AEROSPACE

SAFETY

UNITED STATES AIR FORCE

SEPTEMBER 1964

READ
Out In The Breeze
page two

500,000 ACCIDENT-FREE HOURS

AEROSPACE SAFETY

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AFRP 62-1 SEPTEMBER 1964 NUMBER 9

FALLOUT

SEEING TWO AS ONE

While reading the article "Eyes Outside" (May issue), the statement "Quick and accurate reporting is absolutely essential if the FAA and the military are going to keep abreast of hazardous or potentially hazardous airspace areas," stuck in my mind. It reminded me of two incidents that occurred at Brookley in 1958. I was a flight engineer on a C-47 out of Craig, standing in my usual place at the controls of the flaps and landing gear.

In the first incident, GCA was directing us out over the bay in heavy cloud cover, when suddenly we broke into clear sky. Directly in our path was a slower moving Gooney with one of the biggest tail sections I ever saw. The pilot nosed her over, I dropped the gear and we went under the unsuspecting crew of the other C-47. GCA's explanation was "We saw both of you as one aircraft."

The next one occurred around 1500 in a perfectly clear sky. We were banking to left from the east to come in over the hangar. Enjoying the clear view I spotted a T-29 (hospital ship) banking to his right from the west. I notified my pilot of the collision course with the T-29 and we continued our turn out of the pattern. To the best of my knowledge, neither incident was reported.

You'll probably say "but this happened six years ago." To me I now feel I've told someone who might be interested.

SSgt Armon B. Allen
Rantoul, Ill.

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500,000 ACCIDENT-FREE HOURS

A safety milestone was recorded on 21 July when the 1502 Air Transport Wing, MATS, completed 500,000 hours of flying without an accident. Flying C-124s and C-118s, the present and previous members of the 1502d have realized an unprecedented achievement in the history of aviation safety. Most significant is the fact that, for over eight years, they delivered thousands of personnel and tons of vital cargo throughout the free world without a single loss of life or aircraft.

This record attests to what can be accomplished by professional airmen, even when faced with such hazards as:

- Long range, over water missions with limited weather information and few emergency landing fields.
- Operational extremes that have included transitioning of aircraft and crews from 78-degree temperatures to minus 19 in a 30-hour period.

- Loss of two engines in flight.
- Runaway propellers at heavy gross weights and hundreds of miles from an emergency field.
- Continuous training and upgrading due to rotation of approximately one-third of the personnel each year.
- Congestion in the Honolulu area where operations in 1963 totaled 255,855 to rank 10th among all FAA operated terminals.
- Mission requirements ranging from daily passenger and cargo lift between the Pacific Coast and the Far East to night formation flying in heavy transport aircraft during tactical exercises.
- Operation on unfamiliar route structures on all continents except Antarctica and into strange fields throughout the world.
- Rapid reaction, irregular hours and long missions to provide airlift support in response to threats to peace throughout the free world.

The record of the 1502 Air Transport Wing stands as the strongest possible argument that complacency can be conquered, that standardization and training do pay off, that accidents can be prevented by professional airmen backed up by safety conscious supervisors and by dedicated support personnel. The half-million consecutive accident free hours flown by the 1502d is one of the singular achievements of military aviation and warrants the admiration of everyone in the United States Air Force. ☆

The back seat of the T-Bird is a drafty place, when the canopy goes. This article will give you an idea of what to expect should you find yourself . . .

Pilots who have been in the back seat of the T-33 when the canopy let go in flight are quick to tell you that the experience is not only disconcerting but downright uncomfortable.

Sensations described include tremendous noise, precluding voice communication at speeds above 200 knots; violent buffeting of the body, with a resultant difficulty in manipulating the arms; flying debris in the cockpit, chill, and visual difficulties especially with the visor up. There is also a tendency toward disorientation.

Front seat pilots would have their problems too, as will be noted later.

Fortunately there have been very few canopies lost from T-Birds, but it can happen and has happened. A recent occurrence resulted in a fatal accident. The pilots, instructor in the rear and student in the front seat, were on a cross-country at night. The airspeed indicator had been acting erratically so the IP called for a chase aircraft at destination to lead him in for a landing.

Carefully then the IP prepared the student up front for the coming landing. He explained the situation and, because of light rain and a wet runway, informed the front seat occupant that the landing would be a little hotter than normal but that with 10,000 feet of runway there would be no problem. To be on the safe side, he told the student that, if it appeared necessary, he would request him to raise the canopy once they were on the ground to take advantage of the braking effect.

Moments later the canopy departed, in the words of the instructor, like an explosion.

The IP's first sensation was that there had been an explosion of some kind and that he was in his seat outside the aircraft. His helmet was pulled up against his chinstrap and his oxygen mask was over his right cheek. He repositioned his mask and helmet, then attempted to lower his seat. This took two try's.

By now he knew he was still in the aircraft and that it was not out of control. His next move was to bend over to the right of the stick to get out of the windblast. Airspeed was somewhere around 270 KIAS.

Symptoms reported were lack of ability to hear because of the windblast, visual difficulties, inability to keep his hand on the throttle because of the wind and inability to get his helmet visor down.

Finally, with the situation getting more desperate and with his inability to see or communicate with the front cockpit, the pilot ejected.

As a result of this accident a test flight was made by Lt Colonel Harry R. Bratt, chief of bioastronautics at the Air Force Flight Test Center at Edwards, and Major Donald M. Sorlie, chief of the manned spacecraft operations division. Both men are Command pilots. Major Sorlie occupied the front cockpit, with Lt Colonel Bratt in the rear. Both men were dressed in thermal underwear, heavy winter flight suits, leather gloves with woolen liners.

Takeoff was accomplished by Major Sorlie with Lt Colonel Bratt taking over at approximately 170 KIAS and 400 feet altitude. Lt Colonel Bratt's comments were:

"Takeoff was accomplished with the helmet visor lowered. I had intended to raise the visor after takeoff, but after experiencing the windblast effects associated with the takeoff and acceleration to 200 KIAS, I abandoned this idea as impractical; that is, the windblast effects were so strong that I was convinced that the visor had to be in the lowered position to permit vision. Even with the visor lowered, the buffeting about the cheeks and eyes was very strong. Below 200 knots, audio reception by radio or intercom was poor, but understandable. At speeds in excess of 200 knots, the radio and intercom became unreadable because of the external noise.

"Beginning at approximately 200 knots, high-frequency head buffeting produced the visual impression of 'dancing' of the instrument numerals and indicating needles. This phenomenon increased in severity with increasing airspeed. At no time was I unable to correctly read the instruments or scan the panel. At no time did the apparent movement of the instruments attain an amplitude or frequency such that blurring of vision occurred, although double-images were constantly present when observing cockpit instruments and controls at speeds in excess of 200 knots. Distant vision was not affected.

"Extreme cold began to be noticed between 10,000 and 20,000 feet MSL (outside air temperature —11°F). My fingers, cheeks, and nose became very painful and the tips of my fingers became numb after about two minutes above 10,000 feet MSL. My hands became stiff and clumsy. I was able to manipulate the card of the J-8 compass, but with difficulty. I would estimate that it took two to three times as long as usual to rotate the card from the outbound to the inbound heading. The same comments apply to manipulation of the UHF and VOR tuning controls. Feet, body, and upper arms were uncomfortably cold, but tolerably so. The numbness of my finger tips convinced me that the threshold of tolerance had been exceeded and that continued exposure could result in frostbite.

"The level flight acceleration at 5000 feet MSL was terminated at 270 knots. Buffeting, although severe, was tolerable, and I felt that I could tolerate an additional 20 knots, without difficulty. At 270 knots, however, I was unable to hold my back forcibly against the seat

OUT IN THE BREEZE

back-rest because of the forward pressure of the air circulation. This was in spite of having the shoulder harness tightened more than I customarily use in routine flying. Since bending forward in the cockpit exposed the back of the parachute to the slip stream, I became greatly concerned about the possibility of windblast deploying the parachute and terminated the acceleration at 270 knots and did not voluntarily exceed 220 knots."

Major Sorlie commented: "The helmet visor was placed in the down position during the entire flight. Although both cockpits were cleared of extraneous material prior to flight, considerable cockpit residue was encountered on takeoff. Some of this residue lodged in my eyes. No windblast effects were noted, due to the protection of the forward wind screen. Some venturi effect was encountered from between the pilot's legs, flowing upward between the pilot and instrument panel. The intensity of this venturi effect increased with increasing speed, but was tolerable with the visor down. Hands were held to the opening between the helmet visor and mask to prevent the irritating effect of wind entering behind the visor. No numbing effects were noted due to cold, as experienced by the rear cockpit pilot. While in the traffic pattern, the rear cockpit pilot had difficulty actuating the landing gear lever, and the gear was actuated from the front cockpit. The approach and landing were uneventful. The rear pilot had a tendency to level off slightly high but touchdown was smooth. The VOR—ILS-ADF was inoperative due to canopy removal."

As a result of this flight Lt Colonel Bratt's conclusions were as follows.

1. The direct windblast effects on the rear seat occupant preclude useful vision, unless the helmet visor is lowered. At night, the combination of reduced light transmission through the lowered visor and the effects of buffeting in degrading visual acuity could readily lead to spatial disorientation.

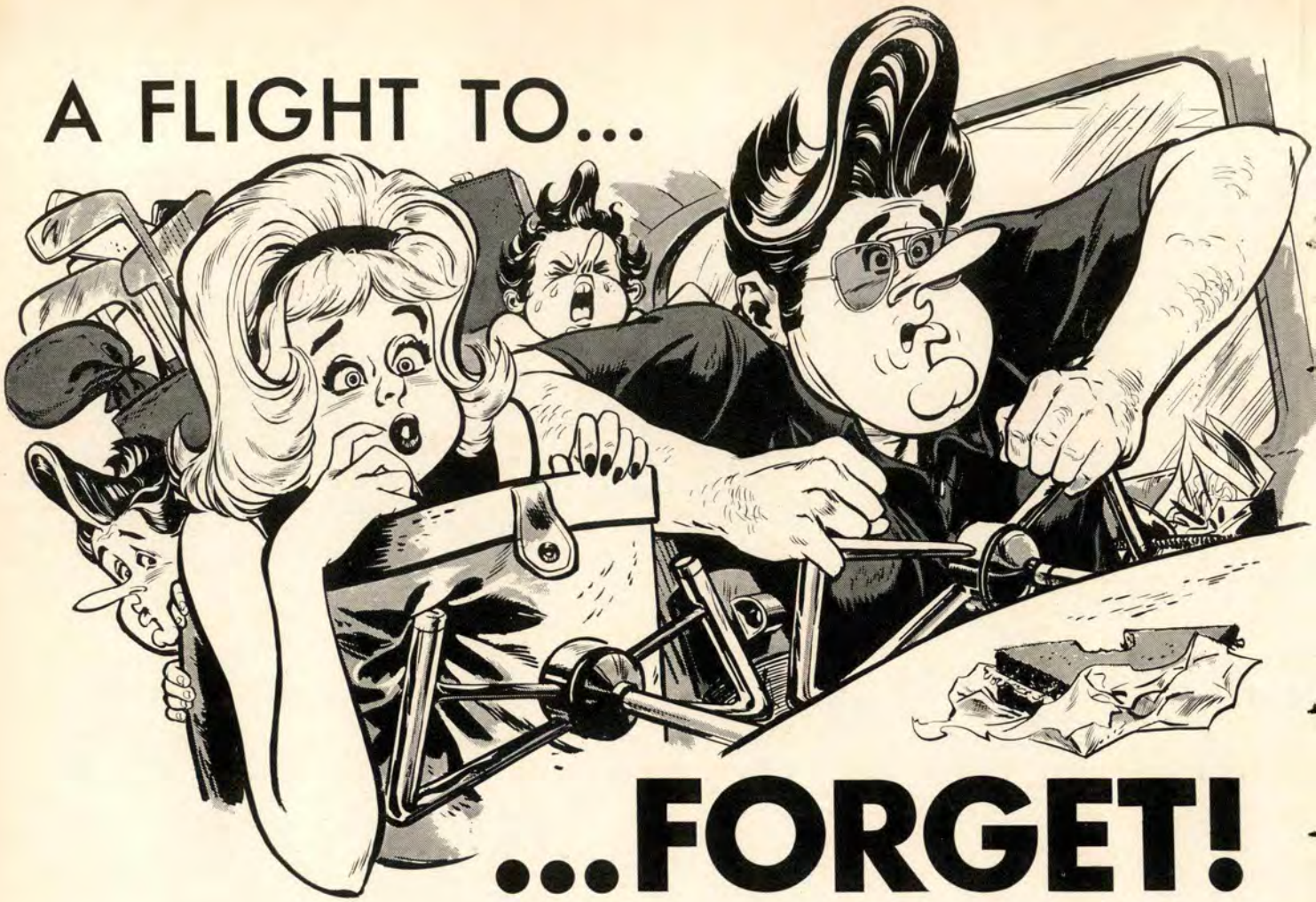
2. Audio reception at the lowest possible airspeeds (130-140 knots) for good control is marginal and is impossible at airspeeds in excess of 200 knots.

3. As pilots customarily dress for flying the T-33, the effects of cold would be intolerable with air temperatures at or below freezing.

4. Landing the T-33 at night from the rear cockpit with the canopy off would be equivalent to an extremely low visibility instrument weather approach in which only the runway lights were visible. The pilot would require glide slope and azimuth information, either by ILS or GCA, on the final approach.

In addition Major Sorlie was of the opinion that: "Landing of the aircraft would have been marginal with the visor up during night or instrument conditions, if cockpit debris entered the eyes and excessive draft were present causing eye irritation and subsequent restriction of vision." ☆

A FLIGHT TO...



...FORGET!

"Honey, would you please put down that magazine and pay some attention to me?"

Silence.

An exasperated Mrs. C. Z. Chumley was beginning to reach the end of her rope. The day was hot, the children had been perfect demons, and her husband had breezed through the house like a cyclone hunting for a straw hat factory. He had slowed only long enough to grab a cold beer from the refrigerator, peck her dutifully but absently, and get reading material on his way to the hammock in the only shade in the back yard. Now, with something important on her mind, she couldn't get his long nose out of that book.

The mail had brought a letter from her parents in England. Again, longings to visit the land of her birth had been aroused. Several times plans had been made for her to make the long journey, but one thing after another—children, transfers, and once a new engine for her spouse's Jaguar—had prevented her going. Now her mother was making a special plea and Mrs. C. was determined to try her very best. Besides she was anxious to show off her progeny.

"Chauncey!" This time the tone of voice was ominous. The reclining figure in the hammock sat up and paid attention.

"Were you calling, dear?"

"Yes." Mrs Chumley pulled up a lawn chair and, using a most soothing tone, got into the task of selling the idea of a trip to the old country. C. Z. began to accept the idea that his wife was serious about the trip. Ideas began to generate.

"Tell you what, if we could get space available from McGuire we might be able to make it. Otherwise it's out because we simply can't afford it." He shook his head, thought about it a while, then had another idea.

"I've got it. I could join the base aero club. We could fly to McGuire, leave the airplane and fly it home when we get back to the States."

Four days later the Chumley family with two weeks' leave, a world of optimism and ironclad determination were airborne in a four-place light plane which the male spouse referred to only as a "bug smasher." The fact that he had broken Air Force regulations as well as base and aero club directives and SOPs mattered not a whit to Captain C. Z. Chumley. After all, he was finally at 5500 feet, eastbound.

Prior to takeoff on this Sunday morning the scene had been rather hectic. The Chumley family arrived at the aero club hangar with clothing, gifts, toys, a picnic basket, golf clubs (for St. Andrews, no less; after all why not play the best?), forty pounds of camera equipment

and Mrs. Chumley's hat box. To say that the aircraft was over grossed would be a monumental understatement. As far as the weight was concerned, there was no problem. Chumley simply ignored that. There was a volume problem, however, that was only solved by the man of the family placing kids in the back seat, wife in the front, then stuffing the remaining items in around them. The hat box, of course, went on the "copilot's" lap.

Preflight amounted to undoing the tie-down ropes. The flight plan, which was on the brief FAA form, was filed with times rather vague, and the weather briefing was even more hurried than usual.

Fortunately, the base had 10,000 feet of runway, the sun had not yet heated the air above 80°F, and the elevation was only 670 feet. As it was, the little airplane barely managed to get off in 9850 feet, its 145 hp engine working furiously.

There was a brief moment of anxiety when Chumley could not get the aircraft to rotate—the stick seemed to be binding. Then the light dawned.

"Get that hat box out of the way—quick!" Mrs. Chumley reacted instantaneously and lifted the hat box, which permitted her husband to get the stick back.

Now at cruise altitude, the engine purring smoothly and the prospect of a glorious two week trip ahead of them, the Chumleys faced new problems.

"Daddy, I gotta go to the bafroom."

"And I'm thirsty."

Chumley knew from experience that he couldn't win, so he got out a map and found an airport five miles ahead. The landing reminded one onlooker of the Midway gooney birds setting down. The onlooker was even more astonished when the airplane disgorged the Chumley family and what was apparently four tons of various and sundry goods which had to be removed to get everyone out.

Chores completed, the reloading process repeated, Chumley taxied to the end of the 1500 foot strip. My, it looked short. Holding on the brakes and pushing the throttle to the firewall, C. Z. prepared to takeoff. Fortunately there was a dirt road alongside the strip. A zig at the end, then a zag onto the road gave them an unlimited runway that finally permitted the still overloaded plane to stagger into the air. Once again they were on their way.

Two hours later Mrs. Chumley pointed to a small instrument and asked her husband if it was important that what appeared to be a gas gage said empty.

"Empty, it couldn't be. We've only been flying for two hours." It was then that Chumley began to wonder about the weight they were carrying. Quick mental calculations convinced him that it really was a miracle that they were flying. No wonder those takeoffs had been so long. Perhaps the engine wasn't sluggish after all.

Back to the maps. Now, where were they? Paddlefoot Omni was behind them but how far behind them? Ah, there was an airport on the map, but was it ahead of them or behind them? Years of relying on the clocks had rid him of the habit of relying on visual check points. Now his training in pilotage began to come back. Finally, he picked out some hills that appeared to match those indicated on the map, and off in the distance there appeared to be a lake that squared with another map indication. Meanwhile he was frantically cranking the omni in an effort to get a radio fix.

Throttling back, he began a shallow descent. Time dragged. Mrs. Chumley didn't trust airplanes anyway and now she was convinced that next time they would take the train.

Finally, in the distance, the airport he had located on the map came into sight. Would they make it? A forced landing with this load, and his loved ones, could be disastrous. Chumley's hand was never lighter on the controls. He had on just enough power to keep the bird flying. They were getting closer. Then—sputter, cough, roar, sputter. They were on the fumes, all right. Then, that was all. The starved engine gave up.

"Cutting it pretty thin, weren't you?" observed the man with the pickup as he tied a rope around the nose gear to tow the airplane off the runway.

Chumley, for once, was speechless. That fence at the end of the runway had looked 20 feet tall. How the gear cleared it he would never know. But it had and the aircraft had settled in on the dirt and rolled onto the concrete for about 40 feet where it slowly shuddered to a stop.

The next 800 miles consisted of a series of two-hour flights punctuated by one-hour stops while the airplane was fueled, the family removed from the cabin, fueled and defueled, and replaced among the items of cargo. It was a hot, tiring, irritating trip. At nightfall McGuire was still some 200 miles ahead so the Chumleys called it a day. C. Z. was for continuing but his wife quickly vetoed that suggestion.

"We've had enough trouble in this sardine can in broad daylight," she said.

During the night a front had moved in from the gulf and thunderstorms were numerous along their planned route. The Chumleys continued, but on a winding, devious course among the thunderbumpers. There were times when they detoured as much as 25 miles. Once Chumley had tried to poke his way through a dark looking mess lying across their path. But the airplane didn't fly too well upside down, the kids cried, Mrs. C. complained about hanging on her belt and all the contents of the cabin—minus the strapped in passengers—came tumbling down, or up, depending on how you look at it, into their faces.

Then there had been that long period of terrifying silence when the

A Flight To Forget

continued

engine quit. It had been so long since Chumley had flown recips that he forgot some airplanes have carburetors. Fortunately, with carburetor heat and the lower altitude to which they descended away from the storm, the ice melted out and the engine coughed reluctantly to life.

As they traveled along one of the children, obviously mystified, asked, "Daddy, are we getting any place?"

"Whatta ya mean, getting anyplace? Sure we are," Chumley replied, slightly annoyed with what he construed as possible criticism of his conduct of the flight.

"Well, I wondered because you've been talking to the same man on the radio ever since we left home."

Puzzled, Chumley inquired as to what the child was talking about.

"That man, Uh Roger. You talked to him lots of times yesterday and again today."

Chumley started to explain, decided against it and advised the child that that was just the way things were and not to worry about it.

Finally they were over McGuire, at least the omni said so. Chumley couldn't see the ground because of the undercast.

"McGuire Tower, niner six two one Alpha, over the field at five thousand, landing instructions. And make it fast will you, friend, I'm a little low on petrol."

"Two one Alpha, are you Air Force and are you on an IFR flight plan?"

"McGuire, Two one Alpha. I'm Air Force aero club and negative on the flight plan."

"Two one Alpha, McGuire. Everything in the area is near minimums and we have no arrival for you. What is your destination?"

"McGuire, one Alpha. I—uh—am not on a flight plan. Destination is McGuire, please give landing instructions. And make it fast, this bug smasher is on the fumes now."

Airman Billingsley turned to his boss. "Sarge, there's some nut up there not on a flight plan says he wants to land here. Says he's an aero club type and he's about out of fuel."

"Ask him if the aircraft is instrument equipped, has he got an approach plate and is he instrument rated."

When asked these questions by the controller, Chumley replied quickly, "Affirm, negative, affirm, and please, let's get on with it. Ol' Alpha here is about to cough her last."

"One Alpha, are you declaring an emergency?"

"Uh, negative, just hurry up will ya?"

In the tower there was a hurried consultation; then, "One Alpha, switch to 134.1 for GCA. They'll get you down."

"McGuire, One Alpha, negative on the 134.1. I don't have that freq."

"Roger, One Alpha, go to 127.5."

"Listen, tower, I don't have all those freqs, this is a light plane."

"One Alpha, switch to emergency, 121.5. You must have THAT."

"Uh, Rog, tower. Radar, have you got me?"

"Two one Alpha, this is GCA, make a right turn to 190 degrees and descend to three thousand."

"GCA, one Alpha, turning right 190 and please hurry."

Moments later Chumley was instructed to turn right again to 270 and continue descent to 1500 feet. Finally, after another couple of turns, the welcome voice advised Chumley that he was now on final approach, five miles out and slightly high. At 200 feet and almost over the threshold Chumley had the runway in sight. There was another agonizing moment when the engine quit, followed by an embarrassed period during which a tug had to be dispatched to tow the aircraft off the runway.

What followed was not pleasant. Fortunately Mrs. Chumley and the children were spared from the scene in the operations officer's office.

The following seven days were glorious indeed. Luck was with them and within 24 hours of their arrival at McGuire the Chumleys were bound for England. There Mrs. Chumley's parents made much of the children, gifts were exchanged and all had a wonderful time. The only damp spot was the day Chumley motored to St. Andrews where rain fell by the bucketfuls all day long. Nevertheless, he would be able to brag at home that HE had played St. Andrews.

On their arrival back at McGuire, Mrs. Chumley demanded that her spouse obtain several large boxes and ship their huge load of paraphernalia home by express. Thus lightened, their trip in the "bug smasher" was less eventful than the eastbound flight had been. In fact, they made it home in one day.

Now, Captain, I have here eight pages of charges listing violations by the dozen of base and aero club directives, Air Force regulations and Federal Aviation regulations," said the base commander. "The FAA would be very interested—and grateful, I might add—if you would explain *in writing.*"

"But, sir, I was just flying that little ol' bug smasher. Now if I had been flying an Air Force plane, naturally I. . . ."

He was cut short. "Chumley, I want you to explain to me and to the FAA *in writing.* I know there's no real explanation, but I'm sure we'd all be entertained, if not amused, by what you have to say for yourself. But before you leave, I'd like to make a few things clear.

"No matter what kind of equipment you are flying there are rules to be observed. That 'bug smasher' as you call it can kill you just as dead as a Mach 2 jet. In fact, I wouldn't be caught in one of the things myself. Not only did you violate every rule in the book but you endangered your family as well as yourself. You also jeopardized an airplane in which the club has more than eight thousand dollars invested. You fouled up traffic so bad at McGuire that it took them two hours to get things back to normal. What if there had been an Air Force transport full of people that had to land because of an emergency?

"Now get this straight. As far as the aero club is concerned, you're through. As a matter of fact, if anything like this happens again I might shut down the club for good just to protect people like you from yourselves. Now get out of here and get writing. And Chumley . . ."

"Yessir."

"Quit bragging about playing St. Andrews. I tried that miserable place once and got rained out three days running." ☆

YOU AND "REX RILEY"

Lt Col Ben L. Holliday
815 Combat Support Group
Forbes Air Force Base, Ks

HAVE YOU EVER THOUGHT — as you near your destination—of advising of any code aboard and of your servicing or billeting requirements? It just might be that no one even knew you were coming, much less that you need transportation and quarters for 21 people! Inbound, get a clearance to the common Pilot to Dispatcher frequency 372.2, as shown in the Enroute Supplement. Not all bases have this, but the list is growing.

For several years now I have been kicking around in the Air Force in administrative aircraft, landing at bases assigned to every Air Force command. For the past few years, I have been a SAC Base Operations Officer. In both capacities, especially the latter, I have become intimately familiar with the famous "Rex Riley" Award for outstanding transient services.

As of this writing, my home base is the proud possessor of this unique award. I say, "as of this writing," because this special recognition is not easily earned nor easily retained. Each base is continually reviewed by "Rex" and he has no qualms about taking away the award if a base does not continually measure up to the high standards required to merit his special recognition.

My purpose in writing this article is to point out certain things a pilot can do to assist a base in its service to him. In assisting the base, he automatically assists himself. For example, Section II of the FLIP lists a DV and servicing code for a pilot to use in completing his Form 175. This information, if passed by the operations dispatcher and the FAA Flight Service people, tells the destination base of any rank aboard, servicing and transportation requirements, passenger and cargo data, ad infinitum. The problem is, many pilots do not take advantage of this flight management tool. All too often, nothing is entered in the "Remarks" section of the clearance, yet valid servicing requirements exist for the destination base.

Then we have the situation where, because of unforecast headwinds or severe weather, a pilot will divert to a more suitable field. Upon his arrival, with 30 passengers needing billets, or with a Code 6 aboard, only the operations driver meets him because the mechanics of the system didn't work to advise the diversion base of his requirements.

Unfortunately, and much to our chagrin, we Base Operations people are not clairvoyant. If we were, about 98 per cent of these problems would not occur.

When you walk into the flight planning room to plan your delivery of 10 people and 2000 pounds to Podunk Air Force Base, check the FLIP for code entry appropriate for your mission. If you are discharging 10 of your passengers and 1000 pounds of your cargo at Podunk, then enter the appropriate code in the "Remarks" section of the Form 175. If you can take on five passengers at Podunk to your next destination, indicate this also.

You have now done one important part of your job as the pilot for that mission. Or have you? Can you be positively sure that your destination base will receive your transportation and servicing requirements? No, because Murphy's Law applies. There is a real good chance that during the relay of your flight plan, someone won't pass the word.

Now you normally have a workable radio aboard your aircraft. Use your Pilot-to-Dispatcher frequency to pass service requirements. So Base Operations has been told twice of your needs? Better twice than not at all!

Try this system sometime. I think that you will be happier for it. I know that we Base Operations types will be.

One final point: If you have *kudos* for a base, let Rex know about them. All too often, only the bad reports come to his attention while the good ones are accepted as a matter of routine. I am sure he wants to hear the good as well as the bad. ☆

Round Table on Guard

ED NOTE: Actually, it was an informal session — one of those things that gets started over a cup of coffee. This one centered on an old, perplexing problem: misuse of Guard Channel. Those involved were FAA, Facilities, a Project Officer and a safety education type. During the session the FAA representative suggested that publicizing comments made here might possibly aid in promoting more ideas. In the next issue an article, "For Want of Warning," tells how an F-101 aircraft was lost, by the margin of one blocked Guard transmission.

Editor: Gentlemen, to set the stage, three events have prompted this Round Table: One, a recent accident in which two pilots—not monitoring Guard during a GCA —failed to execute lost communications procedures, crashed into mountains and were killed. Two, neither the many articles that have appeared on unnecessary Guard transmissions nor any other actions have alleviated the problem. Three, we continue to receive many letters from pilots and safety officers citing the seriousness of this problem.

Project Officer: The accident mentioned was attributed to pilot error. Of course we can never know for sure, but the pilots were not monitoring Guard. A colonel, the safety officer of a major command, reported that the air was cluttered with unnecessary Guard chatter when he flew through the same area the day before. We suggest that the pilots killed in this accident, as I'm sure all of us here have, turned off Guard so they could hear the GCA controller.

FAA: What a miserable way to die—because you can't use the frequency set aside to save your neck.

Facilities: Who would you say are the worst offenders?

Editor: Controllers — Center, Approach, Departure, Tower Personnel . . . some pilots, but mostly, it's the ground controllers.

FAA: That may be true, but what causes the controllers to use Guard? It's usually because they can't contact the pilots on normal communications—maybe their radio has malfunctioned, or the pilots have turned down the volume so they can yak on the intercom, or they've gone to a tactical frequency without telling the controller, maybe they've tuned in the wrong frequency, and forgotten the previous frequency.

Editor: Now it's just a convenience frequency—not an emergency frequency. A controller can't get a pilot to answer, he picks up another mike, says "Air Force 12345, come up 327.4." It's too easy, maybe if we gave each one a pad and required him to jot down the time —who he called and why—make the use of Guard a nuisance.

FAA: Now, just a minute. When a controller uses Guard he has a reason to get contact with the guy. He may be at a conflicting altitude. He . . .

Project Officer: He should know that ahead, shouldn't he?

FAA: Not necessarily. There are many things the pilot, riding around listening to one discrete frequency, doesn't realize. Remember, the controller may be, and likely is

SUGGESTIONS WANTED

How about it, readers? Have you a solution to the Guard problem? Send your suggestions to the Editor, Aerospace Safety Magazine. We will pass them on to FAA and Facilities specialists.

working a lot more traffic on VHF than on your UHF. Then there's the "pop-ups"—the '101 that crashed a short time back was a "pop-up."

Editor: What's a "pop-up"?

FAA: He's a guy no one knows of ahead of time. He calls in—maybe he's been VFR, maybe he diverts—any number of reasons, but he calls and wants a radar vector or some other service to an airport. These guys have to be served too. All at once a controller can get snowed. He may have a real potential midair staring him in the face, and he's going to use Guard if he thinks he needs it.

Facilities: That brings up another point: Define an emergency.

Project Officer: Anything covered in the Red Bordered pages of the Dash One or anything else which, in the opinion of the pilot, constitutes an emergency.

FAA: Don't leave out the controller. He may have a few opinions of what constitutes an emergency from his end, too. Agreed, he might over anticipate the situation a little.

Project Officer: Okay. Another abuse is this "Ground Check on Guard." Maybe this has to be for towers and centers, but surely not for aircraft. If they get a good check on another frequency and a "click" when they switch to Guard, that ought to be good enough.

FAA: I don't know all about the military setup but when I worked in towers we had a dummy antenna. We could check Guard without blasting out over the air.

Facilities: I believe one procedure—at least it used to be, was for the radio mech to check with tower on another frequency, ask if it was okay to check on Guard. If Guard wasn't in use, Tower would say OK.

FAA: That's no good. Tower only knows what's going on in the local area. If I'm sitting up here in a T-Bird at 35,000, I can hear every Guard transmission in Southern California.

Project Officer: That's the thing. Besides, no one knows in advance when Guard may be needed for an emergency. This ground check may be just at that time.

Editor: Well, publishing articles hasn't provided the solution. Every safety publication I know of hammers away at this all of the time.

Facilities: I think first we'd better analyze the problem—define an emergency. Suppose I query AFCS, they have planes out monitoring, they get all transmissions on tape, maybe if we got with them, went over some of these tapes—that seems to me to be the first step.

FAA: Project Officer: Editor: Good idea.

Facilities: Okay, I'll write 'em.

Project Officer: We can check this "Ground Check on Guard" right here on the base.

FAA: Right, and I'll check this out with Center. I know we used to check it without transmitting on the air.

Editor: I still say we've got to get to the basic causes. And it's going to take drastic action, not preaching.

Facilities: May be, but we've got to have factual information first. I just came back from a trip, nearly 50 hours. I don't recall that misuse of Guard was very much of a problem.

Project Officer: What were you in?

Facilities: A Gooney Bird.

Project Officer: Yeah, get up around 40,000 and see the difference—how much IFR did you fly?

Facilities: Very little. Weather was good.

Project Officer: That's another thing. It's always worse in IFR, especially around congested terminals.

FAA: That's for sure—and there's always some joker around who has to be led; who can't tune his radio; who doesn't have the right maps . . . or doesn't know how to read them, and who thinks the controller has nothing else to do but wait on him.

Project Officer: And he thinks the radio is his own party line. This is another point that bugs me. You take a line pilot and some of the administrative types who have some professional pride—they use proper terminology, are brief, concise—it's obvious they know the score.

FAA: I'm glad you said it, but if controllers were as informal with their radio discipline as a lot of pilots the situation would be a lot worse.

Facilities: Well, I think we've all got the problem pretty well in mind. I think the first step is to query AFCS, then we'll get together again.

FAA: And I'll find out how we ground check Guard without transmitting on the air, and query the controllers on their opinions of what constitutes a necessity to use Guard. Our house might not be clean on this point, either.

Project Officer: Keep me posted. I still think something can be done. I'd like to go over the tapes.

Editor: And if anyone gets an idea as to how we can publish something that will make an impression, let me know. We've reported on the two guys killed over here on the side of a mountain. Even that hasn't seemed to have had any effect. ☆

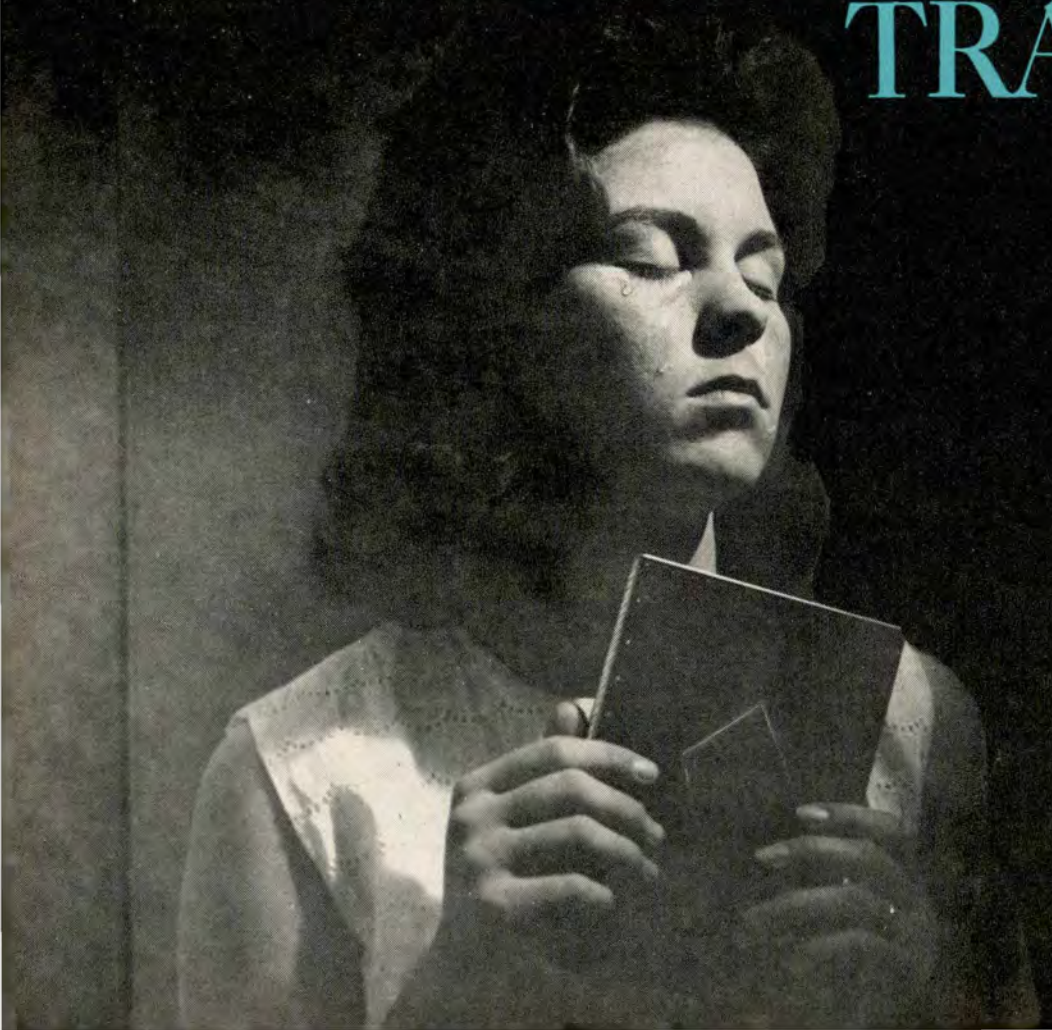
Col James F. Risher, Jr
Chief, Ground Safety Division

As this is written, we in Aerospace Safety are basking in a warm glow of satisfaction in the knowledge that only three Air Force persons lost their lives in traffic accidents over the past Memorial Day weekend, whereas 13 lives were lost in the comparable period in 1963.

We are further gratified because for the first time in 1964, Air Force fatalities from motor vehicle accidents are on a downward trend as compared to the previous year.

There are other indications which make us hopeful that the amount of stress now being put upon accident prevention in this area is beginning to pay off. Nevertheless, should we need a reminder that the possibility for further progress against our number one ground accident source is almost unlimited, the following sampling from our files will be convincing. The writer requested a random (literally) sampling of reports of accidents which had occurred in the first few months of 1964. Following are brief resumes of eight reports which were picked from the files for review:

A RANDOM SAMPLE OF TRAGEDY



• A SSgt from a midwestern base departed his home at 0930 on a Saturday morning in his automobile, picked up a friend and spent much of the remainder of the morning at a local bar drinking beer (quite a few beers). After dropping his friend at his home, he entered a public highway at high speed and weaved and skidded for over half a mile on a straight road before his car finally overturned. The sergeant was thrown clear and instantly killed.

• Four airmen from a foreign base were traveling in the automobile of one of the airmen at excessive speed over a wet and winding highway in the rain. The driver attempted to pass a foreign automobile on a curve and collided with a civilian truck approaching from the opposite direction. All four were killed. Fortunately, the driver of the truck, though injured, survived. The airman had previous driver violations.

• An airman driving alone in a foreign country late at night at high speed rammed a native truck from the rear. His automobile was completely wrecked and the airman was killed. Again, fortunately, the driver of the truck, although injured, survived. There was strong evidence of excessive drinking as well as excessive speed associated with this accident.

• Six airmen from a base on the east coast were involved in an accident in which all six sustained major injuries but in which, miraculously, none was killed. They were on an outing in a private automobile and paused on their way to purchase one fifth vodka, one pint vodka, and one pint bourbon. These beverages, according to the report, were consumed during a two hour period at an outdoor theater. Subsequently, they made two bar stops. They then decided to visit yet another bar on the opposite side of the town. The accident occurred while their automobile was wandering around back streets in their search for this establishment. The automobile, moving at an excessive speed for city driving, struck a railroad embankment at the end of the street, traveled 45 feet through the air, and landed upside down on a six-foot embankment on the far side of the railroad. The automobile was demolished. The citation read in part "reckless driving and driving under the influence."

• An Air Force 2d Lt was driving his private automobile within speed limits under complete control, when a civilian vehicle abruptly entered the highway in front of him. Unable to stop or avoid the civilian automobile, the officer was killed.

• An airman was killed near one of our eastern bases when he fell off the rear bumper of his own automobile which was being driven by an airman friend. The victim and several friends had been celebrating at a bar and after a period of time had departed for a restaurant some 500 yards away. The airman fell in the path of an on-coming vehicle as the automobile on which he was riding made an abrupt turn on the highway.

• An Air Force lieutenant was killed while riding in the company of an airman, a fellow sports car enthusiast, in the latter's automobile. The investigation showed that the airman was driving too fast for conditions and lost control of his new car on a sharp curve on a secondary road. The driver was injured and the lieutenant was fatally crushed as the car overturned.

• An airman was killed while riding his friend's new motorcycle. The airman, who was a capable motorcyclist, was thrown from the vehicle when it collided with an automobile, driven by a civilian, which pulled suddenly in front of his motorcycle from a side road. The accident was not the fault of the airman, whose vehicle, was under proper control and moving within prescribed speed limits at the time.

A brief recapitulation reveals several facts from this limited sampling which fall into the well established pattern of Air Force traffic accidents. There were ten fatalities and an equal number of serious injuries in these eight accidents. That the fatality toll was no higher was largely a matter of chance. Of course, we should not forget that the use or absence of seat belts could have been a factor in some of these accidents. But the total of ten deaths, grim as it was, seems fortuitously low here, especially when we consider that some or all of the six airmen who were injured in one accident might well have been killed.

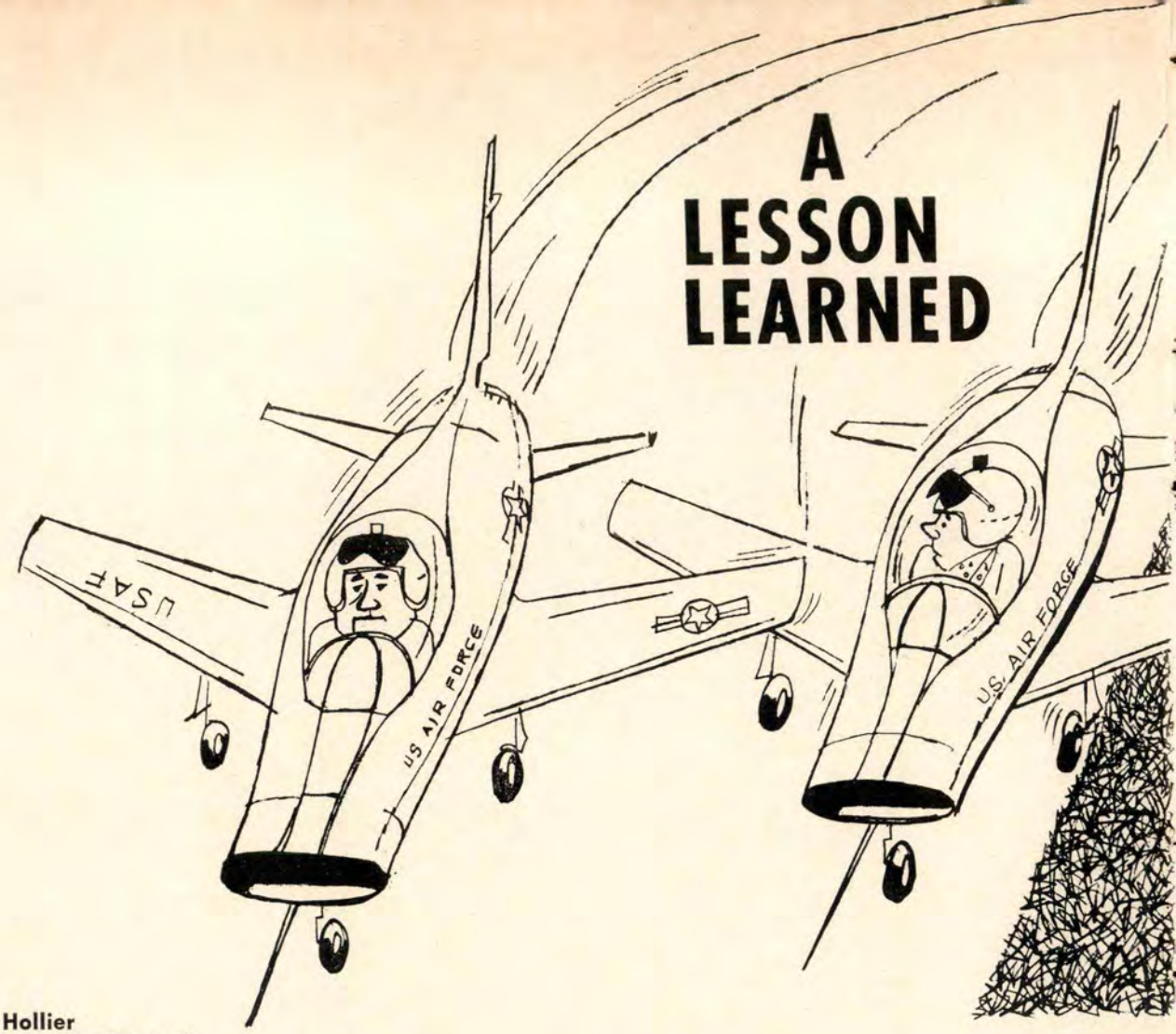
All Air Force persons involved were between the ages of 18 and 25, except the Staff Sergeant, who was 33. The highest enlisted rank was staff sergeant and all others were A3C through A1C; the highest officer rank was second lieutenant.

In those accidents involving collision between vehicles, the primary fault was shared equally between Air Force and civilian drivers. Two accidents clearly resulted from gross error of the civilian driver and two were caused by equally gross error of the Air Force driver. Contrary to the school of thought which coined the "Stop the GI Killer" slogan, this is the overall pattern of accident experience.

From the standpoint of Air Force traffic accident prevention, however, the cardinal fact is this: Of only two accidents may it be said that the Air Force victims could not have controlled completely the circumstances which cost their lives. The second lieutenant whose right-of-way was suddenly blocked by another vehicle while he was driving under proper control was such a victim; likewise, the airman motorcyclist whose path was also suddenly invaded by an automobile was such a victim. Even here it must be noted that had this airman been wearing a helmet, in accordance with a major air command directive, he may have been alive today. But *all* others who died, and all who were injured, in the other six accidents were clearly the victims of their own, or their Air Force companions' reckless, irresponsible, and foolhardy personal conduct and driving behavior. All were victims of conduct and attitudes on the highway which were completely incompatible with Air Force standards, and must certainly have been foreign to their behavior in the Air Force environment.

Corrections of these attitudes and these behavioral deviations on the part of our young men in the off-duty environment is a continuing challenge to all Air Force commanders and supervisors. We believe that progress is being made. But we know that we cannot rest in our efforts to make our young men more aware of their responsibilities to themselves, their families, the Air Force, and the nation. ☆

A LESSON LEARNED



Capt Carroll E. Hollier
354 TFW, Myrtle Beach AFB, S. C.

I guess it's time for this story to be told. It lay, a closely guarded secret, for years. However, recently I went the route of many fighter jocks. I became a Wing Weenie, specifically, Wing Flying Safety Officer. All of the schooling, instructions and work I have undergone since I took this job have convinced me that, although it may be human to err, not to profit from that error is catastrophic. In other words, every lesson learned should be preserved and passed on for the edification of others.

Picture, if you will, the average fledgling hot rock pilot (cocky, scarf, stupid). Yep! That was me. The locale of this story was a fighter training base in the Southwest. The bird was the F-100. We were sent there for the dual purpose of checking out in the aircraft, and, at the same time, to try to learn all of the tricks of the fighter trade (and believe me, they are many). You might even say we were kept busy, but we all enjoyed every minute of it. Besides, when you were down in the mouth, you could always smile and take solace in the fact that you were here and not flying an "aluminum overcast" like most of your old buddies from basic training. Fate was smiling at you and you were indestructible.

It was a normal desert day, clear, hot and beautiful. Man, I found a home out there! We had a six A.M. briefing for an eight-thirty takeoff. The briefing was conducted by the instructor and was very thorough. In fact, we had all commented on the thoroughness of all briefings since our arrival at the base. This instructor had the reputation of being an excellent pilot and for some time I had been eager to fly with him. Troops who had flown with him said that he was one of that rare breed of pilots who, besides having the ability to perform the job himself, was a master of the art of showing a student how to do it also. He had experience and experiences coming out his ears. He had flown combat in the Korean conflict and was half a MIG away from being an ace at the close of hostilities (said he looked and looked but never found a half a MIG flying around). He had about 3500 hours of flying time, all of it in fighter type aircraft. 2800 hours of this was in single engine jets including 1500 hours in the F-100. Impressed? I was!

The mission was to be air-to-ground gunnery. We would be a four ship formation. The flight line-up was given and I was number two. The instructor, naturally, would lead. Flight call sign was (I'll never

forget it) SNUFFY. Start engine time was given and all gunnery patterns and procedures were cussed and discussed. As I said, nothing was left to chance. We even had time for a cup and a weed before going out to the aircraft.

My preflight was unhurried. I was strapped in at least 15 minutes prior to start engine time. After start the flight checked in on UHF, joined up in the marshalling area, taxied to the arm-dearm area and from there to number one for the active. From this point on the flight took on the semblance of the proverbial Chinese fire drill.

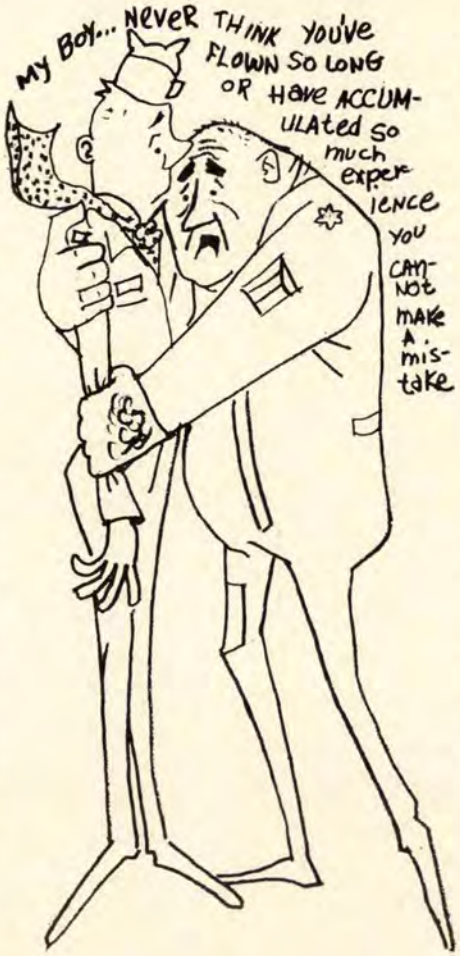
First we were told to hold for an emergency. It seems some nut in a T-Bird had a fear of flying just because his oil pressure was zero and his engine was making peculiar noises.

Very inconsiderate, he must have known we had a range time to meet. Well, no sweat. We'll just fly a little faster enroute. Ah! He's finally on the ground.

Then the tower called and said we'd still have to hold for another emergency. An F-100 was inbound with a utility hydraulic system failure, and, no, we couldn't expedite our takeoff before he arrived over the field. So we sat and waited and grumbled. Finally he landed safely. Still no soap though, 'cause he stopped straight ahead to wait for gear down locks to be installed. At this point we should have called off the whole shooting match, because we wouldn't get any range utilization anyway. It was past our range time, but we were spring loaded to the press-on position.

When the runway was finally clear, we taxied into position as rapidly as possible. A student landing period was almost upon us and on the ground those cockpits get kinda warm. Lead signaled for engine run-up, brake release and AB's. We rolled in two ship elements with 30 second spacing between elements. I concentrated on holding a good wing position. Just before reaching nosewheel lift-off speed, I noticed the lead was drifting to his right and into me. Well, the runway was pretty wide, so I followed suit and drifted too. He kept coming, though, and I was running out of lateral runway and ideas at the same time. It seemed like we had been rolling a couple of days and my nosegear was making a valiant attempt to come up through the floorboard. Quick like a bunny I snuck a looksee at the airspeed. Holy mackerel! 155 knots and we hadn't even rotated yet! I was in the world's fastest tricycle. I jerked the bird off the runway and passed directly over lead, missing him by less than I like to remember. He continued drifting toward the side of the runway I had just vacated.

As soon as I was clear of him lead broke ground and immediately went into about a 45 degree bank toward his right, the side I had been on. I aged about ten years. After about 30 degrees of turn lead righted his aircraft and went into a slight climb. I called and told him his gear was still down. He rogered my transmission and promptly rolled over to a near inverted position. Everyone began hollering at him over the radio. Then, suddenly, the aircraft righted itself and the instructor called that he had everything under control and to start trying to make this fiasco look like a formation. Needless to say, we didn't fly too tight for a few minutes.



Aside from a few gray hairs and the fact that we were too late for our range period, the balance of the mission proceeded uneventfully. So after flying around the flagpole for about 45 minutes, SNUFFY flight landed, a much shaken group of young men, especially me. The instructor met me at my aircraft and hustled me into a briefing cubicle in operations. I believe if he could have found a SECRET sign he would have hung it on the door. He first apologized and then gave me the straight skinny. His explanation was preceded with this sound advice: "Never think you've flown so long and have accumulated so much experience that you cannot make a mistake." How many times have I had occasion to remember that!

While the flight was delayed so long at the end of the runway he had decided that he would make a few additional (typical fighter jock) checks. He had, among other things, run his aircraft trim full nose down, full right aileron and full right rudder. Suddenly, we were cleared to line up and takeoff, and, in his haste to expedite, he FORGOT TO RETRIM THE AIRCRAFT. His right rudder trim accounted for his drift on the runway. His nose down trim made it very difficult to raise the nose causing the excessively long takeoff roll. The right aileron trim caused the bank right after takeoff. When I called him about his gear, he was standing on his left rudder while holding the stick somewhere in the lower left side of the cockpit and having to use two hands to do it. He let go with one hand to raise his gear and couldn't hold his altitude. Evidently he thought better upside down, because, while he was inverted, the cause of his little problem hit him right between the eyes. He retrimmed and that was it.

We both decided not to spread the story around and get the Head Shed troops all excited. But I'm sure he will understand my stated reason for reneging. So I'm getting this off my chest in hopes that somewhere, someone will slow down a couple of beats and follow that checklist. It covers everything in the cockpit. However, I'm sure you'll excuse me if I push the TRIM FOR TAKE-OFF BUTTON a few more times than the good book calls for. ☆

You're Wanted

...Safely Home

SMSgt Edward J. Matus
NCOIC, Flight/Nuclear Safety Div
WRAMA, Robins Air Force Base, Ga

Here's a pitch on behalf of the next of kin. Look at the pictures on this page. They show personal equipment of Air Force crewmembers. Carelessness, such as this, can be deadly.

Hypoxia — when allowed to happen through equipment upkeep errors — is without excuse. Unforgivable! Pointedly so. Because the sequence of events that leads to the destructive end of life and property is man made. Why man made? Because the events are controlled by man. Man allows them to happen, primarily, due to his own attitude — his attitude toward the very equipment that permits him to live in a hostile environment.

[illegible] when it is known can be careless with their own life protection equipment.

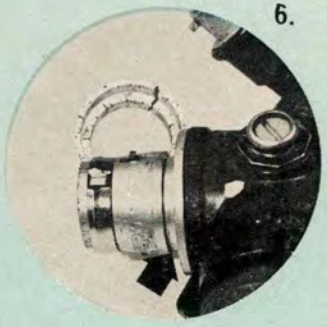
What sort of thinking should we apply to this recurring "careless" attitude toward personal equipment care? What will cause an individual to take the time to personally concern himself with the condition of his life-sustaining equipment and then, as prescribed or as needed, do something about it?

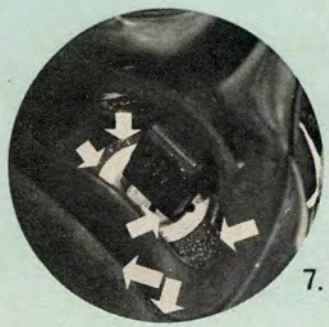
If you believe you do not have the time to get your helmet repaired or your oxygen mask cleaned, then you probably also believe that "accidents" always happen to the other guy. Past accident evidence shows that it's people like this — people with this attitude — who are

possesses is self-preservation. You would think "to stay alive," in itself, would influence his attitude and be a strong enough motive to maintain at least a semiconscious level of thought that would induce him to care for his lifesaving aids.

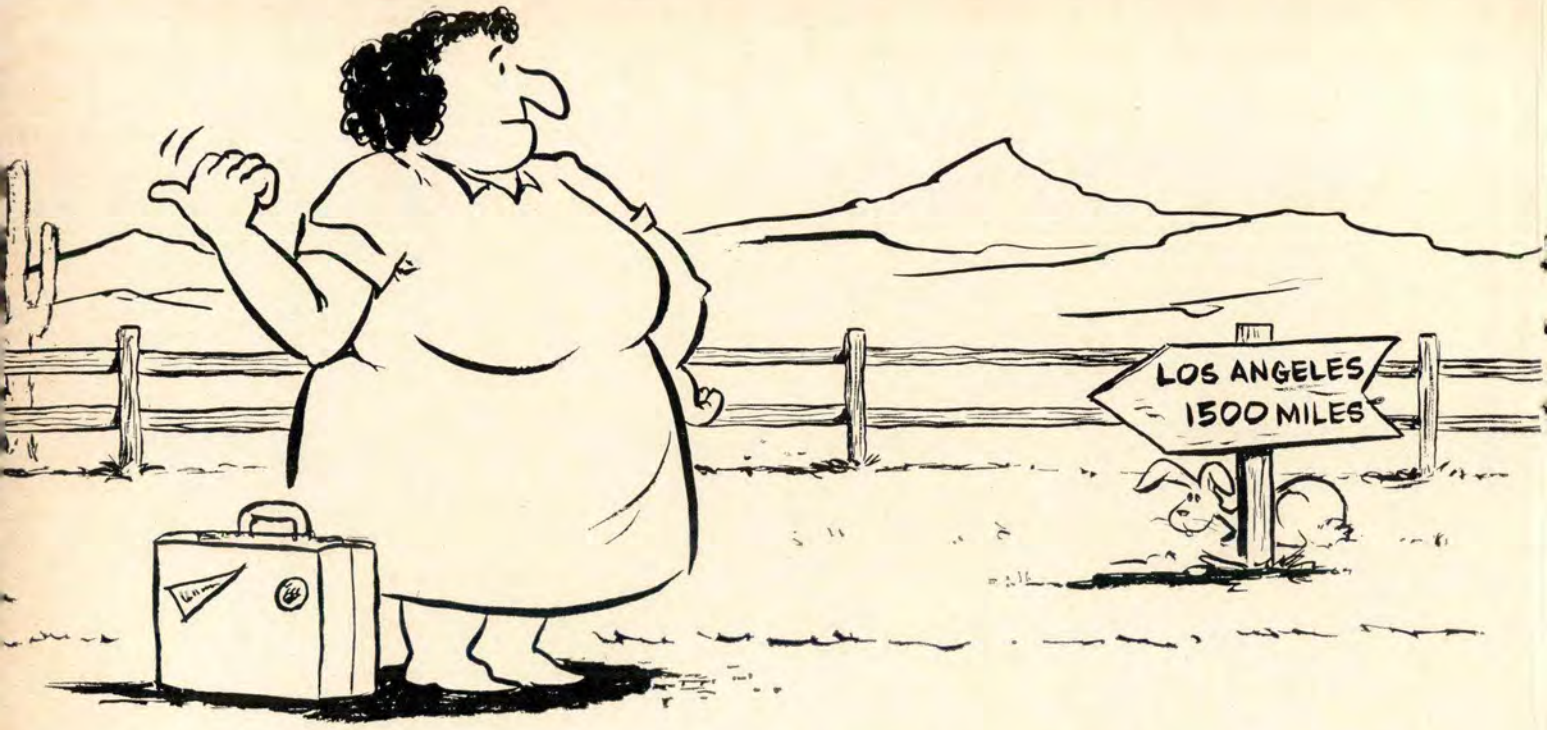
The photographs of the helmet and oxygen mask shown here show, irrefutably, that men the "other guys."

Loss of life because of poorly cared for personal equipment *is* preventable. And it requires virtually no effort on the part of the aircrew member. Simply bring it in to PE for inspection, cleaning and repair or replacement as necessary. It costs you nothing, and can save a life — yours! ☆





Equipment shown in the seven photos was all turned in to PE by Air Force crewmembers. Note that life-saving design of this equipment had been negated by: (1) cracked helmet, (2) broken visor button, (3) missing visor attachment screws, (4) missing screws in a mask attachment fitting, (5) deteriorated ear pieces, (6) missing connector gasket, and (7) dirt in oxygen mask.



Lt Col Harold K. Boutwell, Directorate of Aerospace Safety

MY mother - in - law doesn't know anymore about flying than a bedbug, but she knows one thing: mountainous terrain can be dangerous. In fact, she won't fly to the West Coast, although she has flown all over the East and South.

Sounds silly, perhaps, but maybe some of us who are paid to know the flying business would do well to pay a little attention to what that sweet old gal says.

Naturally her fears are based on newspaper accounts of aircraft flying into the hills. It doesn't take a Rhodes scholar to add up these accounts and come out with the answer that there may be additional risks in the mountains.

I hope you are still around because I want to relate an incident. It's based on fact and it happened this year.

An IP was administering an instrument flight check on a cross-country. On arrival he filed the following Operational Hazard Report:

"We requested an Edgar 3 departure from Tall Timber AFB on our DD175 and filed for 11,000 feet to Pouch and then V-307 to Queenly Field. Ground control cleared us at 11,000 to Queenly Field via direct Pouch and then V-307 to Queenly. We requested from Departure Control to fly the Edgar 3 departure as I was giving an instrument check. Tall Timber Departure said they would be unable to grant us the Edgar 3 departure because of conflicting traffic. They gave us instead a vector direct to Pouch. However, they did not alter our assigned altitude of 11,000. The direct route to Pouch from Tall Timber took us directly over Mt Eve which is 12,307 feet high.

"Tall Timber departure control got us well on our way on the vector to Pouch and then handed us off to Seaside Center. We checked in with our altitude and our estimate for Pouch which Seaside Center acknowledged.

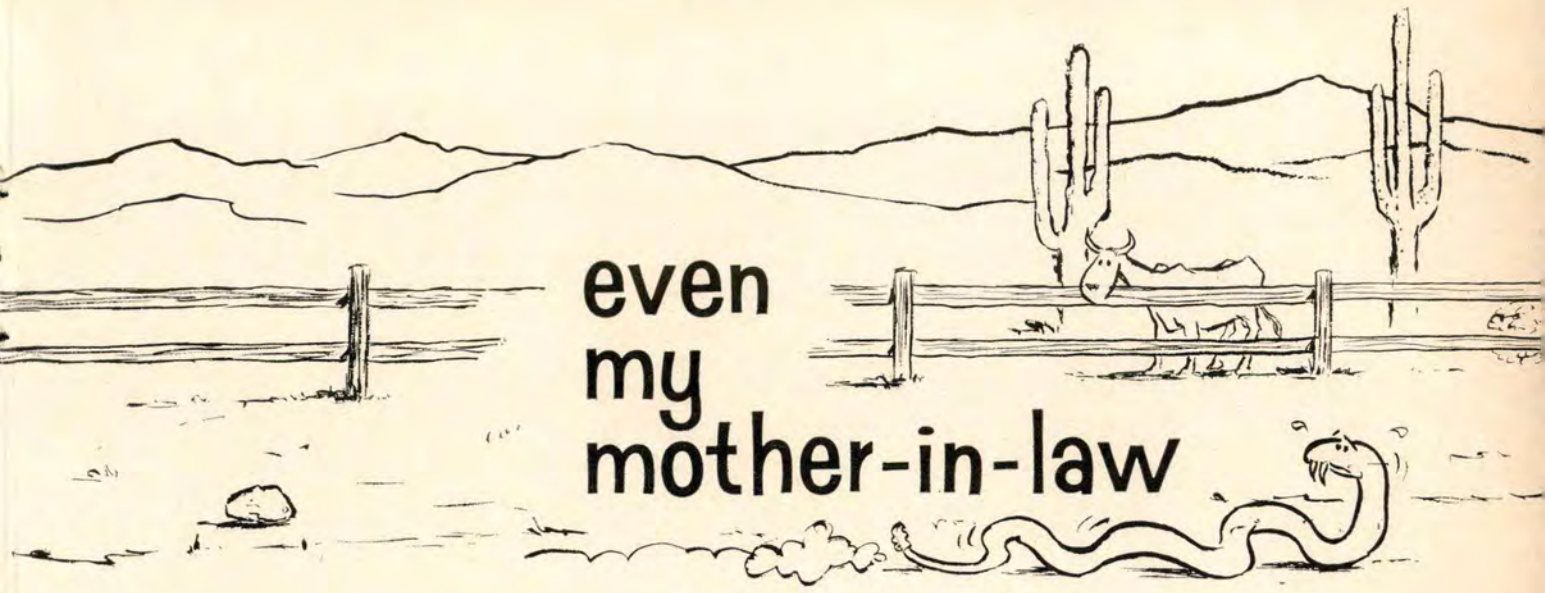
"After about five minutes the FAA controller at Seaside Center said we had Mt Eve 12 o'clock at 15 miles and said also that we were outside of controlled airspace so that he could not give us vectors or altitude changes to clear us from the mountain. We requested and received an altitude of 15,000 feet to clear the mountain.

"A definite operational hazard exists when departure control gives an aircraft a vector into uncontrolled airspace at an altitude that is below the terrain along the flight path. If departure control wanted to send us direct to Pouch they should have checked the terrain along our proposed flight path and assigned us an altitude that would clear all terrain."

There is something about a "close one" that really triggers action. The first thing we want to know is—what happened? How does one get jockeyed into this position and how can we prevent its recurrence.

To begin with let's congratulate the FAA controller. But for his timely action we may have lost a crew and an aircraft. Well Done!

An investigation was conducted to determine all the facts surrounding this near mishap. But before we get too involved with the facts here are a couple of quotes that should be kept in mind. "Before beginning a flight, the pilot in command of the aircraft will familarize himself with all available information appropriate to the intended operation." And, "When outside of control areas and over designated mountainous ter-



even my mother-in-law

rain, an aircraft will not be flown less than 2000 feet above the highest terrain or obstacle within 25 miles of intended line of flight."

Here is the sequence of events that must be added to the OHR.

The pilot planned his flight as stated in the OHR. He asked for 11,000 feet. Had he been cleared in accordance with his flight plan he would have attempted to cross a 14,000-foot mountain (out of controlled air space) at 11,000 feet. But that's getting ahead of the story. RAPCON advised Tall Timber Tower that, when Air Force 99999 requested a clearance, to advise him that 11,000 was too low for the route that he requested. When Air Force 99999 began to taxi, the pilot advised the tower that he now wanted 11,000 to White Sox and 13,000 to Calamity Falls. (NOTE: This change did insure minimum enroute altitude clearance for that portion of the flight conducted in controlled air space.)

The clearance was issued to the Calamity Falls VOR via direct Pouch, flight plan route, maintain 11,000 while in controlled airspace. The RAPCON was unable to approve the Edgar 3 departure because of other traffic. Examination of the direct route to Pouch, or the route from the end of the SID direct to Pouch, indicates that at 11,000 feet, neither meets required terrain clearance.

Two minutes after Seaside Center had obtained radio and radar contact with AF 99999 they asked him if he was VFR and if he had Mt Eve in sight. The pilot replied negative; he was IFR at 11,000. The controller therefore advised the pilot that Mt Eve was at his 12 o'clock position at 15 miles at 12,200. The controller asked the pilot if he wanted a higher altitude or whether the pilot requested a vector around the mountain. The center controller explained that he could not vector an aircraft outside of controlled airspace unless requested by the pilot.

Two minutes later the pilot requested a higher altitude and was cleared to climb and maintain 14,000 feet while in controlled airspace.

There are the facts.

Who did what to whom?

The experts in air traffic control made the following statement. "We consider the handling of this aircraft by the Tall Timber RAPCON and the Seaside Center to be normal."

Now let's review the pilot's actions.

Although there were mitigating circumstances in that the flight route was changed, let me point out that the route flown was actually within five miles of the route filed.

Slowly but surely we have arrived at the crux of the matter; i.e., proper flight planning. These pilots failed to refer to a map showing the topography of the flight route area.

It is quite understandable how the change in flight plan could have misled the pilot into thinking that ATC had done him an injustice; however, had he referred to a map and not the FLIP Enroute Chart alone he would have realized immediately that his proposed flight would have required a "mountain penetration capability" type aircraft.

Another point that should be stressed was that his clearance altitude pertained to controlled areas only. Moral: Do not use the FLIP Enroute Charts for planning flights in uncontrolled airspace.

As my mother-in-law says, "flying around in mountainous terrain can be dangerous." ☆

H_2O . . . FRIEND OR FOE?

Willie Hammer, Directorate of Aerospace Safety

Moisture is one of the essentials of life, but its presence may constitute a hazard, causing mishaps and malfunctions. The major problems result from condensation of atmospheric moisture.

Everyone is familiar with the phenomenon of moisture condensing out of the atmosphere, usually at night, onto cold objects such as blades of grass, leaves, rocks and metal objects.

Similar occurrences take place when the moist atmosphere inside a missile silo hits the metal of a cold refrigerant line, a tank cooled to a cryogenic temperature, or a cool piece of metal equipment. In some instances, enough moisture may condense on equipment to form a continuous stream of water, even when the ambient temperature is far above the dew point.

The worst effect of condensation of moisture on metal surfaces is the action of water as an electrolyte in the promotion of corrosion. The commonest forms of corrosion are electrolytic in nature between two dissimilar metals or different components of the same metal. For corrosion to occur there must be a conductor between two metals, and a liquid electrolyte to carry dissolved metal ions in solution. In general, corrosion due to condensation of moisture is negligible when the relative humidity is less than 30 per cent.

Corrosion has numerous adverse results.

- Structural strength of metal may deteriorate to such an extent that parts or fasteners may fail.
- Corrosion products may build up to such an extent that parts which should move freely will bind and be rendered immovable. A frequently seen example is that of rusting nuts and bolts which must be disassembled. In a case involving Atlas F, a critical solenoid could not be activated because parts were rusted.
- Corrosion products may cause jamming of valves, orifices or other flow passages, resulting in operational failures.
- Pinholes caused by corrosion may permit leakage of toxic or flammable liquid propellants.
- Surfaces may be roughened and disfigured, ruining the appearance of the item.

Water condensed or deposited inside electrical conduit, equipment or connectors may cause short circuiting. Moisture in these places may also induce corrosion which may cause short circuiting. This may occur if the equipment is not shielded against the entrance of very humid air, rain, snow or washdown water. At night, relative humidities in many areas are frequently over 90 per cent. Metal need be only slightly cooler to cause condensation of moisture.

Examples of malfunctions which have occurred from these causes are:

- A Titan I pressure switch failed because of corrosion caused by moisture condensed after extreme temperature changes. This resulted in a false hydraulic pressure indication and loss of missile alert status.

• Moisture in an electrical connector permitted a short circuit which discharged the power and servo batteries in a BOMARC missile, and ignited the ramjet engine flares. Contamination was present in the connector. Dry, it was a poor conductor; wet, it became a conductor good enough to permit the short circuit.

• Communications equipment, jack stations and terminals of maintenance telephone nets in Titan I complexes malfunctioned because of corrosion caused by moisture introduced by high pressure water washdowns.

• Moisture condensed from humid air collected in AGM 28 connectors causing short circuiting of the electrical system and malfunction of the missile.

High humidity may cause overloading of air cooling systems. To cool air it is frequently necessary to dehumidify it. The warm, humid air is passed over cold coils which reduces its temperature below the dew point desired. Excess moisture condenses and is removed.

The refrigeration necessary to condense a pound of moisture is much greater than that required to cool a mixture of air and moisture to a specific temperature. (To cool one pound of air-vapor mixture one degree Fahrenheit requires removal of about one-quarter of a BTU of heat. To condense one pound of water from gas to liquid necessitates removal of over a thousand BTU's.)

Moisture may enter equipment and piping in cryogenic or high pressure systems opened for maintenance and repair. This moisture may later cause malfunctions of the system by freezing and blocking orifices and valves. In cryogenic systems, the extremely low temperature of the cryogenic fluid may freeze the moisture and plug passages with the resultant ice. In high pressure systems, expansion of a gas through a valve will create a drop in temperature which will also cause freezing. The most familiar example of this is in the freezing of carburetors of aircraft. Another is in the formation of vapor trails by high speed, high altitude planes.

External freezing may also cause jamming of movable parts by layers of ice. This may occur when a missile kept in a warm, humid shelter is suddenly exposed to frigid outside temperatures. In another case, atmospheric moisture was condensed in a Titan I disconnect by cold helium vapors (about —200°F). During the next exercise, the moisture froze again, preventing the disconnect arm from falling away properly and causing it to hit the silo crib structure as the missile was raised on its elevator.

Moisture may have other adverse effects on materials and equipment:

• Some solid propellant motors are hygroscopic (absorb moisture from air). Moisture may cause leaching of ammonium nitrate or ammonium perchlorate from motor grains by which the ammonium compound is washed out of the propellant mixture. It is then deposited on the surface of the grain making it oxidizer rich. After ignition burning will take place at an abnormal rate, creating excessive pressures which may burst the motor case.

• Some propellants are harmless when dry but will form corrosive compounds with moisture. An example is nitrogen tetroxide, which when wet will form extremely corrosive nitric acid. Acid formed this way damaged a Titan II computer by pitting electrical connectors and gold plated surfaces.

• Moisture may cause swelling or change the properties of non-metallic materials. Humidity will so affect the plastic radome of the BOMARC missile that severe variations in energy transmissions through the material will occur.

• Moisture condensed in fuel tanks may dilute the fuel, or otherwise cause erratic engine operation. Moisture in oil may destroy its chemical characteristics and lubricating properties.

• Optical devices, such as television lenses, goggles and facepieces, may fog in the presence of moisture, reducing their effectiveness or preventing further operations.

• Thermal insulation will lose its insulating value when even partially saturated with moisture. In many cases, the insulation itself may be ruined beyond rehabilitation.

(Above) Friend? No doubt about it. Ever try to water ski without a good supply of H_2O? (Opposite page) Foe? The worst effect of condensation of moisture on metal surfaces is when water acts as an electrolyte and promotes corrosion. Structural strength of metal deteriorates and parts or fasteners may fail.

High humidity may also cause psychological and physiological stresses in people. Tests have shown that persons working in atmospheres of high temperature and humidity become irritable and fatigued more easily, have less ability to concentrate and make numerous errors. The length of time protective clothing which is impermeable to moisture can be worn decreases as the humidity builds up inside the clothing. Provision must therefore be made to minimize the presence of moisture inside such equipment.

Tests have shown that in temperatures of 70 degrees to 80 degrees Fahrenheit people may be comfortable even when the humidity is as high as 70 per cent. (The exact amount will vary with the person, the clothing worn, the activity and the wind velocity.) At a temperature of 80 degrees and humidity of 90 per cent or more, a person may begin to feel uncomfortable. At 92 degrees Fahrenheit or higher and with humidity of 90 per cent or more, there may be increases in body temperature, pulse and rate of breathing, and heat exhaustion. The increase in body temperature is due to the fact that evaporation and heat loss from the skin are inadequate to dissipate the heat produced by the body. High relative humidity means that there will not be much evaporation

H_2O . . . FRIEND OR FOE?

continued

because there is already considerable moisture present.

Problems may also be created by *low* humidity. Generation of static electricity is one of the principal ones which affect missile system operations. Low humidity is conducive to the accumulation of electrical charges and to severe discharges. Tests showed that personnel entering a warm, dry room from Arctic cold and removing a parka or wool shirt might carry 3.9 millijoules of electrostatic energy at 8000 volts. This is far above the energy requirement to ignite a gas-air mixture (about 0.03 millijoules for hydrogen and 0.5 for methane in air).

Low humidity will also cause drying out of organic materials such as cotton, plastics, wood and leather. This may result in shrinkage and cracking of wood items and of sealants. The mucous membrane of persons in low humidity spaces will dry out, leaving them susceptible to respiratory infections caused by bacteria normally picked up by these surfaces.

Proper humidity and moisture may be maintained in a number of ways:

- Use vapor barriers to prevent moist air from reaching corrodible or moisture sensitive materials.
- Eliminate introduction of water by seepage, rain, indiscriminate washdowns or by air wash systems.
- Install and use dehumidifiers and drying equipment.
- Package corrodible spare parts in moistureproof containers. Do not open moistureproofed packages until necessary to do so.
- Use anti-corrosion coatings, paints or noncorroding materials to protect or reduce deterioration of metals.
- Avoid damage to coatings and paints which might destroy their protective films.
- Replace dessicants when they near saturation.
- Provide adequate drain holes at locations where moisture might accumulate.
- Keep air conditioned spaces at the temperatures and humidities specified.
- Purge and dry critical components as required by technical orders.
- Keep rocket motor nozzle and solid propellant gas generator closures in place.
- Avoid leaving hygroscopic materials on corrodible metal surfaces.
- Keep the doors and windows closed between air conditioned and unconditioned spaces.
- Insulate cold surfaces on which moisture might condense. Where insulation is not feasible, use drip pans and drains to remove the moisture.
- Potting compounds and sealants should be used where required, and replaced as necessary to keep out moisture and humid air. ☆

MISSILANEA

TOO MANY COOKS. Here's an accident that once again emphasizes the veracity of that old saying about too many cooks spoiling the broth.

A specialist trouble-shooting the armament system of an F-102 was working on the launcher rails in the aft bay. He had assured himself that all selector valves were disconnected prior to trouble-shooting the system. After locating a bad wire in the aft selector cannon plug he reconnected the forward valve. Then he left the aircraft for a few minutes. While he was gone the missile safety officer and loading crew chief, investigating an incident, inspected the aft selector valve and apparently left it partially connected.

You guessed it. The specialist returned to the aircraft, stuck his head into the lion's mouth and hollered for someone to pull the trigger. Sure enough, someone obliged him; the rails retracted and the man received a broken vertebra.

This accident was caused by uncoordinated maintenance and incident investigation being conducted simultaneously.

MACE (CGM-138) HOIST FAILURE—A missile replacement team was attempting to de-mate the M16E3 rocket motor from a Mace missile. The right pivot jaw on the 14-C bomb hoist failed as the screwjack was being retracted and weight of the rocket motor was being shifted from the missile to the hoist. The motor fell about 20 inches to the transporter and the left bomb hoist cable pulled out of the adapter hoist cable lug. Damage included one broken pivot jaw point and a cable pulled loose from the attachment lug. The rocket motor was declared unserviceable.

Investigation revealed that:

- The bomb hoist had been weight tested the previous month.
- The annual cable inspection had been accomplished approximately three months before the mishap.
- The pivot jaw assembly had been magnafluxed about three months before the mishap.

Primary cause factor was determined to be materiel failure. An EUR was submitted recommending that the sheer strength of the pivot jaw be increased 10-25 per cent, also possible redesign of the threaded portion to increase the strength at the critical bearing joint.

Lt Col John A. Worhach
Directorate of Aerospace Safety

FAA ADVISORIES

Robert L. Terneuzen
FAA Liaison Officer
Directorate of
Aerospace Safety

RECORDED APPROACH CONTROL INFORMATION — To relieve congestion on approach control frequencies, the FAA is conducting a test evaluation, whereby recorded airport info (landing runway, wind, altimeter setting, etc.) is automatically broadcast on some selected VORs and VORTACs. Pilots using this feature should, on initial contact with approach control, repeat the phonetic alphabet code word appended to the recorded broadcast. This will indicate that he has received the lastest information.

The use of this feature is not mandatory but pilots are urged to participate.

Tests are being conducted on the following NAVAIDS:

- John F. Kennedy Intl. VORTAC, IDL 115.9 mc. The scheduled weather broadcast service and air/ground communications by the New York Flight Service Station on the Idlewild VORTAC will be suspended for the duration of the test; however, it will be available on the Deer Park VOR, Roverhead VORTAC, Hampton VORTAC, plus assigned VHF/UHF communications frequencies.
- O'Hare Intl. VOR, ORD 111.6 mc.
- San Francisco Intl. VOR, SFO 111.8 mc.

WHAT'S NEW IN WEATHER REPORTING. The FAA is vitally interested in providing its air traffic controllers with the most modern radar equipment, especially a system that will improve their capability to observe severe weather conditions.

In November 1963, the Bureau of the Budget directed the establishment of a high level committee to work on the coordination of federal meteorological services. This committee is composed of representatives of the Department of Commerce, Army, Navy, Air Force, Agriculture, Interior, State, Treasury, the National Aeronautics and Space Administration and the Federal Aviation Agency. Chairman is Dr. Robert M. White of the U.S. Weather Bureau. They and their committee on basic aviation meteorological services are actively working on methods to improve receipt of and dissemination of severe weather advisories.

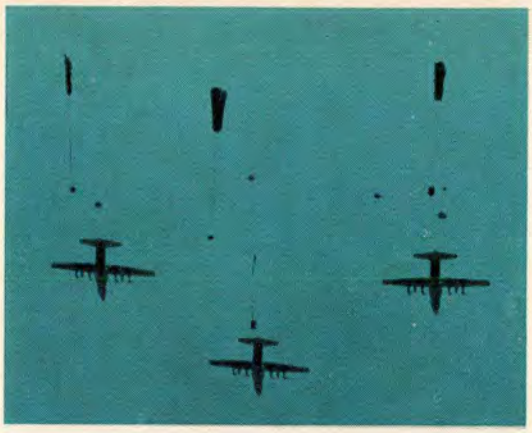
The FAA is vigorously attacking the problem of supplying improved weather data to both the controller and the pilot. The installation of circular polarization on FAA air traffic control radars some years ago improved the capability to maintain continuous tracking of aircraft through heavy precipitation; however, circular polarization eliminated much of the weather appearing on the display.

At 19 selected FAA terminal facilities, Weather Bureau radar data are being remoted to the IFR room to assist the controller in determining areas of severe weather not generally seen on airport surveillance systems because of circular polarization. The Weather Bureau radar displays will not be used directly to vector aircraft around severe weather echoes but will be used to provide the controller with information concerning weather location so that he can vector the aircraft around the adverse weather using the air traffic control radar.

The FAA is presently evaluating the use of AVQ-10 airborne radar systems in the Denver Tower and the Chicago Center. This evaluation is in the early stages insofar as their usefulness in air traffic control is concerned. But there is hope that the AVQ-10 will prove to be of value to controllers in providing improved weather information to pilots at a minimum cost at some of the less busy locations.

In the late fall of this year, the FAA expects to have installed in the Washington Center a modification of the existing radar systems which will permit the display of precipitation areas on the controller's operational display. This will be done through the use of the iso-amplitude contour lines showing the intensity of the precipitation in the area. Hopefully, this will permit controllers to vector aircraft around severe weather areas without reference to anything but their own operational display. Concurrently with this evaluation a technique of superimposing weather data received from the Weather Bureau radar onto the controller's radar operational display will also be evaluated. This technique uses a polar videcon camera to continuously photograph a Weather Bureau display and remote this data to the FAA ATC facility.

As soon as these various techniques can be evaluated, it is planned to install the best of them in ATC facilities as rapidly as resources permit.



FOUR STAR PERFORMANCE

Lt Col Paul L. Smith, 839 Air Div., Sewart AFB, Tenn.

★ THE 314TH TROOP CARRIER WING, Sewart Air Force Base, Tennessee, earlier this year won its fourth successive USAF Flight Safety Plaque. No other unit had ever received more than three in a row. The 314th had over 125,000 accident-free hours at the time of the award.

What's so special about the 314th record? I'm sure a lot of fighter jocks don't think so much of a four-engine transport outfit racking up a mark like this. Well, the 314th is not just a transport wing. It is an assault unit that does things that make safety officers' hair stand on end. For instance?

Well, how about taking our big bird out to a little 80-foot wide, 2500-foot long army dirt strip in the boondocks. Just to make it interesting, let's load a 15,000-pound bulldozer on board and fuel up so we weigh about 120,000 pounds. Now, let's get real dirty and put some 60-foot trees on one end and some power lines on the other. Give up? Not the 314th. They don't like situations like that and they don't do it on a daily basis. Point is, they have done it. And they continue to take that big aluminum overcast in and out of sod and dirt airpatches constantly, delivering men and equipment, weighing as much as 25,000 pounds per load.

If you think stopping a 50-ton aircraft in 2000 feet is strictly on the safe side, you must come take a ride with us some day. Takeoffs often involve clearing a fifty-foot group of trees off the end which requires a bunch of power. Loss of an engine under these conditions gets to be a mighty interesting proposition.

What else? How about setting up a cable stretched four inches off the ground and bringing our big bird down with the aft cargo door open, ramp at the trail position, and catching that cable with a hook which yanks a load out of the cargo compartment. Now, let's foul this up a bit by making that a 15,000-pound cargo. Let's also locate that cable out in a soy bean field where the approach and departure are over trees. No landing field and darn little level ground. It's called ground proximity extraction and that's just where you get—in close proximity to the ground—at 120 knots. Hardly a routine transport operation, but the crews do it daily.

An innovation of this technique involves coming down over an area without hooking a cable. Instead, they just release a chute which then yanks the load out. They've done this one at 15 feet over a snow and ice covered field where a landing could have been disastrous.

Of course we have the new CLOSE LOOK formation procedures. You fly five second in-trail formation at 250 knots down at 300 feet. At the DZ you pop-up to drop altitude and slow down for the troopers to exit. Then back on the deck for escape. Sounds like a fighter bomber action, doesn't it?

All this is meant to show that this isn't a bunch of slow Joe point-to-point airline pilots. Point to point! A crew in this outfit may be in South America this month, Europe the next, and in Asia later on. They average about six months a year on the road and about half of the rest of the time they're dropping troops and equipment for the Army at Pope and Campbell. A well adjusted wife is almost a necessity.

The record they have established is no accident, if you'll forgive an old pun. It goes back to Colonel W. H. DeLacey, now in Portugal, followed by Colonel William Moore, now the 839th Air Division Commander, and currently under the command of Colonel Arthur C. Rush. These men recognized that Safety is a command function and they emphasized it. When your staff knows you're behind the safety program, they get behind it too. When an outfit flies to all parts of the world, is recognized as the leader in assault airlift, and is chosen as the innovator of such items as the extraction systems, the CLOSE LOOK procedures and the assault landings on sod and dirt areas, they have to be good. The 314th is. ☆

PROS ON THE HOSE

The F-106 hit, burst into flames, skidded, and bounced to resting place. Dark areas show fire damage. Pilot was rescued by men in photo below, who stopped fire from spreading and completely destroying aircraft.

Tony Rotondo
Crew Chief

Fred J. Sprouffske
Asst. Fire Chief

Fred Fletcher
Deputy Fire Chief

SMSgt James F. Terrell
NCOIC McChord Fire Dept

TSgt Curtis L. Dunn
NCOIC "A" Shift

It was the second flight of the day for the aircraft, an F-106 assigned to McChord AFB, Wash. The fighter was only 10 hours out of IRAN. The flight was uneventful until moments before touchdown. The subsequent events left the pilot thankful that a team of real pros was standing by to handle just such dangerous emergencies as he was about to experience.

During flare, with the main gear tires only inches off the pavement, the aircraft began to roll to the left, the nose began to rotate upwards and the aircraft veered off the left of the runway. Opposite the 2200-foot point the left wingtip hit the runway shoulder. It continued to drag the ground intermittently until the left main gear touched down.

Now, with the tires on the ground, the aircraft was in a wings level, nose high attitude. It continued this way for a moment then became airborne again until the gear and aft section struck a mound of earth. Now the gear failed and the aft section broke into flames.

As the aircraft started breaking up the nose section broke off causing the canopy to jam closed. When the fighter stopped sliding the pilot, trapped in the cockpit, began to hack away at the canopy with his canopy breaking tool.

Help was quick to arrive. As the '106 was approaching the runway on final, the base fire department was just winding up an emergency involving a C-124 that had landed with engine trouble. Deputy Fire Chief Fred Fletcher was following the transport to the ramp when the F-106 accident occurred.

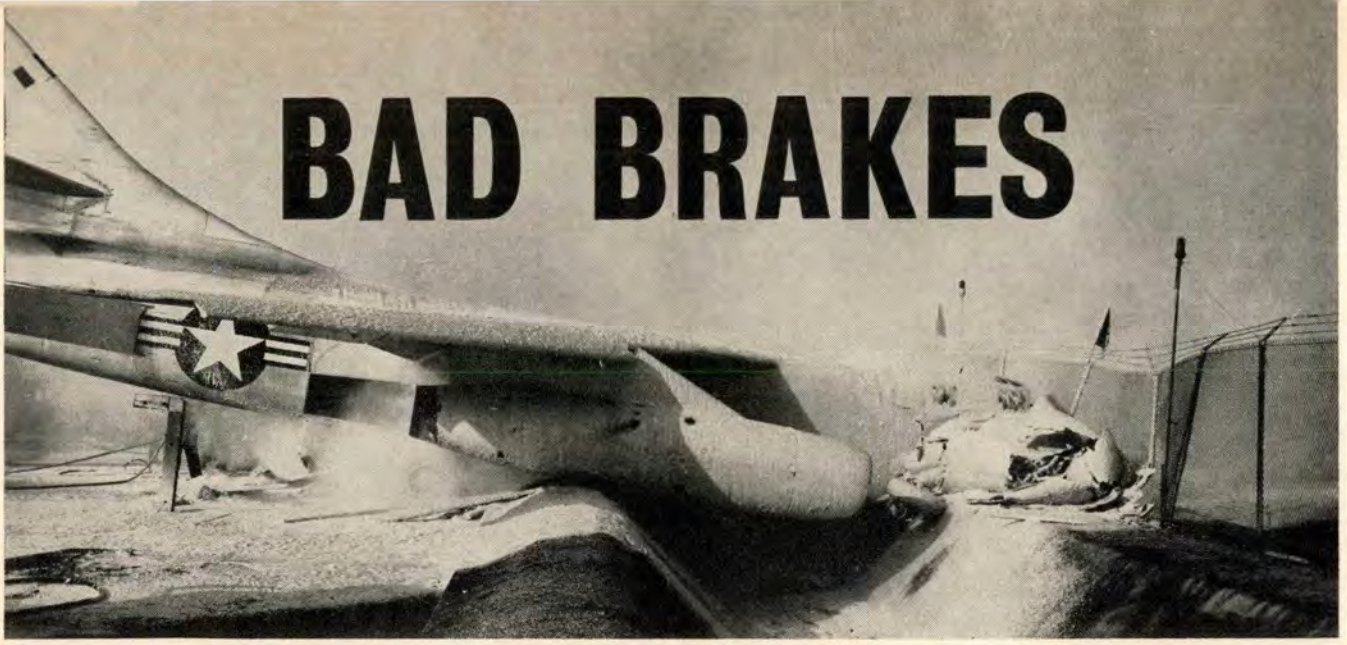
Immediately Fletcher started for the burning fighter, while alerting the fire crash net via radio. He arrived at the scene just after the aircraft stopped sliding. Despite the fire spreading through the aft section and the wings, Fletcher was able to approach the cockpit and attempt to open the canopy. Due to the stress on the fuselage, the canopy had jammed and could not be opened. Fletcher managed to break a small hole in the canopy and assure the pilot that crash firefighting equipment was on the way and would be there in seconds.

Moments later the crash rescue crew, consisting of Assistant Chief Fred J. Sprouffske, SMSgt James F. Terrell, NCOIC of the Fire Department, TSgt Curtis L. Dunn, NCOIC "A" shift, and Crew Chief Tony Rotondo, arrived and broke out the right canopy glass with a sledgehammer. They pulled the pilot free. A doctor had arrived and the pilot was delivered to him, uninjured.

Meanwhile firemen had stopped the spread of the flames which had enveloped the tail section, most of the left wing and forward to the engine intake on the right side.

This prompt action by the McChord firemen typifies the courage of USAF firefighters. When a life is at stake promptness and knowhow are essential. These are acquired to a great extent through training—monotonous, tedious, even hazardous, but necessary training. And, when the chips are down, TRAINING PAYS OFF. ☆

BAD BRAKES



Upon release of brakes and application of power the right wheels would not revolve. More power was applied and the aircraft began a right turn. (A left turn from parking position had been directed by tower). After 360 degrees of turn the aircraft taxied toward takeoff position.

During taxi along the ramp, observers noted that the right outboard wheel would turn about half a turn, then slide a short distance on the ice and snow-covered ramp before turning again. An observer phoned the tower which, in turn, relayed to the pilot the report that the right outboard wheel was not turning, but sliding. The pilot acknowledged this call and the aircraft was seen to stop for a brief period.

Runup was normal, ATC clearance was issued and the aircraft took off. Four minutes after takeoff the pilot reported over the range, on course.

During climb the loadmaster made another engine check and noticed a fire in the right wheelwell. He told the pilot. At this time the loadmaster observed the jump light and heard the alarm bell. The right propeller was feathered and the right engine fire extinguisher discharged. The pilot reported he was returning.

The crew chief reported that the fire was still burning. It became more intense. Flames extended from the wheel well to the horizontal stabilizer. The loadmaster and two passengers bailed out. The aircraft began to break up, rolled inverted and crashed.

This is but one of several disastrous experiences the Air Force has had with hot tires and brakes. The fact that the trend in recent years has been to increase aircraft weight and speed, or both, has tended to aggravate the situation. It's a basic physical fact that when brakes are applied, intentionally or otherwise as was true in the case recounted, there is a buildup of heat. This heat buildup, if excessive, can and does lead to fires and explosions. In this ill-fated case duration of flight was approximately 15 minutes. This is about normal. In other words, an overheated brake-tire assembly can be expected to reach a temperature-pressure peak 15 minutes after last use.

Here's another case, not so disastrous, but it could have been just as fatal had firemen arrived a few seconds earlier and approached the overheated gear assembly. Two landings had been accomplished 35 minutes apart. After the second landing the aircraft was taxied back to the hot spot, parking brake was set and the before-takeoff check completed in preparation for an assault takeoff. After taking the active runway notification was received from the tower that the left wheels appeared to be smoking. The aircraft was cleared to the end and off the runway. No brakes were used except for the final stop. The parking brake was set and the engines shut down after the check pilot verified that the left main wheels were hot and smoking. As the fire truck reached the aircraft the left aft main tire exploded, ripping the inboard landing gear door and fairing and buckling the outboard door. Inspection revealed the brakes of both left wheels had overheated and burned through the tire. The right brakes had heated to the extent that the rubber was blistered around the bead of the tire. Crewmembers reported that the brakes were used normally during the mission and that very little braking action was used after the last landing and during taxi back.

Here's one, no flight involved: During a SAC exercise, B-52s were required to taxi a great distance to the non-optimum runway. A total of seven turns and relatively fast speeds were necessary to meet the timing criteria of the exercise. At completion of the taxiback it was found that two tires had blown on one aircraft, and one tire on a second aircraft. All aircraft were found to have hot brakes with a brake change required on one.

A dragging brake was listed as the prime suspect when a fire broke out on the Nr 7 brake assembly as a C-135 rolled into a parking spot.

And here are some fighter incidents related to brake problems:

- An F-100 left the runway at the 5000-foot point when the brakes failed following touchdown on a night formation landing.

- Another '100, lining up for takeoff, lost braking when the anti-skid was turned off. After recycling, the same thing happened. The mission was aborted and cause of the

brake failure traced to a faulty anti-skid detector.

● Excessive braking at high landing roll speeds was given as the probable cause when the right main gear tire of an F-86 failed shortly after landing on a 10,000-foot runway.

History gives us no indication that overheated brake and tire problems will not be with us in the future. Some materiel changes, e.g., aluminum wheels, frangible plugs and stronger tires are expected to help minimize the hazard. To further lessen the hazard here are some basic tips for all crewmembers:

- Use light braking at high landing roll speeds.
- Steer with feet lowered on rudders so as not to apply inadvertent brake pressure.
- Don't set parking brakes when hot—if necessary, have wheels chocked and release brakes immediately.
- Use reduced power when taxiing.
- Use reverse on normal landings, and as soon as practicable after touchdown in order to achieve maximum deceleration without wheel braking.
- Have maintenance personnel check for dragging brakes if more than normal power is required for taxiing.
- Apply brakes before a turn, then coast through the turn to minimize heat buildup from centrifugal side loads.
- Leave gear down after takeoff to help dissipate heat after successive full stop landings.
- Plan the mission so as to space landings on which brakes will be used.
- Write up all anti-skid and other brake system defects.
- Verify that power is reduced to idle after touchdown.
- Guard against underinflated tires.
- Check for foreign objects becoming lodged in wheel assemblies.
- Pay close attention to signs of scorching, improper adjustment, fluid leaks, abnormal tire wear and wheel binding on walk-around inspections.
- Know and comply with your Dash One recommended procedures. ☆

Ask AND YOU SHALL RECEIVE

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

EVER BEEN FLYING ALONG, everything fine, then for some reason you can't quite identify, the weather picture doesn't look right? Everyone has, at one time or another.

In such cases you can: 1. Do nothing, and wait and see what happens. 2. Ask, and know what is going on.

Safety demands the second of these two alternatives. Surprises, particularly when flying an airplane in weather, can be dangerous.

Following are two examples: "I was going to turn around, but the weather could have been VFR over the check point." This statement was made by a crewmember in a flight of four that almost followed their leader, who fatally crashed. The weather had been forecast to be VFR but enroute the ceiling lowered and the rain came. All aircraft, in string formation, began to descend to remain VFR—even below the lowest altitude established for the mission. At the checkpoint three aircraft broke off, changed to IFR and went home. Evidently the leader continued to descend and crashed into a cloud covered hill. Signs were ignored. The forecast was not good, and it was not questioned when obviously it had busted.

A flight of T-33's were in the local area for a fine VFR flying day. Blowing dust was noted by the pilots but no questions were asked of the tower or PFSV. A weather advisory for gusty winds and blowing dust had been issued but someone failed to call the airborne aircraft. During a hasty approach one T-bird crashed because of turbulence and poor visibility. Again the obvious was ignored. An alternate could have been reached, or the flight could have landed earlier.

As all experienced pilots have learned, conditions encountered may frequently differ from those forecast either for the good or for the bad. And whenever conditions differ, especially on the bad side, questions should be asked. Answers are available from the following resources:

- PFSV. By using 344.6 pilots can talk directly with USAF forecasters and receive enroute and terminal forecasts. The US Navy has a few UHF facilities. Most are on 344.6, but check the Enroute Supplement to make sure. The US Army has some UHF and VHF facilities. Check the flight supplements for correct frequencies.
- PTFS. (Pilot to forecaster service). The USWB in conjunction with FAA operates two pilot-to-forecaster facilities in the U. S. The Kansas City frequency is 122.6 and the other, at Washington, D. C., uses the same frequency. The Kansas City facility has been modified so that certain FSSs are connected to it by landlines. Requests can be handled through FSS direct to forecaster on FSS frequencies 134.9, 122.1, 126.7, or 255.4.
- FSS. FAA operated Flight Service Stations can provide weather observations and interpret forecasts issued by the USWB. They also can provide latest information on weather advisories and radar reports. FAA personnel have been trained as weather briefers by the USWB.
- Transcribed Weather Broadcasts. Simply by monitoring VOR at 15 minutes and 45 minutes after the hours, the weather observations can be obtained for nearby airfields. SIGMETS and advisories to light aircraft will also be broadcast on VOR. At overseas locations, selected radio beacons also broadcast weather at +15 and +45. In addition, as listed in Section III, FLIP, terminal reports and forecasts are broadcast every hour on selected HF frequencies.
- If these three sources cannot be contacted, then as a last resort ask ARTC. Normally, however, they do not have all the information you need and may have to ask for it from the local WB or FSS.

The point we want to make is that a service is available. It should be used and used frequently. Watch the weather—if the situation differs from forecast— ASK! ☆

Aerobits

SERIOUS SMOKING HAZARD. During climbout the B-47 aircraft commander lit a cigarette. Oxygen setting was 100 per cent, emergency on. No problems were encountered until he leaned forward, bringing the lighted cigarette into the stream of oxygen. The cigarette flared, the paper flamed and immediately thereafter the oxygen mask became a torch with the flame occurring just outside the mask. In order to remove the mask the pilot had to hold it with one hand while removing the chin strap with the other. He pulled off both the mask and his helmet and clamped the hose about halfway in order to shut off the flow of oxygen. Only after he had done this was he able to turn off the regulator. All flame subsided after the oxygen supply was cut off. The aircraft commander received second degree burns on the thumb and right wrist and first degree burns on the left wrist and right index finger.

T-STORM TIPS—The following statements concerning aircraft operations in and around thunderstorms are extracted from data gathered by the National Severe Storms Research Project:

- Severe turbulent conditions (u_{de} = 35-50 fps) can be encountered at some point in any thunderstorm.
- In a growing thunderstorm or large thunderstorms, extreme turbulence (u_{de} > 50 fps) can be expected to be present in some part of the storm.
- It is not uncommon to encounter turbulence in the clear air near a thunderstorm or a squall line.
- Turbulence has been found to increase with altitude up to at least 5000 feet below the top of the visible cloud, and some records show possible severe turbulence even immediately above the storm cloud.
- Hail of some size is present in practically all thunderstorms.
- Current-day airborne radar is not adequate for penetration of storms.
- There is a danger in overflying growing thunderstorms. Vertical growth rates exceeding 5000 feet a minute are not uncommon.
- For current and future supersonic aircraft, water erosion and water-impact forces at altitudes above 30,000 feet may be of serious concern.

Hq Air Weather Service

B-52 STARTER DISINTEGRATION—An excellent job of airmanship was demonstrated recently when an engine starter disintegrated during the takeoff roll. No discrepancies were noted during the preflight, and the engines were started for what was planned to be a routine combat crew training mission. Taxi and takeoff were made with no abnormal indications until at 125 knots on the takeoff roll, Nr 7 engine fire warning light illuminated. (This was later determined to be due to starter disintegration.)

Engine instruments were rechecked but no abnormal indications were noted. Due to a long takeoff roll caused by slush on the runway, no attempt was made to retard the throttle. The aircraft was accelerated to 180 knots for flap retraction before Nr 7 throttle was retarded. As flap retraction was started, Nr 8 fire warning light illuminated.

The pilot was then flying the airplane

on instruments in weather (600 feet overcast). He was advised by the pilot in the IP position that there were visible flames on Nr 4 pod. Engines 7 and 8 were shut down and the aircraft was climbed through the overcast.

Visible fire continued inside the pod for another 10 minutes. When all evidence of fire was gone, circuit breakers were reset to obtain fuel flow indications on the remaining engines.

After five hours of flight, Nr 3 engine oil pressure dropped to zero with excessive EGT and the engine was shut down.

The AGM 28 missile engines were operated at maximum continuous thrust to compensate for the three aircraft engines that were shut down, and the aircraft was flown to an alternate SAC base where an uneventful landing was made.

Excellent airmanship and crew coordination enabled this pilot and his crew to cope with the inflight emergencies under low ceiling conditions and safely recover this aircraft to fly again.

Lt Col David J. Schmidt
Directorate of Aerospace Safety

NEW SAFETY AWARD ESTABLISHED. Air Force Missile Development Center, Holloman AFB, has established the AFMDC "Outstanding Flying Safety Award." The award is given in recognition of outstanding flying safety records by individuals who have had no major or minor aircraft accidents (pilot attributed). Eligibility for the award is based on total accident free flying time and a minimum of 12 months flying AFMDC aircraft. First recipient was Major Richard A. Eicholz for 20 years of accident free flying in which he amassed 10,539 hours.

ENROUTE JET PENETRATION PROCEDURES. A recent Operational Hazard Report cited that enroute penetration instructions were received which descended a T-33 aircraft to 5000 feet approximately 35 miles from the air base of intended landing. The pilot filing the OHR considered this a hazardous operation had the fuel supply been short. In reply to the OHR it was pointed out that enroute jet penetration procedures are established and utilized to expedite arrival at terminal areas. They may be refused by the pilot if he desires to continue at altitude and use a published high altitude approach procedure. Pilots accepting an enroute jet penetration procedure are responsible for assuring that adequate fuel is available for the type of penetration planned or accepted.

Harrie D. Riley
Directorate of Aerospace Safety

HOT FLYING BUCKETS—During the first six months of this year, 71 turbine wheel bucket failures were reported and 111 others were found cracked in B-47 engines.

In nearly all cases, throttle vibration gave the first indication that any malfunction or failure had occurred. Similarly, in most cases a large piece of the turbine wheel bucket was fired out the tail portion of the engine leaving a gaping hole.

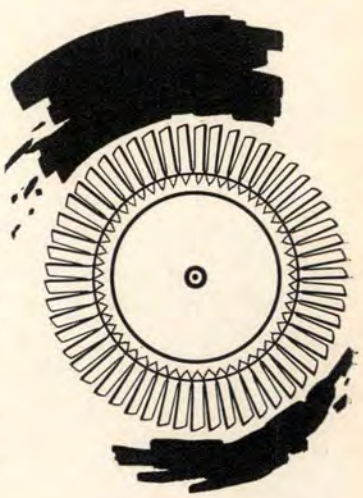
Fortunately for the crews flying these airplanes, no major damage occurred and only aircraft incidents were reported.

Numerous articles have been written on this subject, but the recent increase in bucket failures causes this writer concern over the future safety of this airplane.

Engine manufacturers and depot engine specialists long ago stated that thermal shock during starting and prolonged high operating temperatures within limits are the reasons for T-wheel bucket failures.

It is understandable that high temperatures (within limits) will be attained during certain phases of a mission, however, there are times when the pilot can contribute considerably to engine longevity.

Starting: Carefully watch EGT gages to prevent over-temperature, particularly during alert starts. If there is a chance the



Aerobits

temperature was exceeded, record it in the Form 781.

Climb: Don't be too demanding of the engine unless a critical need for power exists.

Refueling: We know it is impossible to have the eyeballs on EGT gages and the tanker at the same time with only one set of EGT gages, so try not to make rapid throttle bursts. Refueling behind the KC-135 demands higher power from the B-47 to attain and maintain contact, so naturally higher temperatures will be attained.

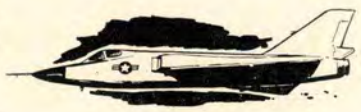
If any question exists and the probability or possibility of an overtemp was attained, write it up in the Form 781. This is about the best insurance you have as a pilot of preventing a hot turbine bucket from separating and flying through a control cable or fuel tank.

Lt Col David J. Schmidt
Directorate of Aerospace Safety

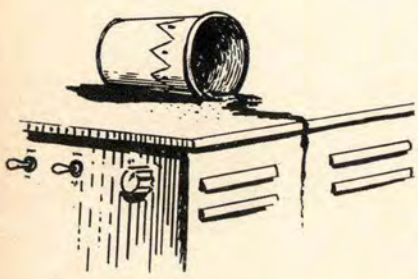
THE 40-DEGREE TACAN ERROR—Here's an OHR that gives an example of the 40-degree out-of-phase error that Safety of Flight Supplements warn about:

Inbound to Sausalito VORTAC, the mag bearing indicator registered 052 degrees. At 186 miles the DME locked on and the Nr 1 needle (TACAN) swung and locked onto a mag bearing of 012 degrees. The VOR remained on 052 degrees. The ID 250 could be rotated through 360 degrees and the CDI would remain centered. No OFF flags appeared. At 75 miles DME the TACAN was channeled to Oakland. It locked on 070 degrees (proper bearing). It was then switched back to Sausalito TACAN and it locked on 052 degrees. Operation appeared to be normal. It remained normal until the aircraft passed directly over the TACAN station, then it locked on 40 degrees off the outbound track, left of the tail. It remained there until Crockett when the pilot switched to Travis. It then locked on the Travis TACAN 40 degrees left of the actual inbound track and remained 40 degrees in error during the remainder of the approach.

WELL DONE RECIPIENT GETS VALOR AWARD. Captain Joseph B. Chiodo, Jr., 438 Ftr Intcp Sq, Kincheloe AFB, Mich, has been awarded the Aviator's Valor Award. Captain Chiodo was named the 1963 recipient of the award for his courageous and professional handling of a severe and unusual malfunction in the elevator control of his F-106 during a flight over Canadian bush country. The award is presented by American Legion Post Nr 743 of New York City to a living member of the Air Force for a conspicuous act of valor or courage performed during an aerial flight in or out of combat.



Captain Chiodo received the Air Force's Well Done award in December, 1963, for this flight.



COFFEE: HAZARDS AND COSTS—From the Trans Canada Airlines publication, The Grapevine, comes the following:

"Several items in the Grapevine over the past years have mentioned instances of unit contamination by spilled coffee. The units have ranged from oxygen regulators through radio tuning units to—most recently—DC8 autopilot controller units. There have even been instances of coffee spills on Viscount radar indicator units.

"Replacement and cleaning of these units costs a lot of money. Spills also create real hazards: shock, failure of a critical navigation unit, loss of a safety system, fire, smoke. Sudden turbulence, etc., make some of these spills unavoidable. Many of them, though, would appear to be carelessness. Most can be avoided by using the coffee cup holders, which are installed in all aircraft types, and a gentle suggestion to the flight attendant that the cups not be over-filled."

Good advice for USAF crews, too. ☆

WELL DONE

CAPTAIN ROBERT E. HANEY

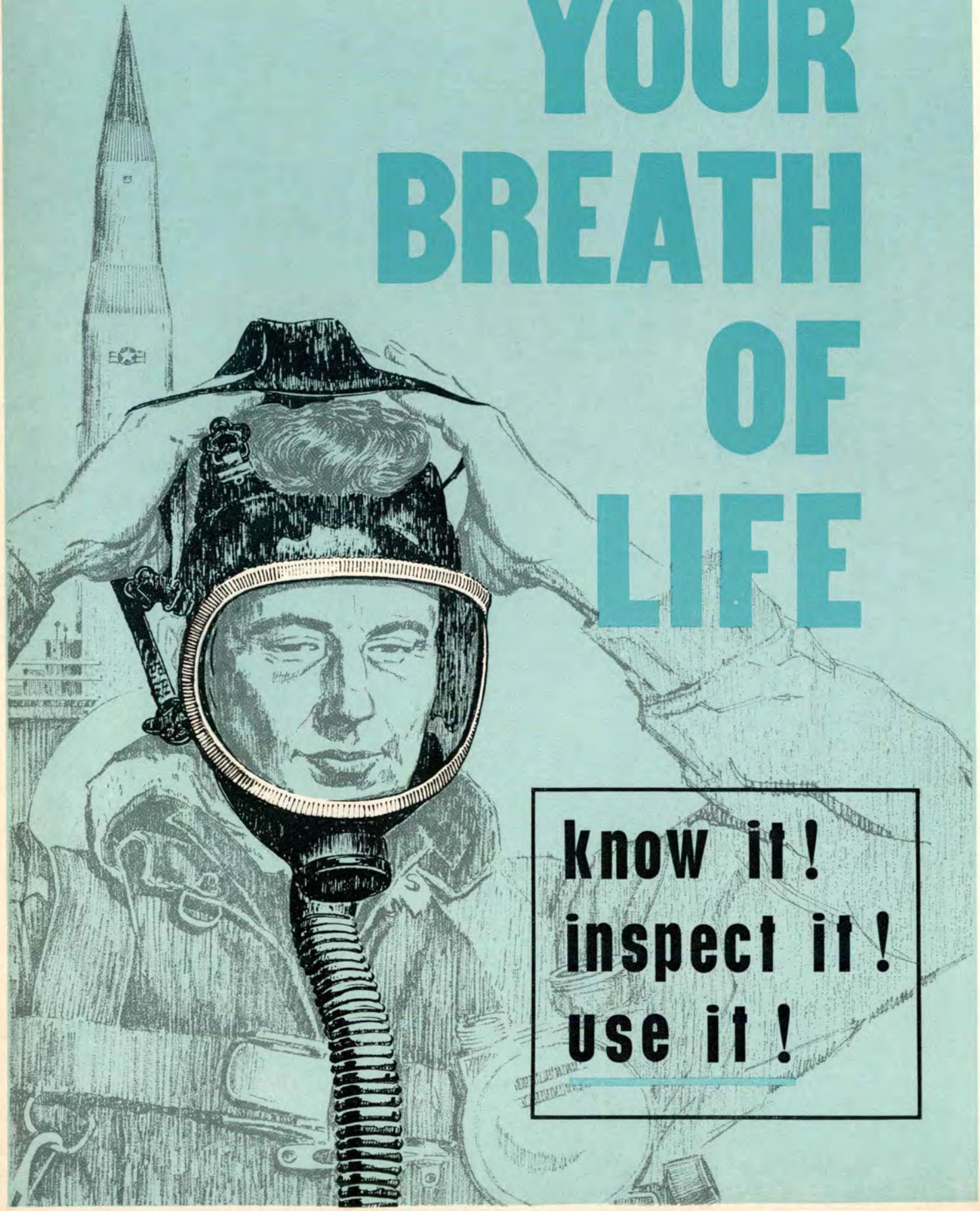
366 TACTICAL FIGHTER WING, HOLLOMAN AFB, NEW MEXICO

Captain Haney was on a routine, periodic inspection test hop in an F-84F. The takeoff and initial portion of the flight were uneventful as he went through the checklist, testing one system after another. As he raised the landing gear after completing a low airspeed controllability check, the control stick snapped violently forward. Before he could get his hand back on it, the stick snapped back toward him and stopped. In the short seconds that this took place, Captain Haney realized that he was perilously close to minimum control speed and that if the stabilator jammed in the nose-up position, his aircraft would be out of control. The stabilator was jammed in a position which would permit level flight at 180 knots. Captain Haney called another pilot who was in the area and had him look the aircraft over. Nothing appeared damaged, but movement of the stabilator was limited to little more than one inch up and down.

Captain Haney maintained 23,000 feet and flew a simulated landing pattern. He found that he was able to control the descent through careful use of power and the very limited movement of the stabilator. Once he determined that the F-84 was controllable during landing approach, he descended to the field and made a long, straight-in approach and perfect landing. The stabilator control rod was found to be broken loose near the mechanical advantage shifter.

Through calm and professional analysis of a serious problem, and careful evaluation of the controllability of the aircraft before committing himself to a landing, Captain Haney saved the Air Force a valuable fighter aircraft. Well Done!

YOUR BREATH OF LIFE



know it!
inspect it!
use it!

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