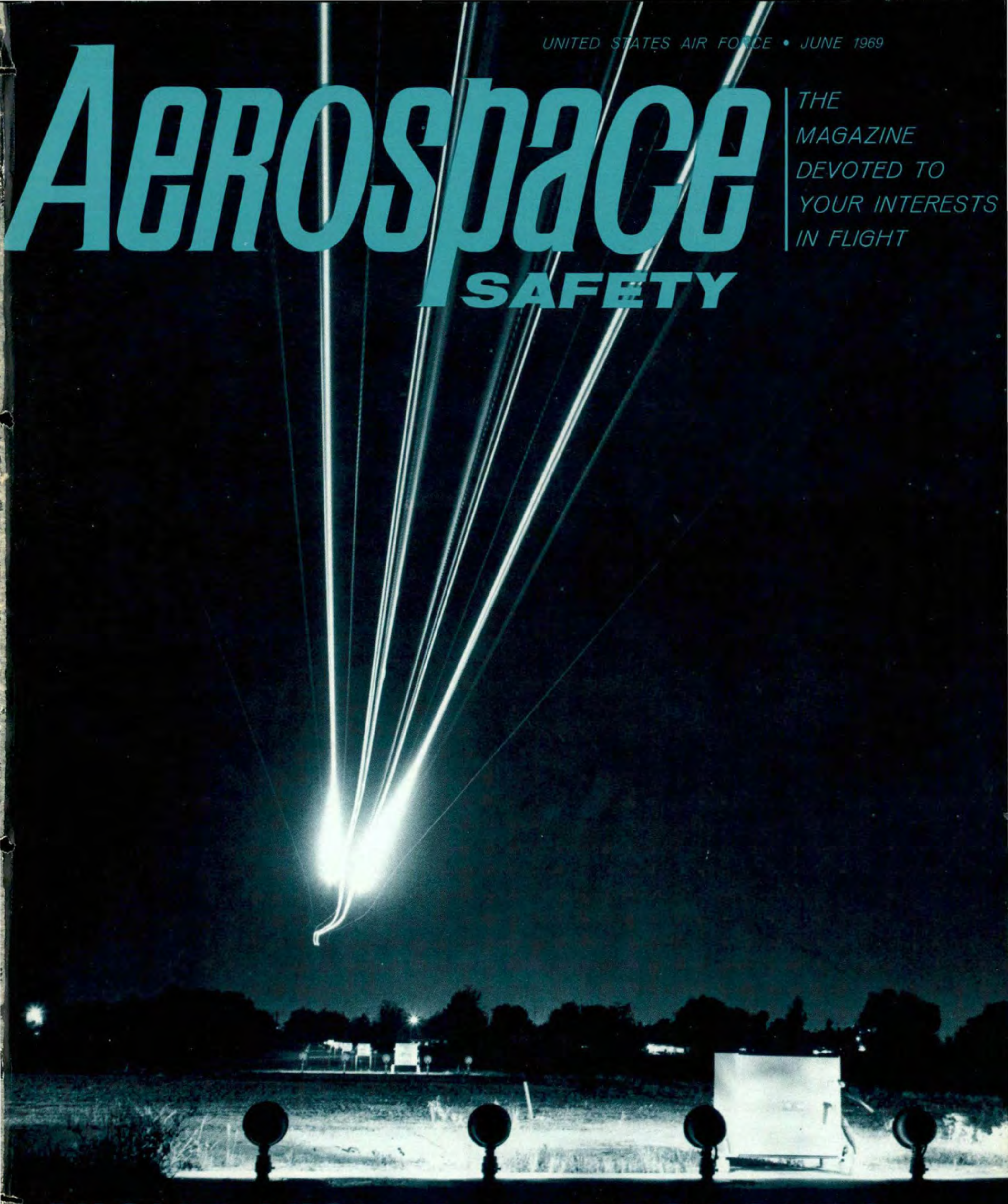
UNITED STATES AIR FORCE • JUNE 1969

Aerospace SAFETY

THE MAGAZINE DEVOTED TO YOUR INTERESTS IN FLIGHT



NIGHT VISUAL APPROACHES

THOSE LITTLE OLD MAPMAKERS . . . they chart your course

DROWNING IS FOREVER . . . asleep in the deep

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June 1969 AFRP 62-1 Volume 25 Number 6

SPECIAL FEATURES

REGULAR FEATURES

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PREFLIGHT

101 Critical Days—that's the slogan adopted several years ago for the annual drive aimed at saving lives during the high hazard summer months. During the past four years the average number of accident-caused fatalities in the Air Force during this period has been 164. That's better than one a day.

Most of these fatalities result from traffic accidents—about 75 per cent. The next biggest category is water sports, which accounts for about 15 per cent. It doesn't take a genius to figure out that many of these fatal accidents were the result of stupid mistakes, pure carelessness, negligence or a combination of these.

The theme this summer is *Common Sense and Courtesy*. A little of both will go a long way towards cutting those casualty figures.

In this issue there's a short article on water sports and the toll these activities take. It's titled "Drowning is Forever." We suggest especially that supervisors and commanders peruse this article.

Also in this issue are articles on *who* makes the charts and navigation materials and *how*; one on the peculiarities of "Night Visual Approaches," and a discussion on the pros and cons of standardization (page 16).

Flight and Missile Safety Plaque Award winners are announced on pages 22-23.

ROYAL AIR FORCE AKROTIRI

Guest Editorial by Flight Lieutenant D. J. Cox, Command Instrument Rating Examiner and Station Flight Safety Officer RAF

As I near the end of my tour at Akrotiri, the privilege of writing an editorial has fallen to me. Although it will lack the authority normally provided by the position held by previous authors, I claim to be able to write from an "inside" position and can, I hope, provoke a few points for thought.

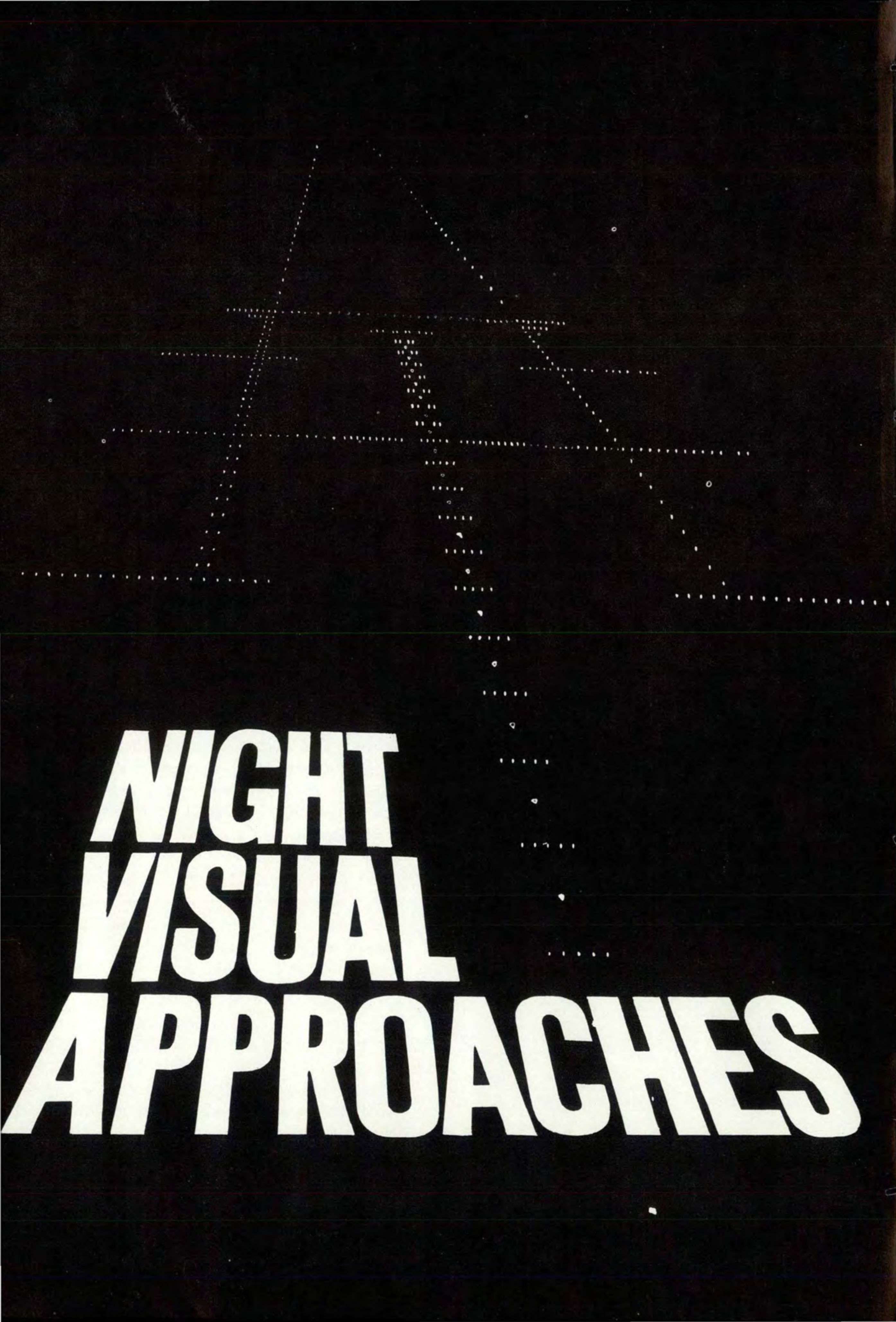
As I see it, the whole concept of Flight Safety in the Royal Air Force is undergoing a gradual change. The old picture of a Flight Safety Officer looking for hazards and then requesting corrective action is, I believe, gradually giving way to one of his being a roving adviser or consultant. Personally, I like this new picture; Flight Safety can no longer be thought of as an isolated concept, it must become an inherent part of planning, flying and engineering. To effectively keep accidents reduced to a minimum, the emphasis must be more on before-the-fact prevention, rather than after-the-fact enlightenment. To achieve this, there must be a continuous relationship between management, supervisors, operators and engineers, and who better to promote and maintain this relationship than the Flight Safety Officer. As aviation progress becomes more and more dependent on the higher levels of skill and intelligence required to operate and maintain modern aircraft, this relationship assumes an even greater importance.

I question, however, whether increased skills and intelligence are enough. I think not—a good burglar has these qualities. Unless these are combined with integrity, they are wasted. This must be encouraged by appealing to a person's pride rather than through punitive measures. Punishment, or fear of it, can be self defeating from a flight safety point of view, because it nearly always provides a feeling of injustice and discourages willingness to admit to errors or mistakes. If others would have made the same mistake in the same circumstances, then it is the circumstances which should be changed, but they never will be without the communication of doubts and fears, and the willingness to admit mistakes.

Like any quality product, flight safety is the result of detailed and comprehensive design. A fine record is not arrived at in a short period of time. Rarely, if ever, can a Flight Safety Officer prove that he has prevented an accident, but he does know that his Flight Safety Program has failed somewhere, whenever a Board of Inquiry is convened to investigate an aircraft accident. Often we find, as the result of such an inquiry, many new restrictions are imposed. This is because the investigation does not end with the determination of the cause or probable cause, for this determination and its cure touches only the symptoms of the problem of accident prevention. Considerable care must be taken however, to ensure that the problem is not just restricted out of existence, for this, to my mind, is the oldest, easiest, but worst approach to flight safety, and it doesn't really get the job done.

A Flight Safety Officer's job is really a thankless, but enormously important task. Most people desire the result of safety and yet do not wish to pay the price of prevention. Flight safety staffs are often accused of making an operation more difficult and of dampening the pleasures of life. Yet even the accusers must know that the only charge can be one of a simple attempt to save life and conserve operational capabilities. ★

Courtesy "Look," NEAF Safety Magazine



NIGHT VISUAL APPROACHES

Reprinted from Boeing Airliner

During the first eight years of commercial jet operations — prior to 1967 — approximately 16 per cent of the major aircraft accidents occurred during night approaches over unlighted terrain or water toward well-lighted cities and airports. Meteorological conditions in all cases were such that the flight crew could have employed visual reference to light patterns on the ground. In 1967, the accident rate under similar conditions was 17.5 per cent. Accidents involving highly instrumented aircraft continue to occur during seemingly safe night visual approaches.

This article discusses one subtle aspect of night visual approaches that can lead even experienced pilots into dangerously low approaches. A study being conducted by The Boeing Company is based on commercial jet experience, but the problem is thought to extend to all types ot operations and equipments: commercial, military, and private.

Boeing research with a simulator measures the relationship between pilot performance and the information he receives by looking out the windshield during a night approach. A number of variables (such as light patterns, terrain slope, darkened areas, starting altitudes, and distances) are being sampled to determine their effects on pilot performance in the absence of altitude information.

The city/airport model (Figs. 1 and 2), including flashing lights, color and strobe effects, was mechanized to simulate a realistic view of a pilot-controlled descent to the airport. In a series of tests, 12 senior instructor pilots each made 12 approaches. Periodically during these approaches, the pilots were requested to estimate altitude. Additional workload was introduced by having the pilots locate and report other traffic in their forward field of vision.

Pilots were allowed to choose their own descent path, except for two instructions: (1) They should attempt to be 5000 feet, 180 mph (156K) at ten miles out, and (2) 1250 feet, 120 mph (104K) at four and one-half miles out (the point at which they might expect to intercept a three degree glide slope). The test conditions were terminated at four and one-half miles, approximately one mile short of, and 250 feet above the point where relative motion would normally start to favorably influence altitude judgment at the end speed of 120 mph (104K).

During these tests, a variable of major concern was the visual angle of the light pattern on the ground, i.e., the angle subtended at the eye by the nearest and farthest lights along the flight path. Closing on the city at a constant altitude, this angle becomes increasingly larger. In a vertical descent at a constant distance, such as made with a helicopter, this angle becomes progressively smaller. From any starting altitude and distance, there is a specific flight path in which this visual angle remains constant (Fig. 3). This approach path follows the arc of a circle centered above the

Fig 1. Test crew flying the Boeing Simulator.

Fig 2. Plan view of the city. Airport is slightly left of center at bottom.

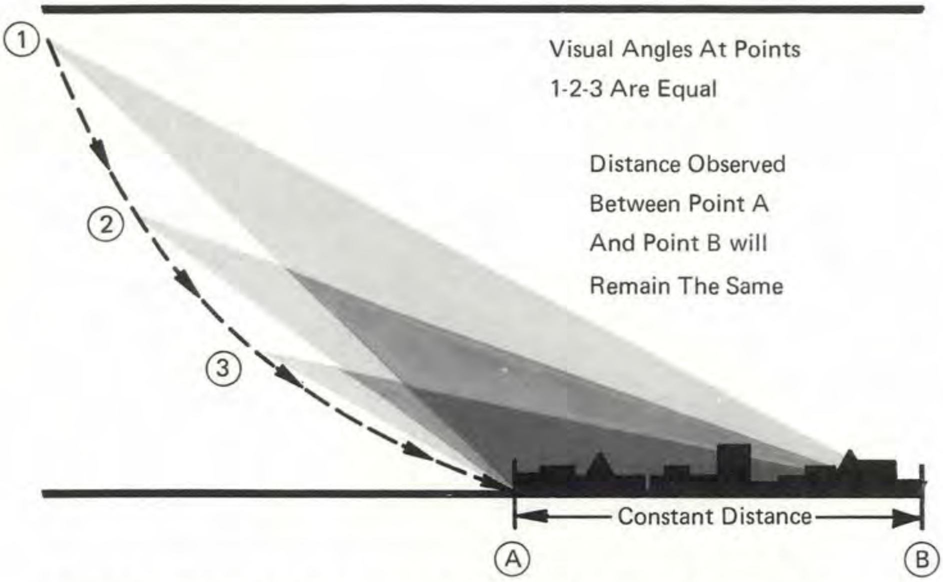


Fig. 3. For any starting altitude and distance from the city, there is a specific path in which the angle subtended at the pilot's eye remains constant.

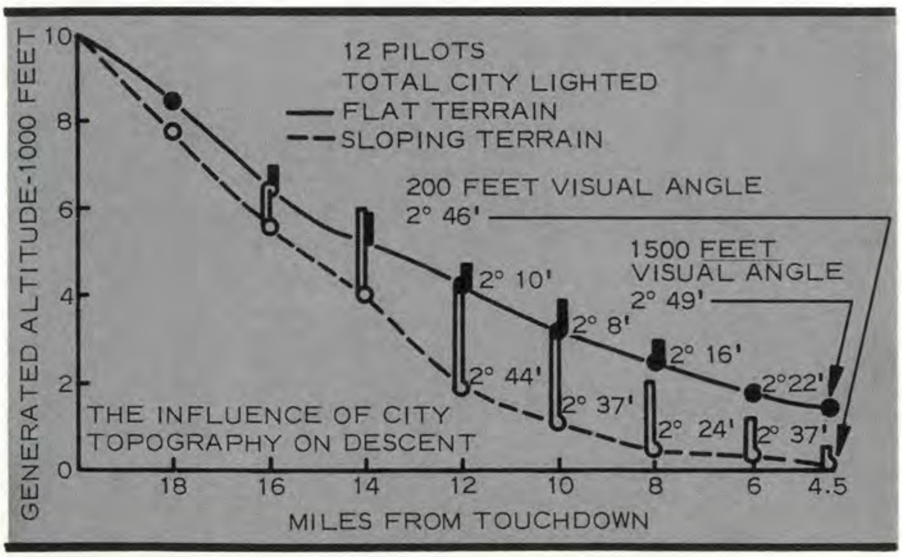


Fig 4. Shown is average generated altitude or flight path flown to a flat city and sloping city. Tops of bars show pilot's average estimate of altitude at each point.

pattern of city lights, with its circumference contacting the terrain. The diameter of this circle is usually large enough to give the subjective impression of a straight-line descent.

Pilots, through training and experience, develop a visual frame of reference which allows them to conduct safe conventional approaches to *flat* terrain. Many successful approaches are made by effectively maintaining a visual null (no change to the subject angle). Pilots may "fly the null" so consistently that, when deceptive conditions are introduced (such as irregular light patterns, up-slope lights, and other topographical features), their approach paths go to critically low altitudes. Figure 4 is a composite plot of the average performance of 12 experienced pilots flying approaches to a flat city and to an identical city with a three-degree up-slope. The bars projecting above the actual flight paths represent the pilots' estimated altitudes. The significant point to be observed is that the visual angles at the terminal point in the approach to the sloped city were essentially equal and thus the actual altitudes at this point averaged some 1300 feet lower. In each case, the pilots were advised immediately prior to the approach as to whether the city was sloped or flat. In other words, the pilots continued to view the city/airport light patterns, spread out over varying topography, as representative of a flat city. During these series of tests, a number of pilots flew too low—many below zero altitude, and one to 2500 feet below the airport elevation.

Another variable, which had small but statistically significant effect on approach path, was the distribution of lights on the terrain. It was expected that the addition of lights to the depth and width of the city would produce a better visual reference. However, data indicate that the larger, more complex light patterns may actually be detrimental if they tend to be misleading, as in the case of up-slope terrain.

The following city/airport/approach features are considered to aggravate the problem:

- A long straight-in approach to the airport located on the near side of the city.

- An airport runway length-width relationship which is unfamiliar to the pilot.

- The airport situated at a slightly lower elevation and on a different slope from the surrounding terrain.

- The navigational facility located some distance from the airport.

- Substandard lighting of the runway, and other landing aids not available.

- A sprawling city with an irregular matrix of lights spread over various hillsides in back of the airport.

- Industrial smoke or other obscurations, which decrease the brightness of lights and make them appear farther away.

The data being developed at Boeing support the visual angle hypothesis as one systematic explanation of night visual approach accidents. Investigations of possible solutions to this problem, and their interaction with other phases of operations will take time. However, there are immediately available means for potential reduction of night visual approach accidents. These include more frequent reference to altimetry—barometric or radar, cross checks with other crewmembers, and most important of all, knowledge and awareness of special problems associated with these approaches.

The study this article describes was based on commercial jet experience and commercial airports. In Air Force operations under all conditions and in all parts of the world, USAF pilots frequently find themselves facing just such problems as those presented in this article.

But USAF pilots have a lot going for them—aids that, used to best advantage, enable them to cope with these problems successfully. Among these are VASI, which is available at most bases where our aircraft operate. VASI, perhaps, is underrated by many pilots but it is a highly effective piece of equipment when properly used.

Then there are DME and ILS, which, combined with the altimeter, will enable the pilot to successfully handle those illusions described which cause him to misinterpret what he sees. These aids are usually available at airports where the airport control zone environment could cause pilot confusion.

During a night VFR approach to a runway in a setting such as described in the article, a practice instrument approach may be advisable. In addition to the practice, the pilot will be protected against the confusion the landscape might produce. This is a standard procedure for MAC crews who, under MACM 55-1 must initiate an instrument approach (precision, if available) for all night landings. If VMC prevail, the pilot may cancel his IFR clearance and land visually after having begun the IFR approach.

Finally, one more handy aid is the instrument approach plate. Don't overlook the information it contains.

Someday, perhaps, we will have simulators in which we can program a visual representation of any number of approaches. This may even be as much a part of the flight preparation for crews as flight planning, preflight briefing. Meanwhile, however, use of what we have now, if properly applied, should enable us to handle even the trickiest situation.

The authors, Drs Conrad L. Kraft and Charles L. Elworth, will appreciate hearing from readers who can aid their research by writing to them regarding city/airport combinations containing potentially dangerous conditions. Their address:

The Boeing Company
Organization 6-5353, M/S 23-28
P.O. Box 3707
Seattle, WA 98124 ★

SURVIVAL....

Lt Col Robert H. Bonner, USAF, M.C., Directorate of Aerospace Safety

"Why so much emphasis in the Air Force on survival training?" This question is usually asked by an individual who is already overworked and who has a heavy ground training schedule. Any further inroads into his "free" time are resented, and rightfully so. This resentment sometimes allows the individual to be less attentive, occasionally antagonistic to the material taught, and openly resistive to participation.

The idea that survival is simply a mixture of common sense and a little luck just isn't true today in the Air Force. Webster's Dictionary defines survival as, "The continuation of life or existence in the presence of or *in spite* of unusual difficult conditions." In today's Air Force, this takes training, knowledge, and lots of technique. Survival in our modern high-speed aircraft is an all-encompassing term. Our ability to fly, our finesse in instruments, our ability to react to airborne emergencies, are all elements of survival. Successful escape from a disabled aircraft either by ejection or ground egress is part of survival. Proper use of the parachute, release of the survival kit, and release of the risers after water or ground impact are part of survival. Finally, existing and subsisting until rescue, are elements of survival. Any miscue or wrong act in any of the above phases can make survival impossible.

The reason for all this training is to teach us to act in such a way that we can survive. A lot of engineering talent and energy have been expended in developing ejection seats and items of equipment specifically designed to enhance our chances of survival. Unfortunately, some of these items are as complicated as the aircraft in which we fly.

The engineers can only do so much. The rest depends upon you. The engineers can design an easily flyable airplane, but the ultimate operation is dependent upon the pilot. Only through practice and conti-

Moment of truth—now is when all that training should pay off. Knowledge is often equal to survival in this formula.

All those goodies! Do you know how to make best use of all the items of your survival gear? Life support folks do, and they'll be glad to help you.

nual training does the pilot maintain his high degree of skill in operating his aircraft. The same situation exists in the use of egress systems and survival equipment. The proper use and ultimate successful outcome depend upon the aircrew member. How well he remembers his training and how frequently he practices what he has been taught are directly related to his chances for survival.

Life support sections throughout the Air Force are manned by dedicated, qualified technicians who are devoted to providing you, the aircrew member, with the best survival training possible. If you could remember all that has been taught you by these dedicated life support people, your chances for survival would be optimum. Unfortunately, many of us do not remember everything taught to us because we entered into the survival training with a passive attitude. This may have been due to resentment, or possibly boredom, or, perhaps, because the reality of *it* possibly "happening to me" might be too painful to accept. Only through active participation in survival training, refresher courses, and frequent self-induced practicing can we maintain our proficiency in the use of our sophisticated egress systems and life support equipment.

You may ask, "What can I do?" Enter into all life support training as if your life depends on it, because it does. Be enthusiastic about the efforts of the life support technicians in attempting to help you become as proficient in the operation of your survival equipment as you are in the operation of your aircraft. Develop mental checklists that can be used daily so that you can mentally rehearse ejection sequences, survival radio operation, survival kit release, life raft inflation, survival kit location and contents and their use.

Practice emergency ground egress every time you get into the aircraft. Develop the skill and ability to quickly disconnect your personal leads so that you have the confidence that you can escape from your aircraft on the ground with minimum delay. Practice identifying objects in the survival kit while blindfolded, to gain confidence that recognition will be automatic at night. Also, practice operation of survival radios while blindfolded so there is no question in your mind that you can effect your rescue at night.

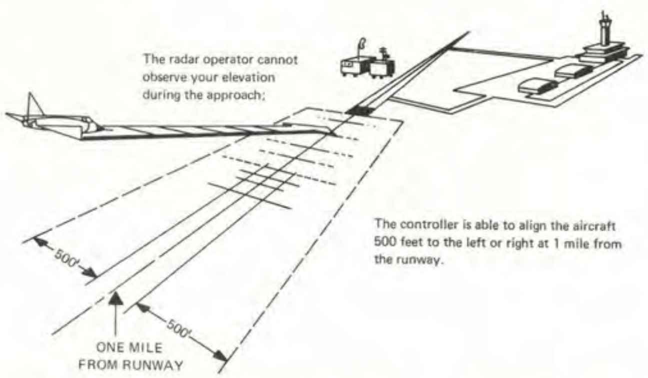
If we can approach survival training with the same professionalism with which we approach the maintenance of flying proficiency, then we do not have to rely upon "good luck" for our survival. ★

the I.P.I.S. approach

By the USAF Instrument Pilot Instructor School, (ATC) Randolph AFB, Texas

SURVEILLANCE RADAR APPROACHES

Occasionally, when precision radar (PAR) is not available, a surveillance radar approach (ASR) may be required. Procedures for the transition to final are the same for PAR and ASR approaches, but major differences exist between PAR and ASR finals. These differences should be clearly understood by the pilot.



Most pilots realize that surveillance radar does not provide glide slope information and controllers cannot observe aircraft elevation during an ASR approach. Not all pilots realize that ASR course corrections are usually less accurate than those given during a PAR approach. However, if the controller's corrections are accurately followed, an aircraft should be within 500 feet of the extended runway edges at one mile.

Surveillance approach radar guidance will normally be discontinued when the aircraft is one mile from the landing threshold. At this point, the controller will advise the pilot that he is, "One mile from the runway; take over visually and land." If the pilot does not have visual reference with the runway environment at this time, he must execute a missed approach. NOTE: Under TERPs, the lowest weather minimum authorized for an ASR approach has been changed to 300-½. Significantly, whenever the visibility is one-half mile, a pilot performing an ASR approach will be unable to see the runway from one mile out. However, approach lighting, which is part of the runway environment, should be identifiable. Approach lighting configurations must be carefully considered before an approach is started.

With the implementation of TERPs, ASR approach procedures have changed. Range and azimuth information are provided as before. However, Air Force controllers no longer advise the pilot of the minimum descent altitude (MDA). Nor do they provide recommended mean sea level altitudes each mile on the final approach. The pilot has the responsibility to know and adhere to the applicable MDA. Controllers simply clear the pilot to descend to MDA at a designated final approach fix.

An ASR approach fix, established under TERPs criteria, will be not less than three miles or more than six miles from the runway. Controllers will inform the pilot, "Descent to minimum descent altitude will be authorized at (number of miles) from runway." At the designated final approach fix controllers will state, "(Number of miles) miles from runway; descend to minimum descent altitude."

When flying an ASR approach, a pilot must plan to arrive at the applicable MDA before reaching a point one mile from the runway. The MDA must be reached in time for the pilot to identify the runway environment not later than the one mile point. From an obstruction clearance viewpoint, after descent is authorized, a pilot could descend vertically to the MDA. In reality, such a maneuver may prove to be a little tricky. A better technique is to consider the normal ASR final descent gradient of 300 feet per mile as approximately a three degree glide slope. Estimate the descent rate required to maintain the imaginary glide slope and establish a slightly greater descent rate.

To estimate the rate of descent required for a three degree glide slope, subtract headwind from the KIAS, divide by two and add a zero; e.g., 130 KIAS — 10 Headwind = 60 or 600 FPM.

In the given example a 600 FPM rate of descent would cause a pilot to arrive at the MDA and the one mile point simultaneously. To ensure that the MDA is reached before the one mile point, the recommended ASR descent rate would be 700-800 FPM. ★

THOSE LITTLE OLD MAPMAKERS

All aircrews are familiar with WACs, but a LAC — that's something else. A WAC, of course, is a World Aeronautical Chart used for air navigation.

Now, you can get a LAC—Lunar Astronautical Chart—simply by ordering one at 35 cents a copy or $4.00 for the whole series, from the Superintendent of Documents. These and other exotic new charts are produced by the same people who furnish us with the more familiar tools of our trade, such as FLIPs and WACs—the Air Force's Aeronautical Chart and Information Center.

If you are one of those who thinks of ACIC as a dingy office full of little old men in eyeshades drawing maps, think again. ACIC is big business with many varied customers and products. Its St Louis headquarters is a conglomerate of buildings, some dating back more than 100 years (the government almost never gets rid of a building), and about 4000 people, most of whom are highly educated, highly skilled

specialists in a great variety of skills and disciplines.

Lunar reference mosaic. Charts for actual moon landing have already been prepared. At right, technician is programming type placement on chart, a tedious job even with latest machines.

Among ACIC's many customers are all of the military services, NASA and other government agencies as well as businesses and individuals who subscribe to those services that are available to them. For example, the astronauts carry charts, just as any aircraft crew, in the cabin of their spacecraft. The chart on pages 10-11 was prepared for the Apollo 9 mission. It shows orbital tracks by number, tracking stations and their command areas as well as other information. An armchair Apollo tracker could have sat in front of his television set with one of these charts and kept good track of where the Apollo capsule was at any given time.

When our first astronauts go to the surface of the moon they will need maps. And ACIC is busy preparing these maps on a scale that will indicate, depending on the series, topographical features as small as tiny craters only a couple of feet across.

THOSE LITTLE OLD MAPMAKERS CONTINUED

The ACIC customer we're most concerned with, of course, is our own aircrews. In addition to standard navigational charts and Flight Information Publications (FLIPs), the Center produces many special purpose charts, such as those used for air targeting. Some of these publications are: Operational Navigation Charts on a 1:1,000,000 scale (which are replacing the WACs), Jet Navigation Charts, 1:2,000,000, and Global Navigation Charts, 1:5,-000,000. These are all used for air navigation, depending on speed and distances involved in the mission.

The publications pilots are most familiar with are the FLIPs, which provide information for all phases of a mission from planning through departure, enroute cruise and arrival in the terminal area anywhere in the free world.

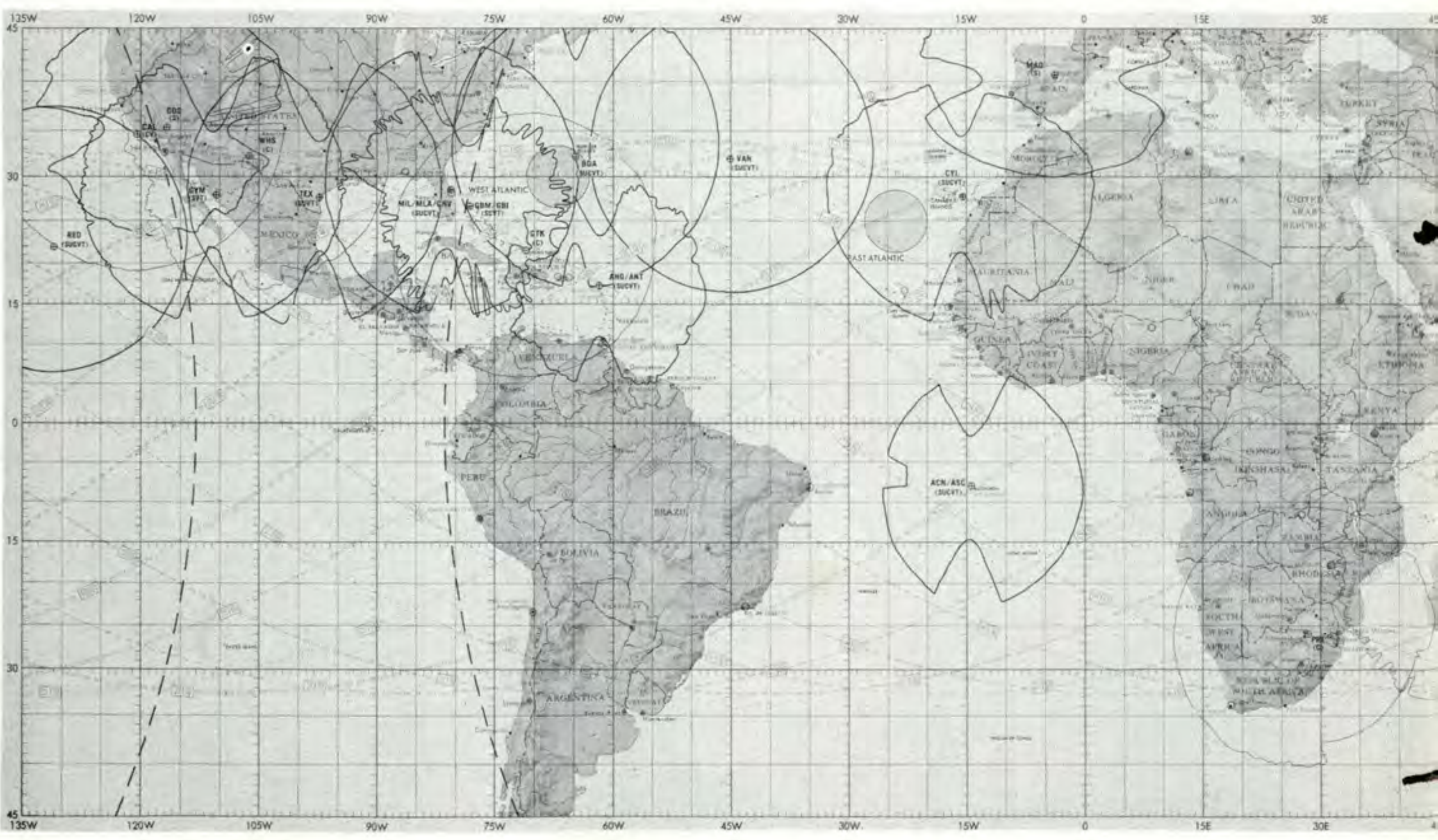
Occasionally symbols or procedures depicted on FLIP plates are questioned by pilots. ACIC welcomes both questions and corrections when a chart or plate contains an error and they even make it easy for the person with the gripe. General information and instructions for sending corrections are printed on the first page or inside of the front cover of all FLIPs. While these publications are amazingly accurate, they occasionally contain errors which must be called to the attention of ACIC so that they can be corrected at the earliest possible moment.

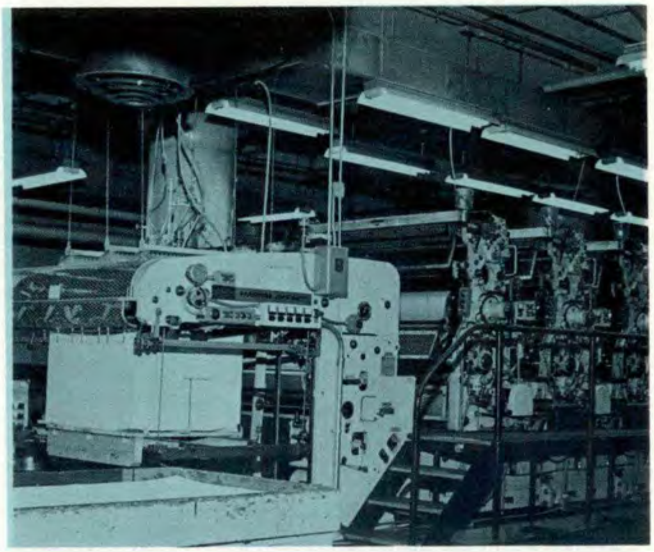
Changes in procedures, and resulting chart depictions usually bring some inquiries. Since many ACIC products are used by all the services, they must portray items in such a way that they will be clear to all users. The symbol for a procedure turn on an instrument approach plate, for example, is drawn the way it is because of the different procedures used by the Army and the Air Force.

The people at ACIC show their concern for aircrews by rigid quality control of their products. Describing how computers and other machines aid in accuracy would require pages, but accuracy is paramount whether the chart is for missile targeting on the other side of the world, for lunar landings or for aircraft navigation in the USA.

Part of the quality of the product is its ability to stand up under normal use. Charts that tear easily, colors that fade when exposed to ordinary light, pages that rip out of booklets at the least stress would make Air Force missions more difficult, even in some cases, unsuccessful. So ACIC has machines that test these physical characteristics. Amazing how strong the glue is in a Terminal Approach Procedures booklet.

As one of the world's largest car-

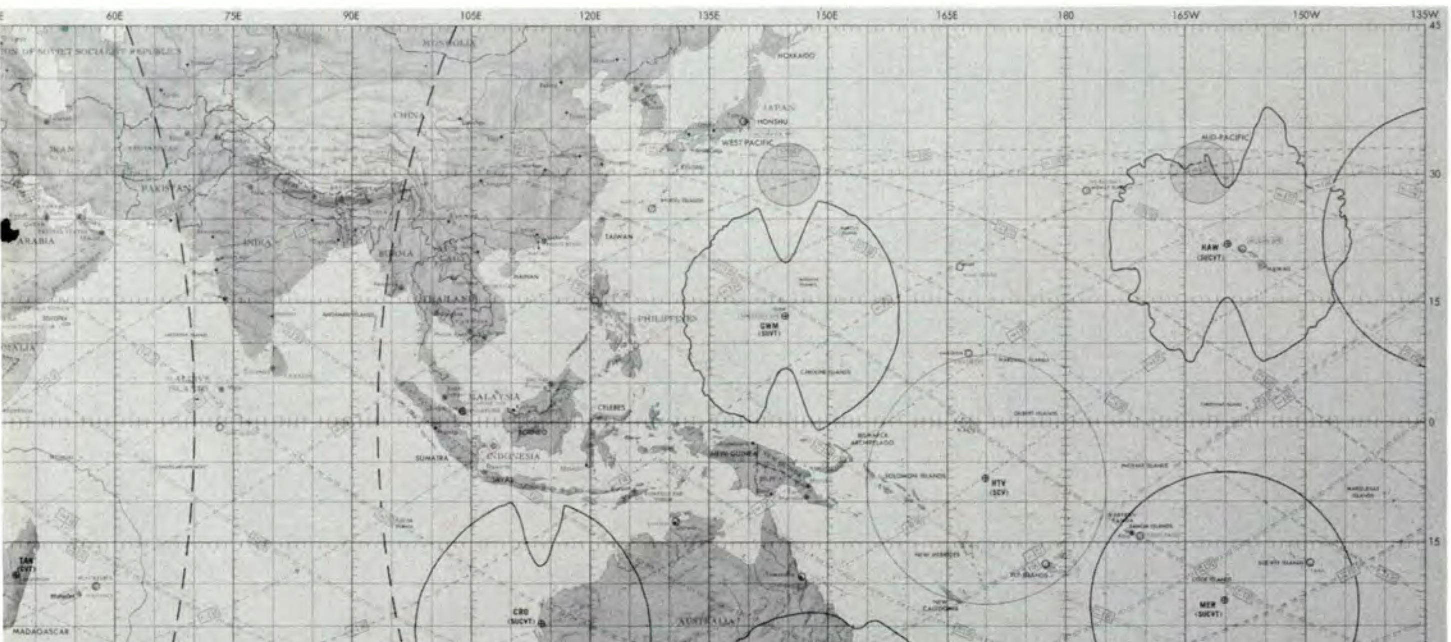




T. A. White, Chart Research Division, measuring star plates using a stellar comparator. Right, five color press at ACIC Hq. Chart for Apollo 9 mission shown below.

tographic organizations ACIC uses many types of highly sophisticated equipment, including computers, complicated printing presses, many different cameras and other photographic equipment. Its people, many of whom have advanced degrees, employ their many skills enhanced by their machines toward one goal: to give the users a quality product.

Air Force needs dictate the kinds of products ACIC produces. As it becomes more important to know the exact location of a given place on the earth's surface, ACIC is responsible for putting it on a chart. This is known as geodesy, a mathematical science that deals with the location of exact points on the earth's surface and the terrestrial shape. In recent years satellites have been employed to obtain very precise earth measurements. Although the task is far from complete, many places have been pinpointed exactly in reference to other places. It is this knowledge that makes practical the ballistic missile.



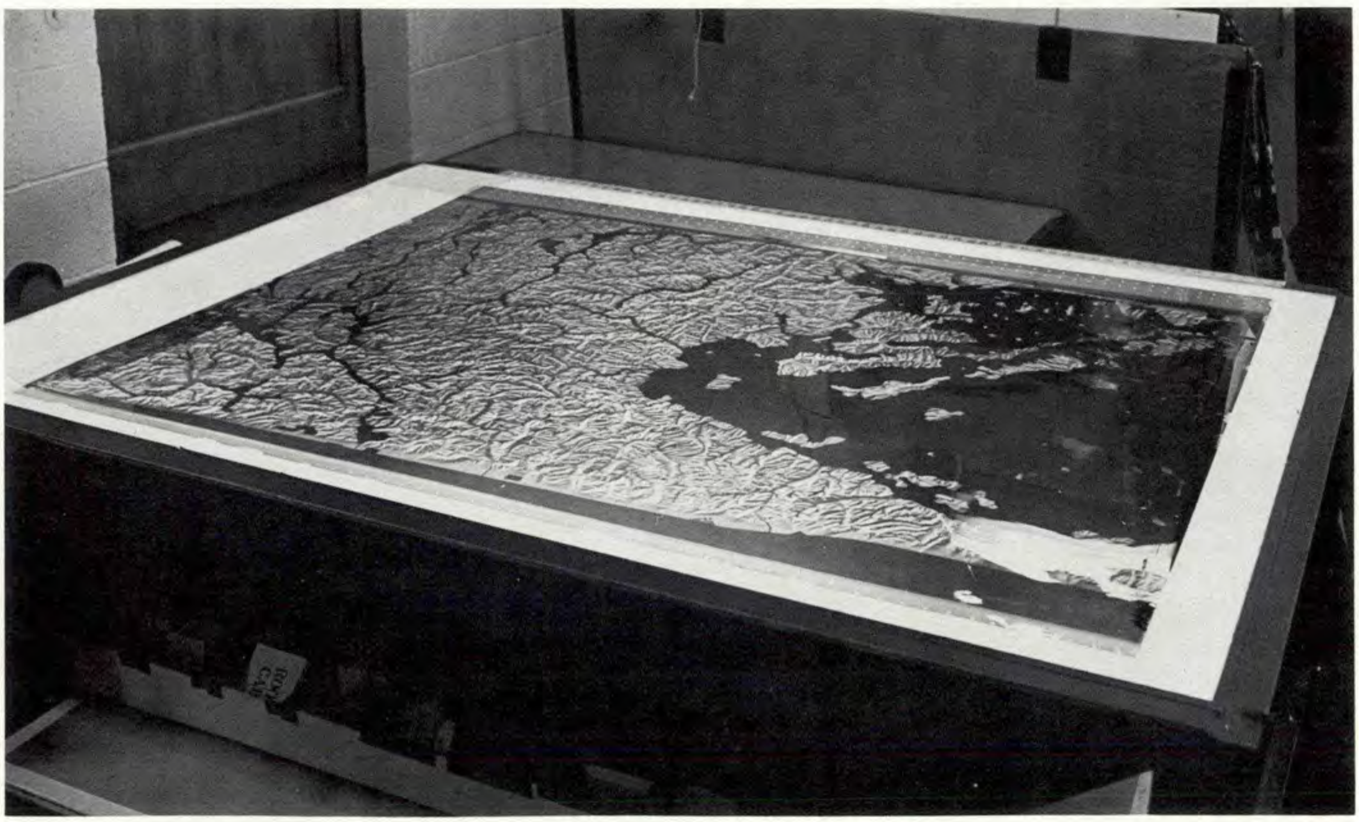
THOSE LITTLE OLD MAPMAKERS CONTINUED

Cartographer Helen Hoffman demonstrates terrain emboss method of depicting three dimensional relief on charts. Below, relief negative prepared to represent three dimensional portrayal of topography on aeronautical charts.

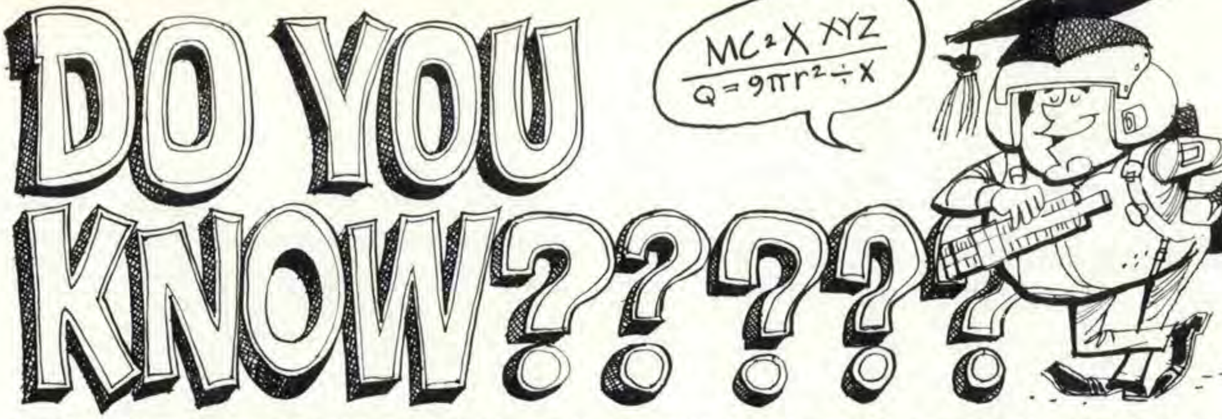
Perhaps, if you are an aircrew member, you have noticed some difference in the shading of topographical features. This used to be done by air brush and was a very tedious, time-consuming and expensive job. A new method developed by ACIC called *Terrain-Emboss* is faster and less costly. In this technique a toolable sheet of plastic or aluminum is formed into a three-dimensional shape upon which features are pre-printed. It is then photographed under special lighting which produces shaded relief features. Charts showing topography now employ this method.

While ACIC is an Air Force unit, it works closely with other military services, NASA, intelligence organizations, and other government departments. Its people are employed around the world; for example, a detachment was located for some time at the Lowell Observatory at Flagstaff, Arizona to study the moon and planets for topographical information.

Other people are busy updating the charts Air Force crews use in their day-to-day jobs. They know that every time an Air Force aircraft starts an approach their skills are riding in the cockpit along with the crew. ★



DO YOU KNOW????



HERE IS A VERY INTERESTING QUIZ FROM A RECENT ISSUE OF "THE PROFESSIONAL APPROACH" AFSC MAGAZINE

Major L. A. Chastaine, SED

In spite of the fact that most pilots in Air Force Systems Command are very experienced with lots of flying time and years in the cockpit, there are still numerous errors and omissions in the DD Form 175 and AFTO Form 781. Listed below is a little pop quiz on these two forms. Can *you* pass?

AFTO FORM 781

1. When entering your name in the Part I, be sure to include both initials.

☐ True ☐ False

2. The largest number of pilots that can log flying time simultaneously is:

☐ a. 3 ☐ c. 5
☐ b. 4 ☐ d. 6

3. Two IPs are flying in a T-bird; can they both log IP time simultaneously?

☐ a. Yes ☐ b. No

4. You must log some day instrument, night instrument, or simulated instrument time to legally log approaches.

☐ True ☐ False

5. The letters BTG are used to record a back seat touch and go landing.

☐ True ☐ False

6. You must log some VFR time to legally log a landing.

☐ True ☐ False

7. A sortie is defined as:

☐ a. One takeoff and landing.
☐ b. One flight.
☐ c. One mission.
☐ d. One takeoff and one or more landings until termination of the flight.

8. If the flying time is not creditable for annual minimums, place an L in the right hand column.

☐ True ☐ False

9. When recording the takeoff and landing times, you should:

☐ a. Record to nearest minute, using Zulu times.
☐ b. Record to nearest 5 min., using Zulu times.
☐ c. Record to nearest minute, using local time at takeoff, and local time at landing destination.
☐ d. Record to nearest minute, using local time of departing station.

10. If you have just passed your annual instrument check ride, the letters ______ should be entered in Column E of the 781.

☐ a. PF ☐ c. YF
☐ b. YP ☐ d. YL

11. If you have just passed your annual proficiency check ride, the letters ______ should be entered in Column E of the 781.

☐ a. PF ☐ c. YP
☐ b. P1 ☐ d. PP

12. An instructor pilot must sign the 781 with a statement to the effect "Maj Jones satisfactorily completed his annual instrument flight check this date."

☐ True ☐ False

DD FORM 175

13. If you are flying AF aircraft 517917, the proper entry in RADIO CALL is:

☐ a. AF17917 ☐ c. A7917
☐ b. A917 ☐ d. A17917

14. There is no need for an altitude to be placed in INITIAL CRUISING ALTITUDE, when the flight is VFR.

☐ True ☐ False

15. The Symbol D is correct to use in the ROUTE OF FLIGHT section.

☐ True ☐ False

16. A pilot must place his proper instrument rating in the INST RATING block.

☐ True ☐ False

17. The date that is placed in the DATE block is the Zulu date.

☐ True ☐ False

18. Who can sign the 175 in the SIGNATURE OF APPROVING AUTHORITY?

☐ a. Any rated pilot.
☐ b. Any rated pilot, providing he is shown on flight orders as pilot in command.
☐ c. Only the pilot who is on the flight orders with the asterisk by his name, designating him as pilot in command.
☐ d. Any pilot designated by the pilot in command can sign.

19. You must include your last name, first name, and middle initial when placing your name in the *NAME AND INITIALS* block.

☐ True ☐ False

ANSWERS

NOTE: These answers are only the considered opinion of the author and in no way constitute an official Stan/Eval policy. If you can find a reg or reference which would prove any answer incorrect, please send it to SED, Eglin AFB, FL 32542.

1. B—False; 2. Six pilots. Command pilot, aircraft commander, two instructor pilots, pilot and copilot; 3. No; 4. True; 5. False; 6. True; 7. D; 8. False; 9. D; 10. B—YP; 11. D—PP; 12. True; 13. D; 14. True; 15. B—False; 16. B—False; 17. B—False; 18. C; 19. B—False.

REX RILEY'S
CROSS COUNTRY NOTES

REUNION: CBI PILOTS—The 24th Annual Reunion of the China, Burma, India-Hump Pilots Association will be held on August 23-24, 1969, at the Downtown-Holiday Inn, Nashville, Tennessee. For information, contact Herb Fisher, Port of New York Authority, 111 Eighth Ave. (Room 1409), New York, N.Y. 10011. Phone : (212) 620-8396.

ELLINGTON AFB. Jocks who have happily watched the airspeed climb during an enroute descent should realize that this may not always be the most expeditious way of getting into your destination.

An example is Ellington AFB. Apparently not everyone gets the word, even though it's spelled out in the Aerodrome Remarks for Ellington: "Inbound IFR aircraft accepting enroute penetrations and radar vectors for HOU can expect traffic delays at low altitude."

Forewarned is you-know-what.

CANOPY CUTTER. There are probably many crewmembers who don't fully realize the value of the canopy cutters stowed in fighter type aircraft. Conspicuous by their absence from this group are those who have used this tool to cut their way out of a wreck. Here's one that happened the other day.

An F-105 with troubles was on the way to home plate from a training mission. Fuel wasn't transferring from the forward and aft tanks so the pilot elected to recover at an intermediate municipal airport. He slowed down to charted touchdown speed, touched down firmly, and the left main tire blew out. After skipping about 700 feet down the runway, the left main gear collapsed, the left drop tank came off causing a yaw which resulted in the nose and right main gears collapsing.

Both canopies were partially crushed when the bird rolled onto its back and stopped. The pilot was able to knock out enough of the cracked canopy to get out but the Electronic Warfare Officer in the back seat had to use the canopy cutter to chop a hole through which to exit.

So, make sure you know where the cutting tool is located, how to get it out of its holder, and how to use it.

THRILLER. FOD almost ruined this F-4C crew's day. There were no problems until joinup after gunnery practice. Then the stick wouldn't move aft of the neutral position. Hydraulic pressure readings were normal. Level flight could be maintained at 200 KCAS and 500 fpm descent at 190. Flaps produced a pitch down and were immediately raised. The landing was made with full available aft stick and power controlling the rate of descent.

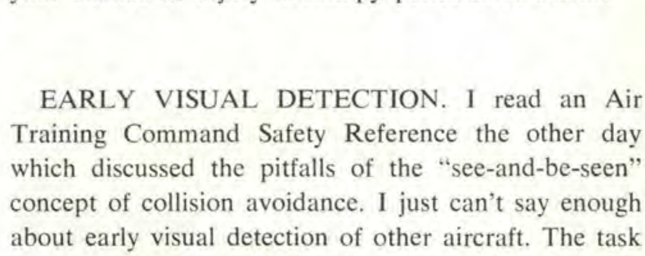
The culprit was an upper cap from an Aero 7A ejection rack that somehow got behind the stabilator bellcrank.

IT'S HARD TO DUCK A DUCK when you are churning along at 1200 feet on a low level route doing 420 knots. Birds usually can't be spotted in time to take the necessary evasive action. The other day an F-4 ran into a flight of four. The front seat pilot had just started a left turn and didn't see the ducks. He was stunned and blinded as one hit him in the right arm, shoulder and helmet. It made an eight inch by 18 inch hole in the glass in the front cockpit right quarter panel, glanced off the instrument panel and glare shield and then hit the front seat pilot. He attempted to roll out of the turn, reduce speed, and gain altitude but was hampered by bird debris that had blown under his visor up the oxygen mask and into his eyes. He regained vision in one eye by rubbing away the debris with his left hand and surveyed the damage after ascertaining that he had positive control of the aircraft.

Both fire warning lights and the master caution lights were broken. They wouldn't illuminate when the warning light check switch was actuated. The fuel low level light had illuminated when the bird struck but the fuel gage read 8000 tape and 12,000 counter and didn't change when the fuel feed tank check switch was actuated.

The crew could not communicate with each other until speed was reduced to about 180 knots indicated. The front seater dumped the internal wing tank fuel and made a full stop, straight in landing. The force of the bird striking the pilot's helmet broke a small portion of the lowered visor, but the pilot believes that he would have been seriously injured had his visor not been down. Keep that visor down when you are operating at low altitude. Its proper use will minimize your chance of injury if canopy penetration occurs.

EARLY VISUAL DETECTION. I read an Air Training Command Safety Reference the other day which discussed the pitfalls of the "see-and-be-seen" concept of collision avoidance. I just can't say enough about early visual detection of other aircraft. The task becomes increasingly difficult as we enter airports, big city environments where the sky is literally full of machinery. Even some relatively small towns and resort areas generate a large volume of air traffic. Let's say, for instance, that you are moving along at five miles per minute with the prevailing visibility at five miles and you spot a small aircraft near your flight path at your altitude and about five miles away. You have about 60 seconds to take evasive action. But—how often do you actually see the other guy five miles away? You're being vectored by radar to a final ap-

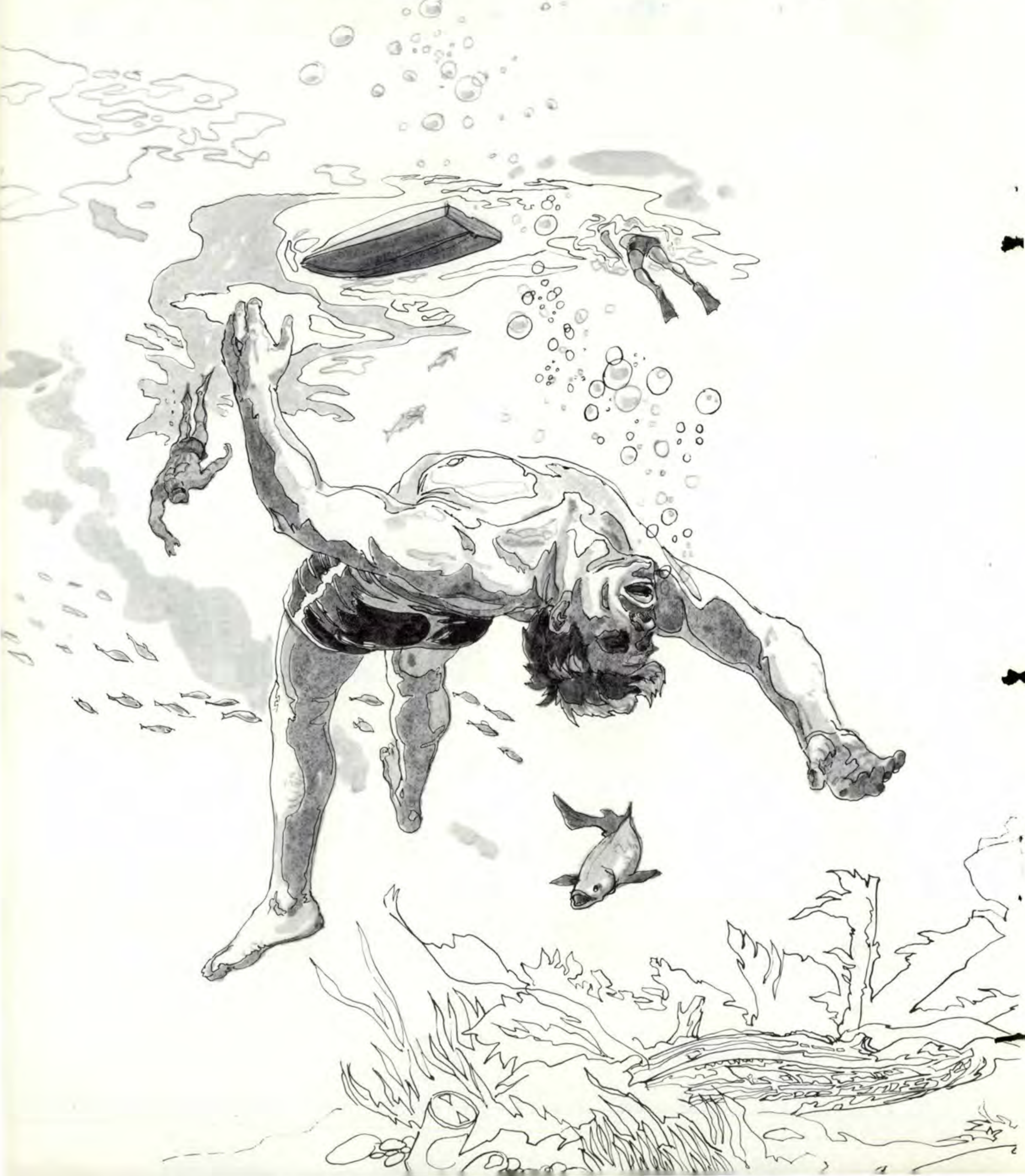


proach and you are cross checking those gages fairly often. If you sight a target at less than five miles, your reaction and evasion time is drastically shortened. Let's not consider speeds only; size makes a big difference in difficulty of visual detection. Here's a significant item from the ATC reference.

"To illustrate, make a pencil dot on the wall and then back off about 12 feet; the dot is about the size of a T-37 at 10 miles. Now draw a line through the dot about one-fourth of an inch long and again back away 12 feet; this is the same as a T-37 at five miles. These converging aircraft would pass in roughly one and one-half minutes from 10 miles. However, remember the size of the pencil mark—how soon could you detect the other aircraft?"

Don't rely on others to clear you. ★

DROWNiNG iS



FOREVER!

Just about every week of the year is reserved for some special enterprise or observance. National Dairy Week, Be Good to Secretaries Week, Cotton Week, ad infinitum.

Now there is National Safe Boating Week, June 29-July 5. And for good reason.

The U.S. Coast Guard reports that in 1967, 1312 people died and 1365 were injured in 5275 small boat accidents. Carelessness and lack of knowledge were cited as major cause factors.

These figures are for the general population. The Air Force, too, has its troubles with boaters and others who go in for water sports. Sixty-one Air Force people lost their lives to drowning during 1968, about one-third of whom were somehow involved with a boat.

Take the case of Sgt No-swim. He was riding on the bow of a slow moving boat and enjoying dragging his feet and hands in the water. But boats are not rock-solid platforms. This one rolled slightly and the sergeant fell into the river. Almost immediately he sank out of sight. Although there were swimmers present, they could not locate his body until many hours later.

Boating is big as a family pastime and with good reason. The kids enjoy it, so do the parents, and it helps keep the family together. It is also a safe sport, but as with almost everything, there is an element of risk. We try to counteract this with education but sometimes the education doesn't take.

Three adults and a child were returning from fishing when a pulley on the steering system failed, causing the boat to upset. All of them managed to swim to the overturned boat, although the child was the only one in the group wearing a life preserver (the other preservers had been lying in the boat and were now under the boat). Gradually all but one adult slipped away and drowned during a five-hour period.

Squadron parties can be a lot of fun, but like other pastimes, they can turn into tragedy under the wrong circumstances. Circumstances such as . . . water came over the transom and swamped the boat. Three men jumped overboard . . . one swam to shore, one stayed with the boat and was rescued, the other drowned.

Many of the Air Force men who were victims of such mishaps would surely have survived had they taken even the most simple precaution, that of wearing a life preserver. Of course, it seems almost inconceivable that people who don't know how to swim would go out in a boat without a life preserver on. But they do. And there are other people —boat owners—who permit their passengers to ride without such protection. So, somewhere along the line our education attempts have failed.

Most of the information presented here came from a study made in the Ground Safety Division of the Directorate of Aerospace Safety for documenting a movie on why people drown. It is expected to be released later this year. According to the study, more than half of the 61 drowning deaths occurred to men who were considered average or better swimmers. Sixteen of them were alone in the water, seven had entered the water alone. An attempt was made to rescue 46 of the 61. Ironically, all but 10 of the victims were within 300 feet of the shore, a boat, dock or some other haven. 39 were within 100 feet.

Of course, not everything is known about each mishap, but we do have some definite information on what caused these drownings.

Alcohol was a known factor in five cases, probable in 12 and possible in nine others. Cramps was suspected in 25 cases and fatigue in 23. Panic was a definite factor eight times and may have been involved in 10 other cases. Also listed frequently were cold, swimming alone, water temperature, over confidence, non-swimmer.

One of these — panic — seems particularly tragic. This usually results from another of the listed factors—lack of swimming ability. Now let's make a rundown of one case that was repeated, with variations, far too often: A non-swimmer, not wearing a life preserver, close enough to shore to be rescued fairly easily, with a rescuer available, panics and endangers the life of the rescuer who is forced to disengage, which leads to a drowning.

A life is lost because the victim *didn't know how to swim,* he *failed to use a life preserver,* he *made rescue impossible* by his panic. Pretty discouraging.

Now we realize that not everyone who conceivably could be a drowning victim is going to read or even see this article. But a lot of you will, and many of you have potential victims under your supervision or command. Drowning is, in the Air Force, a young man's hazard: two-thirds of the victims last year were between 19 and 23. So this has been presented for both groups, with the hope that *those who can,* will be their brother's keepers. Maybe, in this way, we can prevent at least some of these needless tragedies this summer. ★


THE HORNS OF THE DILEMMA
Standardization--too much?
not enough?

Anchard F. Zeller, Ph.D., Directorate of Aerospace Safety

The following musings resulted from an attempt to evaluate a number of aircraft accidents to determine whether or not "too much standardization" was a factor. The "hypothesis" advanced by the individual who was responsible for this effort was that standardization stifled initiative and that a review of a selected number of mishaps experienced by a group steeped in the standardization concept would reveal this.

The accidents were duly reviewed, with most inconclusive results. As the point at issue was never clearly engaged in the accident reports themselves, an estimate had to be made on a subjective basis. This proved to be the undoing of the whole project, for what could on the one hand be interpreted as overstandardization, could equally or even more readily be attributed to lack of standardization. The same series of events which could be interpreted by one with a jaundiced view toward standardization as "so much standardization that he can't think," were interpreted by the exponents of the standard approach as "obviously he had not learned his standard procedures." It is almost certain that everyone who reads this will recognize some of the problems with which he himself has wrestled many times.

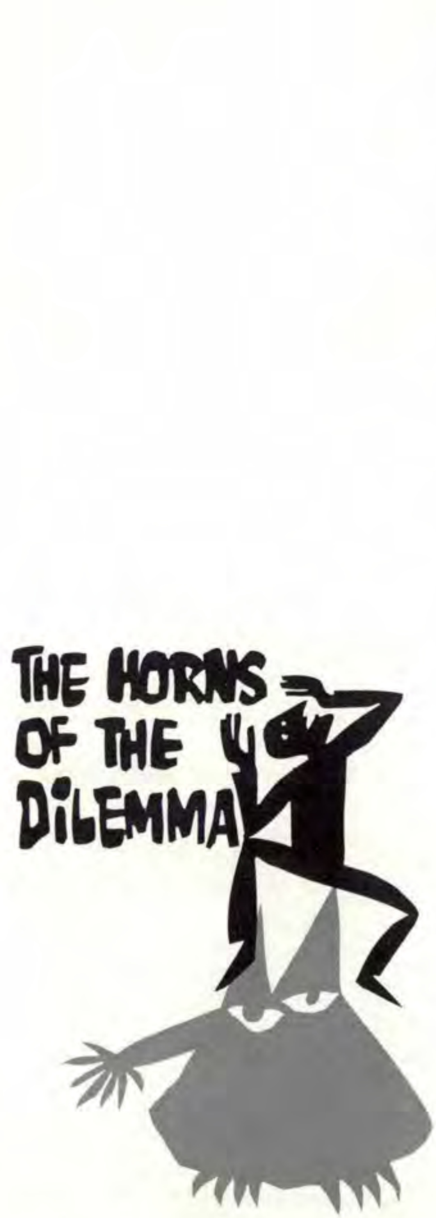
The ancient Romans were never ones to miss a bet. After all, one couldn't be too careful and gods were a dime a dozen. If you needed a new one, just create it. It's not surprising, therefore, that any time anyone wants a symbol of his particular area of frustration, a little research will show that the Phoenicians or the Greeks or the Romans or someone had one already made. Take Janus, for example. There was a lad as two-faced as they come. With one he could look back to where he had been and with the other he could look ahead to where he was going. If there was ever a group of people who could profit from such ability, it is those concerned with the problem of standardization. Like many controversial subjects, this one has only to be mentioned and all within hearing loudly endorse their support of the concept. This, however, is usually the last point on which any agree. When the details of what is to be standardized and how to standardize it are introduced, differences arise and viewpoints that are poles apart are apparent.

In order to discuss standardization, it appears that this primrose

path of agreement is as good a place to start as any. It is stated by many that things that aren't standard just aren't as desirable; operations are difficult, maintenance is costly or impossible, replacements require special effort, and, in general, the standard product is a good thing. Take the case of the ugly duckling, for example. Everyone was sure that an unstandard product was involved and that it was of little value. But, as the story unfolds, the problem was that a swan isn't a duck no matter how you look at it. When the whole situation cleared up, the ugly duckling turned out not to be an unstandard duck but a perfectly standard and, in the mind of the story teller, highly superior swan. Just a case of mistaken identity you might say, but still largely adhering to standardization.

On the other hand, just take a look at women's dresses. If there was ever a place where lack of standardization is appreciated, it's here. Who wants to meet herself coming down the street, particularly if the image isn't too flattering? And consider collectors of all kinds. They are not at all impressed with standardization. Collectively, these people spend unbelievable amounts of time, effort, and money to find the different, unique item, often one with imperfections which would make the standardization advocate shudder. One of a kind is the epitome of success and desirability to those with this point of view. It is apparent then that while almost everyone pays due homage to the god of standardization in theory, in fact, the opposite point of view is the one so dearly cherished.

To get the discussion from the esoteric to more practical matters, let's look at the design of aircraft. Those concerned with this problem fall into precisely the same categories as the groups previously discussed. After giving lip service to the concept, with hardly a pause for breath, the arguments about details are presented with great vigor. Ease of design, ease of use, ease of maintenance are only a few of the advantages which can accrue from standardized design. Costs are cut, efficiency is promoted, and all ap-



pears well, except a few points of issue arise. What about the repetition of designs proven to be defective? Well, of course, there is universal agreement that no one would want to do that, but was it really so bad? How about using the results of later experience which in dicates it can be done better. Of course no one wants to throw away the results of progress. Certainly, if it can be done better, it should be changed.

The question then arises: How much better? Improvements are relative. Most are gradual, with small changes being involved. Large innovations are rare. The horns of this dilemma have been tied together by some manufacturers who have initiated the concept of block design changes, which merely means that the little changes are all saved up until there appear to be enough to warrant a change in the end product, which is then held stable until another collection of small changes accrue.

Really important changes, however, are often changes in concept which not only dictate new designs but which render once-standard designs not only less effective but often actually undesirable. The development of CRT (Cathode Ray Tube) scopes, the concept of integrated instruments, the use of heads up displays all compromise older developments as a direct consequence of the fact that they now exist. They demand prime space and dictate major changes to accommodate them. New missions or capabilities such as those associated with STOL or VSTOL aircraft may require a whole new set of presentations and controls, so what was standard must yield to what it is hoped will become standard, and so the struggle continues.

In spite of these difficulties, the advantages previously mentioned for standardization still hold. Its lack is all too often directly reflected in accidents with a coincidental loss of men and equipment.

Perhaps it would appear that the problem has been stretched to an

absurdity. There are, the standardization exponents would say, many areas highly susceptible to considered standardization. There are, fortunately, standardization groups whose whole purpose in life is to arrive at a catalog of the elements of standardization which have universal or nearly universal application so that the designers of even new concepts have at hand the unit parameters with which to develop their new ideas. It would be a great disservice to suggest that these groups have not made great strides toward the standardization of elements. Yet even in this area, solution of the problem is not easy. For example, with all of the facts equally available, and there are a great many of them, the various services cannot yet agree upon the "best lighting" for an aircraft cockpit. Should the standard be red or should it be white, or should it be both? Both — now that's a good solution which would appear to resolve the standardization problem. But if such a solution is accepted it introduces another equally knotty problem, for if there is now a standard which permits a choice, some one must make that choice. So standards must be developed to define the use of the now standard equipment which has flexibility built into it.

If there is any one subject that will cause pilots to choose up sides, it is the relative merits of standardized procedures and evaluations as opposed to what the opponents call a more dynamic process of decisionmaking. The latter places greater reliance upon the initiative of the individual who is faced with the choices which must be resolved. Those who support the by-the-book approach have a lot going for them. The commands which have advocated this way of doing things have a most enviable accident history to support their point of view.

Those who oppose it, however, also have a strong platform. Situations aren't standard, and can't be. The individual who has learned a rote response can apply only that, and if the situation varies from that for which the response was designed, it can become most inappropriate. The proponents of this approach suggest individuals should learn the system, all of the appropriate responses, and have the reasoning ability to logically integrate a problem with background knowledge of the capabilities of the system and from this develop unique emergency responses directly applicable to the specific situation.

Unfortunately, people just aren't that versatile, and so the battle is joined and neither side gives an inch. Each leaves the discussion having reconvinced himself of the merits of his point of view with a smug assurance that, while the opponent may be a nice fellow, he is basically a little stupid.

To the individual with no standard axe to grind, if one can be found, it appears that each side has much merit and that an assiduous mixture might result in the best overall solution. Certainly, considering the price of aircraft and the price of training, it costs too much to let every pilot or any other specialist choose his own method of operating. There have to be standards, there have to be tests to assure that these standards are met, and there have to be systems to assure that these are accomplished. Static reliance on such a system, however, is not enough.

It is not possible to conceive of, and certainly not to develop, a precise set of actions for every possible procedure or emergency. There has to be room for choice of decision. Too much reliance on standardization can undoubtedly result in failure to appreciate the dynamics of the situation. Although *ideally* each individual should be able to apply all standard techniques and then be able to go beyond this if circumstances dictate, such persons are rare or nonexistent. So, the two-faced god of standardization demands homage to both of his contradictory points of view.

Whether the discussion is about standard procedures or extrapolated beyond this to dynamic design, one thing is certain—man must be taught and nowhere does the controversy over standardization become more violent than among those who teach. Is it better to teach "how"—standardization? Or to teach the dynamics of the situation—lack of standardization? This is a never-ending controversy. And should the teaching itself be standard or should each instructor be permitted to exploit his own unique capability?

A threat to the concept of academic freedom that gives a teacher the right to teach as he likes raises the hackles of an educator, just as a challenge to clinical judgment affects a physician or a criticism of his techniques stirs a pilot. Much of this problem arises from the fact, sometimes denied, often reluctantly accepted, that people are different. A truly standard training course must be directed to the lowest level of competence if all are to fulfill its requirements. If it is directed toward the average, the lower half has difficulty in grasping it fully and the capabilities of the upper half are potentially wasted. In a situation where the best of the best is required, some provision must be made for appropriate recognition of both these differences and of the associated modifications in training. The concept of universal standardization in training is thus, of necessity, violated, so standards are set up at various levels for various groups or to cover special activities. If carried to the extreme, this implies that each little standard is unique unto itself and thus the concept of general standardization is destroyed.

Regardless of any of these points of view, realistic people must accept that any standard that is set up will be routinely violated because of human frailty. The standardization dilemma might be paraphrased to state that even if all are standard, some are more standard than others. So the ephemeral vision of standardization with all of its advantages continues to be neutralized by the stark facts of reality. People are different, missions change, and technical progress does occur. But standardization still offers many advantages, so while placating the forward face of the god, the rearward-facing aspect must be equally considered.

It is good that there are those who are dedicated to progress. It is equally good that there are those devoted to consolidation and standardization of that which exists. The constant confrontation of the two can, with careful refereeing, lead to the retention of the best and the development of the needed. ★

FLIGHT *Safety Awards*

AAC	• 17th Tactical Airlift Squadron, Elmendorf AFB, Alaska
	• 317th Fighter Interceptor Squadron, Elmendorf AFB, Alaska
ADC	• 4780th Air Defense Wing, Perrin AFB, Texas
AFRES	• 452d Military Airlift Wing, March AFB, California
AFSC	• Directorate of Systems Test, AFFTC, Edwards AFB, California
ANG	• 119th Fighter Group, Fargo, North Dakota
ATC	• 3630th Flying Training Wing, Sheppard AFB, Texas
	• 3550th Pilot Training Wing, Moody AFB, Georgia
	• 3500th Pilot Training Squadron, Reese AFB, Texas
MAC	• 9th Weather Reconnaissance Wing, McClellan AFB, California
	• 33d Aerospace Rescue and Recovery Squadron, Naha AB, Okinawa
	• 61st Military Airlift Wing, Hickam AFB, Hawaii
	• 89th Military Airlift Wing, Andrews AFB, Maryland
PACAF	• 37th Tactical Fighter Wing, Phu Cat AB, Vietnam
	• 8th Tactical Fighter Wing, Ubon Royal Thai AFB, Thailand
	• 12th Tactical Fighter Wing, Cam Ranh Bay AB, Vietnam
	• 817th Tactical Airlift Squadron, Naha AB, Okinawa
	• 21st Tactical Air Support Squadron, Nha Trang AB, Vietnam
SAC	• 509th Bombardment Wing, Pease AFB, New Hampshire
	• 92d Strategic Aerospace Wing, Fairchild AFB, Washington
TAC	• 75th Tactical Reconnaissance Wing, Bergstrom AFB, Texas
	• 464th Tactical Airlift Wing, Pope AFB, North Carolina
	• 4442d Combat Crew Training Wing, Sewart AFB, Tennessee
USAFE	• 36th Tactical Fighter Wing, Bitburg AB, Germany
	• 50th Tactical Fighter Wing, Hahn AB, Germany

MISSILE *Safety Awards*

CATEGORY I (Air-Launched Missiles)

AAC	•	21st Composite Wing, Elmendorf AFB, Alaska
ADC	•	78th Fighter Wing, Hamilton AFB, California
ANG	•	142d Fighter Group, Portland International Airport, Portland, Oregon
PACAF	•	355th Tactical Fighter Wing, Takhli Royal Thai AFB, Thailand
	•	12th Tactical Fighter Wing, Cam Rahn Bay AB, Vietnam
	•	366th Tactical Fighter Wing, DaNang AB, Vietnam
SAC	•	416th Bombardment Wing, Griffiss AFB, New York
	•	456th Airborne Missile Maintenance Squadron, Beale AFB, California
TAC	•	4510th Combat Crew Training Wing, Luke AFB, Arizona
USAFE	•	81st Tactical Fighter Wing, RAF Bentwaters, England

CATEGORY II (Ground-Launched Missiles)

ADC	•	46th Air Defense Missile Squadron, McGuire AFB, New Jersey
SAC	•	321st Strategic Missile Wing, Grand Forks AFB, North Dakota
	•	381st Strategic Missile Wing, McConnell AFB, Kansas

CATEGORY III (Units Launching Missiles—Test and Research)

ADC	•	10th Air Defense Group, Vandenberg AFB, California
SAC	•	1st Strategic Air Division, Vandenberg AFB, California

AERO CLUBS WIN FAA SAFETY AWARDS

Twenty-eight Air Force Aero Clubs won FAA Flight Safety Award certificates for completing a full year of flight operations in 1968 without a single aircraft accident.

Administrator John H. Shaffer presented the certificates to the winning clubs in a ceremony at FAA Headquarters in Washington, D.C.

The awards were first presented in 1964 as part of a joint USAF-FAA program to promote aviation safety by honoring Air Force flying clubs that achieve a record of no accidents or incidents. The following clubs were 1968 award winners:

ADC	•	Adair AFS, OR
	•	Hamilton AFB, CA
	•	Oxnard AFB, CA
	•	Perrin AFB, TX
	•	Tyndall AFB, FL
AFLC	•	Kelly AFB, TX
AFSC	•	Arnold AFS, TN
	•	Edwards AFB, CA
	•	Eglin AFB, FL
	•	L. G. Hanscom Field, MA
ATC	•	Lowry AFB, CO
	•	Moody AFB, GA
	•	Reese AFB, TX
	•	Vance AFB, OK
	•	Webb AFB, TX
SAC	•	Barksdale AFB, LA
	•	Fairchild AFB, CA
	•	Grissom AFB, IN
	•	March AFB, CA
	•	Whiteman AFB, MO
TAC	•	Bergstrom AFB, TX
	•	MacDill AFB, FL
	•	Shaw AFB, SC
USAFA	•	US Air Force Academy, CO
PACAF	•	Misawa AB, Japan
	•	Kadena AB, Okinawa
USAFE	•	Bentwaters/Woodbridge, England
	•	Bitburg AB, Germany

OPERATION CRASH

Lt Col Thurman Lawrence, Jr., Directorate of Aerospace Safety

Sixty minutes from bed to bash may not be a record, but it certainly has to be tallied as a good try. Here's an account of that hour.

The pilot arose at 0600, had breakfast and drove to the civilian airport where the helicopter had been hangared overnight. With the assistance of a couple of sergeants, neither of whom was a helicopter specialist, he preflighted the bird and ran up the engine, finding no discrepancies.

The weather was good but a bit gusty — 12,000 broken, 10 miles visibility, wind 10 gusting to 18.

Takeoff was begun after all passengers were aboard, but at about 40 feet in the air and 35-40 knots, the engine failed. The forced landing was made in a plowed field, tail low, with touchdown nearly parallel to the furrows. The tail rotor hit first, followed by the main gear, then the nose gear which failed on contact. The main rotor blades struck the ground, cut off the tail

cone, and the helicopter rolled over onto its left side. There was no fire and the crew and all passengers escaped. Now here are some points of interest and a few more facts.

The pilot allowed himself only one hour from bed to takeoff. Is that enough time to accomplish the morning necessities, have breakfast, drive to the airport, perform the preflight, complete TO and landing data, brief passengers, accomplish the engine runup and before takeoff check and be ready for takeoff five minutes early?

When the pilot arrived at the airport, the helicopter had already been moved out of the hangar by a civilian worker. It was the pilot's responsibility to drain the sumps since he was not at an Air Force installation, but he failed to do so. Investigation revealed that the fuel tanks had not been drained the previous day and that the forward fuel tank sump drain was obstructed, although it was the tank normally used.

Passengers were not briefed as required, although part of the flight would have been over water.

Testimony indicates that a power-to-hover check was not accomplished and that the takeoff was not accomplished over the best area for an emergency landing.

During the autorotation landing the tail rotor made first contact with the ground.

A fuel cell that had been recently removed from the aircraft was found to be contaminated, but the other tanks and the fuel strainer were not inspected.

The aircraft was not on a red-X status while the fuel cell was removed.

Although records reflected removal of a cell from one tank, the cell was actually removed from another tank.

Unbelievable? Possibly, but this is a true story about an accident that occurred in 1968. The many errors involved are certainly not what we would expect of an Air Force pilot, but pilot factor accidents in helicopters usually contain some of these errors.

When adequate interest and guidance are not demonstrated at all echelons of command, a less than satisfactory attitude may be reflected in the operating unit. Some major commands which possess helicopters do not have a safety officer knowledgeable in helicopter operations at any echelon of command. Consequently, small detached units sometimes do not receive the attention necessary to assure that operations are conducted without undue risk to personnel and equipment. In some units, required supplements to AFM 60-1 have not been accomplished for helicopter operations.

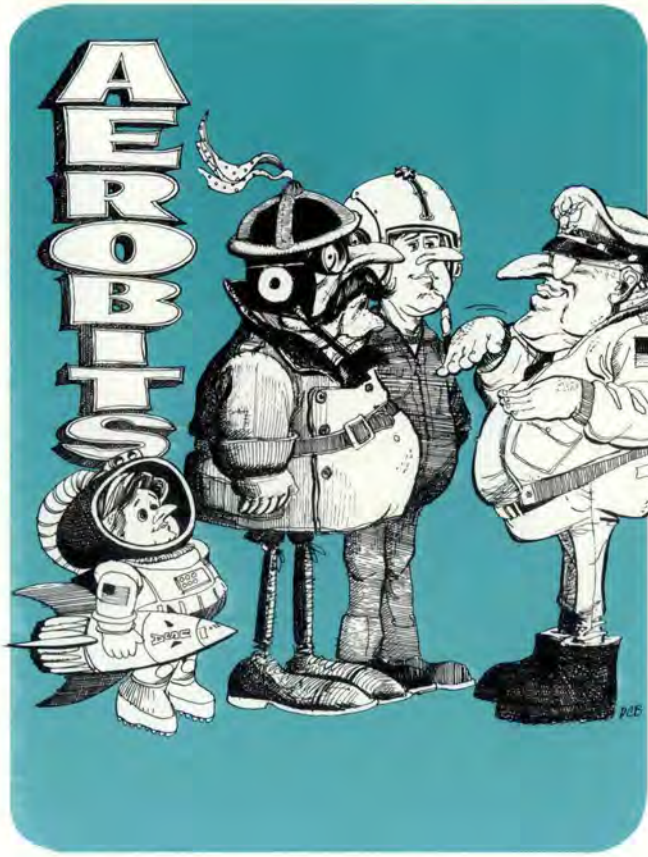
Helicopters are an essential part of the Air Force fleet and are here to stay. Their increasing size and sophistication, as well as the greater role they are playing in Air Force operations, make it necessary to give them equal representation in the flight program. ★

THE CENTURY SERIES FIGHTER pilot misjudged a night landing and hit short of the runway hard enough to cause the main landing gear to fail. Investigators determined that the pilot did not manage his fuel properly and was not aware of fuel remaining in his external tanks. He failed to adjust his final approach and landing to allow for the extra weight. The supervisors got a slice of the blame on this one because the pilot was not provided sufficient crew rest prior to the mission. Fatigue degraded his performance during critical phases of flight. It was also determined that the night checkout phase of environmental training was inadequate. Full night checkouts with instructor pilots were not required.

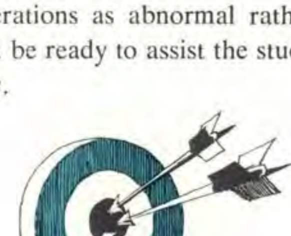
WRONG HANDLE. During a functional checkflight the pilot asked the navigator in the back seat to extend the gear with the emergency gear lowering T handle. The navigator pulled and away went the canopy. Seems he got hold of the wrong handle. How does that old saying go? "Look before you *pull?*"

ATTENTION IPs! A C-141 instructor was giving a fellow pilot his last local flying training before initial Aircraft Commander upgrading check. They shot several touch-and-go landings in a stiff right crosswind with an eight-knot gust factor and noted nothing unusual. However, the IP did recall that the pilot overcontrolled with his ailerons on the next-to-last landing. Maintenance discovered damage to the right wingtip on the through-flight inspection and the flight crew was called in during the ensuing investigation.

Findings: Aircrew factor; the pilot flying the bird did not use proper crosswind landing technique. Supervisory factor; the instructor pilot allowed the pilot in training in the left seat to momentarily exceed the bank required in a normal crosswind condition. It was determined that the IP momentarily relaxed his surveillance of the pilot in training because of his demonstrated readiness for upgrading during earlier phases of the flight. It was recommended that the Dash One be changed to include this warning note: *Warning: Because of slow aileron response to gust forces at landing airspeeds, pilots must anticipate the need for immediate gust corrections to avoid excessive bank angles prior to touchdown."*



The contents of this report warrant the special attention of all instructors. To get the maximum benefit from this IP's experience, instructors should treat all crosswind operations as abnormal rather than normal conditions and be ready to assist the student immediately if necessary.



WHAT'S AIMS? This question is important to all Air Force crewmembers and many support types. The term AIMS is an acronym of acronyms. Since an acronym is a word formed from the first (or first few) letters of several words, here we go:

The A stands for ATCRBS which is taken from Air Traffic Control Radar Beacon System.

The I stands for IFF, Identification Friend or Foe.

The M stands for Mark XII identification system.

The S stands for Systems reflecting the many diverse AIMS configurations.

What is AIMS going to do for us in the relatively near future? Well, it will not only allow controllers to positively identify and easily follow the progress of large numbers of aerial targets, it will also give them rather exact pressure altitude information.

CHECK YOUR COMMUNICATION AND NAVIGATION EQUIPMENT. How many pilots check all communication and navigation equipment on every flight? The checklist calls for it. But some pilots feel this applies only to instrument and stan/eval checks. Consider the fact that during an 11-year period there were 92 major accidents in which communication or navigation equipment failures were either the cause or a contributor.

All communication and navigation equipment must be checked thoroughly before every flight, commensurate with airfield facilities. Be prepared to implement an alternate course of action when necessary in the event of communication/navigation equipment failure during flight.

Lt Col Harold T. Stubbs
Directorate of Aerospace Safety

THE BIG BIRD VORTEX AND TURBULENCE PROBLEM has been a special subject for some time now. Turbulence generated by large aircraft in all phases of flight, from takeoff to landing, will continue to be dangerous, even to other large aircraft and most certainly to small ones. The hazard doesn't disappear when the big machine is taxied in and parked. A few months ago this column told of the dangers of taxiing as close as 300 feet behind another aircraft. Anything much closer than this can really get you into trouble if it's a big engine that is being run up.

Last month an aero club solo student completed his flight and attempted to taxi back to the club parking area. To get there he had to taxi behind a C-97 because there were numerous support vehicles blocking the taxiway in front. He noticed that the right inboard engine of the C-97 was running and tried to get as much clearance to the rear as possible to avoid the prop wash. He managed to stay 120 feet to the rear but this didn't hack it—the upwind wing was lifted and the other wing and prop tips contacted the ground. He had waited until the C-97 engine appeared to be idling. What appeared to be idle was actually 1850 rpm, considerably less than max power but substantially more than idle.

Don't take a chance. Those ground crewmen and other aircrewmen don't always see you—they didn't in this case until it was too late.

AN INSTRUCTOR PILOT and two students were on a low-altitude cross-country in a TH-1F. After an hour and twenty-five minutes the student missed his intended checkpoint. The IP assumed control of the chopper so the student could locate his position on his map. While both students were busy the instructor descended from 100 feet AGL to about 50 feet AGL and flew down a wide, dry river bed toward the checkpoint, a large bridge. Suddenly he saw some wires stretching in front of the bird but he was too late to avoid them. They struck and severed two ⅛ inch diameter telephone wires. One blade trim tab was sawed in half, resulting in a strong lateral beat and an immediate emergency landing. There were no injuries. The damage was repaired in 40 manhours, but the dire potential of incidents like this one is obvious. Low-level cross-country training limitations (minimum of 300 feet AGL into the wind, minimum 500 feet AGL downwind; night—minimum of 1000 feet AGL) must be strictly adhered to. ★

Mail Call

REX RILEY POSTER

You might be interested in the way the Rex Riley blank balloon poster (USAF Safety Kit, Oct-Nov 68) was used here in Korea.

The Rex Riley posters were placed at strategic locations with the following words placed in the balloon: "This balloon is worth $25.00. See 27 Nov 68 issue of the *Defender* for details."

The *Defender* (weekly newspaper) thus publicized a contest to select a safety slogan. Seventy-nine entries were submitted and judged by a panel of five men from various organizations. The winning entry was "Drive as though your family is in the other vehicle."

The actual safety value of this type contest will never be determined but probably every individual that entered the contest automatically became a little bit more safety conscious.

As an aside, filling in comic balloons is a game that apparently many people enjoy. There are many posters clipped from the newspaper that are filled in and tacked on various unofficial bulletin boards or placed under plastic desk tops. These contain messages that were not entered in the contest but indicate that Rex Riley is a pretty funny guy as well as being a safety officer.

Maj Vernon D. Hesterman
Flying Safety Officer
6314 Support Wing
APO San Francisco 96570

MISS LIFE SUPPORT

Recently, while looking at the March issue of *Aerospace Safety*, much to my delight I saw your picture on the back of the magazine. If possible I would like to get our bid in before your series starts in the April issue. We have a Safety Board in the Complex which would be brightened muchly with some pictures of you and/or any other goodies which would aid our safety program.

Looking forward to your up-coming series!

Lt Col George E. Maxon, Jr
37th TFW/DCMM,
APO San Francisco 96368

MAYDAY

We would like to enter the following in one of your publications. It is centered around the thought that tests sometimes waste the effort of learning capacity when the fourth answer is given. Also it may add to the thinking line of some of our pilots who find themselves in a similar situation. This was written by A1C Scottie Hathorn, jet engine mechanic, and urged by Sgt Ben Chandler, electrician, to be entered.

"Hurlburt Approach Control, T-33 Echo 59, 12 miles NW on Victor 247, inbound at 7500 feet. Gear up and locked, released and now up and jammed. Suspected ice formation in wheel pits, over."

"Echo 59, Hurlburt Approach. What corrective actions have you taken?"

T-33—"The actions I've taken so far aren't even in the book yet. G forces have no result."

Hurlburt Approach — "Echo 59, commence 360 degree left turn and stand by."

T-33—"Dear Approach Control. I don't mean to take up your time but within the next few seconds I'm going to commence one of two choices: Nr 1, I can make a drastic one minute cut version of up, up, and away to 15,000 feet and take a 12G kick in the rear which might do the trick, or, Nr 2, I can come straight ahead and belly in."

Approach Control—"What about Nr 3, eject?"

T-33—"What about Nr 4, none of the above?"

A1C Elva S. Hathorn
4409 CCTS, Hurlburt Fld, FL

SAFETY LITERATURE

This may not be a first, but it's certainly worth a mention in *Aerospace Safety*.

Our Flying Safety Officer, Major Harry Ensey, observed that the safety notes and magazines he placed in our barracks reading compartments were faring rather poorly in comparison with the more popular skin magazines. So, he simply covered the safety sheep in wolves' clothing with the most gratifying results. By the time one realizes that only the cover and center fold are authentic, he is far too committed to change books. Result: Our safety literature gets full exposure to flight crew eyes!

Maj Robert H. Kelley
Ops Officer, 5th SO Sqdn (PACAF)
APO San Francisco 96227

How about sending us a sample? ★

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.

☆ U. S. GOVERNMENT PRINTING OFFICE 1969 341-218/10

Major
Charles H. Schaufler

363 Tactical Reconnaissance Wing
Shaw AFB, South Carolina

Major Schaufler was the instructor pilot in an RF-4C on a low level proficiency flight for a student in the front seat. After a few minutes he heard the student say, "Look out" and simultaneously there appeared to be an explosion in the front cockpit with glass and debris flying around both cockpits. The noise level created by windblast was so great that communication between cockpits was impossible. Major Schaufler noticed his EJECT light illuminate and saw jagged glass where the windscreen used to be. He observed the student leaning over in the front cockpit. Unable to establish voice contact, Major Schaufler immediately noted that the rpm of both engines were normal and began trying to check the right side of the front cockpit for fire warning lights, fuel counters and tele-lite panel. Visibility was reduced due to windblast under the helmet visor which caused his eyes to water and his vision to blur. Seeing that the rpm was good, he grabbed the stick and throttles, began a climb to 5000 feet and slowed the aircraft to 220 knots. He could now see that the student was seated upright, but was not moving. He still could not determine if the man had been injured.

Major Schaufler declared an emergency on UHF but was unable to hear on UHF so did not know if he had been transmitting or not. At 5000 feet he again transmitted on Guard, declaring an emergency and requesting an F-4 to lead him in for a landing. After much calling on interphone, Major Schaufler got an OK signal from the student and began slowing the aircraft to set up landing configuration. Meanwhile, the UHF transmissions (Guard) that Major Schaufler had been making were received and an RF-4 awaiting takeoff was diverted to intercept and lead him to home base. With fuel at almost 11,000 pounds, he again attempted interphone contact with the student to determine his condition and to have him dump fuel. After repeated attempts, he made himself understood and the student turned the dump switch on, gave Major Schaufler an OK signal, and passed a note to the rear seat saying that he was squawking emergency. Rendezvous with the chase aircraft was accomplished and a visual damage assessment made. Ascertaining that damage was confined to the front windscreen and side panels, Major Schaufler decided that the student would fly the aircraft down to about 200-300 feet AGL, then he would take control and complete the landing from the rear cockpit. This would allow Major Schaufler to be exposed to the windblast for only a short period of time while accomplishing the landing. Using this procedure, Major Schaufler brought the aircraft down to a very smooth landing and rollout.

The professional flying skill displayed by Major Schaufler after the collision with a bird, and his quick and accurate analysis of the emergency resulted in the safe recovery of a valuable tactical aircraft. WELL DONE! ★

Captain
Louis A. Meier

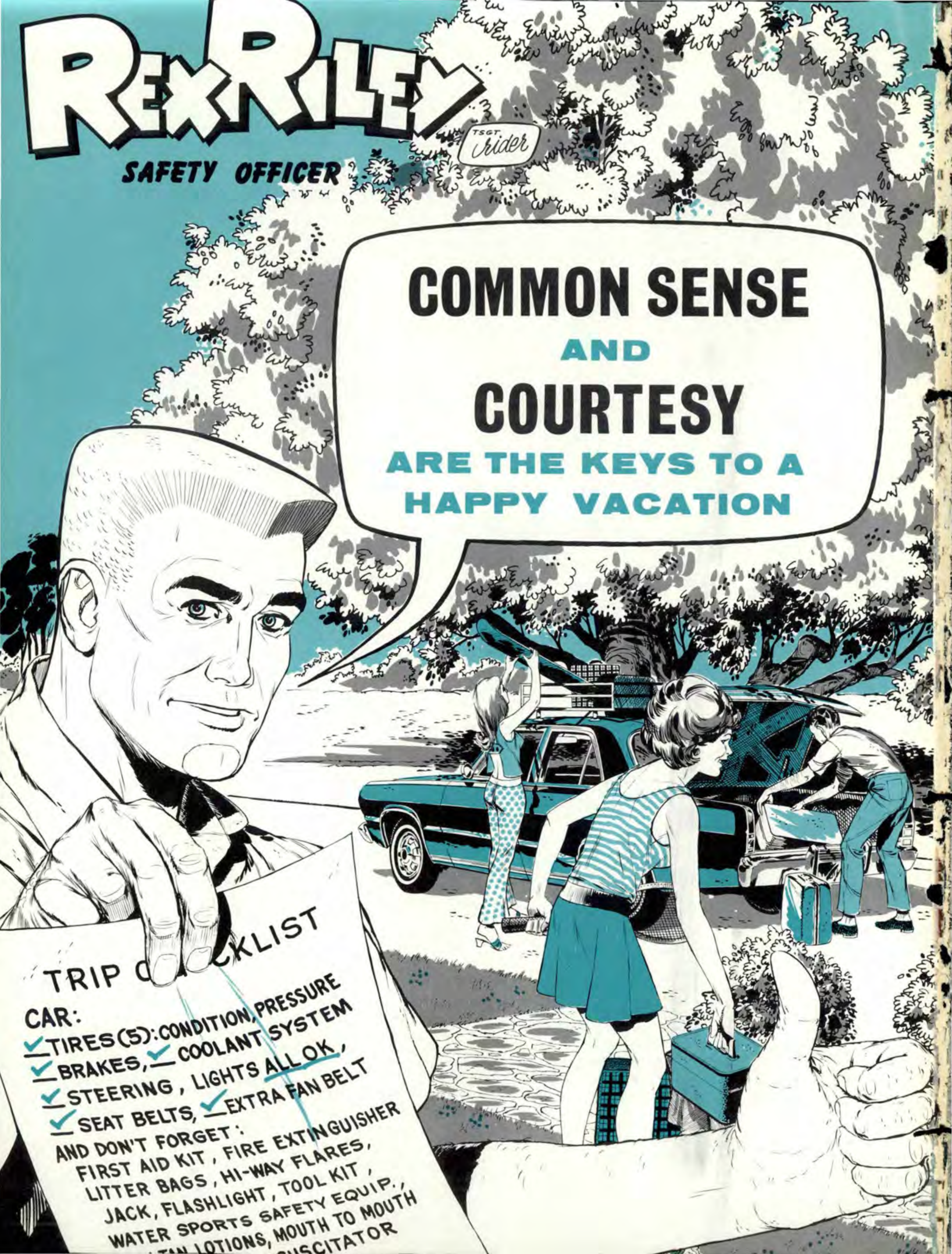
19 Tactical Air Support Squadron
APO San Francisco 96227

Captain Meier, flying an O1-F from Quan Loi, RVN, encountered heavy automatic weapons ground fire. Five rounds hit the tail of his aircraft severing the left rudder cable which caused the rudder to deflect full right and the aircraft to enter a severe left skid. He called the command post and requested that someone be diverted to make an aerial assessment of the damage. Approximately five minutes later Sidewinder 12 called Captain Meier and advised him there were several holes in the tail section and the rudder was locked in the full right side position, also in his opinion a safe landing would be impossible.

Quickly analyzing the situation and noting the performance of the aircraft, Captain Meier determined, after a series of stall checks, flap settings and power changes, that the aircraft was partially controllable by use of ailerons and throttle adjustments. He elected to fly to Bien Hoa and attempt a landing on the wide hard surface runway with crash equipment available.

With the reduction of power over the touchdown point, the ailerons became totally ineffective. The aircraft lurched to the right requiring immediate application of power to fly out of the exaggerated skid. Several approaches were made with the same results each time. With late evening monsoon winds approaching and the fuel supply running low, Captain Meier realized that he had few landing attempts left. Knowing that shortly after touchdown he would certainly leave the runway, he concentrated on locating an area where he could go off the side with the least amount of damage. After making two more approaches and touchdowns to determine where he must land for the aircraft to leave the runway at the right place, he made a long, flat approach and touched down at the predetermined point. The aircraft veered sharply across the runway to the right and came to a stop 25 yards from the edge of the grassy area with negligible damage to the plane. The crewmembers were uninjured.

By his cool professionalism under stress, Captain Meier not only effected his own safe recovery but also saved a valuable aircraft. WELL DONE! ★


REX RILEY
SAFETY OFFICER
TSGT.
COMMON SENSE AND COURTESY ARE THE KEYS TO A HAPPY VACATION
TRIP
CKLIST
CAR:
TIRES (5): CONDITION, PRESSURE
BRAKES, COOLANT SYSTEM
STEERING, LIGHTS ALL OK,
SEAT BELTS, EXTRA FAN BELT
AND DON'T FORGET:
FIRST AID KIT, FIRE EXTINGUISHER
LITTER BAGS, HI-WAY FLARES,
JACK, FLASHLIGHT, TOOL KIT,
WATER SPORTS SAFETY EQUIP.,
LOTIONS, MOUTH TO MOUTH