher accident rate is associated with limited amounts of current flying. This undoubtedly reflects the loss of proficiency which comes from lack of practice.

In view of the numbers of mishaps involving misjudgment of approach (12 reported in this study), this phase of flight continues to deserve close attention. Sterilization of the approach ends of runways to the point of touchdown is one way of improvement here.

Then too, everyone, individually, must personally accept and fulfill his professional responsibility and each organization down to the flight crew level must constantly self-evaluate existing procedures and standards if we are to cut down accidents such as those summarized below.

ACCIDENT BRIEFS

Following are briefs of C-47 and T-33 accidents in this study. Accidents were included only if they fell within one of two criteria: (1) Operator possesed relatively high total time experience and low operational experience in the aircraft involved, (2) Operator possessed ample time in aircraft involved but had not flown enough (in opinion of reviewer) in recent months prior to accident.

C-47

- Pilot landed downwind from instrument approach (18K tailwind). Aircraft ran out of control off runway into ditch.
- Pilot made a hard landing. Blades hit runway when pilot attempted to stop the bouncing by pushing nose of aircraft down. Weather was not a factor.
- Aircraft crashed in mountains 49 miles off course. Copilot was experienced in jets. Had flown two

LACK OF

hours weather in preceding six months. This was pilot's first flight and copilot's second flight in theatre. Unfamiliarity with IFR procedures and facilities believed to be a factor.

• Hit mountains trying to maintain VFR under instrument conditions. Pilot had been flying T-33 aircraft past three years. Unaccustomed to low performance C-47.

T-33

• Undershoot. Encountered snow glare on approach.

• Porpoised on landing, improper recovery, washed out gear. Pilot was jet indoctrination student on initial solo flight in T-33.

• Improper SFO pattern, stalled at low altitude, landed on overrun in attempt to go around, gear up.

• Aircraft ran off runway, could not attain takeoff speed. Used incorrect abort procedures. One break of four years in training and one of two years.

• During SFO civilian aircraft in traffic pattern so SFO pattern extended. At field boundary, pilot noted that he was short so applied power. Aircraft touched down at 120 knots, 150 feet short of the overrun, shearing all landing gear.

• On a cross-country flight a landing was made at a strange field. The approach was made at a shallow angle and the aircraft gear struck a hump in the stabilized area, not an overrun, on the approach to the runway. Right main gear spar was found cracked.

• Descended through an overcast 400 feet, light snow and fog. The aircraft stalled and contacted pierced steel planking 786 feet short of overrun.

• One minute after takeoff the pilot declared an emergency; four minutes after takeoff the pilot declared MAYDAY. The aircraft had flamed out; the pilot was unable to eject and rode the aircraft to the ground. The pilot did not turn fuel switches to the ON position.

• Administrative flight to deliver a passenger. The aircraft departed on an instrument flight plan and five minutes after takeoff the pilot declared an emergency and reported a flameout. An attempt was made to glide under radar control to a nearby air field but en route the aircraft crashed.

• As the aircraft neared the runway on final approach it contacted the ground.

• Struck power line poles on night takeoff in low ceiling.

• Lost control during night takeoff in weather.

• Flew aircraft into ground after takeoff.

• Aircraft and crew not located after changing clearance at low altitude on night cross-country flight in weather.

• Crashed after takeoff. Disorientation during night weather.

• Night cross-country. Disorientation after changing flight plan to alternate in marginal weather.

• Weather 50 feet, one and one, half mile, fog, rain, radio difficulty was experienced, prolonging holding. During GCA dogleg to final, the pilot apparently allowed the aircraft to descend and strike the ground.

• Collision with ground. The aircraft was cleared to climb IFR to 33,000 feet. Takeoff was 26 minutes prior to the crash and normal radio transmissions were made prior to the crash. The pilot had been flying four types of aircraft.

• Collision with ground. Two minutes after takeoff, the aircraft crashed. Weather was 500 overcast. Violation of crew rest regulation.

• Crashed while attempting landing in low ceiling in low turn.

• Night administrative flight for the purpose of transporting military personnel. After return solo, the pilot was flying ILS approaches. Tower personnel last observed the aircraft in a shallow left turn from traffic. The aircraft crashed.

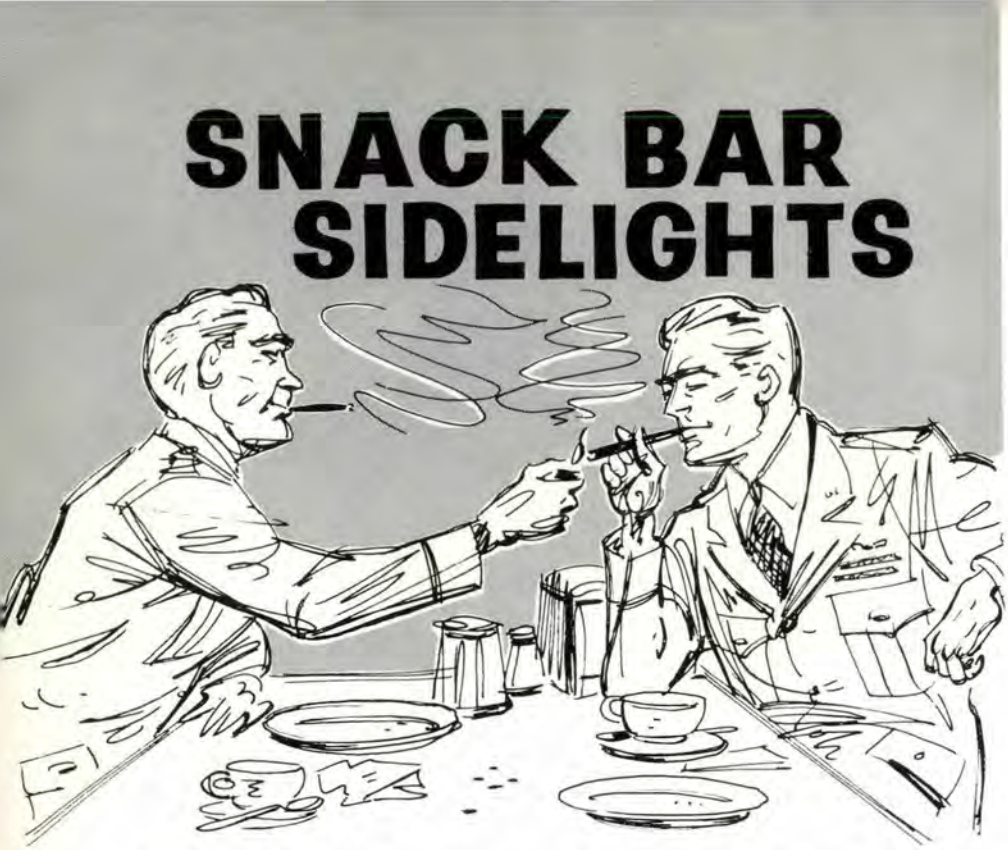
• During penetration the aircraft was flown into the ground. On GCA surveillance approach to runway the track was not maintained.

• During descent in holding pattern the pilot turned his head to look at the rear over his right shoulder. He then returned attention to his instruments and realized that he had entered an unusual attitude. His attempt to regain control of the aircraft was in vain. He abandoned the aircraft at approximately 12,000 feet.

• Destination weather deteriorated so the pilot diverted. He became lost during letdown and was finally vectored by GCI to a nearby airfield. At landing the aircraft porpoised and the nose gear sheared. ★

This article is based on a study of major accidents in which low pilot proficiency—Commensurate with credited flying hours—is a suspected factor. Recognition for the study, conducted during the last fiscal year, goes to Lt. Col. J. M. Rodgers, Lt. Col. K. I. Bass, and Lt. Col. Robert P. Paulin.

SNACK BAR SIDELIGHTS



"Hi, major, join you?"

"Glad to have you, lieutenant."

"You're the flying safety officer, right?" the lieutenant asked, putting his tray on the table.

"That's right, Jim O'Niell."

"I'm Williams, one of the IPs in flying training."

"I know—you look beat," O'Niell said.

"Sure am, more mentally than physically, though. I'm still struggling for the old answer."

"What's that?"

"These checkouts. What're acceptable minimums for checking a guy out?" the lieutenant asked.

"Well, does he fly safely, know his procedures, complete all required maneuvers satisfactorily? Apply your judgment as an IP. He either hacks it or he doesn't."

"It isn't that simple. In theory it is, but up there in the bird, it isn't."

"How so?"

"Take this guy I just flew with, a light colonel. He gets his ten hours a month and, naturally, isn't too smooth. I can understand that. But his knowledge of procedures is about on a par with his flying. This is where it gets binding. How much leeway is he allowed?"

The FSO didn't hesitate.

"None. He either knows his procedures or he gets another chance to learn them, then takes another checkout ride. If there is something he doesn't understand you explain it to him."

"As I said, it's not that simple. I flew with this guy last week. He got mixed up on his hydraulic emergencies and I suggested we count it an instructional ride and give it a go today. Today you might say he was much improved. He only left out one step, but that step nullified the whole procedure. In an actual emergency, this one omitted step could cause an accident. I told him we'd have to try it again. What do you think he said?"

"Tell me."

"'Look, lieutenant,' he says to me, 'I've got an important conference to prepare for and won't have time to spend on studying the Dash One. Let's be reasonable about this. I left out one item. I'm squared away on that now. The rest of the ride was passing. I've got 6000 hours and can judge to a pretty fair degree, you know. Why don't you just sign the form?'"

"What did you do?"

"I compromised. I had him explain the emergency step by step until I made sure he had it right; then I signed him off."

"And now your conscience bothers you?"

"I guess that's it. I went up to Wing, got permission, and spent two hours going through accident folders. You know, just as I feared, in every case there were factors to show that people are not doing the job. These factors fell into three categories. In some, they had direct bearing on the accident—like the pilot failing to connect his zero lanyard. In others, it appeared they did. 'Pilot's oxygen mask had deteriorated to the point where it is doubtful if proper functioning was possible' is a case I remember. Some seemed to have no bearing. For example, three crewmembers had no footprints on file as prescribed by AFR so-and-so."

"All discrepancies discovered are customarily noted in accident reports," said the major, "whether they have apparent bearing on the accident or not."

The younger officer was still disturbed.

"The thing that bothers me is what is the acceptable minimum? I don't mean as to flying technique—I think I can tell whether or not a person can fly without bashing himself or the bird—I mean as to his knowledge of the aircraft and its systems, radio technique, departure and approach procedures—that sort of thing. Using the discrepancies in accident reports as my basis, I contend that mistakes are made on every flight, at least by CRT pilots like the colonel I just flew with. Agree?"

"Possibly you're right. As a safety officer my concern is not so much whether or not mistakes are made, but whether or not they are potential accident triggers, What I mean is, say a pilot makes a position

report and includes more information than necessary. This is a mistake; he's using too much frequency time, but I don't think this error is very significant from a safety standpoint. But if he reports he's at an altitude other than his actual altitude; or if he isn't using the correct altimeter setting—this can have considerable safety significance."

"Then you're saying some mistakes are acceptable and some are not. Who differentiates on this, the IP who flies with him twice a year? Am I supposed to weigh his mistakes, then pass judgment as to whether or not he will be a safe pilot for six months hence?" the lieutenant asked.

"I would say this is part of being an IP."

"This is an area we have very little guidance on," the lieutenant said. "I have been rated three years, the last 15 months an IP in a T-Bird. The pilots I fly with have, in some cases, nearly 20 years rated experience. Many have more jet time than I have. Virtually all outrank me by two, three or four grades. Not a single one has, in my opinion, done everything perfect on a flight. They haven't been dangerous to the extent of having a near-accident—except two or three—but they all fall short somewhere. Usually it's a new procedure; they simply can't keep up to date on everything.

"Am I supposed to be a good Joe, be understanding and point out these little things and forget or am I supposed to write all these little things up. If I write them up I'm a heel—a kid instructor who has no respect for years of experience, no consideration for the fact that these guys have full-time jobs in addition to flying, no understanding of the easy way to work the game.

"If I'm too easy, then I can go around with my fingers crossed, hoping they make it each time they go up. When the field socks in, I can hope the guys I've kept from spinning under the hood are not flying. When I hear of a flameout I hope it isn't one I had to keep reminding about using alcohol.

"Sure I'd be a real fine guy, but I'd be skating on thin ice and so would some other guys. The only difference would be, I'd know it, but I'm not so sure they would."

"Here, have one of mine," the major held out his cigarettes. "Have you discussed this with your Ops officer?"

"What can he do? He's really in the middle. If I give one of these guys a hard time, he takes it in both ears. After all, they wear command wings, leaves or eagles, they've survived combat and flown 20 or 30 different airplanes. It's real hard to argue against them."

"Are they all like that?"

"No, but many are, to a degree. They like to be reminded they've still got some of the old smoothness—few have."

"I would say the only solution to your problem is to stick to Dash One procedures and insist everyone operate accordingly. Keep it strictly business. Be factual, unemotional; appeal to their professional pride. If you hint that they're dangerous to themselves, they'll resent it. Use a little psychology on them. You'll have to get them to want to do right. If you once start accepting below standard performances, you'll gradually accept less and less."

"Major, that sounds good. And, I guess, it's about as close to a solution as we can come. But it's mostly theory. There's a lot of politics in this. I have to average out the flight; a little weak here, but I offset it with something that was a little above average. These guys are humans. They're vain, they eat up encouragement, relax, and show me their best when I say something like, 'You're doing fine.' But if I say, 'Sir, I would like you to get straight and level, then run through it again, you left out two items,' this is a sure way to make them unhappy—not with themselves usually, but with me. Sometimes it can eventually get so bad I have the feeling I'm almost being dared to write up a failing ride."

"We can bring this up to the Old Man. I know we can get his backing. He will flat tell you they either cut it or they don't. His neck, my neck, the Ops officer's neck and your neck—all our necks—are out a mile if we have an accident and it comes out that the pilot wasn't *really* qualified."

"I'd rather names were kept out of it," the lieutenant said.

"Oh, sure. Names wouldn't help. I'll fill him in; apparently it's getting bad again and I know he'll spell it out at the next fly-safe meeting."

"You think it will help?"

"I'm sure. He will get on the old 'get our your Dash One and study it until you know it' bit, and you'll see a big improvement—for a while."

"That sounds good. It sure would help if they'd only read their Dash Ones more."

"And, lieutenant, should this situation not improve, let me know, or on anything else. That's what I'm here for. You'll either find me down the hall, poking around on the line, or in here. More coffee?"

"No, I don't have time right now. Gotta hold down the scheduling desk for a couple hours. Thanks, major."

"Anytime." ★ TJS

SUN MON TUE WED THU FRI SAT

ONE WEEK IN MAY

Last May wasn't much different from the average month of May that rolls around every year. The weather was about the same as usual for that time of year—a few showers back east, snow flurries up north, dry in Southern California with smoke and haze (SMOG) predominating.

Kids were looking forward to liberation from school (so were teachers), brides were busily preparing for their pending nuptials and storm windows were coming down in New England. There was a difference, though, probably not statistically but certainly specifically. Just one week out of the month will suffice to show you what we mean about *different*. Four Air Force men lost their lives in ground accidents that could have been prevented.

For them that week was certainly different—it was their last on this earth. One of them drowned, two were killed in automobile accidents, and the fourth was electrocuted while working at his trade. In each case one or more simple precautions would have prevented the ensuing tragedy. Now, if that were a typical week we could multiply by 52 and come up with only 208 accidental deaths for the year. But it wasn't typical, you see, totals are usually more than four a week, so our multiplying factor climbs up the scale. Where it will stop can only be determined by you, and I mean you who are reading these words, right here, right now. I don't know your name, where you are stationed, how old you are, whether you are married or single, or whether you have no children or six or more. I do know this: Next Monday when the accident reports for this week are compiled I will know all these things about four or five, or maybe six or ten of you. (Last year there were 565, more than 10 a week.) Now, I don't like to sound unfriendly, but I'd rather not know these things because it will mean that you are dead.

Review these accidents with me. I have the four reports before me.

The first concerns a Captain who liked boats. Early one morning he put out in the marina alone in his boat and spent the day enjoying himself. In the evening a dense fog bank rolled in from the ocean. A little later the Officer of the Day was notified that the Captain had not returned and that the fog was getting thicker. The Coast Guard was informed and a search party assembled. Finally, about 10 PM, the boat was found, but it was not until the following afternoon that the Captain's body was recovered. Death was by drowning at approximately the time the boat was found.

It was ascertained that there were four known factors: The officer continued to operate his boat in thick fog; the boat was not equipped with seat belts; the body was found without a life preserver; the buddy system was not used.

It is too late for the Captain, but the squadron now requires:

- Personnel to log in and out when boating.
- Boat users to attend boating class before being allowed to use the marina.
- All incoming personnel to receive an initial interview with the Commander on water safety.

The next two fatal accidents are fairly typical. We see this kind every week. The airman, accompanied by one passenger, was driving at about 70 miles an hour—the legal speed limit was 50—and the weather was foggy with about 300 feet forward visibility. Time 10 p.m.

About one mile east of a small town the road curved sharply and the car was unable to make it at the speed it was traveling. The driver hit the brakes, rolled on to rain-softened shoulders and turned over twice. The car finally stopped on its top, 195 feet from where the skid started. The passenger, fortunately, was not injured, but the airman died. There were, incidentally, no seat belts.

A week later a Tech Sergeant at another base was killed when his car, traveling at about 75 mph, left the highway and skidded 110 feet along the edge of the roadway. The car then crossed a two-lane highway and traveled 30 feet along a ditch, hit a pair of six-inch square posts, and rolled over four times. The car traveled a total of 395 feet after the brakes had been applied.

The night was clear, the roadway smooth, and there was no evidence that the Sergeant had been drinking. There was, however, the eternal curve. The Sergeant was thrown into the back seat of his car and died from multiple head injuries. As in the previous case there were no seat belts.

The final report is even more tragic, if that is possible. The Staff Sergeant was noted for his ability and was considered one of the outstanding young NCOs in the squadron. He had been cited on several occasions for his intense desire and interest to excel in ground safety. Nevertheless, in checking some electrical equipment, he committed a fatal mistake and was electrocuted. Why? It was felt by investigators that the Sergeant was so engrossed in the task at hand that he completely ignored the same basic safety precautions that he continually urged upon the men under him.

That's it for one week in May. There aren't any more. But next week there will be a new folder made up. In it will be the same dreary accident reports of deaths. Will one of them be yours? ★ RWH

WELL DONE

1st LT LELAND WOLFORD

539th Fighter Interceptor Squadron, McGuire AFB, N.J.

LT. Leland Wolford was flying Number One position in a flight of two F-106s on a night intercept mission against five B-52s at 43,000 feet. This flight, from McGuire AFB, was conducted under an IFR plan, VFR on top.

While flying approximately 200 miles out to sea, southeast of Atlantic City, the first intercept was a successful simulated missile attack against the target aircraft. Upon commencing his second pass, Lt. Wolford observed complete AC and DC power failure. Several unsuccessful attempts were made to reset the generators; however, the emergency generator functioned properly and provided AC cockpit lighting plus UHF transmitter and receiver capability.

At this time Lt. Wolford declared an emergency and joined up with another '106. During the join-up, his speed brakes were extended to reduce the over-take speed on the lead aircraft but he was unable to retract them. This, of course, put Lt. Wolford in a rather precarious position because with speed brakes extended he was able to maintain only 200 knots at 100 per cent military power at 40,000 feet. Lt. Wolford decided to return to McGuire, at 40,000, because of the limited amount of fuel remaining.

Prior to descent, cockpit heat was turned full "up" to prevent the windshield and canopy from fogging over. An unrestricted letdown was obtained under GCI control, and at 7000 feet, the canopy and windshield iced over. Momentary visual contact with the lead aircraft was lost until the left side of the canopy could be cleared by hand, contact re-established, and join-up executed.

By now the battery and radio transmitter had gone dead. Lt. Wolford circled the airfield for about 10 minutes until the windshield and canopy ice began to melt. He used a flashlight to signal the lead aircraft that he intended to land, and a precautionary GCA landing pattern was set up. On base leg, because of the lack of DC power, the nose gear did not indicate down. He pulled the emergency gear extension handle and the nose gear went to the down and locked position.

With no lighting in the cockpit, Lt. Wolford used his flashlight to determine his instrument readings prior to landing. The ice on the canopy and windshield reduced visibility to a minimum so a formation approach was executed, and over the end of the runway the lead aircraft initiated a go-around. Lt. Wolford made a normal touchdown and the drag chute deployed successfully.

Investigation revealed that the loss of AC and DC power was due to the complete failure of the engine-driven gear box. The cause of the incorrect functioning of the speed brakes was attributed to the malfunctioning of a signal switch plunger in the speed brake area, which is below the drag chute installation.

Undoubtedly, the superior skill demonstrated during this emergency saved a combat F-106 aircraft. Lt. Wolford's actions reflect much credit on himself and the U.S. Air Force. Well Done! ★

IF YOUR CHUTE DEPARTS,

Seemingly a properly fitted B-5 harness.

Feel pretty secure with that nylon strapped to your back? You do, except when you're too low? But there is the zero second lanyard—that helps.

Have to get out too high? They've thought of that too. There's a little bottle of oxygen aboard—just pull the apple. With automatic release and all, a guy can relax.

So you have to go. Those gents with the slide rules have got it all figured out for you. Pull up the handles. Pop! Canopy gone. Now the trigger—bye, bye, baby. Try to beat the system, pull the D-ring if you're low, but the lanyard will beat you. Or, if you're up where the lanyard's not hooked, don't worry. This little gem will open itself, besides you can always go for the handle.

"Bam! What happened? Where'd my chute go? Feels kinda lonesome up here all alone. Boy, is that ground coming up fast. It's going to be hard, too. But they say you never feel it. I wonder now."

There you were. One second happy and secure. Then something happened—your chute had ideas of its own. Whether it came off over your head or slid down your back really doesn't make much difference. It's gone. And there you are without even an umbrella.

Think it can't happen? It can and it has. In March of this year a pilot separated from his harness and was killed. The chute was found two miles from the body, and when examined, the harness was found to be adjusted for a man of six feet. The pilot was five feet six inches.

So pay attention, partner, these pictures will show you how. (Incidentally, this demonstration made believers out of the troops watching.)

Except, backstrap's a little loose.

Body jacknifes after leaving seat.

Leg straps and sling slide toward feet, pack moves up your back.

Look at 'er go . . .

Going, going . . .

Gone! A heck of a place for a chute.

Note all straps still fastened.

IT'S A FAST RIDE DOWNHILL!

Now that's only one way it can happen. There's another way, guaranteed to produce the same result. Observe as we go from left to right: Again, an apparently well fitted harness. But this time, note the backstrap. It has been tightened but we spread the chest strap a little. Ever hear of such a thing? Shoulder straps are like a loose brassiere and down they come. Wow! Lt. Col. J. L. Tissue, our guinea pig, is not sure he likes this. Finally, no comment needed, is there? Now reflect a moment—long flight, leg straps loosened a little and sling pulled forward under hips for comfort. What a perfect setup for a fast ride straight down, in case you have to leave the bird. For the eagle eyes: We know the subject was wearing low cut shoes. Also, that T-Bird in the background may show some discrepancies. It was being worked on. ★

When scattered from coast to coast and border to border, supervision and safety problems are built in. These and other problems can be solved. Read how, in . . .

A CAPELLA

Capt. J. E. Murphy, Det. 12, 2223d Instructor Sq (Nav Trng) (CONAC) Dobbins AFB, Ga.

Somewhere in the dark past of the Air Force a principle was evolved. Perhaps it wasn't actually a principle, and certainly the past of which I speak was not really dark, but a conscious practice was in effect, and it continues to this day—almost.

So that the shock won't be too great, let me lead into it slowly and gently by asking a question: "Did you ever hear of a squadron consisting of 30 aircraft, 60 pilots, 46 navigators, and numerous support personnel being commanded by a navigator . . . and the Squadron Operations and Training Officer also a navigator?

Before you shout, "Impossible! Only a pilot can run a flying outfit," let me tell you it's a fact. And furthermore, the squadron has an enviable mission accomplishment and flying safety record.

This seeming invasion of what once had been an area of responsibility reserved exclusively for pilots has been an accomplished fact for some time now in the 2223d Instructor Squadron (Navigator Training), CONAC. The squadron, with its headquarters at Robins AFB, Georgia, has 12 detachments scattered somewhat unevenly from the east to the west coast, and the commander of each is a navigator!

The assigned mission is to train 864 assorted weekend warrior type navigators in TC-47 aircraft and in ground school to develop and maintain their proficiency for M-Day assignments, mostly with MATS.

In case you're wondering what a TC-47 is, it's nothing more than the old Gooney Bird with 9 or 10 additional navigator stations installed in the cargo compartment. With this ancient equipment plus a few fresh approaches, the mission has been successfully and safely pursued from its inception in 1955. Since then the program has undergone several organizational and compound changes, assuming its present structure in July, 1960, but the mission has remained the same for all of that time.

Navigators conducting PE inspection prior to training mission.

Of course, there are reasons for the flying safety record alluded to. Some are almost built in; some have to be worked at. The TC-47 has been a reliable machine. In 1960 its accident rate was only 1.3.

The mission itself is relatively undemanding, since by the very nature of the training all flights are planned to be conducted under VFR conditions, and consist primarily of straight and level flight on six-hour round-robins.

Monthly flying safety meetings are required at each detachment for all aircrew members. In addition, the Detachment Flying Safety Officer is often a member of the Base Flight Safety Council and attends all Flying Safety Meetings conducted by the base.

The Squadron Commander and the Operations and Training Officer have a combined experience of 16,000 flying hours—one of the reasons they were selected for key supervisory positions.

We maintain a strong Operational Hazard Report-

ing program. Pertinent items from all OHRs are extracted and disseminated to each detachment. Also, detachments are advised immediately if any mechanical trends disclose potential hazards. Precautions are taken while Unsatisfactory Reports (URs) are being processed—the fix as soon as possible after the discrepancy is found.

Some safety considerations are not built in, and allowances must be made. The crews fly over a wide variety of terrain in equipment that was on the drawing boards back in the '30s. The airplane which revolutionized air transportation when introduced now must be babied, fussed over, cajoled.

A significant portion of the flying is to such diverse places as Bermuda, Newfoundland, Puerto Rico, and until recently, across Cuba to Jamaica and Panama.

These overwater flights are necessary to provide navigators with practice in LORAN and pressure pattern—a most important phase of their training. Naturally, being several hours from land when an emergency develops deserves consideration from a safety standpoint. Excellent maintenance, careful preflight and knowledgeable interpretation of instrument displayed symptoms are some of the things that pay off here.

The problem of supervision is considerable because of the vast geographical dispersion of the units.

In addition, most of the detachments are tenants on bases of other commands or have only limited maintenance capabilities of their own and are dependent in varying degrees for maintenance support on the whims (sometimes call priorities) of their hosts. This is not meant in any way to disparage the support they have received, for in most cases it has been excellent. It is mentioned merely to point out an area which is often outside each commander's direct control. However, the continuing need for the best in maintenance support challenges the commander to exert every means at his disposal to obtain it.

• Obtaining spare parts is becoming increasingly difficult. Every trick known to man or maintenance officer has been used to keep the aircraft in commission. Even though our flying mission is paramount, we never cut corners in order to get a flight off the ground. If the airplane isn't right, it doesn't go, period.

• The squadron, as presently manned, is unable to conduct its own standardization flight checks of its detachment crews. This poses a training-scheduling problem that must be solved.

So there it is. An analogous situation would appear at first glance to be something like having a one-arm life guard in the Sahara. He's not where he can do any good. But if he were, then what?

Imagine yourself with these problems. What would you do? The safest approach (and after all, that's what this article is about) would be to obtain the most competent assistance available. And that is exactly what was done.

The CONAC Flight Standardization Team at Robins AFB, with a strenuous road schedule, administers flight checks to assure that the detachment crews maintain squadron-wide minimums of proficiency and standardization; while at detachment level, the day-to-day operation of the aircraft, within certain limitations, is the particular responsibility of the respective commanders. They, in turn, rely on their operations officers, who are pilots, for the continuing proficiency of the crewmembers under them and the safe and efficient use of the aircraft.

The controversy, or concept if you will, of mission accomplishment as opposed to or reconciled with flying safety has undergone several interesting changes down through the years. It used to be that flying safety was what was left over when the mission had been completed, and usually included the somewhat wishful pretakeoff admonition of "happy landings!" It then evolved into a rather fuddy-duddy attitude exemplified by the C.O. who exhorted his men, "I don't give a damn how you do it; get it done! . . Oh yes . . safely." From there, it has tortuously come to the one generally accepted today: that the mission planned and conducted with full deference to all considerations of flying safety is the successful mission.

However, the Instructor Squadron has taken this a step farther. After a realistic evaluation of the degree of urgency of its assigned mission it was determined to actually view the mission as being "safety" itself. Now this distinction may seem a little sophisticated but it has been a mild surprise to find that the required training is being accomplished in at least the same

Left, flying a training mission over Panama. Below, a view of crewmembers and station arrangements in a modified Gooney (TC-47).

amount and quality as before and with the greater margin of safety that that attitude provides.

Major Max Zuckerman, commander of Det 12 at Dobbins AFB sums it up succinctly: "I want it so safe they'll take away my flight pay."

While this goal may provide the basis for several fascinating, if not heretical theses, it is the one to which by logic we are all committed. So in pursuit of this end a little hard thinking was done. The disadvantages (sic) of the detachments being so far removed from the parent organization were recognized. It was also recognized that even in the sorriest situation there was some good and an endeavor to turn the disadvantages into advantages was made.

Each detachment was required to have its own standardization board consisting of at least two members from each crew position. However, since a representative detachment has 4 pilots, 3 navigators, 2 aviation mechanics, and one radio operator, the result is that practically the whole flying complement of each is on the board. This, in turn, has both advantages and disadvantages.

For instance, it's an advantage that standardization is the intimate concern of the people actually performing the misison. The operations officer, who is usually the president of the board, is able to have the same close relationship that exists in fighter outfits between flight leaders and their wingmen. The small number of people involved permits supervisors to observe the exact qualities of their crews and, flying often with each of them, in effect they can conduct one long, continuous standardization check.

A disadvantage is the tendency, even in this era of the committee mind, for such small groups to suffer from inbreeding of ideas. To solve this, the minutes of all 12 detachment stand board proceedings are screened by the squadron, and pertinent items are extracted and distributed to the detachments for consideration or adoption.

The conditions under which each unit operates are different, as are the aircraft. When these erstwhile C-47s were modified to become TC-47s, somehow not many of them came out exactly alike. There is no TC-47 Dash One Flight Manual, as such, and no existing C-47 manual describes the contrivance precisely. Therefore, a certain latitude is allowed in the way each detachment standardizes its procedures. But don't get me wrong. Each aircrew member, active and reserve, completes an annual exam on his crew position based on the Dash One. All procedures are based on the flight manual except when there may be a difference in the installed equipment.

This would be an appropriate place to relate an incident which would demonstrate the discipline, knowledge, skills and resourcefulness of a crew, thus proving the effectiveness of the whole standardization program. But there have been no such incidents, no hairy tales, no close ones—none of those adrenalin pumping throbbers to illustrate how well the prosaic routine pays off. Perhaps that in itself is the proof.

Since man does not yet have complete control or knowledge of his environment, it is readily admitted that fortune can account for some of this, but it also indicates that the squadron is headed in the right direction, for the fewer the incidents the less likely the accidents.

In the final analysis, however, it is in the delicate area of the pilot-navigator relationship that the entire tone of the squadron's flying safety program is set.

People being what they are, certainly there must have been one occasion when a pilot has sought to serve his personal desires in recommending a flight against even his own better judgment, thereby forcing the navigator to decide where the pilot's specialized knowledge of flying left off and where his own judgment as commander should intervene.

And there just might have been one remote instance where their roles were reversed, and the pilot was faced with the uncomfortable alternative of either conducting a dubious flight or incurring the displeasure of the man who writes his ERs.

Fortunately, so far such occurrences have been more theoretical than real, and the main factor has been the philosophy of such commanders as Major John J. Granley at the Minneapolis-St. Paul International Airport, who says:

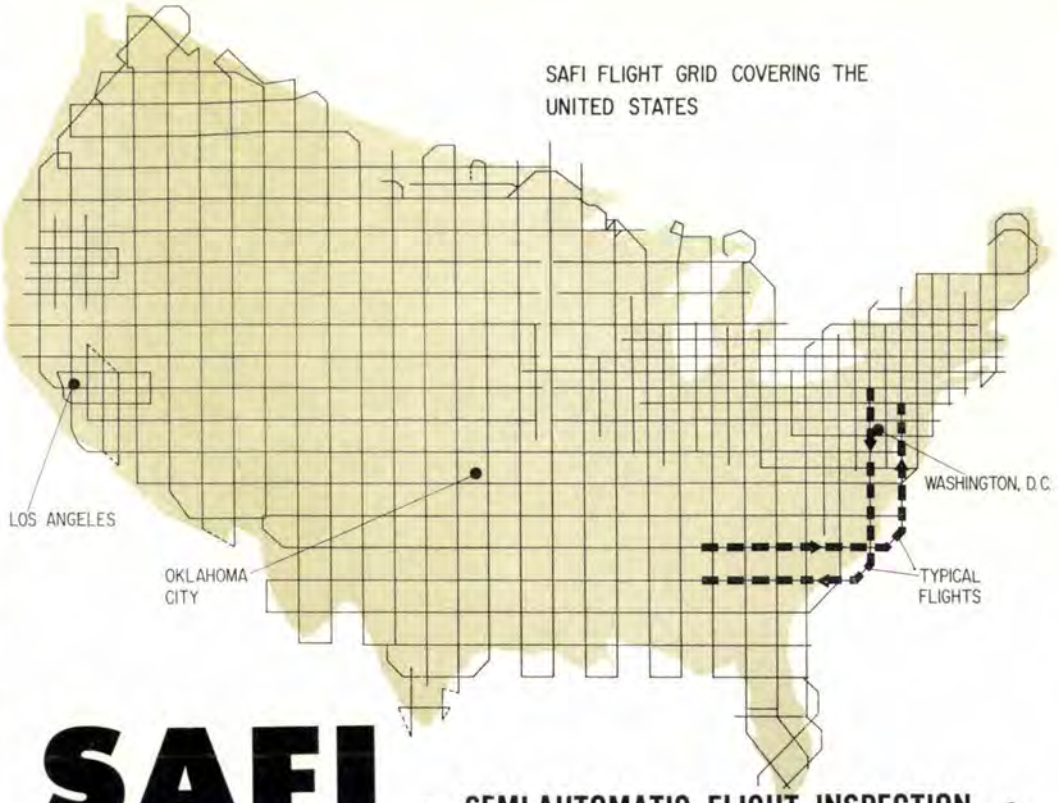
"I approach the mission of Detachment 6 without any reservations. Our philosophy or policy is education and cooperation in the flying operation for pilots and navigators. Over a period of time I have become more aware of the problems of a pilot, and, in turn, the pilot has attained a better understanding of the problems of a navigator. This educational progress has resulted in a realistic approach to mission accomplishments. The mutual understanding of problems peculiar to pilots or navigators has developed a flying program that prohibits any compromise with flying safety.

"As a navigator and Detachment Commander, naturally I rely greatly on my ranking pilot, who is the Detachment Operations Officer, for a safe and effective flying program. The Operations Officer's advice is invaluable, particularly in the phases of flying where a pilot's knowledge is mandatory. However, all commanders normally follow this procedure whether they be pilots or navigators. Consequently, the responsibilities of any commander of a flying unit are the same, regardless of his flying rating."

In a similar vein, Major Raymond J. Wautelet, of Detachment 11 at Clinton County AFB, Ohio, remarks:

"As a navigator in command of a flying unit I hold no special reservations about formulating policies concerning piloting of aircraft, maintenance of aircraft and administration of the unit. In fact, being a navigator for some years has given me a chance to observe other crewmembers and understand their problems. Mission accomplishment and flying safety are not the responsibility of one crewmember but of every crewmember. A navigator commanding a flying unit can be compared to an executive in a civilian corporation who does not necessarily know all the details and technical aspects of operating each of his branches. He has the big picture of this operation and obtains advice from his experts in each field. Thus, the navigator commander calls on his pilots, supply, maintenance and administrative personnel for expert advice on matters pertaining to their particular fields."

This started out to be an article on how different this squadron is, instead it shows how much it actually has in common with many others. In the words of one of the detachment operations officers, "The only difference between this and any other flying organization is the wings worn by the commander." ★



SAFI • SEMI-AUTOMATIC FLIGHT INSPECTION •

Five FAA aircraft, packed with SAFI (Semi-Automatic Flight Inspection) electronic gear, are now criss-crossing the continental United States and providing a new high in Navaid facility checking capability. These aircraft, with their 5000 pounds of electronic gear each, have the capability of checking every Omni, TACAN and VORTAC station in a swath 80 to 160 miles wide.

Constant flight checking is necessary to keep the Navaid system operating reliably. Flight checking may be defined as the art of measuring the accuracy and adequacy of the navigational signals in an actual flight through the air space.

In the past, flight checks were made by aircraft flying circles around and radial courses across the individual stations. This traditional method generally checked only one station at a time; consequently, as the number of stations increased so did the number of inspection aircraft and the amount of time required to check them.

The five Convairs in the Project SAFI system, operating at the 10,000 to 24,000-foot "intermediate" altitudes, continually fly straight-line grid patterns that cover the entire U. S. Equipment within the planes receives and tape records the signals transmitted by every Navaid within a predetermined swath on both sides of the flight path. When the Convairs have flown all of the lines within the grid they have effectively measured and recorded the signals transmitted in every direction by every Navaid. This inspection program is performed on a regular continuing basis. Another advantage lies in the fact that facilities checking can now be accomplished during instrument conditions whereas under the old system VFR was required.

Using this tape, as input, the Airborne Instrument Lab system automatically navigates the flight check aircraft, and automatically tunes each of the Navaid receivers to the proper channel at preselected points along the flight path. It compares the received signals with precomputed values for those signals to immediately detect gross bearings errors, and sampling the outputs of every Navaid at predetermined intervals converts the received data to digital form. Records are then sent to Oklahoma City for final detailed analysis and evaluation by the IBM 704 Computer.

For added safety, the FAA has standby transmitters at every station along the airway. On alternate flights these standby transmitters are checked. There are now over 800 VOR stations (over 400 of which are VORTAC) in operation. By 1965 over 1200 VORTAC stations are expected to be in use in the Federal Airways System.

The SAFI equipment within each aircraft consists of 11 VOR receivers, 11 TACAN sets, four DME sets, VHF and UHF communications equipment, a range-beacon receiver, magnetic tape transports (two input program tape readers and one analog and two digital recorders for output data), digital equipment to perform various control and conversion functions, and a turbine generator to provide power for the system during inspection flights. Multicouplers and commutators permit three common antennas to handle all basic system functions.

SAFI equipment is designed to enable the FAA to periodically, accurately, and economically inspect the performance characteristics of every station in its continually expanding network of Navaids. ★

Office of Public Affairs, Federal Aviation Agency

C-NOTES

For The Want Of a Survey—We've wanted to get this story before you for quite a while. The tragedy caused by failure to recognize a seemingly minor, but death dealing, hazard is made dramatically clear in the history of flight which is taken verbatim from the results of the accident investigation on file at our headquarters.

"The lead RF-101 was cleared into position for takeoff. The pilot aligned the aircraft on the right side of runway 14 (13,500′ x 200′) with his wingman on the left side. Engines were stabilized at 80 per cent RPM and lead started his takeoff roll. The wingman observed lead's right afterburner light, then the left afterburner. He noticed the left AB to have a lower intensity light than the right. At this point the wingman ducked his head into the cockpit for a time check (they were departing on a 15-second interval). As Nr. 2 looked up he observed lead crossing in front of him from right to left. Nr. 2 watched lead come out of afterburner and deploy his drag chute. The chute blossomed fully. The aircraft continued to the left, veered off the runway, crossed the runway shoulder (main gear tire marks definitely show the anti-skid cycling while traversing the shoulder area). Leaving the shoulder area, the aircraft entered the rough graded safety zone. At 1400 feet after leaving the runway the left main gear struck a mound of gravel three feet high, nine feet six inches in diameter. This mound bounced the left wing into the air and as it contacted the ground, again, the left main gear failed. The drop tanks ruptured, exploded and were torn from the aircraft at this point. Ground marks indicate the aircraft slid another 1000 feet on the left wing with the right main gear failing outboard. The right wing dug into the ground and caught on a buried steel mat. (This buried steel matting is the remainder of a large aircraft storage area.) Contact with the mat ripped the right wing off the aircraft, broke the main spar carry-through, and sheared the inlet guide vane ring assembly off the right engine. At this point it is believed the aircraft rolled over and came to rest 75 feet beyond the matting. The aircraft exploded and was partially consumed by fire. The pilot was killed as a result of the fire."

RF-101

Quoting again, in part, from the Accident Investigation Board's analysis of the factors involved: "The condition of the terrain beyond 350 feet of the runway center line was not in accordance with standards prescribed in AFM 86-6. The terrain was generally acceptable and would have supported the aircraft so as to sustain minor damage. *The three foot mound of earth, however, directly contributed to the total destruction of the aircraft and loss of the pilot.*"

Further comment on this tragic affair would seem superfluous; however, it is a fact that all of us become intimately familiar with our local flying yard to the point of building-in fudge factors for obstacles on the approach flight path, and so on. Herein lies one of the prime advantages of a Flight Safety Survey. A fully manned, highly motivated Flight Safety Survey team always includes a member who specializes in thoroughly reviewing all aspects of the airfield facilities. Included in his reference kit is a copy of AFM 86-6. It is not unreasonable to assume that an objective, dispassionate and thorough Flight Safety Survey would have revealed the 3′x9′6″ mound that existed 350 feet from the runway center line. This hazard could have been removed in 30 minutes by a competent cat operator. Removal of the mound of earth would have saved a combat ready pilot and his aircraft. Investigation of the "saved" aircraft would possibly have resulted in a fix which, in turn, would save an aircraft in a like situation on another day; i.e., "For the want of a nail the shoe, for the want of a shoe the horse, for the want of a horse the battle" . . . . ad infinitum!

Note to Commanders: If you feel that the daily press of affairs has caused you to lose your perspective, how about asking your next higher headquarters to look you over? You may have a Sequoia growing in your pine forest.

Note to Jocks of the Line: The questions that *require* your answer: "Are you 'hedging your bets' with known local airfield shortcomings?" Or, "Are you aware of local airfield hazards that continue to exist month after month?" If your answer is "yes" to both, put down the magazine, pick up your feet, move toward the man in charge and lay it on the line! Don't let that be the end of it. We're all allergic to blank paper and writing instruments. Overcome that built-in headwind. Put your info in writing via that handy dandy OHR and route it to the local chieftain. He will be interested, and his interest and follow-up may insure *your* being around to enjoy that canopy to canopy air scrap you dream about.

This will be the last on the F-101 from Y.O.D. Major Jim Modisette, an extremely well qualified F-101 type, who was "vacuumed in" from ADC via CSC, is now in charge of and will beat the "VOODOO" drums to invoke the operational success and safe flight for the "one-oh-wonders."

Lt. Col. Jackson Saunders, Fighter Division

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F-104

The Vanishing Gray Area—Recently I had an opportunity to associate with some of the keen types who operate the Silver Slivers—the F-104 aircraft. Such an occasion always gives me a lift more than somewhat, and besides it gets me out of Smog Gulch. This time, however, I got a little shook.

During a bull session some of the jocks talked about the "best" techniques of putting the "4" down on an unprepared surface. After I finally got back some of my composure and could talk again, I talked loud and clear. Disregarding the few occasions where pilots have landed short as "successful" unprepared-surface landings, to my knowledge there is no case where the pilot has survived a gear up or down, or ditching type landing in the F-104! Let's clarify the landing-short type as being a successful, unprepared-surface landing. Here the pilot has full control of his machine and plenty of thrust to regulate his approach, but nevertheless—due to a small miscalculation—he touches down short. By this time, in all probability, he will have full military throttle and the "motor" will be accelerating; therefore, even though he hits hard and, in some cases, causes damage to the aircraft, the impact is a skipping type and it doesn't come unglued—completely.

Let's talk about the pilot who is confronted with the situation of instruments winding and unwinding and the noise from the rear section ceases. There he is—knee-deep in adrenalin and all attempts to restart the "motor" fail. Through a windmilling engine or the RAT we will assume he has control of the aircraft, but he cannot reach Rogers Dry Lake at Edwards AFB. In the days of the "Spamcan" and the "Jug" the pilot would pick a suitable farmer's patch and belly in; later, with the "80" and the "Hog" he would lower the gear and put 'er in. And in most cases he was successful; in other words, he lived. Therefore, *there was a gray area*—the area in which the pilot had a decision whether to bail out or not, depending on the circumstances and his frame of mind. I believe those days and decisions are gone, at least as far as the "4" is concerned. The reason: There is not one case involving a deadstick landing of an F-104 on an unprepared surface where the pilot has survived, gear up or down. Whatever you may think or may have heard about the escape system in the '104, there isn't a case on record during dummy runs and live ejections where the system did not function as designed. I've talked to those pilots who have used it and to some of the wives of those who didn't. See ya'all! ★

Maj. Daniel D. Hagarty, Fighter Division

THE RATED RODENT

Mouse scampered briskly along the hangar floor. Things are pretty lean around here, he thought to himself, good thing people drop a few crumbs out of their lunch. So intent was he on dining that, BUMP! He staggered back, collected his wits and, holding one paw to his aching head, gazed upward to see what he had run into.

"Hello there," he managed. "Who might you be?"

"I'm Jet," the huge creature replied.

"Jet?"

"Yes, Jet. For a moment I thought you were a pilot about to wake me up for a night ride, you hit my tire so hard. Funny, I have never been able to figure out why every pilot kicks my tires. Do you suppose it's something like a jockey whipping a horse—to make sure he runs better?"

"I wouldn't know," Mouse replied. "By the way, I'm Mouse, but I swear I can't figure out just what you are. Didja say your name is Jet?"

"J-E-T, Jet. Haven't you ever seen an airplane before?"

"Well, not up close," Mouse said. Then quickly, "but I've seen a lot of them flying, oh ever so high up in the air. Do you do that?"

"Of course, what do you think we planes are for?"

"But how do you go without those big fans on your wings? Don't you need 'em?"

The aircraft looked down at the little mouse tenderly. "My friend, I don't wish to insult you by saying you must be stupid. But obviously your experience is with recips."

"Re—what? All I know is that part of you must be missing. Are you busted?"

By midnight, Mouse had received quite an education from Jet. When the aircraft found out that the little creature was a city mouse and only recently had moved into the hangar by way of a flight lunch from a distant metropolis, she patiently educated him on airplanes in general and jets in particular.

"Now that you know all about me," she said, "how would you like to go along for a ride?"

"Fine, I'll just hop up here in your airscoop and wait for your pilot to take us up."

"NO—don't do that! An owl tried that one time and I spit feathers for a month. Besides, I got an upset stomach and they had to overhaul my engine. I wanted to tell that dumb pilot to look in my intake but they don't understand everything you say to them, you know. Sometimes they're very careless."

Mouse jumped up on the wing and climbed into Jet's cockpit. "I'll just snuggle up in here out of sight and get a little sleep until we're ready to go," he said.

Jet almost swallowed a bucket. "That would be the last place you would ever snuggle, my friend. You're in the oxygen hose, and that little cap isn't a door. The pilot probably wouldn't notice you in there until he ran out of breath. Then he'd pass out and we'd all be dead. Besides, I wouldn't be anywhere near as pretty all bashed up as I am now. Just slip down inside that map case there. No one will ever notice you."

After several false starts and a little scolding from Jet, Mouse finally found the map case and settled down.

Several hours later he was awakened by noises in the cockpit as the pilot climbed aboard. He rapped on the side of the map case with his tiny fist. "Jet, are you awake?"

"Good morning, my friend. How did you sleep?" Jet inquired.

"Oh, fine," replied Mouse, "what's going to happen now?"

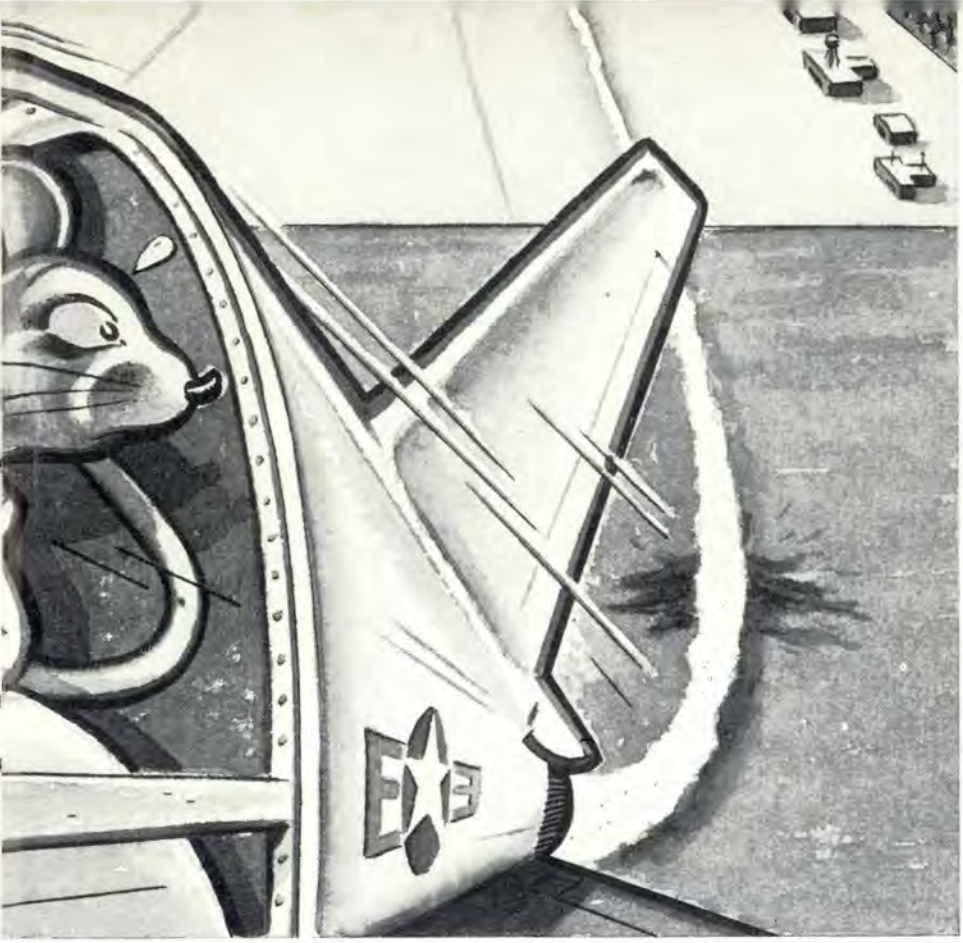
"That's the pilot," said Jet. We're going for a ride and I can tell you now it will be quite a ride. This guy and I have been fighting each other for a long time. I plan to really shake him up, wait and see."

Mouse thought for a moment, then asked, "Just what do you have in mind, Jet?"

"This particular pilot has a bad habit of not computing his takeoff roll accurately," said Jet. "I've been planning for some time now to teach him a lesson. I'm going to keep back a little power and give him just enough to get off the ground. I figure on clearing that big pile of dirt about half a mile off the end of the runway by about two feet. Boy, will he squirm!"

The next thing Mouse knew, the aircraft was rolling, then it stopped for a few minutes and he could hear the man talking to somebody. He kept saying, "Repeat that again."

"Is this man hard of hearing?"



Mouse asked Jet.

"It would seem that way," Jet replied. "But this is routine; you've got to get used to this sort of thing."

A few moments later Mouse heard the pilot talking to a "Roger" then the aircraft was moving again.

"We're going to take off now so brace yourself," Jet informed him.

Mouse didn't want to miss this, so he sneaked out of the map case and crawled up the pilot's back and perched on his helmet. Jet charged down the runway and Mouse was somewhat frightened and also thrilled at the acceleration. Then the nose of the aircraft came up and a few seconds later Mouse felt a new sensation and knew that he was actually flying. They didn't get very high, though, and Mouse could see the mound of dirt looming up ahead of them. For a moment he thought sure they were going to slam into it and he placed his paws over his eyes. But nothing happened; there was no jolt, no jarring crash and he opened his eyes. They were still pretty close to the ground but he could no longer see the earth pile. He looked back and, sure enough, they had passed it, but he could see that the margin must have been pretty small.

"Whew, you scared me half to death," he said.

"You think YOU were scared," said Jet, "you should have seen the pilot's face. Now, watch closely. I'm going to turn a few red lights off and on. Some pilots are a bit forgetful. This is the way we have of reminding them. You're going to see the busiest pilot in seven counties."

Just then a light blinked on the panel. Mouse relaxed to watch the fun. Jet was right, first this light then another. It seemed like a symphony in lights—all red. The pilot's hands darted here and there and when Mouse peered down over the front edge of the helmet he could see perspiration pouring down the pilot's face.

"Aren't you being a little hard on him?" he asked Jet.

"He's getting just what he deserves," Jet replied. "I'm really doing this for his own good. I happen to know that our boy hasn't read his Dash One in six months. If I don't wise him up a little now, he's going to kill us both one of these days. Maybe I can teach him a few lessons."

The flight now settled down to routine and Mouse took a short nap. He was awakened by Jet saying "We're going to penetrate. That's pilot lingo for getting down to a lower altitude, but quick. We'll be landing in a few minutes and I think I'll give this joker another scare. Just before we touch down three red lights will go on. To the pilot this will indicate that his gear is not down. Pilots forget this once in a while. We jets always try to remind them 'cause landing on our bellies really smarts."

Mouse watched as the runway came even closer. They were almost to the ground when suddenly the pilot saw red lights. The pilot thrashed around so fast Mouse had a hard time keeping his balance on the helmet. Then the red lights went out and almost immediately they were rolling along the pavement. Quickly the pilot pulled the throttle the other way and Mouse wondered what was going on. "I wish I understood a little more about this," he thought to himself.

Finally the airplane came to a stop after driving around for a while, and the pilot got out and walked off toward a big building.

"Whew, you had me a little frightened," Mouse said to Jet.

"Hah," his friend replied, "did I teach him a few lessons! I'll bet he's in there reading the Dash One as though it were the only book in the world. And the simulator—I'll bet he spends the next few days sharpening up his emergency procedures."

Mouse scrambled to the ground and looked up at his big friend. "I'm getting a little hungry. Think I'll go over to the snack bar and see what's cooking. See you later." ★

RWH

THEY WALKED AWAY

Every indication was that this was to be one of the hundreds of "routine" flights Air Force aircraft would make this October day. Flight planning by the two command pilots was complete and thorough. Weather—generally low ceilings and visibility on the first leg, but no problem. A careful pre-flight failed to turn up discrepancies. Despite the experience of these two pilots, or possibly because of it, the pilot who was to fly in the front seat took the time to assure that his companion was properly hooked up and to brief him on ejection and seat separation procedures, even possible interphone failure. Engine start, taxi and runup were normal. At exactly 1830 this particular "routine" flight was committed when the T-33 lifted off into the evening dusk for Schilling via Birmingham, Memphis and Springfield.

A weather broadcast was partially picked up when Montgomery VOR was tuned in. The pilots thought they heard ceiling reported as 900 feet. From their vantage point, VFR on top, they could see distinct, individual lights around the city.

Upon passing Birmingham at 40,000, VFR on top, a routine position report was made to Atlanta Center. Atlanta acknowledged, and the copilot, who was handling the controls, increased power to 99 per cent and began a climb to 42,000 feet. They had used 20 gallons over computed fuel and decided upon a more economical altitude.

Approximately two minutes later the "routine" phase of the flight was over. Here are the words of the man who remembers it well. He had the front row center seat.

"All the cockpit lights began to increase in brilliance. I noticed an increase in RPM to approximately 103 per cent so I immediately throttled back, then saw the loadmeter pegged at 1.0. With my gloved left hand I busied myself trying to put out a circuit breaker fire that had broken out by my left hip pocket. The fire was qiute bright and very similar to the glow of an oxy-acetylene torch when applied to metal.

"As I turned off the battery switch, I noted that the generator OUT light was on, as was the inverter OUT light. I also noticed that the loadmeter was at zero at this time. I turned off the generator switch since it was obvious that it was inoperative, and turned the battery switch back on again to assess the damage.

"The ARC-27 power circuit breaker had arced and melted a hole in the metal panel and disappeared. The ARC-27 control circuit breaker was also popped as was the right hand inverter circuit breaker. I also tried the left hand inverter but the inverter OUT light stayed on. During this procedure I turned the IFF to emergency. I then switched back to the right hand inverter."

The fire had been extinguished and the immediate emergency analyzed and contained. Actually, the only major problem remaining was to get back on the ground. This wasn't to prove a simple task.

While fighting the fire the Instructor Pilot started an emergency descent with the intention of returning to Birmingham. Both pilots immediately turned off all electrical equipment and descended to 20,000 feet en route to Birmingham. After reaching 20,000 the Instructor Pilot returned the battery switch to ON, restoring the interphone, and the two pilots discussed their next possible course of action. The uppermost thought of the Instructor Pilot was to conserve battery power in order to transfer fuel and prevent the possibility of engine failure due to the fact that it had oversped. Fuel was still being used from the pressurized tip tanks. The ARC-27 UHF radio was completely dead. The only flight instruments operating were the pitot static instruments, the turn indicator and standby compass.

The Instructor Pilot circled Birmingham twice at twenty thousand feet with the thought of attempting an emergency landing if the airport could be definitely located visually below the undercast. Although the glow of the city lights was quite bright, the undercast was too thick to find the airfield. A landing at Birmingham was decided against, based on the unknown ceiling at Birmingham, the known hilly terrain of the area, no flight instruments and no UHF radio to obtain a clearance or determine traffic.

They thought of flying a triangular pattern but discarded the idea because the Instructor Pilot believed there to be no GCI sites or fighter bases in the area.

With the decision not to attempt an IFR letdown and landing at Birmingham the pilots elected to proceed to Montgomery since they had observed distinct lights upon passing that city. Although both pilots had believed they heard the Montgomery VOR broadcast a reported 900-foot ceiling, their visual observation led them to believe that a VFR descent through breaks in the overcast could be made, allowing a landing at Maxwell Air Force Base. From over the city of Montgomery at 20,000 feet, the aircraft was descended to approximately 2000 feet before it was clearly evident that it would be impossible to descend any lower and remain VFR. At 2000 feet it was readily apparent that the overcast was much thicker than it had appeared from 20,000 feet. It was not possible to determine even roughly what the ceiling and visibility were below the overcast.

With a landing out of the question at Maxwell AFB, the pilots flew to Craig AFB, 35 nautical miles to the west. The same poor weather conditions were found there. They then decided to head northwest to Memphis, Tennessee, in hopes that weather there would permit a landing.

They climbed to 30,000 feet while heading toward Memphis, the Instructor Pilot tranferring fuel each time the fuselage tank quantity dropped to approximately 60 gallons. Although the fuel transfer was progressing satisfactorily, the Instructor Pilot noted that the batteries were becoming progressively weaker. This was evidenced by the increased time required to transfer fuel to the fuselage tank.

Dry asphalt and concrete	.5 to .85 C of F
Snow (that has not been exposed to temperature above about 25° F)	.25 to .35 C of F
Snow (that is just below the freezing point and exposed to the sun)	.2 to .25 C of F
Rain or slush on snow or ice	.075 to .2 C of F
Frost changing to just above freezing	.075 to .2 C of F

FIGURE 1

SAMPLE STOPPING DISTANCE REQUIREMENTS
(From Operating Procedures Manuals)

C-47	Multiply Dry Runway Stopping Distance	By 1.3 (Wet Grass)		2.5 (Wet concrete ice or snow)
T-29	Multiply Dry Runway Stopping Distance	By 1.35 (Wet)		2.25 Ice
T-33	Multiply Dry Runway Stopping Distance	By 1.8 (Wet)		
B-52G	Multiply Dry Runway Stopping Distance	By 1.43 (Min. wet or hard packed snow to light layer of new snow)	1.67 (Min. hard packed snow and some ice)	2.0 (Min. ice)
		1.60 (Planned wet or hard packed snow and light layer of new snow)	1.95 (Planned, hard packed snow and some ice)	2.45 (Planned ice)
F-102	One Example: If dry distance is 3000 feet figure 5500 feet for wet runway. (Drag chute and speed brakes open)			
KC-135	Application of brakes at 80% of touchdown speed on a dry runway equals application of brakes at 100% of touchdown speed on a wet runway.			

FIGURE 2

siderably with surface conditions and in some cases varied with speed.

How's that? You say you don't understand? How could they get a greater maximum coefficient on a wet runway than on a dry runway? Who ever heard of sticky water?

You have a point. But, checking back we find they report, "The values of maximum friction coefficients were, in general, considerably lower for wet surfaces than for comparable dry surfaces."

For more info, why don't you run upstairs to the flying safety office and dig out the October 1959 Flying Safety magazine. It contains an excellent article on landing roll that was compiled by the Navy. Figure 1 came from that article.

But, in your specific case check your Dash One. Find out the procedure for the airplane *you* fly. Figure 2 is made up from Dash One information.

Why don't they make all charts the same: have a common factor to multiply by for wet runways, for snow, for slush, for ice?

I don't know. Come on, I'll go with you. Maybe I can learn something while I'm waiting for them to plow the runway. ★ TJS

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THE TOP SCHOLARS

The Air Force has five good reasons to expect a boost in the promotion of its accident-prevention program as result of the outstanding scholastic accomplishments of the officers named below:

- **Capt. James M. Foley, ATC, Randolph AFB, Tex.**
- **1/Lt. Leonard F. Mixson, ATC, Perrin AFB, Tex.**
- **Maj. Thomas H. Paskell, SAC, Fairchild AFB, Wash.**
- **Capt. William J. Schoder, HedComd, Andrews AFB, Md.**
- **Capt. Louis C. Smith, TAC, Reno Municipal Airport, Nev.**

These men have made straight "A" grades in the Flight Safety Officers Course at the University of Southern California—a curriculum which includes Aeronautical Engineering, Aircraft Accident Prevention, Aviation Physiology and Aviation Psychology.

We take great pride in congratulating them!

FALLOUT

LETTERS TO THE EDITOR

Fly Safe Ribbon

Last month a few letters—pro and con—about the flying safety ribbon suggested in July, were published and at the time I thought that was all there'd be to it. Not so, according to the IN basket. For instance, in the two letters following, the first is signed by two Captains stationed at Williams AFB, and they're all for it. But the Captain who wrote the second letter really did unwind in taking exception to the suggestion. By the way, he too is stationed at Williams. (Ed.)

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* * * * Concerning the safety award for "safe" aircrews, support it! Many of our major Air Commands already have some "diploma" system to give worthy aircrews recognition for doing the job safely and professionally. The "diploma" system is not standardized and is not reflected in the permanent records or on the uniform of the aircrewman. Other services present uniform devices for skill with a rifle or accuracy with a hand grenade. For any soldier, competence with his weapon should be a thing of pride and should be recognized. It can be done in the Air Force as indicated by Captain John S. Wright's letter (July issue).

As safety officers, it would be a pleasure to know that the safety minded and professionally skilled airman is recognized for his contribution to a strong Air Force by an appropriate Air Force award.

Capt. Walter L. Baughman, USAF
Capt. Charles F. Tribolet, USAF
Flying Safety Office, Williams AFB

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May I take exception to the idea presented by Captain John S. Wright? Although I am considered a newcomer to the USAF, I do have considerable experience in all weather interceptors and was a psychology major in college before coming to the Air Force.

The pride of earning—and I mean earning—the aviator's badge (wings to most), Air Medal, DFC, DSC, or other established award is inherent in every pilot regardless of his service, be it Navy, Army, Marine Corps, or the Air Force. He is a professional soldier and has but one purpose: that is to be ready to defend his country when and where he can, and to willingly give his life if that be necessary. It is not to accumulate 20-30 years of safe accident-free service, and then to retire on a fat monthly check from the government, although many believe in the latter.

The business of being a part of a weapon system is an inherently dangerous one even in the performance of everyday peacetime scrambles. To achieve the maximum performance of his weapon, the pilot should also be pushing to the maximum of his capabilities, and this leaves no room for slight error. But in accomplishing the primary mission in an effective manner, safety becomes a by-product, and a by-product only. Safety for safety's sake should never become the primary goal of the USAF pilot.

The prestige of the many Air Force decorations and awards has dropped tremendously since the beginning of WW II; ask anyone in another service.

Let's not give decorations only so the uniform will look pretty; if that's what we want, issue a full set of medals to each and every officer and airman—it would hasten the inevitable.

I can imagine what comments you would receive from Luke, Lufberry, McGuire, Bong, Gentile, and the rest of the great flyers if they could read a proposal for safe flying.

Let's keep the "safe awards" for truck drivers in the Base Motor Pool. Flight pay and the knowledge of a job well done are enough for pilots of the USAF. You should not award medals for properly accomplishing what is expected of you.

Capt. P. P. O'Briant, USAF
Williams, Ariz.

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Captain Wright's recommendation for a fly safe ribbon is a good idea. MATS presently awards gold flying safety pins to crewmembers who acquire 5000 hours without an accident, and diamond studded pins to those with 10,000 accident-free hours. To give Capt. Wright's flying safety ribbon some real prestige I would suggest awarding the initial ribbon at, say, 3000 hours with a cluster for every additional 2000 hours. For jet jocks the requirement could be halved.

Color of the ribbon will be determined by the heraldic types anyway, so I won't say his proposed artwork is a little gaudy.

Maj. Robert C. Collver, USAF
Aircrew Stand. Div, Hq MATS

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Great stacks of "Hero Medals!" A ribbon and medal (with clusters) after so many hours of safe flying—Phooey! Being one of the older fighter pilots around I offer that any self-respecting pilot would not want, nor accept, such a valueless piece of finery for display next to ribbons which *mean* something.

Too many of us have come within an eyelash of clobbering, have lucked out and found the field in foolish below-minimum approaches, or have uttered a quiet prayer at the end of a flight for the fact that, although we got behind in our work in the air, we were still alive on the ground.

Really point out the hot pilots? Probably more, it would point out the "old ladies;" the "circle the flagpole;" and "VFR only" types (plus all the professional copilots, and don't say there aren't any).

But if you're going to hang a medal on every pilot, don't stop there. Dig up one for navigators who don't get lost; for copilots that don't fool with the throttle quadrant; for crew chiefs who keep the windscreen bug-free (a little bug on the medal for this one); for tower operators who never lost a tower; and for weathermen who never get wet, ad infinitum. And we are the ones who poke fun at the Russians for having so many "Hero" medals.

Lt Col John J. Cartwright, USAF
4241st Strat Wg, Seymour Johnson AFB

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You wanted to hear from troops in the field about the fly safe ribbon so here I am. It is evident from Captain Wright's suggestion that he has given it considerable thought. Having over 700 hours of single engine jet time plus over 300 hours in the old Gooney, I am all in favor of his suggestion to the letter. I think it should be stipulated, however, that the ribbon would be awarded so long as any accident was not pilot error. This would allow pilots (such as I) to be awarded the ribbon even though they might have had an accident that was attributable to a mechanical malfunction or maintenance error.

The only piece of criticism I can think of is the effect the award might have on pilots who've had an accident or two and as such may not be awarded a ribbon. They would certainly stand out in a crowd and feel conspicuous on any occasion requiring wearing the uniform with medals or ribbons. Also, how would you include or exclude other crewmembers if they were part of a flight on which the pilot goofed and it resulted in an entire crew's being involved in an accident?

Capt. Richard Giordano, USAF
APO 113, New York, New York

P.S. Despite the single criticism, I still feel it is an excellent suggestion.

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I would like to second the motion made by Capt. John S. Wright in the July issue for a Flying Safety Ribbon. This would be an excellent method for acknowledging sustained years of safe operation as an Air Force crewmember. While it is

necessary to bring to everyone's attention the consequences of careless preflight and flight habits, there should also be some recognition of the fact that most pilots do make the extra efforts to insure and complete a safe and successful mission. The Flight Safety Ribbon would provide the recognition that is now taken for granted.

Maj. H. J. Reichenbach
Hq USAF Security Service
San Antonio, Texas

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The award of a Flying Safety Ribbon for accident-free performance has been the subject of correspondence between Hq USAF and major commands, dating back several years. Any award program has to be fair and equitable, and all eligibles must have equal opportunity to acquire the recognition. One reason offered for disapproving the ribbon reads: "To consider total flying hours alone, without regard to the variables under which flying hours are accumulated in different types and models of aircraft, would automatically result in an advantage to some pilots, and would be unjust to those who fly particularly hazardous missions or aircraft that are more susceptible to accidents than others." While some people believe the suggestion has merit and some commands have established safe flying awards, its implementation USAF-wide is not supported nor approved by Hq USAF because of the obstacles of fairness which seemingly exist in such an award program.

Thank you, Captain Wright. Your suggestion stirred up a few interesting comments. Ed.

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Supersonic Cadets

There are a number of ex-Naval Aviation Cadets—now Naval Aviators—who would take exception to your statement in the article "Talons for the Eaglets" in the July issue of Aerospace Safety Magazine: . . . that Class 62F of the Basic Air Training Command will be the first pilots to fly supersonic aircraft prior to receipt of their wings.

The number of Naval Aviation Cadets who flew the supersonic F11Fs before receiving their wings is not known to me, but it is considerable, since it has been part of the training course since 1959 and possibly even earlier than that.

G. F. Ryan, Lt, USN
Ftr Sq 101, Det A, NAS Oceana
Virginia Beach, Va.

For a minute I thought sure we'd goofed, so I re-read the pertinent statement. Quote: "Just what will make them a select group is the fact that they will be the first pilots to fly a supersonic training plane before they earn their 'wings.'" Please note the type is a TRAINING plane, and to our knowledge the T-38 is the only supersonic trainer. Anyway, thanks for writing. It's good to know some members of our sister services are still looking at the magazine. Yours for continued readership!

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C-Notes

Regarding the C-Notes in the August issue, I believe that there is another, quicker and more positive, method for determining whether the drag chute has deployed or the afterburner has failed during takeoff in the F-100.

If a sudden deceleration is felt during takeoff, check the EPR gage. If it still indicates the takeoff setting, assume that the drag chute has deployed and jettison the chute. If the EPR indicates low (0.3 to 0.4 below takeoff setting), assume that the afterburner has failed and move the throttle inboard to close the eyelids. In either case if the aircraft has not passed the refusal point, abort the takeoff.

The mirror method could be used to augment this procedure, but might divert the pilot's attention from his gages and the runway ahead of him.

Capt. Donald F. Casey
Operations Div, Eglin AFB, Fla.

Here are four comments from the F-100 project officer:

(1) Captain Casey's point is well taken, however, other inadvertent drag factors can be introduced on takeoff such as accidental or through mechanical failure, speed boards are extended; partial blowout of the AB and the EPR gage has been known to stick. Failure of gear or gears to retract fully or one or more extending through mechanical failure shortly after they were up on takeoff—inadvertent loss of the target on a dart tow mission.

(2) The EPR gage is the best clock in the cockpit to indicate thrust—no argument—however, the pilot's attention is directed to line speed, nosewheel lift off speed, the runway and back again to the airspeed. The break ground point is when he is most likely not looking at the EPR gage and the most critical time for an AB failure and inadvertent drag chute failure.

(3) The answer to this one is tough. If he assumes the chute to be deployed and elects to jettison same, he could be wrong and while attempting to jettison the chute he then deploys it at a critical point.

(4) The only answer to the entire problem is to exercise his best judgment using all the aids, including the mirror, to assist him and to know his emergency procedures forwards and backwards and to then translate this knowledge to the correct action.

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Name of Game

The article, "The Name of the Game," in the July issue certainly leaves me cold. This article also appears to encourage pilots to purposely create a hazardous condition for himself as well as others flying in controlled air space.

First, I'd like to ask if JLT, the apparent author, has ever spent any time in a busy tower and tried to separate transmissions emitting from seven different frequencies on his console, with only about 50 per cent of the pilots identifying themselves or their positions on the airdrome or in the air. Also, there are land-line communications from FAA Centers, Base Operations, Tactical Units, and Crash/Rescue Operations.

Second, I'm sure any pilot who values his life or those he is transporting, plans his route sufficiently well to know what facilities are available, letdown procedures, runway lengths, runway headings, and other information generally provided by base operations where he filed or in Flip Charts published regularly. As JLT points out, a pilot would be fouling to request a repeat and slower transmissions. Believe me, this is not a foul. Good controllers will pass instructions as fast as possible to maintain traffic flow. Further in the article, the tower operator supposedly was spying on the pilot by issuing break instructions and advising him to recheck his gear-down-and-locked before the pilot was ready to request such instructions. This type of control means that the tower controller knows what and where his traffic is, and is keeping ahead of it at all times to prevent two aircraft from arriving over the same spot at the same time.

Now a few brief sentences on the qualifications of controllers:

• The qualified controller must first attend schools based on procedures of the FAA but much more complex. By this I mean they must learn not only CAR 60, ATM 2-A, and other FAA publications, but all of the Air Force directives such as AFM 55-14, AFCS Regs and Manuals concerning Air Traffic Control, and all AF Regulations that apply to flying.

• When the controller has successfully passed the seven phases for the basic Air Traffic Controllers Ticket, he must be facility-rated at each base and into each position that he may be required to control traffic: some of these are VFR Tower, DF Controller, Radar PAR Controller, Radar ASR Controller, and Approach Controller.

• After completing all of this to the satisfaction of his immediate supervisor, Unit Flight Facility Officer, Base Operations Officer, and the FAA Center or Approach Control personnel, he still can not issue control instructions until he has an AFSC of 27250. He must attain the rank of Staff Sergeant and a fully qualified AFSC before he is eligible to accept the responsibility of being a shift supervisor. This normally means approximately four to seven years experience in the Air Traffic Control field. During this time he will be working under all known kinds of conditions and controlling all kinds of aircraft from L-4 through B-58s, with low-on-fuel fighters mixed in.

We in the Air Traffic Control field are trying to provide a safe and expeditious flow of traffic for the Air Force. Articles that encourage a false picture do not help us or our flying safety record. I highly recommend such articles be stricken from a good publication like the Aerospace Safety Magazine.

Capt. Milton C. Rogers, USAF
Det 1, 2034 Comm. Sq, Stead AFB, Nev.

Dear Milt—Hope you're in the tower the next time I'm headed for Stead. Meet you at 30,000 over the flagpole. JLT

LET'S SUPPOSE . . .

. . . you're at 30,000 feet, VFR on top. The world below is slipping along nicely at 430 knots. The VOR is behaving itself and you're hitting each checkpoint within a minute of estimate. The bright overhead sun relaxes you. All is right with the world. "Gad, I wonder who or what could exist down in those knobs." Barely is the thought out of your mind before the chances are good you'll find out—but quick 'cause a fire warning light comes on followed by one, then another explosion. "Best I let everybody who'll listen know that I'm in trouble." Switch to Guard and start yelling.

Now let's stop supposing and get down to some hard-to-take facts. The chances are mighty good no one is going to hear you make your plea, for the simple fact is: WE DO NOT HAVE A DEPENDABLE EMERGENCY FREQUENCY. And do you know why? It's not that we don't have 121.5 and 243.0 mc designated as Guard, and it's not that our radios aren't reliable. It's simply because there are too many people who think they have some special right to use these emergency frequencies for their own benefit. Now if that's hard to swallow, you can believe me that it has been proved!

Let me qualify the word "people," lest anybody feels he has been left out. Specifically, the violators are pilots of the Air Force, Army, Navy, Marines and Coast Guard, and military and civilian controllers and tower operators. There is no doubt that these dedicated folks know that Guard channels are to be *used only for emergency purposes.* So why are the distress frequencies cluttered up so badly that a pilot in a real down-to-earth, jumping-up-and-down panic maybe can't get through? Basically there are two reasons:

- The general feeling that "I'm a little special and besides there is no one on Guard right now."
- The definition of an "emergency."

Again let's get down to some specifics; the most common missuses of Guard are:

- Ground facilities issuing departure and clearance instructions (on Guard channel).
- Long and prolonged practice GCAs (on Guard channel).
- Failure of pilots to monitor assigned frequencies.
- GCI, ARTC, and tower controllers trying to establish routine contact with aircraft (on Guard channel).
- Search and rescue (on-scene SAR frequencies are published in the National SAR Manual).
- Pilots trying to establish air-to-air contact (particularly in refueling operations).

If you go through each reported instance of misuse, it becomes immediately clear that very little if any action is being taken except a polite exchange of letters and forms, weak excuses and hidden apologies. How come? Do we have to have an accident, lose an airplane or a life before we start kicking people in the bottom instead of slapping them on the wrist when they violate? The time to start action is *before* we have a bad go; pin down the guilty, hurt them before we all get stuck with some reforms that will be mighty hard to live with.

I've just about said my piece, except for some final recommendations that will lick the problem:

- *Educate,* educate, educate every bloody soul who touches a VFH or UHF set, that 121.5 and 243.0 mcs are for emergencies only.
- Discipline yourself.
- Report *every* violation.
- Identify the violator.
- Discipline the violator. ★ JLT

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