

TAC ATTACK



MAY 1973

SLUF CHAPTER TWO
Pg 16

for efficient tactical air power

TAC ATTACK

MAY 1973
VOL. 13, NO. 5

Tactical Air Command

COMMANDER
GENERAL WILLIAM W. MOMYER

VICE COMMANDER
LT GEN DALE S. SWEAT

Published by the Chief of Safety
COLONEL E. HILLDING



editor
Maj Tim Brady

assistant editor
Capt Jim Young

art editor
Stan Hardison

managing editor
Mariella W. Andrews

layout and production
SSgt John Tomkowski

ANOTHER PROSAIC LOOK
AT THE SHORT
LITTLE UGLY FELLER.



CURRENT INTEREST

STARS	4
STRAIGHT UP — STRAIGHT DOWN	8
TRANSITION TRAUMA	14
SLUF — CHAPTER TWO	16
SPRING FLYING CAN BE COLORFUL	20
1972 ANNUAL SAFETY AWARDS	26

DEPARTMENTS

Angle of Attack	3
Aircrewman of Distinction	7
Lessons that Live	13
Chock Talk	18
TAC Men of the Month	23
TAC Tips	24
SPO Corner	28
TAC Tally	31

TACRP 127-1

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

Contributions of articles, photos, and items of interest from personnel in the field are encouraged, as are comments and criticism. We reserve the right to edit all manuscripts for clarity and readability. Direct communication is authorized with: The Editor, TAC ATTACK, HQ TAC (SEPP), Langley AFB, Va. 23365. Autovon 432-2937

Distribution FX, Controlled by SEPP.



Angle of ATTACK



MISSION

A big part of the flying safety officer's job is salesmanship. All aircrewmembers, at one time or another, have been on the receiving end of a flying safety pitch. But have you ever closely examined the product the safety type is selling? It all has to do with the mission, so to begin, let's examine that part of it.

The mission is man getting machine to the target, achieving the target objective, and bringing the machine back. It involves many peripheral responsibilities, such as that of maintaining formation integrity, as well as an awareness that your particular mission is only a small segment of the overall objective. You and your airplane represent just the tip of the iceberg. It means that once you achieve the target, you have completed only half of the mission. And how does safety fit into all of this?

Safety is man getting machine to the target, achieving the target objective, and bringing the machine back. Sound familiar? It should; it's the same definition as mission. The logic that describes efficient mission accomplishment is the same logic that calls for safe mission accomplishment.

So, the next time the safety salesman comes around, take a good look at the wares he's peddling. He's talking mission.

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



S **T**ANDARD **T** **E**RMINAL **A** **R**RIVAL **R** **O**UTES

S **T**A **R**S

by J. W. Hafley
ATC Specialist

HQTRS TAC COMM AREA, LANGLEY AFB, VIRGINIA

WHAT IS A STAR? Very simply, it is an air traffic control coded instrument flight rules (IFR) arrival route designed for use by arriving IFR aircraft destined for certain airports. It provides an en route descent via a logical flight profile or transition from cruising en route altitude to an initial approach fix. The purpose is to standardize traffic flow and simplify clearance delivery procedures.

Standard Terminal Arrival Routes (STARs) are taking their place along with the old familiar Standard Instrument Departures (SIDs). Currently, civil use is

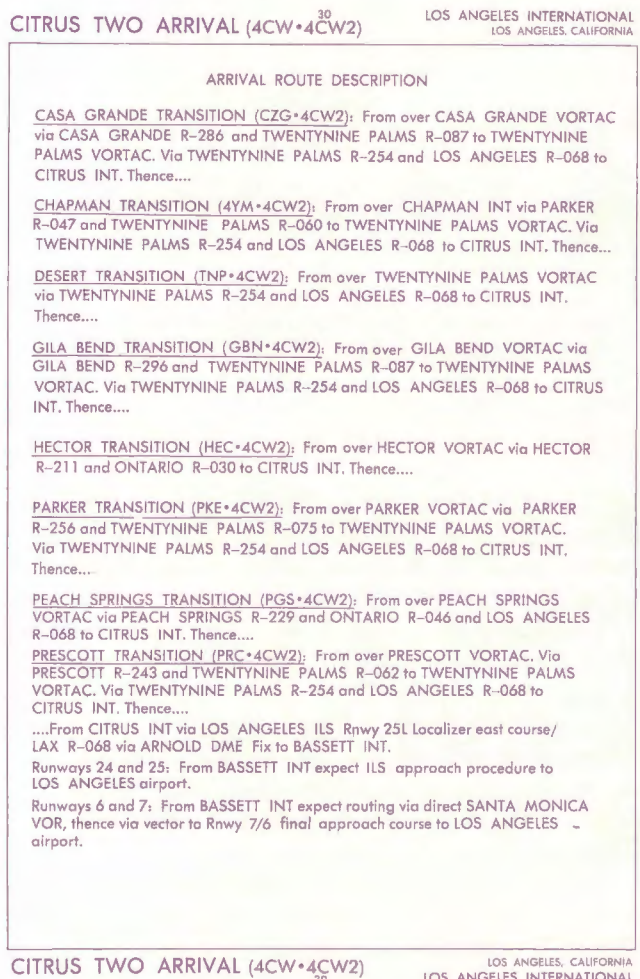
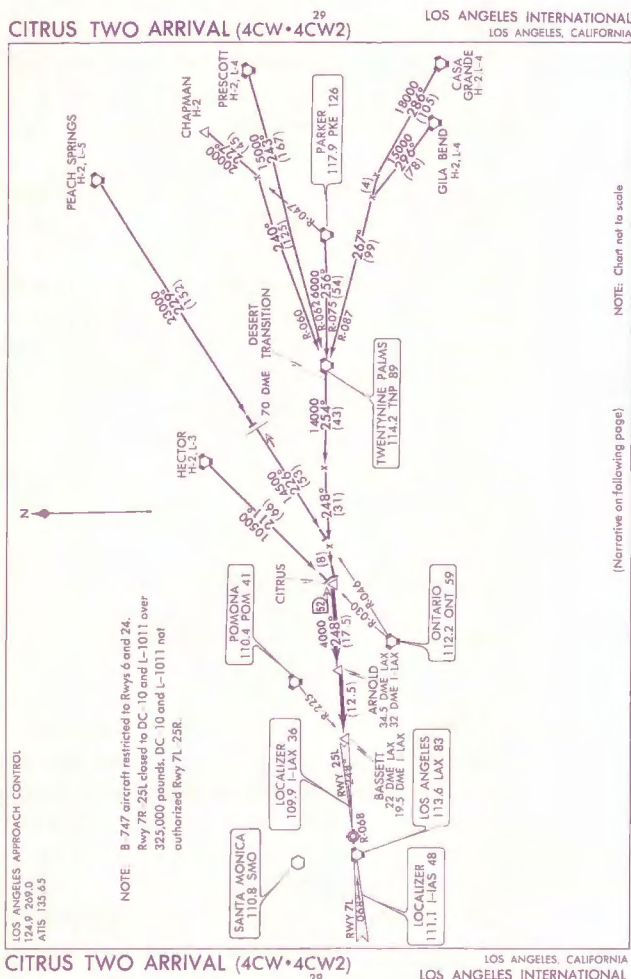
increasing, but DOD application is temporarily delayed due to concern over publication form and protection for possible communications failure. But let me explain.

The STAR idea was developed by FAA traffic control people for much the same reason as SIDs came into being. They identify commonly used flight profiles that blend into the traffic flow pattern. Separation from other tracks is engineered — so to speak — in calm, deliberate procedure planning sessions. The controller is relieved from pulling a hairy clearance out of his skull in the heat of a heavy traffic situation. And above all, it eliminates many, many words in the exercise of communications between pilot and controller. Detailed radar vectors are not required and controllers can serve considerably more traffic in a given time span. The goal of smooth flow traffic operations at high density terminals is considerably enhanced through the general application of STARs.

STAR development criteria will parallel the concepts we now have in use for SIDs and other Terminal Instrument Procedures (TERPs). A STAR or STAR

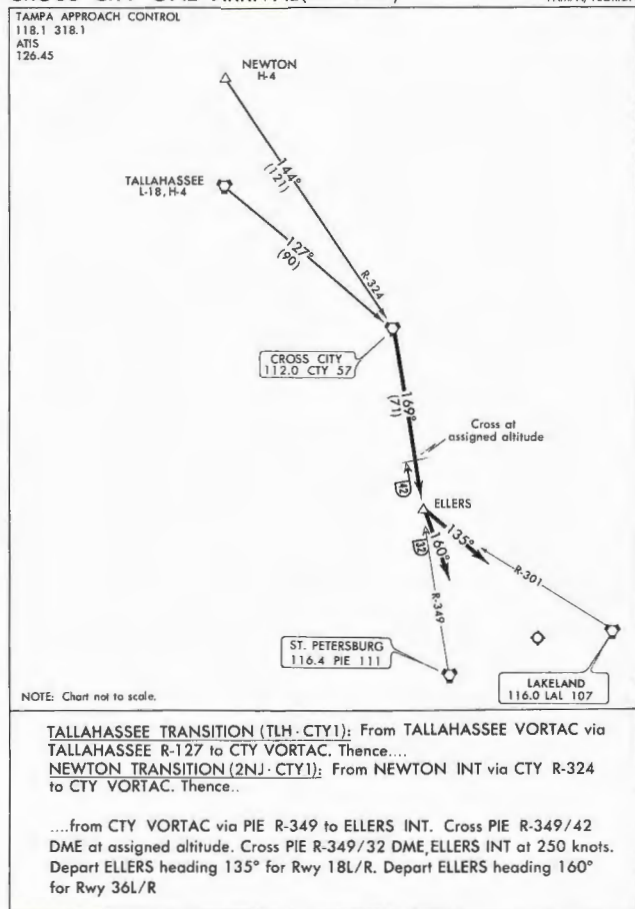
transition commences at an appropriate en route fix, e.g., NAVAID, intersection, DME fix. It will terminate at a published instrument approach procedure initial approach fix or at a fix from which radar vectors will be applied. The route will be kept as simple as possible and use few and the same type NAVAIDS. Also, according to criteria, a STAR may serve more than one instrument approach procedure or more than one airport in a terminal area. STARs are not to include altitude limitations, speed control, or other requirements of a non-standard nature such as transponder codes or frequencies that will change based on conditions or circumstances. When military STARs are developed there will be a further criteria that the termination fix shall be clearly defined in the text of the procedure.

The sample STARs accompanying this article show the wide variation the civil STAR procedures now take. It's not likely that the military would care to compound the pilot's cockpit problems with one like CITRUS TWO ARRIVAL for Los Angeles. On the other hand, one like



STARs

CROSS CITY ONE ARRIVAL (CTY•CTY1)



CROSS CITY ONE ARRIVAL (CTY•CTY1)

TAMPA, FLORIDA
TAMPA INTERNATIONAL

CROSS CITY ONE ARRIVAL for Tampa might be advantageous. It is noted that the termination fix, though clearly BASSETT in the CITRUS procedure, is not defined in the CROSS CITY procedure.

The plan for naming and numbering is also common to previous practice. The name should correspond to the fix or geographical location where the STAR commences and the original publication will be number ONE. As STARs are developed the coordination and processing practices will be the same as are now in use for SIDs. Publication will be similar and be in accordance with appropriate agency directives.

Planned full application of STARs to all aircraft will be effected when adequate publication and distribution to military operators are accomplished. In the long view, FAA plans to incorporate STARs in the National Airspace

System computer managed ATC program. Distinctive computer identification codes will be assigned for each STAR procedure on a national nonduplicated basis. Of course, as the program progresses and new navigational systems come into general use — and new aircraft for that matter — there will certainly be special STARs developed. There will be RNAV procedures or transitions to existing STARs. There will be transitions designed for STOL aircraft and also for helicopters.

Presently, controllers may now issue a STAR clearance to any civil aircraft. It may be applied to military aircraft only when requested verbally by the pilot or by inclusion of "STAR" in the remarks section of the filed IFR flight plan (DD 175). Of course civil aircraft have the prerogative of declining the STAR clearance by verbal request or inclusion of "NO STAR" in the remarks section of his flight plan.

The military program for STARs is now a matter of analysis and study. One of the primary concerns is that present STARs and STAR transitions do not provide adequate information in event of two-way radio failure. Other factors delaying general participation involve the TERPS criteria and the methods for processing procedures and publication in the FLIP. Headquarters and the Instrument Flight Center are working toward resolution of these issues. General guidance will be included in a revised AFR 60-27 which is now in coordination at MAJCOMs.

For the time being, however, we have no military STARs published. Normal traffic density at military terminals is being accommodated through the use of en route radar controlled descent and clearance along regularly used routes as filed in the day-to-day conduct of training and operations. Military use of civil airport STARs is naturally minimal, but is officially limited to preplanned use by aircraft equipped with dual radio capability.

The current FLIP IFR SUPPLEMENT wraps it all up in a Special Notice.

DOD RESTRICTED USE OF STANDARD TERMINAL ARRIVAL ROUTES (STAR) CHARTS

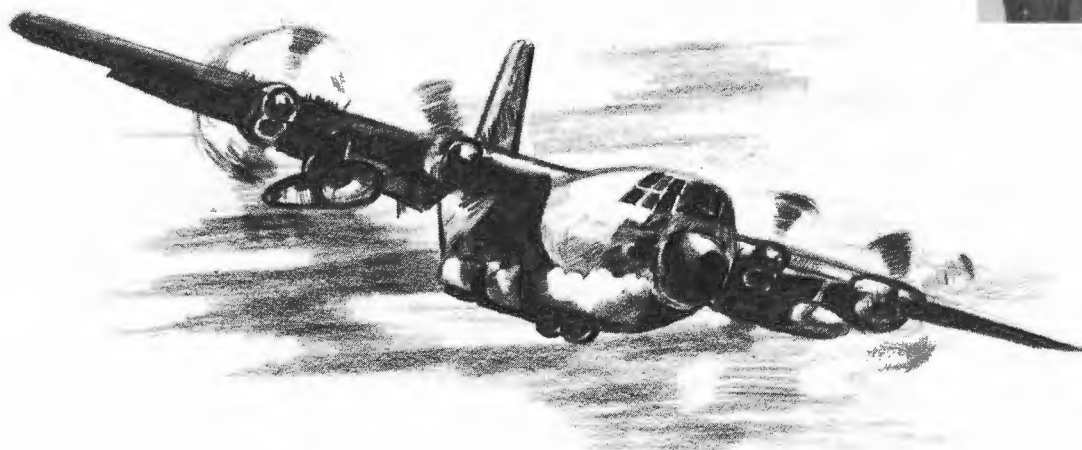
Regulatory action concerning the use of Standard Terminal Arrival Routes (STARs) by DOD aircraft has not yet been finalized. Many of the FAA developed STARs do not provide sufficient routing or altitude information to allow orderly completion of flight to destination airports in the event of communications failure. Therefore, use of STARs is restricted to DOD aircraft equipped with two functioning transceivers compatible with air traffic control.

TACTICAL AIR COMMAND

AIRCREWMAN of DISTINCTION



SMSgt Curtis



Senior Master Sergeant Walter S. Curtis, 36th Tactical Airlift Squadron, 316th Tactical Airlift Wing, Langley Air Force Base, Virginia, has been selected as the Tactical Air Command Aircrewman of Distinction for March 1973.

Senior Master Sergeant Curtis was the flight engineer aboard a C-130E aircraft flying a mission in support of a joint Army-Air Force exercise. Prior to an anticipated night landing at Wright Army Airfield, the landing gear was extended, but the right main gear indicated unsafe. After determining that the utility hydraulic system was operating normally, SMSgt Curtis observed that the aft right main gear was not fully down and locked. The aircraft was depressurized in order to initiate emergency actions. SMSgt Curtis turned off the utility hydraulic system, depleted all system pressure, deactivated the landing gear electrical system, and then began the process of manually extending the landing gear from the cargo compartment. The emergency gear extension handle WOULD NOT move the gear towards the down and locked position. The aircraft commander decided to fly the aircraft back to the home station and preparations were begun to contend with the possibility of a collapsed

landing gear on landing. In order to more positively secure the main landing gear, SMSgt Curtis began to chain the main landing gear down and while in the process he uncovered the cause of the gear malfunction. A piece of metal from the lower track shoe was lodged between the right aft shelf bracket and the actuating screw (right main gear). He used the emergency gear extension handle to raise the gear, and then he carefully removed the obstruction. SMSgt Curtis was then able to extend the gear to the full down and locked position. Since it was impossible to determine whether any further damage had occurred, SMSgt Curtis completed the chaining of the main landing gear. No further gear problems were encountered, and the aircraft successfully terminated its flight at Langley AFB.

The timely corrective action employed by SMSgt Curtis to resolve the landing gear malfunction averted an extremely hazardous situation. His actions prevented possible injury to crew and passengers, were directly responsible for the preservation of a valuable Air Force aircraft, and certainly qualify him as a Tactical Air Command Aircrewman of Distinction.



straight up

Faster than a speeding bullet, able to leap tall buildings in a single bound." To anybody 35 or older that phrase brings back memories of "Superman." But military men for many years have yearned for an aircraft with the same attributes: that of being able to leap vertically into the air and then transition into conventional level flight. And the desire to achieve this capability has caused a large number of different concepts to be pursued.

Most of these Vertical Takeoff and Landing (VTOL) projects did not advance beyond the drawing board status while only a few advanced to actual prototype status. And finally, a number of them did actually fly, achieving varied results.

Discussions of VTOL aircraft often tend to mingle with another class of aircraft known as Short Takeoff and Landing (STOL) aircraft, hence the acronym-V/STOL. But it should definitely be pointed out that the VTOL and STOL are two entirely different breeds. Most STOLs have both fixed wings and fixed engines and acquire their STOL capability from carefully configured aerodynamic configurations. Most are equipped with long, high-lift wings aided by such devices as leading edge slats, full-span flaps, and boundary layer control.

But the VTOL situation is much more complicated. The force provided by either a propeller or jet thrust must be turned through 90 degrees. The second alternative is to have two different propulsion systems — one for vertical flight and one for level flight. Every conceivable combination of these concepts and every type of propulsion system have been considered down through the years. The many different systems have been supported by all three services, the NASA, and the aerospace contractors themselves.

EARLY DEVELOPMENT

The turboprop and turbojet engines of the late 1940s caused engineers to recognize the potential of VTOL aircraft. For the first time it might be possible, they reasoned, to eliminate these disadvantages of the only type of currently flying VTOL — the helicopter: (1)



straight down

by William G. Holder

inefficient range and payload carrying capability, (2) slow speed (usually less than 175 miles per hour), (3) grounded during adverse weather conditions, (4) vibration and high noise, (5) highly vulnerable in combat conditions, and finally (6) extreme mechanical complexity.

So during the late 1940s, the National Advisory Committee on Aeronautics (NACA), forerunner of NASA, started serious VTOL research with scale wind tunnel models. Both the Navy and the Air Force also began to show interest in the military possibilities of the VTOL aircraft.

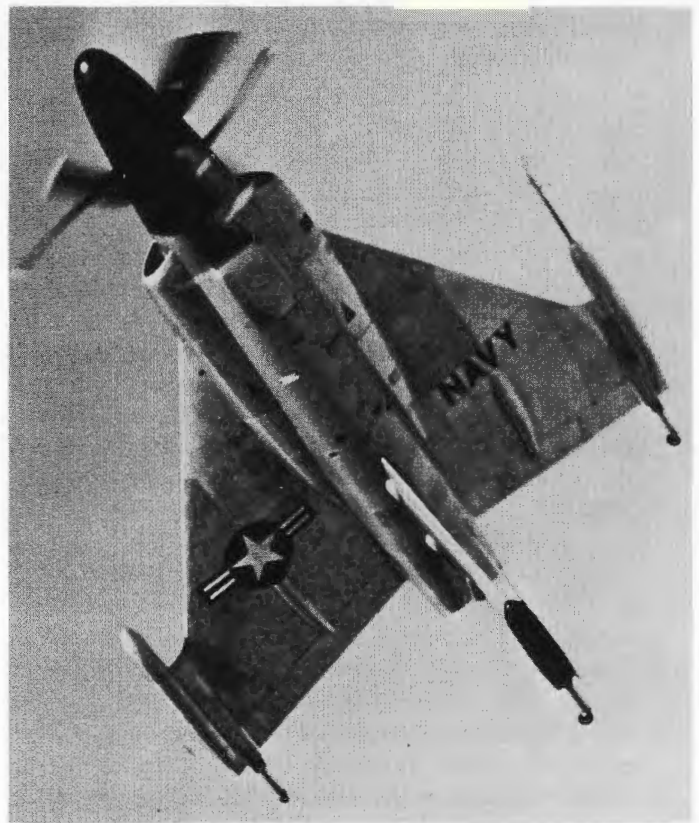
Since during that time period it was not considered feasible to launch high-performance jet aircraft from carriers, it appeared that the Navy stood the most to gain from developing a VTOL. The XFV-1 and the XFV-1 were the two VTOL projects assigned by the Navy to Convair and Lockheed. These aircraft carried the nickname "pogos" because they were designed to sit on their tails and take off with power provided by huge props turned by gas turbines. The Convair entry in November of 1954 was the first aircraft other than a helicopter to accomplish the transition from straight up flight to sustained horizontal flight.

In May 1951, the Ryan Company demonstrated another Navy-sponsored concept: that of using a jet engine for direct lift. The so-called air test vehicle looked like a "trashcan resting on a set of stilts." The vehicle had a broad high wing, a conventional fuselage, and a vertical stabilizer with the horizontal stabilizer fitted on top like a DC-9 airliner. The two powerplants were attached onto the sides of the fuselage and were capable of being rotated.

Due to its success with this initial vehicle, the Air Force awarded a contract to Ryan for the X-13 VERTIJET. (A point of interest is that the X-13 presently rests outside the restoration hangars of the Air Force Museum awaiting restoration so that it can be displayed as an important part of aviation history.) The X-13 became the first jet to go through the complete cycle: take off vertically, transition to level flight and then reverse the process for a vertical landing. The extremely small X-13



RYAN X-13 VERTIJET



CONVAIR XFY-1



BELL X-14

TAC ATTACK

straight up—straight down

had a squatty appearance, a delta wing plan-form and a large tail fin coupled with wing-tip fins.

During this time period, Bell also constructed the XV-3 CONVERTIPLANE which used a tiltrotor concept. But none of these aircraft ever went into production even though they were probably past the state-of-the-art for the time period of their development.

Along with the XV-3, Bell also constructed the X-14 VTOL. The X-14 was designed and built under an Air Force contract awarded in July 1955. It was the first VTOL ever built to employ the jet vectored thrust principle. Powered originally by twin, nose-mounted jet engines, the X-14 achieved flight by means of rotating cascade thrust diverters mounted at the tailpipe exit. The pilot directed thrust either vertically for hovering flight, horizontally for conventional flight, or at an intermediate angle for transition.

During hovering and low speed flights, control of the aircraft was maintained by reaction controls. Aerodynamic surfaces performed this function during conventional flight. The aircraft was delivered to NASA in October 1959. They replaced the original engines with J85 turbojets for increased thrust and redesignated the vehicle the X-14A. In addition to defining stability and control requirements for NASA VTOL testing, the X-14 was used to investigate and simulate the approach phase of lunar landings for the Apollo lunar program.

One of the weirdest looking VTOLs ever to come off the drawing board was the Hiller X-18, a tilt-wing deflected thrust small transport. The X-18 had two Allison turboprops for propulsion and one Westinghouse engine for pitch control in the vertical-wing configuration. Two wings, of 48 and 60 foot spans, were tested in order to more thoroughly explore phenomena associated with wings operating at very high angles of attack. The control system consisted of dual conventional aircraft controls which functioned in conjunction with the wing rotation. The X-18 weighed in at some 33,000 pounds.

Another 50s vintage VTOL was the Ryan VZ-3RY which evolved from Army interests in an aircraft which could get in and out of confined areas. The so-called VERTIPLANE could hover, make complete transition

from vertical to horizontal flight, and could even fly backwards and sideways.

RECENT VTOL PROJECTS

In July of 1960, the three military services under DOD sponsorship entered into a program for development of VTOL transport type aircraft. This program was formulated to develop and test "experimental aircraft for the purpose of investigating flight concepts and evaluating the operational suitability of this type of aircraft for service use."

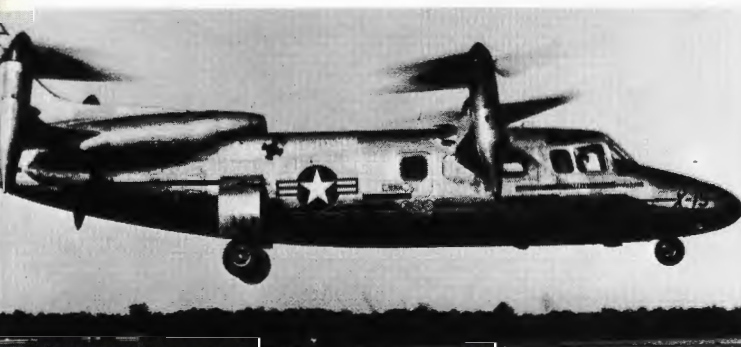
The tri-service program evolved into the testing of three different VTOL concepts. The first was the development of a tilt-wing VTOL called the XC-142 which was managed by the Air Force. The second aircraft used a tandem tilt-propeller and carried the designation, X-19. The Air Force also maintained control over this program. The third aircraft, which was under Navy sponsorship, was a tandem tilt-duct aircraft, the X-22.

XC-142

A total of five XC-142 aircraft were contracted for early in 1962. The design objective of the program was, from the beginning, to combine transport and helicopter characteristics into an aircraft which could take off and land vertically and be capable of conversion to and from conventional flight without requiring unusual pilot techniques.

Employing a unique variable-incidence wing, which could be positioned through 100 degrees, the XC-142 was able to demonstrate a nearly vertical rise before transitioning to horizontal flight. The added 10 degrees (over 90 degrees) allowed the aircraft to lift into a hover even with a tailwind. The wing was powered by two hydraulic screw jacks and was controlled by a variable rate switch which allowed the pilot to move the wing in either direction at any rate up to a maximum of about eight degrees per second.

With the wing at 90 degrees, pitch control was provided by a horizontally situated tail propeller. The



X-19



BELL X-22A

four main propellers were powered by four GE T-64 engines and had a cross-shafting transmission to provide flight safety in the case of an engine failure.

The aircraft had a cruising speed of approximately 250 knots and a maximum speed of 400 knots. The first flight of the XC-142 took place at the Chance-Vought Flight Test Center in Dallas in September of 1964. (The Air Force Museum also has one of these aircraft which will be placed on display in the near future.)

X-19

The X-19 research aircraft was a six and one-half ton vehicle that was also configured as a utility transport. Two aircraft were built during the program at a cost of 11.6 million. In this particular design, the four propellers, mounted in nacelles at the tips of the tandem wings, were tilted to a horizontal position to obtain vertical lift. The propellers were driven by a shaft transmission system powered by two interconnected engines located high in the aft fuselage.

The aircraft had a design cruising speed of 300 knots and a maximum speed of about 400 knots. The range with the design payload of 2000 pounds was about 425 nautical miles.

X-22

The X-22 was a dual tandem, ducted propeller vehicle which was designed and built by Textron's Bell Aerosystems Company under a Navy contract. An important feature of the aircraft was its extremely versatile, variable stability and control system. This system enabled the X-22 to conduct flight research on handling capabilities of this type of transport and permitted investigation of the flying characteristics and flight control problems generally applicable to all other VTOL aircraft.

The X-22 made its maiden flight on March 17, 1966, when it hovered for 10 minutes. The first vertical takeoff, transition to conventional flight and return to a vertical landing took place March 1, 1967. For takeoff, the X-22's ducts were rotated to a vertical thrust position. As altitude was gained, they were transitioned to a horizontal thrust position for forward flight. For landing, the procedure was reversed.

Four General Electric T58 turboshaft engines, each rated at 1250 horsepower, provided the power to drive the seven foot diameter propellers. Power was transmitted from the engines to the propellers through a system of gearboxes, so interconnected that a single engine could turn all four propellers.

XV-4A

The XV-4A was one of three hardware concepts

investigated to consider lift-propulsion concepts suitable for VTOL operation in an Army field environment. The design was based on a jet pump principle which was demonstrated on a test rig by Lockheed. Through high-speed jet exhaust, entrainment of ambient air increased mass airflow sufficiently in a vertical direction to provide augmentation of primary power by up to 40 percent.

On June 10, 1964, one of the aircraft in the XV-4A program was lost in a conversion from conventional to vertical flight. The aircraft was undergoing deceleration tests at altitude and reportedly went into violent pitching oscillations from which the pilot was unable to recover.

XV-4B

The XV-4B was nothing more than a modified XV-4A but incorporated a number of significant changes. The "A" was powered with two P&W 3300 pound thrust turbo-jets which were mounted horizontally and obtained thrust in the vertical direction by diverting thrust downward through the fuselage. In contrast, the "B" was powered by six GE engines of which four were mounted vertically in the fuselage, and two were mounted horizontally in nacelles in the wing roots.

The first tether test flights of the "B" model were performed at Marietta, Georgia, in October of 1968 and flight in the conventional mode were performed in early 1969. On 21 March 1969, the XV-4B crashed during a test flight. The pilot ejected safely, but the aircraft was completely destroyed. This crash dealt a serious blow to American attempts at developing a VTOL capability, and was just another of many crashes that had occurred on a number of the US VTOL test programs.

XC-142 (composite photo)



straight up—straight down

XV-6A (HARRIER)

Initial development of the Hawker Siddeley Harrier began in 1958 as a private venture, but as interest in the radical new concept grew, the British government quickly took an interest. Under the designation of P. 1127 there were six prototypes of the aircraft constructed. Nine KRESTRELS, which were improved versions of the aircraft, followed and were powered by a 15,200 pound thrust engine.

Jointly funded by the US, Germany, and Great Britain, the KRESTREL program was formed in a special tri-partite squadron composed of personnel from each of the three nations. The initial KRESTRELS were extremely underpowered and also had other problems. But with the addition of a new engine, the US interest in the aircraft was greatly intensified.

The HARRIER is a true VTOL aircraft which achieves both lift and propulsion through the vectoring of thrust from two engines which are mounted horizontally in the fuselage. Swivel nozzles are located near the wing root on each side of the fuselage. The aircraft is not only capable of vertical takeoff and landing, but under certain conditions can fly backwards.



HAWKER SIDDELEY XV-6A HARRIER

The present configuration of the aircraft, which has been purchased in limited numbers by the US Marine Corps, is armed with two 30mm Aden guns which are mounted in pods under the fuselage. Other ordnance such as Sidewinder missiles, Zuni rockets, and the Rockeye bomb can also be carried by the aircraft.

By late 1971, the Marines were operating about nine HARRIERs in the first Marine Attack Squadron in Beaufort, South Carolina. The Marines seemed to be well satisfied with the performance of the aircraft. However, at this time the future of the HARRIER, with regard to US forces, is uncertain. But successful or not, the HARRIER will always hold the distinction of being the first operational VTOL to be operationally deployed with the Armed Forces of the United States.

NOW

Even today there are VTOL fall-out projects being brought into existence on both sides of the ocean. NASA and the Army are interested in the development of a tilt-rotor vehicle. The research aircraft would have over a six ton gross weight with 25 foot diameter rotors. This would be only a test vehicle with possible operational vehicles to be four to five times larger. The concept is not at all unlike the old XV-3 project which was discussed earlier in the article.

Also, Short Brothers and Harland are developing the Short Skyspy, a pilotless vehicle to hover over a combat area and be capable of returning pictures of the area back to a communications center. The vehicle, a VTOL of sorts, is planned to be powered by a single-stage, low-pressure ducted fan.

The Navy recently awarded North American Rockwell Corporation a \$46 million contract for the development of two VTOL fighter prototypes. The aircraft may eventually be modified for use on the Navy's small carrier control ships. The aircraft would be powered by the same F401 engine which powers the F-14B Tomcat.

The tremendous data base acquired during the 50s and 60s will provide a strong platform from which to spring for the VTOL aircraft of the future. And the direction which will be sprung? Why straight up, of course!



William G. Holder is a space systems analyst with the Foreign Technology Division, Air Force Systems Command, Wright-Patterson AFB, Ohio. He has worked with the Boeing Company on the Bomarc B and the Saturn V. As a lieutenant in the U. S. Army, he served three years as an air defense guided missile instructor. Mr. Holder is the author of a number of technical articles and the book, Saturn V — The Moon Rocket. Skylab, his latest book, will be published this fall.



From A Collection of Anonymous Stories Published In
1942 By the Army Air Forces, TAC ATTACK Presents:

Lessons That Live

No. 8 of 17

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

HOW TO GROW OLD IN THREE MINUTES

Yes, I was one of those so-called "hot pilots" who are so crazy about flying that they'll fly anything they can get a propeller to turn on. Notice that I said I was. The only ships we had at Eglin Field at the time were some old PB-2s and there was a lot of talk about grounding them. Naturally, since that would mean no more flying, we argued valiantly (although we knew better) that they were fine ships and perfectly safe. We'd work on them ourselves, as members of the crew, to keep them in as good condition as possible.

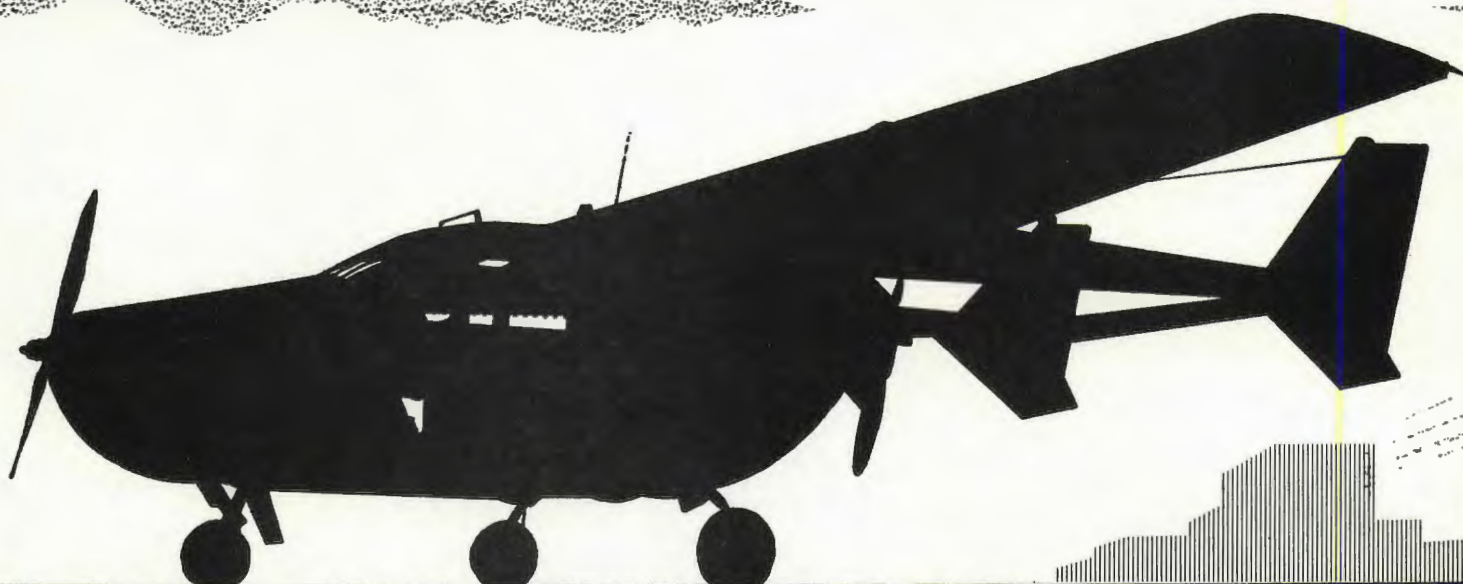
On a beautiful afternoon last fall I started for Orlando in one of them. Looking back now, it seems to me I had a hunch something was going to happen.

The old Curtiss Conqueror engine, however, purred like a cat full of cream and my misgivings vanished. Suddenly I noticed smoke coming out of the engine. I cut the throttle and ignition but the smoke got worse and flames began to creep out from under the cowlings. I looked for a place to set it down and spotted a little field that I might get into in a pinch. There was plenty of room to jump but all I could think of was another PB-2 we had back at Eglin which had no wings. If I could save the wings on my ship we could put them on the wingless one and we'd still have something to fly!

The smoke got thicker and the heat was terrific but I was bound I would save those wings if at all possible. I tried slipping it to keep the flame and smoke out of my face. At 500 feet, as I leveled off to glide in, the fingers of fire shot back and the cockpit became a raging inferno. When my pants began to burn and I felt raw flame against my skin I knew I had waited too long. Which would it be — burn to death in the plane or jump and fall to my death? Reasoned action was out of the question; I simply fell over the side, pulling the ripcord as I fell.

The chute opened and almost simultaneously I hit the ground. I was blistered, my clothes were burned off me, but I was alive. The plane was a total wreck.

I grew old as a pilot in those flaming few minutes.



TRANSITION TRAUMA

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 110TH TACTICAL AIR SUPPORT GROUP (ANG/TAC)
PO BOX 668, BATTLE CREEK, MICHIGAN 49016



REPLY TO
ATTN OF: SE

18 Jan 73

SUBJECT: Transition Trauma

TO: Editor, TAC ATTACK

1. The conversion from a Reconnaissance Unit to a Tactical Air Support Group (Air National Guard) in June 1971 was and is a difficult transition. We had earned an Outstanding Unit Award in our RB-57s and were proud of our mission and unit. The O-2A was difficult for our pride (going from jets to props) and the battle weary aircraft from SEA are giving our maintenance areas fits. After a discouraging eighteen months of consistent problems and little relief, people get discouraged. I felt a "pep" talk was in order and at the quarterly Maintenance Safety Meeting I presented the speech attached. (See next page.)

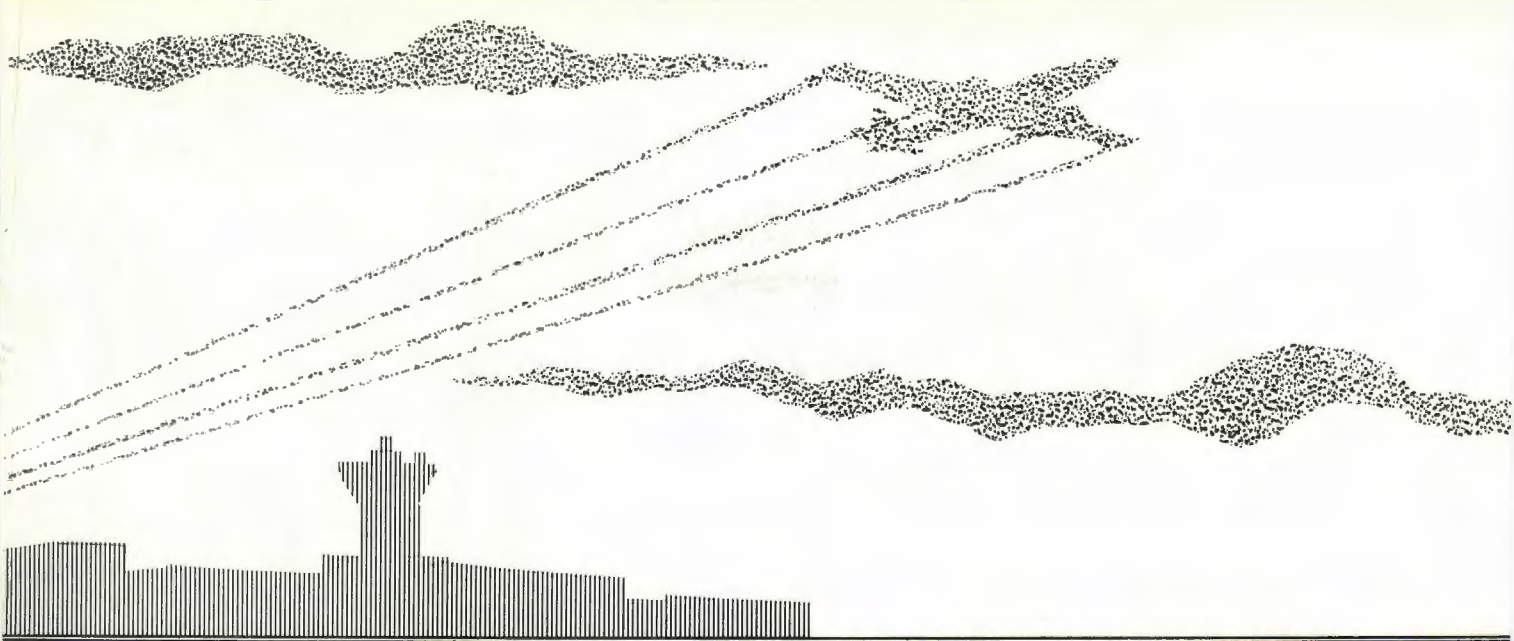
2. In order that the pilots would also understand what is happening, I told them what had been done and read the speech to them. They amazed me. I received many compliments and spirits seemed to pick up. It may not last but I can hope.

3. I'm sending this to you, not because I wish to display my literary ability or inability, but other units with similar problems may find this helpful. Right now there are five O-2A Air National Guard Units and three Active Duty Units. Perhaps we are the only unit whose pilots and maintenance people are egoists that prefer to fly and work on jets - but can't.

FOR THE COMMANDER

NORMAN A. OSBORNE, Maj, MI ANG
Chief of Safety

1 Atch
Safety Speech



During the last Flying Safety Meeting with the pilots, I passed out a questionnaire — pilots were not supposed to put their names on it and they were to give their opinions of what they thought would cause the next accident; hazardous situations; suggestions for corrections; and comments.

The most significant item concerning the pilots is the growing laxity, lack of professionalism, and poor attitudes among supervisory personnel, ground crews and pilots.

This surprised me a little — not only that it's happening in all areas but also that the pilots were recognizing their own deficiencies as well.

They mentioned an attitude of "broke again, well what can you expect from a mickey mouse airplane?" OK. The materiel quality of the O-2 falls far short of any other military plane we've had here. That doesn't mean the quality of work or attitude toward recurring problems should be less than professional.

You are professionals. Every job, no matter how small or insignificant it may seem, is very important and deserves the best you can give.

Let me explain something to you about pilots.

They're an awful lot like you — some of them are cocky and opinionated (just like some of you) — some of them are quiet, some are loud — some are just average — but they're all men, and like you, they put their pants on one leg at a time. They all, however, love to fly and spend a great deal of their spare time out here doing it.

They also are a nervous bunch. The saying goes — old pilot, bold pilot, but no old bold pilots. I know we don't have any old, bold pilots.

This O-2 makes them nervous — it used to be that we could have a bunch of airplane problems, add a couple of our own and if everything turned to garbage, lift the ejection seat handle and make a nylon letdown by

parachute. In this aircraft, if you waste too much time deciding what to do, it is no longer necessary to take corrective action — because you'll be straining yourself unnecessarily and crash all tensed up.

We seldom wear parachutes any more — there's no requirement except for certain missions.

This mickey mouse aircraft can and will kill — just like any other.

Let me lay on some facts:

1. We are in the Tac Air Support Mission.
2. We have O-2 aircraft.
3. There is no follow-on aircraft projected for Air Guard O-2 aircraft on this base.

We're in this business to stay — at least until many of you complete your tour or retire.

Those are facts and we're stuck with them.

Let's make a concerted effort to change attitudes and start the new year with a "can do — will do in spite of the aircraft" attitude.

I'd like to tell you one more thing about pilots —

As long as there has been an Air Force the pilots have always regarded the ground crews (all ground maintenance types) as professionals. This has been especially true here at Battle Creek — and for a darned good reason. You have shown yourselves to be real pros. A very recent article written by the Air Force Inspector General shows that they (USAF) are recognizing Guard professionalism. He stated that the Air National Guard has some of the finest maintained aircraft in the world.

Of the O-2 aircraft that I've seen at other bases, I always have been and still am proud of ours. Only the attitude has been changed.

"Aviation in itself is not inherently dangerous. But to an even greater degree than the sea, it is terribly unforgiving of any carelessness, incapacity or neglect." ➤

SLUF...

by Major Jim Bustle
23 TFW, England AFB, La.



In March of 1972 TAC ATTACK published the first chapter of "SLUF" written by Major Jim Bustle. We thought it was great stuff and invited him to write us another article. This, "SLUF - Chapter Two," is the result, written in the same distinctive style as the first. Ed.

And the war party of THUD returned to their home in the Land of the McConnell where the Family of THUD, Tribe of Real Jock, did sally forth daily under the banner of the Flying Tiger. And they sayeth of their chief, "Our one-heart steeds are valiant, but old and few in number. Let us pasture them with honor and become one with the Family of SLUF, Tribe of Real Jock, whose mounts are young and warlike, that the banner of the Flying Tiger may never be furled."

And their chief did say, "It is Good."

And so the Family of THUD did take themselves into the Family of SLUF and did migrate to the Land of Cajun. There they did plant the



CHAPTER TWO

counsel and say, one to another, "It is Good."

And in the strange land afar off, the Clans of Atlantis and Mount Lemmon, Family of SLUF, Tribe of Real Jock, did battle fiercely and valiantly.

And there was one among them who rose above the others, who was large of stature and mighty in his strength. Who called no man master and would have no slave. Who could dart his deadly spears swiftly and surely into the most elusive target. Who rode as if one with his steed. But fortune smiled not on the gifted, and Big Tony fell in battle.

And it came to pass that soon after the Family of SLUF joined the fight, the longest war was ended.

It could not be said that they turned back the enemy. It is not claimed that their courage did stay the tide of the Red Sea. It is truth that they fought fiercely. It is truth that all had their wounds before. It is truth that the Chief of the Nation of PACAF did say, "Be ye proud, warriors of SLUF, for ye have done well."

And the Chief of the War Party did say to his valiants, "A warrior asks no higher praise. It is Good."

And in the Land of Cajun, the Clan of the Flying Tigers awaits the next great battle as they hone their warrior skills.

And they grow stronger with each setting of the sun ➤

Lemmon to the west, there was also weeping, for many young warrior-teachers were to leave the Clan and journey east to worship the Flying Tiger.

And it came to pass that all these warrior-teachers did assemble in the Land of Cajun and there set about their tasks which seemed as thirty crore.

Mightily did they labor and the Tribe of Real Jock breathed as with new life. And the one called Lou, Chief of the Flying Tigers, did say, "It is Good."

The war clouds then did gather and the Clans of the Atlantis and the Mountain Lemmon did join forces and sally forth to battle. And the warrior-teachers, now of the Clan of the Flying Tigers, were sorely vexed that they did not also don armor.

But one wiser than the rest said, "Do you not teach a child to walk before it is allowed to run? Be patient, brothers, for cubs are easy prey, but Tigers in full manhood are the fiercest of warriors."

And all did acknowledge this sage

banner of the Flying Tiger. They then called to the two clans of the Family of SLUF who lived by the Lake of the Atlantis and in the desert surrounding the Mountain Lemmon, "Family of SLUF, your newest brothers beseech you that you should teach us to ride the new steed so that the Tribe of Real Jock may not diminish."

And the two Clans of the Family of SLUF did say, "So shall it be. It is Good."

And by the Lake of the Atlantis, the warrior-teachers were chosen. One was wrinkled, one was bald, one round, one tall, one stern and one unshaven. With heavy hearts, they did bid farewell to the ones called Moby Dick, Rabbit, Super-gnat, Wop and Limey.

In the shadow of the Mountain of

CHOCK TALK

...incidents and incidentals

GET THE LEAD OUT

by Captain George Bravakos
TAC/SEFR

Hey! How many of us jocks and maintenance types have been guilty of innocently drawing, writing radio frequencies, courses, time checks, or inspection notations on some exposed part of an aircraft? Do you know that the LEAD or GRAPHITE of a pencil acts as a positive electrode? That a metal such as zinc acts as a negative electrode? Add a small amount of moisture to these elements and you produce a CORROSIVE chemical reaction.

Some time ago, at McClellan AFB, an inspector produced a corrosive chemical reaction simply by drawing a line around a crack on an aluminum wing skin. A few weeks later, the line lost its importance because the entire area that encircled the crack fell out! Unapproved marking pencils can have a similar destructive effect on turbo-jet engines. The General Electric Small Engine Division reports that when it becomes necessary to mark any hot section part during inspection, maintenance, or storage, only the following marking materials are approved for use:

- (1) Chalk
- (2) DyKem Red (Yellow or Black)
- (3) Ink (Justrite Slick-Black; Marco 5-1141; Marsh Stencil Ink)
- (4) Soapstone

GE further recommends that the use of grease pencils or any marking material that contains lead, copper, carbon, zinc, or similar material be prohibited. The use of these marking materials will introduce intergranular corrosion attack and/or carbon impregnation (alloy creation) when exposed to engine operating temperatures, and may result in a loss of structural strength. If an aircraft or engine part has been marked with an unapproved material, all traces of the material must be promptly removed, but in the process be very careful to avoid removing any surface protection.

If you're in doubt as to a certain type of writing material to use, check the TOs.

BUNDLED UP

The Thud jock ran through the normal checklists in preparation for an FCF of an F-105. On runup, he checked the flight controls then checked them again as he took the active. Everything was operating normally. On takeoff roll at 155 knots, he attempted to apply back pressure, but the stick wouldn't move.

He aborted the takeoff, got her stopped OK and turned off the active, at which time he checked the flight controls again. They worked great (natch!). Just before engine shutdown he checked the controls again and this time the stick wouldn't move aft. Maintenance found that the arresting hook wire bundle was loose and that some goodies which attach the auto pilot actuator to the gimbal were snagging on the wire bundle.

It's very important to keep in mind that when you, as a maintenance technician, work with one system of an aircraft, other systems will be affected by the quality of your work. This is especially critical when working around the flight control components. One small error, a missed checklist or TO item, can lead to far more serious happenings if you don't keep the total picture in mind.

HAZARD REPORTS DO WORK

A hazard report was submitted recently by the control tower at Cannon AFB when a tug crossed the active runway against the red signal light, as an aircraft began its takeoff roll. Luckily no collision resulted. The thorough investigation which followed disclosed a deficiency in not only the vehicle operator's color vision but also the color vision test prescribed for an airdrome license. The result is a forthcoming emergency change to AFM 77-1 which will require all driver schools to use the standard flip charts (VTS-CV) and the VTA-CTT test for color vision. Our thanks to Captain Eugene G. Lamoth, 27 TFWg, for his thorough investigation and excellent recommended corrective action. Thanks also go to the tower for originating the hazard report.

with a maintenance slant.

FUEL CONTAMINATION

An incident report received from another command gives us the opportunity to review a couple of errors so that we can reinforce our own procedures. No one was hurt in the incident, nor was the C-130 dinged, but it could have ended differently.

As the crew was practicing instrument approaches, number two and number four engines began performing erratically and were not responding properly to throttle positions. The aircrew safely landed the airplane and later, during troubleshooting, maintenance determined that the fuel system was contaminated. Tracking back through the records and contacting those bases where the airplane had been refueled, maintenance was able to determine from which base the contaminated fuel was pumped aboard. Digging further into the problem revealed that each time the aircraft was preflighted by the crew chiefs during an eight-day period, they failed to perform a check of the fuel drains or the sumps. Further, each time they refueled the machine they did not complete the checklist by performing a fuel contamination check.

The results of these omissions could have brought down one fine machine and wiped out a few people in the process. It all relates back to discipline. If each of us does not have the self-discipline it takes to make checklist discipline work, then that checklist is completely ineffective.

Undisciplined knowledge is worthless.

GET A HANDLE ON IT

When the pilot of an A-37 tried to put the gear down the handle wouldn't move, regardless of the amount of pressure applied. The instructor pilot searched around the cockpit trying to find something to use as a pry bar. He unstrapped from the right seat and got the canopy breaking tool. Then while the pilot pressed down on the gear handle, the IP used the canopy breaking tool as a lever and with much oomph managed to move the gear

handle down. The gear extended normally and the mission was terminated without further incident.

Cause: Somebody misrigged the nose gear actuation linkage.

MULTIPLICATION

When the pilot entered the cockpit of the F-4, he stowed the Dash Thirty-Four checklist and the local aircrew aid in the map case, then strapped in. While doing the pre-start checks, he discovered that the seat wouldn't raise and noted that the upper cannon plug for the seat motor had been disconnected. He unstrapped, got out of the cockpit, and the line chief jumped in and removed the checklists from the map case so he could get to the cannon plug. The plug was connected, the pilot got back in and made a normal start. As he taxied out the line chief saw one of the checklists fall to the ramp from somewhere on the airplane. He took no action except to have the crew chief pick up the checklist.

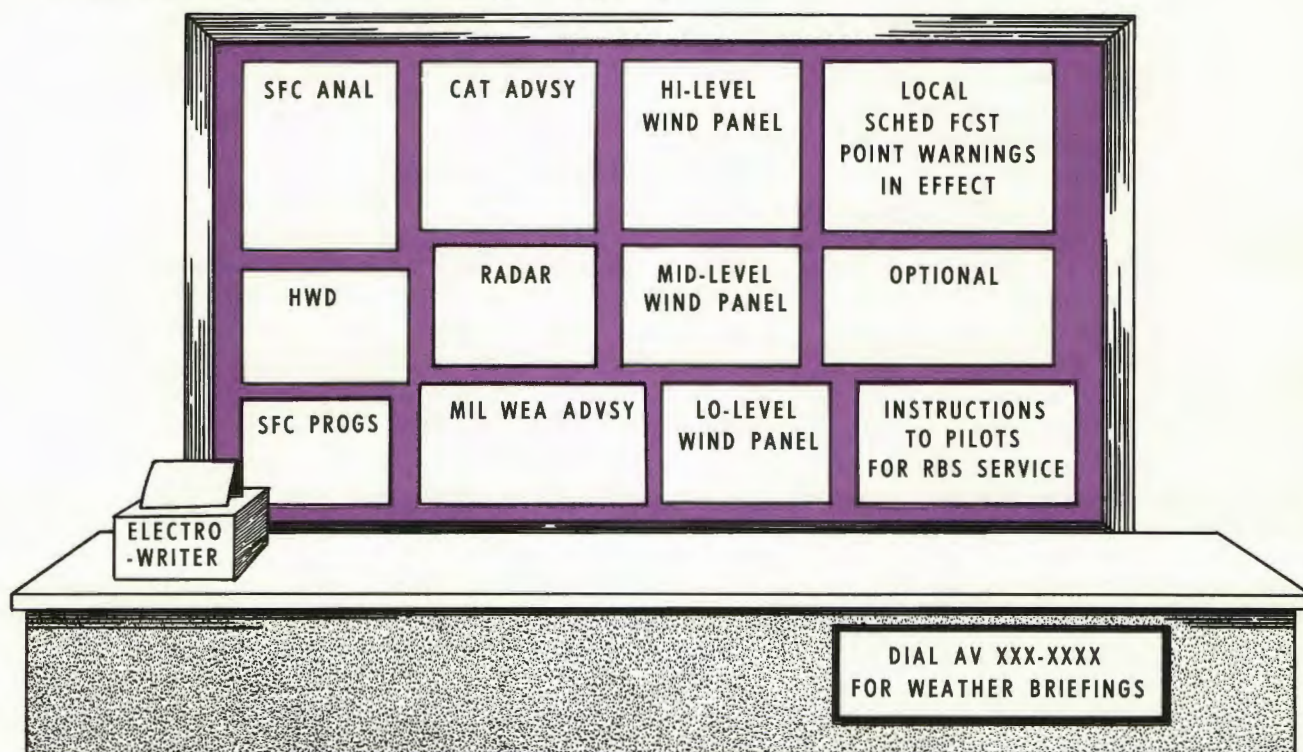
After takeoff as the jock brought the throttles out of burner, he felt a thump. Thinking that maybe he had hit a bird, he had his wingman check him over. There was nothing abnormal either with the airframe or the engine instruments so he continued the mission.

After landing, the pilot discovered that his checklists were missing. (Note: These were not the normal inflight checklists.) He discussed it with the crew chief who produced one of the missing checklists. Remembering the thump shortly after takeoff, the pilot relayed to the crew chief what he felt had been the fate of the missing checklist. He was right. The checklist had been ingested by the engine; scratch one engine.

There were a number of errors made: the line chief didn't maintain any control over the items he removed from the cockpit nor did he take any action when he saw one of the checklists fall off of the airplane. But the whole thing started when somebody didn't connect that seat adjustment cannon plug. From that point the errors multiplied and multiplied . . .

SPRING FLYING

standard pilot briefing display



*What!
No Forecaster
on duty?*

Have you been confronted with the situation pictured here? If you have, you were exposed to the recently implemented Regional Briefing Station (RBS) concept of providing weather support. This concept of operations evolved as a direct result of the CSAF directed drawdown

of Air Weather Service and involves the reduction of base weather forecasters and the resultant reduction of hours of forecaster services.

Each base weather station with reduced hours of forecaster service is assisted by a selected Regional Briefing Station to insure the availability of 24-hour service. Air Weather Service locations with reduced services provide a standard pilot briefing display, such as shown in the illustration, which is maintained during the hours that no forecaster is on duty. A class "A" telephone to serve as a dedicated instrument for aircrews to contact the RBS by autovon is located near the briefing display so the pilot can view all pertinent weather charts while receiving an aircraft clearance briefing from the RBS

can be colorful

by Captain James F. Hines
Hq, 5th Weather Wing,
Langley AFB, Va.

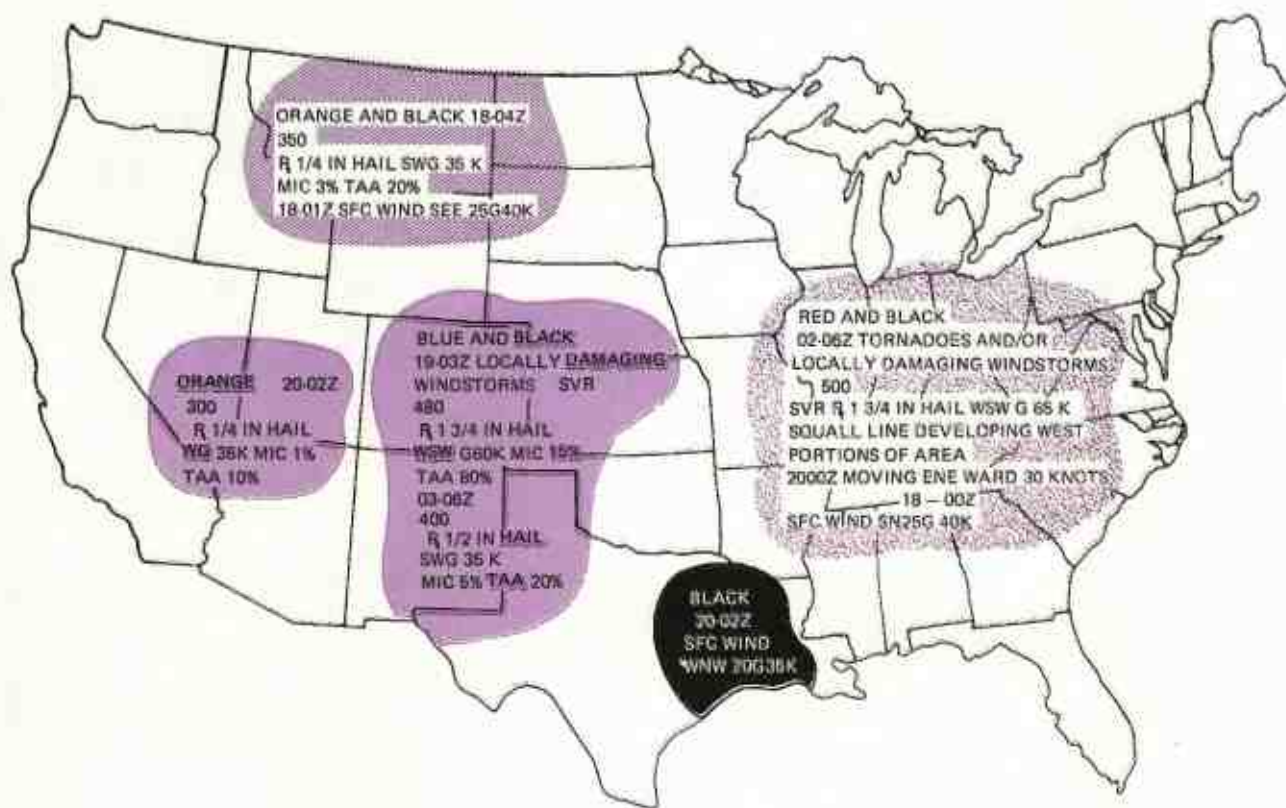
forecaster. As usual, there are exceptions to this procedure. Several bases have been identified for reduced airfield operating hours. Therefore, you will find that both forecaster and observer support at these locations will be limited and that standard briefing displays will not be maintained or updated. Nevertheless, current weather information will be available via the dedicated telephone service.

By now, you're probably asking yourself what all of this good information has to do with spring flying and colors. I thought you would never ask! At this time, I would like for you to focus your attention on one of the most important charts on the pilot briefing display, the

Military Weather Advisory. An example of such an advisory is offered here to aid the discussion and to jog your memory.

MILITARY WEATHER ADVISORY

The Military Weather Advisories are prepared by highly qualified meteorologists at Air Force Global Weather Central every six hours and are valid for 12-hour periods. They describe color coded areas throughout the CONUS where broad scale SEVERE weather is expected to develop. The following color code and definitions are used in these advisories:



spring flying can be colorful

EXPLANATION OF CATEGORIES (FORECASTED WEATHER) AND PERTINENT TERMS

Red	Tornado or tornadic waterspout.
Blue	Severe thunderstorms accompanied by gusts of 50 knots or more, or hail greater than 1 inch in diameter.
Green	Moderate thunderstorms with maximum wind gusts greater than 34 knots but less than 50 knots and hail (if any) 1/2 inch or greater but equal to or less than 1 inch in diameter.
Orange	Thunderstorms accompanied by gusts of less than 35 knots and hail (if any) less than 1/2 inch in diameter.
Black	Surface winds of 35 knots or greater.
Purple	Two or more inches of rain in 12-hours or less.
Hatched Purple	Accumulation of two or more inches of snow in 12-hours or less.
Brown	Freezing precipitation.
MIC	Maximum instantaneous coverage defines the percent of area which will have the predicted convective weather at the time of maximum activity during the valid period.
TAA	Total area affected is the percentage of the area which will experience one or more thunderstorms sometime during the valid period of the area.

Color coded area warnings contain only advisory information and not actual occurrences. The color scheme identifies areas with high potential for development of severe weather during the indicated valid period. These color coded areas also reflect the movement of the weather hazard for the entire forecast period and are not indicative of a saturated area of severe weather. Therefore, it may be possible to fly through a color coded thunderstorm area without encountering or even sighting a thunderbump. This is likely in case of a squall line or front with movement from one side of the area to the other side in the 12-hour period.

Now, you're probably asking yourself, so what? How does this impact on us flying types? First, it is the field forecaster's responsibility to take the advisory from the central and translate its content into meaningful information for you. This means he will relate and interpret the information into specifics for your flight. This task will be much easier if you understand the chart and will be more meaningful in pre-planning your flights to avoid potential severe weather as well as in making your "go" or "no go" decisions.

You and your friendly weatherman can make colorful spring flying safer by working together!! ➤



TACTICAL AIR COMMAND

Maintenance Man Safety Award

Staff Sergeant Orlin L. Fagan, 313 Avionics Maintenance Squadron, 313 Tactical Airlift Wing, Forbes Air Force Base, Kansas, has been selected to receive the TAC Maintenance Man Safety Award for March 1973. Sergeant Fagan will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



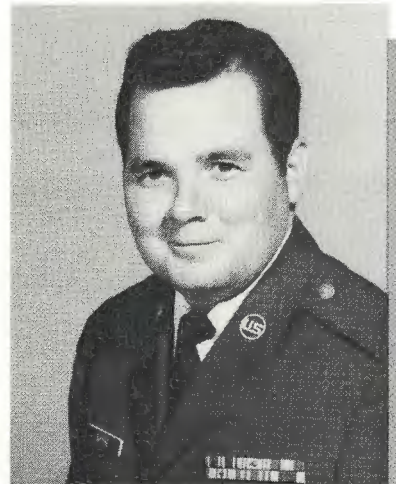
SSGT FAGAN



TACTICAL AIR COMMAND

Crew Chief Safety Award

Staff Sergeant Thomas C. Sayre, 4500 Consolidated Aircraft Maintenance Squadron, 4500 Air Base Wing, Langley Air Force Base, Virginia, has been selected to receive the TAC Crew Chief Safety Award for March 1973. Sergeant Sayre will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



SSGT SAYRE



TACTICAL AIR COMMAND

Ground Safety Man of the Month

Staff Sergeant Richard A. Thornton, 834 Supply Squadron, 1 Special Operations Wing, Hurlburt Field, Florida, has been selected to receive the TAC Ground Safety Man of the Month Award for March 1973. Sergeant Thornton will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



SSGT THORNTON

TACATIPS

...interest items,

CHEER UP

Do you recall seeing the old safety film in which the Gooney Bird pilot, noting that the copilot was having a bad day, tried to pump some sunshine into the situation when he smiled fatherly at the copilot during the takeoff roll and said, "Cheer up." The copilot promptly pulled the gear up at which time the concrete chewed up the props.

Recently (not in TAC) something similar happened. The instructor pilot took control of the airplane during the takeoff portion of a touch and go in order to demonstrate the school solution. As the IP advanced power he moved the speed brake switch in and told the student, "Check speed brake switch in the UP position." With absolutely no hesitation and with lightning-like reflexes the student reached over and raised the gear handle. (Oh, No!) The gear began to retract, the concrete began to rise, and the aircraft continued to accelerate. Just as the gear doors nudged terra firma the airplane achieved flying speed and the IP was able to fly it clear. After a controllability check the IP brought the scratched machine in for an uneventful landing. We can only speculate as to the verbal assault which must have followed. The student was unable to explain why he did what he did. He said he understood the instructions perfectly but he instinctively raised the gear handle.

Perhaps part of the answer lies in anticipation. As crewmembers we anticipate what the boss wants us to do in trying to stay ahead of the situation. Anticipation is part of what being a good crewmember is all about. But, if the boss's questions don't jive with our answers, maybe we should rethink the question. Don't give him apples when he wants oranges.

LIGHTNING

The F-4 pilot was making a left turn descending through 6500 in the weather at night when static electricity was noted building on the pitot tube and then

something flashed off the left wing. This was immediately followed by an intense flash of light which momentarily seemed to light up the whole world and also jolted the airplane. A milisecond later both fire lights illuminated. The pilot pulled off some power and began to climb to VMC conditions. During the climb he found out that he had lost the UHF radio, heading indicators, INS, and airspeed indications. Using power, angle of attack, and the attitude indicator, the pilot continued the climb to VMC conditions. Leveling at 14,000 feet he was able to contact approach control on VHF and received vectors back to home plate. He was able to descend through a break in the clouds and when the field was in sight, he lowered the gear and flaps. Immediately the aircraft yawed and rolled to the left, but the pilot was able to control it. Both the gear and flaps indicated down but the machine was difficult to turn to the left. Both fire lights were still illuminated and large amounts of smoke were coming from both sides of the cockpit. The jock dumped pressure which decreased the smoke. He then advised approach control that he would make a downwind landing with an approach end engagement. At approximately three miles on final all the lights and instruments went out. The pilot turned on the flood lights and told the backseater to prepare to eject. He continued the approach using power, attitude, and feel as the sole references. The barrier was engaged successfully, terminating the harrowing experience.

The damage to the airplane consisted of numerous burned and fused electrical components, and bunches of popped circuit breakers caused by the violent surge of electrical power from the lightning strike. The fire lights were illuminated (most probably) when the fire warning magnetic amplifiers were triggered by the lightning. The investigators found no specific cause for the yawing and rolling of the aircraft but they postulated that the sudden surge of electrical energy resulted in spurious stab aug inputs to the flight control system.

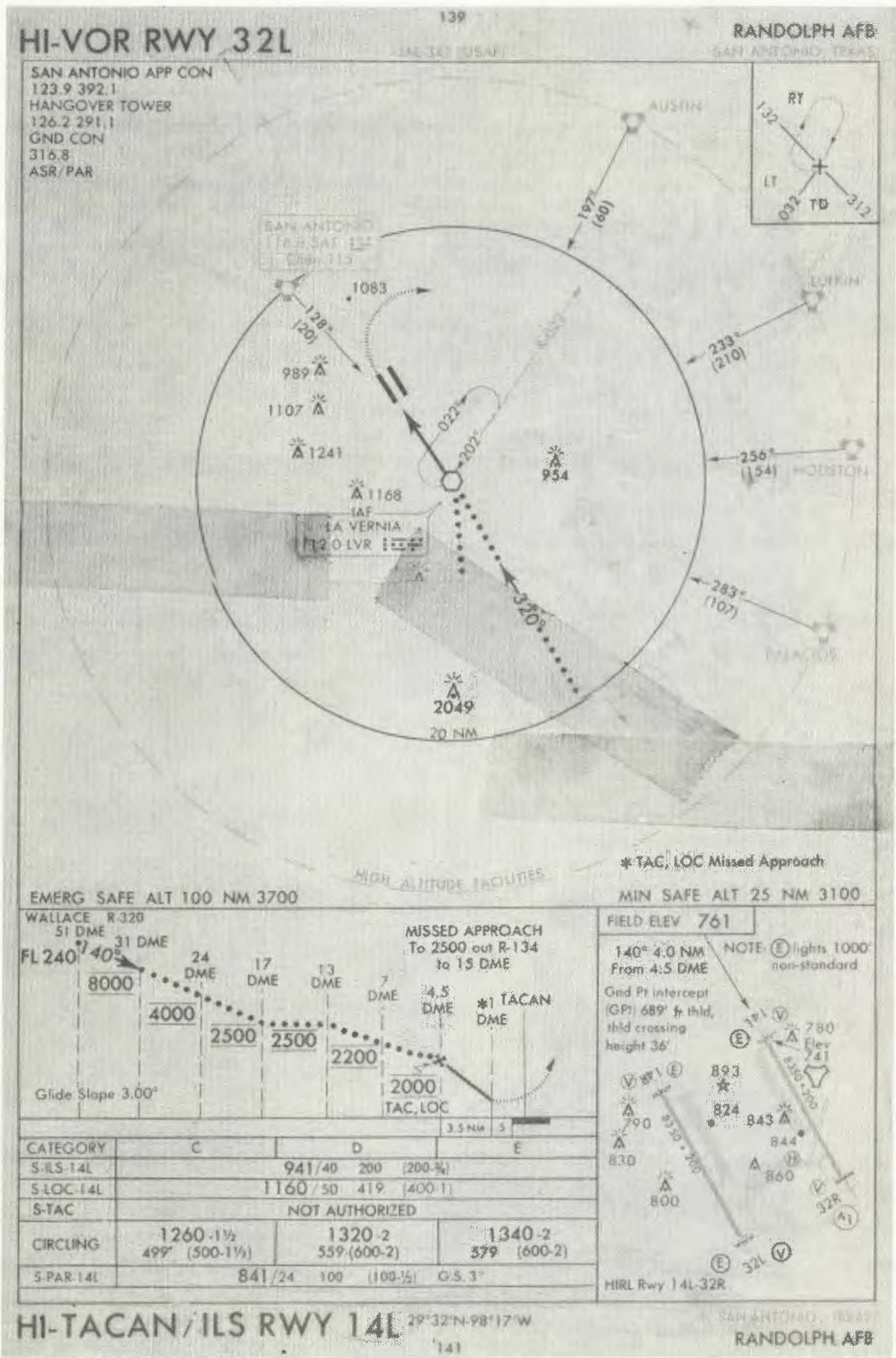
Hats off to the pilot who used superb judgment and a beautiful piece of flying.

mishaps with morals, for the TAC aircrewman

PATCHWORK APPROACH

From the 12th Flying Training Wing (ATC) at Randolph we have this jewel:

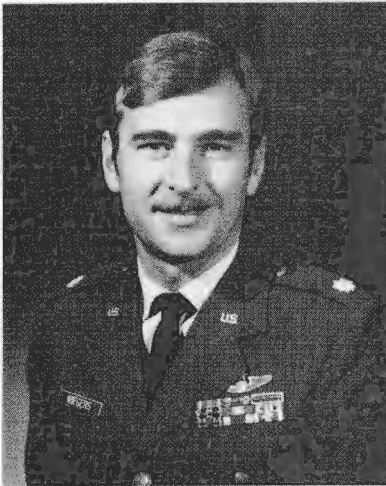
"This approach plate was found in an aircraft. It appears that it was torn by a pilot and repaired by an enterprising young maintainer. Take a close look and then see how you would go about flying the approach and determining your minimums - ROTS OF RUCK."



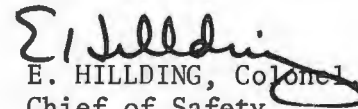


INDIVIDUAL SAFETY

We are proud to present the Tactical Air Command Individual Safety Award winners. The contribution to our mission made by these men will never be known . . . we have no way of counting accidents that have been prevented. Selection for the highest Tactical Air Command Award in their individual field is our way of recognizing outstanding efforts in behalf of accident prevention. I wish to add my congratulations to the many they have already received.



MAJOR WIEGERS


E. HILLDING, Colonel, USAF
Chief of Safety

Outstanding Flight Safety Officer

Major Francis A. Wiegers
355 Tactical Fighter Wing
Davis-Monthan Air Force Base, Arizona



Mr. HARLAN

Ground Safety Man of the Year

Mr. Paul R. Harlan
31 Tactical Fighter Wing
Homestead Air Force Base, Florida

AWARDS FOR 1972



MSGT MCKINNEY

Outstanding Contributor to Weapons Safety

Master Sergeant James R. McKinney
4 Tactical Fighter Wing
Seymour Johnson Air Force Base,
North Carolina

Outstanding Weapons Safety Officer

Captain Michael N. Cotignola
316 Tactical Airlift Wing
Langley Air Force Base, Virginia



CAPT COTIGNOLA

Outstanding Weapons Safety Noncommissioned Officer

Technical Sergeant Ralph C. Stallings
4 Tactical Fighter Wing
Seymour Johnson Air Force Base,
North Carolina



TSGT STALLINGS

SPO COR

FUEL MANAGEMENT A-7

Maj Bob Lawler

A recent A-7D accident brought out the fact that we need to reemphasize fuel management. It hurts to think that a costly aircraft had to be lost to bring this subject to light. Here's how it went.

Two A-7Ds were scheduled for a tactical strike/escort mission with refueling en route. Aircraft fuel transfer was normal from takeoff until after the inflight refueling. Forty minutes after coming off the tanker, the pilot made his first fuel "ops" check, noting 9800 pounds of fuel remaining. The pilot did not confirm position of "main" and "transfer" needles at time of "ops" check. By checking these needles, the pilot would have known that a fuel transfer problem existed, but he made his fuel checks by noting the totalizer readout only and thus denied himself vital information. Bingo fuel was called at 4900 pounds and approximately one to two minutes after the bingo call, the master caution and fuel low lights illuminated (just like the book says). Fuel indicator readings were: "T" needle — zero, "M" needle — 1000 pounds, totalizer — 4900 pounds. Although the totalizer read 4900 pounds as it was supposed to, the pilot only had 1000 pounds of gas available in the main tanks and was unaware of the 3900 pounds of fuel in the externals. It was at this time that the flight headed for nearest recovery base. Both lead pilot and pilot involved were uncertain as to what was happening and believed the problem to be a fuel indicator malfunction. The problem was actually fuel in the external tanks not transferring and could have been corrected by following procedures outlined in Section III of the Dash One. In an attempt to correct the situation, the pilot placed the alternate feed handle in the alternate feed position, hoping to obtain additional fuel. Approximately one minute later, with "M" needle reading 900 pounds, the wing transfer switch was placed in emergency. Simultaneously, both boost pump lights illuminated. The wing transfer switch was returned to normal, probably saving the engine from an immediate flameout. The pilot then noticed that the totalizer began a slow increase from 4700 pounds to 5800 pounds, where it remained. This rise on the totalizer added to the pilot's confusion and further belief that the indicator was malfunctioning. No other emergency

procedures were accomplished. No check of external tank fuel was conducted. The sump low light then illuminated with 350 pounds fuel remaining on the "M" needle (just like the book says). A descent was started for a recovery field and shortly thereafter both boost pump lights illuminated and the engine flamed out. A continuous



1. While in flight with the fuel tank quantity monitoring switch in "wing" position and fuel in the external tanks, the "M" and "T" needles would be in these approximate positions. Under normal feed conditions the "T" needle would not move until the externals were empty.



2. In the same situation (fuel in the externals), if the "T" needle begins to move (decrease in quantity) it is an indication that the externals are not feeding. A quick check with the fuel tank quantity monitoring switch will confirm your suspicions.

NER



airstart was attempted without success and the pilot ejected safely at 5500 feet.

Investigation of this accident determined that both external fuel tanks were full of JP-4, totaling 3900 pounds. The pilot could have saved this aircraft if he had recognized that the external tanks were not feeding, which could have been determined by checking the external fuel tanks with the fuel tank quantity switch and fuel gauge.

AERO CLUB: AFTER LANDING IN A CROSSWIND

Capt Al Mosher

Several months ago I discussed crosswind landing techniques in light aircraft. The two mentioned were "wing low" and "crab." Both of these resulted in the aircraft contacting the runway under some semblance of control and at that point I discontinued the discussion. Since it takes a little more maneuvering before you can crawl out of the airplane, let's continue from that point.

Most of our aero club aircraft have no selective ground steering. Either you have it or you don't and our tricycle type aircraft usually have it. The rudder pedals determine the nosewheel position which, under normal conditions, determines the aircraft ground track. At nosewheel touchdown, the nosewheel, by use of the rudder pedals, must be aligned with the runway. If they aren't, the aircraft will go some direction other than desired and that results in big trouble.

The effectiveness of the nosewheel vs the rudder as a steering device is dependent on two things. First, the speed of the aircraft and, secondly, the weight on the wheel (assume a dry paved runway and a good, properly inflated tire). Thus, the effectiveness of nosewheel as a steering device is not an immediate thing, but rather, takes place in the several seconds that it takes to lower the full weight onto the nosewheel.

In the wing low method of landing in a crosswind, the rudder will not be aligned with the desired ground track at touchdown, so as the main gear touches down, the rudders must be moved to align the nosewheel with the runway. For example, in a left crosswind, the left wing would be held down (into the wind) and right rudder used to hold track to the touchdown point. Controls will be used as necessary during the roundout. However, as the nosegear touches, the rudder must be returned to neutral (assuming no skid was entered during initial touchdown).

In the crab method, if used in its pure form, the aircraft must be aligned with the runway during the roundout, but again as the nosewheel touches down, the rudder pedals must be returned to neutral. Again, using the example of a left crosswind, the aircraft would be flying final with the aircraft pointed somewhere to the left of the runway. During the roundout, right rudder would be used to align the aircraft with the runway. After touchdown, the rudder must be neutralized prior to the nosewheel becoming a fully effective steering device.

An incorrectly positioned nosewheel, upon nosewheel touchdown, could ruin your whole day. It might even ruin your whole life. A little hangar flying may be helpful and could change the course of your history.

emergency situation training

F-4E

by Captain Charles J. Licari, Flying Safety Officer
27 Tactical Fighter Squadron, MacDill AFB, FL

SITUATION: You are leading a flight of two F-4Es in day VMC conditions, approaching weather, when you simultaneously lose both generators.

IMMEDIATE ACTION: Remain VFR, change leads, and relay your problem (HEFOE) to the new lead.

ANALYSIS:

ELECTRICAL: Indications of double generator failure are:

Warning lights: Only the DC bus light will be illuminated. You will not have either generator out light or bus tie light (F-4E block 35+ and aircraft after TO 1F4-789).

ADI: Off flag visible.

Loss of pressurization: (Gets very quiet).

Battery: On battery power you will have battery bus and, if the battery relay is closed (pre-flight item), the essential 28V DC bus. The F-4E is equipped with a nickel cadmium battery rated at 24 volts 11 amp hr. It takes approximately 18 volts to close the battery relay. If you lose the battery relay, you lose essential 28 volt bus. Guesstimates on battery life are from 5 — 30 minutes depending on charge, etc., with relay closed. Operative equipment is listed in the checklist under emergency power distribution chart. The chart does not indicate which is essential 28V and which is battery bus. Basically, with the battery bus alone, you have eject light, ignition, (boost pumps on Block 41+), and white flood lights.

HYDRAULIC:

Flight Controls: Normal, except rudder feel force reverts from 11.5 to 2.6 pounds per degree of rudder deflection.

Gauges: Unreliable. They will fail at the last pressure reading.

Utility: Check for utility press by actuating the rudder.

Gear: Electrically sequenced. You have to blow down. If already down, blow down anyway for positive pressure on down side.

Flaps: If down, they will go to low drag trail position. Can only be blown down, but do not blow down since you'll probably rupture utility hydraulic system.

Speed Brake: Will retract.

Aux Air Doors: Will close and stay closed. Expect auto acceleration after landing.

Hook: Can't raise. Can lower. Plan approach and engagement.

Variable Inlet Ramps/Bellmouth: Last selected position.

Nozzles: Mechanical function good (if oil press good) (AB possible with jam acceleration, torch ignition).

PNEUMATICS: Utility pump will no longer charge. Remember the Dash One note about leaks in the pneumatic system.

FUEL TRANSFER: You will continue to have fuel transfer for all external and internal fuel until you lose essential 28V DC bus (battery relay — open). After that fuselage fuel only. Hydraulic transfer pumps are actuated at time of generator failure. Feed tank check and fuel low warning light are only indications of remaining fuel.

JETTISONS: Have jettison capability until essential 28V DC bus fails.

ENGINE INSTRUMENTS: Will probably fail at last indication.

Fuel Flow: Fail.

RPM: OK — Self-generating.

EGT: You'll have until battery relay opens.

Oil Pressure: Fail.

Hyd Pressure: Fail.

Pneumatic: Fail.

Warning/Indicator Lights: None except DC bus.

FLIGHT INSTRUMENTS:

Airspeed: Good.

Altimeter: Must correct for SPC inop.

VVI: Good.

AOA (tone): Good until essential 28V DC fails.

Navigational Capability: Fails.

Standby Altitude Indicator: Good ($\pm 5^{\circ}$) for 9 minutes after failure. You have to fly using standby attitude indicator and standby mag compass.

LANDING:

No flap, approach and barrier engagement. (If no barrier — remember no anti-skid protection or nose gear steering.) Get VFR as soon as possible. Aside from WX being vertigo inducing — you have lost all anti-ice, de-icing capability. At least stay clear of the freezing level.

CONSIDERATION:

Land as soon as possible. You might have as much as 30 minutes on battery power or as little as 5 minutes.

Jettison ordnance but retain wing tanks; you may have to land on them if gear fails to extend. (You need essential 28V DC power to jettison).

While you still have intercom, review emergency procedures and ejection signals with other crewmember.

If all electrical fails you will have RPM, airspeed, VVI, mag compass, altimeter, hydraulic fuel transfer, emergency gear, and hook extension.

ADDITIONAL COMMENTS:

Can't dump fuel.

Get gear down indications before electrical power is lost, then drop hook if gear position is compatible.

Original generator failure(s) MIGHT have been due to loss of engine oil. Engine(s) failure is a possibility and your oil pressure gauges are no longer providing info.

TAC TALLY

AIRCRAFT ACCIDENTS

UNITS

MAJOR ACCIDENT RATE COMPARISON

	TAC		ANG		AFRes	
	1973	1972	1973	1972	1973	1972
JAN	5.0	0	8.5	0	14.9	0
FEB	5.2	1.6	8.6	0	6.7	0
MAR	4.9	3.0	7.0	16.5	4.8	0
APR						
MAY						
JUN						
JUL						
AUG						
SEP						
OCT						
NOV						
DEC						

	THRU MARCH					THRU MARCH			
	1973		1972			1973		1972	
	ACDTS	RATE	ACDTS	RATE		ACDTS	RATE	ACDTS	RATE
9AF	3	4.4	1	1.6	12AF	3	3.5	0	0
1 TFW	0	0	0	0	27 TFW	0	15.0	0	0
4 TFW	0	0	0	0	35 TFW	0	0	0	0
					49 TFW	0	0	0	0
23 TFW	1	24.4	0	0	58 TFW	0	0	0	0
31 TFW	0	0	0	0	67 TRW	0	0	0	0
33 TFW	0	0	0	0	71 TASG	0	0	0	0
					313 TAW	0	0	0	0
68 TASG	0	0	0	0	314 TAW	0	0	0	0
316 TAW	0	0	0	0	355 TFW	0	0	0	0
317 TAW	0	0	0	0	366 TFW	0	0	0	0
					474 TFW	2	23.6	0	0
354 TFW	2	13.6	1	15.2	463 TAW	0	0	0	0
363 TRW	0	0	0	0	23 TFW	0	0	0	0

TAC SPECIAL UNITS

1 SOW	1	11.3	0	0	4410 SOTG	0	0	2	25.3
2 ADG	0	0	0	0	4485 TS	0	0	0	0
57 FWW	1	19.2	0	0	4500 ABW	0	0	0	0
ADS	1		0	0	OTHER	0	0	0	0

TAC		
MAR 73	Thru March	
	1973	1972

4	13	6
3	9	3
4	8	7
4	9	4

3	8	3
2	4	1
66.7%	50%	33.3%

SUMMARY

TOTAL ACCIDENTS
MAJOR
AIRCREW FATALITIES
AIRCRAFT DESTROYED

TOTAL EJECTIONS
SUCCESSFUL EJECTIONS
PERCENT SUCCESSFUL

ANG		
MAR 73	Thru March	
	1973	1972

1	5	5
1	5	4
0	1	1
0	3	3

0	3	2
0	2	2
0	66.7%	100%

