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Aerospace SAFETY

THE MAGAZINE DEVOTED TO YOUR INTERESTS IN FLIGHT

SPECIAL REPORT: TAC 1967

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TAC

This month Aerospace Safety visits the Tactical Air Command. Doing this story was a lot of fun and we learned a lot. Our only regret is that there aren't enough pages in this magazine to describe TAC adequately.

Then, too, there was not enough time to visit all the TAC bases and units; therefore, some may feel slighted because they weren't specifically mentioned. Our **modus operandi** had to be: visit some and try to make these representative of others.

One thing we can testify to is that TAC, contrary to the belief of many, is not just a collection of fighter pilots and hot airplanes. The Command is a complex of different kinds of forces and specialists that stretches clear across the spectrum of modern military might. At the same time it is capable of using its tremendous capacity to wage war for humanitarian purposes and frequently does.

This series on the major air commands is an attempt to inform Air Force people with the mission, capabilities and some of the safety practices of the commands other than their own. We sincerely hope that TAC-67 starting on page 3 and General Disosway's editorial on page 1 accomplish this goal in regard to the Tactical Air Command.

The Editors

MEASURE OF SUCCESS

I consider myself the chief safety officer in Tactical Air Command.

Further, I expect each of my commanders to use the same approach to safety within their scope of authority.

Of course we have safety staffs at all levels. And the concern of myself and my commanders does not reduce their function. If anything, it enlarges their area of responsibility, and our interest improves their effectiveness.

From a practical point of view, safety staffs function as an extension of our eyes and ears to keep us informed about where the dangers lie—what the existing and potential hazards are, which corrective action will best handle the situation. However, some of these recommended actions can be completed only if the commander gets behind them. Without command emphasis and interest, a safety program may never get off the ground. Command support is the essential ingredient!

I use safety as a measure of operational effectiveness. Safety rates provide me an index to gage command performance and efficiency. As a commander my two prime resources are men and aircraft. Each time I suffer the loss of either resource through accident I lose part of my capability to get the job done, and the downgrading of our combat potential by a preventable accident is a matter of serious command concern.

We have lost a lot of experienced talent in the command over the past year and a half. Few persons in our student input have had experience in TAC's low altitude environment and in the weapons system in which they are expected to achieve combat ready status. Few have ever been on a bombing and gunnery range. Few have had air refueling experience. To complicate the problem, our maintenance complexes and support agencies have been manned with a high percentage of entry-level airmen. However, whatever our incoming personnel lacked in experience, they made up for in favorable attitudes and exceptional motivation. Their drive and enthusiasm compensated to a degree for their unfamiliarity with TAC's complicated mission.

Under these conditions any unusual or unexpected occurrence becomes a potential accident. A failure to follow a standard, such as a checklist, can have—and has had—fatal results. To counter these problems it has been necessary to increase supervisory control at all levels, to improve our training programs, and to establish additional procedural safeguards. As an example, we instituted end-of-runway checks of our fighter aircraft just prior to takeoff. The best qualified people we have take a close look at the airplane. What may have developed during engine start, taxi, and arming, is picked up by a pair of sharp, well-trained eyes at the end of the runway. We look for, and find, the panel that worked loose, cut tires, and the beginning fuel or hydraulic leak.

Last year in TAC, approximately one thousand aircraft were turned back by end-of-runway checks after they had been cleared from the flight line. Estimate the cost of the accidents if only one per cent of these rejected aircraft had crashed and you can realize the value of that extra safeguard.

Our unit commanders have identified and corrected many other potential mishap areas through their increased emphasis on safety surveys, closer supervision, and better training. In addition, the aircraft incident report has gained in usage and importance within TAC as a forecaster of developing problems. The complete and candid reporting of incidents by commanders before events reach accident proportions permits early trend identification and timely command action. Honesty in incident reporting is on the positive side of safety and offers an opportunity for accident prevention, as opposed to the negative approach of reacting after accidents occur. The impact of incident integrity in lives and aircraft saved will never be known. Paradoxically, in the safety business you can never be sure when you succeed, but you certainly are aware—painfully aware—of the failures.

My staff, field commanders, and supervisors have combined their efforts to keep me advised of their problems. Through their efforts and the support of members of this command we managed to reduce our accident rate in 1966 in spite of the changing character of the command. And, important statistically, we reduced the aircraft accident cost factor by about 15 million dollars. That is the measure of safety success for which my commanders and every individual in Tactical Air Command can openly take credit.

I am proud of their achievement.

G.P. Disosway

GABRIEL P. DISOSWAY, General, USAF
Commander, Tactical Air Command

TAC 1967

Fighters

Bombers, Transports

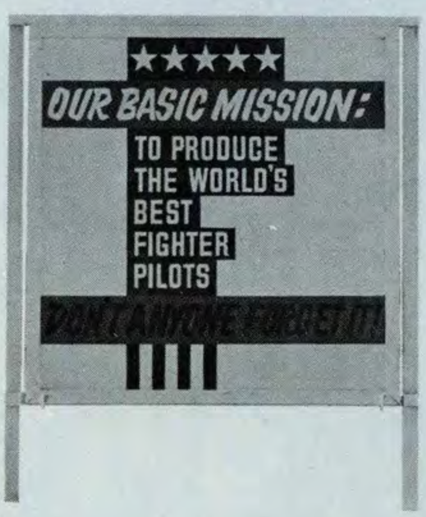
Commandos, FACs

Vintage airplanes and the latest.

Come along while

We visit

Tactical Air Command.



To try to describe the Tactical Air Command reminds one of the story about the blind men and the elephant. The picture you get depends on your perspective.

Deep in a remote piece of arid desert about 100 miles northeast of Los Angeles, pilots in the Air Force's fastest, most versatile fighter-bombers hurl themselves at targets laid out on the desert landscape. Nearby—as the F-4 Phantom jet flies—fighter pilots are learning the techniques of air combat tactics within sight of Las Vegas, the world's most bizarre resort city.

More than 2000 miles away the Air Force's slowest airplanes land and take off in a constant procession around the traffic pattern. These O-1, O-2, and U-10 pilots look down on the white sands of Florida beaches bordering the Gulf of Mexico. Several hundred miles north big C-130 Hercules transports drone through the skies of Tennessee. Reconnaissance pilots fly some of the most sophisticated aircraft in the world over the Carolina beaches while other men slog through the swamps of Louisiana.

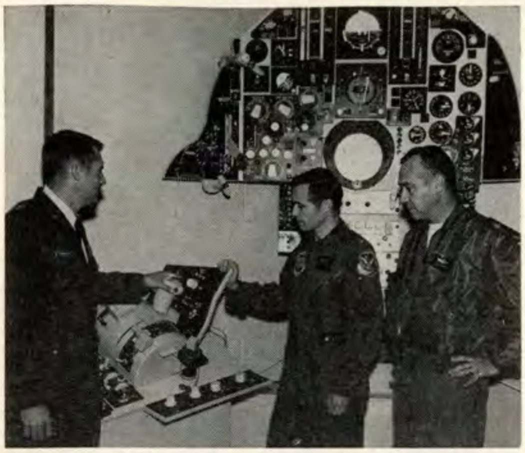
This is TAC.

Historically, the image of TAC has been the fighter pilot, dressed in an assortment of weird garments, strapped in the seat of a sleek fighter plane dashing to shoot the enemy out of the sky. This image is only partly true today. TAC is much more than this and its people engage in a wide variety of activities that demand a thousand and more skills, some of them unknown except to the few men who perform their particular mission.

TAC's mission today is still that of maintaining a combat-ready force capable of conducting sustained operations anywhere in the world. But the war in Asia has altered TAC's role in the Air Force scheme of things. Two other responsibilities have been laid on, that of supporting the Air Force world-wide by providing trained, combat-ready aircrews and support people, and performing operational tests of weapons and equipment.

TAC was at low ebb following WW II. Events then favored a concept of massive nuclear retaliation that demanded big bombers, later intercontinental missiles, to counter a nuclear threat. Gradually however, there was recognition of the necessity for a highly mobile, flexible force capable of repelling any aggressor anywhere in the

Article by
Lt Col Hank Compton
& Bob Harrison



Captain Dale Thompson, F-105 instructor at McConnell AFB, uses mockup to make a point to Captains Bill Nottingham and Bill Givens while . . .

Captain David Holland practices techniques in F-105 simulator.

Their next stop will be Southeast Asia where they will be flying F-105s in flights like this one on its way to a strike on military targets in North Vietnam.

world. This latter concept took years of development and threats in the Middle East, the Formosa Strait, Berlin and Cuba before TAC evolved into the force it is today.

For this report, the editors visited Tactical Air Command Headquarters at Langley AFB, Va., and eight bases representative of TAC's many activities. The most striking thing we detected during these visits was the dedication exhibited by the people we met. Most of these were TAC professionals who had served in Southeast Asia. Their primary job, and concern, for many months has been that of producing skilled replacement crews and support people for Southeast Asia, Europe and elsewhere. Training a huge number of people of diverse backgrounds as combat-ready crews capable of carrying out, in many cases, a brand new mission is a real challenge. TAC's pros are doing a bang-up job.

Visit some of these bases with us and take a look at TAC 1967.

REPLACEMENT TRAINING

Out on the plains, down near Wichita, TAC is meeting one of its many commitments—that of training F-105 pilots for SEA. The Replacement Training Unit at McConnell AFB is doing the same job that the other RTUs are doing—converting former multi-engine jet and recip drivers to combat-qualified fighter jocks.

The training is a real challenge to instructors and trainees alike. For the instructor, it is a test of his skill and ability to qualify students in a supersonic, single-seat fighter-bomber that is employed, for the most part, at low altitudes. The aircraft is extremely sophisticated and capable of carrying and delivering a wide variety of armaments. During the time available, both instructor and trainee are hard put to insure that the student has mastered not only flying the aircraft, but the various systems, delivery techniques, day and night aerial refueling and navigation. The student must absorb all this, but perhaps the burden lies on the instructor because it is his judgment that determines when a man is qualified to go it on his own. No purpose is served if a student kills himself and wrecks a valuable aircraft during training.

To head off accidents caused by inexperience, when the student starts flying he may solo only when weather is VFR and the runway is dry. Later, he will be permitted to fly with minima of 800 feet and two miles, the lowest allowed. As each phase is introduced, the student's first ride is with an instructor. This may vary from one to three or four rides, depending upon the phase and the ability demonstrated by the student.

Most of the flying takes place in the McConnell area and the range north of Wichita. However, since the range is too small for some work, the class deploys to George AFB, Calif., where the students practice gunnery on the Dart target and get experience with the AGM-12 and AIM-9 weapons. During this phase, which lasts for about three weeks, the squadron takes its own maintenance personnel. The time spent going to and from George is well utilized by having the students refuel enroute from SAC KC-135 tankers. To give the budding fighter pilot a taste of realism in navigation and target identification, the flight normally goes first to the range directly from McConnell before recovering at George.

Of course, a program of this kind has some hazards. TAC counters these with various kinds of safety meetings and indoctrination, and certain safeguards that are built in. One of these is the qualifications of the instructors, nearly every one of whom is a combat veteran and highly skilled in his trade. Another is that classroom and simulator training are closely meshed with flying training to insure retention of principles taught in the classroom. Then prior to each phase a detailed briefing is conducted to ensure that the students understand what they will be doing and how to perform the mission. Add to this the fact that instructors will not turn a student loose until he had demonstrated that he can perform the mission safely and satisfactorily—and there is a difference.

This is the only F-105 RTU; however, the 4520th Combat Crew Training Wing at Nellis AFB trains pilots just out of pilot school and others transitioning to the F-105.

F-4 TRAINING

Replacement Training Units for the F-4 are located at George AFB, Calif., and MacDill AFB, Fla. In addition, there are CCTWs for the F-4 at Nellis and Davis-Monthan AFB, Ariz.

George AFB, located in the high desert about 90 miles northeast of Los Angeles, is the home of the 831st Air Division commanded by Col William E. Bryan. The 479th Wing with four F-4 squadrons and one F-104 squadron turns out replacement crews for these aircraft. At the present, classes average about 60 F-4 pilots and 15 F-104 pilots.

All of the RTUs are rich in experience since most instructors have served a tour in SEA and many are Korean veterans. This is also true in the 479th where just about all the IPs are combat veterans. In addition, the Wing keeps current on the latest in SEA by having IPs ferry aircraft to Asia. There they bring themselves up to date and this information is integrated into the training programs.

Unlike the RTUs for other fighter aircraft, the 479th and the 15 Tactical Fighter Wing at MacDill train two crewmen for each aircraft since the F-4 is a two-seater. Front seat students are all experienced pilots while back seat pilots are recent UPT graduates who have been trained in back seat F-4 duties at Davis-Monthan AFB.

Two of every three classes get additional training in specialized ground night attack operations. This part of the course covers such subjects as mission planning, target recognition, target attack, *switchology* and recovery. Targets are discussed in detail and simulated strike missions planned and *flown* in the classroom. Emphasis is on the realism of SEA operations problems.

Students are also introduced to the techniques of working with Forward Air Controllers. First, they get a background on in-country war, the philosophy of guerilla warfare, the mission of air power in a counterinsurgent environment and the mission of the FAC. Then they play realistic war games in which they simulate the disposition of enemy units, infiltration rates and routes, and the operations necessary to counter enemy efforts. This phase culminates with FAC guided missions in which an IP acts as the FAC.

To assure close coordination between flying and classroom, in-

F-4 instructor, Captain Richard Hamilton, explains point to students at Nellis AFB.

Student, Major Lyle Beckers, then follows classroom instruction with practice in cockpit.

At Shaw AFB, Air Force pilots learn reconnaissance skills for missions like the one shown above in which RF-101 photographs damage to target.

Meanwhile in C-130 Replacement Training Units, other pilots and loadmasters learn techniques of parachuting supplies at low altitudes.

structors attend some academic classes, teach others and participate in the frequent critiques.

The 90-hour course for F-4 crews (70 hours for F-104 pilots) leaves no time for wasted effort. For this reason, and safety, students get their first ride in each phase with an IP, and in each flight throughout the course there is an IP usually leading the flight.

TACTICAL AIR RECONNAISSANCE

There is not much similarity between the balloons of the War Between the States and the modern weapons of today's Tactical Air Reconnaissance Force, but the basic purpose is unchanged: To provide commanders immediate intelligence on the location and actions of enemy forces and the effectiveness of friendly activities.

The 363rd Tactical Reconnaissance Wing at Shaw AFB, S.C., trains RF-4C, RF-101, and RB-66 crews in current visual, photographic and electronic techniques. RF-4Cs and '101s are used primarily for visual and photographic work while RB-66s are the platforms for detection and analysis of hostile electronic signals, both radar and communications. Not only do RB-66s collect information which can reveal the strengths and weaknesses of an aggressor's offensive and defensive systems, they greatly increase the efficiency of fighter, bomber, recce, rescue, transport, and all other aerial missions by detecting and jamming enemy radar, thus decreasing the efficiency of communist SAMs and interceptors.

To appreciate the job of the recce crews, imagine collecting detailed intelligence data while cruising 500 feet above the ground at 600 knots and using a 1/250,000 scale chart. A typical item of interest would be a bridge in a wooded area which you would see for three to five seconds. In this short time you must catalog the type construction and number of spans, estimate size and width and make a detailed analysis of the approaches to the bridge. This is the type of work that the RF-4C and RF-101 crews must be capable of doing when they graduate and head for Southeast Asia and other hot spots. It is easy to see why all of the instructors are combat experienced with first-hand knowledge of the importance of reconnaissance. They know that information on the enemy must be collected before the other forces arrive on the scene as well as after the action has taken place. For this reason all recce outfits must be highly mobile.

Film processing trailers are moved on C-130 or C-124 aircraft for deployments. Recce aircraft cameras are loaded before takeoff for overseas; the aircraft are air-refueled on the way and usually fly an actual mission before landing. Film can then be processed and completely analyzed 30 minutes after the trailers arrive.

TAC TRANSPORTS

Tactical airlift is essential to TAC's fast striking forces. This role is filled by the six troop carrier wings located at Forbes, Dyess, Lockbourne, Pope, Langley, and Sewart Air Force Bases. As with the fighters, the C-130 units remain combat ready while training replacements in the RTUs.

Most of the pilots transitioning into the C-130 at present are SAC veterans, although any class would contain representatives from most of the commands. The C-130 is considered to be a pilot's airplane, but the way it is used means that pilots being introduced to it have to learn some new tricks. By the time they graduate from the RTU they have learned how to make assault landings on short, narrow dirt strips, the techniques of low level deliveries such as PLADS (Parachute Low Altitude Delivery System) and LAPES (Low Altitude Parachute Extraction System). The former requires precise timing as the aircraft approaches the drop zone at 200 feet, and parachutes pull the cargo from the big aft door and gently lower it to earth. LAPES is similar, but the cargo is loaded into containers somewhat like sleds and extracted by parachute as the aircraft flies about 5-10 feet above the surface.

During visits to the 516th Troop Carrier Wing at Dyess AFB, Tex., and 64th TCW at Sewart AFB, Tenn., we observed several training assault landings and deliveries and flew some missions. Accident prevention, as we noted throughout TAC, is practical—based somewhat on more-or-less standard safety practices and programs but primarily on professional performance.

The troop carrier wings are extremely busy with a multitude of missions. For example, the 516th provides support to the Military Airlift Command and USAFE, performs missions laid on by higher TAC Headquarters, trains new C-130 crews and support personnel and accomplishes some research work. At Dyess, for example, a dirt assault strip covered with several different kinds of planking is the scene for a Tri-Service test.

While training continues to be a primary occupation, the troop carrier wings get a lot of TDY during exercises supporting the Army. In addition, they are frequently called on for humanitarian missions to provide aid to victims of catastrophes such as earthquakes, floods, etc. And whenever trouble breaks out, anywhere in the world, the big four-engine Hercules transports will deploy to deliver the men and supplies to counter the threat.

AIR COMMANDO WING

If an uninformed stranger should wander into England AFB, La., he might think he had suddenly been transported back 20 years in time. For most of the aircraft he will see were famous in World War II. C-47s drone around the traffic pattern shooting touch and go landings. Others, some with guns sprouting out of their flanks, are lined up neatly on the parking ramp. Across the way is another row of antiques—A-26s—to reinforce the impression one has stepped back in time.

Actually this is the home of the 1st Air Commando Wing, one of the most unique and interesting units in the Air Force. Although activated as part of TAC only in 1962, the Wing has a heritage going back to WW II and the old 1st Commando Group of China-Burma theater fame.

The Commandos might be described as a bunch of generalists who operate in specialized conditions. This description may seem paradoxical, but it is accurate. Each man is, actually, a specialist but he has so many other skills that he can perform in a number of different roles. For example, one may be by AFSC a communications specialist. But that alone is not enough. The same man probably is a well qualified instructor, he may be and probably is parachute qualified, well skilled in armament and the use of explosives, possibly he has some medical skill and he probably knows at least one language besides his own.

Although the aircraft might appear to be relics cast off by a

Air Commandos fly updated version of WWII A-26 shown here in practice weapons delivery. Combat controllers frequently make use of their many skills. Training is rigorous and realistic.

Parachuting is just one qualification all Air Commandos have. Although skilled as warriors, they . . .

Frequently perform humanitarian missions, although recipient of medic's attention may not agree.

modern air force, they're in top shape and just the thing for the Commandos. Since their operations are generally conducted in newly emergent nations and those whose cultures have yet to reach the jet age, the aircraft are compatible with those the Commandos are likely to find in the hands of the natives.

Normally, the Commandos operate by invitation in relatively small teams in countries where subversive insurgency is either a threat or in progress. Their aircraft must, therefore, be relatively simple and easy to maintain, suitable for operations from small and often unprepared strips and capable of a wide range of performance. The Commandos swear by their old airplanes and are convinced that, under the conditions in which they operate, they are superior to the latest jets.

As an example they cite the A-26A. This aircraft has gone the full circle, starting as the A-26, later being designated the B-26. Now it is the A-26 again. It can carry up to 10,000 lbs., has a long loiter time, can be used in a number of roles on the same mission. On one flight the aircraft might be used to bomb a target, strafe with the eight 50 cal. machine guns in its nose, perform reconnaissance with a combat photographer in the rear compartment. Those eight 50 calibers speak with a loud voice. A recent SEA returnee describes how the 50s in his A-26 blew an enemy truck completely off a road.

While the Commandos engage in combat when necessary, the emphasis is on developing indigenous counterinsurgent capabilities. They equip and train friendly forces and advise on planning and employment of resources. They're also experts in psychological warfare and train indigenous forces in harassment and counter-information techniques.

Despite the widespread conception that they are an elite group of combat specialists (which they are), the Commandos also expend a great deal of effort and resources in a humanitarian role. They assist less sophisticated peoples in improving sanitation, provide medical care and train natives to develop their own medical capabilities. They assist in local development of airfields, agriculture, communications and a number of other areas where assistance is vitally needed. Their motto, "Any Time—Any Place," has taken the Commandos to Africa, Asia, Latin America, the Middle East and Europe.

Becoming an Air Commando isn't easy. The tough training includes daily PT, learning a variety of skills and language, exercises that are made as realistic as possible, including an evasion course that usually winds up with the "evader" being captured by the "enemy." There is parachute training—most of the men are jump qualified—and pilots perfect the techniques of close air support, weapons delivery, visual reconnaissance, and operation from minimum air fields. They receive survival training in all environments, some are SCUBA divers, and all are skilled in hand-to-hand combat.

Combat controllers may have to clear a jungle drop zone with machetes before directing aircraft into the location, and they learn to live off the land.

Pilots, in addition to other skills, know the techniques of leaflet and speaker missions and night flare operations.

Navigators must be experts at finding their way at low level at night.

Hurlburt Air Base, part of Eglin AFB complex, is scene of A-1 training for USAF and MAP pilots . . .

While FACs learn their trade at Holley Field, Hurlburt satellite.

Meteorologists not only must know their business but must have the ability to teach their specialized skills.

In addition to the C-47 and A-26 aircraft previously mentioned, the Commandos operate C-123s, A-1Es, U-10s, T-28s, and RA-26As, the photo-recce version of the A-26.

SPECIAL AIR WARFARE

Hurlburt AB, Fla., part of the big Eglin complex, is another place that looks like it belongs to another era. The newest airplane on the patch is the C-123.

Around the clock A-1s and C-123s land and take off on their way to and from training missions. Students include both Americans and Vietnamese. From the base A-1s can be seen striking targets on a nearby range during weapons delivery training. Guiding them are student forward air controllers flying out of Holley Field, 15 miles down the road.

The C-123s, some with a pair of jet engines augmenting their two recips, fly a heavy schedule that includes equipment and troop drops, assault landings on dirt strips and navigation. Some of their missions are conducted at night at low level; students and instructors alike testify to the thrills this produces.

Holley Field is an unusual little satellite of Hurlburt. This is where a forward air controllers learn the business. It is one of the most compact air bases in the world and one of the busiest. With a pair of paved runways and a dirt strip, the base O-1s, O-2s and U-10s make an average of 10,000 landings a month.

The base appears to be rather makeshift, with trailers and canvas huts the only buildings, but it is well organized and has most of the facilities of the average air base. One nice thing about it, you can walk from Maintenance to Supply, to Headquarters—with a cup of coffee at the snack bar—without covering more than about 150 feet.

While he's proud of his little base, the thing the commander, Lt Colonel Sam Pool, likes to talk about most is the people who run the place and instruct students. Of the 50 IPs, 48 are SEA combat veterans. Among them they have 14,000 combat missions with 25,000 hours combat flying time. Their performance is reflected in the number of decorations they have earned. There are eight Silver Stars, one Legion of Merit, 22 Bronze stars, 579 Air Medals, 42 Distinguished Flying Crosses, six Purple Hearts and 19 Air Force Commendation Medals.

Forward air controlling requires more than simply knowing how to fly an airplane. Pilots new to the FAC business find that they have to learn a whole raft of things in order to control an airstrike. One of the first responsibilities impressed upon them is that, "During an airstrike the FAC is in command." First, he has to identify the target. Once he has a fix, it is his job to direct the fighters in such a way that the strike is carried out with maximum results. With this goes the collateral responsibility of protecting friendly ground troops and civilians.

At first, all may be confusion. To the beginner locating the target is usually hard enough. Then the FAC has to determine the best approaches to the target for best results. He probably will be in contact with several different agencies, in the air and on the ground. He must brief the fighter pilots on the target and its location, the terrain, weather, the location of friendlies, anticipated ground fire and best bailout position and heading.

From the fighter leader he gets the information he needs to accomplish the mission: number and type of aircraft, ordnance they have, loiter and bingo fuel time and their present location.

Then he must mark the target, get out of the fighters' way, assess the strike results and determine what, if any, further effort is needed.

Actually, he has to know and perform more than this, but these items afford some idea of the complexity of the FAC job.

These are the skills he learns at Holley Field and the Eglin range. When he gets to the real thing, experience will make him a pro or he is in the wrong business.

TAC CENTERS

A tragic mistake that has plagued many nations in the past has been the attempt by its armed forces to fight the current war with the last war's methods and technology. TAC is not about to fall into such a trap; therefore, it operates several specialized centers to continually research, test, and prove new concepts, techniques and procedures. These centers are located at:

Eglin AFB, Tactical Air Warfare Center, which conducts operation tests and evaluations of new tactical air systems, and the Special Air Warfare Center.

Nellis AFB, Fighter Weapons Center, charged with developing and improving tactical fighter techniques and procedures. The Center is responsible for developing optimum tactics for close air support, interdiction and air superiority in addition to performing operational tests of new fighter weapons systems.

Pope AFB, Tactical Airlift Center, with the mission of testing and developing techniques and procedures for tactical airlift.

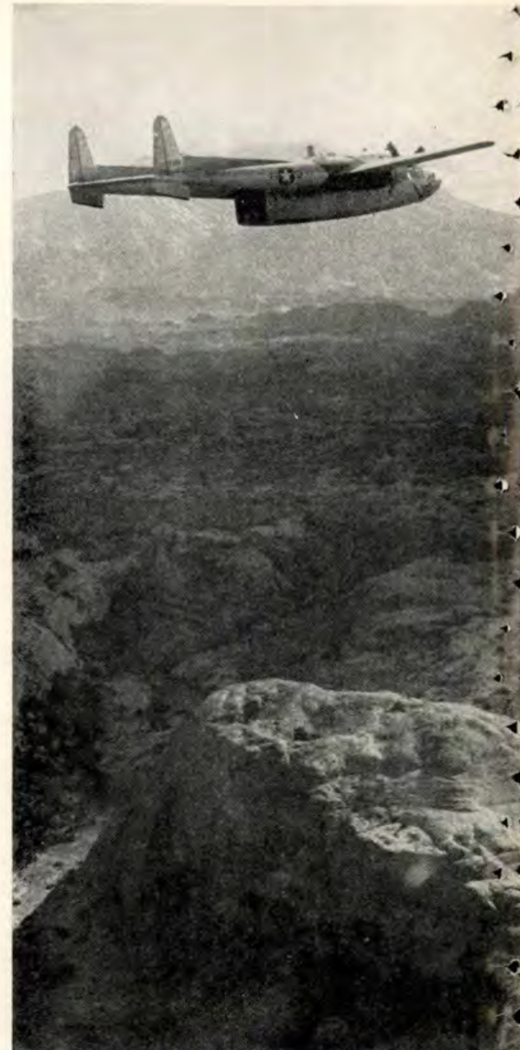
Shaw AFB, the Tactical Air Reconnaissance Center.

An example of the activities at these centers is provided by the Tactical Fighter Weapons Center at Nellis AFB, 10 miles north of Las Vegas. The base and its gunnery ranges cover over three million acres, a vast complex vital to the missions of the 4525th Fighter Weapons Wing and the 4520th Combat Crew Training Wing.

Important center activities are a Combat Operations Division which identifies, analyzes, and solves current tactical combat problems; an Operational Test and Engineering Division which conducts tests on new equipment and munitions; and special training courses to bring senior officers and civilians up to date in the state of the art in the entire tactical weapons field.

The Combat Operations Division maintains constant liaison with forces in the field and crossfeeds information with the OT&E Division. The Engineering and Test Division uses any or all of the Center's weapons training missions to test new theories and make improvements on old methods.

The 4525th FWW trains instructors in both the hows and whys of armament use. These "Ph.D.'s" in weaponry return to worldwide tactical forces and provide the guidance essential to achievement and maintenance of professional fighter-bomber forces. A very intensive three months of rocketry, dive bombing, napalm, nuclear delivery and the other facets of weapons employment make up the tight curriculum. The Wing graduates only 56 weap-



Air National Guard crews maintain combat readiness in several aircraft, including C-119 and . . .

F-100 shown flying low level mission. ANG pilots must be ready for rapid deployment therefore . . .

Support equipment is mobile, ready for instant move. Here each cart contains equipment for a specific aircraft of the 108 TFW at McGuire AFB.

ons officers each year; therefore, it is a signal honor to be chosen for these elite schools.

TACTICAL AIR GUARD

With its many commitments, TAC welcomes the support it receives from the Air National Guard*. Operating a variety of aircraft, the TAC ANG units perform in many roles to supplement TAC while maintaining combat readiness in case of a national emergency. Fourteen TAC ANG units are fully manned, equipped, and geared for instant mobilization. Called the BEEF BROTH force, nine of these are fighter groups, four are reconnaissance units, and one is a Combat Control Group. With these units standing by, TAC is able to perform all its diverse responsibilities with an extra degree of confidence.

The idea that the ANG is composed solely of "weekend warriors" is a myth. Each unit has a nucleus of full-time people in essential positions. The rest of the guardsmen lead very busy lives, holding down regular jobs or running businesses while keeping current in their ANG requirements. Aircrews perform the same type of flying missions as their brothers on active duty, and they meet the same flying standards as regular TAC pilots.

The editors visited two TAC Air Guard units while preparing this article – the 140th Tactical Fighter Group at McConnell AFB, Wichita, Kans., and the 108th TFW at McGuire AFB, New Jersey. From these we can draw some generalizations that apply to all TAC ANG units.

These are hard working outfits. They fly five days a week and two nights. Most Guard flights are for the purpose of meeting standards prescribed by TAC, but frequently ANG crews supply close air support, reconnaissance and other duties required by Army ground forces during exercises. During FY 1966 the ANG took part in 12 exercises supporting TAC and the Joint/Combined Exercise program. Eight of these were staged overseas.

With their own refueling capability as well as that supplied by SAC tankers the Guardsmen are ready to go any place any time. One of the striking things one sees when visiting an ANG installation is the preparations for fast reaction to an emergency call-up. Necessary items are sturdily packaged and neatly arranged for immediate loading aboard airlift aircraft. Under "Beef Broth," units must not only be able to move immediately, they must also be able to sustain themselves in the field for specified lengths of time.

There's no question as to the quality of the men who are the Guard. For many of them their ANG duties are an extension of their vocation. Doctors in private practice perform the same role in uniform. Many of the pilots are airline pilots or fly for a living as corporation pilots, test pilots or instructors. Maintenance technicians might perform the same duties, most of the time in civilian coveralls and part of the time in military fatigues.

Flying for the ANG is not a license for a weekend jaunt in a military aircraft. Fighter pilots reporting on duty usually have a scheduled requirement that consumes all their time. One flight may be for rocketry or gunnery on the range. Next time it may

*The Air Force Reserve will be covered in a later article on the Continental Air Command.

Maintenance training is a big item in TAC, both to fill command's own needs and those of overseas commands.

General Disosway, TAC Commander, prepares for flight in A-37. He considers himself TAC's chief safety officer. (Wichita Eagle Staff Photo.)

be air refueling practice or close air support for an Army exercise. Reconnaissance crews may also support an exercise, or they may find themselves flying photo missions for the state, while tactical airlift crews may be hauling equipment or troops.

To perform these many missions the TAC ANG operates KC-97L tankers, C-119s for cargo and troop movement, F-100, F-105, F-86H and F-84F fighters, and RB-57s, RF-101s and F-84 recce birds. All of these aircraft have had years of service but the Guard operates them successfully. This is reflected in their aircraft accident rate. The ANG major aircraft accident rate for 1966 was 5.3 accidents per 100,000 hours of flying, a reduction of 30% from the previous year.

The 108th Tactical Fighter Wing at McGuire AFB and its three subordinate groups have had only one major aircraft accident since 1964 – an F-105 which was not destroyed or the pilot injured. The 184th Tactical Fighter Group at McConnell AFB had not had a fatal accident since 1949, until this winter when one of its pilots was lost in an F-100 in the Colorado Rockies. Their only other accident occurred in 1958 when a T-33 had a landing accident. The pilot was not injured.

MAINTENANCE

The flight line at TAC bases is an anthill of moving people and aircraft. On the taxiway near the runway ground crews check outgoing aircraft for worn and cut tires, air, oil and fuel leaks. Armament men in the crew check the condition of stores.

When the aircraft return, other crews, with earphones plugged into the aircraft, place pins and make a fast check of the aircraft before the pilots taxi to the parking ramp.

FOD is a problem, of course, on all flight lines. To prevent FOD, ramp and runway sweeping is a continuous job, for some aircraft screens are used during all engine runups. Those little bags hanging from the belts of flight line personnel at George AFB are not lunch containers or tool kits – they are FOD bags. Spot a nut, bolt or other stray object and you pick it up and place it in the bag.

With an overabundance of entry-level airmen and a shortage of experienced maintenance personnel, TAC has the problems common these days to all Air Force bases. To prevent problems arising from actions by inexperienced people, no three-level may work independently—the policy is to have a qualified technician on hand at all times. Refresher training is an annual requirement for supervisors as well as airmen working in cockpits and on egress systems. Entry-level airmen are upgraded as rapidly as possible, which means a massive OJT program and extensive use of Field Training Detachments.

In addition to training its own maintenance and support personnel, TAC is responsible for training replacements for SEA. This program – Southeast Asia Maintenance Training (SEAMAT) – takes airmen of all levels, but predominately five level, and retrains them to meet the needs specified by PACAF. The length of training varies with the skill, but an average program runs about six weeks. The students receive theory in an FTD along with practical experience working with a qualified technician.

Recognizing that quality maintenance is a necessity for successful mission accomplishment, TAC concentrates on producing skilled replacements to meet its own needs as well as those of the overseas commands. This is truly a major effort and requires a big chunk of TAC resources to do the job.

SAFETY

Safety in TAC takes many forms. As stated earlier, accident prevention is practical in that professional performance is not only emphasized but demanded. This does not mean, however, that there aren't plenty of other programs, procedures, and techniques in being. Most Air Force personnel are generally acquainted with the more standard of these, so we won't use space to describe them here. But there are some efforts that we think will be of interest.

Young men, along with their highly prized attributes, unfortunately create special problems; they are the high risk group in traffic accidents. TAC's figures show that men between the ages of 17 and 21 have 28 per cent of the accidents while 21 to 24-year olds are involved in 37 per cent.

TAC has gone all out in an attempt to reduce these figures. One method is expediting local driver orientation programs. The command also has a traffic workshop to support the AFR 50-24 local orientation course. To minimize traffic deaths and injuries, TAC encourages the use of seat belts and has had good results. Command-wide, TAC figures seat belts are installed in 99 per cent of its people's private autos with 14 bases at 100 per cent.

Something new is the emphasis on two-wheeled vehicles. These account for only three per cent of the total registered vehicle count but 23 per cent of the accidents. TAC motorcyclists are required to have their headlights on while operating their cycles on base – for identification – and this practice is being recommended also for off-base driving. A two-wheel vehicle operator handbook has been published and is in the field.

The safety survey is a time-tried method of determining safety problems and accident potentials. TAC presently is using the small team concept of a manager and specialists. Usual team composition is a chief who concentrates on management and flight safety at Wing level, with other members handling operations and training and squadron safety, maintenance, missile, nuclear and ground safety. The team concentrates on two areas, (1) gross deficiencies and (2) repeat deficiencies. Discovery of either of these requires the commander to correct the item and report his action. Minor deficiencies are reported to the local commander for action at his discretion with no reply required.

Maintaining a mobile, fast-reacting strike force is a king-sized job. Lay on as an additional duty training aircrews, maintenance and support people for world-wide operations and you have a real tough job. And it could be expected that, as the magnitude of training and the rate of conversion of pilots to entirely different aircraft and mission increased, the accident potential would go up.

On the contrary, TAC managed to lower its major aircraft accident rate slightly, from 8.8 in 1965 to 8.7 in 1966 at a savings of $15,000,000 in aircraft alone. How? By simply identifying the high accident exposure areas and taking prompt corrective action. We also know that credit should go to an awful lot of sharp guys in TAC these days who are doing a real professional job. In fact, that pretty well sums up TAC-1967. ★

Careful preflight is a major factor in accident prevention. Major Lyle Beckers checks F-4 at Nellis AFB.

Accident status sign at George AFB keeps base personnel safety-conscious.

REX RILEY'S CROSS COUNTRY NOTES

"I didn't know you wore glasses. When do you wear them?" How many times have you heard this question? If you need glasses, the best answer is, "only when I want to see." There certainly should be no stigma attached to the requirement for "cheaters"; many fine pilot types wear them and are much the better for it. Occasionally a flyer who needs spectacles doesn't use them and finds himself in a corner.

A couple of months ago a fighter pilot creamed one of our modern weapons. You guessed it; pilot factor, in that the aircraft commander was not wearing corrective lenses as required by his medical clearance. Sure, there were other contributing causes, but this one nailed the pilot's hide to the wall. Don't let it happen to you! Don't jeopardize others' lives unnecessarily by neglecting to wear your glasses. If you need 'em, wear 'em!

A few evenings ago I was flying east through the Chicago area. It was a clear night and the visibility was unusually good. The sky was literally filled with the beacons of other aircraft, and I thought, "thank God for the boys in the Control Center."

Departing Washington, D.C., the next day I had to notice the effective technique of one of the sector controllers. While directing my climbout, he was handling other traffic like an orchestra conductor. "Tighten up your turn for me, Eastern 402 . . . Increase your rate of descent for me, National 711." He personalized at least half of his instructions and requests and made me feel like I was on a team that couldn't possibly lose. The following letter is certain evidence that we are all on this team, a sober reminder of the vital importance of knowing all of your emergency procedures and using them when the chips are down.

FEDERAL AVIATION AGENCY
6900 Los Angeles Drive, N.E.
Albuquerque, New Mexico 87114

January 12, 1967

Commanding Officer
Air Command Staff College
Maxwell AFB, Alabama 36112

Dear Sir:

We are taking this opportunity to commend Major M. A. Schalk of the Air Command Staff College for the manner in which he conducted his flight into Amarillo AFB, Texas, on December 19, 1966.

Major Schalk was flying A80663, a T-33, on an instrument flight plan from Maxwell AFB to Amarillo AFB when he experienced two way radio communications failure. The Albuquerque Center had been advised of this situation by the Fort Worth Center, and plans were being formulated to move several aircraft from Major Schalk's flight path for descent into Amarillo Air Force Base. After accepting a radar handoff from the Fort Worth Center, the Albuquerque Center radar controller observed Major Schalk's change of radar transponder code from code 2100 to code 1400 when his flight was about 40 nautical miles east of Amarillo. This change indicated he was beginning a descent. Shortly thereafter a code change from code 1400 to code 0600 was observed indicating Major Schalk was below flight level 240 and continuing flight under VFR conditions.

Major Schalk's timely and proper use of radar transponder code resulted in considerable reduction in controller workload making the task of controlling air traffic much easier for the controllers concerned.

We wish to express our thanks for a job well done by Major Schalk.

Sincerely yours,
WM. S. DALTON
Chief, Albuquerque Center

NIGHT STROBE LIGHT REQUIREMENT. In the February 1967 issue, I stated that the runway approach strobes should be on at night when the visibility is less than three miles and the ceiling is less than 500 feet. CORRECTION: The strobes should be on at night when the visibility is less than three miles or any time a ceiling of *any* height is reported.

EJECT! EJECT! EJECT!

You will find those words recorded in many a fighter aircraft accident report. They are the words transmitted from an accompanying aircraft or from a ground controller to a crippled bird . . . *"Why the hell doesn't he punch out?"* Reminds one of the fellow armchaired in front of his television set telling the harassed quarterback to pass. No problem – except for the harassed quarterback – and the pilot of the crippled aircraft.

What delays ejections? What happens in the cockpit that inhibits the right action at the right time? Surely the hesitating jock knows the score. He knows the odds against recovery from certain uncontrolled flight conditions. He knows that a powerless jet fighter is earthbound in a big hurry, and that a high speed descent even from a comfortable altitude takes only seconds.

What else does he know that can muddy up the picture?

Too much, maybe.

For instance, he knows that his good buddy ejected not long ago and is no longer among the ranks. The parachute failed to open, said the accounts. A "streamer."

He knows that about 12 per cent of those who eject don't make it, for one reason or another – odds that aren't very appealing, especially to the non-gambler.

He knows that listening to a training session, maybe in a noisy hangar, clustered around a dearmed ejection seat, can be pretty dull and not much like the real thing. He knows he didn't learn very much, with all those more pressing thoughts taking precedence in his mind.

He knows that a lot of guys "broke their backs" getting out of their birds. He might even know that this happens in ejections from all types of fighters — in some more than others. And it would be just his luck to be one of them.

And he knows about the sharpie who crash-landed his flamed-out bird just the other day and walked away without a scratch!

OK. So we've got some mighty important brainwashing to do. That jock who sat there too long, sifting out all that knowledge isn't the only one. Chances are he isn't too different from you, my friend.

First, let's look at that illfated 12 per cent. Big as it is, it looks pretty small alongside the statistics of those who stick with it and aren't around to defend their faulty judgment. And get this — only a tiny fraction of that 12 per cent resulted from malfunctions of the system. Every system has its operational envelope, just as does the aircraft itself. Once in a while somebody gets away with something that just shouldn't have happened — and again muddies up the picture. But each system has its capabilities and its limitations, and the pro knows these like the back of his glove. The buddy whose parachute didn't open? Of course it didn't. It needed about 75 more feet of altitude. In level flight, it would have worked on the deck, but descending at a high sink rate, it had to be deployed at several hundred feet above terrain level. And he's still fighting stick and throttle, and debating. He's one of those who make up that 12 per cent and is representative of most. High sink rate and not enough air space.

Sometimes it's not hanging on to enough airspeed to get an up vector before punching. They're in the 12 per cent. Or not slowing the bird enough, when there was opportunity to do so. There are

a few of those included. Some found themselves short on fitness and moxie when in the drink, even though everything worked as advertised to that point. They are in that 12 per cent, too.

So, if every man who flies in a high performance jet knows his egress system, its capabilities and limitations, and exercises this knowledge within the envelope, that worrisome 12 per cent would shrink to close to zero.

What about all those other bits of knowledge that could lead our friend to oblivion? Take injuries, that may cripple and stymie a budding career. Wouldn't that thought stay your hand on that ejection handle a moment?

Back injuries do sometimes occur, because you are quite suddenly booted from stationary to — whoosh! Newton's Law is busy at work here. A force is applied which propels you from your usual habitat. This is the action, and the reaction is compression of the body because of its inertia. We are all fairly elastic — especially the junior birdmen — and we come out little the worse for wear. But if the force is unevenly applied or is compounded by adding adverse vectors, it may exceed the limits of elasticity. Then, we have some compression that doesn't spring back. The docs tell us that our modern X-ray technology can expose this (sometimes only after a sharp-eyed panel of experts mull over the films) and what we have is finally translated by the layman into those nasty words — "broken back." The majority of these compression fractures would never have been diagnosed without that X-ray visualization and would have been treated as a back sprain. Some have been so slight that there were no symptoms. Most all have healed with minimal treatment and a short period out of the cockpit. Incidentally, if you want to see a badly injured back — one that is more appropriately labelled "broken" — take a look at some of those incurred on crash landing.

With better training, the incidence of back fracture can be reduced. Most of the ejections are under controlled or semi-controlled conditions, and proper restraint and positioning is possible. It's the fixed alignment of the body at the instant of cartridge firing that counts, not before or after. If the spine is flexed from its normal erect alignment at that instant, flexed in any direction, the forces will be unequally applied to the surfaces of the vertebrae and damage may occur. And if the straps are loose or can slip, any spinal flexion present is bound to increase when the downward thrust on the body occurs.

Our hesitant jock may be worrying about other sources of injury, too. He has heard that there are man-seat-chute interferences in between eight and 14 per cent of ejections (depending on the system), leading in a few instances to injury or even fatal outcome. Actually, the number of such events producing injury is so small that this threat should definitely not deter the decision. Perhaps his knowledge includes the item that one-third of all injuries associated with ejections occurs in the parachute landing phase. Landing on undeployed survival kits, being slammed into the ground or other obstacles by severe oscillation, or dragging in high wind conditions are the problem-makers here. Each has a solution, and as before, the knowledge of the *equipment* and *how to use it* is the knowledge our friend really needs.

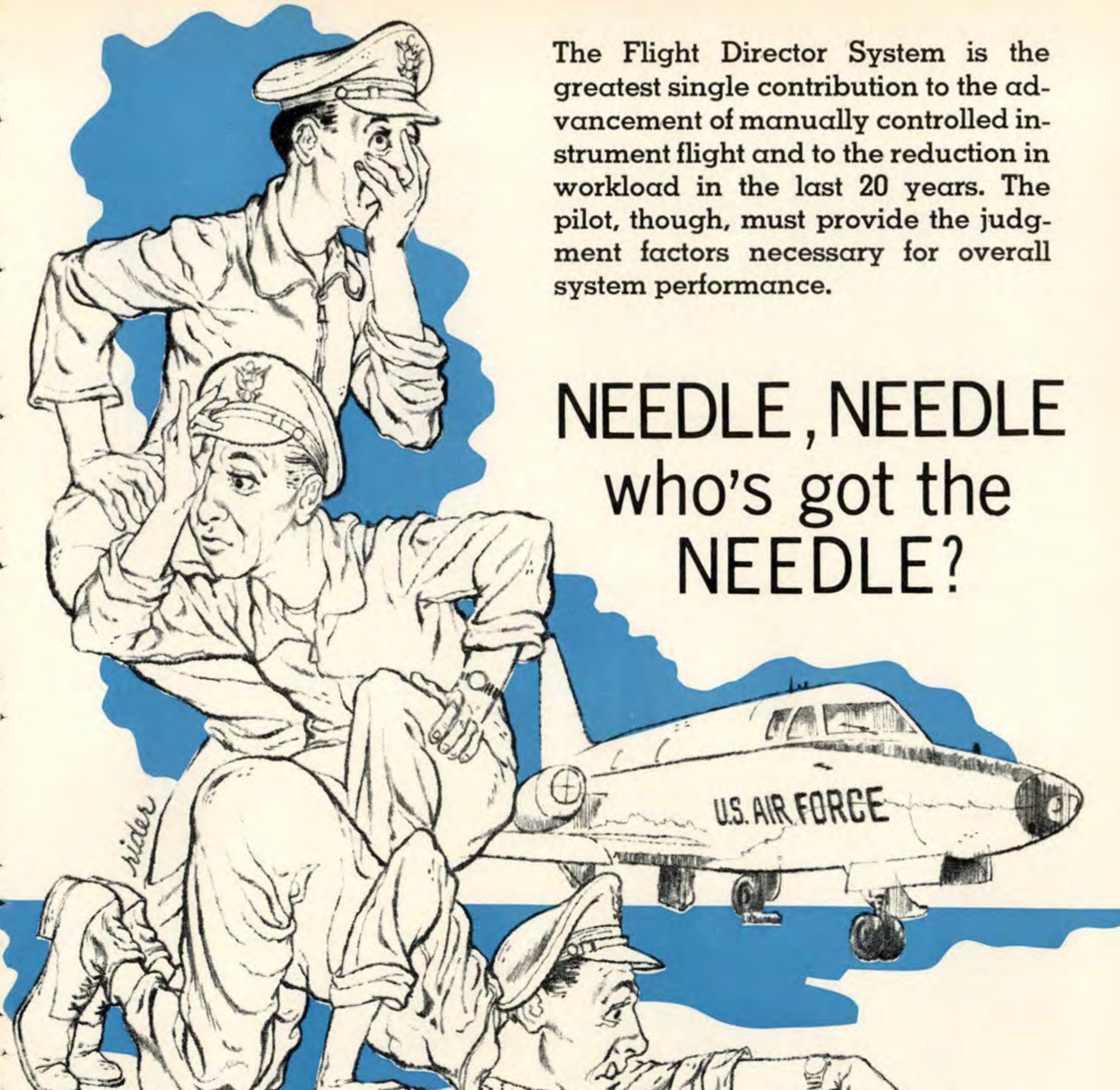
The people engaged in life support equipment development and logistics are not content with the egress picture, despite its gradual improvement. (They never will be content, because it is unrealistic to assume that either better equipment or better knowledge will reduce our fatality and injury rates all the way to zero.)

Equipment improvements *are* needed and are becoming available in more of our fighters, old and new: faster acting systems, better stabilization systems more tolerant of CG variances, greater thrust with reduced spinal impact, better man-seat separation devices, to name a few. Technical orders can and will be improved, as can the quality of training devices and instruction.

But, when the time comes to pull that handle, let's be sure that one vital bit of information is fed into that helmet-encased computer: The crews that know their equipment and procedures and punch out within the design envelope make it — over 95 out of a hundred of them — and are flying again in short order. ★

The Flight Director System is the greatest single contribution to the advancement of manually controlled instrument flight and to the reduction in workload in the last 20 years. The pilot, though, must provide the judgment factors necessary for overall system performance.

NEEDLE, NEEDLE who's got the NEEDLE?



Capt Thomas E. Brand, IPIS, Randolph AFB, Texas

One dreary morning a T-39 crew prepared to launch into the murk. The copilot had just completed his checkout program for this Cadillac of the Air Force. The weather was down to the usual 100′ and ¼ with tops at FL 200. The pilot received the clearance, reviewed the departure instructions, then set the heading marker on the first departure heading. Takeoff clearance was received and the aircraft was airborne without incident. The copilot became engrossed with departure control concerning the SIF codes and radio calls.

Unknown to the pilot, Murphy was at work on the attitude indicator, rendering it inoperative in the roll axis (no warning flags). The pilot selected manual heading mode and started to bank towards the bank steering bar. He immediately noticed an indication of Murphy's work. After quickly crosschecking the turn needle, heading indicator and the copilot's attitude indicator, he confirmed failure of his attitude indicator. The pilot

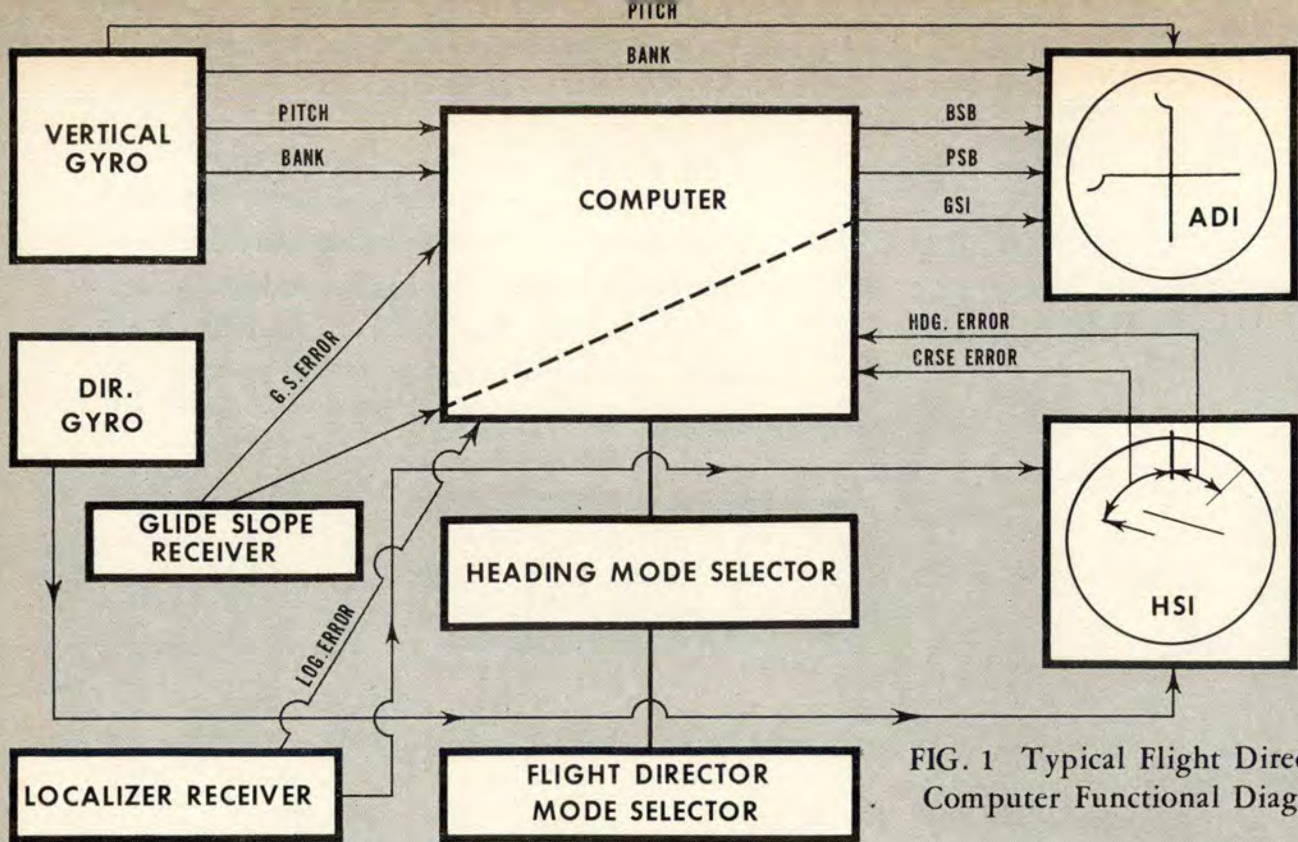


FIG. 1 Typical Flight Director Computer Functional Diagram

continued the turn, rolling out on the selected heading. What was his first indication of attitude instrument failure?

Before you answer this question, consider a second situation.

A T-38 was recovering from a night student training mission. The weather was deteriorating so the IP in the back seat was flying the approach. The aircraft crossed the outer marker and was established on the glide slope. The IP was keeping the pitch and bank steering bars centered. Murphy went to work again, this time failing the glide slope receiver. The glide slope indicator stayed at the glide slope index (NORMAL) and the glide slope warning flag was in view. The weather had dropped to 300 and one, so the IP concentrated on keeping the steering bars centered, telling the student to call when the field was in sight. The aircraft touched down two miles short of the concrete, *with the pitch and bank steering bars perfectly centered.* Momentarily disregarding the obvious, not cross-checking the glide slope warning flag, minimum altitude, or having a radar backup, why did the IP land short?

These situations have occurred several times. Just the aircraft and details have been changed. Would you have recognized these failures? These two incidents, apparently unrelated, have something in common: Both pilots were using the Flight Director System at time of the failures. What does that have to do with attitude indicator failures or flying an ILS to touchdown two miles short of the runway? Everything.

Consider each situation separately.

The bank steering bar (MANUAL MODE SEL) provided the T-39 pilot with his first indication of attitude indicator failure. As he rolled toward the bank steering bar he noticed the bar centering with the attitude indicator at zero degrees of bank. The bank attitude should have been 35 degrees for the 60 degrees required heading change. Cross-checking of the turn needle, heading indicator, and the copilot's attitude indicator, made it evident that the pilot's attitude indicator had failed but that the bank steering bar could be used for bank attitude information.

The pilot was able to use the bank steering bar in this manner because the remote attitude gyro supplies inputs to both the attitude director indicator sphere and the flight director computer (Figure 1). The computer compares the gyro input with the selected heading to position the bank steering bar.

Therefore, if the circuit between the gyro and the attitude indicator fails, or if the attitude sphere malfunctions, the Flight Director Computer provides another means of attitude information via the bank steering bar. If these failures occur, usually no warning flags will be in view.

It must be emphasized that a complete analysis of aircraft performance instruments is essential prior to following the command steering information. If the bank steering bar is followed blindly you might be turning the aircraft to keep up with a failed heading system.

Whether or not you elect to use the Manual Heading mode on an instrument takeoff is up to you or your command directives. If properly used, it can provide you with bank information and prevent a very exciting aileron roll shortly after takeoff.

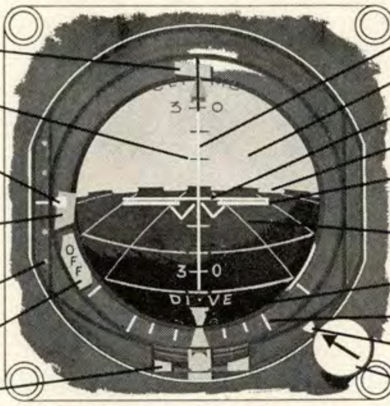
The T-38 pilot was not as fortunate as the T-39 jock. His flight director system display was correct *for the information available.* (The glide slope input to the computer was erroneous.) Remember, the pitch and bank steering bars display command information and do not reflect actual aircraft position. The glide slope warning flag is not the most prominent display, particularly in a red lighted cockpit and when the pilot is a little apprehensive and concentrating on cracking a low ceiling. True, the pilot should have been cross-checking the raw information and altimeter during the approach. One might wonder then, why did the pilot continue to fly the pitch steering bar?

A simplified, technical discussion is necessary to explain why the pilot might continue to fly the pitch steering bar.

With the Flight Director Computer in the final approach mode, basic pitch gyro signals are compared to glide slope deviation to provide steering commands to intercept and maintain the glide slope. Now, with a glide slope receiver failure the glide slope indicator stows to the center index, or glide slope deviation as seen by the computer is zero. The only pitch input to the computer then is the pitch gyro signal. The computer will continue to provide pitch commands relative to the attitude at the time of failure. The computer thinks this attitude is keeping the glide slope deviation zero. Also in the basic computation there is an attitude washout circuit which computes a new attitude reference every 10 seconds. This computation is based on attitude changes.

To illustrate this phenomenon, imagine that an ILS is tuned, the Flight Director is in the approach mode and the glide slope indicator is stowed at the center index of the glide slope deviation scale. The aircraft is straight and level. The pitch steering bar will be centered (after 10 sec) on the miniature aircraft dot. Assume the pilot makes a three degree nose down pitch change. Initially the pitch steering bar will be displaced above the miniature aircraft. After 10 seconds the bar will recenter on the miniature aircraft even though the aircraft is still in a descent. Now, if small changes in pitch are made and the pitch steering bar is used, you would notice the aircraft returning to approximately the three degree nose down attitude originally established. In other words, the failed glide slope receiver is telling the Flight Director Computer that the aircraft is on glide slope. The computer then commands or positions the PSB relative to the last aircraft attitude, not the glide slope. The computer uses only the information available, nothing more. A design change is needed to stow the glide slope indicator to provide a prominent warning of glide slope receiver failure.

These two situations emphasize the importance of understanding the Flight Director System and its capabilities. In the first case, the Flight Director Computer can provide the first indication of attitude indicator failure. The second case presents an instrumentation deficiency that must be recognized by the pilots.



This article is not intended to alter normal procedures; rather it is designed to provide an understanding of two Flight Director System operations. If we have aroused your curiosity to the point that you would like more information, write to: 3511 Flying Training Squadron, Attn: PT-IPIS-R, Randolph AFB, Texas 78148. ★

the I.P.I.S. *approach*

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

INTERPRETING THE IFR SUPPLEMENT

Recent discussion with several pilots and operations dispatch personnel has revealed that the listing of Jet Barrier/Arresting Gear (J-BAR/A-GEAR) information in the DOD FLIP IFR Supplement is subject to misinterpretation. We have also received questions concerning availability of sequenced flashing lights in approach lighting systems. These items may best be clarified by referring to the following excerpts from the IFR Supplement (Enroute) and Approach Procedures (Terminal) Flight Information Publications (FLIP).

J-BAR/A-GEAR Equipment

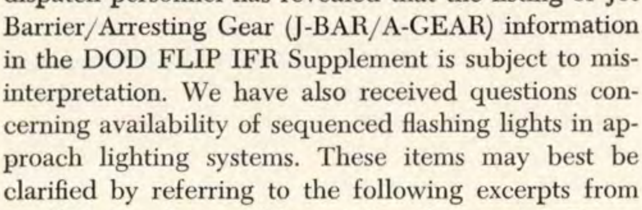


Figure 1—Airport Diagram from FLIP Approach Procedures (Terminal)

◈ NORTON AFB, CALIF. (San Bernardino) 34°06′N 117°14′W "DT2" **H–2, L–3**
AF 1156 BL4,6,7,9 H100 (CON) (S140, T185, TT310) (SWL 65/PSI 400) **(KSBD)**
JASU- 2(MD–3), 3(C–26), 2(C–22), 1(MA–1), 1(MA–1A)
FUEL-A+J4, SP, O–128–133–148 PRESAIR LHOX
J–BAR/A–GEAR RWY 5 MA-1A ①② ; BAK-9 ①③ ; BAK-9 75′ OVRN; MA-1A 240′ OVRN.
RWY 23 MA-1A ①② ; BAK-9 ①③ ; BAK-9 75′ OVRN; MA-1A 240′ OVRN.
AERODROME REMARKS- PPR. Clsd to tran jet acft ex C–141 and T–39. CAUTION–Avoid Tri-City aprt 1½NM SW Norton AFB. Civilian lightplane tfc oprg in this area of control zone at all altitudes to 2000′ MSL. 7000′ rwy 05–23 open. Ldg rwy 05 only t/off rwy 23 only. No J–B, A–G. No Ovrn. Use extreme ctn dur gnd oprs. Spare dragchutes not aval, no repacking svc fr 2100Z Fri thru 1500Z Mon. Tran alert/maint unrestricted. ①Not usable. ②240′ prior to thld. ③75′ prior to thld.

Figure 2—Sample from FLIP IFR Supplement (Enroute) Airdrome, Facility Directory

Consider runways 5 and 23 in the airport diagram (Fig. 1). J-BAR/A-GEAR equipment is installed on these runways as indicated by the symbols / A-G and J-B. In order to determine the type, exact location and usability of the J-BAR/A-GEAR, refer to the IFR Supplement (Fig. 2).

J-BAR/A-GEAR are listed, for each runway, in order of their location down the runway, starting at the approach end. Footnotes specify the usability and position, i.e., distance into overrun (75′OVRN), of the J-BAR/A-GEAR equipment. Proper interpretation of J-BAR/A-GEAR on RWY 5 is as follows: The first J-BAR you encounter on an approach to RWY 5 is an MA-1A. The footnotes one and two explain that this MA-1A is "not usable" and is located "240 feet prior to threshold". This MA-1A is not designed for engagement from the approach direction of flight but is intended for use when landing on RWY 23; therefore, the reason for the "not usable" footnote.

Continuing the approach to RWY 5, we find a BAK-9 A-GEAR; "not usable" because of the approach direction of flight and located "75 feet prior to threshold." Continuing down RWY 5, we find another BAK-9, this one located 75 feet past the runway end on the overrun, and another MA-1A located 240 feet out on the overrun.

Referring to RWY 23, we find the same J-BAR/A-GEAR listed in reverse order. The MA-1A and BAK-9 on the approach end of RWY 23 are footnoted as "not usable" for the same reasons explained above.

One condition not included in this example is the case where a J-BAR or A-GEAR is located some distance down the runway not on the overrun. For example, if an E-15 were located 2000 feet down RWY 5, the notation in the IFR Supplement would be: RWY 5 "E-15 2000′ and RWY 23 E-15 800′ ".

Sequenced Flashing Lights

LIGHTING

(Specific lighting facilities available are indicated by following code.)

B–Rotating Light (Rotating beacon) (includes flashing white; green and white; split–beam and other types.) (Omission of B indicates beacon is not available. At civil aerodromes, omission may indicate that beacon does not operate standard hours (sunset–sunrise.)

L–by itself indicates temporary lighting such as flares, smudge pots, lanterns.

-1 Portable lights (Electrical)	-6 High intensity runway lights
-2 Boundary lights	-7 High intensity approach lights
-3 Runway floods	-8 Sequenced Flashing lights
-4 Runway or strip	-9 Visual Approach Slope Indicator Systems
-5 Approach lights	-10 Threshold Strobe Lights
	-11 Rwy Centerline light

Figure 3—Lighting Code from FLIP IFR Supplement (Enroute), Airdrome/Facility Directory Legend

Sequenced flashing (SF) lights, sometimes referred to as "strobe" lights, should not be confused with threshold strobe lights. SF lights are identified in the Lighting Code (Fig. 3) by the code number 8, and threshold strobe lights by the code number 10. SF lights are condenser discharge lights which flash in sequence toward the threshold along the approach lighting system centerline. Normally, the brightness of SF lights cannot be adjusted.

Threshold strobe lights are normally located on either side of the runway threshold and may or may not be installed in an approach lighting system.

Sequenced flashing lights may be installed with Ivala A, U.S. Standard H, or U.S. Configuration B approach lighting systems. The type approach lighting system may be determined by reference to the airport diagram (Fig. 1). If the runway has one of the above type approach lighting systems, and SF lights are included in the system, code number 8 will be listed in the lighting code in the Airdrome/Facility Directory. RWY 5 in Figure 1 has an H type approach lighting system, however, the absence of the code number 8 in Figure 2 means that SF lights are not installed.

In addition, if the sequenced flashing lights are nonstandard in length—standard length 3000 feet—the code number 8 will be footnoted to indicate the exact length. When an aerodrome has more than one approach lighting system that may incorporate SF lights, and SF lights are installed with one system (lighting code number 8 listed), the system(s) without SF lights should be identified by footnotes, in Aerodrome Remarks, or in the aerodrome diagram, e.g. Dow AFB. ★

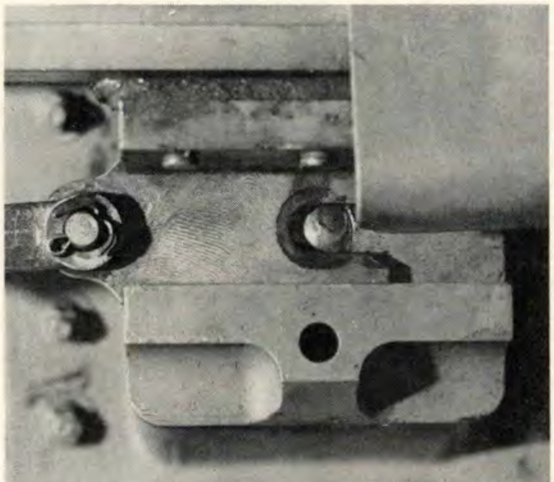
CHECK Door Latches

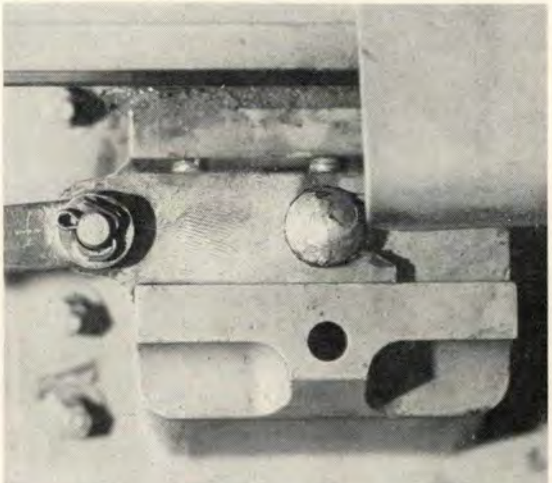
Maj Richard R. Bragg, 3630 FTW,
Sheppard AFB, Texas

The cabin door of a CH-3C came off in flight and lodged in front of Nr 2 engine. Although shattered plexiglass was ingested by both engines and Nr 2 failed, the IP and student landed the helicopter safely.

Apparently when the emergency release handle had last been actuated and repositioned the aft lock failed to engage. It then vibrated loose at the aft attaching point and the door worked free. The top photo shows the entire mechanism with the aft locking bolt not securely engaged. The same condition is shown in closeup at lower left. The latch properly locked is shown in the lower right photo.

Examination of other CH-3Cs indicated that the door could appear secure when it is not. Close attention should be given these latches for secure locking after each operation of the emergency release locks.





STAY IN THE CORRAL

Harrie D. Riley, Directorate of Aerospace Safety

A flight these days is not like it used to be in the good ol' days of flyin' by the seat of your pants. No siree! Things are different. No more is the space above the terra firma a place to cavort in the flying machine with wild abandon like the bronc busters in the days of the open ranges. To be sure, you have lots of horses under you and you can bust out easily from your invisible corral. However, if you do, you may get a little rhubarb from the Air Traffic Control sheriff, which might be a little like the bite of the barbed wire.

In our earlier years of operating the flying machine, rules of the air were non-existent, just as there were no provisions for law and order on the frontier of the old West.

But things changed at long last on the frontier. Remember the Wyatt Earps, the Marshal Dillons and the "man from Dodge City," all helped to bring control to the open spaces. They patrolled along the pony express trails, the overland routes and were particularly active in the terminal areas at the end of the trails. The pony express trails might be compared to the jet routes of today as they were the speed routes and shortest distance. The overland routes compare to the airways below FL 240 as they feed the slow traffic into the terminals. Well, anyway, they were necessary, just as now, to separate traffic.

Things were quite rambunctious along the pony express trails and the overland routes. But that's another story and you can relive some of it on TV—you know, Bonanza.

Not nearly so glamorous are the episodes today of the air traffic control sheriff and his posse of enforcers trying to control the modern rider of the purple sage — oops!

Now, whether you ride along the airways trails that follow a SID procedure or wander through the Positive Controlled Area or follow the Oil Burner trails or hurdle the ADIZ barricades, you've got to be alert so that you do not get a report. What report you say? Well, not a report of a Winchester '73 but something with about as much sting. A report from FAA using Sections from FAR 91 like a fusillade.

Here are some examples of the kind of report some buckaroos in today's airspace have received and how the action lasso is applied to prevent further infringement of the rules.

Left FL 450 for FL 350 without obtaining an amended clearance when no emergency existed. (This is a violation of FAR 91.75[a].) Who would do such a thing? Not you! Well, probably not, but it seems that this bad man misunderstood the information he received from a combat center controller as an approval of his request to descend to a lower FL. Well, he escaped the pokey for this offense, but all pilots and GCI controllers of his hangout have been rebriefed on the importance of accuracy in air traffic control matters.

On an IFR flight, aircraft was flown 15 miles right of assigned airway in the vicinity of another aircraft at the same altitude on another airway. Whoa! How can this happen? It seems that the pilot's flight planning was rushed, and the heading transcribed to the Form 70A was for a different airway from the one intended for his route. Now flying down an airway other than the one provided for in your clearance is just not allowed, and this then is a viola-

tion of FAR 91.75(a) since no amended clearance was obtained. Needless to say the one who committed this dastardly deed was punished. Yes-siree, he got a 30-day restriction — to fly only in the local area — and was required to complete a proficiency and standardization flight check before being returned to full freedom.

Everything was going fine for our next airways trail rider. He came all the way across the wide open spaces without a hitch, until he contacted the man maintaining law and order at the terminal. This particular controller issued a clearance for a VOR approach with a 4000-foot limit. This VOR procedure had an outbound heading of 221 degrees with a turn to the left, west of the VORTAC to an inbound heading of 72 degrees. It's a good procedure to help you get to your stall but not this pilot. He took a round about way and went south and made an entirely different maneuver. When the controllers caught up with him he was charging back inbound using the VOR/ILS approach instead of the VOR that had been planned. This was a little bit disconcerting as there was traffic ahead of him at the outer marker. This all happened because the pilot had turned to the page for VOR/ILS instead of the page for VOR in the letdown book.

Needless to say, the pilot received a gig for deviating from his clearance without obtaining an amended clearance when there was no emergency. The whole incident was made a special subject for the organization's flight safety meetings to help in preventing a similar occurrence.

One of the biggest pitfalls for the airway traveller has been staying in the altitude limits of a Standard Instrument Departure. Here is how one got out of bounds. The clearance was to depart by Departure One. This SID procedure contained an altitude restriction of 2300 feet until crossing a specified intersection, before climbing to the assigned IFR clearance altitude. The first thing the departure controller heard from the pilot was that he was climbing through 10,000 feet prior to crossing the specified intersection. His explanation was that he thought the radar vectoring he received after takeoff invalidated the altitude restrictions of the SID procedure. It should be noted here that radar vectoring never negates any altitude requirement of the SID unless there have been specific instructions.

You can see by now that these are not very glamorous episodes. The actors weren't really bad guys deliberately trying to beat the system and this is true for practically all the infringements of flying rules. Of course, once in a while there is someone who just has to kick over the traces and momentarily abandon his discipline for a one-time risk. Cases like this might have more dramatics than the tales above, and they usually have dire consequences, at least an FEB and maybe an aircraft accident. But this article is not geared to heroics. Well, if it isn't, why?

This dissertation has been made because most of the violations today are inadvertent violations. They result from misunderstanding air traffic control instructions, a reference to the wrong chart, an error in navigation or a lack of knowledge of some procedure. With this in mind, don't be complacent in your everyday flying operations. Be professional in flight planning, and don't hesitate to ask for clarification of any air traffic control instructions that create any doubt as to the intentions of the controller. ★

MINIMUM FUEL. AFM 60-16, dated 15 November 1966, describes *minimum fuel* as a term which identifies a flight condition when the remaining usable fuel supply may be needed to insure a safe landing in normal sequence with other traffic *without* priority traffic handling. If at any time the remaining usable fuel supply suggests the need for traffic priority to insure a safe landing, the pilot will declare an emergency.

Lt Col J. D. Oliver, Jr
Directorate of Aerospace Safety

WAS IT YOU? Once every six seconds, ten times every minute of every day and night throughout the year, an Air Force airplane takes to the air. Once every six seconds, ten times every minute, someone certifies that an Air Force aircraft is ready for flight. Once every six seconds, ten times every minute, a pilot is declared and accepts that he is ready to fly. Once in a while someone is wrong. Either the pilot, or the aircraft, or some other person or facility essential to a successful flight wasn't ready. Once in a while someone dies. Most of the time this doesn't happen. Even more of the time it isn't necessary. Then why does it happen? It happens because somewhere, sometime, somehow, someone didn't do all that he could to prevent the accident.

Was it you?

Anchard F. Zeller, Ph.D
Life Sciences Division

JOINT EXERCISE MIDAIR – "Friendly" Flight was directed to intercept and attack "Bogie" Flight. Friendly lead spotted the Bogie and began his attack after directing one element to remain above as top cover. Bogie Flight consisted of six aircraft, however, and Friendly lead had only four in sight. The other two were in the process of joining as Friendly pressed his attack. A midair collision occurred between Friendly's wingman and Bogie's Number Five, resulting in major damage to both airplanes.

There were several causes: supervisory error in that the flight leaders failed to observe all aircraft in their immediate vicinity; high cover failed to keep Friendly lead informed of other aircraft in the vicinity; and the aircraft control and warning radar controller failed to advise Friendly of Bogie's number and activities.

The supervisory factor was more complex than simple lack of observation. There was no operations plan or other procedures to delineate the rules of engagement and establish safety criteria. This is very important where more than one unit has personnel and equipment participating in a maneuver or exercise. This regulation and liaison is even more vital if more than one service is involved.

SHORTLY after the pilot put his T-39 in the holding pattern at 18,000 feet, something hit the windshield. There was no further incident and everything looked shipshape in the cockpit during letdown and landing. As power was applied for the touch-and-go, a high frequency noise occurred. The crew suspected that it came from a faulty main door seal.

A second landing was made with the same results, so it was written up in the Form "1." Inspection revealed that both engines received damage to the inlet guide vanes and first row rotor blades. Both engines were removed and replaced. It was suspected that ice from the nose section broke off, struck the windshield and was ingested by the engine causing the damage. The crew supported this theory, having noted that there was ice on the windshield and wing leading edges at the 18,000-foot level.

CONFESSIONS OF A CRASH CHASER. Some years ago I was a crash chaser. When the crash phone rang in my office, I listened long enough to hear the location and ran quickly to my vehicle, turned on the rotating beacon and siren, and rushed to the flight line. If, in fact, a crash occurred, I followed the fire trucks and raced to the scene. Usually the emergency was "terminated" and I returned without the light and siren to my office.

When I received a call at home advising me of an emergency or an accident, I jumped into my foreign sports car and had a ball, weaving through traffic to the scene or the flight line.

I carried an emergency radio while on the road or away from home and office. Upon the proper signals, I left wherever I was, or did a 180 from wherever I was going, and again weaved through traffic to the site (standby or crash).

One day, while on a "crash chase," I witnessed an 0-11 (fire truck) overturn and one Air Police vehicle collide with another Air Police vehicle as they were rushing to the scene from two sides of the same building.

I finally slowed up enough to do some thinking. Over a period of six years I had done a lot of crash chasing. I had flashed lights, operated the siren, and gotten to the scene in a hurry. Then I had to wait for the crash rescue people to do their job. There was really nothing for me to do until their work was done. Even then there was no rush for me to do my job. I had made those hasty dashes, risking accidents, for no real reason. I finally realized that during the six years and literally hnudreds of emergencies and accidents, after weaving and "sirening" I never had a true requirement to be at the scene and witness a crash. All I had accomplished was to be a possible impedance to the crash rescue team.

I'm a Flight Safety Officer. My primary job is to prevent accidents. If they occur I assist in the investigation.

We need the crash rescue equipment and ambulances at the scene. On certain occasions a need exists for special equipment and EOD (explosive ordnance disposal). Everybody else, and I do mean EVERYBODY, who has a bona fide requirement to go to the scene should do so in an orderly, routine manner. They need no lights, no sirens.

Let's not compound the accident. ACCIDENTS CAN CAUSE ACCIDENTS. Don't let your eagerness lead you into one.

Maj Saul Faktorow, Chief of Safety
460 Tac Recon Wg (PACAF)

PRELIMINARY STATISTICS FOR 1966 show that USAF aircraft were involved in 59 major and 18 minor accidents while participating in mission support flights. Every major command suffered at least one accident and 21 different aircraft models were involved. These included utility, trainer, fighter and cargo types. The primary causes of these accidents, as determined by the investigation boards, were:

Pilot Factor	48
Supervisory	3
Materiel Failure	13
Maintenance	2
Facilities	1
Undetermined	10

Several inspections and flight safety surveys conducted last year uncovered serious deficiencies in the operational control, maintenance practices, quality control and flight safety programs of support aircraft. We wonder if this apparent laxness of effort, in nontactical operations, is due to the mistaken belief that mission support flights are not important and thus do not require the best from everyone. Although they lack the glamour of SAC's airborne alert sorties, or TAC's close support missions, or MAC's airline type operations, mission support flights are important. A flight to transport a briefing team, or to deliver a part is a vital segment of the overall Air Force mission. It deserves and must receive the same close supervision and control, precise planning and detailed maintenance support afforded tactical missions. Commanders, crewmembers and maintenance personnel must re-evaluate operational and maintenance practices to identify and eliminate any deficiency that could contribute to the loss of a mission support aircraft. ★

Lt Col J. D. Oliver, Jr
Directorate of Aerospace Safety

Fallout
LETTERS TO THE EDITOR

IPIS Approach

Regarding the first question in The IPIS Approach (March issue, page 12) pertaining to AFM 60-16, par 8-15, when will we learn to read regulations as written? The *intent* of paragraph 8-15b(2) of AFM 60-16, is not to permit the pilot to continue to the published minimum altitude but to execute a missed approach when advised that existing weather is below the minimums published for that approach. The statement that the weather may improve during the approach does not make sense. The weather can also get worse. If the Air Force had intended that pilots would be allowed to come down to published minimum altitude for the approach, they would have so stated. IPIS has confused the issue by changing the terms.

The reason we don't want pilots coming down to "take a look" when a field is reporting below minimums is on file in your accident reports. Years ago we learned from bitter experience the value of an alternate. At McChord in 1952, a C-54 crashed on missed approach after making an approach to "take a look" at the field which was reporting below minimums. Less than 20 miles away a field was CAVU. This was just one of many of the same type accidents. The pilot has an obligation to his passengers and/or crew to use his head. If a field goes below minimums, don't fight the damn problem; go to your alternate. That's why we plan for and select alternates. If IPIS is teaching otherwise, somebody had better take a look at their program. It's no fun picking up bodies off a hillside when a pilot had no business making or continuing an approach to a field that had gone below minimums. If we start letting pilots come down "to take a look" in the hopes that the weather may improve, we haven't learned much from the accidents we have suffered in the past.

LtCol Gordon T. Caldwell
APO San Francisco 96334

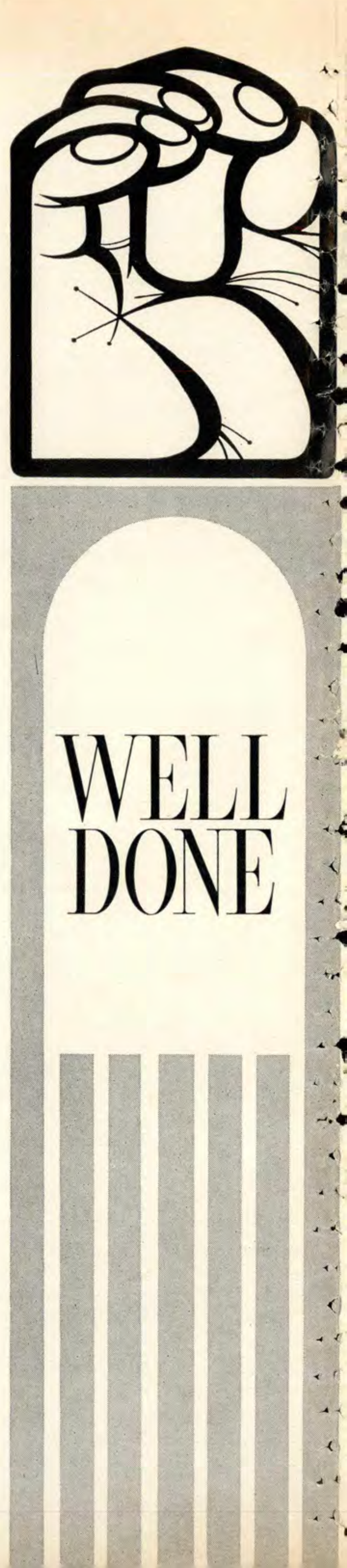
Although Par 8-15b, AFM 60-16, as originally published, is confusing, it requires the pilot to continue as cleared. So, unless the pilot receives another clearance prior to reaching the missed approach point, he will reach the published minimum altitude and start a missed approach. The manual states that you are cleared to the "missed approach altitude." *IPIS realized this and, in its article, attempted to head off as much confusion as possible by implying there is an error.*

This matter was presented to the USAF project office for AFM 60-16 (AFXOPXY). That office is aware of the error in the manual and has changed it to read "missed approach point." *The altitude authorized at the missed approach point is the minimum published altitude for that particular approach. The purpose of this paragraph is to assure that the pilot will continue his penetration/approach as cleared, even though he has learned that the weather is below minimums after starting his penetration/approach.*

The Air Force project office decided that the collision avoidance factor of proceeding to the missed approach point before starting the missed approach outweighed the importance of other factors.

Thank you for taking time to write us.

☆ U. S. GOVERNMENT PRINTING OFFICE 251-217/8



CAPTAIN
GEORGE E. DAVIS JR.
13 FTR. INTCP. SQ.
GLASGOW AFB, MONTANA

Captain George E. Davis was cruising at flight level 310 when his F-101 began oscillating in yaw. The yaw was minor at first, but eventually became so severe that it caused engine compressor stall and, coupled with roll and pitch oscillations, which later developed, nearly caused loss of the aircraft. Throughout the flight everything possible was attempted in order to maintain aircraft control. Captain Davis found that through proper rudder manipulation, he could momentarily stop the oscillations; however they would gradually build to a peak again despite all effort to the contrary. When a descent was begun, and the speed brakes extended, the aircraft entered a nose up rolling oscillation that caused heavy airframe buffet and brought on near entry to a pitch-up condition. Captain Davis managed recovery however, and continued descent. Gear and flaps were lowered and Captain Davis determined he could control the aircraft at a reasonable approach speed of 210 KIAS, so he decided to attempt recovery. As the aircraft neared the ground, the oscillations caused more and more concern. Captain Davis knew if the aircraft got too much of a start in the wrong direction, it would crash before he could abandon it. Over the approach lights, he began playing the oscillations and was able to bring the aircraft into a relatively stable condition of flight just prior to touchdown. He placed it on the runway pointing straight ahead and nearly wings level.

Early in the flight, an airborne Montana National Guard F-89 had been vectored in to check over the F-101, and he stayed with Captain Davis until he landed. The pilot reported that the rudder was flipping back and forth and that at the peak of the oscillations the tail of the aircraft was describing a circle of 20 degrees from the aircraft axis. The pilot of the F-89 had been previously qualified as an F-101 instructor pilot, and later submitted a written statement praising the skill and aircraft knowledge Captain Davis had demonstrated during the emergency. Captain Davis's courage and skill warrant a WELL DONE!

CAPTAIN
MICHAEL D. THOMAS
13 TAC. FTR. SQ.
APO SAN FRANCISCO, 96288

Captain Michael D. Thomas was the leader of four F-105s on 10 September 1966. Briefing, taxi and takeoff were completed without incident. An air refueling was accomplished enroute and the remaining portion of the flight inbound was uneventful. Arriving at his destination, Captain Thomas selected afterburner, popped up to 14,000 feet and started his delivery run. At approximately 8000 feet, his aircraft received major damage; however, he continued his dive run and delivered his stores. Immediately after delivery, his aircraft received additional damage, causing the aft overheat light to come on, accompanied by a complete loss of left rudder control.

Captain Thomas transmitted that his aircraft had received major damage and gave the other flight members his heading and altitude. The number two pilot reported damage; Captain Thomas joined on him and observed fuel and hydraulic fluid streaming from his aircraft. Captain Thomas checked his own aircraft again and noticed the aft overheat light had gone out; however, the P-1 hydraulic system read zero, the stability augmentation was disengaged, and the left rudder pedal was dangling freely. He unbuckled his seat belt, reached forward along the rudder well area and grabbed the left rudder cable. By holding the cable, he stabilized the rudder pedal and was able to control lateral stability. Captain Thomas escorted his number two man to the nearest suitable field and told him to land first because he was losing fuel rapidly.

While waiting for the number two man's aircraft to be towed off the runway, Captain Thomas put his aircraft in the landing configuration, checked controllability, and landed while holding on to the left rudder cable. The drag chute mechanism and tail hook were also shot out and the drag chute failed to deploy after touchdown. Captain Thomas maintained directional control by using right rudder and left brake. With the tail hook inoperative a barrier engagement could not be made, but he stopped the aircraft just short of the end of the runway. Captain Thomas's fast reaction, keen analytical evaluation of flight conditions, and precise knowledge of aircraft systems enabled him to save the Air Force a valuable weapon system. WELL DONE!

No comment!!!
Editor