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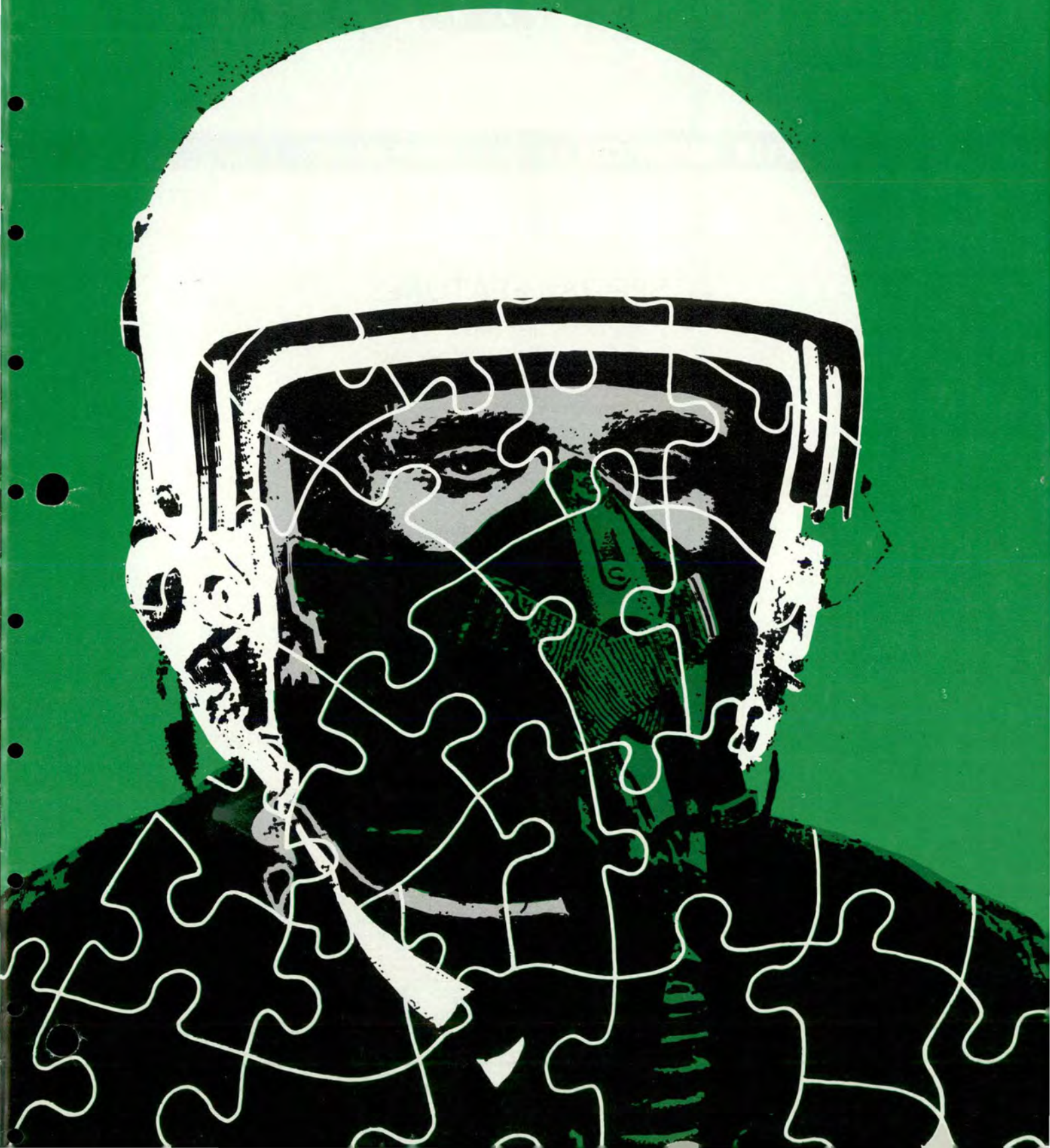

UNITED STATES AIR FORCE

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AUGUST 1976

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SPECIAL FEATURES

REGULAR FEATURES

DEPARTMENT OF THE AIR FORCE • THE INSPECTOR GENERAL, USAF

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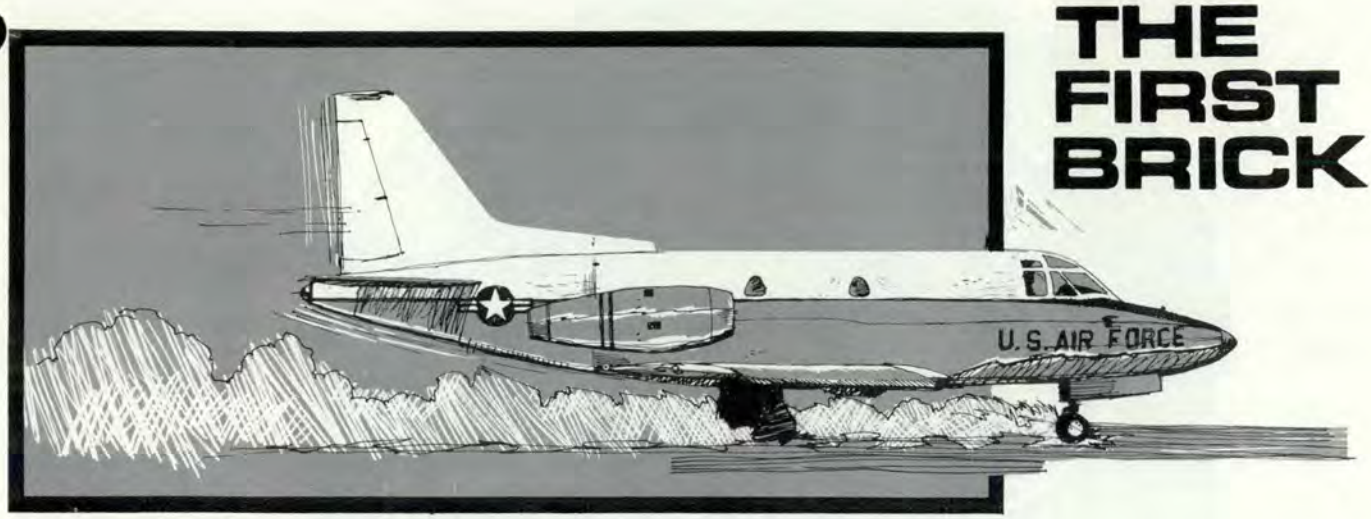
AUGUST 1976 AFPR 127-2 VOLUME 32 NUMBER 8

FEAR OF THE FIRST BRICK



LT COL JIM LEARMONTH
Directorate of Aerospace Safety

"There is nothing more useless than the altitude above you, the runway behind you, and the fuel you don't have." The runway behind you and what *you* have allowed to happen while it was getting behind you is what I'm concerned about.

During the last year, I've become more familiar with and concerned about landing and rollout problems as they relate to the T-39. We continue to learn more about T-39 hydroplaning, and almost any meeting of T-39 pilots now includes another pronouncement on landing and stopping (some of questionable validity!), followed by a heated discussion. We have heard proposals of thrust reversers, antiskid brakes, drag chutes, ad nauseum. I would like to add some light to the discussion without adding any heat.

The three important phases of landing on a wet runway are: landing, braking and directional control. But first, plan the approach. Plan to land on the runway most nearly aligned with the surface wind. Calculate the correct final approach (minimum run) speed and fly it to the planned touchdown point. Now relax. Let's look at the problem remaining. Once on the ground, the important relative values are: RCR, runway length (in front of you), runway direction, and ground speed. Let's take a specific example: 2000 feet pressure altitude, 30 degrees C temperature, 15,000 pounds gross weight, no wind, RCR 10. The optimum braking, flaps down, S/B open is 4150 feet ground roll. Now that's not bad, but we can't all use optimum braking. Even 50 percent of optimum should give us an 8300-foot ground roll. This should be no problem on a 10,000-foot runway. You notice I'm speaking of ground roll, for the problem is strictly a ground speed problem. If you have executed a good minimum roll/wet or slippery runway landing, you are as near the approach end of the runway as possible at between 95-100 knots ground speed.

The next problem is maintaining the aircraft on the same ground track as the runway while it decelerates to taxiing speed, *using the entire runway length.* Your anxiety to stop the aircraft can become your greatest enemy during the landing rollout. Directional control is difficult in wet runway conditions and almost impossible with one or more blown tires. Structural damage to the aircraft is almost a certainty when the airplane leaves the hard surface traveling sideways. Going straight ahead off the end of the runway at moderate speed is by far the lesser of two evils.

Let's review the technique which I've proposed.

1. Land on speed as near the end of the runway as possible. That fits the title, "USE THE FIRST BRICK," but be sure to also use good judgment and don't take a chance on landing short.

2. Use the entire runway and moderate braking effort to stop.

3. If it becomes obvious the aircraft is not going to stop, maintain directional control and ride it out straight ahead (unless there is some overriding consideration).

Maybe in the future we will see incident reports that end like this 1971 mishap at Wiesbaden, Germany, ". . . braking action remained zero until 1500 feet from end of runway. At that point, braking became sporadic and the aircraft began to fishtail. The pilot decided he would be unable to stop safely on the available runway. He straightened the aircraft out and allowed it to roll 375 feet into the sod overrun where it stopped *undamaged.*" AND USE THE LAST BRICK TOO. ★

SO NOW YOU'RE AN INSTRUCTOR PILOT!

MAJ DONALD E. YARBROUGH
4018th Combat Crew
Training Squadron
Carswell AFB TX

Second In A Series

So now you're an instructor pilot! You've completed all the tests, passed your check ride, and been certified by your commander. Your prestige has just jumped up a notch or two, and you're probably well satisfied with your accomplishment. Rightly so. However, are you aware that your chances of becoming an accident statistic have increased along with your status?

"Why," you ask? "I'm more proficient, more knowledgeable and more qualified than ever before. I should be less likely to be involved in an accident."

You're right, you should be safer than the average bear, but the statistics show that isn't the case. IP's have their own special place in the accident stats. They experience an

accident rate out of proportion to their numbers. For a lot of reasons, you could be another instructor-involved accident just waiting to happen.

"Oh yeah, you're going to tell me about increased exposure and all that. I've read about how instructors are exposed more often and for longer periods of time to the more hazardous phases of flight than anyone else. That must be what you're driving at."

Well, yes, increased exposure is one of the things I had in mind.

There are several others, too, if you're interested?

"Go ahead, over."

Thought you'd never ask. You see there are a number of hazards that an instructor must live with that don't affect the average crew dog. There are others that affect both, but are felt by the instructor in a different way. It's these hazards that are peculiar to the IP's task that you need to know about. They have been discovered the hard way by your instructor and his instructor and his instructor before that.

You've already mentioned exposure. Along with increased exposure goes *fatigue*. Fatigue brought on by an instructor's constant high level of physical and mental activity is the particular kind of fatigue I'm talking about. The instructor pilot on board any aircraft feels responsible not only for his activity but for the actions of everyone else as well. He must be constantly paying attention to the actions of the student and all the while making sure that essential tasks are performed correctly. The stress brought on by increased activity causes the instructor to become fatigued faster than anyone else on board.

You're aware, of course, of how fatigue can have an adverse effect on one's judgment, perception and reaction time. Here's our IP on final approach at the end of a six hour post-pro: He's thirsty, hungry and his bladder is about to burst. His


FATIGUE

students have been in and out of the seat for relief a couple of times or more, but not our IP. He's been too busy minding the store and keeping the whole ball of wax together. Think about it.

Then there is a special hazard I like to call the *Student Syndrome.*


STUDENT SYNDROME

It's a fancy label for a type of mental set experienced by a student when he's flying with an IP. He tends to depend on the oldhead IP to make, or at least review, the decisions that are made. He will sometimes do things with the airplane that he would never do if he weren't "backed up" by the IP. His decision making process is almost always altered by your presence. He nearly always considers what he thinks you want before he reaches a decision on anything. All this flip flop thinking takes time. Here he is closing on the tanker: *Damn, I've never closed this fast before, but my IP doesn't seem to be worried.* Meanwhile, our IP thinks: *Looks like a high rate of closure to me, but I'll wait a little longer to see if he corrects.* Think about it.

Complacency is a tender trap that has killed many aviators, but it has a special meaning for instructor pilots. It's the root of that old saw, "It's the good student that will kill you." You can be lulled into complacency by a pilot who has been showing you a flawless performance. You may forget why you are on board. It can be a temporary, but fatal, memory lapse. Think about it.


COMPLACENCY

Most of the time while you are flying as an instructor you will really just be watching. The other guy will be moving the controls. It is possible for him during critical phases of flight to make control inputs so quickly and so wrongly that recovery actions, even if initiated as quickly as is humanly possible, may not be soon enough to avert disaster. This is a *control environment* that you live in as an instructor. Guard the controls, expect that other guy to make mistakes with them, and take the airplane at the first sign of a deteriorating control environment. Consider, also, that each time you change students the control environment will change. You must adapt to that change. Adapting is stress on you. The more frequent the change the greater the stress. Think about it.

Overzealousness has taken its toll of eager young instructors. They want to do such a fine job, are so concerned that their student gets the full benefit of their expertise, that they completely overlook routine actions. Here's the overzealous instructor: He's talking his pilot through one of the best ILS finals the world has ever seen. Right on glide slope, the VVI is painted on, power changes are minute. He is

giving verbal encouragement and is reenforcing the learning process of the student by earned praise in the best possible manner. The only thing wrong is our instructor has forgotten to put the rollers out! Think about it.

Pressure is one of the seldom mentioned items that can start you down the primrose path. Real or imagined, it makes no difference. It makes you do things you wouldn't

ordinarily do. It can come from many directions to force you into a coffin corner. From scheduling: "Get this guy his night heavyweight or you're going to be pulling alert for him next Thursday." From the command post: "The DO wants you to try those flaps a few more times because he thinks it's an electrical problem and not a jammed segment." From the student: "Isn't the weather good enough for just one more approach, sir? I need it to finish my upgrade requirements." From yourself: *I've got to show this guy the superb skill that makes me an IP.* Think about it.

After a year or so of instructing you might feel like you've seen and done it all. You've had your share of hairy recoveries, you've seen all of the mistakes the students make time and time again. Because of your frequent flights as an IP you have honed your flying skills to a

razor's edge. You take great pride in demonstrating aerial maneuvers with flawless precision. There is still one little hazard that may trip you. OVERCONFIDENCE. Think about it.

Up to now I've been busy giving a lot of reasons why instructor pilots are involved in more than their share of accidents. Really, though, these things don't *cause* the pilot error accident that I'm talking about. The accident in which the instructor and student let a flyable machine make unscheduled ground contact is caused by DISTRACTION. All the things I've talked about so far are only some of the many ways an instructor pilot can become distracted. Distracted from what? From flying the airplane, of course.

Now, there is another aspect of flying and flying accidents that you might consider. It deals with a characteristic of humans called emulation. By that I mean that some of your attitudes will rub off on your students. Your attitudes toward professionalism, safety, and air discipline are particularly important for your student's continued safety. If you, by word or deed, show him that rules are made to be broken, that attitudes of "safety first" are to be sneered at, or that bravado is a substitute for disciplined airmanship, you may be setting him up for disaster at some point in the future.

Keep It All Together

The more impressive and liked you are as an instructor the more likely your students are to acquire your attitudes. Probably, no one will come back to you with an accusing finger after a former student of yours bites the dust, but you'll have to sleep nights, won't you? You'll be asking yourself questions like these: "Did I teach him everything I could in the time I had available?" "Was he emulating me and my attitudes towards safety, discipline, and airmanship when he crashed?" Think about it.

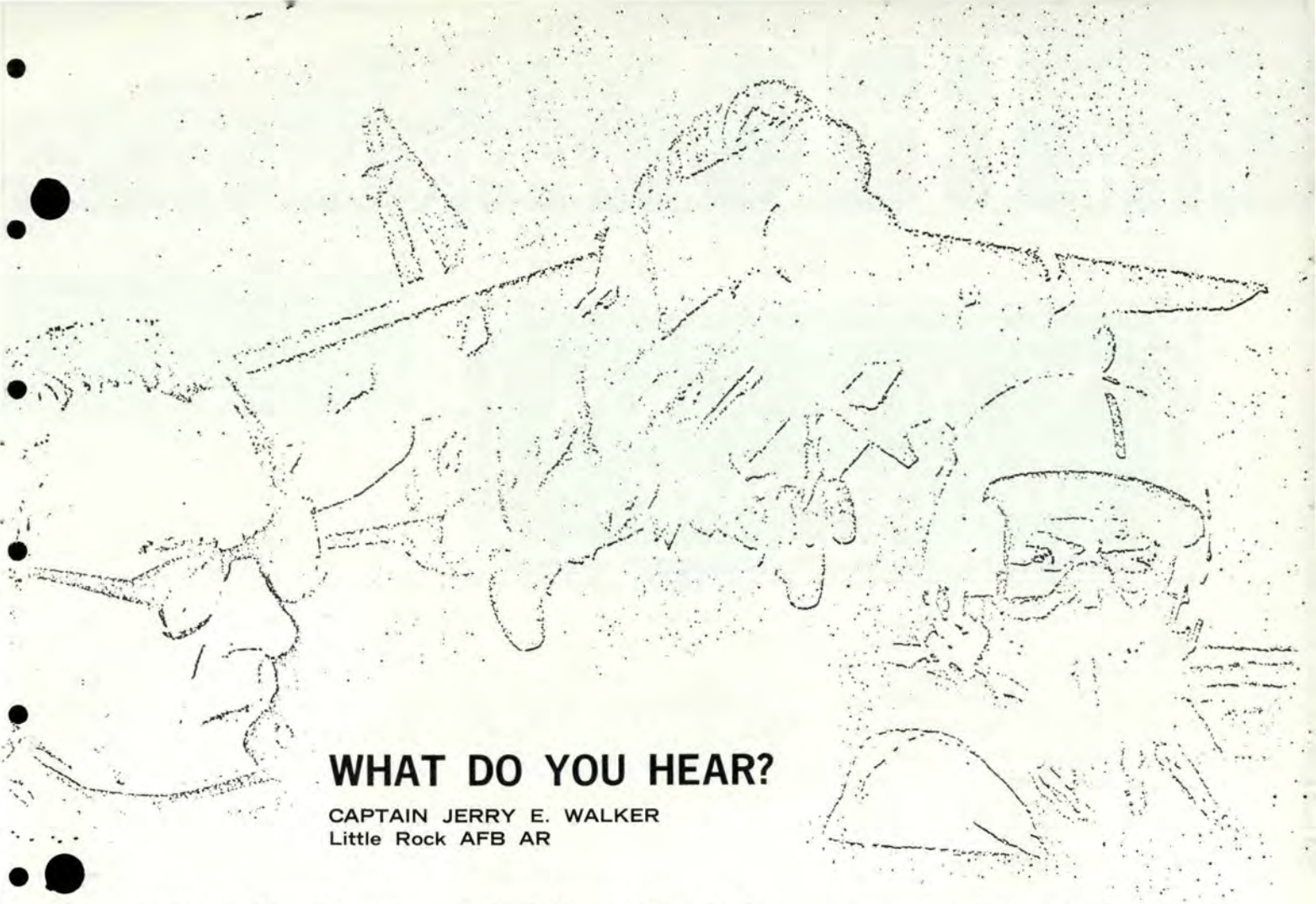
I don't have all the answers for you. I don't suppose anyone has. I do, however, have a few broad guidelines that I think will improve your chances of collecting your retirement.

- AVOID SURPRISES.
- FLY ONLY AIRWORTHY EQUIPMENT.
- KNOW YOUR PROCEDURES, AND INSIST THAT EVERYONE YOU FLY WITH KNOWS HIS.
- AVOID THE PITFALLS THAT LEAD TO DISTRACTION.
- FLY THE AIRPLANE.

THINK ABOUT IT. ★

ABOUT THE AUTHOR

Major Yarbrough has logged almost 5,000 total flying hours, most of it in the B-52. In 1967-68 he was assigned to the 1st Air Commando Squadron, Pleiku RVN, where he flew 211 missions in the A1E, Skyraider. His B-52 time includes over 1700 B-52 hours as an in the units, at CCTS, and in CINCSAC. Major Yarbrough will voluntarily retire from the Air Force 31 August 1976.



WHAT DO YOU HEAR?

CAPTAIN JERRY E. WALKER
Little Rock AFB AR

Investigation of a Hazard Report concerning approach clearance confusion indicates the need for greater pilot awareness.

An aircraft was cleared during letdown for an ILS approach. The weather at destination was 700' ceiling with 6 miles visibility. The pilot was subsequently notified by Approach Control that the ILS was out of service, so he requested a PAR. Several minutes later Approach replied, "Callsign, say you'll take an NDB." The pilot replied, "Roger, request PAR if available."

When the pilot said "roger" the approach controller wrote NDB on his strip and then cleared the pilot for a PAR approach. Approach Control passed the aircraft to GCA as an NDB approach. The pilot requested and received "Lost [illegible]nm" and "Missed Approach" instructions from GCA. This action further led him to believe that he was receiving a PAR.

At the radar final approach fix the GCA controller made the required gear check and advised the pilot that glide path advisories would not be provided. The pilot continued on his last assigned heading and altitude.

The GCA controller advised the pilot that he was well left of course and asked if visual contact had been made with the runway. The pilot made a negative reply and the GCA controller requested that missed approach procedures be executed. The pilot replied that he was on a PAR; he probably thought that he would receive instructions at any moment. The aircraft proceeded off the PAR scope and GCA cleared the pilot to land. When the pilot flew past the airfield, the senior GCA controller took charge and directed a missed approach. The elapsed time between the initial request for missed approach and the initiation by the pilot was one and one-half minutes. The fact that the pilot continued on last assigned altitude probably averted a disaster.

This incident highlights the philosophy that accidents are the result of a chain of errors.

The approach controller erred in passing the pilot off to GCA as an NDB when in fact the pilot had been cleared for a PAR. The GCA controller erred in not positively directing the pilot to execute missed approach instructions when it was evident that the pilot was not conforming to any published approach. The pilot erred when he complacently continued an approach after receiving numerous radio calls that should have caused some doubt as to the validity of the approach.

In conclusion, listen for what is said and not what you want to hear. ★

THE IFC APPROACH

Do You Know The Answer??

A look at our recent articles reveals that it has been awhile since we have had a quiz. The following are queries that we have received from the likes of ya'll. If all the questions are easily answered by you, congratulations, we hope that you are sharing your knowledge with others. On the other hand, guessing at the answers may indicate some basic gray areas and the need to get back into the books. The correct answers are listed on page 27.

1. After landing at a military aerodrome you should confirm the closing of your flight plan by:

a. Contacting Tower while taxiing down the active runway.

b. Contacting Ground Control or Base Operations while taxiing to the ramp.

c. No transmission required. Flight plan is automatically closed upon landing.

d. Either a. or b.

2. Assume you are on a stopover flight plan at a civilian aerodrome. As soon as practical after takeoff you must:

a. Contact departure control to activate your flight plan.

b. Notify the tie-in flight service station of your departure time.

c. Expect the departure time to be passed to flight service by the Tower.

d. None of the above.

3. Normally an aircraft having the right of way will maintain its course and speed. However, if the danger of collision exists, you must:

a. Maintain course and airspeed.

b. Reduce airspeed and give way to the right.

c. Reduce airspeed and descend in order to provide adequate vertical separation.

d. Take whatever action is necessary to avoid collision.

4. A radar approach (PAR/ASR) is considered a published instrument approach procedure provided:

a. Radar minimums are published in the FLIP.

b. If not operating in the PCA, aircraft position can be established within 25 miles of the terminal radar by use of a NAVAID.

c. Published minimums are at least 300 and 1 for ASR, 100 and ¼ for PAR.

d. Both a. and b.

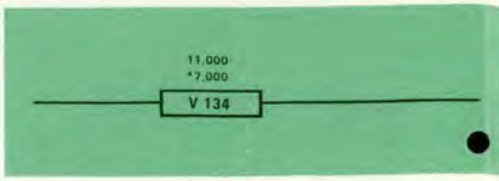


FIG. 1

5. Which of the following statements is true concerning a stopover flight plan:

a. The "route of flight" blocks must be filled out for each leg.

b. A void time is a mandatory entry in the remarks section of the DD Form 175.

c. Enroute changes in destination not reflected on the original flight plan are authorized without refiling a DD Form 175 provided clearance is obtained from ARTC and flight service is notified.

d. All the above.

6. You wish to use King AFB as an alternate. Ceiling and visibility requirements should be:

a. Ceiling of at least 1500 feet or 1000 feet above the published minimum, whichever is higher, and a prevailing visibility of at least 3 miles.

b. Ceiling of at least 1000 feet or 500 feet above the published minimum, whichever is higher, and visibility of at least 2 miles or 1 mile above published minimum, whichever is higher.

c. Ceiling of at least 1500 feet or 1000 feet above the published minimum, whichever is higher, and visibility of at least 2 miles or 1 mile above the published minimum whichever is higher.

d. None of the above.

By the USAF Instrument Flight Center
Randolph AFB, Texas 78148

7. US En route low altitude charts provide MEA information above the airway identification block. An MOCA (Minimum Obstruction Clearance Altitude) is sometimes shown directly below the MEA and is identified by an asterisk (See Fig 1). The designation of an MOCA indicates:

a. A higher MEA is required to insure positive NAVAID signal reception.

b. ATC may clear you below MEA but not below MOCA provided the assigned altitude is at least 300 feet above the floor of controlled airspace.

c. Descent below MEA in a radar environment is possible only if you are being radar vectored and have been issued lost communication instructions.

d. Descent below MEA in a non-radar environment is possible only if you are within 22 NM of a VOR, VORTAC, TACAN.

e. All of the above.

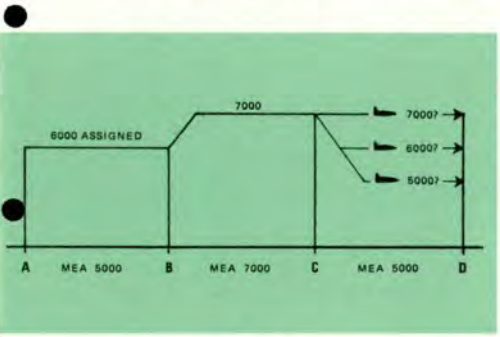


FIG. 2

8. Your last assigned altitude is 6000 feet. You are in the weather and lose communications just after point A (Figure 2). You climb to 7000 feet at point B because of the MEA. What altitude should you fly from C to D?

a. Continue from point C to D at 7000.

b. Descend to 6000 (last assigned) at point C.

c. Descend to the MEA (5000 feet) at point C.

9. During a radar approach, lost communications instructions will be issued:

a. By military controllers only.

b. When weather conditions indicate that IFR conditions will be encountered during the approach.

c. Prior to reaching the final approach fix.

d. Only when requested by the pilot.

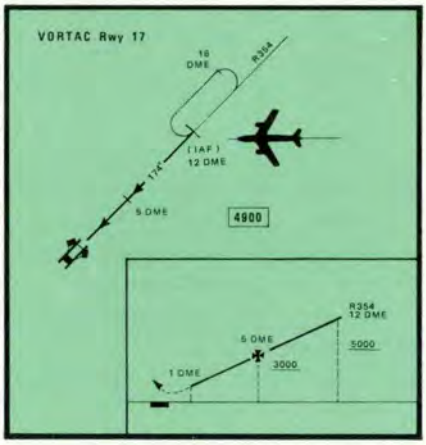


FIG. 3

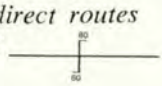
10. You are being radar vectored to the low altitude IAF at 6000 feet and subsequently cleared for the VORTAC Rwy 17 approach (See Figure 8). Upon reaching the IAF at 12 DME you should:

a. Maintain your last assigned altitude (6000 feet) until established on a segment of a published routing or instrument approach procedure. Then fly the approach as published.

b. Turn immediately in the shorter direction to intercept the inbound course.

c. Start a descent to 3000 when the aircraft is abeam or past the IAF and on a parallel or intercept heading to the inbound course.

d. Both b. and c.

11. Changeover Points are used on all federal airways, jet routes, area navigation routes and direct routes with MEAs. A symbol  *is used on FLIP charts to indicate where you should change to the NAVAID ahead for course guidance. If the symbol is not depicted, the changeover point is:*

a. Midway between the navigation facilities for straight route segments.

b. At the interception of radials or courses when the routing forms a dogleg.

c. Not required for route/airway segments less than 40 NM in length.

d. Both a. and b.

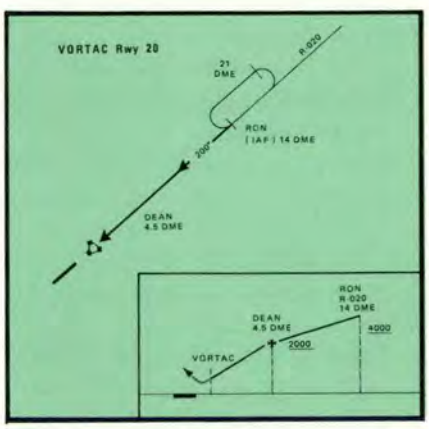


FIG. 4

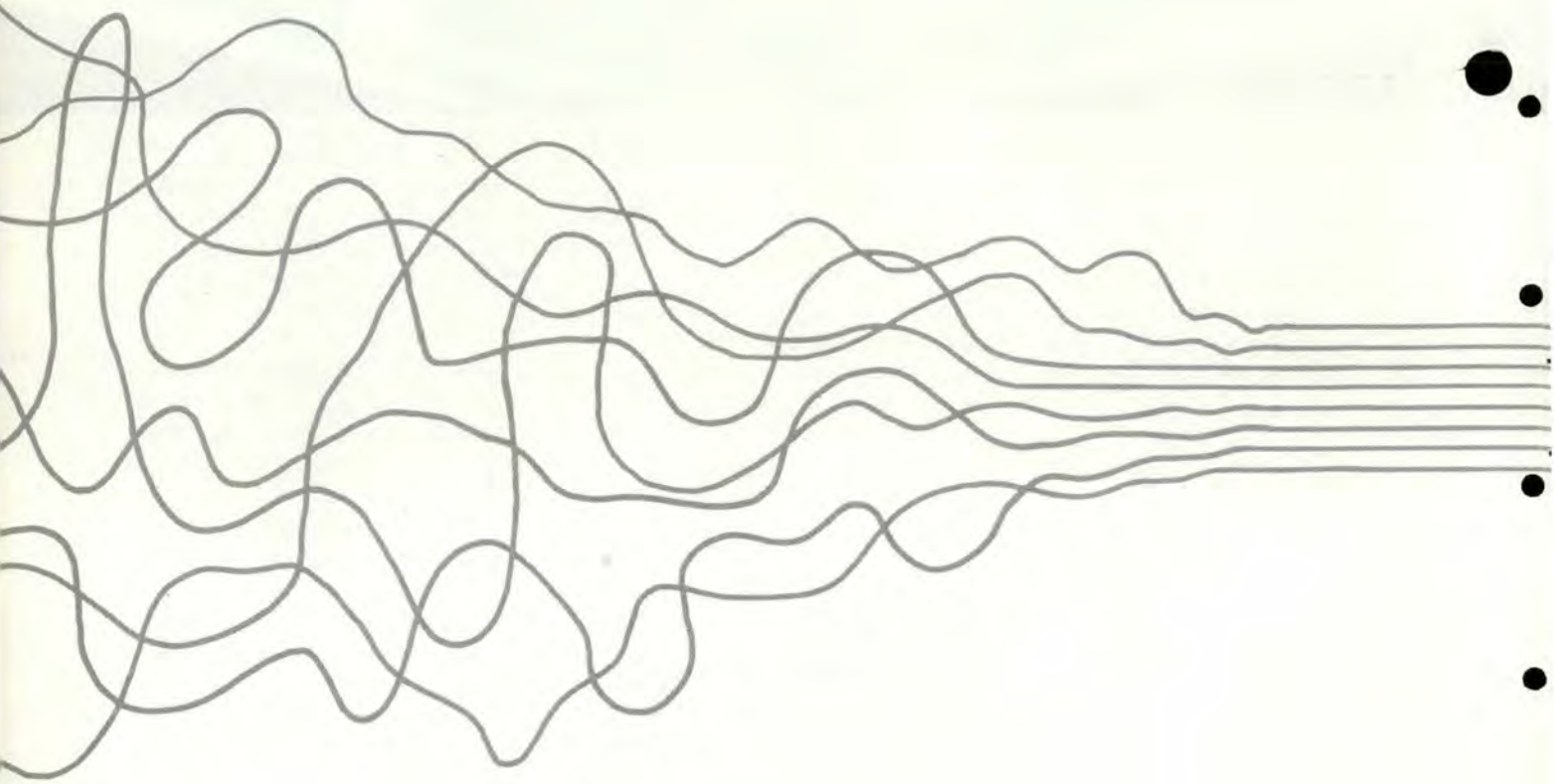
12. See Figure 4. You are established in the holding pattern at RON at 5000 feet and subsequently cleared for the approach. You are expected to:

a. Turn immediately toward the RON IAF and descend to 4000 feet.

b. Maintain 5000 feet until the RON IAF then fly the approach as published.

c. Request an ATC clearance to descend to 4000 feet prior to arrival at the RON IAF.

d. Either b. or c. ★



The accident narrative stated ". . . The pilot admitted that he was *complacent* about his ability to land safely in weather reported as '. . . ½ mile visibility with light rain and fog' . . . ." Another narrative contained these words ". . . the crew chief explained that he had become *complacent* in his review of aircraft forms . . . ."

Complacency. From time to time we see it crop up as an "explainer" or mitigating circumstance in an accident sequence. But what is it? Let's consult Webster's.

"Complacency: A calm sense of well-being and security." Sounds good, but perhaps this second definition is closer to what we had in mind: "A feeling of self-satisfaction accompanied by unawareness of actual dangers or deficiencies." Although this is the most common interpretation, the psychologist's definition is yet more revealing.

Psychologists describe complacency as a "fantasy form of living which we *all* use as a way of *protecting* ourselves from the frightening thought we might not be here tomorrow morning."* Two words in this definition are especially disturbing: All and Protecting.

The use of the word *all* connotes a certain omnipresence of the attitude. We—mankind—are all complacent in our daily living. So the first—and perhaps the most important—element of the concept is its universality. The second word, *protecting*, indicates that we use complacency as a kind of "defense mechanism." Those of us who labored through Psychology 101 remember well the other defense mechanisms—projection, rationalization and the like. And if we accept the psychologist's definition then we must also view complacency as a necessary psychological adjustment we use to occasionally protect us from a harsh, and sometimes cruel, world.

Definitions are fine but the salient question really is this: is complacency a significant problem in USAF accident experience?

This is not an easily-answered question; such questions never are. And a great part of the difficulty stems from the fact that complacency has an insidious and virtually unknown—albeit undeniable—effect on aircrews and their performance.

How can we be sure this influence is truly present? These representative examples from USAF's accident experience confirm our contention: . . . The aircraft was cleared from FL 330 to FL 100. The aircrew acknowledged the descent clearance and subsequently contacted the GCA controller for approach instructions. The aircraft's last recorded transmission was between the aircrew and the controller: the aircraft crashed into the ground moments later, was totally destroyed and 24 people were killed. One of the accident board's findings was that checklists were improperly accomplished; switches were in wrong positions; altimeters were improperly set . . . .

*Extracted from the article, "Complacency, Let's Define It," by Dr. Chaytor R. Mason.

COMPLACENCY

WHAT IT IS...WHAT WE CAN DO ABOUT IT

MAJOR T. R. ALLOCCA
Directorate of Aerospace Safety

. . . Flight was normal until return to base area. Terminal weather began to deteriorate rapidly. Aircraft was cleared to terminate early because of lessening visibility. An enroute descent to a PAR final was accomplished. The aircraft struck approach light stanchions when it touched down on the overrun; both main landing gear separated from the aircraft; the aircraft continued approximately 4000 feet down the runway and caught fire . . . . A board finding was that the pilot did not request clearance to an alternate upon initial receipt of weather below visibility minimums and he continued the approach below decision height and landed even though he had received and acknowledged weather below minimums . . . .

Checklists not properly accomplished; switches in the wrong positions; landing in weather known to be below minimums . . . . Instances such as these are hard indicators of a complacent attitude and provide real-world examples of the definition: "A feeling of self-satisfaction accompanied by unawareness of actual dangers or deficiencies." So if we agree that complacency has contributed to Air Force accidents, our next task is to suggest a remedy.

One remedy is education. Complacency is such an inherent part of our daily lives and mental make up that we're often not aware of just when and how it's affecting old Ish! So we must make people aware of the fact that complacency *is a problem*. And we can conduct awareness campaigns—you know, the kind which includes posters, films, briefings and the like. And these are excellent courses of action for "educating" the Air Force flying public. But we must do more.

We must go beyond this conventional approach and take other, perhaps novel, courses of action to counter complacency's effects. A good answer is training; but not the traditional type of training. Not the training which evokes a Pavlovian response to a checklist item; rather the training which ensures that the crew member knows what he's doing when he throws a switch or sets a dial. The training which makes aircrews think rather than react. For if we keep thinking, perhaps the tendency towards taking "short cuts" or missing steps will be less likely to occur. And if we keep thinking, perhaps the full consequences of our actions will loom brilliantly in our minds, and perhaps that "feeling of self-satisfaction accompanied . . . deficiencies" will be less likely to affect our actions.

Are these the only answers? Hardly. The dearth of literature in the area suggests that this is a most fertile area for fresh and novel ideas, for cross-talk, for brainstorming, for hangar-flying. And if we talk about it—let it surface (to speak in the Psychologist's lexicon)—maybe then we can get a handle on it.

Complacency . . . it's bothered us in the past. Let's put it to sleep. ★

AIRCRAFT EMPATHY

"Aircraft Empathy" refers to that prevalent aviation tradition that there is a special interface between man and machine without which flight becomes sterile, mechanical and, yes, dangerous. The article from "RAF Air Clues" has different terminology but the message is loud and clear. A pilot's knowledge of and appreciation for his aircraft are major factors in flying safely.

When driving your car do you:

(1) Turn the steering wheel when stationary?

(2) Sit at traffic lights in gear with your foot on the clutch and then do a racing start on the green?

(3) Drive off from cold without warming the engine?

(4) If stalled at night with headlights on, leave them on while restarting the engine?

(5) Force the synchro-cones to adjust the engine rpm when changing gear?

If you answer "No" to most of these questions then you are qualified to read on. You probably have sufficient feeling for machinery to criticise this article constructively.

If you answer "Yes" you could be one of several types:

a. You have never considered such ideas.

b. You understand the questions but consider them irrelevant.

c. You believe that all machinery is built in the service of man and ought to perform to his wishes under all forms of treatment. Further, if it breaks it should be replaced.

Type *a* might find the article revealing. Type *b* may see that if he wants his car to last longer, the questions become relevant. For Type *c* there is no hope: the article will either fall on deaf ears or the blood will boil with rage and indignation.

ASKING FOR MOON ROCKS?

The aim is not to question the habits of car owners, but to concern

those who fly aircraft in a feeling for the machinery. The quest is for aircraft empathy.

In order to get the best from an aircraft, to stay in the air longer for a tankful of fuel, to fly safer and for the aircraft to last longer, the operator must be sympathetic to the aircraft he flies. The pilot who does not have a working knowledge of aerodynamics is at an obvious disadvantage. If he does not appreciate the effect of the stress he imposes on his aircraft, he is a liability.

Aircraft empathy starts as an educated understanding of the hardware of the aircraft, and progresses to a common sense, realistic and sympathetic handling of that hardware. Philosophically, the control column becomes an extension of the hands and the instruments extensions of the brain. The aircraft becomes a mechanical alter ego.

THE NEED FOR EMPATHY

The arguments for empathy become pedantic by their repetition. However, the Service has lost the lives of pilots and many thousands of pounds through thoughtless and crude handling of its equipment.

Empathy is certainly desirable and important, there can be no argument about that. I think it is vital. I recommend that it should be considered, taught and even assessed at flying training schools.

HOW TO START

The first stage in achieving empathy is understanding. What is required is not only the essential details given in most pilot's notes, but a broad education about the valves, switches, jacks, motors and generators, pipe joints and unions, etc. Size, material, stress level, wear rate, working temperature, and the position in the aircraft of all these items should be appreciated. The aircraft structure should be studied (not necessarily to degree standard!), how it's built, where the stress paths are and what it is made of. Furthermore, knowledge need not be limited to the aircraft. There are vast areas of relevant information in such subjects as strength and property of materials, metallurgy, workshop practices, high-temperature plastics, transistor theory, and many others, all of which are building blocks for empathy.

The next step in achieving empathy is more abstruse, but can be likened to the advantage of card

AIRCRAFT EMPATHY.

continued

sense for playing cards or numeracy for manipulating figures. The aircraft operator has to apply sympathetically his ever-increasing knowledge and understanding to the handling of his aircraft. This requires acceptance of the importance of empathy to the long term benefits of the aircraft. It requires a schooling of mechanical finesse to the natural manipulative skill that is gained during flying training.

The final step is to realise that perfection can never be achieved. There is a process of continual refinement, and there is a real sense of excitement and achievement in developing this mechanical other self.

ACHIEVEMENTS

The two most important achievements of the application of empathy are that machinery, which is subject to wear and failure, can be made to last longer, whilst flight becomes safer.

Reconsider the analogy of the car made in the introduction. The wear rate on cylinder walls is dependent on several factors: the number of cold starts, lubrication, and engine rpm during warm up. By adjusting driving technique and the use of the car, the wear rate can be changed by at least a factor of 2.

A driver who:

a. Idles his cold engine with full choke,

b. Drives away from cold using over 4000 rpm, or

c. Forgets to change the oil regularly,

may ruin the cylinder bores in 40,000 miles. However, the driver with mechanical sympathy who:

a. Pushes his car into the garage, if it is parked just outside,

b. Walks to the corner shop for his cigarettes,

c. Warms up a cold engine at 1500 rpm for at least a minute, or

d. Changes the oil at the first signs of degradation,

may well double the bore life of the engine. And it costs him only the oil change. Clutch and brake wear, battery life and fuel consumption all improve with empathy, at no extra charge.

Back to aircraft. The civil variant of the Avon is "lifed" at about 3000 hours, but the RAF changes the Avon at 500 hours. Obviously a fighter cannot be operated like an airliner, but the point is, a change in handling increases life by a factor of 6. Think again, though: there are aspects of the airline style that could be used for the fighter. Instead of the slam acceleration relying on the ACU, lead the rpm by a controlled movement of the throttle. Thermal shock to the turbine is reduced, fuel consumption is also reduced and the engine is accelerated as far away from the surge line as possible. Non-operational climbs could be restricted to the maximum continuous rating instead of full military power.

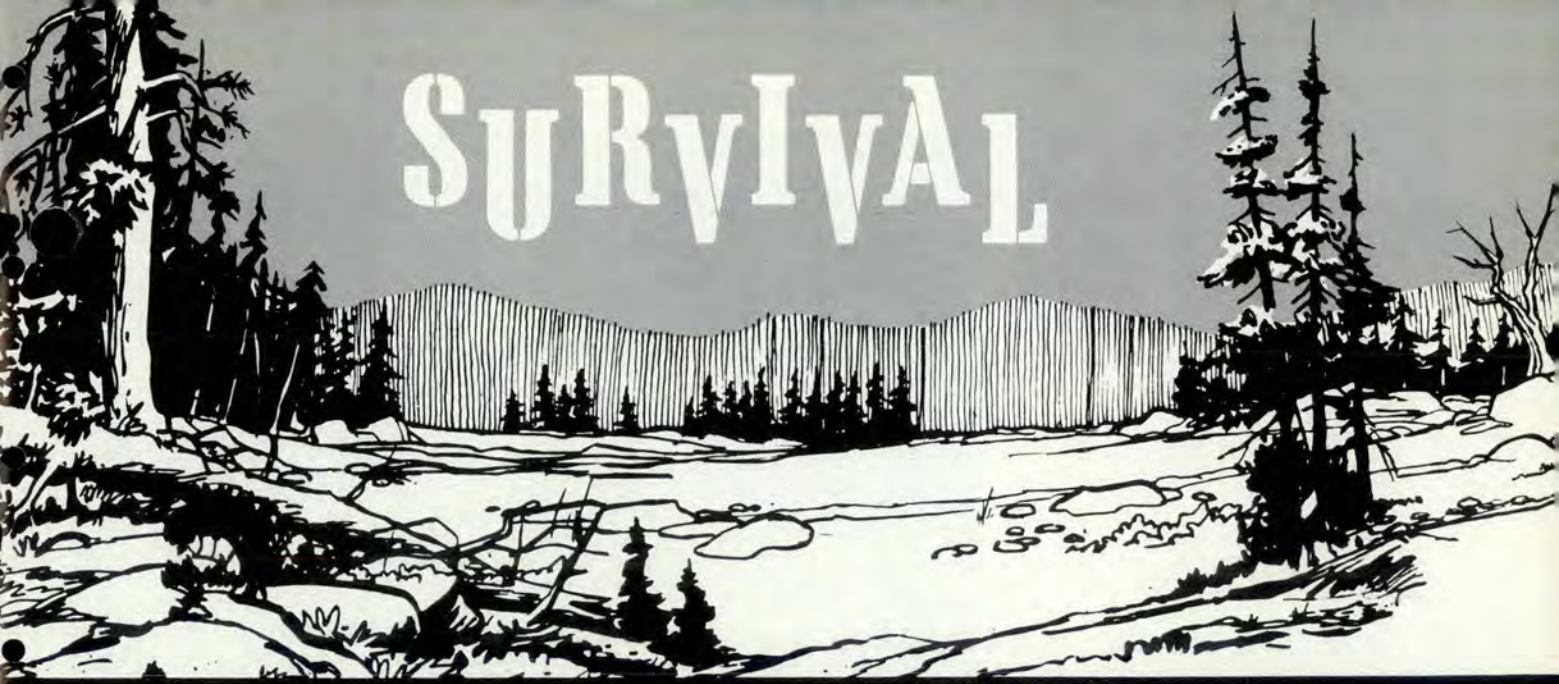
Throttle "pumping" in close formation is another source of engine and airframe wear. Large throttle movements which are made to produce minute corrections of the aircraft position cause unnecessary compressor blade fatigue, intake skin panting, thermal cycling of the turbine and increased fuel consumption. If a particular aircraft is two feet aft of correct station, a quarter of an inch movement of the throttle forward may marginally increase the thrust sufficiently to move the aircraft. The same quarter of an inch should be removed as the aircraft approaches its correct position. The formation result may not approach "Red Arrow" perfection but surely it's good enough for government work. An Avon costs about $250,000 and a Spey costs about $600,000; if their lives could be doubled the Service would halve the cost of engines.

Do you still need convincing that machinery should be cared for: Why break into the circuit at 6g when 4g will do? Why land 10 knots fast and force the 'chute or brakes to cope with the square-lay increase in kinetic energy? Why carry out the controls full and free checks by running the protesting hydraulic jacks and motors hard up against their end stops? Why taxi fast round corners, throwing the aircraft weight onto the outer wheels or bogies? Why wind on maximum nose wheel steering and expect the tires to hold onto the tarmac? And why risk FOD either to your own engines by taxiing close to your leader or to other engines by letting your jet wake cross parked aircraft?

CONCLUSION

Aircraft empathy involves the operator in man-machine integration. It requires a full understanding of the aircraft, its systems and the environment in which it flies. Aircraft handled with sympathy will last longer, fly safer, and will cost less to operate. (Besides which, it is more professional—Ed.) ★

From RAF AIR CLUES



Subsistence Off The Land

SSGT CHARLES R. TEAGARDEN
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PART II

In Part I, Nutrition and Survival Rations, the food requirements for survival and the general purpose rations were covered. In this article, some sources and methods of food procurement will be discussed.

Perhaps the most overrated element essential to human existence is food. We go to great lengths in its production, preparation and consumption. We indulge in foods we like and discard what we dislike. But what happens when the foods we recognize are no longer available? Besides a feeling of hunger, our senses sharpen and the motivating force to procure takes over. However, the need for food, both physical and psychological, is less than we might think.

You, as a potential downed aircrew member, may one day be faced with a situation where your normal staple foods are limited. Uncle Sam has taken into account this possibility and, on most the aircraft, has provided you with survival rations in your seat or survival kit. Due to restricted space, the number of rations is limited. What happens when this supply runs out? Hopefully by then, you would have given some thought to subsisting off the land.

In any survival or PW situation, most plant and animal life is a potential food source. You can't turn your nose up just because it's never been on your menu before. Insects, as an example, can be an excellent source of food. The following list shows their potential:

This list would seem unappetizing to most people, but, it's food and may be all that is available. If you look long and hard, in most situations, you'll find something to eat.

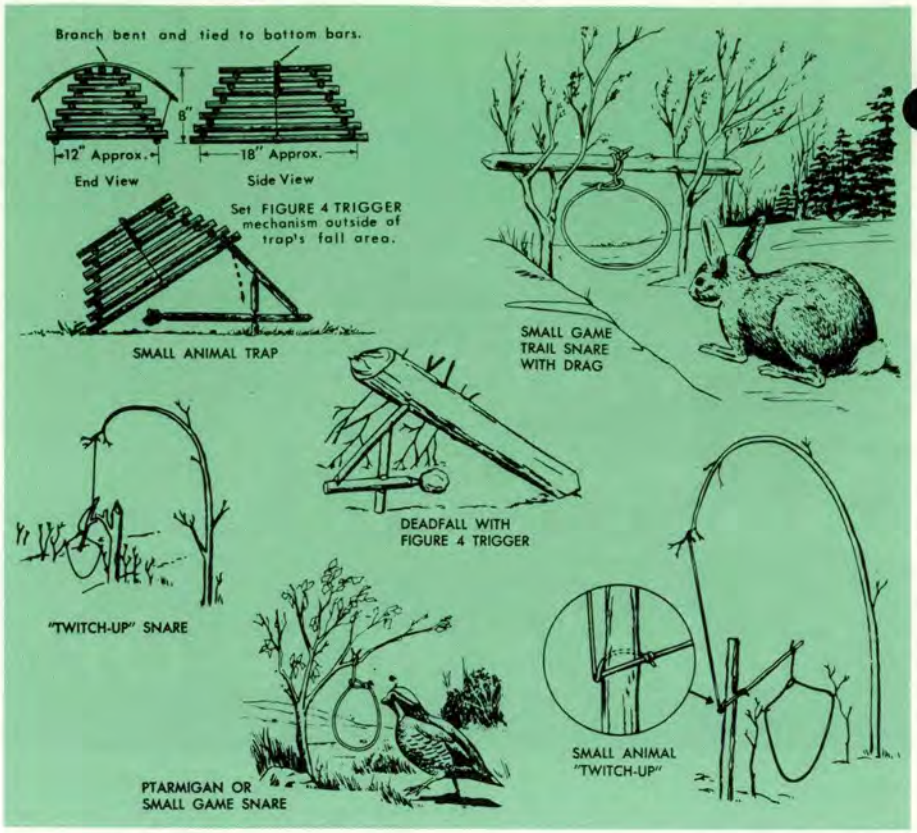
To aid in your quest for food, think about these questions and comments. What type of environment will I be in and what are some of the basic things I can do to aid myself? How much food do I need to stay alive? What are the ways in which I can procure foods?

INSECTS AS A SOURCE OF NUTRITION

INSECT	NUTRITIVE VALUE
Termites	Protein, Fat (100 grams of fried termites = 561 calories)
Caterpillars (smooth skin—any type eating non-toxic plants)	Fat, Carbohydrates
Earthworms	Protein
Silkworm and Pupae	Vitamin A, Fats, Minerals
Larvae	Protein, Water
Locusts	Protein, Fat, Calcium, Solium and Iron
Grasshoppers	Vitamins B_1 and B_2
Grubs	Protein, Fats
Water Bugs	Fat, Protein, Water

SURVIVAL: SUBSISTENCE OFF THE LAND

continued



Your environment will be the circumstances or conditions that surround you. Though you can't change your environment, you can learn to coexist with it. First, dress to fit your environment so you'll be able to cope with it. Next, check the flight path for terrain features and check with your local weatherman for the extended weather forecast. With this information in mind, you'll know what to expect and perhaps the shock of finding yourself in a hostile environment won't be as bad.

How much food you need in a "subsistence" situation (SURVIVAL) depends on three things: (1) How big you are—larger people normally require more calories than smaller; (2) How old you are—the younger person burns up a larger number of calories than the older; (3) What the climate is—more energy is required in a cold climate than in a hot one. The average individual burns up approximately 3300 calories per day just to maintain normal body functions and carry on day-to-day activities. In a survival situation, the caloric intake needed could rise to approximately 4000-5000 calories, again depending on size, age and climate.

Now that you're aware of environmental conditions and your calorie requirements, you can concentrate on foods. You could do research at your local library on the various plant and animal life of a given area or you could wait until it's too late and wish. Remember, it's important to supplement emergency rations by living off the land in any extended survival situation. Life can be sustained by hunting, fishing, trapping and gathering. Though edible plant life is often more readily available, animal life generally yields more nourishment per pound. Here is a breakdown of the various ways food may be procured and some general tips.

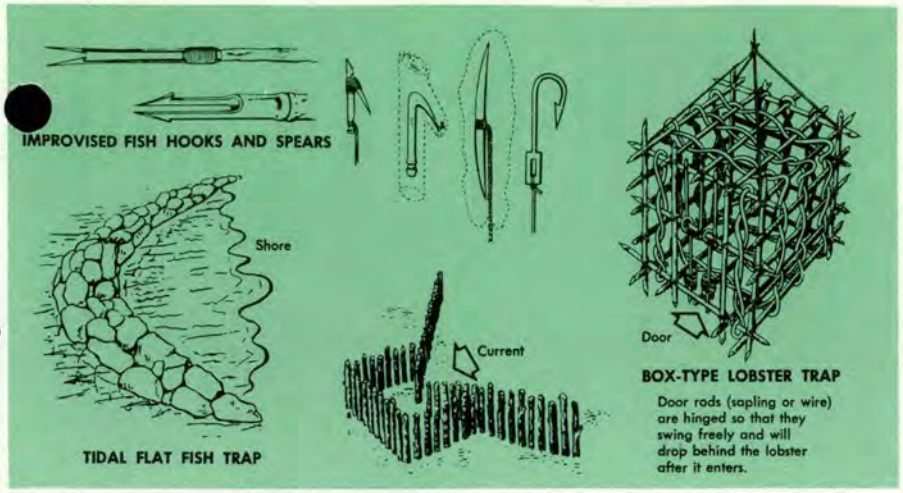
HUNTING

Hunting may be accomplished in one of three ways or a combination thereof: still hunting, stalking and blind stalking. Still hunting is a process of simply finding a place where an animal will probably pass, for example, near a trail, watering hole or feeding ground. You should hide nearby, downwind, remain motionless and wait for the game to come within range. In any case, think small. A bull moose could easily spoil your day, so stick with the bunnies and such.

Stalking is an attempt to keep some cover between yourself and the animal. This requires slow, tedious movement. Move quietly, keep downwind, avoid sudden movement, and freeze if the animal looks your way.

Blind stalking requires skill, a knowledge of the animal you're hunting, and some guess work. To blind stalk, locate a fix on the animal in relation to some easily distinguished landmark. Determine the animal's direction and rate of movement and estimate where it will be by the time you have moved to a new position downwind and within range. Your route of travel should be under cover. If you think blind stalking sounds tough, you're right, it is! But, it gives you something to do on your days off. Who knows, you might trip over an anthill on the way and, viola! Here are a few general hunting tips:

- Tracks and droppings may be



Animals provide an important and often easily accessible source of food. Traps provide a convenient way of hunting for game. The types are limited only by your resources and imagination. Some typical examples are shown on the far left. Traps also work for fish, as do homemade hooks. The picture to the immediate left shows some ideas.

indicative of the type of animal and its feeding habits.

• Feeding signs may indicate the type of animal. Watch for chewed grass or bark, peeled or scarred bark, or cropped shrubs.

• Bedding areas may indicate recent occupancy and the number of animals.

FISHING

If you have access to a permanent body of water, fish could prove to be a food source. Remember, when the water is frozen, exercise extreme caution when walking on the ice or when cutting a hole through it.

Fishing methods: Hooks are supplied in the minimal survival kit or they can be improvised. Line can be acquired from the inner core of the suspension lines on your parachute harness. Hooks may be baited with insects, worms, pieces of meat or bits of metal or cloth (a lure). Jigging uses a baited hook or lure which is dipped repeatedly beneath the surface of water. This method is especially effective at night.

Spearing and tickling fish are methods which require patience, skill and great care. Spears may be fashioned from any available material. The point ideally should have a type of barb to secure the fish. Tickling fish is an art that is easily mastered with some practice. Find a log in the water or an overhanging bank, lay parallel and reach slowly to the underside coming upward toward the bottom of the log or bank and grab the fish.

Nets and fish traps are two of the most effective ways to capture fish. Nets can be constructed from the inner core of the suspension line. Traps can be constructed from vegetation.

NOTE: Wild animals are territorial, so if a bear tries to argue with you over your catch, PLEASE lose the argument. Giving him the fish will save your life and give you another chance to find your fish elsewhere.

TRAPS

Traps are divided into three basic types or categories; mangle, strangle and hold; all are utilized with some degree of success. Mangle traps are normally used against larger animals and require more effort in their construction. They are large weighty objects, made of rocks or logs, and are designed to fall on the animal when a trip line is pulled, thus killing or disabling the animal. The strangle trap is designed to kill the animal using a simple loop attached to a twitch up or weight which will pull the animal off the ground. The hold trap is usually a box which will trap the animal when a trip line is released. Tips when using traps:

• Become familiar with the habits of the animal you are trying to trap.

• Set traps on trails, at watering places, in or near bedding areas, or where kills have been made.

• Set traps in quantity.

• Don't contaminate the area with human scent.

GATHERING

Plant species number beyond 300,000, of which a very small percentage are poisonous. Plants as a food source will be covered in detail in a future article. Animals besides being food sources, may lead you to edible plants and caches of nuts. Don't overlook eggs or the kill of an animal. Again, be cautious; your last wish is to change from the tracker to the trackee.

Food procurement is explained in fuller detail in AFM 64-5, Survival-Training Edition. Also, don't overlook the AFM 64-15 carried in your parachute. It illustrates many of the techniques discussed above.

To a degree, our culture determines the foods we eat; to overcome our culinary prejudices and eat strange foods could prove difficult. Asking one to eat an earthworm or grub would probably yield a reaction of "no way." But in a survival or PW situation, eating is essential if one is going to survive. Men have become seriously ill and even died because they refused to eat strange foods; strange in the sense that they weren't in their normal diet. Remember, you must make a mental adjustment and eat any and all foods, especially in a PW situation. ★

the second time around

MAJOR JACK SPEY
475 ABW

"This is Homedrome information India, time 02:45 Zulu, special observation. Sky condition: indefinite ceiling, 500 feet obscured, one mile visibility—fog. Temperature 68, dew point 68; wind 090 at 5 knots, altimeter 29.94. Expect VOR approach Runway 12; departure Runway 12. PAR and ASR out of service. Inform Homedrome Approach Control or Tower on initial contact that you have received information India."

Major Pete Simmons and Captain Jim Warren had flown the weekly courier run together many times over the past two years. Both were familiar with the route and had averaged 40 hours per month since being assigned to Flight Operations. Both were instructor pilots in the T-39 and very proficient on the gauges. Both had flown many low visibility radar and ILS approaches up and down the east coast.

Major Simmons called for the descent check list prior to the hand-off from Center to Approach Control, and the VOR approach to Runway 12 was briefed. The weather was close to minimums; however, both pilots had flown together fre-

quently and were very familiar with the airport, so neither had questions during the approach briefing or needed further elaboration on crew coordination procedures during the approach.

"Homedrome Approach Control, this is Bellcrank 40 out of niner thousand for four thousand. We have information India."

"Bellcrank 40, Homedrome Approach Control. Roger. Reduce air speed to 170 knots, if feasible. Radar contact 35 miles NE of the airport."

"Bellcrank 40. Wilco. Request radar vectors to the VOR final approach course."

"Bellcrank 40, Homedrome Approach Control. Roger. Expect radar vectors to the VOR final approach. Expect lower altitude in six miles."

"Bellcrank 40. Roger."

Approach Control provided vectors to the final approach radial, and descent was made to 1300 feet MSL prior to the VOR (FAF). Time to the missed approach point was 2 minutes at 120 knots. Major Simmons hacked the clock at station passage and a 600 foot per minute descent was initiated. MDA was reached at one minute 10 seconds after station passage and level off completed at MDA.

"Start watching for the field, Jim."

"Roger."

"One minute thirty, Jim. You have the runway in sight?" Pause . . .

"Runway in sight just off to the left. Go visual!"

Major Simmons went off instruments and started a shallow left turn to get on runway center line. Power was reduced to establish a descent. As the pilot started the flare, Jim saw the 5000 feet remaining marker flash by and noted the speed at 110 knots. Instantly realizing that the Saberliner was going to fast to stop in less than 5000 feet, he warned: "We're long, Pete; less than 5 remaining! I advise a go from here."

"OK! Let's go-around. The boards are coming up."

"Roger."

"Go-around check list."

After the aborted landing and established on the instrument climb, the copilot called the Tower: "Homedrome Tower, this is Bellcrank 40. We're on the go for missed approach—ah—advise Approach Control we'll need vectors for another approach."

"Bellcrank 40. Roger—ah—stand by for a frequency."

"Bellcrank 40, maintain runway heading. Climb to three thousand and contact Approach Control on 363.8. Are you experiencing any difficulty?"

"Bellcrank 40, negative. We were too hot on that approach. We're airborne, climbing to 3000, going to Approach Control."

A non-precision approach, as such, has a number of problems associated with it when weather is close to minimums. Let's examine a few.

It is desirable for the pilot to descend to and level off at MDA prior to the MAP so that the MDA is not exceeded prior to sighting of the runway environment sufficient to effect a safe landing. This means descent must be initiated again once visual clues are adequate for a landing. If the visibility is low and/or close to minimums, the approach may be excessively steep in relation to the first one-third of the runway, the touchdown area. After the approach descent is then reestablished, touchdown may occur well down the runway with stopping distance available becoming a critical factor.

When visibility is minimal, be mentally prepared for an aborted approach. Late sighting of the run-

the second time around

continued

way may prevent an approach from being made with sufficient runway remaining to stop the aircraft.

During a non-precision approach, do not expect to be on runway center line unless you are flying a localizer only approach. VOR, ADF, and TACAN are designed to get you "in the ball park" but not necessarily in perfect alignment with the runway, especially when tracking from the navigation facility to the airport.

During the above approach to Homedrome AFB, the copilot was concentrating his vision off the nose of the aircraft while looking for the field. What he did not take into consideration was the fact that the pilot was tracking into a left crosswind and was slightly to the right of the on course as the MAP approached. Jim was not looking far enough to the left of the nose of the aircraft, having assumed the aircraft was on course.

As the MAP is approached, it is important to check the CDI and note the aircraft position relative to "on course." Note also the drift correction or intercept angle. A quick analysis will give a clue as to the direction to look for the airport or runway environment. It may not be straight ahead and seldom is. The surface winds given by ATIS, Approach Control or Tower will give an important clue as to the correction needed on final approach, and this combined with aircraft position relative to the CDI will help in looking for the airport in the proper direction.

Jim expected that the first visual clue of Runway 12 would be the sequential strobes of the 3000 foot long approach lighting. After the missed approach, while on downwind, examination of the airport diagram at the bottom of the letdown plate revealed that Runway 12 has an A3 lighing system and no strobes. Being accustomed to landing on Runway 30, the primary instrument runway and most often used due to winds, the crew assumed strobes were available. The lesser effective approach lighting system added to the delayed runway sighting.

Speed was also a factor in this case. The aircraft weight permitted the final approach to be flown at 105 knots. 120 knots was used since the approach plate gave the exact time to the MAP for a 120 knot final.

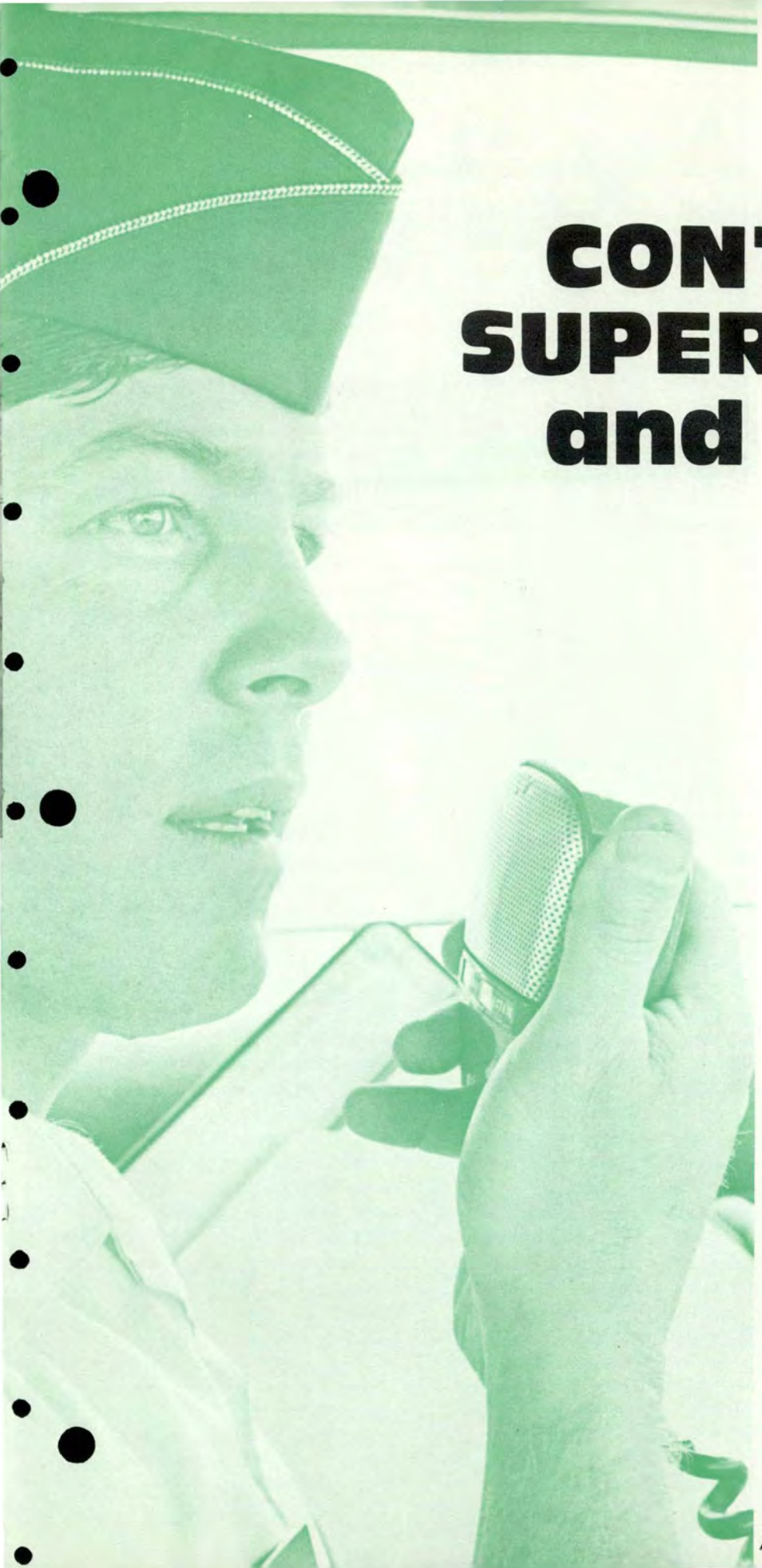
During a non-precision approach, the slower the ground speed the more time the pilot has to see and react to the runway visual clues during transition to visual conditions. If the aircraft performance and command directives permit some latitude in final approach speeds, consider using the lower speed to give yourself a few added seconds for runway acquisition and transition to visual conditions.

During the approach to Homedrome AFB, as briefed, Jim had momentarily turned on the landing lights close to the MAP. The glare, resulting from reflection off the fog and mist, masked the contrast produced by the lights from the ground and runway against the black of the unlighted terrain. This may have contributed to the delay in recognition of the runway environment. Moisture on the windscreen also refracted the light, further hindering forward visibility.

Consideration should be given to delaying use of landing lights until such time as it will not obscure forward vision. Use of windshield wiper systems may improve forward vision when descending through dense clouds, fog or mist.

Bellcrank 40 landed safely out of the second approach. During vectors to the final approach course the second time, the crew formulated a *better picture* of the problem in terms of runway lighting, weather, and anticipated slant range visibility. Captain Warren noted the aircraft's position relative to the CDI as he started his search for the airport lighting. A slower final approach speed was used from the VOR inbound. Landing lights and scan lights were left off until over the threshold thus preserving night vision.

In the crew bus driving to Ops, Pete and Jim discussed the two approaches and concluded that sometimes things go better the second time around. ★



CONTROL & SUPERVISION and FLYING

COLONEL PAUL M. DAVIS
24th Composite Wing

No aircraft accident, however clear-cut the ultimate cause and blame, is due to a single failure or failing. Many interrelated factors form a chain which leads to tht final event. But one factor that is almost always present is inadequate control or supervision of some aspect of the flight. Therefore, it will do no harm to remind ourselves of what we mean by "Control & Supervision of Flying" and of the responsibilities in this arena which authority carries.

WHAT IS IT?

What do we mean by the words "control and supervision?" By control we mean to direct and regulate. By supervision we mean to oversee, to watch over imaginatively and intelligently. The two are thus complimentary and are an essential part of the vocabulary of all who are engaged in flying. For not only must those in authority control and supervise their subordinates but we must all, individually, control and supervise, regulate and watch our own actions.

Let's look at this more closely. Supervision is the means by which we ensure that all those under our command carry out their duties cor-

SUPERVISION

continued

rectly and efficiently; but we must supervise in such a manner as not to appear to interfere unduly; not to get so immersed in the detail of the task as to deny the proper responsibility of those who have delegated powers.

Everyone needs supervision—the pilot new to the squadron, the experienced operations officer, even the squadron commander and those above him. Some people are lucky enough to be able to supervise without much conscious effort, but the majority of us must work hard to acquire the skill. The degree of skill which an individual attains will depend to a large extent on the help and supervision he himself has received in the past.

Most aspects of our tasks are governed by orders, regulations, standard procedures and other instructions. We hope they are all clear and concise because orders and the like are there to be complied with for specific reasons, not because of arbitrary whims on the part of some supervisor. Some people in immediate authority seem to think that the mere existence of an order exonerates them from ensuring that it is complied with. These people are often heard to cry, generally after an accident, "we have a regulation against that and he (he being the unfortunate pilot or aircrew member) signed it and I have his initials to prove it." This is not leadership, nor is it proper control and supervision of flying.

Unless we are sure that an order has been carried out, how can we be sure that our subsequent actions are based on proper foundations? Some people think, too, that to comply with the letter of the law is sufficient. But there is more, much more, to it than that. Consider a simple training mission. First, the task is laid on, the participants selected and briefed, the flight plan is computed, the flight is authorized, flown, and finally the crew is debriefed. All of this is very straightforward, but all too often the task selected is the yet unfilled sequence on the training chart. The briefing makes liberal use of such glib phrases as "line-up and take-off will be standard. Any questions?" There being none, authorization consists simply of a signature on a clearance, and the debrief a casual check that the mission was accomplished and another signature on a hastily prepared grade slip for the flight records.

But, did the authorizing authority know the capabilities of the crews involved? The limitations? Was he aware of their strengths and weaknesses *before* the flight? Did he relate the task to the weather, satisfy himself that the crew fully understood the rules, check the flight plan and ensure—by a thorough debrief—that lessons were learned from all aspects of the flight? Such consideration of the factors involved in every flight is by no means automatic and many serious accidents testify to the fact that no small number of officers in positions of trust and responsibility did not consider these things.

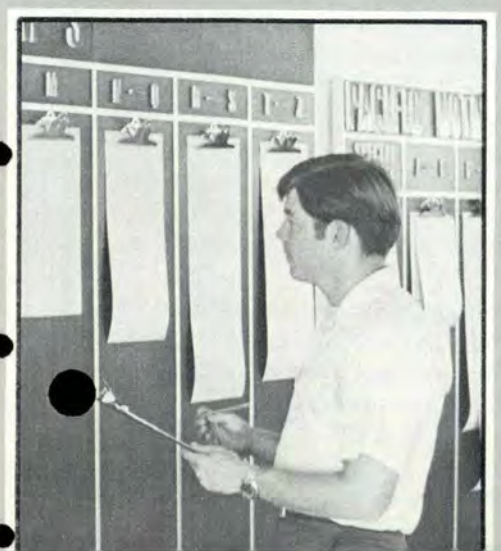
HOW IS IT OBTAINED?

Often, investigations reveal that past failings have been condoned or followed by no more than gentle wrist slaps when it was obvious that more severe disciplinary action should have been taken. Each case, of course, is different and must be treated on its merits. The degree of remedial and corrective action required will, in general, depend on the seriousness of the failure. What good to detect a failure if nothing is done about it; it is pointless to make orders and then fail to enforce them. How often has a minimum altitude for, say, an aerial demonstration or flyby, been laid down only to be contemptuously ignored? Either severe disciplinary action should have followed the failure to comply with the order, or the order should have been changed —prior to the flight.

The authority to order a flight carries with it an absolute responsibility to supervise. The need for

those who authorize flights to consider the flying experience, capabilities and qualifications of the aircrew can never be taken lightly. Whether the flight is to be advanced training by an exceptional pilot or a simple training exercise by an inexperienced student, the person ordering that flight must be certain that the task to be performed is not beyond the capability of the individual involved. If it is clear from the evidence of an accident investigation that an individual was being extended beyond his limits, how much sooner should this fact have been spotted—and remedied—by his supervisor?

A particularly vulnerable phase in a pilot's career comes in the early stages of his first squadron tour when he is being trained to become a productive operational pilot. Individuals, even of apparent equal ability, progress at different rates; inexperienced pilots generally do not admit to their limitations, even if they know them, and some will have had difficulty making the grade or will have exhibited potentially dangerous traits in their first months in the squadron. Crews need very close supervision if their self-confidence and skills are to be developed without at the same time overtaxing their ability and confirming bad habits. It is tragic that this care and protection all too frequently are found missing.



WHO NEEDS IT?

An all encompassing answer might be "who doesn't?" That, however, is oversimplification. Inexperienced or below average pilots are not the only ones in need of supervision. Many accidents due to gross breaches of flying discipline such as low level "buzz jobs" or "shining the fanny" types involve pilots of acknowledged ability and skill who are occasionally in supervisory positions themselves. Information on the motives for this sort of behavior is limited because not many survive the accident. Nevertheless, the resulting investigation all too frequently turns up evidence which indicates a lack of essential supervision.

An oft repeated remark is to the effect that the pilot or crew concerned were normally beyond reproach and that their lapse was completely out of character and, therefore, inexplicable. Investigation, however, often presents an entirely different picture of the people involved, much more in keeping with the final result. Quite clearly the accident was not out of character at all. Those responsible for supervision and control simply did not know the real character of the people involved, or even worse, chose to ignore known failings.

Bad habits, long standing personal antagonism and past blatant disregard of orders and regulations all too often come to light only when it is too late. Pilots and crews are not Jekylls and Hydes who change their personality as soon as they step into an aircraft. They are quite normal human beings whose behavior is fairly predictable once their basic personality and character is recognized. To supervise effectively we must know those who work for us. The close contacts of our profession enable us to observe our subordinates much more closely than our civilian counterparts can and thus we have a better opportunity to understand their motives and actions.

WHY IS IT ESSENTIAL?

The United States Air Force needs men of character, of spirit and initiative. But we also need them to be skillful, thoughtful and responsible. We cannot afford the brash young, or old, loner. There simply is no place for him. The young and inexperienced need the help, guidance and influence of the older and the more experienced. To check and restrain, to direct, guide and oversee demands that those in authority understand and know the men and women for whom they are responsible. This, simply put perhaps, is the solution to our problem. It is not an easy solution; indeed it is most difficult and is common to all supervisors at all levels of management and in all professions.

But skill in it *must be acquired*. For unless we continually study our subordinates and strive always to know them better, we will not know their capabilities, their strengths and their weaknesses. And without this knowledge how can be hope to properly and responsibly "Control and Supervise Flying?" ★

OPS TOPICS

OPEN POD

The F-4 crew was on a cross-country flight. The crew had checked the baggage pod access door prior to engine start for the first leg and during the through flight checks at the refueling stop. However, after landing at home they found the pod door open and the contents of the pod gone. It seems that the access fasteners on the door can be positioned so that they appear fully closed but are not really locked. Subsequently the vibration and air loads inflight can cause the fasteners to unlock and allow the door to open. The unit involved in this mishap has modified its pods with alignment marks on the fasteners and heavy bags inside the pod to secure loose items. Even with these precautions it's a good idea to check those access fasteners carefully. It might save you from having to buy a whole new set of traveling clothes and gear.

NEW TCA PROCEDURE

Effective 30 April 1976, the FAA established the requirement for arrival and departure procedures to be contained within the limits of a TCA. This procedure applies to all heavy aircraft (above 12,500 pounds certified takeoff weight). Aircrews operating into a TCA can expect stairstep letdowns to remain above the floor of the TCA airspace. The result of the FAA order is that IFR flights will not be operating in or through the airspace below the TCA where VFR traffic is concentrated.

HATR

By now, aircrews and air traffic controllers should be familiar with AFR 127-3, 11 Jun 1976 and the new report, AF Form 651. Air traffic matters and near midair collisions (NMAC) were taken out of AFR 127-6 and should now be filed as a Hazardous Air Traffic Report (HATR). The report is much more detailed than the AF Form 457. We'd like for you to look it over so you will know the kind of information we need when the time comes to file. A few things to remember:

1. We want to know about *all* NMACs.
2. Do not file a NASA Aviation Safety Report (NASA Form 277) when an HATR is filed. The reg takes care of the NASA input.
3. Whenever possible, you aircrews should make an airborne report that you intend to file a HATR for an NMAC. The investigation wheels can then get rolling.
4. Don't delay notification to the handiest USAF safety office or base operations office after landing. You can even fill in the AF Form 651 blanks over the telephone. The flight safety guys will take it from there.

GROUND AIRSTART

An F-105 engine flamed out on the ground approximately 30 seconds after reaching idle rpm. The pilot used an airstart procedure in an attempt to restart the engine. A large fuel vapor cloud enveloped the aircraft with the ignition cycle in progress. The potential for a serious mishap is obvious. TO 1F-105D-1 does not address the consequences of attempting an airstart on the ground.

I would draw your attention to page ii and quote a couple of statements which should be kept in mind. "Your flying experience is recognized; therefore, basic flight principles are avoided." "Unusual operations or configurations such as asymmetrical loading are prohibited unless specifically covered herein." 'Nuf said?—Lt Col Jim Learmonth, AFISC/SEF.

OPS TOPICS

OPEN CANOPY

The OV-10 had been used on a previous sortie to familiarize an allied officer with FAC tactics. The officer had been briefed on egress and cockpit systems and procedures by the OV-10 pilot and life support personnel. After the flight the passenger deplaned and the OV-10 departed for home station. Approximately 10 minutes after takeoff, the left rear canopy came open. This canopy is not normally used and the latching handle can be placed in such a position that while it appears secure the over center mechanism is not engaged and the canopy will open. Apparently the passenger opened the left canopy during taxi and did not close it securely. The pilot, who had securely closed the canopy before the previous sortie, had no reason to suspect the status of the canopy was changed. (The handle looked secure on preflight.) It was only after the vibrations in flight moved the handle that the canopy came open. The moral of the story is: (1) Be sure your passenger understands what not to touch (unless you okay it) (2) Always check carefully after unqualified people have been in the aircraft.

THAT'S WHY WE WRITE IT UP!

A T-39 recently experienced a turbine blade failure as a result of an overtemperature. The investigation of this mishap indicated that a previous overtemp (3 days earlier) may have contributed to the failure. The only reason the earlier overtemp is known is that the crew wrote it up. There were no procedural deficiencies on the part of any person in either mishap. This merely serves as an example of the value of fully and accurately completing the 781.

STOWED OR NOT

We have been dropping equipment out of airplanes intentionally for years. But we also drop things unintentionally. In particular, we have had several incidents where equipment was not properly stowed in cargo compartments before cargo doors were opened.

FALSE START

The B-52 crew was engaged in an alert aircraft changeover. The copilot was removing personal items from the storage bin beside his seat. He moved the oxygen hose and as he released it, it snapped up against the copilot's side panel contacting the engine start selector switch. The force of the blow from the hose moved the selector switch and fired the cartridges on engines 4 and 6. This is the second mishap recently in which careless movements of personal equipment were directly involved. Most cockpits don't have much extra room, so be very careful when moving around.

HABIT INTERFERENCE

The pilot was making his first solo flight in an aero club T-34. Everything was fine until after he advanced power for takeoff during a stop and go landing. At this point the gear began to retract. The aircraft slid to a stop on the runway and the pilot exited unhurt. The pilot had never soloed a retractable gear aircraft before. All his previous experence had been in aircraft where the flap switch was on the forward instrument panel. Apparently during the takeoff sequence he mistakenly retracted the gear as a result of an old habit pattern.

OPS TOPICS

FO (KNOB)

During an ACM mission the pilot in the rear seat of an F-4 initiated a right turning defensive maneuver. When he tried to recover from the turn he could not move the stick left of neutral. The instructor, in the front seat, took control and recovered by completing the roll through inverted to wings level. After a controllability check the IP found that he had sufficient control to make a successful landing. The investigation uncovered a plastic knob, similar to that used on the pilot's flight instrument light rheostat, jammed between the left lateral control spring cartridge and a bulkhead in the left SLR compartment. This knob did not come from the cockpit. It is probable that the knob had in fact been present in the compartment since manufacture. Although this is an unusual incident, it illustrates the hazardous potential of foreign objects. If you lose something in a cockpit, write it up! You might have to fly that airplane again.

COVERING THE COVERS

When the UH-1N was preflighted, the crew did not notice the inlet covers laying unsecured under a seat in the left alcove. (There was a briefcase blocking the view of the covers.) Later as the Huey was flying to the aux field the crew saw both covers fall out of the aircraft. The unit involved no longer carries inlet covers (secured or not) on local flights.

DON'T LET IT SINK IN

As the F-15 Eagle crossed the runway threshold the pilot pulled the throttles to idle. When a sink rate began to develop, the pilot reacted by increasing pitch instead of power. As a result, the aircraft fuselage tail fairings and AB external nozzle segments were dragged on touchdown. As an additional note, the pilot had not flown for 29 days prior to the mishap. When your proficiency is down it pays to be a bit more careful.

THAT "SINKING FEELING" AGAIN

Two more fighter pilots have experienced that sinking sensation common to steep, low power approaches. Like the Eagle pilot in the mishap above, these two cases involved pitch angles so high that the tailpipes of one and the tail hook boattail and engine shroud of the other scraped on the runway. In both cases the pilots flew into a low airspeed high sink rate condition and recognized it too late for corrective action. Also like the Eagle mishap, there were special circumstances. In one case the pilot was an inexperienced student and in the other the approach was at night.

STATIC ELECTRICITY INFO

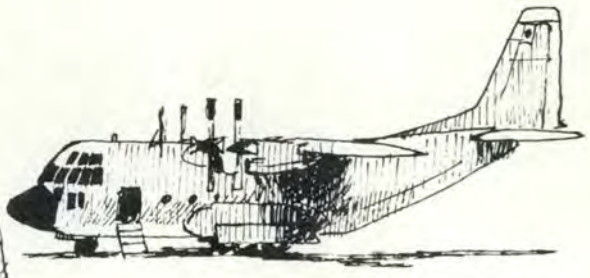
Information concerning incidents that have occurred as a result of electrostatic discharges is needed by the Air Force Electrical/Static Hazards Team (SA-ALC/SFQH) for research and historical background.

Mishap information should contain accident/incident report number, if reportable. If not reportable, a factual narrative, date, place, organization, weather, clothing worn, and agency/equipment involved.

Information should be forwarded to the Air Force Inspection and Safety Center (AFISC/SEG), Ground Safety Division, Norton AFB, California 92409, Attn Captain Countryman. ★

From Fighter To Airlift

MAJOR P. K. WOOD, MC, USAFR
179 TFG • Mansfield Lahm Aprt OH



In late 1975, the 179th Tactical Fighter Group, Mansfield, Ohio Air National Guard, began to receive rumors that the unit was being considered for a major change of mission. We listened with smug disbelief that our bold fighter jocks, dog-fighting in sleek, single seat, supersonic rockets with wings, would soon be driving multi-engine prop-type transports. No way, we said, can the Guard shoot down the best damn fighter outfit in the nation, with an eight-year, accident-free record of flight operation, with a first lieutenant being named Top Gun in the Ohio Air National Guard Turkey Shoot, three years in a row, despite getting married and fathering a new baby. No way, we said, can they renig on their promise to trade the old F-100's for the new A-7's being delivered to many Guard Fighter Squadrons.

No way, we said, would our stall, spin, crash, burn and die, drink and love all night, fly three 8-G missions, with head swiveling the full 360 degrees on the shoulders, ever be a bus driver in the C-130. We yelled and screamed about the runways being too narrow for those trash haulers, high noise levels, FOD problems, inadequate hangar space, wasted tax dollars, morale deterioration, friends in congress, obvious reasons why this idea was preposterous. Certainly, with a letter to the right congressman, alluding to the fact, that our commanding officer can drink more than your commanding officer, the whole disaster plan would be averted.

But, slowly, the rumors began to change to reports, then to telephone calls, then visits to and from Guard Headquarters, then to messages, and finally directives. And, suddenly, the stark reality—delivery dates for the first C-130. Reluctantly, but inevitably, we began plans for "4 Flights of 4," the valiant F-100's, fading, to the boneyard.

The psychiatrist has studied and written extensively about the mind of the aviator, and even the progressive thinking Erica Jong in her book "The Fear of Flying," alludes to the psychologic slips and Freudian fantasies inherent in flying. The age-old concept of the airplane being a phallic symbol with wings, and the exhilaration of the G-Force replacing the orgasm, are so overplayed as to become boring. This flight surgeon, however, has heard with his own ears, a high ranking flight commander, goggles, leather jacket, scarf trailing, admit readily that lovemaking is first in his mind, when no plane engines are turning up. And having served a tour of duty as flight surgeon aboard the nuclear carrier Enterprise, I know the fighter pilots are the boldest, and bravest of all, as the Army Air Corps song so proudly hails. Each squadron

aboard the carrier has its own stereotype, personality, be it attack, heavy bomber, helicopter, reconnaissance, or mail carrier, each proud of its mission, but, never quite to match the image at happy hour, or in the air, of the "Thousand-Mile-An-Hour Club."

Now, admittedly, most flight surgeons are frustrated fighter pilots, and this author is no exception. Nothing thrills him more, with the possible exception of a beautiful girl, than assuming control of the stick; and with the security of 30,000 feet and $100,000 worth of training in the front seat he goes cavorting through the windswept heights, lazy 8's, split S's and his own version of the hammerhead stall when he doesn't apply enough back stick on his loop. He really knows deep down inside he could do it himself, but for the time being, he is happy to let his flying buddies make the take-offs and landings, the low level air-to-ground, and the wing-tip echelon in the soup. Not so with the true fighter doing open heart or brain surgery, he knows he can do it better.

In this writer's career he has come to realize that fighter pilots are some of the finest people in the world, but like doctors, they must be reminded once in a while, they cannot walk on water. There must be some mutual harassing, as well as some mutual respect to make aviation medicine meaningful. The old adage of the commanding officer of a powerful aircraft carrier being worried that some snot-nose lieutenant doctor will lose his shot card and ground him, makes only a good sea story for happy hour. The flight surgeon is really like a good bartender—hears all, tells nothing, and takes a hell of a lot of chances. Unless the pilot is missing an eye, or a leg, or running a 106 degree temp, he most likely can go flying, if his peers in ops will give him an airplane. Once the aviator knows the doc feels this way, he will come to see you when he doesn't feel the tiger in his bomb bay.

With all this fanfare 'twixt the doc and the daredevil, the author is left with high respect for the flying types, and many good hours of boondoggle stick time.

Now the bicentennial year is fully evident, and our mission is set. Having just returned from a one-way backseat ride in the faithful F-100 fighter to deliver the D model and bring the refurbished fighter back to retrain, the author saw the first C-130, sitting on the ramp, vacated by the super sabres.

And, you can be sure, our pilots will be ready, if not in heart, in determined mind. We will be the best damn MAC outfit in the land. And the flight surgeon is proud to be a part of the 179th. ★

mail call

Review of an F-111 accident, which occurred in 1974, indicates that indoctrination of air traffic control tower personnel which followed may be a good idea for all tower personnel. An article, with a title such as ["Traffic Control Panic or Routine"] and similar to the following, is recommended for *Aerospace Safety*.

"All tower personnel should be aware of a phenomenon that occurs if certain aircraft, e.g., the F-111, dump fuel while in afterburner. The dumping fuel is ignited by the afterburner and a long tongue of flame results behind the aircraft 30 to 40 feet and rather horrendous looking. This can and has given observers the impression that the aircraft is on fire, and conscientious tower personnel have erroneously advised pilots accordingly.

"In the case cited, the aircraft had encountered severe FOD on takeoff, resulting in an emergency engine shutdown, and fuel dumping, while still in burner on the good engine, to expedite recovery.

"If a pilot is advised at a critical time that he is on fire when he is not, [that] may be just enough extra to cause him to 'punch out' when actually by 'cool hand Luke' procedures he can adequately cope with the emergency. The pilot in the FOD accident referenced, although concerned with the 'on fire' transmission, 'cool handed' it and recovered the aircraft.

"Recommend that all tower personnel be briefed on the subject in the interest of precluding a panic situation. F-111 bases can even provide an afterburner/fuel dump demonstration. It's considered a safe procedure and is discussed in the F-111 Pilots' Handbook."

GEORGE E. KAMMERER
Aviation Safety Specialist
Sacramento Air Logistics Center
McClellan AFB CA

(Extract from a letter by Capt Wayne R. Sander, Aircraft Maintenance Division, HQ Twelfth Air Force, Bergstrom Air Force Base, Texas)

Gentlemen:

I take exception to the article entitled "Two Perceptions" in the May 1976 issue of *Aerospace Safety*. I'm sure that Major Sutton's intent in writing the article was to give the maintenance man an "attaboy," but I question his means of doing so and your judgement in printing it. First, let's consider the maintenance man who reads the article. If his primary job is on the flight line, chances are that he reads it in his flight shack or shop between jobs. Hopefully he is able to finish the article before he is called out on the next job . . . and hopefully he is able to infer that the major means maintenance people when he writes "The foregoing chain of events is stopped every day by people doing their job—really doing their job." The author clearly points out that there are "maintenance" booby traps and that "maintenance" tried to kill him, but when the "attaboy" comes in the last paragraph, we become "people." If the maintenance man didn't finish the article or didn't understand its intent (chances are he's not a college graduate), he has a bad taste in his mouth, right? Maybe he's even as hard headed as I am and has the bad taste even if he did understand it. Rest assured that very few will respond "Gee, someone realizes that the majority of us are doing a good job" . . . as the author intended.

Dear Sir,

Reference the excellent article on Aerodynamic Coupling in your May issue, I'd like to make one small plea for the English language "as she should be spoke." The singular of "vortices" is "vortex", according to my Webster's New Collegiate Dictionary, and not "vorticie" as shown in figures 2 and 3 on page 22.

Errors such as this one (and "waivered" as opposed to "waived", a pet peeve of mine) are common in the USAF jargon, but use in highly respected publications such as yours only tends to further engrave them in stone in our minds.

I'm not trying to be a bad guy or a nitpicker of simple typos, nor am I hoping for my name in print (actually I'd rather not) but I do feel that this is one area where you can help prevent the decline and fall of the English language.

Thanks again for all your efforts on behalf of spreading the word. We quote you often. I intend to use your "Two Perceptions" article from the same issue in our maintenance safety program.

Yours for better English,

PETER S. MINER, Captain, USAF
Chief, Quality Control
Edwards AFB, CA

ANSWERS TO IFC APPROACH QUESTIONS				
	1. b.	4. d.	7. e.	10. d.
	2. b.	5. d.	8. b.	11. d.
	3. d.	6. b.	9. b.	12. d.

PROPER FIT AND CONFIGURATION OF HELMETS

MAJOR WILLIAM D. HARRISON, Directorate of Aerospace Safety

Aircrew helmet loss rate during ejections has been running a steady 15 percent for some time. While this is an improvement from some of our earlier experience, we can do better with proper attention. Some hints to improve your chances of keeping your hat are:

- Helmet should be properly sized and individually fitted.
- Chin and nape straps should be fitted, and worn, snug against the chin and neck areas.
- Visor/s should be cut to form a light seal along the top of the oxygen mask.
- Visor/s should be worn down and locked at all times, if possible.
- Prior to ejection, time permitting, the chin strap and oxygen mask should be tightened further, and the visor/s should be lowered and locked.

These simple steps may save you from getting a few lumps on your head. ★

LET'S TIGHTEN OUR BELTS

A recent major aircraft accident investigation re-emphasized the need for properly adjusted restraint equipment.

The accident investigation board determined that due to an improperly secured lap belt, the pilot was displaced forward and to the right of his ejection seat during impact with an obstacle and the ground. *The improperly secured lap belt was not the cause of this fatal accident nor did it contribute to the fatalities, but the potential is there.* This mishap does point out the necessity to review the subject of restraints. You, the air crew, should be aware of how important it is to properly adjust lap belts and shoulder harnesses.

This subject should also be emphasized during life support continuation training.—*Mr. Rudolph Delgado, Directorate of Aerospace Safety.*

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UNITED STATES AIR FORCE

Well Done Award

Presented for outstanding airmanship and professional performance during a hazardous situation and for a significant contribution to the United States Air Force Accident Prevention Program.

Captain MICHAEL E. DURBIN

Captain

RONALD D. SILKEY

Major

JOHN J. FRANCIS

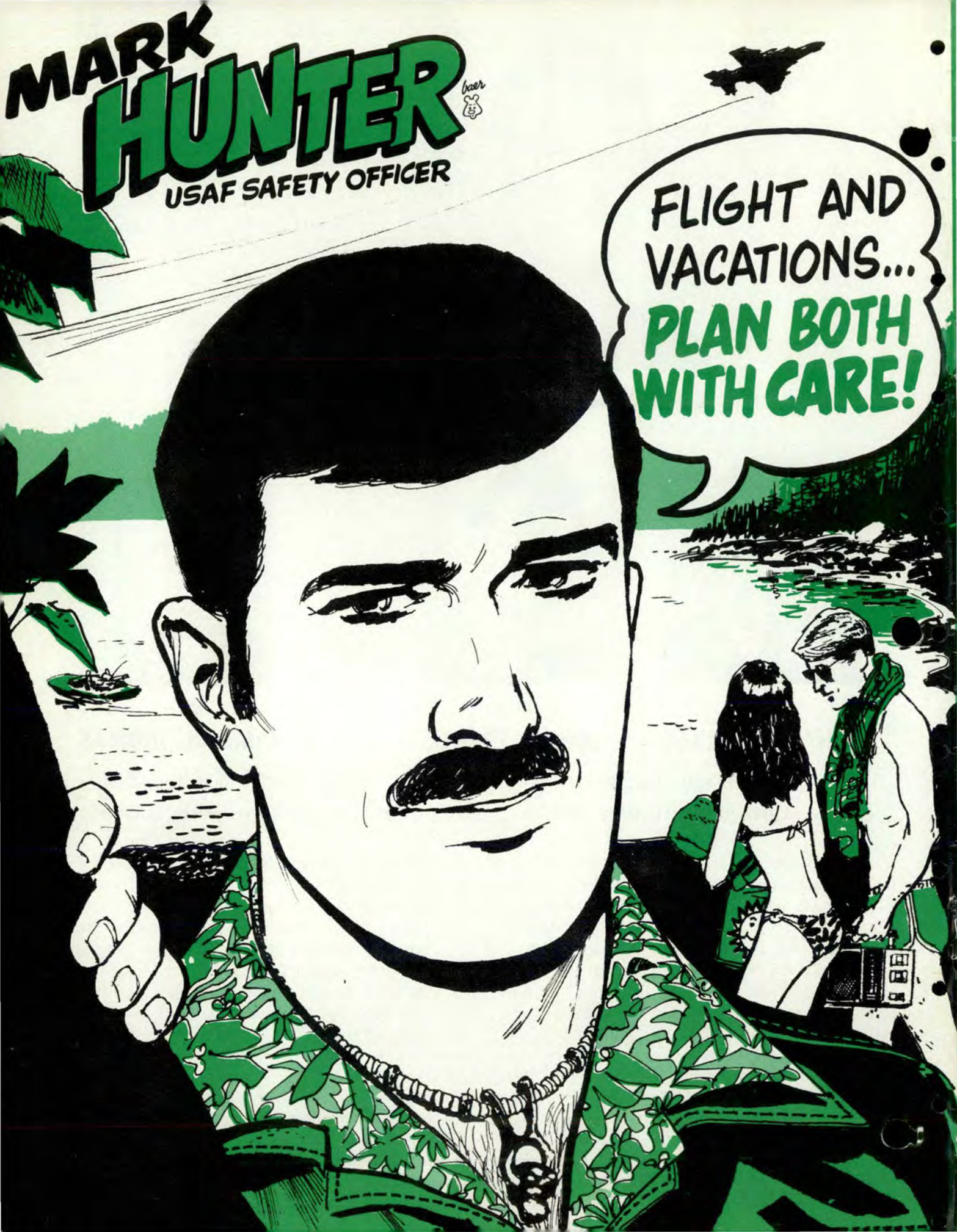
Major

JAMES H. THOMAS

3246th Test Wing
Eglin Air Force Base, Florida

Air Force Flight Test Center
Edwards Air Force Base, California

On 3 December 1975, Captain Durbin made a maximum power night takeoff in his F-15. The briefed mission quickly went by the wayside, however, when a safe gear up indication could not be obtained on takeoff. When Captain Durbin attempted to extend the landing gear, the right main gear still indicated unsafe. Captain Ronald Silkey, flying an F-4, visually determined that the right main gear was still in the wheel well. The problem was further compounded when the nose and left main gear could not be retracted. Activation of the emergency gear extension system and yawing and porpoising of the aircraft were to no avail. Captain Durbin was in continuous contact with Major James Thomas, an F-15 test pilot TDY to Eglin from Edwards AFB, California. Reviewing the alternatives, Captain Durbin chose to make the first approach and arrestment of the F-15, at night and with one gear up. Captain Durbin planned to fly the aircraft onto the runway, lower the nose wheel, and maintain wings level at 140 KIAS until crossing the barrier. Major Thomas notified the supervisor of flying, Major John Francis, who directed the foaming of the runway and the positioning of emergency vehicles. After several practice approaches, Captain Durbin landed his crippled aircraft and successfully engaged the barrier. Through teamwork, courage, and the exceptional professional knowledge and skill demonstrated by Captain Durbin, an irreplaceable aircraft was successfully recovered with minimal damage. WELL DONE! ★


MARK
HUNTER
USAF SAFETY OFFICER
FLIGHT AND VACATIONS...
PLAN BOTH WITH CARE!