

# TAC ATTACK

JUNE 1966



THE INVISIBLE HAZARD ....page 16



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# TAC ATTACK

JUNE 1966

TACTICAL AIR COMMAND

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## current interest

### PHASE INSPECTION

- improved maintenance management Pg 6

### WHY CORROSION

- somebody neglected his job Pg 10

### SURVEY OF PLACES

Pg 13

### WAKE TURBULENCE

- the invisible hazard Pg 16

### INSTANT RECON

- 363rd cuts accident rate over 50% Pg 20

### WEATHER WARNING

- what can it tell you Pg 24

## departments

Angle of ATTACK	3
A 2nd Look	8
Chock Talk	11
P-Shooter	14
Phyllis	15
Tac Tips	27
Recognition	29

### THE COVER

Artist TSgt Russ Hempstead has depicted the air-flow disturbance at the trailing edge of a high-performance wing . . . the invisible hazard.

..... pg 16



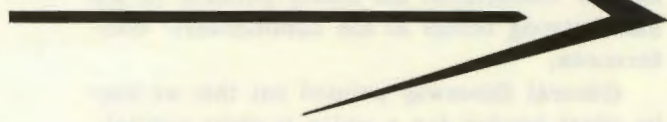
### TACRP 127-1

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# Angle of ATTACK



## Accident Prevention is Our Charter

COLONEL GUST ASKOUNIS, TAC Chief of Safety, presented these remarks at the close of the Second Annual TAC Safety Conference. In summing up the conference proceedings, Colonel Askounis effectively stated the TAC philosophy of accident prevention.

**D**uring the three days of this conference, I noticed some of you taking notes on the proceedings, just as I have. I imagine the summaries you will prepare from your notes will look much like mine ... facts, figures, ideas, and suggestions. Some are old, some new ... some complicated and some simple, some good and ... I hope ... none bad.

In all of our notes, and in the presentations you have listened to here, you will find no magic formula, no safety gimmick, no single safety directive that will sterilize TAC of all accidents and make us completely safe. If we could derive one single formula from the proceedings of this conference, it should be labeled "Hard Work."

By this time you must be impressed with the problems and hazards you as safety officers must cope with to direct a successful accident prevention program. We have managed to highlight here only a few segments of the complex safety management problem that goes to make an effective integrated accident prevention program. And now time will permit me to mention only a few of the ideas brought to my attention through the speeches presented and the questions you submitted.

If any of you have wondered about General Disosway's support and interest in the safety program, I'm sure his address at the start of the conference eliminated all your doubts. He made it crystal clear that he and all of his TAC commanders are, in effect, safety officers as well as commanders. Some of you men-



tioned later that you wished your commander could have heard General Disosway's positive statements on the integrated accident prevention program in TAC. Let me assure you that he has established his safety policies in the same strong terms at his commanders' conferences.

General Disosway pointed out that we may be short handed for a while in many specialties... including safety. But we have a job to do in spite of the handicaps, so pull up your socks until the replacements arrive and with firm command support, get the job done... safely! He realizes that as a Chief of Safety you are, and must be, a nuisance in order to keep your commander advised of hazards that exist in his operation. Remember that you are working for your commander. You cannot divide your loyalty and properly fulfill your responsibility to him.

**W**e recognize that the growing sophistication of some weapon systems have complicated your problems in accident prevention. This is specially true when you are involved in technical accident or incident investigations. I want you to remember that expert technical assistance is immediately available to you if you will make your problems known to us. Don't be afraid to call for help! Too often we find that small problems have grown to accident proportions before we hear about them. Document your problems... develop your command position... and then notify us so we can take action to help you solve the problem.

**T**his leads to the use of incident reports and their vital importance to us in our before-the-fact accident prevention program. Our efforts in trend identification and early recognition of developing problems can be only as good as the data we collect in our analysis section. The accuracy of this data depends wholly on the reports you send us. Your reports must honestly and completely reflect the results of thorough and painstaking investigation. Lack of integrity by a few in investigation and reporting can hurt us all. Because our data analysis system, like any, is only as good as the raw data, incorrect cause factor identification may lead to false and misleading conclusions. Some hazards will remain unknown and uncor-



Colonel Askounis believes safety officers must stay abreast of conditions, problems in the field. He calls the Thunderbirds an outstanding example of well planned, efficient operation; visits with his "favorite team" whenever their paths cross.

rected whenever dishonest or inaccurate reporting occurs.

I cannot understand the reluctance of some units to submit incident reports. If this is due to a misunderstanding, I want to straighten it out right here. We consider the unit submitting the greatest number of incident reports to have the most aggressive accident prevention program. In every case, this is a direct reflection of the local commander's interest and emphasis. I worry about the units that are obviously under-reporting their incidents.

**O**ur Safety Surveys throughout TAC, and the reserve forces gained by TAC, are guided by the concept of assistance, not inspection. We don't try to harass the units we survey and we are not looking for nitpicks. In addition, we try to provide answers to questions that arise during our surveys. However, if you are not doing your job according to TAC standards, you can definitely expect us to say so. We do our utmost to be fair when we assess these ratings. We are also firm in our requests for corrective action.

Our approach to surveillance of the accident prevention programs of the reserve forces gained by TAC can best be explained by the word "togetherness." I believe that increased and continuing personal contact between the regular and reserve units will provide the increased flow and easier exchange of information that will be mutually beneficial to both. We must build the footpath between regular and reserve units into a two-way street of safety exchange.

We heard in one presentation of the need to carefully prepare our accident investigation



teams in advance. There is no other way! We cannot afford to add to the aggravation and loss of an accident by failing in our pre-accident preparation. Plan for each foreseeable contingency with people who will know what to do and the equipment they will need.

I fully agree with the importance of an Aerospace Safety Council as it was described in another presentation. However, I must stress that to function effectively, the council must be chaired by the unit commander. Only with the local commander's emphasis will the council be capable of directing immediate and positive command action. Firm direction and control of the council is too easily lost without the commander's leadership.

**I**n organizing your safety program, you must start by integrating all the functional elements of accident prevention. With thoughtful management you can then apply effective before-the-fact action at any level required, encompassing all elements and functions of your unit.

We have emphasized the squadron safety program as the foundation for an effective wing program. Also, the squadron safety program is the logical training ground to prepare replacements for the safety career field. The Project 66 squadron safety officer OJT program should be your basis for safety officer training.

Remember the vital need for close coordination between maintenance and safety. Work closely with your Chief of Maintenance and your Quality Control people. Get to know their reports and learn how they can help you in your job. Understand their problems and they will be more inclined to understand yours. You must always know the status of your fleet... the maintenance people are the ones who can provide you this information daily. I promise you that your efforts in the maintenance area will be fruitful.

**W**e must sell accident prevention as the result of effective management and efficient mission accomplishment. To do this selling you must take a positive approach. Get the job done, but without needless loss of men or machines. Avoid at all costs the "Don'ts" and "Can'ts" which have earned many safety officers less than the cooperation and respect they need to

accomplish their mission.

I would like to point out a fact that I have discovered in my years of service: There is no such thing as a dead-end job, but there are quite a few dead-end people. Hard work is recognized in any field. Some people intend to start working hard after they are promoted or given additional responsibility. Remember that in any job you have the responsibility to fulfill your assigned duties, prepare yourself for the advanced job you want, and train your replacement. Do this and you will never end up in a dead-end job.

**I** have heard some of you comment that you are reluctant to borrow from the ideas and experience of others... you want to go it alone and learn from your own experience. With this sort of tunnel vision you are turning your back on history. You will find you encounter very few new problems if you actively solicit the ideas of the old timers. Be receptive to their experience and suggestions. Use the good ideas of those who are successful, or adapt them to your mission and operation. Don't lose your aggressive approach to safety and become static or complacent. Be flexible... dynamic... search for ideas! If you don't succeed the first time around, keep at it! This is how you breathe life into an accident prevention program and keep it alive and effective.

**F**inally, gentlemen, keep looking forward. Translate your ideas and those you have received in these meetings into an active, progressive program in your unit. You exist in our organizational structure because people and machines are not perfect. Accident prevention requires complete dedication to the concept of safety. It requires untiring efforts within each staff agency to keep a safety program moving forward.

Through your staff coordination you must provide the information and problem solutions your commander needs to run a safe and efficient operation. Whether you represent the unit with the best or worst record... the best or worst mission... opportunity surrounds you to save lives and equipment. In large measure, accidents can be prevented.

Accident prevention is our charter!



**H**ow do you get more flying hours from a squadron of airplanes? Classically, the primary controlling factor in aircraft utilization rates has been the amount of time that must be spent in inspection, repair, and preventive maintenance . . . down time. As our weapon systems become more complex, we find we must spend more hours each month, or each maintenance cycle, on periodic and hourly inspections. Consequently, the aircraft are available for mission flying a smaller percentage of the time. Another concept in maintenance management called Phase Inspection, is reducing aircraft down time . . . increasing each aircraft's availability.

In the past, we operated under a system that provided maintenance inspection of an airplane after specified periods of flying time. Each 25, 50, or 100 hours, the aircraft was taken out of commission until the inspection was complete. This resulted in thirteen days average down time for F-105s, for example, out of a 200 hour flying time schedule. Four days of the down time was for hourly post flight inspection, and nine days at the end of the cycle was used for periodic inspection. Similarly, the RF-101 was scheduled for thirteen days down . . . six days for hourly inspections and seven days for the periodic.

Tactical fighter, reconnaissance, and troop carrier forces are currently being reorganized into tactical squadrons capable of operating in a deployed environment. Working with a smaller unit of aircraft available, they will be less able to afford the periods of extended maintenance down time we have been accustomed to.

Therefore, the new Phase In-



# Inspection

spection concept, that may reduce our out-of-commission rates, is being tested and implemented on various TAC weapon systems.

## The System

Phase Inspection is a consolidation of the hourly post flight and periodic inspection requirements into small packages. Each package has the same work content and involves approximately the same number of clock hours.

Under a Scheduled Phase Inspection concept, the work is broken into groups of equally divided work tasks. An inspection crew with specialist support accomplishes these phases on a scheduled basis.

Further refinement of the phase concept enables us to accomplish a few work cards of the next phase inspection while the aircraft is not scheduled for a mission, or during down time for other causes. This is called Recovery Phase Inspection. When it is fully implemented, this principle requires that all inspection requirements be completed before the established time for the next phase inspection, thereby eliminating the down time scheduled for that phase. The phase inspection principle readily

adapts to forward operating base (FOB) and dispersal base programs.

The major objectives of phase inspection are to increase weapon system availability for mission accomplishment, level out peak demands for specialists, and more readily enable inspections to be completed at deployed bases.

## Advantages

Experience with phase inspection to date in PACAF and TAC has shown that increased aircraft availability for the flying schedule is the principle advantage. Also, since the aircraft is out of commission for a shorter period of time than under the periodic inspection system, inspection flexibility is increased.

The phase system will also make it possible for us to accomplish most inspections at deployed sites without using an inspection dock because inspection requirements are divided into smaller work packages. In addition, the peak demands for specialists typical in the periodic inspection systems will be leveled out considerably by grouping the phase deck cards into balanced workload segments. Inspection



By F/L Ronald G. Slaunwhite, RCAF  
Hq TAC (DMEMM)

on

times for many aircraft will require only one work shift . . . the aircraft will be able to return to flight operations the next day for operational commitments.

Mechanics in the field find the phase inspection concept more popular than a periodic inspection system. They like the small work package, the workload is steadier, and they can go home when their phase is completed.

Finally, the number of unscheduled maintenance actions should decrease under this system because each aircraft is inspected more frequently on a scheduled basis. And the phase concept increases the probability that you will discover an item that is about to fail . . . before it fails!

### Problems

Spare parts will likely be one of the problems associated with getting an aircraft through a phase inspection. Lack of a supply reaction capability and spares assets to prevent excessive down time waiting for parts can seriously degrade the system.

Specialist availability, too, may become a problem. To meet the short aircraft down time in a phase inspection, specialists must

be provided as planned. However, the present AFM 66-1 priority system places unscheduled maintenance ahead of scheduled maintenance. This makes it difficult to keep specialists on scheduled work. In addition, the present requirement to maintain a specific operationally ready (OR) rate places a maintenance manager in the position of having to get aircraft in commission so the OR rate can be maintained. This often causes overtime work, pulling specialists from planned work tasks to recover aircraft returning from missions.

Because inspections come more frequently under the phase system, workload control will have to use extra care in scheduling specialists. Success of the phase system, or any inspection system, depends on their availability to meet planned workload requirements.

### Savings from Phase Inspection

At this time the phase concept is being tested on the F-105 at Nellis AFB. It will soon be tested on the F-4 at MacDill AFB and Shaw AFB. Two C-130 wings are using the phase concept and four more will soon implement it. Meanwhile, phase inspection work decks are being developed for the F-100 and F/RF-101 aircraft.

The 13 days down time for an F-105 under the periodic system in PACAF have been reduced to seven days with the phase concept. Similarly, down time for the RF-101 in one unit has been reduced from seven days for the periodic inspection to four days for the major phase under the new system. Comparable savings are being achieved on C-130 phase inspections, and are possible for most weapon systems.

Experience in PACAF and the

tests underway in TAC show that the Phase Inspection concept does increase airframe availability. By reducing scheduled aircraft down time we gain greater flexibility in maintenance scheduling.

### Conclusions

We are faced daily with a need for increased aircraft availability and we have recognized a need for standard aircraft inspection procedures which will be compatible with deployed, squadron-size operations. Phase Inspection appears to be the answer . . . we envision that it will become the standard aircraft inspection procedure for most TAC weapon systems.

The value of Phase Inspection as a maintenance procedure is evident from the many advantages it offers over other inspection concepts. It will:

- Increase weapon system available for mission accomplishment,
- Increase inspection flexibility,
- More readily enable inspections to be accomplished at deployed sites,
- Minimize the peak and valley workloads,
- Improve maintenance morale.

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*Flight Lieutenant Ron Slaunwhite came to TAC from the Aeronautical Engineering Branch of the Royal Canadian Air Force.*

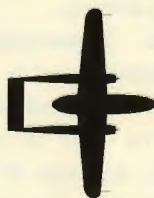
*Ron has served in Aircraft Maintenance and Aeronautical Engineering positions with #1 Air Division (RCAF), Metz, France; RCAF Station Penhold, Alberta; and #6 Repair Depot, Trenton, Ontario. He is presently assigned as an exchange officer with USAF in the Plans and Procedures Branch, DME, at Hq TAC.*

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A

# 2ND LOOK



As the pilot applied power for takeoff, number two started to backfire. Since there was plenty of runway ahead and number one was developing good power, he decided to press on and give the bad engine a chance. Number two cleaned itself out and was running smoothly at liftoff. Trouble really started after the pilot pulled back to METO power. Cylinder head temp on number one rose rapidly to 280 degrees with a two inch manifold pressure drop ... and number two engine followed shortly with the same symptoms.

The crew, in weather by this time, suspected carburetor ice, tried heat to one engine and then the other. But this only produced backfiring, detonation, and further loss of power. After pulling off carburetor heat, opening cowl flaps, and turning back to the field, the crew found that cylinder head temps would come back to a reasonable figure with power reduced. Number two smoothed out at 2600 rpm, but number one was still rough and torquing on the mount. On final they feathered number one and got the 20 passengers safely on the ground without further trouble.

Damage to the engines was such that both had to be changed.

The almost simultaneous and identical problems on both engines pointed toward contaminated fuel, and investigators found that the aircraft was serviced the day before with a 50-50 mixture of Avgas and

JP-4! The aircraft commander had personally seen the 115/145 sign on the fuel truck and the flight mechanic noticed that the fuel was the proper color when he serviced the bird. Further checking revealed that an airman with only several weeks total service had inadvertently filled the 115/145 truck with JP.

The lock control system provided by T.O. 42B-1-1 was not in use at this base. This system makes such an incident "impossible" by providing the JP driver a key that will only unlock the JP pump.

A second look, beyond the pilot's failure to abort takeoff when the engine backfired, reveals a pitfall that is always waiting for us ... the hazard or accident potential that we have long since recognized, taken action to correct, and dismissed from our package of current worries. The disastrous effects of jet fuel in piston engines was recognized many years ago. It attracted a great deal of attention and an almost fool-proof fix was devised. Incidents of JP in Avgas trucks and recip's tanks decreased ... then dwindled to nothing. It was no longer a problem. Compliance with 42B-1-1 disappeared from our safety survey check lists. Then, of course, the old, forgotten problem reared its ugly head!

No accident potential is ever completely eliminated. It may be suppressed ... but suppression is an active thing. When you relax the suppression control, or awareness that "eliminated" a problem ... the problem is still there as big as ever.





The pilot had been airborne one hour and twenty minutes when his O-1 started bucking and backfiring. Fortunately, he found an abandoned airfield nearby and made a smooth emergency landing.

Investigators found that the Birdog had used excessive oil two flights previous. Although four quarts of oil in three hours on that flight had not exceeded TO specifications, the engine technicians borescoped the engine at the time and found number three cylinder was scored. On the next flight, with a new jug in number three, the engine used three quarts of oil in one hour and forty-five minutes. This time the ground crew added oil and sent the bird off again . . . to land in the abandoned airfield.

When engine specialists arrived at the emergency field, they found oil-fouled spark plugs in number three and four cylinders. No real problem . . . twenty of plugs. But after the plug change the Maytag Messerschmitt was still running rough, coughing smoke, and dropping 90 to 110 rpm on the mag check. Since these were still the symptoms of bad plugs, the technicians changed the again oil-saturated plugs in number three and launched the bird for home station . . . forty-five minutes away.

As could be expected, the engine ran rough on the way home, but the pilot managed to get it safely on

the ground before the engine shook itself off the mounts. This time the maintenance troops looked beyond the oil-fouled plugs and found worn intake guides. In six hours they had both cylinders changed and the problem cured.

A second look at this determination to launch a single-engine aircraft with a known engine problem raises serious doubts about the soundness of the decision. And hindsight is not involved. Maintenance supervisors had adequate information before they authorized takeoff with only a stop-gap plug change.

The first cylinder change actually increased oil consumption from 1.3 to 1.7 quarts per hour. In spite of this, they launched the bird after only servicing it with oil. Their decision to risk return from the emergency field may have been based on the greater ease of maintenance at home. Perhaps they considered the forty-five minute trip back against the hour-twenty before the engine failed on the last flight as reasonable odds . . .

However the decision was made, you still have the grim picture of a single-engine airplane taking off with two bad jugs out of a meager six available. And six hours of maintenance would have made it possible to avoid the risk. Two-thirds chance of success sounds like a gambler's approach to flying.



The message referred to a major accident where an F-105 inadvertently engaged the BAK-9 on the approach end and an incident where an F-100 damaged its tail skid by contacting the barrier cable. From there on it spoke for itself: THE F-100 INCIDENT IS SIGNIFICANT IN THAT IT WOULD PROBABLY HAVE RESULTED IN A MAJOR ACCIDENT HAD IT BEEN AN F-105. THE UNGUARDED TAILHOOK ON AN F-105 WOULD HAVE ENGAGED THE BAK-9 BARRIER CABLE ON A TAIL-LOW LANDING RATHER THAN RESULTING IN A BROKEN TAIL SKID AS IN THE CASE OF THE F-100. ACCIDENTS AND INCIDENTS

INVOLVING INADVERTENT APPROACH END ARRESTMENTS OF TAIL HOOK EQUIPPED AIRCRAFT HAVE BEEN OCCURRING SINCE 1961. POSITIVE CORRECTIVE ACTION TO INSTALL TAIL HOOK POINT GUARDS AND TAIL HOOK INDICATOR LIGHTS ON THE F-106, F-102, AND F-100 AIRCRAFT WAS NOT TAKEN UNTIL MAJOR ACCIDENTS VERIFIED THE NEED FOR THESE DEVICES.

Does it take a second look to see deficiencies in similar equipment when we've pinned down an accident cause factor in one design?

Then why don't we take that look?



# why corrosion ?

...somebody neglected his job

By Maj W. Haygood  
Hq TAC (OSMEN)

"Immediately after he placed the Master Arm switch to ARM position, the gun began to fire ... Investigators found small particles of steel wool in the male portion of the cannon plug ... The particles were residue of a cleaning operation."

Maintenance would be greatly simplified if systems could be designed with no interconnections. In aircraft munitions and armament sub-systems there will always be electrical and mechanical connectors. It is our job to determine and assure that the connections are serviceable.

Engineers have developed many test sets, gauges, and tools for our equipment. They have provided us with many procedures which help to control problems which are commonly present with electrical-mechanical connections. They tell us how to test for torque, clearance, adjustment, continuity, discontinuity, imped-

ance, shorts, capacitance, insulative qualities, and many more.

Where we fail, is in the simple day to day common sense use of the equipment. No engineer can design a connector which can't be dropped, stepped on, crushed, or otherwise mishandled. Cleanliness is a virtue which men either have or must be taught to have. Corrosion is difficult but possible to detect and correct. It takes time for corrosion to develop. Mechanics make the mistake of overlooking the initial signs of corrosion until time allows the decay to interfere with the designed purpose of the equipment.

There are three simple rules which, if followed, will eliminate corrosion, contamination, and deformation as cause factors in mishap reports:

1. Study T.O. 1-1-2 until you understand the warning signs of corrosion and know the corrective action required.

2. Contamination is another way of saying that things are dirty; the corrective action is to keep everything clean and prevent dirt from getting into places where it can cause problems.

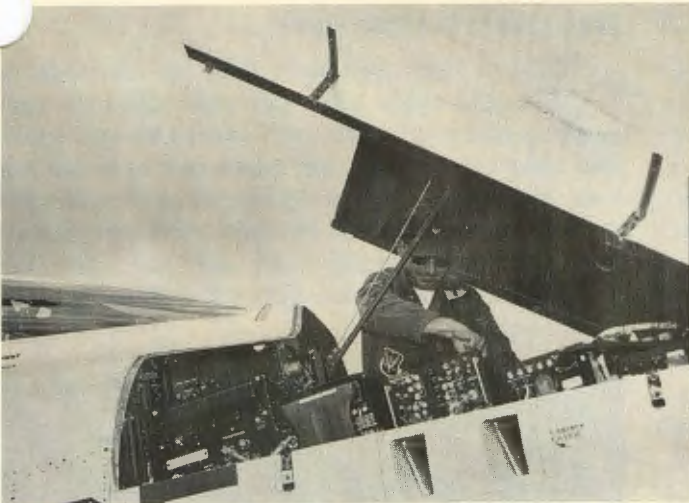
3. Deformation is a catch-all word for describing the results of one or many careless acts which cause a component to lose its original shape. The corrective action is to exercise care in handling equipment.

Inert objects do not cause the previously discussed problems; people do. The personnel error may be contributed over a long period of time by the actions, or failure to act, of many people. The error may be as described in the quote from the message above.

Such acts are the unintentional, uniformed, or unnoticed acts of human beings. Such acts are preventable.







# CHOCK TALK

## Phantauly brakes

The overseas Phantom phlyer made a normal approach for landing. On touchdown he felt the left tire wobble. He managed to retain control by lowering the nose and using a combination of nose wheel steering and right brake. After the pilot got his chariot stopped, the maintenance types found that the left wheel was completely locked. Had the aluminum runway not been completely dry, this pilot's good work might not have been enough to keep the big bird on the runway.

When the investigators tore into the locked wheel, they found that all of the brake puck pressure pads had fallen off the end of the piston... one had lodged in the brake assembly and caused the wheel to lock. For good measure, they decided to take a look at the right brake. Although it had performed the way it was supposed to on landing, they found that all of the pressure pads in the right brake had fallen off too!

Because this was the seventh such locked-wheel problem the unit had experienced in two months, they went back over the records... and found that all seven aircraft had experienced complete utility hydraulic failure at some time before the brake puck problem occurred. When queried, the responsible depot agreed that there is increasing evidence that the brake pistons are retracting and causing the pads to fall off whenever a utility system failure occurs.

The unit is now inspecting brake puck pressure pads after every utility failure... and urging that the depot take early action to correct the design deficiency.

## lines crossed

During the after-takeoff climb on an FCF for a number one engine change, the C-47's number one engine oil exceeded the maximum allowable, and the oil pressure fell below minimum required. The pilot feathered the sick engine and completed a single engine landing.

A close look at the number one engine revealed the main oil pressure and return lines were crossed at the oil cooler regulator. The crossed lines caused a reverse flow through the regulator and oil cooler. Only a limited amount of oil would flow in reverse, and it wasn't enough for cooling.

Evidently, the lines were crossed by the two qualified five-level mechanics who installed the engine. The regulator is marked in and out, but the lines are not labeled.

## would'ja believe... maintenance factor

The board spent a lot of time scraping, digging, and piecing parts together. When they were all finished, they decided the reason it all happened was that the retaining nuts and washers for the main fuel control were improperly installed. Cut and dried, you say? Take a look at what else the board learned...

The inspector on duty cleared the red X for the fuel control installation without performing the inspection prescribed by T. O. 00-20-1. Also, the shift supervisor did not closely supervise installation of the fuel control by a three-level mechanic and a five-level mechanic who had never installed this particular component before.



## takes two

The pilot had just herded his Hundred into the parking area and was preparing to shut down. Fifteen seconds after the bird came to a complete stop, the nose gear retracted... up and locked!

After the flight line troops jacked up the F-100 and placed the gear handle down, the nose gear came down and stayed.

Two separate errors made this incident possible. Altho the six-foot-five pilot doesn't remember touching the gear handle, chances are good that he bumped it with his knee while stirring around the cockpit with his pre-shutdown routine. But that alone would not have retracted the gear if the main gear struts had not been over-serviced. They were fully extended... eliminating the protection of the landing gear squat switches.

## mark the spot

During a recent safety survey, fire extinguishers were found in various and sundry locations about the ramp. Some were between the parked aircraft, and some were sitting along the edge of the ramp. While some were too far away from the airplanes to be immediately available when needed, others were in danger of jumping up and striking wings and things on taxiing aircraft.

After the folks concerned mulled it over for a while, they came up with the recommendation that permanent positions be marked on the ramp and the extinguishers be kept on the marks. It should take only a minimum of effort to locate the best spots, and then only a few minutes to spread the paint.

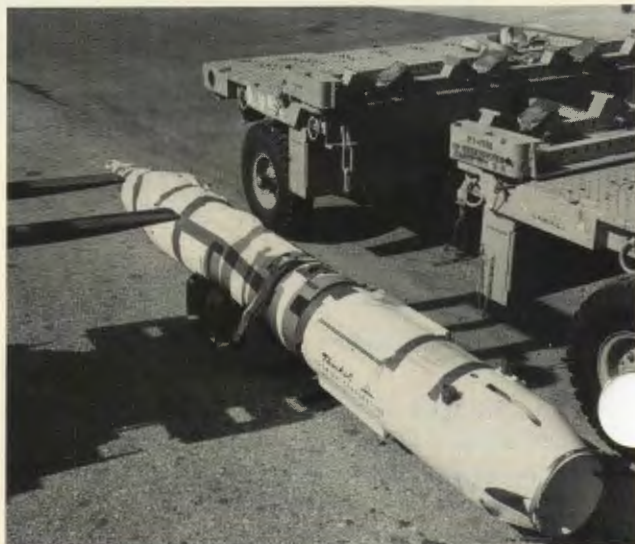
## inspection cycles

The One-O-Wonder was cruising peacefully along at 37,000 feet when his pitch inhibitor out light illuminated. He turned off the pusher and CSL, and then before descent, turned off his AFCS. The Voodoo immediately went into some fancy pitch oscillations, so he re-engaged AFCS and regained control. When he again tried turning off AFCS at 20,000 feet the same oscillations recurred, so he turned it back on and left it alone until after landing.

Maintenance investigators found the viscous damper flat. When they removed it, they found it was corroded internally. This prompted them to inspect all the birds in the unit... they found five more dampers in need of service. The unit decided to increase the inspection cycle on the viscous damper to every 25 hours.

## transferred vibrations

While in level formation flight at .85 mach, an F-105 pilot noted a mild airframe vibration and a grinding noise. The vibration ceased when airspeed was reduced. The noise did not seem to be associated with the engine, and ATM operation was normal. Post-flight investigation revealed that bearings were failing in the electronic equipment cooling turbine. They produced a vibration that was transmitted to the airframe.



## missing check list

A MSgt, SSgt, and an Airman First were watching as an Airman Second prepared to transfer an AGM-12 missile from a maintenance stand to a missile trailer. While Airman Second positioned the forklift, Airman First fastened the left tie-down strap on the missile cradle. MSgt and SSgt were supervising from opposite sides of the forklift.

On the first attempt with the forklift, they found the missile misaligned for proper lowering to the munitions trailer and directed Airman Second to back off and try again. As he backed off, the unfastened right tie-down strap caught on the trailer. Before they could stop the forklift, the missile and cradle slipped off the tines of the lift. All three men tried to catch it and managed to slow it down somewhat... it landed on the steel-toed safety shoes of Airman First. Neither missile, shoes, nor toes received serious damage.

The report cited supervisory error because MSgt was not using a check list and missed the caution that could have prevented the mishap.



We've been asked by several people in the field to pass the word on some of the items that come up during Safety Surveys around TAC. In hopes that this approach will benefit many of you . . . commanders, supervisors, and indians alike . . . we cornered our Survey Team Chief long enough between trips to have him scribble a few lines. In coming months he'll let you know what to expect from his visits, and (knowing him) he'll provide you with a chuckle or two as he gives you a run-down on what he has encountered during his . . .

# Surveys Of Places

As a starter let me pass on a few things that caught our survey team... the reverse psychology bit. Not too long ago while trooping the line in a safety vehicle, one member of the team noticed a malpractice by a maintenance type and asked the flight safety troop with an to stop so they could correct it. In short seconds they were confronted by an irate second lieutenant maintenance officer who coldly informed them that safety or no, nobody parked any kind of a vehicle within 10 feet of his aircraft. The safety officer swears that boy is going far - like Viet Nam or North Korea - as a matter of fact he's still swearing. But it was a good show and the sort of action we respect.

This next one happened to

yours truly only recently. While looking at some fuel pits during a pretty heavy rainstorm I was politely told by a fine POL sergeant that the new blue raincoat can produce static electricity and is not compatible with refueling operations. I'll be over the pneumonia bit in a week or so!

Some of the things we've found? Well, we ran across a maintenance man on a workstand with no side rails. As our team member stepped over to question the supervisor, he noticed that individual had a cast on one leg. Seems he had been working on a stand without side rails and...?!?

At another base we discovered that aircraft were arming while facing across a highway. When armed, the hot guns would swing

Surveys of places

By Lt Col Paul L. Smith  
Hq TAC Office of Safety

down the highway, through a town, and across a golf course. We believe the ultimate solution to this problem will be construction of butts similar to the one McConnell recently put up. As the local people encroach on the territory adjoining our bases we find less and less room for arming areas.

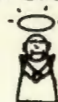
One item that we often find when visiting our troop carrier wings is the lack of a safety program for the Aerial Port personnel. They need ground safety assistance and must also be included in the flight safety meeting. They must have CIF cards. In general they should be treated as aircrew members... which is what they are.

At still another base we found one of the best OHR systems we'd seen. Local actions were outstanding. The trouble was we had no knowledge at TAC of some of the problems uncovered. The unit had not passed the information to us or to other units.

We will look very carefully this year at seat belt use. This is one area of the mission Safety 70 program which will pay huge dividends in man days gained (not lost) if we apply it properly. Our report will reflect your general attitude about seat belt use in both military and civilian vehicles, percentage of belts installed and belts used, and how your injury rate stacks up against that of bases which report 100 per cent installation.

Next month we'll cover more unusual items found last year and current look items for 1966. See you then.

S O P





# BOEING P-12E



## The PEASHOOTERS

This highly maneuverable, husky little biplane was first developed by Boeing as a by-product of the F-4B series aircraft in 1929. By 1932 a total of 366 P-12s were built for the Army and closed out the biplane fighter era by outlasting its contemporaries in squadron service.

One company-financed airplane was sold to China in 1932 where it was shot down, but only after downing two of the three Japanese that had jumped it.

Gross Weight . . . . .2,680 pounds  
Wing Span . . . . .30'  
Top Speed . . . . .189 mph  
Cruising speed . . . .160 mph  
Landing speed . . . .60 mph  
Range . . . . .620 miles  
Armament . . . . .Two .30 cal mach guns  
Engine . . . . .Pratt & Whitney  
R-1340, 525 HP

## letters . . .

to  
the  
EDITOR

Reference "Approach End Arrestment," an article by Major Andrew Patten in the Apr edition of TAC ATTACK. We believe this article was a very good presentation of the developments of the Approach End Arrestment idea and its implementation into the Air Force as a standardized emergency procedure. However we would like to clear up one point in the article concerning the F-102 Approach End Barrier Engagement speed which was erroneously stated as 10 knots above normal approach speeds. It was decided by the using commands and the SAAMA Flight Manual Manager to fly normal approach speeds, rather than 10 knots high, as recommended by Edwards

Flight Test Center. It was felt that flying normal speeds and attitudes would be more familiar to the pilot, thereby allowing increased safety and greater accuracy in the touchdown point.

Maj Hugh B. Foster  
Flight Manual Mgt. Sec.  
SAAMA, Kelly AFB, Tex

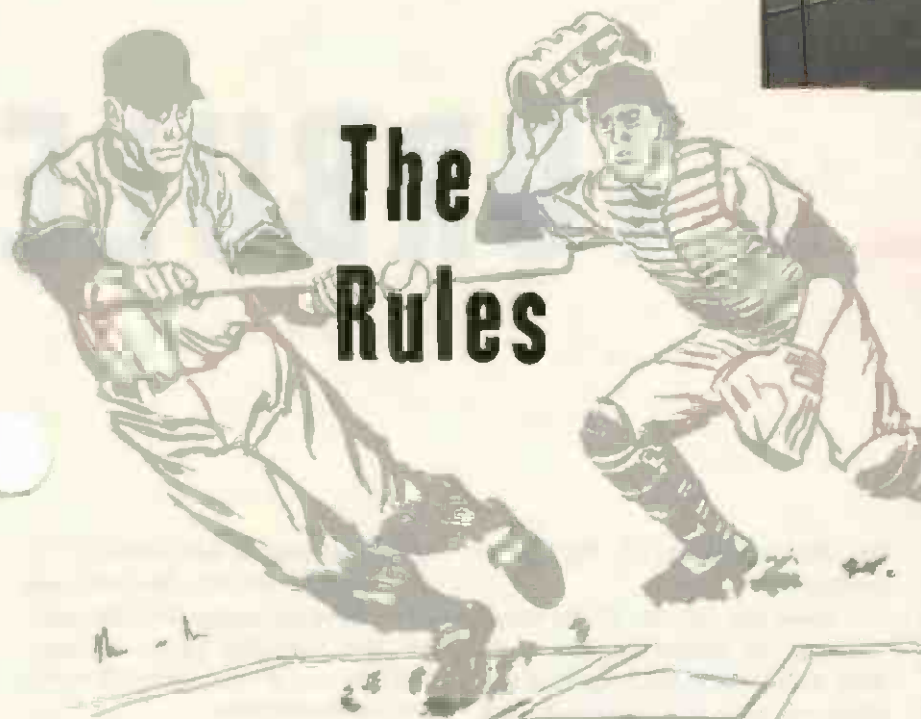
Thanx for bringing us up to speed on the Duece . . . apparently, when the author did his research at Edwards missed the change back to normal proach speed.



# Phyllis plays...



## The Rules



If your idea of a good summertime game is to sit in the bleachers with a cold beer and cheer your favorite baseball team to victory, come with me and watch an imaginary game like you've never seen before. It's the bottom of the ninth, your team is at bat, and the score is tied. With two outs Casey comes to bat and quickly strikes out. But wait, what's this? Casey's manager comes out of the dugout and demands another strike for Casey. The umpires and opponents all agree that if Casey demands another strike there isn't much they can do about it and the pitcher throws the ball. Casey hits a

grounder to left field. He dashes to first, and because the umpire is looking the other way, cuts across the mound to third and goes in to home base. Your team wins.

Later in the evening you and your wife play a game of bridge with the new couple in the neighborhood. As soon as you start dealing they start grabbing cards. When the bidding starts you pass and the gent on your left says in a boastful voice "I bid one big heart." Translated, that means he has a big hand but not quite enough to open with a two bid ... probably about 18-20 points. His partner responds hesi-

tantly with one no trump so you know her points probably total no more than six or seven. And so it goes through the evening.

Think it will never happen? Right you are. Baseball players, even little leaguers, are going to go on carefully adhering to the rules and regulations of baseball. They all saw what happened to boxing. Bridge players will go on trying to cut each other's throats by precision bidding and brilliant playing but they will be infallibly polite while doing so.

The story is quite different out on the highway where disobeying the rules and being discourteous often carries the penalty of instant death. The Casey type will put up the greatest show of poor sportsmanship you have ever seen. He will think nothing of tailgating you for miles, suddenly passing and ramming in front of you ... only to slow down and make a turn without signaling. The Goren-like bridge player will use his horn for everything except for what it was intended. He will cross over the white line, jump red lights, go through on yellow lights, and never wait his turn at a four way stop.

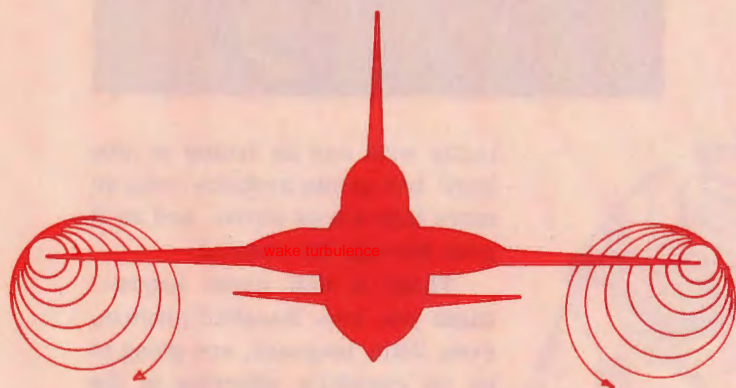
Courtesy and rules make a game worth playing ... but in driving, they can be worth your life!



...the invisible hazard

# WAKE

# TURBULEN



The F-105 pilot maintains good, tight formation position as the flight approaches takeoff speed. Just before his nose wheel breaks ground he feels himself moving too close to the lead airplane. Rudder doesn't seem to help. As both birds become airborne, the wingman realizes he is dangerously close. He holds the nose down and moves almost directly under Lead before he regains full control of his airplane. After landing, they find that the wingman's left wing tip scraped across his leader's horizontal stabilizer.

As a C-130 pilot slows his heavily loaded aircraft from 230 knots to 125 knots prior to a paratroop drop, he finds he must use more and more left aileron to hold his formation position. Suddenly his right wing drops ... he drifts across behind and below his element lead. The tail surfaces of

his airplane strike six paratroopers.

These are but two of the many mishaps in recent months that have resulted from unexpected encounters with the turbulent wake of another aircraft. The reports on these mishaps variously label the forces which caused temporary loss of control as: prop wash, wing wash, vortices, suction, and sometimes ... undetermined.

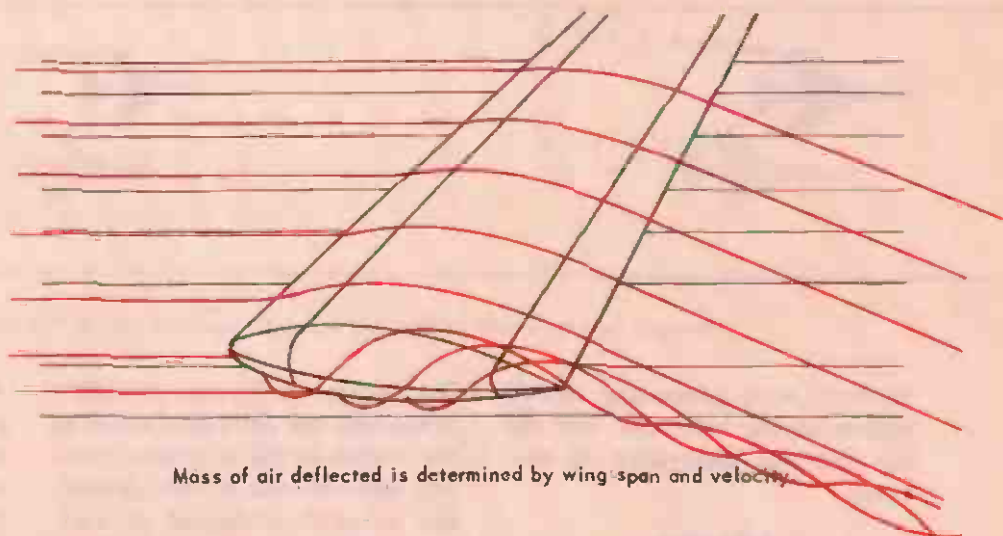
Wake turbulence actually consists of many factors but the one we most frequently encounter is the vortex. Thrust turbulence is present to some extent behind every powered aircraft, but it decays rapidly. Much more persistent, and more violent are the vortices created by a lifting wing. Most of us think of jet wash or prop wash when we encounter turbulence behind another aircraft, but it is almost invariably

wake turbulence. Because they are an off-shoot of lift, the vortices have become larger and stronger as our aircraft have become heavier ... as our wings lift more and more airplane.

In generating the lift necessary for flight, every winged airplane deflects a continuous stream of air downward. From the simplified definition of lift we learned in Primary, we recall that the shape of a wing and its forward velocity create a high pressure area below the wing and a low pressure area above it. It is natural for the air forced away from the high pressure area to move toward the low pressure area above the wing. If you could get a direct head-on look at the smoke trail from a jet aircraft, you would see that the smoke spirals out behind the airplane, splits, and follows two circular paths outwards, upwards, and in-



# NCE



wards to the top of the airplane. Each of the two vortices has a core, or a center of maximum rotational velocity. The rotating air inside the core is also moving forward at high speed toward the retreating aircraft.

The amount of air that the wing can deflect downward is determined by the span of the wing and its forward velocity, or airspeed. We can define lift as the mass of air displaced by the wing times the downward velocity.

The amount of lift being generated at any one time can also be expressed as the weight of the aircraft times the load factor. In straight and level flight the load factor is 1 G, so lift is equal to the weight of the aircraft.

With this bit of theory in mind, let's explore the downwash and rotation in wing tip vortices.

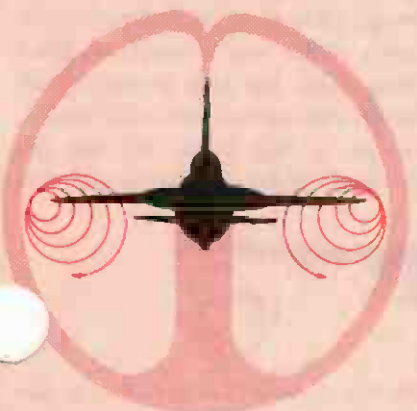
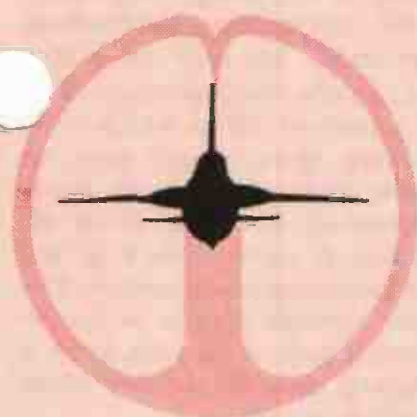
## WEIGHT

As gross weight of an airplane increases, it requires more lift and must displace more air. As more air is displaced, the vortices become stronger. If other factors remain unchanged, an aircraft will create a more violent wake right after takeoff than it will on approach after it has burned most

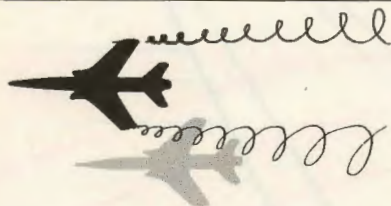
of its fuel. But because the vortices are dependent on the amount of lift being generated, a tricycle-gear aircraft will not produce significant vortices on takeoff roll until it is rotated for takeoff. As in the case of the F-105, a formation position that feels comfortable during the start of takeoff roll can become rapidly untenable as the leader's wake develops, and finally envelops his wingman's wing. And conversely on landing, vortex generation will stop as soon as lift stops ... when the full weight of the aircraft is being carried by the landing gear.

## WING SPAN

The mass of air that is displaced by the forward velocity of the aircraft is determined by wing span. Therefore, to lift a given weight with a shorter wing, we must increase the energy that we impart to the displaced air. For a given weight, the shorter the span becomes, the more intense the vortices will be. This factor becomes very important when we come to the slender, low aspect ratio wings on supersonic and delta-winged aircraft. The high weight and very low span of these







Vortices form on takeoff as the wing begins to create lift, are at max intensity at liftoff speed.

aircraft are generating much higher vortex velocities than did the previous generation of aircraft.

## AIRSPEED

This may come as a surprise, but the lower the airspeed, the stronger the vortices become. It makes sense, however, when you realize that the slower the airplane is flying, the less air it encounters each second. In order to generate the necessary lift, it must give this air a stronger downward velocity. This stronger downward velocity is then translated into greater energy in the vortices.

To put it another way, you can say that the vortices trailing behind an aircraft result from air that spills up over the wing tips during the lift-generation process. The lower the airspeed, the more spillage occurs and the more power is required to maintain a given condition of flight.

Airspeed change was a factor in the C-130 mishap cited above. The formation had just reduced speed almost 50 per cent. The size and intensity of the vortices from the lead aircraft had increased. The pilot found that he was using more and more control pressure to hold position. Perhaps he allowed himself to drift in ... deeper into the growing vortex. With his wing coming under the

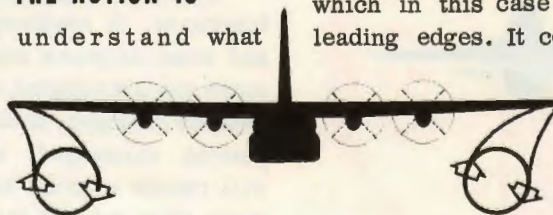
full influence of the lead aircraft's downwash, the rotational effect of the vortex added to reduced control effectiveness at low airspeed. His aircraft continued to bank toward the lead and he drifted down and across behind the other aircraft.

## LOAD FACTOR

We have said that the amount of lift being generated can be expressed as the weight of the aircraft times the load factor. In 1 G flight lift equals weight. But in accelerated flight ... a steep bank or a sharp pullup ... load factor is increased. Therefore lift increases and the size and intensity of the wake increases. For instance in a level 60-degree bank turn load factor increases to 2 G, lift doubles and the intensity of the downwash doubles. It's easy to see that turbulence generated during a fast round of ACT may be quite significant. If you fly thru your own, or someone else's wake while you're pulling a turn into the buffet, you can get some pretty good bumps.

## WHERE THE ACTION IS

Once we understand what



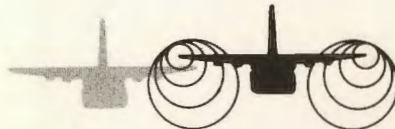
Cores of vortices move inboard, distance between them is about 75 percent of wing span.

vortices are and how they are generated, the important thing is to understand where they can be expected to occur. On a conventional straight wing the vortices roll out behind the wing, drop down from the influence of the downwash, and move inboard. The rate at which they drop varies with the airfoil shape, angle of attack, and the amount of lift being generated. But they always drop ... that's the important thing.

The cores of the twin vortices always move inboard from the wing tips, following the initial rotational movement from the bottom to the top of the wing. The distance between the centers of the two vortices depends on the lift distribution of the wing, but it is usually about 75 per cent of the total wing span.

On high performance, swept wings the formation of vortices is essentially the same ... the same general rules apply. But when you get to the extreme case of a delta wing, (which is aerodynamically little more than a couple of giant wing tips) the high pressure air spills out around the outer edges, which in this case are also the leading edges. It converges into





Slow-up in formation prior to parapod increases size and intensity of vortices.

the low pressure area above the wing, forming the vortices at the same time. Therefore, the vortices are already rolled up before they pass the trailing edge of the wing, instead of forming some distance behind the wing as with a conventional wing. The illustration on the cover this month depicts a cross-section of vortex flow past the trailing edge of a high performance wing.

## DISSIPATION

Wing tip vortices come in symmetrical pairs. When one core is broken, the other core usually breaks at the same place.

The size of the cores gradually increases with time. Their rotational speed is decreased by friction, but unless they are torn apart by shear, turbulence, or interference from some external object, the vortices continue to spin for several minutes. At low altitude any wind of more than five

knots usually has enough velocity and turbulence to shear the cores apart in a minute or two.

Tests have indicated that the original intensity decays very little during the first thirty seconds, then drops off at a faster rate. However, there have been reports of vortex encounters as much as five minutes behind the aircraft that originated them.

## KNOW WHERE THE ACTION IS

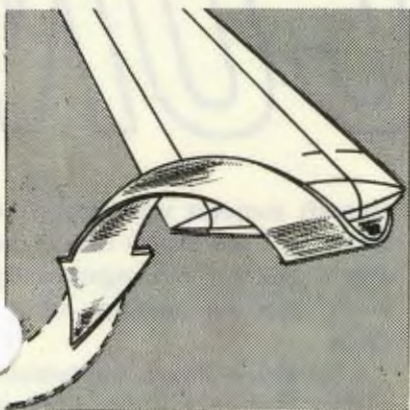
Wake turbulence behind any aircraft is dangerous, but it is greatly increased by the size of the aircraft. As we have seen, it is directly related to the amount of lift being produced. A pilot approaching the wake of an airplane similar to his own should be able to retain control and fly out of it if he realizes what he is involved with in sufficient time. But an encounter with the wake of a much larger airplane can be disastrous at low altitude.

The best general rule at low altitude or in the traffic pattern is to stay above the wake of other aircraft. Remember, the vortices drop almost straight down in still air. An above-and-behind position on final approach will keep you

safe. Following the same VASI, GCA, or ILS glide slope will also keep you clear of the turbulence from an aircraft ahead of you.

The rotating air in a vortex can produce a roll rate of about 80 degrees per second ... about twice the roll rate capability of most light aircraft. If you fly directly between the center of the vortex cores from a heavy transport, your aircraft could encounter a downdraft of about 1500 feet per minute. This explains the nose-heaviness you experience as you move in under the boom of a tanker. When your wing enters the tanker's downwash you have to add power and trim nose-up to hold altitude. Then as your wing moves ahead of the downwash and only your tail is in it, you reverse your trim to stay in position. Should you attempt to move directly to one side or the other from contact position on the boom, instead of dropping down and back, you would encounter forces that would cause a sudden (and unexpected?) roll tendency.

The best way to avoid the invisible hazards of wake turbulence is to know where they are most likely to exist. ➔



## References:

- Tirey C. Vickers, Hazeltine Corp., "Living With Vortices"
- FAA Circular 90-23A





Photos courtesy 363TRW.

# Instant

# RECON

...363rd cuts accident rate over 50%

**F**ew wings in Tactical Air Command operate three different types of tactical aircraft over half the globe. Even fewer are the units that manage to reduce their aircraft accident rate by over 50 percent in one year.

The 363rd Tactical Reconnaissance Wing at Shaw Air Force Base, South Carolina, fits both descriptions. During the last year the wing flew over 30,000 hours in RB-66, RF-101, RF-4C, and support aircraft and reduced its major

aircraft accident rate from 7.16 to 3.3 . . . the lowest rate in the wing's history and significantly lower than the average rate TAC!

The 363rd Wing's four tactical reconnaissance squadrons, three





Professional maintenance, inspection, and servicing keep 363rd's birds ready for any call.



maintenance squadrons, and combat support group are charged with training for, and maintaining combat effectiveness in gathering visual, photographic, and electronic reconnaissance information in tactical operations. Much of the wing's training activity, therefore, consisted of participation in joint-service exercises in which small elements of three to six aircraft were deployed to remote locations

in Alaska and throughout the "South 48."

The realistic training of deployed operations demanded the utmost in planning and organization from every member of the wing. Mobility preparations had to be complete and thorough. Maintenance work and inspection schedules had to be monitored with special care to assure that the maximum number of aircraft were



363 TRW Commander Colonel Victor N. Cabas' active leadership spurred the wing thru very demanding but successful year.

Lt Col A. B. Wallin, 363rd Director of Safety, sparks wing accident prevention program.







363rd's newest aircraft, RF-4C, appears strange but powerful and efficient from any angle.



L. R. Klaffer, Royal Australian Air Force, Ops Officer of 9th TRS, goes over mission plan with aircrews.



RB-66 Destroyer, an old standby, is active in 363rd's operation.

available . . . often on short notice . . . when they were needed.

As the only active reconnaissance wing in the command during the year, the 363rd stayed more than busy. On two occasions training plans were interrupted for actual deployments. During the Dominican Crisis, six RF-101 aircraft were redeployed on short notice from an exercise in the West to augment other elements of the wing assigned to the mission. Again, when the wing was called on to augment its forces already in Southeast Asia, aircraft were redeployed from an exercise and joined the rest of the deployment enroute.

Every assigned mission was launched and the short-notice deployments to combat situations were carried out without incident . . . an indication of the excellent maintenance program and general tactical preparedness of the 363rd Wing.

During 1965 the 16th Tactical Reconnaissance Squadron converted from RB-66 aircraft to the RF-4C, a new aircraft for the wing. The RF-4C was involved in landing and flight control problems during the period of aircrew transition and combat-readiness training, but in spite of the difficulties, the squadron became operational and deployed to Southeast Asia without



Final maintenance check before . . . 01





Rapid, efficient turnaround adds to success of the mission.



Early morning recce during Alaska deployment produced this striking photo.



takeaway assures it is ready for mission.



Camera maintenance and inspection are important parts of 363rd's operation.

mishap before the end of the year. Two other squadrons, the 20th Tactical Reconnaissance Squadron equipped with RF-101s, and the 41st Tactical Reconnaissance Squadron, equipped with RB-66s, deployed PCS to Southeast Asia without incident during the year.

The missions assigned to the 363rd Tactical Reconnaissance Wing during the year included operations over widely varied geographic areas, in all weather conditions, and in actual combat. Operations were conducted from remote locations in the Arctic and over tropical areas of Southeast Asia and the Caribbean. The wing's aircrews encountered snow, ice, and low ceilings in Alaska

and intense rain and thunderstorms in the tropics. Many of their deployments were ocean crossings consisting of long flights with numerous air refuelings enroute. RF-101 and RB-66 aircraft assigned to the 363rd logged over 6700 hours of actual combat support time during the year.

Under the energetic leadership of Colonel Victor N. Cabas, the men of the 363 Tactical Reconnaissance Wing have set an outstanding example of efficient operation through their professional airmanship, superior maintenance, and careful planning for a complex and demanding mission.

Well done, 363rd . . . TAC is proud of you! ➤





by Lts Charlotte Russell  
and  
Chuck Giddens  
Det 2, 5th Wea Wing

### ...what can it tell you

"No sweat ... I'll go VFR" is the caption on a poster depicting a hardy TAC pilot toting his gear to his trusty (we hope) aircraft. Looming ominously in the background is a thunderstorm. What ensues can be left to the imagination.

There's a warning here ... both visual and audible. Even so, how many of you have taken off into local thundershower activity? Only mild you say? Circumnavigable? Chances are next time that local shower will develop into vicious thunderstorms towering above your operational ceiling, stretching to both ends of the horizon, and covering ground seemingly faster than you are.

It's summer again ... time for widespread thunderstorm activity, and you may encounter one or

more on any route. Present or forecast thunderstorms, depending on their extent or intensity, may be cause to alter, delay, or cancel your flight. It may pay to linger a while at the forecast counter before you sprint to the flight planning room.

The first thing the forecaster is required to do when you present him your DD-175, is to brief you on any severe weather activity along, and 50 miles either side of your route. He has received this information in a centrally prepared area forecast from the Kansas City Severe Weather Forecast Center. Prominently displayed at the weather station in the form of a graphic bulletin is the same information, depicting areas of forecast severe weather on an overlay of the U.S. In the

case of thunderstorms, letter and color coding is used to indicate forecast intensity and persistency over each area. The terminology involved has caused a certain amount of confusion concerning area coverage, so we've represented it below. You have seen it before, but look it over again. Perhaps thunderstorm forecasts will be more meaningful to you.

A new graphic bulletin is issued from Kansas City every six hours. Warnings are issued immediately if severe weather is occurring or moving into an area not previously forecast. So generally, a forecast of thunderstorms along your route is based on a centralized area forecast.

Kansas City issues various other warnings including the Aviation Severe Weather Fore-



st, which you normally receive in the form of an inflight advisory. For more specific information, particularly when it appears you must alter your route or change destination, you can contact Pilot-to-Forecaster Service on 344.6 UHF (Metro).

The forecaster has several tools at his disposal when he briefs you on current enroute and destination weather. Among them are observations and forecasts, pilot reports, radar advisories (sequences), and the radar summary chart which displays the most recent areas of precipitation activity. If weather in your local area is the problem, stations equipped with GPS-9 radar provide excellent weather coverage for a radius of about 200 miles. Stations with the older, and sometimes finicky, APQ-13 weather radar may pick echoes at 100 miles. If the echoes are very strong, they may show up at 150 miles. The APQ-13 will pick up moderate and stronger rain, but light rain or cumulus ... even in lines ... can be seen only at close range, if at all. Operation-

ally, the local flying area for a base may exceed the coverage capability of weather radar. Sometimes we can ask GCA to monitor weather, but max range for GCA radar is 60 miles and when GCA is busy, our weather advisories naturally slow down.

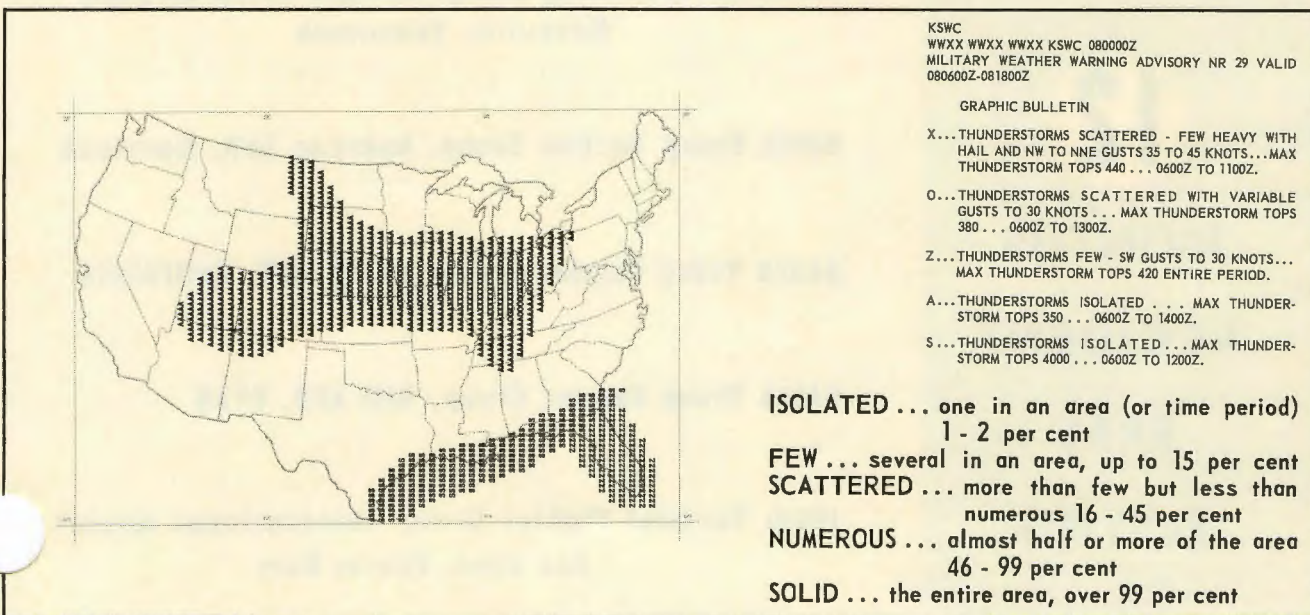
Cumulonimbus clouds represent strong vertical convective currents. Most simply, they occur in moist air that is heated from below or cooled from above, so that the warm air is displaced by surrounding colder air. So the forecaster must have measurements of temperature and moisture content of the air from the surface to great heights in order to determine the possibility of thunderstorm occurrence.

Since the temperature and moisture structure of the atmosphere may be constantly changing, the radiosonde values can give the forecaster only a general idea of thunderstorm possibility. There is also an instrument time lag in recording parameter values. And since upper level wind velocities increase with height, radiosonde values don't always show a true

vertical sounding. Stations without radiosonde capability must choose the nearest sounding, which of course, may not be representative for their particular area.

Assuming we always have representative values of temperature and moisture content, the upper air analysis still may not provide us a clear-cut picture of thunderstorm occurrence. For instance, thunderstorms may occur only when a sufficiently high surface temperature is reached to produce an unstable condition. This factor, then, generally depends on the varying ability of different surfaces to absorb solar heating. Therefore, though we may know that local conditions are favorable for thunderstorm occurrence, we can't say exactly where or when they will appear.

Area rather than point forecasts pretty much reflect the state of the art in air-mass thunderstorm forecasting. You may have to divert from your planned destination because of local activity when the forecast you received stated only "TRW VCTY." Before





you go busting in to the weather station, bear in mind that an area forecast of isolated thunderstorms will give any single station a slight chance of having the only occurrence within 100 miles. On the other hand, when you ask, "Where are the CBs you've been forecasting all week?", you'll probably be told that CBs have been reported in the general forecast area. Thunderstorm movement with frontal zones or squall lines may often be predicted, allowing the forecaster to make a timely point forecast. But air mass thunderstorm forecasts are based on representative parameters for large areas.

Air mass thunderstorms have

been termed comparatively tame, but text book models are too often over-simplified. Thunderstorms rarely occur as a single cell. Much more frequently, we find them as multicellular storms imbedded in middle clouds. In short, all thunderstorms are potentially dangerous. And for any forecast thunderstorm activity the forecaster must enter on the DD 175-1, "thunderstorms with hail, severe turbulence, and moderate to heavy mixed icing." We can't get away with the light treatment ... like, "Don't sweat the icing ... the hail will knock it off."

Of course, pilot reports are very valuable to us. Because conditions are constantly changing,

the timely information which you can provide is our best source of information. Even the absence of weather tells us something ... possibly, conditions are developing which will inhibit vertical build-ups.

In research projects, jet pilots have flown into thunderstorms to record temperatures, vertical velocities, structural stresses, and airframe damage. Among other things, they learned that confidence doesn't diminish the hazards of flying through a CB. You, the pilot, are the forecaster's eyes aloft ... but please, guys ... don't start your own research projects!

## UNIT ACHIEVEMENT AWARDS

The following units have been  
awarded the TAC Unit Achievement  
Award for:

**12**

**MONTHS  
ACCIDENT  
FREE  
FLYING**

**134th Air Refueling Group, McGhee Tyson Airport,  
Knoxville, Tennessee**

**909th Troop Carrier Group, Andrews AFB, Maryland**

**944th Troop Carrier Group, March AFB, California**

**945th Troop Carrier Group, Hill AFB, UTAH**

**156th Tactical Fighter Group, International Airport,  
San Juan, Puerto Rico**



# TAC TIPS



## AMATEUR HOUR

The two Hundred herders swapped lead during a formation takeoff. Lead caught up and joined with Two during the turn out of traffic. As Lead slid into position two gave him the signal to change lead. While they were changing lead, BOTH PILOTS LOOKED IN OPPOSITE DIRECTIONS.

When they decided to look at each other again, they were extremely close. As they tried to break away from each other, Two's wing nudged Lead's drop tank up into his aileron. Deciding to call it a day, they stayed away from each other long enough to make straight-in landings and walk away from the airplanes.

## RUDDER FLAPPER

About ten minutes after takeoff, at 410 knots, the Squash Bomber pilot felt his bird start vibrating. It soon became severe. His wingman reported the rudder was flapping. After the pilot disconnected stab aug, the vibrations ceased.

When he landed, the pilot learned that the bird had experienced the same problem a week earlier, no wingman had been present to see the rudder, and no one on the ground had been able to locate the cause. This time the maintenance folks decided to impound the aircraft and really investigate.

Sure enough, they found the trouble ... deteriorated insulation on a wire bundle in the electronic compartment. This was a B-model '105 and all hands agreed the older birds need closer watching.

## ALIBI IKE

Communications, specially at high density airports have been a major bottleneck to operations for a long time. Pilots are crying that communications are saturated. One cause of this saturation has been

unnecessary explanations ... often alibis. For example - "Say again, you were blocked out by another aircraft." Who gives a hoot why, just say "say again." Explanations are superfluous. On your next flight see how many Alibi Ikes you notice. Or are you one too?

## OVERLOOKED

While climbing his Phantom thru FL 280, the front phlyer noticed his companion in the back seat was sleepily nodding his head and not responding to conversation. The front seat pilot immediately asked for and received clearance and descended below 10,000 feet. During the descent he discovered he had no cockpit pressurization. After a few minutes at low altitude the back seat troop recovered, and when the flight surgeon checked the recently hypoxic pilot after landing, he found no after effects.

A look at the Phantom's cockpit revealed the vent dump valve was not seated. The pilot stated that during the cockpit check he looked at the valve handle but didn't insure it was seated. The ON/OFF switch on the oxygen regulator was OFF and difficult to move. After the switch was cycled a few times, it froze and would not move. A check of the rest of the regulator revealed no other discrepancies.

The back seat pilot stated that slight nausea was the only hypoxia symptom that he recognized before becoming helpless. He thought he went to 100 per cent oxygen; however, with the regulator turned off he would have been unable to breathe.

Most units wire the oxygen regulator ON/OFF switch to the ON position...this unit is doing it now! But in the interest of his own self-preservation, an aircrew member would do well to build inflexible habits like looking at the blinker...and seeing it blink, waiting for the cockpit to pressurize at 8000 feet...and being alarmed if it didn't!



## RAPID ROBERT

The F-84 pilot made an uneventful hookup with a KC-97 tanker and started to transfer fuel. When the boomer told him he had a full load, the Hog driver hit his disconnect button and dropped straight down. The Boomer saw that disconnect had not taken place and actuated his disconnect button. The stubborn boom didn't come loose until it had partially ripped the receptacle from the fighter's wing.

Next time, this pilot is going to assure himself that the boom is free before he moves out of the refueling envelope.

## OOPS, SORRY

It was scheduled to be a practice AIM-7 missile firing against a drone. Shortly after the drone was launched at 35,000 feet by another fighter, the firing aircraft picked up a radar contact and started his attack. Range control cleared him to fire because the drone-launch aircraft had called a good target and breaking away and down.

When the drone launch aircraft saw the firing aircraft diving out of the contrail level, he realized something was wrong. Although he tried to take evasive action, the inert missile struck him on the right fuselage while he was inverted. The right engine ingested missile and aircraft fragments and had to be shut down, but he managed to make a successful emergency landing.

## SOUND PHAMILIAR?

While he waited to top off his Phantom's fuel for a test flight out of periodic, the phlyer decided to perform a high speed taxi test. He had noticed during taxi to the fuel pits that his nose wheel steering was pulling to the right. He received clearance to an 8000 foot runway nearby and decided that the 10 to 12 knot tailwind wouldn't present a problem. He planned to accelerate to 80 knots with nose steering engaged, come out of burner, and decelerate.

All went well until the phlyer pulled the throttles to idle . . . the big bird accelerated to 110 knots before starting to decelerate. He briefly considered taking off, but thought there would be no problem stopping. He decided the drag chute would have negligible effect at that speed with a tail wind. (And he wanted to take off on the test flight after refueling).

About 200 feet from the end of the downhill runway, the right tire blew. The tail hook picked up the cable but didn't pull out any chain before the airplane sank into the dirt off the end of the runway. There was no overrun.

## NOSE WHEEL STEERING

As a T-39 pilot from another command was taxiing his little bird, the HYD PRESS/PWR OFF light illuminated; and the nose wheel steering quit working. The pilot pulled the emergency brake T-handle, pumped the brakes, and turned on the auxiliary hydraulic system. The hydraulic pressure built up and the brakes took effect. However, the Sabreliner traveled 30 feet on the grass along side the runway before it stopped when the gears sank about five inches into the soft ground. The aircraft was towed back on the taxiway undamaged, and investigators could find no electrical or hydraulic malfunction of the nose wheel steering system. The most probable cause of this incident was that the main hydraulic pump switch was inadvertently left in the OFF position.



## BRIGHT IDEA

Sometimes the wheels of officialdom turn slowly. Sometimes you find you need equipment right away . . . the day after you ordered it. Such was the case at Buckley ANG Base when the 140th TFW found they needed approach lights to runway 32. Rather than continue to operate without approach lights while they waited for them to be installed, they ingeniously rigged the temporary lights shown here. Captain Don Neary stated when he sent us the photo that altho the lights are few and small, they provide the depth perception needed for proper clearance above the end of the runway. Good show, gang!



## KOREN KOLLIGIAN, Jr., TROPHY



Captain Robert E. Watkins of the 435 Tactical Fighter Squadron, George Air Force Base, California, was awarded the Karen Kolligian, Jr., Trophy for 1965, in ceremonies at the Pentagon, 6 May 1966.

The trophy was donated by the Kolligian family in 1958 in memory of First Lieutenant Koren Kolligian, Jr., USAF, who was declared missing in line of duty on a flight off the coast of California. The award is presented annually to the pilot or aircrew member who most successfully coped with an emergency during flight.

Captain Watkins distinguished himself and earned the trophy by exceptionally outstanding airmanship on 12 October 1965 while handling a serious refueling emergency during an over-water deployment to Southeast Asia.

On the fourth air refueling the probe assembly separated from the tanker hose and slid down the probe of Captain Watkins' F-104 aircraft. After numerous abortive attempts to refuel from a diverted tanker with his damaged probe, he finally managed to take fuel with tanker hose draped across his canopy.

Captain Watkins' calm reaction to this critical emergency, and superior airmanship while facing probable bail-out over the ocean averted the loss of a valuable combat aircraft. Good show - Captain Watkins!

## LOADMASTER OF DISTINCTION



Staff Sergeant Raeford M. Darroch, 777 Troop Carrier Squadron, Pope Air Force Base, North Carolina, has been selected as a Tactical Air Command Aircrewman of Distinction.

Sergeant Darroch was crew loadmaster on a C-130 during a night paratroop drop exercise. Over the drop zone the Army jumpmaster's re-

serve chute was inadvertently deployed into the airstream by one of the troopers preparing to jump.

Sergeant Darroch immediately recognized that the jumpmaster would probably be dashed against the door of the aircraft. Once pulled from the aircraft, the jumpmaster's main chute would deploy with the possibility that the two chutes might tangle and collapse. Sergeant Darroch leaped forward and cut the reserve chute shroud lines with a knife. Even though he was wearing a parachute, Sergeant Darroch risked his own life. Had he been unsuccessful in immediately cutting the shroud lines, he too could have been pulled from the aircraft, entangled with the jumpmaster's parachutes, and dashed against the side of the aircraft.

Sergeant Darroch's outstanding presence of mind, professional knowledge, and judgment in averting serious and possibly fatal injury to the Army jumpmaster readily qualify him as a Tactical Air Command Loadmaster of Distinction.



## AIRCREW ACHIEVEMENT AWARD

Aircrew Achievement Award



Captain Boyle - Pilot



Captain Ganss - Co-pilot



1st Lt Lariviere - Nav



SSgt Berry - Flight Mech



A1C Johns - Loadmaster

The C-130 crew of Captain George A. Boyle, 777 Troop Carrier Squadron, Pope AFB, North Carolina, has been selected to receive the TAC Aircrew Achievement Award for the period ending 31 March 1966.

On gear retraction after takeoff for a combat support mission, Captain Boyle's crew noticed an unusual aircraft vibration. On inspection, they found the right main gear door partly open. Seconds later the C-130 yawed violently and the door separated from the aircraft. They lowered the gear to determine the extent of damage and found the right front main landing gear wheel was loose from the axle and cocked at a 45 degree angle. By skidding the aircraft, the crew made the damaged wheel fall off into the sea. They then jettisoned 12,000 pounds of fuel and rearranged equipment in the cargo compartment to obtain an aft CG for landing. Through careful and correct planning, and coordination by all crew members, the aircraft was brought to a successful stop on a foamed runway with minimum damage.

The outstanding professional ability, sound judgment, and teamwork displayed by Captain Boyle's crew merits their selection for the TAC Aircrew Achievement Award.

## MAINTENANCE MAN OF THE MONTH

Maintenance Man of the Month



Master Sergeant Wayne L. Schubert of the 4510 Combat Crew Training Wing, Luke Air Force Base, Arizona, has been selected as a Tactical Air Command Maintenance Man of the Month. Sergeant Schubert will receive a letter of appreciation from the Commander of Tactical Air Command and an engraved award.

## CREW CHIEF OF THE MONTH

Crew Chief of the Month



Staff Sergeant James W. Smith of the 464 Troop Carrier Wing, Pope Air Force Base, North Carolina, has been selected as a Tactical Air Command Crew Chief of the Month. Sergeant Smith will receive a letter of appreciation from the Commander of Tactical Air Command and an engraved award.



# AN ANALYSIS OF TAC ACCIDENT EXPERIENCE

# TAC TALLY

for april 1966

## ACCIDENT FREE

ACTIVE	MONTHS		ANG/RES
15 TFW			
23 TFW	5	8	131 TFW
67 TRW	4	7	140 TFW
479 TFW	3	6	122 TFW
4500 ABW	58	69	349 TCW
4442 CCTW	41	44	403 TCW
516 TCW	20	34	459 TCW

## MAJOR ACCIDENT RATE

TYPE	TAC	* ANG	AFRES
ALL	7.6	9.4	7.8
		8.9	13.2
A-1	0	15.7	
F-84		5.3	
		0	15.8
F-86	114.7	0	
	121.6		31.1
F-100	16.4	14.6	
	14.4		17.0
F-101	27.3	95.2	
	0		0
F-104	18.7		
	23.3		
F-105	19.3	0	
	22.3		46.8
F-4	6.0		
	10.5		
B-57		0	
		12.3	
C-47	0	0	0
	0		0
C-97		0	
		6.6	
C-119		0	8.0
		0	1.3
C-123	0		
	0		11.0
C-130	1.5		
	1.8		
T-29	0		
	0		
T-33	0	0	
	0	5.3	
T-39	0		
	0		

### T-28

MAJOR - Aft disintegrated on pullup

from 45 degree dive bomb run.

MINOR - Gear-up, flaps-down landing in  
plowed field after cylinder head failure.

### F-84

MAJOR - Aft crashed short of runway  
after experiencing radio difficulties.

### F-101

MAJOR - Landed short, damaged landing  
gear.

### C-119

NR - Nr 2 engine failed to unfeather  
FCF. Attempted single-engine go-  
around after unsafe gear indication.  
Crashed in open field.

## APR TALLY

UNIT	MAJOR	MINOR
4410 CCTW	1	1
102 TFW	1	
123 TRW	1	
434 TCW	1	

\* estimated due to non-receipt  
of ANG rates at press time.

thru apr 66

1965



