

# TAC ATTACK

NOVEMBER 1972



THE LOST CENTURYS...PG 16

HARDISON



for efficient tactical air power

# TAC ATTACK

NOVEMBER 1972

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The Lost Centurys,  
Where are they?  
Page 16



## CURRENT INTEREST

REVENGE AT VIRGILVANIA	4
A-7D — WHY ISO?	10
THE LOST CENTURYS	16
AIR TRAFFIC CONTROL	24
THE AIRLIFT INSTRUCTOR SCHOOL	27

## DEPARTMENTS

Angle of Attack	3
TAC Tips	8
SPO Corner	12
TAC Men of the Month	15
Lessons that Live	20
Chock Talk	22
Letters	30
TAC Tally	31

### TACRP 127-1

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# Angle of ATTACK

## extra effort



After you've put in a hard day's work planning the flight, pre-flighting the machine, flying the mission, and fighting the airplane onto the ground after an emergency of some kind, about the last thing you want to be bothered with is the safety type hounding you for another piece of paperwork. You've done a good job and you're tired; you want to go home, prop up your feet and sip on a martini while listening to the soothing (?) mutterings from your spouse. You've been de-briefed by maintenance, de-briefed by ops, explained the situation to the DO, filled out a mission report, and talked to a dozen other people on the telephone. Certainly that's enough!

Is it? Let's take a look at that piece of paperwork that the safety people ask for . . . it's called an incident report. When completed, it is transmitted to every base that uses your type of airplane. It alerts them to a situation that may save them money and possibly lives. Even if an error on your part contributed to the incident, the report alerts everybody in hopes that the same error won't be repeated. If the incident was caused by a materiel malfunction, then maintenance is required to submit an EUMR (Emergency Unsatisfactory Materiel Report). This one seemingly insignificant piece of paper may bring about fleet-wide changes in the machine that will reduce or eliminate the chances of a repeat performance.

When you take the extra time to fill all the squares on the incident report, you are being "Mr. Good Samaritan." You are helping those behind you who earn their bread in precisely the same manner as you. You may even save a life.

In football, they call it "Extra Effort."

It pays off . . . for you and for countless people you've never met.

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



# REVENGE at VIRGILVANIA



by MSgt James H. Hearon, Jr.  
USAFSOF, Eglin AFB, Florida

Frank Ellis glanced at his watch and was startled to see both hands on the dial pointing toward 12. "I can't believe it's midnight," he said, "it seems like I just got here."

The place in question was a roadside restaurant with adjoining bar and Frank was sitting on a bar stool with the remains of his fourth martini in his right hand. Accompanying him was Mike Doyle, a friend whom Frank had not seen for three years.

"Well Mike, it's been nice seeing you again and I'd like to stay longer but I told Ann I'd be home tonight and I've still got about 70 miles ahead of me."

Frank's home was located in West Virginia and he had been to a business meeting in Pittsburgh. It wasn't too far out of his way to drop in on his old war buddy, Mike, and bend elbows with him for a couple of hours. They always had some laughs and reminisced about the past.

It was now 12:30 am and Frank was heading toward the Pennsylvania border. He was wondering if Ann would be waiting up for him. After all, he did say he'd be home tonight and Ann always worried when it came to driving a car at night.

Frank didn't see any state line marker, but he knew he must be pretty close to West Virginia. Suddenly he noticed the headlights of a car behind him that seemed to materialize in his rear view mirror. "Must have pulled out of a farm road," mused Frank, and continued on.

It wasn't so much the pulsating red light, but the extremely loud blare of the siren that shocked Frank back to reality. He almost lost control of his car but managed to slow it down and pull over to the side of the road safely.

Frank sat in his car trying to figure out what he had done to warrant being stopped. His speed had been between 60-70 and as far as he could recollect he had



en any traffic laws.

As Frank looked up to the man who approached his car, he was startled to see a bright red uniform. It was identical to a policeman's uniform but it was red with white leather belt and a silver badge of authority.

Suddenly the red uniform wearer spoke, "May I see your license, sir?" Frank fumbled through his wallet and passed his license to the man. He asked, "What did I do wrong officer?"

"That will be for the judge to decide. Please follow me into town."

At this point Frank was fighting off the feeling of nausea and felt a cold clammy coating of perspiration cover his body. When the police vehicle came into view in front of his car, Frank noticed it was all white with red lettering and emblems on the side and rear. Oddly, the license tags were red with white numerals. "Strange," thought Frank, "that isn't the color of West Virginia or Pennsylvania tags." The lead car made a left turn onto a narrow two lane road and Frank followed for about three miles before the city came into view. He noticed the sign saying, "Welcome to Virgilvania."

It was now 1:15 am and Frank's thoughts went to Ann. He must call her as soon as possible to let her know that he was all right and, as soon as this situation could be rectified, he would be on his way.

He was now inside the building and a young officer approached him, "Please step this way, sir." Frank followed him down a corridor and entered a door on which was stenciled, **B. A. Test**. As Frank crossed the threshold, he noticed it looked exactly like a hospital first aid room. As a matter of fact, this whole building must be the cleanest place in the world. White walls, ceiling, curtains and all the trim was in red. As a matter of fact, everything was red and white except the black lettering on the door through which he had entered. The thought passed his mind that whatever was wrong must be real wrong for him to be in the room with the black lettering.

"I wish someone would tell me what's going on," cried Frank, noticing that his words sounded a bit higher than usual. The officer answered, "Mr. Ellis, we are going to give you a blood alcohol test. At the time you were apprehended, your car was weaving all over the road."

"That's ridiculous," hollered Frank, "I am perfectly sober."

"We'll see," answered the man in red.

By this time, Frank's mind was really in a whirl. They sat him at a table and a man in a white coat asked, "Would you please roll up your left sleeve?" Frank watched the needle penetrate his skin and the vial fill up with dark red substance. "This will only take a few minutes, sir," said the man in white. He released the rubber tubing from Frank's arm and when the tube was

filled, he slowly pulled the needle out under a gauze protecting pad, then disappeared into another room.

It was just unbelievable — this never happened before — as a matter of fact, Frank began to doubt it was happening now. It seemed like a dream. **But the worst was yet to come.**

It couldn't have been more than ten minutes later when a man entered who looked like the chief. He was tall, in full uniform including red garrison hat with gold braid on the visor. "I'm afraid I have some bad news, Mr. Ellis. Your blood shows a .12 percent alcoholic content, which means you were driving while intoxicated."

Frank jumped up from his chair, insisting that his alcoholic consumption was definitely not enough for him to be drunk. As a matter of fact, he insisted he was as sober as any man in the place. "I'm sorry, Mr. Ellis, but your trial is scheduled for noon tomorrow."

"What do you mean my trial?" bellowed Frank, "am I to go to the firing squad or the gas chamber?"

Oh, this is really something. No one will ever believe it. Red caps, white cruisers, I think I'll laugh in his face, then I'll wake up and tell Ann what a crazy dream I had.

Frank suddenly realized that the chief was talking, "No, Mr. Ellis, it's not as drastic as that but I'm sure you'll remember this incident for the rest of your life." He added, "Of course you'll have to spend the night here with us and appear before the judge tomorrow. However, if you'd like to make a phone call, you may use the one on the desk."

"Why can't I pay my fine and go?" said Frank.

"It's not as simple as that, Mr. Ellis. This city is an independent territory and does not belong to Pennsylvania or West Virginia. We have very severe penalties for drivers whose blood alcohol test shows .10% or over, and in your case it was .12%."

Frank knew it was senseless to pursue the rebuttal further, he was in the wrong and the BA test proved it. He picked up the phone and called Ann. After 15 minutes of explanation, Frank assured Ann he would be home some time tomorrow and not to worry about him. After hanging up, he wondered if what he told her was true. Somehow he began to doubt his words. He wondered if he would **ever leave this place.**

Frank was escorted downstairs and led through a sort of processing line. He was photographed and fingerprinted and given a white frock to wear. He was led to a dressing room where he removed his clothes and put on the frock, then was led to a private room that resembled a hospital room. The door locked behind him and Frank walked to the neatly made bed and sat on the side of it.

"What do they mean by an independent territory," thought Frank. "We're either *in* the USA *or* *out* of it. These people must be nuts."



## REVENGE AT VIRGILVANIA

He walked to the window and looked out but could not see much as most of it was poorly lit. He could make out a structure across the grassy lawn that resembled an auditorium or stadium. Other than that, there wasn't much to see. What a predicament. He still couldn't believe it.

He glanced around the room and spotted a button on the wall, just over the bed headboard, with a volume control underneath and a printed notice about the size of a business card, saying, "For information about Virgilvania, press this button." Frank promptly pressed the button.

The voice from the speaker was clear and businesslike and said, "If you are not a resident of Virgilvania, you may be wondering about some customs of our city. During a survey of the Pennsylvania and West Virginia territory in 1917, it was discovered that 37 square miles of land did not belong to either state, and it would not be fair for one state to acquire it and not the other. Also, there was no way it could be divided equally because of existing mountains and the location of a river. It was decided to hold a meeting with the residents of this land and abide by whatever decision they should bring forth. The citizens met for two weeks and finally came up with a master plan. This section would be called Virgilvania and would be independent of either Pennsylvania or West Virginia. Everything went along fine for 30 years. The land incident was not publicized and the residents in both states maintained excellent relationship with the citizens of Virgilvania. Then on the fourth of July 1947, the citizens had a giant Independence Day celebration. Traffic was kept to a minimum and children and adults alike partook in the festivities throughout the streets of Virgilvania.

"At one o'clock that afternoon a call was received at the station from patrolman Phil O'Connor. Phil was patrolling the northern road leading into town. He said he was run off the road by a speeding, reckless driver who was heading into town, unaware of the celebration. The officer taking the call alerted all policemen in town to clear the streets immediately but before they could even get started, the disaster had occurred. The speeding vehicle headed straight down the main street and into the unsuspecting crowd, spewing death and destruction in all directions. When the final count was taken, it was appalling. Eight women, five men and 12 children were killed and 15 others injured. It was the greatest disaster ever to strike Virgilvania in its 30 year existence. The police had their hands full trying to keep the crowd from tearing the drunken driver limb from limb. After he was

placed in custody, all that remained in the street was the vehicle of destruction. There it stood — blood covered, dented, and a little pink hair ribbon stuck to the windshield with blood. The members of the remaining crowd formed a ring around the vehicle, then by some odd compulsion they merged toward the car and with their bare hands, smashed and dismantled the entire vehicle. In a matter of 10 minutes, nothing was left resembling an automobile except four wheels, scattered on the road. The crowd slowly vacated the street. The mood of fun and festivity had been shattered and Virgilvania stood as a town of sorrow and tragedy. The driver of that death dealing vehicle was sentenced to 20 years in prison but died after serving one year.

The city of Virgilvania established strict traffic laws especially for drunken drivers and woe be to the man or woman crossing the borders, while driving a motor vehicle, while intoxicated."

The silence after the last sentence indicated that was the end of the tape. He was almost dumbfounded. "What is going to happen to me?" wondered Frank. While wondering, he fell asleep, trying to escape mentally from this entire nerve-wracking situation.

It was 6:30 am and Frank had just awakened. He found fresh towels and soap in the bathroom, and also a new toothbrush and toothpaste. However, there was no razor and Frank realized the reason for its absence.

At 7:30 a man entered the room carrying a tray of food and placed it on the night stand. At 11:30 am Frank heard the lock turn in the door and it opened. Two men stood in the doorway; one was the Chief of Police and the other was a man Frank had never seen before. They were both dressed in their bright red uniforms with shoes shining like mirrors. The Chief held out a black robe and said, "Will you please put this on, Mr. Ellis, then we can proceed with the trial." Frank took off his white frock and put on the black robe. Frank asked, "Can you tell me what is about to happen?" "You'll find out in due time," said the Chief.

Frank was led down the corridor and upstairs and directly out the front door. As they entered the street, Frank noticed not a soul was in sight other than the two men accompanying him. No traffic, no voices, nothing — just like a deserted ghost town.

The two walked briskly toward the next block and Frank noticed they were heading toward the main entrance of the stadium which he had seen through the window last night. They walked beside the high brick wall until they came to a double set of wooden doors. As they entered the stadium, Frank almost froze in his tracks. Every person in town must have been sitting there quietly, just waiting.

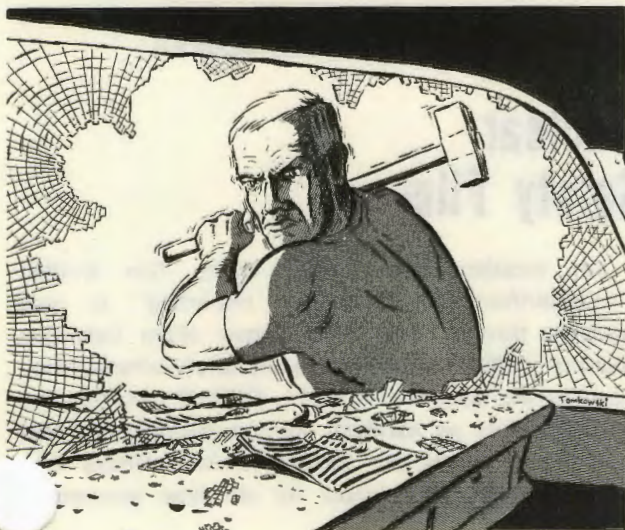


Near the center of the arena was a large red circle about 20 feet in diameter with Frank's new Cadillac in the center. About 15 feet away from the circle was a six step platform with a 3 ft high fence around it. "Good Lord," thought Frank, "are they going to run me down with my own car?"

Frank was escorted to the platform and after walking up the stairs, he stood there alone and watched. The escort team departed the arena. All that remained was Frank and his car. **He was alone and afraid.**

Frank scanned the crowd and directly ahead of him he saw a section of the stands specially arranged with 12 policemen in their red uniforms and a man in the front row with a black robe and white hair. The white haired man stood and held a paper in front of him. He spoke, "Frank Ellis, your case has been reviewed and through the results of your blood alcohol test, you have been found guilty of drunken driving. Your driver's license will be returned to you five years from this date. The rest of your sentence will be carried out immediately." He sat down amid the deathly silence and Frank was visibly shaking. The perspiration rolled down his face, even though the temperature was a cool 58 degrees. "Why did I ever stop for those drinks?" thought Frank. "Good Lord, no driving 5 years. That may cost me my job. What can I do? What can I do?"

Suddenly Frank saw four hugh men approaching from the far end of the stadium. They were wearing red shorts and they were each carrying something, indiscernible to Frank. As they grew closer, Frank noticed they were heading toward his shiny car and not him, and now the objects in their hands were distinguishable. "You can't do that," screamed Frank, "**you can't ruin my car, you can't, you can't.**"



The four men took up positions on each side of the car and the man in front of the car raised his sledge hammer high over his head and looked toward the judge for approval. The judge nodded and the first crashing blow struck the hood of the car. The stands came alive with cheers — loud screaming cheers reminiscent of gladiator days. The second man smashed in the door on the left side and again the cheers went up. On and on it went and Frank stood there, helpless, watching his car be demolished.

After 25 minutes of steady blows, the men left the stadium, the crowd was still cheering. Pieces of metal lay everywhere and Frank's car was completely flattened. Again the stadium grew quiet and the judge rose, "Mr. Ellis, the sentence of the court has been carried out. You are free to leave Virgilvania but take heed never to drive here again in an intoxicated condition. The lives of our people are more valuable than all the cars in the world." A tremendous roar went up from the crowd and Frank was led back to the police station.

"I think you'll find all your belongings in order, Mr. Ellis. You will be driven to the bus station and given a ticket to your home."

It was 4 o'clock in the afternoon and Frank Ellis was a dejected looking character as he sat in the bus terminal at Virgilvania. His car had been demolished, he had lost his driver's license, and he was completely worn out. The vision of those men smashing his car had never left him. He wondered how they could get away with such actions. But that was the law and Frank had broken it.

"Mr. Ellis, Mr. Ellis." Frank opened his eyes and found himself in new surroundings. The bus station decor was gone and he was lying on his back looking into the eyes of a young nurse. "Your wife is here to see you, Mr. Ellis." Ann rushed up to the bedside crying, "Frank, thank God you're alive. The officer said it was because you used your seat belt that you were saved from going through the windshield when your car hit the tree."

Frank noticed the plastic tube in his arm and felt the bandages on his head. So it all never happened. He must have dozed and run off the road. "How bad is the damage to the car, Ann?"

"It's completely demolished," she said.

Ann sat there holding Frank's hand. He was silent in thought when the nurse arrived to take his temperature. He looked at her nurse's cap and as the emblem came into focus it read, **Virgilvania City Hospital**. Frank wondered about the coincidences. His car was demolished and there was a city called Virgilvania. "Ann, I've learned a lot on this trip, I only wish I could pass it on to everyone." As he thought, he fell back to sleep and Ann said, "You can tell me about it later, dear." ➤



# TAC TIPS

... interest items,

## Fit To Be Tied

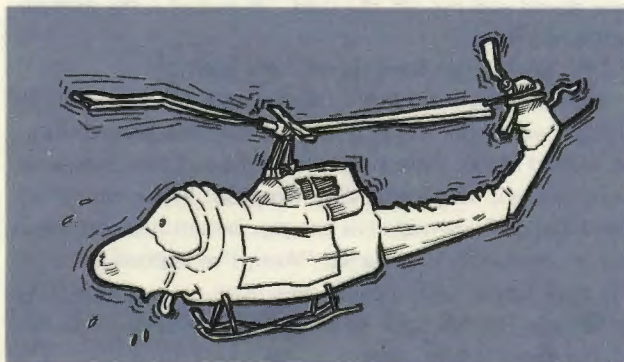
As the UH-IP helicopter pilot approached the tail during preflight, a problem developed at the loading hatch. After investigating, he returned to complete his walk-around.

A normal battery start was then attempted but when the blades wouldn't budge, the pilot discontinued the start. Before he had a chance to close the throttle, something broke loose and the main rotor completed two revolutions.

The thing that broke loose was the tie down strap which, seconds before, was still attached to the main rotor. When one end of the strap snapped, the other end remained attached to the main rotor. It flailed the tail rotor which, in turn, struck the drive shaft housing of the vertical fin.

All for the sake of distraction and one missed checklist item...

Distractions, unfortunately are common. That's why we use checklists. The key word is USE!



## Kits

Money is getting tight all over and the folks out at Air Force Inspection and Safety Center who put together the Flying Safety Officer, Ground/Explosives Safety Officers' Study Kits are feeling the crunch as much as anyone. In order to stay within their current budget, they have initiated a couple of actions:

(1) The kits have been combined into one monthly kit which will include all safety disciplines.

(2) Distribution has been cut drastically. The combined kit will now go to only the primary duty safety office and then in just two copies. This means that only the wing will receive copies and the safety officer at the wing level will have to extract the poop applicable to his units, reproduce the material, and dole it out to the people who need it.

For additional information, check the Sep-Oct '72 Ground/Explosives Safety Officers' Study Kit.

## Nuclear Safety Film

An excellent new nuclear safety film entitled "Accident/Incident Deficiency Reporting" is now available through your film library (Film Catalogue Number TF6532). Commanders and safety officers often question the guidance on DULL SWORD reporting and this film does an excellent job on pointing out how insignificant events can identify serious defects in nuclear system. It's a must for all those involved in nuclear safety.



# mishaps with morals, for TAC aircrewmnen

## Stick Go Lightly

Not long ago we had an incident involving the over G of an F-4. The whole thing happened during an ACM mission, when the defending aircraft pulled between 9 1/2 and 10 G. The left engine mount bolts sheared, the engine dropped 3 to 4 inches below normal, and one engine flamed out. A successful single engine landing was made. There is a warning in the F-4 Dash One that says "Caution should be used when maneuvering in the transonic speed range because the nose-rise tendency could lead to aircraft overstress or loss of control."

Another warning states the following:

"Nose-rise can occur during high AOA (angle of attack) maneuvering. This is characterized by a reduction or reversal of stick forces and can result in inadvertent increase in AOA and possible overstressing of the aircraft or loss of control."

There you have it, in a nutshell. You fly and fight the airplane basically at high subsonic mach numbers and high angles of attack, both of which can lead to over G problems. Stick force lightening is the engineer's name for what happens. Simply, it means that when you increase the angle of attack, the airflow across the wing starts to separate. This moves the center of pressure forward on the wing (so the engineers tell us). This forward shift produces a nose up pitching moment, and either the stick feels lighter or the stabilator feels more effective. In either case, holding the same stick pressure can lead to an increase in G, which can be the primrose path to overstress.

One more word — the Dash One says you can pull 8.5 g legally under certain criteria — only when gross weight and airspeed are equal to or less than 37,500 pounds and

.72 mach, respectively! The good book also states that accelerations above 6.5 G should be used only as necessary in mission performance.

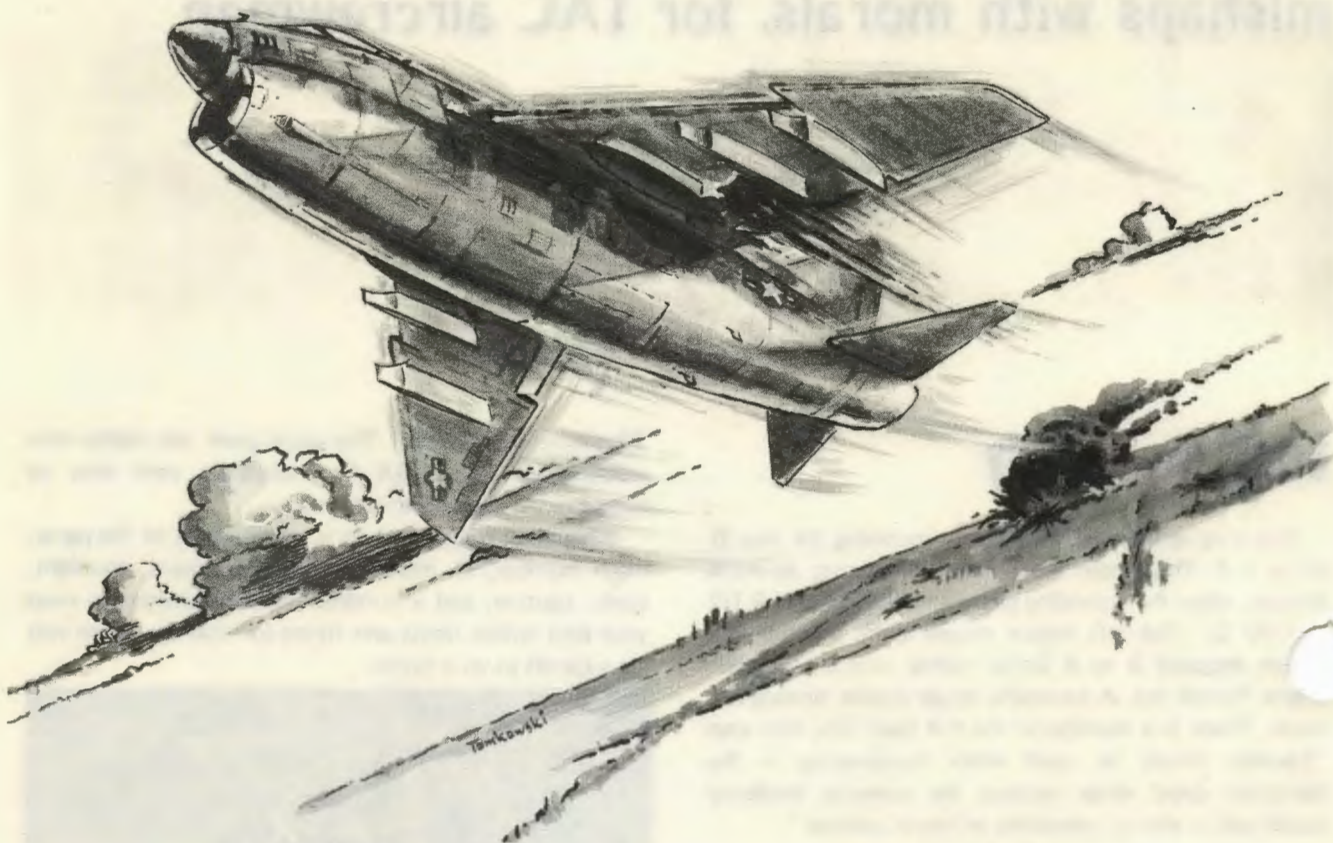
What it all boils down to is you use seat of the pants, mach number, G meter, altitude, judgment, foresight, study, caution, and a hundred other parameters to keep your bird within limits and flying for that day when you get a bandit in your sights.



OVER G



# A-7D: Why ISO ?



by J. D. Eaton, System Safety Engineer  
Vought Aeronautics Company

No one will contest the fact that the A-7D ISOLATED UTILITY system is a nice feature to have in a combat environment. It's comforting to know that the Short Little Ugly Feller (SLUF) will take a hit in a wingfold actuator, for example, and not cause loss of PC-2 system pressure to a vital system, like the flight controls. By way of quick review, placing the flap handle in ISO UTILITY closes the utilities isolation valve and depressurizes the following utility systems: landing gear, flaps, nose gear steering, wingfold, arresting gear, wheel brakes, and RAT extension/retraction system (at least one RAT cycle is available from RAT accumulator when in ISO UTILITY). Combat damage to any of these systems, while isolated, will not result in loss of PC-2 pressure to the flight control, speed brake, gun drive, or air refueling systems. Life insurance premiums for aviators are out of sight, but ISO UTILITY is good, cheap combat zone insurance. The

consensus for use of ISO in a training environment is not so overwhelmingly unanimous, however. Sure, the Dash One says "Flap handle — ISO UTILITY" after cleaning up the bird, but the O Club bartender says happy hour discussion of this step is interfering with his business.

Why, as in combat, is ISO important in a training environment? Ever heard of a midair collision? What about absorbing a ricocheting 20 mm or flying thru the bomb blast of the first guy down the chute? Birdstrikes? Combat isn't the only place where you can sustain damage to a utility hydraulic system. If the damage to your utility system has also caused loss of PC-1 or PC-3, or both, and the flap handle is left in ISO, PC-2 will be available for RTB.

The ISO system is also designed to increase inflight reliability of the PC-2 system and reduce maintenance manhour requirements. Consider this: there are more than 50 valves and actuators, more than 75 swivels and extension units, and a lot of plumbing, fittings, and o-rings in these isolated systems. It doesn't take a 37 m.



to dump PC-2 fluid. A torn o-ring or loose fitting will do the job nicely. Small leak or large hole, the result is the same. But there is an important difference. A small leak takes much longer to deplete the system of fluid. A PC-2 failure that might have occurred an hour into the flight with the flap handle in flaps UP may never occur with the flap handle in ISO. It may manifest itself simply as an annoying drip on the ramp when the flight's over. Replacing an o-ring or tightening a fitting is a much quicker, much simpler, less expensive procedure than towing the bird from the runway, replacing a pump, checking the filters, resetting the emergency landing gear selector valve, servicing and bleeding the system, and performing an operational checkout. "The fewer the maintenance manhours per flight hour, the greater the pilot flight hours per machine" (ISO's law).

The bartender interposes that PC failures don't happen often enough to cause concern, and besides, three PC systems are plenty. A rich man won't miss a dollar. Truth is, hydraulic systems are not perfect. They are subject to the vagaries of contamination, improper servicing, maintenance error, and plain old material failure. If it were not so, the bird would hardly be fitted with three separate systems. As to not missing a dollar, it depends on the dollar lost. The particular dollar wagered in this case may be the undercarriage. Loss of PC-2 places all the eggs in one basket, the emergency landing gear extension system. It's a pretty reliable basket, but (like the PC-2 system) not a perfect one. It is subject to leakage, hardware failure, misrigging and improper actuation, and vulnerable to improper servicing (especially on a typical cross-country Sunday afternoon). Following PC-2 failure and use of the emergency landing gear extension system, the A-7 has been "service tested" in several undesirable variations of the tricycle gear configuration: nose gear up, one main gear up, nose and one main gear up, and all gear up. The nose gear up landing probability following PC-2 failure has been significantly reduced in the A-7D by the drag link tension spring, but the egg basket is still not foolproof. Spread your eggs around. Put a couple in the ISO UTILITY basket.

Flying in ISO has other advantages. If a PC-2 pump should fail internally and introduce bits and pieces of itself into the PC-2 system, a closed ISO valve will keep the landing gear and flap systems clean, ensuring smooth operation of the emergency extension systems. Also, flying in ISO will preclude inadvertent actuation of a utility system in flight. A-7 accident files record an illustrative incident. An A-7A was performing dive bombing maneuvers with the flap handle in flaps UP. At 150 KIAS, 6 Gs applied at the bottom of a run, the gear handle "fell" out of the up detent. Shouldn't happen, but it did. The landing gear was badly bruised by the sudden

confrontation with the elements and the result was a nose gear up landing. While the chances of this particular accident happening again have been substantially reduced by redesign of the detent and installation of a stronger gear handle spring, the omnipresent spectre of possibility cannot be dismissed. Cover your six with ISO.

The bartender relays a question: What about fluid leakage/pressure loss from the utility brake accumulator with the flap handle in ISO? Admittedly, this used to be a problem. But hardware changes to the aircraft have eliminated it. On [17] [27] → [202] after T O 1A-7D-596 and [203] → , the accumulator is no longer located downstream of the isolation utilities valve. With this change incorporated, the accumulator receives a constant charge from the PC-2 system, regardless of the position of the flap handle. As long as the Anti-Skid switch is in ANTI-SKID or OFF, the utility brake accumulator is protected from any fluid leakage through the power brake cylinder. If your aircraft has not been modified, possible utility brake accumulator leakage is still not reason enough to fly out of ISO. Even with complete loss of utility brakes (which is unlikely) following a PC-2 failure, there are acceptable alternates for stopping the aircraft. The Dash One recommends approach end engagement, and you are backed up by remaining runway barrier cables and the emergency brake accumulator.

The bartender insists there must be a disadvantage to flying in ISO. There is. Current Dash One procedures call for movement of the flap handle from ISO to flaps UP in the descent phase, preparatory to extending the landing gear. This can and has led to inadvertent extension of the flaps at high speed (handle in flaps UP vice ISO and moved to flaps DOWN vice UP). The Navy had some unhappy incidents in this regard early in the A-7 program and changed the procedure. The Navy leaves the flap handle in ISO until the gear handle is placed down, then moves the flap handle to down, extending gear and flaps simultaneously. This procedure is completely within the capability of the PC-2 system and has eliminated the inadvertent high speed flap extension problem. There is a simple trick, however, which should preclude inadvertent flap extension while complying with the Dash One. Whenever you contemplate moving the flap handle out of ISO, bring the handle inboard and push it forward. If the handle won't go forward, you were in ISO. If the handle goes forward, you are not in ISO. From this point, the next notch aft will *always* be Flaps UP. A habit pattern like this will save you no small embarrassment if you get distracted at the critical time.

The bartender says enough. He's convinced. He'll put his beer tap handle in ISO if someone will just order another round. ➤



# 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.

## FOD-THE THIEF WHO RARELY GETS CAUGHT!

Since man first climbed into a flying machine and "slipped the surly bonds" of that endless expanse, he has been plagued by FOD — Foreign Object Damage.

FOD costs the Air Force millions of dollars a year in replacement equipment and expended manhours. The thief who commits this form of *Grand Larceny* is usually a 25¢ bolt or nut, a piece of safety wire, or a pebble that dates back to prehistoric times.

Let's look at a few startling figures and see exactly what we mean by Grand Larceny. Thus far in 1972, Tactical Air Command units have reported 32 incidents of FOD. The estimated cost of these incidents is \$656,473 in equipment and labor. Dividing the cost figure by the number of incidents, we find that each FOD incident has cost TAC approximately \$20,000!!! That's quite a tidy sum for our thief. But what's more perplexing is the fact that the thief continues stealing from AF assets. Once in a while he gets caught but more often than not, he gets away with it.

The only hope of ever catching up with our thief is in a strong FOD prevention program at each of our installations. Commanders and airmen alike must be

genuinely concerned with the FOD threat. In almost every FOD incident report received at this headquarters, para 16a (the preventative action taken or contemplated block) invariably states "All personnel will be briefed on this incident." In spite of this action, it is obvious that the FOD threat is not being properly emphasized. We believe the answer to this problem lies with our supervisors.

A good example of what concerned supervision can do has occurred at MacDill AFB. Their FOD people have developed a brochure explaining the FOD problem and how to overcome it. This brochure was so well done, that the air staff decided to disseminate it Air Force wide. It's on its way; look for it! Another example of positive concern is TAC's adoption of a radiographic enhancement program whereby, through the use of X-ray, FOD can be detected in the forward engine bay and vari ramp areas of the F-4. All TAC F-4 units are using this program and a study is in progress as to its feasibility on other aircraft.

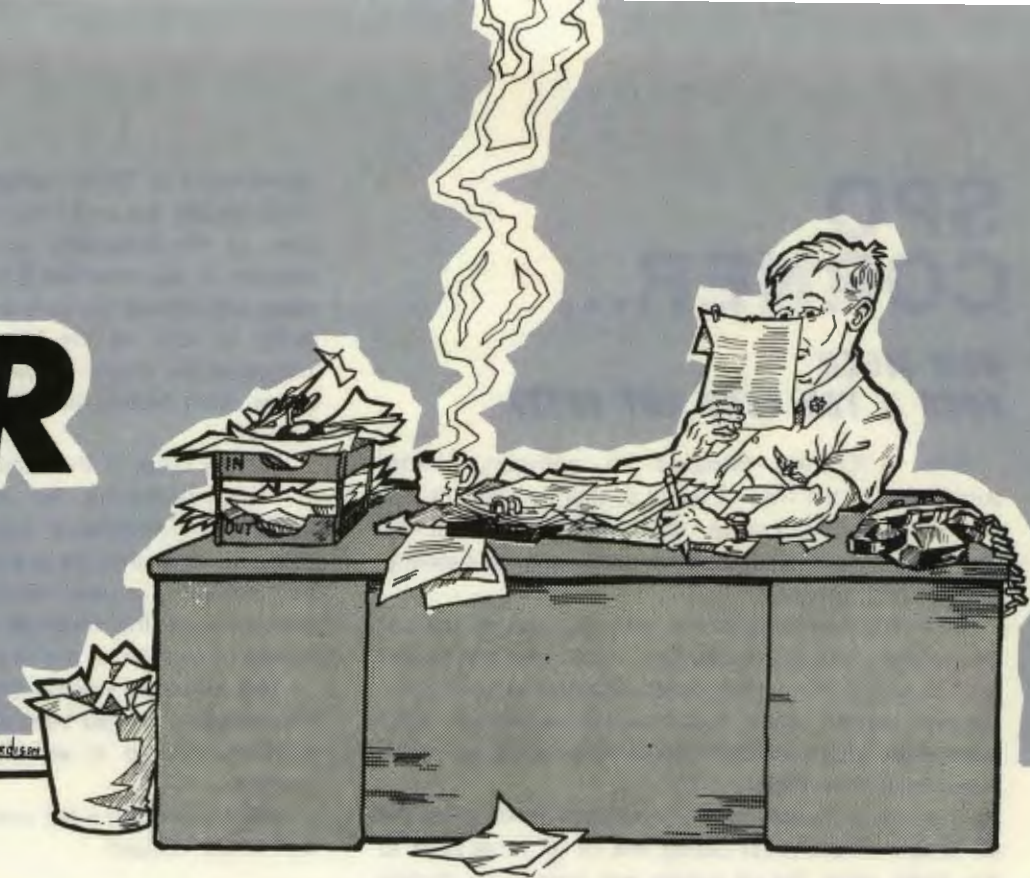
Although the source of that \$20,000 per FOD incident may seem remote, when you get right down to the nitty-gritty, it comes out of your pocket and mine.

It is up to us to find and share positive preventive measures.

**Capt George Bravake**



# NER



## RF/F-4 UTILITY LIGHT

The following tidbit, worthy of note, was provided by some of our friendly allies in the Air National Guard who fly the RF-4C. It seems a night takeoff was aborted at fairly high speed because the AC could not get the left throttle into the AB position. Later analysis by the aircrew revealed the utility light (that's the one with a clamp and a long cord, that can be moved around) in the rear cockpit had been clamped to the forward lower portion of the canopy rail which allowed it to block movement of the inner throttle. A look at the rail showed considerable wear, indicating this to be a fairly common place to fasten said lantern. It might be a good idea for all you rear seat RF types to take a look at where yours is clamped — especially prior to takeoff. It could cause embarrassing delays (or worse) if and when the burner is requested.

## F-4 BLOWN TIRES

**BLOWN TIRES** — It goes on and on! Look at these '72 statistics as of 1 October:

TAC: 1 F-4 minor accident  
33 F-4 incidents

USAF: 2 F-4 major accidents  
3 F-4 minors  
"Bunch" of reportable incidents

The causes continue to come up "undetermined" or "pilot factor" in a majority of these mishaps. AFISC at Norton, AFLC, AFSC and all the using commands continue in their attempts to find genuine causes that can be identified and alleviated. You jocks can help all of the above agencies by assuring yourselves you're using the proper braking and control techniques for all the various contingencies associated with returning your Phantom to Mother Earth. The one area where pilot fault is either found or implied too often is tire failure at or very shortly after touchdown. As you all know, the F-4 MK II antiskid system does not have locked wheel or touchdown protection. If the rudder pedals are depressed prior to touchdown or wheel spin up, a locked wheel and a blown tire will probably result. So — one more time — keep your heels on the floor and your tippy-toes off the brakes — until you need them. Then be ready to use the chute, rudders, nosewheel steering, differential braking, and your beads in the optimum manner to keep it on the runway.

**Maj Burt Miller**



# SPO CORNER...

## **HOW MUCH DOES A TEN CENT NUT COST?**

The A-7D was designed to withstand brutal punishment in the field of battle so that the machine and man could return another day to fight. But just like any other machine, it can be subdued by apparently insignificant objects.

In a recent major accident, an A-7D met an age old enemy and came out second best. A ten cent nut caused the loss of a 2 1/2 million dollar aircraft, but fortunately the pilot ejected safely. Just how did this piece of FOD accomplish such a defeat? (Certainly a 10/32 nut is no match against the mighty A-7D.)

It seems as though the FOD managed to infiltrate the oil system of the A-7D during one of six times prior to this flight when the oil system was opened for routine

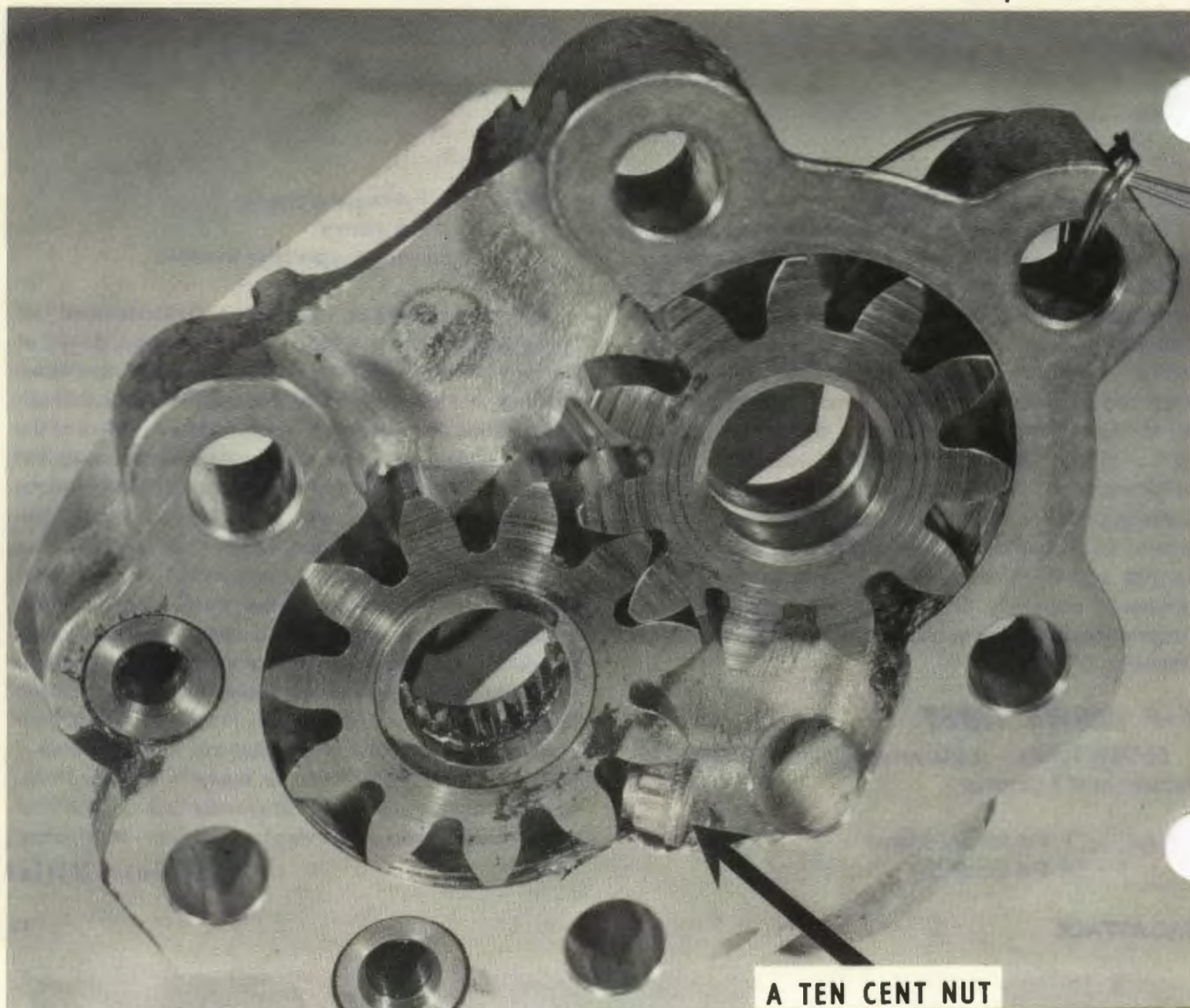
maintenance or TCTO compliance. Once in position, FOD pressed the attack by sneaking through enemy lines to the vulnerable low pressure turbine scavenge element. If was here that it thrust itself into the scavenge gears and sheared the quill shaft, causing the one-hearted A-7D to lose its life blood. When the investigators recovered the engine of the subdued SLUF (from 27 feet below terra firma), they found the FOD only slightly scarred.

Primary cause of this accident was maintenance factor in that inadequate or improper compliance with established maintenance procedures allowed a foreign object to enter into the engine oil system. As a result of this accident, it was recommended that a one-time inspection of the force be accomplished and strainer screens be installed in the oil scavenge system.

This seemingly insignificant 10/32 nut could have been a do-gooder if it had been where it was supposed to be; however, allowed to wander, it brought down a great machine.

How much does a ten cent nut cost? About two and a half million dollars!

**Maj Bob Lawler**



**A TEN CENT NUT**



## TACTICAL AIR COMMAND



### Maintenance Man Safety Award

Technical Sergeant Vincent J. Carrubba, 311 Munitions Maintenance Squadron, Hurlburt Field, Florida, has been selected to receive the TAC Maintenance Man Safety Award for September 1972. Sergeant Carrubba will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



TSGT CARRUBBA

## TACTICAL AIR COMMAND



### Crew Chief Safety Award

Airman First Class Larry E. Hardin, 4500 Consolidated Aircraft Maintenance Squadron, Langley Air Force Base, Virginia, has been selected to receive the TAC Crew Chief Safety Award for September 1972. Airman Hardin will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



A1C HARDIN

## TACTICAL AIR COMMAND



### Ground Safety Man of the Month

Staff Sergeant Reynaldo Ovalle, 33 Munitions Maintenance Squadron, Eglin Air Force Base, Florida, has been selected to receive the TAC Ground Safety Man of the Month Award for September 1972. Sergeant Ovalle will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



SSGT OVALLE



# the lost cent

the lost century

## F-103

## F-107

## F-108

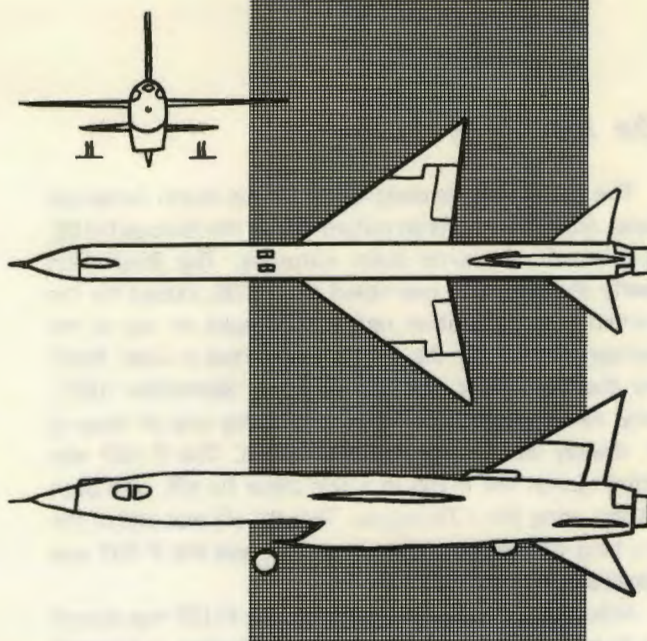
**W**ho can ever forget the magnificent shows by the Thunderbirds in the North American F-100 Super Sabre? Have you ever stood around the bar singing the Voodoo parody of "Ghost Riders in the Sky" with the countless jocks who flew the McDonnell F-101? And who can forget ADC's gray delta wing Daggers and Darts, the F-102s and F-106s built by Convair? To many people, Thud ridge and the Republic F-105 Thunderchief symbolize what being a fighter pilot is all about. When we talk about strapping on an airplane, many think of the jocks with their spurs mounting the Lockheed F-104 Starfighter. The McDonnell-Douglas F-4 Phantom (formerly the F-110), droop-snouted and mean looking, is certainly making an unforgettable mark on aviation history. The F-111 by General Dynamics has become a solid addition to the Air Force inventory. All the Century series aircraft have established enviable reputations and have become, or are rapidly becoming, legendary to those who have flown them.

What about the ones missing from the list — the lost Centurys? The F-103, F-107, F-108, and F-109 are seldom mentioned. Have they been relegated to a dusty corner in the hall of aviation history? Do you remember what they were and what happened to them? Let's briefly examine the story behind each of these missing aircraft.



# turys

## F-103



The F-103 program began in April 1950 with the Republic Aviation Corporation as the prime contractor. This aircraft was developed to serve as a prototype for an interceptor weapons system. It had a double cycle, turbojet-ramjet engine. This engine incorporated an afterburner for use in conjunction with the turbojet cycle. The afterburner also operated as a ramjet engine in the alternate cycle. The turbojet was to have been used for takeoff and speeds up to mach 2.1. At this point, the turbojet was bypassed and the ramjet cut in. The engine, operating as a turbojet with afterburner, was rated at 22,100 pounds thrust. As a ramjet, it was rated at 37,400 pounds thrust. As you can see from the photo, the F-103 looked more like an air-breathing missile than an airplane. Aiding this streamlining effort was a submerged pilot compartment which included a forward vision periscope arrangement and a downward ejection capsule. The pilot

entered the cockpit in an interesting manner. The ejection seat also functioned as an elevator! Predicted performance for the F-103 included a rate of climb of 40,000 feet per minute, a ceiling of 75,000 feet, and a speed of mach 3.0. The airframe was to have been made primarily of titanium and stainless steel to overcome aerodynamic heating. In its interceptor role, the F-103 internal load would have been six F-98A missiles and 36 2.75 inch FFAR rockets.

Lack of funding was the major culprit responsible for the cancellation of the F-103 program in August 1957. Had it been built, it certainly would have contributed to a much different looking interceptor force today. At the time of program cancellation, the first prototype was in final assembly and engineering was about 95 percent complete. The funding was shifted to the F-108 program. However, that's another story. Let's first take a look at the F-107.

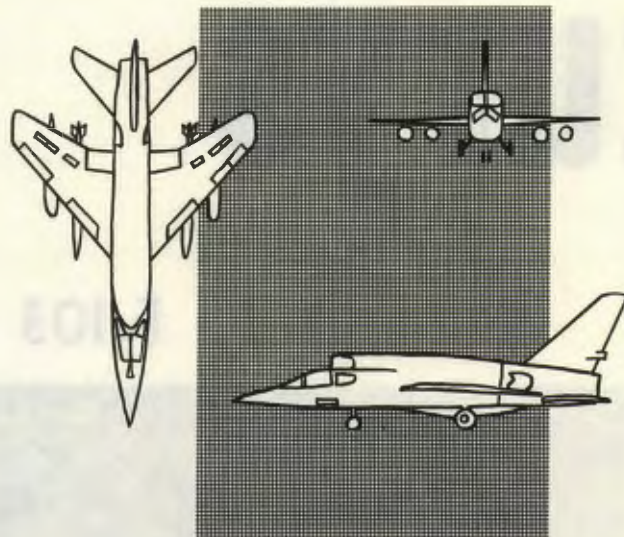


## *the lost century*

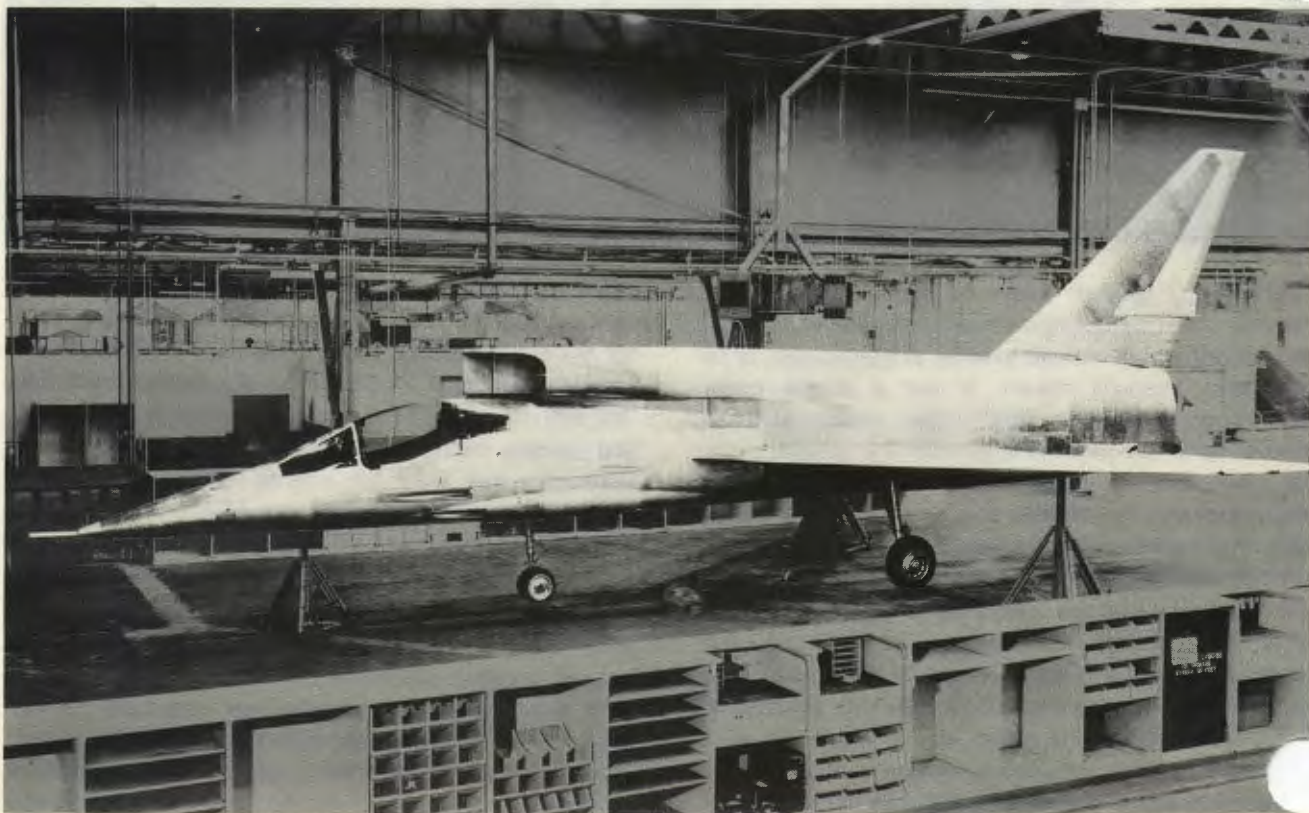
The F-107 was the designation for the North American Super Sabre. As an outgrowth of the famous F-100, it assumed this name quite naturally. The illustration clearly shows how it resembled the F-100, except for the pointed nose and rather radical air intake on top of the fuselage. Design for the F-107 was started in June 1953, and the first flight was completed in September 1956. Only three aircraft were built, and today one of those is on display at the Air Force Museum. The F-107 was pitted against the F-105 in a two-plane fly off, with both aircraft using the J-75 engine. This fly off was one of the first held for modern military aircraft and the F-107 was judged second best.

Although it lost the competition, the F-107 was one of the hottest airplanes in the air during its time. It attained mach 2 in both level and climbing flight. The aircraft had the "coke bottle" area rule fuselage, with a fuselage belly depression to carry a special store. It employed an advanced variable inlet duct with external shock compression, a design later incorporated into the XB-70. Spoilers were used instead of ailerons on its thin, sharply sweptback wings, and rudder control was accomplished with a one-piece moveable vertical stabilizer. Although it never became operational, the F-107 did contribute to the

advance of aviation technology. Two of the three L were provided to NASA, where they were used as research vehicles. The F-107 program was terminated in March 1957, making way for the F-108 program which started three months later.



### F-107





The North American F-108 had a relatively short life in aircraft developments go. The program started in June 1957, and was terminated in September 1959. The F-108 never flew, but a full scale mockup was constructed at the North American plant. Designed as a long range interceptor, the F-108 was probably the largest fighter aircraft ever designed up to that time. Resembling the XB-70, the F-108 was programmed to use the same J-93 engines. It featured a canard configuration and was to have been made from stainless steel. With a length of 85 feet and a height of 22 feet, the F-108 would have weighed 48,000 pounds empty and up to 81,500 pounds at takeoff gross weight. The F-108 was designed for a mach 3 cruise capability, a 1,000 mile combat radius, and a ceiling in excess of 75,000 feet. Had the F-108 been built according to design parameters and lived up to its predictions, it would have capabilities comparable to any fighter aircraft operating today. Its crew of two would have been able to operate in all weather conditions by

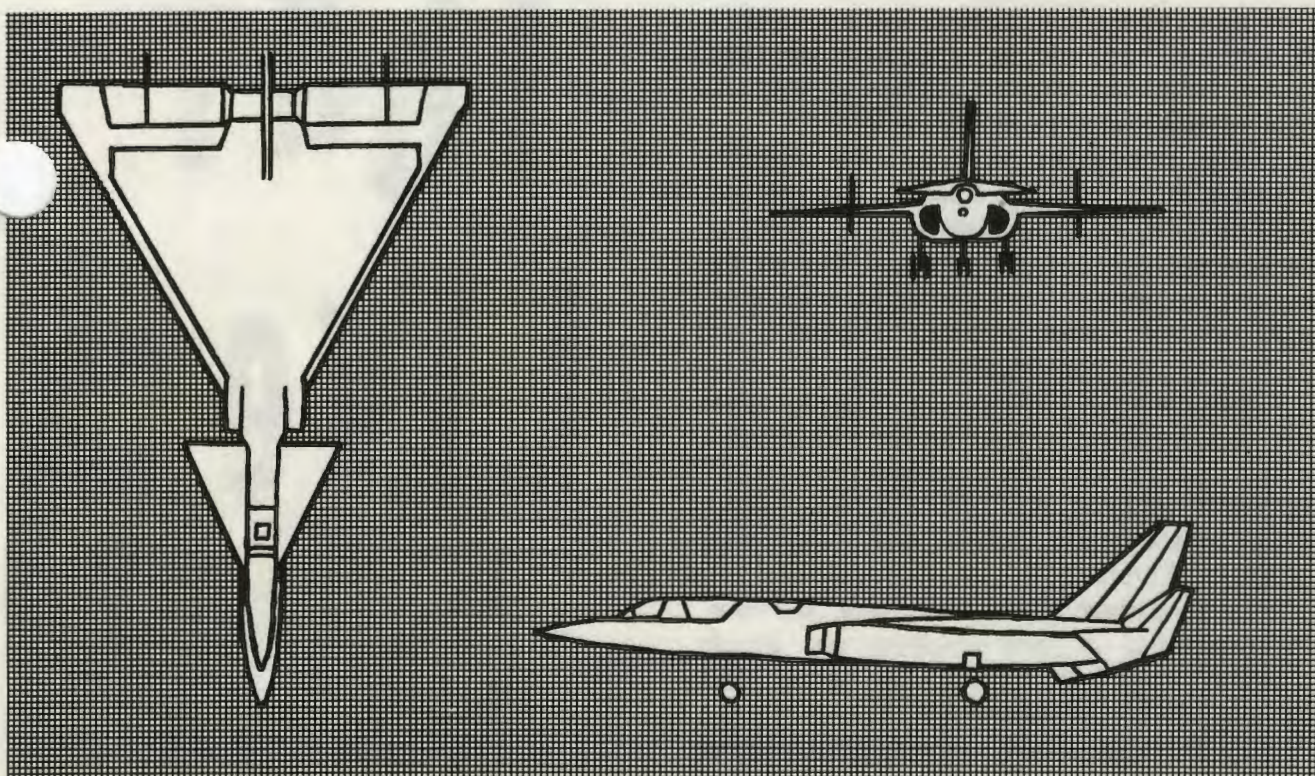
using an advanced fire control system.

The F-109 is really the stumper of the lost Century series fighters. You've all seen it, and a number of you have even flown it. It's more commonly known as the two-seat version of the F-101. The F-109 designation was changed to the F-101B.

The F-110, as many of you know, was the Air Force designation for the Navy's F-4. During the "commonality" period, the F-110 designation was dropped in favor of F-4.

There they are . . . the lost Centurys. These were the birds that didn't make it. However, in some respects, they'll be here for a long time because, without these ghostly birds, aviation technology wouldn't be as far along as it is today. They truly tried and tested many advanced concepts which are reflected in the operational aircraft of today.

Lost? Not really. They're an unseen portion of our "Pride in the Past — Faith in the Future." ➤



## F-108

*Credit is gratefully given to the Air Force Museum for providing photos and research material for this article. In particular, credit goes to William G. Holder, Aerospace Engineer, USAF, for his initial research into the subject of the F-103, F-107, F-108, and F-109. Ed.*



*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 in 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. 2 of 17

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





# to live long, plan well

**T**his happened before radio, but forget about that. There are still plenty of places on this little old planet where radio facilities are either lacking or unusable at times. I was flying an old Fokker from San Diego to San Francisco with a capacity load of enlisted men and baggage. There was enough fuel for a nonstop flight but the old crate was heavy.

Upon arrival over Burbank, I saw that broken clouds were sitting tight on the pass at Saugus. Weather reports prior to departure indicated a solid overcast in the Bakersfield-Fresno area with a ceiling at 4,000 feet. It seemed a good idea to go on top while the ceiling was still broken so I climbed a winding course, avoiding clouds, until I could level off on top of the stuff at 11,000 feet. It was plenty cold up there in my summer uniform. I knew that 30 minutes would put me across the pass where I could let down to the top of the clouds. Right there, something told me to play it safe so I stayed up there another half hour and then descended, breaking into the clear at 4,000 feet as expected. But where? Directly below was a small lake. Only at the very foot of the pass did the map show such a landmark. One look over the trail and I nearly choked. The north slope of that pass wasn't two miles behind me. Had I come down at the end of the first 30 minutes as intended, I'd have crashed at the 5,000-foot level in the cloud-shrouded pass.

The reason? Simple. A check of the early morning weather sequence on arrival showed that Saugus had reported a north wind velocity of 86 m p h at 10,000 feet. Since my airspeed was only 110, I wasn't making much headway while sitting up there at 11,000.

My face is red as I write this, but I must report that that very same wind report had also been available at my point of departure and I hadn't even bothered to check! Only luck and a crazy hunch had prevented what certainly would have been a nasty smear.



# CHOCK TALK

chock talk...incidents and incidentals

*...incidents and incidentals*

## **STIFF STICK TORQUES PILOT**

The F-4 control stick movement felt very stiff on takeoff and the pilot had trouble moving it to control the aircraft. He declared an emergency and managed to land the aircraft without further incident. As you can imagine, the troubleshooting on this one was rather extensive and here's what was found. The rear cockpit control stick torque tube was installed backwards. This reversed the bearings at the control stick pivot point and placed the pressure and slide bearings on the wrong side. A detailed check into the aircraft's maintenance history failed to reveal any work accomplished in that area. In addition, there had not been any pilot write-ups previous to this incident. The conclusion was that some previous undetermined depot or original manufacturer's maintenance had installed the tube incorrectly.

The purpose of this discussion is NOT to point fingers of guilt at anyone, but think for a minute of the inspections this bird went through without having this error detected. It just points out that even when you KNOW something is right, inspect and double check it anyway. You can never be too sure.

## **HE TOOK IT IN THE NECK**

An airman reported for duty in the Weapons Release Shop. He and another airman proceeded to the munitions area to link and align a load of 20mm ammo. They had processed about five belts of one hundred rounds each when a round connecting two belts together did not align in the link properly. Not having a link/delink tool the airman picked up a screwdriver and struck the base of the round. The blow detonated the primer, causing the round to explode. The airman was injured by a shrapnel wound in the neck and will lose approximately sixty days from his job.

The investigation found the primary cause to be supervisory error. The supervisor did not make alignment tools available, nor did he properly supervise the operation. A lack of common sense certainly enters the

picture here. A shred of it on the part of the airman would certainly have prevented this accident.

## **CROSS WIRED PHANTOM**

The F-4 experienced a fire light on the number one engine. The engine was shut down and an uneventful single engine landing was made. When the maintenance types dug into the bird, here's what they found. There were two bolts missing and three bolts loose on the afterburner torch igniter valve. The nut plates showed evidence that they had lost running torque. This permitted the bolts to back out, the gasket to rupture, and hot air to escape into the engine bay. This, in turn, caused a hot spot in the fire warning loop. The serious aspect of this incident is that all the engine problems listed above were on the number two engine, while the fire indication was on the number one engine! Following the only indications he had available, the pilot shut down the number one engine (his good engine) and used the number two engine (his bad engine) to bring the airplane home. The fire warning leads had been REVERSED on the fire warning lights in the front cockpit. Under slightly different circumstances, this condition would prove disastrous!

## **SMOLDERING PROP**

Upon completion of refueling the C-130, the ground crew noticed that number one prop was smoldering. The fire department was summoned and the situation was brought under control. Later, it was discovered that during extensive maintenance, an elusive someone had positioned the prop master switch to manual and the number one prop de-ice switch on. When power was applied to conduct the refueling, a fifteen second shot to the prop de-ice heating elements every sixty seconds not only melted the elements but wiped out the prop.

Now we know why there's a Dash One caution which says "When the airplane is on the ground, do not operate the propeller anti-icing or de-icing for an engine that is running." Makes sense.



*with a maintenance slant.*

### **SCORE-- CHECKLIST 1- THUD 0**

The F-105 pilot lowered the landing gear and was unable to get the nose gear down. A chase aircraft confirmed that the nose gear doors were partially open and the nose gear was up. The pilot made further attempts to get the nose gear down, using normal and emergency systems, recycling, and pulling Gs. Nothing worked.

### **TIPSY HERKY**

Does your Maintenance Control receive weather warnings? If so, do you know what action to take after receiving one? The recent cutback in weather services may have disrupted the flow of vital information to YOUR unit. Here's an example of what happened at one base.

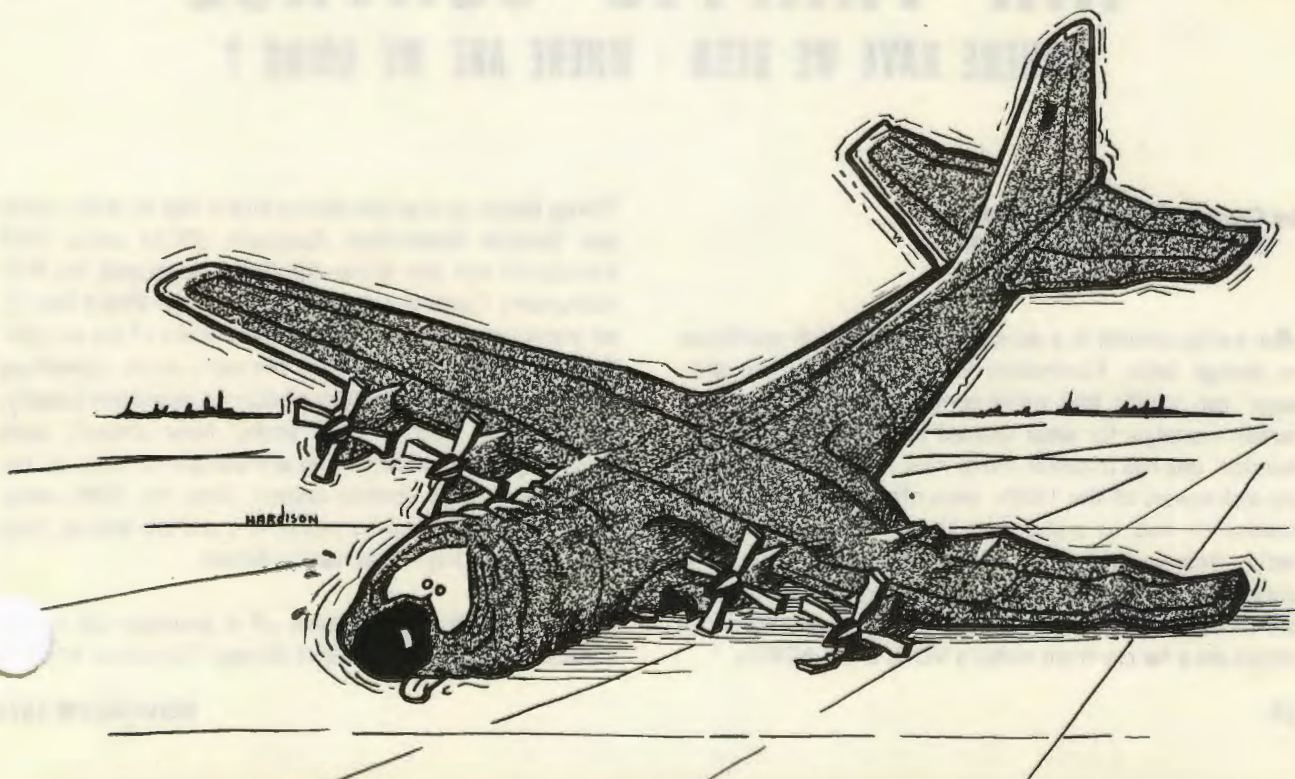
Winds, associated with a thunderstorm, reached a peak velocity of 52 knots. The high winds caused a C-130 parked on the ramp to yaw approximately 30° and tip over on the left wing pylon tank, then return to an

Following his emergency procedures, the pilot jettisoned his drop tanks, landed the aircraft, and slid to a stop with relatively minor damage to the aircraft.

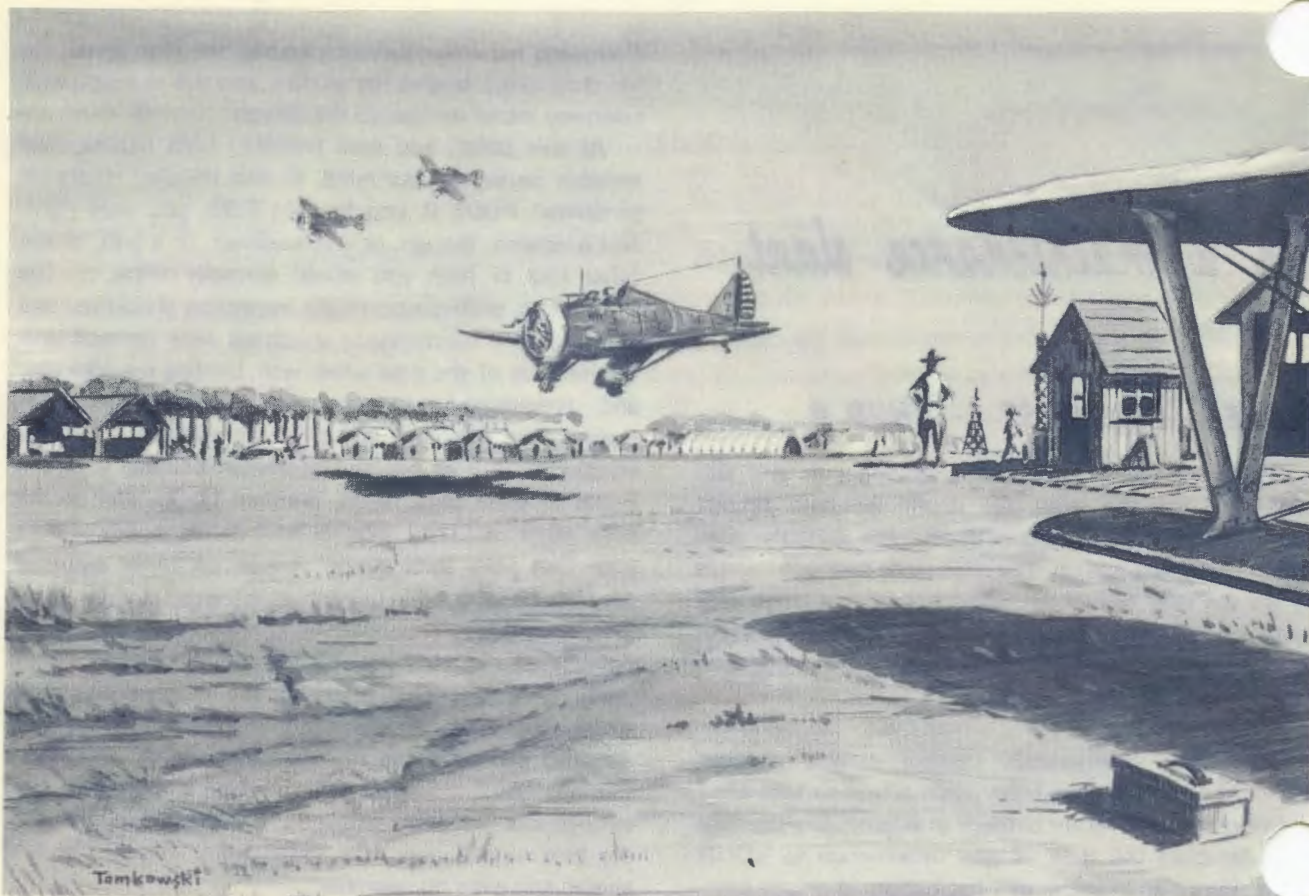
At this point, you have probably been mulling over possible causes in your mind. Broken linkage? Hydraulic problems? FOD? If you thought FOD, you were right. Not a wrench, though, or a screwdriver, or a bolt, or any other tool or item you would normally think of. The work cards, preflight-postflight inspection checklists, and two flightline maintenance checklists were jammed into the left side of the nose wheel well, binding the nose gear and preventing extension. An informal survey of maintenance personnel and pilots at several F-105 units revealed that it is not an uncommon practice with the F-105 to place pins, forms, preflight books, etc., in the nose wheel well until removal prior to flight. Where does *your* unit place these items? Are all personnel aware of the hazards involved in using nonauthorized storage areas? They should be!

upright position. One blade of the number one prop struck the ramp and was bent. The left pylon was damaged and separated from the pylon strut, which was warped. Adding insult to injury, a portable fire extinguisher had been left under the left wing. When the big bird tipped over, the extinguisher struck the left aileron and wing tip assembly.

The unit, in their preliminary message, rather smartly stated that they were conducting an "immediate review of weather warning and tie down procedures." Do your procedures need updating? Don't wait, check 'em and see.







# AIR TRAFFIC CONTROL

WHERE HAVE WE BEEN - WHERE ARE WE GOING ?

by Captain Joseph L. Thomas  
Hq TAC/DCF, Langley AFB, Va.

**A**ir traffic control is a dynamic process which continues to change daily. Controllers from the "old brown shoe days" can testify that we've come a long way. Despite a certain nostalgia for what seemed to be the golden era of aviation, one has to admit things have improved. Our early control towers of the 1930s were often guard shacks and controllers had to make do with one or two common radio frequencies, which were extremely noisy and unreliable. Most older pilots can attest to the fact that the old en route light beacons and low frequency loop radio ranges are a far cry from today's VORs and TACANs.

Things began to improve during World War II; VHF radios and Ground Controlled Approach (GCA) units were introduced and the Army Air Force developed the first Instrument Landing System (ILS). Before World War II, air transportation was a minor component of the world's transportation system. During the war military operations telescoped a quarter century of normal peacetime aviation development into a few years. New aircraft were becoming more sophisticated and demanded more of the ground air traffic control system. Thus, by 1945, while the controllers had better equipment and procedures, they were still working just as hard as before.

One of the first major tests of a precision air traffic control system came in 1948 during "Operation Vite."



the "Berlin Airlift" as it is more commonly known. During 1948 and 1949, the skies over Berlin were thick with aircraft airlifting fuel and food to the two and a half million people of West Berlin. The air traffic control services provided to these aircraft were almost superhuman. This is especially true when you consider there were five Russian airfields in the same area where the Western Powers were operating three of the busiest airfields in the world. The two greatest steps forward in air traffic control were made during the Berlin Airlift: (1) Direct communications between the ARTCC controller and the pilot, and (2) The use of radar to control aircraft from departure to arrival.

The 1950s saw the changeover from propeller driven aircraft to jets, and from VHF to UHF radios. During this period radars were improved, new NAVAIDs entered the system, and air traffic concepts changed. Radar Approach Controls (RAPCONs) began replacing the old manual/conventional approach controls.

As the 1960s approached, air traffic controllers were faced with even greater challenges in terms of aircraft and new ATC systems. The FAA was updating its Air Route Traffic Control Centers (ARTCCs) and Terminal Radar Approach Control (TRACON) facilities. By this time the, through development and testing, had secured the



ASR-4 surveillance radar and was working on the ASR 5, which was later purchased by the USAF and classified as the AN/FPN-47 Radar Approach Control (RAPCON) System.

Air traffic controllers found themselves in Viet Nam as advisors in the early 1960s. By 1968, ten fixed air traffic control locations were being operated and maintained to support the Southeast Asia war effort. These locations became some of the busiest air terminals in the world, exceeding O'Hare International Airport in total operations.

In addition to providing standard terminal services, air traffic controllers also manned six Air Traffic Regulation Centers (ATRCs) in Viet Nam. ATRC controllers operated as part of the Tactical Air Control System (TACS) working within long-range radar sites with Weapons Controllers. The mission of the ATRC was to provide service to tactical aircraft operating within the combat area. These services included radar control, radar monitoring and artillery and air strike advisories.

In the seventies, the air traffic controller can look forward to an ever changing future as new and modern equipment is procured. New equipment coming into the inventory will be automated and semiautomated, designed to release the controller from routine and manual tasks.

Control within the terminal area will be vastly improved in the 1970s as BRITE II radar, ATIS, new radios, and new tower consoles are added to the control tower. BRITE II radar will improve surveillance and aircraft movements within the airport traffic area. This system will provide the tower controller with a new capability which will permit safer and more positive air traffic control service. It will provide better spacing and





## Air Traffic Control

sequencing of traffic. This system is already installed at a number of bases and is in the process of being installed at others. ATIS (Automatic Terminal Information Service) will provide automatic and recorded relay of routine non-control, but essential terminal information such as weather, approach information, traffic patterns, airfield, and runway conditions. Project "Rivet Switch" is a program to eliminate the old radio equipment in use today, and replace it with new dedicated or multichannel radios. New control tower consoles are designed for more effective utilization, and will increase the capabilities for landline and radio communications.

In addition to improvements in control towers, en route and terminal radar facilities are also being updated. Many mobile GCAs are being replaced with GPN-12 fixed GCAs or RAPCONs. These new facilities will be the latest in dual-channel solid state radar, and will include the TPX-42 DAIR (Direct Altitude and Identity Readout). These new radar facilities will also have improved radios, videomappers and tape recording capability.

Other improvements include solid state ILS, NAVAID status panels, new pilot-to-dispatcher radio, and improved landline communications for inter/intra air traffic control facility coordination. New tower and radar simulators at the USAF Air Traffic Control school will permit student controllers to receive training as close to "real life" as possible. In addition, the new TPN-19, Landing Control Central will provide truly mobile air traffic control equipment capable of base type operations.

To keep pace with the introduction of new air traffic equipment and procedures, more effective utilization of air traffic control officers and NCOs will occur as a result of career-broadening opportunities. Future air traffic control officers will have to have a college education with math through calculus, or be rated. After being accepted into the 16XX career field, they will attend an extremely difficult, technical ATC course at Keesler AFB, followed by 18 months actual control training at one of seven CONUS officer training locations.

Not until all this training is completed will an officer be ready to take his place as a qualified ATC officer. Once an officer has three years in the career field, he is eligible to apply for Training With Industry (TWI) under the AFIT program. This training includes ten months training with the FAA, in which he will attend the FAA Academy and work in an ARTCC. Further along in his career, the air traffic control officer will attend an Air Traffic Control Staff Officers School at Keesler AFB. These new entrance requirements, together with the increased training requirements and the fact that approximately one-third of

all future air traffic control officers will be rated, shall insure that the future ATC officer force will be able to keep abreast of, if not ahead of, ATC systems developments. In addition to the improved training for officers, an NCO training program has been developed. Under this program, enlisted air traffic controllers will have the opportunity of attending civilian colleges and obtain an AA and eventually a BA degree in Air Traffic Control. However, even with improved equipment, procedures, and personnel, future air traffic control faces many problems. The days of VFR flying for military pilots may be numbered, and with mandatory IFR and Stage I, II, and III VFR Advisory Service, further demands will be placed on the ATC system. With the increase in the size of aircraft, wake turbulence will continue to be a problem. Automation of air traffic control system, along with a reliable collision avoidance system, are areas in which development must be expedited. Saturation of the aviation system, particularly during certain hours by both military and civil aircraft, will continue to complicate air traffic control. The impact of environmental concerns will also be important in the future. All of these subjects, and more, are being studied by both the FAA and the military, and will require many changes to existing flying/air traffic control procedures.

The future in air traffic control promises to be exciting and stimulating. We must learn, however, to put the "good old days" behind us, because future aviation and air traffic control will require a sense of dedication and responsibility never required before. As President Nixon stated in his State of the Union Message on 22 January 1970, "The seventies will be a time of new beginnings, a time of exploring both on the earth and in the heaven, a time of discovery. But the time has also come for emphasis on developing better ways of managing what we have and of completing what man's genius has begun but left unfinished."







# THE AIRLIFT INSTRUCTOR SCHOOL

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the airlift instructor school

**W**hen you wander back through the history of TAC's long association with the C-130 Hercules, it gives one the impression that he's actually looking at the barometer of reaction by the United States to incidents of civil strife, natural disaster, and world crises. In many ways one can even judge the depth of national policy commitment by counting the number of C-130s that were called to the scene, be it internal or international. And rightly so. There is no airplane anywhere, in its category, that is as flexible as the Hercules. After all, how many airplanes can be loaded with 30,000 pounds of assorted cargo, flown for 3000 miles, then landed on a 3000 foot dirt strip?

Of course, as with other things, the C-130 has changed and irgh the years. We've seen it go from Roman-nosed, partie-bladed prop A model to the longer legged E model

identified by its four-bladed props and large external fuel tanks. We've seen the gross weight increase from 124,000 and 135,000 to 155,000 and even to 175,000 pounds. We've seen it grow skis, sprout whiskers, bristle with guns, drop bombs, carry and launch other airmachines, and act as an airborne command post. We've seen the people flying the machine go from rosy-cheeked lieutenants and captains to sage-old lieutenant colonels and majors and back to lieutenants and captains again. We've seen airdrop tactics move from the WW II "V" formation to the more flexible "in-trail" formation. We've seen the introduction of the Adverse Weather Aerial Delivery System (AWADS) which will call for even more changes in tactics. And we've seen pilots progress from the right seat to the left seat, then back to the right seat again as instructors. We've seen navigators, flight engineers, and loadmasters increase





## THE AIRLIFT INSTRUCTOR SCHOOL



their knowledge and proficiency and thus attain instructor status. But there's one thing we haven't seen . . . a TAC Airlift Instructor School. That is, up until this year.

Now, out at Little Rock AFB, Arkansas, just such a

school has been organized. Eventually the school will train instructors for all crew positions; however, at the present time only pilots and flight engineers are receiving the course (ground school and flying). As a matter of record,



Attendance is now mandatory for those upgrading to Instructor Pilot (IP) and Instructor Flight Engineer (IFE). TAC airlift units can no longer upgrade pilots and flight engineers to instructor status within their unit. Exception to this policy can be granted through TAC DOL (Director of Airlift). It's a different story for instructor navigator and instructor loadmaster candidates. Currently, navigators and loadmasters are receiving only ground school; however, along about January 1973, they too will receive flying training and it is anticipated that at that time similar restrictions concerning unit upgrading will apply.

### THE SCHOOL PHILOSOPHY

Picture a dimly lit classroom with papers strewn about, ashtrays bulging, and a quivering mass of students fidgeting in their seats while nervously awaiting the arrival of the airlift deity, the INSTRUCTOR. The door bursts open and in strides the INSTRUCTOR with a mangled rum crook jutting from the seasoned face. He steps behind the lecturn, gazes with disgust over the assemblage of lowly students, slowly removes the pulpy cigar from his mouth, belches once, then begins, "All right, I'm gonna tell you what I'm gonna tell you and if you get it, you'll be able to pass the stan/eval test. If you blow the test, it'll be for one of two reasons. Number one: you didn't listen; number two: you didn't study. If you got any questions, save them till the end of my pitch and if I can't answer the question, then you don't need to know it. Any questions?"

Of course this is an obvious exaggeration of the traditional instructor and is not representative of the new school. The example is used to point out that in the past, instructional efforts have revolved around the instructor as the center of learning. Today, while the classrooms appear to be conventional and the ashtrays may still overflow occasionally, the training philosophy has gone through a complete (and needed) change. The traditional training philosophy has been replaced by a new approach called Instructional Systems Development (ISD) which focuses on the student as the center of learning. It removes the instructor from his ivory tower position of dictatorial information dispenser and instead integrates him into the learning situation as a guide and manager. It also removes the student from the barrage of fast flowing facts which, traditionally, he has had to absorb by osmosis and instead thrusts him into the learning environment as a participant.

The school instructors are a group of dedicated, aggressive men who apply the ISD approach both in the classroom and the airplane. Their purpose is to train the instructor candidates, using the ISD approach, so that the

graduate can apply the learned principles in his future instructional efforts. Thus, the primary objective of the school is to teach the instructor candidates HOW to teach rather than what to teach.

### THE PROGRAM

The first few classes to attend the new school were composed of previously qualified instructors. Their attendance was necessary in order to get quality feedback concerning course content, course goals, and methods of instruction. Many of these instructors' ideas were adopted and incorporated into the syllabus.

As stated previously, the primary objective of the instructor school is to teach the instructor candidate how to teach. Not a great amount of time is spent on advancing the attendee's knowledge of aircraft systems. When the unit wing commander selects a man to attend the course, he is selecting the best qualified individual who should already have a detailed knowledge of aircraft systems. It's important to note, however, that during the course of instruction, the attendee will conduct practice teaching sessions on aircraft systems. In this manner, the instructor candidate gains a measure of additional system knowledge.

### THE COURSE

The length of the course for all crew positions is 17 training days (approximately 23 calendar days). This includes 8 classroom training days plus various other academic, mock up, or instrument trainer sessions that vary according to crew position. In the flying phase, pilots and engineers will get five flights plus a stan/eval check ride (30 hours); navigators will get three rides (20 hours) plus a lead flight check (5 hours) and an instructor flight check (5 hours). Loadmasters will receive three instructional flights plus a check ride (20 hours).

### SUMMARY

The Airlift Instructor School has been the goal of many people for a long time. With the overall experience level of airlift pilots decreasing, the school represents a repository of knowledge that will be vital in maintaining a well informed and highly qualified instructor force. Additionally the school offers the bright prospect of eliminating the burden of instructor upgrade training within primary mission squadrons and, without a doubt, its future contributions to instructor standardization within the airlift fleet will be long reaching. Better standardization means a better safety posture. All TAC airlift will benefit.



# letters to the editor

## judgment

I would like to draw your attention to an article published in the February 1971 issue of your outstanding magazine. The article was under TAC Tips, subject: "F-100 Abort." In that article you questioned the pilot's judgment in doing his bold face procedures "by the numbers" in that he dropped his tail hook as the last step in the bold face abort procedure. You stated, "Why not do first things first," and "It's nice to be standardized — but don't let it kill you."

In the April 1971 Letters to the Editor, you published my letter questioning TAC ATTACK'S position in regard to standardization. In answer to my letter you stated, "By deploying his drag chute first he forfeited his chance to catch the BAK-12 with his tail hook." Additionally you stated, "To read the bold face procedures straight out of the book takes approximately seven seconds."

In the example cited in the August 1972 issue entitled, "Over-Education," the pilot made an attempt to catch the only barrier he had available by dropping his tail hook as the second step in his abort procedure. If it takes seven seconds to read the bold face procedures, he would not have gotten the hook down in time to catch the mid-field barrier. In one case you damn the pilot for following the Dash One, and in the next you damn him for not following it. Quote: It seems he did his abort procedures "by the numbers." That's all well and good but look at it another way — why not do first things first (February 1971) and, quote: Whatever the explanation, one points remains clear. Had the pilot accomplished the bold face procedures in sequence, he could

have stopped the airplane on the runway and wouldn't be reading about it now (August 1972).

In one instance you condone not following the checklist; in the next you chastise because the pilot did follow it. Let's get to the real issue, Pilot Judgment. As stated in all Dash Ones, these procedures provide guidance for most operations but are not a replacement for sound judgment. Had the pilot caught the mid-field barrier, you would have applauded him for good judgment. Because he missed the mid-field barrier, you say his judgment is bad and damn him for it. As you state in the "Over-Education" article, "If you choose to ignore the procedures, you'd best be right."

I agree that, with perfect judgment, we wouldn't have any pilot factor accidents; but, as TAC's Safety magazine, you can't take that as a position — as to whether or not pilots follow checklists.

Major John D. Mitchell  
Chief, Safety Division  
4410th Special Operations Training Group  
England AFB, LA

*You're quite correct. With perfect judgment, we wouldn't have pilot factor accidents nor would we have much need for safety magazines.*

*We would be naïve to believe that Section III of the Dash One and the Emergency Procedures Section of the checklist contain crew actions for all emergencies and cover all situations. Certainly the builders of the book recognize that fact, as you pointed out in paragraph four. This does not mean that we pilots have a blank check for ignoring checklists. In most cases the flight manual and checklists cover the situation being confronted, but sometimes they don't. So where does that leave the man in charge of the machine? It leaves him in the position of making a decision based upon his knowledge of the equipment, evaluation of the situation and his experience.*

*We at TAC ATTACK attempt to add to a man's experience and to his ability to correctly assess the situation by pointing out both good and bad judgments made by other men. The goal, of course, is to help the reader think and be more aware of what he might do should a similar situation occur.*

*It's a hard fact of life that, in many cases, success is criteria. Ed.*



# 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	5.7	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
OCT		3.2		6.9		2.1
NOV		3.3		6.9		2.0
DEC		3.2		6.4		1.8

# AIRCRAFT ACCIDENTS

## UNITS

	THRU SEPTEMBER					THRU SEPTEMBER			
	1972		1971			1972		1971	
	ACDTS	RATE	ACDTS	RATE		ACDTS	RATE	ACDTS	RATE
9AF	6	3.2	7	3.6	12AF	13	4.4	6	2.1
1 TFW	3	10.0	2	7.0	23 TFW	1	9.8	0	0
4 TFW	0	0	0	0	27 TFW	1	5.7	1	5.9
23 TFW	0	0	N/A	N/A	35 TFW	1	3.4	1	3.2
31 TFW	1	5.6	2	11.4	49 TFW	4	16.3	0	0
33 TFW	1	12.1	0	0	58 TFW	2	4.8	3	8.2
68 TASG	0	0	0	0	67 TRW	0	0	0	0
316 TAW	0	0	0	0	71 TASG	0	0	0	0
317 TAW	0	0	0	0	313 TAW	0	0	0	0
354 TFW	1	4.4	1	5.2	314 TAW	0	0	0	0
363 TRW	0	0	0	0	355 TFW	1	4.4	0	0
4403 TFW	0	0	2	16.3	347 TFW	1	6.7	0	0
					474 TFW	2	8.5	0	0
					463 TAW	0	0	0	0
TAC SPECIAL UNITS									
1 SOW	1	2.1	3	8.2	4410 SOTG	2	9.5	1	8.1
2 ADG	0	0	0	0	4485 TS	0	0	0	0
57 FWW	3	21.3	1	6.7	4500 ABW	0	0	0	0
AOS	1	-	1	-	OTHER	2	-	1	-

TAC		
SEP 72	Thru Sep	
	1972	1971
3	42	25
3	28	20
0	32	10
2	26	15
4	27	17
4	19	15
0%	70.4%	88.2%

## SUMMARY

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

ANG		
SEP 72	Thru Sep	
	1972	1971
1	16	18
1	13	15
0	2	6
2	11	15
2	8	12
2	8	9
100%	100%	75.0%



