

TAC ATTACK

TAC Attack

February 1972

FEBRUARY 1972



HARDISON

BIRDSTRIKE UPDATE...Pg 16

for efficient tactical air power

TAC ATTACK

FEBRUARY 1972

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Angle of ATTACK

MORE THAN JUST NUMBERS

decrease the number of lives lost and to lower the number of aircraft accidents are all achievable goals.

The goals are expressed in numbers, which in themselves are coldly impersonal. But behind each number is the face of someone in TAC... someone we need... or a valuable item of equipment... something we can ill afford to lose.

Let's lower the numbers.

As we charge ahead, with one month in 1972 already behind us, let's take a look at what happened in 1971.

It was a year that saw U.S. Air Force men walking on the moon, while here on earth TAC's flying safety record reached an all time low. Both were significant achievements.

Our accident rate has marched steadily downward since 1968. In that year we severely dinged 82 airplanes, lost 54 aircrew members in the process, and had 10 failures in 66 ejection attempts. By comparison, in 1971 we had 25 aircraft accidents (a reduction of 57), lost 24 aircrew members (30 less), and recorded 23 successes in 24 ejection attempts.

In 1971, versus 1970, we bashed 12 fewer airplanes, lost nine fewer aircrew members, and improved the successful ejection rate from 79 percent to 96 percent.

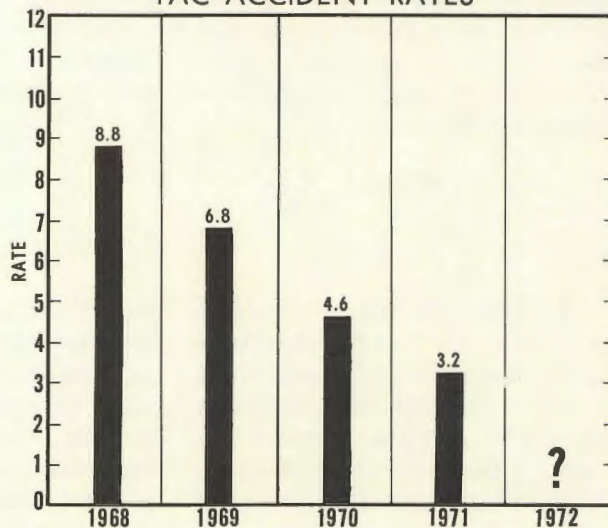
TAC had a very good year, thanks to a lot of people throughout the command doing a lot of hard work, but let's not trip over our feet while we're moving forward and still looking backward.

The trend for the past four years has been toward a fewer number of accidents. Has it bottomed out?

The answer must be a resounding NO.

But with the answer comes the need for an even greater effort in 1972. To reduce the rate further, to

TAC ACCIDENT RATES



Gerald J. Beisner

GERALD J. BEISNER, Colonel, USAF
Chief of Safety

THE GOOD OLD DAYS

The good old days

by Major Tom LaPolt
314 TAW, Little Rock AFB,
Arkansas

Editor's note . . . This article is about C-130s. Please keep reading because more importantly the article is about something new . . . something which will probably affect all of you no matter what you fly or how you earn your Air Force dollar. It's about the Systems Approach to Training (SAT) . . . what it is and how it works. SAT is the new light on the horizon which may be signaling the path of training for the future.

Just after the first of the year I stopped by the "Stag Bar" and joined a discussion about the Good Old Days — that is — the days before the arrival of C-130 Systems Approach to Training (SAT). The Group having the discussion was composed of several "School Squadron" instructors, who taught both under the old conventional system and the new SAT monster, plus several "old head" squadron pilots who have seen the results of both systems.

When I entered the discussion, the instructors were talking about how the old simulator training was conducted and how great it used to be

to brief and instruct students for an hour and a half to two hours each day on systems and such. One of them said, "Remember the look they had on their faces . . . totally amazed on how much we knew about the airplane. A copilot right out of ATC couldn't believe it when we traced the route of a drop of fuel from the refueling truck through the entire fuel system and out through the engine tailpipe. He really paid attention!"

The talk then went on to the simulator itself and how we used the entire first day describing, in extreme detail, each system, each switch, and most of the circuit breakers. We were

so complete and so detailed that we didn't get an engine started until the second day.

The second day was really fun — if the student didn't realize by now that we were pretty sharp, he got the idea during engine starting malfunction practice.

A few laughs followed and another instructor piped in, "Oh for the good old days! Remember the look they had during lesson three when we showed them how to start one engine by using another engine's starter button. We really set them up for that and it would warp their minds for a couple of days at least."

After another beer and a few jokes the discussion turned to the simulator check ride. Someone said, "Remember the pride we had when our students had a check ride and then told us that the check pilot wasn't able to pull anything on them that they hadn't seen before. That was truly an instructor's reward for nine days of hard work presenting every conceivable malfunction and emergency. We also remembered the terrible feeling when one of our students got caught on something we didn't show them. You can bet our next students had that malfunction drilled into their heads. What a list of odd-ball emergencies and problems we had.

"The flying phase under the old program was better too. We had two extra days to work on additional things. By the time a student graduated he had been exposed to everything there was to know about good old Herky. He was ready for a check ride anywhere; if he could only recall what his instructor had told him."

The problem was that the student didn't know what was really important and what was nice to know. SAT sure changed that. Not without resistance though.

All of us instructors were gathered for a three-hour session with the Wing Weenies from training. They talked about SAT and how it was better than our old program, then they compared the Conventional and SAT programs. They started with a remark about what an entry level crewmember should be taught to enable him to perform his crew duties safely and professionally. They told us that the crewmember should be able to perform in his crew position and safely and professionally complete a non-tactical flight from Point A to Point B.

We had them there! What if Point B was an isolated remote strip and they broke down? Could they analyze the problem, make necessary repairs, and get out or request proper maintenance support? Answer — probably not! One point for us!

That didn't shut them up, however; they went on to tell us that the course is designed to transitionally qualify crewmembers to operate in a peacetime environment with adequate maintenance support. The "School" trains crewmembers from all branches of the armed services as well as students from numerous foreign countries. With this in mind the "School" must train and instruct only those items that satisfy all users.

Gaining units cannot expect the student to be proficient in areas which are deemed necessary only by

that organization. For example, a unit that requires pilots to be familiar with and operate the flight engineers overhead panel can expect "School" graduates to be totally ignorant in this area. However, if a graduate, in his crew position, appears to be only throwing switches and does not know what happens, how it affects the system and does not know all the Dash One notes, cautions, and warnings, without getting into nonessential "Nuts and Bolts," the student is weak and did not retain his training.

Crewmembers should be expected to continue self-study after graduation and learn all they can about the airplane. With experience, they should gain detailed knowledge of other crew positions and acquire the detailed knowledge that may be required by their gaining unit. Everyone must understand that the "School" instructs a student only on those tasks that have been proven essential for the safe and professional performance of Phase I duties. In short, the "School" teaches the student what he needs to know to perform his duties in a non-tactical environment. To judge the graduate by any other standard is not fair.

A very important point to remember is that the old conventional program, and most other military training, is based almost entirely upon opinions of instructors, supervisors and commanders. More often than not, this kind of training is based on the instructor's opinion of what should be gained from the course. The shotgun approach is used and, as a result, the course usually contains much more than it really needs. What should be taught must be based on a detailed task analysis of each crew duty and each task to be performed. When this approach is used, the following results:

- Students receive specific information essential to safe and professional operation of the aircraft.

- Students are taught everything they need to know to fulfill the needs of their specific aircrew positions because all instructional time is devoted to relevant items and areas.

- Student retention is normally higher because all data presented is limited to relevant information. The student no longer has to differentiate between important and nonessential material.

In contrast, under the conventional system, the student is taught a lot of information and statistics which are not usable while performing his crew duties. For example, a lot of engineering data, specialist information, and troubleshooting procedures are taught that may never be used. Time is spent on nonessential items and areas. Students are not able to determine essential information, and since so much material is presented, the retention rate is greatly reduced.

It all sounded great, but almost to the man the "School Squadron" instructors were resisting. We needed more information, especially about the remark, "that students are taught only those tasks that have been proven essential for safe and professional performance of their duties."

The Weenies hastily explained that under SAT, the first and most important step is to complete a task analysis for each task in each crew position. The task analysis itself is a 19 step procedure. It is primarily a method of describing human behavior in a job situation in a manner which is useful and meaningful for anticipating training requirements. The training requirements can then be used to prepare a training program. When the task analysis is completed on every task for each crewmember, the product will concern what the crewmember needs to know at the end of the course to perform safely and effectively.

Once this is known, step two

the good old days

begins — End-of-Course Objectives (ECO). The End-of-Course Objectives are, quite simply, the objectives of the course. They show both student and instructor what is required for graduation. They are directly related to duty assignment requirements. By studying the various ECOs the student knows exactly what he is expected to know and just as important, the instructor knows exactly what is required. Student progress is then a strict manner of pass or fail.

Just as important, the new student can study the ECO and have all the necessary information in one single reference. By using the Dash One only, the student would have to cross reference limitations in Section Five to review engine limitations. The use of ECOs results in saved training time. The ECO does not replace the Dash One, but supplements it in a training environment. It is a training tool.

Task analysis complete, ECOs complete, next comes step three — determine how the course can best be presented to enable the student to achieve the End-of-Course Objectives. To accomplish this, new training aids are developed and old ones discarded. During the academic phase, a pilot no longer watches fuel bubbling through the entire system or learns about valves and things which he cannot and does not control. Instead he learns about the system in sufficient detail so that he can analyze emergencies when they occur. The engineer goes more deeply into the system, since he is the one who primarily operates it, but he does not go into as much detail as an aircraft fuel specialist would. To insure that the student does not study nonessential engineering data he is told exactly what to study. He has an outline of each block of instruction listed by ECO number and Dash One

page. In addition, mockup trainers are used to make the student completely familiar with all checklists and proper panel setup. This saves valuable time during the simulator phase.

Based on the Task Analysis and ECOs, the simulator phase has been changed. Emphasis is placed on simulation of a realistic training mission. The simulator is not used as a systems trainer, but instead, is better utilized as a procedural trainer. Emphasis is placed on normal and emergency procedures in a realistic mission profile. Pilots spend more time working on instrument, normal and emergency procedures. Emergencies, where possible, are not compounded. The simulator is used to make the crew member more proficient and better qualified to transition to the flying phase. Prior to each simulator flight the student knows step by step exactly what the

entire training mission will entail. He studies the material, has the opportunity to discuss it in the pre-mission briefing, practices it in the simulator, and reviews it in post-mission debriefing. The big thing is that the simulator is now student oriented; not instructor oriented. If the student has prepared properly for the mission, it is possible that the instructor need only present different cues and make sure that the proper response is given.

The better utilization of the simulator and classroom training aids results in less time being required in the flying phase. Some feel that the students need ten hours of extra flying time. However, it is not necessary. The graduate under SAT is better qualified upon graduation and is trained for a lot less money. Extra flying time would not significantly increase the graduate's proficiency,



but the extra flying time would add to the expense of the course.

Finally the meeting broke up and I broke for home. On the way, I kept thinking about that last remark — "The SAT graduate is better qualified and trained for a lot less money." Tomorrow at the office I'd do some checking and see for myself.

Right off the bat, I found that things really have been going good for SAT. While reading, "A Systems Approach to C-130E Aircrew Transitional Training," a report published by the Air Force Human Resources Laboratory, Air Force Systems Command, Brooks Air Force Base, Texas, I read, that according to USAFTALC (TAC), Cost Reduction Program, Individual Savings Action (T203-4553), SAT had produced an annual verified savings of nearly five million dollars. Now that's a heap of money! But how about the SAT graduates?

Since SAT was incorporated in January 1970, more than 2500 pilots and flight engineers have graduated from the course. All these students have one thing in common: As required by TAC Supplement 1 to AFR 50-10 an AF Form 241, Graduate Evaluation, was submitted to the gaining unit by the "School." Of the over 2500 graduates, less than 50 percent have had a completed 241 returned to the "School." This is about the same percentage of 241s that were returned under the old conventional system. I guess from that alone, SAT is at least holding its own.

The AF Form 241 is a tool used by the quality control section of the "School Training Shop." Each 241 that is returned is reviewed and area grades are placed on a graph to look for trends. In addition, each remark on every 241 is extracted for staff review. These remarks are of value to the "School" and can result in changes to the course. Recently another command made several

remarks that copilots were weak in taxiing and nose wheel steering operation. Since the pilots in question had less than 600 total hours flying they received a right seat checkout at Little Rock. However, action is now underway to see how many gaining units require pilots to receive all check rides in the left seat. If enough units require left seat check rides it is possible that in the future some left seat training will be given to all pilots. An example of course change that started with 241 remarks, was the addition of four extra days of training for flight engineers during the ground phase. Last summer an analysis of 241s on flight engineers revealed that additional preflights were desirable. To provide this, the daily flying schedule was changed to give more time for turnarounds, so that flight engineers could pull a complete preflight. As Dean Martin says, "Keep those cards and letters coming, folks."

I noted that participation in the Graduate Evaluation Program is not as good as it could be, but it's not worse than under the old program. How about the grades returned on the SAT graduate, compared to the conventional program? SAT is doing the job here too.

The grades on a 241 range from "0" (training level not acceptable) through "4" (further training would not be of significant value). Since the introduction of SAT, there has been a slight increase in the proficiency levels of students. The increase has been more pronounced for pilots than for flight engineers. Prior to SAT the majority of grades for pilots were grouped in the "2" and "3" proficiency levels. Since SAT there has been a marked increase in the "4" level grades and a significant decrease in the "2" level proficiency grade. The proficiency level for flight engineers has increased only slightly, but most important, it has not decreased.

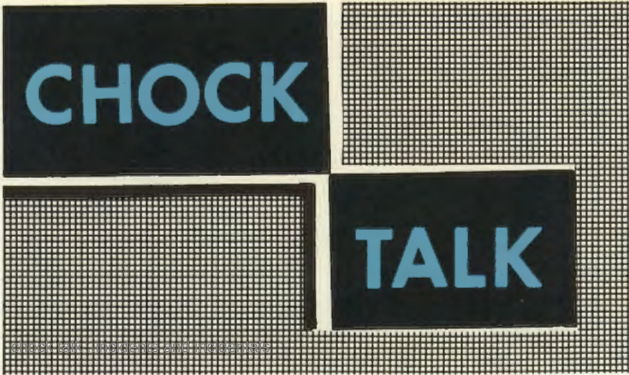
The majority of remarks that are

written on returned 241s concern the area of system knowledge. We are the first to admit that graduates are not systems specialists. In the short period of time that students are available for instruction it is impossible to make systems specialists out of them. This was true in the conventional program too. In the past it appeared that this was accomplished but, in reality, we were only a vast library for "pet questions." The student arrived for training, was exposed to "pet questions," left after graduation and retained enough "pet question" material to make his way for awhile. This system was often at the expense of items in other proficiency areas — the old "2" level proficiency grade that was prevalent before SAT.

The usual remarks in the systems area read like this. "Student has insufficient systems knowledge." — "has acquired an outstanding knowledge of procedures; however, he lacks the basic knowledge which would provide necessary background information to prepare him for those situations not covered by a procedure . . ." "Recommend increased training in the overhead panel, particularly the pressurization and anti-icing subpanels," this same 241 continued by saying, "Knowledge of systems, limitations, and emergency procedures above average for experience in the aircraft." These remarks were extracted from pilot 241s.

In my review of student 241s, I came to the conclusion that just about everyone is pretty well satisfied with the SAT graduate, but there are still a few Stan Board types, plus some instructors and supervisors, who want ten years of experience compressed into a one month training course.

I guess the good old days were really not that good. The SAT graduate is better trained than the old conventional student and trained for a lot less money too! ➤

**CHOCK****TALK***...incidents and incidentals*

TOO MANY PINS

During takeoff in the A-37, a moderate nosewheel shimmy was felt; however, the pilot decided to continue the takeoff. After airborne, when the pilot could not raise the gear handle, he decided to recover at the home patch some thirty-five miles away. He contacted ops and advised them of his difficulties, then made a low approach over mobile. They informed him that the nose gear was cocked 90 degrees. The pilot declared an emergency and orbited at 5000 feet to burn off his external fuel while the centerline of the runway was being foamed.

Approach was normal and upon touchdown the pilot shut down both engines and lowered the nose into the foam. The nosewheel straightened out and the airplane was brought to a stop on centerline with no damage.

To cite the cause, we have to back up to the point just after completion of pre-flight when the pilot told the transient alert crewman to pull the gear pins.

One end of the pin streamer was attached to the nose gear pin and the other end, which has a metal lanyard and clip on it, was attached to the nose gear torque link safety pin. It so happens that in the A-37 the clip end of the streamer is supposed to be attached to the torque link safety pin but only when the pin is removed for towing and stowed in a receptacle just above.

The previous day someone had noticed the clip dangling free (as it should be except for towing) and had connected it to the torque link safety pin. The transient alert crewman didn't know any better and pulled both pins. The pilot didn't notice that the streamer had one too many pins attached.

Now we know why Item 3 on the exterior inspection checklist states, "Nose gear torque link safety pin — installed."

DOUBLE TROUBLE

After a half-hour of cruising in the F-4, number two throttle could not be retarded below 80 percent RPM. The throttle worked OK from that position to full throttle. Three minutes later number one engine compressor stalled . . . RPM came back to 70 percent and all manner of throttle movement would not change things. Since both engines were not the purest, the jock decided to keep both of them running and wisely headed for home. He declared an emergency and flew a straight-in approach to a successful landing.

Investigators ripped into the machine and found that FOD had caused the damage to number one engine. A bolt or screw had been ingested into the engine and caused extensive damage throughout. But here's the wipeout — a wire bundle clamp was found jammed in the throttle quadrant of the rear cockpit in a position that prevented rearward movement of the right engine throttle.

CONTROL THE DIET

Jet engines do not have a discriminating diet. Like the "eggplant that ate Chicago" they'll gulp down anything that makes its way to the chasms of their gaping mouths.

Case in point: An armament crewman was dearming the F-4 after completion of an air-ground mission. The crewman walked from the left inboard wing station toward the nose gun with the gun safety pin in his hand. As he passed the left engine intake, the pin and streamer suddenly disappeared from his grasp and into the innards of the hungry engine . . . the hungry ex-engine.

Do we blame the voracious appetite of the jet engine or do we get smart?

with a maintenance slant.

with a maintenance slant

STUCK STICK

The F-4 was cruising at fifteen grand when the stick began a rearward march which the pilot could not counter. The nose reached forty-five degrees nose high and the airspeed bled off to 150 knots. The machine then rolled left to an almost inverted attitude and suddenly the pilot had full control again. He recovered then zigged for home and put her on the ground without delay.

Investigators are not sure what caused it. The autopilot was not engaged and trim had not been used immediately prior to the uncontrolled stick movements. They think that maybe a blockage of the calibrated bleed air port in the stabilator feel trim bellows occurred and then was nullified by a combination of decreased ram air pressure (as the airspeed decreased) and the forces encountered during the recovery.

WANDERING WIRE

The pilot crawled into the F-105, strapped in, and started the cockpit check. When he placed the battery switch on, an unfamiliar thunk resulted . . . the centerline baggage pod had jettisoned.

Maintenance grabbed the airplane and gave it a thorough going over but could find nothing wrong. A look at the baggage pod provided the answer.

A short circuit occurred when a loose wire in the pod made contact with the jettison terminal. It seems that during manufacture the fuel quantity wiring was disconnected but not removed from the pod . . . it finally caught up with them.

All fuel quantity wiring has now been removed from the pods.

TAC ATTACK

A-7 OIL (AGAIN)

The lack of a good oil quantity indicating system is one of the current bugaboos in the A-7. Anything that is done to further aggravate the situation gives rise to teeth grinding and approaches the pucker factor limits.

For instance: The A-7 pilot noticed an oil pressure fluctuation after a little over an hour of flight. He declared an emergency and entered an immediate straight-in precautionary landing pattern (PLP). The fluctuation increased on final but the engine kept running and the jock was able to get the bird on the ground with no damage.

An estimated five quarts of oil had been lost in flight due to a partially opened oil sampling valve. The valve was found to have rotated past the normally closed position due to a bent limit stop. Marks on the valve indicated the possible use of pliers or some other tool. Not too unusual except that it's a hand operated valve.

It's just a small thing . . . like a hole in the jugular.

COLOR IT FOD

During start for an engine runup on the C-130 the turbine inlet temperature began to climb rapidly and smoke was seen coming from the engine. The engine was immediately shut down.

The cause was FOD in the guise of a rag. The inlet had been inspected before engine start by the line chief using a brilliant aldis lamp . . . he saw nothing unusual.

The rag was silvery in color and closely matched the color of the inlet. Investigators determined that the rag was probably blown by gusty winds to a position on the top inlet guide vane or on top of the torque shaft and went undetected 'till the damage was done.

This unit is now using orange or red rags.

SPO'S CORNER



A-7D - IMS BATTERIES

In December the IMS battery problem came to a head and action was taken to correct a potentially weak system within the A-7D. How serious is the problem? Let's look at the source. The early models of the Navy A-7 did not have a main battery, consequently the IMS battery was necessary to supply power to the IMS platform for the critical time following generator failure while the pilot was extending the RAT. It's a good system; however, the IMS battery seems to be the Achilles heel. We bought a Navy bird, installed a main battery and retained the IMS battery. But what happens when the IMS battery is pulled or is inoperative? Here's what immediately comes to mind.

Situation: No IMS battery, in the soup as Blue 2 with light on the star, lose the generator, then lose Blue lead.

The standby attitude indicator operates off the generator and is supposed to have approximately 8 minutes of useful attitude reference after the generator fails... maybe. Granted, the odds are greatly against being in Blue 2's situation; however, Murphy's Law has a frequent way of sneaking in. The corrective action, of course, is first to recognize when the generator fails and then extend the RAT... simple enough.

So it comes down to this:

Problem: Provide the critical 30 seconds for emergency power to the IMS platform following generator failure. Solution: A modification is under consideration to use the main battery as the power source and eliminate the emergency IMS battery entirely.

Why didn't I think of that?

MAJ BOB LAWLER

THE SPO

SPO — What is it? Well, the letters stand for Systems Project Officer. He is an officer assigned to Hq TAC Safety with responsibility for a specific weapons system, in this SPO's case the F/RF-4 and RF-101.

Responsibility for doing what? That's a little harder to pin down. He works to a degree with attitudes and intangibles. He crosses the spectrum — from an HR submitted by a jock down on the line who never heard of a SPO to monitoring incident reports for proper actions. He monitors recommended corrective actions suggested by accident investigations to make sure they aren't pigeonholed without due consideration. A SPO is the guy who insures you have a "Friend in Court," the guy who looks out for Blue Four at the command level when almost anything concerning his weapons systems comes up. Take the F-4, for example. Proposals for new hardware come up constantly. Your friendly SPO is on

hand, trying to make sure you jocks get the best, safest available. If there is a Dash One change under consideration, chances are your SPO will see it and make his comments on it before it goes to press. If a particular maintenance or materiel problem arises, your SPO is on the horn with the experts, making sure we get a fix on the way as soon as possible.

In short, the SPO for your weapons system is a safety monitor, both for the line jock and the Commander. He acts as a safety catalyst for his weapons system. Since, of necessity, he is isolated from the field physically, he relies 100 percent on receiving the necessary information from the field. He gets this to a large degree from incident reports, EUMRs, and the like. So, your SPO isn't going to be any better than you let him be. If you want a good one give him his tools — message traffic. Without it, you don't have your "Friend in Court."

CAPT JIM YOUNG

THE WIND BLEW....

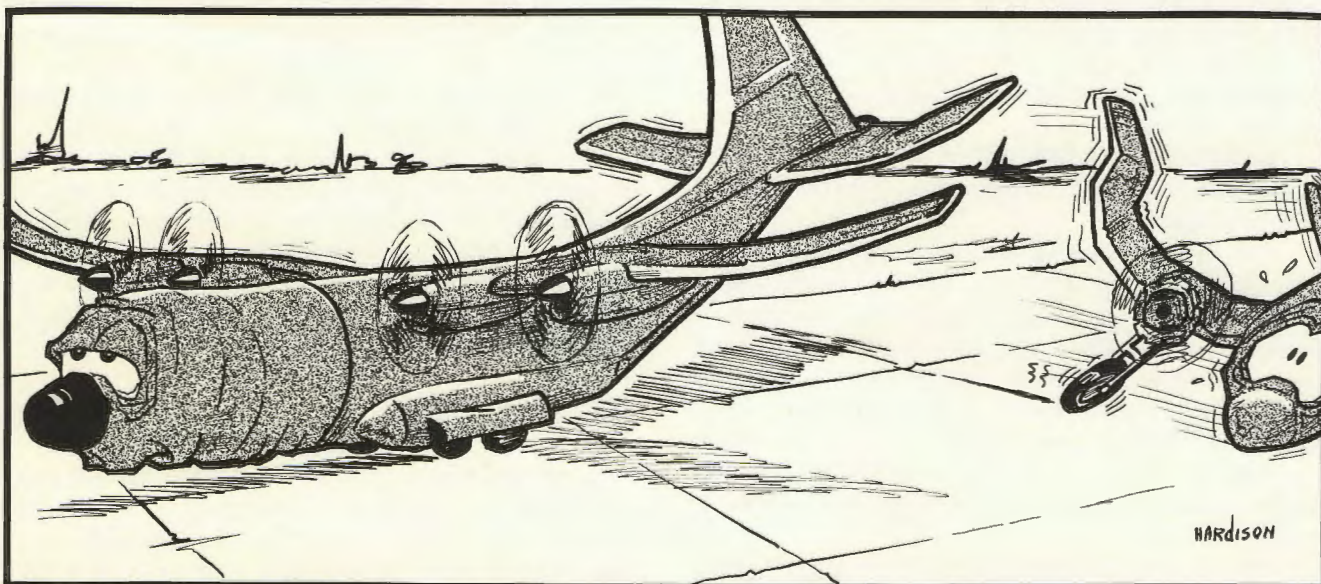
C-130 prop blast has done in two lighter aircraft in recent months. The first mishap occurred in November when a Cessna 150 pilot rather unwisely decided to taxi behind a Herky bird holding in number one position for takeoff. The wash blew the 150 on its nose and right wing, then turned it completely upside down. The 130 was in ground idle at the time. One week before Christmas a Douglas Racer pilot waiting to takeoff received an unexpected present when his control column and yoke began violent oscillations. The RSO controller, an interested bystander, saw the tail of the C-47 bouncing

two feet in the air. The C-47 pilot told the tower he was out of control (a first), then declared an emergency and shut down the battered Gooney bird. About this time a C-130 also waiting for takeoff finished his 30 second runway. Control abruptly returned to the C-47. In this last mishap the tail of the C-130 wasn't pointing directly at the C-47 but it was close enough for the surface wind to move the prop wash on the Gooney's tail.

Moral — look out for the other guy even when you are in the right. You may have to taxi behind a C-5 someday.

Remember it's not always what's up front that counts.

MAJ LOU KENISON



ANOTHER LOOK AT HYDROPLANING



In 1968 TAC ATTACK went all out with a series of articles designed to expose the evils of hydroplaning. All manner of charts, graphs, photographs, and illustrations were used in hopes of implanting some of the knowledge gained through testing and unfortunate experiences.

However, four years have streaked by, people have come and gone, and the emphasis on hydroplaning seems to have decreased somewhat.

There have been no scientific breakthroughs that have eliminated the hazards of hydroplaning. Runway grooving would help but this was known in 1968, and as of today very few runways are grooved.

It still rains, water still collects on runways, and airplanes still land on these wet surfaces . . . sometimes without the greatest success.

So let's make another trip around the pattern and review some of the factors that make up the phenomenon of hydroplaning.

Full dynamic hydroplaning means simply that the aircraft tires are not in contact with the runway surface, rather that they are being supported from beneath by a wedge of water. There are other factors, such as force vectors, inertia, and other goodies that go into the technical explanation of how a tire hydroplanes but the guy in the hot seat doesn't think in terms of formulae, so the statement that a tire is being supported by a wedge of water, while not completely and technically accurate, is adequately descriptive.

Whether or not an airplane will hydroplane depends

almost entirely upon three factors: (1) ground speed, (2) tire pressure, (3) water depth vs tire tread depth.

Surprisingly, aircraft weight doesn't have any bearing on the ability of an aircraft tire to hydroplane except in indirect association of aircraft weight to touchdown airspeed.

SPEED

There's a simple formula for determining the speed at which a tire will hydroplane. Determine the square root of the tire pressure and multiply it by nine (10.3 for mph). Uh, oh — sorry — the point was just made about pilots not thinking in terms of formulae so to be consistent, a quickie chart has been provided to pick off the total dynamic hydroplaning speed.

A couple of things to remember about the speed. First, you must apply the wind factor in order to come up with a touchdown ground speed. Second, the chart speed is for total hydroplaning. Below that speed it is still possible to partially hydroplane; however, some area of the tire footprint will be in contact with the runway surface, making some braking action possible.

TIRE PRESSURE

Since the whole bit is based upon tire pressure, it goes without saying (almost) that if you don't know your tire pressure, you can't compute the hydroplaning speed (a true nugget of wisdom). A point to remember here is that

because of the difference in tire pressures, the nose gear tire will hydroplane at a different speed than the mains (nice to know if you're trying to use nosewheel steering).

WATER DEPTH VS TIRE TREAD DEPTH

Hydroplaning occurs when the fluid depth exceeds the depth of the tire tread. Other factors such as runway surface texture and tire design also enter the picture. A smooth tread tire will hydroplane in less fluid depth than a ribbed-tread tire. But looking at it realistically, the pilot rarely flies around with the tire tread depth figures in his pocket and rarely does he have complete information on the runway fluid depth. The runway information the pilot receives will be limited and may only be a radio transmission, such as "RCR — wet runway." That should be the cue for super-caution . . . for decision and action.

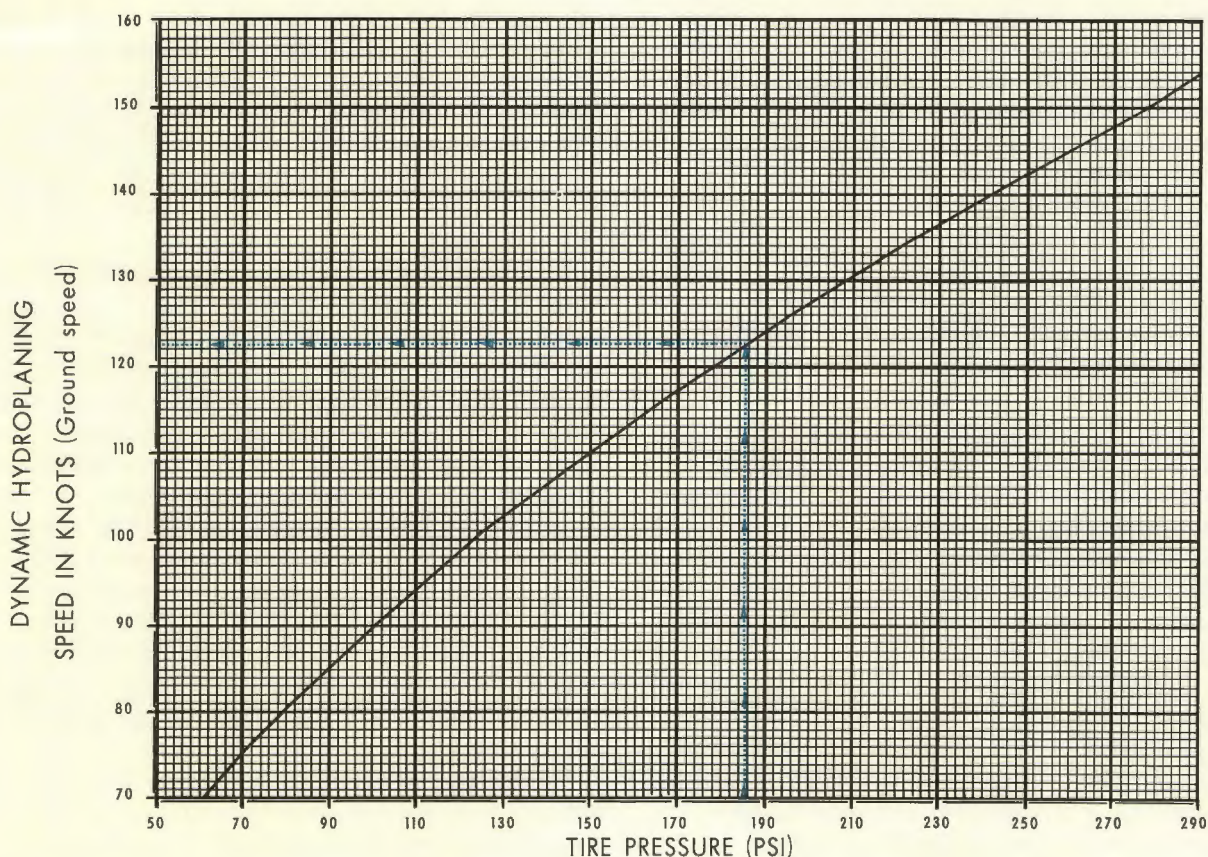
THINGS TO DO

What action? There are several options, one of which is available to the jock. The best, but sometimes the least likely, is to go somewhere else (another jewel wrought from many hours of introspection). If that option is not possible, plan on an approach-end barrier engagement,

assuming the airplane and the runway are so configured (and is recommended by the flight manual). Barring those two choices, use minimum run landing airspeeds and touch down firmly with as much runway ahead as possible.

If a crosswind is present along with hydroplaning conditions, things get sporting. Upon landing, the nose of the airplane will weathervane into the wind but the airplane will drift downwind. The airplane will be pointing toward one side of the runway and drifting toward the other. Aerodynamic controls can stop the crab but not the drift. Asymmetrical power (if available) may keep you on the runway long enough to make a mid-field barrier engagement (if available), or a departure end barrier engagement. If your machine has reversible fans, asymmetrical power will not only keep you on the runway but will slow you down below hydroplaning speed. So in a crosswind give yourself more runway by landing on the upwind side.

The evils of hydroplaning are still lurking around, still as treacherous, and still as vengeful on the unwary. A lot of thought and planning are just as "in" today as they were four years ago . . . still some of the best preventive medicine around.



WEAPONS WORDS

THE GOOD AND BAD OF IT !

By Lt Col William R. Barrett
Hq TAC/SEW

We plugged in our computer to check the back grooves of its memory bank for 1970-71 mishap statistics. A whole gaggle of information poured forth, including some prophetic utterances from its logic circuit. All this reminded us of the story about the airline navigator who reported to the pilot that he had some bad news and some good news. The bad news, altitude 30,000 feet, speed 750 mph, position unknown — we're lost. The good news — we're making good time!

We made good time in reducing our 1971 accident/incident rates compared with 1970: There were no AIM/AGM missile reports but we did have two drone accidents; reports on nuclear systems remained zero, and the number of explosives mishaps dropped a whopping 20 percent!

This would have made our day but we know explosives mishaps caused by personnel error actually increased in 1971. We continue to be plagued with people-caused mishaps, the largest number involving accidental gun firings and inadvertent releases. The former has resulted in holes being punched in people and equipment, while the latter accounted for a wide variety of hardware scattered about the earth in unlikely places... usually off-range. Both ground and aircrew personnel contributed their share of errors to make inadvertent gun firings and release of external stores our number one "personnel error" problem.

The contrivance, made with errors, is always unusual and often near disbelief, but the results are inevitably the same — AN ACCIDENT! We have selected three mishaps, one each caused by ground crew, aircrew, and non-crew error, as typical examples. First, the talents of two TAC munitions loading crews combined to accomplish the firing of a "safe" gun. After each crew separately verified the gun was "cleared," and firing circuits disconnected, a 20 mm projectile from this weapon punched a big hole in the aircraft nose gear strut. The accident investigating board, in reconstructing the events which must transpire before a 20 mm cannon can fire during a functional check, reported two safeguards had been violated. The gun clearing operation was incorrectly performed because

a round in the firing position was not removed. In addition, the gun firing lead was not disconnected or worse — inadvertently connected. These two conditions existed when the normal switch settings were made in the functional check and the chambered round fired when the trigger was depressed.

Second, an accident occurred when a pilot inadvertently released his external stores. He was trying to set-up switches to monitor right hand missile tone, but accidentally placed the external stores rotary selector switch to tip stores. This armed the system for jettison! Subsequently, he fumbled in reaching for the radar reject button, hit the bomb release button and immediately ejected the launcher rails and missiles from the aircraft.

Third, an NCO was injured during explosives ordnance disposal training. A part of the training was detonation of blasting caps. Two blasting caps were placed in a small hole about eight inches deep. Each cap was in contact with the other to insure sympathetic detonation. After personnel observed both fuzes burning properly they retreated to a safe distance. A loud blast was heard and two minutes later an NCO, disregarding the 30 minute waiting period prescribed by TO procedures, started toward the detonation point. Nearing the blast point, he observed bubbling water in the hole followed almost immediately by detonation of the second blasting cap. Fortunately, medical personnel did not find any fragments of the blasting cap embedded in the individual's many lacerations.

The reason why people commit errors remains elusive; however, we are not ready to accept the old cliché, "to err is human." We feel it is just as human to use the tools available correctly, thereby eliminating personal error. We are convinced you have been provided, through better safety engineering, improved checklist procedures and a safer working environment — the tools necessary to reduce the number of personal errors resulting in mishaps.

In 1972 the overall experience level of TAC personnel is expected to be lower than it was in past years. This will include Safety people. In addition, a review of our Safety manning shows little prospect of immediately filling all positions. Much of our effort in 1972 will be toward a more streamlined and centralized safety program, update of our training to accomplish more in less time, and a closer monitor of manning requirements.

In conclusion, we know what we're going to work on, but only you can speak for the number of personal errors that will cause mishaps during 1972. ➤

Tactical Air Command

Unit Achievement Award

Our congratulations
to the following units for
completing 12 months
of accident free flying :

114 Tactical Fighter Group, Joe Foss Field, South Dakota
18 November 1970 through 17 November 1971

61 Tactical Airlift Squadron, Little Rock Air Force Base, Arkansas
31 October 1970 through 30 October 1971

Detachment 1, New Mexico ANG, Kirtland Air Force Base, New Mexico
1 November 1970 through 31 October 1971

12 Tactical Reconnaissance Squadron, Bergstrom Air Force Base, Texas
1 November 1970 through 31 October 1971

71 Tactical Fighter Squadron, MacDill Air Force Base, Florida
23 October 1970 through 22 October 1971

561 Tactical Fighter Squadron, McConnell Air Force Base, Kansas
24 October 1970 through 23 October 1971

908 Special Operations Group, Maxwell Air Force Base, Alabama
24 October 1970 through 23 October 1971

422 Fighter Weapons Squadron, Nellis Air Force Base, Nevada
25 October 1970 through 24 October 1971

129 Special Operations Group, Hayward MAP, California
25 October 1970 through 24 October 1971

162 Tactical Fighter Training Group, Tucson MAP, Arizona
28 October 1970 through 27 October 1971

110 Tactical Reconnaissance Group, Battle Creek ANGB, Michigan
29 October 1970 through 28 October 1971

113 Tactical Fighter Group, Andrews Air Force Base, Maryland
6 November 1970 through 5 November 1971



Birdstrike

birdstrike update



UPDATE

The sun had begun its trip westward from the cloudless zenith as the second ship broke ground 15 seconds behind the leader. It was to be a two ship low level nav and bomb mission capped off with a high altitude return then some practice instrument work on the tail end of the mission. A routine mission with no forebodings of disaster.

The flight of F-111s climbed southward in loose formation to 10,000 feet heading for the low level entry point. An automatic let down on TFR (Terrain Following Radar) was accomplished with the wing sweep set at 46 degrees. After leveling at 1000 feet AGL the pilot maneuvered the lead ship to a radio facility to get an exact update for the computer. The low level mission would be flown on automatic TFR over terrain varying from rugged mountains to desolate salt flats.

The first turning point was far behind as the two 111s pressed on toward the target area. The lead ship WSO (navigator) was busily checking the computer to insure the proper coordinates were set in as the pilot glanced down to check on the "miles to go" to the next turning point. As he looked up again something streaked into his line of vision and the whole world seemed to come apart.

The noise was overwhelming. Debris, crud, and corruption were flying around the cockpit propelled by a tremendous rush of air. Cockpit visibility was severely impaired and the G forces being experienced told

the pilot that the airplane was definitely out of control. He reached for the handle and initiated the ejection sequence.

The ejection of the module was successful and both men walked away. The pilot was in fine shape; the WSO received painful eye injuries despite the fact that his helmet visor was down.

What happened? Hostile ground fire? A SAM? Explosion? NO...none of these. It was just a harmless turkey vulture. Harmless??

Birds, like the aforementioned, and his countless feathered cousins, cost the taxpayers a whopping ten million pieces of bread with each year that drops off the calendar. Other costs, not as easily calculated, include consternation, teeth gnashing, and great adrenalin rushes resulting from the harrowing encounters shared by jocks who've experienced windscreens and canopy shattering rendezvous with our feathered counterparts.

Tales of misery and woe have led

to sage advice telling of avoidance countermeasures. But certainly there must be something, other than words, with which we can do battle with the feathered fiends. Shaking the bushes has produced a few things that are being researched, investigated, and talked about in the birdstrike arena.

MICROWAVES

Dr. J. A. Tanner, who is the head of the Control Systems Laboratory of the National Research Council of Canada, may have part of the answer. Since 1966 he and his associates have been doing some interesting research in the effects of microwaves on birds.

It seems that when birds enter a field of microwave radiation they express a profound desire to escape. The contention is that an airborne system could clear birds from a path ahead of the airplane without permanently damaging the birds. By the same measure, a ground based system could keep an airport clear.



BIRDSTRIKE UPDATE

The total effects of microwaves on the fowl population are not understood at this time; however, experimentation is continuing.

In a letter to TAC ATTACK Dr. Tanner said, "We are getting close to the stage of being able to specify the microwave field parameters to achieve a particular end result such as clearing an airport of birds or clearing a flight lane in the air. The results of some of our experiments en route have opened our eyes to potential personnel hazards involved in the operation of such microwave equipment and have prompted us to expand our experimental program to take a closer look at this aspect."

So it appears that quite a few problems must be solved before any form of anti-bird microwave equipment, airborne or ground based, can be put to operational use. Meanwhile, other approaches to the birdstrike problem have been investigated.

In a recent ASD sponsored study investigating birdstrike damage prevention, several interesting approaches were explored. Among these were: Lasers, Bio-Sonic Transmitters, Strobe Lights, Airstream Deflectors, Shredders, Windshield Cover with Periscope, and Windshield Materials.

LASERS

The Bureau of Sport Fisheries and Wildlife has investigated the effects of Lasers on birds. They found that birds demonstrate a startled jump when exposed to a Laser pulse (understandably), but do not react by flying. Increasing the power can cause physical damage to the bird (again understandably); however, a power output great enough to kill birds could cause grievous damage to other animal life (such as people).

BIO-SONIC TRANSMITTERS

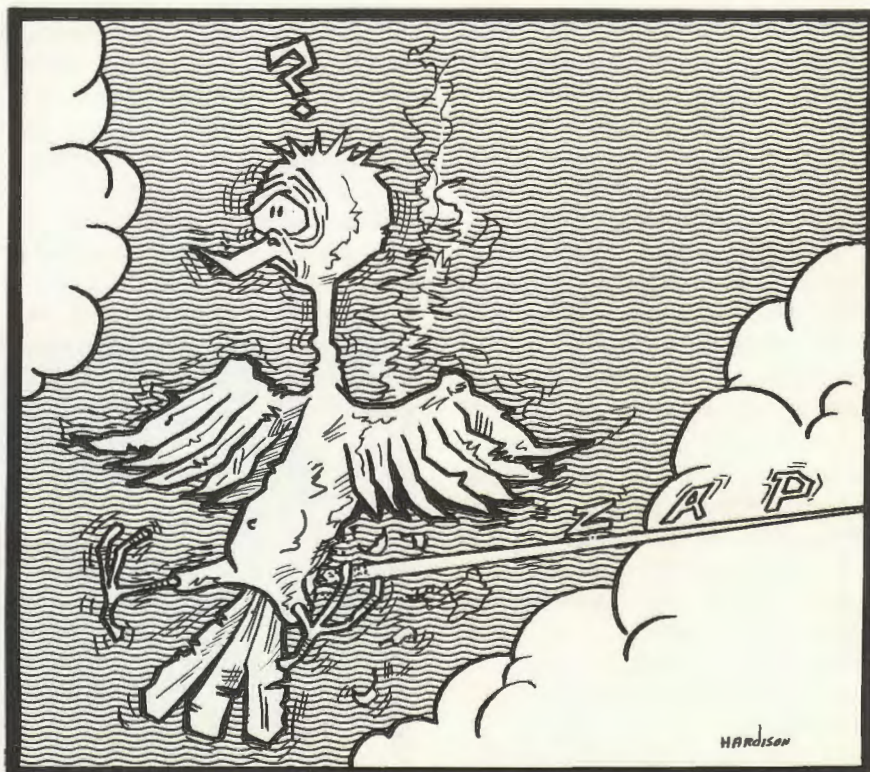
It has been demonstrated in the past that birds become frightened and fly away when they hear their "alarm" call. This system of scaring birds away from airports by playing recorded tapes of their alarm calls has, generally, met with satisfactory results. Transposing the idea to an airborne system carries with it some obvious disadvantages. First it would be necessary to design equipment capable of projecting sound far ahead of the airplane. Next, what sound should be projected? Each species has its own distinctive alarm call and there are hundreds of different species of birds. Assuming all the calls are on tape imagine what would happen if they were all played in a very brief time frame at the power necessary to get the sound out ahead of a 500 knot airplane. Talk about noise

pollution... So, it seems that bio-sonic transmitters, in the present form, are not suitable for aircraft.

STROBE LIGHTS

Reports indicate that commercial aircraft equipped with strobe lights have fewer birdstrikes than equivalent non-equipped airplanes flying the same routes. Apparently the birds see the light and maneuver away from the source. However, the effectiveness of the strobe light has not been fully evaluated. It is not known, for instance, if birdstrikes can be reduced on high speed (500 knots) aircraft equipped with strobe lights.

This area appears to offer some hope and should be investigated further. Strobe lights are scheduled for installation on some T-38 aircraft. A comparison of birdstrike rates on strobe equipped aircraft with the remainder of the T-38 fleet should provide a statistical conclusion as to its effectiveness in reducing the hazard.



AIRSTREAM DEFLECTORS

An airstream deflector capable of altering the direction of airflow about the aircraft resulting in changing the flight path of the on-rushing bird is not considered practical. The forces required to divert a four-pound bird with a closing velocity of 500 knots are much larger than the forces available to achieve the diversion. Even if the concept were practical from an energy viewpoint, aerodynamic considerations would make the idea impractical.

BIRD SHREDDER

A series of blades designed to shred the bird prior to windshield impact has been investigated. Unfortunately the mass and momentum of the bird would not be significantly reduced by such a gadget. A screen or grate could produce the same shredding results, however, in order to be effective the grate would have to be made of wide bars with very little space between the bars. Consequently, pilot visibility would be very limited. To make the device retractable would add to the complexity of the system and degrade its usefulness. Shredders are, therefore, impractical.

IMPACT RESISTANT CANOPIES AND WINDSHIELDS

There are materials available which can increase the strength of aircraft canopies and windshields. For example, the F-15 design goal is to provide protection from a four-pound bird when traveling at 0.7 mach. The material being considered for the windshield is polycarbonate clad with as-cast acrylic faces (a polycarbonate sandwich).

Polycarbonate has been on the market for several years but only recently has been used for aircraft windshield glazings. Estimates cite



that a 0.7 to 0.75 inch thick polycarbonate windshield would defeat a four-pound bird at 500 knots.

A degree of experience with polycarbonate windshields has been gained from T-37 aircraft. Some T-37s were retro-fitted with windshields made of a polycarbonate material, however, early experience indicated some problems with optical distortion. Optical quality has since been improved by special polishing processes and it appears now that acceptable optics can be achieved.

Of all the passive approaches to birdstrike protection (bird shredders, airstream deflectors), the use of polycarbonate materials for impact resistant windshields and canopies appear to offer the best means of achieving a measure of crew protection from our feathered friends. Some testing remains but at least it's something within "the state of the art."

Except for the strobe light analysis and the work being done in Canada on microwaves, there seems to be little activity in the active approach to the problem. One must wonder if all means of air capable and transmittable energy patterns used as bird shields or deflectors have been

investigated. Ten million dollars a year is quite a hunk of cash to spend because of birdstrikes. Perhaps we ought to spend a little more money and find out what the birds don't like and then see if there is an airborne way of giving it to them.

That, however, remains in the future. Let's look at a few things, in review, that can be done now to help prevent birdstrikes.

The migratory season will be upon us again in March and will last through mid-April. Make plans now to do something about it. Most birdstrikes occur below 1000 feet AGL so keep your operations in their air to a minimum. Plan now to decrease your local night flying during the migratory season; it might save an airplane. Know the general migratory routes and avoid them as much as possible (especially 1000 feet or below). Check with your safety type and see if his spring plans include stirring the pot for some means of bird control around the patch.

Meanwhile, a practical approach to the problem can reduce the hazard. There's a lot we can't do to prevent birdstrikes, but let's make sure that we've done all that we can do.

To all sportsmen . . . good hunting.

To all pilots . . . poor hunting. ➤

TAC TIPS

... interest items,

AERO CLUB NOTE

In the modern day world of aviation Goliaths and Davids, the Goliaths come out on top.

Take the case of the Cessna 150 that challenged a C-130. The Herky was holding number one with throttles in ground idle when ground control cleared the 150 to taxi to the parking area. The route took the Cessna behind the C-130. As the 150 came into the prop wash, the operator felt a mild buffet and turned to get out of the way of the blast of air ... too late. The nose and right wing hit the ground, then the airplane flipped over.

Four thousand bugs cheered, having been given a longer expected life span due to the demise of one of their persecutors.

GRAB THE RIGHT HANDLE

The perplexing problem of which handle, switch, knob, or lever to pull, push, flip, or rotate has been with us from day one. No matter how haphazardly they're strewn about the cockpit, it still remains the responsibility of the pilot to grab the right one for the function needed. It's obvious that in each airplane the switchology can be improved. Equally as obvious is the fact that while pressing for changes we must do our best to live with what we have.

An illustration of grabbing the wrong handle and consequently not doing the best with what's available comes to us from another command.

The IP and student pilot were shooting a GCA in a T-28. On downwind the student was getting a little warm and reached for the cockpit air handle. A few seconds after he turned the handle the engine quit. The IP tried one restart which was unsuccessful, then ordered a bailout. Despite the low altitude they both made it over the side and had good chutes. Rescue picked them up within a few minutes.

Much later the airplane was salvaged and investigation turned up the reason behind the engine failure ... namely, fuel starvation. They also turned up the reason behind the fuel starvation. The fuel selector handle was positioned to OFF.

The student pilot, in attempting to get more air, reached for the cockpit heater handle, confusing it with the cockpit air handle, and wound up with the fuel selector handle in his hand. He shut off the gas.

It's up to each of us, as pilots and crewmembers, to know what we're doing. Sometimes it's a game of "you bet your life."

SNARLED THROTTLE

The F-105 was number two in a flight of four on a SID en route to the range for an air to ground gunnery mission. As the pilot adjusted the throttle to maintain formation position, he felt a slight restriction to aft movement. He moved out to a loose position to check the problem and found out that the binding became more severe with each throttle movement. When he tried to pull the throttle aft he determined that 92 percent was as low as she would go. Movement above that was no problem. The pilot then found out that the aft side of the rear throttle quadrant dust cover spring assembly (whew) was torn and that when the throttle was advanced, the torn portion was freed from the take up reel and became raveled, causing the restriction. The pilot then advanced the throttle slightly and was able to guide the torn portion onto the take-up reel with a finger while he reduced the throttle to about 87 percent.

Using this power setting, he took the lead and was able to make a straight in approach. Forward throttle movement was unrestricted should he have needed it. The jock landed without any further problems and was able to retard the throttle to idle after touchdown (wouldn't you know it).

mishaps with morals, for the TAC aircrewman

THROUGH RAIN, SLEET, SNOW, ICE...

Down in a major southern city, a U. S. Post Office Branch found a way to increase its efficiency.

Seems like a box of emergency radios passed through their bailiwick en route to Somewhere AFB. The box broke open and the radios spilled out. Being quick to capitalize on the situation, the employees began using the emergency radios to dispatch and control the mail carriers.

Worked great 'till some wise-guy pilot turned in a hazard report and the FCC tracked 'em down.

If TAC ATTACK had a "Fickle Finger of Fate Award" it would most certainly have to go to this infamous Post Office Branch.

Thanks a lot, fellers.

F-111 SPLIT FLAP

The flight in the F-111A was a student training mission which had proceeded normally to the range and back home for some practice instrument work. During a go-around from a GCA, at about 200 KIAS, the flaps were retracted to 15 degrees. The aircraft attempted to roll hard right. The pilot immediately placed the flap handle full down and the roll tendency stopped. The pilot then entered a closed pattern for an uneventful full stop landing.

The cause was pinpointed as a failure of the left inboard flap actuator torque shaft and of some wiring in the right asymmetry sensing switch.

The aircrew passed on some good poop. They stated that nearly full stick was required to hold wings level with the left flap full down and the right flap at 15 degrees down. They also feel that the rolling tendency could not be controlled with a full split flap condition. It points out the importance of stopping at the 15 degree position during both extension and retraction to provide for adequate reaction should a split flap condition exist.

ATTENTION THUNDERBIRD ASPIRANTS

Applications are being accepted through 1 May 72 by the USAF Thunderbirds for an exec officer who will eventually move into the Commander/Leader position.

Experience requirements: Grade, Lt Col or Major; Flying Experience, min of 2500 hours with 2000 hours in jet fighters, and a completed SEA tour.

Additionally, the Thunderbirds are accepting applications through 31 May 72 for a narrator and demonstration pilot. Narrator will perform that function for one year then fly as a demonstration pilot for two years. Applicants for both positions must have less than ten years active commissioned service (as of 31 Dec in selection year), have a SEA tour out of the way, and have 1000 hours jet fighter or jet trainer experience.

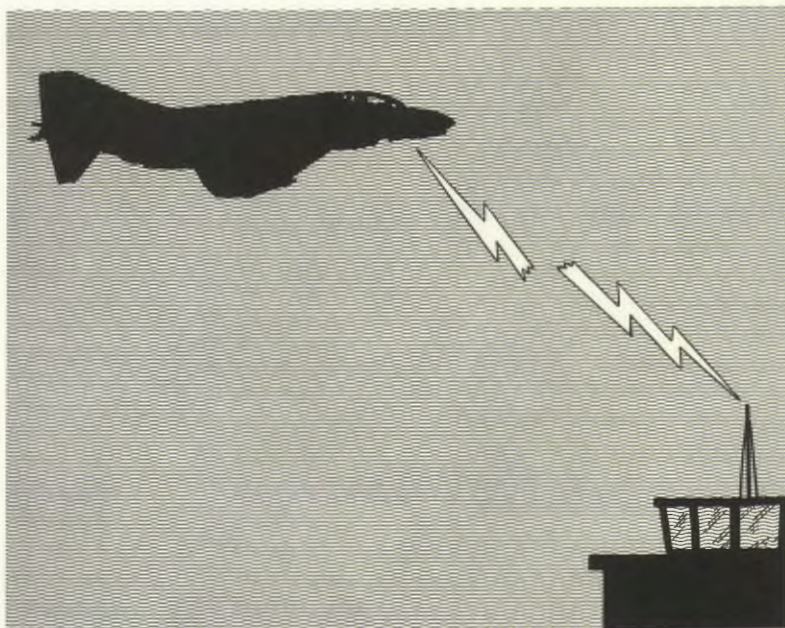
All applicants check AFM 36-11, Chapter 8, for application routing and zap an info copy to the Commander, USAF Demonstration Squadron, Nellis AFB, Nevada 89110.

Good luck!



KEEP TUNED In

by Rex M. Stewart
FAA/TAC Liaison Officer



You've probably heard this before, but it bears repeating. Close pilot/controller harmony is a must in the application of air traffic control. The lack of mutual understanding between pilots and controllers with respect to the other's intentions leads to "surprises" and there is no place for surprises in either the cockpit or the control room. The FLIP and AIM publications explain many of the air traffic control functions and procedures which are based on ANTICIPATED PILOT ACTIONS during certain air traffic control situations. Your awareness of these procedures might keep you from "surprising" the controller the next time up. Here are some examples of the more common misconceptions:

ADHERENCE TO ATC CLEARANCE. As spelled out in FLIP and the AIM, an ATC clearance is not a blank check. You are still required to abide by the applicable rules and regulations regardless of your clearance. Insofar as the controller is concerned, your acknowledgement of the clearance means that you understand it and will comply. If you have any doubt whatsoever, ask for clarification — or a repeat — or an amended clearance. Sure, the controller doesn't like to repeat a long-winded clearance, or come up with a new one, but he would rather do that than be "surprised" further down the road.

INSTRUMENT APPROACHES. ATC procedures now permit controllers to use the same arrival procedures for military turbojets as for civil turbojets, such as, radar vectors to final approach course in lieu of high altitude penetration/approaches. (As a rule of thumb, the point at which the en route descent should begin is normally determined by adding 10 to the first two digits of the flight level. For instance, if you are at flight level 350 you should be cleared for en route descent when

approximately 45 NM out. Obviously, the existing traffic situation will be the determining factor.) You will normally be aware of the type of approach to expect prior to entry into the approach control area. Don't surprise the controller with a last minute request for a different type approach. If a high altitude penetration/approach is available for your use, and you would prefer this instead of normal arrival handling, be sure to let the controller know your intentions as early as possible prior to descending below the initial penetration altitude.

TWO-WAY COMMUNICATION FAILURES. There are those who will argue that any time you are proceeding on an IFR clearance, and lose communication with the controller, you are in an emergency situation and anything goes. Not really! The cheese may get a bit binding, but a radio failure does not necessarily constitute an emergency. It is up to the pilot as to whether or not he finds it necessary to exercise his emergency authority. Otherwise the controller will be expecting you to comply with the prescribed radio failure procedures and rules. One final word on the subject, as indicated in recent messages/notices, the radio failure beacon code (7600) will not appear on the radio display unless interrogated by the controller. On the other hand, the emergency code (7700) will normally be displayed automatically provided the transponder is PROPERLY ACTIVATED by the pilot. Efforts are currently under way to provide an automatic 7600 display to enhance the controllers' recognition of radio failures. Meanwhile, don't count on your 7600 squawk being observed unless the controller has reason to suspect a radio failure. Should the situation so dictate, don't be reluctant to exercise your emergency authority including use of code 7700.



NAVIGATOR EXPLAINS TOTAL INVOLVEMENT

by CAPT GILLES BUSSIERES
UFSO CFANS

ATTENTION NAVIGATORS!! I know you're out there somewhere; I just can't hear you. As a matter of fact, I had to go all the way to Canada to get an article written by a navigator. Let us hear from you. Ed.

Is the navigator's involvement in Flight Safety superfluous? For some the involvement of navigators is compared to a non-paying passenger at best, and a back seat driver (pejorative sense only) at worst. After all, would a defensive driving course be directed to passengers of a car? Of course not! Even the Directorate of Flight Safety recognizes that attitude when it classifies navigators after the weather forecasters in the other personnel column. There is nothing particularly upsetting with this attitude, unless it is advocated by navigators themselves, for it leads to a dangerous indifference toward not only flight safety, but also the ultimate goal itself - accomplishment of the mission.

Navigators are members of a specialized team dedicated to the safe and successful accomplishment of the mission at hand. A navigator owes it to himself and to every member of the team to be an active and effective link in every phase of every mission.

Student navigators are taught the basic skills required to carry out future tasks. Safe and accurate navigation is the primary objective, and it must be achieved regardless of the situation. It will not always be easy to achieve; weather conditions, equipment unserviceability could be such that these skills may really be put to the test. Students of navigation should keep this in mind.

Weather avoidance is also a vital aspect of mission accomplishment. It involves interpretation of the radar returns and the subsequent correct evasive action, while still keeping track of your position.

Since the majority of flying accidents occur around airports, particularly during the approach to the runway, here again the navigator has a contribution. This is no time for the navigator to consider his work finished. It is a time to monitor approach clearances, check clearance limits, monitor the approach itself with all the instrumentations at your command, and assist the pilot with pertinent and useful information.

Reporting and discussing unserviceabilities, dangerous procedures or problem areas with other members of the team, on the ground or in the air, is another involvement. The navigator should not be tempted to say that it is none of his business or that it is outside his area of responsibility. Remember instead that involvement may save costly material resources or even human lives. This is reason enough to make it your business too.

To be prepared for a given mission then, means much more than just planning it. It also means anticipating problem areas and resolving them in advance. After all, emergency procedures have evolved from just such anticipations. Above all, make sure that you never let routine tasks turn you into a complacent navigator, and you will always be prepared. Remember also to involve yourself actively in every phase of every mission... as if your life depended on it.

Fellow navigators, ask no more whether you are involved in Flight Safety. Ask instead, "What more can I do for Flight Safety?" and by the way, do you know why the Directorate of Flight Safety ranks the navigator behind the weather forecasters in the other personnel column? It is because we make fewer errors than they do.



Reprinted from HOT LINE



TALON SERVICE NEWS
OCTOBER QUARTER 1971

Back in 1909, the automobile tire manufacturers recognized that airplane tires had to be different from those built for automobiles. Not only was the automobile tire unable to withstand the severe landing shock, but the flexing of an airplane tire during ground operation was about 2-1/2 times greater. The optimum design was a tire

of much greater strength that required specific air inflation pressures to minimize heat generation and limited the tires to intermittent use to provide cooling periods.

Heat is generated within the body of the tire primarily by the flexing of the carcass. Wheel brakes, hot weather, and bearing friction also contribute to the heat accumulation. The flexing action of a heavily loaded rolling tire creates friction which progressively builds up heat within the tire at a rate faster than it can be dissipated. Excessive heat buildup can cause deterioration of the plies or tread and lead to premature tire failure. Lower than recommended inflation pressure contributes to excessive tire deflection and causes greater fatigue and more heat buildup. The life of the tire depends on correct air inflation pressure at all times.

The nylon cord in the tire will stretch during the first 24 hours following mounting and inflation. This will result in a 5% to 10% drop in air pressure. No new tire should be placed in service until at least 12 hours after being mounted and inflated to regular operating pressure. The air pressure should be then adjusted to compensate for the decrease in pressure caused by the stretching of the nylon cord body. Tires inflated in a heated room and then stored outside or in an unheated area will experience an air pressure loss of about 1 lb/in² for every 4°F drop in ambient temperature. While air pressure loss is more common during cold weather, there are no regional or seasonal limitations.

Air loss is normal as all aircraft tires leak a certain amount thru their sidewall vent holes. The vent holes permit air which has seeped thru the inner liner to escape before it results in separation of the carcass or tread. However, if a tire has a pressure loss of 5% or more during a 24-hour period, the reason should be determined. You should keep in mind that the wheel can also be responsible for the air pressure loss.

There are numerous causes of air pressure loss, and a trial-and-error system is uneconomical; it is important to establish and follow a systematic checklist.

Your checklist should begin with a careful examination of the external surface for cuts or punctures that could possibly penetrate the cord body and inner liner. Foreign object damage is second only to heat in the destruction of a tire. Any visible rigid object coming in contact with the tire during taxi or towing is capable of inflicting damage.

Although the tire bead is hidden from view, any exposure of the nylon cord body in the bead toe area or under the face of the bead and the heel should be carefully inspected. Hidden bead damage is also evident by signs of extreme tire heat. Any rough edges along the outer edge of the bead or chafer strip should never be ignored. There is also the possibility that the bead was not

properly seated because of careless handling during mounting, lack of lubrication, insufficient air pressure, or kinked and distorted prior to mounting.

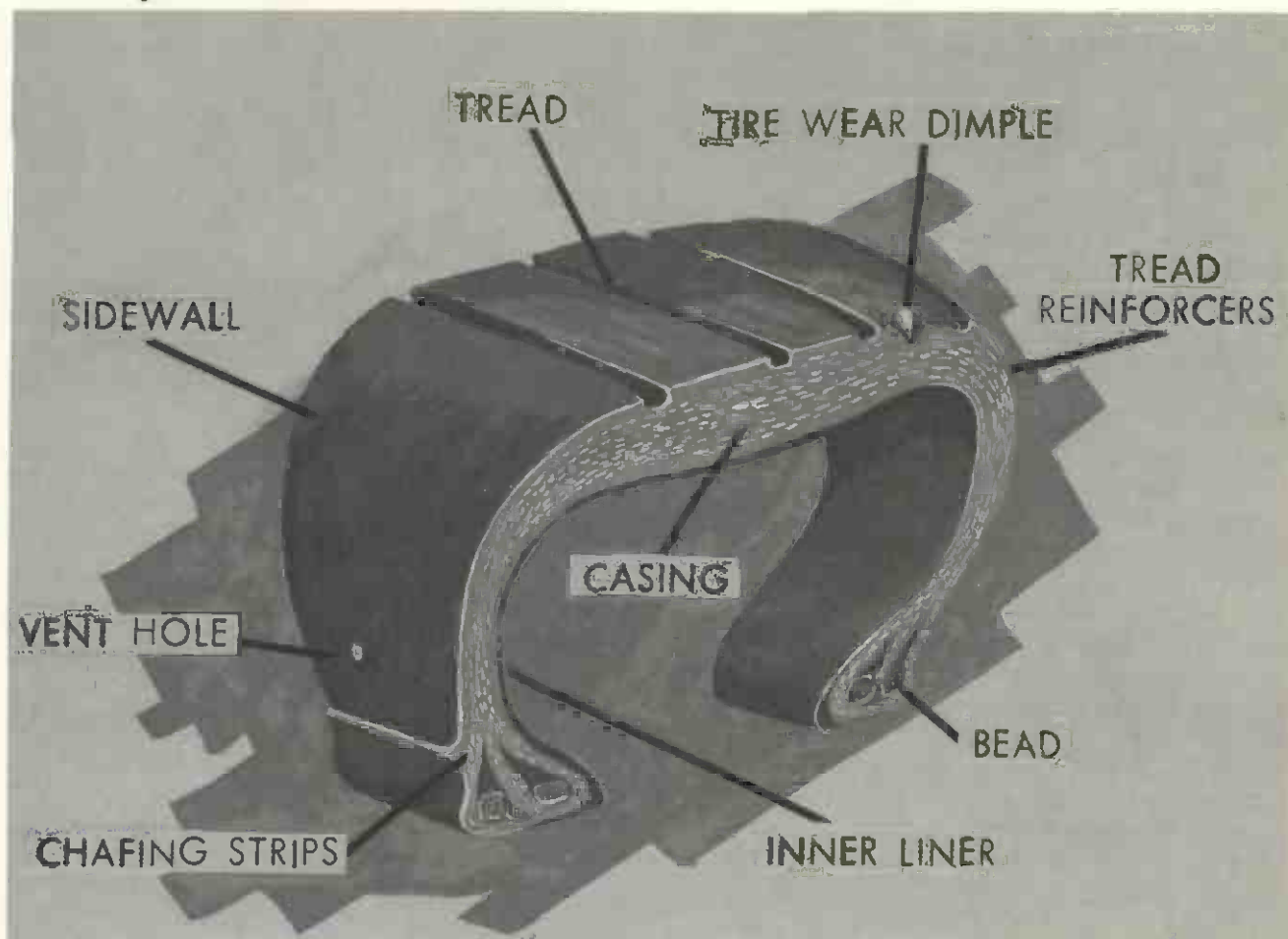
Air pressure loss can be attributed to various areas of the wheel. When preparing to mount a tire and wheel, it is recommended that the wheel assembly be thoroughly inspected for discrepancies such as cracks, checking abrasions, an exceptionally smooth painted surface on bead seat ledges, corrosion or wear of bead ledge in the toe area of the tire bead; these discrepancies must be corrected. Scratches, gouges, or tool marks in the bead ledge area may often cause air pressure loss. Dirt and other foreign material accumulation in the bead seat area may prevent proper bead seating.

Air pressure may escape thru the pores of the magnesium wheel castings. An application of a suitable paint or impregnation process can correct this deficiency. Check tubewell area for cracks, and see that all mounting screws and bolts are properly sealed. Care must be taken to see that the wheel halves or demountable flange junction point has not been damaged during handling, and any damage must be repaired before mounting tire and wheel. This surface must be free of dirt and other foreign material. The wrong type, size, twisting, or lack of lubrication for a preformed packing may cause air pressure leakage. Used packings should be thoroughly inspected. Do not use packings that have become deformed, shrunk in size, chipped, or damaged or that show signs of deterioration. Proper wheel tie bolt torquing procedures will assure proper compression of sealing preformed packings.

It is important that the proper packing be used when installing the tubeless valve and that the surface be free of scratches, gouges, tool marks, corrosion, and foreign material. Valve caps should always be used and tightened fingertight. A complete inspection of the wheel assembly before it is assembled is your best guarantee against air pressure loss in this area. The installation of air filler valve caps on all tires will prevent the entry of contamination. If air pressure loss occurs after the tire and wheel are mounted, the use of a soap and water solution may quickly pinpoint the leakage point. Use caution when applying the soap and water solution in the vicinity of the wheel bearing. Failure to properly dry the wheel bearing may ruin it.

You should keep in mind that underinflation permits greater carcass flexing, increases heat buildup, and breaks down the tire sidewalls. It also induces tremendous strain in the tread area and increases the tendencies toward ply and tread separation. Underinflated tires have a lower hydroplaning speed and are subject to more damage than overinflated tires. Overinflation adds stress to the tire, lowers resistance to bruising, increases skidding, subjects

tire pressure loss



the center of the tread to accelerated and uneven wear, and increases groove cracking. It reduces the effect of hydroplaning, but it also reduces the braking coefficient.

Use extreme caution when inflating a tire from a high pressure air source. Tire maintenance technicians have been seriously injured or killed from tire overinflation. Most aircraft wheels will burst before the tire from high pressure air.

It is not too uncommon to discover an inaccurate tire air pressure gage in use, and that the difference in air pressure is due to different gages being used and not the air loss. Tire pressure gages are also affected by temperature variations and lubricants that may cause incorrect readings. All gages should be recalibrated periodically. The same gage should always be used when checking a tire before and after the stretch period.

For optimum tire performance, inflation pressures should be checked and adjusted daily, preferably during preflight inspection when the tires are cool. Maximum tire life can be obtained only if the correct design deflection is maintained. Crew chiefs and tire shop technicians should

be constantly alert for signs of air pressure leakage.

A pilot skidding a tire at 100 KIAS on a dry paved runway can destroy a tire in about a third of a second. The heat generated by an underinflated tire during taxi, takeoff, and landing will destroy a tire nearly as quickly. Most aircraft tire blowouts are attributed to underinflation. Proper inflation is the key to aircraft tire maintenance.

The following message from the USAF tire manager at Hq OQAMA points out some interesting facts relative to aircraft tire failures.

"Subject: Aircraft Tire Inflation. In the past few weeks there have been one major aircraft accident and several incidents involving new and rebuilt tires. Underinflation was evident in all cases and the major cause in most failures. It is imperative that aircraft tires be inflated properly for gross weight of aircraft prior to each flight. If tires are operated on one mission underinflated, damage will result and tire can fail on a later mission when properly inflated... We solicit your aid to improve aircraft tire maintenance."

NEW

new products

PRODUCTS



A new kit for washing aircraft is available under GSA stock number 7920-490-6046.

The kit contains an applicator head and six 5 x 11 inch sheets of the cleaning and polishing material.

A swivel joint on the back of the applicator can go up, down, or sideways enabling the operator to clean areas difficult to get at with

ordinary mops. In addition the applicator is curved to conform to convex aircraft exteriors.

The cleaning and polishing materiel can be quickly installed since the applicator head is equipped with a hook and loop fastening device.

Look for the kit to be included in an upcoming revision of TO 1-1-1, "Cleaning of Aerospace Equipment." ➤



Lt Col Bryde

TACTICAL AIR COMMAND AIRCREWMAN of DISTINCTION



Lieutenant Colonel Joseph C. Bryde of the 184th Tactical Fighter Training Group, McConnell Air Force Base, Kansas, has been selected as a Tactical Air Command Aircrewman of Distinction.

Lieutenant Colonel Bryde was flying as number three on a low level navigation mission in an F-105D. While flying at 1000 feet AGL and 400 knots, the airplane suddenly began a rapid roll to the left. Lieutenant Colonel Bryde disconnected the autopilot and the stability augmentor, applied right aileron pressure and right rudder with no effect. The control stick would not move to the right and the airplane continued the roll to a 100 degree left bank. He reduced power and applied heavy positive G load which caused the airplane to roll slowly back to the right. The airplane rolled to a 60 degree left bank but upon reapplication of power the airplane again began the roll to the left. Lieutenant Colonel Bryde again reduced power and established a climb to reduce airspeed below rudder lock-out speed where he was able to maintain wings level flight with nearly full right rudder. He climbed the stricken F-105 to an altitude above 18,000 feet and declared an emergency. Lieutenant Colonel Bryde discussed the situation with the flight leader and the mobile control officer and was advised by the flight leader that the right aileron appeared to be full down. He then lowered the left flap to relieve the heavy right rudder

pressure. Lieutenant Colonel Bryde still could not move the control stick to the right, but could establish a 10-15 degree right bank with rudder. He experimented with flap positions and minimum control speeds with the gear down to determine best landing configuration. With the left flap 48 percent down, and the right flap full up, a controllability check was made and the airplane was landed from a straight in approach at 235 knots. Touch down was 2000 feet down on a 12,000 foot dry runway and he used aerodynamic braking, deployed the drag chute, then slowed to taxi speed with normal braking. Inspection in the parking area found the right aileron to be full down, left aileron neutral and both spoilers closed. Further inspection revealed a small wire bundle clamp support bracket in the right wing had broken from its mounting screw and lodged in the right aileron power control unit, locking the control valve in the extended position and routing hydraulic pressure to the down side of the right aileron actuator.

Lieutenant Colonel Bryde's rapid response in countering the sudden uncontrolled roll at low altitude and his superb airmanship displayed in the landing without full use of the flight controls prevented the loss of a valuable airplane and certainly qualify him as a Tactical Air Command Aircrewman of Distinction.

TACTICAL AIR COMMAND



Maintenance Man Safety Award

Technical Sergeant Rayford D. Sherrill, 4452nd Combat Crew Training Squadron, George Air Force Base, California, has been selected to receive the TAC Maintenance Man Safety Award. Sergeant Sherrill will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



SSgt Sherrill

TACTICAL AIR COMMAND



Crew Chief Safety Award

Sergeant Richard B. Stalnaker, 547th Special Operations Training Squadron, Hurlburt Field, Florida, has been selected to receive the TAC Crew Chief Safety Award. Sergeant Stalnaker will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



Sgt Stalnaker

TACTICAL AIR COMMAND



Ground Safety Man of the Month

Technical Sergeant Robert P. Boeckelmann, 474th Tactical Fighter Wing, Nellis AFB, Nevada, has been selected to receive the TAC Ground Safety Man of the Month Award. Sergeant Boeckelmann will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



TSgt Boeckelmann

Letters to the Editor ...

FLEAGLE SCORES AGAIN

One of the high points here in Iceland is the monthly arrival of your magazine. Of particular fame is the cartoon series entitled FLEAGLE by Stan Hardison.

One particular cartoon sequence came rather forcefully to mind a few days ago as we were preparing to shoot a minimum fuel penetration in weather announced as 200 and ½ with no alternative within seven hundred miles. We refer, of course, to the one which depicted Fleagle caught in the throes of an actual GCA to minimums and his subsequent crash. Considering the flying conditions in Iceland, we feel that this cartoon is especially appropriate to our situation, which brings us to the point of this letter.

Having dug through the squadron copies of just about every magazine published by the Air Force, we were unable to locate the one which contained the aforementioned cartoon. We would, therefore, greatly appreciate either a copy of same or information on how such a copy may be obtained.

Thank you in advance for your trouble.

John J. Halle and Bob Hervatine
57th FIS, Keflavik, Iceland

The issue is on its way plus we've taken the liberty to include you on our distribution list for our quarterly Fleagle posters. Ed.

REUNION

The 8th Tac Ftr Wg will hold its annual reunion 25-26 February 1972, Sheraton Park Hotel, Washington, D. C. For further information contact Lt Col F. N. Markey, Hq USAF/XOXFTJ, Washington, D. C. 20330, telephone OX-76838/57545 or Lt Col R. L. Markey, 1111 19th Street, (AF/SAGF), Arlington, Virginia 22209, telephone OX-48571.

FLEAGLE GETS ANOTHER PAT ON THE BACK

Colonel Beisner

I have been a constant reader of the TAC ATTACK for a long time and find that as the months (and years) go by it gets better and better. I like the method of presentation, the thought content, and above all Fleagle.

In my opinion, you and your magazine are doing an outstanding job of promoting safety. Have you ever considered putting out a Fleagle Handbook? You know, "Fleagle's Handbook for Hapless Aviators" or some such thing.

I hate to tear up your magazine to save Fleagle but at the present there is no other recourse. Fleagle's picture truly does save a thousand words and I feel sure has kept some of our troops from aluminum plating hillsides and runways.

Thanks for putting out an outstanding flying safety magazine. Keep them flying and CHEERS.

Lt Col Henry K. Good
Hq AWS, Director of Safety
Scott AFB, Illinois

Anyone else like the Fleagle Handbook idea? Ed.

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It is requested that Fighter Squadron TWO HUNDRED THIRTEEN be included on the mailing list for your fine publication.

Your magazine is read by all aircrews in the squadron, and I would like to insure that we receive TAC ATTACK monthly for inclusion in our technical library.

Fighter Squadron TWO HUNDRED THIRTEEN is an F4J squadron currently undergoing training for its sixth combat deployment to SEA.

Commanding Officer
Fighter Squadron TWO HUNDRED THIRTEEN
FPO San Francisco 96601

Your copies should be arriving soon. Ed.

TAC TALLY

AIRCRAFT ACCIDENT RATES

* Estimated

MAJOR ACCIDENT RATE COMPARISON

	TAC		ANG		AFRes	
	1971	1970	1971	1970	1971	1970
JAN	1.6	4.8	16.7	5.9	0	0
FEB	1.6	3.9	11.6	2.6	0	0
MAR	3.1	4.6	7.0	1.7	0	0
APR	2.7	4.9	4.9	2.4	0	0
MAY	2.5	6.2	5.7	3.6	0	0
JUN	2.6	5.5	6.9	3.6	0	0
JUL	2.9	5.1	7.1	6.1	0	0
AUG	2.7	5.0	7.8	6.9	2.7	0
SEP	3.2	4.7	7.4	6.6	2.4	0
OCT	3.2	4.5	6.7	6.8	2.1	0
NOV	3.3	4.6	6.9	6.7	2.0	0
DEC	3.2	4.6	6.7	6.6	1.8	0

UNITS

	THRU DEC			THRU DEC	
	1971	1970		1971	1970
9 AF	3.7	2.3	12 AF	2.1	7.0
1 TFW	5.3	5.2	23 TFW	0	3.9
4 TFW	0	4.1	27 TFW	4.3	7.0
31 TFW	12.8	4.1	49 TFW	0	9.4
33 TFW	0	0	347 TFW	0	N/A
354 TFW	7.6	0	355 TFW	0	N/A
4403 TFW	13.1	0	474 TFW	0	0
			35 TFW	2.5	9.4
363 TRW	3.3	5.7	67 TRW	0	3.3
316 TAW	0	0	313 TAW	0	0
317 TAW	0	0	314 TAW	3.0	0
			516 TAW	0	0
68 TASG	0	0	58 TFTW	8.3	14.2
			4453 CCTW	0	9.6
			71 TASG	0	0
TAC SPECIAL UNITS					
1 SOW	6.3	6.3	4410 SOTG	3.7	0
2 ADG	0	0	4500 ABWG	0	0
57 FWW	5.1	0	4485 TS	0	0

TAC SUMMARY

	DEC 1971	THRU DEC	
		1971	1970
TOTAL ACCIDENTS	3	33	43
MAJOR	1	25	37
MINOR	2	8	6
AIRCREW FATALITIES	0	24	33
AIRCRAFT DESTROYED	1	21	34
TOTAL EJECTIONS	1	24	28
SUCCESSFUL EJECTIONS	1	23	22
PERCENT SUCCESSFUL	100	96	79

FLEAGLE

