

TAC ATTACK

OCTOBER 1967



other end of the
boom ...page 4

for efficient tactical air power

TAC ATTACK

OCTOBER 1967

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TACTICAL AIR COMMAND

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current interest

FROM THE OTHER END	Pg 4
- of the boom	
HOW TO HAVE AN ACCIDENT	Pg 12
- with only a little trying	
THE OTHER DOOR	Pg 14
- operation goof-proof	
WHY THE GRANNY BREAK?	Pg 18
- for phantom flyers	

departments

Angle of ATTACK	3
Loadmaster of Distinction	7
Chock Talk	8
Better Mousetrap Dept	10
TAC Tips	16
TAC Tally	22

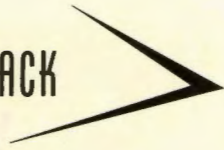
TACRP 127-1

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



Safety is where the Action is!

Safety, or more specifically an efficient and mishap-free operation, is a positive thing. It is the result of a lot of thought, hard work, and action.

The units...and people...that manage to operate in an accident-free atmosphere do so with a good deal of daily professional effort. An accident-free year is a significant accomplishment. But the people who get there do it one day at a time. They actively go about finding ways to successfully complete a job, instead of hemming themselves in with "don'ts" and "can'ts."

The purpose of an accident prevention program is not to restrict operations. A positive safety program actually extends our operational capabilities by:

- Examining our equipment, facilities, training, and operations.
- Following through on corrective action when deficiencies turn up.
- Briefing and educating the people in our operation on the things that cause accidents...and how to avoid them.

Commanders can generate this action, safety officers can guide and monitor it, but the action itself...the work...must come from every man in every job in every unit.

The action that makes a successful accident prevention program is the action that makes any operation successful. You can't separate them.

So the action that comes from a spirited group of people, who know what they have to do, and how to do it in the best possible manner...that action produces a safe operation.

Safety is where the action is...planned, positive, and purposeful action.

Think about it!

N. K. CRANFILL, Colonel, USAF
Chief of Safety

from the other end of the boom

by SSgt William S. Wagner
922 Air Refueling Sq.
Wright-Patterson AFB



Yes, I lie down on the job!

And it's true . . . I have a high-priced crew chauffeuring me around the sky! But it's not pure rest and relaxation. In fact, I worry a lot on dark, vertigo-producing nights when a flight of fighters is behind me.

Why do I worry? My nickname's Clancy. I lower the boom. You fighter types call me "Boomer."

I fly that long gaspipe on the back end of a tanker. My captive bird swivels around a flex coupling at one end and "ruddevates" at the free end. The control surfaces combine a rudder and elevator function and fly the boom in azimuth and elevation. The rudder control stick keeps my right hand busy following your receptacle around the refueling envelope.

The boom telescope handle on my left makes it a two-fisted job and adds the third dimension to the envelope. I can reach out from zero to 20 feet with the sliding tube, but six and 18 feet mark the inner and outer limits for normal contact. That adds up to a long 12 feet to play with before you get an automatic disconnect.

The telescoping tube can kick harder than any mule. You may have seen a few small hoofprints around some receptacles.

The tube can either hurt you or help you. That's why I worry a lot. Boomers want your air refueling contacts smooth and safe. We feel as good about a soft "contact made" as you do about grease-job landings.

To keep me busier than any slide trombonist you've ever seen, I have a few gages to monitor in my horizontal hideaway. As in most any flying job, I have limits to observe... and some degree of penalty if I exceed them.

My crowded "pad" boasts an assortment of switches and gages. I have switches that control internal and external tanker refueling lights, manual or automatic boom limit control, coaching switches for the receiver director lights, and four important gages. Three of the gages tell me boom positions: azimuth in degrees right or left, elevation in degrees below horizontal, and sliding tube extension in feet.

The fourth gage tells me about my signal coil operation...the chances for a normal contact with all automatic boom limits working. A bad signal coil denies both you and me the protection of automatic disconnects when we exceed azimuth, elevation, or extension limits. Without the signal coil I'm in the manual mode...and my crosscheck really speeds up. So does my radio chatter. I try to keep the receiver pilot informed about his position in the envelope before we're forced to call for a disconnect. Or worse, a break-away!

Sometimes I can't talk to you. Say we have radio failure and you must have your fuel...I hope you're real sharp on following the pilot director lights. And I hope you know your visual signals. That's all the we have left!

One of us can't be zigging while the other one's zagging. Threading the eye of a needle about 34 feet away at night, with a thread almost as big as the needle's eye...that takes close cooperation! We can't afford much improvising. We can't play it by ear without creating unexpected problems.

That's why air refueling worldwide, with or without radios, mating tankers with a wide variety of airplanes, demands standardization. We boom operators have to live by the air refueling procedures manual.

And we need your cooperation and understanding. Some of my hairiest memories involve night, radio-out refuelings with needle-nose fighters. Shish-ke-bab skewers...when they don't stabilize and they move in too fast from pre-contact.

About then I hope you've read the manual and recognize director light signals. I don't have many places to hide.

Refueling the F-4 creates a few special problems for boom operators. The size and location of the Phantom receptacle makes us long for the days when we played hide-the-B-47. There was a beautiful slipway and receptacle, a good size funnel...and well lit!

In setting up for the F-4, I trail the boom at zero azimuth, ten foot tube extension, and 32 to 34 degrees elevation. Because of the F-4's receptacle angle, this is the best boom position for initial contact. I run all my boom checks

beforehand...azimuth, elevation, and telescoping. I note the boom control minimums and keep in mind any tendency of the boom to lead or lag the control stick. If the boom has any tricks up its ice shield, I want to know in advance.

When you come within two or three feet of the nozzle, I ask you to stabilize. If you don't, I have problems. The F-4 receptacle is very small and almost fully hidden from my view by the nozzle. To keep from cocking the nozzle and damaging the receptacle, I must extend the tube slowly and accurately. A moving receiver, whipping boom, or sudden stab leaves those little mule-shoe reminders.

I know some of you fighter pilots get a little edgy about this time. You can't understand why the delay. I'm sure the time seems a lot longer than it really is. But here's a time to make haste slowly. There's too much at stake. And your canopy is mighty close.

If I've reached you at twelve foot boom extension, with azimuth centered and about 32 degrees elevation, you should see "Captains Bars" on my pilot director lights. If you keep them lit on that pinball machine, you're among the best in the business. The bars indicate exact center. Unless we're offloading in radio silence, I'll try to talk you back there if you move out.

The pilot director lights take a little extra study. The interaction of the fore-and-aft and up-and-down lights may mislead you

other end of the boom

at first. The axis of the director lights is inclined at a 30 degree angle to the fuselage... about the same angle as the trailing boom. The up-and-down lights change as the boom angle changes. The fore-and-aft lights change with the push-pull of the boom from 12 foot extension. As a result they don't give you pure vertical and horizontal indications.

If you move straight up, you're compressing the boom and reducing its angle with the fuselage. The lights will indicate that you made an up and forward movement. Moving forward in level flight you again compress the boom, but this time the boom angle increases. The lights will show you flew forward and down. You can see how small fore-and-aft corrections to "Captains Bars" can be made by moving vertically in the envelope.

For a time, normal disconnects with the F-4 caused some difficulty. Some of us boomers began to think the receptacle was smaller than the nozzle! Most of the time the Phantom pilot succeeds in breaking his hold on the boom by pulling his IFR circuit breaker. When this doesn't work, the next step is rude treatment of nozzles, toggles, and receptacles. But it's better than landing in a two ship in-trail formation. Some of my boss's landings are tough enough... without a trailing satellite.

When all else fails, the brute force disconnect is a last resort.

It's a tug-of-war between tanker and receiver. The weight of your fighter slowly moving down and aft pulls the telescoping tube to max travel. There's no more. Now it's up to the weakest link to let go.

And when it does I'm glad the boom isn't mounted on a bungee cord.

It's anybody's guess whether the boom nozzle or the receptacle will let go first. Sometimes the entire boom gets torn up. Seldom does tanker or receiver avoid some air refueling system damage.

The angle of boom nozzle entry is critical on the F-4 on hookup and equally so on a brute force pull out. If the Phantom pilot can start in the "green" or "Captains Bars" position and maintain the same angle on the tanker centerline during his slide to freedom, the boom nozzle should release. The farther he's away from zero azimuth and 30 degrees elevation, the more likely he'll encounter nozzle binding. If you descend vertically or decelerate straight aft and level, during a brute force disconnect, you change that critical boom elevation angle. If possible, hold that 30 degree angle to the tanker fuselage as you withdraw.

Equally important: Move slowly! Maybe the term brute force suggests too much violence. Fast, erratic movements or sudden jerks aggravate the problem. It works better if it's slow and easy. And the chances that both of us will

refuel again on that sortie are a lot better.

I know how I feel when I lose a nozzle. I can imagine how a fighter's buddies feel when they see their onload disappear because the boom's broken. It's a rough way to lose a mission.

The visual signals between tanker and receiver give some fighter pilots trouble. There are about ten of them, but the two ending with a stowed boom confuse most of you. I've heard some boomers describe fighters following a boom thru actual stowing... like a hummingbird... still trying for an offload.

The crutch I use to keep them straight in my mind is nodding your head for Yes, or moving it horizontally for No, before stowing. If I nod vertically before stowing: I'll be back. My problems are temporary and I hope you can sweat out the short delay. If I move it side-to-side and go stowed: I'm out of business. I've got a malfunction or boom problem too dangerous to fool with.

Believe me, nobody is more anxious to give you fuel if it's humanly possible, than your boomer. Like you, we take pride in our work. We want to give you the best we have from Tally-ho to Disconnect. If we could reach your windshields, we'd wash 'em! But Green Stamps we can't provide.

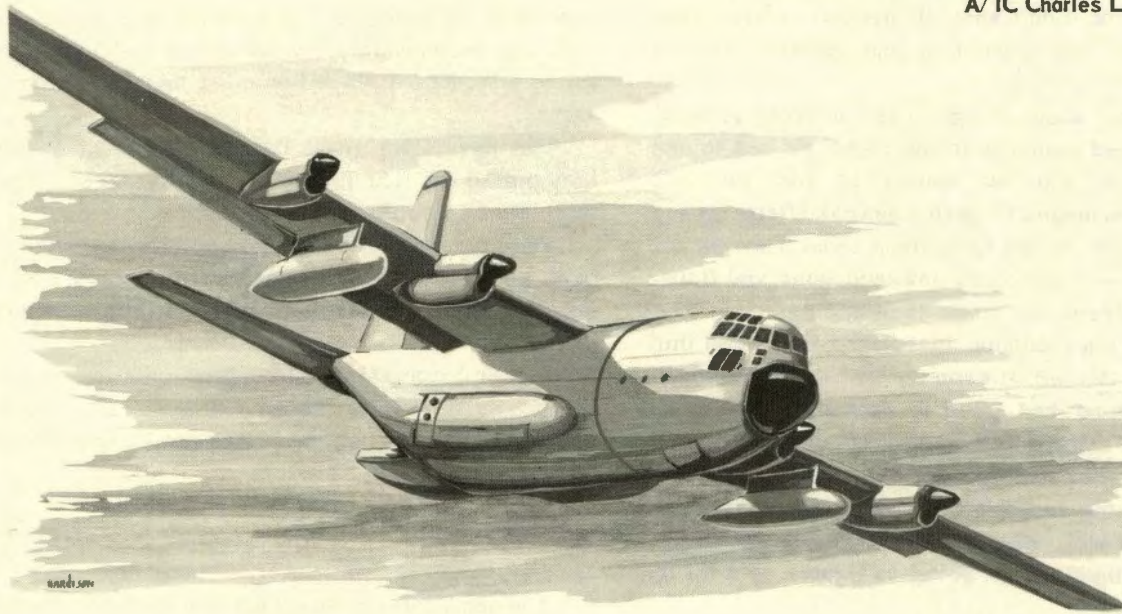
We really respect you fighter pilots. And we want to provide you the best and safest refueling that our experience will permit. ➤

TACTICAL AIR COMMAND

**LOADMASTER
OF
DISTINCTION**



A/IC Charles L. Ivy



Airman First Class Charles L. Ivy of the 62nd Tactical Airlift Squadron, 64th Tactical Airlift Wing, Sewart Air Force Base, Tennessee, has been selected as a Tactical Air Command Loadmaster of Distinction.

Airman Ivy discovered a flare had jammed in the flare tube while on a C-130 flare support mission. He attempted to eject the flare from the launcher by pushing it out with a wooden plunger. At this time, the compressed air driven firing piston dragged the entire flare back into the launcher. The flare immediately exploded, showering him with smoke and hot air.

He realized that ten seconds after the initial

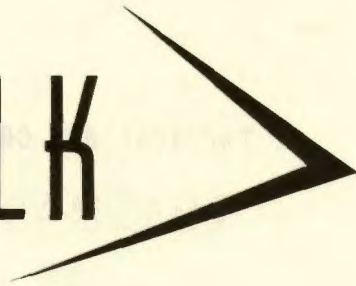
explosion the primary explosion would take place. The flare would burn at 15,000 degrees Fahrenheit. He knew it would be impossible to extinguish the fire with the equipment aboard the aircraft. Because of the blinding light and intense heat from the flare, he would be unable to work within forty feet of it.

Airman Ivy immediately signaled his two assistant loadmasters to evacuate the area and then jettisoned the entire launcher from the aircraft.

Airman Ivy's calm demonstration of outstanding professionalism and airmanship in this hazardous situation qualify him as a Tactical Air Command Loadmaster of Distinction.



CHOCK TALK



tighten it up

The F-84 pilot was flying wing in a formation take-off. Although he didn't know it, his left aileron went full down, and then locked in that position, during takeoff roll.

He found out about it right after he broke ground! The bird rolled violently to the right! He had to use full left stick and left rudder to stop the roll.

The pilot managed to get his gear and flaps up and punch his tanks in the local drop area. Then he set up a straight-in approach, lowered gear and flaps, and landed without any more excitement.

When the maintenance investigators looked into it, they found the left aileron control linkage disconnected. Someone had tried to replace a 5/16-inch bolt and self-locking nut with a 1/4-inch bolt. And then whoever did it forgot to properly tighten the nut! Both the nut and bolt were kicking around loose in the spoiler well when the investigators got there.

The unit involved is going to tighten up a bit on inspections.

chaffed lines-1

The student aircraft commander and his instructor had just completed a Mach 2 profile in an F-4. Then they returned to the pattern to shoot touch and go landings. Climbing to downwind after the second one, they got the feeling they weren't getting full power. Checking, they found the right engine nozzle full open.

A few seconds later the right generator dropped off the line. And oil pressure was down to about seven pounds. They shut down the right engine and landed.

Investigators found that a frayed wire had made contact with the hose that returns engine oil to the right engine. Electrical arcing then cut the hose and the engine oil went over the side.

chaffed lines-2

Passing 13,000 feet in their climb, the T-39 crew saw their right engine fire warning light come on. It didn't go out when they leveled off and pulled the throttle to idle. And it stayed on after they shut down the engine!

The persistent little light even stayed on after they pulled the fire T-handle and discharged both extinguishers into the offending engine.

They turned their Tiny Airliner around and landed back at their takeoff base. When they pulled off the runway, the fire department couldn't find any evidence of fire.

Closer inspection by the engine folks revealed that the forward loop of the fire detection system had chaffed against some fuel lines until it shorted out.

old, familiar tale

The instructor pilot in an F-100F was Number Two in extended trail formation. Suddenly, while he had about 450 knots and 2G on the airplane, the saddle back cover came off. He went home and landed without any more trouble.

On the ground, inspectors found that when the saddle back cover came off, it damaged a fin on the right 275-gallon drop tank. They also found that none of the eight saddle back latches had been secured before takeoff!

check that checklist

Just as the Phantom crew broke ground on takeoff all their external stores jettisoned. Like ... one 370 and one 600-gallon tank, two SUU-25 flare pods, four CBU-24s, one MER, and two TERs.

...incidents and incidentals with a maintenance slant.

inside outside

To make a long story short, the armament investigators found a short in the external stores jettison switch. As soon as the airplane was airborne, the circuit was complete through the landing gear switch.

The mechanic who signed off the inspection after loading had not made a mandatory circuit test. He couldn't have overlooked the test if he had been following his checklist.

aw, c'mon guys!

The two Airman Seconds were pulling a 15-day circuit check on the bombing system of an F-100. They hadn't gone far in their check when the ejector cartridges fired in the Type VII pylon. The pylon was damaged beyond repair and some of the aircraft skin was torn and bent.

They had not removed the cartridges before they started the inspection...because they weren't using their checklist!

The F-100 had been loaded and armed for a gunnery mission. It was a routine operation, the people involved had been doing it every day for months.

Everything went smoothly until sometime after takeoff, when the right gun bay door came off. That wasn't enough, it banged against the right drop tank as it left the airplane. And the drop tank, with a big split in it, lost all its fuel!

The disappointed pilot went home and landed... mission abbreviated and valuable training lost.

When armament inspectors took a look at the bird on the ground they discovered the door had been improperly installed. The people who installed the door put the leading edge outside the aircraft skin instead of inside as it is supposed to be. Once the bird was airborne, airloads ripped the door off.

The unit involved decided to show all their load crews how it happened...so they wouldn't make the same mistake again.

PEANUTS

Courtesy of Daily Press, Newport News, Va.
© United Feature Syndicate, Inc. 1966



BETTER MOUSETRAP DEPARTMENT

For some reason, fighter airplane drag chutes have always given us a lot of trouble. They forever seem to be working themselves out of rig...or is it just that the results are often so dramatic when a drag chute system fails?

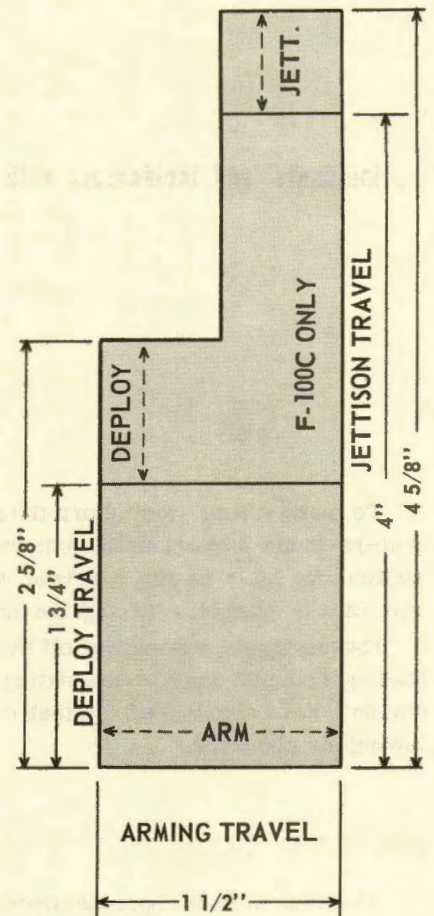
It's difficult to accurately measure the F-100C drag chute control handle travel. It's especially hard to make accurate adjustments with the common six-inch rule we find in most mechanics' tool boxes.

Master Sergeant William Hainline of the 185th Consolidated Aircraft Maintenance Squadron, Iowa Air National Guard, mulled

all this over and came up with a handy measuring gage. It's easy to carry, simple to manufacture, and makes adjustment quick and simple.

Sergeant Hainline made his measuring guide from .080 2024-T3 sheet aluminum, marked it with 1/8-inch metal letter punches. Using three different sides, he can measure the three critical points in drag chute handle travel... Arm, Deploy, and Jettison.

Good idea, Sarge...your idea makes an accurate job easier! And folks working on other birds can adapt your idea by changing the measurements to fit their particular machines.



3rd TFW

REUNION

Editor
TAC ATTACK Magazine

Dear Sir:

It would be greatly appreciated if you would print the following notice for former officers of the 3rd Tactical Fighter Wing, the first jet fighter unit assigned PCS to Vietnam:

"A reunion of the 3rd Tactical Fighter Wing will be held at the Westward Ho Hotel in Phoenix, Arizona, on 10 and 11 November 1967. All officers who were assigned to the wing at Bien Hoa are cordially invited. Personnel desiring reservations or information should contact LCol H. M. Christiansen, 1933 Sioux, Glendale, Ariz. 85301, or phone LCol C. H. Purcell, Luke AFB, Ext 2941/2942."

Sincerely,

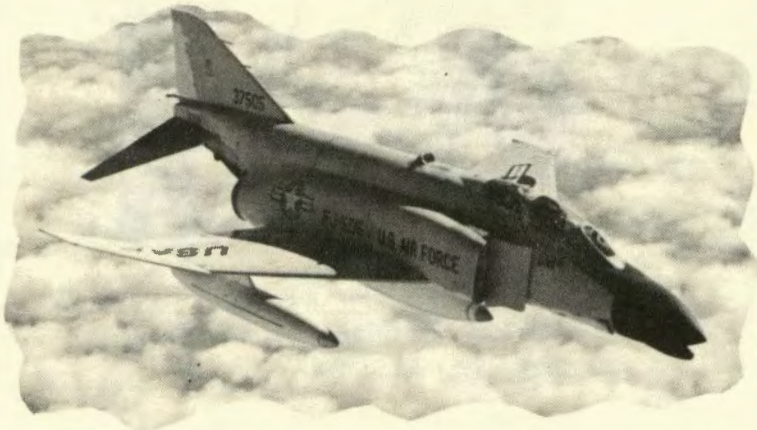
ROBERT ACKERLY, Colonel, USAF

MAINTENANCE MAN OF THE MONTH

Technical Sergeant James M. Horne of the 4410th Combat Crew Training Wing, Hurlburt Field, Florida, has been selected to receive the TAC Maintenance Man Safety Award. Sergeant Horne will receive a letter of appreciation from the Commander of Tactical Air Command and an engraved award.



Sgt. James M. Horne



CREW CHIEF OF THE MONTH

Staff Sergeant Harlen H. Duesing of the 33rd Tactical Fighter Wing, Eglin Air Force Base, Florida, has been selected to receive the TAC Crew Chief Safety Award. Sergeant Duesing will receive a letter of appreciation from the Commander of Tactical Air Command and an engraved award.



Sgt. Harlen H. Duesing

HOW TO HAVE AN ACCIDENT . . .

with only a little bit of trying

Captain F. V. Hall, Flying Safety Officer with the New York Air National Guard, sent us the ideas for this short course in how to have an accident. He claims that the inspiration came to him after he viewed the tire pictured here. It had just been removed from a bird recently returned from a cross-country flight. (The other one was almost that bad!)



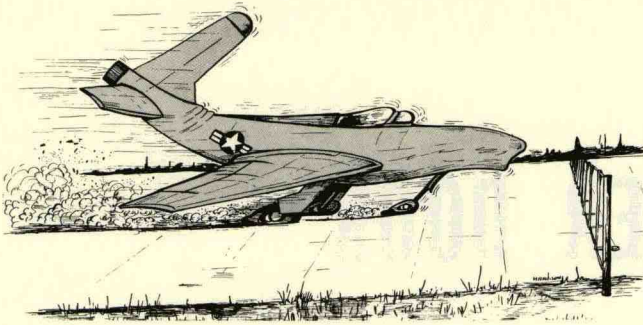
Accident Check List



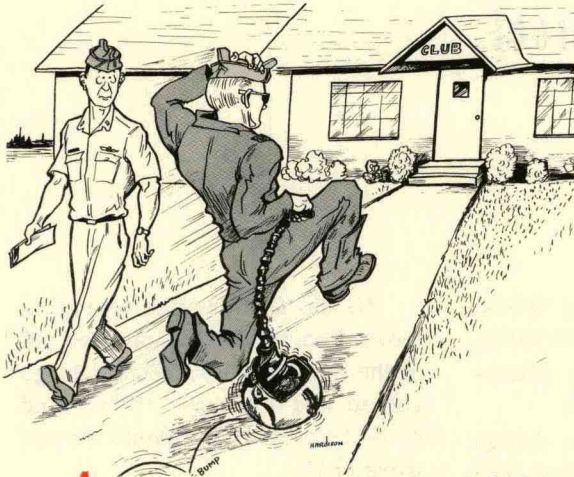
1 Schedule your X-C flights so you really don't have time to ask Maintenance to change those worn tires.



2 Land at bases with limited transient maintenance for your type of aircraft.



3 Make no-drag-chute landings.



4 Leap out of your chariot and dash straight to the Club at each base. (Never turn around to look at your bird.)



5 Always accept the signature of a Transient Alert 3-level apprentice mechanic on the post and preflight of your aircraft.



6 Limit all preflights to 30 seconds or less.

(Method: From a minimum of 100 feet extend arm, raise thumb, align with eyes. Slowly rotate thumb over flying machine. If machine is only touching the ground in three places, two wings and vertical stabilizer are visible...bound up ladder, push starter, and taxi.)



7 Develop a real good case of get-home-itis.

If you are in the habit of accomplishing at least two steps of this checklist, you are cleared for X-C flight...BUT ONLY IF you carry the following equipment with you at all times:

1. A four-leaf clover.
2. Rabbit's feet (yes, FEET)
3. Assorted beads, medals, charms and incense, as may suit your personal preference.
4. A very large portion of unused luck.
5. Sufficient cash to reimburse Uncle for that bird you're about to bash.

THE OTHER DOOR

. . .behind one door they make
missiles goof-proof

They approached two doors. Size, shape, color, were the same. Apparently, they housed operations of equal importance.

"And in this area we design and redesign our missiles until they're goof-proof." The scientist guide led the visiting TAC Super Sarges thru the right-hand door. "I think the other function is more important, but you'll enjoy this one more."

The laboratory seemed a block long and almost as wide. Awed, curious, and slightly bewildered by the gadgetry, the missilemen stared at bubbling beakers, ion chambers, a cyclotron, laser beams, and racks of test tubes. Computers whirred in the center of this beehive of activity. They nodded and agreed, "Yes, it's really spectacular."

The spectacled, slightly paunchy scientist in his immaculate lab coat leaned forward with an expectant smile, "Can I answer any questions about our Operation Goof Proof?"

"Gosh, Doctor Missilerr, this looks like something plucked out of the 25th century," Super Sarge gulped and continued, "What kind of diabolical experiments do you work on?"

He responded by escorting them to a rack in a corner of the lab and asked, "Recognize any of these?"

"Of course," responded Senior Super Sarge, "I've worked with 'em for years." Pointing, he added, "That's the AIM 9B Sidewinder, here's an AIM 7D Sparrow III, next to it's an AGM 12B Bullpup, and that one's an AGM 45A Shrike."

"You've passed that test without a missile miss, but do you know why they're here?"

"Yes sir!" explained Super Sarge, "You make them goof-proof. At least, that's what you said when we came in here."

"I'm puzzled," offered Senior Sarge, "I thought they were all designed to be goof-proof."

Doctor Missilerr chuckled, "Well, that's what we try to do."

by Lt Col Ben B. Benigno
Chief, Safety Survey Div.
Hq TAC

But almost every day, some young man handling missiles proves we've overlooked something. For example, one young pilot waited 12 seconds after firing his target rocket... then fired his AIM 9B into a cirrus cloud background. The missile couldn't tell the difference between the target rocket and the clouds. It chose the clouds. When the Wing reported the mishap they called it failure to guide. Obviously, we've got more work to do on this one."

Super Sarge winced, remembering many other incidents in the same category, "Goofs in the cockpit will be hard to fireproof. I remember when a pilot launched a Sidewinder a mere six seconds after firing his target rocket. He had a weak tone, indicating that he didn't have a good lock on the target."

"Yeah, I remember that one," interrupted Senior Sarge, "They reported that one as failure to guide, too!"

Warming up on the subject of human error, Super Sarge continued, "Do you remember the time we ran out of silicone grease... and assembled missiles with dry O-rings?"

"I'd like to forget that one," Senior Sarge admitted. "We almost lost an airplane and crew when a Sidewinder blew up right in front of the bird."

Doctor Missilerr smiled knowingly, "You see, they're still not goof-proof, but we're working on them. Here's one we thought we had corrected. Had the human factor completely removed... or so we thought. We'd had problems with pilots failing to hold the trigger long enough to launch the missile. The servo grain in the guidance and control unit fired, but the missile didn't launch.

I thought we'd licked the prob-

lem with a hold-down relay in the circuit. Clever as that was, it didn't take all the goof potential out of the system. Some untrained young maintenance man installed a 3 amp fuse in a Sidewinder power circuit calling for 10 amp protection. You probably heard about it. When they loaded the circuit the undersized fuse blew... the missile failed to launch. We're working on a wrong-size-fuse-rejector now."

Senior Sarge offered, "It seems that some of our troops work overtime finding ways to Murphy a missile."

The Doctor pointed toward a busy technician. "See that young lady? She's experimenting with the Sparrow... devising a fool-proof system that'll keep pilots from pulling triggers too soon after going to ARM position."

This brought back memories to Super Sarge. "I remember when Captain Sully got a good target contact and lock-on. He was cleared to fire when he passed abeam the tow airplane. He selected the ARM position, centered the dot, and SWISH! The missile left the rail... but it failed to guide. The bright boys who investigated the failure figured the pilot allowed less than one second from ARM to missile firing."

"Well, that's why we're here. It's too easy for pilots to forget," opined Dr. Missilerr. "We're having similar problems with the Bullpup and Shrike. Here's another one: Failing to make proper electrical connections appears to be a popular pastime among missile men. The missile motor on the Bullpup has failed to ignite several times because adapter umbilical disconnect fittings were improperly installed."

Senior Sarge nodded in agreement, "The same thing happens

when Plug P10 isn't mated properly to J10. All the checks look good, but the missile just won't fire."

"Even if you can train them to make all their cable connections right," Super Sarge injected, "someone will forget to install the flares. And the pilot ends up with a Bullpup that can't guide."

At this point Dr. Missilerr excused himself. He was summoned to the telephone. After a brief conversation he replaced the receiver firmly... too firmly. He returned, face reddened, trying to maintain his composure. "We've picked up another problem. I thought our transporting procedures were fairly fool proof. You know that missiles have to be tied down during transport. Well, somebody didn't. I guess we'll have to dream up a way for missiles to tie themselves down when they're loaded on trailers."

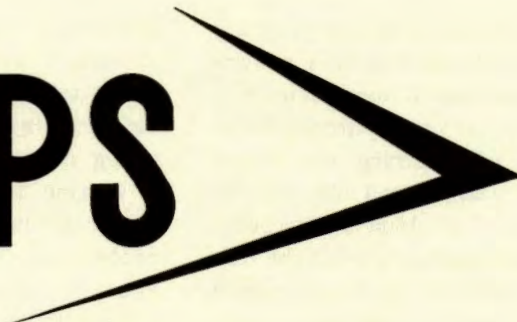
"Ouch! You've got our sympathy, Dr. Missilerr... and we'd better get along. Your job sounds impossible." Senior Sarge hesitated, "On our way out, can you let us see what's behind the other door? You mentioned it's important."

"Certainly! Happy to do it. It's not very spectacular, but it means as much as this lab... possibly more." He pushed the door wide open.

Senior and Super Sarge saw a classroom... pretty ordinary one. Blackboard, chalk, a few mockups. Dr. Missilerr was right... not very spectacular.

"Here's where we begin," he advised. "But it's basic to any operation. When our unit training program breaks down on teaching fundamentals... Operation Goof Proof may as well give up. And by the way, a lot of your missile problems could be solved in a classroom!"

TAC TIPS

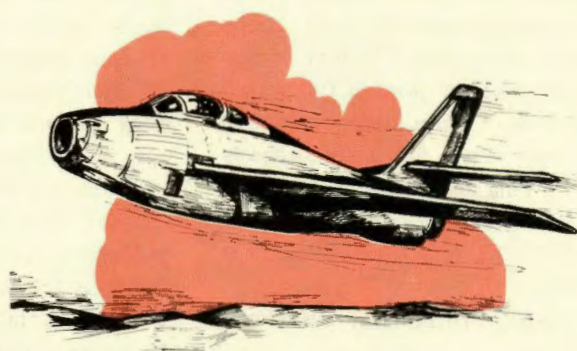


BAD ACTOR

As they neared the end of their range period, the flight of three F-84s started into their second strafe pass. Pulling off the target, Number Two called bingo fuel. Hearing the call, Lead declared that this would be last pass.

Number Three, realizing he would have no more chances to score, fired a long burst. He started from slightly out of range, steeper than normal... and fired past the foul line. The range officer fouled him, but they were heading home anyway.

After the bird landed, the crew chief discovered a ricochet hit on the trailing edge of the left aileron... that took 166 manhours to repair. Others have been less lucky and taken the ricochet in their windshield or engine!



HERKY TRICK

Every once in a while you come across an old C-130 problem that a new crew has not heard about. When you're taking off from a slushy runway, water accumulates in the nose gear downlock. Even though

you recycle the gear, this water sometimes freezes and the spring mechanism in the housing assembly becomes locked in ice. When you try to lower the gear the downlock won't open.

Before you go locking and chopping at bulkheads, or rassing with a bunch of chains to tie the gear down, consider the following: Depressurize the aircraft. Remove the nose gear access plate, go to air conditioning manual pressure, and select maximum cargo compartment heat. Toggle the manual pressure switch to increase the differential pressure to 3 or 4 inches. All that extremely hot air going out through the nose wheel well should shortly take care of your icing problems.

In the same manner, you can free the main gear should they freeze. Just remove a main gear access panel and try the same procedure.

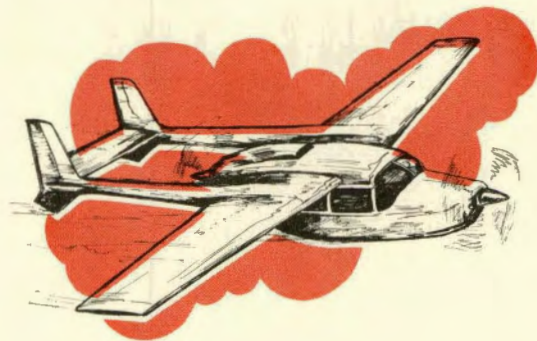
...interest items, mishaps with morals, for the TAC aircrewman

BUNDLE BUNGLE

The 0-2 loadmaster dropped six leaflet bundles out the right side baggage door. He thought the static lines tangled on his seventh and last drop... he and the pilot felt a bump. Then the Skymaster started a tooth-loosening vibration.

Yanking back his rear engine throttle, the pilot feathered the pulsating pusher prop. He landed okay with only his forward engine.

Inspectors found a piece of the blade end missing and a dent in the boom skin opposite the pusher prop. One blade of the prop had feathered normally, but the chipped blade ended up in flat pitch. Loadmasters aren't dropping bundles any more when they suspect static line fouling... there aren't too many places to hide when that bundle hits the fan!



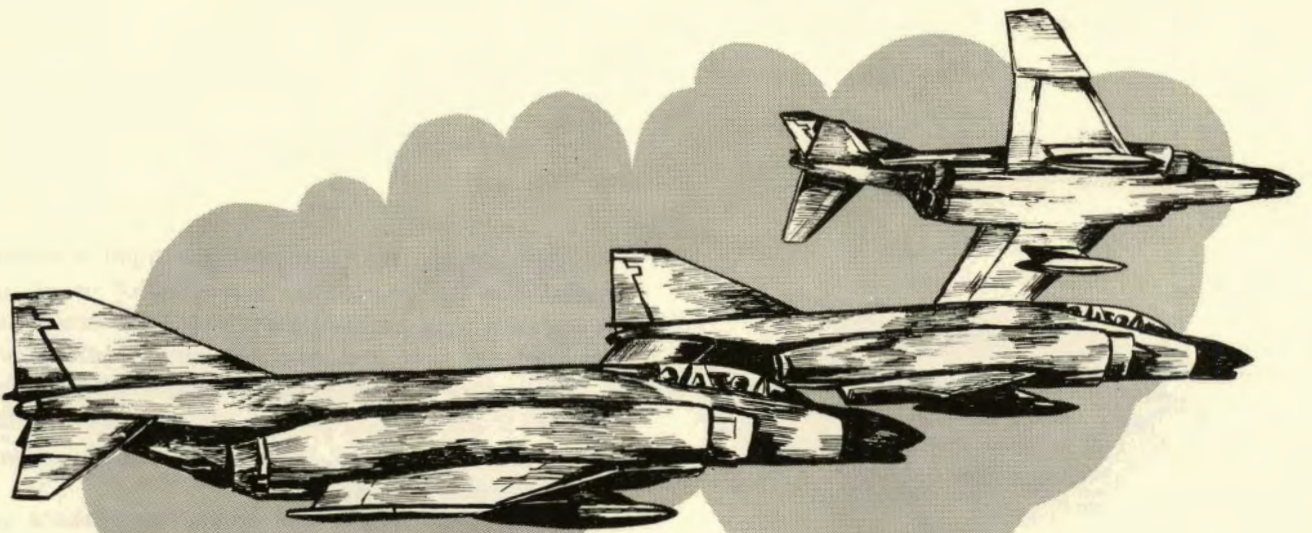
HANDLE WITH CARE

The C-54 pilot called "gear down" on final approach. His co-pilot responded immediately. But when he pushed the gear handle down it broke off about two inches inside the pedestal.

They orbited the field while the flight mechanic unfastened the pedestal's gear control panel. He inserted a long screwdriver in the bell crank and lowered the gear. His substitute gear handle lacked a "down safe" detent without the pedestal panel, so he held it down during landing. Did the same with the gear warning solenoid. They stopped on the runway and inserted gear pins.

The maintenance troops couldn't find cracks and suspected the handle ... weakened over years of up-and-down travel. They recommend elimination of an unnecessary chamfer that weakens the handle, and checking the gear handle assembly during phase inspections. In addition, they suggested that strong-arm co-pilots ease up on gear handles ... let the hydraulic system do the work!

WHY THE GRANNY BREAK ?



Back during the summer when the new traffic pattern rules for the F-4 were announced, many of us wondered why. Why restrict a fighter as capable as the Phantom to 60 degrees of bank and 2G in the landing pattern?

The answer lies in a series of bashes and some mighty close calls that F-4 drivers experienced in the last few months. Specifically, two loss-of-control bailouts in the traffic pattern where TAC troops just barely got out in time. And one where they brought the bird home after coming within 100 feet of the trees in regaining control. We also heard about similar problems overseas... both east and west... at about the same time.

In each of these accidents and close calls, one or more of the following conditions was present:

- Unexpected angle of attack increase reduced stall margin.
- Unexpected airspeed bleed-off.
- Adverse yaw and dihedral effect.

You're driving up initial as Number Three in a right echelon. It has been a good day. Your scores on the range were better than you've done so far in the program. After you settle down in position you ask your back-seater how it looks.

"About 290 knots and 1700 feet," he responds.

"No, I mean how's the formation from where you sit?"

He says it looks darn good.

You nod acknowledgement when Two passes you the break signal. Then you toss the signal to Four, on your right.

You count off Two's break after Lead starts his turn. Five seconds... beautiful!

And then you're counting for yourself. On five you roll up in a sixty degree left bank. A quick glance in the cockpit confirms that the attitude's about right and the engine instruments are all where they should be. Then you go back outside to watch the formation as you all fan out toward downwind.

Nose is kinda high... use some left rudder to bring it back where it belongs. Add a little bank with the rudder... that should put you right where you want to be.

When you're about half way through the turn you ease in just a little more bank... hardly noticeable, and almost unconscious. Keep that spacing!

And then you're ready to start rolling out of the turn. You've enough time in the bird that these things are becoming automatic instead of mechanical. You bring the stick smoothly to the right of center.

Nothing happens.

You move the stick farther right... then all the way to the stop.

Now the bird's rolling left, past 75 degrees of bank. And the stick won't stop it. Top rudder brings the nose up to the right, but it doesn't correct the bank.

Unload! Let the stick go forward! It feels wrong... you're already pointing severely down!

Burners... light the burners!

You see that you're down to about 1000 feet and rolling past 90 degrees of bank.

Eject! Eject! Ejec... you hear the rear seat go and pull the lower handle.

You swing twice under the parachute before you're on the ground. You don't have time to deploy your survival kit. The empty airplane impacts with a 17,000 foot per minute descent.

You had felt some moderate buffet, but that was normal in the break, you told yourself. And your airspeed was much too high to worry about stall. Or was it?

As you rolled into that comfortable break you loaded the bird to 2G. It takes that much to hold level flight with a 60 degree bank. Then you eased in a bit more bank when you gave it the bottom rudder to bring the nose down. You had 65 degrees... and 2.4G to hold level flight.

Half way around the turn you rolled in a bit more. About 73 degrees. Now the bird needed 3.6G to hold level flight.

That's what did it.

By that time your airspeed was down to about 270 knots. And your bird, weighing 35,000 pounds, wouldn't go beyond 2.7G without stalling.

You were stalled! And going down. At 1000 feet!

THE GRANNY BREAK

This is the reason for the relaxed traffic pattern in the F-4... just plain basic aerodynamics. The bird wasn't meant to be pulled around that way at that airspeed.

But let's look at a variation that can give you just as much grief...

You roll into the same 60-degree bank and hold it almost half way around the turn. Looking up at Lead and Two, you feel that you're going to be outside of them. About five more degrees of bank will correct it. At 65 degrees of bank and 280 knots you still have 0.8G before stall.

As you slow to 270, still holding 65 degrees of bank, there is only 0.3G between you and stall. Angle of attack has been climbing steadily as airspeed bled off, but you're looking outside the cockpit... this is strictly a visual maneuver.

And very shortly you begin to reduce your bank to roll out behind the guy in front of you. You're inside of him... he's kinda high.

Maybe a couple of hundred feet.

Your hand reaches for the gear handle as you glance quickly at airspeed. It's below 250... good. Gear down.

He's still kinda high... wonder if he climbed. Or did I lose that much in the pitch?

You feel the bird shudder a bit. Airspeed must still be about 200... 205. And then the bird starts rolling to the right. All by itself!

You give it some left stick.

Nothing.

More left stick.

Still rolling to the right. You try putting the stick to the right and back left again... anything!

When the bird is inverted it seems to hesitate a second. Then it's rolling again... and faster!

As it completes the roll and comes upright, you try back stick to raise the nose. But the roll only tightens. You're almost inverted again. And there isn't much air between you and those trees!

Eject!

Quick!!

As you tightened the turn, you had to increase G to keep the bird level. And increased G meant increased angle of attack. That meant you were closer to stall.

Then you decreased angle of attack again when you rolled wings level on downwind. But the airspeed you

used up with that high angle of attack didn't come back that easy.

The ground was awful close, but you could have flown out of the stall by adding full power, relaxing back pressure, and extending the flaps.

Yes, you forgot the flaps.

Others have forgotten the gear.

The time required for an F-4 to slow down from 200 knots (74% RPM) to onset buffet at landing weights is only sixteen seconds. The bird travels about three quarters of a mile. McDonnell pilots ran this test duplicating the power settings and configuration in one of our accidents. They used very smooth control motions. Any maneuvering would have induced a stall much sooner than the normal 140 - knot stall limit.

There have been several instances, both here in TAC and overseas, where an asymmetrical wing load has led to serious control difficulties. The Dash One says the F-4 will fly through takeoff and landing with the equivalent of a full 370-gallon tank on one wing of a clean airplane. That's something like 2400 pounds more on one wing than on the other. Yet we've seen people get in trouble with unbalanced fuel loads of 1500 to 1800 pounds.

There are two factors involved. First, you must recognize that you have an unbalanced load. You should know... or at least suspect... when one of your drops has not fed all the way out.

Second, you must give the airplane a little special consideration when you know it's in this condition. This is particularly important in the traffic pattern. At low speeds your control surfaces may not have enough authority to overcome the rolling moment of a heavy wing.

Actually, the heavy wing doesn't cause your airplane to stall. But it gives you a rapid roll rate when you break into it. With this rapid roll rate, you can easily overshoot the 60-degree bank you want. In less time than it takes to tell about it, the rapid roll induces adverse yaw. When you put stick and rudder against the original roll to stop it, you aggravate the adverse yaw.

And adverse yaw is what made all of these mishaps become serious stall problems. Or perhaps you could say the pilots complicated the situation when they failed to recognize adverse yaw.

Many of them happened in formation... and they didn't happen to the lead airplane. The pilot was in-

volved with more than normal landing pattern business. In a sense, he wasn't flying his own pattern. He was trying to match the pattern in front of him. And when his bird gave the first symptoms of a stall he didn't immediately recognize them. Buffet onset was there, but he wasn't sitting there waiting for it... as he was during the demonstration he flew through with his instructor.

And when the bird began to roll from adverse yaw and dihedral effect, he wasn't ready for it. By moving the stick away from the roll he added drag to the wrong wing... increased the adverse yaw. As yaw increased, dihedral effect tightened up the roll. It was a vicious circle.*

Another factor that complicated these traffic pattern gyrations was the closeness of the terrain. If you had more altitude, you wouldn't hesitate to push the nose over at the first hint of a stall coming on.

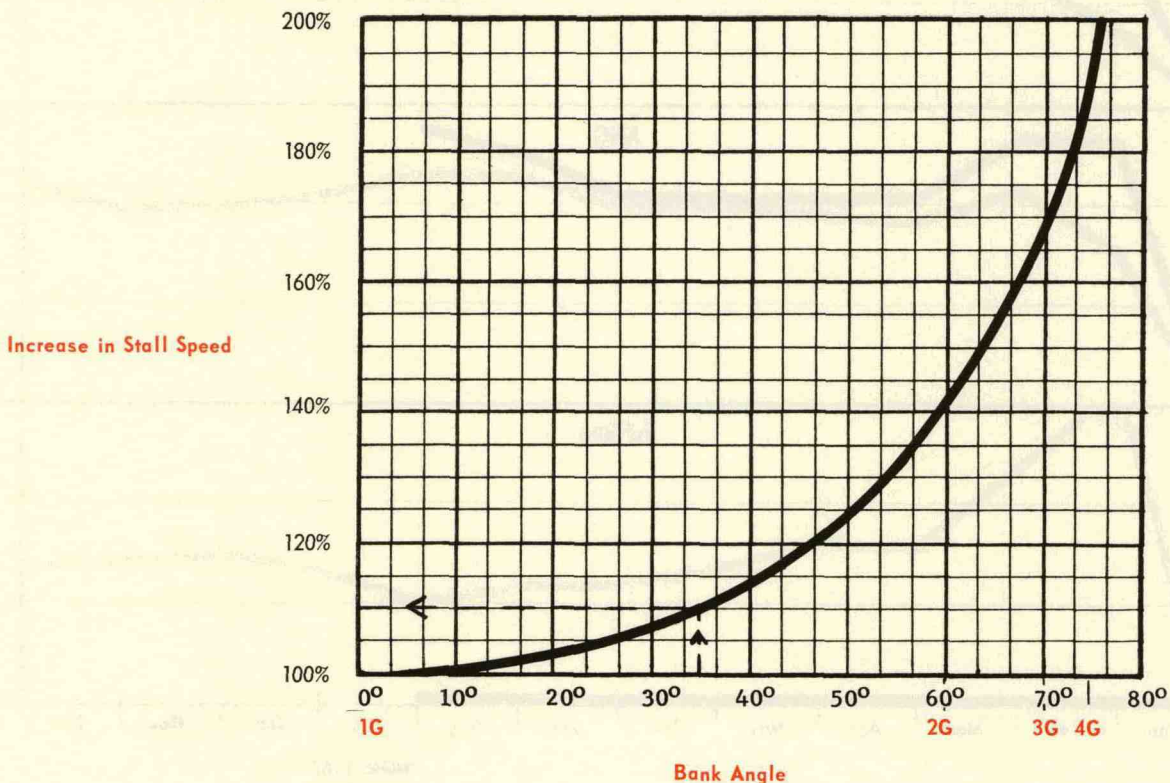
So why the Granny break? It's just common sense. You don't need max performance in the traffic pattern... 'specially when you're busy flying formation. And when recovery altitude under you is a whole lot less than optimum!

Fifteen units angle of attack will turn you very efficiently... 2G and 60 degrees of bank (they're inseparable) insure you an adequate, but not generous, margin above stall.

If the guy in front of you sucks his pattern in a bit too tight, don't follow him. There's no point in getting into the same trouble he's heading for... and bailing out beside him! ➔

* If you're not too clear on adverse yaw and dihedral effect, look up "More on Turning the F-4," in the May '67 TAC ATTACK. For a more technical and detailed discussion, see the March '67 issue of FIGHTER WEAPONS NEWSLETTER.

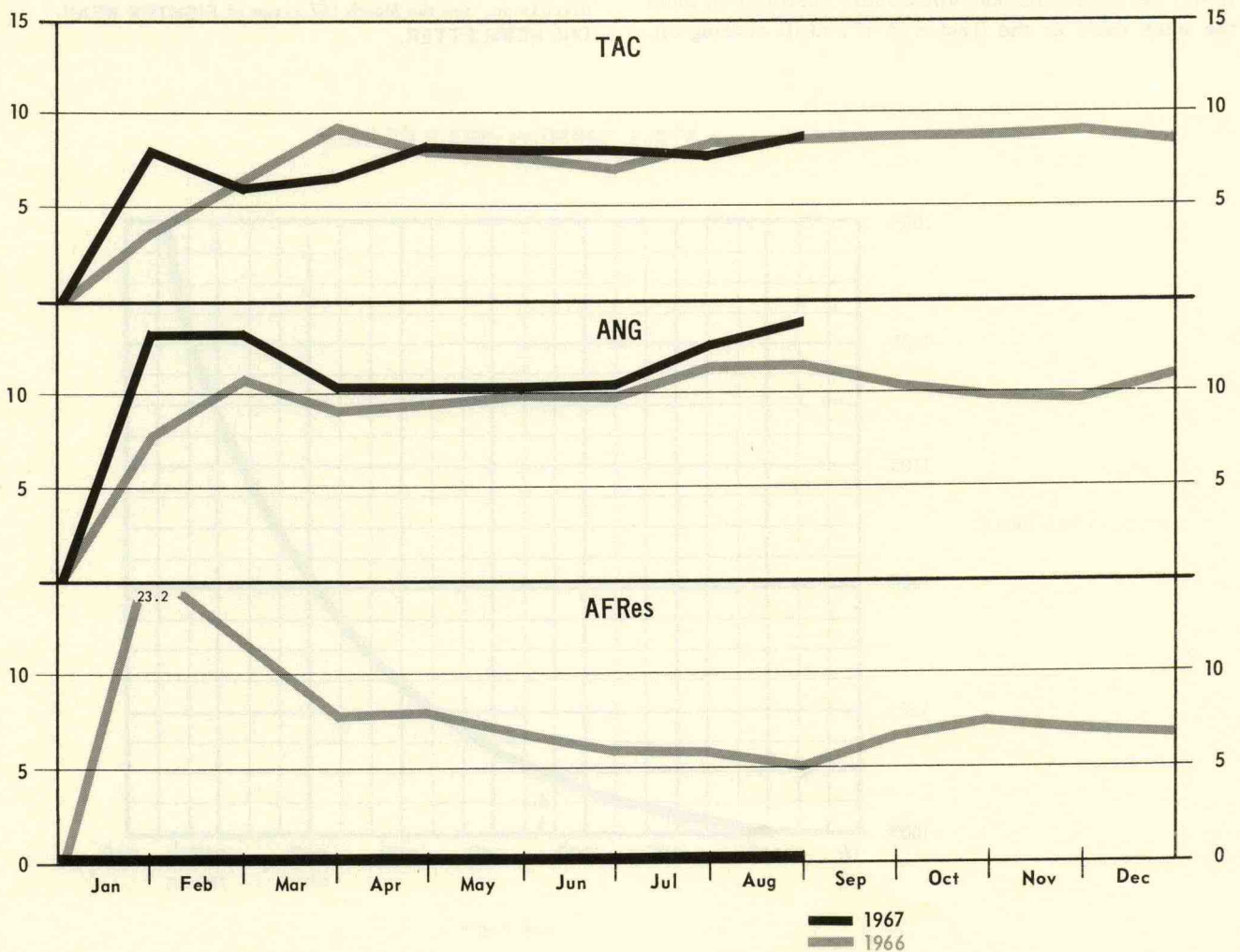
STALL SPEED vs ANGLE OF BANK



TAC TALLY

MAJOR AIRCRAFT ACCIDENT RATES

AS OF 31 AUGUST 1967



UNITS

	1967	1966
9 AF	8.1	6.3
4 TFW	0	10.5
15 TFW	22.5	11.9
33 TFW	10.8	12.7
354 TFW	42.0	24.0
4531 TFW	0	—
363 TRW	11.3	16.5
64 TAW	0	0
316 TAW	0	0
317 TAW	5.9	0
464 TAW	3.4	0
4442 CCTW	9.0	0
12 AF	10.2	11.4
23 TFW	9.0	33.5
27 TFW	16.6	11.9
479 TFW	11.6	12.2
67 TRW	7.1	25.2
75 TRW	22.6	0
313 TAW	0	6.7
516 TAW	0	6.2
4453 CCTW	4.6	4.8
4510 CCTW	8.2	10.3
4520 CCTW	12.4	10.2
4525 FWW	28.5	—
Special Units		
1 ACW	7.3	18.4
4410 CCTW	8.5	8.6
4500 ABW	0	0
4440 ADG	0	0

AIRCRAFT

TYPE	TAC	ANG	AFRES
A-1	17.4 20.2		
RB-66	0 0		
F/RF-84		24.0 13.2	
F-86	— 80.5	11.2 0	
F-100	14.3 14.5	27.7 17.3	
RF-101	40.9 40.8	29.6 53.9	
F-105	14.6 23.3	0 0	
F/RF-4	13.7 7.4		
C-47	6.9 0	0 0	
KC-97		0 0	
C-119		0 0	0 5.0
C-123	0 0		
C-130	0.7 1.4		
T-29	0 0		
T-33	6.2 0	0 8.7	
T-39	0 0		
O-1	15.6 0		

ALL RATES ESTIMATED

1967	1966
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