AEROSPACE

SAFETY

UNITED STATES AIR FORCE

DEADLY LITTERBUGS . . . Page Six

SEPTEMBER 1963

THE INSPECTOR GENERAL

LT GEN JOHN D. RYAN, former Commander of SAC's Second Air Force at Barksdale AFB, Louisiana, has been assigned as The Inspector General, USAF. General Ryan succeeds Lt Gen W. H. Blanchard.

A West Point graduate, class of 1938, General Ryan earned his pilot's wings the following year. He was serving as Operations Officer, Second Air Force, when he was transferred to the Mediterranean Theater of Operations early in World War II to assume command of the 2d Bombardment Group (H). General Ryan also served as Operations Officer, 5th Wing, Fifteenth Air Force, before returning to the United States in 1945.

A veteran SAC commander, General Ryan brings a broad variety of staff and command experience to his new job of directing the Air Force's world-wide inspection, safety, and security programs. In 25 years of active service he has commanded a bombardment group, a wing, two air divisions, and both the Second and Sixteenth Air Forces. Previous staff assignments include a tour of duty at Bikini Atoll during the atomic weapons tests, an assignment as Operations Officer, Eighth Air Force, and duty as Director of Materiel, SAC. ★

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IN THIS ISSUE

FALLOUT

A UNIFIED VIEW

The author of the article "If You Fly At Night" (March issue), while concentrating his efforts towards night VFR low level flight, left out certain items of interest regarding night flying. It has been accepted generally that night adaptation should be accomplished prior to night flying and that this takes about 30 minutes minimum under special lighting condiions (red light and/or red goggles or total darkness). Further, it has been accepted as gospel that bright white lights destroy night vision, hence, white lights should be extinguished during night operations in outdoor areas within pilots' area of vision.

We feel that these items should be added to the Operations Duty Officers checklist for night flying operations:

- Outside white lights: Extinguished.
- Vehicle headlamps in the vicinity of aircraft: Out, when driving, use only the parking lights.
- Hangar lights: Red, or if unable, hangar doors closed during flight ops.
- Operations area lights: Red.

In addition, use of landing and taxi lights should be only as absolutely neccessary. Indiscriminate use destroys night vision. Any competent pilot can take off, or land for that matter, on a runway with runway lights, without using landing lights. If, however, flight is being terminated, landing lights may be used if the pilot feels, from a safety standpoint, they are necessary.

A last parting shot: pilots should be issued, and use, only flashlights with red lenses. Too many use clear lenses and destroy what little adaptation they have accumulated during the flight. We use our own personal flashlight and attach it to our person so that we do not have to fumble around the darkened cockpit for it.

In this light (??) we recommend the film "How To Use Your Eyes At Night," number TFI-5386/QD, which, though basic in its approach, covers the subject well and lends support to our statements.

Robert R. Vaughan, Lt, USN
W. Biehl, Jr., LtCol, USMC

(Flying Air Force aircraft and stationed at Sandia Base, administered by the U. S. Army.)

Your comments in regard to the presence of white lights in and around base operations are quite correct if night vision is to be effective. However, with the exception of overwater flights, we do not feel that night vision (off center or rod activation) is actually used or can be used, in current operational aircraft. To maintain night vision the level of luminance must be very low and even ground lights from towns or isolated dwellings will destroy true night vision. You will note that the article referenced places emphasis on visual acuity and pilot proficiency and did not mention night vision per se. This was done deliberately since, as previously stated, we do not feel that night vision is utilized.

COMPLACENCY

The article "Complacency" in the April issue must have been a last minute space filler. Consequently, it probably was not coordinated with the Cargo Branch.

The C-47 flight manual, page 2-2, states: "The air crew visual inspection procedures outlined in this section are predicated on the assumption that maintenance personnel have completed all the requirements of the Manual of Inspection Requirements, TO 1C-47A-6. Therefore, duplicate inspections and operational checks of systems by air crewmembers have been eliminated, except for certain items required in the interest of flying safety."

The C-47 checklist and flight manual do not call for an inspection of the flap area by the pilot. How can the author tie this in with complacency and implicate probable operator error?

Further, our C-47 experts feel that a correct appraisal of the emergency called for a no-flap landing.

Selection of this article for publicatcn is definitely not up to the usual high standards associated with Aerospace Safety.

Maj Michael Mandzak
APO 130, New York, N.Y.

You're right about the paragraph in "Complacency" that refers to the importance of checking flap control conditions by the pilot. Actually, this paragraph was marked for deletion but was inadvertently printed. The present Dash One lists two items of exterior inspection required by the pilot: "Control Surface Locks — Removed." and "Pitot Covers — Removed."

Thanks for writing. The article was published because complacency is a continuing, major problem — particularly in the C-47 aircraft.

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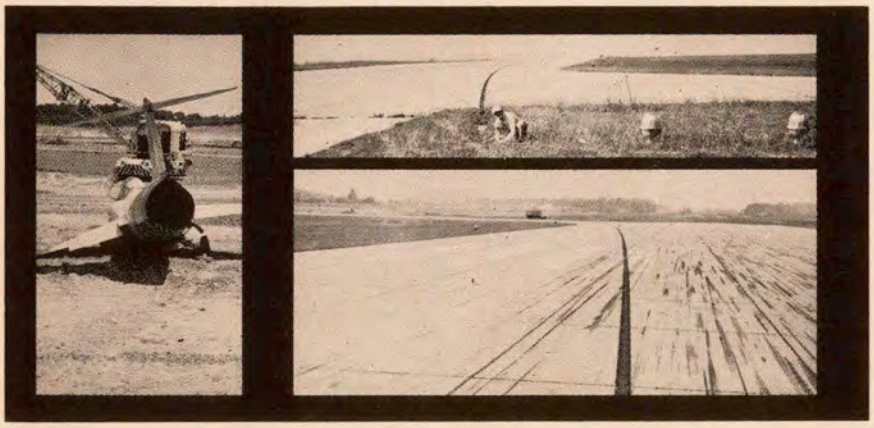
For of all sad words of tongue or pen,
The saddest are these: "It might have been."
— Whittier

WHAT MIGHT HAVE BEEN



WHUMP! The tires of the fighter hit the runway at 200 knots, 500 feet down the runway. Nose down immediately, drag chute out at 190 knots. To this point things were going pretty well for the pilot. It had been a bit of a sweat since initial trouble had begun a few minutes back at 35,000 feet.

The flight had been a short one, the climb discontinued when the nozzles failed to close when the pilot had eased the throttle out of afterburner. An attempt to relight the burner failed, so the tower had been notified of the difficulty and an immediate landing requested.

Subsequent attempts to relight the afterburner were fruitless, so the pilot advised that he was dropping the tanks in the mountains. He left the throttle in AB to dump excess fuel and continued toward the base, descending at 300K and takeoff flaps. Gradually he slowed the fighter to 275K, then to 240 when he decided he had the field made. Over the approach end of the runway he lowered the gear and shut down the engine.

At this point it appeared that things were in good order. Then the drag chute failed. Heavy braking blew the left tire and the aircraft started drifting to the left. At the junction of a taxi strip and the end of the runway the aircraft left the pavement at 50-60K. Still things looked good. Then that approach light. It was a tall, sturdy structure and it sheared off the left gear but good, causing the aircraft to veer further to the left for another 800 feet before the side load on the nose gear caused it to fold and the aircraft came to a rest.

The crew abandoned the wreck uninjured.

Now, another emergency, same type of aircraft, situation looking good to a point. A similar result, only greater damage.

Shortly after takeoff the pilot noted that the Nr 1 generator had gone off the line. Resetting merely resulted in an *on* and *off* situation. The next indication was that both generators had failed, with the attendant problems of radio and instrument failures. Compounding the mess was evidence of hydraulic malfunction.

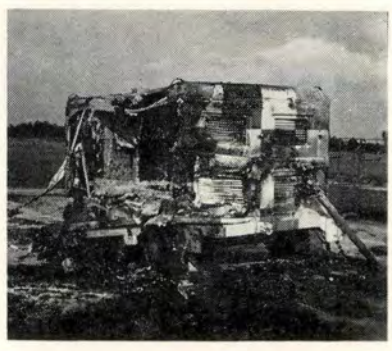
Skipping a few details, we find this pilot landing heavy on a 10,000 foot runway, touchdown between 200 and 210K. Drag chute was delayed until 185K, at which point it departed the aircraft. Braking apparently was normal, but seemed to the pilot to be lacking because of the weight and speed. He hesitated using maximum braking for fear of blowing one or more tires, but bore down on the binders as he approached the barrier.

Contact with the barrier was two or three feet off center and engagement did not take place. The pilot stopcocked and turned off the master fuel switch as the aircraft plunged straight ahead off the overrun and into the dirt. Finally it stopped 1200 feet from the end of the overrun, sans gear. Along the way, the aircraft struck a concrete post adjacent to the ILS trailer with the right leading edge flap. This caused the aircraft to turn to the right; the right tip tank hit the trailer, ruptured and started a fire. Fortunately, the pilot was uninjured.

The purpose of relating these two mishaps is not to discuss the merits of either case insofar as pilot technique, skill, judgment and responsibility are concerned. We wish merely to use these cases as examples of what can happen if all systems aren't GO.

In the first instance, the pilot had it hacked until the drag chute let go. It still didn't look too bad, until the tire blew. Even then, there was a good chance, with the level ground and relatively low speed, of walking away from an intact bird. That approach light, left over from some tests years before, and still in use pending reconstruction of the runway and relocation of the lights, was that proverbial final straw.

Both of these accidents remind one of a boy crossing a pond on stepping stones. He runs along, from stone to stone, balancing as he goes. But if there is one stone too many, and there's a bit of moss or



water on it, the foot slips and the boy gets a bath whether he needs it or not.

The pilot in the second case was faced with a hand that held five aces. Despite the question of whether he should have landed in a heavyweight condition, he was on the ground in good shape. Then fate took a hand. The drag chute failed; no barrier engagement; the post by the ILS trailer. Catastrophe.

It's ironic that one safeguard after another can fail, yet a major accident might not ensue had not some overlooked factor crept into the act, in the above cases a light standard and a post.

These two accidents illustrate that we can't afford for systems to fail. Drag chutes have proved too fallible, in fact there have been 272 failures this year. Too often barrier engagements are missed, even though the aircraft may be only slightly off center. Tires are pushed to the limit by weight of the aircraft and the high speeds to which they are subjected which result in extremely high temperatures. Granted that under heavy breaking a tire might be expected to fail, proper inflation, inspection and timely changes will prevent many tire failures.

Then there is the point discussed in many articles in this and other safety publications—obstacles. After apparently successfully surmounting a series of crises, it is a heck of a note for a pilot to have his bird torn out from under him by a post sticking up out of the ground.

The fact that the post — or some holes in the ground — might be located 1000 feet from the runway is not worth arguing. A few months ago an F-100 blew a tire, left the runway and traveled some 500 feet or more across bare ground to another abandoned runway. Luck alone prevented a serious accident when the main gear struck a pile of rocks over a foot high. The rocks had been accumulated on the old runway as the result of runway and taxiway cleaning. The responsible party undoubtedly thought they were safely out of the way.

In essence this article is a pitch to all flight and ground personnel to not take anything for granted when it comes to flight safety. Then we won't hear those sad, sad words during an accident investigation — "It might have been." ★

ARMS TIGHT

Lt Col Donald G. Williams, AFFTC, Edwards AFB, Calif.

A recent major parachute accident has called attention to a hazardous procedure in opening a parachute during a jump. The parachutist in this incident pulled his ripcord and then kept his right arm extended from his body. During parachute deployment, some of the risers struck his arm and a major accident resulted. But read the full story.

An experienced parachutist was making the sixth jump in a series of 17 from a C-130 to qualify as an Experimental Parachutist. He used a standard automatic seat parachute assembly with the automatic parachute ripcord release (F-1B) set for a ten second free fall. He had an inflight inspection and a final briefing by a qualified Inflight Inspector and Jumpmaster. The automatic parachute ripcord release was armed by the Jumpmaster just prior to the parachutist's exit, the Jumpmaster retaining the arming cable assembly. The parachutist exited in standard airborne position. He was observed by the Jumpmaster to be in a head down position, parachute pack up, facing the line of flight. After approximately ten seconds, the pilot chute was observed to come out of the pack and the canopy appeared to inflate fully without incident.

The parachutist said that at approximately ten seconds, he reached for the ripcord, pulled it, and kept his right arm out to the side. He did not know if he initiated parachute deployment by pulling the ripcord, or if the automatic release functioned at the same time or immediately before or after. He did not remember whether the canopy deployed under his extended right arm (as was apparently the case), or between his legs, to flip him over. He was aware of risers being twisted, which indicated that he flipped through two groups of risers. He stated that he had no feeling in his right arm during descent. Fortunately, he managed to fall on his left side and received no further injury from contact with the ground.

In this incident, the parachutist sustained a very bad multiple fracture of the right upper arm and contusions of the nerves in this area. In considering the factors leading up to this accident, post-flight checks revealed that the automatic parachute ripcord release functioned properly, apparently just before or at the instant the manual ripcord release was pulled. *It appears that the accident occurred because of the jumper's body position and because he kept his right arm extended after pulling the ripcord.*

To prevent similar accidents in the future, all fliers who may have to bail out should be advised that it is very important to:

- Keep their arms against their bodies.
- Keep their feet together.
- Pull the ripcord (when necessary).
- Bring their arms back immediately against their bodies until the parachute blossoms. ★

Our Flying Booby Traps

"You better keep up with the navigating; I've got my hands full flying this thing," the pilot called across the cockpit.

"Right!" . . thump . . the copilot pulled two inches of slack out of his seat belt and tried to hold his chart steady. "Just keep your CDI centered," he said. "I've got the next frequency in. We should pick it up in a few minutes, soon as we get across this last ridge of mountains." He looked up from his chart, cupped his hands around his eyes and leaned his head against the windshield. All he could see was the sweeping red blur of the rotating beacon as it was reflected by the rain-soaked clouds.

"See anything?" the pilot asked, rolling left aileron, then waiting until the little airplane in the attitude indicator came level again.

"Nothing. Solid soup." He paused, riding out a couple bumps, then added, "At least it's too warm to be picking up ice." He held the headset tightly against his ears. "Hey, I've got a good signal on the Omni now," he said. He looked at his watch. "About one minute to go to turn. The CDI is coming over."

"You take it awhile," the man in the left seat directed. "I want to take another look at this ILS plate."

"O.K., I got it."

The CDI on the copilot's ID 249 edged against the circle in the center of the instrument. He eased the yoke left until he was averaging slightly less than a needle width turn. He let the plane bounce around, watching the RMI card turn, until 160 moved almost to the top index. He rolled out on this heading, rolling in up-elevator trim to pick up the 200 feet the aircraft had descended in the turn. The CDI was centered. He looked at his watch. Seven minutes to go to the station.

Ka-whump! The pilot glanced up, checked his attitude indicator and tried to see out the side window. This had been the most severe jolt yet. "Here," he handed the let down plate to his copilot, "you better get familiar with this. I've got it. What's the heading? . . . holy smoke! Bob, what's going on? Look at your Nr 2 needle! It's pointing off to the left and behind us. Gimme your map." He reached over and pulled the chart from the copilot's lap. "I'll tune mine in." He checked the frequency on the chart and dialed it in his Omni, flicking the toggle switch to check identification. ".. -.. .--," he heard the signal as "TO" flicked into the "TO-FROM" window, the CDI centered and the Nr 2 needle swung up and stopped under the top index. "Mine's O.K.," he said, looking across at the copilot. "What's wrong with the Nr 2 needle on your set?"

"I don't know." The copilot looked at the overhead panel and reported, "The instrument selector is on the Omni - ILS position. The VOR-ADF selector is in ADF position. Hold what you have and I'll switch to VOR position . . . It doesn't do any good."

"O.K., this is no time to experiment. Put it back like it was. Both our CDIs are working and my Nr 2 needle seems to be pointing to the station. I'll fly the Omni. You see if you can get the ILS, and set up the outer marker on the ADF. See if you can get a radar vector."

The copilot did as directed, then looked over and said, "Wouldn't you know," when Approach Control reported radar off the air. He pushed his headset closer to his right ear and said, "I've got positive identification on the ILS: CDI seems to be operating."

Descent clearance was received, checklists started and the plane began to lose altitude. Over the Omni station, and cleared for an ILS approach, the pilot turned right until he had centered the ADF needle under the top index of the RMI. "You sure this ADF is working?" he asked.

"It must be. I have positive identification, and from checking the chart, this is the right heading from the Omni station."

The pilot reached over and took the chart. "You fly, I'm going to double check. I don't like this crazy instrument set up. When you hit the outer marker start outbound."

"Roger."

Turbulence had decreased slightly with the slower airspeed being flown in descent. Still, it was bad enough to cause the pilot to glance at his panel frequently.

"High station outbound, leaving 5000," the copilot reported to Control as he made his turn over the outer marker. "Approach," he added, "your glidescope working? I'm not getting any indication."

"It's been operating normally, but we will check it."

The pilot took the ILS plate, glanced at the frequency and set it in his Omni selector. He reached up and turned on the localizer. "I've got it," he said, "and my glideslope seems to be working. It's moved to the top . . ." He tugged at the wheel. "I've got it."

At 800 feet, low station inbound,

the copilot called, "I see lights; will advise runway in sight."

"Roger."

"Runway in sight. You can take over visually."

"Roger, recheck the gear."

Landing was routine.

The fact that it was borders almost on the miraculous when the chart accompanying this article is considered. Unbelievable as it may seem, this is a verbatim copy of the legend that has been posted in the cockpit of an Air Force aircraft. It has been posted there to help prevent pilots from becoming confused on Omni, Tacan, and ADF settings that are possible. (Actually, there is one other, should either pilot switch the UHF selector to the ADF position.)

And, friend, if you suspect this may be an advanced model complete with the latest in communication gear, you are wrong! This happens to be one of seven T-29s on one Air Force base. No two of the aircraft are exactly alike. Some have Tacan, some don't. In some the Tacan runs off the Nr 2 alternator, in others it doesn't. Only the one described above had the ADF-VOR selector switch and two other, adjacently located, comm toggle switches — neither of which have any apparent effect on equipment operation. The accompanying chart, made up and pasted in the cockpit of this particular aircraft became possible only through the trial and error efforts of a flight examiner who was concerned over the inherent safety hazard.

In the fictional account in the beginning we only gave our two pilots a little turbulence on a night flight. Suppose we threw in a little engine trouble, or radio trouble — could get sticky.

This is not an isolated case. Tour a few Goony Bird cockpits. Talk to T-Bird jocks.

It appears a bit incongruous, in these days of standardization, when each and every aircrew member is to do each task in exactly the same way, that our aircraft are anything but standardized.

The cockpit design-human factor role in aircraft accidents is common knowledge. To cite another example, there have been several gear collapse cases in C-118s where the flap and gear handles are identical in appearance, adjacently located and move in like directions for about the same distance. Inadvertent gear retractions have been less frequent in aircraft where the flap control is a flap shaped switch at the rear of the pedestal and the gear control is a wheel-shaped lever on the instrument panel.

There is cause to suspect that the pilot whose hand inadvertently was a few inches off, and thereby actuated the wrong control, is a bit resentful when tagged with "pilot factor," especially when a strut microswitch is supposed to prevent the gear from retracting on the ground.

But these things have long been known and written up in accident prevention articles such as this time and again. It's almost as if no one cares. In fact, from the evidence, this is a pretty fair assumption.

Why, then, another article on the subject? Simply to refocus attention on the fact that if we can't eliminate booby traps — and apparently we can't — then we must learn to handle them as safely as possible. (This may be one of the reasons aircrew members get hazard pay.) Think about it. Study and figure out the system in the airplane you fly, *ahead of time*. If it almost defies understanding, do as the FE did in this case, make up a placard and paste it in the cockpit.

And remember this, in the cases of ersatz installations the guy who added a piece of additional equipment (in order for you to fly safer, of course) wasn't a pilot and had no requirement to make any logical arrangement. If it works, and aircrew members can reach it, he has done his job. The intricacy of settings necessary to make it work is limited only by the ingenuity of the specialist who made the installation — and some installations are so complicated that there is suspicion a team of specialists was required.

What can be done? Write up such hazards; maybe modifications can be made during IRAN. Paste placards in the cockpits. Discuss such subjects at aircrew meetings. And, above all, understand the system in the airplane you are flying— when you're dead, the fact that you were booby-trapped will be small consolation to your next of kin. ★

PILOT'S SIDE

Position of Selectors	ID 249	ID 250	
		#1 Needle	#2 Needle
Inst Selector on VOR/ILS VOR 1/ADF 1 Selector on VOR 1	#1 VOR	#2 VOR	#1 VOR
Inst Selector on VOR/ILS VOR 1/ADF 1 Selector on ADF 1	#1 VOR	ADF	#1 VOR
Inst Selector on TACAN VOR 1/ADF 1 Selector on VOR 1	TACAN	#2 VOR	TACAN
Inst Selector on TACAN VOR 1/ADF 1 Selector on ADF 1	TACAN	ADF	TACAN

COPILOT'S SIDE

Position of Selectors	ID 249	ID 250	
		#1 Needle	#2 Nee
Inst Selector on VOR/ILS VOR 1/ADF 1 Selector on VOR 1	#2 VOR	#2 VOR	#1 VO
Inst Selector on VOR/ILS VOR 1/ADF 1 Selector on ADF 1	#2 VOR	ADF	#1 VO
Inst Selector on TACAN VOR 1/ADF 1 Selector on VOR 1	#2 VOR	#2 VOR	TACAN
Inst Selector on TACAN VOR 1/ADF 1 Selector on ADF 1	#2 VOR	ADF	TACAN

DEADLY LITTERBUGS

LITTERING is an American trait in which we take no pride. It's unsightly, and has provoked such stringent measures as fines for anyone caught in the act of littering. Insofar as the Air Force is concerned, littering is more than unsightly — it's downright dangerous. We've known this for a long time, ever since one of the first aircraft accidents ever investigated. The reason the OX-5 failed, which initiated an emergency that ended in the accident, was a little old pork chop bone. How it got tangled up in the working parts in such a manner as to cause the engine to fail was never determined. How it ever got there in the first place wasn't determined either. Suffice to say, it wasn't supposed to be there, and it's not unreasonable to assume that this was one of the first occasions for issuance of a reminder to keep aircraft free from foreign objects of all kinds.

Reminders, appeals, threats — nothing has done the trick; partial success, maybe, but cure, no!

Any military pilot who ever flew an open cockpit aircraft learned on his first slow roll that: you gotta keep the goggles on if you are going to keep dirt out of your eyes, you gotta keep the seat belt cinched up tight so your head doesn't stick down below the windscreen, because even little grains of sand really smart when driven into unprotected areas of the face.

Later, as closed cockpits came into style, if the pilot needed a pencil he had a pretty good chance of obtaining one en route by rolling inverted, waiting a moment, then picking one out from the assortment of junk that accumulated on the canopy. He had a reasonably good chance of picking up a cigarette this way. Matches were almost a certainty and sometimes he might luck out and even get a lighter.

Of course, like a lot of other things associated with flying, there was some risk; the pilot stood a chance of getting an inverted uppercut. Of course, if the uppercut was delivered by an old fatigue cap, the risk was small. But sometimes it could be a wrench, a hammer, or as can be assumed from earlier evidence, even the sharp point of a pork chop bone.

Speculation leads to the conclusion that there is virtually no end to the antiques that could be located topside should it be possible to fly some of the older bomber and cargo aircraft inverted for a short time. Who knows? Might pick up a pretty good Lambretta scooter that way.

Farfetched? Not necessarily. Take the case in which investigators found the bones of two dogs and a fox. That's right, at an aircraft accident site in Tennessee. Using some deductive reasoning they concluded that, if you were a hound dog, it would have been a beautiful morning for chasing a fox. That, apparently, was what this pair of dogs was doing when the aircraft crashed and burned on top of them. But, possibly remembering the pork chop bone incident, the board had to check out the evidence.

Why are the pages of Aerospace Safety magazine being used to again belabor this subject if past efforts have been to so little avail? Here's why. Sometime prior to takeoff the pilot of an F-102 dropped his flashlight. The rubber boot at the base of the control stick well was not secure and, as the pilot pulled back on the stick to rotate for liftoff, the flashlight fell or vibrated into this opening. It lodged forward of the control stick base preventing forward control column movement and jamming the control stick in a near full aft position. The aircraft rotated to a 70 to 90 degree nose up attitude and climbed to approximately 150 feet. At this point the pilot punched out at the wrong angle for the rocket seat. He struck the ground before the chute opened.

Because another fighter pilot was lost and a century series fighter destroyed, you are reading another article on the subject. This is in line with one of the recommendations, "That maximum publicity be given the circumstances surrounding this accident specifically emphasizing the dangers of loose objects in the cock-

Litter: Things lying scattered about; scattered rubbish; disorder or untidiness (not to be condoned in Air Force cockpits). The rivets on the back of the bug were found in a jet engine intake after overhaul.

The third flashlight from the top was the one that caused a fatal F-102 crash; the other three were broken by investigators in confirming the cause.

pit and the limitations of the low level escape system installed in the F-102 aircraft."

Other recommendations stemming from this accident included:

That immediate action be taken to provide positive retention of the flight control stick boot to the retaining flange in a F/TF-102 aircraft.

That an immediate study be initiated to determine if this hazard exists in other USAF aircraft.

That a flashlight storage compartment or holder be designed and installed in a safe, accessible position in all USAF aircraft.

That the Dash One be revised to delete optimistic and misleading information regarding zero level escape capability, that more reliable egress system be procured and that the parachute deployment feature be re-evaluated.

What would happen if an object jammed *behind* the control stick? Let's see.

In this case the pilot had been experiencing difficulty keeping his nasal passages clear during descent and had been using an inhaler to alleviate the problem. During a GCA pattern he placed the inhaler on top of the front cockpit instrument panel. At the point of touchdown the pilot elected to go around. At this time he felt an object strike his hand, then noted it fell to the floor. Next he found that the stick was impeded from aft travel. He was in that in-between-tight wherein he could neither continue the go-around nor land on the remaining runway. He did the natural thing, leaned forward to remove the obstruction from behind the stick. The natural thing happened (save for this, the incident may never have been reported) — the aircraft descended, just enough to scrape the baggage pod along the runway for 80 feet. Damage was minimal; neither the baggage pod nor the runway needed repair prior to further use. Recommendations following this incident were, essentially: pilots should pay attention to operating their aircraft, and don't put loose objects where they can move about and possibly jam controls or distract you.

And, though experience has taught that a flashlight or an inhaler can cause binding of the stick, the foreign object need not be that large. An F-84 jock, when he found he couldn't move the stick aft of neutral, used both hands, tugged, shoved forward, then back and found he had broken the jam. After he landed, the culprit — an instrument screw, one-fourth inch long with a one-eighth inch head — was found under the stick.

Here's another. First, what happened, then all the steps in checking the incident out just to show the trouble, work and expense that can result for a little foreign object.

The F-105 was being flown on an acceptance check prior to a high

flight mission. In level flight at 22,000 feet, at a calibrated airspeed of 340, both 450 gallon pylon tanks and one 650 gallon centerline tank jettisoned as the pilot was making a right turn. No damage to the aircraft; complete destruction of the tanks. After landing the aircraft was impounded and the following detailed investigation conducted.

Step 1. All jettison circuits were checked for stray voltage. Negative.

Step 2. An operational check was made on all jettison circuits. No discrepancies.

Step 3. A test rig was installed in pylon and centerline jettison circuits, then AC and DC power applied. All systems and switches that were used during the actual flight were activated. There was never any indication of stray voltage on the jettison circuit.

Step 4. A test rig was installed in the pylon jettison circuit and all connections and the relay box were tapped. No stray voltage.

Step 5. The relay box was removed, the cover taken off, and the relay box was shaken over a clean white cloth. A small piece of safety wire, metal shavings and small pieces of solder droppings fell out.

Step 6. The relay box and components were replaced and all jettison circuits checked. No discrepancies.

Step 7. The external stores jettison button cover was removed. No foreign objects or other discrepancies found.

Step 8. The cover on the circuit breaker panel in the battery compartment was removed. No foreign objects or other discrepancies noted.

Step 9. A test rig with flash bulbs was installed in both inboard pylon stations and the centerline pylon jettison circuits. The aircraft was then flown on the exact mission profile it had been on when the mishap occurred. After the aircraft landed the flash bulbs were checked and none were fired. When the jettison circuit was activated all bulbs fired.

Step 10. The aircraft was then flown on the same mission with two empty 450 tanks and one empty 650 gallon centerline tank. No discrepancies.

Step 11. Aircraft set up to fly another mission, same profile, with full tanks, and, if no discrepancy, to be released for acceptance flight. All flights were over water.

The primary cause was not discovered, however investigators concluded that the most probable cause had to be attributed to the foreign objects found in the relay box causing a short circuit to momentarily actuate the jettison relay.

Earlier this year investigators sifting through an aircraft's remains came across a three cell GI flashlight and a box-end wrench. They concluded that these items had no bearing on the accident, but did feel obligated to comment that they were indicative of a poor quality of maintenance.

Sometimes the evidence is suspected, but cannot be isolated. Following the unexplained crash of a large transport during final approach, probers reported a possible area of control malfunction due to jamming by foreign objects. They requested that a feasibility study be made on installing a protective barrier in the forward cockpit area to prevent objects from falling forward below the pilot and copilot and into the control system.

Remember when the 781 had a metal cover? After a few forms had slid down into control cables of T-Birds they took the metal cover off.

An F-101 pilot found his control stick was binding. He declared an emergency, described the condition and was able to make a successful landing. After a little search a jar of baby food, was found down among the control cables. Since the report didn't elaborate, how it got there will have to be left to the reader's imagination. One amateur analyst suggested that, if fighter pilots must baby-sit, they shouldn't wear their flying suits at the time.

RECOMMENDATIONS

What can you say. Basically the cure for litterbugging is good housekeeping: good housekeeping during manufacture, during IRAN, during periodic, during day to day maintenance and during operation. People who work on airplanes, or components in airplanes, have got to catch all their scraps and deposit them in a suitable waste container. Aircraft cockpits do not fit this category. Tools and other equipment used in maintenance (a maintenance stand was discovered in an aircraft fuel tank) must be accounted for following each job. Pilots who are unable to always hang on to their personal equipment might do well to fasten it to their person. Remember the WWII cadet days' requirement to wear the flashlight on a string around your neck?

Litterbugging along highways is one thing; it makes an unsightly advertisement for America, subjects the individual to a fine if caught and poses somewhat of a safety problem to nocturnal pedestrians.

Litterbugging in aircraft is much more serious. We were tipped off by a pork chop eater early in the fabric-covered biplane era. Because not everyone who works around and in aircraft heeds this lesson, preventable aircraft accidents continue to occur from this cause. ★

Correction

Despite every precaution errors will creep in. Aerospace Safety had one in the August issue, page 16. The number of lives lost in private motor vehicle accidents for the first five months of this year was 130, not 312 as reported.

A pair of Trans-Maintenance troops present their view of a common problem in . . .

Our Story...

SSgt Neal E. Yehl and A1C Lloyd T. Waggoner,
APO 286, New York, N.Y.

WE, as proud members of a Transient Maintenance Section in the USAF, are beginning to think that we are becoming a necessary evil to our transient crews. We have also become their favorite scapegoat. For some time we have been reading "Rex Recommends" and before that "Duncan and Heinz" in Aerospace Maintenance Safety, but we have seldom seen an article that gave any type of praise to the Transient Aircraft Maintenance Crews. The articles reflect how our crews are always giving the pilots and flight crews a hard time. We, as members of one of these so-called "goof off" sections, have decided that it is about time we presented our side of the story.

It seems that the favorite issue of many pilots is the long time it takes Transient Alert to get their aircraft ready to go. If the pilots would try to find out exactly what goes on after they leave their aircraft, they might not think that T/A goofs off. There is always the possibility that the POL truck is busy somewhere else or that one of the specialists required is busy on another transient aircraft.

A flight crew does not have as many sections to do business with as T/A does. In addition to waiting for the transient aircraft to arrive, each of these sections has work to do. Some of our jockeys think that they are the only pilots in the Air Force, and all we have to do is wait 'til they arrive before we work. Well, we have news for them. This Air Force has a bigger inventory than just one aircraft.

It must be nice to arrive at a station, jump out and holler over your shoulder, "Fix it." We are always running into the guy who thinks he should have been parked in front of Base Operations. We lead our hero in, and park him where we are told to park him. The first words we hear are, "Why did you park me here? I wanted to park in front of Ops." He may not know or care that the spots in front of Ops are reserved for VIPs and are kept empty. Or, perhaps there's a base directive that allows only certain aircraft to be parked in front of Ops. First thing he says to his buddies at the Officers's Club, "They parked me out in the boondocks and the area in front of Ops was empty."

We also have the guy who jumps out of his bird and says, "I want a quick turn-around, I'm leaving in 30 minutes." Did he look around and see that the base is involved in a big exercise? NO! He is not interested. Did he notice the ramp full of aircraft wanting a quick turn-around? Not on your life. To top it all off, he hits the proverbial ceiling when we tell him it will be at least an hour before his plane will be ready. He doesn't realize the T/A might be short-handed and that four or five men are trying to take care of a full ramp of aircraft. This isn't his problem; he's in a hurry and it shouldn't take that long to service an airplane.

Then we get the type who also wants a quick turn-around and will be leaving in 30 minutes. When he reaches Base Ops, he meets an old buddy, decides to have a cup of coffee and catch up on the news. They get so engrossed that before they know it, two hours have come and gone. There are also plenty of legal reasons for not meeting your ETD: weather, clearance trouble. This we aren't complaining about. But *why can't we be told* when changes are made? Instead of giving us a call and telling us that they won't be leaving when they said they would, they leave us sitting in the cold — wondering what happened to our flight crew. It's no good to ask Base Ops about our crew; as far as they know, "the crew left an hour ago."

Just as bad as the late comer, is the pilot who tells us that he won't be leaving for at least three hours and then changes his mind. When he gets to his plane 45 minutes

Our Story...

later and it isn't ready, he asks in a not too friendly tone, "Why?" We remind him that he said he wouldn't be leaving for at least three hours, so we left his bird to get one of our quick turn-around aircraft ready to go. "Well, I changed my mind," he says.

Worst yet is the pilot who gets out of his bird and says that he is going to RON, and he won't be leaving before 1100 hours the next day. So he leaves, and during the night changes his mind. He gets to Base Ops at 0730 and files out. He goes to his aircraft and finds out it isn't ready yet. "Why?" he asks. We ask him why he didn't inform us of his change in plans, and he says he forgot. Meanwhile, he continues to raise the roof with our supervisor because his plane isn't ready.

There is also the guy who calls us all kinds of names because we weren't there to park him. He's "never seen such a lousy T/A and I'm going to inform your commander of your neglect of duty." We tell him that we didn't know that he was inbound, but he thinks that is merely an excuse.

No matter where you go, there is always the following type: We pick up our hero as he comes off the active. We are allowed to exceed the normal speed limit in order to make it easier for aircraft taxi which just seems to stimulate him to greater speeds. We try to get him to slow down by decreasing our speed, but first thing you know, he's breathing down our necks with 280,000 pounds of screaming aircraft. Sure, everyone says *to make* him slow down. I have only one thing to say to this: It is pretty unnerving to look into the rear view mirror when all you can see is the needle nose of a sleek fighter or the huge main gear of a bomber. You ask why we don't use our STOP signs on the trucks to slow him down. It wouldn't do any good, he's too busy admiring the base. Otherwise, I doubt that he would be exceeding a safe speed in the parking area. We get the impression that some of our jockeys think they are driving a race car and that the taxiway is the back stretch of the Indianapolis 500.

One of the biggest sore spots we have in this operation is hand signals. It might be interesting to know just how many of our jockeys *know* the basic hand signals. We have to know them, why don't they? We have to take test after test in order to be sure that we know the signals that affect the type of aircraft we work with. All this training is wasted when we try to park a guy who looks at you like you are some kind of a nut when you stand in front of him and try to park him with hand signals. To top it off, he gets out of his bird and asks,

"Why'd you keep moving your hands in the air?" It makes you wonder sometimes. The regulation that covers hand signals isn't that hard to find. Just look up AFR 60-15.

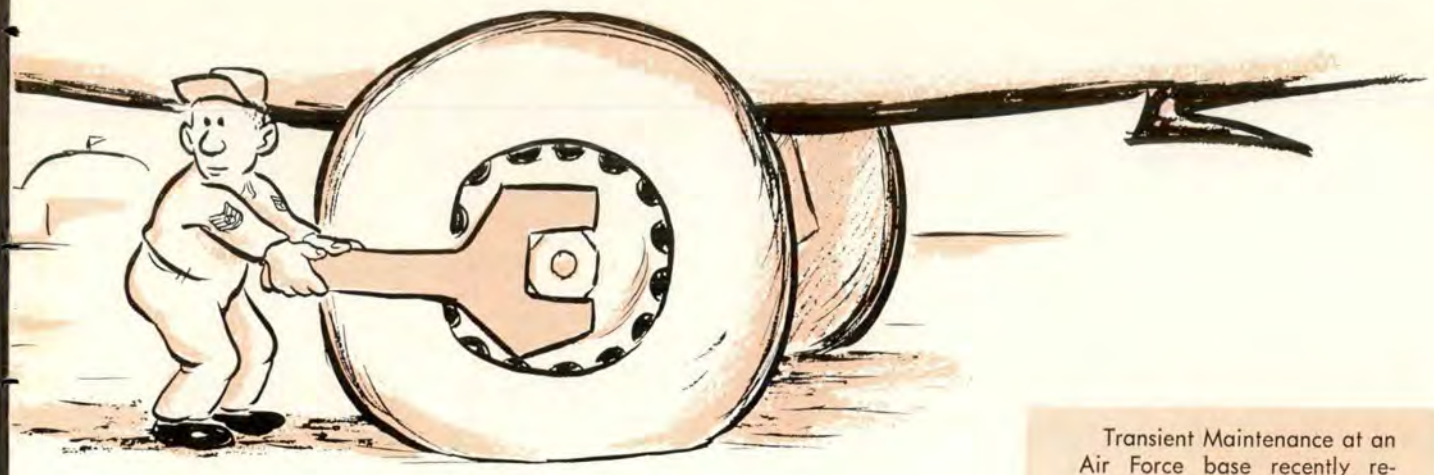
We get a pain now and then with some of the discrepancies that are written in the 781A.

One day a T-33 landed and the pilot informed us that he had experienced fluctuating fuel pressure. We asked him at what altitude he

was flying and he replied "30,000 feet." We told him that the barometric bellows in the fuel control were probably frozen and did not compensate for the change in altitude. We checked, and his fuel control was covered with ice. He argued that something else was wrong. We suggested that he let the fuel control thaw out and then run it up to check it out. The pilot persistently argued that he wanted a new fuel control. We told him that it wouldn't be necessary to change it. The pilot remarked, "It sure is nice when the ground crews tell us flight crews how to fly a plane." After I got permission to speak, I told him "how nice it is when the flight crews tell the ground crews how to fix a plane." The other pilot agreed with me. We realize that most pilots take an interest in their aircraft, but there are some who don't. Why don't they stick to flying the aircraft — for which they are trained — and let us fix the machine?

Then we have another kind. We get an inbound on a T-33 and at the same time Base Ops informs us that the pilot asked that T/A be informed that he will need a tire change. He has a left main tire cut to the cord. How can a pilot know that he has a tire cut to the cord unless he left his home station with it? In that case, he never should have left the ground with it.

One day, and before a pilot left his plane, he wrote a discrepancy in his 781A: He had experienced a "hot start" at his *home station.* We pulled an inspection and found that we would have to replace eight turbine blades. Was he trying to prove that he was brave enough to fly an aircraft that should have



been on a "Red Cross?" Or was the maintenance at his home station so bad that he thought he could get better service at a transient base? Maybe he didn't want to make the crew chief mad by writing up the hot start and refusing to take the plane until the inspection had been pulled.

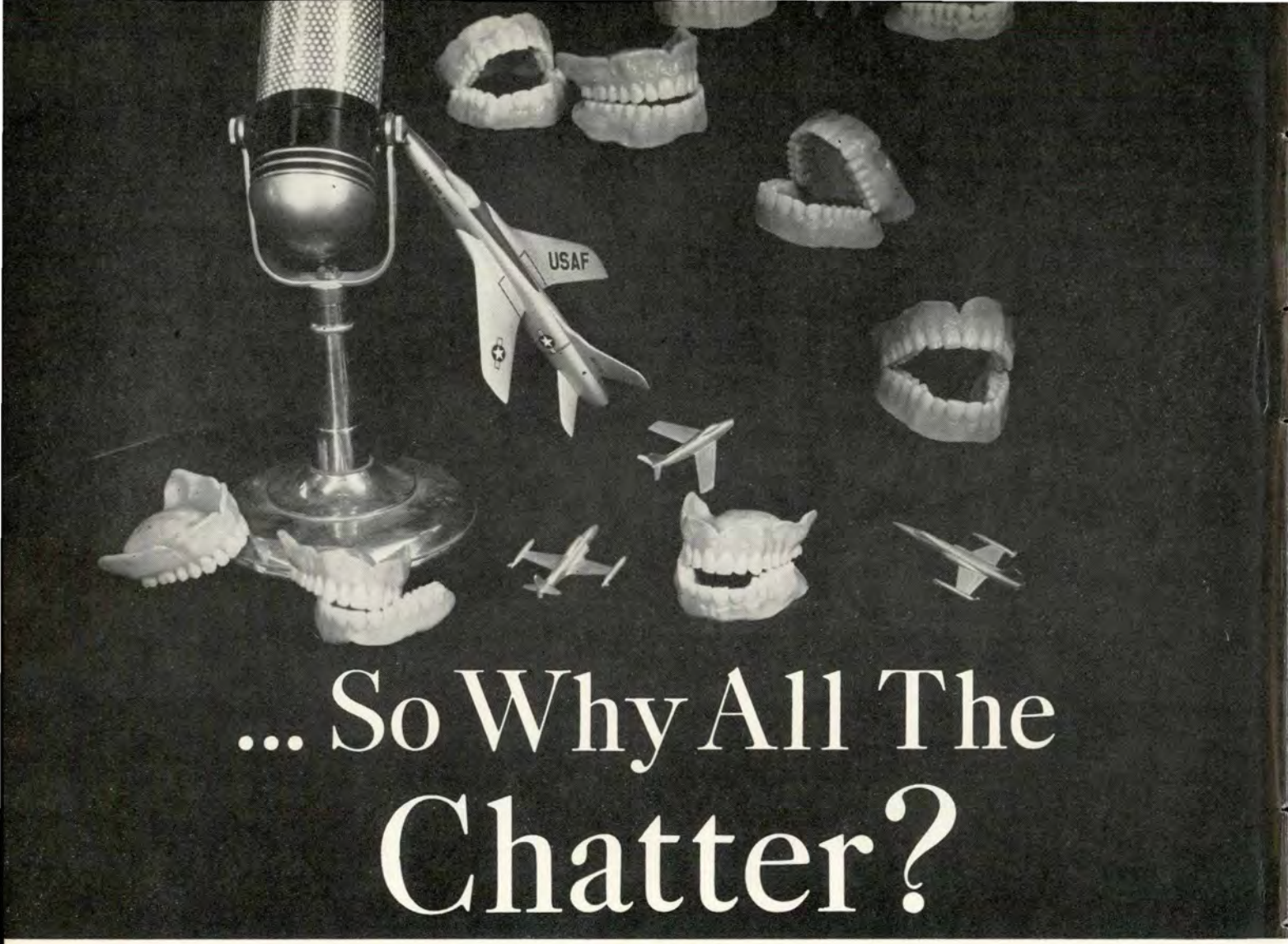
Our pilots are always complaining about how the Transient Maintenance sections are never able to fix their planes satisfactorily. If they think that we perform such lousy maintenance, why do so many of them depart their home station with maintenance problems, problems that, by the book, should have grounded the aircraft BEFORE it left home?

Don't misunderstand us, all our jockeys aren't this bad. But, our Transient Maintenance Sections aren't nearly as bad as some jockeys make them sound, either. We have met a lot of pilots who know the rights and wrongs. When something goes wrong, they don't jump all over Transient Alert; they look up the actual cause of the trouble. They don't try to run you down with 280,000 pounds of aircraft, they know that there is a safe and sane speed in the parking area. A lot of them know the hand signals like they know the back of their hands. They will follow every move we make. When you give them a signal, they do it *then* — and not when *they think* they should.

Gentlemen, we all have a job to do — be it big or small. We all have the same basic goal. We are here in this service to protect our country and our families. We have to work together in order to achieve these goals. Some of us are here because we have to be, but the biggest part of us are here because we want to be. Whatever the case, we have to work together. We are not begging for sympathy; we are asking for a little COOPERATION! ★

Transient Maintenance at an Air Force base recently reported that a visiting pilot wrote up the VHF NAV toggle switch in the rear cockpit as inoperative. When the T/M people started working on the aircraft, they were jolted at what they found. Here's a list of discrepancies:

Left main gear actuator leaking; right wheel bolts safety wired backwards; accumulator had zero pressure, diaphragm broken; cracked tail pipe; rod end bearing on right elevator push rod broken (stock nr 3110 554 3380 bearing ball rod end); wires bare in VHF NAV splice in rear cockpit shorted to bonding; VHF NAV monitor lines broken. There were three open write ups on the 781B; front cockpit right aileron trim control difficult to operate; cockpit lights in front cockpit will not adjust to full bright; rotating beacon will not rotate. The aircraft had considerable corrosion damage. This in fact necessitated the changing of the pin in the left main gear actuator.



... So Why All The Chatter?

THERE'S a lot in print these days about the stress and strain under which the air traffic controller does his job. However, the job can be accomplished with a minimum of stress if we could eliminate the unnecessary words and the lengthy transmissions that saturate our system. While the controllers are feeding traffic to the runway in a safe, orderly flow, they can achieve greatest efficiency if the pilots would anticipate control instructions (to a degree), i.e., information to previous aircraft, sequencing in pattern, field conditions and other data. And most important, if they would return the queries and statements rapid-fire, much like a ping-pong match.

To stand off and watch, or listen on frequency to a controller smoothly handle a continuous flow of traffic for as long as forty-five minutes to an hour, with diversified types and classes of aircraft, departing, arriving and remaining in local traffic, is an education in traffic control and pilot technique. The cause for control agency saturation soon becomes evident. Pilots can improve the efficiency of traffic flow by improving their microphone techniques. As the traffic picture develops, as the traffic stream increases, the pilot, too, should reduce his transmission time, helping to reduce the strain and tension.

Picture four C-130E transports in closed traffic, touch-and-go, two heavies for departure and three utility aircraft in three directions from the field, approaching to enter the pattern; traffic is at a brisk pace, control is positive and sure, instructions are brief and concise.

"Charleston Tower, Charleston Tower, this is Air Force six seven four two five, over."

"Air Force four two five, Charleston Tower, over."

"Aw, roger, Charleston, this is Air Force four two five, we're about fifteen miles or so west of your station, at two thousand feet, visual flight rules, for fifteen minutes passenger stop, requesting your duty runway and landing instructions, over."

Couldn't this transmission be improved, reducing mike transmission time?

Why not —

"Charleston Tower, Air Force six seven four two five, over."

And when answered —

"Air Force four two five, fifteen west, two thousand, VFR, landing."

The Air Traffic Procedures Manual expressly defines verbiage for each traffic control situation under which a controller may operate. Control phraseology is standard and the controllers do their best to keep abreast of standardized phraseology. But what of the pilot's mike technique and phraseology? Very little coverage is allotted in the Flight Information Manual and associated publications for air-to-

ground transmissions. And for situations not clearly defined, when standard phraseology is not known or does not apply, the general rule is for the pilot to use plain language to make himself understood.

Periodically, however, we are faced with problems of control when we are saturated with traffic, the saturation being caused by poor mike technique, lost time in extraneous transmissions, long winded speeches, interspersed with aw's, roger's, this-is, over, etc. To eliminate this load on the system, the pilot must not only plan ahead for his approach, departure, or other phase of flight, but also plan ahead for each transmission. Give a little extra thought to some simple, clear cut phrases and they will soon become part of a smoothly polished airman's vocabulary, free of hash that brands one as a jabberjaw.

There was a time when the military pilot hardly talked to a civil agency while in flight. He would communicate with military towers, and work only INSAC, ATCS or MFS stations enroute, passing up the centers entirely due to lack of direct communications capability. Now look at the picture in 1963. At civil airports controlled by a federally operated control tower, well, you know the rule — everybody, practically everybody in the area, is on the radio. Go IFR and you've got a lot of radios on the frequency; work a sector in a high density area and you can hardly get in a word edgewise. More and more pilots, both military and civilian, are doing more and more instrument flying. Most air carriers, including MATS are flying strictly IFR, and there is a big increase in executive flying and general aviation light-twin and single-engine stuff. Most of our communicating is direct pilot-to-controller and everyone is on the frequency at one time. Due to this increase in the single-channel simplex method of communicating, it is becoming increasingly important for pilots to improve their mike technique.

Initial transmissions are to ground control or to the tower for taxi instructions. Pilots sometimes give their message of intent with their first call and fail to get any response. Then they repeat the call, again give their message and again fail to receive controller's instructions. It would save a lot of trouble if we make sure that we're on proper frequency and capable of receiving before giving our message.

Even though most of our equipment today is crystal controlled, eliminating the necessity for hand tuning the receiver, we may not hear any transmissions because we have, one, a dead receiver, or two, the volume is improperly adjusted. So if we can hear the tower, (or ground control), then we're ready to give our message of intentions. However, if nothing is heard when we are ready to transmit, then give a preliminary call only, let the tower answer you, then give your message. We haven't blocked the frequency with wasted transmissions. Since we can hear the controller, we eliminate the preliminary call; if we don't hear the controller, either we don't have a working receiver or business is light. The following illustrates:

"Charleston ground, MATS 33279."

Had we been sure of adequate reception from the facility,

"Charleston ground, MATS 33279, taxi instructions to Dover."

And there's one type of pilot that usually says

". . . request taxi, time and altimeter."

Stay on ground control until either advised to go to clearance delivery frequency or until ready for takeoff. Could be that ground control wishes to query you about some additional information requested from Base Ops, or wishes to have you retard power to allow passage of other aircraft behind you, or desires to have you change your longitudinal direction to prevent prop wash blowing across the active. So stay with ground until ready to go, then switch to tower. control is not always kept up to date It is not necessary to advise ground of this, so you can save one transmission.

When ready to go, first face the runway with your aircraft, then state that you're ready. If they have room for immediate departure, you may not have time to get into position and roll if you've got more than a single ninety-degree turn to make to get on the runway. Simply state, "MATS 279 ready on one-five." Specify the runway, always; this is sometimes vital. Could be that tower has traffic holding short of two or more runways. Local of your specific location by the ground controller. So to prevent a loss of time while the local controller queries your position, give the runway with your call.

Let's go back a little . . . when to acknowledge instructions. To put it simply, when the controller can immediately and readily see that you are complying, no acknowledgment is necessary. But when you are coming up to a runway enroute to your run-up position, or heading back to the ramp and you are instructed to hold short, acknowledge; that controller is going to hold his breath until you trundle up to the solid yellow line and s-t-o-p. Or if cleared to move into position and hold, acknowledge — "Position and hold," don't just say "Roger," 'cause again he's going to eyeball you extra carefully (he may have lots of other traffic to look after) while you maneuver the monster out of run-up area, onto the runway, line up and reset brakes.

When airborne and planning to go to the practice area, no need to give the tower your mission profile. Just make the normal traffic pattern exit but stay on their frequency until departed from the area, or until they have given you specific permission; "frequency change approved." Eliminate "Air Force three-six-two is leaving your area for a little while and we'll be calling you again to shoot a few landings after we do some air work." If you want to work departure radar while still in the traffic area, request change to departure control.

When departing on instruments, wait for a frequency assignment after becoming airborne (unless flying jet equipment); no need to query the controller as to what frequency or when to switch. Though most pilots will ask for a departure frequency before making the big leap, you should have received this data in preflight briefing or planning.

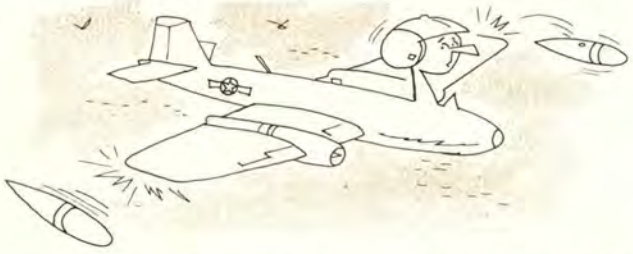
While enroute, phraseology is pretty well standardized, but pilots will still make too many lengthy transmissions even though most reasons for communicating are for the position report. Unless the geographical reporting point consists of more than one word, we can still make most position reports to the center with but nine words, so why all the chatter? ★

TSgt Gordon S. Hall, Charleston AFB, S. C.

CROSS COUNTRY NOTES

...from REX RILEY

OOPS, WRONG SWITCH — The pilot of this B-57 knew his cockpit well but derned if he didn't actuate the wrong switch! Both tiptanks made the prettiest, but inadvertent, separation from the aircraft you ever did see.



His explanation was that he was busy investigating rudder power effect at low altitude-low airspeed and then reached for the rudder power ON-OFF switch. The tiptank jettison switch is not only identical to that for the rudder power ON-OFF, it is located only five inches away. So . . . it got actuated, inadvertently, of course. And away they went — both tiptanks.

It's a good idea to take another good look, no matter how well you think you know the cockpit of your aircraft.

T-33 BLOWN CANOPIES. Two blown canopies make it worthwhile to relate the stories to you because either event could easily happen again.

First one — as the IP and student were running the checklist before taxiing, the student retracted the pip-pin and arm rest initiator pin. It's too bad that he didn't follow the approved procedure of putting his hand on the pin instead of grabbing the streamer flag. But anyway he yanked on the streamer not knowing it was wrapped around the canopy jettison T-handle and sure enough the canopy blew just as it's supposed to do. Nobody was hurt this time and the canopy missed the rest of the T-Bird. How many times have you grabbed the streamer instead of the pin itself? Rex used to once in a while but he has quit real quick.

Second boo-boo — this one is about an inexperienced personal equipment specialist. The T-33 was scheduled for a test flight but the weather clobbered, so the test pilot cancelled out for the day but left his parachute in the airplane intending to fly the test hop the next morning. The personal equipment folks found that the pilot chute was due for a 10-day inspection so an airman was told to go to the aircraft and have at it. When he arrived the canopy was closed but he noticed the canopy opening instructions stenciled on the side. He hopped up on the wing, pressed a button and a door opened exposing a cable. The next direction said "Pull" and pull he did — nothing happened. A second tug produced the inevitable (but unexpected to the lad) — the canopy smartly departed the T-33. In this instance the canopy hit the airplane inflicting dents, tears, etc. The airman's supervisors were well qualified around T-Birds and evidently thought the airman was too, since they gave him no briefing or instruction. The unit reporting this incident has everybody briefed now so it just can't happen again, can it?

WILL WE EVER, EVER LEARN. This is not a new story but before Rex retires he sure would like to see just one year go by without an "unintentional" wheels up landing. The investigator in this one tells

it very nicely, so except for hiding the unit, location, names, etc., Rex will quote. "Aircraft (T-33) departed 1455 MST. Copilot flew first hour performing instrument approaches. The pilot then made two simulated flameouts, low approaches. Normal traffic was entered for touch and go landings. Aircraft was Nr 3 on the pattern during first approach. The break was delayed for spacing. The pilot then silenced the gear warning horn since he would have to wait to extend his gear. The preceding aircraft was making a minimum run landing so the pilot elected to make the same type landing to maintain spacing. The tower was notified of this and the pilot states he feels sure he reported gear down (tower tape shows he repeated gear down on two occasions). Also tower was unable to check gear due to aircraft landing out of the sun. At this time the pilot states he was not aware gear was not extended. He recalls checking Selsyn indicator, but the 'up' indication did not register with him. His attention was on an aircraft preceding him on final approach (3000 - 4000 feet ahead). The tower then cleared Nr 3 to land. The pilot attributed the floating action to the jet wash. Also he stated his airspeed on final approach was quite manageable. When the aircraft made contact with the runway, full throttle was applied and the speed boards retracted. (The flaps were left in the down position.) When it became evident the aircraft would not become airborne, the throttle was stopcocked. The aircraft came to rest 3500 feet from the approach end, and in the center of the runway. The copilot stated that he did not notice the 'up' indication or that the horn was not blowing. Aircraft damage: pitot tube bent, both speed boards scraped, both wing flaps scraped, forward belly section scraped; estimated manhours for repair — 70 manhours.

"Action taken: Flight operations has directed that the landing gear horn will not be deactivated in landing patterns. Directive has been posted in PIF."

HERE'S ANOTHER WAY. After the landing, the pilot in the front seat of a T-33 retracted the speedboard and evidently intended to raise the wing flaps in a smartly executed Dash One approved manner. Instead he grabbed the gear handle and brought it out of the down and locked position and sure enough the nosegear unlocked, the horn blew and so on. Our stalwart quickly (but not quickly enough) realized his error and socked the handle to the down position almost in time to prevent a bent T-Bird. Just wonder why the big panic to clean up an airplane on a nice long runway. Because this has happened more than once recently, the next time you grab something in the cockpit in an automatic reaction, stop to THINK, is this the deally that I really want or is it something that will embarrass the hell out of me.

SHADES OF YESTERYEAR. Rex recently "guessed" that since no word about buzzing and other unauthorized flight maneuvers appeared in the magazine since it was called *Flying Safety*, these things didn't happen anymore. He guessed wrong. One young student just about put an end to his flying career when he proceeded to entertain his girl friend who lives near his base. He attempted a clover leaf type of maneuver and didn't have sufficient altitude for recovery.

While waiting and hoping for this student pilot's personal recovery, we'll have to point out that there has to be a safer way of entertaining lady friends.

YAKITY, YAKITY, YAKITY. For quite a while now Rex hasn't preached on a favorite subject "Unnecessary Radio Chatter." But the other day, flying around the flag pole, I was almost ashamed to preface my call sign with "Air Force." Reason: About 10 other flag pole flyers were keeping up such constant, irritating, long-winded meaningless statements and conversations with towers, centers, GCAs that Rex wanted to be disassociated with such garbage. There is probably no other single shortcoming that advertises lack of professionalism of the Air Force pilot than his non-standard and over-verbose phraseology on the radio. Maybe he has been exposed to too much overwritten military correspondence and has forgotten the art of plain talk. I suspect that our greatest offenders are the old dogs who refuse to be taught new tricks. If you are in this two decades plus group, run this little check on yourself. The next time you fly with a lieutenant, listen to how he makes his radio calls. If you notice a difference, YOU are most likely the offender.

The only one IMpressed by a unique radio style is you — all others who have to put up with it are DEpressed. ★

The loss of a $600,000 aircraft is not a cause for rejoicing. Here's one in which part of the loss may be recouped if all pilots will, read, remember and apply.

HEED THE WIND

LAST SPRING A C-119 became a total loss and two of its passengers were injured when it crashed on landing at a municipal airport. This accident was one of those cases where the pilot thought he had it made only to have the bottom drop out (literally) at the last moment before landing.

The flight had been routine, in VFR weather, and the aircraft arrived at the municipal field to drop off some passengers. Everything appeared to be normal as the aircraft turned on final approach for the landing. Visibility was good and the wind, 25K gusting to 40, was almost down the runway. The pilot had computed an approach speed of 108K and testified that the indicated airspeed fluctuated between 110 and 120 in moderate turbulence on final. Just after the aircraft flared it suddenly seemed to settle and the gear and belly plowed through a slight rise at the top of a gully right off the end of the runway.

The initial impact was so slight the pilot thought he had a normal landing and he pulled back on the yoke to keep the nosewheel off. The loud scraping noise and a veer to the right convinced him that something was wrong and he applied left rudder, cut the mixtures, put the nosewheel on the ground and attempted nosewheel steering all to no avail. The aircraft slid some 1200 feet and ended about 50 feet off to the right of the runway.

In addition to the main landing gear, the aft section of the cargo compartment floor and the clamshell doors were torn off and the loadmaster, seated in the last seat on the right hand side of the fuselage, was thrown out of the aircraft when the floor went. He received various cuts, bruises and a concussion, Another passenger received minor injuries but the other nine persons aboard escaped injury.

Investigators determined the primary cause to be pilot factor for the following reasons: Under the existing conditions, touchdown point was too close to the end of the runway, approach angle was too shallow, and airspeed was to low.

Contributing were the gusty wind and a downdraft causing a sink factor immediately off the approach end of the runway. High carbon monoxide content of the pilot's blood was considered to be a possible related factor.

The terrain at this airport is peculiar and, with the existing wind condition at the time, an unusual situation was created. The ground on final approach slopes downward from a hill off the end of the runway to a gully about 25 feet below the landing surface immediately short of the runway. There is no overrun and from the runway to the dropoff into the gully there is a slight rise and hump at the crown of the dropoff. This was what the gear and bottom of the fuselage struck initially.

The downhill slope of the ground on the approach apparently causes some problems and may deceive a pilot into thinking he is higher than is the actual case. The big problem on this day, however, was

C-119 struck top of gully with results as shown here. Loadmaster, who went out of the aircraft when floor ripped out, was wearing these boots. Luckily he was not wearing oxfords.

the wind and turbulence. As the wind passes over the crown of the hill on which the runway is located it has a tendency to follow the terrain and dip downward into the gully. This would create a downdraft as well as a churning effect that would produce a rotating kind of turbulence right off the end of the runway. This would not be a serious problem if there were an overrun or if a portion of the runway were sterilized, e.g., no landing permitted in the first 500 feet. This is not the case, however. The runway is 5000 feet long and ends abruptly only a few feet from the dropoff into the gully.

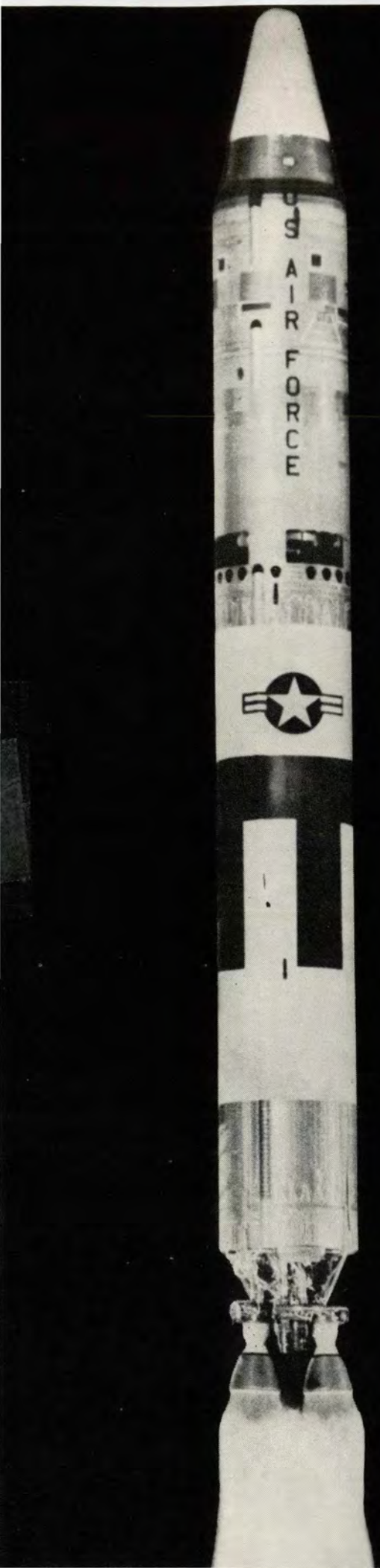
While the pilot had computed Vs plus 30 to be 108K, and both he and the copilot testified that indicated airspeed was 110-120K, wind shear produced by the gusty conditions and the descending air at the gully just short of the runway could have, and apparently did, result in a sinking effect that caused the aircraft to descend into the ground. Unfortunately this occurred at the worst possible point and resulted in impact of the gear and aft compartment about three and one-half feet below runway level. The condition would have been aggravated, of course, by a shallow approach. An ANG pilot, flying regularly out of this field, said that when using this runway he always makes a higher and steeper than normal approach.

Abnormal wind conditions have caused many an Air Force accident, therefore it would behoove pilots to occasionally refresh themselves on this subject. The problems of windshear were discussed at length in an article, "Seeing the Shear," in the April 1962 AEROSPACE SAFETY. The following is a quotation from the section on Mechanical Shear. ". . . Downdrafts, particularly when encountered just short of the runway threshold, require immediate counteraction on the part of the pilot. Turbulence may or may not be associated with mechanical shear. Advance planning will minimize the surprise factor and promote more rapid and positive counteraction techniques."

In this case, due to terrain and the location of the runway in respect to the downslope, the pilot was undoubtedly unable to make any correction in time to avert the accident. But the last sentence in the paragraph above has particular meaning. Advance planning, a la the ANG pilot, resulting in a steeper approach and possibly a bit more airspeed probably would have brought about a safe landing, particularly in view of the fact that the pilot testified that the runway length was far more than sufficient and stopping was no problem.

In connection with a refresher for pilots, a persual of AFM 105-5, Weather for Aircrew Trainees, would be valuable. It has been suggested also that Dash Ones be revised to include information on the subject of windshear during the landing phase, particularly during gusty, turbulent conditions.

Another safety factor related to this accident involves personal protection through the use of proper equipment. The loadmaster's feet scraped along the ground for quite a distance. A look at the boots he was wearing, in the accompanying photo, will rapidly convince one of the value of their use. Had he been wearing oxfords the condition of his left ankle would not be hard to imagine. ★



The Changing Role of Aerospace Safety

Brigadier General Jay T. Robbins, Director of Aerospace Safety, DTIG; discussed the concept of Aerospace Safety, how it has changed in the past and how it may change in the future, at the 53d Air Force-Industry Conference held 19-21 June at Santa Monica. Theme of the conference was Safety Engineering of Missile/Space Systems. Feeling that General Robbins' remarks would be of interest to many who were unable to attend the conference, AEROSPACE SAFETY presents the major portion of that speech.

I propose to take this opportunity to offer a few remarks on our concept of Aerospace Safety, how it has changed in the past and how it may change in the future.

Let me preface my remarks on the USAF Aerospace Safety effort with this observation. It seems to me that the nation itself is becoming more safety minded. For example, I have noted a significant increase in the number of articles published in magazines and Sunday supplements which have a strong safety theme. In addition, the country seems to show an increasing awareness of the work of the National Safety Council. Another symptom of this national awareness can be noted in the sale of seat belts for cars.

Consider how our manned space shots unify the people in a nationwide concern for the safe return of our astronauts. For the first time the safety precautions which are a vital part of each space launch are subjects of national interest and conversation. You in industry have shared this safety emphasis.

It logically follows that the functions and responsibilities of my organization must keep pace with this increased national awareness of safety as a way of life. In fact we are immodest enough to think that the USAF by contacts with industry and the community has contributed toward a better understanding of the need for safety in whatever we do.

Not only has safety increased in importance within the nation and the USAF but the scope of our Aerospace Safety efforts has also been enlarged. In short we have recognized that there are more things to be safe about today than there were yesterday.

In the context of an increasing national appreciation for safety let's take a look back in time to see what conclusions can be reached concerning the role of Aerospace Safety from a historical viewpoint.

During the period after World War II you will remember that we became concerned with supersonic flight on an operational basis. The advent of the jet engine brought this about and created the need for increased pilot proficiency as well as the need for more efficient structural and aerodynamic design of high performance aircraft. The safety efforts at that time consisted of establishing a basic level of safety through design using proven techniques, and then flight testing the system to iron out those fringe areas where our technical know-how was to some extent lacking. We used the man as a performance evaluator as well as our emergency back-out computer. Here the USAF-Industry safety team worked hand-in-hand and the results were gratifying. Many times our test pilots brought back a limping bird which otherwise would have been lost. This permitted engineering changes which resulted in better systems. And so, it was largely a matter of fly-fix-fly until many of our engineering problems were solved and our operations became safer.

When the system went to the operating command, the fly-fix-fly procedure went along with it. As the using command flew sortie after sortie, we found that engineering changes were still necessary to remove safety hazards uncovered by the concentrated use of the system day in and day out. Again, it was a combined USAF-Industry effort.

This then is a brief historical treatment of the role of Aerospace Safety. It included ground and air accident prevention programs, traffic safety, and explosive safety. We worked hard to improve the record and we were successful. But even as we did this, new safety problems were just over the horizon. As time went by, we saw our inventory changing to include air-to-air, air-to-surface, and surface-to-surface missiles. These changes in inventory necessitated corresponding changes in our concepts.

Consequently, with this technological evolution in the makeup of our military forces came the need to expand the role of safety in order to keep pace with the requirements and peculiarities of our new weapon systems.

We were in a position not unlike that of the father with two children who suddenly finds that he is about to have another. We could not neglect our existing responsibilities simply because our family was enlarging. We, both industry and the Air Force, had to step up our activities to include new and larger responsibilities which accompanied the diversified weapon inventory. In short, we had to change the role of Aerospace Safety to cover a broader spectrum created by missile and space programs.

But simply recognizing the need to expand our safety efforts was not enough. We had to recognize that the nature and scope of safety problems would increase as well.

Our missile and space programs brought to light many new problems which we had not had to face before. For example, we had become accustomed to looking at the number of accidents per 100,000 flying hours as an index of our safety effectiveness.

With missiles, we had to change this approach to account for the fact that the birds did not fly missions and could not accumulate flying hours. We had to realize that a green light on the status board represented something quite different than it had in the past.

So, the time proven method of fly-fix-fly which worked so well with our aircraft had to undergo a change to acknowledge that with few exceptions, most actual missile launches are accomplished prior to operational turnkey and we don't have recoverable birds. Incidentally, the using commands should be commended for their programs in which selected crews launch live missiles from the Atlantic Missile Range and the Pacific Missile Range. It is unfortunate that the economics involved do not permit more of this activity since practice launches invariably add to our operational knowledge and related safety procedures.

But by-and-large, today our missiles in operational silos are in a quiescent state. The bird sits in the hole with our people lavishing tender loving care on it.

But since we don't fly the system day after day, our operational safety activities must be focused on exercising subsystems and performing maintenance and operational checks. Out of these activities we must be constantly alert to find safer ways of doing things, to make fixes where required and to try to anticipate the needs of the future.

From this it can be seen that the role of Aerospace Safety has changed markedly with the advent of missiles. But regrettably one thing hasn't changed. We still lose lives, property, and combat capability through accidents and mishaps.

When they occur, we subject each one to an exhaustive investigation in the hope that we can arrive at corrective measures which will avoid a recurrence. Some may feel that this is the best way to obtain safe reliable systems but I do not agree. If I have to rely on the results of an accident to uncover deficiencies and to prevent future accidents, I am behind the power curve and am not doing my job as effectively as I would like to do it.

This point also emphasizes the changing role of Aerospace Safety. The single fact of the matter is this: Preventing the next accident will require more diligence than we have expended in the past. This means that we have to search constantly for new ways to prevent mishaps since most of the basic accident prevention techniques are not new and have been used by our predecessors.

And so the handwriting is on the wall. In what is close to a geometrical progression, each new technological breakthrough brings with it new safety problems. Just as the jet engine created new safety problems, so will (nuclear) propulsion. LASERs, high energy fuels, and space command satellites, challenge both you in industry and we in the Air Force safety business. The time may not be too far distant when we will see a space vehicle take off, go into orbit, accomplish its mission and return to home base. The day will also come when strategic and tactical satellites will be land launched and recovered. In the process, the manifold safety problems inherent in such complex operations will tax our capabilities and ingenuity. The role of Aerospace Safety is a dynamic one.

But let's get back to earth: We have our safety problems today and we need to discuss them. It is not my intent to amplify these problems out of logical proportions My purpose is to impress you with the fact that our task of preventing accidents today is significantly more challenging and more demanding than it has been in the past. I sincerely believe safety engineering is one way to meet this challenge.

It is clear that safety engineering must be adopted as a way of life — for top management, engineers, and designers. As products become more complex the need for early recognition of safety engineering becomes increasingly important.

Finally, the idea behind safety engineering, stated as simply as I can state it, is this: A "what if" attitude on the part of the designer can prevent more accidents than 30 ECPs made farther down the road. ★

•missilanea

COMMON SAFETY SENSE. All of us are endowed with a certain amount of common or ordinary sense which we fortify throughout our lives by our own experiences and the experience of others. Cause-and-effect events enable us to know right from wrong and good from bad. A review of missile accidents and incidents where personnel or supervisory error was involved reveals that many were the result of failure to use this common sense!

There are AF regulations, manuals, and technical orders which tell us the right way to do a job. Common sense tells us that any deviation from published procedures is the wrong way and that deviations beget mishaps. During a recent propellant loading exercise at a ballistic missile site, an automatic abort occurred. The investigation of the abort revealed that the helium pressurization line was torn from the missile and the main readiness power circuit breaker had "popped." In an effort to expedite the off-loading of the LOX, the squadron commander authorized personnel to proceed with the trouble shooting without written technical data. This was in direct violation of command policy. As a result, approximately 12,000 gallons of LOX were dumped into the bottom of the silo and the first stage LOX tank sustained damage. Where was common sense here?

Another incident occurred while a TCTO was being performed on the standby battery cabinet terminals. A contributing cause was that the electrician's tool slipped off a hex nut and grounded a 28-volt DC current into the facility common ground. This, in turn, caused some of the ordnance on the missile to fire and resulted in damage to both the missile and the facility. The tool the electrician was using to loosen the hex nut was not a box end wrench or anything similar; he was using a cable stripper! Here again, the airman did not use common sense, for it we don't have the proper tool for the job, it seems logical to stop work and get the proper tool.

These are only two incidents of many that illustrate the point. Regardless of age, education, or AFSC, each of us has the responsibility to use our God-given intelligence, including our common sense, and thereby save the Air Force money, time, and grief.

Capt Frederick C. Freeman, Jr., Directorate of Missile Safety

FALCON. GAR damages continues to occur frequently, primarily from personnel error. The incident to follow is merely a repetition of previous similar mishaps. Damage to the missile was not discovered until inspection after the missile had been returned to storage. Then it was discovered that the bird had a gouge five inches long ending in a good-size hole in the top of the fuselage to the rear of the aft launcher hooks. Sure enough, examination of the aircraft revealed a screw protruding from the Nr 3 rail. The screw was bent to the rear and the head was severely damaged, This screw was one of three securing the rebound spring anchor block to the rail housing. Compound had not been used to secure the screw.

It was theorized that the screw head may not have protruded very far until the missile was slid onto the rail. Then it was forced out, or unscrewed further, as the missile traveled aft. The loading crew did not detect the loose screw prior to loading, nor did the crew that downloaded the missile detect anything amiss.

The causes of this mishap are purely personnel error. Inspection of the rail prior to loading should have revealed the loose screw. Proper securing of the screw with compound probably would have prevented its coming loose. In addition, launcher rail assembly procedures did not provide proper screw staking instructions.

Corrective action included emphasis on proper inspection procedures, acquisition of the correct cementing compound, inspection of all launching rails, a query to the AMA on staking instructions.

USE OF COMPRESSED GASES
RULES FOR SAFETY USE:

• *ALWAYS READ THE LABELS TO IDENTIFY THE CONTENTS OF COMPRESSED GAS CYLINDERS.*

• Return cylinders with conflicting or illegible name of contents to stores (or to suppliers).

• Do not use oxygen as a substitute for compressed air (or for any other gas).

• Never force connections that do not fit together easily.

• Never use oil or grease on oxygen connections.

• Keep safety caps on cylinders that are not in service —especially when the cylinders are being moved.

• Do not lift a cylinder by its safety cap.

• *DO NOT MAKE OR USE NON-STANDARD ADAPTERS TO JOIN CONNECTIONS WITH DIFFERENT THREADS.*

• Never use a gas cylinder as a roller or support.

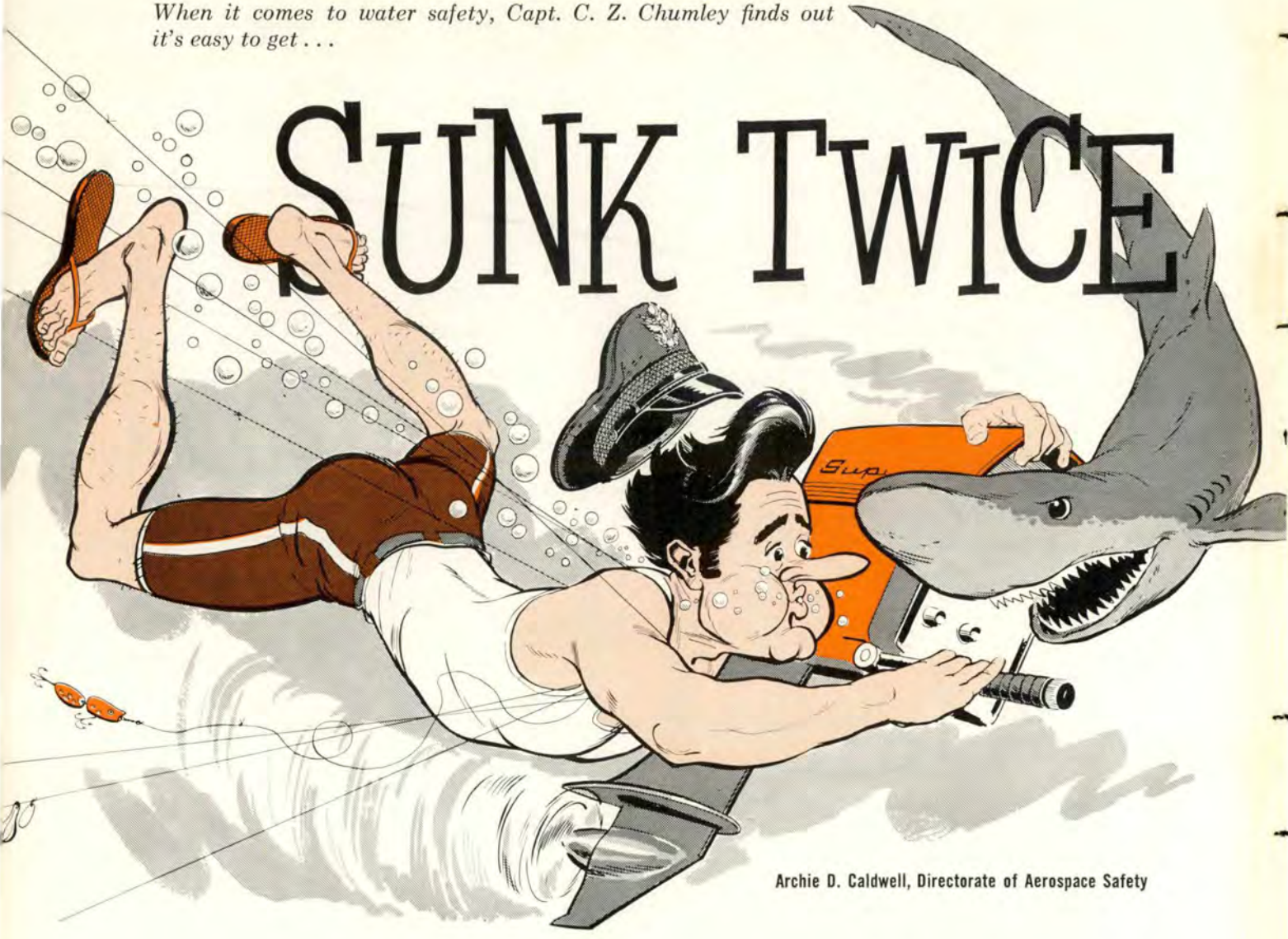
• Do not pressurize low pressure containers with high pressure cylinders unless a pressure regulator is used. Use only good tubing or flex-hose; discard kinked lines.

• Protect cylinders from extremes of temperature. ★

From Boeing Minuteman Service News

When it comes to water safety, Capt. C. Z. Chumley finds out it's easy to get . . .

SUNK TWICE



Archie D. Caldwell, Directorate of Aerospace Safety

Perfect wrist action and the controlled flexibility of a $70 fly rod resulted in a graceful loop of two-pound test line and the outlay of the "dry fly" neatly on top of an eight by ten piece of paper. "See — smooth action of the . . ."

"Gimme the rod." The pudgy hands of the World's Greatest Aviator, Captain Chauncey Z. Chumley, snatched the fishing gear from Major Audick. "I think I got the hang of it now."

A vigorous backswing shot the line at eye level past the two toward the corner of the Base Ops building "See, the old master only needs to be shown once and can do anything. Now watch me hit that . . ."

A slight tug on the line caused C. Z. to look to the rear. Chumley's long suffering Colonel was attempting to extract a simulated mayfly and number four hook from the bill of his service cap. "Well, Captain, looks like you got me right between a 'cloud and lightning.' May I ask what your — no, let *me* tell you. You're getting all set for your vacation because you think I've approved your leave. Well, I haven't taken any action on your request because of the inspection that's coming up next . . ."

"Here, let me help you get that hook out, Colonel," Chauncey interrupted. He grabbed the hook and pulled — just enough to rip a piece of embroidered lightning from the cap and to open a gash in the old man's thumb. "See, that did it," C. Z. exclaimed.

"It certainly did. Although my better judgment tells me not to allow your being at large in our civilian-populated resort areas or in our national resources, your leave is hereby granted. And don't think that I've forgotten that little episode of last week when you borrowed Mitchell's motor scooter and ended up in the pool; it's just that I think for the betterment of the base, and my own safety, two weeks' leave should be beneficial to all concerned."

Chumley leaped with joy. "Thank

you, sir. A rest is just what I need to settle down. You'll see."

C. Z. saluted smartly, placed his right foot to the rear of the left, and did a quick about face, neatly snapping the tip off the borrowed fly rod. With a sheepish grin, he handed the rod back to the major. "I guess I won't do any fishing this time. I've got a better idea on outdoor sport!"

The colonel looked at the broken fly rod and its dismayed owner. "You're not borrowing some other piece of equipment that you're unfamiliar with, are you?"

Chaunce looked back over his shoulder as he clashed gears in the Jag and yelled, "No, sirree sir, although Major Johns said I could borrow his water ski boat if my leave was approved."

As the Jag took off amidst flying gravel, the colonel turned to Major Audick with an expression of fear. "Say, Al, you don't happen to know the phone number of the local Coast Guard, do you?"

"Okay, dear, just ease her back into the water. That's it!" Chumley, attired in flame orange bathing suit, knee-deep in water, was directing the launching of the borrowed boat. Mrs. Chumley at the wheel, faithfully following C. Z's orders to the letter, failed to notice that the rear half of the station wagon was almost completely submerged. C. Z., acting like the true master of the sea, released the retaining clips, and the boat bobbed merrily free of the trailer.

After the tow truck had removed the family car from its watery grave, Chumley and family assembled on the dock in preparation of what he described would be a "glorious day of fun, sun and water."

The small boat settled lower in the water with each item C. Z. tossed in. Extra five gallons of gas, each in a gallon bottle, cameras, picnic cooler, lunch box, water skis, portable radio, etc. Chaunce leaped smartly into the boat and fumbled the key into the ignition. Mrs. C. had two of the children in the stern and was in the process of helping the oldest when Chaunce slipped the mooring lines and hit the starter switch. The Evinrude started instantly. "Yippee, here we go!" he yelled, and slipped the powerful motor in gear and jammed the throttle forward. The quiet power took hold and the "World's Greatest Pilot" spun the wheel. It was fortunate the stern slammed against the pier giving C. Z.'s better half a chance to regain her balance from a modified (yet undignified) "splits" position between boat and pier and to grapple her way into the front seat.

"Wow, feel that power!" C. Z. yelled over the rush of wind, but no one heard. The children were clutching each other in terror and Mrs. C. was busy sinking her fingernails into the fiberglas panelling.

"Look, Mom, PT-109." Chaunce leaned forward and aimed the bow at a small fishing boat anchored in the mouth of a cove. The lone fisherman's eyes widened as C. Z. came charging nearer. At a scant 15 yards, Chaunce spun the wheel and yelled, "Torpedoes away!" As C. Z. passed to the rear of the fishing boat, he failed to notice its stern anchorline. The bow rode smoothly over it and gracefully lifted out of the water. The horizon tilted suddenly. Chumley put in full opposite wheel and chopped the throttle, but the boat was already airborne. As the stern came down, it spun around with a motion that resembled the "twist" and all hands flew out like so much flotsam and jetsam. There was the sound of breaking glass and a muffled explosion as the bottles of gasoline slammed into each other and the battery box. The somewhat shaken fisherman had seen it all and had quickly slipped his lines and was at the scene to pick up his wet passengers. It wasn't until C. Z., the last to be picked up, was aboard that he spoke. "Dern fool. You just cost me two anchors, 400 feet of anchor line, and the biggest dang fish I ever hooked. What in the tarnation were you . . ." His comments were cut off by the siren of the patrol and rescue craft.

The Lieutenant of the Coast Guard Auxiliary completed the last line on his report, signed it and turned to the soggy shape of C. Z. "Now let me get this straight. You say you had no previous experience with boats, but you thought that because you fly and drive a car that there wouldn't be anything to it."

"Yes, sir, you see, sir, it's the fact that the TV commercials show all the boats swishing around so effortlessly with plumes of water and spray I thought that . . ."

"You thought! That's a laugh. This accident was caused by your NOT thinking. Let me just touch on some of your more important mistakes. Only one life preserver aboard; you should have one for each person. It's a good thing the fisherman was close by and that we had you spotted as you took off from the pier. We were going to stop you for excessive speed. Which brings up another point. You were in an area clearly marked for fishing craft, with a 10 knot limit."

C. Z. shuffled his feet and started to speak but didn't. The Lieutenant continued. "Who in his right mind would carry gasoline in glass bottles, and next to the battery box to boot. We managed to take what's left of the hull in tow and have notified the owner. Even if you had placed a fire extinguisher aboard, it's doubtful you could have controlled a fire of that magnitude. We're sorry that most of your gear went down, but none of it seemed to float and none of it was tied down. I wish I could make you see the unfortunate ones we fish out of the water after pulling stupid stunts like yours. It just might make you understand that boating and water safety rules are for the single purpose of protecting lives and property. Almost all coastline and inland water areas have rules and regulations. Find out what they are and adhere to them, and you'll stay out of the hospital and trouble."

Chumley looked at his damp family wrapped in blankets and a cold chill came over him when he thought of how close he had come to losing everything. "I promise that from now on I'll find out how things work before trying them, sir. You'll see, from now on I'll put safety first on the water as well as on land and in the air. No more danger for old dad here. As of now I am going to stay out of trouble. Yes, sir, from now on . . ."

The Lieutenant interrupted C. Z. "I wouldn't bank on that, Captain Chumley."

"Why — what's the matter?"

"Well, if I'm not mistaken, I believe that red-faced, angry-looking individual coming over here is the owner of the boat you borrowed. Looks like you're sunk again." ★

LIGHTNING STRIKES A GLOBEMASTER

Lt Col Garn H. Harward, Directorate of Aerospace Safety

Usually lightning strikes cause minor damage to an aircraft but the experience of a C-124 crew during February 1963 could have resulted in a major catastrophe had it not been for the skill of the flight crew. The aircraft was cruising at 10,000 feet in light to moderate turbulence with no lightning observed. Areas of severe weather were circumnavigated either visually or through the use of the APS 42 radar. Yes, the crew had been briefed on the severe weather advisory.

While skirting through and around towering cumulus buildups, St. Elmo's Fire was observed. Suddenly the cockpit was filled with a blinding flash followed by a loud explosion. The flash of light was so intense that the flight engineer was temporarily blinded. The lightning passed through the aircraft, smashing overhead cockpit windows, burning out numerous lights and radio components, and interrupting power in three of the four engines. All engine instruments were erratic, with number 1 engine overspeeding and power interrupted on number 2 and number 3 engines. Also, an out of trim flight condition existed.

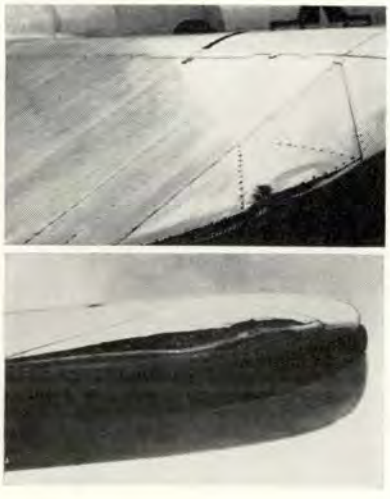
Immediately after the strike, the aircraft entered an area of intense precipitation. The pilot's overhead sliding sunshade partially deflected heavy rain and windblast from striking the pilot.

MAY DAY was a "must" at this point. Under current flight conditions, a rapid evaluation of the emergency situation was difficult. The pilot called for more power but the throttles were already full forward. Immediately, a rapid check of all systems — fuel and electrical — was made. After finding the magnetos dead on the analyzer, it was noted that the magneto pins had popped on numbers 1, 2 and 3 engines. By this time, 3500 feet had been lost. Number 1 pin was pushed in and the engine rpm increased to 3500. It was impossible for the engineer to retard the number 1 throttle as all four throttles were being held in the forward position by the pilots. The other pins were pushed in with an accompanying surge in RPM, but after a few seconds all engines appeared to be operating properly. The flight crew still was not sure of its flight status, therefore preparations were also made to jettison cargo.

The aircraft made a 180-degree turn to proceed to the nearest available landing area. Some moderate turbulence was encountered. The airspeed was reduced to 160 knots and flight continued to the new destination without further incident except for some communications difficulty.

The cause of the complete power loss on engines 1, 2 and 3, and partial power loss on number 4 was due to 10 of 16 magneto test pins being automatically actuated to the "OFF" position. It is believed that a massive electrical charge, picked up by the "P" leads and arcing to ground inside the switch case, generated the heat necessary to build up sufficient air pressure to actuate the test pins to the "OFF" position.

As a result of this incident, extensive tests were made by the parent organization to determine the amount of pressure required to actuate the magneto pins and the AMA has requested that switches be forwarded for evaluation. Although a duplication of this incident is remote, the above information may be of value to other crew personnel, should a similar condition be encountered. ★



Photos show damage to wing structure as result of lightning discharge. Cockpit overhead window was also smashed.

COMPUTE AND EVALUATE X 4

... FOUR TIMES

Maj Wilson V. Palmore, Hq Air Weather Service, Scott AFB, Ill.

BEFORE COMMITTING your machine to land, you should consider many factors, depending upon your mission and the weather. Among the latter are ceiling, visibility, turbulence, precipitation, navigational aids, and runway conditions. And if you continually evaluate surface wind forecasts and observations, you will be prepared to cope with a critical factor in landing.

Surface wind is used to compute approach and touchdown speeds, allowable crosswind component and landing roll. When should these computations be made? During preflight planning, inflight, arrival and letdown or on final approach? The correct answer is *all.*

Preflight. During the briefing the forecaster will give you forecast surface winds to include direction (*true*), speed and any gusts for the period/ETA. ± one hour. Using the forecast you should determine approach speeds and landing roll. In the event of strong winds you should decide if the conditions are within allowable speed and crosswind component for your aircraft. If the wind and runway conditions are no problem, you may not have to compute any further; but, keep an eye open for possible changes. If you have a critical situation or a rapidly changing one, the next steps must be taken.

Inflight. Keep in mind your original computations based upon the forecast conditions. En route, check over PFSV to update your landing forecast. (Be sure to give ETA [Z] when requesting a forecast.) Evaluate the forecast and make any necessary changes to your landing intentions.

Arrival and Letdown. When you first contact approach control or tower, the controller will give you the latest weather observation as received from the weather types. However, the surface wind portion of the observation will be supplied by the controller. The wind direction will be *magnetic* not *true* as furnished by forecasters or observers.

To digress, at USAF bases the winds reported from either tower or weather personnel are taken from the same wind-sensing equipment, usually located near the primary instrument runway. In some cases there will be dual wind equipment if there are two prime instrument-approach runways. In the weather station the wind indications, speed and direction, are displayed continuously on a graph recorder. From reviewing the recorder, weather personnel are able to give a good review of what the wind has been doing. The wind reported on the weather observation will be the average speed and direction during a one-minute period. If gusts are occurring, the strongest gust recorded during the preceding 15 minutes will be reported. Tower or approach controllers view the wind indications from an indicator. Controllers report the winds as seen on the indicator. They report any direction fluctuation or gusts which they have seen. Lesson over. Back to the problem at hand.

Again evaluate the information which you have received.

Final approach. Prior to reaching final, tower or GCA controllers will give another wind report (direction, magnetic). At this point there certainly is no time to go through elaborate landing computations. However, if you have made prior calculations, last minute adjustments can be made or you can *go around* if the wind pattern has become critical. Some bases have wind socks near the end of runways. You can consider them as another aid for evaluating wind direction.

A review of the facts:

- Forecasters provide surface wind forecast, direction true.
- Weather observations include surface wind reports — direction true, speed and direction averaged over a one-minute period, highest gusts reported prior 15 minutes.
- At USAF bases weather and tower winds are observed from the same sensing location.
- Controllers report surface wind direction (magnetic) and speed as viewed from an indicator.
- Surface winds are ever-changing, especially near fronts, around showers, and thunderstorms, and during hot afternoons.
- Do not rely on one specific report to commit your machine, especially during rapidly changing situations; continually evaluate all the information. ★

AERO BITS

BLOWN TIRES, BRAKES AND BARRIERS

During takeoff, just prior to nosewheel liftoff, the right main wheel tire failed. The F-101 pilot immediately executed abort procedures. The tire disintegrated, leaving the aircraft with a bare main landing wheel. The bare wheel severed the BAK-6 arresting cable. However, the tail hook successfully engaged the MA-1 barrier cable which stopped the aircraft on the overrun. Minor damage was sustained when the nose landing gear collapsed because of soft ground.

The primary cause was tire failure from an undetermined reason. Contributing cause was cutting of the BAK-6 barrier cable by the skidding right wheel. Several months prior to this accident, an F-106 with blown tires was destroyed when the wheels severed the arresting cable, preventing a successful engagement.

Don't forget: release the brakes prior to barrier engagement. This procedure for barrier engagement is outlined in Section III of the F-101 Flight Manual. Barrier tests at Edwards AFB indicated that the chances of a rolling wheel cutting the arresting cable are far less than a non-rotating wheel skidding over the cable. This is further substantiated by 15 barrier engagements with blown tires. In only two cases were the cables severed; in both cases the wheels were locked.

ASD will attempt to improve barrier performance in this area by conducting a study of cable cutting by aircraft with blown tires. Results of this study will be made available to all using commands. In the meantime, Get Off The Brakes Prior To Barrier Engagement!

Maj James O. Modisette, Directorate of Aerospace Safety

DISENGAGED CONTROL COLUMN

Recently, a B-52 crew came perilously close to a major accident during takeoff when the pilot applied nose down force on the control wheel after gear retraction, but the control wheel disengaged and the big bird continued to climb. The copilot was instructed to take control of the aircraft until the flaps could be retracted and a safe altitude reached. The pilot's control wheel was then stowed and re-engaged followed by a positive push-pull check by both pilots to insure the elevator function of the control column was positively engaged.

In reviewing the conditions that led to the incident, the flight crew stated that the preflight was normal and no one else had entered the cockpit during the few minutes they had been out of it, and neither pilot had disconnected the control column after the AAER control check.

The aircraft had been modified under TO 1B-52-1478 in which counter-balances had been installed on the lower portion of the control column. With this modification the control wheel does not slam forward into the instrument panel recess when the disconnect lever is rotated. The wheel must be moved forward since the counter-balances under the floor will tend to keep the wheel in a near neutral position.

This problem of partial engagement should have presented itself during the AAER check but didn't. Some of us still like the pilot/copilot push-pull system of insuring positive engagement of the elevators. SAC Operating Procedure 63-21, 20 May 1963, reinstates an old procedure used to insure positive engagement of control columns before takeoff.

Lt Col David J. Schmidt, Bomber Section, Directorate of Aerospace Safety

Shaded area on map, which includes portions of areas covered by several air route traffic control centers, was placed under area positive control as of 22 August and will be known as the Los Angeles Positive Control Area.

OPTICAL MASERS (LASERS) AND VISUAL IMPAIRMENT

Inexpensive optical masers have recently become readily available to experimenters and researchers. In fact, laser crystals are even advertised in newsstand electronics magazines with the caption "Now . . . Make Your Own Laser." The widespread interest in this new field demands that more publicity be given to these extremely hazardous devices. Air Force Medical Service personnel should caution hobbyists and emphasize instruction, inspection, and continued surveillance where these devices are in use in research and operational facilities.

Within the band width of light emitted from the

commonly used ruby crystal maser, the sun's energy is about 1/20 watt per square centimeter, as compared to much greater levels (kilowatts per square centimeter) for ruby masers. The narrow beam of extremely intense light is capable of producing severe burns as well as permanent visual disability. Although the collimated, coherent beam is precisely directional, its intensity is so great that reflections or off-axis viewing can also produce severe eye damage.

The precautions listed below are of paramount importance.

- The laser must be shielded or enclosed to preclude any possibility of incident direct or reflected light striking the eye.
- Laser operations should be performed in well-lighted rooms, protected from entrance by uninformed or unauthorized personnel, or, if out of doors, in such a manner that the light beam cannot be directly observed at any time.
- Persistent after images of an intense light source should be reported to a physician at once.

Reprinted from USAF Medical Service Digest, June 1963

GDL CHECK FROM TOWER—

I read an article in a newspaper some years ago which I thought put a good Samaritan on the legal rack. Seems this fellow was witness to an accident that caused severe injury to a party. In keeping with civil and moral law, the Samaritan stopped and lent all possible aid. The injured party improved and subsequently sued the Samaritan, charging aid rendered did not help but caused additional injury.

This article was catalogued and given an infinitesimal niche in the remotest recesses of my repository. Today my memory tape was turned on by a bundle of correspondence about control tower operator responsibility. Seems Air Traffic Service, because of peculiar geographical conditions, made dispensation to tower personnel at an airfield located on an atoll. An agreement let the tower operators give landing aircraft the verbal gear-down-and-locked check. Now ATS says this deviates from authorized phraseology and places a part of the pilot's responsibility with traffic control operators.

What ATS says is true, but unfortunately because some hard headed cretins try to make it so. The good Samaritan in the tower renders a very busy pilot a most comforting aid, and, too frequently, a quite timely one. But after a habit is established, and for some reason once omitted, and an airplane lands on its belly, there ensues a hue and cry: "TO THE CROSS."

Responsibility assessed to its rightful owner isn't too difficult in most cases. Why can't we pull together without accusation when something goes awry? All you tower people: I'd appreciate a gear down reminder and I'll never blame you to any degree if I ever land with my wheels up. I'll sign an agreement saying this.

Lt Col K. I. Bass
Directorate of
Aerospace Safety

T-33 CANOPY—

Recently an F-104 pilot ejected, following a flameout on the landing approach. The ejection was initiated at 600 feet above the ground with the aircraft in a descending attitude. The low level escape system functioned normally and the ejection was successful.

The aircraft exploded on ground impact and debris struck a T-33 parked for runup on the taxiway. When it became apparent to the occupants of the T-Bird that their aircraft was in the path of the F-104 wreckage, the pilot unlocked the canopy and started to raise it electrically. The canopy had opened approximately three inches when the T-33 nose section was struck by the engine of the F-104, tearing off the nose and battery compartment. Other debris struck the vertical stabilizer, the tailpipe and ruptured both tiptanks. The entire area was immediately engulfed in flames.

After loss of electrical power, the pilot in the front cockpit attempted unsuccessfully to open the canopy manually. When this failed he unstrapped, stood up in the seat and tried to push the canopy off with his back, but the canopy would not budge. He then bent his knees down to a squat and straightened them out quickly, hitting the canopy with the lower portion of his back. The canopy was shattered by this action and the pilot exited through the hole. The pilot in the rear cockpit decided to use the canopy knife to make a hole in the rear portion of the canopy. He experienced considerable difficulty in removing the knife from its mounting, but after approximately one minute he was able to remove the knife and with one upward blow, broke a hole in the canopy, through which he exited the aircraft. The immediate arrival of fire fighting vehicles on the scene was a factor in the successful egress of the crewmakers, otherwise the delays encountered in exiting the aircraft could have resulted in severe or fatal burns.

This accident illustrates several interesting points:

First, the effectiveness of improved low level escape capability in the F-104 was again demonstrated.

Second, this is the first reported escape effected by use of the canopy breaking knife.

Third, and most important, is that the occupants of the T-33 lost valuable time in leaving the aircraft because of unfamiliarity with emergency procedures. Neither pilot was aware of the possibility of ejecting the canopy when it is partially open. Page 22, Section III, T.O. 1T-33-1, clearly states that the canopy can be jettisoned from any position from closed and locked to fully open by pulling the T-handle or raising the right armrest in either cockpit. ★

UP THE CORRIDOR

Capt Robert W. MacDonald,
USAF Interceptor Weapons School, Tyndall AFB, Fla.

"There I was—thirty thousand feet, on my back, in the soup, airspeed zero . . ."

You often hear a fighter pilot jokingly preface a tale with that statement. There is, however, a situation that could very easily lead to such a predicament—or worse. The situation is a max power climb on instruments that get out of hand.

The problem is a very real one, particularly to Air Defense Command crews flying the F-101 and the F-106. A sleepy-eyed pilot who is scrambled in the middle of a dark night, weather from 100 feet to 40,000 feet, with instructions to make a "gate climb," really has his work cut out for him. For the next two or three minutes he is going to be in an unusual position and it's up to him to see that it doesn't become an uncontrollable position.

To understand what he is up against, let's analyze the conditions of a max power climb in the F-101 and F-106.

A max power climb will result in a pretty healthy climb angle becoming even steeper in colder weather. The airspeed schedule and resulting climb angles are the optimum for reaching combat altitude in the minimum time.

On a 50°F day, the F-106 will have a climb angle of 28 degrees at 10,000 feet. The F-101 would be close to that figure.

During the initial phase of the climb a gradual reduction in pitch angle is necessary to maintain the desired indicated airspeed. Transition to the second phase of the climb begins when the desired climb mach is reached. At this point, a definite increase in pitch angle is called for.

What about airspeed? In order to correct an airspeed error, a pitch change is necessary. The problem comes in determining how much of a pitch change. When airspeed is too high, the tendency is to make a large pitch correction for a large airspeed error. This often results in an excessive pitch angle accompanied by a rapidly decreasing airspeed necessitating a pitch down correction. Now the tendency is to use too little pitch change since the result is an uncomfortable negative G condition. This reluctance to push forward on the stick when necessary causes our airspeed problem to become critical. In a max thrust climb, the only way to correct a low airspeed condition is by lowering the nose. The sooner this condition is detected, the easier it is to make the correction.

Getting back to our pilot and the problem he faces, it is safe to say that if this is his first gate climb on instruments, he is really going to have his hands full. In addition to the steep pitch angles and airspeed problems, which will probably occupy 100 per cent of his attention, he will also be required to attend to such items as check-in and identification procedures, occasional turns and, of course, spatial disorientation. On the other hand, if he has practiced the gate climb previously in VFR conditions, he should have a pretty good idea of what to expect. He will know, for example, that rapid cross check of his instruments is a must. He will know that his attitude gyro is his primary pitch instrument and that any airspeed change must be initiated with precise pitch change on the attitude gyro. He will be aware of the fact that a low airspeed condition might require a pretty healthy push forward on the stick to keep things from getting out of hand. He will be prepared to make a smooth change in pitch when he reaches his climb mach. He will anticipate level off altitude and will make a smooth transition to level flight.

Commanders can help to minimize the problems associated with a gate climb by insuring that each pilot regularly practices this type climb in VFR weather—preferably under the hood.

Once the pilot knows what to expect throughout the phases of the max performance climb, his task becomes more routine than hazardous. ★

WELL DONE

Capt. Paul G. Krey

452 Troop Carrier Wing, March AFB, Calif.

Captain Paul G. Krey, Instructor Pilot, was on a transition mission in a C-119 with Captain Robert G. Becker, Major Morris M. Jaffey, a flight engineer and two aerial photographers aboard. Captain Becker had completed his transition mission, and a Phase II low level, simulated heavy equipment training mission was being conducted with Major Jaffey in the left seat and Captain Krey in the copilot's seat.

While approaching Holtville, Calif., at approximately 1000 feet, and slowing to 130 knots, Major Jaffey noted that the left propeller was becoming erratic. After an unsuccessful attempt to feather the prop, he advanced the control to high pitch and slammed it back to feather — still no success. He tried to get some thrust from the left engine by controlling the amount of throttle applied, but the RPM began rising rapidly and throttle was again retarded.

During the time required to accomplish Dash-One emergency procedures, the aircraft altitude had dropped to 500 feet and the airspeed to 110 knots. Captain Krey decided to land the C-119 in the first available emergency field. Desert temperature at the time was 112° F, further aggravating the performance problem. On the approach for the emergency landing, Captain Krey saw the red knobs of high tension lines running parallel to the main highway and perpendicular to his approach course. By quickly lowering flaps to takeoff position he was able to "jump" these wires. Furthermore, he was able to clear the normal power line at the field boundary with the nose gear and one main gear; the tire on the right main gear, however, made contact with the power line.

An excellent emergency landing was made in a 2400-foot alfalfa field without damage to the aircraft or injury to the crew or passengers.

Investigation revealed that the left propeller system had lost four quarts of fluid. The quantity of oil found in the blade socket indicated failure of seals on the Nr 4 blade torque cylinder.

Three days later Captain Krey and another pilot made a maximum performance takeoff and returned the aircraft to base ready for its next mission.

Captain Krey's extensive knowledge of the C-119 and its flight characteristics, enabled him to avert possible loss of equipment, lives, and major property damage. His decisive actions demonstrated professionalism and superior judgment. WELL DONE, Captain Paul G. Krey! ★

FOD

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only YOU can control it!

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