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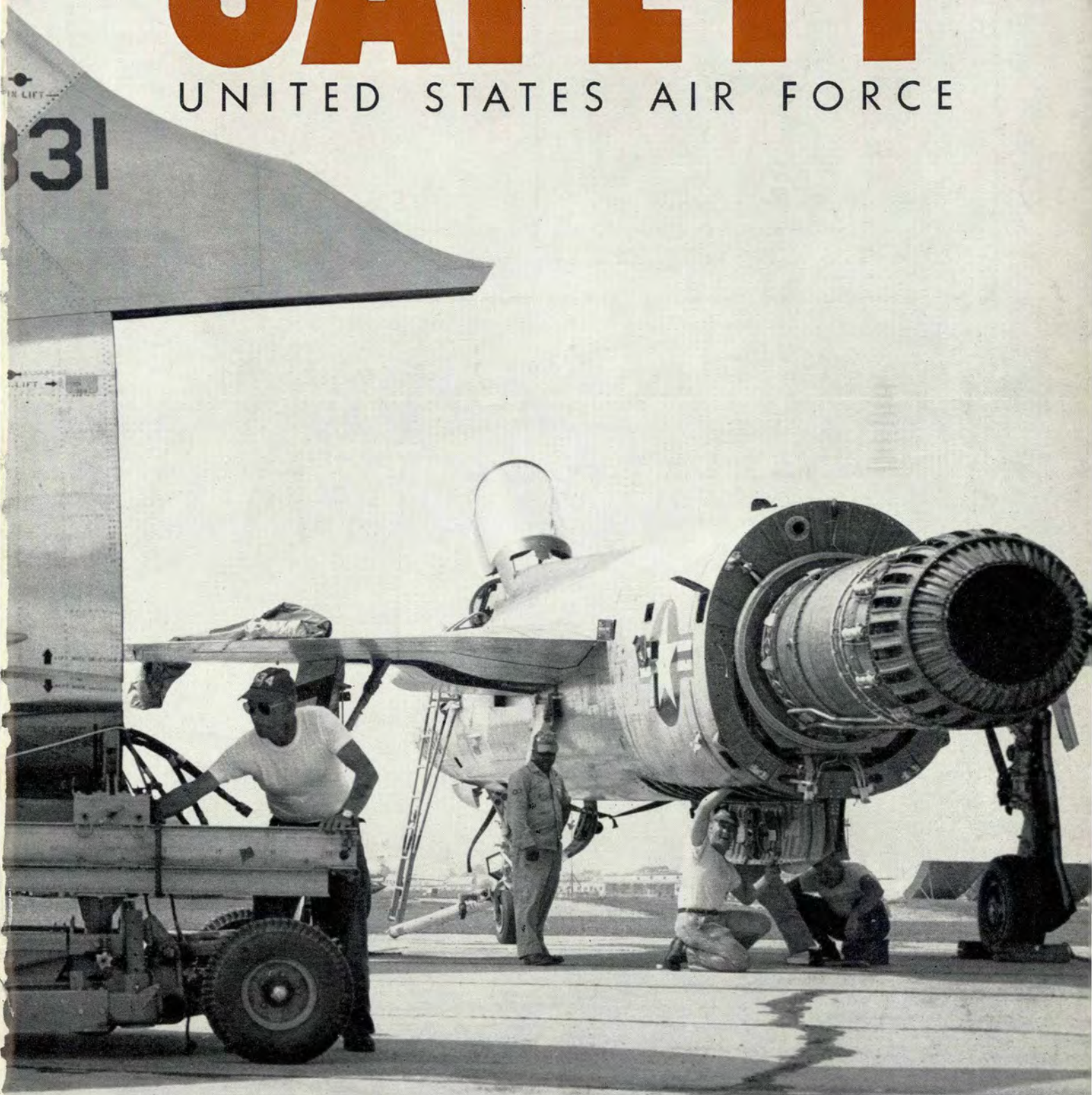
SAFETY

UNITED STATES AIR FORCE



MARCH 1961

MAINTENANCE AND MATERIEL

TWO POINTS OF VIEW

"That left tire may look low but I just checked the tire pressure all around."

"If I ever get my hands on that joker, I'll murder the **!!?? Bum!"

IN THIS ISSUE

Chief, Literature Branch
Lt. Colonel Francis D. Hessey

Editor
Lt. Colonel Jimmie L. Tissue

Art Editor
SMSgt. Steven A. Hotch

Feature Editor
Amelia Askew

Production
Major Francis H. Dawson

Distribution
SSgt. James D. McFall, Jr.

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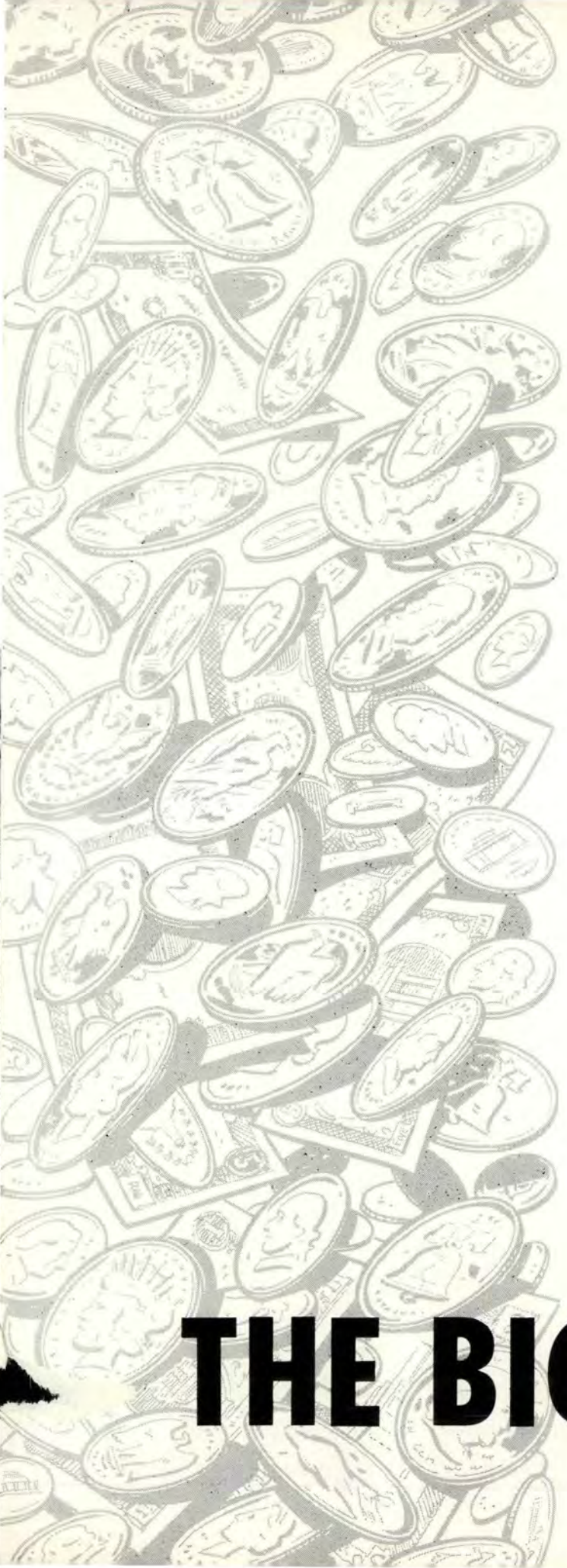


THE BIG PAYOFF

Everybody in the 39th Air Division can point to its 1960 safety record with genuine pride. Professional flying and quality maintenance have paid off big.

During the past year this Air Division completed more than nine months without an aircraft accident. The 21st Tactical Fighter Wing, with two F-100-equipped Fighter Squadrons, exceeded one year without an accident. As of 26 August 1960 the 4th Fighter Interceptor Squadron exceeded one year without an accident, and as of 9 October 1960 the 6139th Support Squadron also completed one year without an accident.

These accomplishments did not just happen. They were made to happen by the direct action of every individual in the 39th Air Division. These individuals brought about these accomplishments by promoting safety every day of the year.

In July 1959, prior to reporting for duty as Commander of the 39th Air Division, I was briefed by the Commander, Fifth Air Force, and each of his staff agencies. The Assistant for Safety pointed out that at that time the 39th had a higher aircraft accident rate than any other Division in the Fifth Air Force and that one of its Tactical Fighter Squadrons had the highest aircraft accident rate of any like Tac Squadron in the Air Force.

It isn't enough to merely say that everyone must promote safety. There must be, and there are, some specifics. The most important single factor in maintaining a low aircraft accident rate is the attitude of all Commanders toward safety, and this means from the Major Air Command down through the Squadron.

Some Commanders give lip service to safety and devote very little time to it, while others expect to have an occasional aircraft accident. The USAF cannot afford this kind of attitude nor can it afford to retain such an individual as a Commander.

In the 39th Air Division, all Commanders are firmly convinced that the *number one objective is to prevent aircraft accidents.* They are also firmly convinced that this Division can go one full year without a single aircraft accident. It has been done. This constitutes an objective of the 39th and no one is allowed to forget it at any time.

If anything else is placed ahead of safety, then it can be presumed that a reduction of the accident rate is not sincerely desired. By this I do not mean that the Emergency War Plan Training Program is not important. However, by flying safe aircraft safely, all required training will also be accomplished.

Not only must each Commander have the proper attitude toward safety, he must actively participate in it. This duty cannot be delegated, and it cannot be done from behind the desk.

He must spend time on the flight line and in opera-

tions, particularly at bases in Japan where snowstorms (yes, even in March), rainstorms or fog banks can engulf the entire airfield in a matter of a few minutes. Alternate airfields are distant. When there is any doubt, flying should be curtailed and airborne aircraft recalled or diverted.

The Commander should make it a point to inspect the active runway daily from end to end. It's amazing how many times loose objects that have just fallen off aircraft have been found on the runway. Any one of these items could easily cause a tire blowout—and blowouts can cause accidents.

It is understood that this inspection is the responsibility of the Airdrome Officer; however, since a large percentage of aircraft accidents occur during the takeoff or landing phases, the Commander must also make this his responsibility.

The Civil Engineer plays a pretty important role in this safety business. In the 39th Air Division, the number one priority for this officer is to keep the runway and adjoining airfield areas in the best possible condition. Overruns and shoulders are continuously inspected to insure that excavation holes close to the runway are not left open and that ruts are filled. The pilot must be given every advantage in preventing aircraft damage, in case his should leave the runway.

The Commander alone cannot prevent aircraft accidents. He must have help. Next to the individual Commander, the most important persons in preventing aircraft accidents are the Director of Safety and the Flying Safety Officer in each organization. These individuals must be the best qualified pilots and the best officers assigned, preferably experienced in both operations and maintenance.

In selecting officers for these key positions, the Commander must review command file effectiveness reports when local files are not available. Selecting the best will pay great dvidends. These officers must have an inquisitive mind, the ability to analyze problem areas, and be "Bird Dogs" for smelling out trouble spots.

In the 39th, the best qualified Flight Commander is the Flying Safety Officer for each Tactical Squadron, and all members of his flight are his assistants.

Accidents don't just happen! They are caused. In many cases they are caused by some person who has failed to do his job—either on the ground or in the air. And since aircraft accidents are caused, then they can be prevented. This can be done by professional flying and quality maintenance.

Of course, professional flying adds more to the flying safety program than almost anything else. The pilot must know his aircraft thoroughly from end to end; this is his profession. When an emergency occurs, he must know exactly what to do. His reaction time must be as close to zero as possible.

Here's an example: The quick thinking and positive action during an emergency on the part of one of our pilots averted an almost certain accident.

After takeoff at approximately 200 feet, the pilot heard a loud explosion. He immediately shut off the afterburner and started to climb. The guide vane antiice light came on and shortly thereafter the engine overheat light illuminated. After making sure there were no boats in the water under him, he jettisoned the external fuel tanks and two practice 500-pound bombs. He immediately made a 180-degree turn, declared his emergency and notified the tower of his landing intentions. He completed a successful landing without further damage to the aircraft.

In this case an afterburner "pigtail" had failed, causing raw fuel to leak and ignite on the hot afterburner. Through the actions and example set by this pilot, two similar aircraft were saved. Two other pilots repeated this performance later—under almost identical circumstances. *This is professional flying in the ultimate!*

To assist the pilot in learning more about his aircraft, a good plan is to send him through the refresher mobile training detachment course for his particular airplane at every opportunity. When the training detachment is not available, it is suggested that Tech Reps conduct briefings and classes.

In addition to the pilot's knowing his aircraft completely, the supervisor, Squadron Commander, Operations Officer and the Flight Commander must know each pilot thoroughly. They must know all about him: his qualifications, his strength and his weaknesses.

As previously stated, aircraft accidents can be prevented by professional flying and quality maintenance. Obtaining quality maintenance in a minimum period of time creates a problem, and here again people are involved. The first thing that must be done is to closely review the quality of maintenance personnel. Quality and safety begin with properly trained, indoctrinated and motivated workers. The undesirables must be eliminated through procedures outlined in Air Force Regulations.

In the 39th Air Division, a total of 200 undesirables have been eliminated. These persons were identified by screening records of personnel, Air Police, Courts Martial, punishment under Article 15 and delinquency. We couldn't afford to have an airplane prepared for flight by the individuals who insisted on staying out late every night and drinking heavily. These usually were the same persons who had repeated offenses on record.

Along with the undesirable personnel, at first we had *undesirable* or unsafe aircraft. To identify these undesirable *or unsafe* aircraft, a complete review of aircraft historical records was made. Safety-of-flight and delayed discrepancies for each airplane were listed and the aircraft considered *unsafe* were grounded. And these airplanes remained grounded until all safety of flight discrepancies were corrected.

When this was completed, then one squadron at a time was grounded until the Quality Control Branch could perform a thorough inspection of each aircraft. This branch of the Chief of Maintenance complex did an outstanding job on this project. All safety-of-flight

Brigadier General Travis M. Hetherington, Commander, 39th Air Division

discrepancies had to be corrected before the aircraft was released for flying. As many as three or four of these discrepancies were found on some aircraft.

To determine the over-all quality of maintenance per unit, Saturday morning aircraft inspections were conducted. Each Squadron Commander accompanied me through the Squadron Flight Line area to inspect his aircraft. Particular attention was paid to aircraft cleanliness, missing panels or screws, loose items in the cockpit, tire pressures and delayed discrepancies awaiting parts.

Of the discrepancies awaiting parts, 60 per cent were determined to be in error by Materiel Control Branch. Parts had not been ordered; they had been received and used on other airplanes, or requisitions had been canceled by the depot. Quality Control Branch inspects a minimum of one-third of all in-commission aircraft per month. In addition, every aircraft involved in an in-flight emergency is immediately impounded on landing and given a complete Quality Control inspection. And no corrective maintenance is performed until that Branch has completed this inspection.

To help the aircraft crew chief perform his job, a management guide has been prepared. It outlines all duties and responsibilities of the crew chief and provides checklists for everything that must be done to his aircraft, to include inspections and servicing. This guide has proven very beneficial to those persons who are new to the job as well as to the older hands who have not yet formed the habit of using guides and checklists. Tail number scheduling will also assist the crew chief. From the weekly schedule he can plan his maintenance for days that the aircraft will not fly.

You may be sure that every Air Force wife has a place in our program. Each month I personally brief all newly arrived wives of the 39th Air Division and this briefing is followed by a tour of the flight line, maintenance, operations and support facilities. One of my major points of discussion is Safety and the important part that wives have in it.

To fly high-performance aircraft is an exacting science and the pilot must have all faculties available and alert. He cannot afford to worry about finances, family quarrels or the breakfast he missed. The aircraft mechanic or specialist must be equally alert.

Last winter one of our airmen jettisoned two full external fuel tanks from an F-100 parked in a hangar with twenty-four other F-100s. The tanks burst, of course, and jet fuel covered the hangar floor. It would have taken just one little spark, and $25,000,000 worth of airplanes and facilities would have gone up in smoke. And it's too frightening to even think how many lives might have been lost, if it had happened. *Why* did this airman push that button? Was he worried about finances, illness, his wife or child? This we do not know. We do know though that the Air Force cannot afford to have careless or preoccupied people around its aircraft. There is a direct correlation between unhappy home life and accidents. Wives play a very important part in preventing aircraft accidents and they too must do their share.

Similarly, I personally interview each new officer and senior non-commissioned officer who is assigned to Misawa Air Base. On Tuesday, the Base Personnel Officer provides me with the personnel records. After a careful review of the records, which denote projected assignment within the 39th Air Division, I then conduct a personal interview with the new officer—normally the next day.

At this time, I can ascertain if we are placing the right man in the right job and outline our goals of professionalism and quality maintenance. It is my practice to encourage the new arrival to suggest any particular, unusual method or methods he may have observed at his former base that might be adopted here to further our goals.

At the same time I inform him of incidents that have occurred in the section to which he is assigned. I do this so he will guard against a repeat of similar ones. I make a special effort to explain that I maintain an "Open Door" policy and encourage him to come to me with suggestions that will be of value to our operation. Also, I let him know that we can go one full year without a single aircraft accident, and that our number one objective is to prevent such accidents. These interviews have proven valuable: Not only do I meet and get to know my supervisors, I also receive many new, usable ideas.

Through professional flying and quality maintenance, the 39th Air Division intends to continue its goal: "two-years-without-an-aircraft-accident." We like to think of it as The Big Payoff. ★

SSgt Robert C. Reid, Editor, Desert Wings, USAF Flight Test Center, Edwards AFB, Calif.

Please Don't Feed . . .

Things are growing on the Lake Bed. "Please don't feed the engines. Prevent F.O.D. The engine you protect may save your life."

Sounds a bit gibberish? Not to a flight line mechanic, a pilot, or any one of assorted specialists and technicians whose duly appointed rounds require them to spend most of their time on the Edwards AFB Flight Line. To these people, F.O.D. is almost a naughty word when drawn to its full meaning of Foreign Object Damage to jet engines. And Foreign Object Damage to USAF jets runs up to a fifty-million-dollar tab each year and accounts for an unknown number of pilots killed and aircraft lost.

Here at the Air Force Flight Test Center, one of the most dynamic F.O.D. control programs in the Air Force is in effect. This program has drawn world-wide attention and is furthering the aims in this vital area.

But first, for the uninitiated, a word about F.O.D. and why it is so critical. A jet engine is much like a giant vacuum cleaner, gobbling great gulps of air to keep itself running. The air is literally sucked into the engine on the ground, and is crammed into a compressor which packs it before entering the combustion section. The compressor is a series of thousands of blades, whirling around a hub at speeds up to 10,000 revolutions per minute. If the compressor fails, so does the engine, by one of various routes, usually accompanied by fire and explosion. Needless to say, these occurrences are not popular.

Almost anything engaging the whirling compressor blades will at least cause damage. Remember the straw that was rammed through a telephone pole in the hurricane? Even the most minute objects create havoc—sand, gravel, pieces of wire or cotter pins.

But do you know what some of the things found, during investigations, are? (Fortunately, not here.) Some of these things have been wrenches, flashlights, screwdrivers, books, cigarette lighters, clipboards, pliers, fuses, and a wide assortment of hardware, running from nuts and bolts to gas caps.

And this says nothing of people who have gotten too close to the gaping mouth of a jet. If they are lucky enough to survive after being sucked in, they come out looking pretty much like a piece of raw meat.

So there's the problem. According to Mr. James E. Leithliter, Chief of the Maintenance Group's Quality Control Branch and Recorder for the Edwards F.O.D. Damage Committee, most damage results from items being left in the jet intake during work on the engines by mechanics and technicians. And Air Force figures back up his statement that only a small percentage of damage actually is caused by the engines sucking up objects from the ramp, and/or runways.

Under the chairmanship of Major Lawrence C. Roberts, of the DCS/Materiel Office, the committee has applied a firm, hard-hitting program to combat F.O.D.

On the flight line, posters bloom from every pole, bulletin board, and fence capable of holding them. One is entitled "F.O.D. Engine Killers," and the space beneath, with holes for hanging things, is "reserved for foreign objects found during jet engine minor repair." The space is empty, and a scoreboard of Foreign Object Damage beneath it shows a row of goose-eggs dating back to January, 1960.

F.O.D. Bulletin Boards play an important role. Posted thereon are all the latest directives to inform and educate the troops.

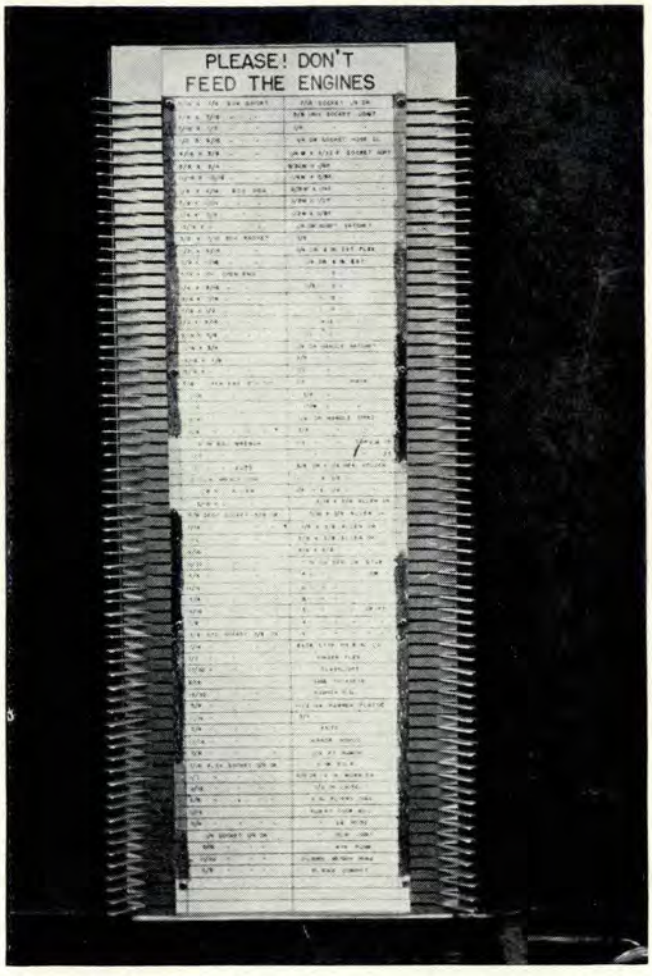
A blown up cartoon on another well shows an obviously shattered pilot sitting dazed in the wreckage of what is barely identifiable as a jet fighter. The caption reads: "Found: one wrench. Owner may claim same by contacting Captain Smiley."

Each mechanic in the engine shop has hanging on his tool box roll-away, a convenient sheet metal container in which he can place any debris from the job. It too is labeled, "Prevent F.O.D."

Also on the roll-away is one of the cleverest devices ever invented to curb F.O.D.: a tool counter. Each tool in the mechanic's box is represented by a sliding tab on the board, which reads either "IN" or "OUT." When the mechanic removes the tool to use it, he slides the tab to the "OUT" position and when he returns it to the box, the board reflects its "IN" status. This way, all tools are carefully accounted for and it lessens the chance of a screwdriver ending up in the engine. After all, the surgeon must make an instrument count before he sews up the patient, and a wrench left in a jet could be as fatal as a misplaced scalpel.

At the top of the tool counter, incidentally, is a small sign that reads: "Please don't feed the engines."

...the Engines!



Above, the "handy dandy" tool counter enables mechanics to keep close inventory on tools in use. Below, as mechanic finishes with the tool it is returned and checked off. Even though this is an excellent aid, it's no better than the people using it.

Back at the beginning of this article we said: "Things are growing on the Lake Bed." Actually, Major Calvin Jackson, the Assistant Base Operations Officer, a member of the F.O.D. Committee, and the man who organized a police-up of the lake bed runways, coined the phrase. Things were growing, in a manner of speaking. The previous two dry winters have left the surface of Rogers Dry Lake arid, and nature's natural resurfacing job, when the rainwaters smooth out the lake bed, has not been performing too well.

It took some forty men from the Maintenance and Air Base Groups two days to collect a truck-and-a-half load of debris from the runways and adjacent areas. The winds had uncovered junk dating back to WW II days, such as shells, pieces of metal, axles and rocks.

Major Jackson has also come up with a decal to go on mechanics' tool boxes that is a constant reminder to prevent F.O.D. The red-white-and-blue "F.O.D. Checklist for Aerospace Mechanics" has created command-wide interest for its uniqueness.

All activities, including tenant organizations and contractors here, play an active role in the prevention of foreign object damage. This brings to mind an incident involving a parka that took some rough treatment. Moments before, it was on the back of a contractor technician who ambled too close to the intake of an operating F-101. Twenty-one stitches were required to sew him up after he was sucked into the intake. Still, the cushion of the parka probably saved his life.

F.O.D. control does and will continue to play a vital role in the conservation of money, manpower, equipment, and lives. A salute to the F.O.D. Committee for its untiring effort which has put Edwards on top in this all-important program. ★

"WE'RE STANDARDIZED"

"And what is your job, Major?" Unless the person who asks this question is familiar with Strategic Air Command operations, my answer of "Standardization" is usually greeted with a blank stare, a polite "Oh," or a frantic "My gosh! Is it contagious?" If they hurry home to consult Webster's New Collegiate Dictionary about my line of work, they'll suspect that I'm just putting in time until retirement. Mr. Webster lists the correct spelling and pronunciation, but the meaning of the word just isn't there. The Air University didn't go that far when publishing the United States Air Force Dictionary and "standardization" doesn't even appear.

Briefly and simply, standardization is a means by which generally acceptable standards of performance are established and then maintained through a continuing program of training, evaluation and retraining. By careful evaluation of the operating techniques and procedures employed by flying personnel, we can insure standardization of performance. In addition, we determine the effectiveness of our training endeavors.

Any Strategic Air Command organization with aircraft assigned lies within the scope of standardization. This means that all flying personnel who operate SAC aircraft are ground tested and flight checked periodically as to their ability to properly perform all duties associated with their particular rated specialty. Sound like a good idea? We think it is. Perhaps a quick look at the flying safety record before and after standardization was injected into our operation will tell you that it is. How does the 15th Air Force record of 1.62 accidents per 100,000 hours flying time in 1960 look when compared to the 28.6 accidents per 100,000 hours that was our sorry plight in 1948? Standardization doesn't take credit for all of this improvement, but it certainly does deserve a lion's share. Every level in the chain of command has its part in maintaining and improving this worthwhile undertaking. Since numbered airforce represents the half-way point from top to bottom in the Strategic Air Command structure, this seems to be a logical place to pursue our subject.

It all started with a letter dated 20 November 1948 from the Commander-in-Chief, Strategic Air Command, to General Emmett O'Donnell, then the Fifteenth Air Force Commander. The text of that correspondence went like this:

"Dear Rosey:

Our accident rate has recently increased 65%, the majority of accidents occurring during takeoff or landing.

This condition indicates that our emergency procedures and standardization programs should be strengthened as early as possible.

As pointed out during the recent commanders conference, I consider it necessary to establish, as a matter of priority, a competent standardization crew at each Wing Headquarters to serve as Standardization Boards as outlined in our letter of November 12. Additionally, it appears desirable to assign a standardization crew to each Air Force Headquarters.

Major C. A. Laustrup, Stand. Div., Directorate of Operations, 15AF, March AFB

With a full crew operating from each Air Force and Wing Headquarters, we plan to deviate from the provisions of our letter of November 12 by assigning only a partial crew to Headquarters SAC.

Periodic conferences between standardization crews assigned to Air Force Headquarters and separate units will make it possible for all units to adopt the best procedures developed throughout the command. These conferences would be monitored by personnel of this headquarters.

Please give me your thoughts on the problem of flying safety and standardization in general, and specifically on the program outlined above.

I am forwarding the same to Generals Ramey, Hutchinson, and Cullen.

Sincerely,
CURTIS E. LeMAY
Lieutenant General, USAF
Commanding"

Thus the ball started rolling, and General O'Donnell had his scouts scouring Fifteenth Air Force units to select the "Cream-of-the-Crop" to man his headquarters standardization board. One week later, on 27 November 1948, he dispatched the following letter to General LeMay:

"Dear Curt:

In reply to your letter of 20 November 1948, I fully concur with the formation of standardization boards as a means of promoting flying safety, as well as improving the bombing ability of our crews. The establishment of a standardization crew within each bombardment group has been directed. I am also taking immediate steps to obtain a complete B-29 crew of the highest caliber to constitute the standardization board of this headquarters.

I plan to have the Headquarters Standardization Board visit each of my groups about three times each year. This is based upon their spending approximately two weeks per visit with each of the seven groups. They will check the group standardization board and spot check two or three crews, including at least one of the lead crews in each squadron.

The primary project for these boards is the standardization of takeoff and landing procedures, and emergency procedures. Secondary projects will be the standardization of bombing team procedures, conducting crew proficiency tests and night tests, and administering proficiency checks to prospective new crew members prior to their assignment to a crew.

I am sure that full and proper utilization of these boards will go a long way toward increasing flying safety and over-all quality of our bombing teams.

Sincerely,
EMMETT O'DONNELL, JR.
Major General, USAF
Commanding"

Let me point out that at this particular time the only operational tactical units assigned to this numbered air force were B/RB-29 equipped.

During the twelve years which have ensued since this exchange of letters, many changes have evolved. For instance, the "board" was replaced by a "division." In addition, branches have been formed within this division according to aircraft type in order to facilitate and improve the administration of all standardization matters pertaining to bomber, tanker, missile, and support operations.

Organized in accordance with SAC Manual 51-4 (our "bible" for standardization activities), the Fifteenth Air Force Standardization Division is operated under the able leadership of Lieutenant Colonel Jack T. Martin. His wealth of experience in tactical aircraft, ranging from B-24s and B-29s through B-47s and B-52s, makes him a natural for the job. Maintaining proficiency as an Instructor Pilot in B-52s and staying current with the operating procedures of all types of assigned aircraft affords him the opportunity to authoritatively administer the numbered air force standardization program in a manner that insures complete coverage of all flying activities. As chief of the division, he has personally supervised the selection of each individual who mans a standardization slot in this headquarters. Personnel so selected represent the most highly qualified persons available from within our resources for each individual specialty. Each of these individuals assigned to a tactical branch must maintain currency and proficiency in that particular aircraft and be able to effectively evaluate the performance of aircrew members flying in their same specialty. A tour of standardization duty at Fifteenth Air Force Headquarters is normally of three years duration. Stability of assignment has long been recognized as a necessary factor in maintaining a continuing program that is both efficient and effective. Definite correlation exists in any comparison of standardization personnel attrition with aircrew failures among our operating organizations.

The Strategic Standardization Group (SSG), located at Barksdale Air Force Base, Louisiana, is responsible for all phases of the command standardization program. Operating directly under the SAC Chief of Training, the duties and responsibilities of SSG are many and varied. A standardization Branch, formed within the Headquarters Training Division, acts in an advisory capacity to the Chief of Training regarding all matters pertaining to standardization. In addition, this branch provides the coordination necessary and exercises final approval (or disapproval) authority of all projects that have been a combined effort of SSG and the Standardization Divisions of 2nd, 8th and 15th Air Forces.

One of the prime responsibilities of the Strategic Standardization Group lies in the operation of its Field Evaluation program. Operating under the Task Force Concept, this program was developed to provide the Commander-in-Chief, Strategic Air Command, with a means for the realistic evaluation of our combat ready crews, a gauge to measure the effectiveness of our tactical units, and an appraisal of the adequacy of our training and standardization activities.

Several methods of evaluation were tried but cast aside for reasons of economy and efficiency. During the summer of 1959, SAC accepted a 15th AF proposal which provided a true evaluation of our aircrew effectiveness through the medium of unannounced Task

Brig. Gen. Roger M. Crow, former Director of Operations, 15AF, takes simulator ride during his standardization check.

Force visits. This means that, under this concept, SSG evaluations were conducted on a no-notice basis. One great advantage of this system was that the no-notice method of evaluation had a mild effect upon the normal activities of a unit being assessed. Indeed, this was in sharp contrast to the total disruption of all operations previously required during scheduled visits by a Strategic Standardization Group Task Force. With scheduled visits the training program of a tactical organization was brought to a near standstill during the SSG visit while everyone concentrated his efforts toward a successful evaluation.

Along with the New Year came a new concept in task force operation which was precipitated by a major change in SAC's training period alignment. Effective 1 January 1961, each unit was assigned a Numbered Air Force Training Period once each fiscal year. This three months period will be used for Operational Readiness Inspections, SSG Task Force evaluations, and other peacetime operation schedules. This allows a unit to undergo nine months of uninterrupted training and then to be evaluated and inspected during a specifically designated period. Because of its infancy, this new concept is untried and unproven, but its merits are readily apparent. Our units have long awaited an opportunity to conduct their training operations without the ever-hanging threat of having their entire program scuttled by an IG Team or an SSG Task Force. If these new procedures continue to develop and maintain all units and aircrews in a state of proficiency, enabling the immediate and successful completion of their assigned mission, then the goals have been achieved.

No stone goes unturned. Top, while Maj. G. R. Hammond checks an AC in the simulator, MSgt J. T. Purtell observes compliance of checklist by TSgt L. M. Dalley. Bottom, KC-135 boom operator, MSgt Villeneuve is checked by MSgt M. R. Yanora, 15th AF Standardization Board.

This SSG Field Evaluation Program provides that each SAC unit possessing aircraft is visited at least once each 12 calendar months by a task force. Except for those made in conjunction with a SAC Inspector General visit, SSG evaluations are announced sixty days in advance by a letter of notification stating specific mission requirements. This procedure allows a unit ample time to program and publish these requirements in the unit activity schedule. In a tactical organization, a minimum of twenty-five per cent of the authorized crew strength is evaluated, including a complete check of the senior standardization crew. Aircrews receiving checks are selected on the basis of a proportional representation of those in the various levels of experience and proficiency.

The evaluation of an aircrew member consists of a comprehensive check of all items that are required to be performed in his particular crew position during the course of both normal and emergency types of operation. This check includes a ground phase, as well as an air phase. During the ground portion of the check, each crewmember is examined in his specialty to ascertain his knowledge of normal and emergency procedures, special weapons activities, bomb release systems, and various tactics. In addition, during their visit SSG personnel may evaluate any other activities so directed by Headquarters SAC.

During the course of a Task Force visit, each unit involved is required to furnish aircraft and the support necessary for task force members to accomplish their proficiency flying. This represents the only means available for SSG flying personnel to maintain their proficiency and currency. These proficiency flights are programmed for the second week of the task force visit so that they may be planned into the unit's schedule without upsetting any previous plans. Thus far, Fifteenth Air Force units have given this program their

fullest support by providing SSG personnel with reliable equipment and adequate facilities.

Upon completion of their visit, the Task Force Commander, with a compilation of the results of all phases of the evaluation, presents this material during a formal critique for the commander of the division, wing, or squadron concerned. Members of the Fifteenth Standardization Division are always in attendance at these critiques whenever a unit of this numbered air force is involved. Ordinarily, this critique is conducted on the afternoon of the second Friday of the task force visit. Immediately upon return to March Air Force Base, the Director of Operations for Fifteenth Air Force, Colonel Jean B. Miller, Jr., is thoroughly briefed on every aspect of the evaluation. On the next normal duty day, Lieutenant General Archie J. Old, Jr., Fifteenth Air Force Commander, is presented a complete critique by Colonel Miller covering all phases of the Task Force visit. General Old takes an intense personal interest in each of his unit's endeavors with SSG, being generous with his commendations for a job well-done, and seldom finding it necessary to take the alternative route.

When, in isolated instances, a unit appears to have regressed to some extent since its last evaluation, help in the form of highly skilled specialists is immediately dispatched from this headquarters to assist in bolstering the training and standardization efforts until a satisfactory level of proficiency can be attained and maintained. Assistance of this type is never forced upon a unit, and help from headquarters is ordinarily well received. Quite often it takes an outsider to discover what's wrong with an operation, since those closely connected see the weakness every day without recognizing its insidiousness.

A large percentage of the formal staff visits to subordinate units are made in conjunction with the 15th Air Force Inspector General's Operational Readiness and Compliance Inspections. In addition to the assistance rendered by standardization personnel to the IG by this augmentation, the flying phase of the ORI offers an excellent opportunity to observe how the crews perform under pressure. Ordinarily, we try to fly with a highly experienced standardization crew the first day of the visit, and then evaluate one of the newer combat ready crews on the second day of flying. This gives us the opportunity of not only "checking the checkers" but also provides a good evaluation of the products declared ready by a unit's training and standardization programs. During the compliance portion of the visit, which ordinarily follows the flying phase, all other standardization activities are closely observed to insure proper conformance with existing procedures and directives.

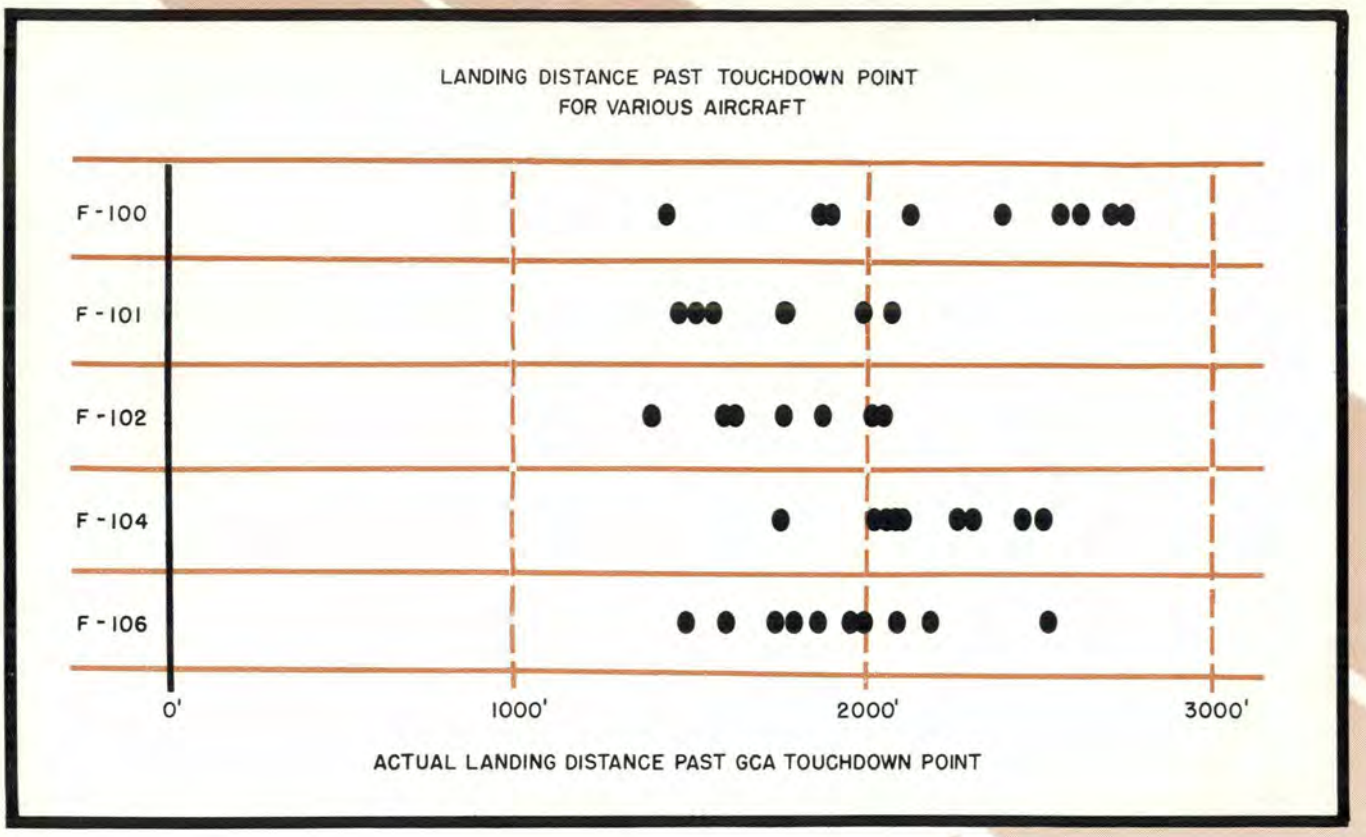
The desired results of a standardization program within any organization can only be attained with the whole-hearted support of the Senior Standardization Crews. During the past year, a program was instituted whereby this elite group of aircrew members are periodically brought together to discuss new methods of training and evaluation, consolidate recommendations for changes to flight manuals and operating procedures, and attempt to derive solutions to mutual problems. Times, dates, and places are selected for these get-togethers that afford each crew attending an ample opportunity to obtain training and proficiency sorties to and from the meeting. The success of these endeavors thus far has been without question and the benefits are many. Once a recommendation for any change, addition, or deletion has been approved by the majority of those in attendance, it is then presented by representatives of the numbered air forces at the next conference conducted by the Strategic Standardization Group.

Whenever a Fifteenth Air Force aircraft encounters an in-flight emergency anywhere in the world, within minutes he can be in contact with experts in the required specialty for the type aircraft concerned in the Headquarters Command Post. Standardization aircrew members are frequently called to give advice and assistance during these emergencies. Recently a B-47 aircraft flying in the vicinity of Hawaii was able to correct an emergency situation arising from the failure of a wing tank to feed properly by following the instructions relayed to him from the 15th Command Post in California. Assistance of this nature is rarely required, but it's comforting for an aircrew member to know that it is available if he needs it.

Regardless of how long an airplane remains in our inventory, someone is always coming up with a better idea on how a certain operation should be accomplished. As an example, a conference was recently held to revise the Flight Manual for our old stand-by, the C-47. Recommendations for changes are sent to each numbered air force standardization division for consolidation; then, they are presented to the other numbered air forces and to SSG for concurrence; on to SAC for approval, and finally to the Command Conference for Air Force acceptance. This procedure insures that each and every idea presented from the lowest echelon of command will eventually appear in the flight manual revision if the majority of persons processing the recommendation are in agreement. Standardization members of this headquarters go to any length, within reason, to prove or disprove any theories advanced as a better means of accomplishing a desired item.

I feel safe in saying that the only persons you'll find in the Strategic Air Command who are opposed to the standardization program are those who have been forced to relinquish their flying status as a result of not being able to live up to the exacting standards that are demanded. A standardization check form which indicates an outstanding performance by a pilot, navigator, early warning officer, gunner, or what-have-you, ranks in prestige with a highly complimentary effectiveness report. An impending check, one in progress, or a recently complete evaluation is a continuing topic of conversation wherever flying personnel gather.

Standardization has paid for itself by providing us with a means of establishing safe and dependable ways to perform our flying duties. Standardization organizations have been formed in our missile units, and we are confident that the same notable increase in efficiency and proficiency will accompany this program that for years has increased the capability of our manned aircraft units. Perhaps our need for standardization can be found in a quote from Ralph Waldo Emerson who said: "Our chief want in life is somebody who shall make us do what we can." ★



Captain Tommy I. Bell • Wright Air Development Division

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Get the

Has this ever happened to you? You're making a GCA in one of the Century types and, being somewhat of a tiger and in particularly good form this day, your final approach is a series of "on glidepath . . . on centerline . . . on glidepath . . . on centerline . . . " all the way down. The GCA operator gives a quick "You're now passing through GCA minimums . . . on glidepath . . . on centerline . . . over end of runway . . . you're now over the GCA touchdown point. Take over and land visually."

At this point, much to your consternation, you find yourself with excess altitude or airspeed (maybe both), and this Century type just *isn't ready to land!* Two thousand feet farther down the runway you finally get the bird on the ground. If you're landing on the usual 10,000 feet of dry concrete, there's no particular problem in stopping, and you probably didn't give it much more thought.

But—suppose you didn't have the usual expanse of dry concrete. Suppose it's a wet, slippery runway where every little inch counts. Now what about that 2000 feet between your touchdown point and that of the GCA operator?

The problem of the distance between an actual touchdown point versus a GCA touchdown point came to the attention of the Flight and Engineering Test Group. A flight test program was run on it and the Group came up with something you hotter instrument types have probably known in your subconscious all along. Anyway, here it is:

- The GCA touchdown point is predicated on the height of a radar blip (which will also accommodate a C-124 without guiding it into the ground), thus a fighter type aircraft is still about 12 feet in the air when the controller suggests that it should be touching down.
- The actual touchdown point for Century Series

fighter aircraft may be as much as 2400 feet farther down the runway than the GCA touchdown point.

For the test program, Standard F-100, '101, '102, '104 and '106 aircraft were utilized. An F-105 was not available at the time, but perhaps TAC can run its own program for any doubters flying the Thunderchiefs.

The aircraft were operated in the standard configuration with gross weights and center-of-gravity locations normally encountered during instrument approach conditions. Through the use of a photo-grid, all approaches which were not exactly on the GCA glideslope were detected and discarded. Both the 2½-degree and the 3-degree slopes were used. Perhaps the most validating feature of the test was that 16 test pilots were used during 42 flights, being alternated between the various type aircraft to reflect a cross section of varying pilot techniques in flareout and landing.

The results of the test are shown in the following table which gives the average distance between GCA touchdown point and actual touchdown point for the various aircraft:

	F-100	F-101	F-102	F-104	F-106
3-degree Glideslope	2000'	1700'	1700'	2100'	1900'
2½-degree Glideslope	2400'	1800'	1800'	2200'	2000'

Perhaps some of you are wondering "What does this mean to the pilot?" It obviously is not enough to look in the performance section of the Dash One, to compute the landing roll, then accept at face value that this is the length of runway needed to stop the aircraft. If an instrument approach is contemplated, some consideration must be given to the following three factors:

- Location of GCA touchdown point. Usually this is 750 feet down the runway but some are as close as 250 feet. Others are as far down as 1000 feet.
- Distance past the GCA touchdown point where the aircraft will actually land.
- Rain, snow or ice on the runway which obviously lengthens the landing roll. WADD is currently working on a scheme by which these factors can be considered in computing the landing roll.

Here's a suggestion for Century Series pilots: Note your landing distances on your practice GCAs, take an average leaning towards the long side and add it to your computed landing roll. It may save you from making a very costly and serious error. ★

WE'RE NOT SO DIFFERENT

Maj. Edward J. Will, USAF Tactical Missile School, Orlando, Fla.

No, we're not, really—publicity to the contrary notwithstanding. Give or take a few inches, Kentucky Windage for comet dust resistance, gravity and other scientific problems, plus a few rumors that our airmen wear beards and smoke cigarettes with or without filter tips. We CATS categorically deny we're any different, safety-wise, from any other USAF operational outfit. At the risk of being called modest, we will say, however, that our operation differs so slightly from one involving fighter aircraft that the casual observer would have difficulty in distinguishing our work area from any other. Strangely enough, some of us have had the same misconception at times. On occasion we get all charged up as missile men and think perhaps we *are* different. But this impression doesn't last long, for we see a safety item pertaining to aircraft and are brought back to earth!

The USAF Tactical Missile School is responsible for training student teams to launch and maintain the TM-61C Matador and TM-76A Mace guided missiles. Basically, both weapons resemble T-33 aircraft (use J-33 jet engines) and are launched by rocket boosters from mobile launch platforms. They fly at speeds over 650 mph, at altitudes above 35,000 feet, and have a range greater than 650 miles. Matador guidance to the target is achieved by electronic control of its flight by ground personnel. The Mace has a self-contained system called "Automatic Terrain Recognition and Navigation" or ATRAN.

Now that we've completed the indoctrination course, let's see if we can convince all missile men that the space age hasn't replaced common sense and standard ground safety practices. We use many vehicles in our area and one of our potential hazards is the presence of carbon monoxide.

Several months ago—duly crediting the efforts of a local ground safety chap—we had a specialist from a neighboring base check our area for carbon monoxide. His test indicated that we were being exposed to very high and almost fatal concentrations of monoxide. It's a fact and a startling one too—in some areas men working outdoors were subjected to concentrations high enough to cause trouble.

We immediately shut down all equipment and installed new exhaust stacks that dissipated the fumes about 10 feet skyward. Also, we spread the word among the troops and cautioned them against the old rascal carbon monoxide poisoning, and thought sure everyone in the area had received a good education in the facts of life, but darned if they didn't continue to drive into the hangar and let their engines grind away while they took time for a root beer, told war stories to a fuzzy buddy (usually standing next to the exhaust), and later headed for home wondering why they had a headache and felt a bit woozy.

After watching a few of these operations we dashed to the base library to do a bit of research. The only information we could find was contained in a huge and dry technical volume, hardly considered "invitational reading." By cutting out the fat and keeping the meat we discovered that carbon monoxide is called "CO" by lads who've studied chemistry. With our corny sense of humor we put out a bulletin on carbon monoxide, entitled: "Extra!!! CO Kills Missile Man!" and my, how our chemists (who were eligible for promotion) laughed.

Anyway the gas is formed by incomplete burning of certain materials and is produced by motor vehicles and furnaces. You can't see it, smell it, or taste it. But, and this is the sneaky part about it: *One part in 800 will kill you if you're exposed for 30 minutes.*

It kills by preventing blood from taking oxygen, or, to quote the medics: "The purple carboxyhemoglobin formed combines with blood to form carboxyhemoglobin." No matter how you say it: It Can Kill!

The exhaust from vehicles pours out a 7% concentration. These fumes are 56 times more lethal, therefore a few minutes spent in a confined area, breathing exhaust fumes could make a Missile Man a statistic.

Speaking of vehicles, we'd say the biggest accident producer is the crane. There are several types but the basic problems are the same. There is a terrific accident potential existing with high voltage lines and severe electrical storms common to this area. Even though the cranes have placards warning the operator to stay clear of overhead wires, every now and then a crew will manage to find some excuse for working near high voltage lines. The corrective action is obvious: constantly cautioning personnel of this hazard and supervising operations to make sure the warnings are heeded.

In a few isolated instances where it is necessary to operate near overhead wires, arrangements are made to have the power turned off until the operation has been completed. Some preplanning recently eased this problem when a replacement power line was installed high enough to clear our crane booms. This has also paid dividends, since we can now shift missiles throughout the compound without the worry of striking power lines. We'd recommend that all operations similar to ours be provided with underground cabling or placing overhead wires high enough to clear the cranes. The expense involved is, of course, no comparison with the possible loss of life, should a high voltage wire be struck. True enough, if a wire were struck and the crew stayed aboard a rubber-tired vehicle, electrocution would be avoided. But there are too many "ifs" because

IF in the excitement a man stepped down he would provide the necessary ground, and he's had it!

About two years ago we had a convoy of vehicles on the road. The driver of one jeep failed to secure the radio antenna properly and when it worked loose and touched a power line near a traffic light, it killed the engine. Luckily, the driver stayed aboard so he is alive today. He said it sure shook him though . . . said he tingled all over . . . hair felt funny . . . could hear his heart pounding in his ears and had an acid taste in his mouth. The vehicle behind him pushed him clear of the line, and all ended well. If he hadn't sat still—well?

During the summer we have some severe lightning storms. And that time is not far off. Basically, a crane boom is nothing more than a big antenna and it makes for a peachy-keen lightning rod. Anyone perched in the seat of a crane makes a beautiful target and since this could produce shocking results, our people keep a weather eye out for lightning. When they spot a storm rolling in, they lower the boom and lose no time in getting out of the seat.

In addition to the electrical hazards, cranes introduce the same problems they must have had during the construction of the Wall of China. About the most common one, of course, is trying to prevent a man from tackling too heavy a load. It's a simple matter to tie guide ropes to the load, step aside, and guide it from a safe position. Easy as it seems, from time to time you'll see a muscle man trying to outshine the crane as he pushes a three-ton-load with his back. Let a clutch slip or a cable snap—and there's one less warrior on our side.

There were a few red faces around here the other day. We read a Ground Safety Bulletin from Hq USAF cautioning personnel against the danger of wearing rings while working on aircraft. We felt foolish because, actually, we knew it. We just forgot. Our men are constantly climbing up, down, over, and under missiles just as much, if not more than the average USAF aircraft type mechanic. In any event we reminded our men that many fingers had been lost because mechanics were wearing rings when working on aircraft, using makeshift devices as workstands, and jumping from elevated locations. This was followed up with a bulletin that warned them against wearing rings, and insisted that workstands and ladders be used. A kind word to newlyweds with shiny wedding rings: "String it on your dogtag or wrap adhesive tape over it." It was a lengthy bulletin but we considered it important; besides the men could take a copy home to help convince their ladies that they are trying to stay out of the hospital and retain their digits!

Just in case you're not convinced we're no different from you guys, here's an incident I recall: Two years or so ago while having a Coke with a missile type from California, we saw an old classmate who is now stationed at Huntsville, Alabama. He gave us a rundown of his problems in the missile field and this gave us an opening to let him see a letter from still another classmate now in Denver. Also a true missile man, he gave us the full treatment on his problems in Colorado, and so help me, Hannah! any chap stationed in Alabama, California, Colorado, or right here could use the same letter by just changing the return address. So with this in mind, let's dig into the theory angle and toss in a few opinions about the potential hazard areas that apply to all missile operations, plus preventive action that should save filling out a few accident reports.

One of the most important preventive measures we can take is to see that our technicians follow Tech Orders to the letter. Granted, this is normal practice (or is it?), but it is also normal for an operator to do some skip-reading of a procedure after he has carried out the operations over a period of time.

The crux of our problem is that the constant change, the modification, improvement and materiel failures require that our procedures and Tech Orders be constantly revised. What was a safe practice one day becomes a hazardous operation the next day because of the rerouting of cables, shifting of ballast, and so on.

Tech Orders are the primary source of making all personnel aware of these changes and, bless their lil' hearts, the chaps who prepare our publications spend a lot of time pointing out the hazardous portion of each operation. These items change from day to day.

Even with the planning and effort expended in preparing accident-free procedures in Tech Orders, we must constantly caution our personnel to inform their supervisors of potential hazardous areas they may have discovered during the course of normal operations. A typical example of this situation occurred one day when the Assembly Team started to remove an aft section from a missile. Much to its dismay the monster started to assume a nose-down attitude. Quick thinking by the crane operator saved the missile. As soon as this operator caged his eyeballs he staggered to his section chief, who took immediate action to alert all installations of the danger. We're positive that this action saved a lot of grief, money, and lives.

As the equipment gets older, problems arise that require additional maintenance to eliminate hazardous conditions. For example, safety hooks that automatically latch into position may fail to make contact because of a lack of lubricant or perhaps the stress on the gear suddenly prevents a pin from falling into place.

While it is the responsibility of the supervisor to discover and remedy conditions of this nature, we find that unless every warrior stays bright-eyed and bushy-tailed, we have an accident in the making. The mechanic who greases a moving part—not called for by Tech Orders—and the operator who conscientiously climbs up and taps an automatic safety latch in place, are both responsible for causing an accident unless they tell their supervisors about these problems. Then, and only then, can we take the necessary action to correct the condition through publications and maintenance and make sure that everyone is aware of the action necessary to prevent one more accident.

Well that's it. We have run the gauntlet. We've discussed many of the problem areas common to all units and those that cause extra heartaches among missile folk because of the fluid situation and rapid changes. Here again, though, many a flying organization has been through the same mill when it was assigned a new type airplane. Crewmembers' common sense and the good safety practices contained in the Accident Prevention Handbook, AFM 32-3, guided them through many a hazardous situation, and the same has applied to us. **No, we're not so different.** ★

Although the accident rate for the F-100 has steadily decreased since this airplane became operational, it still accounts for more accidents than all the other Century Series fighters combined. Several factors are involved but the main one seems to be that there are more F-100s in the inventory and they are flying more hours than other Century types.

A quick review of the 1960 accident record reveals that some of the old cause factors from previous years have been repeated with monotonous regularity, e.g., midair accidents to the tune of five! All but one of these happened between aircraft in the same formation and most of them involved position changes. Maybe a little more emphasis on formation techniques and air discipline during briefings is called for.

Target fixation! Does that sound familiar to you fighter jocks? Three of these, the record shows. However, one of the "targets" happened to be the range tower. The other two pilots evidently pressed the target too close, and these weren't jackpot pilots by any means. Both were in tactical units and had over 600 hours in the F-100. Being eager is fine; but observing and being conscious of range rules is more important than getting that last burst in the old bull's eye, if you have to do it the hard way.

And, of course, except for the guys it has happened to, we all know we'll never land an airplane with the gear up just because we "flat forgot" to put the rollers down. Here again, this little gem happened four times during the past year.

We don't mean to imply here that most of the F-100 accidents are caused by pilot goofs. Some of them end up in the "pilot-factor" category even though they were induced by one or a series of materiel failures or maintenance errors. These are perhaps understandable, but —in the eyes of the accident investigating board—they could have been prevented by properly executed emergency procedures and adequate knowledge of the Flight Manual.

Materiel failure and pilot factor were fairly evenly divided as to accident cause factors and together accounted for nearly 70 per cent of the total. Tires and struts took their toll, and we hope that better tires and reworked struts will correct this. Prospects for a fix for afterburner plumbing leaks look better now than for a long time, even though it is still a long-range item to you jocks who fly the bird every day. In the meantime, maintenance, supervision and inspection are the key words to reduce failures in this area.

I hope this doesn't read like a lecture; it is not so intended. I hope it will provide food for thought. Anytime one of you F-100 jocks have an item you'd like to pass on for the other drivers of the Century Series types, please send it in. We're always glad to hear from you.

Maj. Clarence H. Doyle, Jr., Fighter Branch

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We're still losing pilots and F-100 aircraft in stalls and spins. Every time I get a report of a stall or spin accident, I think of a remark which Major Dave Davidson made to me. He said: "This old F-100 is a helluva fine airplane but you've got to keep the airspeed up." Truer words were never spoken.

There is a lot more to it than keeping up the airspeed, however. The computations required to know what minimum control speed is under all conditions of weight, angles of bank, and loading are beyond the capabilities of us humans. Everyone will agree that the F-100 is an extremely honest airplane and is very difficult to force into a spin. It will enter a spin if forced, however, and when it is fully wound up, it takes some time to recover. Indeed, if stores are not jettisoned, recovery may not be effected.

The best method I know of to avoid stalls and spins is to learn to recognize minimum control speed. It is evidenced by two easily-recognized reactions on the part of the aircraft. These

NOTES

are control stick lightening and yaw. If the aircraft is clean, control stick lightening will usually come first. A dirty or asymmetrically loaded aircraft may yaw first. Corrective action is to relax stick pressure and kick hell out of the rudder against the yaw. This is the time to remember, *Don't feed in aileron!* If corrective action is taken *before* the aircraft yaws more than 10 degrees or so, a spin will not develop. Of course, if the nose is pointing way up and your airspeed is low and decreasing, you are in for several seconds of suspense. This is no time for ham handed action. Very light control pressures must be used to bring the nose below the horizon and regain flying speed. Some pilots have selected afterburner under these conditions and immediately entered a spin. Their experience would suggest that the throttle should be left *as is* unless the aircraft is actually spinning. Then, of course, it should be retarded to idle.

Two F-100s entered spins last year while the pilots were orbiting after having taken a full load of fuel from a tanker. Undoubtedly, in both cases the pilots failed to take into account the heavy weight and didn't keep the airspeed up. Both were fatal accidents therefore we never will know what really did happen.

These fatalities are the most tragic, it seems, and certainly should never have occurred. What causes a pilot to stay in a spinning airplane anyway after all hope of a safe recovery is gone? It may be pride or a sense of guilt, or perhaps it is just because he is too busy to realize how low he is before it is too late. I think that if each pilot schooled himself to *Get Out*—regardless—if the aircraft is still spinning at 10,000 feet above the terrain, he would most likely do it.

So how are you—the F-100 pilot—going to keep out of trouble with stalls and spins?

- First of all, you must learn to break off an engagement when you run out of both airspeed or altitude—even if you're whipped.
- Second, know the capability of the aircraft and don't try to force it beyond this point.
- Third, remain aware of the requirement for adequate airspeed at high gross weights and stay at a safe airspeed.

If all of this fails, be sure that you know the spin recovery procedures well enough to automatically perform them and include in your plan of action an ejection at 10,000 feet above the terrain if the aircraft isn't under control.

In the event all this sounds like a review of basic flying, forgive us. We were thinking of those who lost the toss in 1960, and hoping one of the five or six who might be destined to lose it in '61 will benefit.

Lt. Col. Waring W. Wilson, Fighter Branch

F-100

RF-101

Last fall, an F-101 pilot stationed overseas experienced a "close one" while he was checking out the aircraft prior to its being put on the alert pad. With both engines of this RF-101C started and the left-hand (L/H) droptank pressurized, the L/H throttle was advanced. As the engine came up to full military, the crew chief heard a not-so-loud "pop" which was immediately followed by a real loud explosion, with high flames shooting out of the L/H intake duct. In less than blinking time, the pilot shut down both engines, raised the canopy electrically (about half open), slid out over the right-hand (R/H) side of the cockpit and dropped to to the ground. By now a ground fire was going pretty good along the L/H side and up the side of the forward end of the L/H droptank to the forward end of the canopy. Needless to state, the pilot and his crew chief cleared the area with speed that would have brought the USA a Gold Medal, had they been on an Olympic Team. The fire was put out in record time, the area cleaned up, and inspection completed.

The L/H droptank filler cap had come off. It is believed that this filler cap was not properly installed in the first place, and it held until the tank was pressurized and then blew off. This undoubtedly accounts for the "pop" sound that the crew chief heard just before the big explosion. They found the cap to the left and forward of the tank. In all probability the fuel was blown out of the tank and sucked into the intake, causing the explosion in the compressor section. Damage to this RF-101C was considerable.

You've heard it before and you've read it before: That "intake" will make a grab for anything that comes its way, from fuel to airmen. If fuel is sucked in, as in this case, an explosion can put an aircraft out of business in a hurry. If a crewmember makes it into the intake duct he may or may not get back in business. No doubt the pilot and crew chief of this aircraft are well aware of their oversight in not checking the installation of the filler cap (Item 16 on Page 2-4, F-101 Handbook.) Checklist, anyone? ★

Lt. Col. Jackson Saunders, Fighter Branch

• A LINE CHIEF LOOKS

I'll bet there isn't a subject related to flying and maintaining an aircraft that's been talked and written about, and (we hope) practiced more than *Safety*. All professions, industries, and businesses must practice safety but none has a greater requirement than the business of providing a *safe aircraft to fly*.

This article represents the flying and ground safety views of one Line Chief and the methods used to put these views into practice. No line chief can have a sound safety program unless he has well informed personnel and makes certain that safety is practiced every day in his squadron.

In almost every letter, publication and pictorial pertaining to flying and/or aircraft maintenance, there is some information which can be extracted to promote safety—either its correct application with the happy ending, or the overlooked fuel leak accompanied by a disastrous ending. There can be no deviation from the proven principles of safety. As Line Chief, it is my responsibility to see that these principles become a guide and working tool for our assigned airmen. And I should like to use my squadron as an example. The Tech Order Familiarization Chart looks pretty much like one you'd see in some other squadron, with perhaps two important differences:

First, while the chart does not contain a great many Tech Orders, it does have all those necessary to provide the maintenance personnel with data on aircraft systems, procedures, practices, policies, and ground safety.

Second, the maintenance troops who initial the T. O. Familiarization Chart have read the listed Tech Orders. To check my chart for being up to date, I query the persons who've initialed it, just to make sure the men have read and understood the information in the Tech Orders.

Keeping your personnel up to date and well informed cannot be overemphasized. How about a cup of coffee? Our coffee shop has been equipped to provide a place for maintenance personnel to relax in an atmosphere that will provide a healthy mind and body. At one end of the room you'll find a bulletin board with all the latest rosters, schedules, directives and up-to-the-minute maintenance info.

The engineering section of the bulletin board is divided into two parts. The first contains all current maintenance and safety information. The second part contains the engineering and safety information of a permanent nature.

Along the wall you'll see large maps, of the world and some special US maps. Above the coffee bar are the latest safety posters. The reading file is located under the bulletin board; it contains the latest issues of Aerospace Safety, Aerospace Accident & Maintenance Review, TIG Briefs, and Engineering Bulletins published by the various aircraft and engine manufacturers, and, of course, The Airman. We like to believe that as he reads these publications, the airman is progressing in technical knowledge and at the same time is reminded of the importance of safety in his work. Whenever an airman in this squadron has been known to volunteer for extra duty, chances are he's been found studying the latest tactics of Supermouse or Mighty Man.

The Line Chief must constantly review his incoming correspondence. It is my practice to pick out all information of a technical nature and that which applies to flying or ground safety and then give my troops a personal briefiing, usually in a group meeting. I have found this most effective. To accomplish this we have roll call 30 minutes prior to our regularly scheduled time; this half hour is one of the most important parts of my day. It gives me an opportunity to know my troops better and to personally conduct the maintenance and safety briefings. Following this, group discussions are encouraged. This personal contact helps to clarify any confusion; it creates unity and permits us to work as a team with one goal in mind.

The 334th Tactical Fighter Squadron, commanded by Maj. Charles W. Barnett, is a proud squadron in a proud wing—the 4th Tactical Fighter Wing. It is commanded by General Joe H. Moore. (Some of you readers may recall the article "Four Points for the Fourth" in the May 1960 issue?)

The squadrons within the wing have the benefit of a progressive flying and ground safety office. The efforts of these people cannot be overemphasized. The wing quality control section conducts periodic inspections of the squadron flight line and hangar facilities. Results of these periodic and spot inspections of your assigned aircraft are a good guide as to the effectiveness of your maintenance and safety program. Within the squadron, our assigned Safety NCOIC conducts inspection of equipment, facilities and flight line procedures and where necessary, corrective action is taken immediately and procedures set up to prevent recurrence in the future.

Our squadron has made safety the responsibility of every man in it. For instance, policing of the parking area, taxi area, and hangar is scheduled three times weekly. These are in addition to daily policing of the areas by the Crew Chief. Constant attention to cleanliness of the area, coupled with sound intake maintenance procedures, has resulted in a very low squadron foreign object damage (FOD) rate.

Foreign object damage remains one of our recurring topics at our maintenance and safety briefings. During intake inspections and/or maintenance, the man performing the job is required to remove all loose objects from his pockets and clothing. The airplane is placed on a red cross, and the man is inspected by a supervisor. The supervisor inspects this man to make certain

AT SAFETY •

all loose objects have been removed from his uniform; in fact the supervisor even counts the buttons on the mechanic's uniform before he enters and again after he leaves the intake! If maintenance is being performed in the intake, the mechanic is required to complete a physical inventory of his tools prior to entering the intake and again after leaving it. No one will argue that overlooked tools, inadequate policing of intakes and loose articles of clothing have cost the Air Force thousands of dollars. This inexcusable waste can be greatly reduced through education of maintenance people and adequate inspection procedures, both of which are a part of our program.

During my tour with the 334th, the squadron has transitioned through two Century Series jet fighters. Any phase of transition into a new aircraft is a phase of learning for both the ground and air crews. Training and experience become of prime importance to the maintenance personnel. During these periods, everybody must devote his spare time to progress in training, safety and experience. It is imperative that all flight line maintenance personnel consult Tech Orders whenever any problems are encountered. Preflight and postflight work cards must be used to the fullest extent.

Operating instructions provide maintenance and flying personnel a means of preventing confusion between pilots and ground crew which sometimes results from using non-standardized signals. There has been a lot of discussion, pro and con, on the subject of pilots' preflight and walk-around inspections. I do not intend to try to settle this one, but I do have an opinion to express. The pilot who comes out to the aircraft, gives his shining bird a glance, kicks the nose tire, places the aircraft forms in the data case and gives the crew chief the start-engine signal, stands a good chance of not being with us long enough to make his next promotion. This procedure is not practiced nor condoned in our wing or squadron.

All maintenance personnel and pilots are human beings and as such, are capable of human error. Therefore, the final inspection conducted by the pilot and crew chief is another very important inspection phase which has in many cases disclosed malfunctions which could have contributed to an accident if not detected. In the course of a pilot's walkaround inspection, he is not only assuring himself that the aircraft is ready to fly—he is also gaining confidence in his aircraft and crew chief.

Ground and Flying Safety are promoted to a large extent by example; the line chief and all his supervisors must practice what they preach. *The policies and procedures established by Tech Orders, manuals and standing operating instructions must be followed.* There just isn't any room for guesstimations or doubt among your supervisors. In short, you can't tell your maintenance personnel one thing and turn around and contradict your word by your own actions. None of this "do as I say, not as I do" stuff. Actions of this nature not only confuse the younger, less experienced airmen, they open the door for them to violate any and all maintenance and safety procedures.

In November of 1959, the 334th Tactical Fighter Squadron was selected to provide aircraft and personnel to support "Operation Fastwind." This operation was a joint civilian and military endeavor to reclaim the 100 kilometer closed course speed record from France. The squadron was committed to furnish four F-105Bs and one F-100F, with necessary maintenance personnel, of course. Two F-105Bs were flown to the East Coast where they underwent an exhaustive and thorough inspection to be sure that all systems and clearances were within factory specifications. Both air-

CMSgt Harry T. Baird, 4th CAMS, 4th Tac Ftr Wg, Seymour Johnson AFB, NC

craft were modified to accommodate recording equipment necessary to substantiate a successful speed run.

My assignment as Line Chief of "Operation Fastwind" provided a wonderful opportunity to compare manufacturer's inspection and safety procedures with those followed by the Air Force. A rather interesting observation was that at no time during operation of Fastwind was there a conflict between the two systems.

Late in November, the four F-105Bs, and an F-100F departed for Edwards Air Force Base, California. To support the maintenance of these aircraft, twelve maintenance men were selected from the squadron. The normal flight line crew for the F-105B aircraft was doubled to provide faster turn-arounds and not sacrifice safety. Our schedule required having two airplanes ready for takeoff at all times from 0800 to 1700 hours. This was necessary since two additional attempts to break world speed records were being carried out at the same time. Availability of radar control dictated our takeoff times.

The day after our arrival, General Moore and Major Barnett started their practice runs, and these practice sorties were to continue until the record was broken.

The inspection procedures followed during "Operation Fastwind" were no different than those used at our home base. Because of daily speed runs to Mach 2 and sustained G loads on the aircraft during the run, particular emphasis was placed on security, clearances and stress inspections. During these high speed runs, the maintenance personnel encountered some new problems —at least new to them. The additional heat resulting from friction and higher engine operating temperatures created the need for special inspections. Maintenance problems were quickly solved and additional inspections were established to cover the problem areas. In less than 30 days from the original notification date of "Operation Fastwind," General Moore established a new world's speed record for the 100 kilometer closed course. At no time during "Operation Fastwind" were maintenance standards or safety sacrificed because of the mission. During the operation, both company and Air Force inspection systems were used to the fullest extent.

Equipment and aircraft were double-checked after each bit of maintenance. The coordination and cooperation displayed by the company and Air Force personnel played an important part in bringing about a speedy and highly successful conclusion.

In the past few years there has been an increase in two very undesirable conditions:

First, there has been a trend in some organizations to lessen the importance of the postflight inspection. As an example, take the pilot who kicks the nosewheel tire for his walk-around inspection or the crew chief who signs off the postflight inspection because the tire still has air in it after the flight. Both are guilty of negligence; the actions of these two crewmembers constitute an accident looking for a place to happen. Supervisory and maintenance personnel cannot slacken their diligence when complying with inspection requirements.

Second, in too many instances, crew chiefs write up minor maintenance in their forms to be carried forward. The accumulation of minor maintenance items on aircraft forms is an immediate indication that your maintenance and safety policies are not being followed. All too often many minor discrepancies lead to major ones, and the line chief who condones these conditions is asking for trouble. Check your men when they are performing the postflight inspections. Be sure that the postflight work cards are being followed; review your aircraft forms daily. A good postflight inspection and completion of minor maintenance as it is generated will be reflected in a low accident record.

I have learned that safety is something we live with daily and practice perhaps without giving it too much thought. Maybe it is a good thing that the practice of safety can result from the application of good habits. If you'll make safety a habit with all your airmen, you'll find the results most rewarding. These views on safety are not presented as the answer to the problem of having a sound safety program throughout the Air Force. Each Line Chief has his own way of managing and supervising his personnel. Each has his own problems and own solutions. I just hope some of this information will be helpful to you. The use of these principles daily has paid off for our squadron. In the three-year tour as line chief—and transitioning through three jet fighter aircraft, the F-86H, F-100C and F, and the '105B—the record stands with three major accidents; no fatalities, no injuries and no accidents charged to maintenance.

Here is a list of a few helpful hints:

- Schedule police and cleanup details.
- Schedule equipment and facilities inspections.
- Schedule inspections of tool boxes.
- Insure that preflight and postflight cards are used.
- Insure that adequate fire extinguishers are available and that your troops know how to use them.
- Insure that grounding cables are used both on the flight line and in the hangar.
- Review your familiarization charts to insure the necessary Technical Orders are listed.
- Review your standing operating directives to make certain they are up to date and complete.
- Establish controls for engine runup, taxiing and authorization to sign off red crosses.
- Review aircraft forms daily for correct maintenance data collection coding and delayed discrepancies which could have been cleared without delay.
- Conduct daily briefings with your maintenance personnel to keep them informed of the latest technical and safety data.
- Impress upon your personnel the importance of referring to Tech Orders and consulting their supervisors if and when in doubt about their assignment.
- Display all available safety and technical posters. Provide a reading file that includes all aircraft technical and safety publications.
- Insure that test equipment and torque wrench calibrations are up to date.
- Work at maintaining high morale among your men.
- Make sure your OJT program is sound.
- Conduct personnel inspections of the flight line procedures to make certain all standing operating directives are being followed.
- Know your men. Know their capabilities and limitations.
- Remember: All the written information in the world on the subject of safety is useless, unless it is put into everyday practice. ★

LOW ALTITUDE INTERCEPTIONS

Major L. W. Svendsen, Jr., Chief, Interceptor Br., Tac Eval Div, Hq 5AF, Fuchu Air Station

Two pilots were flying a night, low altitude, intercept mission with Number Two acting as target. Number one had completed one successful run and was attempting a second—altitude, 2500 feet; weather, 4000 feet scattered, 10 miles visibility—mission results: one less fighter pilot and one less interceptor aircraft.

Thus began a summary of a recent fatal accident involving an F-102 which was on a night, low altitude, intercept mission. The primary cause was undetermined; however, six probable causes were listed. It is important to note that had the pilot cross checked his altimeter accurately, none of the probable causes *listed* would have been valid. Therefore, in a discussion of low altitude intercepts (LAI), and particularly night LAI, we now have one cardinal rule "to hang our hat on": "Check the altimeter accurately and often."

No one who has ever flown a night LAI mission over water on a moonless night can put pen to paper and say it is inherently safe. However, in accepting a balance between operational requirements and flying safety, it becomes incumbent upon supervisors of interceptor aircrews to take a mature, positive approach to control, guidance and training in this phase of operations.

What are some techniques which will insure bringing home the "hack" safely? The first and probably most important is a rather nebulous one which must be developed in any good combat fighter pilot. It is still the spirit of attack borne by a fighter pilot which brings success to a fighter aircraft, regardless of how highly developed the aircraft may be. This is particularly significant in this discussion. When you leave the briefing room to set up your bird, make up your mind you are coming home with a recorded kill. Couple this with a tenacious application of LAI techniques which you have developed to the point where they become second nature, and your problem is practically solved. Anyone can come home with excuses; the man most sought after is the one who comes home with the goods.

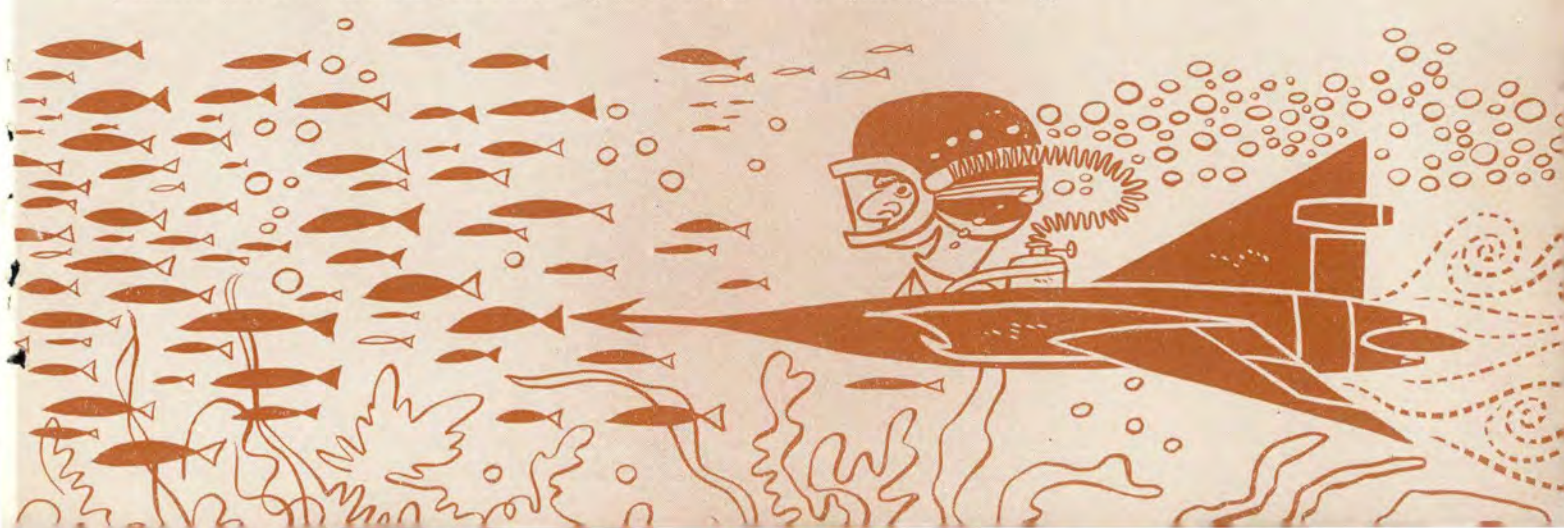
In the acquisition phase, get below your target if possible. However, in areas where severe ground clutter is present, and you may be unable to pick up your target, reduce Intermediate Frequency (IF) gain to the point where ground clutter begins to disappear. If you still have trouble, direct GCI to position you astern and synchronize your speed at a range of about four miles, (outside "B" time). Vary altitude. When lock-on is obtained, turn IF gain all the way up to preclude breaking lock and go burner to satisfy the positive closure requirement. If distance from target complex permits, convert slightly to either side to obtain optimum attack geometry. If you break lock, back off and try again.

Let's illuminate some of the pitfalls which the inexperienced fighter "I" pilot must watch for on a night LAI mission to prevent ruining his evening.

Radar breaking lock just prior to the final phases of the attack will cause the pilot to divert his attention to the radar. You must discipline yourself to maintain an altimeter crosscheck and not permit undivided attention to the radar. With the reestablishment of a lock-on, recheck your steering information. It is not unlikely, in the case of an overwater flight, that a buoy, vessel, or target reflection might be picked up, and you may inadvertently select it instead of your assigned target. Crosscheck your steering information against the altimeter; it doesn't take much of a push over to lose a thousand feet. Remember, a number of erstwhile fighter pilots have accidentally flown into the ground firing gunnery where they were visual all the time.

Vertigo or spatial disorientation are old "bugaboos" but are germane to this discussion. Your radar horizon is reliable; however, be sure that you understand the possible precision errors after a turn is complete. Check it against your MM-2 after rollout. Use it only for a wings level reference; do not relv on it for indications of pitch change. Trim for hands off.

Our present low-level intercept program has certain safety restrictions; i. e., minimum interceptor altitude; however, bear in mind that closer tolerances may become necessary if the balloon goes up. Become an expert in the area of LAI and the other phases will be a "piece of cake." ★



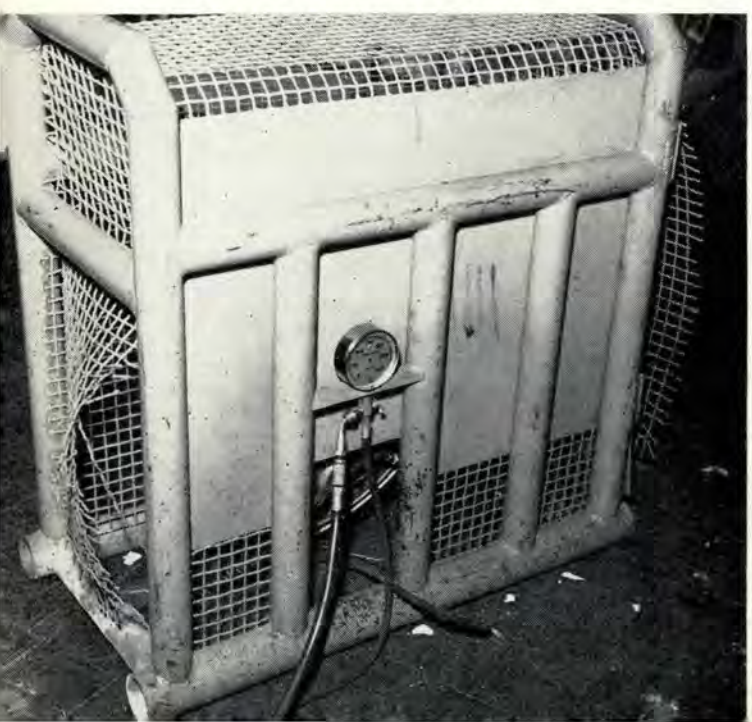
The weapons inventory includes several types of high performance aircraft. Because they fly at fantastically high speed, they also have to land at high speeds. Consequently, the tires on the wheels of these aircraft have to take truly murderous stresses and strains—make no mistake about that. They hit the ground at speeds that can melt rubber, yet they must survive shock that would burst steel drums.

Successful flight operations are increased by this marvelous tire performance, which, in turn, depends on the men who repair the tires and the men who fly the planes. The safety of these personnel and the aircraft and the success of each flight necessitate strict compliance with maintenance and operational tire-safety requirements. These requirements are just as exacting as the performance specifications which the Air Force demands of contract tire designers and manufacturers.

Some important characteristics of improved high performance aircraft design are the ever-increasing weight, landing speed and tire pressure. Tires, like other components, must not be larger nor heavier than needed for successful flight operations. The critical nature of weight, space and shape requirements creates a continuous nightmare for the planners, designers, maintenance and flight personnel. As a result, continuing research and development has produced smaller and smaller tires and wheels. This decreases the weight and space for landing gear and increases the aircraft combat capability. Add to this the uncontrollable or unpredictable landing and takeoff factors—a sudden and powerful crosswind at a crucial moment, critical runway temperature or conditions which jeopardize tire safety but are not visually discernible by the pilot—and it's pretty clear that compliance with appropriate Tech-Orders for each aircraft tire is a "must" for maintenance, flight line and flight personnel.

Let's talk about some representative boners that indicate some of the far-reaching implications of improper tire maintenance which may result in death, injury or damage.

Here is what can happen when a tire is over-inflated. The Airman was uninjured, only because of the protection from the tire cage.



In the first case, an airman was inflating an F-100F nosewheel, assisted by another airman operating a Worthington MC-1 air-compressor. The air chuck was missing from the low-pressure output line. The first airman didn't take time to get a replacement but connected the high-pressure line to the tire. Then he instructed his assistant to open the air valve. A few seconds later, the assistant found that he could not shut off the air. The compressor valve threads were stripped. The tire exploded, critically injuring one of the airmen.

Here are some statements which appeared in the remarks section of the report: Filling any low-pressure container—tire, tank or hydraulic servicing unit—from a high-pressure source is like an open reservation to a hospital or morgue for any number of people. In the case above, the explosion and injury was caused by violating warnings stated in numerous Tech Orders, to the effect that: "Under no circumstances will high pressure air be used for inflating low pressure systems." Daily preventive maintenance inspection accomplished in accordance with T. O. 00-20G-1 would have resulted in replacement of the missing air chuck. Supervision appears to have been inadequate, as indicated by the fact that personnel training and/or maintenance discipline was unsatisfactory. Placing the assembled wheel and tire in a cage type guard before final tire inflation would have minimized the personnel injury potential.

The second case involved two civilians who began breaking down an aircraft tire and wheel assembly following T. O. 4T-1-2 to remount a new tire and tube. After disassembly one of the men visually inspected the flange, lock rim, and the wheel for cracks and over-all serviceability of the parts. They didn't see any defects, therefore reassembly was completed with a new tire and tube. The valve jack was placed on the tube stem and inflation began.

When the tire pressure reached 90 pounds, the men started toward a nearby smoking area for a cigarette while the tire was inflating. The recommended pressure for the tire was 85 pounds. But inflation was continued to remove flat spots. (T. O. 4T-1-3 permits a 50 per cent excess but not to exceed 200 pounds.)

As the men started to walk away, the flange broke under the increased pressure and pieces were hurled 70 feet, crashing through a window. Subsequent inspection of the 1⅛ inch thick flange disclosed a pre-existing ¾ inch deep crack extending around the entire circumference. The lock rim and wheel were undamaged, and the lock rim remained properly seated.

The remarks read like this: Zyglo or magnaflux inspection of the wheels, flanges, and rims before remounting would have detected the crack in the flange. The use of a tire cage guard would have contained the flying flange. Failure to take these precautions accentuates the need for improved supervision.

In the third case, an airman, disassembling aircraft wheels removed the valve cores from four RF-84F

**Filling any low-pressure container–
tire, tank or hydraulic servicing unit–from a high-pressure source is like an open reservation to a hospital or morgue for any number of people.**

wheels. While the tires were deflating, he proceeded to reassemble some other wheels previously broken down and inspected. After completing this reassembly, he returned to breaking down the RF-84F wheels. He had completed disassembly of one wheel and had removed several bolts from the second wheel when the tire blew up in his face.

About the only remark that can be made is that this airman did not observe the following warnings in T. O. 4T-1-2: Paragraph 2.2 states, "Serious injury to personnel can be sustained if any part of the dismounting operation is attempted prior to complete deflation of the tire." Paragraph 2.3 states, "Regardless of the type of wheel, the tire bead must be loosened from the wheel rim flange and bead seat before proceeding with dismounting. This is the most important operation in the entire procedure of dismounting a tire."

In the fourth incident, four men were engaged in dismounting, mounting, and inflating aircraft tires. One of the men was in the process of inflating the first tire that had been remounted on a wheel rim. He noticed two nitrogen bottles nearby and asked the other men if these could be used to inflate the tire. After some discussion, it was decided to use them.

The filler hose on the nitrogen bottle was connected to a high pressure gage which in turn was attached to the valve stem on the tire. Approximately 200 pounds pressure was indicated on the delivery pressure gage. As one of the men reached to remove the filler line, the tire and wheel assembly exploded. All four of the men were injured.

Remarks: Tire inflation should have been accomplished with properly regulated air or nitrogen, and from a filtered compressor and outlet. The safety precaution in paragraph 2-15 b (2) of T. O. 4T-1-2 requires that "Periodic checks of air pressure within the tire, during inflation, will be made to avoid over-inflation."

Paragraph 4-4, T. O. 4T-1-3, requires frequent pressure checks with a pressure gage to obtain required inflation; it also specifies that pressure regulators on service equipment are not to be depended upon to avoid over-inflation. The use of a tire cage guard—in accordance with the safety requirements in paragraph 2-14, T. O. 4T-1-3—would not have prevented the explosion, but it would have given protection to the four men. Here again, the lack of maintenance discipline and knowledge demonstrated in this case points toward management and supervision.

These four actual cases are representative of the needless deaths, injuries, and waste resulting from improper tire maintenance—*before the wheel and tire assembly is installed on the aircraft.* Tragic and costly as these cases are, they are not the whole story of unsatisfactory maintenance knowledge and discipline. Bet you haven't given much thought to that one.

Think for a minute of the fact that wheels and tires, surviving similar maintenance, *are installed on aircraft every month.* Maybe these questions will make some of you wonder a bit:

- How many wheels and tires disintegrate on landing or takeoff as a result of inadequate inspection, over-inflation or under-inflation?
- How many of the men in these planes are killed or injured as result of these malpractices?
- How many planes are destroyed or severely damaged each month because of these types of tire failure?

Under-inflation is a frequent cause of tire failure during landings.

The following report of a landing accident illustrates some of the tire failures which occurred throughout the Air Force during the last 12 months and also indicates the importance of correct inflation:

The tire on the right main gear failed at a landing speed of 120 knots. The plane went out of control and collided with two parked aircraft before it stopped. A gage check of the other main tire and nose tire revealed 18 pounds and 14 pounds under-inflation, respectively.

Following a review of accident facts, it is evident that some tire maintenance personnel are not aware of how frequently their lives and the lives of others depend upon their technical and mechanical competence. Some tire maintenance supervisors are not aware of—or they disregard—some of their most important responsibilities, such as:

- Securing authorized and required tools and equipment.
- Providing competent job instruction, orientation, training and motivation.
- Enforcing effective maintenance controls to insure proper procedures and satisfactory work.

The immediate superiors of some tire maintenance supervisors have failed to insure that their supervisors *understand* and are motivated to accept and fulfill their responsibilities. They have also failed to keep up-to-date on management and maintenance techniques.

I was talking about this problem with one veteran supervisor and here's what he had to say:

"These tire failures don't just happen. They are caused. There is a reason for every one of them. I

PRESSURE • • •

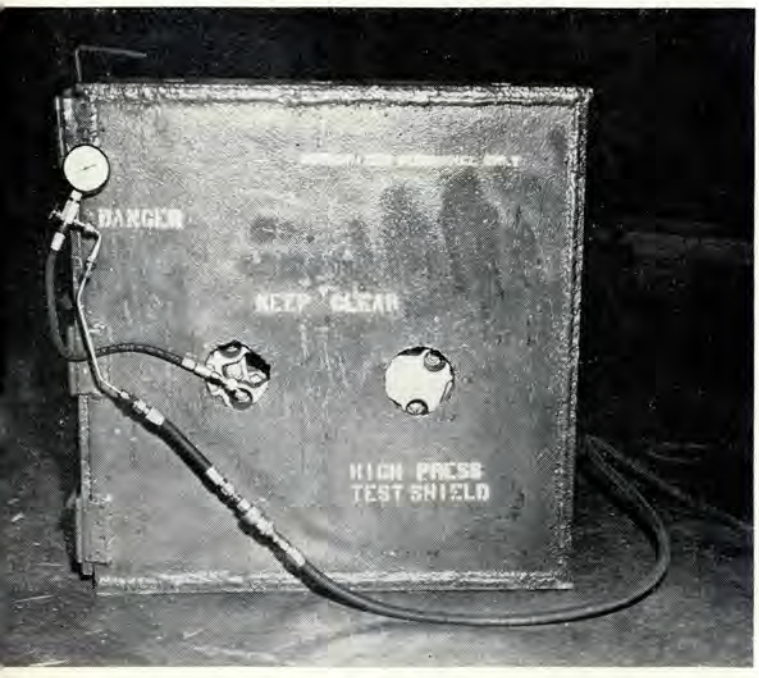
make it a point to observe and study my personnel, equipment and facilities, and to discuss conditions and practices with the men. They frequently come up with suggestions for improvements too.

"Every Monday morning we take about 15 minutes to discuss near-misses and slip-ups of the previous week, and present methods to improve our controls. This is very informal and most of us have a smoke or coffee at this session. We also discuss Tech Order changes, then include them on our posted operating procedures. The initials of everyone are required to show they've read 'em. If someone gets injured, or a wheel, a tire or other piece of equipment is damaged, we discuss it as soon as possible after the emergency is taken care of. We feel that using such hindsight enables us to know a situation or practice that may exist which could cause a serious injury or equipment damage. Also, we know that these things can be found if we look for them systematically and objectively. Whichever it is, it should be identified and corrected before the chain reaction is completed in the form of an injury or property damage.

"In addition to our daily spot inspection we make a *complete* inspection every week. Each man makes an operational check of the compressor, valves, and other equipment to be sure they are working properly immediately before being used. About every two months we have an informal brainstorming session for five or ten minutes; besides being a lot of fun, we usually come up with a challenging idea for improvement.

"While we appreciate the importance of hindsight, we also know that foresight—anticipation of the unusual and planning to tackle it—is a must to insure efficiency and economy. This is another reason we know the correct Tech Orders and manuals must be followed. It's easier, safer, and cheaper."

Another type of tire cage guard referred to in T. O. 4T-1-2. This cage and remote reading pressure gage offer maximum protection.



Another seasoned supervisor with 17 years experience in aircraft tire maintenance puts it this way:

"The greatest deterrent to proper tire and wheel maintenance is not the lack of money, equipment, material or regulation. It's mental. It's the negative attitudes of supervisors and personnel. The most common reason for these undesirable attitudes seems to be a misunderstanding of the meanings of accident and prevention. No doubt you've heard them—same as I have. They are frequently expressed by such views as, 'It's just another accident,' or 'It just happened—no one could help it.'

"Such expressions, with their many variations, are an indication that these people consider an accident something that could not have been foreseen or avoided, or what some of them call fate. Many of these views probably stem from a lack of knowledge or understanding of the facts, or a mental refusal to accept the facts. It is surprising to me how many people consider accidents to be beyond human control. They do not seem to understand that in 98 per cent of the results called 'accidents,' the improper acts or conditions which brought them about were committed, permitted, or ignored by people. And these accidents can also be observed, prevented or controlled by people."

Wherever Air Force management philosophy, policies and safe practices are accepted, accidents are recognized for what they are: the results of poor management, supervisory failure and inefficiency which permit unsafe acts and unsafe conditions to go uncorrected. Everybody has heard about checklists. The pilots have theirs, and here's ours for the tire maintenance shop:

- Do shop personnel have access to all applicable Tech Orders and manuals for the tires, tubes and wheels they maintain, and to the shop equipment they use?
- Have you made certain that the men know, understand and follow proper Tech Order and manual procedures?
- Do you frequently check work practices of your personnel to insure satisfactory maintenance discipline?
- Do you have all the tools and equipment needed for your shop?
- Do you have tire and pressure gages checked at regular intervals—particularly when they've been dropped or damaged—for accurate calibrations?
- Does each man in your crew know the required performance standards for his job?
- Do you insure compliance with the safety rules in AFM 32-3 which apply to your activity?
- Do your personnel ever confuse high pressure tires and high-pressure air? (Par. 2-20A, T. O. 4T-1-2, defines a high-pressure tire as one requiring pressure in excess of 100 psi. Par. 1-8 and 1-9, T. O. 34 Y1-56-21, indicate high-pressure air as air pressure above 500 PSIG.

Good tire maintenance can save lives, aircraft and property. ★

Harry J. Warren, Director of Ground Safety, CONAC, Mitchel AFB, New York

NITROGEN
UNDERSTAND IT · RESPECT IT

Nitrogen. It's an everyday word and there are everyday hazards associated with the use of it. Generally speaking, most people have the impression that nitrogen is completely harmless. They know it is one of the principal constituents of the air we breathe and that it is inert. While it is true that the standard atmosphere consists of 78% nitrogen and 20.95% oxygen, the oxygen content is most critical and essential to sustaining life. When the oxygen in air is reduced or replaced by nitrogen or other gases such as CO_2, man cannot survive very long. This was almost proved recently when two airmen were involved in a nearly tragic incident. Believe me when I say there is a vital need for all missilemen assigned to a launch complex to thoroughly understand such hazards. They must be able to determine that these hazards do exist and they must know how to cope with them—immediately.

The airmen involved in the incident obviously hadn't given a second thought to the serious hazard to which they subjected themselves. The first airman—we'll call him Airman A—entered the LOX storage tank and valve skid pit to close a tricock and stop the flow of liquid nitrogen that was draining from the system. As soon as the draining liquid nitrogen was exposed to atmospheric conditions, it immediately became gaseous —heavily saturated with moisture caused by the temperature change. To the casual eye, the gaseous nitrogen, filling and surrounding the pit, might appear as ordinary fog, or possibly a cloud of gaseous oxygen which most missilemen have by now become accustomed to seeing.

Airman A's first mistake was his failure to recognize this surrounding "fog" as gaseous nitrogen and that such a heavy concentration is a serious threat to any man's life. About the time he reached the tricock, he fell to the pavement. Airman B, who fortunately was nearby, heard Airman A's safety hat strike and rattle around on the concrete floor of the pit. Disregarding the existing hazard, he proceeded into the pit to rescue Airman A. Before he could complete his rescue efforts he too was overcome and fell to the pavement. By this time other personnel were alerted to the emergency and lost no time in getting the two airmen out of the pit. They were promptly removed for emergency treatment and hospitalization. Airman A was in the more serious condition, which is understandable, since he was exposed to a lack of oxygen for a longer period of time. In fact, Airman A was hospitalized for nearly 60 days, while three days were sufficient for his buddy. This incident has convinced those who are familiar with it that the presence of gaseous nitrogen is an omen of danger.

Before any person is permitted to enter an area, room, manhole, tank or vessel that has been or is suspected of having been exposed to gaseous nitrogen, the air must be checked to make sure that its oxygen content is adequate to support life without physical impairment. Since nitrogen gas is colorless, odorless and tasteless, it is impossible to determine its presence without the use of specially designed detection instruments. Therefore, whenever the presence of nitrogen gas is suspected, specific tests must be made immediately to determine that sufficient oxygen exists in the work area to sustain life. This is accomplished with a portable meter which samples the air and provides a direct readout of the per cent by volume of oxygen in the air being tested.

Whenever tests reach less than 19% oxygen in the air, personnel should not be permitted to enter the oxygen-deficient area without special breathing apparatus and employing the buddy system. Most of the portable breathing apparatus affords protection for only a short period of time. It is important, therefore, to know if the unit is fully charged and for how long a period it will protect you before you enter an area with suspected oxygen deficiency.

Up to now we have discussed the hazards and characteristics of gaseous nitrogen (GN_2). However, since liquid nitrogen is initially delivered to the launch sites and is employed extensively, its characteristics should be understood as well. High purity liquid nitrogen is a faint yellow, transparent liquid, slightly lighter than water, weighing 6.74 pounds per gallon. It has an extremely low boiling point of minus 320° F at normal atmospheric pressure. Liquid nitrogen expands in volume when converting from liquid to gas in a ratio of 695 volumes of gas to one of the liquid. This is an important point to remember since a pressure rupture may occur when liquid nitrogen is trapped in a closed system and refrigeration is not maintained.

Nitrogen cannot be maintained as a liquid if its temperature rises above minus 232° F, regardless of applied pressure. Liquid nitrogen trapped between valves in an unvented system can cause violent rupture of the plumbing. Pressure gages must be provided on all closed systems handling nitrogen. These systems should also be provided with pressure relief valves and blowout discs to protect the system.

Personnel assigned to work with liquid nitrogen, be they propellant handlers or system maintainers, must be made acutely aware of the hazards that exist. As previously indicated, liquid nitrogen is extremely cold, yet any spills on the body will produce burns. The extent or seriousness of such burns depends entirely on the size of the spill and the length of time it is left on to freeze skin tissue.

Personnel engaged in the transfer of liquid nitrogen from one unit or system to another, or performing maintenance work on a liquid nitrogen system, should be equipped with impervious outer clothing, heavy, insulated gloves, foot protection and face shields.

Also, emergency deluge showers should be located at all points where nitrogen is transferred into or out of storage tanks. Victims of liquid nitrogen spillage or splashing on their bodies must wash off all spillage and be given medical attention immediately.

The best protection against injury or accidents when working with liquid nitrogen is to understand it, respect it, and protect yourself against it. ★

Lt. Col. Francis G. Morong, Chief, Missile Safety Opns Div, 1st Missile Div, Vandenberg AFB, Calif.

I could tell what my wingmen were thinking while we briefed. "Dobbins would be a good RON stop. At least half of all those shapely GS-3s would be at the Club for the Saturday night hop. So what if the murk was 8 miles thick. We could hack 600 and 2; after all there was good old Savannah forecast to remain 2500 and 5."

Fuel satisfied 60-16, NOTAMS were checked and NAVAIDS looked O.K. A well planned flight, I thought. Those 2nd Louies did a good job on the 21A. Emergency fields were all listed, GCI and GCA sites recorded. The back side was so full there wasn't even room for DF facilities.

Five minutes out of Dobbins, things looked rosy. Our Super-Hogs were skimming the tops at 40,000 feet and Metro stated the weather was improving. "Defrosters on, go channel 15." Looking out at both wingmen tucked in close, I felt a touch of pride when I contacted approach control.

"Heavy traffic in Atlanta area, stand by for holding instructions and expect a possible twenty minute delay," came back and caught me unprepared. What happened to the good old days when they gave jet fighters a priority?

"Unable to hold, proceeding VFR/OT to my alternate, notify Flight Service." I didn't conceal my disappointment.

A quick fuel check showed we were right on schedule. Now to tune in the Savannah range and get a weather check on Travis was the next procedure.

The build-ups were getting higher along this leg, I noted, but Savannah range should be coming in loud and clear by this time; we're only 8 minutes out.

"Sunspot 3, give GCI a call and get a vector to Savannah." I glanced at the pilot on my left and could see he wasn't wasting any time.

Savannah Approach Control came in: "Sunspot flight you're cleared for an immediate penetration and low approach Travis Airport, report over the low frequency range."

"Roger" I was pleading now, "but we can't pick up the range. Will you confirm the frequency 249?" Back came an easy Georgian drawl: "That is affirmative, 249."

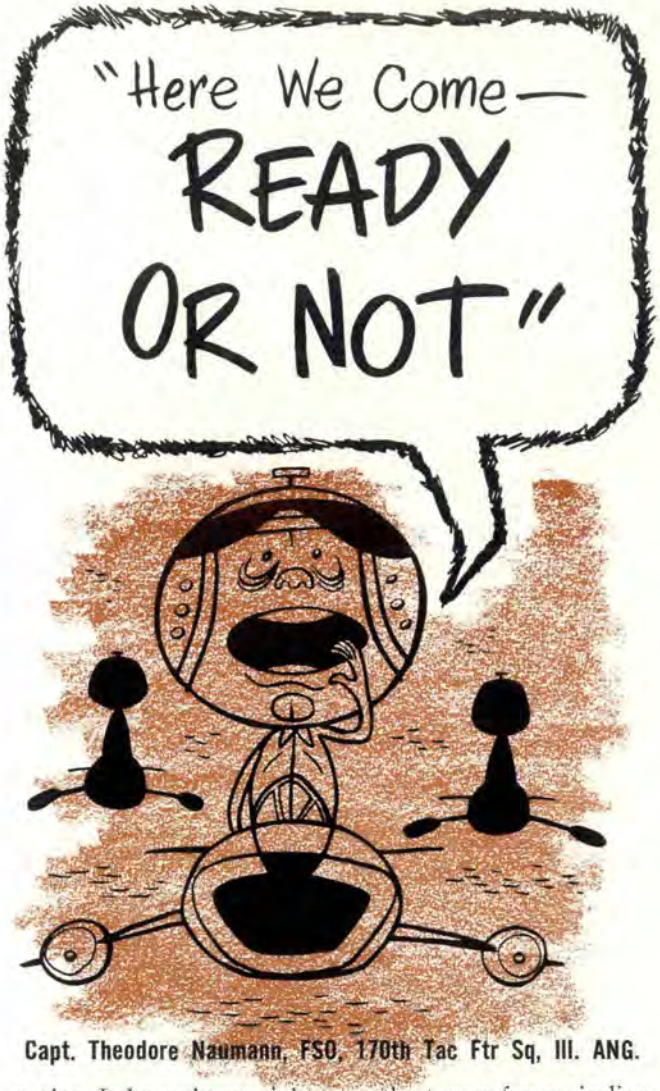
There were three Bird-Dogs wandering aimlessly at this point. (Even the tower didn't know about the 30-minute shutdown caused by the electrical storm.) I tried to check with No. 3 who was still struggling with Stargazer. Obviously radar was painting mostly thunderstorms; I thought "no sense in trying search radar at nearby Hunter AFB either." I continued to crank 249 using antenna, loop and max volume, but with no results. Our ETE was running out when 3 came back and confirmed my suspicions: no radar contact.

It looked like the end of the line when that drawl from Travis tower asked: "Would you like a DF letdown to the Travis Airport?"

"Affirmative," I said and made a stab for the tone button. I heard two mike buttons depressed before I could reach it.

Travis tower "DF'd" our flight through a standard penetration, put us on an inbound course to the field and descended us to minimum altitude where we broke out of a ragged overcast at 400 feet.

It was raining at Travis but the UHF DF didn't notice. It brought us right over the tower for a circling approach.



Capt. Theodore Naumann, FSO, 170th Tac Ftr Sq, Ill. ANG.

How many times have you arrived at your destination and found one or more radio aids unreliable?

Has precipitation static ever clogged your low frequency equipment?

How often has your TACAN or VOR unlocked when you needed it most?

Radar coverage is improving and MTI is eliminating most thunderstorm interference under certain conditions but it is not guaranteed to do the job. You need some more insurance.

DF is admittedly a secondary navigational aid. It is standing by in case you need it. The question is: Will you be ready or not when the time comes?

Check your rating with the DF quiz.

- **Do you list the DF facilities with the emergency fields on your 21A?**
- **Do you always have a DF frequency set up for instant use?**
- **Do you know the standard DF letdown procedure for your base?**
- **Do you know your aircraft's DF equipment?**
- **Do you practice DF?**

Ed. Note: For Base Commanders Only—Have you established a DF letdown procedure for your base?

✓ CHECKLIST ✓

In the December 1960 issue of Aerospace Safety we published a story called "True Automatic Start." A portion of the story dealt with a proposed T-33 modification that would allow the pilot to flip a single switch to get an airstart if the bird was flamed out. This modification would eliminate the most complicated airstart procedure of any Air Force jet aircraft.

Briefly, the single "Gang-Start" switch supplements and over-rides the existing fuel and engine control switches to simultaneously gangload the fuel booster pumps, actuate the airstart ignition system, turn the starting fuel control "ON" in the automatic position, switch to the emergency fuel system and actuate the fuel de-icing system through the airstart ignition time delay relay.

The installation of the "Gang-Start" switch will eliminate the need for a pilot to make a check of several instruments and switches to determine the cause of flameout, and then locate and actuate a different group of switches in a prescribed sequence at a time when the pilot is subjected to the stresses of an extreme emergency.

Now for the good news. We're actually going to have the "Gangload" switch on our 2940 T-33s, and before too much longer. The modification has been approved all the way up and down the line. Modification kits should be made available starting this month. Completion date is expected within 6 months. Hallelujah!!

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In case you didn't receive or hear about HqUSAF Message AFOOP-FD-AC 1488/60, here it is:

Unreadable TACAN Identification Signals. Navy reported at a TACAN steering group meeting that some TACAN identification signals are unreadable. A recent accident investigation listed this as a contributing factor. No malfunction reports have been received at this Hq; however, pilots may have encountered this discrepancy without filing a report. The usual discrepancy is a tone signal in lieu of dots and dashes. Request a survey of your flying units be conducted to determine whether unreadable TACAN identification has been encountered. The date, location of occurrence, faulty facility, number of times encountered, and type aircraft should be stated, if known. We are desirous of providing a fix if this discrepancy is prevalent.

• • •

The following is a Navy pilot's account of a GCA landing made all the more hairy by a sticking altimeter. The aircraft involved was not a transport, but that fact is only incidental to the experience. What is of interest is the pilot's "from-now-on" statement. The experience also serves to emphasize the importance, where transports are concerned, of pilots constantly cross-checking altimeters during descent. His report reads:

"While making an actual GCA to the base, I was cleared to descend to and maintain 2400 feet until reaching the glide slope. I descended at 1300 fpm and 150 knots as recommended on the approach plate. I leveled off (I thought) at 2400 feet; at least my altimeter appeared to be holding steady.

"The GCA controller told me I was slightly below my assigned altitude, but because of my altimeter reading I continued on the same power setting. The next transmission from GCA told me I'd gone off the bottom of their scope and to execute an emergency pull-up.

"I went into afterburner and began a max angle climb. It was then that I noticed my altimeter still indicated 2400 feet! I hit it with my fist (sometimes referred to as a 'first rule of troubleshooting'). That freed the needle and it unwound and caught up passing through 1500 feet. All this still in the soup!"

The pilot closed his account by simply stating that the mountains east of the base extended up to 1400 feet, that he'd scrambled back to 2400 feet and finished the GCA to a successful landing, and that "from now on the rate-of-climb will be included in his instrument scan, even when holding an assigned altitude."

Investigation disclosed a burr in the altimeter had caused it to stick at 2400. (Flight Safety Foundation)

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With Military Flight Service rapidly disappearing and the subsequent loss of a clearing agency for flights from non-military bases it was natural that the clearance authority portion of AFR-60-16 would be changed. Here is how paragraph 43 will read:

"(1) Command and senior pilots and pilots possessing current AF Form 8A (green card) for their own flights and flights by pilots of aircraft in formation which they command.

"(2) All pilots—for their own flights, and flights by pilots of aircraft in a formation which they command, when departing installations not providing a military aircraft clearance authority capability. Organization commanders will judiciously exercise authorization for assigned and attached pilots, not possessing clearance authority prescribed in paragraph 2A above, to use airfields not providing a clearance authority capability.

"(3) Air Force commanders—for flights from installations under their jurisdiction for pilots not possessing clearance authority."

• • •

Here's the story of an odd happening sent to us by Captain Milton Stein, Flying Safety Officer at Chanute AFB, Ill. A T-33 from a southern coastal base prepared to land at Chanute. On first approach to landing the pilot declared an emergency due to an unsafe left gear indication in cockpit. A successful go-around was accomplished and on second pattern all landing gear indicated safe. After parking aircraft, a visual check of the left gear and wheel well revealed a seven-inch frozen land crab up in the left gear well, outboard

and forward of the left main landing gear actuating strut. The aircraft was placed on red cross and a thorough inspection and gear retraction accomplished. During the inspection it was ascertained that the position of the land crab in the left gear well could not have given an unsafe gear indication. However, this could constitute a definite hazard in other sections of the aircraft. Darn right, what if that rascal had made it to the cockpit?

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During December 1959 an incident occurred in which the crewmember received painful burns to the hands. The injury was aggravated by the shrinking of the B-3A flying glove over the bare hand. As a result of this accident DIG/Safety stated that the severity of the burns could have been reduced had the pilot been wearing cloth inserts that were designed to be worn with the glove. It was recommended their use be made mandatory. Headquarters ATC indicated that the insert-glove combination cannot be satisfactorily utilized because their inserts tend to bunch and wrinkle, thereby reducing manual dexterity.

The following information subsequently furnished by Headquarters WADD is quoted:

• The glove inserts, nylon, Specification 8415-269-0501 were developed for use with an intermediate temperature range glove assembly which consists of a five fingered leather outershell and five fingered wool insert. The nylon inserts are intended to afford maximum dexterity and protection to the hands when the two piece assembly is removed in extreme cold conditions, to manipulate or adjust instruments or tools.

• The type B-3A Leather flight gloves were developed to satisfy requirements for a summer flight glove with maximum dexterity and sensitivity. The gloves are sized to fit tightly over the bare hands. The use of the nylon inserts with the glove would require a larger size of the B-3A glove to prevent bunching and wrinkling. This would result in a loss of dexterity and sensitivity. Since the nylon insert does not absorb moisture it is possible that there would be some slippage on the hands. The use of the insert would not add appreciably to the thermal protection. The use of the nylon insert with the B-3A glove would provide more protection than the B-3A alone, provided the heat was not great enough to seriously affect the leather. Flames or heat intense enough to shrivel and/or penetrate the leather would fuse the nylon at the point of penetration.

• The current developmental efforts are to produce a fabric glove with an all-leather palm and fingers. The glove currently being evaluated is the same design as the B-3A glove and sized in the same manner.

In view of the above it is concluded that, although inserts are available for issue and offer additional protection from the effects of heat and cold, their use should be left to the discretion of using activities. The tests were to have begun last October. Aerospace Safety would welcome reports from anyone who may have given the new glove a trial.

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B-57 Rudder Boost—A rudder assist system is being installed in all B-57A, RB-57A, RB-57B, B-57B, B-57C, and B-57E aircraft. The system is unique in that its operation is governed by rudder torque tube

twist. It is a relatively simple hydromechanical system which sleeps until the pilot applies approximately 100 pounds of force to the rudder pedal. It was designed to effectively reduce single engine minimum control speed, without affecting any of the other flight characteristics of the B-57. Where 12 degrees of rudder deflection was all that a pilot could muster at 155 knots, full rudder deflection or 25 degrees will now be available for emergencies.

The new rudder assist system is simple. It consists of an accumulator, a hydraulic cylinder with a slide valve and necessary plumbing. To understand its operation you must be familiar with the torque tube and blow back rod system in the controls of B-57 aircraft. The torque tube provides artificial feel and the blow back rod prevents over-controlling at high airspeeds. A simple explanation of the control system would be that the pilot flies servo tabs, and they, in turn, fly the control surfaces. The control linkage to the rudder is connected to the trim, or servo tab, through a slot in the rudder control lever.

When the tab is fully deflected, the control contacts the end of the slot giving the pilot direct connection to the rudder. The new rudder assist slide valve uses the play in the slot (torque tube twist) to govern operation of the rudder assist system.

The hydraulic cylinder is attached to a rudder bellcrank and its piston is connected to aircraft structure. The slide valve is housed in the cylinder and is connected to a bellcrank in the control linkage to the rudder. Any differential of movement between the rudder and the control linkage is measured by the slide valve. When the torque tube twist is about six degrees, the slide valve is cracked open allowing hydraulic pressure to the cylinder. Approximately 100 pounds of rudder pedal force is required to twist the torque tube enough to crack the valve.

The output of the cylinder was selected to provide full rudder deflection at low speeds. Since force output of the cylinder is constant, air loads greatly reduce rudder deflection at high airspeeds. The aircraft will be placarded against rudder kick maneuvers above 250 knots indicated airspeeds.

Operation of the system is so smooth that pilots state they cannot feel the power assist coming into operation. The new rudder assist system is expected to drastically reduce single engine accidents, which have accounted for more than 60% of all fatal B-57 accidents. ★

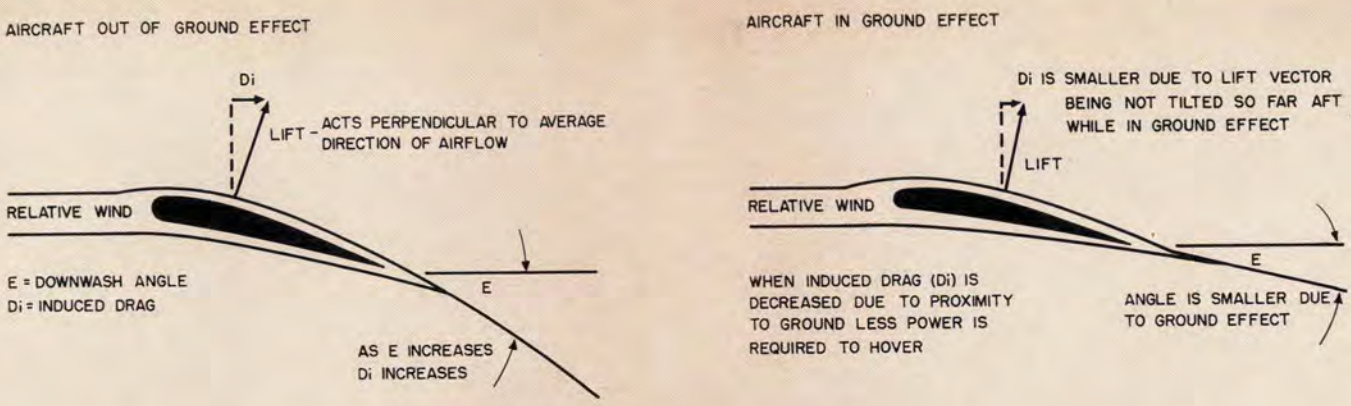

FIGURE ONE

CHOPPER CHATTER

Major James F. Fowler, Cargo Branch, DFSR.

It has been said that "In the springtime a young man's fancy turns to thoughts of love." Maybe so, but it is also the time for young and old helicopter jockeys' thoughts to turn to warm and hot weather 'copter operations. Unfortunately, the same problems coming up this year have existed for years. In this vein, the Directorate of Flight Safety Research transmitted this message to all major air commands. It's in two parts and the first reads thusly:

A review of two recent major helicopter accidents revealed the following conditions:

- Equipment installed or removed from aircraft and no entry made in the weight and balance handbooks.
- Tool boxes, ladders and other miscellaneous equipment left in aircraft, not included in computations for weight of aircraft.
- Inadequate flight planning by pilots, based on the fact that actual operating weights of aircraft were not determined; also expected performance of aircraft was not computed by using data contained in applicable flight manuals.

The second part of the message recommended the following action be taken:

- That entries in weight and balance of handbooks for each helicopter be checked by physical inventory.
- Miscellaneous equipment carried on aircraft be included in computing Form "F."
- Prior to each flight, pilots be required to compute expected performance, using the data contained in applicable flight manuals.
- Pilots on alert for scramble type missions should compute expected performance for the most extreme conditions anticipated during period.

While we're on the subject of helicopter accidents, I'd like to quote an article from the September 1960 issue of the U. S. Naval Aviation Safety Center Magazine. It's entitled "Ground Cushion???" and is pertinent and informative.

"To the average helicopter pilot, ground effect is due to packing air between the rotor blades and the ground. This builds a cushion of dense air which enables the bird to hover with less power while close to the ground. There are others, however, who don't believe that this is the case at all. The following is *their* view:

"There is no such thing as a ground cushion of dense air while hovering close to the ground. A fair and logical question is generated by that statement: 'Why does the helicopter seem to roll off of the cushion and require additional power to keep from settling in when going to forward flight from a hover?' This seems to be incontestable proof that such a cushion does exist. But does it? Let's look at facts.

"In flight training we learned that up to a point, lift increases as angle of attack increases. As angle of attack increases there is a drag generated by the increased lift called induced drag. This induced drag varies as the square of the lift and is caused by the downward flow of air aft of the trailing edge of the wing. The greater the angle between this downward flow and the relative wind, the greater is the induced drag which acts parallel to the relative wind. Now when a wing (or rotor blade) is near the ground, the airflow over the wing is altered because the air velocities cannot have a vertical component at the ground plane. The result is that the required lift is derived with less net downward deflection of the airstream. When the downwash angle is thus reduced, the lift vector is not slanted back as much, and there is less induced drag. (Figure 1.) The slight loss of lift when moving into forward flight is caused by tilting the rotor, thus forcing the thrust forward, to get an accelerating force. As thrust force is generated, lift is sacrificed and an increase in power becomes necessary to keep from mushing into the deck. It's a case of robbing Peter to pay Paul. The only way to regain the lost lift then is to come in with more power." ★

FALLOUT

LETTERS TO THE EDITOR

Air Operations U.S. Forest Service

The Chief's Office and some U.S. Forest Service regions that use aircraft extensively, subscribe to the Aerospace Safety Magazine. These few copies are circulated as much as possible to our personnel.

The November 1960 "Survival" issue has many excellent safety articles. Two of them, "Vice Versa" and "Fatigue" have a close relationship to the problems we are encountering in our air operations. In an effort to improve our air safety we would like to obtain and distribute additional copies of the November issue, or reprints of the two articles mentioned, to all our pilots and key contact personnel. This would require 50 copies or reprints. If these are not available, may we have your authorization to reprint the two articles mentioned?

We will greatly appreciate any help you may be able to give us.

Merle S. Lowden, Director
Div. of Fire Control
U.S. Forest Service

Glad to oblige! Copies are in the mail.

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Recognition For The AO

I've just read the comments on the AO, on the back cover of the December 1960 issue of Aerospace Safety Magazine. As an "experienced" AO, I have observed too often that the AO Report is hardly ever acted upon. It ends up with an A2C for filing as soon as it has been signed by the Airdrome Officer. Is it any wonder, then, that some AOs don't appear too eager in their performance of duty? What recognition is there for a job well done? All too often he is used only to catch h... from someone for discrepancies completely beyond the realm of responsibility of the Airdrome Officer.

The gap that needs plugging will not be taken care of by permanent assignment or a prolonged tour alone. The Airdrome Officer must be made to feel that he is performing a very important duty. Give him a place to work. Give him responsibility; provide suitable sleeping quarters, arrange for relief during messing hours, and, finally, direct the Operations Officer to take action on the recommendations in the AO's report.

Capt. Harry B. Brown, Jr.
1961st AACS Gp, APO 74 San Francisco

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Electronic Secretary

Dial Skyline 4-2222—at any hour of the day or night! That's all you have to do at Elmendorf AFB to turn in an Operational Hazard Report. Reporting an OHR from any Air Force installation in Alaska is that easy, thanks to a suggestion that was turned into the 5040th Air Base Wing and the 5070th Air Defense Wing Offices of Safety. All of this came about in September 1960 when an "Electronic Secretary" was installed beside the desk of the Flying Safety Officer. This automatic device is a telephone actuated recorder, Model DCR-1, made by Electronic Secretary Industries, Inc. The machine consists, basically, of a modified record player, a wire recorder, an amplifier and loud speaker. A vinylite record, containing a standard message, recording period and sign-off message, is utilized. This record is the timer for the entire operation. The wire recorder, which starts immediately following the tone signal, will accept messages up to a total of about 60 minutes, after which the machine will not respond to incoming calls. The automatic restoral of the record player arm, after completion of the sign-off message, electrically resets the machine, releasing the line for the next incoming call. With an assist from an engineer from the local AFRS station, a two-minute recording sequence record was cut especially for the Offices of Safety. Cost of the machine is approximately $500.00.

Use of the Electronic Secretary has cut the receiving and processing time of OHR's to an absolute minimum, plus the added feature of enabling the person submitting such a report to "strike while the iron is hot" without recourse to even picking up a pencil. Prior to installation, OHR's received by the Offices of Safety averaged approximately six per month. Now the monthly average is 12 to 15 per month! Flying safety hazards never before revealed have come to the immediate attention of the Offices of Safety, and it is believed that the machine has already more than paid for itself in improving the effectiveness of the overall OHR program. Some OHR's

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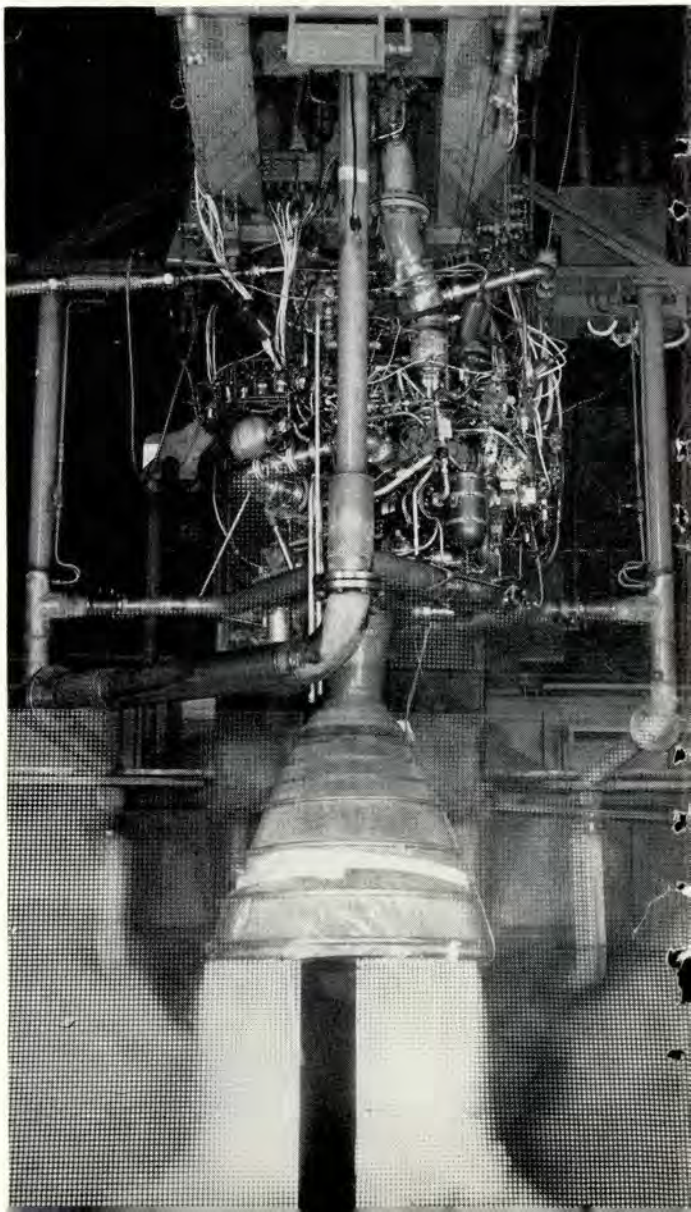
A closeup view of a static firing of a Titan second stage engine, as seen through the protective screen at the Aerojet-General Corporation's facilities, Sacramento, California. The second stage engine is the largest space started rocket engine developed in the free world.



have had corrective action within two days from the initial call to SK 4-2222.

Other useful applications of the Electronic Secretary have been made, such as a current program of utilizing the device to report communications difficulties throughout Alaska. Information went out to all Alaskan Air Force installations to report these difficulties in the same manner as an OHR, except for the initial phrase of the report being *"This is not an OHR."*

The Electronic Secretary is working 24 hours a day for the Offices of Safety, ready to receive and record any message of interest to the safety program. The corrective action taken on OHR's is published monthly in the Elmendorf's Safety publication "SASS" (Selected Alaskan Safety Subjects).

The Offices of Safety at Elmendorf AFB wish to pass this information on to other bases, so that they might incorporate this form of OHR reporting to improve their safety program.

Capt. Albert T. Keeler
FSO, 5070th Air Defense Wing
Alaskan Air Command

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Come Up And See Us Sometime

This is an invitation to pilots to climb those 90 odd steps in your local control tower and meet the other part of the team that keeps you flying. Here at McChord and at most other bases around the globe, the tower, RAPCON and GCA are manned by AACS personnel. Our mission is to provide a safe, expeditious flow of air traffic 24 hours a day. You, the pilot, can make our job an easier one.

The tower is the center of operations for the "traffic cops" of the control zones and airdromes. A crew of two or three men usually operates the control tower. Their duties require a keen sense of judgment, complete control of reflex actions and extreme taxation of all the senses. A few minutes in the tower to observe the operations in progress will leave you with a deep appreciation of this vital link in the chain of aircraft control.

Both the GCA and RAPCON are equally important sides in the triangular chain of aircraft control. Their primary duties are control and separation of aircraft plus the coordination of aircraft facilities. Many lives have been saved by an alert operator vectoring an aircraft to an alternate field in bad weather or under emergency conditions. From the first pass or pullup to the final approach—during such conditions as stray dogs on the runway (and deer at one base) or unforeseen emergencies—your Air Traffic Controller sees to it that you "return safely to fly again." Why not visit your local tower or radar facilities today? Your time will be well spent. Quite often Controllers are invited or required to attend flight briefings. They learn more of what's happening in regard to pilots and aircraft missions, and good relations between pilots and controllers are cemented in this way. Why not keep the ball rolling in both directions? You, the pilot, will find enlightenment, interest and information at your local control tower and radar center. At the same time you will be doing *your* part to cement good relations with the AACS team, thus assuring safe accomplishment of the mission. Stop by soon.

MSgt Harmon McKnight, USAF
1905th AACS Squadron
McChord AFB, Washington

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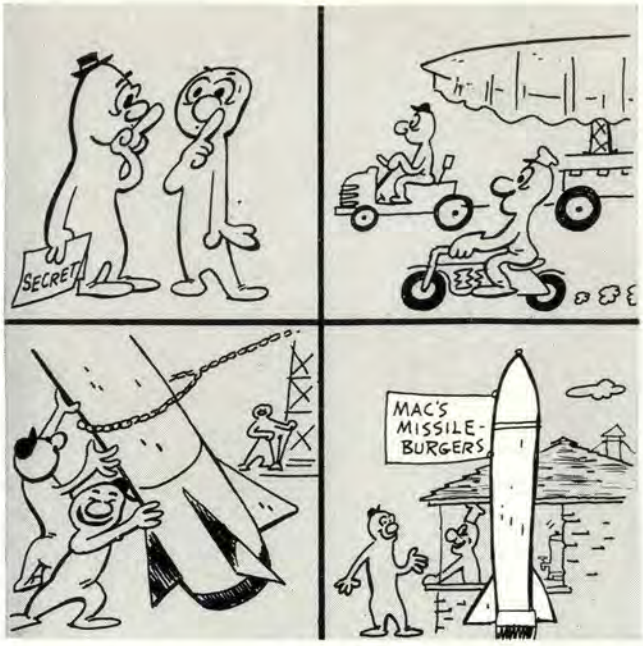
Altimeter Setting

Whoever arbitrarily decided that 24,000 feet msl should be the flight level at and above which all altimeters should be set on 29.92 obviously didn't realize that this is the *only* altitude at which the Kollsman altimeter installed in the B-47 aircraft cannot be set. The triangular shaped index on the 10,000-foot pointer very effectively blocks out the Kollsman setting index. This would seemingly necessitate improvising in one of three ways:

- Set the altimeter before passing through FL 240 (illegal).
- Set the altimeter after passing through FL 240 (again not legal), or
- Approximate the setting.

None is really satisfactory. I am certain I'm not the only one who has on occasion forgotten to set it accurately after



approximating the setting while passing through the checklist altitude, and has subsequently flown for a considerable length of time without the correct setting in the Kollsman window.

Some of the pilots in our squadron have discovered (I can not claim any credit for this personally, but would like to pass it on for what it may be worth) that the correct setting can be set in a rather simple manner at FL 240: Using the 200-foot mark on the outside dial as an index, set 28.82 in the Kollsman window when climbing through FL 240. When descending through FL 240, substract .10" from the correct altimeter setting (e.g., if altitude setting is 30.07, use 29.97), and set it opposite the 220-foot index. It works.

Have you any suggestions or comments?

369th Bomb Sq (SAC) MacDill AFB, Fla.
Capt. William G. Pierson

We've experienced the same difficulties, Capt. Pierson. Thanks for your comments and the suggestion from the 369th. Other high altitude jocks, please note. Sounds like a real good idea. Any better suggestions?

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Pilot's Knee Board

A few months ago I was informed by the UR Control Unit that unsatisfactory items will no longer be UR'd unless they involve safety of flight. I believe that I convinced them that the new (the latest I've seen) all-metal, pilot's knee board is detrimental to safety of flight. They copied the information necessary for the Unsatisfactory Report. This item must have been bought almost "sight unseen," since the only thing that worked properly on the two new ones I tried was the elastic strap. Here is a list of some of the defects:

- (The major hazard.) The spring clamp is too weak and exerts its force in such a direction as to push cards, checklists, and the like, *out of the clamp* rather than holding them in.
- Neither flashlight could be made to work by me nor the Personal Equipment people. We finally gave up.
- The lens holder, apparently made of pot metal and *glued* on, fell off of one.
- The pencil holders lost their springs almost immediately so that extra pencils could not be carried.

Since this knee board will not hold a letdown chart (as the old plastic one I had for five years would), a metal plate is being installed in the rear cockpit of some T-33s here for that purpose. This is progress?

Maj. Carleton B. Latimer
Chief, Flight Test Section
Manned Intcptr, WSPO, Hq WADD


← FIX LIFT
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