
TAC ATTACK
DECEMBER 1967

for efficient tactical air power

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TACTICAL AIR COMMAND

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Angle of ATTACK

REPORT SUPPORT

What are all these reports we have to submit every time something goes wrong? Unfortunately, this question is asked more often than it should be.

I'm referring to Incident Reports, Hazard Reports, Unsatisfactory Reports, and Accident Reports. Too many of us consider them the private domain of the safety officer. But they are actually worth very little unless they reflect the best informed judgment of the people closest to the equipment.

Take, for example, the wing cracks we experienced in C-130s this year. Neither we at TAC, nor the engineers in the support commands, would have known of this problem if we had not seen the first reports. Additional reports identified the scope and size of the problem. They, in turn, focused command and engineering attention on the problem.

Similarly, when F-4 engine flameouts started to be a problem, the reports spotlighted power settings, altitudes, and phases of flight where trouble most often occurred. With this specific information in hand we were able to present a well defined problem to the designers and fixers. There was room for little doubt that we urgently needed a solution.

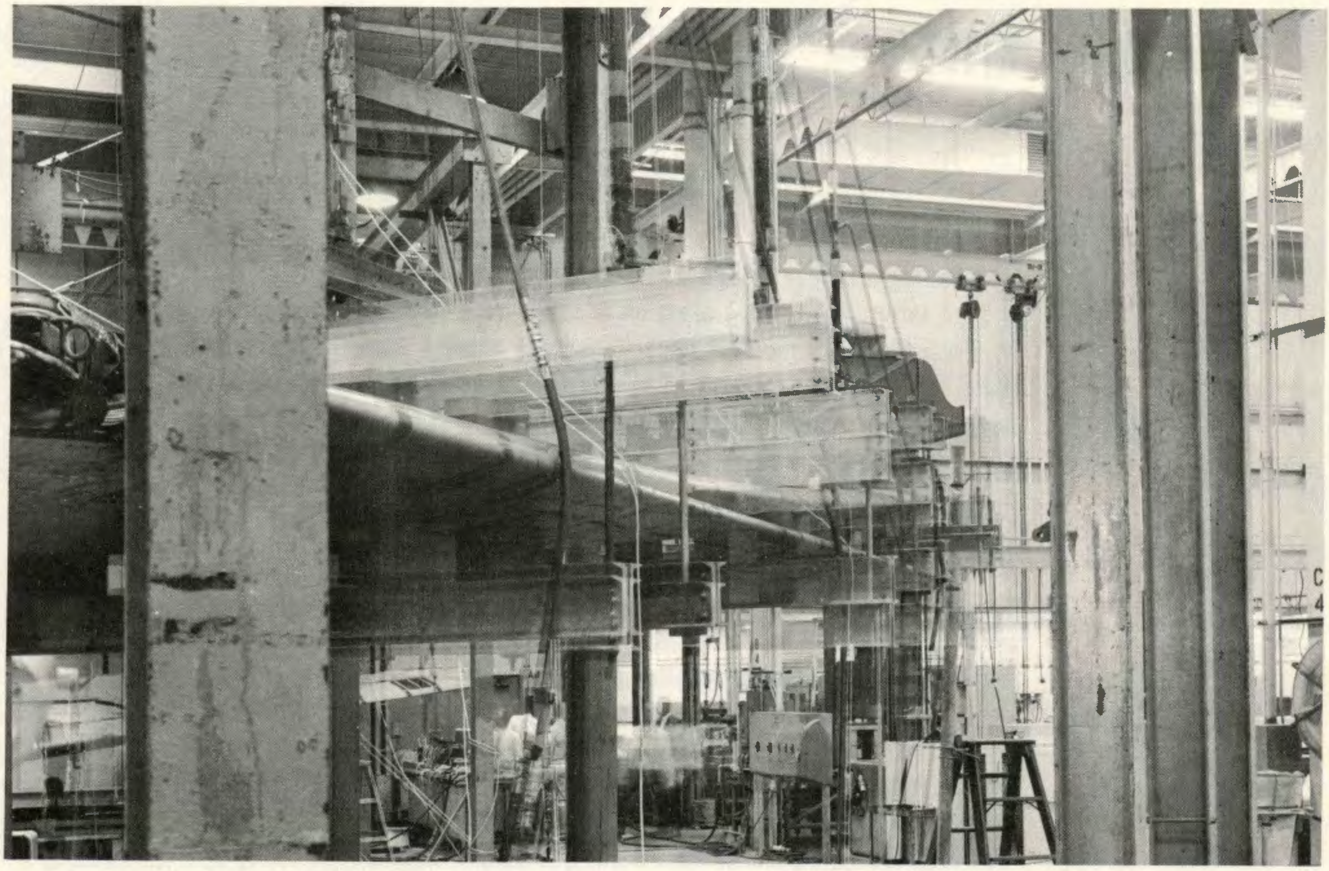
The reports that identify, define, and speed the solutions to these problems are not compiled by safety officers alone. They are important, convincing, and urgent because they come from specialists... from people who speak authoritatively about the technical matters involved. They come from Aero Repair people who work daily with aircraft structures and hydraulics people who know flight controls. They come from non-destructive inspection specialists, quality control inspectors, and engine test cell operators. And from pilots.

Accident prevention reports are valuable only when they are supported by a team. When they don't reflect a team effort... when they are not the consensus of everyone involved... they are often ineffective. Then they are just a waste of time and effort.

We can't afford that waste. And we can't afford the accidental losses that result from unsolved problems.

H. B. Smith

H. B. SMITH, Colonel, USAF
Chief of Safety



THEY FLY 'EM IN THE HANGAR

...to help extend safe service life.

We had just been sitting around the office thinking that the F-100 had been flying for an awful long time, when we heard about something called the Aircraft Structural Integrity Program. It was planned to extend the service life of the airplane.

How do you suppose they do that, we wondered? So we jumped in an airplane and went to smoggy California to find out.

When we arrived at the North American Aviation plant, we found them testing two, count 'em, two airplanes in their structures lab. An F-100 and a T-39! We learned later that there is a good deal of difference in the two programs, although they are essentially accomplishing the same thing... establishing safe service life figures for the two airplanes. But here we're getting ahead of the story.

One of the first things we did was to sit down with Raymond E. Jackman, the F-100 Project Engineer, and William D. Graziano, Structural Analysis Supervisor on the F-100. We asked them to explain the Aircraft Structural Integrity Program (ASIP) to us in non-technical terms. And they did a wonderful job. Would you believe, a couple of engineers who explain their work without pencils and several pieces of graph paper?

Ray told us that the ASIP for the F-100 was established to verify a 5500-hour service life. It was to analyze the effect of operations during the normal life of an F-100, by determining where metal fatigue could be expected to occur. The program included design and test of any modification required to make the airplane safe to 5500 hours. If that sounds like a mouthful, the people working on the program had their hands full.

First, what is the normal life of an F-100? The airplanes in the fleet have lived varied lives. Although the average age of the fleet now is about 3000 hours, some have flown only 1000 hours, some over 4000 hours. Some have always been flown clean, some have been carrying stores under their wings on many flights. Some have lived though the rigors of training, others have been sitting on alert.

Valuable data had been coming in from aircraft in the fleet when they went through overhaul and IRAN at the depot. As the average age passed 1500, and then 2000 hours, you could tell how fatigue had affected the structure up to that time. But at that rate, you would know what to expect at 5500 hours only when the average fleet time reached that figure.

Ray and his people planned to simulate the service life on an airframe in the lab. But they had to learn what they were simulating. How many times is an F-100 subjected to what loads and strains in a flight ... or an hour ... or 1000 hours? To get this information, they started by installing tape recorders and associated instrumentation in four airplanes and putting them back in normal service. Two of these birds were rigged to record about 40 parameters of various types of required information.

This brought in good, specific information. But in order to broaden their statistical base, the engineers decided to record the G loads on about 118 other aircraft. They installed accelerometers and counters in random aircraft around the fleet. These would record the number of times during each flight that the aircraft experienced various levels of G.

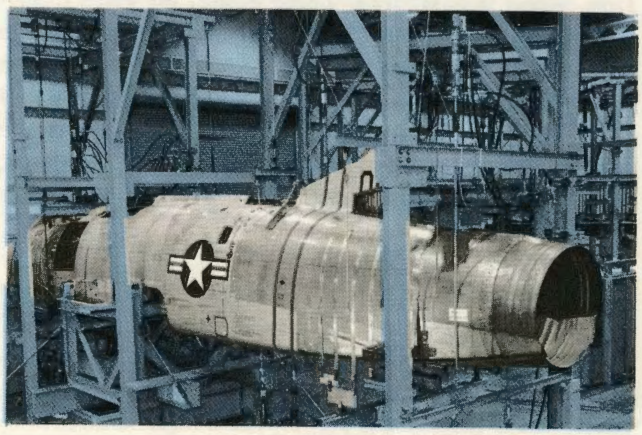
With the information from these airplanes, Bill Graziano and his fellow engineers were able to draw up a valid and representative load spectrum. This was the pattern of load cycles they would put on an airframe in the lab where they could accelerate the lifetime ... get ahead of the fleet.

In addition to this, a Lead The Fleet program was started. The plan was to take a few birds at random and use them more than others. Get them up to, and beyond, the 5500 mark well before the rest of the fleet. Then take a look at them. But the idea didn't work. The press of operational commitments didn't allow us that luxury. We were unable to get the sample airplanes far enough out front fast enough.

We were ready to go to the lab and see how the tests are run, but we had another stop to make. We went to see Clyde King, a Stress Engineer in the Sabreliner Division. Clyde, like Ray and Bill over in the F-100 end of the house, enjoys nothing more than talking about his favorite airplane ... in his case the T-39.

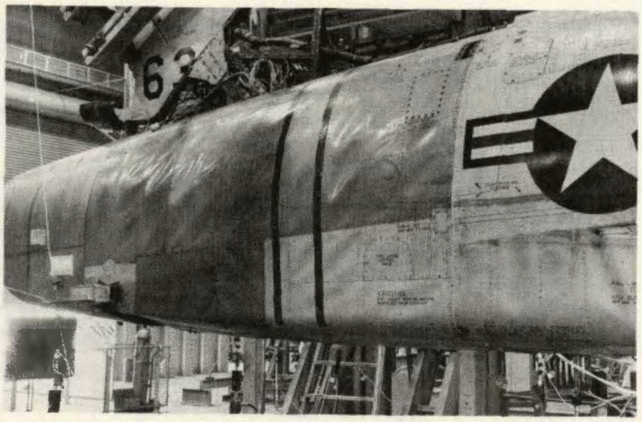
We told Clyde we had learned some things about the F-100 ASIP and wanted to find out if the T-39 program was the same. He reached for a pencil and paper. Non-technical, we told him, or it would probably go over our heads. He grinned, pushed the paper aside, and started to explain the difference between the T-39 and F-100 programs.

The T-39 and its commercial counterpart ... the Sabreliner ... were built to meet FAA specifications



Complex of straps, connectors, hydraulic actuators and hoses in the test jig simulated flight loads on the test airframe.

FLY 'EM in the HANGAR



F-100 skin wrinkled with simulated loads on tail surfaces. Aft section bent down as much as four inches during test.

for a commercial airliner. It isn't subjected to the magnitude of heavy and changing loads in flight that a fighter encounters. But the loads that do occur on the wings and flight controls, as well as landing gear and other parts of the airplane, must be considered. The one item that differed the most between the two aircraft was the effect of cabin pressure in the T-39. A much larger proportion of the total structure is pressurized than in a fighter. And the pressure differential is greater.

Also different, was the fact that the T-39 was designed and certified under the concept that the proposed service life has been tested before certification. When this airplane came along, we were thinking differently about its useful life span. When the F-100 was designed, we thought of its service life in terms of calendar time. We didn't know as much about metal fatigue as we do now. The ultimate loads the structure could withstand were our primary concern, not the effect of repeated cycling loads below the ultimate figure.

The T-39 was designed with the fatigue factor in mind. So it was tested to a "safe-life" of 10,000 flight hours. This required tests and analysis to 30,000 hours before it was certified by FAA. The total structural evaluation consisted of many types of tests. Static tests loaded the structural components to ultimate loads. This is sort of like the load-'em-up-with-sandbags-until-they-break idea ... only a good deal more sophisticated.

Static tests were conducted on wing box sections, longerons, spar caps, skin stringer panels, honeycomb floor panels, riveted and bolted joints. Landing gear doors, for instance, were tested for ultimate loads both open and closed. And all control surfaces had to move through their normal travel under maximum operating loads without jamming.

Impact tests checked the ability of the windshield to withstand birdstrikes up to 350 knots, the effect of hailstones on wing leading edges, and the ability of the landing gear to withstand drop test loads in all attitudes.

Pressure tests proved the ability of the fuselage pressure shell to carry 133 percent of maximum relief valve pressure. In this case, that figure came to twice normal cabin pressure. The wings, which are fuel cells from tip to tip, were pressure tested under a simulated maximum roll condition, producing 16.5 pounds per square inch internal pressure in the wing tip. All single-thickness windows and the front windshield were tested to eight times the maximum cabin pressure differential.

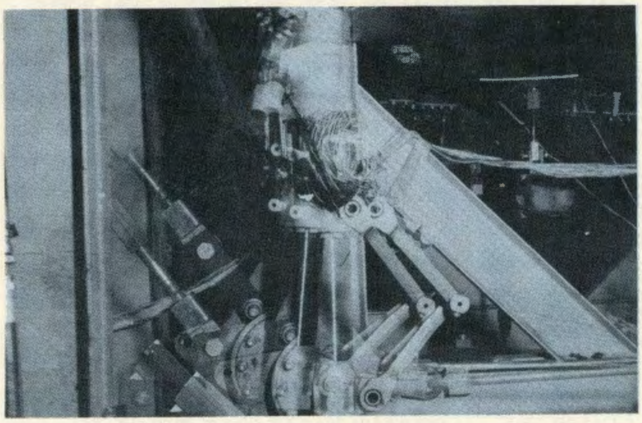
But all these tests are roughly in the sandbag category. The big job was still to come. FAA required that the structure be shown to withstand the repeated loads expected in service for a specified time without a serious failure.

So Clyde King and his T-39 engineers set out to determine a typical load spectrum for their airplane in much the same manner as the F-100 test program was formulated.

Working with an average mission length of two hours, they determined the number and magnitude of maneuver cycles, gust cycles, and ground loads that would be associated with 5000 missions. This gave them their 10,000-hour life.

Since the number of load applications and the magnitude of these loads control the accumulation of fatigue damage, time was not a factor. Therefore, calendar time was greatly accelerated. The T-39 wing was tested for a commercial application until it had sustained in excess of three 30,000-hour fatigue lives.

They mounted the right and left-hand wing panels in a jig by the wing-to-fuselage attachment fittings. By attaching hydraulic jacks to the wing skins through rubber pads, they placed the test loads on the entire wing.



Ground-air-ground cycle adds takeoff, landing loads to flight load simulation. Here landing gear goes through part of test.

For the fuselage fatigue tests they used a complete structural shell. The nose and tail sections did not have to be included. But all load-bearing components were either attached or simulated: vertical tail, engine mounts, dummy nose gear, speed brake, horizontal stabilizer ... even passenger loads.

The initial fatigue tests were conducted with the T-39 fuselage submerged in water. This was to minimize danger and structural damage in the event of a failure. The fuselage was supported in a test tank by a jig representing the attaching geometry of the wing. And loads were induced through the empennage, engines, and other components. In effect, all structural elements were tested simulatenously.

The engineers had determined that the effects of internal cabin pressure contributed most of the fatigue damage to the fuselage. Therefore, they added internal pressures to external loads in order to evaluate the entire ground-air-ground (GAG) cycle of actual operation.

A typical GAG cycle starts in a static ground condition. This is the airplane on the ramp. The cycle moves through ground handling ... the short, positive and negative G-loads which a fuel-heavy airplane incurs during taxi. Next come the combined ground and flight loads of takeoff, and then the simulation of maneuver and gustloads in flight with the cabin gradually pressurized to a maximum altitude condition. Letdown and landing reverse the pressurization schedule while flight loads continue. Finally, typical landing loads are figured into the GAG cycle before it ends with ground handling, or taxi.

Actual simulation of each of the individual loads would have presented an impossible programming problem. But the engineers were able to come up with a sequence of 20 steps that adequately covered the GAG cycle for five T-39 missions. This sequence was repeated 1000 times to provide the 5000 missions, or 10,000 flight hours.

With all this information, our heads were swimming! It was time to go over to the structures lab and take a look at the tests.

When we stepped into the lab we were confronted with a maze of frames and jigs surrounded by hydraulic actuators, power hoses, feedback hoses, wires, banks of recording equipment, wires, more hoses, programming equipment, more wire, more hoses ... and Warren Horsefall.

Warren, a big, soft-spoken man, calls himself a Structures Specialist. After talking to him for a few minutes, we felt he should have a much more imposing title. He was answering most of our questions before we asked them.

As he led us toward one section of the maze we found an F-100 wing. It was right there where all the equipment growing up from the floor met the equipment ... hoses, actuators, wires ... hanging down from overhead supports. To one side was a bank of black boxes, each containing an aluminum drum. Warren explained that these drums have the various loads of the test program scribed on their surfaces.

As a drum rotates, a stylus follows the scribed marks, sending signals to the hydraulic actuators. Other components of the complicated rig monitor the hydraulic pressure applied, match it to the program requirement, and send signals to correct the pressure if it is off.

Warren explained that the program running at the time ... bending the wing ... was simulating a one-hour and forty minute flight every eleven minutes. And as we watched, the wing tip moved up and down 20 inches. Hard to believe. A real wing from a real F-100!

Warren turned us back to the bank of aluminum drums just in time to see one stop turning and another one start. He explained that each drum carried a certain sequence of loads of varying magnitude. In simulating the GAG cycle on the F-100 wing, a taped program was switching the drums on and off in the sequence worked out with data from the instrumented airplanes.

When we asked him how long the wing had been undergoing this torture, he said it was pretty difficult to give a simple answer. And he led us over to the other wing.

Another complete wing, from tip to tip, was in a test rig we hadn't even seen yet! Warren explained that as the tests progress, small fatigue cracks show up on one component or another. Part of the purpose of the testing is to identify each of these failures, devise a fix, or repair, and then validate that fix through more testing. By keeping voluminous records on every component in both wings, they are able to test the fix while the basic test is still running. But it is difficult to say how many hours are on the wing as a whole ... each part has a different history.

Then Warren explained that in order to validate a 5500-hour life for the F-100 wing, they were testing it to 11,000 hours. This factor of two gives added assurance that the 5500-hour life is valid if the test specimen did not fail in twice that much time.

As he talked, we moved toward another part of the hangar where an F-100 fuselage was rigged for fatigue tests. Metal straps had been fastened to the skin and frame members, leading down to hydraulic actuators below. Although the test on the fuelage was not running at the time, Warren explained that it was being tested to a factor of four ... 22,000 hours.

We saw that the F-100 fuselage was supported at the wing attach points, as Clyde King had told us the T-39 fuselage was tested. The straps at front and rear were attached to actuators that pull or push together to bend the fuselage around the wing. Warren explained that the nose section, containing the intake duct, is stiffer than the tail. While the nose actually does very little bending, the tail will bend down about four inches during max-effort tests.

During that kind of bending, the fuselage skin must buckle, or wrinkle, a certain amount. And after many, many repeated cycles, small fatigue cracks appear in the skin. When these occur, they are repaired with doublers and the test continues. The purpose of the tests is to determine the integrity of the primary structure ... the part that carries the load.

Off in another corner we spotted a Sabreliner fuselage (the commercial version of the T-39) inside a wire cage. It was out of the water tank now, Warren explained, but still undergoing tests. The original 10,000-hour airplane was on its way to being certified for a 30,000-hour life. And the tests were being run to a factor of three, which FAA requires for commercial certification. That comes to 90,000 hours! We were impressed. A 10,000-hour airframe is good for about ten to twenty years of normal executive use. At that rate, this bird stands a good chance of outlasting the Goon!

Warren was still patiently explaining the testing procedure. What we were looking at was the fuselage fatigue test ... external loads and pressurization. But a total of 92 separate fatigue tests are conducted to qualify the T-39 airframe. And in great detail. For instance, when the engine mounts were tested, it was done in a temperature-controlled environment to account for engine heat.

After a few more words, we headed back to quiz Ray Jackman and Bill Graziano again. Ray straightened us out on a couple of misconceptions we had picked up along the way and dug out some photographs for us to use. Then Bill leaned forward.

"In a sense, we are still learning about metal fatigue in airplanes," he said. "It used to be that we didn't test airplane structures beyond static loads ... the sand-bag thing. But we can predict static strength to 2 1/2 percent. Fatigue life requires actual testing. And that testing is allowing us to build lighter, more economical airplanes. At the same time it gives us much better assurance of the safe usable life of the airplane. Probably the most important outcome is our ability to predict. We can tell at what point in an airplane's life we must start looking at what component. In fact, we have been able to anticipate some of the problem areas already ... in the relatively short time we've been running tests on the F-100. In some cases we were able to recommend a modification to the Air Force before the failures occurred. In other cases, our experience in the lab helped pin down the specific cause of an accident. And if the fix was not already in the field, our engineers were working on it."

"All in all," Ray Jackman concluded. "The Aircraft Structural Integrity Program has done what it was intended to do: It is giving us the assurance that the aircraft will go to the expected life figure. It's the coming thing."

TACTICAL AIR COMMAND

AIRCREW ACHIEVEMENT AWARD

The C-130 crew of Major Stephen O'Neill, 313th Tactical Airlift Wing, Forbes Air Force Base, Kansas, has been selected to receive the TAC Aircrew Achievement Award for the period ending 31 October 1967.

Major O'Neill's crew encountered multiple generator malfunctions shortly after takeoff on a combat support mission. Generators three and four required a total of four resets in the first 200 miles of the mission. When number one generator tripped off the bus, it could not be reset and the crew shut down number one engine. Major O'Neill reversed course, and 90 miles from home station the number four generator tripped again. This time they could not reset it.

As Major O'Neill began to descend below freezing conditions, the master fire warning light came on indicating a turbine overheat. All circuits checked operative but when the crew reduced power, the light did not extinguish. Number four generator still could not be reset and the crew shut down that engine.

After a successful two-engine landing at home station, investigators found internal shorts on all three phases caused the two generator failures. A faulty keyer in the warning system of number one engine caused the master fire warning light to remain on.

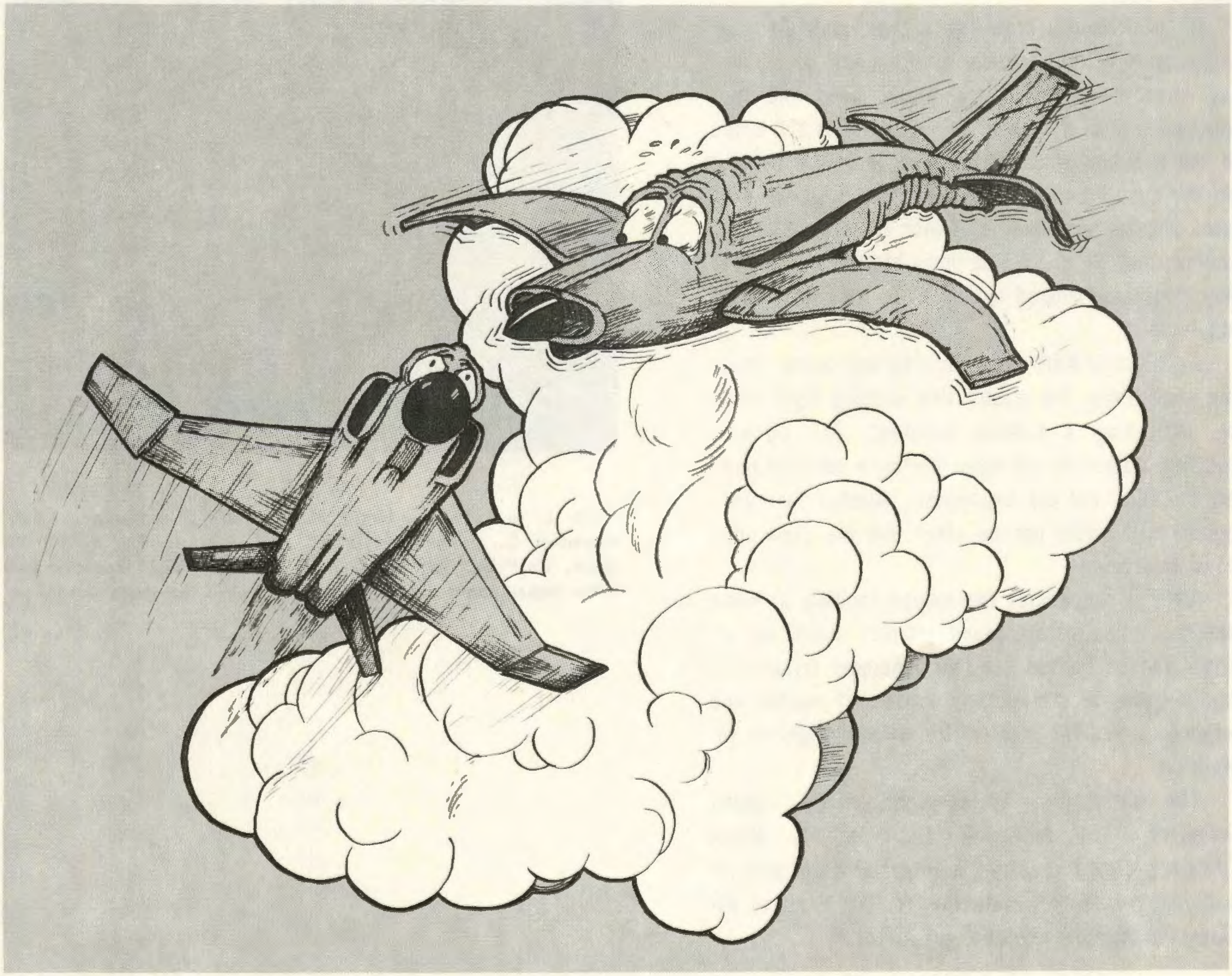
The outstanding professional ability, sound judgment, and teamwork displayed by Major O'Neill's crew in averting a potential major aircraft accident merits their selection for the Tactical Air Command Aircrew Achievement Award.

From l. to r.: A1C James P. Engelker, Loadmaster, Capt. Raymond D. Holden, Navigator, Maj. O'Neill, Lt. Robert R. Stark, Co-Pilot. SSgt Kenneth R. Vickers, Flight Engineer has been reassigned and was not available when the photo was taken.

ABOUT COLLISIONS... they hurt a lot

NEAR MISSES, THEY MAINLY SCARE. They make you look a lot. For a while.

...or: JUST FORGET ABOUT THAT CHECK RIDE.



Thoughts on mid-airs, few of them original, by a pilot who's had a couple of scares himself.

You come up with several questions when you start wondering why mid-airs continue to happen.

• Has improvement and expansion of air traffic control changed the picture in recent years?

No, not really. Most collisions and near-collisions still occur during day VFR. Sixty percent of them still happen below 10,000 feet. And they still involve experienced pilots. Average flying time of the Air Force pilots involved in 31 recent collisions was 2500 hours, with 600 hours in type aircraft.

• Since airlines, many business jets, and part of the private aviation community have gone to high altitude, it is now less congested down low?

Not a chance! The pilot population almost doubled in this country between 1957 and 1966. And private licenses more than doubled. There were over 335,000 student and private pilots flying around last year. Throw in over 5,000 helicopter, glider, and lighter-than-air pilots, and 116,000 people with active commercial tickets . . . you're approaching 500,000 before you even say airline! The low altitudes are more crowded than ever.

• Well, you say, much of that low-altitude traffic is radar controlled. Almost all the traffic climbing to, or descending from, Positive Controlled Airspace is under radar control. It shouldn't be involved in collisions . . . or even near-collisions.

Wrong again! The sheer magnitude of the traffic in some terminal areas can saturate the system. Radar control's ability to function as an anti-collision instrument is compromised. Controller workloads were predicted to rise three percent this fiscal year. Due to the combined effects of undermanning and increasing traffic, workload increased by 15 to 25 percent at some locations by mid-October.

Now, I'm talking about collisions between pilots who never saw each other before. Formation collisions occur for different reasons. One-half of those 31 collisions I mentioned occurred in formation. But I'm looking at the other half. Not because I don't have ideas about the formation problem, but that's another subject . . . we'll look at it another time.

So there you are . . . mid-airs and near-collisions still happen where both pilots should be able to see each other. Most of them happen in situations where there is ample time to take evasive action. Going back to those 31, in only one case was time insufficient for perception, decision, and response before the collision occurred. In the remaining 30, the pilots had time to see each other and react. But they didn't.

An interesting sidelight . . . in none of the 31 was there a violation of either civil or military air regulations. The pilots were doing what they were supposed to be doing.

Except looking!

Why don't we look? It's not enough to say this mid-air or that near-miss happened because the pilot wasn't looking out his window. There is always a reason WHY the pilot erred. Several situations or conditions can provide the WHY. Cockpit design is sometimes the culprit. Sometimes we find one or both pilots engrossed in checklists, charts, or letdown plates . . . because of insufficient preflight preparation. There are also problems in the attitude area. And each one of us can do something about these right now.

We depend too much on radar control. We're spoiled. We don't even make position reports anymore. How many times have you caught yourself at three or four thousand feet in the letdown, still staring at the clocks . . . flying precision instruments? Suddenly you realize there isn't a cloud in the beautiful, clear winter sky. But there are lots of airplanes.

It usually takes a reminder from the guy at the other end of the headset. Something about . . . traffic at two-o'clock, slow moving, altitude unknown. That's when you really look around for the first time.

Generally, the controller isn't required to steer you around other traffic unless he knows it is at or near your altitude. When he finds traffic in his sector, and has no flight plan for it, he assumes that it's VFR. And he reasons that if you are close to this stranger's altitude, you will be able to see him.

ABOUT COLLISIONS

If you're descending in clouds, and about to break out, it's a good idea to have him steer you around the strangers. For that matter, have him steer you any time you don't see the airplane he calls out to you.

We're also guilty of depending on the other guy to do the looking. We don't do it consciously. It's a more-or-less natural result of having IFR and VFR traffic in the same piece of sky.

"That other guy's VFR," you say to yourself. "He's got to be looking where he's going. I'm IFR, flying a precise pattern to a precision final approach.

"I'm mighty busy.

"Let him do the looking."

But you think: "(let him do the looking)," and you keep flying smooth, precision instruments.

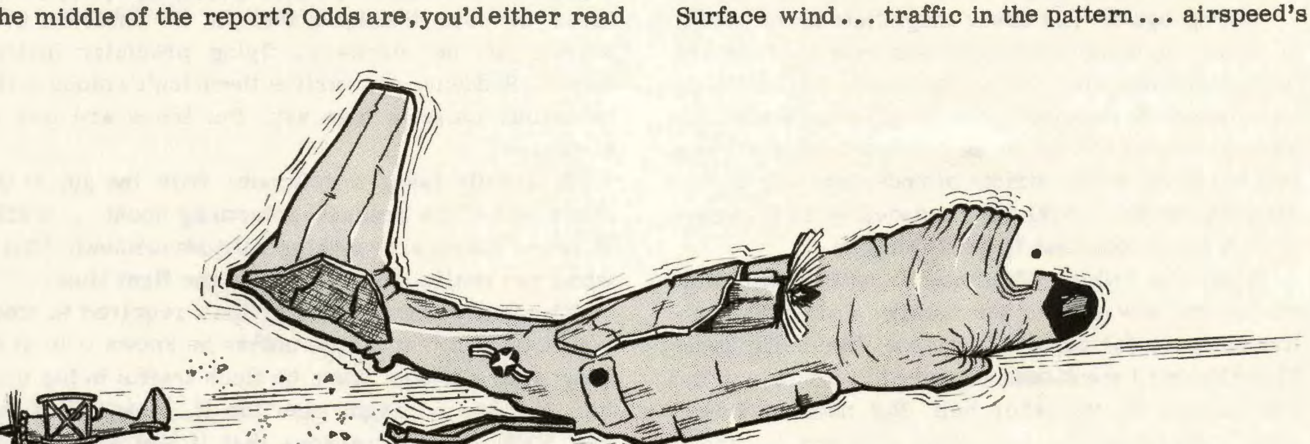
Actually . . . and you may not like to hear this . . . situations arise when a pilot can do only one thing at a time, and do it well. Imagine you're in weather, getting ready to roll out of a turn to the ILS. Then the controller starts to read you an involved terminal weather report. One that comes complete with altimeter setting, dew point, and temperature.

Do you suppose you could digest all the information in the report . . . really understand and remember it . . . and continue to fly precise instruments? What if the localizer needle started to come off the peg in the middle of the report? Odds are, you'd either read back the altimeter incorrectly, overshoot the turn, or change altitude by a couple of hundred feet.

Now, try the same situation, but remove the clouds. You're flying the same careful approach to an ILS. You're also trying to digest everything the controller is conscientiously reading to you. And you're trying to scan the skies for airplanes that might ram you.

If you're fortunate, you'll do one of those three basic tasks completely and efficiently. If you're conscientious, you may try to accomplish all three . . . and fail miserably at all three. You may forget to set your altimeter, or miss the fact that you're making a downwind approach against traffic, or overshoot the turn while you gain 150 feet. Or you may wipe out that nice family of four that just took off from the county airport.

You were trying to perform three distinct, and demanding tasks. One, a purely mental task: Listening to the controller and recording in your mind the facts you need. One task you consider almost mechanical: Turning the airplane to the final approach course. You have done both of these before . . . thousands of times. You have learned to act on the critical information in each sequence . . . localizer needle starts off the peg, roll into a bank. Altimeter setting, reach out and turn the knob. Vertical speed starts to climb, relax back pressure, trim a bit. Surface wind . . . traffic in the pattern . . . airspeed's



getting low ... start to roll out ... answer the controller ... re-trim ... get ready to lower gear ... right cross wind, correct ... airspeed, correct ... call gear down ... altitude, correct ...

A little turbulence may be all it takes to put you right up against saturation. And you haven't touched that third task yet ... looking for unannounced traffic!

Once you broke out, all that precision suddenly lost its importance. You had followed the instrument approach for two reasons: To get you to the runway and to keep you clear of other IFR traffic. Now, in the clear, it will get you to the runway, but it certainly isn't guaranteed to keep you clear of other airplanes. In a crowded terminal area, clearing yourself from other traffic becomes more important than just getting to the airfield.

Precision is one of the great challenges of flying. It's a source of great satisfaction. We take great pride in it.

Maybe we've been carried away by it.

Or is it just that we don't put ourselves into a VFR frame of mind? Is it that we drive into the terminal area thinking ... "I'll not cancel IFR, this straight-in GCA (or ILS, or whatever) is the shortest distance between me and the snack bar."

And in the back of most of our minds there is also a bit of that last check ride ... or the one that's coming up in a few weeks. Practice is another tradition in flying. From earliest training, we try to be practicing something whenever we fly. As flight procedures, instrument systems, almost every facet of flying becomes more complex, we feel we need more practice. We constantly strive for perfection. The drive for perfection is one of the things that attracts many of us to flying.

It begins to look very understandable. Practice ... precision ... perfection. They're natural to us. But we've overlooked a fourth item that must go with the other three. Call it a control: Priority.

Put another way, we're not being precise, perfect, or very professional, when we carry flight techniques for one phase of flight into another. As a matter of fact, we're acting like imperfect non-professionals when we allow this carry-over to jeopardize our own and others' safety.

So let's forget about that check ride! At least when it gets in the way of other important business. Let's make a conscious shift in our thinking when we break out of the clouds.

I find it helps to actually say it aloud: "Now I'm going to fly VFR." If there's someone else in the airplane with me, I say it to him. If I'm alone, I say it to myself ... out loud. It does wonders! I pull my eyes off the gages and practice VFR flying. Sure, I follow the approach pattern ... or departure pattern, if that's what I'm doing ... but I practice following a <u>general</u> pattern while I scan the entire area around me. I consider it a point of pride to spot the strangers before the radar guy calls them to me.

It doesn't bother me a bit if my climb speed drifts a few knots high or low. The bird climbs just as well when you're five or ten knots off for a while.

Likewise, in a VFR penetration, I don't worry a bit when the airspeed stays at 240 or 260, instead of 250 ... and I'm looking outside.

In the same frame of mind, 50 feet off my altitude doesn't bother me ... even 100 feet! I correct back to my target altitude each time I look inside the cockpit. And then I go back to looking around outside.

This idea of a definite transition from IFR to VFR flying doesn't apply to only the one-man airplanes. Even when you have two pilots sitting side by side, all eyes should be on the lookout during critical, low altitude periods.

There are many things that compete for your attention when you are making an instrument approach. Their relative importance varies with the conditions at the time. But in this day of rapidly increasing air traffic congestion, the instrument part of an instrument approach must take a back seat to that other traffic when you have a chance to look around for it.

Remember, the old saying that "the one you don't see will kill you" applies to all of us ... not just the guys in combat!

CHOCK TALK

...incidents and incidentals with a maintenance slant.

tank torque

The F-84 pilot had just accelerated to 450 knots, straight and level at 3500 feet on a navigation mission, when his airplane went into a brief porpoise. He felt he was getting some kind of buffet on the left side of his bird. When the porpoise subsided, he called and asked the lead aircraft to look him over.

Lead dropped back and shortly reported that both the nose and tail section of Two's left drop tank were missing. They decided to turn back toward home and landed without further incident.

On the ground, maintenance inspectors were unable to find a specific reason for the failures. They suspected that the attaching screws for the nose and tail sections of the tanks had been improperly torqued. On a hunch, they looked at several of the other birds on the line. Sure enough, they found several tanks with under-torqued attaching screws.

A word to the wise.....?

turbine torque

The Phantom pilot was beyond safe abort point on takeoff when his right engine fire warning light started blinking at him. He pulled back the right throttle and the light went out. Then he eased the throttle back up to see if the light would come on again. Sure enough, it did. This time he honked the throttle all the way back to idle.

His wingman moved in and checked him over, but found no signs of fire. With the light out, nothing else looked abnormal. He aborted the mission, burned off some fuel, and landed without further complications.

The engine shop people pulled the engine and ran it in the test cell. They found an air leak at the split line of the rear turbine housing. When they re-torqued the split line bolts, the air leak stopped. Re-installed in the aircraft, the engine sent its exhaust gases where they were supposed to go... and the fire warning light stayed out.

tailpipe torque

The T-39 pilot from another command had just taken off on an instrument training mission when he heard a loud thump. Then he saw the fire warning light come on for the number two engine. There was no other evidence of fire, but he shut down the engine.... to be on the safe side. And then the light went out.

He aborted the mission and landed uneventfully from a single-engine approach. On the ground, inspectors found the right engine tailpipe wedged in the engine pod, about ten inches aft of its correct position. Hot exhaust gases, going where they were not intended, triggered the fire warning circuit.

Looking further, the engine shop people found a broken tailpipe clamp. The tightening bolt showed evidence of overtorque.

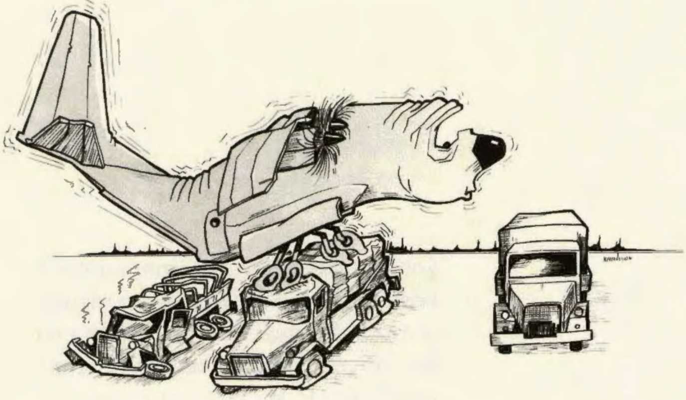
and this is torque

Preflight, engine start, taxi, and takeoff had been routine for the two overseas F-100 pilots. Their local training flight went smoothly... until they were 20 miles from the field. That was when the wingman first noticed the forward fuel cap was missing from his left 335-gallon drop tank.

It was no serious emergency, but they had to abort their training mission. They burned fuel down to a reasonable landing weight and went home.

On the ground, they discovered that about half of the fuel had siphoned out of the tank in flight. When they did some more checking, they learned that the bird had been wearing three flip-latch type external fuel caps, and one screw-lock type cap... the one that was lost.

After the crew chief fueled the airplane for this flight, he used a six-inch screwdriver to tighten down the screw-lock cap. The small-size screwdriver had not given him enough leverage to properly tighten the cap. ➝



by L/Col Carl E. Pearson
Hq TAC (OSP)

TRIP-TOE thru the TRUCK PARK

The C-130 pilot lined up for a max effort takeoff. With 3500 feet of rough runway available, he carefully checked torque before releasing brakes. Acceleration seemed normal as he took the yoke at 60 knots. He raised the nosewheel early to ease the pounding from the unsmooth strip and waited for liftoff. When he ran out of runway he horsed the Herky off the ground.

At 92 knots he skimmed over a dump truck parked 125 feet off the end of the strip. His main gear hit the truck's hood, windshield, and cab. While the pilot fought to keep the bird airborne, it hit a second truck about 500 yards farther along his flight path. Staggering up an incline for another 2000 feet he cleared the top and gratefully eased down the backslope. The Herky accelerated quickly and reached flaps up and normal climbout airspeed.

With airspace below and airspeed to spare, the crew inventoried the damage. Their tiptoeing thru the truck park ruptured the left rear main tire. They suspected that other assorted parts were damaged, but couldn't confirm it visually. The pilot decided to return to his home station for landing and repairs. His landing was happier than his takeoff.

Maintenance inspectors found damage to the gear doors and some sheetmetal tears caused by the blown tire. It all came to about 40 manhours.

Investigators decided that a combination of circumstances ... plus some individual failures ... set up the near-tragedy. These included: Low ceiling and visibility in rain and fog, poor lighting on a rough runway, unnecessary motor pool parked off the end of the runway, and an additional 700 feet of runway that was available, but unknown, to the pilot. They decided that the pilot could have overcome all his problems if he had not raised the Herky's nose too soon and too high in his hurry to make the bird fly. He would have reached max effort liftoff speed at 2500 feet with normal takeoff technique.

by Lt Col Carl E. Pearson
Hq TAC (OSP)

WET SIDE STORY

"You can stop that mechanical monster on a dime?"

"It'll stop on a dime and give you nine cents change!"

"How does it handle?"

"Corners like a Grand Prix racer! My Castiron Cruiser has jumbo power brakes, full-time power steering, low-profile tires, great balance, all the safety gadgets, and the world's second best driver . . . modesty won't permit me to claim first. I can drive into or out of anything . . . rain, snow, ice . . . handling a skid's no problem."

"Okay Hotshot. How would you do on a dime's thickness of water . . . thin dime at that?"

"Strictly no sweat! I'd bet my life on it!"

Our boastful friend could easily lose that bet . . . in a skidding car that won't respond to his frantic attempts to brake and steer. In spite of his costly car and his driving experience he's helpless, because he's hydroplaning.

HYDROPLANING? WHAT'S THAT?

After all these years of just plain skidding, blaming the loss of braking and steering on something called hydroplaning will cause many drivers to stare in disbelief. The word hydroplane suggests water sports, not driving. And you're not too far wrong. In it's simplest sense, you're afloat when hydroplaning. And in a car, that's sporty. In fact, it doesn't have to be just water, ice, or snow to get you started. A thin combination of road dust and moisture, or oil and water, common contaminants, can set you up for that unexpected, uncontrollable glide on a dime-thin lubricating film of fluid . . . most of your tire traction and cornering capability lost due to partial hydroplaning at speeds of 40 to 60 mph . . . easily within normal speed limits.

One of the pioneer researchers who injected the term hydroplaning into our vocabulary is Mr. Walter B. Horne, assistant head of NASA's Landing and Impact Branch, Dynamic Loads Division, at Langley. He reports on NASA research on aircraft and motor vehicle skidding in the August 1967 issue of ASTRONAUTICS AND AERONAUTICS. They've discovered that the basic problems involved in keeping a skidding jet on a wet runway aren't too different from controlling a swerving car on a wet highway.

Mr. Horne's study started at the bottom, literally. He had to learn what happens in the area where a skidding tire and the road surface meet. What destroys the usual working arrangement? What drops braking friction to near zero in the tire-to-ground contact area? What erases steering capability in a fully-skidding tire? The conclusion? Hydroplaning, that's what!

Mr. Horne identifies three physical phenomena in wet-pavement skidding. Two of them, viscous hydroplaning and dynamic

MOISTURE AND SURFACE TEXTURE: BRAKING EFFECT

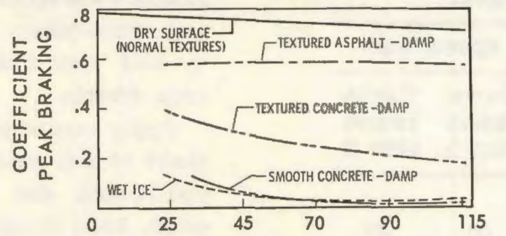


Fig # 1

hydroplaning, create serious control problems for automobile drivers. The third, reverted-rubber skidding, bothers pilot types almost exclusively.

VISCOUS HYDROPLANING

One of a driver's biggest highway worries involves viscous hydroplaning. It's sneaky and difficult to anticipate. Mr. Horne describes it as a buildup of viscous fluid pressure between the tire and road surface. As your wheel speed increases, the pressure rises to a level that lifts the tire off the road. The friction that permits normal braking and steering is sharply reduced. It can vanish entirely. If the texture of the pavement surface is smooth, or fine sand or oil coats the surface, and you lock your wheels in a skid, even a very thin film of fluid can float you out of control. And the vicious setup is about a thin dime's-depth of dewdrops on a smooth-surfaced expressway, curve, or intersection.

Figure 1 shows the braking capability you lose to viscous hydroplaning on concrete and asphalt surfaces, damp versus dry. The texture of the road surface you're driving on can give you special handling problems, especially when the surface is damp. In city driving, surface textures change quickly. You go from concrete to asphalt to steel . . . even cobblestones . . . in a matter of blocks. And you're rapidly changing that important tire-to-road contact, increasing or decreasing your braking and steering potential, without much notice.

The shocker is the near minimum braking you get on smooth, damp concrete. From 35 to 70 mph it's not much better than wet ice. And the large loss in braking on damp-textured or smooth concrete points toward textured asphalt as the driver's friend in wet weather. Adjust your speed and separation accordingly. Your ability to stop . . . your life . . . depends on it.

The wrong braking technique when you're hydroplaning can kill you. Figure 2 is a warning to lead-footed brake jammers. Compare the braking coefficient of a rolling tire at peak braking with one in full skid.

The next time you panic-stop with locked wheels . . . with power brakes that's not hard to do . . . remember this simple graph and its peak braking curve. And roll to a stop.

DYNAMIC HYDROPLANING

Dynamic hydroplaning becomes a problem on flooded road surfaces. When you see raindrops splashing in puddles, or pools of water reflecting lights, you're reaching dangerous water depths. The dynamic fluid pressure building under your rolling tires can lift them off the pavement. And when you encounter total hydroplaning, your braking and steering is gone. You're adrift, subject to whatever outside force pushes you . . . or gets in your way.

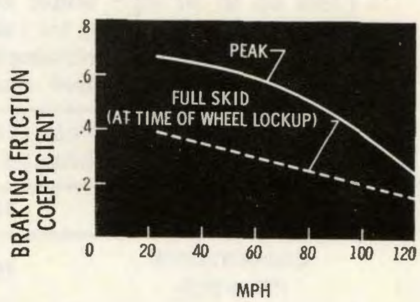
How deep for total hydroplaning? It depends on depth of tread, tread design, and the surface texture of the road. If you're on worn-out slicks and the road's smooth-textured you're in trouble on a heavy dew. If you have new tires on open-textured asphalt surface you can navigate until the water exceeds the depth of your tread groove If you're somewhere between on tire wear and road texture, you're in trouble when you wade into water deeper than your tread depth at hydroplaning speed. And unmatched treads can hydroplane independently, starting with the baldest.

How fast must you be moving to hydroplane dynamically? Mr. Horne offers a quick rule-of-thumb: Your tire will lift off the pavement at about 10 times the square root of your tire pressure in pounds. At 16 pounds tire inflation you'll hydroplane at roughly 10 times 4 (the square root of 16), or 40 mph. With 25 pounds pressure you'll hydroplane at about 50 mph. If you have an underinflated tire it will hydroplane before the rest.

Fig # 2

BRAKING FRICTION COEFFICIENTS

Tire rolling (peak) and tire locked (full skid).



CALCULATED VEHICLE SPIN-OUT SPEEDS ON UNBANKED ROAD CURVES

Smooth concrete. Tire pressure 27 lb/in^2.

Tire and pavement conditions	Spin-out speed, mph		
	Curve radius 500 ft	Curve radius 1000 ft	Curve radius 2000 ft
Wet pavement (0.04 in. water depth)			
Bald or smooth tread	33	40	49
Grooved tread	45	57	67
Grooved and siped tread	49	62	74
Flooded pavement (0.4 in. water depth)			
Bald or smooth tread	33	38	44
Grooved tread	40	46	51
Grooved and siped tread	43	48	52
Dry pavement			
All tires	76	107	152

Fig #3

Spinning out of control on curves takes a heavy annual toll. It's not always the result of drivers exceeding posted speed limits. Study the chart in Figure 3 and think about your car's rolling stock. You'll understand why your rear wheels broke loose the last time you lived through a speed-limit spin-out.

Check the tire and pavement conditions and the low spin-out speeds on a 500-foot-radius curve. Now think about the short radius turns you make during quick lane changes on an expressway. If traffic flow won't permit you to slow down, give yourself more lane-change space. Fast weaving in and out of traffic lanes leads to fancier spins . . . into opposing traffic, or guard rails. The bald-tire spin-out speed of 33 mph is city-street level of driving. At that speed and higher you're fair game on the unbanked curves, intersections, and assorted road surface textures in towns.

BRAKING TECHNIQUE

The comparison in Figure 4 is another convincer, if you're still wavering on wheel-locked braking versus the peak wheel-rolling technique. When you're slowing down on that unexpected condensation, or a wet spot on a smooth roadway, remember: You'll lose nearly half your braking if you lock your wheels.

Apply maximum pedal pressure short of full skid. Back off when you reach the screaming-skid point. Then reapply max pressure short of wheel lockup. It's a rhythmic pedal-pumping action. With practice you can gauge the pedal pressure you need on dry surfaces for peak braking short of full skid.

On wet surfaces, the feel of your car and response to your pedal pressure provide the clue. The scream of tortured tires is drowned out by the moisture. The sensation of your car being afloat, the rear end trying to break loose, steering forces getting rapidly lighter, all warn you. Back off on brake pressure momentarily, then reapply.

HOW DO YOU AVOID HYDROPLANING?

For a starter, recognize it as a serious threat to your life. You can't control road surface texture, drainage, banking, or other engineering deficiencies from your driver's seat. You can't stop rain or dew formation. But there's still a big YOU in the hydroplaning picture.

You must evaluate driving conditions and adjust your speed accordingly. You know the condition of your tires' tread and you must maintain correct inflation. You handle and brake your car. You react to the varied hazards that unfold as you cruise. In short, YOU make the really important hydroplaning decisions.

Your main decision should be: Slow down on wet pavements.

→

Fig #4

CALCULATED DISTANCES REQUIRED TO SLOW DOWN

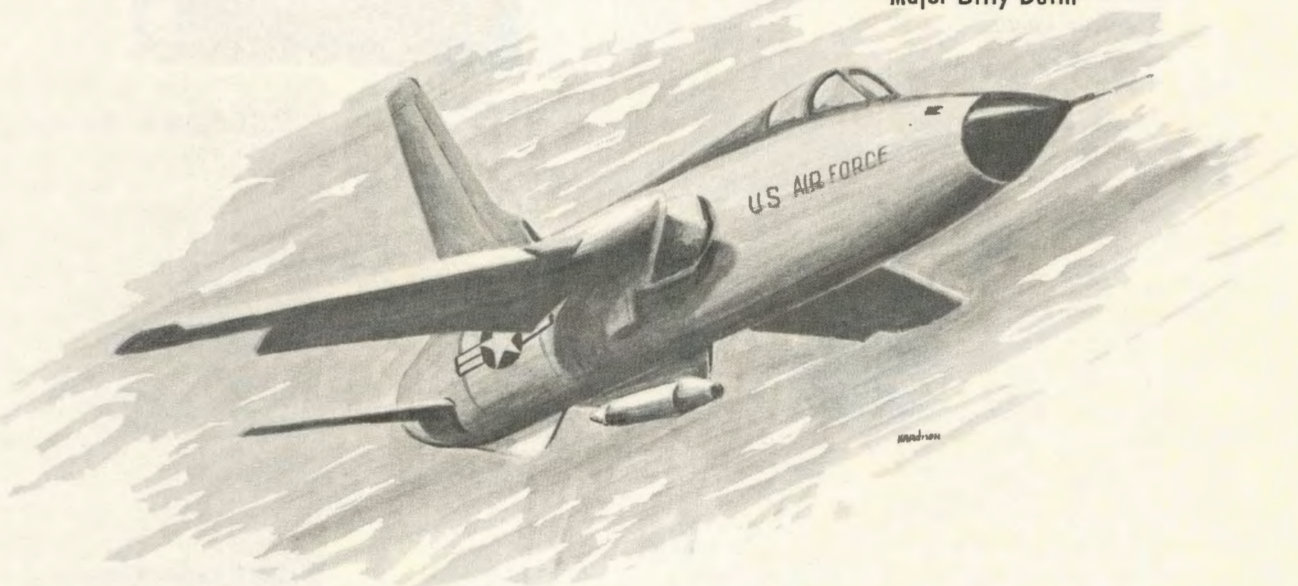
From 60 to 30 mph under peak (tire rolling) and full skid (wheel locked) braking for radial and conventional (bias ply) tires. Friction data obtained from road tests on smooth mastic asphalt. Effective water depth = 0.04 − 0.08 in.

Tire Construction	Peak (Tire Rolling) Braking	Full skid (wheel locked) Braking
Radial ply	124 ft	259 ft
Conventional (Bias ply)	151 ft	310 ft

TACTICAL AIR COMMAND

PILOT OF DISTINCTION

Major Billy Dulin



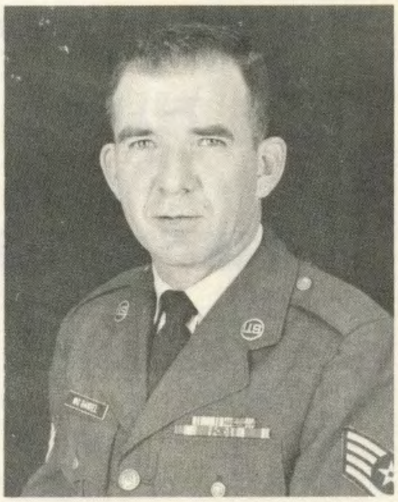
Major Billy Dulin of the 23rd Tactical Fighter Wing, McConnell Air Force Base, Kansas, has been selected as a Tactical Air Command Pilot of Distinction.

Major Dulin was flying his third gunnery mission in the F-105. Recovering from a strafing run, Major Dulin discovered his engine remained at 94 percent and did not respond to throttle movement. A fuel check showed 3,000 pounds of fuel and decreasing at a faster than normal rate. Major Dulin followed all procedures for regaining throttle response without success. He immediately headed for the nearest airport. Enroute he made continuous tight S-turns while pulling Gs to reduce airspeed to gear lowering speed. With only 1500 pounds of fuel remaining, Major Dulin elected to make a straight-in landing. On the last tight turn he was successful in reducing speed and lowering the gear and flaps. Over the overrun his airspeed was too high for landing. In rapid order, Major Dulin extended the ram air turbine, stopcocked the throttle, closed the main fuel switch, and made a successful flameout touchdown. He stopped the aircraft on the runway with emergency braking. A fuel quantity check revealed 500 pounds of fuel remaining after landing.

Major Dulin's professional response to this critical in-flight emergency clearly qualifies him as a Tactical Air Command Pilot of Distinction.

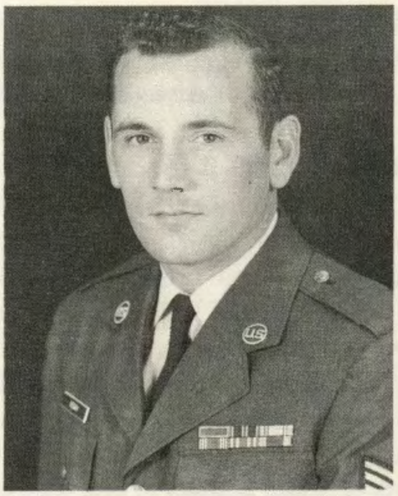
MAINTENANCE MAN OF THE MONTH

Staff Sergeant Bobby L. McDaniel of the 4442d Field Maintenance Squadron, Sewart Air Force Base, Tennessee, has been selected to receive the TAC Maintenance Man Safety Award. Sergeant McDaniel will receive a letter of appreciation from the Commander of Tactical Air Command and an engraved award.



SSGT Bobby L. McDaniel

SSGT James Ridgway



CREW CHIEF OF THE MONTH

Staff Sergeant James C. Ridgway of the 4442d Organizational Maintenance Squadron, Sewart Air Force Base, Tennessee, has been selected to receive the TAC Crew Chief Safety Award. Sergeant Ridgway will receive a letter of appreciation from the Commander of Tactical Air Command and an engraved award.

reprinted from ATC Approach To Safety

PASS IT ON

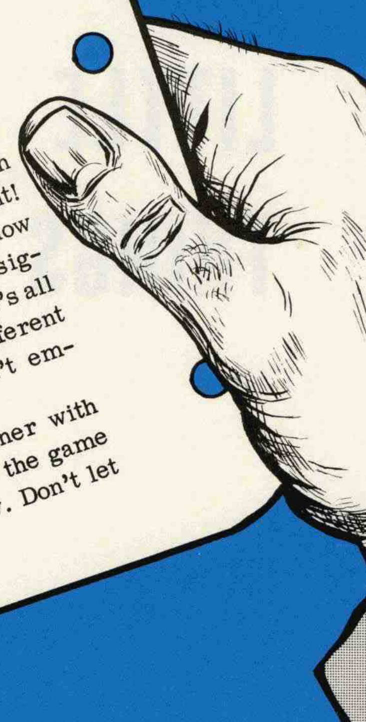
Did you ever play bridge with a "Loner," a guy who tries to go it alone without swapping information in the bid? Were you ever caught at a washout, a bridge out, or a landslide without road sign warnings? Maybe you've gone to formal parties to find them postponed without warning. Ever have house-guests arrive unexpectedly with six small children? How about it . . . you old timers, remember the last time you were stood up by a young lady?

Each of these very uncomfortable, vexing situations is brought on by some nice, honest, well-meaning guy who just didn't take the trouble to pass along some information. Were you ever guilty? When was the last time you got too busy to pass along a Pilot Report of turbulence or icing? How often do you figure you won't file a PIREP because the area is already saturated with other planes, who probably called the information in? Ever under-estimate the severity of a weather phenomenon so you can forget it with clear conscience? Have you ever debriefed a forecaster after a mission and told him how good or bad his forecast was?

There's probably no business or organization in the world which requires greater teamwork than flying, and the key to teamwork is exchange of information. Information concerning significant weather is exchanged through Pilot Reports (PIREPS) which can be filed anytime, any place, with any control agency or Pilot-to-Forecaster Service.

Significant . . . what's significant? Those bumps you just experienced, would you like to have known about them in advance? Then they were significant! That pilot coming behind you would like to know about 'em too. Tell him! Icing . . . how much is significant? Don't know? Take a chance, assume it's all significant and report it! Cloud bases or tops different than briefed? Tell the weather man, it won't embarrass him.

Admit it now . . . ! You've played the loner with weather information, haven't you? So, play the game right. Tell your partners what you know. Don't let the weather "grand slam" you!



Last month we printed a talk, "Be Deliberate," that Lt Col Jones gave to the folks out at Luke, where he is Chief of Flight Safety. This month he sent us one with a humorous touch...but the lesson still comes through loud and clear.

CONSIDER THE LITTLE THINGS

by Lt. Col. Bruce D. Jones
4510 CCTW, Luke AFB

We have learned through the years that the sequence of events leading to an accident can start when a pilot takes an aircraft with a little malfunction. Some of these events are small, seemingly inconsequential warnings. The possibility exists that if accidents are a sequence of little events, then accident prevention can also be a sequence of little events.

In other words, if we pilots consider the little things in the chain of events and apply this consideration, can't we prevent accidents?

A recent example of this involved a flight leader with 340 hours in type aircraft who ran into many little things which resulted in a major accident. First, he hurried the flight planning and briefing a little. Next, he discovered he was a little short of fuel on his preflight. But he went on anyway. He received a little false weather information and ran into a little thunderstorm. And then he used a little nonstandard terminology which delayed his approach a little. When his flight landed in the middle of the little thundershower, his wingman asked him to land a little to the left of center because he was a little too close behind. The runway was a little wet, the pilot lost a little of his directional control. He finally sheared his gear in a little ditch a little ways off the runway.

There was another case where a pilot was landing at a strange base and was told to use a right-hand pattern instead of the normal left-hand one. He had a little more fuel on board than normal. And he was a little unfamiliar with the approach over a little wooded canyon. A little tailwind assisted him in landing a little long and a little hot on a runway that was a little wet and downhill. He didn't need a little drag chute failure, but in his anxiety he jettisoned it a little (??) and took the barrier a little fast. This case had a happy ending...the little barrier saved him a little bit of pilot error.

I believe the real classic was an extremely experienced pilot who had many little personal problems bearing down on him. His income tax was a little overdue, a little girl friend wanted to get married, and he had a little wreck with a car he had borrowed from a friend. These were only a few of the little problems that were influencing him a little.

But he was a big boy, he said, and was scheduled for a little flying demonstration. He was given a little order not to do a specific maneuver in this little demonstration. But he disregarded the order and bought the little farm. The accident board only reported that he apparently had a little more fuel than he expected on this specific day and was affected by a little tailwind. He also had a little lapse of memory and forgot to retract the speed brakes prior to initiating the unauthorized maneuver.

The accident board discovered that the rate of roll is a little slower and the sink rate is a little higher with the speed brakes extended, downwind, and heavy on fuel for that particular maneuver. A combination of many little things added up, to kill this extremely experienced pilot in this pilot-error accident.

Many examples have occurred right here at Luke AFB. Last Friday we had a happy ending to a little incident. One of our pilots was flying wing on a little cross country from Luke to Tinker AFB. He noticed a little oil pressure fluctuation of two or three pounds. A little bit later, he felt several little thumps. These were followed by a little decrease in the oil pressure. Then it went back to normal.

He had his flight leader give him a little check and was informed that he looked okay. But he'd had enough of these little things. He decided to make an emergency landing at Kirtland AFB, which was right on course. They declared a little emergency for a straight-in approach opposite traffic. He didn't want any little aircraft to interrupt his approach and cause him to make a little go-around.

He had set his throttle and left it alone, but he found that even with his speed brakes extended, he could not slow the aircraft down. So he had the flight leader move out a little and he zoomed up to gear lowering speed. With a safe gear down indication, he continued his straight-in approach and successfully landed. He was a little deliberate and no go-around was necessary. The initial investigation disclosed that one of the little oil bearings was failing a little. The pilot saved TAC a combat aircraft because he did take the little things into consideration and applied a little technique.

In conclusion, the little things to consider are fuel on board, airspeed, wind direction, and any little variation or distraction at a critical moment. Continue to consider all the little things and use them as a sequence of events to prevent an aircraft accident.

See you a little bit later! ⟶

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12 Months Accident-Free Flying

TACTICAL AIR COMMAND UNIT ACHIEVEMENT AWARD

302nd Tactical Airlift Wg, Clinton County AFB, Ohio

522nd Tactical Fighter Sq, Cannon AFB, New Mexico

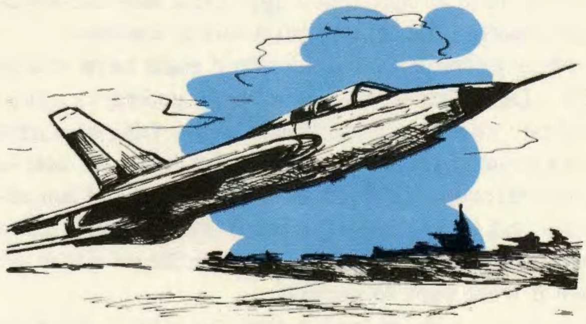
906th Tactical Airlift Gp, Clinton County AFB, Ohio

910th Tactical Airlift Gp, Youngstown Municipal Airport, Ohio

914th Tactical Airlift Gp, Niagara Falls Municipal Airport, New York

TAC TIPS

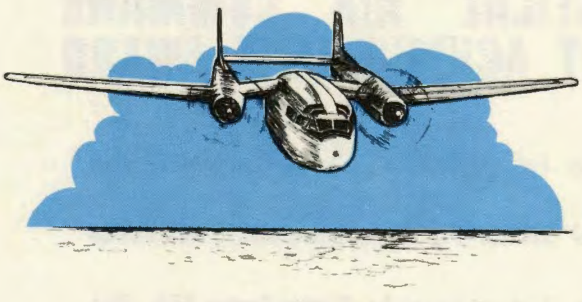
ON THE BALL



When the F-105 pilot retracted gear after takeoff, his right main indicated unsafe. He aborted his mission when recycling failed to give him a good up indication. After he burned fuel down to 4000 pounds, he set up a straight-in approach for landing.

Everything looked good in the cockpit, but when he was on short final, Mobile told him to go around. His right main gear was cocked 45 degrees. He conserved fuel while the fire department foamed a ten-foot strip of the runway. On landing the bird jerked to the right and then straightened when he jammed full left rudder. The offending wheel castered straight and the rollout was uneventful from there.

The mobile officer saved the day on this one. Had he not been on the ball and spotted the cocked main wheel in time to take action, the landing could have been a much wilder ride.



FAILURE FORECAST

The C-119 crew on a long, over-water run was looking forward to the holiday season at home. They had sweated Number Two on the first half of the mission. At cruise, it had been carrying two inches of manifold pressure above Number One in auto rich.

About four hours out over the water, Number Two complained with a big double backfire. The pilot pulled throttles, moved mixtures to auto rich, turned on booster pumps, and retarded spark. A visual scan by the crew and a quick check of his instruments showed no problems, so he added power again. Number Two backfired again!

Running at reduced power, the pilot watched number two oil quantity decreasing. He decided to run it until the oil was gone or it started severe backfiring. Meanwhile, he headed for an alternate. Number Two held out but they found a failed jug after landing.

The engine had warned them of its impending failure. That two-inch spread had been telling the crew something. A compression check or borescoping at their first destination could have told them why Number Two was working so hard.

S'pose the holiday season had a bearing on it?

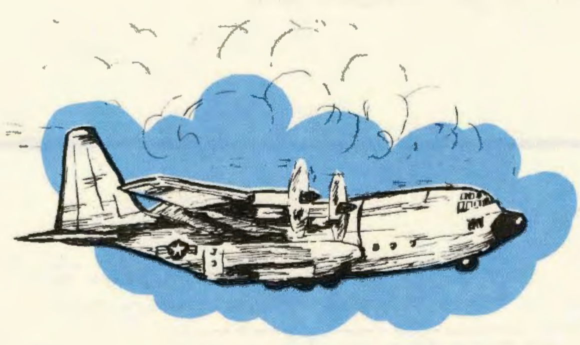
. . .interest items, mishaps with morals, for the TAC aircrewman

POWER PROBLEM

On final, the overseas Herky driver called for 100 percent flaps and slowed his heavy bird to computed approach speed. About a half mile out he reached threshold speed, reduced his descent rate, and heard his copilot call out threshold speed. Anxious for an early touchdown on the short strip, he started round-out about 50 feet out and 10 feet high.

The C-130 paid off . . . still high. He corrected with more nose-up rotation, but neglected to add any power. Tired of flying without thrust, Herky sat down on its tail skid and main gear in about that order. Picking laterite out of the bird's tail, and assorted repairs to the aft end, came to about 65 manhours.

The Herky's a hard-working, forgiving beast of burden. But it'll balk like a mule if you try forcing it to fly when it has run out of energy. If you've arrived and haven't landed . . . feed it power.



NO POP

Electrical smoke and fumes from the main AC distribution bus interrupted the C-130 crew's mission. As the cockpit filled with acrid smoke they donned oxygen masks, flipped regulator selectors to 100 per cent, completed their electrical fire checklist, and departed Flight Level 220 for 9000 feet. On the way down they worked on smoke and fume elimination. About three minutes later the smoke cleared enough to open the inspection panel. They found the NESA control terminal strip and the NESA transformer still smoldering. Closeby wires and equipment were burned or scorched.

Electricians replaced the faulty NESA windshield transformer and repaired damaged wiring. Manhours reached the 92 mark.

The crew figured they should've been alerted to the electrical malfunction by circuit breaker openings or instrument indications before the smoke and fumes hit them. As they saw it, any fire hot enough to burn wires should pop the circuit breakers. That's why emergency procedures are handy things to know . . . not all emergencies have a classic beginning.

LETTERS

. . .to the editor

As an active air reserve pilot I am aware that your magazine is a widely read professional digest which reaches a great number of people interested in fighter aviation. As President of the American Fighter Pilot's Association (Until recently the Night Fighter Association) I thought your readers would be interested to know that our membership has initiated a series of new objectives among which are as follows:

- Establish scholarships for eligible service family members.
- Provide aid to service families in need, especially as a result of Vietnam or national conflict.
- Provide contact with POWs via known methods, i.e., State Department.
- Provide communications with past, present and future fighter pilots of America via news media, youth education, etc.
- Support publicly the national objectives in Vietnam.
- Encourage the qualified youth of America to seriously consider the career of a fighter pilot.
- Reconfirm the principles that made America strong.
- Insure that all involved in fighter aviation recognize it as a businesslike safety conscious profession.

We are trying to enlist new members in our organization for obvious reasons, and we hope to support our objectives in our publication THE RENDEZVOUS. Our membership has been expanded to include active, service, associate, and honorary members, and hopefully we can become a recognized adjunct of military aviation in the accomplishment of our goals.

I want to encourage all who are interested in joining the American Fighter Pilots Association to write to me at the address below for further information. Keep up the good work.

Walker M. Mahurin, President
American Fighter Pilots Association
P. O. Box 90363 - Airport Station
Los Angeles, California 90009

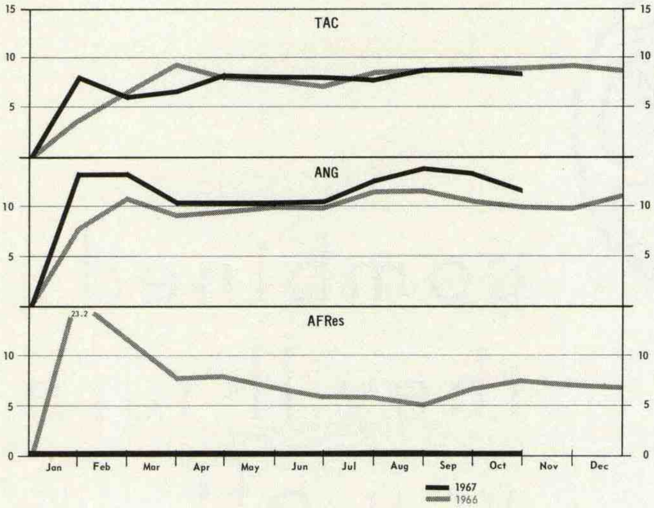
PEANUTS

Courtesy of Daily Press, Newport News, Va.

TAC TALLY

MAJOR AIRCRAFT ACCIDENT RATES as of 31 OCTOBER 1967

estimated per 100,000 hrs flying time



UNITS

	1967	1966		1967	1966
9 AF			12 AF		
4 TFW	6.1	8.4	23 TFW	10.4	31.2
15 TFW	23.2	3.9	27 TFW	11.7	13.2
33 TFW	8.9	14.5	479 TFW	9.1	9.6
354 TFW	34.2	21.3	67 TRW	11.3	15.2
4531 TFW	0	—	75 TRW	20.4	0
363 TRW	9.2	12.2	313 TAW	0	10.6
64 TAW	0	0	516 TAW	0	9.5
316 TAW	0	0	4453 CCTW	3.4	7.5
317 TAW	4.8	0	4510 CCTW	9.7	13.2
464 TAW	2.6	0	4520 CCTW	10.7	17.6
4442 CCTW	6.9	0	4525 FWW	21.2	0

SPECIAL UNITS

	1967	1966		1967	1966
1 ACW	6.2	13.8	4500 ABW	0	0
4410 CCTW	8.5	6.5	4440 ADG	0	0

AIRCRAFT

TYPE	TAC 1967	TAC 1966	ANG 1967	ANG 1966
A-1	20.8	15.9		
RB-66	0	0		
F/RF-84			16.4	10.5
F-86	–	80.5	8.7	8.1
F-100	15.8	15.7	21.0	14.1
RF-101	32.9	32.0	18.8	40.5
F-105	14.2	23.2	0	0
F/RF-4	12.5	7.5		
C-47	5.0	0	0	0
KC-97			0	0
C-119			0	0
C-123	0	0		
C-130	0.6	2.2		
T-29	0	0		
T-33	5.1	0	0	7.3
T-39	0	0		
O-1	12.8	0		

either one
will turn
you on.....

combined
they'll turn
you off.