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Aerospace SAFETY

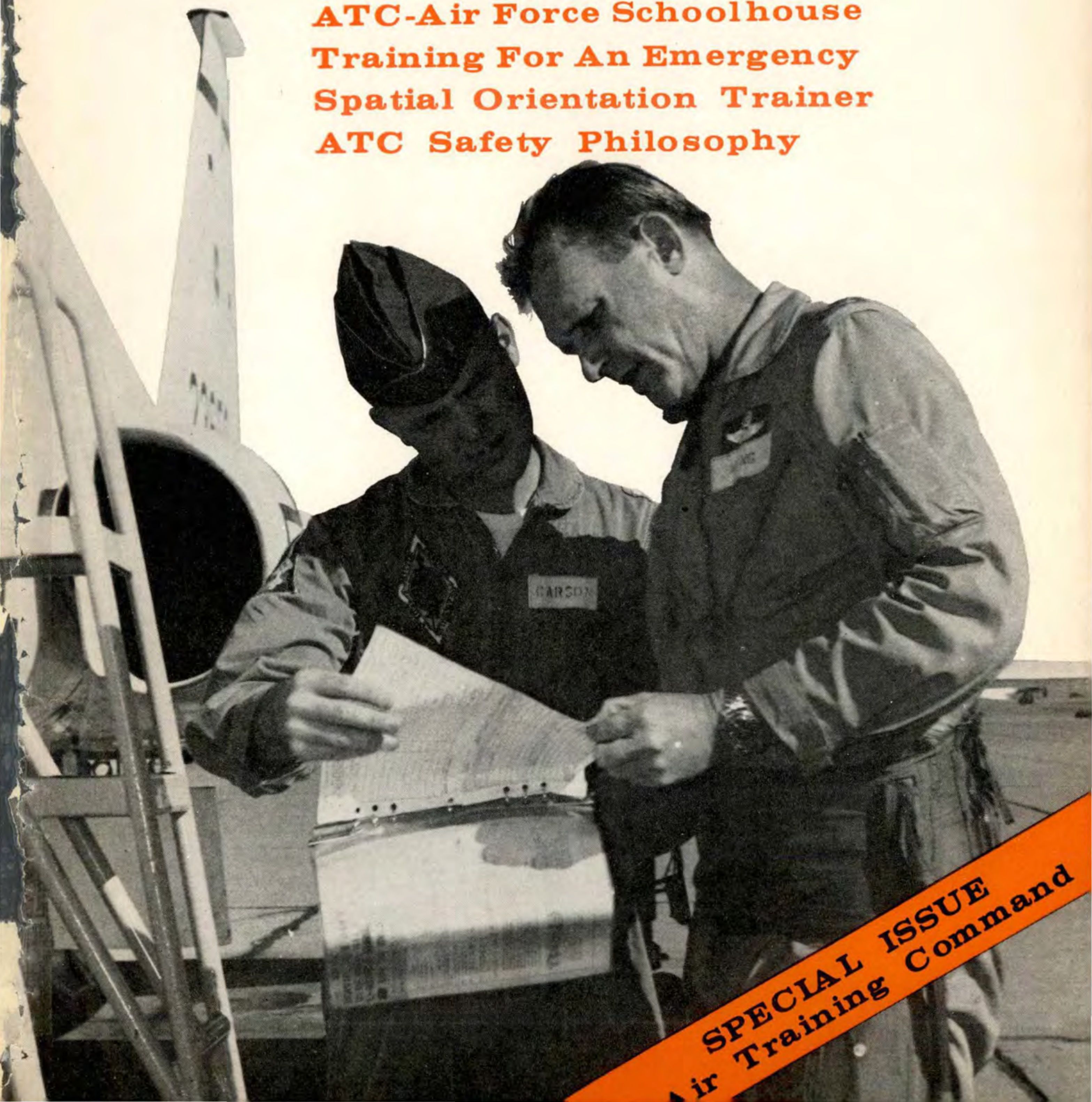
THE MAGAZINE DEVOTED TO YOUR INTERESTS IN FLIGHT

ATC-Air Force Schoolhouse

Training For An Emergency

Spatial Orientation Trainer

ATC Safety Philosophy



SPECIAL ISSUE
Air Training Command

Aerospace SAFETY

THE MAGAZINE DEVOTED TO YOUR INTERESTS IN FLIGHT

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AFRP 62-1 VOLUME 23 NUMBER 1

A DATE WITH CHRIS???

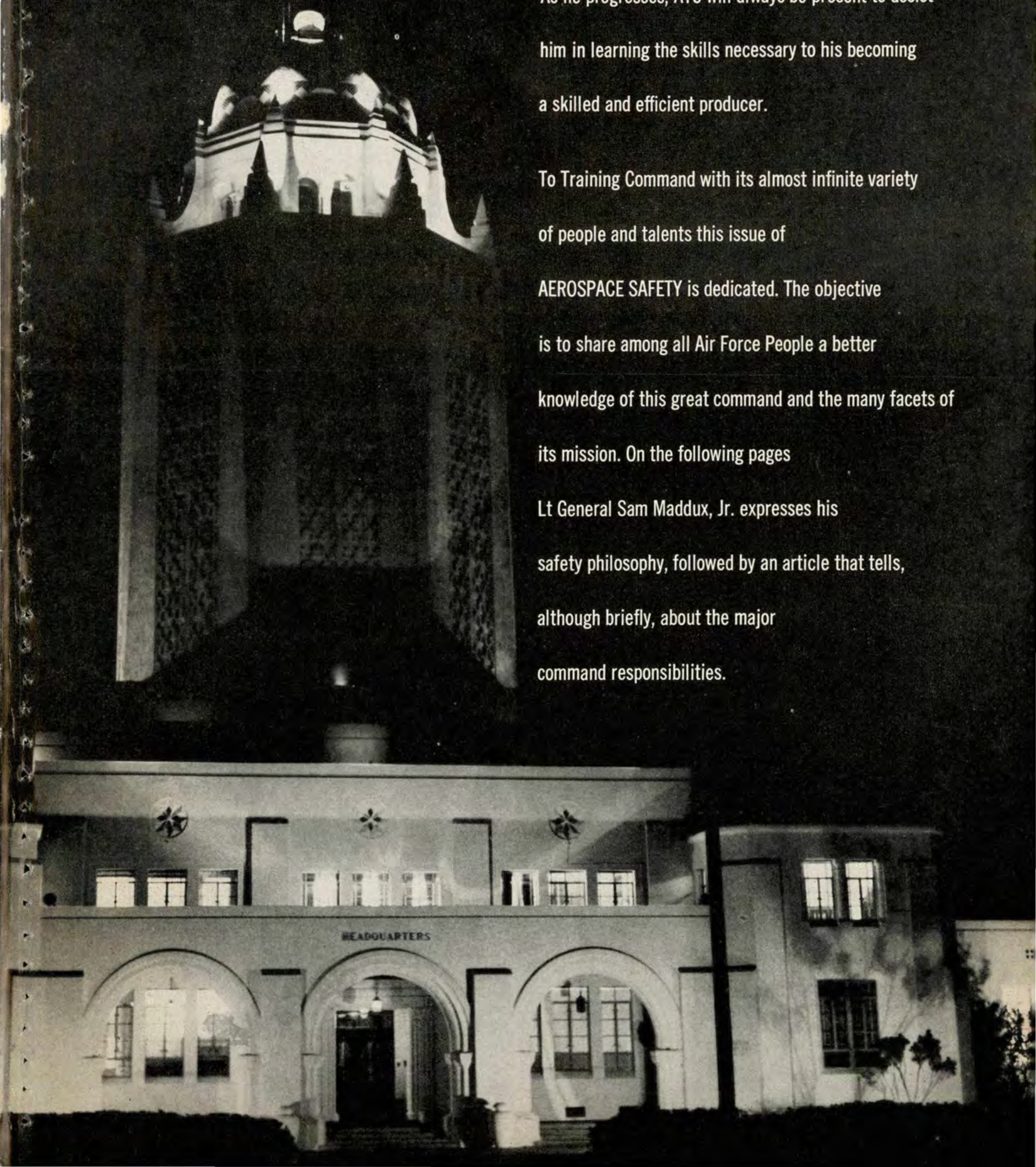
A blonde, green-eyed television and motion picture star is offering "A Date with Chris" everyday on the overseas, worldwide network of the Armed Forces Radio and Television Service.

She's Chris Noel, hostess of one of the most popular record shows overseas, "Small World." She's been with Bob Hope and Red Skelton, "Dr Kildare," and "The Lieutenant" among others on television. "I'm going to play the best young generation music I can find," she says. "If I can provide an hour of pleasant, bright listening every day, I will have done what millions of Americans would like to do."

ATC

Air Training Command is the first stop for a young man as he begins his Air Force career. As he progresses, ATC will always be present to assist him in learning the skills necessary to his becoming a skilled and efficient producer.

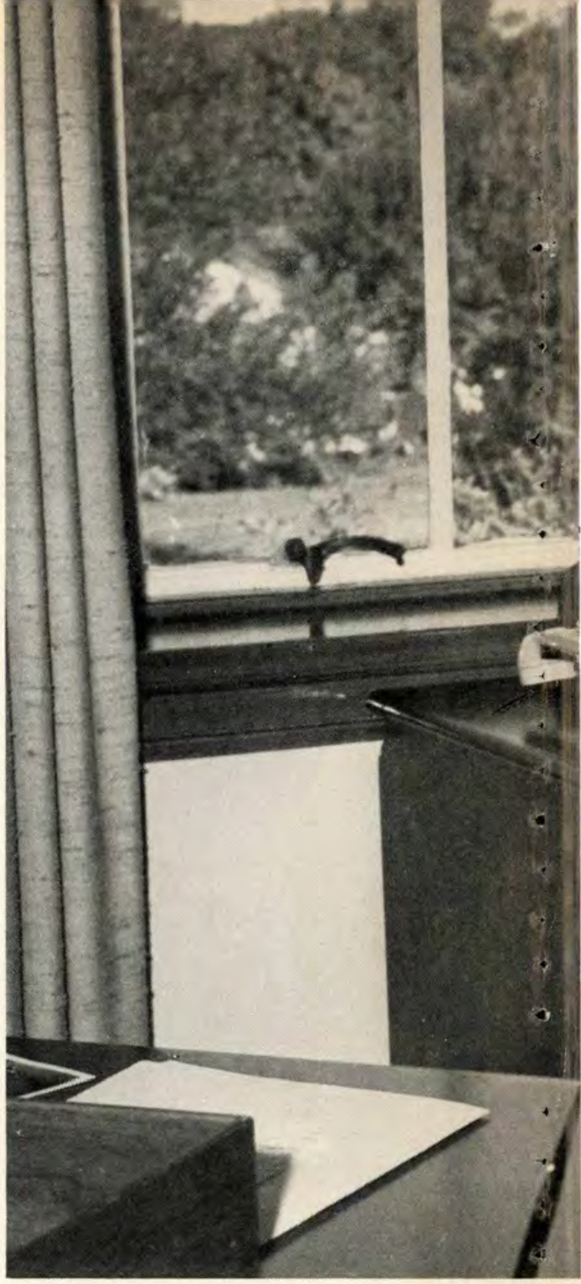
To Training Command with its almost infinite variety of people and talents this issue of AEROSPACE SAFETY is dedicated. The objective is to share among all Air Force People a better knowledge of this great command and the many facets of its mission. On the following pages Lt General Sam Maddux, Jr. expresses his safety philosophy, followed by an article that tells, although briefly, about the major command responsibilities.



A Commander's Safety Philosophy

☆ ☆ ☆

After several months as Commander of Air Training Command, Lt General Sam Maddux, Jr., expressed his thoughts on Safety in a letter to all ATC activities. With General Maddux's permission, his views are presented on these pages.



There are basic things which need to be restated from time to time to insure clear understanding by everyone. Following are my views relative to flight and ground safety:

Safety considerations shall not inhibit the full accomplishment of our mission, for this is the prime objective; however, our premise will be that the assigned mission can always be accomplished safely. Any time a subordinate commander does not agree, pertinent facts should be forwarded promptly. The ultimate goal is zero accidents.

Safety is a function of good management. Commanders are directly charged with responsibility for accomplishing their mission safely as well as effectively. In the final analysis, they are the safety officers.

Safety is not a special subject. It is inherent and integral in everything we do, in every act, in every decision. Safety is the professional approach each time, all the time.

Safety is everyone's business and everyone is involved in safety. No individual can be allowed to shirk his personal responsibility for safety and must be made keenly aware of this fact.

Accidents resulting from willful violation of directives or flagrant disregard for rules of conduct are particularly reprehensible. These will not be tolerated.

Although all facets of an accident prevention program are important, stress should be placed on investigation of the corrective action for incidents and near-misses, whether or not they are officially reportable. Adequate follow-up is a must.

Safety is not something we just have to put up with. Particularly in ATC it must be an attitude and way of life.

Related to the foregoing, it is pertinent to comment on the relationship between Safety and major functional areas such as Operations, Materiel, and Facilities. Although organized at Headquarters level under the Inspector General, Safety Officers should not be considered Inspectors in the accepted sense of the word. They are not concerned with writing report cards on past performance or with current compliance for its own sake. In over-simplified terms, their true concern is the prevention of the next accident. To be most effective, Safety Officers rely on very candid exchanges of information, and when pertinent facts are withheld from them, the safety program will be degraded. An active, rather than passive, spirit of cooperation should prevail, and that is the attitude I would like to see in ATC. As a step toward this objective, our Safety Surveys will discontinue the use of adjectival ratings. As in the past, specific recommendations to correct specific situations will be made but overall scores will not be assigned.

I am aware of the adverse safety impacts resultant from expansion, overcrowding and inexperience; nevertheless, I am convinced that ATC can improve its safety record. Our experience shows that too many accidents result from carelessness or inattention and are therefore clearly preventable. ★

In Vietnam an F-4C pilot, guided to his target by another pilot in a tiny O-1, pulls up after delivering his bombs. . . . Deep in an underground Minuteman complex in South Dakota, a pair of missile maintenance technicians replace a faulty valve. . . . A WAF in Europe busily types orders that will move men across an ocean. . . . A sentry and his guard dog stand a lonely vigil in the darkness at a SAC base. . . . On flight lines around the world, men of many skills are preparing aircraft for their next flight. . . . High above the Pacific, a navigator keeps careful watch on the course a swift-moving C-141 transport is flying. . . . While a flight nurse checks a patient in another aircraft a mile below and going in the other direction. . . .

All of these men and women have one thing in common with each other and hundreds of thousands of others who wear the Air Force blue: They are products of Air Training Command.

Schoolhouse O

Probably every person in the Air Force either started his career in Air Training Command or has attended one or more of the command's training courses. Yet chances are that the majority have only a vague notion of ATC's vast educational responsibilities.

Air Training Command is big and it is complex. Although most of its bases are in the southern states, some are scattered across the country. Navigators, for example, learn their trade at Mather AFB near Sacramento, Calif., armament and munitions are taught primarily at Lowry AFB at Denver, Colo., while aircraft and engine mechanics as well as Minuteman missile technicians get their training at Chanute AFB, Ill. Field Training Detachments extend the command to the farthest corners of the world.

Undergraduate pilots train in T-41, T-37 and the supersonic T-38 aircraft at eight bases. Rated pilots are upgrading to instructor status at Randolph AFB, where students from allied countries learn to fly the T-28 under the Military Assistance Program. Air Force recruits get their first taste of military life at Lackland AFB, San Antonio, Texas, along with WAFs, student officers and sentry dogs. It costs ATC about 800 million dollars a year to operate this huge complex worth somewhere between 2.5 and 3 billion dollars.

f The Air Force

It is the second largest Air Force Command, and, without question, the largest, most complex organization of its kind in the world.

While statistics are of value in gaining perspective, the real scope of ATC becomes apparent only when the many facets of its total responsibility are examined. Admittedly, this article is superficial in its coverage—it would take volumes to do the subject in detail—but on the next few pages there should be sufficient information to give Air Force personnel a better picture of the command.

Ours is a flying Air Force, so it seems only fitting that this article should begin with that aspect of the ATC training effort. First, the Undergraduate Pilot Training program.

The flight line at a UPT base is like no other place in the world. For one thing, two or three traffic patterns are being used simultaneously on parallel runways. T-38s circle continuously in one pattern as students, some with instructors, some solo, practice landings. On another runway T-37s come and go. Although transient traffic is light, the occasional visitor has to be worked into one of the patterns or lined up for landing on a third runway, if one exists.

Then there's the noise. Part of it is generated by the afterburners of T-38s as they accelerate for takeoff. But the incessant scream of the "Tweetie Bird," the T-37, assaults the ears constantly. Getting flightline personnel to wear ear protectors isn't difficult.

Undergraduate pilot training is, of course, a major ATC function. With about 1500 aircraft the command trains some 3000 pilots a year; the FY67 program calls for 2760, plus approximately 300 ANG and foreign students.

A few statistics will best illustrate the scope of flying training.

Students in advanced phase of flying training plan carefully for next flight in T-38.

OUR MAN AT ATC. **Managing Editor Bob Harrison watches takeoffs and landings at UPT base. He visited five bases and traveled 4000 miles in seven days working on this article.**

New class of instructor pilot trainees being briefed on the T-37 by 3510 FTW instructor at Randolph AFB. T-37, taxiing at Reese AFB, introduces beginning pilots to jet flight.

Student and instructor prepare to taxi for takeoff in T-38.

ATC

The command flies nearly a million hours a year and may have as many as 700 to 800 aircraft in the air at one time. Each of the UPT bases has about 150 aircraft flying around 8000 hours a month and making some four million landings a year.

Safety, of course, is a major consideration in student flying. Fledgling pilots fly supersonic aircraft from the ground to altitudes that take them into the radar controlled area above flight level 240. Control of student flights must consider the nation's airways, and the separation of student traffic flying between the base and practice areas and auxiliary fields. Then there is the mix of general aviation, air transport and student traffic.

To handle this complex traffic situation requires close cooperation between the base and the FAA. The UPT bases also cooperate locally with airport operators and civilian flying schools.

Creating and maintaining student training areas and corridors to and from these areas is akin to working a three-dimensional jig saw puzzle. This problem is being alleviated by the use of radar, which affords much better control over the student-flown jets.

Flying safety officers maintain currency in the assigned aircraft and keep current by taking their turn flying with students. This vital concern with safety extends to UPT wing commanders and right on up to ATC headquarters. Wing commanders frequently fly with students, and Col Max King, ATC's Chief of Safety, spends one week out of every busy month at a UPT base flying with students and keeping himself current in the aircraft and with the problems of student flying training.

To say that the students are busy is the understatement of the year. A typical day goes something like this:

Half of the class reports at 0600, briefs, flies and critiques during the first half of the day. The afternoon is just as full, with academic classes, physical education and officer training. The schedule for the other half of the class is reversed. Then add night flying.

During his training the student is introduced to the parachute—the device that someday may save his life. This training culminates in an actual descent via the parasail, a parachute pulled aloft by a line attached to a truck. After he rises to 300-400 feet, the student is cut loose and descends by way of the parachute. Most students find this a lot of fun, but the basic purpose is to expose them to the realism of a parachute descent and landing.

The entire curriculum is exacting and the standards are high. Today all students are college graduates and, on the average, much more sophisticated than their predecessors of just a few years ago. After a week of processing, the new students, most of whom are ROTC graduates, spend 18 to 30 hours in the T-41—the Cessna 172 with Air Force markings. This training is conducted by contractors near the UPT bases.

Phase II introduces the student to jet flying and he logs 90 hours of hard work in the T-37. Upon completion of this phase he goes into T-38s for 120 hours. Meanwhile he is amassing some 600 hours of classroom instruction in aerodynamics, navigation, weather, instrument flying and officer training subjects.

After graduation most of the newly rated pilots go to operational commands for advanced training, although a few volunteers report to Randolph for instructor training.

HELICOPTERS

ATC is also in the helicopter training business. During the past year the helicopter school moved from Stead AFB, Nevada, to Sheppard AFB. One major factor that had to be considered in relocating the school was that of providing realistic training. Stead, surrounded by mountains and wilderness seemed to offer an ideal location. Fortunately, the Air Force was able to find another place with many of the same attractions. This area is located on the huge Ft. Sill Army Reservation in Southern Oklahoma. The rugged hills, deep chasms and lakes provide excellent training terrain, although the high elevations of the Stead area are missing. This is compensated for by having students operate the H-19s, HH-43s and CH-3Cs at partial power during training exercises that call for high altitude work.

Helicopters are not the only aircraft used in training at Sheppard AFB. T-37s have recently been introduced and T-38s are soon to be added to the new pilot training school for the German Air Force.

With the arrival of the helicopter school and the jet trainers, the Sheppard airpatch became one of the most complex in the world. Control of traffic is, of course, absolutely necessary with the mix that exists. In addition to jet trainers and helicopters, the base has a fairly high volume of other military traffic, not to mention the fact that it is also the civil airport for Wichita Falls. Add to this all the factors of a UPT base and a busy general aviation community. As with the UPTs, cooperation is the by-word.

With such a complex force, scheduling, dispatching and controlling student flying is of major import. The method devised would have to combine the elements of safety and flexibility while maintaining simplicity. The Wings meet the challenge with a centralized dispatch and area control center. The center has telephone and radio facilities capable of providing immediate communication with the aircraft, tower, and other agencies to provide central control of student flying, and separation of aircraft by area, traffic pattern, auxiliary pattern or instrument facility assignment.

Space doesn't permit a detailed description of this system but an article that will contain details is planned for a future issue.

Flying training doesn't stop there. At Randolph AFB, home of ATC headquarters, the 3510 Flying Training Wing trains T-37 and T-38 instructors for the U.S. Air Force and some allied countries, foreign students in T-28s and C-47s, as well as Air Force instrument instructors and flight surgeons. This is a man-sized job when one considers the number of flying hours a year, the several types of aircraft and the students themselves.

Both the T-37 and T-38 squadrons polish rated pilots, some of them with brand new wings, into instructors who will staff the Undergraduate Pilot Training bases. The course is tough, for not only must these pilots become proficient in the aircraft, they must also fly in a precise manner and develop the skill required to be a good instructor. Only when they can demonstrate both flying and instructional skills to Air Force standards do they graduate and go forth as pilot instructors.

Down the flight line a ways is the 3512 Pilot Training Squadron

CH-3C approaches for landing during training at remote site in Oklahoma hills. Old cannon barrel serves as cargo during practice pickup by Sheppard based chopper.

Dummy is hauled aloft during simulated rescue. Powerful downwash from blades stands windsock straight out.

Rugged terrain on Ft Sill Army Reservation provides realistic training environment for helicopter crews.

which trains students from 50 countries to fly or upgrade their skills in the T-28 and C-47.

The primary job is training men from allied countries to be pilots. Other missions include

- Qualifying its own instructors,
- Upgrading allied pilots from liaison to attack type aircraft,
- Qualifying rated pilots as C-47 aircraft commanders,
- Qualifying multi-engine pilots as instrument pilots in the C-47.

The problems are many. Some of the instructors, whose first task is to become proficient in the T-28, have worn pilot wings for many years and arrive with mixed feelings about the assignment. Others accept the job as a challenge.

In general, the students are good. But some of the problems are tough. Language is one. Add to this the diets, religions and national customs the students bring with them and—well, it's different.

Training the Air Force's instrument instructors is the primary mission of the Instrument Pilot Instructors School. IPIS is well known, since its graduates can be found on every air base. The school conducts 16 classes a year of six weeks duration and each class contains one or two allied students. The average student is a Captain or Major with about 10 years experience. Century series and B-58 pilots fly the T-38, while all others fly the T-39. All flying is done in the day time with weather minimums of zero-zero for take off, and 100-foot ceiling and one-quarter mile visibility (at Randolph) for landing—the lowest minimums in the Air Force.

IPIS also works closely with Air Force Systems Command, FAA and the Aeronautical Chart and Information Center, for example, with FAA on instrument flying procedures. IPIS routinely assists Systems Command by evaluating proposed new instrument systems and cockpit configurations, and is working with them in a pilot factor program for pilot display elements.

Two other responsibilities of IPIS are updating Air Force Instrument Manual, AFM 51-37, and the Instrument Refresher Course. Pilots will be interested to know that the course has been completely rewritten and probably will be in the field during the first quarter of 1967. Incidentally, there's something new: the course will include programmed texts. However, the manner in which these texts will be used by the various commands has yet to be worked out.

NAVIGATOR TRAINING

The Air Force also has a continuing need for navigators, navigator-bombardiers and electronic warfare officers. ATC trains the men who do these jobs at Mather AFB, where all such training was recently consolidated.

The 3535 Navigator Training Wing owns an outstanding safety record. It hasn't had a ground fatality since June 1963, and its last major aircraft accident occurred in December 1963.

Mather is a pretty busy place when one considers:

- The 160 pilots of the 3541 Squadron fly an average of 45 missions a day during the working week, each mission from 4½ to 7 hours in duration.
- There are missions over land and water with 5-minute takeoff intervals between aircraft.

Student navigator practices using sextant during training flight aboard T-29.

• The Mather T-29 navigator trainers fly, on the average, some 5500 hours a month.

Some of the different types of missions flown are as follows: A 4½-hour low level flight for map reading and radar training. These are flown at altitudes between 2500 and 3500 feet. All clearances are filed IFR/VFR on top.

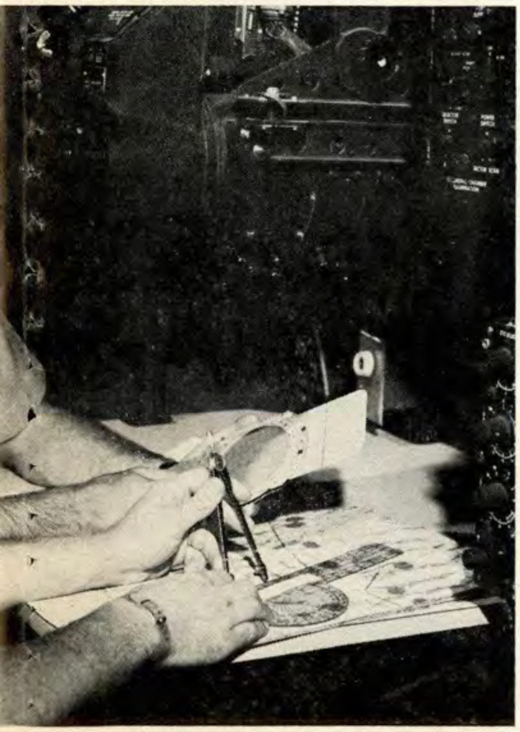
A 6:45 hour mission trains undergraduate navigators in the complexities of map reading, celestial, grid, radar and overwater navigation. The overwater flights may be made over any one of several pre-planned routes which take the students over water for more than five hours.

Navigator-Bombardier trainees fly a 7-hour mission that is a carbon copy of a typical SAC practice mission. They get experience in the use of radar and celestial navigation and test their skill in navigation and bombing. The flights use SAC low level routes; scheduled entry times into the corridors are as rigid as those for SAC veterans.

The 3535th's 360 instructors train about 1700 students a year in nine courses. The undergraduate navigator course runs for 38 weeks, the navigator-bombardier course, 28 weeks, and the electronic warfare officer course, 30 weeks. There are some shorter courses for specific aircraft and requirements. Something new is the RF-4C reconnaissance training which started in October.

Like pilot trainees, the student navigators are all college graduates, some from the Air Force Academy. Most, however, come from the ROTC. To provide quality training that is current with Air Force equipment, the 3535th has about 23 million dollars worth of ground trainers in addition to the aircraft. These range from relatively simple mockups for beginners to the highly sophisticated duplications of B-52 and B-58 Nav-Bomb and electronic warfare systems. In addition, there is a celestial trainer that looks like it came directly from Disneyland. But you'd better believe it wasn't designed to entertain children.

Busy hands of navigator students. Equipment is part of 23 million-dollar inventory of ground training devices.



VAST TECH TRAINING

Another of ATC's major missions, probably the one that consumes the major part of its resources, is Technical Training.

In sheer numbers of students, the peak of training during World War II may have overshadowed the technical training output of today. But numbers alone do not tell the whole story. There are skills today that did not exist just a few years ago and students must be trained in those skills. The result has been a complex of courses and teaching methods unmatched anywhere else in the world.

Most of ATC's technical training takes place at five bases: Sheppard and Amarillo in Texas (the latter being phased out as a TTC); Keesler, Miss., Lowry, Colo., and Chanute, Ill. The combined population of these bases (students and permanent party) averages above 100,000 people. The average number of students in training at one time is about 42,000, in nearly 1000 different courses. This seems almost incredible until we add the 150 or so Field Training Detachments with 1100 courses and 380,000 students scattered around the world. Then the scope of this mighty effort becomes almost impossible to grasp. But ATC has a grasp of it and manages to keep it under control. One of the first things one sees when he studies the structure of ATC is that there are no intermediate headquarters between the operators and command headquarters. This condensation of the chain of command means that the commander of a Technical Training Center, for example, is his own boss and answerable only to the ATC Commander.

Possibly you wonder how Training Command knows whom to train, where and when. Very briefly, these questions are resolved as follows: By a somewhat complicated procedure, Air Force headquarters determines the number of new personnel the commands will need to be trained. This goes to ATC as a Trained Personnel Requirements Document. ATC then develops its program based on these requirements. Final responsibility for planning and conducting the required training belongs to the Training Center.

This means that each TTC is autonomous with guidance and direction from command headquarters. The Center must establish and update each course, develop the most effective techniques of instruction, acquire or fabricate training aids and materials, and, of course, conduct the training. In the process of these accomplishments the command has been a leader in devising new methods of instruction and ways of using sophisticated training aids. For example, ATC pioneered the use of television and programmed instruction techniques in its training courses.

In addition to training new Air Force personnel, ATC has an additional requirement for advanced training of experienced airmen and for retraining of experienced personnel into new skills or on different systems coming into the inventory. Determining advanced training is the joint responsibility of ATC and the operating commands, and is a process of coordination on details of numbers of personnel and kinds of training.

Then there are the Field Training Detachments which consist of a commander and instructors. They provide on-site technical training for support of a system, such as an aircraft, and its support equipment. Some courses are short, others last for two or three months.

Another ATC responsibility is support of the on-the-job training program—a way of life for many airmen. OJT package programs are developed by ATC and implemented at Air Force bases throughout the world.

Weathermen also learn their skills in ATC conducted courses or at universities under ATC contract. Weather officers are trained through the AFIT program at universities throughout the United States. In addition to basic meteorology training, opportunities for advanced study are available, leading to the Master's and Ph.D. degrees.

Airman forecaster training is conducted at Chanute AFB. This course requires prior completion of the weather observer course and possession of the five-level AFSC. The observer course, open to qualifying basic training graduates, is also conducted at Chanute, as is all weather equipment technician and supervisor training.

One of the most challenging problems of recent years has been the buildup in Southeast Asia. Additional thousands of personnel have had to be trained in many skills in a short time. This, of course,

Intent faces of students reflect concentration on intricacies of wave shape forming circuits during training in fundamentals of electronics.

Instructor at Sheppard AFB makes point to students during class in jet engine course.

Trainees' interest is shown as they crowd in on mockup to get the word from instructor.

creates problems in the procurement of instructors, training equipment and funds.

In an article in the USAF Instructors Journal, Brig Gen John M. McNabb, Deputy Chief of Staff, Technical Training Hq, ATC, cites a specific example of how ATC responded to the sudden demand for J79 engine mechanics.

"Because of the SEA buildup and the one year rotation policy, we have had to train a large number of jet engine mechanics as replacements for stateside returnees. Since the F-4C aircraft has such wide use throughout SEA, a majority of these mechanics had to be trained on its J79-15 engine. Not even our F-4C Field Training Detachments could handle the entire load in the time required. So, we set up two resident courses at Chanute to train almost 200 personnel enroute to SEA. When we first were notified on this requirement in December 1965, ATC had no J79-15 engines on hand; nor were there any instructors qualified to teach the engine. Within six months, however, all equipment was in place, both courses were written, instructors were qualified, and classes were in session. The speed with which these courses were set up reflects the high degree of cooperation existing between ATC and other Air Force agencies. And, it reflects ATC's ability to react quickly to emergency situations."

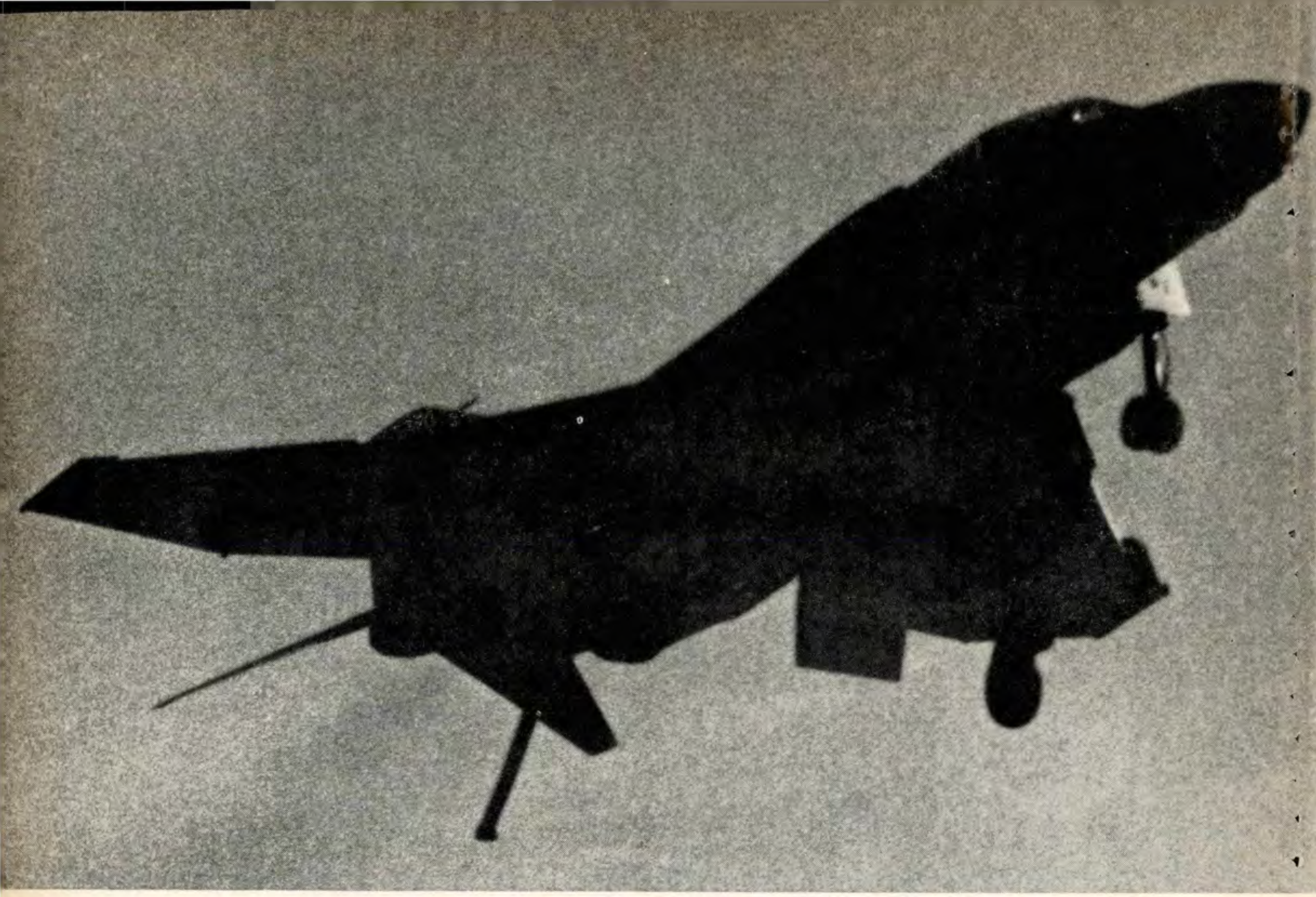
This example is not a one-time, all-out effort. Rather, ATC is accustomed to meeting such challenges, although a more leisurely process is preferred, and the ability to do so is due to the quality and experience of many thousands of ATC's experts.

Obviously training, to be effective, cannot be done without feedback as to the results. This means a constant evaluation to determine the quality of work produced by recent graduates. ATC maintains a quality control program for the purpose of testing the quality of training. In each command ATC liaison offices report on the quality of work produced by graduates of ATC training courses. The IPIS, UPT bases and Navigation School all evaluate training through these liaison offices and visits to the operating commands. This information is used to confirm training techniques and course content and to make improvements where indicated.

Safety in Air Training Command has two basic aspects. One is the immediate problem of training thousands annually with the attendant dangers of hazardous equipment, materials and operations. This involves the entire complex of safety efforts: flying, traffic, industrial, explosives safety. The other, more subtle and certainly long range safety job falls primarily to those dedicated individuals who provide the guidance and motivation necessary to develop raw talent into skilled and productive personnel who man and support the Air Force's weapons.

It is this latter aspect of safety that is expressed in a statement by Col Ernest T. Cragg, Wing Commander at Reese AFB. "We plan on giving each student pilot enough flying safety to last him a lifetime—30 successful years of a full and productive Air Force career."

Others may express the same idea differently. Nevertheless, what is implicit here is that ATC accepts the responsibility of turning out men and women who, by the quality of the training they receive, will be capable of producing quality workmanship. This, we believe, is the cornerstone of safety. ★



DON'T LOOK FOR THIS IN YOUR F-4 FLIGHT HANDBOOK...IT'S

A recent F-4 accident involved the loss of thrust from one engine while the aircraft was in the landing configuration and on-speed at 1600 feet altitude. The flight handbook does not cover this precise situation but proper procedures will be added in the near future.

Your safety types asked McDonnell Aircraft Corporation to recommend a procedure that would provide training and confidence in handling such an emergency and still give an adequate margin of safety. They responded with two procedures to be performed at or near normal landing gross weights. To gain the desired comparison these two maneuvers should be practiced one immediately after the other.

PROCEDURE ONE: Establish a normal approach in the full landing configuration at an altitude of 5000 feet. Maintain the on-speed light and a descent of 500 to 1000 feet per minute. Don't go below 3000 feet. To simulate the emergency, retard one throttle to idle and then immediately advance the "good" engine to full afterburner. Monitor RPM, TOT and nozzle position and retract flaps to the one-half flap position. Note the increase in available thrust and al-

TRAINING FOR AN EMERGENCY

Lt Col Robert F. Brockmann, Directorate of Aerospace Safety

NOT THERE...BUT SOON WILL BE...HERE'S A SNEAK PREVIEW!

most immediate aircraft acceleration as the flaps retract to the one-half position. Raise the gear and level off. Note altitude lost (since starting the simulated emergency), airspeed and available acceleration. Reduce the thrust of the good engine to military and note that the aircraft will continue to accelerate; at this point normal single-engine approach procedures become applicable.

PROCEDURE TWO: Start from the same conditions (landing configuration, 5000 feet altitude, on-speed descent at 500-1000 feet per minute, not going below 3000 feet). Again retard one throttle to idle and immediately advance the other engine to full afterburner. Monitor engine instruments and this time leave the flaps full down. Note the difference in available acceleration compared to procedure one. Raise the gear and level off. Again note the altitude loss, airspeed and available acceleration. Reduce the thrust of the "good" engine to military and note the acceleration (or lack thereof) as compared with procedure one. Retract the flaps to the one-half flap position and note the effect on acceleration.

This comparison of aircraft acceleration and response characteristics pointedly demonstrates the merit of raising the flaps to the one-half flap position when experiencing an engine failure in the landing configuration. Above all, if you are on-speed with "everything hanging" and have a sudden loss of thrust, DON'T retard EITHER throttle. The odds of both engines going at the same time are more than remote. Therefore, go immediately to both burners and raise the flaps to the one-half flap position. By this time the emergency is probably over and you can spend all the time you want cleaning up the sick engine and convincing the guy in the other cockpit how calm you are. ★

REX RILEY'S CROSS COUNTRY NOTES

THE FOLLOWING IS ONE more in a never-ending series of explosives incidents that occur simply because personnel are not familiar with equipment with which they are working.

The ejection seats from a T-33 aircraft were removed by egress specialists and taken to the corrosion control shop for painting. The canopy and seat ejection initiators were left attached to the seats with all safety pins installed. But the corrosion control personnel were not familiar with ejection seats and didn't know that the initiators were armed and safetied with pins. In order to paint the bottom sides of the armrests, an airman removed the safety pins and rotated the arm rests to the UP position. Yes, both canopy initiators were fired in both seats.

The cause of this incident was that personnel unfamiliar with ejection seats were allowed to perform the painting operation without being briefed on the armed initiators and were not cautioned to leave the safety pins installed during maintenance.

Corrective action included: (1) Ejection seat safety training from FTD for all personnel assigned to electrical, corrosion control and aero repair shops. This will be an item of annual recurring training. (2) It was recommended that AFM 50-24 be changed to require initial ejection seat safety training for maintenance personnel. (3) Local procedures have been established to insure that ejection seats are capped and safed by qualified egress technicians prior to sending them to the above shops. (4) Local checklists in corrosion control and electrical shops have been developed to insure ejection seats have been rendered safe prior to shop maintenance.

There are still a lot of explosives incidents waiting to happen. Maybe some of these can be prevented with just such action as this unit has taken. If the program at your base is not as good as it should be, how about adopting the ideas presented above, along with others that occur to you? But remember, tech data are the foundation for any preventive action.

A CHAP KIT CAN KILL YOU if you don't treat it with the respect it deserves. Obviously, this is 180 degrees out of phase with the intended purpose of a survival kit. An officer recently dropped a CHAP kit a total of three feet. When it hit, a loud report and a fire were caused by the explosion of one round of caliber .38 tracer ammunition which was packed inside; the projectile of the round packed above it struck the primer. The fire was extinguished with no damage to the aircraft or crew, but the potential for an expensive accident is evident.

Handle any item of ammunition with care and be particularly careful when handling the CHAP kit.

URs PAY OFF—A new helmet liner designed to provide better sound attenuation, more comfort and retainability during ejection is in production. URs put the finger on problems with the HGU-2AP, which led to an MIP. The new liner (HGU-17/P) is the result.

Made of flexible foamed plastic with a rayon cover, the liner will fit over the entire skull and ears. It will completely fill the helmet cavity, and fit snugly next to the impact-absorbent styrofoam, thus eliminating the polyurethane pads. Special inserts and seals will accommodate the H-143/A1C earphones. The liner will come in five sizes and should be available late this spring.

Spinal injuries during ejection from the F/RF-4C was the subject of an article, "Heads or Tails," in the September AEROSPACE SAFETY. The article was full of timely information for -4C crews. Since then, we have received more data from the 13th Air Force in SEA. What they have to say makes sense. Rex recommends all F-4C jocks be read in on this, so here it is:

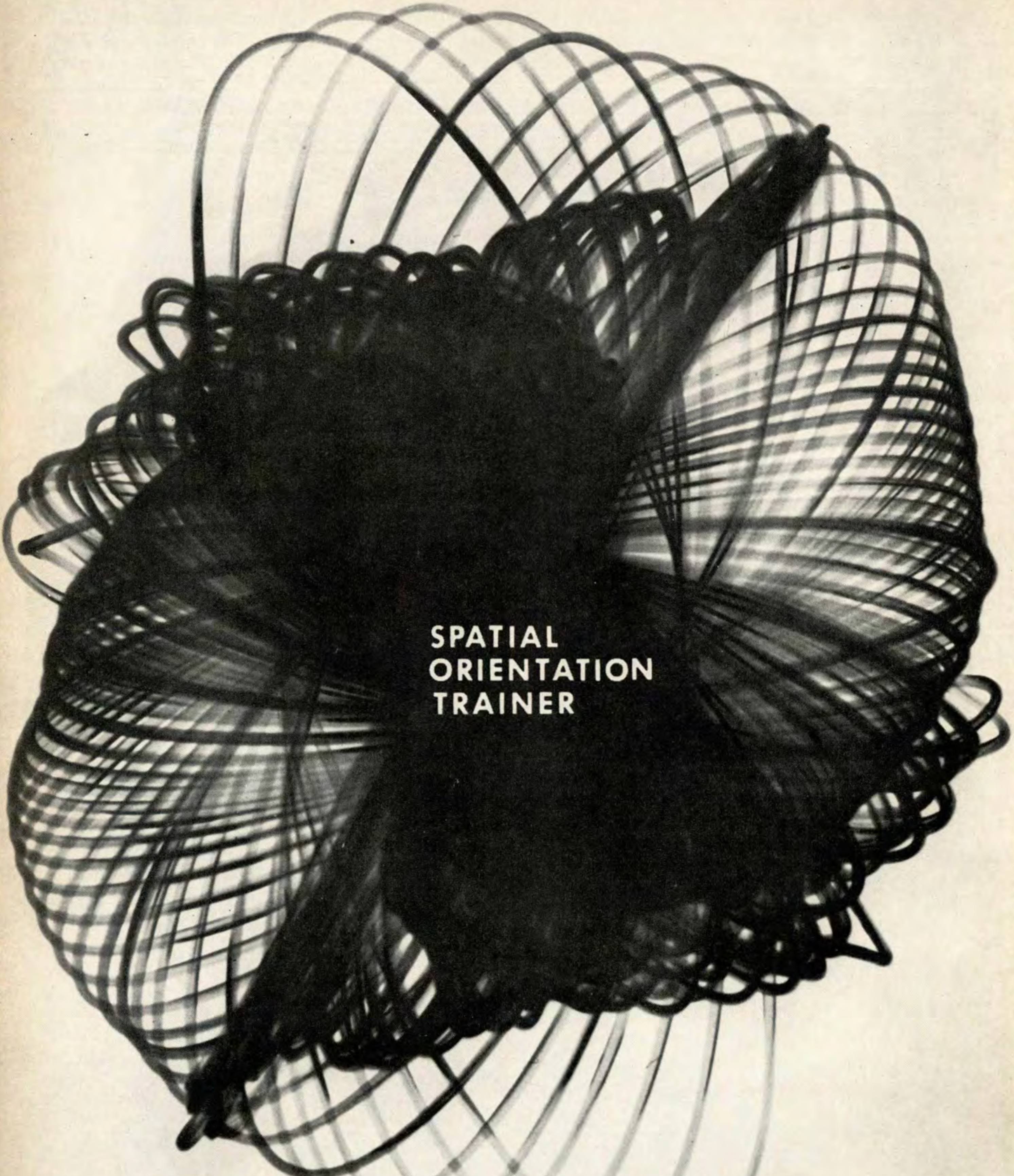
Recent medical debriefings of F/RF-4C aircrews may have revealed why some who eject with the Martin-Baker seat sustained fractures. As described in the Dash One on page 1-55 in the paragraph "Ejection Seat Sequence" and again on page 3-13, Figure 3-5, Step 2, actuation of either ejection handle involves a TWO-STAGE PULL. This results from the initial presence of the canopy interlock which is withdrawn by the departing canopy. If this momentary impediment to full travel of the handle is not anticipated, a crewmember may suspect a seat malfunction and fail to maintain the proper ejection position. Two examples:

- One crewmember pulled the lower ejection handle while maintaining good position. When immediate ejection did not occur, he leaned forward to look at the handle. As he did, the catapult gun fired. Although he landed at sea, he suffered fractures of two vertebrae.
- Another pilot assumed perfect ejection position and pulled the face curtain handles until a stop was encountered. Nothing happened. The aircraft was in flames, below 1000 feet and descending; therefore, an instant of delay may have seemed too long to wait. He released the face curtain handles and grabbed for the lower ejection handle, probably assuming a poor position. A single, uninterrupted pull on it then led to immediate ejection. The man sustained compression fracture of two vertebrae.

The important fact is that neither man had expected the intermediate stop. One knows this led him to bend forward at the wrong moment and the other suspects it.

We recommend all F/RF-4C aircrews reread the Dash One guidance mentioned in paragraph 2 above. Recommend further that the proper ejection position be maintained until free of the aircraft. The delay built in by Martin-Baker prevents ejection through the canopy and cannot be circumvented. This delay must be anticipated if one is to avoid panic which can lead to poor position.

Incidentally, the Aero Medical Research Laboratory at Wright-Patterson is pulling all stops to come up with an improved lap belt and improved lumbar support for the F-4C ejection seat. ★


SPATIAL
ORIENTATION
TRAINER

Spatial disorientation has been a deadly compromiser of pilot performance ever since blind flying was first attempted. Research in recent years has led to a training device that a year or so from now may assist pilots in overcoming this threat.

Capt Kent K. Gillingham, USAF, MC, Aerospace Medical Div., Brooks AFB, Tex

Slowly, over the past several decades, basic knowledge of spatial disorientation has been accumulated, and we are ready to apply some of that knowledge to the task of decreasing spatial disorientation accidents through the use of a special training vehicle.

The Air Force officially recognized the necessity for such a vehicle by establishing a threefold requirement outlining the desired functions of a proposed spatial disorientation training device. The device to be developed and procured would:

- Demonstrate to pilots that sensory illusions of orientation can and will occur in all pilots.
- Evaluate pilots for susceptibility to performance decrements caused by disorientation.
- Train pilots to become more proficient at coping with disorientation.

The first device to be fabricated in response to this requirement was the Spatial Disorientation Demonstrator. The SDD is, in effect, a very inexpensive short-arm centrifuge, the cabin of which travels along a circular (10-ft. diameter) track at angular velocities up to 25 rpm. The cabin can be rotated continuously about its vertical axis and positioned to face any direction relative to the hub of the apparatus. The vertical axis of the cabin itself can be tilted ±15 degrees about a tangential axis, so as to allow the cabin to pitch or roll, depending upon the direction in which the cab is facing. The inside of the cabin resembles an F-100 cockpit and contains a functioning attitude indicator. The pilot, riding in the cabin of the SDD, can be subjected not only to constant angular velocities up to 25 rpm in the main yaw plane with concomitant linear (centripetal) accelerations up to 1 G, but also to various other angular velocities and angular accelerations in the pitch, roll, and planetary yaw planes.

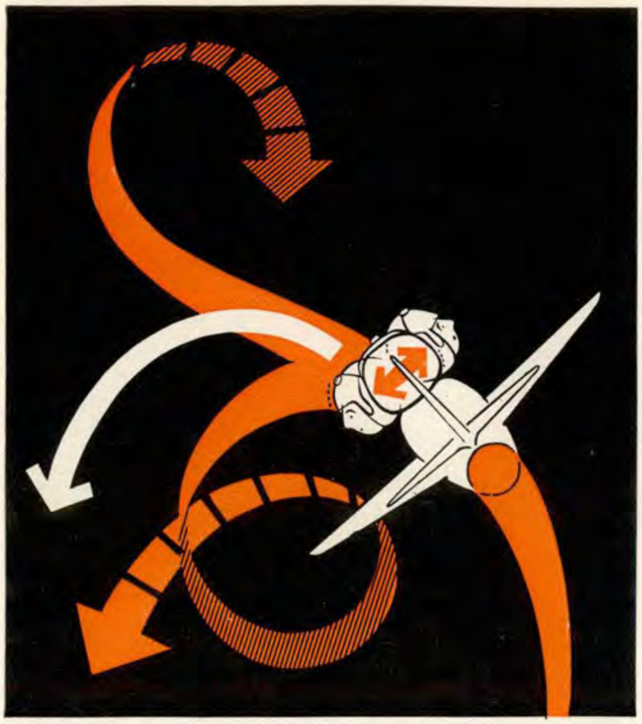
By proper manipulation of the controls, the operator can cause the pilot to experience a number of vestibular illusions that occur in flight and lead to spatial disorientation. Two vestibular illusions which are extremely important from the standpoint of flight safety are the Coriolis and oculogravic illusions.

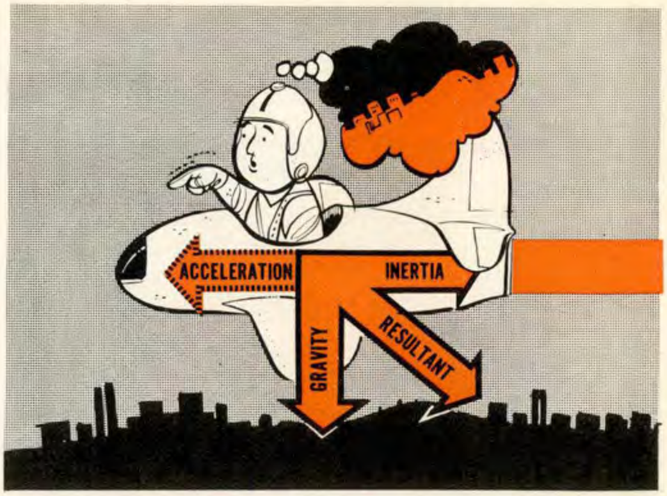
The Coriolis illusion (Figure 1) results when, in a situation of constant angular velocity (like in a turn or a loop), the head is subjected to angular acceleration in a plane other than the plane of the turn. (For example, think of this as having the aircraft in a turn, then moving your head up or down. — Ed.) The illusion suffered following the coupling of such angular motions is one of undergoing rotation in a plane in which no actual rotation has occurred. If one yaws at a reasonably constant velocity for about 10 seconds, for example, and then pitches his head forward while the yaw is persisting, he will experience a sensation of roll; similarly, if he is pitching and then rolls, he will experience the false sensation of yaw.

The Coriolis illusion has been blamed, and reasonably so, for a number of aircraft accidents that have occurred during penetration turns, when radio frequency changes and other cockpit duties require extreme head movements. When the SDD is operated at a high angular velocity around the track, and pitching or rolling motions of the cabin are superimposed, a pilot riding the device experiences very distinct Coriolis illusions of roll and pitch. Under those conditions, illusions of roll and pitch, respectively, are generated; and the inaccuracy of the pilot's perceptions are demonstrated to him by the attitude indicator.

The oculogravic illusion* occurs when an accelerative force acts on the vestibular mechanism or on the body at an angle with the gravitational force. This produces a visual

**The oculogravic illusion, in its original sense, referred only to the displacement of objects in the visual field concomitant with the application of the body of the resultant force described above. Because of the lack of an existing term covering the total sensation associated with such a resultant force, we are expanding the meaning of oculogravic illusion to include not only the visual aspects but also the illusory sensations of attitude and motion generated by the combination of inertial forces with the force of gravity.*





Left, the Coriolis illusion. If the pilot moves his head while in a prolonged turn, he may experience false sensations of violent changes of attitude. Above, the oculogravic illusion. As this high performance aircraft takes off, the pilot may falsely perceive that the aircraft is in a steep climb.

illusion which aligns itself with the resultant of the accelerative and gravitational forces. For instance, a person riding a merry-go-round will visualize the horizon as being perpendicular to the resultant of gravitational and centrifugal vectors. This makes him lean toward the center of the circle.

A more familiar situation, possibly, is that of an aircraft experiencing marked acceleration, e.g., when afterburner is lit. This may produce the illusion of pitchup.

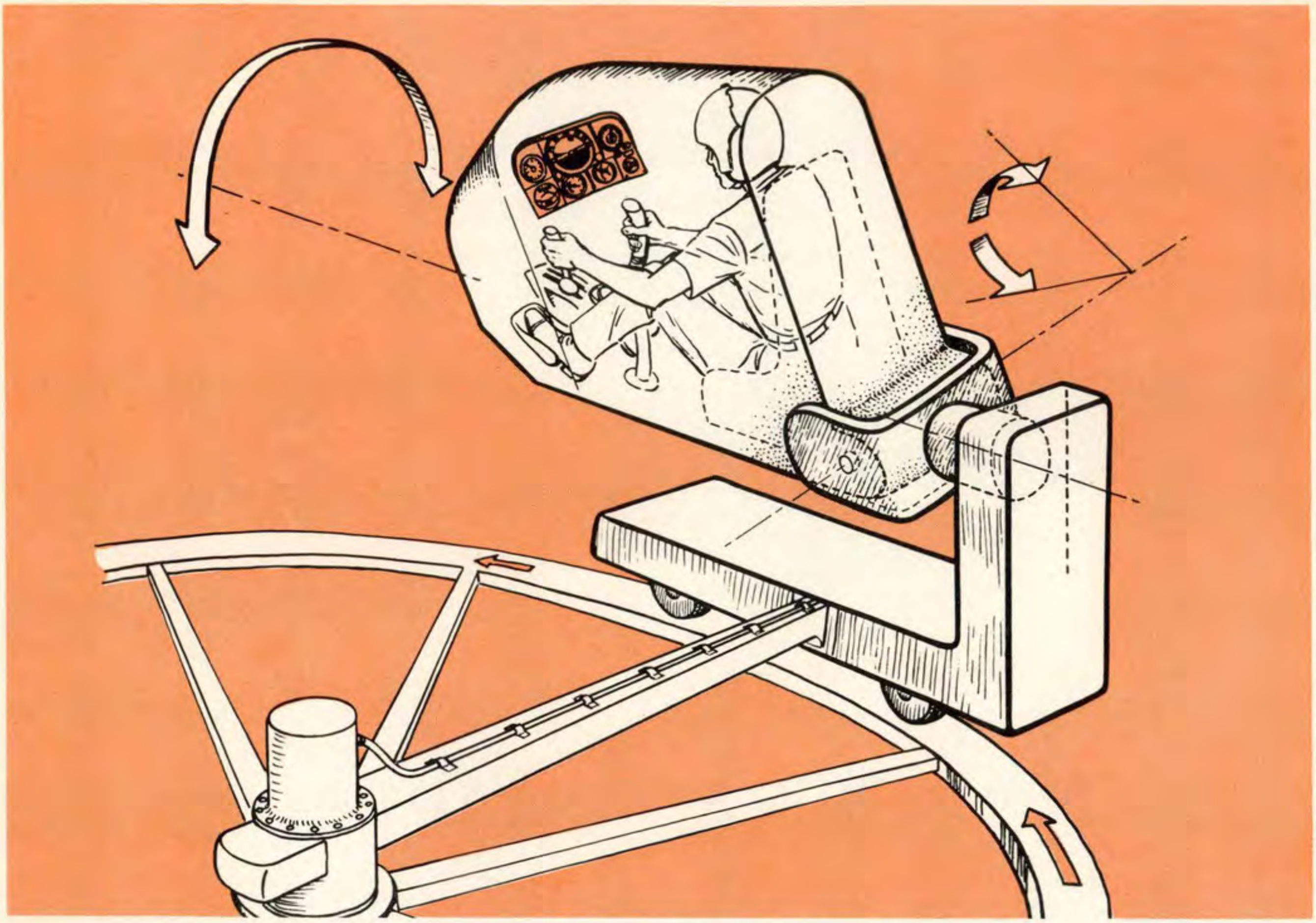
The illusion is common during night and weather takeoffs in high performance aircraft, and the all-too-frequent results of the illusion are full-power crashes several miles from the end of the runway. The SDD, by means of centrifugal force, can produce the oculogravic illusion when it is revolving with the nose of the cabin facing the hub of the apparatus. The pilot riding the device appreciates his illusion of nose-high attitude when he compares his sensation with the display of his true attitude on the gyro horizon.

Several other classic illusions of flight can be generated in the SDD, but the Coriolis and oculogravic illusions are very spectacular yet reproducible illusions, and are thus best suited for demonstration in the SDD.

Although the SDD proved that some important illusions of flight can be reproduced and effectively demonstrated by a relatively inexpensive and safe ground-based apparatus, it was nevertheless not designed to satisfy the evaluation and training functions desired of the ultimate vehicle requested by the Air Force. Utilizing the successful concepts involved in the SDD, and incorporating several additional capabilities, the Spatial Orientation Trainer was designed to satisfy the aforementioned requirement. (Fig. 3)

The pilot controls the trainer's attitude with a control stick. By moving the stick he can roll the vehicle through 180 degrees and accomplish up to 60 degrees of pitching motion. He can pitch and roll the machine at rates which approach those of modern aircraft and can accomplish both motions simultaneously. The greater angular velocities and displacements for which the SOT is designed give it the capability to generate sensory illusions of much greater magnitude. And a functional control stick in the SOT makes it a much more versatile vehicle than the SDD for the following reasons.

If the pilot has control over the attitude of the vehicle, he can be asked to perform a particular maneuver by reference to the attitude gyro. His performance can then be monitored and compared with the performance of other pilots or with his own previous performance. If a pilot is instructed, for example, to fly straight and



Spatial Orientation Trainer. Pilot riding this device can be subjected to the various illusions and can "fly" the SOT by operating the control stick.

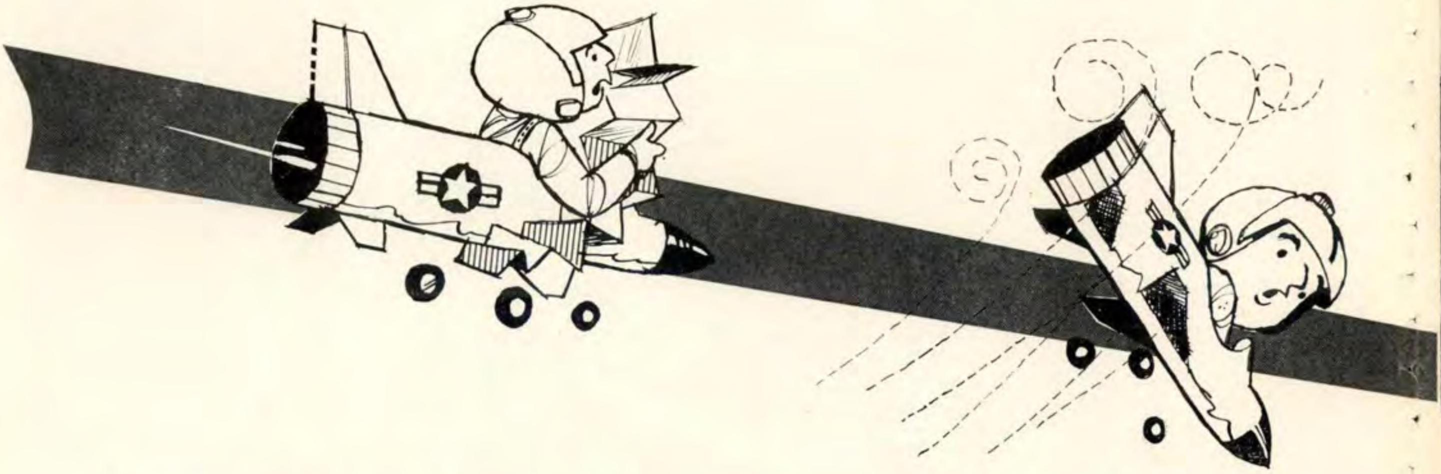
level after having been subjected to a Coriolis illusion, and he is unable to accomplish straight and level flight in the vehicle by a certain elapsed time, we might then be able to conclude that he is more vulnerable to spatial disorientation than another pilot who obtains straight and level flight in less elapsed time. Thus, we believe, an evaluation can be made of a pilot's ability to perform under the stress of conditions conducive to spatial disorientation.

If some pilots, in their initial tests on the SOT, appear to be relatively susceptible to performance decrement during disorienting situations, then the SOT will, we anticipate, be useful in training those pilots to resist the influences of disorientation. We assume that the pilot who has resisted the effects of disorientation in the SOT will be able, should the need arise, to perform more adequately in the air than he would, had he not had such practice. The reasoning behind this assumption is that safe recovery from disorientation in flight involves the pilot's being able to make aircraft control movements solely in response to the visual information provided by the attitude gyro and other instruments despite erroneous sensations. Thus we anticipate that the SOT will function as a trainer as well as an evaluator and demonstrator, as required by the Air Force.

At present we can only suggest the ways in which the SOT will be put to its optimum use. We believe that under-graduate pilots should receive several hours of training in the SOT: first, to show them that spatial disorientation can occur, and second, to give them practice in overriding illusory controlling orientation cues and successfully controlling aircraft attitude by reference to flight instruments. We believe also that the SOT can be used by the flight surgeon to obtain a meaningful measurement of a pilot's susceptibility to disorientation. Furthermore, we believe that the SOT can be helpful in providing needful pilots a means by which they can maintain some degree of practice and proficiency in that type of instrument discipline which spells the difference between life and death during critical episodes of spatial disorientation. ★

THE IPIS APPROACH

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



FLYING THE RADAR APPROACH

FOR INSTRUMENT FLIGHT EXAMINERS

(and interested examinees)

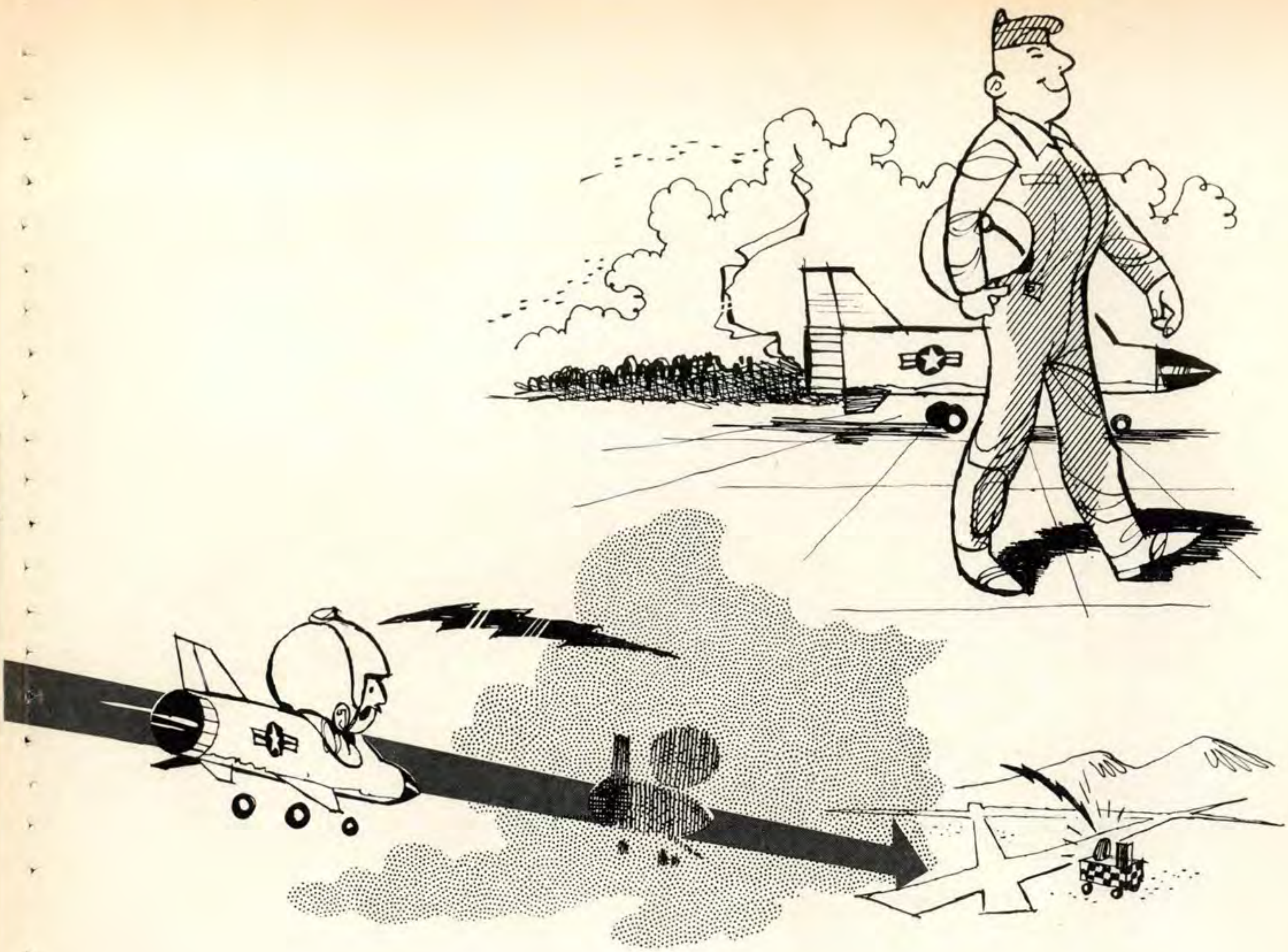
In most instances a radar approach may be successfully completed with minimum effort by the pilot, i.e., maintaining aircraft control by proper application of basic instrument procedures and techniques, following controller instructions, and complying with aircraft flight manual procedures. However, a safe approach under more trying circumstances, such as a strange field located in mountainous terrain with weather down to minimums, presents an entirely different situation from a "no sweat" instrument check at the home drome. Realizing that items to be evaluated on an instrument check are specified by the major command concerned, the following are some areas of consideration the IPIS believes are important.

Transition to Final Approach: Does the pilot consult the IFR Supplement for available back-up UHF/VHF radar frequencies, weather minimums, minimum altitude (decision height) and glide slope angle? Is the terminal instrument approach chart used to determine obstructions, minimum/emergency safe altitudes, approach lighting, runway length/width, and availability of jet barrier or arresting gear? Additionally, are nonradar approach facilities and their associated weather minimums checked?

Are navigational aids required for the lost communication and missed approach procedures selected and tuned? Does the pilot use available navigational aids to remain oriented in relation to the landing runway? Are aircraft configuration and airspeed changes compatible with position and altitude in the pattern?

Final Approach: Are final approach airspeed and configuration achieved prior to glide slope interception? Is the effect of head or tail wind and glide slope angle considered in establishing the initial rate of descent?

Does the pilot respond correctly to controller instructions? Each transmission made by the PAR controller is an interpretation and includes a personal judgment factor. For example, at one mile from



touchdown, 25 feet deviation from glide slope is reflected in a displacement of only .096 inch on the controller's scope! This could be transmitted as 25 feet deviation by one controller, while another might interpret it as 40 feet off. Therefore, glide slope deviation information the pilot receives is important *only* in how the pilot reacts to it, not necessarily as a criterion for evaluating the approach.

Are the pilot's pitch corrections small but positive, resulting in a vertical velocity which *should* return the aircraft to the glide slope? Are desired pitch attitudes maintained constant by reference to the attitude indicator? Are headings overshot (too much bank, or insufficient cross-check of heading indicator)? Does the pilot maintain the heading which the controller thinks he is holding?

REMEMBER! It takes a team effort (pilot and controller) to fly a successful PAR approach. However, you are evaluating *only* the pilot's part of the approach.

Minimums: Does the pilot initiate missed approach at minimum altitude (decision height) as indicated on the altimeter or when reported by the controller, whichever occurs first? Is the proper pitch attitude established during the missed approach? Does the pilot maintain positive control of the aircraft during the missed approach?

If the approach is continued, does the pilot continue to follow the controller's instructions, maintaining precise heading and descent control while bringing the runway environment into his cross-check?

Grading Criteria: Grading criteria, e.g., glide slope control within +80 feet or −40 feet for highly qualified, are designed to provide the flight examiner with specific guidelines for evaluating pilot performance. However, variables associated with the precision radar approach, such as equipment capability, controller proficiency, and turbulence, often demand more judgment on the part of the flight examiner than written grading criteria can provide. ★

SAFETY ENGINEERING ANALYSIS

Lt. Col. Moses R. Box, Directorate of Aerospace Safety

What is a Safety Engineering Analysis? How is it used? How implemented? The author answers these and other questions on this vital subject.

The increased emphasis being placed on the need for a Safety Engineering Analysis for all major weapon system modification programs, modernization programs, or update programs, raises a few questions among many Air Force people. What is a Safety Engineering Analysis? How is it used? How is it implemented?

A Safety Engineering Analysis consists of two basic functions: First, an engineer performing a safety analysis examines and evaluates a job to determine any undesirable events or hazards that might result from the work. This analysis must consider personnel and equipment hazards in the immediate work area as well as possible damage to the weapon system resulting from task accomplishment. Second, he determines what actions are necessary to preclude the undesirable event from happening.

With this simple definition the next question that arises is, "When do we make a Safety Engineering Analysis?" This becomes a matter of judgment. Where the task is simple, the performance of a Safety Engineering Analysis requires little time or expense. A relatively simple engineering change proposal (ECP) may, however, contain hidden hazards. For example, if an ECP involves only changing a wire from one pin to another within a junction box, there is no apparent danger. Analysis may disclose, however, that the adjacent pins carry high voltage or lead to an electroexplosive device which could be inadvertently fired. In either case, a hazard would result and safety actions must be identified to preclude the hazard.

We certainly do not want a safety analysis costing several thousand dollars performed on a simple one-step operation such as changing a tire on a missile transporter. But we in Safety become vitally concerned when a change in a system involves numerous activities on unrelated tasks performed by more than one worker. This could result from a single ECP or from the installation of a change package involving several ECPs. One contractor could be involved or there might be several contractors or agencies accomplishing a major modernization program. Wherever such activities could result in the interaction of people and things at the same time and place to cause an undesirable event, a safety analysis should be performed to determine the hazards and how to circumvent them.

BUILDING BLOCKS

This brings up the question of just how an engineer accomplishes this Safety Engineering Analysis. This is really a "building block" process of analysis. The first step is to break down into tasks each ECP requiring analysis. This breakdown must be to a level that will allow a complete and comprehensive analysis (i.e., welding operations, electrical changes, painting, flushing of high-pressure lines, etc.). The hazards associated with each task can then be identified. The Safety Engineering Analysis should then define the actions required to preclude these hazards and insure a safe level of operation. This action will often involve merely a rescheduling of the tasks. At other times, special emergency equipment may be required. Where only one ECP is involved, the above analysis represents the extent of action required in performing a Safety Engineering Analysis.

We suggest the Safety Engineering Analysis be a separate document, not integrated into other engineering documentation. The format for this document should generally follow the above procedures; i.e., it should contain the following: (a) task description; (b) safety hazards (for each task); and (c) safety actions (for each hazard). To properly evaluate the hazards involved, it will be necessary to have all applicable engineering drawings and procedures, work procedures, and a thorough understanding of the job to be accomplished.

Where more than one ECP is to be incorporated into a single work package, a second level of actions is required. Using the Safety Engineering Analysis prepared on each ECP, the entire work package must be evaluated to insure the compatibility of tasks. Task overlap and other aspects involving combined installations must be identified. Where hazards result from the combination of tasks, actions to remove the task overlap or alter the individual task procedure

SAFETY ENGINEERING ANALYSIS

TYPICAL EXAMPLE

TASK DESCRIPTION	HAZARDS	SAFETY ACTIONS	REFERENCES
A. Remove missile air conditioner.	A.1. Units size and weight could result in damage to equipment or personnel.	A.1. Rated hoisting equipment and truck dolly will be utilized to support and relocate equipment. Exposed critical hardware will be supported and protected with temporary equipment.	Ref: M-64-125 pp-1-85
	2. Guidance equipment can be damaged if missile air conditioner were disabled with guidance in ready.	2. Remove guidance equipment prior to disabling missile air conditioner.	Ref: TO 21M-LGM25-2-42
	3. Personnel electrical shock hazard exists if system is not electrically isolated prior to disconnect.	3. Complete electrical isolation prior to disconnecting.	Ref: M-64-125

to insure safety must be defined in the Safety Engineering Analysis.

At the top of our pyramid of "building blocks" of analyses is the Integrated Safety Engineering Analysis (ISEA) where not only several ECPs are included in one work package, but several work packages are included in one program. This results when several agencies are responsible for accomplishing different modifications, for example, where the Ballistic Systems Division modifies a missile system while the Corps of Engineers performs facility modifications and the Electronics Systems Division works on the communications system. In this example, a single manager command must be agreed upon and the single manager designated to insure all work packages from each agency are compatible with other tasks being performed. To insure this compatibility of tasks, a safety analysis must first consider the over-all program and determine whether an overlap exists between work packages. Where no overlap exists, no further action is required for the ISEA. Each package has already been individually analyzed, so no hazards should exist in the program. Where an overlap exists between packages, the tasks to be performed concurrently must be evaluated for resulting hazards. Where hazards exist, they must be corrected by rescheduling of tasks or changes to one or more of the work packages.

Proper use of the three levels of analysis discussed above should result in the identification of hazards or undesirable events and actions necessary to preclude these events. Is this enough? Obviously the analysis by itself accomplishes nothing if it is only put on a shelf and forgotten. The results of the analysis are the safety actions required to prevent an accident. These safety actions must be incorporated into the engineering data so they will be included in the step-by-step instructions for job accomplishment furnished each worker and, in turn, will insure he knows the safe way to do his job.

The Safety Engineering Analysis, which contains the task description, the hazards associated with each task, and necessary corrective actions, is then made a part of the management or operating plans. The safety officer assigned to the single manager can use this source for determining hazards to give particular attention to when a task is being performed. This copy of the Safety Engineering Analysis should not become an inflexible document. Field changes and schedule changes will cause variations in both the method and sequence of accomplishing a work package. As these occur, changes in the Safety Engineering Analysis will be necessary to insure that it remains current. Again, changes in the Safety Engineering Analysis must be included in the working papers used by the craftsman or tradesman in accomplishing his job.

No one starts out to design an unsafe program. The Safety Engineering Analysis is a tool to help eliminate hazards in modification and modernization programs. To give authority to the use of Safety Engineering Analysis, two regulations, AFR 127-1 (as revised) and AFR 66-2, will soon incorporate a requirement for these analyses. ★

MISSILANEA

A WASTE OF TIME—The pilot set up his switches according to the checklist and started his run-in to the target. When he hit the fire button, nothing happened! Three attempts were made, but the Bullpup refused to launch. The pilot reported "hung ordnance," and returned to home base. The mission was just a *waste of time.*

After the missile was disarmed and the adapter umbilical access door opened, it was discovered that the adapter umbilical disconnect fitting had been installed incorrectly, thus allowing the fitting to vibrate up and down from wind buffeting. This, in turn, caused breakage of frangible links on the fitting and separation of the umbilical disconnect.

Supervisory and personnel errors were responsible for this incident. After the mishap cause was discovered, the load crew could not point out the correct positioning of the fitting when asked to do so. The crew had used the checklist, but failed to comply with step 16 of TO 1F-105B-33-12CL-16, which states that the pin will be installed in the lower position. *This crew needs more training.*

Checklists are designed to be followed by the users as they progress from step to step. However, each crewmember must understand what the checklist is telling him, or it is of no value.

Maj Edward J. Fiske
Directorate of Aerospace Safety

THE AGM-28 (HOUND DOG) was operating normally during preparation for entry into the low-level portion of the B-52 mission, but then the missile's oil pressure light suddenly illuminated. With the AGM-28 throttle in idle, the engine RPM was observed to be 91 per cent and the temperature 620°C. An attempt to place the throttle in "ground start" had no effect on the control. The pilots evaluated the situation and decided to make an emergency shutdown. Just then a muffled explosion was heard in the AGM-28. Emergency shutdown was immediately completed with only a slight vibration experienced. The mission was canceled and the B-52 returned to its base.

During examination of the missile engine, it was discovered that the power lever actuator had malfunctioned. The actuator had remained between the "maximum power" and "takeoff" settings. There were indications the high setting may have existed for about three hours prior to illumination of the oil-pressure light.

It was necessary to replace the AGM-28 missile engine. TO 1B-52C-30-1 states the maximum allowable engine limits in idle position are 440°C. and 58 to 62 per cent rpm.

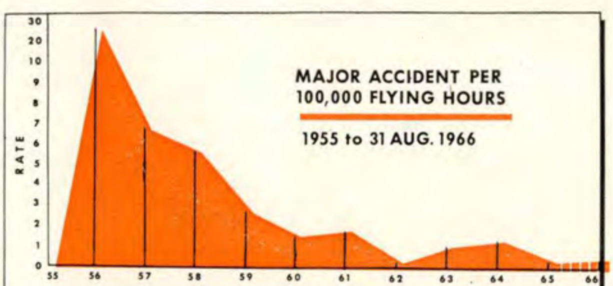
Maj. E. D. Jenkins
Director of Aerospace Safety

AERO BITS

SNOW JOKE when the ice starts flying around parked aircraft. While clearing the aftermath of a recent snowstorm, snow removal equipment, aided by 27 knot winds, blew ice chunks into the rudder of a parked aircraft and ripped several holes in a fiberglass surface. Without the wind this would never have happened. All airport managers, airdrome officers, and flight line supervisors should be aware of the possibility of similar or like occurrences throughout the winter season. Check the winds and have the snow chutes adjusted accordingly.

The B-52 Story

In the B-52 story on page 23, December issue, we referred to a chart pertaining to the B-52 accident rate. Well, somehow 'twixt editor and printer the chart was omitted. Sorry about that—here it is. It shows B-52 accident experience from 1955 through 31 Aug 1966.



"THERE HE IS; there's a man from transient alert who's out there to help me park." Every pilot tells himself this quite frequently and zeros his vision in on the alert crewman. From that point on, he is prone to look through the "gun barrel." Not long ago a pilot was following the signals of one of these gentlemen while proceeding along the edge of the ramp in preparation for a 90 degree turn into parking position. After guiding the aircraft closer to the edge of the ramp, the signalman directed a hard left turn. During this turn the tail wheel left the pavement and the right horizontal stabilizer and elevator struck a fire extinguisher which was located 13 feet from the edge of the pavement.

Three weeks later, in another part of the world, one of our first line transports was guided into the wing tip of another big bird during a parking operation. Damage was light but inexcusable in both incidents.

Pilots cannot assume adequate clearance just because there is a man out front to guide them. Even though the primary cause for such incidents may belong to somebody else, the pilot is always responsible for adequate clearance during ground operations.

OLD HEADS in the chopper business are well aware of the hazards wires and other obstructions present to low flying helicopters. They've been there. They have either had a strike or a miss close enough to be terrifying. Then, there are those new to the game who have yet to experience this—but they will. For both, the SSM at Warner Robins has requested low-level hazard information be included in the Dash Ones. Should make good reading.

SUPPORT SQUADRON COMMANDERS IN SOUTH VIETNAM report an increasing flow of packages destined for friends, relatives and acquaintances stationed there is being received via Air National Guard and AF Reserve aircrew members. These commanders have no objection to packages for personnel assigned to their bases. But, an ever-increasing number are being left for forwarding to other locations within the theater and there is no airlift available to transport these packages. All airlift is saturated and can accept only manifested cargo; therefore, the possibility of the individual receiving packages addressed to him is a very slim one. If you aren't sure that the receiver is at the flight destination point, you will be doing him a favor when you send him the goodies by regular mail.

WITH HAZARDOUS WINTER driving conditions in full swing, the "pro" driver, one who voluntarily obeys traffic laws and drives defensively, always adjusts his driving to existing road, weather, and traffic conditions.

On these cold winter mornings, line your overcoat with a little personal security by taking a tip from the top flight drivers who are old hands at the business of keeping out of trouble on the highways. Before you walk around, kick the tires, light the fires, blow and go, add about three more items to your customary warm-weather checklist: *visibility, safe distance,* and *speed adjustments.* Take an extra minute or so and give yourself some insurance. Remember:

Driving visibility — clear window surfaces of snow or moisture prior to operation; insure maximum performance of windshield wipers and defrosters; anticipate and react to fog patches and other reduced visibility conditions.

Safe distances — whether pulling into a lane of traffic, passing or following other vehicles, or executing turns, your safe distance from other vehicles should be based on the friction capability of the wheel surfaces of your own and other vehicles, and existing road surface conditions.

Speed—adjusting your speed to conditions is one way of staying accident-free. To stop on glare ice at 20 mph takes from 162 feet for regular tires to 85 feet for reinforced tire chains. Incidentally, add another 22 feet to either figure for reaction time.

Remember, a bust on the rear end is neither aesthetically nor physically pleasing. Keep sharp. Drive safely, and keep that smile.

William A. Brown
Traffic Management Specialist
Directorate of Security Police, TIG
Headquarters USAF

Aerobits

A ONE HUNDRED DOG ROARED OFF, just barely, 23 knots low on the line speed check and without burner. Another pilot and some experienced ground personnel observed that the afterburner was apparently not used during takeoff.

After a wobbly liftoff, the aircraft felt as though it was approaching a stall. The pilot jettisoned his external stores and, a short time later, engaged his afterburner. He advised his leader and was ordered to land. During recovery, he over-rotated, broke the tail skid and inflicted minor damage to the six o'clock position of the afterburner eyelids.

On post flight, the engine checked O.K. for power and afterburner sequencing. Then someone asked, "What about the Runway Supervisory Unit?" The officer in charge advised that he noted the pilot's failure to use afterburner but that the RSU radio transmitter failed when he tried to give the warning.

Two firemen suffered second degree burns while fighting the fire which resulted from jettisoning the external stores. All this grief resulted from the pilot's failure to use basic standard procedures: compute and use a line check speed, and check and use the afterburner. ★

FALLOUT

TWO FOR THE ROAD

Your article "Two For The Road" was excellent and well timed. Figure 4 "Circle of Safety" (pg. 8, November issue), could be misleading if taken out of context, i.e., increasing speed does not provide increased safety as deduced by six different individuals when shown Figure 4 by itself. Suggested wording might have been "Circle of Safety" as speed increases, circle must be elongated to provide safety cushion around cyclist. Again, a fine article on an important subject.

Col Allen W. Carver, Sr
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Thanks, Colonel, your suggested wording is much better.

TWO FOR . . .

"Two For The Road," page six of the November issue of AEROSPACE SAFETY, depicts a motorcyclist riding in a turn with his left hand gripping the clutch handle to disengage the clutch. Rather an unsafe act wouldn't you say? Any and all literature on good driving technique will tell you to keep your engine running and engaged while the vehicle is in motion. Even for automobiles, one doesn't disengage the engine torque until the vehicle is almost stopped. In fact, some states have laws making it illegal to disengage the engine while in motion.

Other than this, I am in complete agreement with the article. Within the last two years I have joined the ranks of the $300 price range 90 cc motorcyclists who ride only to work and home again. My duty section is three miles from home, but in that short trip, daily I observe several "almost" accidents stemming from the unsafe acts of both the man behind the wheel and the man on two wheels. The one you can see a dozen times any day is the motorcycle passing other traffic, usually stopped, on the right side. This burns me up as undoubtedly it does others. The fellow who does this not only is endangering his own life but he is putting the idea into the heads of other motorists that all motorcycle riders will do the same thing and therefore the general public has the attitude that a motorcycle is fair game. Run him off the road if you can. Another one you can see any day is an auto pull onto a through road from a side street directly in front of a motorcycle causing the motorcycle to swerve to avoid being run over. Needless to say, this is quite dangerous especially on wet pavement.

So as everyone can see, it is a joint effort that is needed here to put an end to a lot of hard feelings and bruised kneecaps. I'm real happy to see that it has been brought to the public's attention. Thank you!

SSgt H. A. Cook
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You're right, coasting is an unsafe act in anybody's book. However, this man was performing to create a special effect for the photographer—he was leaning while creeping. His clutch lever was adjusted to disengage fairly close to the handlebars and his little finger was kept under the clutch lever to prevent complete momentary disengagement. Also, note that he kept the index finger of his right hand on the front wheel brake lever as an extra precaution while operating close to the photographer.

Thank you for your letter; we hope others were as pleased with the article as you.

1967 AAS ALUMNI DIRECTORY

The Arnold Air Society Alumni Division of the Air Force Association has completed distribution of the 1967 AAS Alumni Directory. All former Arnold Air Society or Angel Flight members who did not receive their copy should contact:

AAS ALUMNI DIVISION
Air Force Association
Box 4023, Colorado Springs, Colo 80909.

1st Lt Terry D. Miller, USAF
President

AVAST, YE SWABS

Regarding the article "Avast, Ye Swabs, We've Been Torpedoed," (October 1966), the Piper U-11 on a VFR clearance was maintaining 4500 feet msl while outbound on the 137-degree radial. FAR states that if one is 3000 feet above the terrain and maintaining a heading between 0-180 degrees, he should fly odd thousands plus 500 feet. If maintaining a heading between 180-360, he should fly even thousands plus 5.

As an AFROTC cadet I find your magazine enjoyable reading. Most of your articles present the always important idea of safety in many interesting ways. Thank you.

Kent D. Nelson
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Laramie, Wyoming

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WELL DONE

CAPTAIN CLIFF A. McCLUNEY

57 FIGHTER INTERCEPTOR SQUADRON, KEFLAVIK AIRPORT, ICELAND

Eleven minutes after takeoff from Keflavik Airport during a night active scramble, Captain Cliff A. McCluney's F-102 lost AC power while climbing through 28,000 feet. An emergency was declared with GCI. While the aircraft was turning toward Keflavik, the oil pressure dropped to 20 psi, fluctuated there for about 30 seconds, and then dropped to zero. Range to Keflavik was 65 miles. (Two years earlier Captain McCluney had been in a flight of F-106s when the leader lost oil pressure at about the same point in the climb. That engine ran for six minutes.) Captain McCluney set engine power at 88 per cent RPM and determined to keep his engine running for at least six minutes. This would put him within gliding distance of Keflavik.

At 20 miles from the field, speed brakes were extended and descent from 28,000 feet began. Power was left at 88 per cent RPM. Because the engine was still running as he passed over the bailout area he had selected, Captain McCluney decided not to eject. He established high key for a precautionary SFO at 16,000 feet and extended the landing gear. The weather was 3000 scattered, 8000 scattered, unknown broken and 20 miles visibility. The runway was not yet visible. The lights on the range station towers two miles from the end of the runway were visible through a hole in the clouds; Captain McCluney used them to judge the position of the field. The pattern was very large because of high RPM and airspeed. At low key the power had to be reduced. Halfway around the base turn, the engine began to vibrate, compressor stall, and backfire flames out the intake ducts. The RAT was extended, speed brakes retracted and the engine was shut down.

The flight instrument lights were extremely difficult to see after engine shut down because the only remaining lights were powered by the battery and were too dim. And the pilot was too busy to adjust the rheostat.

The pattern was continued at 250 knots allowing the extra airspeed for zoom, if necessary. The runway lights came into sight as the aircraft passed through the lower layer of clouds. The landing was perfect. Enough speed was saved to allow turn-off onto the taxiway at the far end of the runway.

The cause of the emergency was complete loss of engine oil. Captain McCluney's handling of this night emergency demonstrated outstanding skill, courage and airmanship. WELL DONE! ★

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Here's plump little Tina with full red lips,
She'll give to you her monthly tips.
With limerick verse,
Profound and terse,
She'll guide you home from your aerial trips.

JANUARY 1967

SUNDAY	M	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1 New Year's Day APC riots 1962	2 Time off for bad behavior	3 Percy Efferdink invents left handed monkey wrench 1932	4 A1C John Slipshod electrician with glow on goes on glowing on and off 1964-196. .	5	6 Sonic Boom protest march ends. Gen Clancy vows to lower the boom. 1962	7 1st National Election 1789
8 Don't get behind me. PLAY IT COOL	9 Minnie Pearl invents first pearl handled mini-gun 1965	10 Percy Efferdink corners left-handed monkey business 1933	11 Alexander Hamilton 1757	12 Theory proved—Alcohol and gasoline don't mix —they don't even taste good 1956	13	14 Pegasus Day For pilots who like to horse around
15 2nd Lt Fuzzy Crockermore buzzes town—buses home 1948	16 Accident investigator takes out unemployment insurance. 1965	17 Ben Franklin 1706	18	19 Robert E. Lee 1807	20 Loss of nut causes pilot to bolt 1966	21 Stonewall Jackson 1824
22	23 Lt MacDonald bought the farm 1923	24	25 USAF Can be safer through your efforts today and every day	26	27 Edison invents incandescent light 1880	28 Mrs. Edison complains about light bill 1880
29 William McKinley 1843	30 Franklin D. Roosevelt 1882	31 In Memoriam Pilot McFlit first to observe his rockets hit 1952	Last Quarter—3rd	New Moon—13th	First Quarter—18th	Full Moon—26th

HAVE ANY AEROSPACE ANNIVERSARIES? Send them to: Tiny Tina 1002 IG Gp (AFIAS E1) Norton AFB Calif 92409