DECEMBER 1958

FLYING SAFETY

UNITED STATES AIR FORCE

STANDARDIZED????

SUBSCRIPTIONS—FLYING SAFETY is available on subscription for $3.00 per year domestic; $4.00 foreign; 30c per copy, through the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Changes in subscription mailings should be sent to the above address. No back copies of the magazines can be furnished. Use of funds for printing this publication has been approved by the Secretary of the Air Force and the Director of the Bureau of the Budget, 18 July 1956. Facts, testimony and conclusions of aircraft accidents printed herein have been extracted from USAF Forms 14, and may not be construed as incriminating under Article 31 of the Uniform Code of Military Justice. All names used in accident stories are fictitious. No payment can be made for manuscripts submitted for publication in the Flying Safety Magazine. Contributions are welcome as are comments and criticism. Address all correspondence to Editor, Flying Safety Magazine, Deputy Inspector General, USAF, Norton Air Force Base, San Bernardino, California. The Editor reserves the right to make any editorial changes in manuscripts which he believes will improve the material without altering the intended meaning. Air Force organizations may reprint articles from FLYING SAFETY without further authorization. Prior to reprinting by non-Air Force organizations, it is requested that the Editor be queried, advising the intended use of material. Such action will insure complete accuracy of material, amended in light of most recent developments. The contents of this magazine are informational and should not be construed as regulations, technical orders or directives unless so stated.

VOLUME FOURTEEN • NUMBER TWELVE • USAF PERIODICAL 62-1

CONTENTS

Melted engines—the product of muddled procedures.

THE EDITOR'S VIEW....

"Standardization," our theme for the month of December, brings to mind a comment made by Ben O. Howard in 1953. In essence, it went like this:

"The prime requisite for greater safety is a willingness to do those things that our records clearly establish as being an effective means of preventing the various types of crashes . . . "

Many of the "old-heads" around the Air Force will recall that by 1953, "Benny" had spent many years studying aircraft accidents, their causes and methods of preventing them. Much of this time was spent under contract to the Air Force and much of it on his own. During the years preceding this statement, "Benny" had made many recommendations on accident prevention, covering almost the full gamut of operations from design to completion of combat missions. It seems singularly important therefore that after years of intensive study he should have epitomized his work with this single statement.

A little thought, and perhaps another look at what he said, will show you why he could make just one recommendation to cover the whole field of aircraft accident prevention. It reaches every person and operation in the Air Force as well as those who support it from industry. For Commanders and Supervisors, the lesson should be obvious. For the most of us—pilots and crewmembers—the key lies in the phrase, "a willingness to do." Few of us are so naive that we do not know the basic requirements of our flying job. The ultimately basic one is to know the machine and the prescribed rules for operating it. The next most basic is to follow those rules.

Aircraft and equipment nowadays are being designed and built to provide the ultimate in safety and performance. As we have made increasing demands on performance of the machine, we have made increasing demands that Regulations, Technical Orders and SOPs be written to provide you with accurate information on how to attain these ultimates. This they can do, but only to the extent that you know them and are "willing to do," or follow them.

This, in the final analysis, is "Standardization."

CROSSFEED

LETTERS TO THE EDITOR

Collision Alert

I've just read a flying safety message regarding two B-52s that collided while in a traffic pattern. At my previous station we used a call sign that we thought was very effective to reduce this midair collision problem. The call signs used by traffic controllers when two aircraft appeared close were "collision alert final" or "collision alert base", whichever applied.

The pilots' response to these call signs were to hold altitude and heading until visual evasive action could be taken. The proper response to a "collision alert" eliminated the possibility of descending or turning blindly into another aircraft, which so often has been the cause of midair collisions near an air base.

Would this procedure have prevented the B-52 accident and saved 13 lives?

Capt. John J. Hill, USAF
320th Air Refueling Sq
March AFB, Calif.

Could be. Somebody has to say something.

★ ★ ★

One-Way Traffic Airways

I've just finished reading with a great deal of interest, the article "The Air Is A National Resource" *(AIR TRAFFIC)* in the September issue of FLYING SAFETY Magazine.

I have worked in AC&W for four years and understand some of the problems facing our civil and military air traffic control administrators. The problems arising in airway traffic are certainly among the most difficult. Very often in the search for a solution the answer is sometimes lost in the entanglement of complexity. Particularly so, in the case of bringing to a minimum the possibilities of midair collision.

It is a fact that if two aircraft were on a collision course at 600 mph, these aircraft, four seconds before the point of collision, would be one and one-third miles apart. *If* all the steps in the human-machine-perception-response sequence were executed precisely, a collision *could* be avoided.

If excessive time were taken in any one of these steps, a collision *would* be inevitable. The best way to prevent a situation like this is to bring to a minimum the number of aircraft that would pass each other at a relatively close distance.

With this in mind, I should like to suggest the creation of one-way traffic airways. Much of the congestion on the airways could then be alleviated, and another result would be more stacking space.

For example, instead of having one airway for East and West bound traffic from Los Angeles to Denver, you might have two airways, 40 miles apart.

True, you'd need twice as many radio facilities, check points, and so on, but with the expected air traffic growth, in 10 or 15 years from now there will probably be twice as many aircraft, thus necessitating the need for more facilities.

May I have your opinion?

T. A. Gehrke, A/2C
4510th AB GRU, Luke AFB.

Sounds good, but perhaps there isn't that much space left up there. No doubt the AMB has considered this, and may make limited application. It's a tough one.

★ ★ ★

Fooey.

About the "Gloomy Sunday" in the October issue of FLYING SAFETY, fooey!

This controller'd better give up. With ten years experience he descends an aircraft IFR without elevation contact on final, and with all this experience he should know that "frantically servoing up and down" would have absolutely no effect on the elevation display. (Up and down servoing moves the azimuth antenna only.)

I think the pilot must have been dead before he made his letdown. Being IFR, he would have been given an altimeter setting at each check point along the way. Then GCA gave him an altimeter a full inch off. He says "Roger" and happily cranks up his new setting on the altimeter. He has to twist the adjustment knob about 15 times but he doesn't get suspicious. Fooey!

A. A. Jekel
GCA Field Engineer
Killeen, Texas

The things people do in moments of complacency and panic are amazing, aren't they?

★ ★ ★

Ole!

In the October issue of FLYING SAFETY, the article by T/Sgt. Perkins entitled, "Gloomy Sunday" was of particular interest to me as I was stationed with Sgt Perkins in England for three years.

I would like to point out some of the ways in which Air Traffic Controllers use in order to prevent erroneous transmission of altimeter settings. Having been in the Air Traffic Control business for almost 12 years I have personally formed a habit of requesting a confirmation on the altimeter setting any time it changes by .02 hundreds inch or more from the last altimeter received. As a further caution against erroneous altimeter settings, AACSM 100-1 requires Air Force Traffic Controllers request the weather station provide a new altimeter setting every fifteen minutes if the altimeter changes by .04 hundreds inch or more in an hour, until the barometric pressure stabilizes.

To prevent pilots from misunderstanding and setting erroneous readings into their altimeter when the station pressure is below 29.00 inches of mercury, controllers are required by AACSM 100-1 to have the pilot read back the altimeter.

I would like to compliment Sgt Perkins on a very fine article.

T/Sgt Robert A. Sanders
1960th AACS Sq, FPO 824
San Francisco.

Like we've said all the time, the whole bunch of us together CAN find the answers.

★ ★ ★

Teamwork

This Wing is scheduled for deactivation and the problem at hand borders on the possibility of pilots and other personnel becoming disinterested in their daily duties.

Captain Frank W. Shipman, Jr., Director of Flying Safety for the Wing, has illustrated very well the important point of maintaining the same vigilance required during past operations to insure a happy ending to the game. Captain Shipman likens our flying safety program to baseball. Casey Stengel closed the baseball season, but teamwork is always in season.

"Our flying safety program is like baseball in many, many ways. Our season can be compared to a typical game, our pilots and maintenance personnel to a team and our support echelons to the fans.

"We started the season with some losses but the team came on fast and the fans have been giving their spirited support. Despite rumors (that have since been corroborated) that the team is losing its franchise, it has built into a league leader. The fans continue their loyal support. True, we've lost some fine players but the bench load of rookies came through. Many of the players are going to other teams next season, some are going to foreign circuits and a few will undoubtedly be put up for the waiver price or retained by SAC (San Augustine Clippers of the senior circuit).

"Now we're playing the last game. We've gotten through two innings without an incident and the hierarchy seem awfully pleased at this. But, you know in baseball when you're pitching faultless ball you aren't supposed to say anything until the game is over. The pitcher certainly looks strong. The whole team is in good shape and if they just continue to play as a team we'll win it, I'm certain. What's more, I'm betting on 'em.

"I have a request of you fans, though. Don't heckle the players even if you feel more fortunate than they. And for cryin' out loud, show your appreciation by staying until the final out. Now eat your popcorn!"

Col. John C. Haygood
Deputy Commander
31st Tac Ftr Wg, Turner AFB.

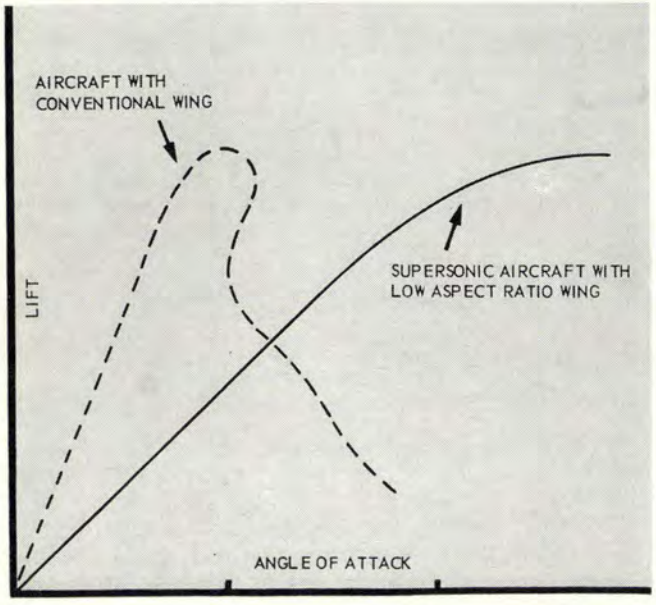
Spinning the F-104

The most difficult part of the F-104 spin program appears to be the composition of this article. Its purpose is not to encourage anyone to rush out and conduct his own investigation of the stall-spin characteristics of the F-104. Instead, it is intended to give you the straight word as to what has been done along this line in accordance with the best specifications laid out by the USAF, and to recommend a procedure to be followed, in the event you should inadvertently encounter a spin.

To begin with, despite its rather radical appearance, the '104 obeys the same rules as its ancestors did, as far as stick and rudder are concerned (to go UP, pull back on the stick; to come DOWN, pull back, farther). Even the spin recovery—if you should manage to accomplish this unlikely and somewhat revolting maneuver—is conventional: rudder against and forward stick. Aileron with, is helpful but not necessary. In fact, most recoveries were made with forward stick alone and some recovered while pro-spin control was still applied.

The F-104 is beyond a doubt the most pleasant handling piece of flying machinery that has taken to the air since its grandfather, the F-80, launched the jet age back in 1944. Subsonic or supersonic, anywhere in the operating envelope of the aircraft, the response to control is conventional; in fact, the average pilot will be hard-pressed to say whether he is sub or supersonic without referring to the Mach meter.

FIGURE ONE.



The one exception to this is at the stall. The F-104 configuration continues to produce lift at angles of attack that would result in a fully developed stall of a more conventional aircraft. (See Figure 1.) When angle of attack is increased beyond the usable range, the aircraft reaches the neutral stability boundary and will eventually pitch-up without further help from the pilot.

This phenomenon is not peculiar to the F-104 but is also present in some of the swept-wing jets of recent years. Unlike the swept-wing aircraft, however, the '104 does not pitch-up because of wingtip stall at high angles of attack. It is caused by lift from the long fuselage forward of the wing, and an even more powerful force, the impinging of the turbulent wingtip vortices from the short, low aspect ratio wing on the horizontal stabilizer at extremely high angles of attack. (See Figure 2.)

Lockheed recognized this problem in the early development phase of the flight test program of the XF-104 and developed a warning system to enable the pilot to deter-

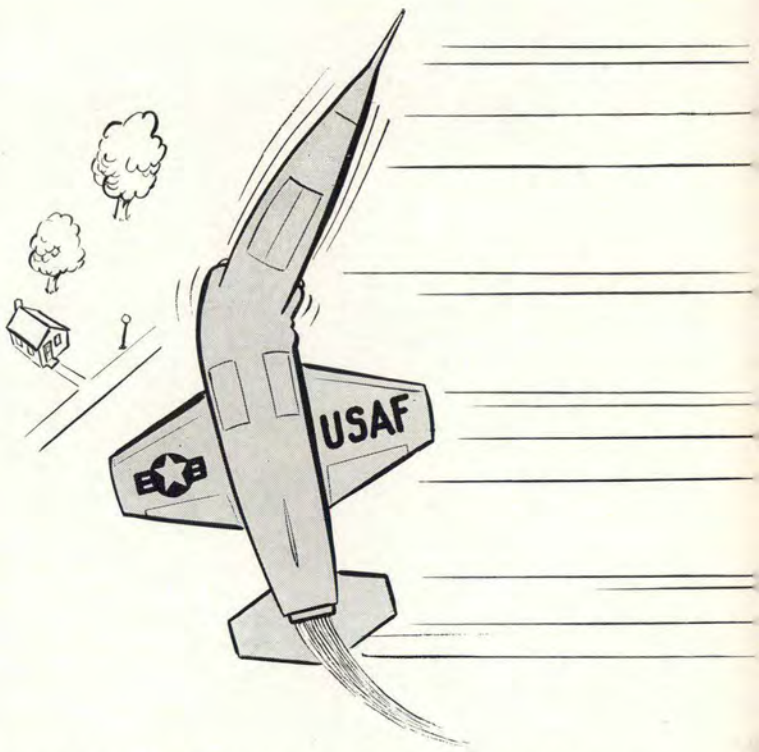
Despite its radical appearance the F-104 obeys the same rules its ancestors did. Even the spin recovery, if you should manage this rather revolting maneuver, is conventional: Rudder against the spin, stick forward.

●

Charles A. Kitchens, Engineering Test Pilot
Lockheed Aircraft Corporation, Palmdale, Calif.

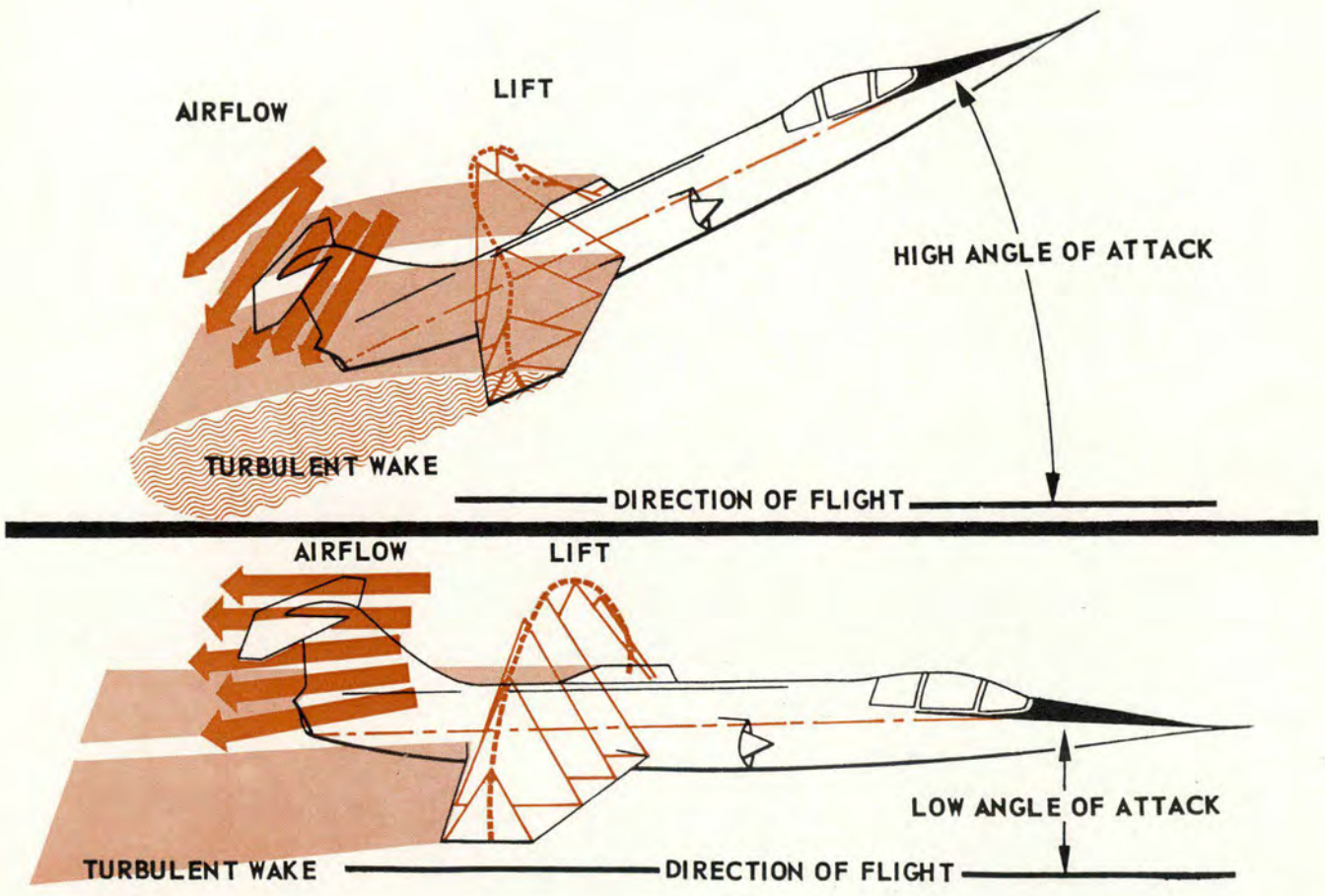
mine when he was approaching the stall area under all conditions of flight while still utilizing the maximum maneuvering capability of the aircraft. This system is known as Automatic Pitch Control (APC). Its operation is based on functions of angle of attack and pitch rate, combined to provide the pilot with a signal to the stick in the form of shaker action when at maximum usable angle of attack.

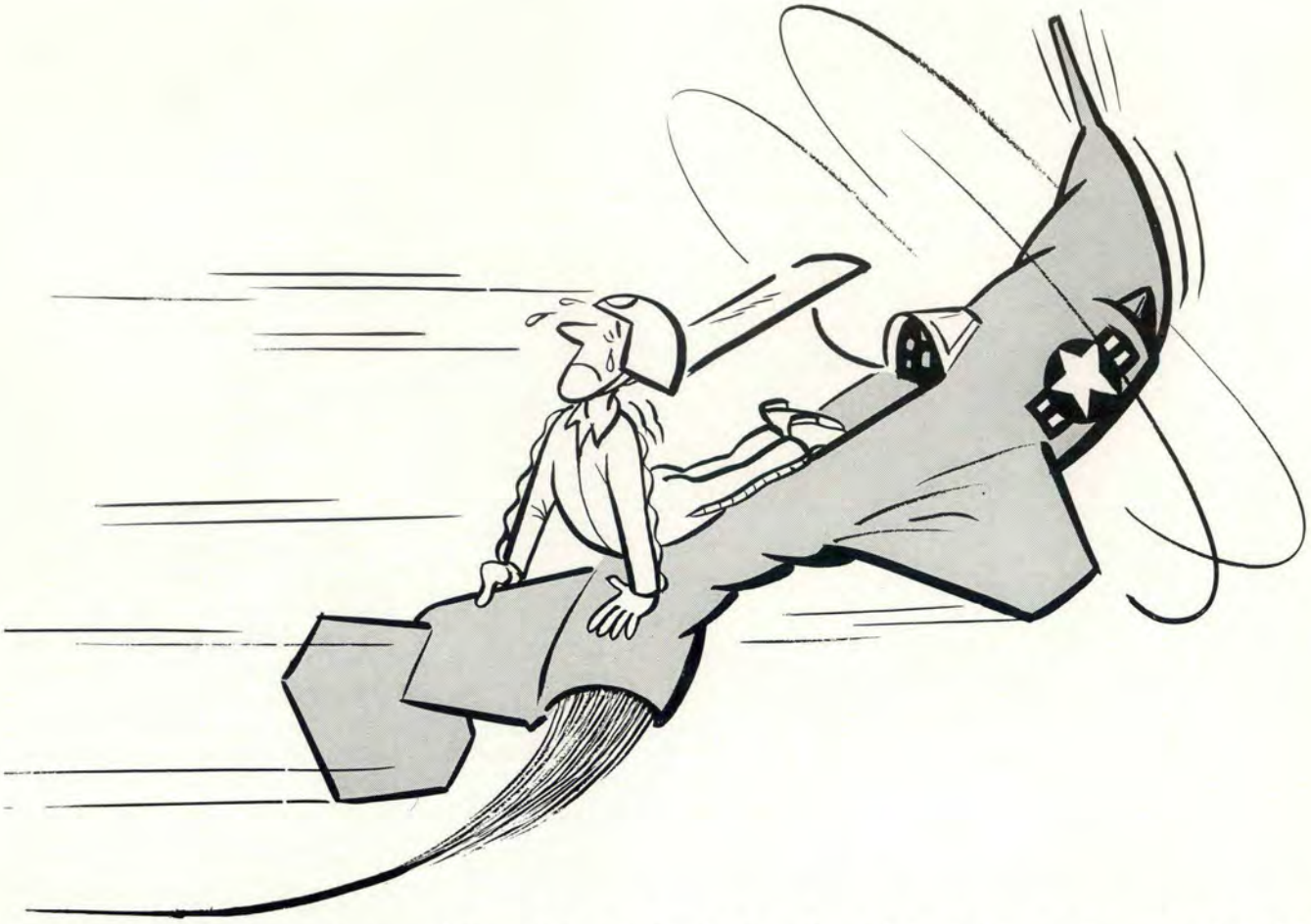
Then if you are "ham-fisted" and insist on pulling in tighter, the system applies a gentle but firm force of 30 pounds to the stick to push it to a point one degree forward of the trim position. Of course, if you are a die-hard and insist, you can overcome this force and penetrate the forbidden area but from here on, you're on your own.



A snap roll could be fun, but the aircraft will be somewhat deformed.

FIGURE TWO.





The pilot was unable to overcome the gyroscopic force of the engine therefore it was impossible to complete more than one turn to the left.

The resulting snap-roll will be a lot of fun and you should not have any trouble recovering, but, if the IAS is high, the aircraft may be somewhat deformed if you manage to get it home. This can be a very effective, evasive maneuver. It will probably scare your opponent to death, just watching. We only recommend it for the tiger types as a last resort. Unless you happen to be rod-racing with another '104, it will be much easier to add a slight amount of throttle and make like a yo-yo on him. Remember though, the stick kicker only operates with the flaps up, so with takeoff flaps down, heed the shaker.

But—the good old USAF says that, although this APC is great stuff, it's still a mechanical system and even though you have a dual system with warning lights, gages and so on, it *can* fail. And there is always one "hamburger" in every outfit who won't believe the gage or the shaker or the kick. You know the type. "It don't hurt 'em none to run 'em that way, besides, it's probably the gage." So-o-o-o, you have to do a spin program just like everyone else. Besides, it says so right here in Military Specifications Umpty-umph. The Wright Brothers did it so you have to do it. As I said before, things haven't changed much—pull back, and so on.

With this ultimatum, and many misgivings based on wind tunnel studies which state, "Hard to spin but impossible to recover" (without a spin chute), and experiences of the Century builders who've managed to bore a goodly number of holes in the Mojave Desert trying to demonstrate their aircraft (those Snark-infested waters at Cape Canaveral have nothing on the Edwards spin range), we launched our spin program.

During preliminary buildup flights, several stall maneuvers were made with the XF-104, followed by several more in the F-104A. Subsonic stall warning in the '104 is almost too good, characterized by increasing buffet and lateral instability prior to the actual stall. The APC, in the form of shaker and kicker, actuates prior to pitchup. Even without APC, in view of this excellent warning, it is unlikely that a pilot would penetrate this area. All stall maneuvers were recovered following pitchup by neutralizing control, essentially without difficulty. The aircraft would pitchup, roll to an inverted attitude and dive out of the maneuver.

Supersonic stall warning is practically nonexistent so you'll have to believe in your APC and fly accordingly. On a slow rate of pull in it is possible to recognize the onset of pitchup and recover by releasing back stick. We've been up to almost 24 degrees angle of attack at high supersonic speeds and recovered without losing control. That's turning the corner at a pretty good rate and the average pilot won't need the APC to get the word that he is not going the same way he is pointed, but it's there in duplicate, just in case.

Following the stall investigation, a systematic spin entry investigation was conducted, using all possible combinations of rudder, aileron and stabilizer position, coincident

with pitchup, and holding them until a spin or dive-out maneuver resulted. All recoveries were made essentially with aileron and rudder neutral and either neutral or forward stick. From this investigation it was determined that the aircraft would always tend to yaw or spin to the right at pitchup and the most favorable control to obtain a stabilized spin was cross-control with aileron against, rudder with, and stick aft.

Of course, the more aft the CG, the easier it is to spin. It was impossible to complete more than one turn to the left with the direction usually reversing to the right at the inverted position. It appears that the yawing tendency to the right during pitchup is a gyroscopic precession force from the engine rotation as it is tilted abruptly away from its normal plane of rotation while aerodynamic damping from the short wings is almost non-existent. This phenomenon showed very little change between entries using military or idle power, probably due to the small differences between idle and military RPM of the J-79 engine.

After determining how to spin the aircraft, several spins were accomplished from 1G entry conditions to determine the most effective recovery technique. This turned out to be conventional, rudder against, aileron with, and stick forward—then, *above all, hold* the controls in this position and *wait*. It may take up to two turns to get the rotation stopped and the nose pointed to the ground. After the angle of attack is broken to a low value, neutralize the controls and *fly* the airplane. Pullout will take about 10,000 feet from the time rotation stops. This determines your abandon ship or "panic button" altitude which should be about 15,000 feet above the terrain, unless you're in the dive-out. We can make more airplanes.

During this spin entry investigation it was determined that a spin was not likely to result unless the entry condition was 1G with a low airspeed bleed-off rate. Entry attempts from slight zooms which gave a very mild pitchup from a lower IAS or accelerated entries from higher airspeeds never produced a spin, regardless of control positions.

★ ★ ★

ABOUT THE AUTHOR

This interesting and somewhat surprising article is based primarily on the notes made by James "Jake" Holliman while he was engaged in spin testing the new Lockheed altitude and speed record holder. Jake was with Lockheed for two and one-half years. Prior to this he had two tours with the Navy Aviation. During his second hitch with the Navy, Jake flew for eight months in Korea. He was educated at Louisiana Polytechnic Institute and the University of North Carolina, but claimed Texas as his home. Jake also worked with Convair, Marquardt and Northrop aircraft companies.

Charles A. Kitchens has been with Lockheed since May 1957. He flew as back-up pilot for Jake Holliman during the F-104 spin tests, and arranged Jake's notes for publication in this magazine. "Chuck" Kitchens has eleven years active duty with the USAF and in addition to combat time in Korea was assigned to the USAF Test Pilot School and the Fighter Section at Wright-Patterson AFB. "Chuck" has asked us to remind you that the "article is Jake's."

Accelerated entries usually resulted in a rather abrupt snap-roll to the right with almost immediate recovery upon neutralizing controls. While the maneuver was not considered to be excessively wild to the pilot, it did result in rather severe inertia loads on the fuselage due to the great length and weight forward of the wing. For this reason, heed the APC and avoid this type of wing-ding.

Zoom entries were made at increasing angles from horizontal to past the vertical with several as nearly 90 degrees as was possible to attain. Some of these maneuvers actually resulted in the aircraft's falling backwards for some distance (enough to turn the pitch and yaw vanes on the test boom a full 360 degrees). None of these maneuvers resulted in a spin or in noticeable loads on the pilot or plane. In fact they produced a rather pleasant, floating sensation as the aircraft gently rotated to a vertical dive and recovered.

Again, I'm not here to recommend that you go out and try this maneuver. I just want to let you know that you don't have to hit the panic button, should you find yourself in the unhappy attitude without airspeed in an overhead type maneuver. Be gentle. Stay loose, and fly the airplane with a light hand. You'll recover in good shape. Most spin problems result from pilot panic, ham-fisted. When the going gets rough, treat it like a woman.

The spin pattern of the F-104 is very oscillatory in pitch, roll and yaw and can cause some confusion during the first couple of turns. This is due to the ballistic nature of the resultant trajectory, in that after each complete turn the nose will swing above the horizon until the trajectory arcs to near vertical, giving the impression that the aircraft is doing a series of pitchups. Actually it is in a fairly stable spin referenced to the relative wind which is tangent to the trajectory.

The most pronounced aerodynamic force in the spin and stall appears to be dihedral effect from the high tail. If insufficient yawing force is not attained to produce a spin the aircraft tends to oscillate heavily in roll. This roll produces a slideslip from side to side which causes more roll *or*, which came first—the chicken or the egg? In any case, a heavy sideslip following or during a stall will give a pronounced, heavy roll in the opposite direction of a magnitude and rate which can be quite confusing, sometimes to the tune of two or three rolls at over 200° second, a "log-rolling" broadside maneuver which will tend to tumble your gyro—to say the least. Recovery, however, was always effected immediately afterwards.

As to loads on the pilot during the entire spin program, none of an excessive nature was ever encountered. The most annoying were those encountered during high roll-rate maneuvers as described above. These were usually of very short duration and tended to confuse more than to apply physical loads. Special restraining harness was not used, only the conventional seat belt and harness standard in the F-104. It must be admitted, however, that the harness was somewhat stretched by the end of the program—no doubt from pulling it extremely tight prior to each maneuver in anticipation of the worst, which never happened.

Inverted spin entries were not attempted. However, some inverted, spin-type maneuvers were encountered during the program. These were very short-lived and gave no indication of stabilizing. It is extremely doubtful if it would ever be possible to stabilize inverted for more than

Treat her rough and you may have a miserable time. Be smooth and gentle and you're in for a very pleasant experience.

one turn due to the geometry of the beast: high T-tail, powerful dihedral effect in the stall, and so on.

A few compressor stalls were experienced in the more extreme maneuvers, usually under negative G but recovered without difficulty after the maneuver was completed.

To give you an idea of the aircraft's reluctance to spin, out of the 46 stall approaches, pitchups and accelerated pitchups performed during the program, only eight resulted in spins. This is a pretty good average considering that a lot of these maneuvers were done holding prospin controls until the aircraft either spun or recovered by itself.

It is also encouraging to note that although a special spin chute was installed and tested prior to the program, it never became necessary to use this "last ditch" procedure. All recoveries were made conventionally.

In summary, the F-104 is built for performance—speed, altitude and supersonic maneuvering. Nothing in the air can touch it. In addition it has superior landing performance and low speed handling characteristics, light weight, boundary layer control, low residual thrust and negligible residual lift from the wing after touchdown, and power reduction, making for landing rolls of 2500 feet or less.

It is not recommended that you fly the F-104 past the artificial stall warning of the APC. It is set well past the maximum maneuvering capability of the aircraft and there is no reason for you to try to disprove our test work in this line. We will send you the records or movies or furnish eye witnesses if you're from Missouri. Besides, it is somewhat nerve wracking and wastes a lot of adrenalin. If you must spin, try it in something that has a lot less expensive machinery at stake. In the F-104, fly within the APC boundary. The performance will be thrilling enough.

As the old saying goes, it is a well-known fact that the spin is of very little tactical value. But if you should goof and get into this predicament in the '104, *stay loose*, analyze the situation and apply the recommended recovery procedure, then wait. If you're still out of control passing through 15,000 feet, pull the D-ring and make a nylon letdown.

Soon many more of you more fortunate fighter pilot types will make the acquaintance of an outstanding flying machine that may possibly replace sex or at least give it some competition. That will be the F-104. So-o-o-o, to allay some of the doubts and apprehension which many of us feel when first meeting such an outstanding star, here are some pointers from a troop who has had her out enough times to have her likes and dislikes pretty well pinned down.

Treat her rough and you may have a miserable time. Be smooth and gentle and you're in for a very pleasant experience.

There are rumors about the F-104 to both extremes. "Pitchup—nothing to it. Won't spin, too horrible and so on." Any way you slice it, the maneuver following a pitchup, whether it be spin or "post-stall gyration," is not pleasant and is guaranteed to give you a head of grey hair if you make a career of doing it. But, here is the encouraging part. You have to work mighty hard to get her to spin. "Pitchup" doesn't mean "give-up" if you have sufficient altitude to wait it out. ▲

WELL ★ DONE

Captain

MERRILL V. McKINNEY

86th Bombardment Squadron

In February of this year Captain McKinney took off from a base in England in a T-33 for a local training flight. The ceiling was 1200 broken with tops at 6000 feet, not too bad for the foggy isle. During the climb several minor surges in RPM occurred. The alcohol de-icing switch was activated each time.

At 26,000 feet the T-Bird engine flamed out without warning even by the low pressure fuel light. Captain McKinney used his excess speed to climb to 28,000 feet, while declaring an emergency on Guard channel and switching the IFF to emergency position. An attempt to contact home base unit was not successful. The canopy, meanwhile, completely frosted over.

Radio contact was made with Approach Control and a DF steer to base was received. A glide to 20,000 feet was made and all unnecessary electrical equipment was turned off. Three over-temp airstarts were made and each time the engine was turned off. The fourth try, this time on Manual, was semi-successful in that the temperature stabilized at 450 degrees, but the RPM was frozen at 80 per cent. Radio contact was made again and a letdown followed. The canopy cleared but the windscreen remained obscured.

With no positive throttle control, Captain McKinney stayed high on the base leg and on final stopcocked the throttle to make a successful deadstick landing on the slick runway.

Well done, Captain McKinney.

First Lieutenant

JOHN K. NEELY

3598th Combat Crew Training Squadron

Lieutenant Neely was flying in a flight of four F-100A aircraft on an air-to-ground gunnery mission early this year. This mission was a part of his student training at Nellis Air Force Base. On his fourth gunnery pattern the F-100 flamed out after pullup from the target, about 200 feet above the terrain.

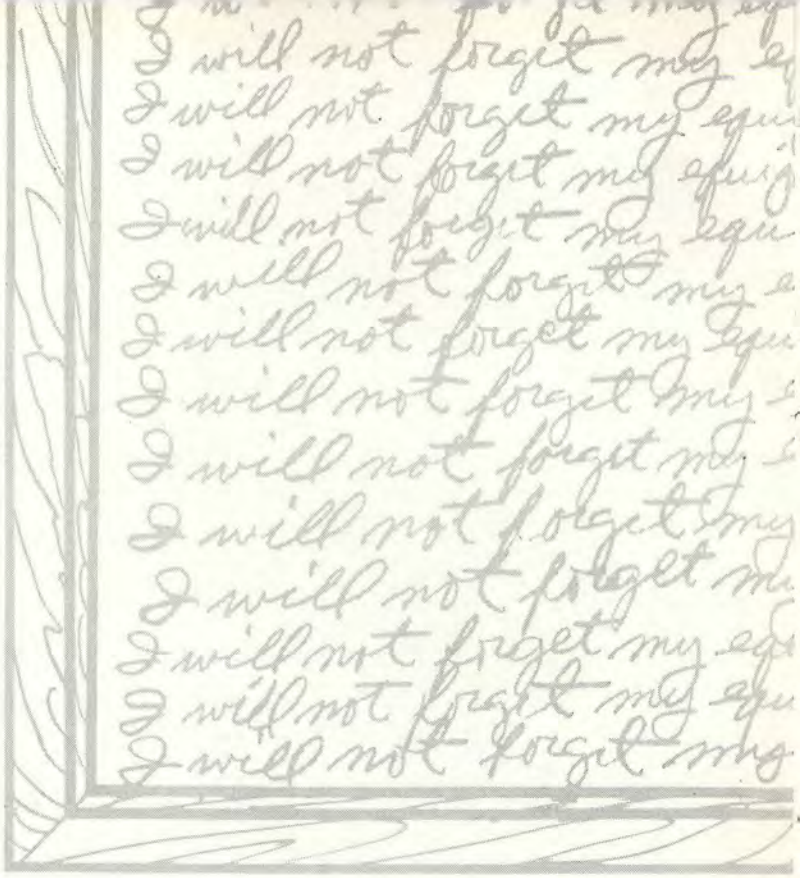
Neely made a successful airstart immediately by turning the emergency fuel switch on and hitting the air ignition switch without stopcocking the throttle. A decision was made to land at a nearby auxiliary, but shortly before the landing attempt, the airspeed indicator became inoperative. The landing attempt was therefore aborted, and Lieutenant Neely with his flight leader decided to return to Nellis for the landing. Enroute to Nellis, the engine flamed out in the emergency system, but again Neely made a restart.

When the two aircraft arrived over Nellis, a simulated flameout pattern was flown, with Neely flying the flight leader's wing for airspeed indications. A good landing was made and the engine was shut down after turning off the runway.

Lieutenant Neely had over 1500 hours of flying time when this incident occurred but only 19 in the F-100. In view of his limited time in this aircraft, he is to be highly commended for the professional manner in which he handled the emergency. His outstanding flying skill and sound judgment resulted in a great save for the Air Force. Well Done, Lieutenant Neely.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Major Jesse C. Wilkins,
Operations & Facilities Branch,
Directorate of Flight Safety Research



Lonely afternoons at some blackboard were a sure cure for the poor memory. Judging from the accident records, most AF pilots could stand some more of the same. It pays to remember. . . .

Details are for

We Americans sometimes think that "Losing Face" is a descriptive phrase applicable only to the oriental race. If this were true, we might then expect to hear many hairy tales resulting from routine training missions, even more than were told as a by-product of WW II. The reason we haven't is because our strong fraternal order virtually castigates the man who gets caught with his knickers down —allowing his incident to grow into an accident. We cast the poor soul into the outer darkness of reduced prestige, wounded pride, sneers of contemporaries and the pricking pen of superiors. Such treatment has the effect of reducing the unfortunate individual to an object of abject pity.

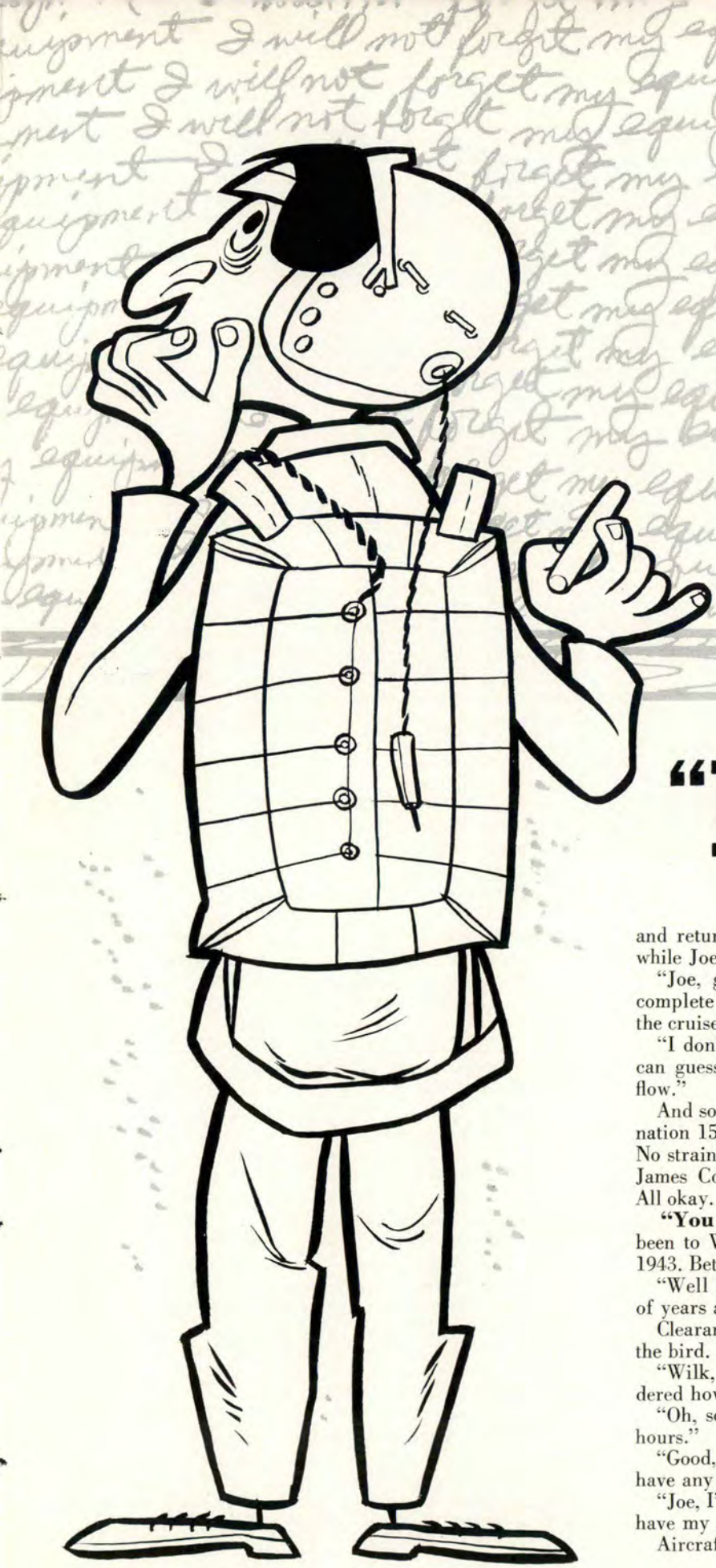
I've exaggerated—only to make the point that a public admission of a "head-up" stunt is usually considered something to be avoided at all costs. The result is that we rarely see or hear of the many incidents, which, if publicized, would be excellent learning media, and which grow out of the apparent neglect of planning details required in this business of flying. Statistics will bear the burden of proof that in the "pilot error" cause factor of accidents, many pilot errors can be traced to a neglect of the simple, fundamental details of good preflight and inflight planning. Details such as failure to check time enroute versus fuel; lack of maps; neglect in inspection of aircraft; failure to draw necessary personal equipment are a few of the many too numerous to list.

Few, if any, in the flying business can deny that they have been guilty of an occasional "head-up-and-locked" stunt. The majority of us have survived without incidents becoming accidents. Perhaps this can be attributed more to the forgiving nature of the birds which Uncle Whiskers procures rather than to our outstanding abilities to emulate our feathered friends.

The foregoing bit of philosophy is to rationalize my failure to attend to the fundamental details of flight planning and to make me feel rather heroic in relating the sordid details of this epic. This tale should prove to the "old heads" that lengthy flying experience does not negate the need for proper flight planning and procedures.

It all began rather innocently on a day when I wasn't scheduled to fly. I was feeling rather eager on this particular day and called the scheduling officer to ask about wangling a flight. Ah! Sweet success! One can always depend on a few sports to cancel. However, I didn't have my flying gear with me and had to draw a flying suit, a P-4 helmet and flight jacket. As all men know, there is no suit like your own suit. This is particularly true when the borrowed garment lacks those accoutrements so essential to the jet pilot, like the computer, procedures and cruise control handbook, screwdriver, maps, knife and all the rest. But I was sure that my flying partner for the day would have the necessary gear which I lacked. After all, doesn't every well dressed man carry such items?

I got my flight gear and rushed to operations. There I met Joe Doaks, my team-mate for this flight. We decided to fly to James Connally for a navigational proficiency flight



"Pros"

and return the same afternoon. I started the flight plan while Joe filled out the 175.

"Joe, gimme your cruise control handbook so I can complete the flight plan. I left mine at home and I need the cruise data to complete the flight plan."

"I don't have a cruise control handbook either, but we can guess pretty close to the true airspeed and the fuel flow."

And so to metro. Checked winds aloft. Weather at destination 1500 feet, three miles. Time en route one plus 45. No strain! Checked West handbook in ops for letdown at James Connally and sectional map of destination area. All okay.

"You know, Joe, it's been fourteen years since I've been to Waco. Flew BT-13s at Waco Army Air Field in 1943. Bet I won't even recognize the place now."

"Well I was stationed at James Connally for a couple of years and I've a few buddies there I want to call."

Clearance filed so we picked up our gear and headed for the bird.

"Wilk, I haven't flown with you before and I just wondered how much time you have in the T-33?"

"Oh, somewhere between seven fifty and one thousand hours."

"Good, I have over two thousand in it so we shouldn't have any trouble we can't handle."

"Joe, I'll check the bird if you'll catch the tanks. I don't have my screwdriver with me."

Aircraft checked—also the Form One. Strapped on fly-

ing iron; APU in; cockpit check completed; radio on, called tower for ATC clearance.

"Did you check the NOTAMS on James Connally?"

"Heck no! Did you?"

"Naw, you continue waiting on the ATC clearance and I'll run back to base ops and take a quick reading."

NOTAMS okay. Received clearance, taxied to active, cockpit checked, lined up and took off.

So far, so good. Even our "guessed at" true airspeed and fuel consumption were jibing real George. Over Fort Worth we called for expected approach time at Waco. It's fifteen minutes beyond our ETA. Still okay.

We checked the West book for James Connally penetration. Ouch!

"Joe, I can't find the letdown for James Connally. Some pilot must have kept it for a souvenir."

"Look for it under Waco."

"But I'm sure it was listed under James Connally when I checked it in base ops. It's not listed under Waco either."

I wondered what to do! Wondered if I should admit my failure to check the charts for the presence of destination letdown and call Waco Approach Control for a detailed description of the letdown. There had to be some escape for my pride. I finally decided to check the Low Altitude Instrument Approach Procedure Charts before squealing like a pig caught in the gate. Nothing on James Connally. I checked Waco. Success! VOR penetration too. Excellent!

We entered the holding pattern over the cone on ETA. I cleared for penetration and broke out at 1500 feet. Visibility was about three miles. Weather called this one right on the button. Over the base, we canceled IFR flight plan.

"Joe, that can't be James Connally! As I remember, there were parallel strips when I was here last and this base has single strips and there are only light aircraft parked on the ramp."

"Yeah, this must be Prairie Hill."

"Well, you know this part of the country. Which way now to James Connally?"

"About two-seventy, I think. I'm pretty well acquainted with this country but this three-mile visibility sure makes it look unfamiliar."

Fuel was now down to 130 gallons and we had to make sure of that 270-degree heading. I called the tower and it verified 270 as the heading from Prairie Hill to James Connally. We took up the heading and three minutes later were over the boondocks with nothing but farms and sagebrush, as far as we could see. Things just didn't look right.

"Joe, tune in the range station and I'll get a reading from the tower on the mag heading from the range to base."

The Number One needle swung around to the tail position. I called the tower for the mag heading from the Waco Range to James Connally. It was 090—180 degrees from my present heading. We did a quick 180 and finally arrived on the pitch with 70 gallons. We landed and taxied in, parked and got out the area map. We actually let down on Waco Municipal Airport. I sure wished I'd referred to this map earlier.

The A.O. walked up. "Where have you guys been? Have any trouble?"

"No trouble other than an active body and a passive mind. We just doped off and made a letdown to the Waco Municipal, thinking it was Prairie Hill."

That "Field Grade" embarrassment was painful, but we "old heads" were sure that nothing else could possibly happen on the trip back to Maxwell. After all, we had certainly accomplished an above average number of bloopers for this fiscal year.

After a quick sandwich at the snack bar, we filed clearance for the return flight; checked the bird; received ATC clearance, taxied out and took off.

"Gawd! this smoke in the cockpit is sure thick. Did you check the oil cap?"

"I sure thought I did."

"I'm sure we've lost the oil cap. We'd better put this bird on the ground. I had this happen to me on runup once, and I lost 10 of the 12 quarts of oil by the time I could get the bird parked."

"Needn't worry about that happening with this bird. It's been modified to the high filter cap configuration and we can't lose all of the oil. The smoke will clear in a second."

I hit the cockpit dump valve and the smoke cleared. The oil pressure was okay again, so we decided to continue on course.

We watched the oil pressure and the flight progressed as planned. Tally Ho. Maxwell! We practiced a jet penetration, cancelled the IFR clearance and entered traffic. Needless to say, I sure was glad this trip was almost over. I'd never pulled so many head-up stunts in my entire flying career. All this rotten luck was a direct result of my acts of omission rather than my acts of commission. Got to watch that in the future.

We turned onto final and rechecked-gear-down-pressure-up—

"Gonna put the gear down, Wilk?"

I grabbed the gear handle. What's that handle doing between the gear-up and gear-down detent? Have never failed to lower the gear before. I thought Joe must have pulled the gear handle out of the down position just to shake me up!

Certainly, I had checked the gear-down indicator and hydraulic pressure. At a quick glance that gear indicator does look like the gear-down indication, especially at night. The hydraulic pressure was up for the gear hadn't begun to cycle. We landed, taxied in, parked and stumbled out of the bird, and patted the cement. Checked the oil filler cap but it was nowhere to be found.

Yes sir, experience really pays off. All of those flubs and not one violation. Not even an incident!

Yup, as I was saying, only orientals worry about saving face, but after my revelation of poor pilot judgment I should sign this article "Anonymous." How else could I pose as a pilot and not be revealed as an accident seeking a place to happen?

What an ego shattering experience! Fifteen years of flying without bending a single bird or even blowing a tire and yet today, I've behaved worse than a basic cadet. I find no comfort from the fact that I've instructed students on the very rules of flying safety which I was so guilty of violating. Today, I let a few unexpected events set me up to become a statistic.

The moral of this story was expressed very succinctly by General Caldara in the February 1958 issue of FLYING SAFETY, wherein he states: "In the Air Force our 'Good' pilots are professionals, excellent in their kind. They pay constant attention to details. They do what they are supposed to do, when they are supposed to do it, the way they are supposed to do it. Only then can he be a 'Pro', a 'good pilot,' excellent in his kind." ▲

ARDC
ADC
MATS
ATC
PACAF

SAC
USAFE
TAC
USAFR
ANG

FLIGHT SAFETY AWARDS

JANUARY TO JUNE – 1958

On the following two pages are listed the twenty-four units which were the flying safety leaders of the United States Air Force for the first half of calendar year 1958. The Selection Committee wishes to congratulate all those organizations nominated, and FLYING SAFETY salutes the winners!

★

59th Fighter Interceptor Squadron
Goose Bay, Labrador, ADC

The maintenance man comes in for his share of praise in the accident-free record of the 59th Fighter Interceptor Squadron. Average annual snowfall of 225 inches and a mean temperature in the winter of 25 to 40 degrees below zero, make the Air Defense mission of this unit at Goose Air Base, Labrador, extremely difficult. The air and ground crews of this far northeast base richly deserve this award.

★ ★ ★

551st Airborne Early Warning & Control Wing
Otis AFB, Mass., ADC

Almost 30,000 flying hours without accident is the enviable record of the 551st Airborne Early Warning and Control Wing, at Otis AFB, Mass. Much of the flying was done approximately 500 nautical miles from land over the North Atlantic Ocean. All training and transition of crews into the RC-121, the prime aircraft, is conducted within the tactical squadrons. The work of the flight engineers and maintenance crews has been singled out for special praise.

4756th Air Defense Wing (Weapons)
Tyndall AFB, Florida, ADC

This multiple mission wing flew almost 15,000 accident-free hours during the past fiscal year. Eight types of aircraft, from the F-104 to the H-21 were involved in the work at this base. A high density of traffic exists at Tyndall AFB with a typical high month having as many as 9200 takeoffs and landings. Much care has been taken in developing IFR departure and recovery routes and the Tyndall RAPCON also deserves special mention.

★ ★ ★

3615th Flying Training Wing
Randolph AFB, Texas, ATC

The 3615th Flying Training Wing at Randolph AFB has had a three-fold mission during this reporting period. The activities here include a basic instructor school, a jet qualification course and basic single engine training. There were no accidents associated with student training through 75,000 takeoffs and landings. The only major accident resulted from materiel failure while an instructor was on a solo flight.

3505th Pilot Training Wing
Greenville AFB, Mississippi, ATC

The 3505th has an assigned primary mission to train and graduate qualified officer pilots from the Basic Single Engine Jet training program. The Wing flew a total of over 40,000 hours with more than 62,000 landings during this period, with only two major accidents. A terrific record, considering the normal accident potential expected of student training.

★ ★ ★

3306th Pilot Training Group
Bainbridge AFB, Georgia, ATC

The mission of this organization is to accomplish primary student training. Phase VIII testing of the T-37 was an additional workload for the reporting period. The 3306th Pilot Training Group at Bainbridge sustained only one major aircraft accident while performing 83,387 take-offs and landings during this time.

★ ★ ★

Air Force Cambridge Research Center
Laurence G. Hanscom Field, Massachusetts, ARDC

Accomplishment of the mission of the Air Force Cambridge Research Center requires scientific flying operations from above the 85th Latitude over regions of the Arctic North throughout the U. S. and to the equatorial regions of the Southwest Pacific. Sixteen types of aircraft were flown for a total of about 10,000 accident-free hours during this period.

★ ★ ★

1st Aero Medical Transport Group
Brooks AFB, Texas, MATS

This group flew almost 20,000 hours without accident during the award period. Its mission is to provide air transportation for patients of the Department of Defense from points of debarkation to hospitals of final destination and between hospitals within the Zone of Interior. The group services 400 hospitals in and out of over 350 airports within the United States.

★ ★ ★

63rd Troop Carrier Group
Donaldson AFB, South Carolina, MATS

This Troop Carrier Group flew Army support missions, special Air Force support missions and provided airlift for the U. S. missile test program and the resupply of several far northern stations. Operational flights ranged as far west and south as New Zealand, east to India and north to Fletchers Island. During the award period the pilots of this group flew 12,500 hours without accident.

483rd Troop Carrier Wing
PACAF

The mission of this wing includes the deployment of personnel and equipment throughout the northern Pacific. In accomplishing its mission this Wing carried over 40,000 passengers and airlifted over 25 million pounds of cargo during this award period. Almost 13,000 accident-free hours were flown during this award period and this zero rate has been maintained for the past 14 months.

★ ★ ★

26th Fighter Interceptor Squadron
PACAF

In accruing almost 12,000 hours of flying time in F-86D and T-33 aircraft during the award period, this fighter squadron had only one major and one minor accident. Neither accident was caused or contributed to by aircrew or maintenance personnel of the unit. No injuries to personnel resulted from either accident.

★ ★ ★

4080th Strategic Reconnaissance Wing
SAC

The outstanding contributions which personnel of this wing have made to the flying safety program have resulted in the reduction of the accident rate from 57 for the last six months of 1957, to zero for this award period. This is the true measure of an aggressive and successful campaign to prevent aircraft accidents.

★ ★ ★

819th Air Division, SAC

During the award period, the 819th Air Division flew a total of more than 27,000 accident free hours. This outstanding safety record was attained in spite of extremely adverse weather, and hazardous world-wide operations. Primary emphasis during this period was directed toward the upgrading of B-47 crews to combat-ready status.

★ ★ ★

4060th Air Refueling Wing
Dow AFB, Maine, SAC

The flying safety record of the 4060th Air Refueling Wing has not been marred since February of 1956. More than 8500 hours were flown during the reporting period, most of these in KC-97 aircraft in support of SAC bombers. Squadron, base and wing flying safety officers have worked closely with all sections to insure the maximum in safe operations.

4th Tactical Fighter Wing
Seymour-Johnson AFB, North Carolina, TAC

During this award period the 4th Tactical Fighter Wing at Seymour-Johnson Air Force Base, N. C., converted from the F-86H to the F-100C. Sixty-seven pilots completed F-100 transition to the new aircraft. Almost 7000 hours were flown without accident, in spite of extensive construction on the runways and taxiways.

★ ★ ★

27th Tactical Fighter Wing
Bergstrom AFB, Texas, TAC

The 27th Tactical Fighter Wing at Bergstrom AFB, Texas, had no minor and only one major aircraft accident during the award period. Materiel failure was attributed as the cause factor in this only mishap. More than 7500 hours were flown in the F-101A during this time. A fine record with a new aircraft.

★ ★ ★

525th Fighter-Interceptor Squadron
USAFE

This Fighter Interceptor Squadron has flown more than 12,000 hours during three consecutive six months periods, beginning 1 January 1957, without accident. Most of this time was compiled in F-86D planes, the rest in the T-33. This flying was accomplished during more than 600 active air defense scramble missions on the continent of Europe.

★ ★ ★

81st Tactical Fighter Squadron
USAFE

For eighteen months the 81st Tactical Fighter Squadron has fulfilled its mission without accident, flying the F-100, the F-86H and the T-33. During this period, the squadron has deployed from France to Africa for training. The maintenance man has figured largely in the fine record of this unit.

★ ★ ★

317th Troop Carrier Wing
USAFE

A total of almost 11,000 flying hours without accident were accumulated during this award period. This marks the completion of nearly five years without accident for this Wing. At the beginning of the award period, the 317th was in the midst of its conversion program from the C-119 to the turboprop C-130A. Outstanding professional airmanship can be the only reason behind such a phenomenal record. Their last accident was in August '53.

492d Tactical Fighter Squadron
USAFE

The 492nd Tactical Fighter Squadron, one of the units of the 48th Tac Fighter Wing, has compiled over 9000 hours in the past 18 months with only two aircraft accidents. Both of these mishaps were the result of materiel failure and were recorded in the 1957 calendar year. Another fine job of professional airmanship.

★ ★ ★

442d Troop Carrier Wing
Richards-Gebaur AFB, Missouri, USAFR

This excellent reserve outfit has flown almost 10,000 hours without accident during this award period. Its mission is to attain and maintain operational effectiveness of airlift personnel and equipment using landing and parachute techniques during combat operations. This record was accomplished although only 40 per cent of the authorized maintenance personnel were available.

★ ★ ★

452d Troop Carrier Wing
Long Beach Municipal Airport, Calif. USAFR

This reserve wing converted from C-46 to C-119 aircraft during the award period. Over 11,500 hours were flown without accident, in spite of the hazardous visibility in this high density area of Long Beach, California. Extraordinary attention to duty and to safety practices are evident in the record of this wing.

★ ★ ★

197th Fighter-Interceptor Squadron
Phoenix, Arizona, ANG

The 197th—the Pride of Phoenix—has flown more than 3000 hours without accident during the award period. Even more exceptional is the record of this ANG Unit over the past few years. The last major accident was in October 1955, and since that time the unit has compiled almost 24,000 hours. A fine record.

★ ★ ★

175th Fighter-Interceptor Squadron
Sioux Falls, South Dakota, ANG

The 175th, in South Dakota, has approximately 3000 hours without accident for this award period. Since the last major accident in April of 1956, this unit has flown over 15,000 hours in its mission of maintaining a combat-ready status for possible national emergency. A great credit to the Air National Guard program.

1958 Flying Safety INDEX

"YOUR STANDARDIZATION

Since the beginning of time, people have been standardizing things. At first they didn't know why, perhaps an experiment or an effort to statisfy a disgruntled mate. Whatever the reason at the beginning, standardization has developed naturally and continued out of necessity.

Civilian companies long ago learned the value of standardization, recognizing that it meant progress, and in the final analysis economic survival. Clients and customers insisted on consistent quality. The answer was standardization, and they became masters at it by necessity.

The Air Force, like other Services, has this same dependence on standardization. We must have it to produce quality and, in turn, to accomplish our mission successfully. To us, it means far more than economic survival. It means personal survival as well.

The fact that we do not always have standardization to the optimum degree, is reflected in our aircraft accident record. Unfortunately, our accident record tells us little about the degree of standardization and its connection with accident prevention unless we dig wide and deep. Our accident prevention efforts are complicated by the fact that when our accident record looks good, we can't be sure that it is a result of complete standardization. And even if we know we have complete standardization now, we can't depend on its status quo in the future. Much of our lack of standardization does not reveal itself in our accident record, but rather in our near-accidents and mishaps.

The Department of Defense recently disclosed in the *National Safety News* that the rate of military aircraft accidents in the first seven months of 1958 declined for the third straight year. The Air Force made a similar announcement regarding Air Force accidents. As a measure of total success, these announcements are meaningful. Yet the fact remains that Air Force percentages of destroyed aircraft, fatal accidents and pilot fatalities versus total accidents have increased during this period in 1958 when compared to the same period in 1957. The cost per accident also increased approximately 30 per cent, giving us something more to think about.

These figures are not very revealing with respect to standardization and accident prevention efforts, but they do suggest that our problems are becoming more serious and costly, and that questions of standardization are still unanswered.

What are a pilot's chances of keeping himself from causing an accident, for instance? And what are his chances of being involved in an accident caused by persons other than himself, because of a lack of standardization?

Unless changes are made, the picture is not good. Pilots still incur major accidents by their own acts in the same percentages as before. They destroy aircraft and reduce their lot by even greater percentages than before. Not only that, they are assisted by supervisors making more errors than before.

Now, what does this mean in terms of standardization?

For one thing it means that we don't have standardization, at least to the degree that we might have. Where did we fail in our efforts? Analayzing the poor pilot technique in inflight accidents for the first half of 1958, for example, we find the existence of five basic faults, all the result of too little standardization:

- Lack of preflight and inflight planning.
- Inadequate procedures training.
- Lack of pilot proficiency.

The Air Force must have standardization to produce quality and, in turn, to successfully accomplish its mission. It means far more than economic survival. It means personal survival as well. Ignore the standard and invite tragedy.

Robert H. Shaw, Research & Analysis Division, D/FSR

A do-it-yourself checklist can be dangerous.

IS SHOWING!"

- Non-assumption of command and supervisory responsibilities.
- Poor flight leadership.

Unless these faults are corrected *now*, the inflight phase of our air operations will continue to be a high accident potential area.

Where and how do we start correcting these faults? By monitoring the conduct of our inflight phase of operations. We must insure that responsibilities are assigned and properly assumed by pilots, instructor pilots, aircraft commanders, flight leaders and supervisors. We must provide training in the amount and degree to which we set a standard, and we must correct each procedure and leadership deficiency as it is discovered, from any source.

What is standardization, really? Basically, standardization consists of setting standards of performance and bringing the level of operations up to those standards. Once achieved, they must be maintained and periodically evaluated with respect to our total product. An important part of an accident prevention program is the evaluation of standards with respect to the accident record. If the accident record is to improve, the standards must be accurately established and rigidly maintained in terms of performance.

What happens if the standards are not set or if set standards are allowed to regress? Somewhere along the line a fault factor appears, setting off a multiplication process of errors, eventually resulting in accidents. Thereafter, operational processes are disrupted and a mountain of expense and work effort are required to repair the damage.

There were classic examples of lack of standardization in 1958, just as in other years. Whether a major or minor accident, an incident, a mishap or a deficiency—each might have been prevented by setting and maintaining the proper standards.

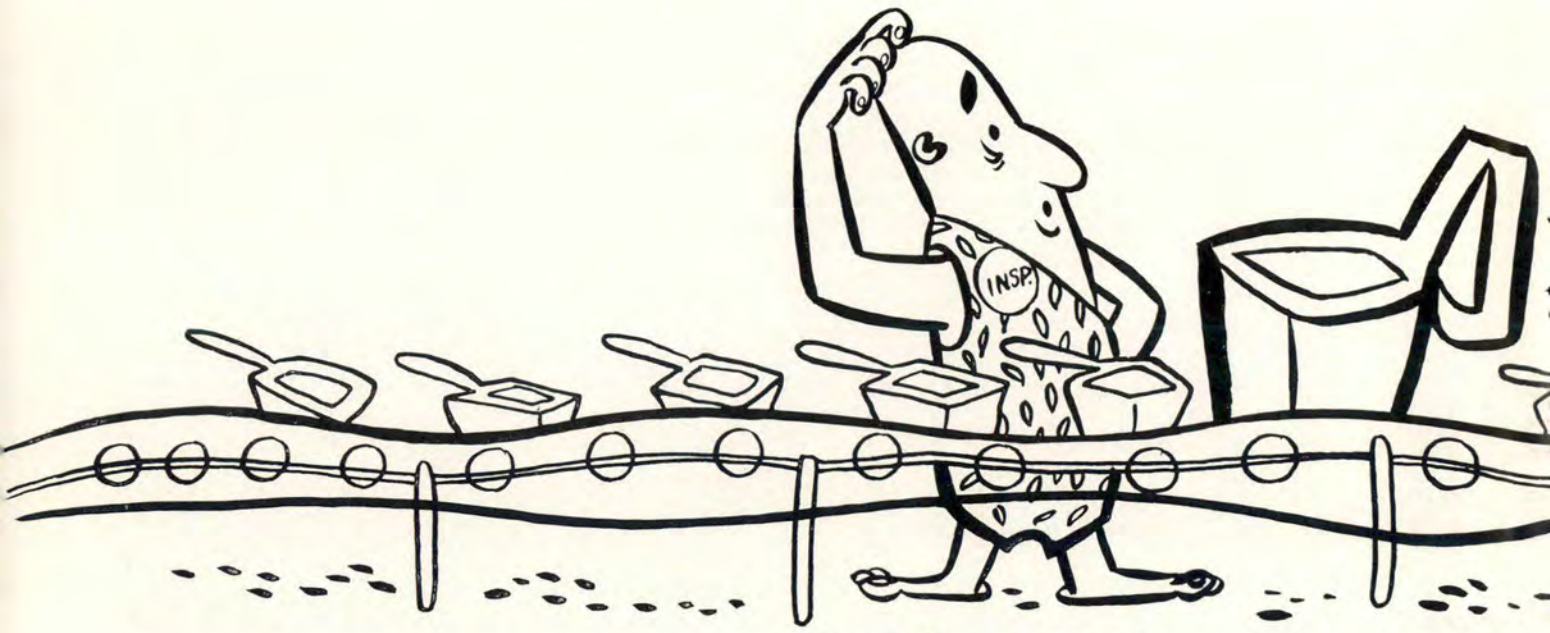
During a routine training flight in an RF-84F aircraft, the pilot experienced engine vibration. He just barely made it back to the field and had to shut down the engine directly after touchdown. An immediate maintenance inspection revealed that the engine was severely damaged by ingestion of several starter section screws. Two of the screws were missing and the others appeared to have sheared from excess torque.

All F-84 aircraft at this base had to be grounded for starter assembly inspection and retorque of starter assembly screws. The inspection turned up several over-torqued starter assemblies in other aircraft. The real fault: Standardization of maintenance inspection.

This non-standard practice of overtorquing causes trouble in other parts of engines too. Several F-100 accidents and incidents have been caused by ambitious maintenance men having a bent for overtorque of fittings. In one instance, an F-100 developed a fire around the afterburner exhaust nozzle and the vertical fin on landing. An inspection revealed a crack in the hydraulic utility pressure line caused by overtorque of the turbine hex nut during installation.

Quality Control Personnel, supposedly representing the epitome of standardization, contribute their share of costly errors. The files contain dozens of cases, running the gamut of all possible errors. Fortunately, most errors are discovered and corrected before they cause an accident.

Following maintenance at an overhaul facility, a post-flight inspection of a B-47 aircraft revealed several loose bolts in the wing-fuselage attaching plate; some of the



Sea or chemical foam, an SOP would have brought these back dry.

bolts had been installed without nuts. How non-standard can we get?

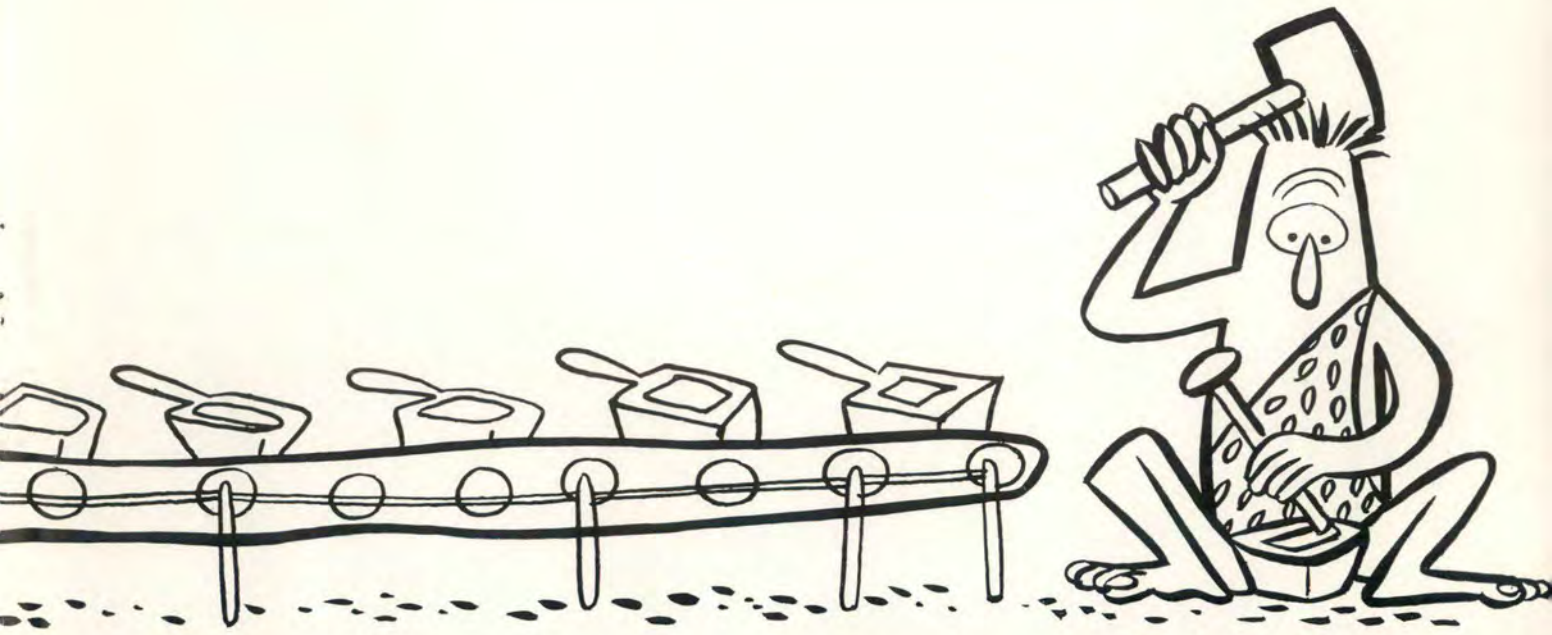
In a recent case, fuel was found leaking from a B-52 outboard fuel tank in the vicinity of cell number 5. An inspection revealed an extra 18 x 12 inch door assembly inside the cell. This had been rubbing against the inside of the cell and caused the fuel leaks. Who could have been so careless as to leave a door assembly inside a fuel cell? A standard inspection would have prevented this inexcusable act. The organization flying this aircraft found towels in the fuel cells of two other aircraft. This type of non-standardization occurs all too frequently and without justification.

One B-52 base reported receiving 192 reconditioned fuel nozzles through base supply as a partial issue of 1500 fuel nozzles. When the nozzles were installed and checked, 39 were found to have improper spray patterns. The fault was traced to improper reconditioning and testing procedures at the overhaul facility.

The finger of non-standardization can be pointed in other directions, too. Recently an F-102 pilot was placed in a highly untenable position by supervisors. Committed for a penetration by GCI, following an Air Defense exercise, the pilot was not advised of the deteriorating weather at the home field. During the subsequent GCA the pilot discovered that the weather was below field minimums and that he did not have sufficient fuel to proceed to an alternate. The approach was unsuccessful and the pilot slammed the '102 on the runway. He made it, but not without considerable damage to the aircraft.

A takeoff abort of an F-89 aircraft reflected a lack of standardization and training within a unit organization. In this case, the pilot initiated improper abort procedures and techniques which, among other things, did not effect a safe stop of the aircraft. Supervisory error contributed to the accident in that the pilot was not adequately trained in emergency procedures. The unit organization did not or was not able to effect a training program to insure that pilots were capable of controlling an aircraft during such an emergency.

A midair collision forcefully demonstrated the need for standardization. Two aircraft came together on the ap-



proach for landing under visual flight rule conditions, each pilot not knowing that the other aircraft was on a collision course. The findings of the investigation reflected a gross lack of standardization of procedures and control. The following errors revealed the need for standardization:

- Air Traffic Controllers failed to exchange essential traffic information with aircraft under their control and with other control agencies.
- Controllers did not assure continual visual or radar observation of aircraft under their control.

The investigation brought out that control personnel were not familiar with the flight characteristics of aircraft under their control; that inter-and intra-facility coordination was being performed by personnel not fully qualified; that supervisory personnel had not been maintaining the required degree of direct supervision over personnel assigned for training, and that the controller supervisors had allowed their own proficiency to deteriorate to a low level.

This was a disastrous and costly accident which could easily have been prevented. Happily, accident prevention measures came swiftly and surely following this accident, and with it came a high degree of standardization.

If we continue to tolerate accidents and incidents and disregard the fault factors that cause near-accidents and mishaps, we cannot help but have a bad accident record. If our accident record is bad, we can be sure that we have not properly set or maintained the standards of performance. And if we have not set or maintained the proper standards of performance, our accident prevention program is not working for us.

Since our standards of performance can be measured and tested within a program, the standardization program can be an effective lever in the accident prevention program. How do we accomplish this? Construct a solid and dependable standardization program around these elements:

- Teach the principles of standardization.
- Set the standards.
- Evaluate the standards.
- Then, maintain them ▲

Deviation leads to destruction. Over-torquing was the cause of these.

C. Z..... thru the looking glass

Wherein the Baron and the Major give with the noble effort to get through to Chumley. Our hero is made of sterner stuff, however. Departed spirits are no match for C. Z.'s bottled kind.

Archie D. Caldwell
Research & Analysis Division
Flight Safety Research

The party must have been a huge success. Captain Chauncey Z. Chumley still had a lampshade in one hand and half-filled bottle of champagne in the other. He unlocked the door and started to shed his clothes. The evening had been perfect as had the party.

"What a fantabulous way to spend a Sunday evening. Wake me early, mother, for I shall be queen of the May," he shouted as the bed lurched under the dead load. There was a faint smile on Chauncey's lips as he thought of the blonde singer's decolletege. He drifted into a deep sleep.

"Better get up now, Captain Chumley." The CQ's voice sounded muffled and far away.

"It's almost time for the briefing. You don't want to be late, do you? Big doings today."

Chumley stretched and kicked off the blanket. Moving slowly to the mirror, he rubbed his eyes and looked. Eyes that looked like an adiabatic lapse rate chart looked back. He began shaving.

"What a party that must have been. I'll bet I had a whopping good time. Ah—la-belle-France! Paris shall remember me as I shall remember Paris."

Chaunce finished dressing, slapped his swagger stick under his arm and vaulted into a waiting motorcycle sidecar. The airman saluted and slipped the clutch at the same time, blurping off down the muddy street to the operations tent.

"You'd think the French would pave these muddy fields seeing as how we're over here to help 'em," Chaunce shouted. "Why, I remember we could eat off the tarmac back at Taliaferro Field in the States."

The three-wheeler narrowly missed a staff car and splashed to a stop.

"I probably won't need you any more today; why don't you take the rest of the day off? Maybe take a trip into town?" Capt. Chumley winked.

The airman saluted and gunned past the row of SPADS on the line and headed back to the motor pool. The "hat in rings" looked good painted on the new ships, C.Z. thought to himself. Chaunce made it to an empty seat on the bench just as Major Lufbery, the squadron C.O., stepped up on the platform.

"The 94th's got a good one today, men; we're supporting a movement up on the front. Same area we had yesterday. It'll mean every ship we can get in the air. Won't be too many, I'm afraid. Be that as it may, I want you section leaders ————"

Chumley's thoughts drifted to Paris and the previous night. Major Lufbery's voice was being forced out of all thoughts and the visions of wine, women and song relived themselves again. Minutes passed.

"I said, what are your ideas on this, Captain?"

Chumley came to. Paris faded quickly as the Major continued.

"You were doping off again, weren't you?"

"Yes, sir. I was just ————."

"I know what *you* were doing. *We* were talking about what should be done in case of an emergency landing here at this field. As you know we've lost four airplanes in three days. Two of 'em had engines riddled with Spandau slugs and the others had engines that sounded like they were full of marbles. One pilot tried to stretch his glide and spun in. Two other intrepid aeronauts ended up in the fence by thinking that a plane stalls easier in an emergency. So they landed too hot. Well?"

Chauncey looked at the floor and mumbled an unintelligible answer, then looked quickly at his watch, a little trick he learned in flying school. Major Lufbery instinctively looked at his watch too and declared the briefing at an end.

"Off in ten minutes, boys; stay together up there. Say, Eddie, keep an eye on Chumley there. Somehow I feel he's working for the 'Baron'."

The dog fight was short, coming at a time that both sides were low on fuel. Chauncey had been right in the middle of it. Sent a D-VII home smoking with one burst. However, his own "Hisso" had taken a few and was running rough—rough, that is—when it was running at all. It was going to be touch-and-go to make it back to the field.

"Here they come, Corporal, looks like they're all there. Better tell the other mechs to get with it, a couple sound like they're on their last spark plug."

"Okay, Sarge. Hey, look at Capt. Chumley's ship."

"Fine time for this mill to quit," thought C.Z., as he wiped the oil from his goggles. "Thought I had the field made too. Might still be able to make it though, by great skill and cunning."

Chaunce had his hands full setting up the deadstick landing approach. A little trickle of sweat ran down his chest. The SPAD swung smartly into the wind on a far out final. Major Lufbery and a knot of pilots who had already landed, turned to watch.

"He's going to be short. I hope he puts it into the pasture rather than to ——. Oh, No! It looks like he's going to try and stretch it."

Chauncey Z. Chumley knew he was short and eased the stick back further.

"Got to stretch it a little. Got to make the field."

Almost everyone saw the small plane nose up sharply, then half roll into the ground. A second later what was left, erupted in flames.

Major Lufbery shook his head. "If he would have paid attention he might not be out there now."

"I'm not, I'm not," Chauncey yelled.

No one heard . . . .

"Make out a notification, Lieutenant. I'll sign it later."

Chauncey looked around. He yelled. No one heard. He reached out to touch an old buddy. There was no touch.

"No! No!" Chaunce moaned, "I won't go, I won't go, I won't ————!"

"Chaunce. Wake up! You've been muttering all night. Maybe next time you won't have so many of those liverwurst and pickled egg sandwiches at your squadron parties."

C.Z. shot bolt upright in bed, picked a flabby spot and pinched.

"Hey! I'm Okay. Whew, I had the darndest dream. Scared me a little, but it taught me a lesson. From now on I'll pay attention. No more goofing off during the briefings, no more sneaking out of the flying safety lectures. By jove, you'll see a new man in me. I'll even read the Dash One, I'll ————."

A slight snoring sound indicated that Chaunce's number one deduction had stopped listening. A deep sleep came swiftly for Chaunce.

The next morning was bright and clear. Inside the Operations building the engine manufacturer's representative was speaking. "——therefore, should the RPM start dropping off on the normal system, the emergency, or secondary system will automatically——." His words faded as Chumley's thoughts drifted to that party at the club and the little blonde who sang with the combo.

From a spot on high, Major Lufbery and the Baron sat and looked down on the briefing room and Captain Chauncey Z. Chumley.

"Well, we tried, Manfred."

"I know, Lufbery, old chap."

"Some of them will just never learn."

"Raoul?"

"Yes, Baron."

"I learned!" ▲

The flight is not complete with the field in sight. Now comes the problem of getting safely....

• • • • Down to

Lt. Col. Michael A. McCuskey, USAF

When someone starts telling you how things should be done, it is normal enough to ask yourself just how much of an expert he is. In most cases you can never tell. You have to accept the information given for what it means to you. If it helps you, fine! If you have a better system, you'd be doing others a favor by announcing it. With that thought in mind, we present the following discussion of landing technique. The author tells of a system that works for him. It may work for you. And regardless of degrees of expertness, the fact still remains that more accidents continue to occur in the landing phase than in any other. If you have a better solution, FLYING SAFETY will welcome your comment.

About four years ago a B-36 aircraft, with a crew of ten, was coming in for a routine landing at Carswell Air Force Base, Texas. The weather was clear, wind inconsequential. Just prior to passing over the runway threshold, the right main gear hit a revetment. The gear collapsed, the right wing tore loose and a terrific fire engulfed the aircraft. When the white hot magnesium fire subsided, the known dead totalled three.

Then, two years later, on a clear, beautiful Texas night —again at Carswell—another B-36 was cleared for a landing. To the crew the approach appeared to be normal, but just prior to passing over the runway the huge main gear hit short. A tremendous twisting action ripped the aircraft. Miraculously, there was no fire. The result was a badly damaged aircraft and eight injured crewmembers.

More detail on these accidents are important for the moment because they point up a well known statistic. These two examples represent but a small number of the numerous accidents which continually confront the Air Force.

During 1957, 42 per cent of all USAF aircraft accidents occurred during the landing phase, and 28 per cent of these resulted from undershooting or from hard landings. Invariably, adverse weather conditions, component parts malfunction or control procedures were not significant factors in contributing to these disasters. Then, why these accidents? Why do our pilots who are the best trained in the world have such landing accidents? These questions could be answered in one general expression. A lack of professional landing technique! This may shock many of our pilots, but let's face the facts: too many landing accidents result from poor pilot technique.

Have you ever made a perfectly smooth landing? If so, do you really know how you made that smooth landing? A professional golfer knows how he makes his good golf shots. This self analysis by the golfer assures habitual professional form. A good pilot is just as much a professional as the good golfer. Perhaps this article will assist you in perfecting your landing technique. You can and should be a professional!

There are just three principles to develop into habits that will consistently assist you in attaining these safe, smooth landings. We know that old experienced pilots outlive the Air Force life expectancy average of 41 years of age. There's a reason: Pilots who follow good procedures develop good habits. In this way more attention is available to cope with unforeseen circumstances. Pilots not burdened with fundamentals or improper techniques will assure themselves of better landings.

Let's discuss these principles in detail, but before we do, an important characteristic must be understood. Once the aircraft is approaching the intended glide path, a pilot must not relate the aircraft nose to the runway as a reference. Instead, he might *imagine* himself as a bird (the aircraft surrounds him) and mentally consider himself as a reference for glide path, track and touchdown. This is the important overall key which opens the door to better landings.

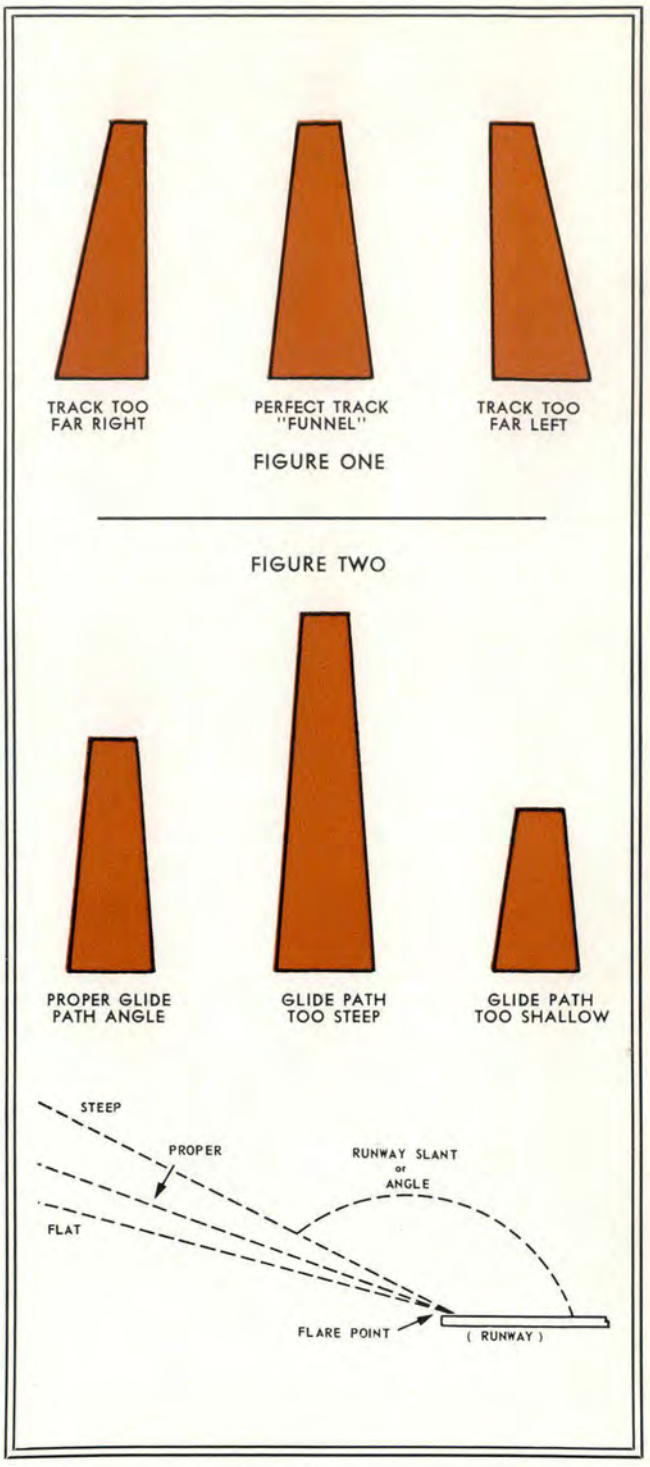
Earth

Now then, let's talk about the principles. *Line up properly*. Maintain a consistent, straight track to the runway. This is made more necessary during adverse conditions of aircraft configuration, crosswind or turbulence. Drifting off track requires additional attention and control to reposition the aircraft. The closer the aircraft is to the runway the more critical the lineup becomes. A straight track will preclude dangerous corrections near the ground and more important, negate a go-around.

Attempted go-arounds under critical engine operating conditions have resulted in numerous accidents. Preclude taking this chance by staying on track! To assure a straight track, maintain a perspective as shown in Figure 1. Make certain that you—not the aircraft nose—are flying down the funnel formed by the runway parallel lines. (During darkness, runway lights present an excellent guide.) Don't worry about smooth control during adverse landing conditions. Keep the aircraft on track. Missing the runway could be an expensive price for insisting upon smooth control.

Maintain the glide path. This principle is perhaps the most important and usually the most difficult to develop into habit. The glide path must be consistently maintained to the flare point. Thus, the power setting can remain fairly constant and consequently the airspeed or trim will vary only slightly.

The net result is that less attention is required for aircraft control and an ideal glide path is assured. But most important is the fact that during all approaches the runway angle appears the same. This affords a consistent flareout opportunity and more accurate power control to assure a good landing on the runway. It's an axiom that "A good approach leads to a good landing." The ideal glide path under no wind conditions amounts to a rate of descent of 400-500 fpm. Of course, a headwind would result in a lesser rate of descent and vice versa for a tailwind.



A steep approach angle is not acceptable. This is particularly true of heavy aircraft where the MAC can vary considerably during routine operation. Consistently safe landings are not possible when the elements of chance are required to control aircraft power and flareout properly. The degree of settling cannot be determined until the aircraft is already into the flareout which is usually too late for proper correction.

A flat approach is not acceptable in multi-engine aircraft. With high power settings required to maintain

The pilot must imagine himself a bird. This is key to landings.

airspeed under this condition, a loss of power could cause tremendous yaw. This could deny use of the runway and require an undesirable go-around attempt.

Establish an imaginary glide path angle to the runway as shown in Figure 2. This glide path angle must be consistent under virtually all conditions (just as it is under GCA). Practice glide path runs to mentally fix the perspective of the desired runway slant. A word of caution: The procedure described is applicable to runways that are relatively flat, with only moderate elevation change. In instances of extreme runway change in elevation an adjustment in perspective angle is obviously necessary to assure the desired glide path. This requires continual concentration but eventually habit will be established and desired results obtained.

Once this glide path angle has been perfected, a 50-foot deviation in rate of descent is readily perceived and immediate correction is possible. Incidentally, your position to the proper glide path can be recognized on base leg, that is, it can be easily seen whether you'll be on the glide path, too high or too low.

Further, with this procedure a straight-in approach poses no particular problem. With the desired glide angle mentally fixed, an approach can be started from any distance out from the observed runway. It may be necessary to fly straight and level to intercept your perspective glide path or you may have to begin an immediate descent. In either instance, fly to the mental glide path first, then set up the aircraft configuration to maintain the desired descent to the flare point.

Now then, when the desired approach angle is reached and it intercepts the flare point, it must be maintained throughout the approach. Imagine now that you want to hit the point on the runway for flareout. As you proceed down the glide path mentally calculate where you would touch down if you continued with the established rate of descent. If it is other than your selected flare point, you are off the glide path and must reposition yourself. In other words, if the runway angle changes, you have drifted off the glide path.

If the flare point has moved, your glide path is off line. In either instance you must return to the desired path immediately. With the perspective angle known and your flareout spot determined, fly *yourself* for that spot. That's it exactly. Fly for the point without changing the selected runway angle or the desired indicated airspeed. Don't point the aircraft at the spot. *You* must head for the flareout point selected. You should be all set now and the aircraft will literally land itself.

Using yourself as a reference to come down the glide path will also assist you in landing an aircraft under various flap configurations. Using no flaps, an inexperienced pilot usually tends to undershoot because he does not mentally fly the proper glide angle. Instead he is prone to use the aircraft deck angle as a reference which results in an undesirable flat approach.

Achieve Minimal Settling. Once the ideal approach has been completed, we're then concerned with the touchdown. Too often pilots are content with just getting the aircraft on the runway, at times resulting in more or less a controlled crash. Some airlines have their pilots cut engine power when the threshold is reached. It saves fuel, true, but it certainly causes a breathless feeling to some passengers who are hoping the pilot has leveled off properly. After proper flareout, continue to reduce power and hold the straight track which you had maintained throughout the approach. Airspeed is decreasing and the aircraft is next to the ground but, we are not satisfied with just putting it on the runway. Now, and only now, look to the runway horizon. Hold the aircraft off to avoid any ballooning or settling at other than a minimal rate. This is done by again applying the rule that you refuse to permit yourself—not the aircraft—to deviate from what is now determined to be the horizontal path to the horizon. Don't let the aircraft be the guide. Fly the horizontal path, maintain track and ease back on the stick. The minimal settling of the aircraft leads to a smooth landing. The perfect landing, however, requires that the main gear touch down in line with the aircraft track.

The procedure outlined above is nothing more than a series of mental calculations with emphasis on a safe approach angle. Once the requirements are known, good habits are easily formed. We must improve our landing technique. We owe it to the Air Force, the taxpayers and above all to ourselves.

Remember, a professional landing technique assures personal satisfaction in that above all you will be doing yourself a favor—by living longer! ▲

I'll be home....

It was a clear, cool early afternoon in the deep South. The blue skies around the airfield made a sharp contrast with the winter brown landscape of dead grass and scrub oak leaves and the dark tones of the evergreen slash pines.

This was plainly a day for living, for planning, for looking ahead to the approaching Christmas holidays. Lieutenant Maston was in excellent spirits as he carried his flight gear out to the waiting F-100. Three hours from now he would be on an airliner, headed north to be with his wife and child who had gone up a week earlier to visit the grandparents.

All that he, Bill Maston, had to do was make this last one hour flight which would qualify him for "combat-ready" status. Then the leave papers could be picked up at the orderly room and he could relax for the four-hour hop in the luxury of one of those commercial jobs. No chute to strap on. No oxygen mask to worry with. Maybe even have a couple of deep-dish olive pies when the pretty stewardess got around to passing them out.

Just one more hour and he would be back on the ground. Ready to dash back to his quarters, grab his bag and make a fast drive to the civilian airport across town. Just one more bomb to drop. One last requirement to meet so he could go on leave, knowing he was at last no longer in training status. Bill felt good. He had it hacked.

True, the day had not gone completely right. Right now he was cutting it pretty thin to catch that DC-7. Seems like every time a guy wants to make a flight real bad, something has to go wrong. This morning it had been the UHF set, then a hydraulic leak.

Original takeoff time had been 0800. After two false alarms and five hours he was at last ready to go. Better not have anything else wrong with this bird. Bill was ready, willing and anxious. Just one week away from the bride had been enough. And that six-months-old boy of his might not even know his Dad if he didn't see him soon.

The preflight check went normally, the mill turned over, temps and pressures in the green. The crew chief checked the controls in the trim-for-takeoff position before Bill taxied the Super Sabre to the head of the runway.

Bill started his roll, cut in the afterburner and raised the nosewheel from the runway. "One more hour," he thought. "Let's go, baby-doll. Grab for altitude!"

No transmissions were heard from Bill after he got his tower clearance for takeoff. None ever will. Bill's plane made first contact with the ground about five seconds after the landing gear handle was moved to the UP position.

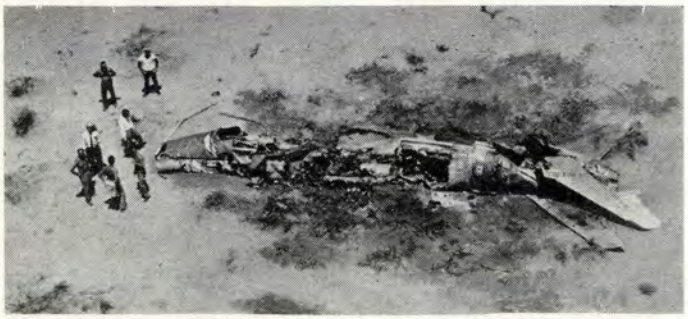
Seventy-five hundred feet down the runway, 1200 feet to the left. Observers say that Bill's plane started skidding to the left immediately after lift-off. The nose was seen to be rising too fast. The left wing was dangerously low as the Mobile Control officer told Bill to get the nose of the F-100 down. Bill tried. The nose was seen to lower slightly and the left wing raised somewhat from its downward angle.

But time had run out on Bill long before his hour was up. The plane made one last gallant effort to become airborne before it dropped into the ground on the left wingtip from about 100 feet in the air.

Bill's plane started to break up after initial impact. Twelve hundred feet of grinding, screeching, exploding chaos later, the fuselage came to rest in an ocean of flame.

As usual the findings of the accident board were brief, terse and pointed. "The primary cause of the accident was improper pilot technique which resulted in a stall. The pilot's improper technique may be attributed to preoccupation and anxiety induced by an attempt to complete this mission in time to depart on an impending airline flight to his home and family. . . ."

". . . . For Christmas."



"....for Christmas"

What's YOUR Analysis

Major Wallace W. Dawson, Fighter Branch, DFSR.

How far in is "too deep", or how much is "more than you can chew?" What size are the britches before you "get too big for 'em?"

It sure would be nice if we could answer these important questions factually, truthfully and timely, and thereby stop cold, all of these unfortunate occurrences we call aircraft accidents. However, we know that this is impossible because things happen in varying degrees. The next best thing then, since we don't have the stock answer beforehand, is to evaluate each situation as it arises, and determine the course of action necessary to accomplish our mission without "getting in too deep," "biting off more than we can chew," and/or "getting too big for our britches."

Following this alternate course of action, where we have to evalute each situation as it arises, necessitates gymnastication of the substance commonly called gray matter. This exercising of the thought process is a thing that we have had to do ever since we made our first decision—to bite Uncle John on the left ear instead of the right one.

Only an idiot would approach a decision, especially one involving his life, without first securing all the information possible. In our case, and when the decision is required in flight, this means weather, wind, fuel, facilities ad infinitum.

The following accident is one of those cases where the pilot involved had to evaluate the situation and make decisions to the best of his ability from the information available. As you read the brief, put yourself in the pilot's place and see if your decisions would have been any different from his.

This is a T-Bird with pilot and—of all things—navigator aboard. The time of year is winter, with takeoff time after dark from a northeastern U. S. airport. The flight is IFR, 606 miles to a southern base at 35,000, with 813 gallons at takeoff.

Takeoff was routine but climb instructions were complicated and fuel-consuming. Arriving over the first checkpoint en route, the flight was determined to be 19 minutes behind and the question of fuel reserve came up. At a later checkpoint the flight was found to be 23 minutes behind and 125 gallons short of the original computation. A decision was made to change destination after the navigator recomputed full reserve and found it inadequate. The pilot requested weather at a closer base and weather for a P-field in the area, from an en route CAA radio station. After a 10 to 12 minutes delay, while the new sequence came in, the CAA radio station gave the pilot weather as 400 scattered, 6000 broken with seven miles visibility, at a low frequency radio station 3.1 miles from the closest Air Force base.

The P-field weather was reported as 9000 broken, seven miles visibility, with both stations forecasting "little change for the next hour."

Over another CAA radio station the destination change was cleared through ATC with the pilot estimating 30 minutes en route with one hour and 10 minutes fuel aboard.

The flight progressed and was cleared to the approach facility and to contact the new destination approach control. The pilot made several attempts to contact destination metro without success, nor could he raise destination approach control. He did, however, get destination tower and was given holding instructions by them. He requested an expeditious approach and was cleared after holding for

12 minutes. He was informed that current weather was 300 feet overcast with three miles visibility. At this time the pilot again tried to contact destination metro, without success. The penetration was started and GCA pick-up requested at the middle cone. Shortly after this the tower notified the pilot that the field had gone below GCA minimums!

The pilot leveled off at 10,000 feet and requested the P-field weather. The tower gave it as 9000 feet broken with seven miles visibility. An immediate clearance to the P-field was requested, VFR on top at 10,000 feet.

The pilot contacted the P-field approach control immediately and received clearance to the range. P-field weather was reported as 6000 feet overcast with three miles in fog. An immediate letdown was requested and Approach Control advised that the approach would be on minimum fuel. The pilot was cleared for a range approach and advised that the visibility had dropped to one and one-half miles. As the approach progressed the pilot was further advised as the visibility dropped to one mile, one-half mile and finally one-fourth mile. The pilot made several low visibility approaches to the field but was never able to get into position to land. When the fuel supply reached 10 to 15 gallons the crew ejected, successfully.

It has been said that there is no such thing as an "accident," that "accidents don't happen, etc., etc.;" that for every action there is an equal and opposite reaction, and that men don't make passes at girls who wear glasses.

Let's conduct a post mortem on this one or call it a lab problem that is *not* academic. Let's dissect this classic and see who did what to whom, when, where and why.

Everything about the flight was completely normal until the pilot received his odd ball climb instructions. This put the flight 19 minutes behind at the first checkpoint. Because the flight was 23 minutes and 125 gallons of fuel short at a later checkpoint (as a result of the odd ball departure instructions), the decision was made to change destination.

A CAA facility was asked for weather at the new destination. Ater a 40 to 50 gallons delay "while the new sequence was coming in" the weather for a station 3.1 miles from the destination was given as 400 scattered, 6000 broken, with seven miles visibility. The P-field which the pilot had in the back of his mind as his "ace in the hole" was reported as 9000 broken, with seven miles visibility. Both stations were forecasting "little change for the next hour."

The flight progressed so that a penetration at destination was started 56 minutes afer receiving the above weather. During the penetration the pilot was advised that his destination had given below GCA minimums. This is little change?

The pilot leveled at 10,000 feet in his penetration and requested the P-field weather. Destination tower gave him 9000 feet broken with seven miles visibility. They neglected to add that the destination forecaster had told them that this weather was one hour old, and that it was probably much lower now, and in fact would probably be down to four miles within the hour. Eight minutes after this information was given to the pilot the P-field reported 300 scattered, 6000 overcast with seven miles. Quite a change in eight minutes. But destination tower had not relayed all the information available.

The pilot immediately tuned for the P-field and switched to the P-field Approach Control. It cleared him to the range and gave the P-field weather as 6000 feet overcast, three miles in fog. When the aircraft arrived over the P-field radio the pilot was cleared for an approach and advised that the weather was "deteriorating rapidly;" a good, four-dollar excuse for not keeping up with the situation.

As the pilot made the approach he was informed as visibility went down to one-fourth of a mile. Three low visibility approaches were made but each time the pilot lost the runway. Although the P-field tower personnel knew that the airplane was milling around in the soup and the pilot was vainly searching for the runway, they either didn't "think" or "bother" to turn the high intensity runway lights up to their maximum. The rest is history.

What's to be gained from this fiasco? What does this mean to me?

Six glaring errors were committed—none of them by the pilot—yet it was his neck that was stuck out for a night bailout. What can we do to keep something like this from happening again? What would *you* have done? What decisions would you have made from the information available? We have evaluated this accident. Here are the six glaring errors as we counted them:

- ATC for lousy departure plan.
- En route radio for wrong forecast.
- Destination forecaster for parroting an hour-old observation.
- Destination tower for not relaying *all* available information to the pilot.
- P-Field Approach Control and/or the people they get their weather from, for not keeping up with a rapidly changing weather situation.
- P-Field tower personnel for not turning up the runway lights.

How would you evaluate it? What are your primary and contributing cause factors? What are your recommendations to prevent a recurrence? Just for kicks, suppose you take time to write us your answer and give us your opinion. Because after all, it's YOU we're interested in. ▲

No Air Force aircraft accident should ever amount to an occasion wherein we merely clean up the mess and go on with the mission. On the contrary, it demands the most careful analysis and best thinking that any and all of us are capable of. Try YOUR skill on this one.

The B-47E had just completed a GCI site ECM run. The two Phase Five capsule ECM operators notified the aircraft commander that they would change seats before the next run. During the seat change the ECM observer accidentally tripped the pressure release (dump) switch from normal to pressure release position.

The cabin altitude of the capsule immediately changed from 9000 feet to 34,500 feet. Before either of the two capsule inhabitants could recover from the surprise of this occurrence and replace their oxygen masks, they were overcome by hypoxia. The aircraft commander, after completing a turn called for a station check and received no reply from the capsule. The aircraft commander then depressurized the forward cockpit and sent his copilot to the capsule to investigate. The copilot carried a walk-around bottle with him. He found the two operators unconscious on the floor of the capsule.

The copilot became excited and in his haste to hook up the oxygen systems of the two, became hypoxic when his own oxygen bottle ran empty during his exertions. He did manage to hook up the ECM operator before he himself blacked out. The aircraft commander then declared Mayday and descended to 10,000 feet where the navigator went to the capsule and revived all three of the unconscious men. After landing, all three were hospitalized by the flight surgeon. The condition of the ECM observer was critical.

REX SAYS—*If a near-tragedy can be a comedy of errors this was it. One can imagine the capsule to resemble the famous stateroom scene in one of the old Marx Brothers movies. One more body stuffed in there would have brought the pressure up. The primary cause of the incident was the accident with the dump switch. Contributing was the design of the switch. The real errors, however, after the incident were two: First, common sense should call for one of the ECM operators to remain hooked up to the aircraft oxygen system at all times.*

The second error after the fact was the aircraft commander's decision to remain at high altitude while the copilot was attempting to revive the two ECM operators.

Some means should be provided so that the aircraft commander can monitor the status of the capsule pressurization. SOP's also should be established to require one capsule crewmember to remain on oxygen and interphone continuously even during seat changes. And aircraft commanders will have to be prodded by some regulation to make an emergency descent immediately when capsule depressurization is lost. Standardization of emergency procedures would have prevented this incident.

★ ★ ★

The pilot of an F-100C made a practice go-around recently. After the go-around was started the speed brakes and landing gear were raised. On approach for landing the Lieutenant retarded the throttle, extended speed brake and followed through with the approach and landing.

Eighteen hundred feet from the approach end of the runway, the F-100C touched down — gear up. It slid straight ahead for 3200 feet. After the plane touched the runway the pilot deployed the drag chute, glanced down and saw the gear handle in the UP position and instinctively placed it in the DOWN position, stopcocked the throttle and turned electrical switches off.

At initial touchdown the landing gear was up and the landing gear doors were closed over them. The aircraft was placed on jacks and with an hydraulic test stand it was found that the gear system operated normally without interruption. The quality control representative found that the landing gear warning horn circuit breaker was open. When the circuit breaker was repositioned the horn operated normally. To cap it all off the landing gear handle warning light was completely wrapped with electricians black tape. There was no light to distract the pilot's attention!

REX SAYS—*The primary cause of the accident is plain to determine. The pilot landed the aircraft without extending the gear to a down-and-locked position. Contributing to cause the accident were three things. The landing gear warning light was taped to obscure the light from the pilot's vision. The landing gear warning circuit breaker was in the open position. This, of course, prevented sounding of the landing gear warning horn when the throttle was retarded with the gear in an unsafe position.*

The third and possibly most important is that the pilot encountered a break in chain of thought during the go-around. After once having lowered the gear for his initial landing pattern the pilot raised it for the go-around automatically and forgot to check it again for his subsequent landing.

In the November issue of this magazine, page 14, this type of accident was discussed. Part of that write-up is obviously worth repeating: The Navy has adopted a requirement that on a go-around, the pilot must perform a complete re-entry into the pattern and re-initiate all landing procedures. This is to reduce accidents due to "psychological set." That is, the pilot's having completed an activity has a feeling of completeness and thus fails to re-extend the gear on the second approach when the sequence of landing activity is different from that normally accomplished. Such a procedure would undoubtedly have prevented this accident. Worth a try?

So far as achievement in aircraft accident prevention is concerned, the year 1958 has been best in history of the United States Air Force. In the firm belief that even this record can be broken, we present

The 1959 Program

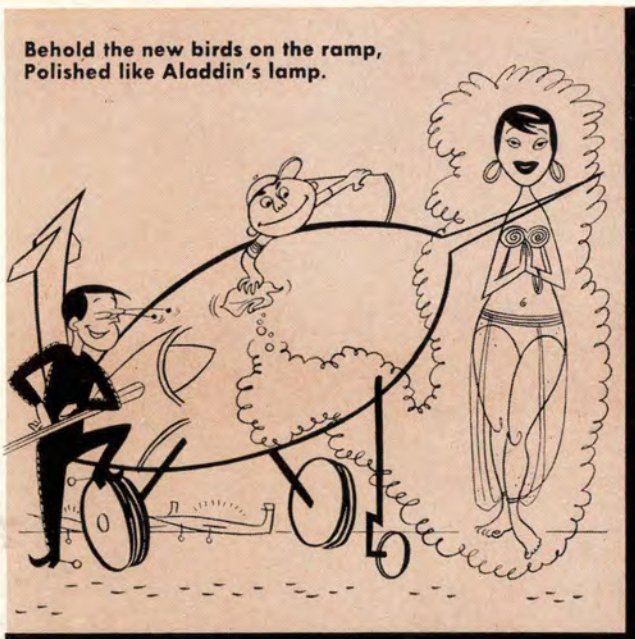
•

JANUARY
The Supervisor
FEBRUARY
Maintenance and Materiel
MARCH
The Care of Man and His Personal Equipment
APRIL
Speed, Altitude and the Man
MAY
Air Traffic Problems
JUNE
Flight Preparation
JULY
Preflight—Taxi, Runup and Takeoff
AUGUST
Flight Techniques and Weather Flying
SEPTEMBER
Approach and Letdown
OCTOBER
Landing Roll
NOVEMBER
Post Flight Activities
DECEMBER
Missiles and Future Air Vehicles

...in a nutshell

MAL FUNCTION

"Get in step," the C.O. cries,
Now's the time to standardize.



Behold the new birds on the ramp,
Polished like Aladdin's lamp.

Fly them well and bend them not,
Or suffer long in Satan's spot.

Where C.O.'s warning should have stuck
Mal can park an Army truck.

Mal makes liar of physicist,
Proves a vacuum does exist.

*U.S. GOVERNMENT PRINTING OFFICE 481009