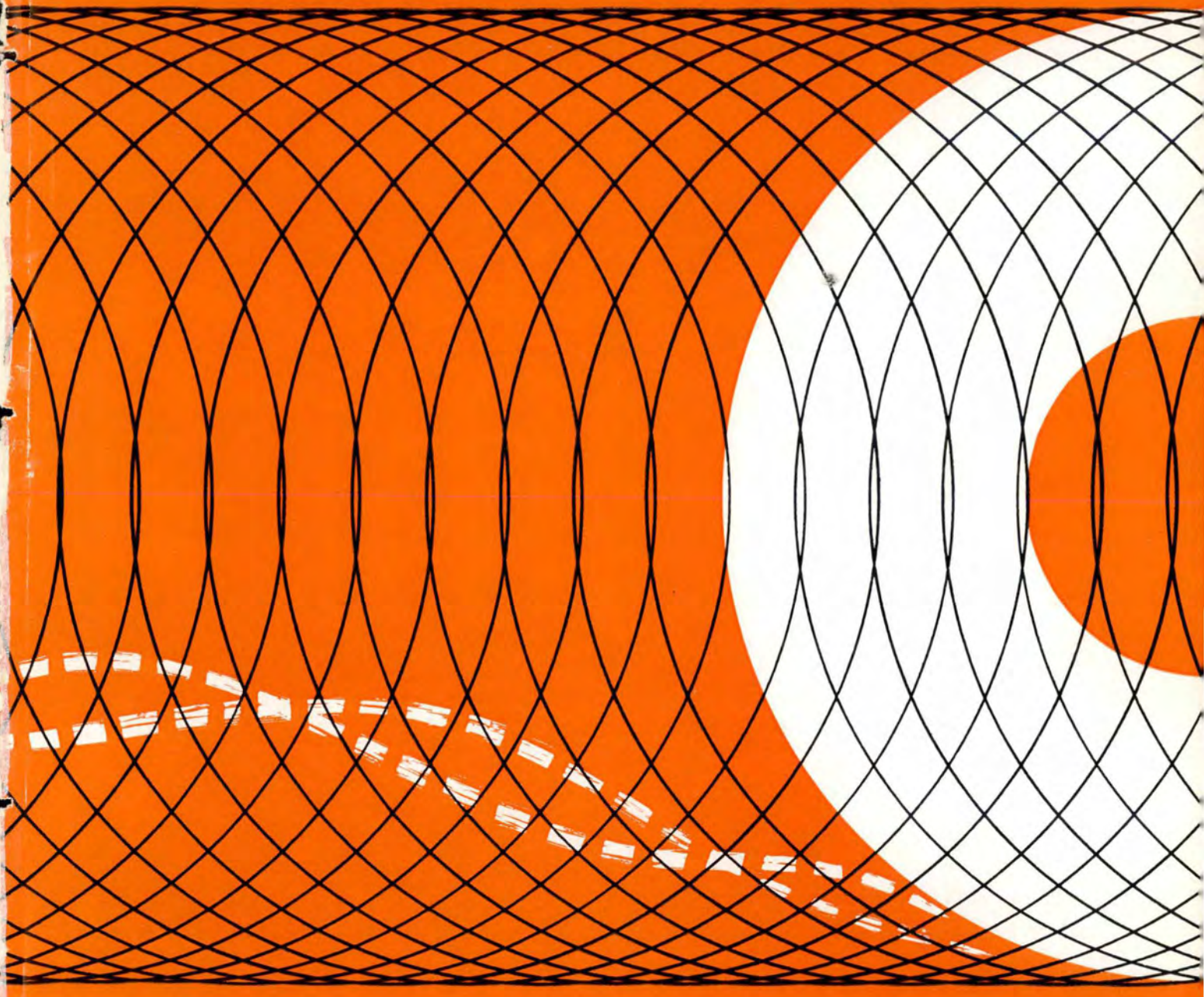
OCTOBER 1959

FLYING SAFETY

UNITED STATES AIR FORCE



THE LANDING ROLL

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VOLUME FIFTEEN • NUMBER TEN • USAF PERIODICAL 62-1

CONTENTS

THE EDITOR'S VIEW

As I write this, the temperature in Southern California is and has been well over the hundred degree mark for weeks, and it seems a bit ridiculous to think about problems of winter operation. But just as the department store manager must display fall clothes in all the windows during August, so must the Air Force manager prepare for the business ahead. With the records available we can be certain that snow, ice and winter storms are going to take their toll of equipment and men during the coming months. It is our collective job to assure that this toll will be reduced. There's really nothing new involved in winter flying. There are the same old problems of obstructed runways, cold engines, ice-laden wings and frost-bitten mechanics. The point is that we have learned much from past winters and the T.Os. and Manuals have been written to show us how to cope with these problems. The people who are going to suffer from increased accident rates are the ones who are too "busy" or lazy to plan for the weather change. When you receive this issue, the time will be ripe in most locations for unit and base commanders to call a meeting of ops, maintenance and facilities people for just such planning. Over to you.

CROSSFEED

LETTERS TO THE EDITOR

Change in Flight Plan

Please accept one young jet pilot's resounding endorsement of Capt. John Smith's "A Slight Change in Flight Plan." (FLYING SAFETY, May 1959). His vivid illustration of the inability of a jet pilot to satisfactorily execute the amazingly complex departure routes which are sometimes dictated by ATC, certainly must hit home to others.

I believe that the punch line of the story was contained in the editor's conclusion, and some further explanation of pilot's prerogatives should have been incorporated in his comments.

As an ex F-100 pilot and a current "not-quite-enough-time-a-month," T-Bird and desk pilot, like others I have encountered the same dilemma though, fortunately, without such disastrous results. Through trial and error I've discovered that at the expense of a few minutes extra on the ground and a polite "no thank you," departure routes can be obtained from ATC which do not require the services of a copilot, two navigators, three radios and several sets of maps.

1st Lt. Donald L. Hodge
Hqs TAC, Langley AFB, Va.

Promote Safety

The photograph here depicts two of many steps taken by this unit to promote safety and extend our 7770 hours (6660 jet) since our last mishap.

The first is a "cane" from the F-89 external engine screens which hooks over the cockpit sill and obstructs the canopy travel. This should prevent the pilot's inadvertently taking off with screens on the aircraft *(don't laugh—it has happened in many a Scorpion squadron).*

The second is a slogan stenciled between the steps on each ladder. The twenty some odd ladders each have a different reminder such as "X-Feed on takeoff," "Check your chinstrap," "29.92 above 24,000," "Hook that dinghy," and so on. This idea, of course, is adaptable to T-33, F-84 or other units using entrance ladders for jet aircraft.

Maj. Daniel A. Engelhardt
AF Adviser, 126th FIS
Gen. Mitchell Fld., Wis.

Amen

I want to add my "Amen and Amen" to Mrs. Swanson's contribution to the June issue of FLYING SAFETY. As one among the many who have to wait and sweat, I agree 100 per cent.

1st Lt. Walter E. Schaefer USAF
Base Chaplain, Hqs 316th Air Div (Def) USAFE

ATC Journal

Because of our mutual interests, we should like very much to exchange magazines with FLYING SAFETY. Here's a copy of our quarterly *Journal of Air Traffic Control.*

In addition to the interest in safety, another factor is that we have an increasing number of military controllers in our association, and I believe that we can better serve them if we keep up on the latest Air Force doctrines and developments.

If you like the idea, please let me know how to address your copy of the *Journal of Air Traffice Control.*

Betty Winspear
Managing Editor
Radio Building
Arlington, Virginia

The idea's a good one and thank you for the Journal. You're on our mailing list.

Friendly Tip from an FSO

I'd like to call your attention to a picture on page 14 of the August issue. It is captioned "Interviewing the pilot is the best way to get firsthand information about the performance of a T-33 after a test flight."

This photograph shows a safety malpractice that should make the FSO shudder. The parachutes are placed pin side down on the wing of a T-Bird. Experience has borne out that chutes should be carefully placed pin side up to prevent bending. Last, but not least, the chutes can easily become soaked in JP-4 when placed on the wing of a T-33A. Action has been taken at Offutt AFB to eliminate the malpractice of placing chutes on the wing. When the fuel cap for the main wingtank is removed during preflight with climatic conditions that are conducive to fuel expansion, the ensuing gush of fuel closely resembles "Old Faithful" in the Yellowstone Park.

A trivial item—but one which is factual is the marring and scratching of the T-33A wing when chutes are placed there in this manner. A scarred wing reduces the efficiency and thereby does little to enhance flying safety.

These are offered only as a friendly tip from FSO to FSO.

Capt. Roy C. Ihde
Director of Safety
3902d AB Wg, Offutt AFB.

Voodoo Booboo

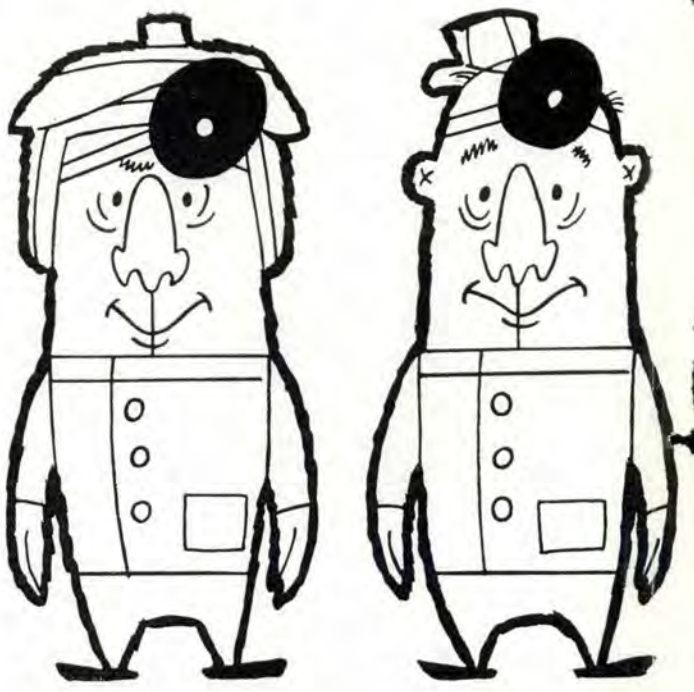
Our Unit—the 75th FIS—has recently moved from Presque Isle to Dow and, in transitioning from the F-89H to the F-101B, are applying an old gimmick to a brand new job.

The "Voodoo Booboos" pictured here are presented during daily briefings to the pilot and radar observer who've made the most glaring mistake in procedures while flying the F-101B, that day. By wearing the "medal" on a bright ribbon about his neck, the crewmember is a target for many inquiries as to exactly what he did to earn this honored distinction. This is one way for all pilots and radar observers to get a firsthand briefing of errors, corrective actions and recommendations that are the important "little things" that make a sharp outfit sharper.

Information Services Officer
75th FIS, Dow AFB, Maine

Sounds menacing. Hope it works!

Three groups must cooperate to guarantee the health of deceleration chute systems. Pilots, alert crews and shop personnel must all qualify as . . .



DOCTORS OF

John Kiker and Howard F. Holton, Aeronautical Accessories Laboratory, WADC

By American standards, which place human life above equipment, we were lucky—the crew escaped — when a B-52 aircraft crashed on takeoff. The aircraft, however, was a different story. According to the experts who investigated the crash, the probable cause was a malfunction of a $1000 deceleration parachute. The cost of this accident: 7 million dollars and an inoperable aircraft.

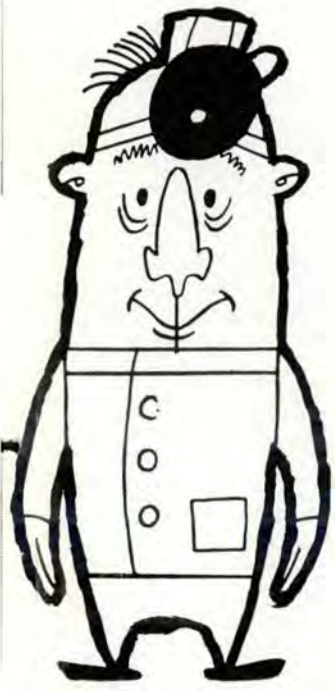
From 1 July 1955, to 30 June 1957, there were 2121 major jet aircraft accidents. In 64 of these, failure of the drag parachute was a contributing factor or the reason for the accident. The crash of the B-52 was one of an unknown number which may yet occur during the remainder of this year. Of course, we do not know how many of these accidents will be attributable to malfunctioning drag chute assemblies. We do know that jet age speed increases the hazards of landing and we know that one of the most important preventives for landing accidents is the use of the deceleration (*drag*) parachute. The entire deceleration parachute system—its pilot chute, its drag parachute—must work perfectly, if landing aircraft are to use the system effectively at speeds from 50 to 230 knots.

The B-52 accident, referred to, triggered the concern of personnel from Headquarters Air Research and Development Command, Strategic Air Command, the B-52 Weapons System Project Office, Middletown Air Materiel Area, and the Aeronautical Accessories Laboratory at Wright Air Development Center. After a meeting of representatives of the organizations concerned, personnel of the Aeronautical Accessories Laboratory and Middletown Air Materiel Area formed an observation team which toured Air Force bases located in areas having different terrains but having typical maintenance workloads in their parachute shops. As part of that team we can say that we were keenly interested in obtaining answers to such questions as, "How well are drag parachutes maintained?" "How closely are technical orders followed?" "How well trained are the maintenance men?" "How can we help solve the parachute problems which endanger life and aircraft?"

We talked with directors of materiel and maintenance, to personnel directly responsible for maintenance and quality control, and to supervisors and workers in parachute shops. We watched the methods and habits of the men who recovered the chutes after they were jettisoned from the aircraft, and we observed the landing practices of pilots who had to depend on the drag chutes for safe landings.

Efficiency in the different areas of interest varied with each base that we visited. In analyzing the drag chute problems at the installations visited, the team came to several major conclusions. Here are some of them.

- The quantity of parachutes available was inadequate.
- The inspection procedures were not as thorough as they should have been to meet the requirements stated in applicable tech orders.
- Only major damage was being identified and repaired, and even such limited repair overtaxed the facilities for maintenance.
- Current tech orders were not



DRAG

serving their purpose insofar as maintenance and repair needs were concerned.

• After repeatedly observing bad retrieving procedures by alert crews and incorrect deployment and jettisoning of the parachutes by pilots, we concluded that the techniques of both pilots and alert crews could stand considerable improvement.

As members of the team, we personally found some staggering problems and almost unbelievable practices. For instance, at one field we saw jettisoned drag chutes lie in the sun for six hours, even though it is generally known that the strength of parachute material decreases 57 per cent if exposed to sunlight for 50 hours. At another we saw wet drag chutes buried in a heap of dry ones, muddy ones dropped on obviously serviceable ones, and others which had been over-exposed to the sun, sent to repair instead of being condemned. Because of aircraft activity and the lack of an adequate number of deceleration parachutes, we saw many of them retrieved, rerigged, and reinstalled in aircraft *without* being inspected or repaired.

Technical Orders—the maintenance lifeline—were just books on a shelf at some of the bases we visited. The parachutes were dog-eared but the pages of the applicable tech orders still had lint from the page cutter's knife *(they had never been opened)*.

Lack of manpower for alert crews causes a tremendous number of problems. Even more problems are created by ignorance on the part of parachute retrievers of the chute's structure and its susceptibility to damage. A jettisoned parachute blows across fields, runways, and frequently across stubbly, rocky or generally very rough terrain and just stays there until retrieved.

After a released parachute has been located, the alert crewman usually drives his truck as close to it as the rough terrain will permit, and here's where the destructive handling often begins again.

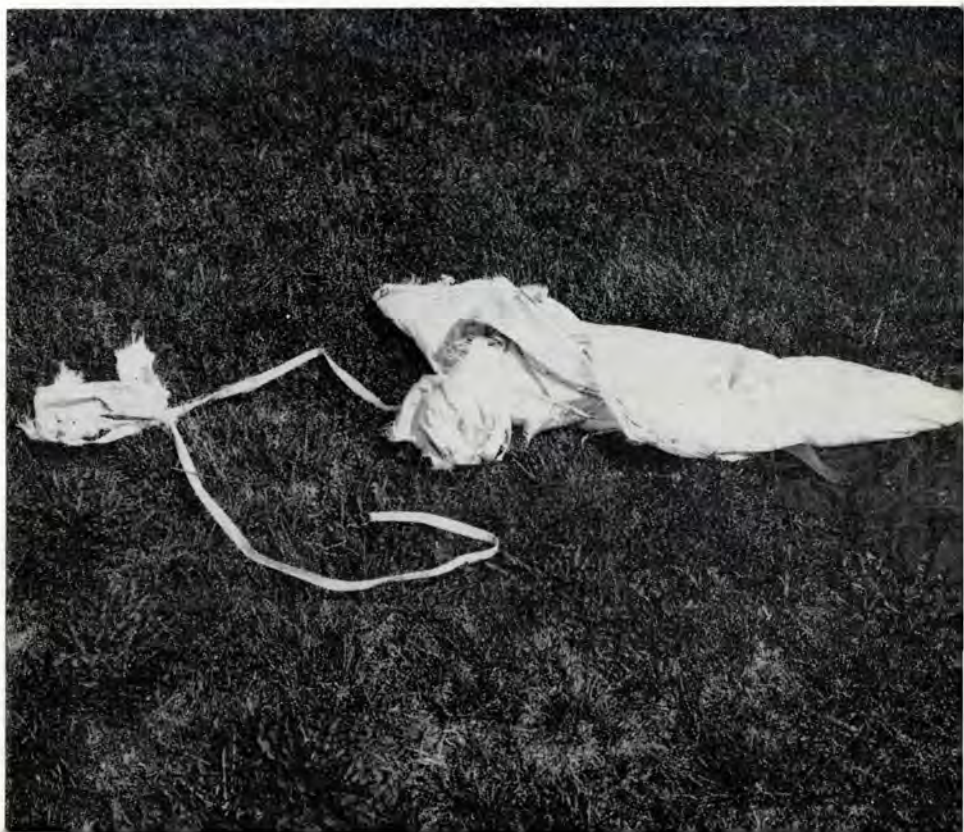
The member of the alert crew quite frequently drags the deceleration chute assembly to his truck, hauls it over the tailgate and drops the jumbled, twisted mass of nylon in a space which may already be jammed with wheel chocks, batteries, grease, containers and various sharp, rough and dirty objects. This retrieved parachute jounces and bounces all the way back to its shop. After it arrives, personnel pull and drag it over all of the items in the truck and —whether wet or loaded with mud— it is dumped on top of other heaped up parachutes which are awaiting inspection services of shop personnel.

None of the mishandling of chutes during the retrieving process is deliberate. It happens in the rush of getting many jobs done in a minimum amount of time and because the men who work in alert crews have not been made aware of the problems they can create by treating a jettisoned parachute as though it were a bag of potatoes.

Members of alert crews are not the only persons who mishandle deceleration parachutes. Pilots, themselves, are responsible for some of the most serious damage to their lifesaving deceleration parachute systems. The men who work in the parachute shops can, in 9 cases out of 10, point out pilot-caused damage. Abraded deployment bags, canopies and suspension lines of the deceleration parachute assemblies are common. The abrasion to such parts, frequently the result of improper landings, can cause the chute to malfunction. Incorrect taxiing procedures can damage the pilot chute and the whole deceleration parachute assembly.

At one base we saw a pilot land on a runway, deploy his chute, allow it to deflate, make an S turn and then taxi straight ahead on another runway for at least 5000 feet. The chute and lines beat up and down on

Pilot chute snagged on runway light is good example of needless destruction during landing.



Above. Guide and drag parachutes as they should look just before pilot pulls the jettison knob. Right. Circled areas show typical damage from abrasion. Top circle is torn panel in ring-slot. Bottom circle shows where approximately one quarter of the ring-slot panel is completely gone.

the runway, whipped and jerked in a crosswind, and endured friction burn as they were dragged until the pilot stopped his airplane and jettisoned his parachute. That was at least 5000 feet of ruinous travel for a life-saving device.

Pilot damage can be corrected to a great extent by correcting landing procedures. There is a Flight Handbook for every type of aircraft, including those which use the deceleration parachute. All landings cannot be perfect and according to the book. We know that. However, if the pilot will think of his deceleration parachute as part of his braking system, no doubt more time and effort will be given to keeping such chutes in good condition. A few simple actions on the part of the fighter pilots, for example, could help a lot.

We'll assume that a fighter pilot, equipped with a deceleration parachute system, is about to land. Nearly all fighter aircraft should land in a tail-down position and then touch down the nosewheel. After the nosewheel is down, the pilot should deploy his deceleration parachute immediately, let it decelerate his speed as prescribed in the applicable flight handbook, then start braking. As long as power is on and complete braking has not occurred, the parachute will be inflated enough to travel *above the runway, not drag on it.* Once the aircraft is on the taxi strip and still at approximately 20 miles per hour, the pilot should jettison the deceleration parachute immediately. This means that it will not be dragged, even at low speeds.

The wise pilot, be he bomber or fighter type, takes advantage of every safety device that has been designed for his protection. He follows the flight handbook procedures and makes those devices work for him.

After jettisoning his parachute, the pilot can give aid to operations by using his radio to report that he has jettisoned his drag chute and giving its approximate location—such as in a field, on a taxi strip or near an obvious landmark of some kind. This information will help speed up the retrieval of this equipment, save the alert crewman's time, and eliminate a lot of weather damage to the chute.

During our observation trip we noted that pilots have a strong personal feeling about their own parachutes but feel no real "kinship" for their deceleration chutes. We became aware of this attitude accidently. During a spot-check inspection, we examined a deceleration parachute assembly which had been removed from an aircraft that was being readied for takeoff. We found that the lower lateral band of the drag chute was cut ¾ of the way through. Despite this, a pilot wanted to use this chute. He was interested only in completing his flight. We pointed out the damage and the dangers. He still wanted to take off. Finally, one of us said, "Okay, let's cut the harness on your personal chute so that the damage equals that of the deceleration parachute. Would you take off with your personal chute in that condition?"

The answer was an emphatic "NO!" and he walked away. That pilot left with a different feeling about his deceleration parachute and perhaps (*we hope*) an appreciation of the importance of the inspections that should be made in the shops, even though such inspections are time consuming.

The pilot should be extremely selfish in his attitude toward the drag chute. He should think of it as his property and, in landing, treat it accordingly. It may be his property two days later, a week later or a month later. Anything he may do to damage it can jeopardize his chances of flying again.

Actually, our experience involving pilots and some of the things we saw, can't begin to match what the parachute shop personnel see and accept as a matter of course. Most shop foremen have collections of peculiar objects that were found in retrieved deceleration parachutes. Corn stalks, manhole covers, weeds, and even snakes have been found in the canopies, the most easily damaged portion of the deceleration parachute system.

One shop we visited used a rock weighing at least eight pounds as a doorstop. Yes, that rock had been retrieved in a parachute.

At another installation, shop personnel found a runway light, complete except for bulb, dangling from a riser. Most of these items became involved in the parachute because pilots failed to land, taxi or jettison the chute properly or because the alert crews did not have time—or didn't take time—to clear the canopies and deployment bags of accumulated debris. Interesting as such objects may be, they are a continuing source of damage to deceleration parachutes.

Damage is cumulative over a period of time. When inspectors have to balance time and manpower against damage and tend to overlook all but the most obvious damage, even the small cut, the few broken threads, the small slit, wherever they may be, become dangerously large and can jeopardize the lives of pilot and crew, and bust up an airplane when landings are just routine.

We all know that risers, skirt and vent bands, and suspension lines are

the most critical parts of a deceleration parachute system and require the most thorough inspection. Inspectors, conscientious and careful as they may be, cannot always accurately judge the percentage of allowable damage to even the most critical parts when inspections are hurried, and pilots are impatiently waiting to fly the aircraft. The inspector cannot afford to assume that all landings will be routine and that the damaged parts of the parachute will withstand even the stresses and strains of such landings. An aborted takeoff or aircraft touchdown at excessive speeds can result in emergency-type landings which impose terrific strain on all parts of the parachute. Damaged areas are overtaxed, and if one of the critical areas gives way, the entire deceleration parachute system fails. The end result can be more than one lost parachute. It can spell disaster for aircraft and crew.

It was the consensus of the team that the whole philosophy on parachute maintenance must become a positive one: "Repairs will be made" rather than "Repairs may be made if. . . ." To emphasize the positive approach, we recommended that Wright Air Development Center set up a one-time course on parachute damage identification and repair, and present the instruction to SAC riggers and to a representative of the Training Command.

Basically, the course was planned to help shop personnel to identify parachute damage and those areas requiring immediate repair.

A second recommendation was that Air Training Command review its parachute rigger course and emphasize inspection and maintenance. In addition, it was desired that the WADC instruction course be included in the ATC course.

In line with emphasis on "positive maintenance" and the course designed to project this philosophy, the team recommended that WADC request Air Training Command to establish a special two-week course on drag parachutes and that all concerned personnel be authorized to attend.

Another recommendation was that the tech orders for the B-52 Deceleration Parachutes be revised and included in one document. To help the maintenance man, tech orders should include more photographs of damage to the chutes, and more emphasis on inspection, repair, and flight safety aspects of this important item.

Team members recommended that procedures be established for the proper handling of deceleration parachutes by alert crews. Another was to assign a *trained* person to the full time job of retrieving jettisoned parachutes and to equip him with a truck—kept clean—to be used during retrieving expeditions. We felt this would go a long way toward eliminating damage to chutes. A part of the instruction for the alert crewmember should be given right in the parachute shop where the "retriever" would get a firsthand look at the type of damage that can result from mishandling. Along with these projected ideas, we were convinced that the following simple procedures could be put into effect immediately to correct the situation:

- Assign at least two crewmen to retrieve large deceleration parachutes.
- Retrieve the canopy so that the debris can roll out or be picked out by the crewmen. Get rid of such things as cornstalks and runway lights from suspension lines before gathering up the retrieved parachute.
- Keep pickup truck free of damaging items. If such items must be carried, keep them covered with heavy tarpaulin. After retrieving and loading the chutes into the truck, do not throw other things on top of them.
- Upon arrival at the parachute shop, lift, or use the canvas retrieving bag to unload the chutes. Empty the bag so it can be used again. And do not dump wet chutes on dry ones!

Since the recommendations were made, WADC has instructed approximately 30 SAC riggers in proper B-52 procedures. These men will, in turn, instruct others. Air Training Command was represented during the course of instruction. Middletown Air Materiel Area is revising the B-52 Deceleration Parachute Technical Orders in accordance with team recommendations.

Action taken thus far is positive and in the right direction. However, the team's recommendations can no more solve all of the problems of deceleration parachute systems than can the continuing effort to find stronger parachute materials and more satisfactory parachute designs. The best designed deceleration parachute ever developed couldn't withstand the abuse or misuse by any of the persons who are responsible, either morally or by regulation, for a deceleration parachute. It takes cooperation from the pilot, from the alert crew and from the parachute shop personnel—a three-way attitude of cooperation—to guarantee within reasonable limits the safety provided by the deceleration parachute system.

SILENT SWITCH

1st Lt. Samuel A. Munch, 3560th Pilot Training Wing, Webb AFB, Texas.

"Webb Ground Control, this is Air Force Jet 16508, standing by for ATC clearance. Over."

"Roger, '508. Your clearance is on request. You're number one."

The preflight had gone smoothly. Other than having to ask that the windshield be cleaned, there were no discrepancies. I felt good—was about to give a 60-4 practice ride to a pilot upgrading in jets. Overhead was a thick, dark overcast. After giving two instrument rides each day, every day for the past few months, I looked forward to actual weather time. Today I was going to get plenty of it.

It seemed like hours before Webb Control called back.

"'508, this is Webb Ground Control. I have your ATC clearance. Are you ready to copy?"

I copied and we fired up.

"'508, cleared for takeoff."

I centered the bird on the runway, made the final checks and told the student, *"You have the aircraft. Let's have a good instrument takeoff this time."*

(Editor's note: Hooded simulated instrument takeoffs are no longer authorized or required for normal operations. Hq., USAF ALMAJCOM Messages 913/59 and 917/59, dated 1 July and 6 July 1959, respectively.)

The T-Bird started to roll. About one minute and 1000 feet later we entered the overcast. The control lights on the instrument panel were too bright so I dimmed everything.

The student was flying the aircraft and it was obvious he was a heads-up type even though his jet time was limited. He flew smoothly, and he complied with all instructions with complete efficiency. It looked like no-sweat.

We broke out on top at 24,000 feet. The sun was two hours from overhead and it was blinding. I pulled the visor over my face and felt relieved when the glare was gone. We settled down to the business at hand, a VOR orientation.

After a time check on Midland, a field approximately 40 miles from home, I called El Paso Center and requested clearance to proceed to the Midland VOR. El Paso gave me the okay, a handoff to Midland Approach Control, and we were cleared as requested. We planned to penetrate, make a low approach and an ILS.

"Uh, Air Force 16508, this is Midland Approach Control. I can't handle you right now. Can you hold for 15 minutes? I can take care of you then."

We decided we didn't have enough time to hold that long, then make the run and still get back to base and meet our approach time.

"Midland, this is Air Force '508 again. Thanks just the same, but we'll go home now. See you again sometime. Over."

"'508, you're welcome anytime."

We didn't know at the time how true our last transmission would prove to be. We continued toward Webb and five minutes out, we contacted approach control and said we'd be in the located area, VFR on top and wanted to reaffirm our approach time. They gave us a Roger and told us to monitor Channel 15. We did. We made an aural identification, both on Big Springs VOR and the ILS low frequency to make sure we were back in our area.

Staying in our own area we continued to practice VOR procedures. I noticed during the tracking, homing and time-check practice that the student was having difficulty incorporating the navigational instruments into his basic crosscheck. This seemed to be his only problem.

I took control of the aircraft to demonstrate a VOR time check. We were too close to our home VOR to make an adequate demonstration so I changed the VOR back to Midland. Then, as I flew, I explained each phase. He seemed to understand what his trouble had been; what he needed now was practice. So I informed him that he had control of the VOR.

I reached forward and flipped the VOR control switch, giving control to the rear cockpit.

The student said *"Roger,"* and flipped his VOR control switch, putting the control back up front.

I should have seen the light but I had dimmed the instrument lights during our climbout and had pulled my visor down. We were still tuned to Midland.

We did not make an aural re-identification since we had previously done so. The student was informing me of each new heading dialed into the ID-249 so that I might better monitor his VOR technique. I was making each change along with him so the maneuver appeared normal. We got station passage and I called Webb Approach Control to give our position.

"'508, this is Webb Approach Control. You're cleared to 21,000 feet. You'll have to hold until 1725 Zebra."

I looked at my watch and it read 1711. Fourteen minutes to hold! I acknowledged and we began our holding pattern. At 1725 I called in again.

"'508, please hold until 1731."

Finally, we were cleared for a VOR penetration and low approach off the Webb VOR. During the penetration we were asked if we wanted a GCA. We talked it over for a moment and decided we'd use it.

In the turn we went to Channel 17. Then came the first surprise. We asked GCA if they had us. The reply

was *"No"* even though we were squawking on our parrot. We were told to call over the VOR at 3900 feet; we did. GCA told us to turn to 260 degrees and descend to 3600 feet. We did that. Then we were turned to 170 degrees and then to 080, at the same altitude. Here they informed us they had to work two F-86D aircraft, with minimum fuel!

I went back to Channel 1 and received instructions from the tower to return to the VOR at 5000 feet. We held on a 220 radial until further cleared for an approach.

We then tracked outbound on the 180 radial and let down to minimum altitude for Webb. We broke out just prior to reaching the minimum, and I got surprise number two—the granddaddy of all surprises!

At first I thought things looked a little strange. Then I saw the ramp! It was on the wrong side of the field. Worse than that, it was the wrong field! I had made a Webb approach, but I had been over Midland at the time.

I called Midland on Channel 4 immediately and was cleared back to the Midland VOR at 5000 feet. I made another approach and landed.

The student and I climbed out, not sure of what had happened. We stood there talking for several minutes before we realized where the *big error* had occurred. Actually there had been several errors. The first was mine. I turned down the control lights on the instrument panel and I did not turn them back up when we emerged from the overcast.

Then came the business with the VOR control switch. I had given him control and he had given it back to me. Neither of us was aware of the switchover. In other words, we should have called the change when we made it.

Too, I should have known something was wrong when GCA said it couldn't find us. I should have double-checked my position right then. But, as we had already been in contact with Big Springs I didn't think an aural re-identification was necessary.

We looked up at the tower and saw the operators looking down at us. They're sharp boys up there. They're on the ball and are always cooperative. I had talked to them frequently when I was giving practice rides to students. They knew my voice and always seemed glad to have me around. I had to go up and try to explain. But, could I really tell them what had happened?

I had been in solid weather from the start of my penetration to approximately 600 feet above the ground. I had passed within minimum clearance of nine aircraft. I could have killed any number of people—not to mention myself!

Maybe I could explain it. But I could never justify my jeopardizing all those lives and that property because of small details I had neglected.

Yeah. The boys in the tower had always seemed glad to have me around. As I climbed the stairs toward them, I wondered if they would ever feel that way again. ▲

★

T-Bird

Quiz

★

1. The minimum exhaust gas temperature varies considerably with each engine; therefore, the acceleration check speed must be computed for each takeoff.

*True*_____ *False*_____

2. A travel pod should be retained if a gear-up landing is planned.

*True*_____ *False*_____

3. You are on a navigation flight. You discover that fuel is siphoning overboard from a wing or leading edge tank. You should plan to land the aircraft as soon as it is safe to do so.

*True*_____ *False*_____

4. Turning on the takeoff-and-land switch activates a pump which supplies extra fuel pressure to the engine.

*True*_____ *False*_____

5. You need to be careful in handling the throttle while taxiing because the governor will not prevent the engine from overtemping and overspeeding.

*True*_____ *False*_____

6. The right tiptank is empty; the left one is full and you must land. If you have over 500 hours in the aircraft, it is all right to retain both tiptanks and land. Attempts to jettison the full tank are not required.

*True*_____ *False*_____

7. Speed brakes must be retracted in order to make a successful barrier engagement.

*True*_____ *False*_____

8. Barrier engagements may be accomplished at any groundspeed from a minimum of approximately 35 knots up to a maximum of 130 knots, but more positive engagement can be assured if the barrier is contacted at a speed as close to the minimum as possible.

*True*_____ *False*_____

9. When towing a target, takeoff distances will be_____ per cent above those given in the appendix data charts.

_____per cent.

10. If a float valve should stick closed, the first thing to do is *climb*.

*True*_____ *False*_____

11. If rime ice is present, a power pattern rather than a speed pattern should be flown for landing. Expect the indicated airspeed to be abnormally high for the power used.

*True*_____ *False*_____

12. With 400 psi oxygen, at 25,000 feet, using 100 per cent, your supply is sufficient for_____hours.

(See page 13 for answers.)

The List

A recent study was made by the Federal Aviation Agency of statements submitted by pilots in connection with reports of near mid-air collisions. The study "revealed an alarming unfamiliarity by pilots of the semicircular rules." Needless to say, violations have occurred because pilots operating VFR or VFR conditions on top are not adhering to the required flight levels for such flights, as set forth in paragraphs 33d and 37e, AFR 60-16, dated 17 December 1958. Heretofore, Air Traffic Control stations have been prohibited from advising a pilot flying VFR when he is at the wrong altitude for his direction of flight. This restriction has now been removed and these stations will have the authority to tell a pilot when he is flying VFR at a wrong altitude.

As the FAA can only afford aircraft separation between IFR aircraft, the semicircular flight levels set forth in the above-mentioned regulation are the only means of assuring vertical separation between VFR and IFR traffic. Ignoring the only means of separating VFR traffic from IFR traffic and thereby incurring the risk of mid-air collisions, is inexcusable on the part of the pilot. Extreme caution is required by the pilot when descending or climbing.

✓

This one involved a Gooney Bird that was being test-hopped after a periodic inspection. During the inspection, the chains in the pilot's and copilot's control wheels had been checked, and in reassembling the pilot's wheel, the aileron chain assembly had been reversed. All of the succeeding flight control checks were then made by using the copilot's wheel, and movement of the control surfaces were correct with relation to the control wheel. No one observed the pilot's wheel turning in the wrong direction when the checks were accomplished. Even when the two pilots made their checks of the flight controls, the same thing happened: the copilot handled the wheel and the pilot looked out.

Anyway, after the aircraft got up into a 60-degree bank on takeoff, the copilot yanked off the left throttle and the wings just about attained level attitude when they hit the ground. Maintenance error and maintenance supervisory error, both enter into this one. But there seems to be a bit of cockpit trouble too!

Recently an F-100 pilot noted that during an autolabs maneuver when the aircraft reached a pitch angle of approximately 135 degrees, the autopilot went to zero G, rather than programming back to proper G value. He decided to wait and see if the autopilot malfunction would correct itself. After a short time, with no change in pitch angle, the aircraft yawed to the left. The pilot corrected with right rudder, which stopped the yaw, and tried to fly the aircraft through. The plane then entered a spin to the right at about 9000 feet. The pilot ejected at 5000 feet.

The lesson to be learned is that the pilot must remain alert at all times during autolabs maneuvers and if a malfunction is apparent, immediately take control from the autopilot and complete the maneuver manually. Cases have been recorded where the autopilot went to full up elevator at the G release, thus causing a stall. In any case, the malfunction must be corrected immediately to avert disaster.

✓

For more than two years now at the Amarillo Technical Training Center, the Air Force has been training airmen in the proper methods of fuel handling, storage and dispensing, with emphasis on quality control. Recently the school expanded its curriculum to include a six weeks course for petroleum officers. Tentatively, each class will train 10 officers who will then return to the field, better equipped to deal with the old bugaboo of fuel contamination. This is definitely a step in the right direction and should save us a number of aircraft over the years.

✓

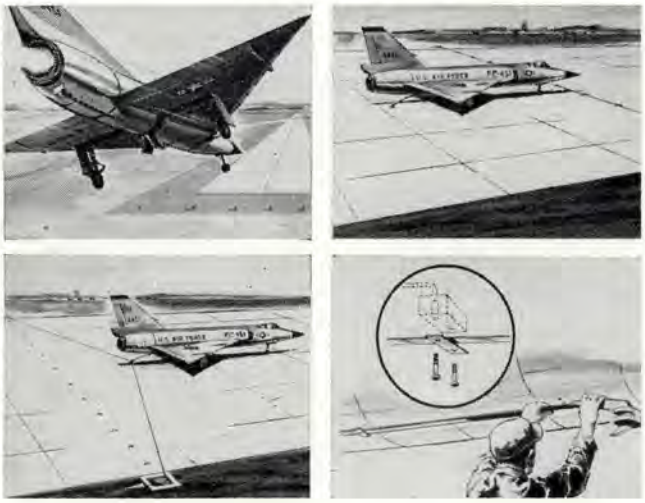
The Cessna T-37A is scheduled to become the T-37B next month. The Aeronautical Systems Center at Wright-Patterson Air Force Base has announced the redesignation of this twin-jet intermediate trainer as the result of two major equipment changes being made. New communications and navigation equipment will be installed in the June production models, and new Continental J69-T-25 jet engines will be installed during November when the T-37B designation becomes official.

✓

Spence Air Force Base in Georgia is the fifth primary base to receive the Cessna T-37 which first entered the Air Force training system in 1957. To date more than 350 of the side-by-side jet trainers are in service.

✓

Where this saying originated, we don't know, but we thank the father of the thought. It is well worth passing along: "There are two well-known finishes for airplanes—lacquer and liquor."



Convair has awarded a contract to All American Engineering Company for the manufacture of spring steel arresting hooks to be installed on the F-106 aircraft. A prototype hook on the '106 has been successfully tested at Edwards AFB, safely arresting the aircraft as it engaged a runway cable and anchor chain barrier at 110 knots. This hook differs from the conventional, or aircraft carrier type, in that it is a simple mechanism, a strip of spring steel secured to the underside of the jet, held flush and under tension. When the pilot energizes an electrical circuit, the hook springs into its lowered position. There are no hydraulic or other servo-mechanisms required to operate it.

✓

Perhaps you've read about it on page 7 of the July issue, but have you taken a look recently at Sections 6 and 7 of your Flight Manual, pertaining to asymmetric flight?

Number Six has already occurred this year. This one involved an F-100C pilot who had three tanks on board. He was still pretty heavy when he began his first turn from base leg for a firing pass. The aircraft was observed to go out of control and strike the ground inverted. The pilot was not the most experienced driver in the world, but neither was he wet behind the ears.

His wingman, while orbiting the scene with the same configuration and fuel load, experienced a stall from which he almost didn't recover. As we've said before, this is Number Six for this year. Some of these will go down in history as *undetermined,* but undoubtedly many of them were caused by pilot carelessness or inattention. This '100C is a real good beast, but you've got to keep the airspeed up, especially when you have all this gunk hanging under it.

✓

Nickel-cadmium batteries for T-33 aircraft have been approved and are scheduled for early installation. This battery *(Type MA-2)* will provide an emergency power source capable of supplying electrical power requirements of VOR-equipped T-33A aircraft for *at least 35 minutes.* There are enough batteries on hand now for 12 per cent of these birds; the remainder will be delivered at the rate of 300 per month. Completion of replacement is scheduled for June, 1960.

Have you requested a tire pressure check from your crew chief lately? Maybe this doesn't appear to be important, and, furthermore, maybe you should trust him rather than doubt him. But a surprise check once in a while might reveal some interesting numbers, might even shake him up a little. Incidentally, how many pilots have actually seen a "tire pressure vs. gross weight" chart for the F-100? Three main gear tires have blown on takeoff this year, resulting in major accidents. This brings up another subject. Are you familiar with the action to be taken in case of main gear tire failure on takeoff, and do you think you could diagnose the problem soon enough to take proper action if you are going 160 knots just before nosewheel liftoff speed? Wouldn't hurt to read the Dash One again, would it?

✓

A WB-50 recently lost the tip of one propeller blade on the No. 2 engine. About 18 inches of the blade entered the fuselage and caused severe damage. The No. 2 engine subsequently tore from its mount. This is believed to be an isolated occurrence but it points out that prop inspections must be carefully performed according to the tech order.

✓

The FAA proposed a rule that would require all passenger carrying air transport aircraft to be equipped with airborne weather radar. Such equipment would be in operation for all IFR, and for night VFR when thunderstorms or severe weather conditions are forecast for the flight plan route.

✓

According to reports reaching the editors, many pilots are not monitoring emergency channel. The UHF radio selector switch will be positioned in "T/R" plus "Guard" position at all times while aircraft are being operated in connection with a flight, except during tactical missions, in which monitoring of emergency channel, 243.0, would interfere with accomplishment of the mission. Remember that what you overhear might keep someone here.

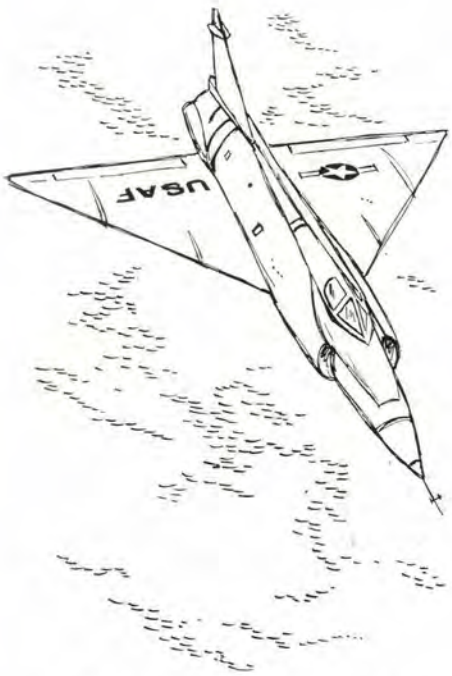
✓

Here's one for the book! A C-47 groundloop, no less. A Gooney was making a touch-and-go landing. As the airspeed decreased and the tail settled toward the runway, the plane started a slight turn to the left. The student pilot over-corrected and sure enough got a sharp turn to the right. The IP now took control and applied left brake and right throttle. Too late or too little, our proud Gooney left the runway and crossed a drainage ditch, coming to rest 250 feet to the right of the runway. Questions that arise are: Was the IP qualified? Was the open drainage ditch necessary to the operation of the airdrome?

✓

Two KC-97s collided in a night taxi accident, as one tried to pass the other to swing out onto the runway. The Investigating Board found "lack of sufficient rest and sleep" to be one contributing factor. The aircraft commander at fault was about to embark on an extended mission even though he had had only six hours of interrupted sleep during the previous 40 hours. It seems that his room in the BOQ was located where noise and traffic kept him awake.

Adequate rest is a *must* for top operational condition.



Two heads are better than one when the time comes to go...

...Down to the

One night last summer I ejected from my F-102A into the Atlantic Ocean, about 15 miles off Long Island. This happened at approximately 2100 hours while flying at 3000 feet.

I was No. 3 man in a flight of four, led by Captain Clarence G. Manning, on a radar night mission. We were briefed thoroughly that morning and again at night, with special emphasis on emergency procedures. We preflighted our aircraft and fired up at the same time. Following instructions from the tower, we taxied out to runway 23 and took off as a flight of four, at 2035 hours EDT.

Takeoff and climb through corridor to altitude were normal. I made three radar intercept runs: two missile simulated runs and one rocket simulated run. Upon completion of the third run, we asked "Occasion" director to return to base. We were at 38,000 feet at the time.

At this time my engine troubles started. Since this is primarily a survival story I won't go into the details of all the emergency procedures. Suffice to say that several thousand feet later, I found myself with a dead engine so Captain Manning and I decided it was time to eject.

Captain Manning told me to clean up the cockpit and prepare to leave the aircraft. He said to make sure my zero lanyard was connected; it was. Altitude was about 6000 feet, as I rechecked that my seat pin was out and placed my flashlight and checklist in the leg pockets of my flying suit. At 4000 feet he told me to blow the canopy. I did. I didn't notice any adverse effects from wind, since my visor was down and the chinstrap snapped on. Captain Manning then told me that the canopy was clear and to eject—NOW! (*Twenty-five minutes after takeoff.*) And that was my last transmission from him.

During ejection I felt myself being shot upward, then I tumbled forward and it seemed that I was upside down when the seat and I parted company. As I completed the roll, my automatic equipment worked with no difficulty.

Everything happened so fast from the time I ejected until the parachute opened that I was unable to react to anything until I felt the opening shock, and it was severe! I felt as though my legs were being torn from my body, after having just been hit at the base of my spine with a 100-pound sledge hammer. The pain was severe, to say the least.

I was oscillating because of the wind, but I stopped this by pulling the front risers. Then, I took my helmet off and disconnected the oxygen hose from my parachute harness. I

Good preflight planning and an alert rescue effort pays off again for a downed Air Force pilot.

Sea

1st Lt. Edward E. Parsons, Jr., 5th Fighter Interceptor Sq., Suffolk AFB, N. Y.

kept the helmet in my left hand as I looked around at the lights on Long Island, trying to orient myself. I tried to judge how high off the water I was by the level of the lights. When I looked down and finally saw the water, I dropped my helmet and listened for it to hit—hoping to be able to judge approximately how far up I was. It hit right away, so I inflated my dinghy and Mae West. The dinghy hit the water in front of me and I fell backwards into the water. This was caused by the wind. I reached up and detached the quick release on my parachute riser to collapse my canopy.

When I hit the water my Mae West *(the new waterwing type LPU-2/P)* was forced out behind me at a 90-degree angle from my body. I went under water approximately two feet but upon reaching the surface, managed to bring these wings in under my arms. Then I swam to the dinghy which was about 15 feet away, and upside down. I turned it right side up and crawled in, rolling over on my back and placing my feet in the narrow end of the dinghy. I had difficulty getting rid of my harness because of the awkwardness and position of the Mae West waterwings, but finally managed, by partially deflating each wing individually. After getting my harness off, I re-inflated the waterwings orally. I left the harness attached to the seat so the parachute would serve as an anchor or a drag.

During the time that I was trying to get into the dinghy, it had taken in a lot of water, so I proceeded to bail by hand. This made the dinghy float better. Then, I proceeded to untangle the parachute harness and parachute from the seat and sea anchor. When I couldn't find the emergency survival equipment I decided I had lost it in the process. I disconnected the parachute from the seat, released the chute into the sea, then brought the seat into the boat and left the sea anchor out. This anchor extended out on the right side and held the dinghy into the wind and helped reduce wave motion of the dinghy by keeping it aligned perpendicularly to the waves. The sea was very rough. Some of the waves were five to six feet high. After a short time, however, I was confident that the raft would not flip over. In fact, it rode the waves so well that very little water splashed into the dinghy.

Every few minutes I would bail water for exercise to prevent cramping and to keep my blood circulating. During the course of the night many thoughts passed through my mind but never did I doubt that I would be rescued. I could see and hear many aircraft flying over the area

DOWN TO THE SEA (Cont.)

searching for me and this gave me a great amount of consolation. I felt more and more assured as the night wore on that I would be rescued as soon as daylight arrived.

My watch was still running. This enabled me to keep track of the hours and helped me to discipline myself to the slow passing of time. I was successful in fighting back panic by keeping in mind that it can cause a person to make serious mistakes. I planned what I would do at daylight —I would bail out as much water as I could in order to get dry and warm. I decided that I could stay in the dinghy one more day and night without ill effects.

Finally, daylight arrived, and I found the survival kit dragging underneath the dinghy. I brought the case up full of water, with the shark repellent leaking. I dumped the contents in the dinghy, found the flares, and then busied myself bailing dark blue or purple water overboard. While doing this I spotted a fishing vessel about 50 yards away and set off a flare, but no one saw it. About five minutes later, an SA-16 came into view to my rear. As he approached, I set off the day flare and he spotted me and started to circle.

The pilot of the SA-16 said that he actually spotted the dark purple shark repellent color in the water before noticing the flare.

The SA-16 dropped a smoke flare on each side of me as a marker. Then the C-47 from home base came into the area and started to circle. (Later, when I talked to some of the personnel aboard, they said they too had seen the shark repellent before spotting me in the raft.)

A few minutes later a Coast Guard helicopter flew in and dropped the pickup basket. I jumped out of the raft and grabbed it as it came within my reach. (It was difficult to keep the raft from going away from the basket because of the downwash of rotor blades.) I rolled into the basket and waited to be hoisted up to the helicopter.

• • • • •

On the day of the flight, at the morning briefing over which Captain Manning presided, he had asked me to give the airstart procedure, as this was the emergency for the day. At the evening session he gave a thorough briefing on what we were to do in case someone had an emergency. The instructions were that if a flight member had an emergency, the other pilot in the element would join up on him to check him over and advise him if necessary. In the event a man had to eject, the other pilot would stay with him until the ejection was completed, then he'd climb to 5000 feet and circle the area. The other two members of the flight were to stay at altitude, coming down one at a time to replace the man at 5000 feet as his fuel got low. I feel that the thoroughness of this briefing helped me to cope with the emergency which I encountered.

Here's one more important point: Captain Manning, my wingman, is a well experienced pilot in the '102 and even before I ejected, my knowing that he was close at hand for advice and help kept me from hitting the panic button. He repeated the procedures and I followed them, and this gave me a feeling of security at all times. Two heads are better than one —when the time comes to go down to the sea. ▲

About the Author

Lieutenant Parsons completed pilot training status on 24 March 1959, and his first and present tactical assignment started on 6 April 1959 with the 5th Fighter Interceptor Squadron at Suffolk Air Force Base, New York. He was with the unit two months when faced with the emergency of ejecting from an F-102 aircraft at night over the Atlantic Ocean. Of particular interest is that Lieutenant Parsons, while only an average swimmer, put to good use the water survival training which he received at basic and advance flying schools.

●

★ ★ ★

Ten per cent of all unsuccessful ejections are due to drowning

Tips for T-Bird Drivers

An investment can be made in things other than money. One of those things is TIME. When an individual devotes 10 or 12 years of his life to a career such as the Air Force, he has made an investment that involves his most productive years. The longer an investment is in being, the more valuable it becomes and as it becomes more valuable, it should be that much more carefully protected.

Fortunately, we in the Air Force have something designed to help us protect this investment which we have made. That something is called "flying rules" or "regulations." These rules or regulations are designed to keep us alive so that we may enjoy the fruits of our investment later on. They were not haphazardly conceived but are the result of lessons learned through hard, costly, and sometimes tragic, experiences. These flying rules are good rules and, if followed, will insure that no harm will come to us from the things they deal with.

One rule says, in effect, "Thou shalt not operate thy aircraft close to the ground nor engage in irresponsible or reckless flying."

"But wait," you say, "surely this can't be *another* article on buzzing? In this day and age? With all the heads that have rolled in the past? With all the emphasis on 'quality control' of pilots? Surely, by now we have distilled our force down to the pure element. Surely, by now we have eliminated forever those undisciplined individuals whose makeup seems to require rapid transportation in close proximity to terra firma!"

Well, friend, I've got news for you. It shouldn't have happened but it did. They shouldn't have taken the chance—. For just a few short minutes these pilots failed to protect their investment, failed to follow the rules that were designed to keep them alive. Did they fail to heed the older heads, maybe? Hell, they *were* older heads!

The pilots under discussion departed a southern base at 35 minutes past a daylight hour. After takeoff, no radio transmissions were made by either pilot to indicate route and/or altitude of flight. Eye witnesses, however, observed the aircraft flying "just above the treetops." While at this hazardous altitude and at an undetermined, but probably high, airspeed the right tip-tank separated from the aircraft. The aircraft entered a left turn with the angle of bank increasing and the (too little) altitude decreasing. The aircraft struck the ground in a 30- to 40-degrees nose-low attitude in a vertical left bank, at 50 minutes past the same daylight hour. No need even to mention the crew.

Maybe we could write an equation to express this occurrence: 10 to 12 years of service=15 minutes of low flying. That hardly figures out, does it? Maybe we should add a plus (+)—that of impressing the pilots' friends who lived close to the crash scene? Still doesn't figure out, not by a long shot.

So, what's the answer—better supervision? For a captain and a major? You can't go with them on every flight. More emphasis on air discipline? How much more emphasis can be put on it! Education? That's what this article is for; how many have preceded it? Sure—like most accidents—this one was not the result of a single event. Sure—the right tiptank came off. But in the 15 minutes that the aircraft had been airborne it should have been above 20,000 feet, according to the climb chart in the flight manual. Would separation of the right tiptank at this altitude make an accident inevitable? Hardly!

No, gentlemen, let's talk plain. This was a buzz job, pure and simple! Low and fast, which is probably the reason for the tank to go in the first place. The old story—pilots spent the night with friends—pilots decided to buzz friends' house on leaving the area. Aircraft crashed, pilots received fatal injuries. Violations of Air Force regulations were committed and common sense was abandoned. Hazardous flying was indulged in. For a few short minutes these pilots neglected to protect their investment.

Have you been negligent about protecting yours lately?

Major Wallace W. Dawson, Fighter Branch, DFMSR

T-BIRD QUIZ ANSWERS

1. True
2. True
3. True
4. False
5. True
6. False
7. True
8. True
9. 20 per cent
10. False
11. True
12. 2½ hrs.

The RAIN

In April of this year at Luxeuil-les-Bains, France, a French Air Force F-100D aborted takeoff and slammed into the chain barrier. The contact was made at about 125 knots and dead center of the runway.

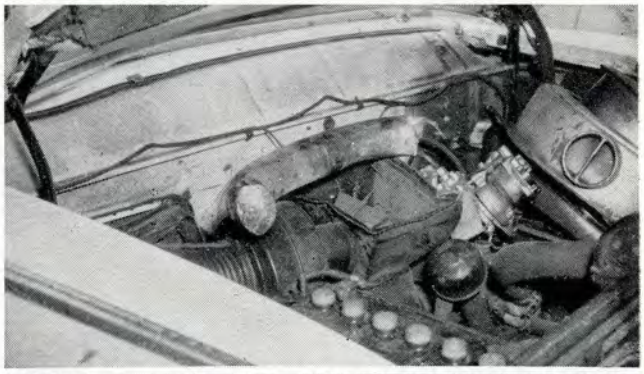
Prior to contact the drag chute had been deployed, tanks dropped and engine stopcocked. The entire 40,000-pound capacity of the barrier was used and the F-100 stopped about five feet from the end of the concrete overrun. The force of the impact was so great that five links from each side of the butt end of the drag chain were whipped off. One of these links flew through the air more than 2000 feet, passing completely through the body of one automobile and halfway through the engine of another. Fortunately, there were no injuries to personnel.

The photographs are graphic enough and the point is proved that airborne chain is still as dangerous as it was in the days of muzzle-loading cannon. But what can we learn from this?

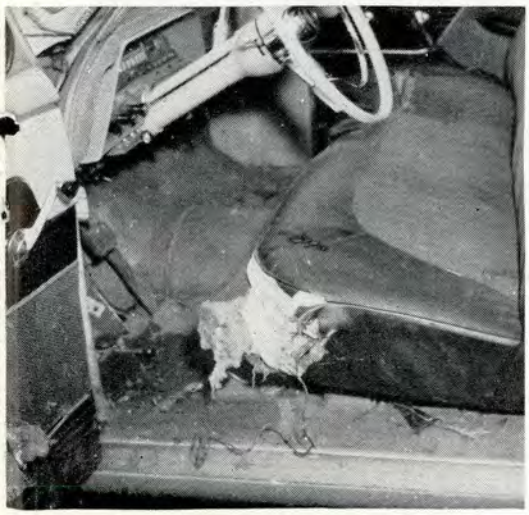
The truth is of course that this is not the first time barrier chains have been known to whip together behind a de-

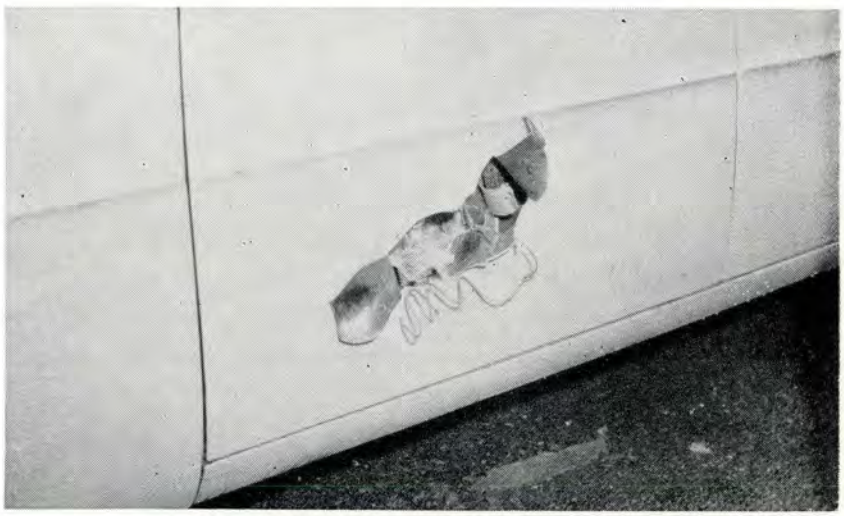
# of CHAIN

celerating aircraft and fly off into space. There is at least one instance of the chain actually crossing ends behind the plane and continuing in an arc until the ends meet again in front of the arrested bird. In this case the nose gear was torn away completely. As a result of this and other instances, Paragraph 1-20 of T.O. 35E-8-2-2-1 specifies that additional lengths of chain may be used at bases operating with F-89, F-100, F-102 and other fighters weighing above 20,000 pounds. Apparently this additional chain had not been added at this French base because the stopping capacity with such a modification would be much over 40,000 pounds. If there's any doubt about the weight and capacity of the barrier at your installation, best take a look at the T. O. mentioned above and add a few links. Of course, if you have not complied with AFR 55-42, which stipulates 1000 feet of runout beyond the barrier, the additional chain will be of little value. The bird will already have come a cropper before the chain has a chance to whip around.



Photos submitted by Colonel Clermont E. Wheeler, USAF, Headquarters Military Assistance Advisory Group, France





During the 1958 World-Wide Flying Safety Conference the Seminar on Landing Roll recommended we print this very fine article from the Navy magazine "Approach."

the Long and the Short of it

A number of items affect the braking of your aircraft. Some of them can be changed by the pilot; others cannot. Though all of these factors are mentioned here, major emphasis is placed upon those about which the pilot can do something.

The first of the factors is the coefficient of friction, which may be defined as the measure of the relationship of the frictional force between a body and the surface on which it moves. It varies with:

- Type of runway.
- Aircraft speed.
- Tire tread pattern and material.
- Inflation pressure.
- Temperature.
- Condition of runway—ice, snow, rain.

Type of runway. Runways are made from various materials, depending usually upon the cheapest material available. Naturally, this material may vary from one installation to another.

Yet we cannot say that one type of material has a definite coefficient of friction, for it has been determined that a runway made of the same material throughout may vary in coefficient of friction from one section of the runway to another.

We can say, however, that dry concrete and asphalt will run from about 0.5 to 0.85 coefficient of friction (*as related to the theoretically possible 1.0*).

Aircraft speed. The speed of the aircraft can be controlled by the pilot and will be discussed later.

Tire Tread Pattern. Tread material and pattern cannot be controlled by the pilot. He *can*, prior to takeoff, check to see how much tread he has, and he should know that on an icy or wet runway a smooth tire will not give him the braking that one with a good tread will. Aircraft tread design is a compromise between the best tread design and a design that will stand up under the high speeds necessary in modern aircraft.

Tire Pressure. Inflation pressure can be varied very little. While the carrier aircraft will generally have a high pressure tire, multi-engine aircraft tend to use lower pressure, and, of course, lighter aircraft generally have lower pressure tires.

In most cases, the lower the tire pressure the greater the friction generated between the runway and the aircraft. *(Figure 1.)* The exception is a runway with water on it.

Here the high pressure tire tends to give better braking since there is less contact area to cut through the water to contact the runway surface. *(See "Condition of runway," Fig. 3.)*

Temperature. The higher the temperature, the worse the braking action. *(Figure 2.)*

Condition of Runway. The condition of the runway causes wide variations in the coefficient of friction. Snow, ice, and rain cause most of these variations. Water on the runway can be the cause of an almost complete loss

Figure One

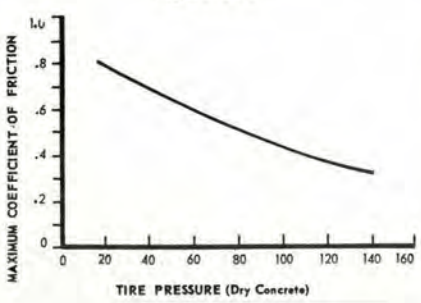
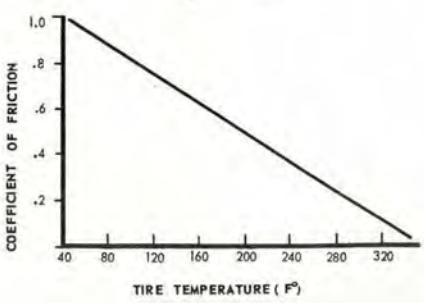


Figure Two



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 Three—Condition of Runway

of friction when the "cushion" of water causes the tires to act as hydroskis. Ice, itself, furnishes a good coefficient of friction. Surprisingly enough, it is about equal to dry concrete or asphalt. Ice, however, causes trouble when it is heated to its thawing point (*as from tire friction*). As soon as the tires heat the ice, the thawing furnishes a thin layer of water for the tire to skid on, and the necessary braking friction is lost.

Braking force is equal to the coefficient of friction times the weight of the wheels.

The retraction of flaps on touchdown increases the weight on tires which, in turn, increases wheel braking effectiveness.

Tests conducted by Goodyear Aircraft Company showed that for an F-84G on dry concrete, with 80 per cent braking efficiency, flap retraction reduced landing roll by 10 per cent. On an icy runway, with 100 per cent braking efficiency, it *increased* the landing roll by 6 per cent.

While aerodynamic braking is independent of runway conditions, wheel braking is, of course, limited by tire-to-runway friction.

A little slippage helps. Maximum braking is obtained with 15 to 25 per cent slippage. If the aircraft is making 100 knots and the outside circumference of the tire is doing 75 to 85 knots, the maximum braking is obtained. More than 15-25 per cent of slippage results in skidding.

Figure Two-A

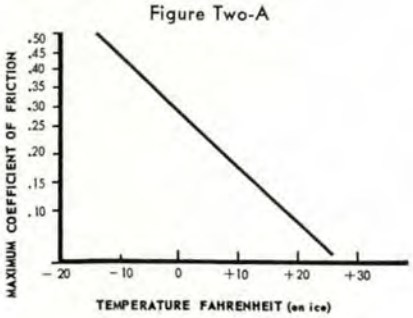
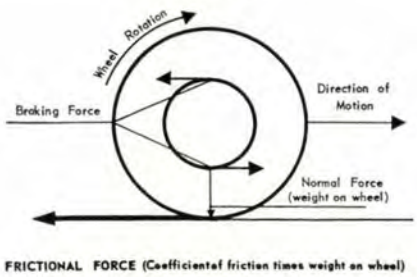


Figure Four



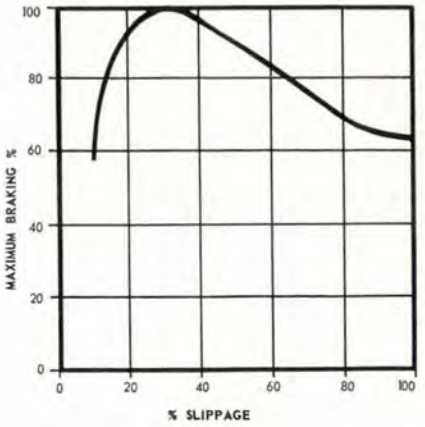


Figure Five

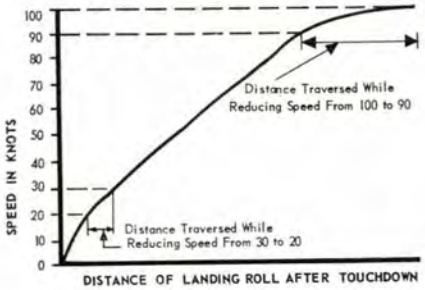


Figure Six

Figure 6 shows a time-distance relationship in the landing roll.

From this, it is easily seen that for a short landing roll, early braking is important.

Once on the deck the aerodynamic braking by the flaps could be outweighed by the reduction of weight on the wheels.

Skid Row. Skidding is inefficient. In the skid the rubber on the tire can melt, giving the tire (*or most of it*) a liquid surface to slide on. This reduces friction a great deal.

Even if the heat is not great enough to melt the rubber, small particles torn loose by the shearing action will act as rollers, again reducing the friction appreciably.

By looking at Figures 5 and 8, we can see that a skidding tire has a low braking efficiency.

The skid, then, is undesirable; however, that is not the worst part of the skidding tire.

Blowouts and Emergency Braking. Very little skid is necessary to blow the tire. After the tire blows, it disintegrates quickly, leaving you on the rims.

Metal sliding on concrete has an extremely low coefficient of friction. Therefore, for two reasons it is undesirable to skid:

• The skid on rubber is inefficient.

• The skid on metal is even more inefficient.

If the emergency brake is the type which locks the wheel, and if the normal braking system is working, pulling the emergency brake then is one of the worst moves a pilot could make.

Aerodynamic Factors. The NACA states that a reduction in landing roll results from the application of *up* elevator just after the nosewheel touches down.

The amount of up elevator is limited to keep from lifting the nose gear, but it transfers a maximum possible weight to the main gear. The savings on dry concrete were 25 per cent of the landing roll; 30 per cent was saved on wet concrete. But if you have a steerable nosewheel, elevator overcontrol can create another problem, and you may lose some directional controllability.

Deflection of ailerons is an effective source of drag—flaperons even more so.

Figure Seven

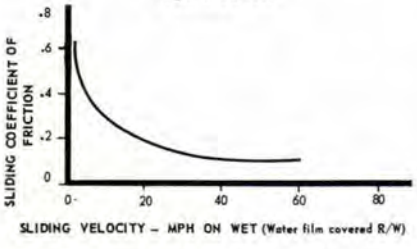


Figure Eight

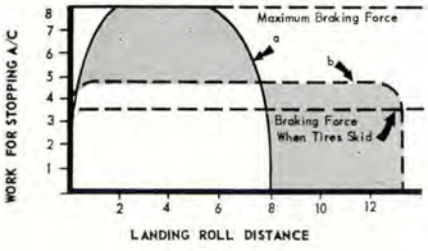
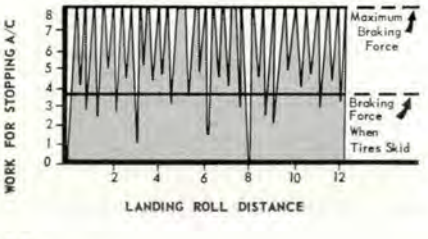


Figure Nine



Any additional aerodynamic drag will help. Opening of the canopy (*not a clamshell type, please*) cowl flaps or bomb-bay doors will produce drag.

If the brakes are the type that fade if used for some time in the landing roll, techniques must be determined for the particular aircraft involved in order to get the most from the brakes.

Get her down, boy. If for some reason stopping in the minimum distance on a particular pass is important, and if the aircraft arrives at the runway with more speed than is desired, then it is better (*if you have a dry runway and good brakes*) to put the aircraft on the deck even with excessive speed, using braking to help stop. The plane can be slowed to a stop more quickly after touchdown than by "floating" up the runway.

To reduce landing roll, touchdown speed is important. The slower the better—within safety limits. If full flaps are employed, a slower safe approach may be made.

The jet engine has residual thrust. When it is at idle, the thrust is enough to keep the aircraft rolling. The speed at which it will keep the aircraft moving depends, naturally, upon the type aircraft.

If the pilot desires to stop in the minimum distance possible, he must consider shutting down the engine upon touchdown. The items which might prevent his shutting down would be possible loss of hydraulic pressure for braking and nosewheel steering.

Steady or Intermittent? Braking technique is of vital importance. This is the application to wheel braking of several factors we have covered. Figure 5 tells us that we want about 20 per cent slippage. The best way to get it is to have a black box give it to us. The A3D has it in its Hytrol antiskid system.

But most of us do not have the black box. We must decide whether or not we can come close to 20 per cent slippage by a steady or by an intermittent application of brakes. If a steady application is used, and a skid is produced, Figures 5 and 8 show that the braking will be poor and other complications are possible.

Figure 8 shows braking work done to dissipate the kinetic energy of a landing airplane. In these diagrams, work other than wheel braking is ignored. The greater the number of pounds of force applied over a shorter length of time, the shorter the distance required to stop. The shaded area *a* and *b* represents this as work. A represents the ideal, that which is obtained, or nearly so, with the antiskid black box braking device.

With no black box, when the pilot applies pressure, trying for a steady braking force, there are infinite patterns that could be followed. Line *b* in Figure 8 is an example of one. The question is this: How near can a pilot come to line *a* without skidding? —remembering that if the skid develops the braking force again drops sharply. It drops even more if the skid produces a blown tire.

Figure 9 shows a pattern when quick hard applications of brake are made followed by rapid easing of the pressure. In this method there can be no more than a momentary skid of tires (*which will not result in a blown tire*) if that much. Each pilot and/or each command must decide which is the better for use in any specific landing situation. (*Because of controversy over the two systems the diagrams were purposely made to cover the same landing distance and the units are arbitrary values.*)

In considering how best to stop all aircraft, it is easy to see that no one system can be *the* system for stopping in the minimum distance. Each aircraft braking system, both wheel and aerodynamic, must be considered, as must the runway surface, the temperature, and the altitude (*for touchdown ground speed*).

The normal landing will not be a minimum distance landing. The saving of brake pucks, tires and other considerations will affect the techniques used to stop. It behooves all good aviators to *learn* the methods that will give the minimum distance ground roll.

If it is not feasible to conduct actual drills, then the good aviator will conduct frequent drills mentally, covering each step necessary to stop in minimum distance, the type aircraft he flies. ▲

Material for this review of the braking problem was obtained from NACA, Army "Aviation Digest," Goodyear Aircraft Co., North American Aviation Inc., and the Flight Safety Foundation.

"He who dances..

Maj. John M. Clark, 2854th Air Base Wg., Tinker AFB, Okla.

It was one of those Indian Summer days that everyone's Chamber of Commerce writes about. As the C-124 took off and headed east, there was nothing ahead but October sunshine and smooth flying. Eight hours later the big bird touched down at a southeastern base to offload its cargo, refuel and then push on toward home.

An IFR was filed, although VFR was forecast for the route, and after two hours of ground time the old bird was nosing west, headed for the barn. Estimated time en route was 6 hours and 30 minutes, so they should be home a little after midnight. It was going to be a long day but under VFR conditions the old Globemaster could make an approach and land by itself.

Upon approaching the terminal area, after 5 hours and 40 minutes of flight, it was learned that the weather was not VFR as originally forecast. Instead, the report was 1000 feet scattered, 1700 feet overcast, 3 miles visibility, with thunderstorms and rain. Although the crew had been on duty since 5 o'clock that morning, the pilot felt he was capable of thunderstorm and precision instrument flying.

Approach Control was contacted and a GCA to base requested. A descent on the omnirange was made with a GCA pickup. On final approach, the aircraft descended to minimum altitude and the pilot executed a missed approach since he had not made contact. GCA picked the C-124 up over the omni again for a second approach but lost radar and radio communications when lightning struck near the GCA site and caused an electrical power surge.

Approach Control was contacted and an ILS to the commercial airport requested. The pilot was cleared for an ILS and advised that the outer marker was most probably inoperative, and that the weather was 1500 feet overcast, visibility 3 miles, thunderstorms and rain.

The aircraft reported over the outer marker outbound and on the procedure turn inbound. Two minutes later, it crashed—¼ mile left of the ILS centerline and 2½ miles from the end of the landing runway. The impact, followed by fire, destroyed the aircraft.

According to the Investigating Board, the pilot:

- Descended below safe minimum ILS altitude.
- Commenced descent without positively identifying his position over the outer marker.
- Disregarded his glide slope needle.
- Demonstrated questionable judgment by attempting and continuing an ILS approach under the above conditions, which were aggravated by thunderstorm activity, instead of waiting for better weather, or proceeding to an alternate.

Well, there it is.

Some fine crewmembers and a whole lot of airplane gone down the drain, and for what? There could be many reasons, such as crew fatigue inasmuch as this one had been on duty for more than 20 hours. Another could be they were so near home base they didn't want to divert; still another could be lack of air discipline.

The Air Force dictionary explains air discipline as "compliance with the systematic rules and procedures adopted or used in operating or handling aircraft."

From the accident report and the listed findings of the board, at least six violations of air discipline are in evidence. The pilot of this C-124 was bound and determined to get his share of violations, and did! Not much more can be said other than that he was caught doing something we've all done and gotten away with: he broke a few rules and procedures for operating aircraft. We were luckier than this pilot. We slipped by with nothing more than a little sweat on the brow. Let's not push our luck too far because, "He who dances must pay the piper." ▲

...must pay the piper"

SAFETY...

I have always maintained that safety is an element of command. It is a management tool which, if effectively utilized, materially aids the commander in his development of an efficient organization. A practical application of sound safety practices will enhance the operational capability of the organization and preserve the manpower, equipment, facilities, and the weapons which are vital to the successful accomplishment of the mission.

Although the responsibility lies with the commander, this is not a one man enterprise. I firmly believe that the success of any accident prevention program is dependent upon a total effort. It requires the active participation of all individuals in whom such a high degree of safety consciousness has been developed, that sound safety practices becomes an automatic reflex action. Accident prevention is then inherent in the operation.

Aircraft accident report files are crammed with details and analyses of recurring discrepancies which have resulted in major accidents and a large toll in human lives. These statistics stand in mute evidence and lend testimony to the indisputable fact that things can and do go wrong. The point is, what do we do about it and where do we go from here? The professional learns from this experience. Once the factors which either lead to or cause things to go wrong are recognized, he is then in an excellent position to eliminate these accident potentials. After having made a detailed study of accident experiences, I have come to the conclusion that a successful accident prevention program requires these items:

- Strong command emphasis.
- Continued surveillance and inspection.
- Standardization in all activities.
- Sound maintenance practices.
- Elimination of accident hazards.
- Education.

In the 7th Air Division we strive to include all of these elements in our program. The Commander, Major General William H. Blanchard, has established a firm policy predicated on the primary importance of safety in all operations. The combat capability of the SAC force must not be compromised by avoidable or preventable accident losses. As a result of this policy, safety objectives have become an integral part of the everyday activities of the 7th Air Division staff, subordinate unit commanders and their staffs, supervisors at all levels, and aircrew members.

So that there will be no deviation from sound safety practices, air and ground discipline must be maintained. Supervisors, alert for the telltale signs which indicate laxness, continually monitor all operations and everyday activities. Whenever a weakness is discovered, corrective action is taken immediately. Deviation reports and accident reports are critically analyzed. Instances of violation of regulations or disregard for published SOPs are dealt with severely. In an effort to prevent recurrence, every incident receives widespread dissemination and follow-up action is taken in each case.

Overconfidence and complacency, the nemeses of aircrew personnel and aircraft operation, have no place in the Strategic Air Command today. Although low accident rates tend to lull personnel into a false sense of security, the SAC commander, his staff and all supervisors must be on a constant alert for signs which indicate the presence of this "Trojan Horse." Commanders and staff officers at all levels have been made aware that the prevention of aircraft accidents in this command is a function of the highest priority. In this respect, the detection and correction of potential accident cause factors is and will remain a continuous activity.

To combat the ever-present danger of poor discipline, complacency and overconfidence, the importance of establishing and maintaining a proper "safety frame of mind" is emphasized throughout the command. No doubt exists in anyone's mind that violations of established operating procedures are completely unacceptable.

Staff visits by qualified personnel from this headquarters are frequent and thorough. Discrepancies are eliminated on the spot whenever possible, and assistance is rendered when needed to correct known deficiencies

General Blanchard makes numerous flights to USAF and RAF bases, both in C-54 and RB-47 aircraft. He is constantly on the lookout for improved methods of operation and new equipment which can be utilized at our bases. Among other things, this has resulted in such things as:

- The establishment of a runway

lighting backup system to be used in the event of complete power failure.

• A procedure requiring the visual inspection of all tactical aircraft just prior to takeoff.

• The programmed construction of GCA turntables at all 7th Air Division bases *(completed at Brize Norton with a turn-around capability of from 5 to 8 minutes)*. In the course of these flights he also has the opportunity to survey the base flight facilities, airfield discipline, approaches and letdowns and air traffic control procedures. His observations have resulted in increased emphasis on installing ILS and improving the approach lighting system at all of our bases.

An important factor in our aircraft accident prevention program has been strict compliance with Strategic Air Command's standardization program. To continue accident-free operations, each supervisor must be alert for any laxness in this program. The operations staff, in particular, spends much of its time in the field to insure that standardization crews and pilots are fully qualified. To assist in this effort, as the Director of Safety I am a member of the 7th Air Division Standardization Board. Examining base standardization activities is a major part of my staff visits.

The operations staff also insures that, upon arrival, TDY units receive a thorough briefing on all operational factors peculiar to this theater. In addition, known risk areas and lessons learned from previous accident experience are specifically pointed out to supervisors and combat crews prior to operating from bases in this command.

A keen awareness of safety has been developed in all our supervisory personnel. Safe practices and procedures and rigid compliance with checklists and office instructions receive primary consideration at all times. I believe that by this professional approach to the problem, accidents and incidents can be prevented before they occur.

The success of the aircraft accident prevention program depends entirely on the development of a high degree of safety consciousness among all personnel from the supervisor to the man at the working level. This is especially true in the maintenance area. A safe operation depends on a safe aircraft capable of accomplishing the mission. Such aircraft are delivered only by quality maintenance personnel.

To this end, the materiel staff spends much of its time in the field with maintenance people. Its findings and assistance are welcomed by all supervisors who recognize and appreciate the importance of constant vigilance in complying with proper maintenance practices. Technical order compliance receives continued special attention. A timely reporting procedure is in force whereby deviations from established flying schedules and maintenance shortcomings of any unit are immediately brought to the attention of the staff for corrective action.

In addition, the Director of Materiel works in close association with the Office of Safety to strengthen the aircraft accident prevention program. Any and all discrepancies, deviations, violations and/or hazardous conditions that are noted, receive immediate attention. They take joint action to correct the situation. A specific example of this can be found in the manner in which this command handled the fuel spillage problem, one of the most serious in SAC. Through the joint efforts and participation of the Command Materiel and Safety staff agencies and their counterparts in the field, the fuel spillage problem has been almost eliminated at all 7th Air Division bases.

While all of the above areas of emphasis result in the correction of hazards, we in the 7th Air Division have employed a few ideas which have helped enormously toward the ultimate goal—preventing accidents before they occur.

General Blanchard requires me to conduct a monthly flight-check survey of all 7th Air Division bases. I continually check base flight facilities, GCAs, traffic patterns, emergency procedures, letdowns and approaches, control tower procedures, air discipline and ground handling of aircraft. My recommendations for improvement and reports of discrepancies, malpractices, and hazardous conditions, are forwarded to the applicable staff agencies for corrective

...in Action

Above. Presentation of 7th Air Division, Flying Safety Base-of-the-Month trophy to 3918th CSG, Upper Heyford, England, April 1959. L. to R. Lt. J. D. Smith, FSO: Lt. Col. J. R. Roberts, Dep. CO; Col. M. G. Zumwalt, 7th AD Chief of Staff; Maj. Marks, 7th AD Director of Safety. Below. Typical 7th Air Division Flying Safety Bulletin Board at Bruntingthorpe, England.

action. The frequent exercise of emergency procedures has resulted in increased operator proficiency at the bases.

The 7th Air Division has also inaugurated the "Operation Vigilance" program. By emphasizing the importance of Operational Hazard Reports and by soliciting the personnel in maintenance, operations and AACS, to report hazards, the tempo of the program to "report an incident and prevent an accident" has been tremendously increased. Now more hazard reports are received each month than were received in an entire year before the program was put into effect. In each case, some hazardous condition that could have resulted in an accident was reported and corrected.

Furthermore, comprehensive flight safety surveys conducted at least twice a year at each base continue to reveal conditions which, without correction, would probably cause accidents. With command attention, these hazards are quickly corrected. This has resulted in overrun construction projects, soil stabilization programs, repair of runways and taxiways, and completion of lighted runway distance markers. All this contributes toward reducing the accident potential.

Our safety education program is directed towards acquainting all personnel with the goals of the program and the ways in which they can help attain them. In addition to the distribution of SAC Safety publications, this headquarters publishes 7th Air Division Fly Safe Messages and Bulletins which contain timely subjects and hints on the practical application of sound safety practices.

We have also inaugurated a vigorous incentive program designed to motivate all individuals towards active participation in accident prevention. Each month recognition is given the 7th Air Division Maintenance Man of the Month, Flying Safety Man of the Month, Ground Safety Man of the Month, Pilot of the Month and contributors to our "Operation Vigilance" program. In this manner, the importance of preventing aircraft accidents is emphasized and an intense personal interest is developed at the working level.

In effect, each and every individual in the 7th Air Division, the commander, the staff, the supervisor and the flight line mechanic is a flying safety man. All of us have a common objective and are dedicated in our everyday activity to the prevention of aircraft accidents.

In summary, an effective program can be conducted without impairing the successful accomplishment of the mission. Rather, it must enhance mission accomplishment by reducing the unwarranted loss of lives and equipment. Major aircraft accidents in the past and the attendant loss of hardware have seriously depleted our aircraft inventory of first-line jet bombers and fighters. There's no argument to refute it; an aircraft accident is a liability on the balance sheet of airpower. Our combat capability is adversely affected by the loss of crewmembers and must be considered. Years of training are needlessly wasted; the cost in human lives cannot be measured.

The basic requirement is therefore clear and concise. The preventable and avoidable accident must be eliminated. Coordinated effort by all personnel in the prevention program will insure positive leadership, increased quality of flight crew and maintenance performance, effective staff participation, and adherence to published regulations and office instructions. Every man must be made to feel that he has a vital part in the program. Unrelenting vigor in implementing this "heads-up" philosophy will result in the "safety habit" and the automatic elimination of aircraft accident hazards.

An outstanding safety record is not just a stroke of good fortune, nor does it become a reality through wishful thinking. Safety requires a lot of hard work by everyone. In these trying times of national peril, the Air Force mission demands it. ▲

When it comes to water survival equipment . . .

Familiarity Breeds Content

Maj. John H. Mork, 41st Air Rescue Sq., ARS (MATS), Hamilton AFB, Calif.

Like most items of modern Air Force equipment, primary survival equipment is fairly complex. As aircraft speeds increase, escape systems must become more elaborate. There is a greater demand on the airman to become completely familiar with all of this equipment. If any flyer does not know his escape system components thoroughly *(ejection mechanism, parachute and flotation gear)*, he is not really checked out in his aircraft. Knowing this equipment means knowing what you can expect from it in an emergency and how to get the most out of it.

The best way to become familiar with the flotation gear is through regularly scheduled water survival drills in swimming pools. The personal equipment specialist can provide the training officer with an old parachute harness, which the trainees can don over their regular equipment just as if they were in the cockpit. For example, the man about to jump into the pool from the diving board *(preferably the high board so he will sink under water and have to struggle to the surface)* would have on his flight suit, flying jacket, portable radio kit, Mae West and his parachute harness. It might be a good idea to wear the flying helmet and oxygen mask too, in order to give the trainee the practice of unburdening himself of a great deal of entangling equipment while in the safety of the pool.

Just before the trainee jumps off the board into the pool, the survival training officer should remind him that depth perception over water is poor. It is difficult to judge with any degree of accuracy just how far away from the water you may be. *(See Lt. Parson's account of his ejection into the Atlantic Ocean, Page 10. He dropped his helmet to gage his distance from the water.)* For this reason it is unwise to get out of the harness or to release the canopy until the feet actually touch the water. The safety fork of the quick release mechanism can be opened, however, and the hand positioned on the riser near the lock. When the body hits the water, the fingers can press the two buttons together and release the canopy on one side, collapsing it.

Standing on the end of the diving board can simulate for the trainee his parachute descent toward the water. This is the time to loosen the chest strap of the chute and inflate one side of the Mae West. Having just one side inflated will make it easier to get into the dinghy, yet there will be plenty of buoyancy for flotation once you hit the water. When the other side of the Mae West is inflated, it might be advisable—if you have the strength—to blow it up by mouth. This will save the CO_2 charge for later use in case your strength has ebbed away. There is some danger of over-inflating and rupturing the bladder if you accidentally pull the CO_2 cartridge lanyard after blowing it up by mouth.

The trainee is now ready to jump, simulating the final stage of his descent. His chest strap is loosened, one side of the Mae West is inflated, his safety fork is opened, and his hand positioned near the quick release mechanism ready for the moment his feet touch water. And down he goes.

Once in the water, don't worry about the canopy coming down on top of you. If the quick release is used *(one-side model)*, the canopy will collapse immediately. Even without the quick release it will drift to one side if there is any wind at all. If the canopy should come down on top of you, as it might with no wind and in rain, it won't force you under water. However, a knife would be useful.

When you bob to the surface after landing, the first job is to get into the dinghy, which may be some distance away. Since you are still attached to the dinghy by the lanyard connected to the parachute harness, do not remove the harness until you are safely aboard and have secured the dinghy to your wrist or belt. Get into the dinghy by the small end, pushing it down under you and falling into it. If you get out of your harness then, try to retain the parachute. It will be useful as a sea anchor or as a marker.

Once in the raft, make sure that you secure everything you take from your kit to the raft or to yourself. You won't be able to get any refills. Survivors often tell of having all emergency gear washed away the first time the raft tips over. With your survival gear, the Mae West and your raft, you can get along in the sea for days. With just the Mae West, survival may be a matter of minutes.

In the accessory pockets of the Mae West are two similar packages, one containing dye marker, the other shark repellent. If you wanted to use the shark repellent at night and didn't know which pocket it was in, you might use the dye marker to no avail. The next day, if you were still around, you would find that the shark repellent doesn't dye the water quite like dye marker would.

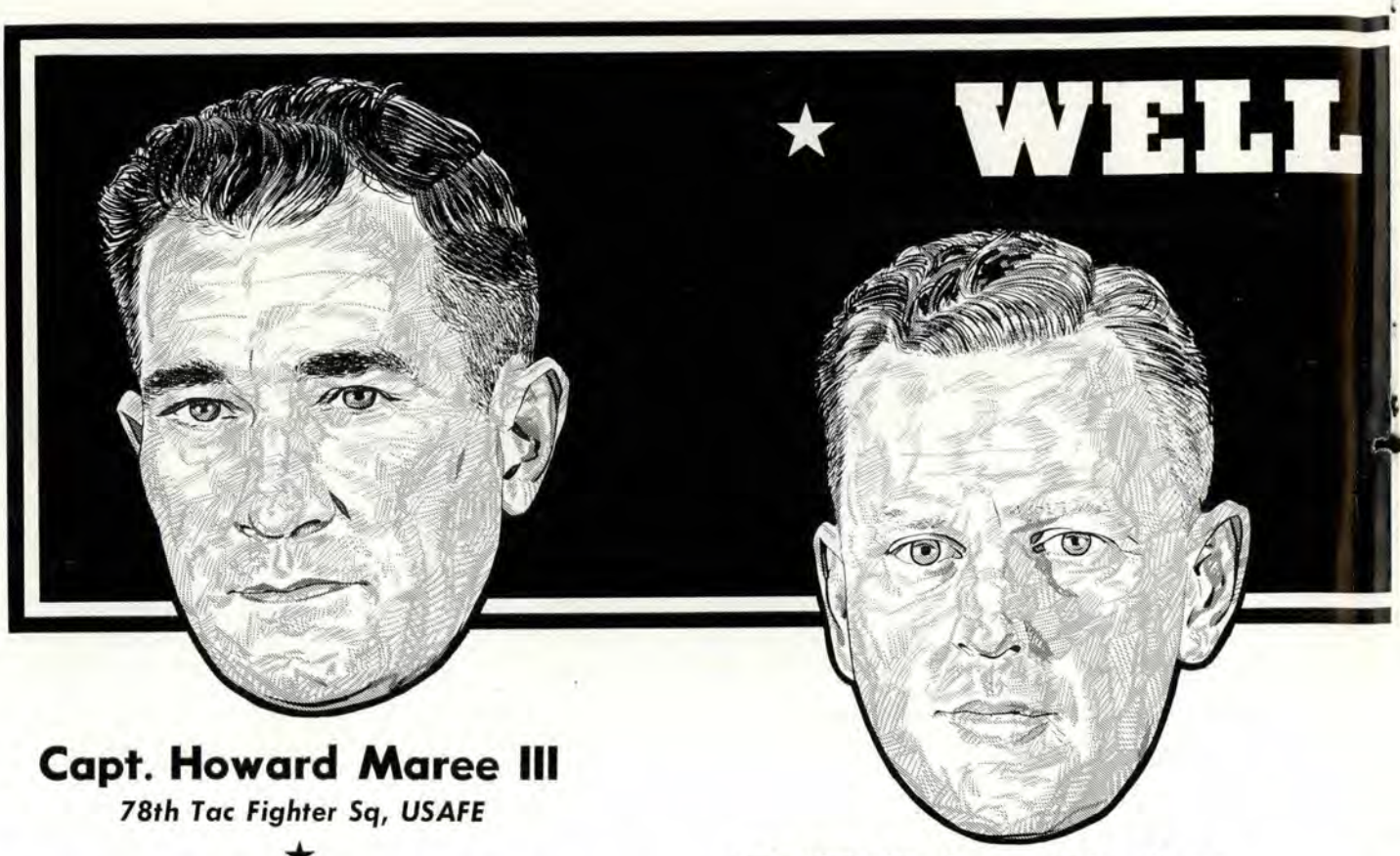
Keep as dry as you can in the raft, and save your energy. Loss of body heat and fatigue are the two greatest dangers you face outside of drowning. If you were wise enough to carry a small personal survival kit in your flying suit pocket, this is where it will pay dividends. A properly prepared kit should contain an extra flare *(preferably a model 13 day-night type)*, a small knife and some candy or condensed food.

The flares are precious and irreplaceable. Do *not* use them until you are fairly sure they *could be seen* by an aircraft or ship.

If you drift toward land, don't let the desire to get ashore outweigh the possibilities of a hazardous landing. In most cases it is just as easy to get picked up at sea. If you do contemplate a landing, avoid rocks and heavy surf. They could mean the end of an otherwise successful battle with the elements.

All survival discussions point up the importance of these two things:

- First, before flying, check that you have the proper equipment in good working order.
- Second, if you are down, remember that Air Rescue Service and affiliated agencies are going to be searching for you. Help them find you by properly using all the communications equipment available. You won't be sorry you did. ▲



Capt. Howard Maree III

78th Tac Fighter Sq, USAFE

★

The flight started as a routine night navigation mission for Captain Maree and his wingman, flying F-101s. In the vicinity of London, at 34,000 feet, the left wing dropped slightly. Captain Maree applied correction but there was no response and the left wing continued to drop until the aircraft was in a 30-degree bank. As more control pressure was applied the aircraft went into a violent half roll with the nose pointed down. The wingman decided he hadn't been checked out in this type of night formation and wisely moved out where he could observe. By using both hands, with elbows locked against his knees, Captain Maree brought the '101 back to level flight. Cautiously, he removed one hand from the stick, retarded the throttle and put down the speed brakes.

At Captain Maree's direction, the wingman declared an emergency and obtained clearance to descend. With power reduced and speed brakes out, a flat glide was established at 290 knots. During descent, both hands, with elbows locked between his knees, were needed to counteract a tendency to porpoise. At 8000 feet the porpoising danger lessened and the pilot pulled the autopilot circuit breaker. Captain Maree had diagnosed the trouble but this action was not about to cure the problem. The autopilot *had* malfunctioned but could not be removed from the control system by the pilot.

With the wingman making the radio calls, Captain Maree flew a large GCA pattern with turn to final approach made 10 miles out. To control the porpoising, both hands, elbows and knees still had to be used. After turn

TSGT. Robert Bigelow

3505th Pilot Training Sq, Greenville AFB, Miss.

★

to final approach, the rudder pedals began to travel through their full limits. With a "higher than normal" approach speed, Captain Maree finally "spiked" the bird on at 200 knots, and pulled the drag chute handle, but the drag chute did not deploy. By careful braking, the aircraft was stopped on the 9000-foot runway without blowing a tire or engaging the barrier.

Use of good judgment, a cool head and plenty of fine flying technique enabled this pilot to save the Air Force a very valuable piece of equipment. Well Done! Captain Maree.

★ ★ ★

The student pilot returning to Greenville AFB on the night of 5 November 1958 expected the forecast conditions of 3000 scattered and 7 miles visibility. He didn't get them. Instead, he got ceiling zero, visibility zero. But, with the help of two top GCA operators, TSgt Bigelow and TSgt Goodrich, he made a landing anyway. Under their sure, professional guidance he set the bird down as smooth and easy as if it were VFR. Here's how it happened: When the student pilot came back to Greenville from a day-night mission, the weather had deteriorated considerably but the field was still at minimums. He went into his penetration at 2120 C. When he came out of his penetration turn, the field had gone to zero zero. Because of insufficient fuel he had to go on into Greenville—or bust. It looked as if it might be just that—bust.

Then Big Brother in GCA got into the act. TSgt Goodrich,

K N O W L E D G E

WELL DONE ★

TSGT. Matthew Goodrich

3505th Pilot Training Sq, Greenville AFB, Miss.

★

seeing the aircraft too far left to make a safe approach, broke off the first attempt while the student was still four miles out. This quick decision saved precious fuel. The aircraft was set up for a second approach and directed onto a short final. Big Brother No. 2 then took over.

TSgt Bigelow, final controller, made a few azimuth corrections and quickly ascertained that the aircraft had gyro failure. It was later determined that the gyro at this critical point was off 20-25 degrees. Sergeant Bigelow continued the plane in a no-gyro approach, and laid it down right on the centerline.

But for the alertness, competence and confidence of this fine professional team, a valuable aircraft and an invaluable life might have been lost. This episode is but a sample of the excellent work—and only one of the numerous saves —performed daily by AACS personnel.

For a first-rate performance while under the gun, Well Done! Sergeants Goodrich and Bigelow. ▲

★ ★ ★

1st Lt. Edward Levell, Jr.

417th Tac Fighter Sq, USAFE

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Within three days last fall, Lieutenant Levell was tested twice. On 8 September, flying No. 2 in his F-100D, he had just become airborne when the aircraft nose came up violently. With extreme forward pressure, Levell controlled the plane and made a climb to 20,000 feet. At that altitude he tested the aircraft in various configurations and at varying speeds, finally learning that he could maintain control down to 150 knots. Using a simulated flameout pattern, Levell managed a safe landing at 155 knots and later learned that the trim impulse actuator was defective.

On 10 September, Lieutenant Levell again took off in his F-100D for an inflight refueling mission. After several successful hookups with the KB-50, he engaged the afterburner and started a climb. One minute later at a speed of 340 knots, his F-100 nosed down sharply with heavy stick pressure. After coming out of afterburner he saw that the pressure ratio gage was fluctuating erratically. Gaining control, his next job was to penetrate the undercast and make a GCA. During the descent, Levell had to cross control the plane, left rudder and right aileron, in order to maintain the correct heading. He leveled off at 2500 feet for the GCA final approach and delayed gear lowering until he was 6½ miles from the field on final. In this configuration, 200 knots was the maximum speed obtainable. Flaps were lowered but airspeed dropped off alarmingly so they were immediately retracted. Now able to maintain 170 knots, Levell continued down the final approach until the half mile mark where flaps were again used. Touchdown was made at 160 knots with 2500 pounds of fuel remaining. When Levell returned to the line, he found that the inner liner of a burner can in the engine had come loose and lodged in the nozzle diaphragm. This caused the deflection of heat downward and burned a hole through the tailpipe and through the lower portion of the aft section.

For two outstanding displays of airmanship, Lieutenant Levell well deserves praise and recognition. Well Done!

the OBSTACLE COURSE

Archie D. Caldwell, Operations Analysis Branch, DFMSR

The chubby hands that flipped the chit book across the bar of the club deftly lifted a pale pink swagger stick from a nearby stool and gave the heretofore unmarred bar top a stout blow. Captain C. Z. Chumley, the Flying Corps' gift to the Near, Middle and Far East, had arrived for refreshments, after a tiresome 3½ hours of office work.

"Look lively there, lad. Jump to the call and serve me up a ration of grog. Looks like a sou'wester a'brewin' outside."

The club barkeep started to mix C. Z.'s usual highball with sea water but thought better of losing his best customer.

"Yes, sir, here you are, just the way you like it."

Chaunce looked at the drink as if he had been without liquid intake since discontinuing taking milk through a baby bottle. "Gad, but the natives are restless today. What wrath have I brought upon myself to be stationed in such a place that lends itself to half-frozen ice cubes, hydroponic grown vegetables, few females, and 'ferners' who don't speak 'Amercan.' Oh how I wait for those infrequent trips to civilization. Jove, reminds me of during the war years near Halmahera when—."

A jangling phone bell spared the barkeep from further listening. He handed the phone to Chaunce with a nod, then sped to the far end of the plank where he could feign deafness.

"Chumley here, ole chap—right sir, jove, yes—yes, by all means. It's 1640 now—right-o, wheels up at 20 hundred for sure. I'll grab my cohelper and be right down to the line—ta ta."

Chaunce hung up the receiver, looked at the untouched highball—with tears in his eyes—and spun off the bar stool in one faultless movement. He sped to his underpaid, reg'lar copilot who was ordering a couple of brews.

"Sam, we're in. I just got a call, we're to take some leave people to Tokyo by the sea. A flight to the bright lights, boy. Come on, let's get ol' reliable in the air."

As the pair neared the operations building, Sam spoke for the first time.

"Cap'n, I've just noticed something. Since leaving the club I haven't been able to see very much. It's sort of foggy, isn't it?"

"An astute observation, me lad. But a little fog never deterred your ol' dad from the completion of a successful flight. Why, I can remember a time it was *so* foggy that—."

C. Z.'s words came to an abrupt halt as he walked into the side of the operations building.

Safely inside, the pair noticed a small knot of a dozen

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Wherein our hero, C. Z. Chumley, succumbs to the "urgency" of the mission at hand and fearlessly flings his bird down the runway into the murk. Sit back and follow our boy as he outdoes himself during the shortest flight of his career.

assorted people who were obviously to be his charges for the trip. A regular crew chief came forward with a clearance form and the '96B.

"Good work, lad. Is the aircraft ready and close at hand? Have to make tracks, you know."

"Yes sir, it's ready. But we had to tow it from the ramp out to here because it was so foggy. Do you think this stuff will lift any?"

Chumley dismissed the question with a thumb pointed to his command pilot wings, turned on his heel and entered the weather office.

"Slap some weather on this, 'Curley,' we got dates with angels."

The forecaster muttered something about "from the mouths of babes" and began his local, route and terminal briefing. Chumley boldly interrupted.

"Never mind all the verbiage, just fill in the little spaces so I can be on my way. Never could see the advantage of getting a world synopsis for a three-hour flight. Why, back at Hamilton in P-61s, we never—."

"Here it is, Captain. We're carrying ¼ mile in fog from the last observation 10 minutes ago. I'll get a special for you right now and—."

"If you say so, laddie buck, if you say so, but make it quick. We're running behind schedule. This railroad's got to make time."

With the misgivings of the A.O., the flight plan was accepted and C. Z. plus entourage left the warmth and light of the ops and stepped into the murk.

"Over here. This way, Cap'n." Sam's voice sounded through the fog like something out of an Alfred Hitchcock movie. "We found the ship. It's right over this way."

The gray mass formed slowly into a brightly polished C-54. Inside the cargo compartment, C. Z. thoroughly briefed his passengers against smoking during takeoff, pointed to the pile of parachutes in the rear corner, and advised that to follow procedures, safety belts would be necessary.

"Honeybucket tower. Air Force 999, taxi, takeoff one C-54."

"Air Force 999, clear to taxi west on ramp to runway 28, altimeter 29.89, winds calm. Advise special observation, visibility ⅛ mile in fog. Call after runup."

"Keep a weather eye out, Sam, this stuff's a little thick. You handle the radio calls and clearance. Tell 'em we're turning onto the taxistrip."

"Air Force 999, Honeybucket tower advises you made your turn too soon. Looks like you're headed for the base motor pool. What are your intentions?"

Chaunce full swiveled a 360, with mutterings about smart tower operators and proceeded down the ramp. A 90-degree left turn later put them on the taxiway where runup was accomplished and clearance received, copied and read back.

"Okay, Sam, I'll fly the gages, you work the throttles and the Sar'nt here will get the gear up on my signal."

The C-54 was turned onto the runway.

"Set your gyro on 280, must have precessed while we were coming out. A whole 10 degrees off. Can you see the runway lights, Sam?"

"Nope."

"Well, never mind, they must be on dim. Call 'em and tell 'em we're on our way with a hi and a yo and a ho-ho-ho."

The four engines coughed, then settled down to takeoff power. Sam had the throttles and C. Z. had the wheel. The gyro didn't move, airspeed picking up, 45-50-55 knots. Everything was like silk. Chumley was about to break into one of his more happy songs when—WHAMM! The old bird shuddered.

"Hit something? Must have been a cow on the runway. Never fear, we'll make it all right."

Sam looked up from the engine instruments and turned a whitish green.

"Tee 33 dead ahead. Who the devil. . . ."

CURRRUNNCHHH! Pieces of the T-33 came into view, then passed.

GAAARRRRAAAZZZZZ! Another T-33 was sliced neatly in half by a port prop.

KEEERRRWUUUMP! And a T-Bird became pot metal stuff. Power on the C-54 had somehow been cut, and as both wings on the transport had been folded over the fuselage like a Navy carrier fighter, it was obvious that the takeoff would have to be aborted.

"Help me on the controls, Sam. I think I'm losing control!"

A C-47 loomed into view and was promptly relieved of its rudder and other bits of hardware. The C-54, having lost all fight, came to a shuddering stop, looking for all like a crash scene from "Hell's Angels." Luckily, there was no fire and by a small-type miracle, no injuries.

"Whew, Sam. Thought we were really in for a good one there for a second. Just wait 'til I get hold of the idiot who put those airplanes on the active. I'll bet he won't do it again."

"I doubt if there're any airplanes left in condition to park anywhere, Cap'n. From the looks of things it appears that we got 'em all."

"You know, Sam, this is the sort of thing that can spoil a man's whole day. But that's the way it goes, chicken one day, feathers the next! If anything else comes up that's important, I'll be in my quarters."

"Yes sir."

"And just one other thing, Sam. Will you close out the flight plan? I feel a sick headache coming on."

The air in the Colonel's office was as calm as the 60 seconds preceding a tornado. As the C. O. finished reviewing the photos attached to the accident report, the color in his face changed from red to a soft purple. The tranquilizers were not doing their full job. Chumley looked at his feet.

"If you'll give me just a minute, sir, I think that I can explain everything. It was just that the circumstances . . ."

"Chumley, I'm trying to remember that if I do you great bodily harm I may never reach retirement. How you could have done this thing is beyond my comprehension. A pilot who has been at this base over a year and doesn't know when he's lined up on a closed runway covered with parked aircraft, who can't get a clue that something isn't right when he can't see runway lights, who doesn't abort a takeoff when he thinks he's hit a cow ! ! Just what can you say to explain some of the things you did?"

"Well sir, it was foggy and we couldn't see so good, and the—"

"That's another thing, Chumley. What in the name of heaven gave you the impression that this flight had the urgency that required you to take off in an eighth-of-a-mile visibility? If you had stuck around the weather office for a few minutes, you would have found out that the fog was forecast to dissipate in about 45 minutes. The more I think about it the madder I get."

"Remember your ulcer, sir."

"Ulcer—smulcer. In reviewing the whole sordid story I think I can point out a few things that may, now I say *may*, give you a hint of what went wrong.

"Your mental attitude regarding this base is one of them. None of us *like* to be stationed in remote areas and we all look forward to getting a trip to civilization, but you not only looked forward to it, you *ran* into it. You ran past the common sense that is needed in making any flight. Unfortunately, with all the work that the fly safe types do, they cannot through regulations, directives or posters, give you—or for that matter, any pilot—the intelligence to make the proper decisions always at the proper time. But they can impress upon you that what you don't know at the right time can be costly in people and machines."

"If there had just been some sign saying that the strip I was on, was a dead runway, I'm sure I . . ."

"Don't give me that, Chumley. You know very well that the dead runway was black top and the runways are concrete. The 10 degrees difference in heading should have given you another clue. And when you took out those half dozen or so 55-gallon drums used to mark the aircraft parking area, you should have really received the message. At least enough to indicate an abort was in order."

"I guess I really fouled up, didn't I? I know that haste makes for waste, and all that, but back at Hamil...."

"Out of my sight, Chumley. I'll decide what to do with you personally when I get some tranquilizers that work. Now out of my office before I. . . ."

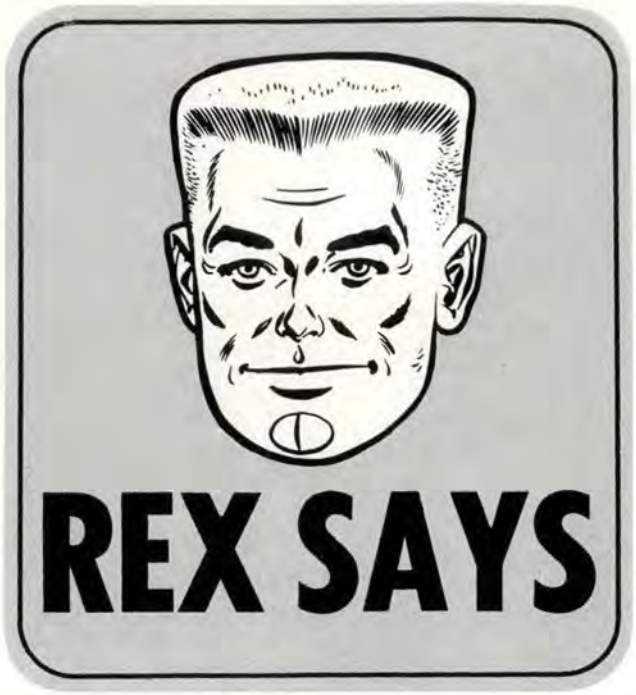
"Yes sir, thank you, sir. I'll buy you a brew and we can talk about it sometime at the club."

"OUT!"

"Yes sir. Just one more thing though."

"What is it?"

"Have you got anything scheduled for a cross-country? I'm awful tired of this place . . . Why, sir . . . You're crying!" ▲



THE "TIGER" START

Here's an incident of more than passing interest to T-33 pilots: On base leg at 1000 feet, the IP *(in rear cockpit)* retarded the throttle toward idle, but in moving rearward, it somehow bypassed the idle detent in the front cockpit and went to "stopcock." The IP saw that the RPM and EGT had dropped but didn't realize immediately that the engine had flamed out. He advanced the throttle but when there was no response, he reacted to the flameout and told the student to actuate the airstart ignition switch. The airstart was successful although a rumble in the aft section was heard. The IP saw the EGT at 900°C and retarded power to bring it within limits. His rapid action in using a modificaton of the low altitude airstart procedure really paid off. For you who are rusty on the *T-33 aircraft procedure for 5000 feet or less terrain clearance:*

T- (1) *Throttle* idle (if time and altitude permit).
I- (2) *Ignition* Airstart Switch—Start.
G- (3) *Gangload* fuel switches.
E- (4) *Emergency* Fuel Switch—Emergency.
R- (5) *Regulate* Advance throttle until burners light; retard throttle to maintain EGT within limits. ▲

OPERATION HOTFOOT

A B-66 landed with a hot wheel assembly after completing takeoff and landing tests. A mixture of carbon dioxide and water was used to extinguish a fire which developed in the wheel brake area. Six minutes later, after the fire was put out, the wheel exploded and killed a man who was standing 69 feet away. In another case, a Navy aircraft made an emergency landing and taxied to the parking area. Water fog was used to cool a smoking tire. While the wheel was being sprayed, the hub blew off and traveled 75 yards.

These two examples could be multiplied endlessly but would illustrate the point no better. Hot brakes and tires are extremely dangerous. Pilots and maintenance personnel who taxi and handle aircraft are urged to review T. O. 4B-1-1 on the "Use Of Landing Wheel Brakes."

The T. O. states, "The fundamental purpose of brakes is to retard motion by transforming mechanical energy into heat energy through friction. . . . Repeated, excessive application of brakes without allowing sufficient time for cooling between applications will cause increased temperatures to dangerous degrees, which will result in complete breakdown of the brake structure, failure of brake drum and wheel structure, blowing of tires and in extreme cases, the complete wheel and brake installations are destroyed by fire. This also applies to excessively short stops from high rates of speed and dragging brakes for any appreciable distance while taxiing at slow speeds."

The T. O. gives this WARNING: *No attempt should be made to cool an overheated wheel and tire assembly with CO_2, water spray or foam, because such practice may cause the assembly to fail with explosive force. Unless a fire definitely exists, overheated wheels and brakes should be cooled by means of an airblast from any source available . . . If a fire definitely exists, the wheel should be approached from the front or rear in the plane of the wheel rotation. . . . The area extending 300 feet to the side of the wheel also should be kept clear for a reasonable length of time after the fire has been extinguished.*

Here is an abstract of some of the main points from T. O. 4B-1-1:

- Immediately after landing or whenever there is considerable lift on the wings, extreme care should be used during any brake applications to prevent skidding the tires and causing flat spots. Proper traction cannot be expected until the tires are carrying heavy loads. If maximum braking is required after touchdown, lift should first be decreased as much as possible by raising the flaps and dropping the nose *(on tricycle gear aircraft)* before applying brakes.
- If the wheels are left down in the slipstream, at least 15 minutes should be allowed between landings to allow adequate time for cooling between brake applications.
- If the wheels are retracted, at least 30 minutes should elapse between landings to allow time for cooling between brake applications.
- If a brake malfunction is suspected or if the brakes are used excessively and are in a heated condition, the aircraft should be maneuvered off the active runway and stopped.
- An aircraft will not be brought into a crowded parking area after the brakes have been used excessively for an emergency stop.
- Parking brakes should not be set while the brakes and wheels are in a heated condition.
- Do NOT drag the brakes while taxiing. Use them as little and as lightly as possible for turning.

REX SAYS—*Don't give your bird a hot foot. Know your tread.* ▲

a colonel's catechism

"The time  has come, "the Colonel  said, "to stop destroying  things, like landing gear  , radar domes  , and shiny silver wings  . I'm rather tired of pointing  out the error of your ways, so heed me now or yet prepare to suffer all your days. You've heard  it said that aeroplanes  are unforgiving beasts  so why persist in teasing them? This stuff has got to cease. 'Twill never fail to puzzle  me why pilots  try such tricks, as stretching glides or landing long  with runways wet and slick. And I can't count the head stones  of once proud boys who tried to lift their jets  from mile high dromes  where eggs  could well be fried  . My heart  is touched with sadness  as I recall the souls  who threw away their letdown  plates and made for sucker holes. Yes the list  of fools is endless and fully long enough. To keep your families  smiling I find I must get rough. So bend  them at your peril for if you save your head  you'll rue the day  that you were born and wish that you were dead  ."

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