TAC ATTACK

OCTOBER 1968

THE BRONCO....page 4

for efficient tactical air power

TAC ATTACK

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TACTICAL AIR COMMAND

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Angle of ATTACK

where are your supervisors ?

Several recent accidents have suggested a downward trend in the quality of our aircraft maintenance. Perhaps it's because in the last two years we have had to adjust from a highly experienced work force to a situation of disproportionate numbers of young and inexperienced airmen. It follows then, that our maintenance supervisors must be especially vigilant and conscientious in their monitoring and training of these lesser-skilled airmen. Yet, despite recognition of the experience-level problem, we are encountering malpractice as basic as bolts unsecured on flight control systems and improperly connected pitot-static lines. Invariably, experienced maintenance supervisors were available, yet the items in question slipped by unnoticed.

How does this happen? Poor scheduling and utilization of high maintenance skill levels is at least part of the problem.

Do you visit your flight line frequently at night after all flying is complete? As you know, most of the recovery maintenance effort is accomplished after normal duty hours. That's when much of the heavy work, aft section removal, engine changes, and the like, take place. Or, have you visited your flight line on Saturday morning, when the last few aircraft are being readied for Monday's flying schedule? How many stripes did you see? In your weapons storage, assembly, and loading area ... how many highly-qualified supervisors were present?

Have you monitored the specialist assistance your transient alert section provides stranded pilots at odd hours, checking skill levels assigned to accomplish the work? Were they adequately supervised?

Now add to your flight line visits the subject of checklist and tech order use. During preflight or post-flight, how many Dash-Six checklists did you notice? If one of your crew chiefs preflighted from memory, how many items were missed?

Quality work by maintenance personnel is as necessary to mission success as pilot skill and training. Neither is more important than the other. One can negate the other. They are both integral parts of our TAC team. When either part of our team fails to perform in the prescribed manner, we all lose.

If you check at this moment or better yet, tonight... where will you find your senior maintenance supervisors, in the "office" or on the line?

R. L. Liles

R. L. LILES, Colonel, USAF

Chief of Safety

TAC's NEWEST....

THE OV-10A BRONCO

By Major John M. Lowery

Want to fly a FAC aircraft that handles and performs as good or better than most high performance fighters? Then try TAC's newest acquisition, North American Rockwell's OV-10A Bronco. This tri-service counterinsurgency aircraft was designed to operate from unimproved airstrips and perform an exceptional variety of missions.

Because of the rapidity with which it has been brought into service Bronco's exact role in future combat operations has not been positively defined. Many of its capabilities are still in a prototype or test stage. At present TAC is training pilots to use it in a forward air control mission, thus augmenting the hardworking fleet of O-1s and O-2s. As this is written a TAC team is busy introducing it into SEA.

The OV-10A is a thoroughbred... faster and tactically more versatile than a helicopter, yet slower and more maneuverable than a jet fighter. It appears ideally suited to the variable requirements of counterinsurgency operations.

In a passive role it can be tasked for a variety of missions which may include any one of the following: Airdrop 3200 pounds of cargo, carry six passengers or five paratroopers, evacuate two litter patients with medic, conduct photo reconnaissance, carry specialized battlefield sensors, flare dispensers, tow targets, psy-warfare loudspeakers, spray defoliant, or insecticide.

SURVIVABILITY

The OV-10 is built to survive... would you believe 8 Gs? This gives the pilot plenty of latitude in getting in and out of a target area without danger of airframe overstress.

The landing gear is probably the toughest and most unique we own. Flying out of 1500-foot airstrips requires a firm touchdown from a short field approach. The Bronco's two-stage, air-oil telescoping, shock-absorbing struts can take 1200 feet per minute without any problem. Because of its unique design the gear resists bouncing. This allows operation from extremely rough fields. In case of hydraulic failure, the pilot can free-fall the gear down and locked.

Brakes are seldom needed because of reverse thrust capability.

For crew protection it has 328 pounds of armor plate behind and beneath each seat. The windshield is also bullet resistant with a one and one-half inch thick front panel. And the two reliable, counter-rotating, turboprop engines are fed from five self-sealing, foam-filled fuel tanks.

Ejection seats are the LW-3B, designed to fulfill escape requirements of medium speed V/STOL aircraft. It is capable of ejecting a crewmember from ground level at speeds of zero to 450 knots; under conditions of high sink rate and off-horizontal at under 200 knots. These latter two capabilities have already been successfully utilized in two critical low-level ejections, supporting the manufacturer's claim "... exceeds all contemporary escape systems."

Following modern day concepts, sequenced ejection of the crew is a standard feature. Time interval between seats is presently 1.15 seconds. This is being improved to eight-tenths. Crewmembers ejecting above 10,000 feet, or over 200 knots are protected by a two-second delay which allows seat deceleration prior to chute opening, thus protecting both man and chute canopy from overstress.

DESIGNED SAFETY

Several features of the Bronco are unique from a safety standpoint. For example, when the crew ejects the IFF automatically squawks MAYDAY even if the set is "off." If an engine should begin losing oil pressure, the prop will automatically feather thus protecting the crew from hazards associated with sudden bearing seizure. This is especially valuable during takeoff on a hot day at high gross weights. One caution though, when performing aerobatics: Avoid prolonged negative Gs, otherwise you may feather both engines when the oil pressure drops. Incidentally, Bronco's engines have air intakes located on top of the nacelle. This and their high wing mount makes them almost immune to some common types of foreign object damage... except forgotten tools.

For stability in rough air there's a yaw damper. This is used primarily during air-to-ground gunnery. But keeping the aircraft stable not only improves accuracy, it lessens stresses all around.

Another item all combat crewmembers will welcome is an engine fire extinguishing system, found only on the USAF version. It consists of an electrically fired, squib-actuated 450 psi bromochloromethane (CB) extinguisher bottle. Bottle firing is ac-

OV-10s are now in SEA augmenting O-1s and O-2s in a FAC role. The twin counter rotating T-76 engines are rated at 715 Shp.

complished by pulling the firewarning light/extinguisher handle, then actuating the agent switch.

If you're the type who worries about radio failure ... don't. The OV-10 contains two FM sets, a UHF, VHF, HF, and a Juliet 28 speech security system. This gives you just about every conceivable communications capability. For navigation you'll find TACAN/DME, VOR/ILS, UHF with ADF, ADF, FM homing, along with a 1064-channel SIF.

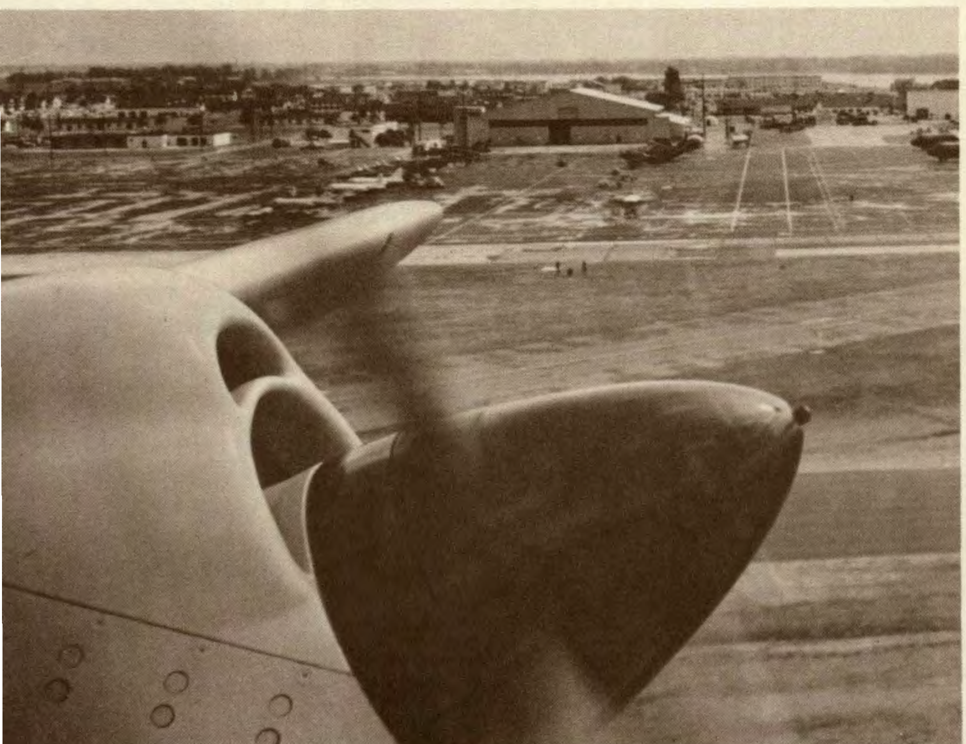
IN FLIGHT

Before writing all this, we flew the Bronco with Captain Peter D. Bernstein of the 4409 CCTS, Hurlburt. Pete finished an O-1 SEA tour as a FAC about two years ago. He showed us some of the bird's capabilities and needless to say, we were impressed.

Nose gear rotation on takeoff was swift and sure ... much faster than a normal jet. Safe single engine speed (clean) of around 77 knots passes so rapidly one hardly has time to notice. Gear retraction takes about six seconds.

Climbout after takeoff was a steep 30 degree angle at 95 knots. By field boundaries at Langley we had over 2000 feet. The mechanical, aerodynamically boosted, flight controls felt like an F-86...smooth, responsive, and light. Roll control is augmented by four plate-type spoilers in the forward part of each

Landing can be accomplished from a steep, powered, on-speed approach. Landing roll on a paved runway is around 800 feet.



Climbout after takeoff is at an impressive 20 to 30 degree angle. Upon reaching airfield boundaries at Langley we were passing 2000 feet.

wing. These spoilers are interconnected to, and driven by, the ailerons.

Top speed is 430 knots in a dive. Cruise is a moderate 210 knots at 550 pph fuel flow. The bird is unpressurized and therefore restricted to 25,000 feet. Single engine altitude is listed as 13,000 feet.

Landing rollout was short and most spectacular. We touched down firmly and promptly went to reverse thrust. Pete says you seldom need brakes. The bird stopped almost immediately . . . in about 800 feet. He told us later that on grass or unprepared surfaces you can lock the brakes (no antiskid) and get stopped in 550 feet . . . without blown tires. On pavement though, you have to avoid skidding for the usual reasons.

The only bad trait we could find in the Bronco was lack of cockpit cooling. Ram air is available and provided reasonable comfort for our 90 degree day at Langley AFB. However, a 90 degree day at TAC Headquarters isn't nearly as hot as 90 degrees in Vietnam . . . generally speaking.

The OV-10 impressed us as an aircraft ruggedly designed to perform a rough mission in as safe a manner as modern technology will allow. Only structural problem uncovered so far is elevator flutter at very high indicated airspeeds. This is presently being corrected.

TAC's first transition class started at Hurlburt in July. If you still have any doubts, just drop into Eglin Aux 9 and ask the man who flies one.

Captain Peter D. Bernstein, pilot, and SSgt William L. Phillips, crew chief, discuss a just completed two hour flight. Aircraft utilization is exceptional and discrepancies, when they occur, are usually minor.

CHOCK TALK

chock talk

....incidents and incidentals

phantom pod picklers

F-4 pilots have had some red-necked moments because of the DCU-94A Bomb Control Panel. It usually happened when they were trying to explain why they unintentionally dropped LAU-59A and SSU-21 dispensers or an SSU-16A gunpod while pickling over a target. And 99 times out of 100, the only explanation was admitting a goof: "I hit the wrong switch on that danged DCU selector panel."

Cussing out the control panel, which helps make your bird a highly versatile ordnance delivery platform, is hardly a solution. But there is a solution almost as simple and it saves a lot of profanity. It is a control panel guard plate. And because it is already outlined in TO 2F-4C-16-2, supervisors may be subject to a red-necked session if their squadron is operating without compliance.

The TO suggests using sheet aluminum to make the plate. Some units have used plexiglas because it doesn't cover selector switch identification. Drill holes in the plate, allowing it to slip over all switches. This locks toggles in the "off" position. Holes for the switch or switches to be used during ordnance delivery can be elongated, permitting full toggle movement.

The cost of one lost gun pod will more than cover the investment of Bomb Control Panel guards for every Phantom in TAC. We've already lost two. Will your unit score the third?

crossed connections

Try placing your left foot in the right shoe and your right foot in the left shoe. Looks wrong? No sweat! Just cross your legs and the average viewer will never notice, that is, if you don't try walking.

The same thing seems to be happening to some of our birds. A VT-29A took off and climbed out normally until reaching 6,000 MSL when failing fuel pressure forced feathering an engine. After an emergency landing, inspectors found that the fuel balance line, from the fuel pressure transmitter to the engine driven fuel pump, was crossed with the fuel drain line, causing a drop in fuel pressure as altitude increased. The connectors are interchangeable. The lines are similar in appearance and located about three inches apart. To the unwary, they looked OK, but it didn't work.

Perhaps the point of this little lesson may long be remembered after a short walk around the maintenance dock... wearing crossed footwear.

quality consequences

An F-105D had been airborne about 25 minutes when the external tanks went dry. The pilot thereupon switched the fuel selector to bombay tank position. Three to five seconds later the Fuel Inlet Pressure caution light illuminated and the engine flamed out. Since he was at 3000 feet the pilot quickly selected emergency fuel system, but was unable to get an airstart. He zoomed to 4000 feet and established a 250 knot glide.

In a further effort to save the bird, he selected main tank, throttle idle, and reselected normal fuel system. All efforts to obtain an airstart were again unsuccessful. He pulled and reset the fuel system circuit breaker. Now at 1500 feet and prepared for ejection, the pilot tried one more start... this time using the cartridge start button. This action restarted the engine and a successful landing was accomplished.

The cause of this near-ejection was simple. Insulation on wiring inside the fuel control cannon plug had been stripped too far by an electrician. Excessive bending of the wires caused one to break, subsequently shorting and closing the main fuel control valve when bombay tank was selected.

Failure of a specialist to provide quality workmanship jeopardized both pilot and aircraft.

with a maintenance slant.

unauthorized mod

Despite all warnings to the contrary someone occasionally modifies an item of Air Force equipment to suit his own needs or desires. In aircraft maintenance this can be quite hazardous. Take the case of a T-33 shooting touch and go landings. When power was applied for go-around the pilot noticed the engine had flamed out. Fortunately he had plenty of runway ahead for a safe stop.

Maintenance investigators discovered that the front cockpit throttle plate had an unauthorized modification. Adjustment screw holes had been enlarged and the idle detent horn had been filed away. This allowed the front cockpit throttle to stop cock the engine when the rear seat IP retarded his throttle to idle.

TOs tell us how to request needed equipment modifications. Unauthorized mods such as this one could cost us an airplane and crew.

F-4 canopy loss

Incident One: Shortly after takeoff, the front canopy separated from the aircraft. Fortunately it fell on an uninhabited area. The pilot stated that before takeoff checks showed canopy down and locked. Investigation, at first, pointed toward pilot error. However, on closer examination, maintenance investigators discovered several seemingly minor maladjustments, none of which could be seen by the pilot. They all added up to a lost canopy.

Incident Two: An F-4 backseater lost his canopy because his canvas checklist bag wasn't secure. He had tried to zip it in the map case but the zipper wouldn't close . . . the case was too full.

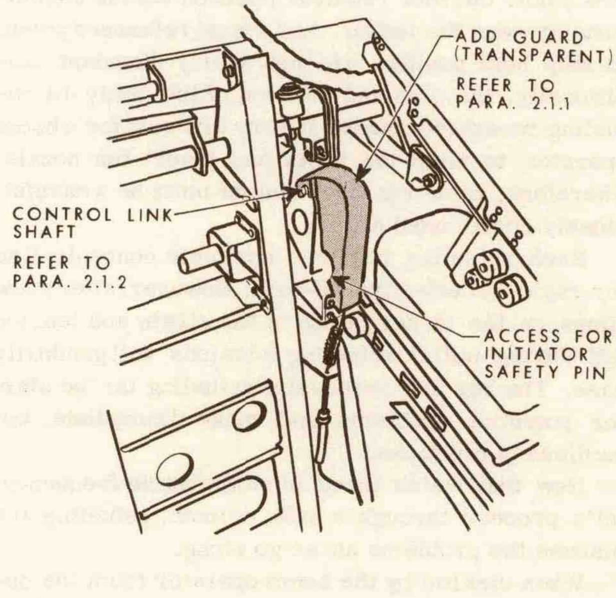
During subsequent maneuvering the bag worked loose and struck the bulkhead-mounted canopy initiator. This fired the canopy.

Incident Three: On a formation GCA approach, lead gave a verbal gear down command. The wingman mistakenly actuated the canopy jettison handle resulting in another lost canopy.

Many of these mishaps have been blamed on the pilots and perhaps some were justified. However, maintenance error in canopy rigging now appears to be involved. This too is somewhat understandable since tolerances are extremely critical. Quality Control advises, "When you rig a canopy, use the low end of the tolerance scale."

In the meantime, some relief is pending in the form of TCTO 1F-4-781, installation of a guard over the rear cockpit canopy selector lever. This should eliminate accidental firing of the rear canopy. ECP F-4-882 provides for a transparent guard over the canopy initiator which will prevent incidents of the "loose-checklist-bag" variety.

In the meantime, watch that canopy!



HOW F-4s REFUEL...

...very carefully

By Major Sol Harp
16th TFS, Eglin AFB, Fla.

Air refueling techniques and procedures during hookup, fuel transfer, and disconnect demand a high degree of crew coordination and training. This is especially true at night and in marginal weather. The F-4 refueling envelope is quite critical which no doubt explains the frequency of bent booms and torn receptacles. We asked Major Harp, an F-4 AC as well as a TAC Safety Officer, to give us a "how to" refueling article in hopes that more understanding will produce fewer incidents, and, possibly, accidents. The following is therefore intended for F-4 pilots, either just out of pilot training, or those experienced pilots who are joining the ranks of TAC's front line fighter pilot fraternity.

Refueling an F-4 creates several special problems for both receiver and boom operator. To an F-4 pilot, correct receiver position seems uncomfortably near the tanker. And visual reference points to help hold position are not overly abundant. Additionally, the size and location of the dimly-lit refueling receptacle makes it very difficult for a boom operator to align the boom and insert the nozzle. Therefore, refueling the Phantom must be a careful, closely coordinated affair.

Each refueling requires complete concentration for rapid and effective off-load. However, after a few times on the tanker, some of the strain and tension felt during initial refueling missions will gradually ease. The key to a successful refueling is: be alert for potential problems and make immediate, but cautious corrections.

Now that we're tuned in on the same frequency, let's proceed through a safe, smooth, refueling and discuss the problems as we go along.

When cleared by the boom operator from the observation position... at least one ship width off the tanker's wing...move to precontact position by easing back and down. Then slide intrail with the refueling boom. The desired precontact position is one-to-two aircraft lengths behind the trailing boom. Precontact boom position is zero azimuth, ten foot tube extension and 30 degrees elevation. Trim for the tanker's downwash and stabilize flight. Now hold in precontact position... canopy one to two feet below nozzle height... until cleared by the boomer to contact.

Here's where a pilot can very easily get into trouble, especially at night or in marginal weather. Even though the tanker is a very large, many-motored bird, it's surprising how difficult it is to see on a very dark, no-horizon night; particularly, when its lights are turned down for refueling. This can lead to vertigo (couldn't spell spatial disorientation), especially when moving into precontact from too far back with marginal visual references.

Stabilizing at precontact point also includes neutralizing closure rate, a much more desirable method of bleeding off excess speed than bashing the "hand" that wants to feed you. And remember, considerable refueling time can be saved, especially in SEA or when a wingman really needs fuel, if correct precontact position is initially obtained.

When stabilized, the receiver calls, "(Call sign) ready," and the boomer will reply, "(Call sign) ready." Establish a two-to-three knot closure rate. Look over the top of the canopy bow to obtain a good eyeball reference on closure rate. If you look under the canopy bow, all you'll see is an extremely large area of tanker paneling without visual references to judge closure rates or stabilized position changes.

Azimuth alignment is a simple matter of flying down the orange reflective tape that marks the tanker's fuselage. Your backseater has the best position for viewing refueling hook-up and can give precise info on positioning. About the time the trailing edge of the boom ice shield passes above your rear cockpit, the boomer calls, "Stabilize."

As mentioned before, the Phantom's fuel receptacle is very small, and it's almost hidden from the boomer's view by the nozzle. As hook-up takes place the boom tube must be extended slowly to prevent receptacle damage. At this point, a sudden move by the receiver may cause the boom's nozzle to leave those little mule-shoe imprints (phantom footprints) atop your F-4. If your stabilized position is optimum at hook-up you'll see "Captain's Bars" on the tanker's director lights.

At contact, the boomer calls, "(Call sign) contact," and you will acknowledge with, "(Call sign) contact." Don't be in a hurry to make a big correction unless you are approaching inner, outer, upper, or lower boom envelope limits. Fly director lights by sliding the "indicator" toward the middle. If it's more comfortable, look under the canopy bow to view the director lights after contact is made.

Refueling requires smooth and slow position corrections, small throttle movements, and trimming out large stick pressures. In short, you're engaged in precision formation flying. These techniques will keep you out of a critical problem called Pilot Induced Oscillations (PIO), which may occur upon disconnecting. PIO's can, and have, led to stalls, post-stall gyrations ... and in some cases, spins.

When you have your pre-briefed fuel aboard, you've reached one of the most critical operations of the refueling mission ... disconnect. There seems to be a psychological letdown at the end of refueling and some pilots tend to relax after the disconnect

Approaching precontact position, trim for the tanker's downwash and stabilize. Hold until cleared by the boomer. Look under canopy bow to view director lights after you make contact, then just fly good, smooth, formation.

How F-4s Refuel

button is pressed. This, coupled with the tight-fitting F-4 receptacle, has caused numerous refueling incidents. Remember, you're not through refueling until the boom is free and you're out of the refueling envelope.

Optimum position for a clean disconnect is zero azimuth on the tanker's centerline and "Captain Bars" illuminated. When you call, "Disconnect now," both you and the boomer press a disconnect button to make a smooth disconnect. But this does not mean the boom is free of the receptacle. There is a slight lag between the time disconnect buttons are pressed and hydraulic pressure bleeds off nozzle locks. Therefore, you must maintain position until the nozzle is cleared visually from the receptacle.

While it may sound like a "piece of cake" there is always a possibility that after disconnect buttons are pressed, the boom will remain engaged, either through system malfunction or nozzle-receptacle binding. If this occurs, maintain your position within the refueling envelope and have your pilot or navigator pull the inflight refueling receiver circuit breaker. This should relieve all hydraulic pressure to nozzle locks, allowing a normal disconnect.

If this fails, however, you have a more difficult problem. But there's still an ace up your sleeve... a way out. In some Air Force circles, this last-resort maneuver is called Brute Force Disconnect. This terminology implies violence. A more descriptive term might be: Tension Force Disconnect.

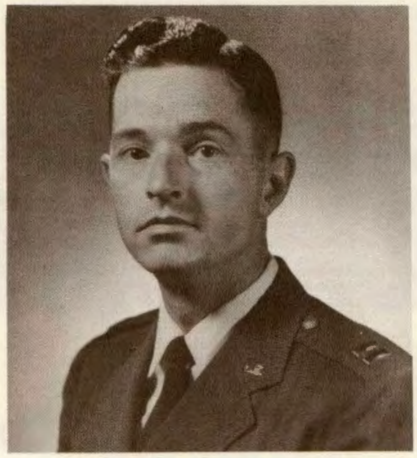
To accomplish this procedure, very gradually reduce power and slide smoothly back and down the boom line. Stay centered in the boom envelope, maintaining about a 30 degree boom-to-fuselage angle. A tension pullout will result, usually without damage to either aircraft. Don't dive down and forward, increasing the boom's elevation angle. The nozzle will almost surely bind, increasing likelihood of boom and receptacle damage.

Marginal weather and night air refueling procedures are essentially the same as those used during the day. However, lack of visual references requires a slower tempo in your total operation. Again ... do not get in a hurry because vertigo or spatial disorientation is magnified in weather and at night. Many pilots have refueled safely at night or in weather, with a severe case of vertigo from hookup through disconnect. If they had not transitioned from visual tanker references to instrument flying after disconnect, vertigo could have caused loss of aircraft control.

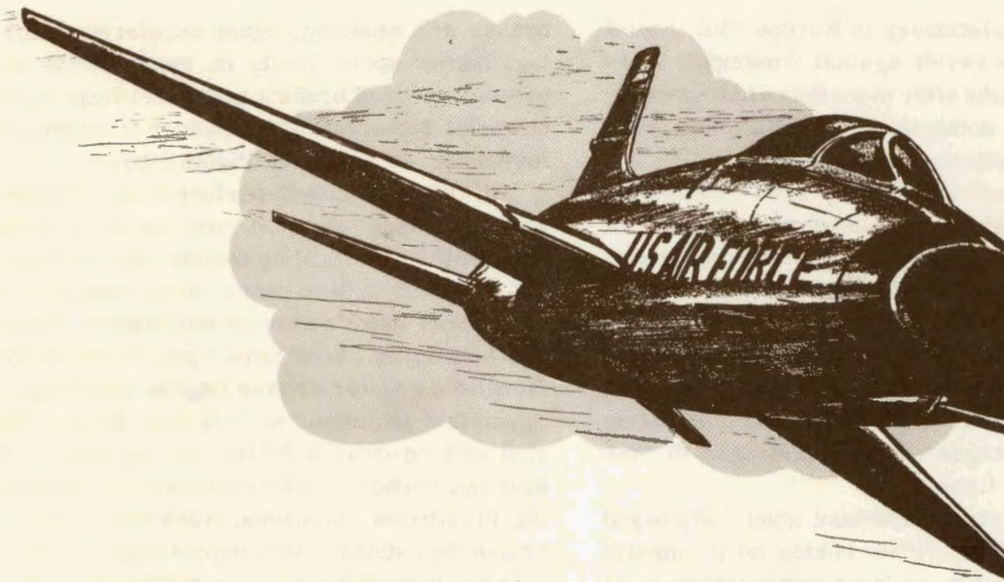
There is much to learn in the whole spectrum of air refueling. This article is just a triggering mechanism on procedures, techniques, and problem areas in two phases of air refueling. Pay attention during your phase briefings, and to your IP's individual briefings. Then you will enjoy a safe and rewarding refueling... might even get Green Stamps.

TACTICAL AIR COMMAND

PILOT OF DISTINCTION



CAPT J.D. FAIR



Captain Jerry D. Fair of the 166th Tactical Fighter Squadron, Lockbourne Air Force Base, Ohio, has been selected as a Tactical Air Command Pilot of Distinction.

While flying an F-100C night air refueling mission Captain Fair rendezvoused with four flight members and the tanker at the air refueling initial point. Just as Captain Fair joined the other aircraft he saw a bright flash and his fire warning light illuminated. Inspection by the number three man revealed no visible fire. He retarded the throttle and the fire warning light went out. Captain Fair decided to continue to Lockbourne; the tanker crew obtained clearance for his landing. He soon lost fuel quantity, oil pressure, and EGT indications. RPM would not exceed 86 percent.

Captain Fair acquired visual contact with the field at a 30 mile range. Entering traffic at "high key," he successfully accomplished a precautionary landing pattern, touching down 1200 feet from the approach end of the runway.

Investigation revealed the explosion had blown a six inch hole in the right side of the fuselage and engine casing. Fire had burned the EGT gage wiring, fuel drain lines, and heat caused the oil pressure transducer to fail.

Captain Fair's calm analysis and judgement during this critical situation readily qualify him as a Tactical Air Command Pilot of Distinction.

WHAT'S RADICAL ABOUT RADIALS ?

By Lt Col Carl E. Pearson

They're not revolutionary in Europe. But, radial tires are leading a revolt against America's soft-riding bias-ply regime after more than a half-century of tire construction domination. And as a result, your highway survival chances should improve.

Even if your next set of tires aren't radial-ply construction throughout, a life-saving feature of radials will figure prominently in your driving safety. A construction component of radials . . . two or more belt plies running hoop-like around the carcass beneath the tread . . . has been adopted for use on our long-established conventional bias-ply tire. The resulting hybrid, a bias-belted tire, will offer some performance advantages and disadvantages of both radial and bias-ply tires.

Why all this current excitement about radials and bias-belts? After all, we've ridden on pneumatic tires since John Dunlop, an Irish veterinarian, built them for his son's bike in 1888. And, we've driven on bias-plys in America over 60 years. Actually, domestic tire design did keep pace with motorist's needs through the years. That is, until many Americans changed driving habits, and highway systems improved.

It didn't happen overnight. After progressing beyond hard rubber tires on steel buggy rims, American drivers preferred ever-softer, cushioned riding in highly-chromed splendor at moderate road speeds. Then came increasing affluence and the youth movement. Change was inevitable.

Added to this, successful promotion of the performance image by the automobile industry convinced staid stenographers and spectacled shoe clerks that cars cause pleasing personality changes. Horsepower and engine options expanded. Power brakes and steering, faster acceleration and cruising, higher speed limits on expressways and turnpikes, improved braking and wheel suspension, more powerful fuels, all this combined to emphasize performance. As a result: Piston Power is "In."

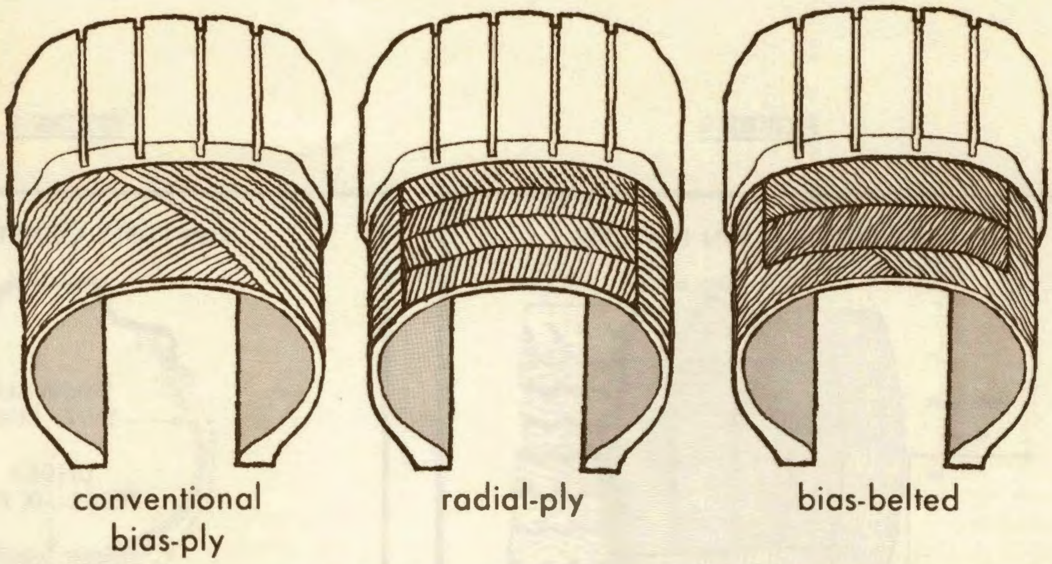
All of this potent-performance package we're wheeling along assorted road surfaces depends on tire ability to translate torque into starting, steering, speeding (within limits, of course), and stopping. That's why there's current excitement about radials and bias-belts. Your tires "gear" you to road surfaces to a greater or less degree depending on quality. In that all-important interface between tread design and roadway a belted tire improves traction, braking, cornering, wet-surface handling, road-holding properties on curves, tread life, and tire crown bruise resistance. And importantly, a belt reduces running temperatures . . . a tire's fearsome foe . . . minimizes tread distortion by standing wave at high speed, and runs quieter and safer under load at turnpike speed.

With that for openers, we'd better explain why radials are "belting" our 60-year old bias-ply road ruler.

ARE RADIALS NEW?

Not in Europe. Tires with a rigid breaker, or overbead, similar to a radial's belt were made in Europe as early as 1913. The breaker idea was combined with radial-ply construction there in 1948. Superior road performance and handling under Europe's difficult driving conditions increased its popularity rapidly. Besides offering improved trac-

Figure 1
BASIC TIRE CONSTRUCTIONS



tion and cornering, the cooler-running, easier-rolling radials realized sizeable fuel savings. And, gasoline's expensive in Europe. Therefore, predicted market percentages of radials in Europe by 1970 are: France, 90 percent; Great Britain, 40 percent; Italy, 30 percent; West Germany, 28 percent. Radials aren't tourists in Europe; they're permanent residents.

Contrasting sharply, America's first tubeless radial designed for use on all models of Detroit's cars was introduced late in 1965. Some auto makers offered them as optional equipment by 1967. Although off to a slow start, a major tire manufacturer predicts radial-ply tires will eventually replace conventional bias-ply types.

WHAT'S DIFFERENT ABOUT RADIALS?

For one thing, they're more difficult to make and use more material. Also, production errors require scrapping tires ... you can't recoup by selling them as seconds.

Main construction differences between radials and bias-plies focus on: (1) crossing angle of carcass ply layers; (2) a girdling belt. Figure 1 shows head-on, cutaway views comparing body ply angles and belt locations of conventional bias-ply, radial-ply, and their "offspring," the bias-belted tire.

FIGURE 1

Structurally, conventional bias-plies have the same number of plies at all casing points. Radial plies have six or more cord plies beneath the tread, with two or more sidewall plies. Bias-belted tires add two belt plies beneath the tread, "borrowing" radials' girdle feature for their otherwise conventional construction.

If anything's radical about radials, it's the angle of carcass cords to direction of travel. A radial's body plies run in a straight line across the tire crown from bead to bead (rim to rim), 90 degrees to direction of travel. Additional ply layers don't cross at an angle. They're aligned the same way, lying directly atop each other. Here's the primary reason for radials' superior vertical and lateral flexing, and reduction of friction-induced heat buildup in carcass plies; excessive cross-sawing between angled conventional ply layers is eliminated. Radial belt cords are angled slightly, almost coinciding with car direction.

Differing, conventional bias-ply cords run diagonally from bead to bead in alternate, crossing layers about 35 degrees to travel direction. Figure 2 in top-view compares ply orientation of radial and bias-ply construction. Conventional tire "on-the-bias" criss-crossing of body cords is readily apparent.

what's radical about radials ?

FIGURE 2

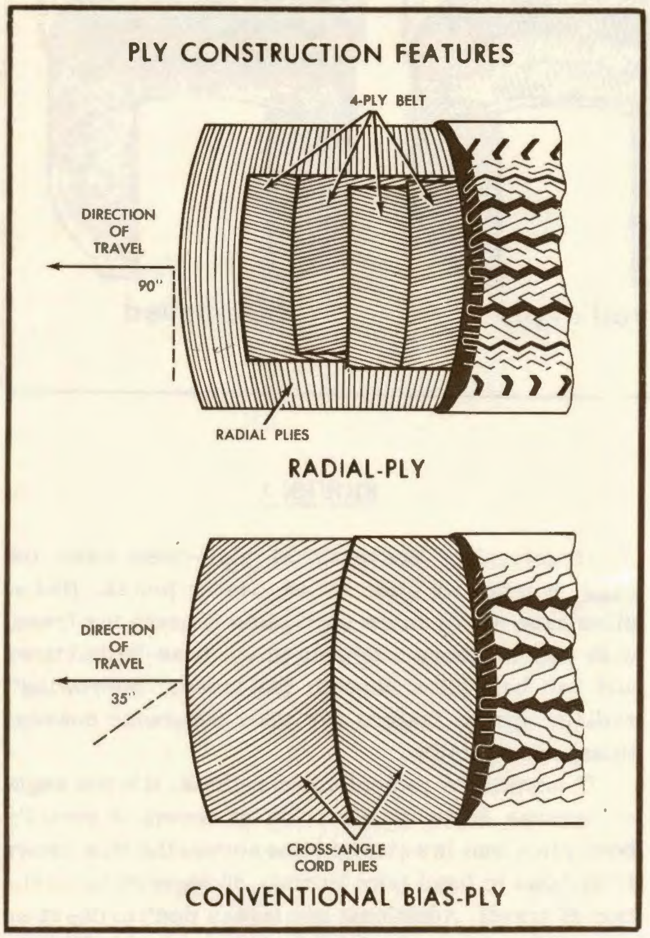
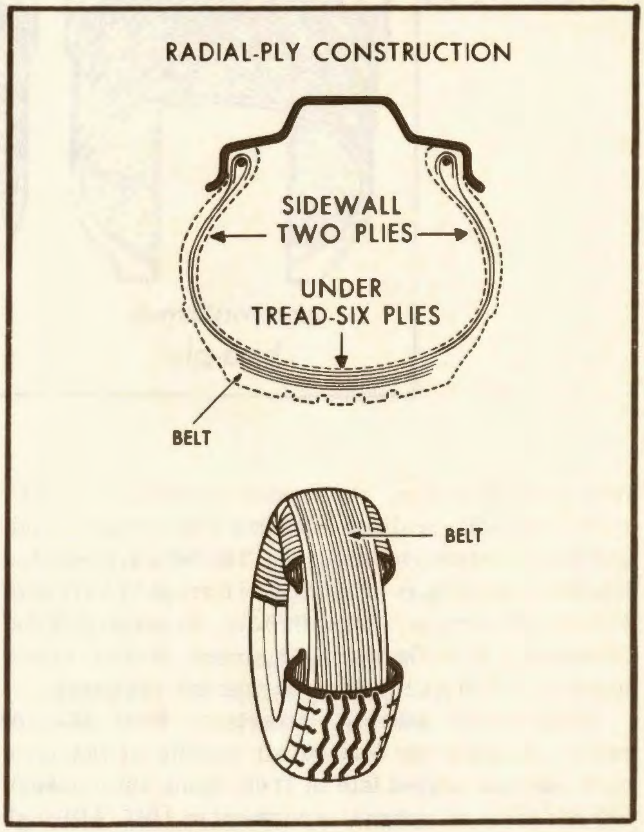


FIGURE 3



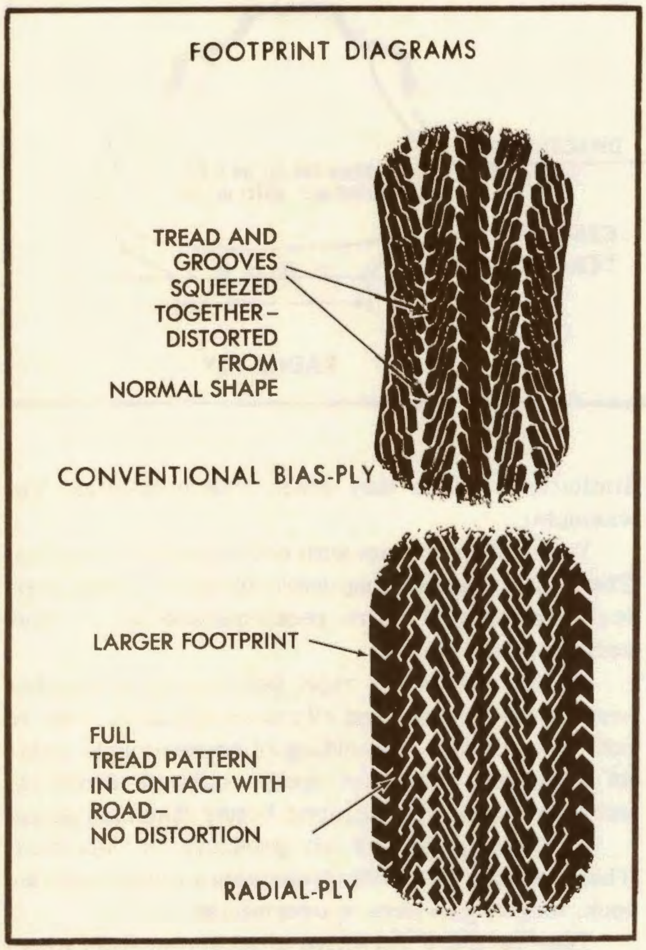
Now visualize inserting two hoop-like plies beneath the tread of a conventional bias-ply and it's obvious that basic body cord alignment doesn't change on bias-belted tires. So, tire characteristics tied to body cords crossing diagonally in layers are still with you in bias-belts.

All radials are belted, adding impact and puncture protection to critical tread areas. Under new Federal tire labeling regulations, the actual number of ply layers in tread and sidewall areas is branded on tires. Figure 3 provides both cross-section and cutaway views of a radial's belt and body cord relationship.

A radial's firm girdle stabilizes tire tread, reducing tread distortion to minimum in road contact. Elimination of distortion-caused squirming, scrubbing tread action increases braking and cornering traction to full tread design capability, and reduces resistance to rolling. That means better gas mileage. Convince yourself by pushing a radial and a bias-ply equipped car. You'll recognize parasite drag differences in a hurry. Also, tire scuffing while rolling wears tread elements faster. Its elimination in radials adds considerably to tire life.

Imagine that both tires are rolling when you check Figure 4. It's a worm's-eye footprint view, contrasting the open-toed, flat-footed "roadprint" of a radial with the spread-to-pinch-toed, narrow instep stance of bias-plies.

FIGURE 4



Greater vertical flex in radial sidewalls puts more tread in firm, undistorted union with road surfaces. Grooves, sipes, and tread elements stay open, delivering all the torque and braking traction, lateral skid· resistance, and cornering capability engineered into your tire's tread design. Its approximate 9,000 gripping edges can function at full potential. Radial's flexibility and belt also reduce "nibbling," or sideways jerk when riding on, or along expansion joints or split-level highways. They get off highway edges and back on with greater ease, angling over road obstacles more smoothly than bias-plies.

WHY DISTORTION?

A phenomenon not present in radials called pantographing causes the narrow-center tread distortion of conventional bias-ply tires. The pantographing action of diagonal body ply layers in tread and sidewall areas cinches in tread during road contact, distorting tread elements and increasing rubber "rub-off." While rotating, bias-plies deflect under load assuming a shorter "loaded" radius in the contact area, then quickly resume a normal inflated radius. Where it meets the road, plies shorten and angle of cord fabric relationships change constantly. Unlike radial plies which are always under tension, the diagonal cords of bias-plies alternate under compression, then tension, "working" continuously... and generating heat. This pantographing process pulls tread in at the sides and bows it out at the ends as tires flex from loaded to inflated radius.

An average tire rotates about 800 times in a mile; at 60 mph each point on a tire flexs about 800 times per minute. At very high speeds pantographing action enlarges into a destructive standing wave. It revolves so rapidly the deflected tire doesn't have time to resume its normal rounded shape. The next time you're tempted to "fly low" on bias-plies remember a tire characteristic called standing wave.

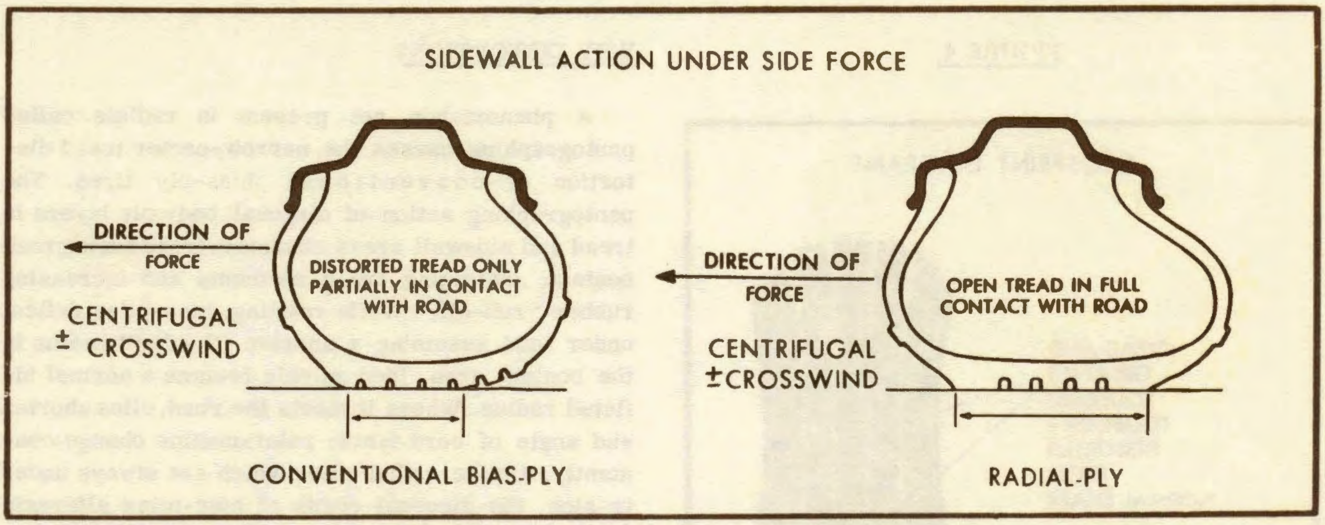
Tread distortion by standing wave occurs in lesser degree at low-to-moderate speeds. It squeezes tread grooves, closing up and reducing "bite" of tread elements under traction, braking, or skidding circumstances. With rain on road surfaces, water escape through narrowed, twisted grooves is limited; you're more susceptible to both dynamic and viscous hydroplaning.

CORNERING CAPABILITY

Figure 5 is important to your understanding "why radial tires?" after 60 years of bias-ply construction. And, why some consider radials the tire of the future. When cornering or negotiating curves, radial sidewall vertical and lateral flexibility provide a clear-cut advantage over bias-ply construction.

what's radical about radials ?

FIGURE 5



Where vital tire-to-road adherence is needed to keep you from spinning off the shoulder or into opposite traffic, radials plant their big, belted feet firmly on the surface. Not affected by pantographing, supple sidewalls bend easily in direction of centrifugal force; that unescapable, sometimes forgotten, inertial force acting on you when turning corners, changing lanes, or rounding short or long-radius curves. While it's pulling your car outward from the center of rotation, another random, unexpected force, crosswind, may add its push to your adhesion problem. With only slight tread distortion, your radial delivers the full traction, braking, and sideways skid resistance built into your tread design throughout a turn.

Reaction of stiff, pantographing sidewalls of bias-plies in a turn with centrifugal or cross-wind force applied, contrasts sharply. Sidewall inflexibility transfers side stresses to the tread, causing distortion and lifting the inside tread edge off the road. What remains in contact is squirming. When your traction, cornering, and sideslip resistance needs are greatest you're not getting full tread potential.

RADIAL DISADVANTAGES

Like people, radials aren't perfect. They have limitations. Some they share with bias-plies. For example:

You can't mix them with conventional bias-plies. Their differing handling characteristics create control problems. They're recommended for all four corners, plus spare.

At low speeds the rigid belt transmits a higher level of road noises and vibration to riders. They're not as quiet and soft-riding as conventionals under 40 mph, but over that speed sidewall flexibility dampens sound and vibration better than bias-plies.

Maintaining proper air pressure is important. Their greater flexibility gives them an under-inflated look, tempting owners to overinflate.

They're more sensitive to incorrect front wheel alignment. Proper balancing of all four wheels is required.

They should be rotated every 5,000 miles.

Sidewalls have less resistance to penetration than bias-plies.

They cost about one-third more than conventionals initially, but consider longer useful tread life . . . and gas mileage improvement.

If you're considering purchase of new rubber for the family bus or sports car there's a newcomer to consider seriously. Match your kind of driving to the advantages and disadvantages of radial tires. You may surprise yourself and join the radial revolution.

From Ground Level

by Major Harvey J. Royer
Aerospace Research Pilot School
Edwards AFB, Calif.

I was five feet off the ground in a dying F-104 that was burning, decelerating, and shedding parts that it shouldn't be shedding. My left hand had the throttle jammed to the wall while my white knuckled right hand had the stick stuffed in the right rear corner of the cockpit. With the airplane still rolling off to the left, it didn't take long to conclude that as far as this particular F-104 was concerned, I had run out of ideas and time. Within a few seconds the bird would hit the ground at a couple hundred knots and roll itself up into a big flaming ball. I remember wondering briefly how it was going to feel during the last second or two of life.

The decision to eject was not prompted by any great confidence in the ejection system . . . there just wasn't anything else to do! My left hand came off the throttle and onto the ejection ring, and while still holding the stick with my right hand, I pulled the ring. My back was already injured in the maneuver that got me into this fix. Because of this and my haste I did very little toward assuming the proper seat position.

I didn't notice any particular delay between pulling the ejection ring and initiation of the ejection sequence. Nor did I notice the stirrups retract my feet. But I did have the impression of the cockpit filling with thin grey smoke. Next I was tumbling through the air trying to remember if the back seat pilot had rehooked his zero delay lanyard. I was still involved in this thought when the seat left me. From this point on I just relaxed and waited to see which would come first, the opening shock or ground contact. The accident board later computed that chute opening beat ground contact by twelve hundredths of a second.

So much for the action and on to any possible lessons. The most obvious thing to say is, sure enough, that seat can save your hide. I came out of the aircraft at ground height in a 30 degree bank. While I did not walk away, I am back on flying status and that's heads and shoulders better than being dead.

There are a couple of other points worthy of note. The first is that once I had initiated the ejection sequence I settled back to be a passive spectator. Granted I was injured and, sure enough, if the auto sequence had not worked properly I would never have made it. Still, by not going through the motions of checking the lap belt and kicking away from the seat I inadvertently held the ejection ring. This action could have interfered with seat sequencing and turned a successful ejection into a fatality.

The answer to that problem is probably for each pilot to go through the entire sequence as often as possible in his own mind, and at his aircraft. Don't stop at just simulating pulling the handles. Go on to check the lap belt and practice kicking free of the seat.

The other point that comes to mind from this incident is the mental set that many of us have toward bail out. I have always been a bug on survival, so I really never questioned whether or not I would leave a disabled aircraft. The truth is, however, that by design and circumstances I've arrived at a frame of mind that says I'll leave an aircraft only when there is nothing left to do. I don't want to support this course of action or launch into any deep discussions about it. What I do want to point out is that we all should occasionally look into our own reasoning and feelings toward the act of jettisoning an aircraft. Your chances of making a proper and timely decision will be better than if you wait until you're face to face with the necessity.

ARE YOU ALERT, TRANSIENT ALERT?

By Major Billy J. Strang
Arkansas ANG

Every transient alert section we contacted seemed preoccupied by something other than service. There were four of us, each flying his own bird. The RF-84F has been in the inventory for many years, so our appearance on the airdromes was nothing new to all but the novice linemen.

Our first landing, after aerial refueling and several hours strapped in the seat, was at a well known base. We stopped for fuel to complete the last leg to an RON base and actually expected quick service because the base had been closed that morning for runway repair. Sure 'nuf, ours were the only transient aircraft in sight.

After an overdue lunch, some leg-stretching, and a stop at base ops, we returned to the flight line. We found that the gauges indicated each aircraft had been serviced with varying amounts of fuel. The Form 781, requiring transient alert to note total amount of fuel on board, indicated all tanks were filled to the same quantity as the previous entry. This "same-as-last-entry" service formula apparently is more widely used than Tech Orders.

Our call to refueling for additional service was followed by a long wait. The only other transient alert man in sight was working on an F-4 which had arrived during our stop at the lunch counter. His pickup truck was parked in front of the bird. Our silent vigil was broken by a yell and jack rabbit departure of my wingman, followed by tinkling of shattered glass. Would you believe that after the unbraked truck rolled into the F-4 radar dome, the alert crewman quickly picked up the pieces of his splintered windshield, hurriedly left with the truck, and returned with a different one, its windshield intact. During the remainder of our long wait, no one seemed concerned about the condition of the radar dome. And unless the transient alert crewman reported his own goof, the name of the game, evidently, is "aircrew beware."

The refueler returned. When fuel transfer began, a hose broke drenching one of our pilots. Needless to say, it was a pleasure to depart this unfortunate base.

At our RON base, things were better. A couple of write-ups required specialist attention, and transient alert got the program going with professional efficiency. Next morning, while completing our flight plan, alert called and said there would be about a half-hour delay because they were expecting the immediate arrival of a VIP. No sweat... you can't fight priority.

We headed for the flight line soon after the VIP arrived. My aircraft was shorted about 1,000 pounds of fuel, but alert soon had the refuelers on hand. The forms indicated that two quarts of oil had been serviced, but I doubted this because it looked as if at least one quart had been spilled on the aircraft around the oil spout.

It also concerned me that the ejection seat pin had been displaced and was lying on the cockpit floor. The lucky chap who was working in the cockpit clearing a writeup had been literally sitting on a hot seat while he worked.

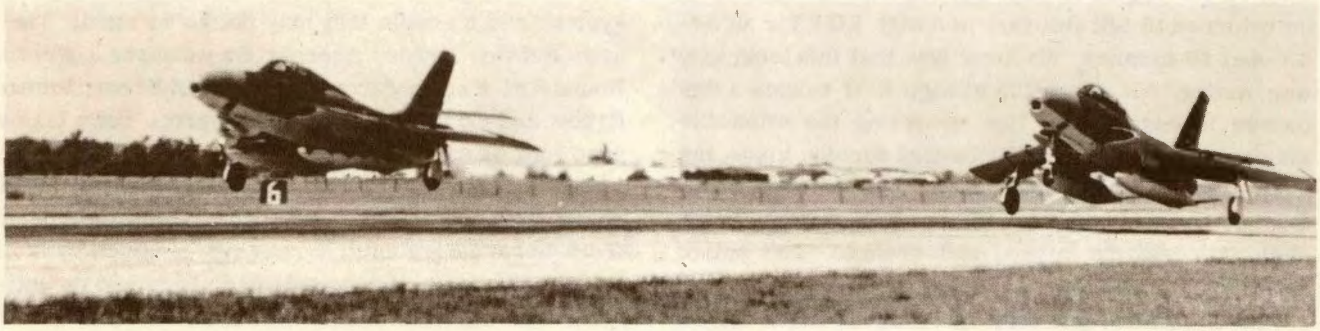
At the next base, we had a full five hour wait for refueling. They apologized for taking so much time but said they were just over-loaded with transient aircraft. We counted two others.

Service was further complicated by two breakdowns and all four fuel trucks running out of fuel. Shorted again on fuel, we decided it wasn't critical for the next flight. So we decided to continue on rather than take a chance on spending the night. And besides, the shift was changing and I wasn't in the mood for a new set of apologies.

We were glad to land at the next base. Several of our unit's pilots reported outstanding transient alert service here. They were right, except that my aircraft was serviced with an incorrect amount of fuel. But, by now, this was no big surprise. And anyway, we were overjoyed that the next stop would be home.

Normal inspection at our home base revealed that somewhere along the trip, two of our aircraft had been serviced with a large amount of aviation gasoline, and the other two aircraft had received some aviation gas. This problem was supposed to have been solved several years ago, but someone apparently allowed it to happen. Perhaps they were watching the clock instead of their job.

This is a true story, but hopefully, an unusually grim one. The bad service we received on this trip is not typical. Most of the time we get excellent maintenance and servicing. But one important matter must be resolved. If we depend on transient alert to service our aircraft while we check weather, refile flight plans, etc, then the aircraft must be serviced correctly 100 percent of the time... 99.9 percent in the fighter business is not good enough.



TAC TIPS

EGT and engine life

F-105 pilots are no doubt aware that there has been an acute shortage of hot section parts for the J-75 engine. Some of the problem could be blamed on the war with its high demands on both aircraft and pilot. But lack of attention by the pilot to the requirements of his engine has also been a factor.

One of the ways you can abuse the engine is in the heavyweight climb and cruise configuration. During climbout the flight leader usually reduces power two or three percent RPM so that the flight members can maintain position. This gives the lead aircraft an EGT reading of 575 degrees or so. However the rest of the flight is usually pulling full military power or about 600+ degrees, to maintain proper position.

Still heavy, the leader levels off with power in the 98-99 percent area. The flight must still pull near military power in order to maintain position. As a result the 30 min EGT limit is frequently exceeded. In combat it is even more difficult to refrain from excessive periods of high EGT due to the necessity of keeping a high airspeed.

It used to be common practice after a period of high power operation to retard the throttle to 575 degrees EGT for about 15 minutes. This, it was felt, allowed the engine to cool off. The throttle could then be returned to full military and high EGT for an additional 30 minutes. We know now that this technique was wrong. All operation at high EGT causes a decrease in engine life. But exceeding the allowable maximum continuous EGT causes turbine blade and vane stretch, along with a rapid deterioration of all the hot section components. In addition combustion chambers become burned and cracked. The entire hot section of the engine takes a beating.

To illustrate, you use up twice as much engine hot section life when running at 635 degrees for 30 minutes as you do running at 635 degrees for 15 minutes. Time at temperature and the actual temperature level BOTH determine how fast the engine hot section life is expended.

The only technique known to provide maximum engine life is "to use the lowest possible thrust consistent with the mission objective." This means if you are in cruise flight, flying wing requiring more than 575 degrees to stay in position, tell the flight leader about it. If you are the flight leader keep the above thoughts in mind and plan your flight to give everyone a break.

Remember, Thunderchief drivers aren't as fortunate as some of their "multi-engine" contemporaries ... one engine, one pilot ... you.

how high is up ?

Several recent landing accidents have proven that while an altimeter may indicate 100 to 200 feet above ground level, aircraft can make unexpected and firm contact with the ground! This has happened even though the pilot used current altimeter settings, and his equipment operated within Tech Order limits.

The difference between actual and indicated altitude is an accumulation of a few small errors of the system and a couple that may not be so small. They are: Survey Error; Aneroid Barometer Error; Round-Off Error; Aircraft Altimeter Error; Human Error and Combat Environment Error. Let's take a good look at each of these.

1. Survey Error - The sign on the control tower reads 1,632 feet MSL. Was this height calculated from accurate geometric readings obtained by civil engineers, or is it a figure read years ago on antiquated barometric devices which, at best, offered a

"guesstimated" altitude?

2. Aneroid Barometer Error - Air Weather Service utilizes a ML-102 aneroid barometer at all permanent and fixed AWS sites. This instrument has a plus or minus error of three-tenths of a millibar which may be corrected to one-tenth of a millibar by comparison to a ML-2 or ML-512A mercurial barometer. This system gives a computed altimeter setting, accurate to within three feet.

3. Round-Off Error - This is a variable which occurs when computing an altimeter setting from a barometer. Since the altimeter setting is given to the nearest hundredth of an inch, the round-off error is plus or minus five feet.

4. Aircraft Altimeter Error - Most pilots are familiar with this one. It may vary from zero to 75 feet but can be minimized using the procedure for altimeter corrections as outlined in AFM 51-37. But have you noticed the difference in correction factors between different airfields? This may result from an inaccurate survey of field elevation, inaccurate altimeter, or various AWS errors just mentioned.

5. Human Error - This is the human element cranked into reading instruments and using conversion tables.

6. Combat Environment Error - In Vietnam only 14 airstrips are equipped with the fixed AWS instruments, previously mentioned. Other strips use instruments offering only estimated altimeter settings, and these may vary, plus or minus, 30 to 75 feet. Nearby explosions can also affect sensitive barometric readings. Field elevations are variable, such as Khe Sanh which has a 108 foot difference from one end of its 3900 foot runway to the other.

You're never going to be exactly where your altimeter says you are on an approach. But you can help reduce the effects of altimeter error by proper application of instrument procedures. Know, and count on estimated altimeter setting inaccuracies, and at forward airstrips in Vietnam expect the survey, combat environment, and human errors.

Don't bust minimums! Being a little bit wrong can cause you to be a little bit dead.

early canopy release

There are still scattered incidents of crewmembers releasing their chute canopy in the air in anticipation of a water landing. This procedure has, on several occasions, resulted in fatal injuries.

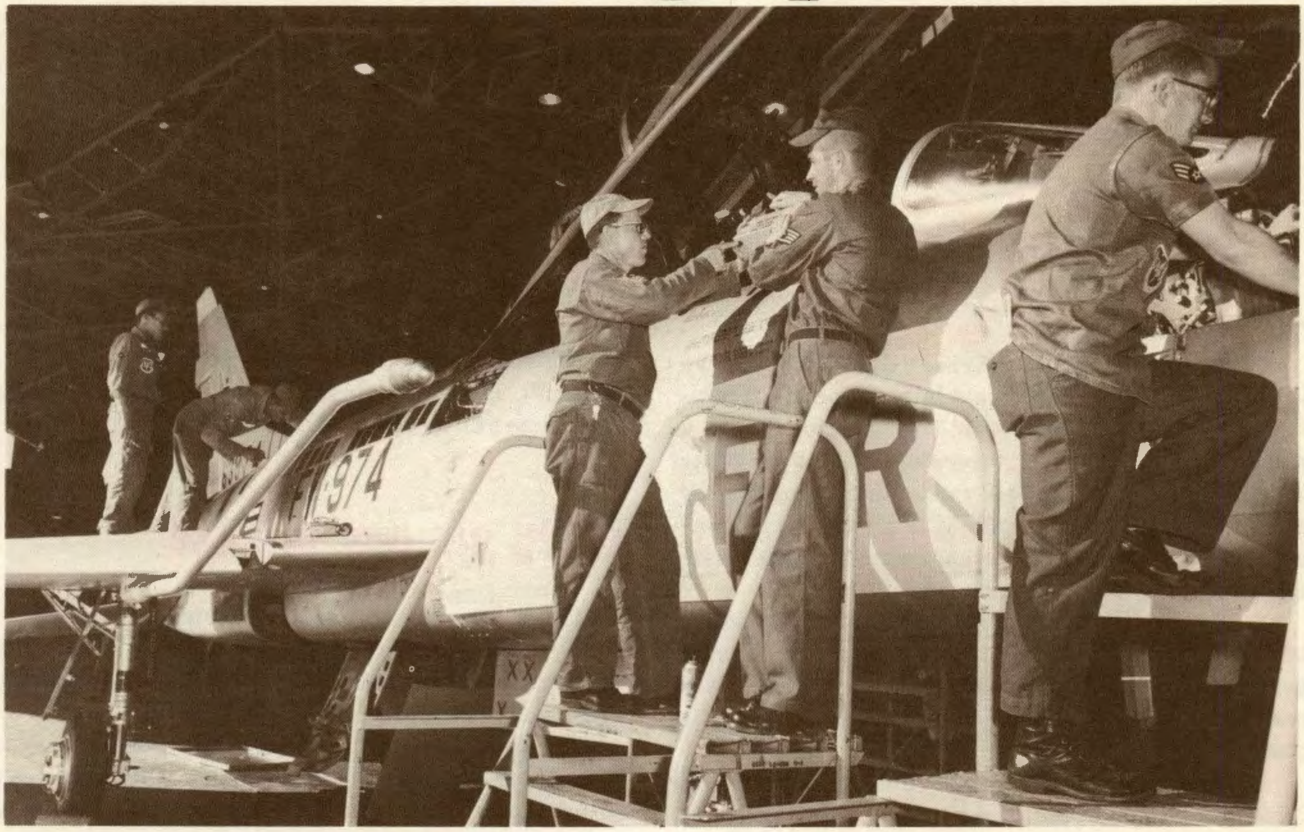
Accurate judgment of height while descending in a parachute is next to impossible. The danger of a premature canopy release far outweighs the hazard of suspension line entanglement. The dual-release parachute harness, coupled with good training in parachute handling and landing techniques should eliminate the need for such a hazardous procedure. Life Support officers should stress information contained in TO 14D1-2-1 and other applicable publications.

discanopied driver

The F-84 jock pitched out for landing and reached for his gear handle. His fumbling fingers closed on the canopy lock lever and pulled it. It worked as advertised. The canopy banged open, broke the canopy arms, and flipped over backward. The rear arm held the doubled-back canopy, but the glass parted from the frame. On his next try the surprised super-hog driver found the gear handle and landed okay.

You can't chalk this up to complacency: it was his second ride. But he's now a firm believer in, "contemplate before you actuate."

recovery phase



by Maj Bruce D. Emery
Canadian Armed Forces
Hq TAC (DMMMP)

Recovery Phase Inspection is now the accepted mode of operation throughout Tactical Air Command. Like all changes, this new method of performing scheduled inspections stimulated mixed emotions by everyone, from the Director of Materiel to the aircraft crew chief. Outright enthusiasm has been the majority reaction. Many people however, were forthright in their opinion that this method of inspection, although fine for fighters, would never be feasible for certain specialized aircraft. Actually, the only major problem encountered is the same one that existed prior to recovery phase implementation; namely, lack of maintenance discipline.

To restate the concept, recovery phase or "running inspection," allows increments of scheduled inspections to be accomplished on a continuing basis. The periodic inspection package was divided into small increments of approximately equal man-hours to be completed in conjunction with unscheduled maintenance. Ideally, all items should be completed during the time phase except for repetitive items. At the phase due time, these repetitive items,

. . . REQUIRES DISCIPLINE

such as greasing, are completed and the phase signed off.

A phase supervisor is responsible for the inspection system in each squadron. His staff consists of four to six phase monitors, each responsible for the quality of inspection on four to six aircraft. The monitors must constantly plan ahead, working with maintenance control and the crew chiefs to insure that specialists and equipment are available, documentation is completed, and top quality work performed. A ten minute movie (Recovery Phase Inspection, FR 779) describing recovery phase is available to put everyone in the picture. Ask for it at your unit.

After initial prejudices were overcome and the system fully implemented, anxious eyes were cast on the performance records. Would recovery phase increase the operationally ready rate and decrease the downtime as predicted? The answer is yes! In many cases, the unit's scheduled maintenance manhours have been reduced accordingly; more than 79,000 hours per year in some instances.

Fears have been expressed that the quality of inspection has declined since the inception of the recovery phase concept. This can be true only if maintenance discipline is relaxed. Quality inspection of equipment is still a requirement. However, timely

scheduling of inspectors is a problem under the recovery phase concept.

Aircraft are no longer stripped in maintenance docks and available for quality inspection at predetermined times. Therefore, inspectors must be in the work area constantly, performing inspections during the relatively short periods that panels are removed. Aggressive action by the phase monitor, working closely with maintenance control, quality control, and the aircraft crew chief, insures that quality is not sacrificed for any reason.

Examination of the maintenance program shows that the same problems plaguing aircraft maintenance since man first flew are still with us. Maintenance forms are not documented correctly. In particular, red X items continue to be cleared improperly. Precision measuring equipment, that has not been calibrated, is used to verify aircraft serviceability. Housekeeping is lax.

In the drive to get the job done, personnel overlook proven necessity for correctly capping disconnected fuel, oil, and hydraulic lines. Storage of valuable pylons and external tanks is not taken seriously. Technical orders and checklists continue to be ignored.

How about in-process inspections? Are the personnel of your unit aware of the importance of inspecting work performed before further assembly prevents adequate inspection? Take time to call for that inspector.

Maintenance discipline is the name of the game and the entire team must play. Supervisors must pound the flight line and supervise. It can't be done from the office... or the cab of a pickup. Phase monitors must know the status of their assigned aircraft. They should be at the aircraft with the specialists, working with the crew chief to prevent maintenance discrepancies. Good housekeeping is a basic requirement of effective maintenance and must be a team effort.

Adherence to fundamental maintenance discipline provides the knowledge and satisfaction that inspection quality has not deteriorated. A phase inspection signed off by your team always must indicate "go."

safety check

by James Gilbert

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FLYING MAGAZINE

Low and slow. He was a student pilot in a 150, much like any other student pilot in a 150, probably ... having some good days, some bad. There is perhaps a clue in his logbook, which showed 34 hours, of which nine were solo, 25 dual. Isn't that ratio of solo to dual rather out of balance? Perhaps he was a slow learner. Many people are, but they often go on to make safe pilots.

It was one of those winter days when you can see forever... not a cloud in the sky. He'd been allowed off solo. What he should have been doing, history doesn't relate, but what he was doing, several witnesses can report very clearly. He was buzzing a small lake; no, it wasn't his girl friend, it was his sister who lived there. He'd been known to do it before. This time, he made one pass at 100 to 150 feet (you could see him waving, they said afterwards) then came back, flying more slowly this time, for another go. And very much lower; he had to turn to avoid a 60-foot tree. He pulled up at the same time, only the 150 quit flying. The right wing hit a tree and then the airplane slammed to the ground. People came (was his sister one?) and dragged him out and took him to the hospital, but by that time he was beyond help.

It's an insidious thing, this urge to buzz. Especially when you're a student. Flying's so exciting, the ads tell you, but they make you do these endless, boring touch and gos, and long, dull crosscountrys when you're really longing to be zooming and diving like a fighter pilot, like you've always known from your childhood airplanes should. Of course you've been warned against buzzing, but how will your friends and relations ever appreciate what a hero pilot you are if all you can ever do is straight-and-level at 2,000 feet? And then you hear another student boasting of the buzz jobs he pulls, and how there's nothing to it. Well, there are a lot of things to it: wires and running out of airspeed, to name but two. You can usually see wires in time, but however hawklike your eyesight, there will come a day when you miss them. And airspeed: A pull-up is just like a steep turn, for your stall speed goes way way up, and if you really pull an airplane into a high-speed stall, it may not be the gentle mushing you are used to, but a vicious half snap-roll, and recovery from nose-down inverted flight at 50 feet is not possible. Don't do it. If you don't believe me, and insist on an occasional buzz job, at least promise to stay above the trees and, you hope, the wires, and also to keep plenty of speed. But best of all, don't do it at all.

Low flying over lakes or the sea brings additional dangers: lack of a clear horizon, and the extreme difficulty of judging your height above the surface. There was another pilot flying another 150 two weeks later; he was much more experienced, with a commercial ticket and instrument rating and nine years of flying, and he should have known better. His brother had sailed that day in a fishing boat from a nearby harbor for a week's cruise, and by all account our hero set off to buzz the boat. He made his first pass head on, bow to stern, then started a low left turn that took him right into the setting sun. It must have dazzled him, for one wing tip caught the water. The big splash that followed was his funeral, for no trace of him or the plane was ever recovered. Nor, for that matter, of his innocent nonpilot passenger.

We mentioned wires; here's a man they caught. He was, it seems, one of those wise guys who can't be bothered to take a flight test, for he had well over a hundred hours logged and still a student license. He set off on a cross-country into frankly doubtful weather, which there is no record of his having checked before departing. It got lower and lower and so did he, till he was reduced to following a highway at 300 feet, just keeping under the clouds. Probably he never saw the towers of the radio station at all. Did he see them marked on the sectional? Maybe, but even if he did, it probably would have been no help to him for the sectional showed them as being 375 feet above sea level, whereas in fact they rose to 549 feet. He hit the guy wires at just about 440 feet ASL. Bad luck, sure: You expect sectionals to be accurate. But also bad judgment, to be flying in that sort of weather.

Two things worth their weight in gold to any pilot: height and airspeed.

Sooner or later buzzing gets even the best.

A 2nd Look at...

get homeitis

By Don Reynolds

"Little if any electrical power was evident in the cockpit after 40-minutes of flight. Ten minutes later, the F-4 yawed easily to the right followed in a few seconds by right engine flameout, then almost immediately by left engine flameout. After attempting several air starts, Maj Benton pulled the lower ejection handle. In less than 30-minutes, he was picked up by a rescue chopper."

This commentary is part of an aircraft accident report prepared by a duly-assigned board. The comments continue, some parts verbatim, including a former commander's character report.

"I have known Maj Benton professionally since 1963 when he joined my squadron." The colonel named several more places and programs, and continued, "... during each of these associations, Maj Benton demonstrated professional abilities, techniques, and aggressiveness of the highest order. Based on these experiences, I would fight to get Maj Benton in any tactical unit I might command."

Benton, a recent combat returnee, worked at Alpha AFB on extended TDY from Bravo AFB where his family lived in their newly-purchased home. He was ferrying the Phantom from Alpha to Bravo with an enroute passenger stop at Charlie AFB to drop off a fellow pilot, Maj Hunt. Hunt helped Benton set up the rear cockpit for the short solo hop to Bravo, while a transient alert airman stood by.

The airman testified, "... While I waited for a fuel truck I overheard Maj Benton talking to Maj Hunt about a generator failure in flight. Maj Benton told Maj Hunt he was going to try to start the aircraft and get at least one generator on the line so he could make his requested 1700 departure."

At engine start, an accessory unit drive shaft snapped. Transient alert could not make the repairs so Benton called his home base and was advised to RON and expect the arrival of parts and a qualified mechanic... to be dispatched in another F-4... the following morning.

While the shaft was being installed, Benton mentioned to Capt Gates, the F-4 pilot who had brought the mechanic from Alpha AFB, that because of suspected electrical malfunctions he would appreciate an escort on his short hop to Bravo. Gates offered to make his return trip to Alpha via Bravo, but no firm decision was made.

Repairs completed, both pilots preflighted for takeoff. Benton's DD-175 was IFR to Bravo; Gates' was VFR direct to Alpha. With Gates looking on Benton started an engine but the generator wouldn't stay on the line. So he started the second engine hoping the situation would change. Neither generator would hold.

Seeing that a problem existed, Gates responded to Benton's signal to check for tripped breakers in his (Benton's) rear cockpit. None were tripped so Gates locked the rear canopy, walked to his own aircraft and started engines.

With no change in the generator problem, Benton signaled Gates, using both hands, indicating he wished to be led to Bravo. Gates responded with a thumbs up signal. Benton extended the RAT for Gates to check, and received an OK signal in return.

From this point on, Gates made all UHF radio calls for the flight's taxi and takeoff clearance, and confirmed to Ground Control that both aircraft would be VFR. Benton taxied out behind Gates, in hopes of bringing the generators on line at higher power settings.

On the runway at 100 percent rpm, the generators still failed to operate, but by then Gates was airborne. Benton followed. With no generator power, the takeoff was made without flaps or afterburner.

Soon after takeoff, Benton's landing gear indicated unsafe. He recycled several times without success. He left them down, extended the RAT and pressed on. Gates led the flight to 14,500 MSL and cruised at 240 knots. Benton closed on Lead's left wing and gave him an OK signal. Gates then confirmed with Charlie tower that he would accompany Benton to Bravo, and then proceed to Alpha.

The flight continued, as outlined in the report: "Major Benton, while maintaining his enroute course attempted to get his generators on the line by moving the generator switches from off to on after placing the RAT back to the stowed position. This procedure was reversed and re-attempted." Minutes later, the Phantom quit flying.

The report lists the accident board's findings:

"Primary Cause - Pilot factor in that the pilot accepted the aircraft with known generator failures.

"Contributing Causes - Supervisory error by the flight leader, in that he led the accident aircraft from taxi and takeoff with a known aircraft malfunction. Material deficiency in that the accident aircraft had an electrical malfunction to cause the external wing shutoff valves to sequence open allowing fuel from the number one fuselage tank to syphon into the external wing tank, during complete electrical failure. Design deficiency in that with external wing shutoff valves open, a complete electrical failure will allow syphoning to occur."

The report commented on the causes: "When Capt Gates received and acknowledged the hand signal for takeoff, he accepted responsibility for the flight. When it became apparent that Maj Benton did not have a radio, the flight should have been aborted. Notwithstanding the positive indication of the OK signal given by Benton, Gates should have clarified the situation with additional hand signals. If the nature of Benton's problem was known, any flight leader would have returned to departure base.

The flight surgeon's portion of the report summed up Benton's error. "After examining Maj Benton and discussing his personality with people who have flown with him, I can find no evidence of any psychological pathology, acute or chronic, that would have affected his decision. I feel that this is simply a case of severe "get-homeitis."

MAINTENANCE MAN OF THE MONTH

Master Sergeant Robert J. Watts of the 4538 Fighter Weapons Squadron, Nellis Air Force Base, Nevada, has been selected to receive the TAC Maintenance Man Safety Award. Sergeant Watts will receive a letter of appreciation from the Commander of Tactical Air Command and an engraved award.

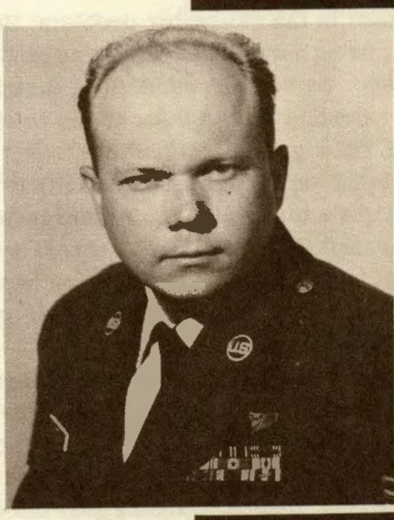
MSgt Watts

TACTICAL AIR COMMAND

CREW CHIEF OF THE MONTH

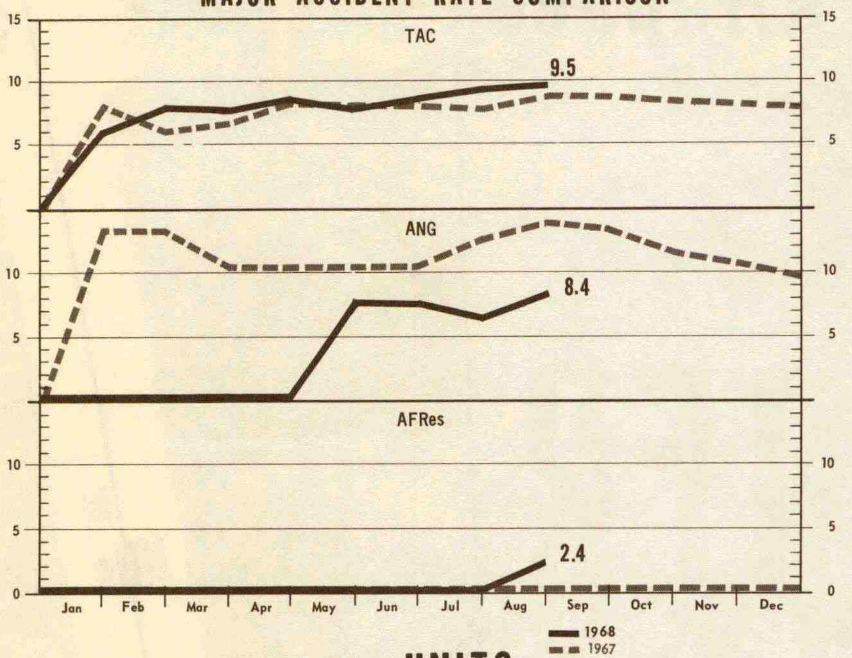
Technical Sergeant William A. Mattson of the 4538 Fighter Weapons Squadron, Nellis Air Force Base, Nevada, has been selected to receive the TAC Crew Chief Safety Award. Sergeant Mattson will receive a letter of appreciation from the Commander of Tactical Air Command and an engraved award.

TSgt Mattson



TAC TALLY MAJOR AIRCRAFT ACCIDENT RATES AS OF 31 AUG 1968 *

MAJOR ACCIDENT RATE COMPARISON



UNITS

	THRU AUG 1968	THRU AUG 1967		THRU AUG 1968	THRU AUG 1967
9 AF	6.5	8.0	12 AF	10.3	10.0
4 TFW	11.0	0	23 TFW	23.0	8.8
15 TFW	11.7	22.0	123 TRW	9.9	15.5
33 TFW	10.2	10.8	27 TFW	9.9	15.9
113 TFW	23.5	16.7	140 TFW	6.8	23.3
4531 TFW	15.3	0	479 TFW	10.6	11.4
363 TRW	3.7	11.4	474 TFW	37.6	0
64 TAW	0	0	67 TRW	12.7	7.1
316 TAW	0	0	75 TRW	0	20.6
317 TAW	0	5.8	313 TAW	0	0
464 TAW	0	3.3	516 TAW	0	0
4442 CCTW	0	8.8	4453 CCTW	14.6	4.4
			4510 CCTW	7.0	8.3
SPECIAL UNITS					
1 SOW	8.4	7.3	4500 ABW	0	0
4410 CCTW	16.9	8.5	4440 ADG	0	0
4409 SUP SQ	0	0	4525 FWW	27.1	27.8
			4416 TSQ	57.3	0

AIRCRAFT

THRU AUG 1968 / 1967

TYPE	TAC 1968	TAC 1967	ANG-AFR 1968	ANG-AFR 1967
A-1	47.7	17.4	0	0
RB-66	0	0	0	0
F/RF-84	0	0	8.1	18.7
F-86	33.0	0	28.4	10.6
F-111	43.3	0	0	0
F-100	12.0	16.0	0	26.7
RF-101	12.5	40.9	0	24.9
F-5	20.4	20.4	0	0
F-105	24.8	14.6	0	0
F-104	13.0	0	109.3	0
F/RF-4	12.3	12.4	0	0
C-47	0	6.1	0	0
KC-97	0	0	0	0
C-119	0	0	2.4	0
C-123	12.5	0	0	0
C-130	0	.7	0	0
T-29	0	0	0	0
T-33	3.0	6.2	11.8	0
T-39	0	0	0	0
C-7	0	34.9	0	0
O-1	8.7	15.8	0	0

* ESTIMATED FLYING HOURS

outside controlled airspace
IFR
BELOW 14,500
you're not protected from other traffic !!
CORVALLIS
108.4
EUGENE
ALFORD
MOHAWK
Mahlon Sweet
365 L 55
MCA V121 4700 NE
KUGN 590
KPNW 1120
LORAINE
KNND 1400
CURTIN
DRAIN MRA 6100
122.1R
REDMOND
RDM 117.6
Chan 123
368
REDMOND
MCA V165 9000 NW
KBND 1110
122.1R
ROSEBURG
RBG 108.2
EUGENE
MCA V121 5700 E
KOEN 1240
MILO
PLACER
TRAIL
MEDFORD
MCA
V23—8000 S
V23E 8000 SE
BROWNSBORO
GOLD HILL
APPLEGATE MRA 10000
KMED 1440
Medford-Jackson Co
1330 L 54
LAKECREEK
MEDFORD JACKSON CO FSS
(Ashland Muni-Sumner Parker)
1894 L 34
(Chiloquin Muni)
4217 L 37
SPRAGUE
KLAMATH FALLS
LMT 115.9
Chan 106
SEATTLE
Klamath Falls
KAGO 1150