

# TAC ATTACK

DECEMBER 1972



for efficient tactical air power

# TAC ATTACK

DECEMBER 1972

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Tactical Air Command

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### TACRP 127-1

Articles, accident briefs, and associated material in this magazine are non-directive in nature. All suggestions and recommendations are intended to remain within the scope of existing directives. Information used to brief accidents and incidents does not identify the persons, places, or units involved and may not be construed as incriminating under Article 31 of the Uniform Code of Military Justice. Names, dates, and places used in conjunction with accident stories are fictitious. Air Force units are encouraged to republish the material contained herein; however, contents are not for public release. Written permission must be obtained from HQ TAC before material may be republished by other than Department of Defense organizations.

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# Angle of ATTACK

## discipline



"The discipline which makes the soldiers of a free country reliable in battle..." This prelude is often quoted by Army types and is from Major General John M. Schofield's dissertation on discipline. It spells out some basics for the Army commander to heed if he is to be successful. But we, as Air Force crewmembers, have few quotations from way back when which can spell out success. The old "keep the light on the star and shut up" or "check in and go cold mike" may have had their place, but we lost a lot of pilots and aircraft under that approach.

Still, in the case of fighter aircraft, we find that one aircraft cannot always hack the job and, for the sake of mutual support, a certain amount of "put it there and keep it there" is necessary. Additionally, in multi-crew aircraft we must depend on others to do a job, do it right, and do it when required. What we're really talking about is flight discipline and it applies to each and every Air Force crewmember, whether he is flying the O-1, the C-130, the F-111, or the F-105. If we are to win, and that is the name of the game, then we must be able to count implicitly upon each man to do his assigned task.

Now we get to the guts of the problem. What is it that makes the "airmen" of a free country reliable?

First of all, we must have knowledge not only of the assigned task, but also the method to attain the goal. We may even want some answers to the "whys," which should increase our motivation to do the job right. We must also know our particular weapon system. What can it do? What can't it do? What does it do best? Answers to these questions usually come from the books and from experience. Now all we need is knowledge of our fellow crewmember's capability, which is best derived from application of good training and standardization programs.

But, we're not there yet. As nebulous as it is, flight discipline does not stop at just knowledge. A willingness to subvert oneself to the leadership of another or, if you are the leader, a willingness to accept the responsibility of command, is essential to flight discipline. A leader who doesn't want to lead and a follower who doesn't want to follow are both invitations to disaster.

Finally, and here is where we put it all together, how do we perform when out from under the gun? Can we do it "as briefed," "by the book," and "as directed?" If so, then we are well on the way to good flight discipline.

*E. Hillding*  
E. HILLDING, Colonel, USAF  
Chief of Safety





# STICK FORCE

by Pat Henry

Experimental Test Pilot

McDonnell Aircraft Company, Edwards AFB, CA

Some recent conversations with F-4 drivers in the field have shown that considerable interest exists on the subject of stick force lightening. Regrettably, very little information is available about this phenomenon. My aim in this article is to discuss what it is, why it happens, and where to look for it. Hopefully, that will clear up some of the confusion and make it easier to avoid the pitfalls associated with maximum performance maneuvering in the region where stick force lightening can be expected.

Looking briefly (and very basically) at aerodynamics involved during maneuvering, it is common knowledge that as angle of attack (AOA) increases, the airflow over the wing will eventually begin to separate. The significant point in this case is that the separation occurs first along the wing trailing edges, primarily on the outer panels. Since the remaining effective wing surface must carry the load, the center of pressure (CP) shifts inboard and forward. Such a shift in the CP effectively produces a nose up pitching moment; an imbalance of forces in the nose up direction. This is really a very gradual and subtle change, but it means the stabilator appears to become more effective as we continue to increase the angle of attack.

Results? A given amount of stabilator travel at high AOA produces greater change in AOA and G-load than at the lower maneuvering levels. Going hand in glove with this is longitudinal stick force. As the stabilator becomes more effective, it stands to reason that stick force per G decreases, and we have the infamous "stick force lightening."

If you will, shift your rapt attention to the graph which has been purloined directly from the Category II Stability and Control Evaluation of F-4E aircraft. It was purposely chosen to illustrate the point because it's an extreme case. In particular, note the region of 4.5 Gs

# LIGHTENING

5.5 Gs. The stick force gradient goes to zero right around 5 Gs for this particular set of flying conditions. From 5 Gs on, no additional stick force would be required to pull higher Gs; in fact, you'd best be ready to release some back pressure if you pull much beyond that plateau.

A very important point needs emphasis here. Even though the stick force gradient goes to zero or beyond, the pilot is still pulling in the positive direction, such as, back stick for positive Gs. Twenty pounds worth, in fact. He need but reduce back pressure to reduce G-load.

If you're like me, you're not inclined to fly like the Thunderbird drivers with lots of nose down trim. True, it will build up the muscle in your drinking arm, but most people find it pretty tiring. Naturally, we trim out most of our stick forces. Beware; there's dangerous footing here. Imagine the most extreme case where all twenty pounds of stick force were trimmed out. Your only clues as to how close you are to overstressing the bird are the accelerometer (difficult to scan while maneuvering in

section, checking your six, etc.), and the tightness of your G-suit. A little back stick pressure would help. More important, with little or no stick pressure resisting you, an unexpected gust, jet wake, or heavy hand on the stick will almost guarantee a G-overshoot. Small stabilator changes in this region produce exciting results, so why not leave everything possible working for you? Trim with care!

Finally, a word about where stick force lightening is most prevalent. Don't pin me down too close, please, but you should be on max alert for it in the mid-altitudes ( $15K \pm 5K$ ) and from .85 to .95 mach. Airspeed/altitude combinations in that ballpark will usually give more than enough lift and stabilator power to pull into G-loads that could overstress the aircraft, before you get to such limiting factors as wing stall, buffet boundary, and the like. It's really not as bad as I may have made it sound, but remember, when you're maneuvering in the stick force lightening region, you're operating pretty close to the edges of the envelope — do so judiciously. ➤

## LONGITUDINAL MANEUVERING STABILITY

Typical Configurations Stability Index Min = 0 Loading: Two dlt AIM-7's

TRIM CONDITIONS → ALTITUDE (ft) 15,300 MACH NO. 0.93 XCAS 495 GROSS WT. (lb) 40,100 CG (in) 32.4 TRIM POSITION (UNITS) 2.3 AND

MIL-F-8785 (ASG) Limits





# CHOCK TALK

chock talk ...incidents and incidentals

...incidents and incidentals

## ERROR AND EXPEDIENCY

Recently, in another command, a crew chief was severely burned as the result of an initial error and an expedient attempt to correct the effects of the error. Here's what happened:

Shortly after engine start in the F-104, the crew chief and his assistant noticed fuel dripping from the bottom of the aircraft just forward of the engine intakes. Unknown to the air crew, the crew chief scrambled up on the right wing and then onto the fuselage. He removed the forward fuselage fuel cap and inserted a screwdriver into the well. Suddenly fuel sprayed out of the filler valve, doused the crew chief and was drawn into the engine intake where it ignited. The crew chief was engulfed in flames and fell head first onto the ramp. Flight line supervisors observed the fire and ran to the crew chief's aid. They removed him from the inferno and smothered his burning clothes. The pilot shut down the aircraft and both occupants quickly exited. The aircraft suffered very minor damage but the crew chief had first, second, and third degree burns over fifty percent of his body. In all likelihood he will be in the hospital for more than a year. Of course the story isn't complete so let's backtrack for a moment.

Seeing the fuel leak, the crew chief seemed to know what was causing it. He assumed (correctly) that the retention chain which connects the outside fuel cap to the filler neck was jamming the fuel tank flapper valve which prevented complete closure of the valve and allowed the fuel to escape through the dump mast. This couldn't happen if the chain were of the proper length and connected at both ends, but this chain was not the proper length and it was broken on the filler neck side; the other end was still attached to the fuel tank cap. When the cap was put into position, the chain dangled below and into the flapper valve, unseating the valve slightly. With the engine running, the crew chief tried to free the valve by opening the fuel cap and pulling on the chain, but that didn't work. So he inserted a screwdriver into the well and pushed on the valve so that he could free the chain. Fuel, under pressure, spewed out. The rest you know.

The first error was in not replacing the retention chain which he knew was broken.

Then, probably because of expediency, he didn't have the pilot shut the engine down to correct a problem which apparently had precedent.

The results were grim.

## IT'S NEVER THE FIRST MISTAKE

Safety pins played an important role in a recent A-37 incident. A life support specialist had received a work order to remove the seat survival kits from several aircraft. He removed most without incident, but then as he approached the next airplane, he entered a sequence of events which almost led to disaster, a sequence which started sometime after the airplane's last flight.

Following the after landing and engine shutdown checklists, the pilot began the sequence by installing the canopy jettison T-handle safety pin incorrectly. Then the potential for disaster abruptly ended when the crew chief, following his post flight checklist, installed the canopy remover safety pin CORRECTLY. With this pin correctly installed, the canopy won't jettison . . . period. Now back to our life support specialist — remember where we left him? He was approaching the plane. Looking for a way to get the canopy up, he opened a small access door and PULLED THE EXTERNAL CANOPY JETTISON HANDLE. (OH NO!) Nothing happened! That last pin, installed by the crew chief, was the saver!

Several things come to mind at this point. Thought number one — people shouldn't pull handles on airplanes if they aren't 100 percent sure what that handle does. Thought number two — people who install pins on airplanes should make sure they do it correctly (in this case one did and one didn't). Thought number three — it's nice to know that we DO have effective safety systems that work — even when a portion is made ineffective through improper use.



*with a maintenance slant.*

### REMEMBER GLENN FORD?

A recent incident in a C-130 calls to mind an old Glenn Ford movie where Glenn diligently pursues the cause of a fatal airline crash to find that an errant cup of coffee had shorted some electrical gadgets in the throttle pedestal, which subsequently caused the crash.

In our story, the C-130 pilot was turning onto the base leg of the traffic pattern when it became obvious that the airplane wanted to turn more than he wanted it to. He glanced at the trim indicators, noting that the aileron trim was full tilt. He then pushed on the aileron trim switch a couple of times but it didn't work. Completing the landing without further incident, the jock turned the key over to maintenance. By this time it's no secret what they found. Coffee!!! At some time in the past, the coffee had been spilled (probably by a pilot) and had entered the trim switch electrical goodies via the holes (deteriorated) in the rubber boot at the base of the trim switch.

The pilot who spilled the coffee should have written it up, no doubt. But it's also a good idea for the crew chief to investigate when he spots the tell-tale coffee stains.

Remember Glenn Ford!

### PIN CHECK

A life support specialist in another command recently performed the ten-day inspection of the F-4 aircraft parachute. He found that the back seat parachute safety pin lanyard was not routed through the alignment ring. He investigated further and found that the safety pin was installed backwards and was not saftied. THE PARACHUTE WOULD NOT HAVE OPENED HAD IT BEEN USED.

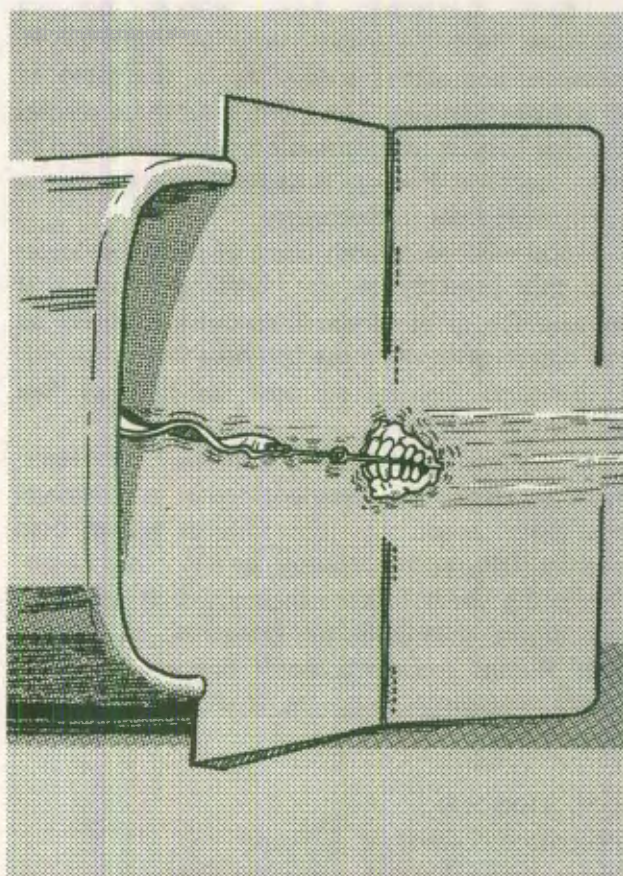
A check of the lanyard routed through the alignment ring is part of the crewmember's checklist. Not once in fifty day's worth of operation was this checklist item

caught. In addition, the ten-day parachute inspection calls for both the lanyard routing and safety pin to be checked. Five previous ten-day inspections failed to catch the mistakes. All we can do is nod our heads in silent salute to the troop who did his job correctly and found the mistake. To the rest of the people, crewmembers and inspectors alike . . . Well . . .

### GET YOUR TEETH INTO IT

While arming an F-4, one of the load crewmembers, complete with checklist in one hand and screwdriver in the other, ran out of places to put things. He removed the nose gun safety pin and held it in his mouth. After buttoning up the gun door he started to transfer the pin from his mouth to his hand when the pin was gulped down by the F-4. Instant indigestion!

This unit is now using pin bags and two men, one to hold the checklist and one to do the work.





Somebody once said, "Even old ideas can be good ideas." In keeping with that philosophy, TAC ATTACK is pleased to present a collection of stories published in 1942 by the Army Air Forces under the direction of General "Hap" Arnold. The series is entitled "Lessons That Live" and all totaled there are seventeen stories, all of which will be presented, running consecutive issues of TAC ATTACK.

The series is introduced by General Arnold and although the authors are anonymous, the narrative accounts of their experiences, told in their own words, are without doubt. . . .

# Lessons That Live

## A MESSAGE FROM GENERAL ARNOLD

A short time ago I asked all pilots to submit, in narrative form, accounts of their narrowest escapes from fatal accidents. The response was instantaneous and tremendously gratifying.

These narratives have already become dog-eared from intensive study by statisticians, engineers and other specialists in the field of accident prevention. The yield from these studies is a rich harvest of information which will help to make our Air Forces, already the safest in the world, even safer in the future.

I promised to publish some of these narratives and this booklet is the fulfillment of that promise. Of the hundreds of accounts received, all well worth printing, these few have been selected, not because they are the best, but because they are the most typical.

In reading these stories, note well, as I have, that accidents or near-accidents are almost invariably caused by pilot failure rather than machine failure, the weather, or any other factor. This being so, it follows logically that accidents can almost invariably be prevented by better, surer flying. Accidents don't happen; they are caused. Knowing the causes, it should be easy to prevent them.

H. H. ARNOLD  
Lieutenant General, U. S. Army,  
Commanding General, Army Air Forces.

No. 3 of 17

Courtesy of Lt Col H. M. Butler, 4500 ABW/SE





# Unhappy Landing

**M**ud baths, they say, are healthful. But I don't recommend the kind I took that chilly October morning. I was flying a new P-40E on a simulated dive-bombing mission and everything had gone along beautifully. As we neared home I was somewhat disturbed to note that the flight leader was landing downwind; however, I quickly tossed my misgivings aside, and I followed him in to land.

While I was on my approach the wind changed to a three-quarter tail wind from the left and Old Sol was shining straight down the runway. The glare from the sun on the wet runway caused me to misjudge my landing. My ship hit the runway and bounced. This caused the left wing to drop and the plane veered off to the right due to the wind from the left rear quarter. I applied the left rudder and brought the right wheel back down on the

runway, but unfortunately I had over-corrected and the ship immediately started off to the left.

As luck would have it, the left side of the runway was covered with a thin coating of mud that was as slick as grease. Brakes and rudder failed to straighten out the plane and it went off the runway, where the wheels bogged down in the mud. The ship did a slow and awkward dive into the ooze, then balanced momentarily on its nose while I hung ludicrously out of the cockpit.

I realized that the plane would go on its back as soon as it finished its little balancing act, so I frantically clutched the sides of the seat and ducked my head. It came over with a crash and my head was dunked up to my Adam's apple in mud. Fortunately, the ship did not have enough forward momentum to slide on its back; if it had, my body and my noggin would have parted company right there. As soon as I could get oriented — probably a second or so although it seemed a year — I cut all the switches and began digging out.

I came through that experience without a scratch. Lucky, considering all the mistakes I made. I shouldn't have tried to land downwind and I shouldn't have looked into the glare. Obviously, I should have given it the gun and gone around when at first the plane struck the runway crooked. I hope others will profit by my mistakes. I know I have!





by Captain "Buck" Sheward  
16 TATS, Little Rock AFB, Arkansas

We're all pretty good. When it comes to flying airplanes, there is no better group on earth. We're the best and we know it. We all have a great amount of self-confidence and we need it to hack the mission. But there is an inherent danger in this supreme self-confidence, this self-possessed knowledge about our skill as airmen. Unless you are aware of this danger and successfully avoid it, it can kill you. I realize that this is a pretty drastic comment, but I can prove it with examples from personal experience, and the thoughts of one of the Air Force's greatest leaders. Let me explain.

During most of '68 and early '69, I was assigned to the

23rd TASS, Nakhon Phanom RTAB, Thailand, as an O-2 FAC. Like anyone else on a combat tour, I formed many deep friendships — the kind of relationships people form during a prolonged period of common stress. I want to tell you about two of the friendships which ended in needless tragedy.

One of my good friends was Will. Will was a great FAC. He was very probably one of the best FACs in SEA. Because of this, he flew many of the dangerous and very critical missions. He was an instructor and he did everything by the book — almost. That "almost" proved to be his failing.

There was a directive at that time that no FAC in our sector of operations would fly below a certain absolute altitude. I've forgotten exactly what that altitude was, but



it was well below the effective range of the guns in our

No FAC in his right mind would go that low anyway. But we were hacked off. After all, we were the "best." We didn't need anyone telling us how low we could go. Where did those guys at headquarters get the nerve to tell us, "the best," how to do our jobs? We were upset but we complied. Well, most of us complied. Will didn't.

Will flew very low, not in the hot areas where it would be suicidal, but in areas where things were cool. He got away with it for a few months but one day it happened. Will crashed — flew into a mountain. The weather was VFR and there were no enemy defenses in the immediate area. He simply had gone too low, could not recover, and crashed. The O-2 was not the hottest aircraft the Air Force ever bought. Maybe the "guys at headquarters" realized this.

Will was one of the best, but he and the observer who was with him that day were dead, claimed by over-confidence and that unnamed mountain in SEA. It was a personal tragedy for me, but it wasn't the last I'd experience for the same basic reason.

Rich was older than Will, more experienced and more stable. He was a command pilot and had been an IP for years before he became one again at NKP. Rich did everything by the book — almost. Again, that "almost" proved fatal.

There was a directive in PACAF at that time, that all recovery attempts were to be made from an instrument approach if possible, PAR if available. No one knows why Rich chose a VFR pattern that particular night. He had escorted a damaged A-1 to the "fence." It had been a long mission for Rich and his student, but not long enough to cause fuel problems. I'm sure Rich was tired. Under these conditions a PAR would have been the safest thing. Rich chose the VFR pattern.

On downwind approaching base, he went into the trees, power on, wings level, slightly nose low. The engines were operating normally. The accident board could find nothing mechanically wrong with the airplane. Rich was one of the best, but he was dead and he took another pilot with him.

Years ago General LeMay initiated a program in SAC whereby the wing commander of any wing which experienced a major aircraft accident would personally brief him on the accident. During one such briefing, he cut a wing commander short with words to the effect:

"I don't want to hear this nonsense about this pilot being the best in your wing. Don't tell me that you can't understand because there were none better. I've heard this story a dozen times and I'm tired of it. If that pilot were truly the best, he would still be alive. He's dead."

It's a known truth that the hot pilots, the ones who are so good that they can throw away the book and do things on their own, get into serious trouble sooner or later. On the other hand, the pilots who realize that they are not perfect, the ones who rely on directives for guidance, seem to live to enjoy a ripe old age. The difference is more than coincidental.

The facts are clear. The common denominator in the current rash of fatal accidents in TAC is a failure to follow directives. The Air Force recognizes this trend, TAC recognizes it, and those of us at the lower levels can recognize it if we look at our own background. When you become so good that you can throw away the book, it's only a matter of time... you're headed for serious trouble.

## ABOUT THE AUTHOR



Captain C. W. "Buck" Sheward is a '64 grad of the Air Force Academy. After pilot training, he spent three years in C-130s, followed by a combat tour in O-2s, then back to C-130s. He is presently an instructor pilot in the Phase I C-130 school at Little Rock AFB.

His article was originally a talk he prepared for a squadron flying safety meeting. Buck is also the squadron chief of safety.



# TAC TIPS

... interest items,

## Minimums

Two incidents which occurred a week apart in different aircraft and different parts of the world bear uncomfortable similarities.

In the first incident, nine RF-101Cs in elements of three were launched IFR for a fly-by at the departure base. With the existing visibility at two miles in ground fog and haze, the intent was to hold above the weather until it cleared to at least five miles viz and then press in for the nine ship fly-by.

Shortly after departing the holding fix for the fly-by, the leader of the third element lost sight of the second element and continued to descend, entering a solid undercast. Suddenly he realized he was too low and called for his flight to pull up. The element later rejoined the formation in the clear and completed the mission.

During post flight, maintenance found obvious evidence that the right wingman of that third element had struck a tree!! It doesn't take much imagination to see what a delay of one more second would have done to the right wingman.

The findings, as you've probably surmised, list supervisory error (element leader) as primary and supervisory error also as contributing in that the fly-by was launched in weather below the criteria established in AFR 60-6. The reg states "Minimum weather criteria for participation in aerial reviews and weapons demonstrations, including those performed in conjunction with good will flights, will be at least 2500 feet ceiling and visibility of at least 5 miles."

In the second incident, an F-111 was shooting a GCA after returning from a combat mission. The pilot states that at 15 miles on final he had the runway in sight but at three miles out he observed a patch of fog covering the approach end. He entered the fog at one and one-half miles and lost sight of the runway. At one mile from touchdown, GCA transmitted that he was going well below the glide path and to execute the missed approach

if field not in sight. Seeing 200 feet on the radar altimeter the pilot initiated the missed approach and came back around for another, and this time successful, approach.

It was not until post flight that the facts came to light. During the approach, the airplane had hit a tree to the tune of about \$17,000 worth of airplane damage. What happened? In transitioning back and forth between instrument and contract flight, the pilot let the F-111 descend far enough below minimums to strike a tree. Again, a split-second more . . .

Gentlemen, there are countless clichés which could be listed here, but you know them all. You know the rule, you know why they were established, and you know how to operate within them. Give it some thought.

## Attention Safety Officers!

Did you know that the vast accident and incident data computer housed at the Air Force Inspection and Safety Center (Norton AFB) is practically at your fingertips?

Recently AFISC instituted a new and improved service of providing flight safety data to MAJCOMs. This service enables the major air command to telephone requests for computer bank data on a 24-hour, seven-days-a-week basis.

How does this help you? Got a study going? Need some data? You can call us directly (Autovon 432-7031 or 7032) and we'll bug (question) the computer. In a reasonably short time you'll have your material.

Simple, huh?



# mishaps with morals, for the TAC aircrewman

## It Takes All Kinds!

Incident Reports are used for many reasons by many people. They are carefully analyzed for trends, potential problem areas, etc. Occasionally, they provide unexpected benefits.

Incident Reports can trigger responses that range from tears of frustration (Dammit — we just covered that last month!) to mild chuckles (They can't be serious!), to full fledged laughter (Hey, read this one — it's a beaut!).

Here are two recent examples that fell somewhere between the gasps and the guffaws. In the first case, the report simply stated, "On takeoff gear would not retract. Attempts to retract gear were unsuccessful." The punch line that springs to mind on this one is, "Poor guy,

he had to land gear down!" The second example is somewhat longer, but here's a condensed version. It seems that a trusty Thud was up on a night refueling mission, and was blessed with a shaky boomer. Fifteen minutes, numerous scratches, dents, clanks, flashes, thumps, and thuds later, a successful hookup was accomplished. Less than a minute later they disconnected, then started all over again. The flying gas station washed the windscreen this time, and the trusty Thud compressor stalled while IFR in JP-4. The report then states that, "The flight discontinued any attempt at air refueling." (Sounds reasonable!) The real punch line in this report came in the corrective action. The report rather tersely states, "It is contemplated that the senior air advisor will visit the air refueling squadron and brief them on the proper technique of air refueling F-105s."

## Kudos

Hats off to the 12th Tactical Reconnaissance Squadron, Bergstrom AFB, Texas. They were recently named the recipient of the McDonnell Douglas trophy for flying 50,000 accident free hours in the RF-4C.

This award marks the first time any unit in the Air Force has been presented the McDonnell Douglas trophy for flying safety in the F-4 or RF-4 aircraft. The award is given by the McDonnell Douglas Corporation, the manufacturer of the Phantom II and Photo-Phantom.

The 12th Squadron was also the first unit to win awards for flying 30,000 and 40,000 accident free hours. The first 40,000 hours were flown in Southeast Asia in combat. The squadron was stationed at Tan Son Nhut Air Base, RVN, from September 1966 until August 20, 1971, when the squadron returned to Bergstrom.

*Ed. Note: This feat was accomplished despite the fact that the assistant editor was assigned to the 12th in the too distant past.*





# SPO COR

SPO Corner is the direct line from the Systems Project Officers at TAC Safety to you. Since every TAC aircraft type is represented by a SPO, you'll be seeing something about your machine, something which may save you some grief. This direct line has a phone at both ends to answer your questions and suggestions (Autovon 432-7031). Or if something is bugging you and you want to write, the address is TAC/SEF, Langley AFB, Va 23365. We need your feedback.

## **BOLT LOGS 625 ACCIDENT FREE HOURS!**

In a recent non-accident of an F-100, the engine was removed for routine maintenance. While removing the engine, the technicians noted the front accessory case leaking excessively. During the subsequent removal of the accessory case, they heard a jingling noise inside the case. Further checking revealed that a bolt was lying free inside the case and that it had been there for some time! The accessory section was last opened during overhaul in October 1968. The engine had logged 625 hours since that date.

The bolt discovered in the accessory section (see photo) is the same one used to secure the accessory case to the engine. Since the case had not been opened since engine overhaul, it was assumed that the bolt had been there since that time. It doesn't take much imagination to determine what would have happened if the right combination of negative Gs had been sustained any time during the 625 hours since overhaul.

This is a classic example of the problems which beset an accident investigation team in trying to determine the exact cause of an accident. It would be somewhat difficult to determine a primary cause, depending upon what remained of the crashed aircraft. Fortunately, this aircraft was not subjected to a great deal of uncoordinated

negative G maneuvering, for had it been, it is felt that aircraft would, in all probability, have been an unexplained accident. Happily, we can record this as a non-accident.

**Maj Bob Lawler**





# NER



## 4 THROTTLE RIGGING CHECK

Flameouts which are the result of misrigged throttles still occur in the F-4 fleet. There have been a couple of mods to the throttle quadrant and improved rigging procedures have been established, but engine flameout incidents due to rigging still occur. Our fearless leader, an "ex" F-4 driver himself, remembered a procedure advocated by McAir some years back that apparently was once recommended but has since fallen into disuse. Review of PRODUCT SUPPORT DIGESTs and discussions with various McDonnell Douglas people revealed the following recommended technique from an article by Pete Garrison which appeared in the 1st Quarter, 1968 edition of the DIGEST. McAir says the words and facts are still valid so without further ado, we plagiarize and provide the following useful information, courtesy the contractor.

Although the existing on-runway check of chopping the throttle from mil to idle and checking to insure the fuel flow does not drop below 425 pph (without cool cam) or 225 pph (with cool cam), provides a valid check of throttle rigging, an additional check can be readily and easily applied during start.

As you bring the throttle into idle or above at 10 percent during engine start, the fuel flow jumps immediately to the minimum fuel flow dictated by the

starting fuel cam (300 pph or 500 pph). As you follow the Dash One procedures, you move the throttle halfway up the quadrant and then back to idle. The getting back to idle is the key to Pete Garrison's recommended procedure — ***snap it back and watch the fuel flow.*** If the rigging is marginal, the fuel flow will immediately drop to well below the minimum starting fuel flow (225 pph or 425 pph). You can snap the throttle forward and aft several times to confirm your findings. If the throttle is properly rigged, no amount of throttle chops will affect fuel flow during start. Until the engine reaches idle RPM, throttle position has no effect on the fuel flow — if properly rigged. ***If you are able to force the fuel flow more than 75 pph below proper starting flow when the throttle is snapped to idle, the rigging is out of limits.***

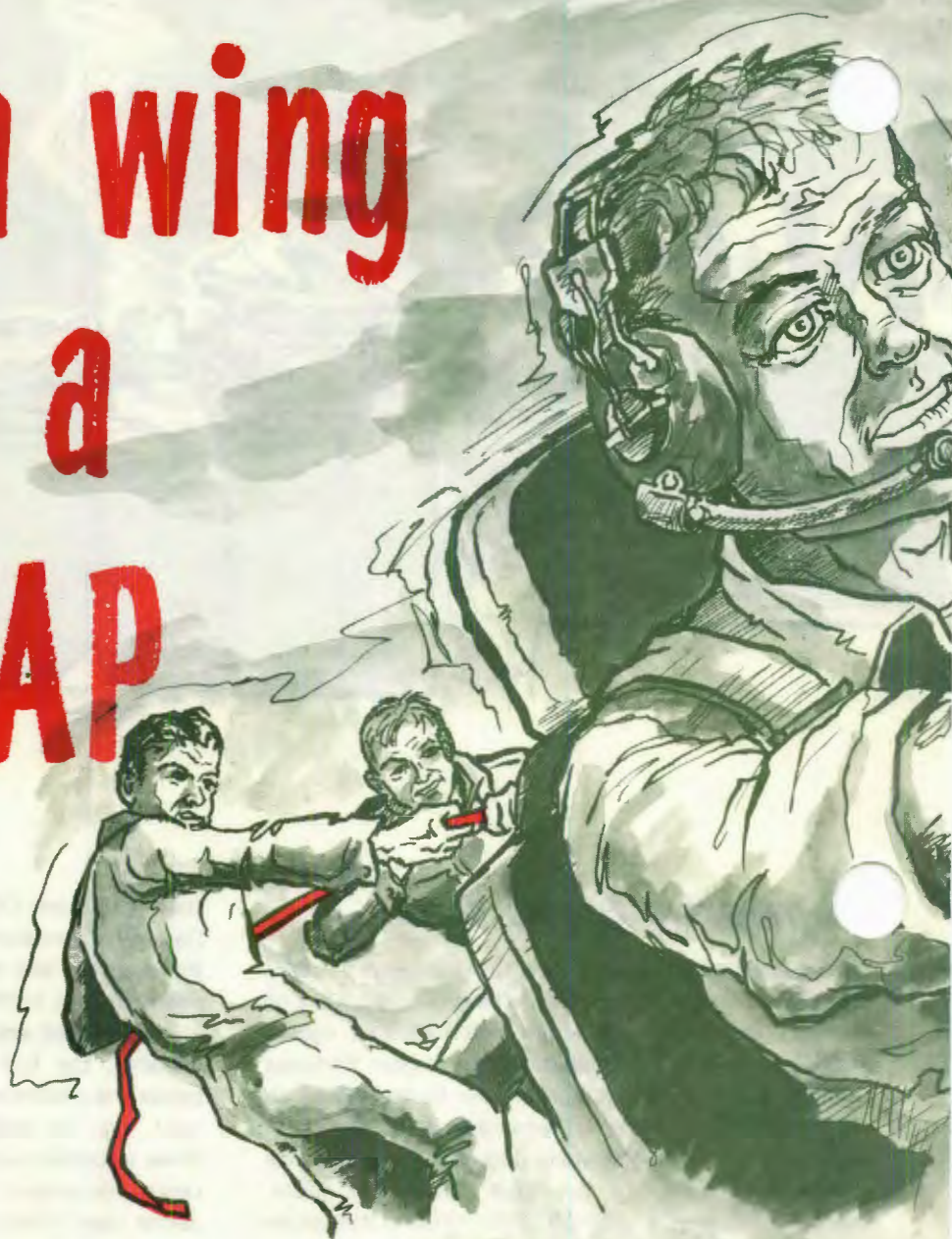
The Dash One procedures for the throttle check on the runway still apply: It's OK to fly it, but don't snap the throttle to idle in flight. You may end up without power! Determining the fact that you have improper rigging while still in the chocks will provide you the opportunity for an early decision (whether to take the machine or get a new one).

In any case, remember — if you find marginal rigging — ***write it up!***

**Maj Burt Miller**



# on a wing and a STRAP



on a wing and a strap

by Maj Tim Brady

Operation Jingle Bells, that's what they called it. It was fourteen years ago this month that a brace of stateside C-130s was deployed to the Far East to bring back many of the fighter types and their support people who had been bugged out earlier in the year on a contingency gaggle. The whole deal was to get the troops back home in time for Christmas; Operation Jingle Bells was a good name for it.

The Herkys were new then, relatively speaking, and didn't have some of the refinements we have today. Like the trim. The birds of today have mechanical stops in the elevator trim system which limit the tab movement to





degrees nose up and eight degrees nose down. Back then the limits were set at 25 degrees nose down and 27 degrees nose up.

But back to Operation Jingle Bells. Crews were returning from points West to various locations in the states dropping off people and equipment in time for the Christmas festivities. One crew was steaming in towards Walnut Ridge, Arkansas, bound for Langley Air Patch with a load of 23 passengers and nine thousand pounds of assorted cargo. Passing Walnut Ridge the crew was advised that all the weather in the world had descended upon Langley and that the command post had recommended an RON at Little Rock AFB. Clearance was received and the craft commander turned the Herky South for Little

Rock then gave it to the copilot. While the AC was perusing the letdown chart, the C-130 suddenly nosed down. The copilot pulled on the yoke while clicking in shots of nose up trim. No good; the normal trim system didn't work. Following emergency procedures, the copilot switched to the emergency trim system which worked as advertised, and enabled him to bring the airplane under control and back to straight and level flight.

With the immediate problem solved, the crew discussed the situation, kicking around the severity of the emergency and the options available. Since the emergency trim system was working OK, the pilot decided to continue to Little Rock, now less than 100 miles down the road.

Over Little Rock, the pilot eased the 130 into high



## on a wing and a strap

station at 20,000, pulled the power to flight idle, dropped the nose, and applied a couple of jabs of nose down trim with the pedestal mounted switch. The airspeed began to build heading for the penetration speed of 250 knots. At 240 knots, the pilot eased back on the yoke to stabilize the speed at 250, but the yoke didn't ease; it wouldn't budge! He gave the yoke more grunt and worked the pedestal mounted trim switch. Nothing. The trim tab had runaway to full nose down and no amount of moving the switch would make it respond! The pilot called for help from the copilot and both of them fought the now screaming Herky. Both pilots put their feet on the foot rests at the base of the instrument panels and pulled like hell, operating on the fringes of a pair of hernias. This effect broke the dive somewhat but not completely. The C-130 was still racing earthbound out of control. The pilot then yelled over the interphone for the loadmaster to bring a cargo tie-down strap to the flight deck.

The loadmaster dug around in the cargo compartment amid twenty-three wide-eyed passengers and came up with a strap, then struggled to the flight deck. The pilot told the flight engineer to tie the strap to the copilot's control column. This done, the engineer and loadmaster grabbed the strap and pulled. With all four of the crewmembers pulling on the controls, enough force was applied to reduce the dive considerably, but still not enough to break it. The pilot then told the loadmaster to shift the passengers as far aft as possible and to move some cargo rearward. The loadmaster, with the passenger's help, moved baggage, toolboxes, and everything else that could be moved, back to the base of the aft cargo ramp. Then he instructed the passengers to crawl up on the aft cargo ramp and door which slants upward from the base of the cargo compartment floor at an angle of about 45 degrees. The passengers held on to stanchions, braces, and overhead racks, peering out of the gloom with emotions which must have bordered on "Hail Mary." The loadmaster then returned to the flight deck to resume his additional duty as strap copilot.

Moving cargo and people aft had shifted the center of gravity rearward and now it was possible for the four of them to break the 300-500 fpm descent and level the aircraft. As the airspeed decreased, the pilot found that with all four crewmembers pulling on the yoke, more than sufficient muscle power was available to overcome the aerodynamic forces imposed by the insane trim tab. The

altitude was now 5000 feet.

Meanwhile the pilot had declared an emergency with the controlling agency, and had received a clearance to do just about anything. The aircraft was under control, such as it was, and the immediate problem was solved; but what now? There certainly weren't enough parachutes to get everyone out and the old "you got it, I'm going for help" routine didn't fool anyone.

Again the crew discussed the situation. It was obvious that a landing of a new breed would have to be attempted. At the slower airspeed less bicep power was required to move the elevator so the pilot instructed the loadmaster to move the passengers back to their seats. He then lowered the gear and experimented with flap positions, finding that with 50 percent flaps and all four of the crewmembers pulling on the yoke, the airplane could be controlled. But merely controlling the machine at 5000 feet was one thing; landing it was indeed another matter.

Fuel was no problem so the pilot decided to practice some approaches at altitude. The pilot made several simulated landings by calling for coordinated control inputs from the crew. Through this means the crew was able to develop synchronized movements, and the pilot was satisfied that he had a good chance of getting it on the ground intact.

The pilot set up for a long straight-in approach to Little Rock AFB, and started down the slope. Initially the glide slope looked like a roller coaster as the pilot called for elevator inputs while flying the ailerons, rudder, and power. A couple of miles before touchdown the crew's movements became synchronized and the glide slope smoothed out. The airplane passed over the overrun and the pilot called for more back elevator and gradually reduced power. With the pilot and copilot hanging onto the yoke and the flight engineer and loadmaster pulling on the tie-down strap, the big Herky touched down in an attitude that ground observers called "normal."

Sounds of jubilation erupted from the cargo compartment as the twenty-three passengers clapped, cheered, and stomped the floor . . . glad to be alive.

The crew had done an outstanding . . . no, incredible, job of getting the airplane on the ground safely. The tie-down strap technique never quite made it into Section III of the Dash One, but the elevator trim limits were changed.

Runaway trim can still be a problem in the C-130 but not of the severity that faced the crew on that winter day in 1958. In the finest tradition of TAC airlift, the crew dipped into the well of ingenuity and came up with a procedure that brought Operation Jingle Bells to a successful conclusion.

And, y'know, Christmas took on a special meaning that year.

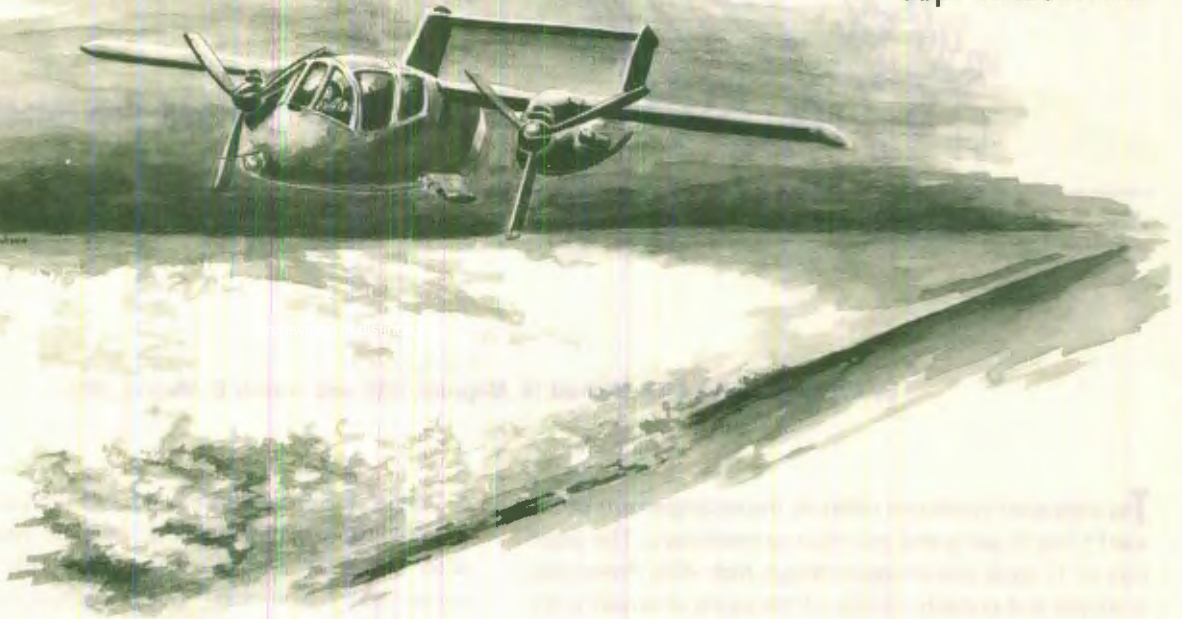


TACTICAL AIR COMMAND

## AIRCREWMAN of DISTINCTION



Capt Armentrout



Captain Gary R. Armentrout, 549 Tactical Air Support Training Squadron, 1 Special Operations Wing, Hurlburt Field, Florida, has been selected as the Tactical Air Command Aircrewman of Distinction for October 1972.

Captain Armentrout was flying as the instructor pilot for a student training night navigation mission in an OV-10A. When the gear was lowered, an unsafe gear indication was observed. Captain Armentrout executed a go-around and recycled the gear in an attempt to obtain a safe gear indication. Emergency extension and positive and negative G maneuvers also failed to lower the gear. Captain Armentrout then elected to land gear up. When attempted to raise the gear, the left main gear would

not retract. Captain Armentrout was able to free the stuck gear for retraction by using a hard left roll with negative Gs. After several practice approaches Captain Armentrout flew his aircraft onto the foamed runway, shutting down both engines prior to touchdown to save the props. Investigation revealed the overcenter bungee had failed and was jammed in the gear linkage. Captain Armentrout's professional evaluation of and reaction to a critical inflight emergency undoubtedly averted a major aircraft accident and possible injury or loss of life. His near perfect gear up landing at night, from the rear cockpit, readily qualifies him as a Tactical Air Command Aircrewman of Distinction.



# the long scarf SYNDROME



a potentially fatal and preventable hazard

by Mutaz B. Habal, MD; Michael M. Megawid, MD; and Joseph E. Murray, MD

**T**he long scarf syndrome refers to the entanglement of the scarf's free floating end into moving machinery. The death rate in 11 cases was an astonishingly high 45%. Prevention is simple and consists merely of removing or covering the scarf when worn near moving machinery.

The long scarf syndrome was described in a letter after we had cared for our first patient with this injury. Since then, we have collected reports of 11 cases that meet our criteria, i.e., the wearing of a long scarf, entanglement of its free end into moving machinery, and a resulting injury ranging from minor to fatal.

**CLINICAL MATERIAL** — Of the 11 patients presented in the Table, nine were females between the ages of 10 and 30. As expected, all accidents occurred in the winter.

Four cases are reviewed in detail to demonstrate various mechanisms of injury.

**CASE 1.** — An 11-year-old boy from Lexington, Mass., suffered total airway obstruction and respiratory arrest after his scarf became entangled in the engine of his snowmobile. The scarf was loosened and his mother revived him by mouth-to-mouth resuscitation. The boy recovered and was seen by his ophthalmologist for retrobulbar hemorrhages with retinal damage. Spontaneous recovery without visual damage occurred.

**CASE 2.** — A young mother in her early 20s from Rochester, Minn., was hauled out of her seat while riding a ski lift when her scarf became wrapped around an oncoming chair. She died of strangulation as she was carried down the chair lift, suspended by the scarf.

**CASE 3.** — A teenager in San Diego, Calif., sustained severe facial lacerations and bruises when her scarf became entangled in the rotating wheel of her boyfriend's stationary motorcycle as she leaned over to inspect the



## COLLECTIVE CASES REPORTED WITH LONG SCARF SYNDROME

| NO. | SEX | AGE   | LOCATION          | INJURY                   | OUTCOME   | SITE       | YEAR |
|-----|-----|-------|-------------------|--------------------------|-----------|------------|------|
| 1   | F   | 11    | Boston            | Minor facial wounds      | Recovered | Ski slope  | 1971 |
| 2   | F   | 10    | Boston            | Minor facial wounds      | Recovered | Ski slope  | 1971 |
| 3   | F   | 12    | Boston            | Facial wounds, fractures | Recovered | Ski slope  | 1971 |
| 4   | F   | 15    | Toronto           | Suffocation              | Died      | Ski slope  | 1971 |
| 5   | F   | 20s   | San Diego, Calif  | Facial Injury            | Recovered | Home       | 1971 |
| 6   | F   | Teens | Alta, Utah        | Suffocation              | Died      | Ski slope  | 1964 |
| 7   | M   | 11    | Lexington, Mass   | Airway obstruction       | Recovered | Snowmobile | 1971 |
| 8   | F   | 12    | Ft Wainwright, Ak | Facial injuries          | Recovered | Ski slope  | 1970 |
| 9   | M   | 11    | Fairbanks, Alaska | Suffocation              | Died      | Snowmobile | 1970 |
| 10  | F   | 20s   | Rochester, Minn   | Suffocation              | Died      | Ski slope  | 1965 |
| 11  | F   | 18    | Maine             | Suffocation              | Died      | Snowmobile | 1971 |

running machinery. Fortunately there was no airway obstruction, but treatment for facial injuries was required.

CASE 4. — A 10-year-old girl from Fort Wainwright, Alaska, was knocked to the ground and dragged under a safety gate that failed to operate when her scarf became entangled in the rope tow at a ski slope. She passed through the gate and was dragged by her scarf into the moving machinery. She suffered only facial lacerations and bruises requiring surgical treatment.

### COMMENT

The most striking feature of these accidents has been the very high 45% death rate. Accidents occur when the scarf's free-floating end becomes entangled in any moving machinery. The alertness of the involved person and the operating speed of the machinery correlate with the extent of the injury produced.

The new vogues, fads, and fashions frequently produce unsuspected inherent dangers. Wearing a long scarf exposes the person to such dangers. Life insurance companies warn of hazards from loose scarves. The long flowing scarf recalls the strangulation death of Isadora Duncan when her long scarf caught in the wheel of her boyfriend's speedy car.

All these injuries and deaths could have been prevented by simple common sense measures. Ten of the accidents occurred in connection with winter sports, so the removal of long scarves should be included in the safety regulations at ski slopes.



Courtesy of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Vol. 221, No. 11, pp 1269, 1270. Copyright 1972, American Medical Association.



# WEAPONS WORDS

## PERSONNEL AND EXPLOSIVES LIMITS

by **Capt Robert W. Carmichael, Jr.**  
**Chief, Explosives Safety Branch,**  
**Hq TAC**

By now everyone involved with explosives safety, either directly or indirectly, should have heard the old saw about exposing the minimum number of people to the minimum amount of explosives for the minimum amount of time. Strict time limits are not always possible; however, explosives and personnel limits are. The Explosives Safety Manual (AFM 127-100) has some very clear and specific guidelines for establishing personnel and explosives limits. To make sure that prudent and workable limits are provided, let us look at a few of the guidelines used in setting up these limits.

Personnel limits are required to insure that only personnel essential to the operation are in the vicinity of explosives. Essential personnel are workers necessary to complete the task safely, and may include supervisors, inspectors, and safety observers. The limits should be based on the type of explosives involved, type of operation being performed and the size of the work area. Personnel limits are not required and need not be posted for explosives locations involving only Class 1 explosives.

At first glance the "buddy system" may seem to contradict the minimum personnel rule, but a closer look reveals that there is actually no contradiction. The buddy system

insures that personnel are ready to effect timely fire warning and rescue operations when necessary. This justifies the presence of two people when only one may be required to do the job.

Explosives storage facilities are designed and sited to store the maximum quantity of explosives. Accordingly, the explosives limits should be the maximum allowed by the available quantity distance and structure design. However, this same rationale does not apply to explosives operating facilities or other buildings not specifically designed and sited for explosives storage. In this case, the minimum amount of explosives necessary to insure a smooth, efficient, and safe operation should be established as the maximum explosives limit. This is true whether the operation is an egress shop with only limited requirements for Class 1 or 2 explosives or a preload facility

requiring 50,000 pounds Class 7 NEW (Net Explosives Weight).

When essential to the mission, commanders may license locations for Classes 1, 2, and 3 explosives without regard to quantity-distance requirements. Class 2 explosives may not exceed 100 pounds NEW under this criteria and Class 3 may not exceed 50 pounds NEW. Note that these are maximum allowable limits and that smaller limits must be provided when possible. A specific limit must be established for each operation and location.

To be effective, explosives and personnel limits must be posted in the work area and included in any local publications prepared for explosives operations. To insure compliance, explosives limits should indicate the number of units or trays, etc., explosives as well as total NEW allowed.

Commanders, safety personnel, and supervisors at all levels must make sure that personnel and explosives limits are adequate to meet requirements, are properly posted, and are strictly observed. ➤

| TAC    |          |      | WEAPONS MISHAPS |        |          | ANG  |  |  |
|--------|----------|------|-----------------|--------|----------|------|--|--|
| OCT 72 | THRU OCT |      | EXPLOSIVE       | OCT 72 | THRU OCT |      |  |  |
|        | 1972     | 1971 |                 |        | 1972     | 1971 |  |  |
| 25     | 109      | 112  | TOTAL           | 3      | 25       | 22   |  |  |
| 2      | 28       | 51   | Personnel       | 3      | 14       | 15   |  |  |
| 11     | 47       | 45   | Materiel        | 0      | 11       | 7    |  |  |
| 12     | 34       | 16   | Other           | 0      | 0        | 0    |  |  |
| 0      | 11       | 2    | MISSILE         |        |          |      |  |  |
| 0      | 3        | 23   | NUCLEAR         |        |          |      |  |  |



## TACTICAL AIR COMMAND



### Maintenance Man Safety Award

Airman First Class Adrian L. Moen, 313 Field Maintenance Squadron, Forbes Air Force Base, Kansas, has been selected to receive the TAC Maintenance Man Safety Award for October 1972. Airman Moen will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



A1C MOEN

## TACTICAL AIR COMMAND



### Crew Chief Safety Award

Staff Sergeant George B. Patterson, 316 Organizational Maintenance Squadron, Langley Air Force Base, Virginia, has been selected to receive the TAC Crew Chief Safety Award for October 1972. Sergeant Patterson will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



SSGT PATTERSON

## TACTICAL AIR COMMAND



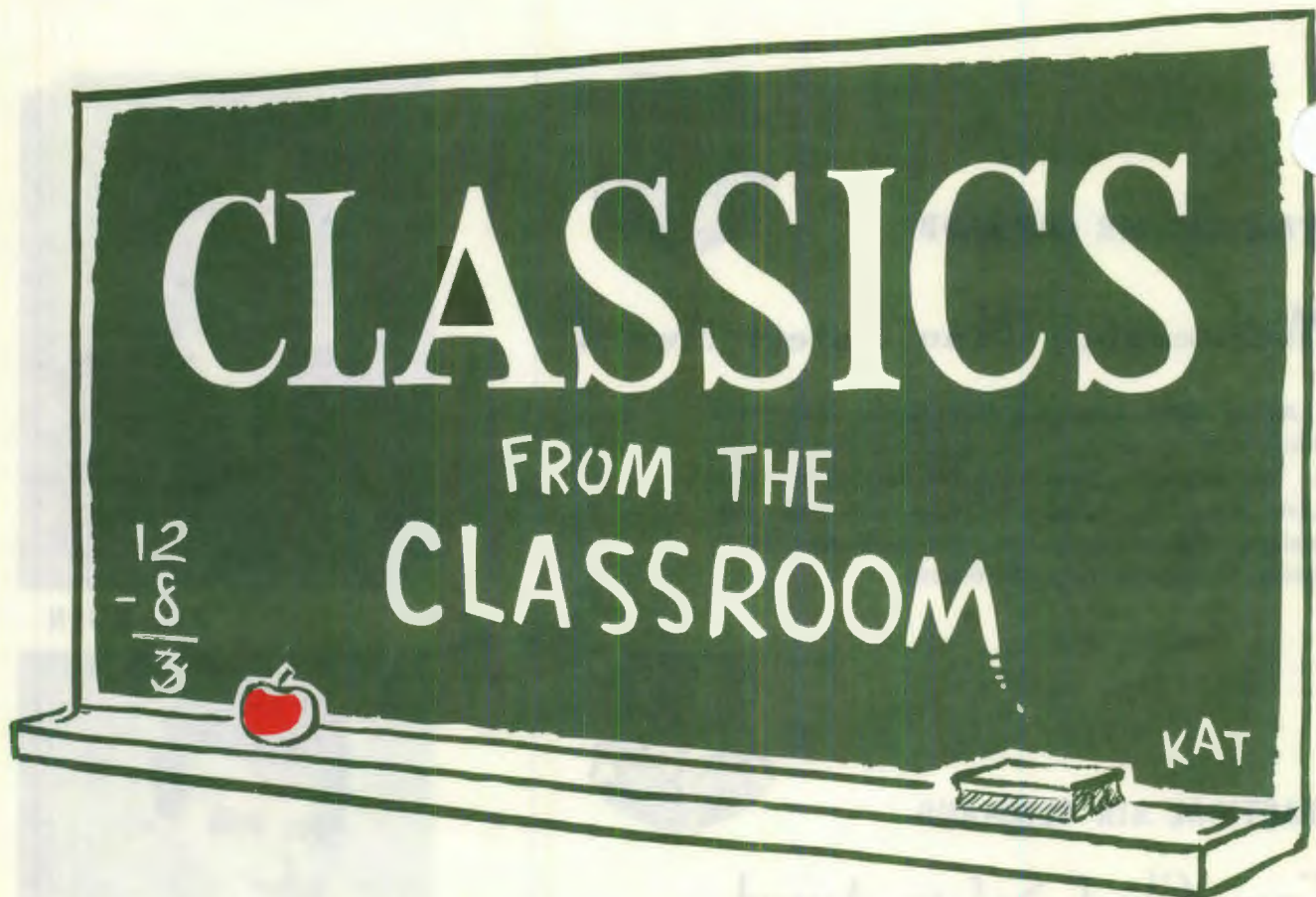
### Ground Safety Man of the Month

First Lieutenant Douglas L. Pulliam, 317 Supply Squadron, Pope Air Force Base, North Carolina, has been selected to receive the TAC Ground Safety Man of the Month Award for October 1972. Lieutenant Pulliam will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



1LT PULLIAM





*From a desk in a corner, a chuckle bounced around the office of TAC ATTACK followed closely by a loud guffaw then uncontrolled laughter. The staff gathered around the assistant editor to administer aid (or restraint, obviously he had flipped his cork). He pointed to an article in the June 1967 issue of TAC ATTACK and between great gasping giggles said, "Hey, that's great; let's run it again." So here it is. The article originally appeared in BOEING MAGAZINE who generously granted a reprint. ED.*

**by Mr. Harold Dunn**

**D**id you know that the first lady aviator was Kitty Hawk? That Roger Wilco invented the "language of communication?" Or that one of the chief by-products of the aviation industry is going places?

This information has been gleaned from test papers and essays during the 11 years that I've taught elementary school youngsters.

Kitty Hawk and Roger Wilco may have their admirers but Baron von Richthofen, the German ace of World War I, has also come in for his share of adulation. A 10-year-old girl summed up her feelings like this: "In a uniform or not, Baron von Richthofen was a dashing figure."

If history repeats itself, it usually does it with some

unexpected twists when grade-school pupils tell the story:

"Spinning jennies were flying jennies that did not work."

"People talked about flying in balloons for centuries. Finally there was enough hot air to get them off the ground."

QUESTION: On his first flight, how long was Wilbur Wright in the air?

ANSWER: I'm not sure. Five feet something with his shoes on.

One of the fringe benefits of being an elementary school teacher is the possibility that the next paper I correct will contain a wrong answer that is twice as witty and delightful as the right one. When members of the grade school set turn their attention to men notable in aeronautics, youngsterisms seem to come as thick as chalkdust. Three examples:





Roger Wilco invented the "language of communication."

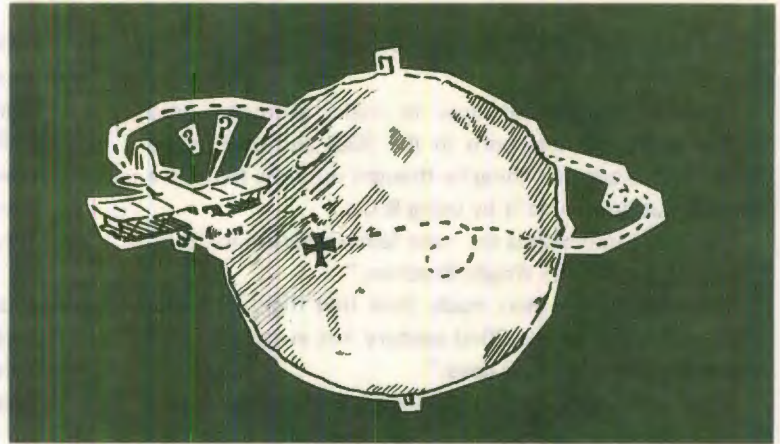


In a uniform or not, Baron von Richthofen was a dashing figure.



When they asked him if he would like to fly to Paris, he rolled his eyes and flashed his teeth and said, "Sure."

TAC ATTACK



Back in 1924, eight men tried to fly around the world but they only ended up where they started.



Some people can tell what time it is by looking at the sun but I have never been able to make out the numbers.



I know what a sextant is but I had rather not say.



## CLASSICS FROM THE CLASSROOM

"Euclid thought out how to make geometry help people to fly. He was born in the 300s and died in the 200s. That is another thing he thought out how to do. He thought out how to do it by using B.C.s."

"Charles Lindbergh is the most famous person in flying history and so are the Wright Brothers."

"The Wright Brothers made their first flight in 1903. 1903 was really in the 20th century but everybody was behind the times in those days."

The elementary school youngster's mind is a vast storehouse of information... half true, half false and wholly delightful. Sometimes he isn't wrong at all. It's just the way he puts it:

"During the Twenties, people started walking on airplane wings and things like that. I know it is crazy but this was before television or anything so what else was there to do?"

"Back in 1924, eight men tried to fly around the world but they only ended up where they started."

"Floyd Bennett comes from the year 1926. He is a famous aviator few people have ever heard of."

Ever hear of the word "pecally?" I hadn't until I came across this in a paper: "When I first started studying about airplanes, pecally things began to happen. First I was heightened by their vast hugeness. By and by I put on my thinker and thought how important they really are. I then heaved a sigh at how it would be fun visiting at where they are made."

Much of the juvenalia that I've collected through the years has been devoted to comments about Charles Lindbergh's historic first solo flight over the Atlantic. Here are three of my favorites:

"Charles Lindbergh was the first to fly to Paris. He did it by the airplane method."

"When they asked him if he would like to fly to Paris, he rolled his eyes and flashed his teeth and said 'Sure'."

"A straight line is the shortest distance between two points unless you are going with Lindbergh to Paris. Things are different there."

In commenting on the duties of the navigator, a girl who claimed she was one of aviation's "starchest supports" wrote: "The navigator figures out the latitude and longitude. Latitude tells him where he is and longitude tells him how long he can stay there."

Her best friend once concluded: "The three main crewmen on a plane are the pilot, navigator and percolator."

If any of these definitions have caused Webster to turn over in his grave, he would have to do it with a smile. Here's what I mean:

"Drone is a spare name for when people cannot how to say pilotless airplane."

"When anybody says plane, what he is saying depends on whether he is saying it to a pilot or a carpenter."

"I know what a sextant is but I had rather not say."

"A visa is a passport permitting an airplane to leave the country. For round trips you need a visa versa."

One chap absorbed the information regarding the many uses for airplanes in our modern world, but his skepticism showed: "How many uses they have for airplanes these days is more for saying than believing."

Three years later his younger sister wrote: "The number of aircraft in the world today is an absurdly large fact of a number."

Ramjets have certainly come in for their share of comments recently. The remarks have proved to be unexpected, unconventional and undeniably true:

"Until it is decided whether ramjets are rockets or jets, we must continue to call them ramjets."

"The way ramjets work, as I understand it, is not very well understood."

"In ramjets the air rushes out when the fuel is ignited. So would anybody."

A couple of years ago there was a tiny moppet in my class who had a delightful way of expressing her thoughts. Here's how she summed up her feelings: "F now on I will put both gladness and wonder in my thought about airplanes."

More than one eager young scholar has started out with a discussion of air travel and ended up in outer space. The following astronomical observations are fresh from the minds of four fourth graders:

"The North Star is, as a mattery fact, almost straight north. This is quite a coincidents."

"Our Mother Earth has small poles and a large equator because of the tremendous speed as she hurdles through the space. Since we are along for the ride, we too tend to be flat at our poles and round at our equators."

"Some people can tell what time it is by looking at the sun but I have never been able to make out the numbers."

"Through the years people have guessed that Venus might be inhabited by women, dragons, or other strange creatures."

No one looks to the future as eagerly as youngsters do. Last year I received these two predictions about future air travel:

"Thanks to what we are learning from aviation, we should soon be able to look forward to having ceilings made out of fog."

"So far planes have only been able to fly in circles of no more than 360 degrees. This could be the next big breakthrough in air travel."



# TAC ATTACK INDEX

ABBREVIATIONS: TT - TAC Tip  
CT - Check Talk SC - SPO Corner  
BC - Back Cover WW - Weapons Words

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| CT - CONTROL THE DIET                           | FEB | 8  |
| CT - STUCK STICK                                | FEB | 9  |
| SC - F-4/RF-4 SPECIAL INCIDENT REPORTING        | MAR | 13 |
| SC - WARNINGS, CAUTIONS, AND NOTES              | APR | 26 |
| SC - VRSP - IT'S LOOKING BETTER?                | MAY | 25 |
| CT - FLIGHT CONTROL FRIGHT                      | JUN | 10 |
| CT - PLUGS AND BUGS                             | JUN | 11 |
| DELAY EN ROUTE                                  | JUN | 16 |
| TT - ZAPPED                                     | JUN | 20 |
| SC - UNNECESSARY FOD                            | JUN | 22 |
| F-4 ENGINE FAILURE ON TAKEOFF                   | JUL | 4  |
| SC - STABILATOR "DROOP"                         | JUL | 8  |
| CT - THE MESSAGE IS OBVIOUS                     | JUL | 14 |
| CT - BLOWOUT                                    | AUG | 14 |
| SC - WHAT'S THE "SHEAVE"?                       | OCT | 24 |
| CT - AGAIN AND AGAIN AND AGAIN                  | OCT | 24 |
| SC - NO COMMENT                                 | OCT | 27 |
| TT - STICK GO LIGHTLY                           | NOV | 9  |
| SC - RF/F-4 UTILITY LIGHT                       | NOV | 13 |
| SC - F-4 BLOWN TIRES                            | NOV | 13 |
| CT - STIFF STICK TORQUES PILOT                  | NOV | 22 |
| CT - CROSS WIRED PHANTOM                        | NOV | 22 |
| STICK FORCE LIGHTENING                          | DEC | 4  |
| CT - GET YOUR TEETH INTO IT                     | DEC | 6  |
| SC - F-4 THROTTLE RIGGING CHECK                 | DEC | 14 |
| <b>F-100</b>                                    |     |    |
| CT - F-100 LOOK OUT BELOW!                      | JAN | 13 |
| SC - F-100, OLD PROBLEM, NEW PEOPLE             | MAR | 13 |
| TT - GREEN APPLES                               | APR | 8  |
| SC - GOLDEN BBS                                 | APR | 27 |
| CT - I DON'T BELIEVE IT!                        | MAY | 23 |
| SC - LUCKY!                                     | MAY | 27 |
| CT - THEY DO NOW                                | JUN | 10 |
| CT - UNWANTED INITIATION                        | JUN | 10 |
| TT - OH HELLO                                   | JUN | 21 |
| SC - ATTILA THE HUN TRAMPLES THE TULIPS         | JUN | 22 |
| SC - F-100 DRY OUT                              | JUN | 23 |
| TT - HURT HUNS                                  | JUL | 21 |
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| SC - WATCH THAT CHUTE!                          | OCT | 27 |
| SC - BOLT LOGS 625 ACCIDENT FREE HOURS          | DEC | 14 |
| <b>F-101</b>                                    |     |    |
| THE ASSUMPTION TRAP                             | MAR | 4  |
| CT - A BLEEDER                                  | MAR | 22 |
| CT - THE RUB                                    | JUN | 10 |
| TT - MINIMUMS                                   | DEC | 12 |
| <b>F-103</b>                                    |     |    |
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| <b>F-104</b>                                    |     |    |
| AIRCRAWMAN OF DISTINCTION                       | JAN | 7  |
| CT - ERROR AND EXPEDIENCY                       | DEC | 6  |
| <b>F-105</b>                                    |     |    |
| CT - WANDERING WIRE                             | FEB | 9  |
| TT - SNARLED THROTTLE                           | FEB | 20 |
| AIRCRAWMAN OF DISTINCTION                       | FEB | 28 |
| SC - A WORD TO THE WISE?                        | MAR | 12 |
| SLUF                                            | MAR | 15 |
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| CT - SCORE: CHECKLIST 1 - THUD O                | NOV | 23 |
| <b>F-107</b>                                    |     |    |
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| <b>F-108</b>                                    |     |    |
| THE LOST CENTURYS                               | NOV | 16 |
| <b>F-111</b>                                    |     |    |
| TT - F-111 SPLIT FLAP                           | FEB | 21 |
| CT - F-111 NOSEWHEELS                           | MAY | 22 |
| CT - FOD - IT'S IN THE BAG NOW                  | MAY | 23 |
| AIRCRAWMAN OF DISTINCTION                       | MAY | 24 |
| CT - HOURS AND HOURS OF BOREDOM FOLLOWED BY ... | JUN | 11 |
| SC - AARDVARK VS H <sub>2</sub> O               | JUL | 10 |
| TT - MINIMUMS                                   | DEC | 12 |
| <b>O-2</b>                                      |     |    |
| TT - PROP SLOP                                  | JAN | 8  |
| CT - CABLE FABLE                                | JAN | 12 |
| CT - SHORT STORY                                | JAN | 13 |
| TT - THE RULES                                  | AUG | 21 |
| CT - WOE IS ME!                                 | OCT | 24 |
| <b>OV-10</b>                                    |     |    |
| CT - A LEMON?                                   | JAN | 13 |
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| AIRCRAWMAN OF DISTINCTION                       | DEC | 19 |
| <b>QU-22</b>                                    |     |    |
| TT - A QU WHO?                                  | JAN | 9  |
| AIRCRAWMAN OF DISTINCTION                       | JUN | 27 |
| <b>T-29</b>                                     |     |    |
| COULD IT HAPPEN TO YOU?                         | JUN | 8  |
| <b>T-33</b>                                     |     |    |
| CT - TOOL INVENTORY COMPLETE?                   | JAN | 13 |
| CT - MURPHY AND GREMLIN JOIN FORCES             | MAR | 22 |



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| CT - OUT O' SPACERS?                           | JUL   | 15   |
| SC - T-33 STARTER CUTOFF                       | OCT   | 27   |
| <b>T-37</b>                                    |       |      |
| CT - ONE SMALL STEP                            | OCT   | 24   |
| <b>T-38</b>                                    |       |      |
| TT - DECISION                                  | JUL   | 21   |
| <b>T-39</b>                                    |       |      |
| IT WAS A DARK AND ...                          | APR   | 14   |
| CT - IT HAPPENS ALL THE TIME                   | APR   | 22   |
| CT - OUT O' SPACERS?                           | JUL   | 15   |
| <b>U-3</b>                                     |       |      |
| CT - PROPS STILL BITE                          | APR   | 22   |
| <b>HELICOPTERS</b>                             |       |      |
| TT - WHAP-WHAP-BLAP!!                          | MAR   | 9    |
| AIRCREW ACHIEVEMENT AWARD                      | JUL   | 7    |
| AIRCREW MEN OF DISTINCTION                     | OCT   | 21   |
| TT - FIT TO BE TIED                            | NOV   | 8    |
| <b>ABORT</b>                                   |       |      |
| SC - RF/F-4 UTILITY LIGHT                      | NOV   | 13   |
| <b>ACCIDENT RATES</b>                          |       |      |
| THE SECOND LEVEL RISK                          | JUL   | 3    |
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| <b>AERO CLUB</b>                               |       |      |
| TT - AERO CLUB NOTE                            | FEB   | 20   |
| SC - AERO CLUB ANTICS                          | AUG   | 26   |
| SC - AERO CLUB X-WIND LANDING TECHNIQUES       | OCT   | 26   |
| <b>AIR TRAFFIC CONTROL</b>                     |       |      |
| KEEP TUNED IN                                  | FEB   | 22   |
| TT - EWAS                                      | APR   | 8    |
| STAGE II WHAT IS IT?                           | MAY   | 8    |
| TT - EWAS DELAYED                              | MAY   | 11   |
| HEY TOWER, HAVEN'T YOU GOT MY CLEARANCE YET?   | MAY   | 12   |
| CALL SIGNS                                     | JUN   | 4    |
| TT - NEAR HITS                                 | JUL   | 21   |
| HE LEARNED HIS LESSON                          | OCT   | 14   |
| AIR TRAFFIC CONTROL                            | NOV   | 24   |
| <b>ANGLE OF ATTACK (EDITORIAL)</b>             |       |      |
| THE ROUTINE                                    | JAN   | 3    |
| MORE THAN JUST NUMBERS                         | FEB   | 3    |
| THE ROBIN HOOD APPROACH                        | MAR   | 3    |
| A STOPGAP MEASURE                              | APR   | 3    |
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| LET'S PUT IT TOGETHER                          | JUN   | 3    |
| THE SECOND LEVEL RISK                          | JUL   | 3    |
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| COULD YOU HAVE PREVENTED THAT ACCIDENT?        | OCT   | 3    |
| EXTRA EFFORT                                   | OCT   | 3    |
| DISCIPLINE                                     | DEC   | 3    |
| <b>AUTOMOBILE SAFETY</b>                       |       |      |
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| THE TREE                                       | JUN   | 7    |
| HE WAS A GOOD WORKER                           | JUN   | 28   |
| TT - WHEN THE DUST SETTLED                     | AUG   | 20   |
| CT - TAIL TO TAIL                              | OCT   | 25   |
| REVENGE AT VIRGILVANIA                         | NOV   | 4    |
| <b>BARRIERS AND ARRESTING GEAR</b>             |       |      |
| SC - F-100, OLD PROBLEM, NEW PEOPLE            | MAR   | 13   |
| IT WAS A DARK AND ...                          | APR   | 12   |
| SC - WHAT'S THE "SHEAVE"?                      | AUG   | 27   |
| <b>BIRDSTRIKE</b>                              |       |      |
| BIRDSTRIKE UPDATE                              | FEB   | 16   |
| <b>BRAKE SYSTEM</b>                            |       |      |
| TT - BRAKES                                    | AUG   | 21   |
| <b>COMMAND AND SUPERVISION</b>                 |       |      |
| LET'S PUT IT TOGETHER                          | JUN   | 3    |
| HE WAS A GOOD WORKER                           | JUN   | 28   |
| IT'S A FACT - NOT A PROMISE                    | AUG   | 3    |
| <b>COMMUNICATIONS</b>                          |       |      |
| SQUAWK EMERGENCY                               | JAN   | 8    |
| KEEP TUNED IN                                  | FEB   | 22   |
| A STOPGAP MEASURE                              | APR   | 3    |
| CT - IT HAPPENS ALL THE TIME                   | APR   | 22   |
| SC - WARNINGS, CAUTIONS AND NOTES              | APR   | 26   |
| WW - THINGS THAT GO "BOOM"                     | MAY   | 10   |
| TT - THAT'S ROG                                | MAY   | 10   |
| "HEY TOWER, HAVEN'T YOU GOT MY CLEARANCE YET?" | MAY   | 12   |
| CALL SIGNS                                     | JUN   | 4    |
| SC - HUMM-CLICK-@*!X# - CLICK                  | AUG   | 26   |
| <b>EJECTION AND EGRESS</b>                     |       |      |
| SC - A WORD TO THE WISE?                       | MAR   | 12   |
| SC - A-7D, AND THEN IT'S GONE                  | MAR   | 13   |
| DID HE GET OUT?                                | APR   | 16   |
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| TT - GET YOUR FOOT INTO IT                     | JUL   | 20   |
| WW - A BETTER CHANCE THAN THE BIRDS            | AUG   | 24   |
| SC - NO COMMENT                                | OCT   | 27   |
| CT - PIN CHECK                                 | DEC   | 6    |

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| TT - A QU WHO?                              | JAN   |      |
| SC - A-7, THE POWER PLANT                   | JAN   | 2    |
| <b>FIRES</b>                                |       |      |
| FIRE IN FLIGHT                              | OCT   | 4    |
| <b>FLEAGLE</b>                              |       |      |
| FLEAGLE - LANDING                           | JAN   | BC   |
| FLEAGLE - EJECTION                          | FEB   | BC   |
| FLEAGLE - BIRDSTRIKE                        | MAR   | BC   |
| FLEAGLE - CREW REST                         | APR   | BC   |
| FLEAGLE - THUNDERSTORM                      | MAY   | BC   |
| FLEAGLE - EJECTION                          | JUN   | BC   |
| FLEAGLE - LANDING                           | JUL   | BC   |
| FLEAGLE - FOD                               | AUG   | BC   |
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| FLEAGLE - TRAINING                          | OCT   | BC   |
| FLEAGLE - GROUND SAFETY                     | NOV   | BC   |
| FLEAGLE - GROUND SAFETY                     | DEC   | BC   |
| <b>FLIGHT CONTROLS</b>                      |       |      |
| TT - PROP SLOP                              | JAN   | 8    |
| THE C-130 FIN STALL PHENOMENON              | APR   | 4    |
| ROTATING CYLINDER FLAP                      | APR   | 28   |
| TT - G WHIZ-LEAD!                           | MAY   | 11   |
| COULD IT HAPPEN TO YOU?                     | JUN   | 8    |
| SC - STABILATOR "DROOP"                     | JUL   | 8    |
| TT - STICK GO LIGHTLY                       | NOV   | 9    |
| STICK FORCE LIGHTENING                      | DEC   | 4    |
| <b>FLIGHT SAFETY</b>                        |       |      |
| RIDE 'EM COWBOY!                            | JAN   | 20   |
| MORE THAN JUST NUMBERS                      | FEB   | 3    |
| TT - THE RULES                              | AUG   | 21   |
| COULD YOU HAVE PREVENTED THAT ACCIDENT?     | OCT   | 3    |
| SC - WATCH THAT CHUTE!                      | OCT   | 27   |
| <b>FOD</b>                                  |       |      |
| TT - CLIPBOARDS                             | JAN   | 9    |
| CT - TOOL INVENTORY COMPLETE?               | JAN   | 13   |
| SC - SAFETY FOD                             | JAN   | 27   |
| CT - DOUBLE TROUBLE                         | FEB   | 8    |
| CT - CONTROL THE DIET                       | FEB   | 8    |
| CT - COLOR IT FOD                           | FEB   | 9    |
| CT - TRY IT - YOU'LL LIKE IT!!              | APR   | 23   |
| CT - FOD - IT'S IN THE BAG NOW              | MAY   | 23   |
| CT - FLIGHT CONTROL FRIGHT                  | JUN   | 10   |
| CT - PLUGS AND BUGS                         | JUN   | 11   |
| SC - UNNECESSARY FOD                        | JUN   | 2    |
| CT - THE MESSAGE IS OBVIOUS                 | JUL   | 14   |
| CT - THUD SHORTSTOP                         | JUL   | 14   |
| SC - FOD - THE THIEF WHO RARELY GETS CAUGHT | NOV   | 12   |
| SC - HOW MUCH DOES A TEN CENT NUT COST?     | NOV   | 14   |
| CT - SCORE: CHECKLIST 1-THUD 0              | NOV   | 23   |
| CT - GET YOUR TEETH INTO IT                 | DEC   | 6    |
| SC - BOLT LOGS 626 ACCIDENT FREE HOURS      | DEC   | 14   |
| <b>FUEL AND FUEL SYSTEMS</b>                |       |      |
| DELAY EN ROUTE                              | JUN   | 16   |
| TT - OH HELL!                               | JUN   | 21   |
| TT - GOT GAS?                               | OCT   | 12   |
| CT - ERROR AND EXPEDIENCY                   | DEC   | 6    |
| <b>GENERAL</b>                              |       |      |
| SOOPER SNOOPER                              | JAN   | 4    |
| TT - "CLASSIC QUOTE"                        | JAN   | 9    |
| TT - PAPER TIGER                            | JAN   | 9    |
| WELCOME TO THE OFFICE OF BLUE FOUR          | JAN   | 10   |
| DID YOU HEAR THE ONE ABOUT                  | JAN   | 14   |
| RIDE 'EM COWBOY!                            | JAN   | 20   |
| SC - THE SPO                                | FEB   | 11   |
| TT - THROUGH RAIN, SLEET, SNOW, ICE ...     | FEB   | 21   |
| TT - ATTENTION THUNDERBIRD ASPIRANTS        | FEB   | 21   |
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| THE ROBIN HOOD APPROACH                     | MAR   | 15   |
| SLUF                                        | MAR   | 15   |
| BIO WHAT?                                   | MAR   | 16   |
| THE CHANGING FACE OF TAC                    | MAR   | 24   |
| TT - DO SOMETHING!                          | APR   | 9    |
| FOTO FOLLY                                  | APR   | 10   |
| THE TREE                                    | JUN   | 7    |
| TT - EXCEDRIN HEADACHE #130                 | JUN   | 21   |
| FROM BOTTLE TO THROTTLE                     | JUL   | 12   |
| THE A-X                                     | JUL   | 16   |
| TT - SAFETY AWARDS                          | JUL   | 21   |
| TAC/ANG/AFRES ADVISORY SAFETY COUNCIL       | JUL   | 27   |
| ANOTHER TEN COMMANDMENTS                    | AUG   | 4    |
| FAREWELL TO A GALLANT LADY                  | AUG   | 8    |
| THE "CAN DO" ATTITUDE                       | AUG   | 12   |
| CT - ROCK AND ROLL                          | AUG   | 25   |
| EPILOGUE OF A FLIGHT SAFETY OFFICER         | AUG   | 25   |
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| HOW WE MADE THE FIRST FLIGHT                | SEP   | 4    |
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| IS THE WANKEL THE AUTO ENGINE OF THE FUTURE | OCT   | 8    | TT - SNARLED THROTTLE                          | FEB   | 20   |
| *HIG ACE                                    | OCT   | 13   | CT - HOURS AND HOURS OF BOREDOM FOLLOWED BY... | JUN   | 11   |
| - A PHILOSOPHY                              | OCT   | 26   |                                                |       |      |
| VENGE AT VIRGILVANIA                        | NOV   | 4    | <b>MIDAIRS</b>                                 |       |      |
| - KITS                                      | NOV   | 8    | COLLISION AVOIDANCE                            | MAR   | 20   |
| THE LOST CENTURYS                           | NOV   | 16   | SC - LUCKY!                                    | MAY   | 27   |
| THE AIRLIFT INSTRUCTOR SCHOOL               | NOV   | 27   |                                                |       |      |
| TT - ATTENTION SAFETY OFFICERS              | DEC   | 12   | <b>MISSILE AND EXPLOSIVES SAFETY</b>           |       |      |
| TT - KUDOS                                  | DEC   | 12   | WW - THE GOOD AND BAD OF IT!                   | FEB   | 14   |
| THE LONG SCARF SYNDROME                     | DEC   | 20   | WW - HAVE YOU HEARD?                           | JUN   | 26   |
| CLASSICS FROM THE CLASSROOM                 | DEC   | 24   | WW - NONNUCLEAR MUNITIONS SAFETY GROUP         | OCT   | 29   |
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|                                             |       |      | CT - HE TOOK IT IN THE NECK                    | NOV   | 22   |
|                                             |       |      | WW - PERSONNEL AND EXPLOSIVES LIMITS           | DEC   | 22   |
| <b>GROUND SAFETY</b>                        |       |      |                                                |       |      |
| DID YOU HEAR THE ONE ABOUT -                | JAN   | 14   | <b>NAVIGATION</b>                              |       |      |
| DAYDREAM TO DISASTER                        | JAN   | 22   | NAVIGATOR EXPLAINS TOTAL INVOLVEMENT           | FEB   | 23   |
| CT - INCREDIBLE                             | JUL   | 15   | THE HIGHLY PROPORTIONAL HSI                    | JUL   | 24   |
| SMART CYCLING                               | AUG   | 28   |                                                |       |      |
| THE LONG SCARF SYNDROME                     | DEC   | 20   | <b>OPERATIONS</b>                              |       |      |
| <b>GUNNERY</b>                              |       |      | TT - DON'T FORGET TO FLY THE AIRPLANE          | JAN   | 8    |
| SC - GOLDEN BBS                             | APR   | 27   | THE PROFESSIONALS                              | JAN   | 16   |
|                                             |       |      | TT - F-111 SPLIT FLAP                          | FEB   | 21   |
| <b>HYDRAULIC SYSTEMS</b>                    |       |      | COULD IT HAPPEN TO YOU?                        | JUN   | 8    |
| A-7D HYDRAULIC FAILURES DEFERRED EMERGENCY? | AUG   | 16   | THE HEAVYWEIGHT CHAMP                          | OCT   | 16   |
| A-7D: WHY ISO?                              | NOV   | 10   |                                                |       |      |
| <b>HYDROPLANING</b>                         |       |      | <b>PERSONAL EQUIPMENT</b>                      |       |      |
| ANOTHER LOOK AT HYDROPLANING                | FEB   | 12   | TT - GET YOUR FOOT INTO IT                     | JUL   | 20   |
| IT WAS A DARK AND...                        | APR   | 12   |                                                |       |      |
| HYDROPLANING, ET AL                         | MAY   | 20   | <b>POWER PLANT</b>                             |       |      |
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| <b>INSTRUMENTS</b>                          |       |      |                                                |       |      |
| TT - WHAP-WHAP-BLAP!!                       | MAR   | 9    | <b>PREFLIGHT</b>                               |       |      |
| COLLISION AVOIDANCE                         | MAR   | 20   | TT - FIT TO BE TIED                            | NOV   | 8    |
| SC - VRSP - IT'S LOOKING BETTER             | MAY   | 25   |                                                |       |      |
| PMDS HAS ARRIVED                            | JUN   | 24   | <b>PROFESSIONALISM</b>                         |       |      |
| SC - F-100 DRY OUT                          | JUN   | 23   | THE ROUTINE                                    | JAN   | 3    |
| TALAR, WHAT IS IT?                          | JUL   | 28   | THE PROFESSIONALS                              | JAN   | 16   |
| SC - STARTER CUTOUT                         | OCT   | 27   | THE CAUTION LIGHT                              | MAY   | 3    |
| SC - F-4 THROTTLE RIGGING CHECK             | DEC   | 14   | CONFIDENCE                                     | DEC   | 10   |
|                                             |       |      |                                                |       |      |
| <b>INVESTIGATIONS AND REPORTING</b>         |       |      | <b>PROPELLERS</b>                              |       |      |
| SC - F-4/RF-4 - SPECIAL INCIDENT REPORTING  | MAR   | 13   | TT - IT ALMOST HAPPENED                        | JUN   | 21   |
| EXTRA EFFORT                                | NOV   | 3    | TT - UNSCREWED                                 | AUG   | 20   |
| TT - IT TAKES ALL KINDS                     | DEC   | 12   | CT - WOE IS ME!                                | OCT   | 24   |
|                                             |       |      | CT - SMOLDERING PROP                           | NOV   | 22   |
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| THE ASSUMPTION TRAP                         | MAR   | 4    | <b>REFUELING</b>                               |       |      |
| TT - WHAP-WHAP-BLAP!!                       | MAR   | 9    | SC - A MATTER OF COMMUNICATION                 | JUL   | 9    |
| - WHOOPS!!                                  | MAR   | 9    |                                                |       |      |
| - DECISION                                  | JUL   | 20   | <b>SEAT BELTS</b>                              |       |      |
| TALAR, WHAT IS IT?                          | JUL   | 28   | EXCUSES, EXCUSES                               | MAR   | 10   |
| SC - AERO CLUB X-WIND LANDING TECHNIQUES    | OCT   | 28   |                                                |       |      |
| ON A WING AND A STRAP                       | DEC   | 16   | <b>SURVIVAL AND RESCUE</b>                     |       |      |
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| <b>LESSONS THAT LIVE</b>                    |       |      |                                                |       |      |
| WRONG NUMBER                                | OCT   | 22   | <b>TAKEOFF</b>                                 |       |      |
| TO LIVE LONG, PLAN WELL                     | NOV   | 22   | SC - THE WIND BLEW                             | FEB   | 11   |
| UNHAPPY LANDING                             | DEC   | 8    | TT - QUICKER THAN BRAKES                       | MAR   | 8    |
|                                             |       |      | SC - ATTILA THE HUN TRAMPLES THE TULIPS        | JUN   | 22   |
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| SC - A WORD TO THE WISE?                    | MAR   | 12   | SC - AARDVARK VS H <sub>2</sub> O              | JUL   | 10   |
| BIO WHAT?                                   | MAR   | 16   | OVER-EDUCATION?                                | AUG   | 22   |
| TT - GREEN APPLES                           | APR   | 8    |                                                |       |      |
| TT - SKY BRIGHTNESS                         | MAY   | 11   | <b>TAXIING</b>                                 |       |      |
| SC - HYPOXIA                                | MAY   | 26   | TT - HURT HUNS                                 | JUL   | 21   |
| HUMAN ENGINE FAILURE                        | OCT   | 20   |                                                |       |      |
| <b>MAINTENANCE</b>                          |       |      | <b>TIRES</b>                                   |       |      |
| CT - CABLE FABLE                            | JAN   | 12   | TIRE PRESSURE LOSS                             | FEB   | 24   |
| CT - SHORT STORY                            | JAN   | 13   | CT - BLOWOUT                                   | AUG   | 14   |
| CT - A LEMON?                               | JAN   | 13   | SC - F-4 BLOWN TIRES                           | NOV   | 13   |
| CT - F-100 - LOOK OUT BELOW                 | JAN   | 13   |                                                |       |      |
| CT - TOO MANY PINS                          | FEB   | 8    | <b>TOWING AND PARKING</b>                      |       |      |
| CT - WANDERING WIRE                         | FEB   | 9    | TT - A ROLLER                                  | APR   | 8    |
| CT - A-7 OIL (AGAIN)                        | FEB   | 9    | TT - AWFULLY CLOSE                             | APR   | 9    |
| CT - MURPHY AND GREMLIN JOIN FORCES         | MAR   | 9    |                                                |       |      |
| CT - HOW ARE YOUR HARNESSSES?               | MAR   | 22   | <b>TRAINING</b>                                |       |      |
| CT - A BLEEDER                              | MAR   | 22   | THE GOOD OLD DAYS                              | FEB   | 4    |
| CT - SUPER TWEET PINS                       | MAR   | 23   | TT - GRAB THE RIGHT HANDLE                     | FEB   | 20   |
| NEW LOOK IN AIRCRAFT MAINTENANCE MANAGEMENT | MAR   | 28   | THE AIRLIFT INSTRUCTOR SCHOOL                  | NOV   | 27   |
| CT - PROPS STILL BITE                       | APR   | 22   |                                                |       |      |
| CT - TOO MUCH POWER                         | APR   | 22   | <b>WEATHER</b>                                 |       |      |
| CT - I DON'T BELIEVE IT!                    | MAY   | 23   | TT - EWAS IS COMING                            | APR   | 8    |
| CT - THE RUB                                | JUN   | 10   | TT - EWAS DELAYED                              | MAY   | 11   |
| CT - THEY DO NOW                            | JUN   | 10   | MA NATURE'S SUNDAY PUNCH                       | MAY   | 28   |
| CT - UNWANTED INITIATION                    | JUN   | 10   | TT - ZAPPED                                    | JUN   | 20   |
| CT - CROSSED WIRES                          | JUN   | 11   | TT - REDUCTION IN WEATHER SERVICES             | JUN   | 20   |
| IS THE CREW CHIEF DEAD?                     | JUN   | 15   | HERE COMES WINTER                              | OCT   | 28   |
| CT - FOAMING OIL                            | JUL   | 14   | CT - TIPSY HERKY                               | NOV   | 23   |
| CT - REMOVED AND REPLACED?                  | JUL   | 15   | TT - MINIMUMS                                  | DEC   | 12   |
| CT - CHAFFED                                | AUG   | 15   |                                                |       |      |
| TT - IF IT WON'T MOVE - DON'T MOVE IT!      | AUG   | 20   | <b>WEAPONS WORDS</b>                           |       |      |
| CT - ONE SMALL STEP                         | OCT   | 24   | THE GOOD AND BAD OF IT!                        | FEB   | 14   |
| CT - AGAIN AND AGAIN AND AGAIN!             | OCT   | 24   | THINGS THAT GO "BOOM"                          | APR   | 18   |
| CT - WHAT WAS THAT?                         | OCT   | 26   | HAVE YOU HEARD?                                | JUN   | 26   |
| CT - STIFF STICK TORQUES PILOT              | NOV   | 22   | A BETTER CHANCE THAN THE BIRDS                 | AUG   | 24   |
| - CROSS WIRED PHANTOM                       | NOV   | 22   | NONNUCLEAR MUNITIONS SAFETY GROUP              | OCT   | 29   |
| - IT'S NEVER THE FIRST MISTAKE              | DEC   | 6    | PERSONNEL AND EXPLOSIVES LIMITS                | DEC   | 22   |
| - PIN CHECK                                 | DEC   | 6    |                                                |       |      |
|                                             |       |      | <b>WHEEL FAILURE</b>                           |       |      |
|                                             |       |      | CT - F-111 NOSEWHEELS                          | MAY   | 22   |
|                                             |       |      | CT - OUT O' SPACERS?                           | JUL   | 15   |



# letters to the editor

## HOT BRAKES

Reference your TAC Tip, "Brakes," page 21, August 72 issue. TO 4B-1-1, "Use of Landing Wheel Brakes and Wheels During Ground Operations," gives specific instructions to insure adequate cooling of brakes after extensive use. The first note on page 4 of the TO concerns the severe overheating that can occur during a rejected takeoff (RTO) stop.

The note on page 1 of the TO states that commanders will bring the information to the attention of personnel authorized to taxi aircraft, maintenance personnel, and fire department personnel. An AFTO 22 is being submitted by this unit to include flight crew personnel in this note.

It is also being suggested that the title of the TO be changed to omit the statement "... during ground operation." Much of the information contained in this publication concerns RTOs, touch and go landings, full stops, etc. These cannot be considered ground operations.

The technical order is only 5 pages long, printed in large type, and is very easy to read. It is suggested that flight crew personnel become familiar with information contained in this publication. As a matter of information, the 4B-1-1 is referenced in the C-130A-1 on page 7-12, Use of Wheel Brakes.

Major Edward J. McNulty, USAFR  
Chief of Maintenance, 913th TAGp,  
Willow Grove AFR, PA.

*TO 4B-1-1 is applicable to all aircraft (not just C-130s). It expands the information contained in the Dash One; consequently, it's good poop for all taxiers and fliers of air machines. When warm weather approaches, some units cycle this TO through the ACIF. Ed.*

## LOUD AND UNCLEAR

"That's Rog?" "Loud and Clear?" No, not quite! There are some inconsistencies in the use of "How do you read?" and "How do you hear me?" ICAO Annex 10 — Aeronautical Telecommunications, Volume II — does in fact utilize the words "How do you read?" as defined in paragraph 5.2.1.4.7, for communications check. The United States, as a member of ICAO, has taken no exception to these words as being appropriate for world-wide use although we have taken exception to five paragraphs in this annex. Sixty-eight countries stated that no differences existed; thirty-six countries notified ICAO that there were differences between their national regulations and practices from those stated in this annex; and fifteen countries didn't answer the mail.

It is interesting to note that the Republic of Vietnam is second in exceptions to this particular annex, claiming four. It is difficult to understand the United States taking no exception to the use of these words in the ICAO annex and then implementing different procedures in FAA Handbooks 7110.8B and 7110.19A. The support of these two documents in DOD publications is understandable although it does create some confusion for the crew member wandering through the skies of many countries, and perhaps contributes to a communications problem.

For MSgt James D. "Sparky" Adams, who responded to your May 1972 edition, as well as the intrepid aviators who must comply with little understood rules the world over, there is indeed a means of assigning a numerical value to a communications check with no more sophisticated equipment than a two way radio and "20-20" hearing. Annex 10 states in paragraph 5.2.1.7.4 that "PANS. — When tests are made, the following readability scale should be used:

### READABILITY SCALE

1. Unreadable.
2. Readable now and then.
3. Readable but with difficulty.
4. Readable.
5. Perfectly readable."

One other category might be considered: "I didn't hear you, say again!" Perhaps when we "read" people, we should be able to tell them how in their own language. There is an obvious deficiency in our recognition of ICAO procedures. We could be a little more consistent; however, we do have bigger problems than this we haven't solved yet.

Lt Col Robert D. Bradshaw,  
Chief, ATC Analysis Division, DCS/Flight Facilities  
APO New York 09633

*Say again?*



# TAC TALLY

## MAJOR ACCIDENT RATE COMPARISON

|     | TAC  |      | ANG  |      | AFRes |      |
|-----|------|------|------|------|-------|------|
|     | 1972 | 1971 | 1972 | 1971 | 1972  | 1971 |
| JAN | 0    | 1.6  | 0    | 16.7 | 0     | 0    |
| FEB | 0.8  | 1.6  | 0    | 11.6 | 0     | 0    |
| MAR | 1.6  | 3.1  | 6.3  | 7.0  | 0     | 0    |
| APR | 2.8  | 2.7  | 8.1  | 4.9  | 0     | 0    |
| MAY | 4.0  | 2.5  | 6.3  | 6.7  | 0     | 0    |
| JUN | 4.8  | 2.6  | 5.1  | 6.9  | 0     | 0    |
| JUL | 4.2  | 2.9  | 6.2  | 7.1  | 0     | 0    |
| AUG | 4.6  | 2.7  | 6.4  | 7.8  | 1.9   | 2.7  |
| SEP | 4.6  | 3.2  | 6.2  | 7.4  | 1.7   | 2.4  |
|     | 4.1  | 3.2  | 5.9  | 6.9  | 3.0   | 2.1  |
| NOV |      | 3.3  |      | 6.9  |       | 2.0  |
| DEC |      | 8.2  |      | 6.4  |       | 1.8  |

# AIRCRAFT ACCIDENTS

## UNITS

|                   | THRU OCTOBER |      |       |      |           | THRU OCTOBER |      |       |      |
|-------------------|--------------|------|-------|------|-----------|--------------|------|-------|------|
|                   | 1972         |      | 1971  |      |           | 1972         |      | 1971  |      |
|                   | ACDTS        | RATE | ACDTS | RATE |           | ACDTS        | RATE | ACDTS | RATE |
| 9AF               | 6            | 3.3  | 8     | 3.7  | 12AF      | 13           | 3.6  | 6     | 1.9  |
| 1 TFW             | 3            | 10.4 | 2     | 6.3  | 27 TFW    | 1            | 5.7  | 1     | 5.2  |
| 4 TFW             | 0            | 0    | 0     | 0    | 35 TFW    | 1            | 4.1  | 1     | 2.9  |
| 23 TFW            | 0            | 0    | N/A   | N/A  | 49 TFW    | 4            | 10.1 | 0     | 0    |
| 31 TFW            | 1            | 5.0  | 2     | 10.2 | 58 TFW    | 2            | 4.0  | 3     | 7.5  |
| 33 TFW            | 1            | 11.4 | 0     | 0    | 67 TRW    | 0            | 0    | 0     | 0    |
| 68 TASG           | 0            | 0    | 0     | 0    | 71 TASG   | 0            | 0    | 0     | 0    |
| 316 TAW           | 0            | 0    | 0     | 0    | 313 TAW   | 0            | 0    | 0     | 0    |
| 317 TAW           | 0            | 0    | 0     | 0    | 314 TAW   | 0            | 0    | 0     | 0    |
| 354 TFW           | 1            | 4.8  | 1     | 4.6  | 355 TFW   | 1            | 3.9  | 0     | 0    |
| 363 TRW           | 0            | 0    | 1     | 4.2  | 347 TFW   | 1            | 7.4  | 0     | 0    |
| 4403 TFW          | 0            | 0    | 2     | 14.9 | 474 TFW   | 2            | 7.9  | 0     | 0    |
|                   |              |      |       |      | 463 TAW   | 0            | 0    | 0     | 0    |
|                   |              |      |       |      | 23 TFW    | 1            | 9.8  | 0     | 0    |
| TAC SPECIAL UNITS |              |      |       |      |           |              |      |       |      |
| 1 SOW             | 1            | 2.4  | 4     | 7.5  | 4410 SOTG | 2            | 8.8  | 1     | 4.5  |
| 2 ADG             | 0            | 0    | 0     | 0    | 4485 TS   | 0            | 0    | 0     | 0    |
| 57 FWW            | 3            | 18.1 | 1     | 6.1  | 4500 ABW  | 0            | 0    | 0     | 0    |
| ADS               | 1            | -    | 1     | -    | OTHER     | 3            | -    | 1     | -    |

| TAC    |          |       |
|--------|----------|-------|
| OCT 72 | Thru Oct |       |
|        | 1972     | 1971  |
| 4      | 46       | 27    |
| 1      | 29       | 22    |
| 6      | 38       | 15    |
| 1      | 27       | 17    |
| ↑      | 22       | 18    |
| 1      | 20       | 15    |
| 100%   | 69%      | 83.3% |

## SUMMARY

|                      |
|----------------------|
| TOTAL ACCIDENTS      |
| MAJOR                |
| AIRCREW FATALITIES   |
| AIRCRAFT DESTROYED   |
| TOTAL EJECTIONS      |
| SUCCESSFUL EJECTIONS |
| PERCENT SUCCESSFUL   |

| ANG    |          |       |
|--------|----------|-------|
| OCT 72 | Thru Oct |       |
|        | 1972     | 1971  |
| 2      | 18       | 18    |
| 1      | 14       | 15    |
| 1      | 3        | 6     |
| 1      | 12       | 15    |
| 0      | 8        | 12    |
| 0      | 8        | 9     |
| 100%   | 100%     | 75.0% |



# FLEAGLE

