

TAC ATTACK

TAC Attack

OCTOBER 1972



THE HEAVYWEIGHT CHAMP...Pg 16

for efficient tactical air power

TAC ATTACK

OCTOBER 1972

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Tactical Air Command

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F-105G,
The Heavyweight
Champ...Page 16



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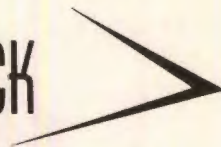
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TACRP 127-1

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

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Angle of ATTACK



could you have prevented that accident?



When you heard the news that a member of your outfit bought it in an aircraft accident, or rolled himself up in his Detroit special, did the thought, "I could have prevented that accident," suddenly burst to the surface?

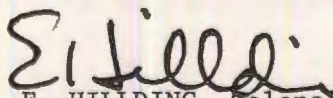
It's a gut feeling that leaves you stunned for a moment until all the excuses begin flooding into your mind. "No one would listen," you tell yourself. "What could I do about it?" "Too much paperwork," another voice says. "I thought someone else would take care of it." Then finally, "I recognized the problem but didn't have enough time to do anything about it."

The phony excuses help for a while, but in time they disappear with the return of the nagging thought, "I could have prevented that accident." You know that if you had worked a little harder, or had brought it to the attention of the proper people, or had been more forceful and convincing in your arguments, the accident would not have happened.

If this hasn't happened to you, great; don't let it. Are you carrying any accidents around in your back pocket right now? Can you say that you know of no correctable hazard in your job, no matter what it is? Can you tell me that there is no accident potential in your outfit? I hope so!

If you can't, what are you going to do about it? Nothing, if you are like some people. But if you feel a responsibility to others and to yourself, you'll start by getting bent out of shape; then you'll do something. Make that something count. If you know of a hazard, report it. Start it on its way to elimination. If you see an unhealthy situation developing, tell somebody about it, and then dog it until it no longer exists.

It's much easier than making excuses!


E. HILLDING, Colonel, USAF
Chief of Safety

FIRE



in flight

by W. E. Cumbie
Military Editor,
APPROACH Magazine

Takeoff in the C-130 Hercules was normal, and five minutes later the aircraft was climbing through 7500 feet. The after-takeoff checklist was complete and the AC had just switched seats with 2P (copilot) when a loud "thump" was heard. The aircraft shuddered.

The 2P, now in the left seat, exclaimed over the ICS (intercom), "That felt like a birdstrike!" The AC looked out the right window and noticed a reflection of flames on the No. 4 engine nacelle. He thought the No. 3 engine was on fire. He turned to execute engine fire shutdown procedures but noticed there were no fire warning indications for any engine.

As he looked again at the No. 4 engine, the 2P notified him that the left wingtip was on fire. The flight engineer isolated the left wing bleed air system. The AC shut down the No. 1 engine, using engine fire in flight shutdown procedures. He still had no indication of an engine fire but secured it as a precautionary measure in the event it had contributed to the fire. At the suggestion of the 2P, power was reduced on all engines to flight idle.

The 2P put the aircraft in a nose down attitude in an attempt to blow out the fire by increasing airspeed. The AC notified approach control of the emergency and got on the controls with the 2P, who was finding the aircraft increasingly difficult to control. Meanwhile, the wing fire continued to burn brightly.

Passing 4000 feet, the 2P sighted a farmer's field off to the left. This was fortunate because control of the aircraft had become marginal. In spite of both pilots' efforts to maintain a constant heading, the aircraft continued a slight turn to the left.

At about 1000 feet, the pilots started slowing the Hercules. At 400 feet, airspeed was down to 160 knots and dropping. Since there was a row of tall trees bordering the landing field, the 2P added a little power and raised

the nose slightly. The aircraft passed over the trees at 100 feet with 135-150 knots airspeed.

Just prior to touchdown, the pilots flared the aircraft slightly and "greased" it onto the field. Impact was relatively soft, and the C-130 came to a stop after sliding about 650 feet.

The cockpit was secured, and the crew rapidly evacuated the aircraft. There were no injuries. The aircraft burned for about 30 minutes before the fire was extinguished by local volunteer firemen.

It was later determined that the aircraft would have soon become uncontrollable. The pilots did an outstanding job of assessing the situation and expeditiously getting the aircraft down without injury to its 16 occupants.

The most probable cause of the fire was a short in the cannon plug for the No. 1 fuel quantity gauge. This allowed 115 volts AC current to be routed to the internal fuel tank wiring. An arc or spark apparently jumped from the wiring to ground at some point in the tank.

Such an arc or spark would not cause an explosion or fire if submerged in fuel. However, it is suspected that sufficient fuel had been burned to leave space above the fuel, which contained a suitable fuel-air mixture for ignition by the arc.

Investigation revealed an uncorrected aircraft discrepancy of long standing — a malfunctioning fuel tank indicator which was first written up more than 2 months before the accident. This discrepancy was not considered cause for grounding the aircraft. The discrepancy read, "No. 1 main fuel tank reads off scale at all times." Corrective action read, "Repaired coax cable, checks good," and "Repaired cannon plug, checked good."

Unfortunately, this discrepancy was not fully corrected by such action. The same or related discrepancy

FIRE IN FLIGHT

was written up five more times during the next 2 weeks. In each case, corrective action was taken, but the problem was not eliminated.

The discrepancy was aggravating to be sure, but was not considered to be grounding. No one realized that it had the potential to cause an accident. Therefore, in the face of heavy operational commitments and limited time within which to perform corrective maintenance, the squadron continued to live with this "minor" discrepancy.

Maintenance personnel verbally advised the flight engineer on the next flight to leave the fuel quantity indicator circuit breaker out to "prevent the indicator from continuing to run." This advice was passed on verbally from one engineer to the next — for a time. This system of communication eventually broke down (about 50 days later). Sometime prior to the last flight, the circuit breaker was pushed in. This allowed 115 volts AC to be introduced into the fuel tank wiring, which eventually led to the wing fire.

There are times when it is necessary to operate aircraft with minor discrepancies. Nevertheless, this accident suggests several precautions:

(1) Beware of repeat discrepancies on a system or piece of equipment. Each discrepancy in itself may indeed appear to be minor, but taken altogether, could indicate major trouble. Don't live indefinitely with aircraft discrepancies, even the "minor" ones.

(2) Ensure that both the discrepancy and associated maintenance actions are properly documented. It's the only way to ensure that all concerned get the word. It has

been proven time and again that the verbal system will break down sooner or later, and usually sooner.

(3) Recognize the value of standard publications. when a lesson is learned through costly experience, as in this case, ensure that it is documented in appropriate publications. Secondly, USE these publications on each appropriate occasion. Only in this way will such lessons be preserved for future benefit. →

Courtesy Navy APPROACH



TACTICAL AIR COMMAND



Maintenance Man Safety Award

Technical Sergeant Robert V. Brewer, 4500 Consolidated Aircraft Maintenance Squadron, Langley Air Force Base, Virginia, has been selected to receive the TAC Maintenance Man Safety Award for August 1972. Sergeant Brewer will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



TSGT BREWER

TACTICAL AIR COMMAND



Crew Chief Safety Award

Staff Sergeant Montfred M. Liknes, 58 Organizational Maintenance Squadron, Luke Air Force Base, Arizona, has been selected to receive the TAC Crew Chief Safety Award for August 1972. Sergeant Liknes will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



SSGT LIKNES

TACTICAL AIR COMMAND



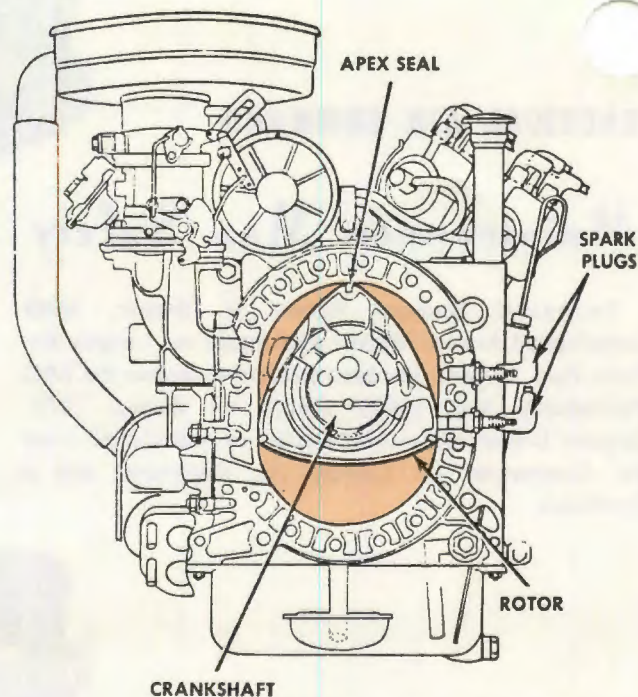
Ground Safety Man of the Month

Sergeant Jerry W. Ballou, 313 Field Maintenance Squadron, Forbes Air Force Base, Kansas, has been selected to receive the TAC Ground Safety Man of the Month Award for August 1972. Sergeant Ballou will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



SGT BALLOU

IS THE WANKEL THE AUTO ENGINE OF THE FUTURE?



Revolution doesn't come often in the auto industry. The last one happened nearly 40 years ago, when the automatic transmission appeared.

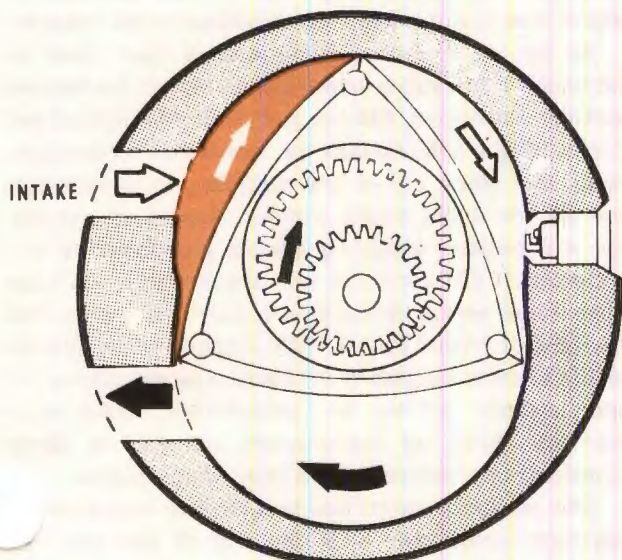
In all the years since the Duryeas developed America's first successful gasoline-engine motor vehicle in 1893, the passenger-car industry has never experienced an engine innovation comparable to the switch to diesel for trucks and trains or to jets for aircraft.

Now the automobile seems face to face with the first revolutionary change ever to overtake its basic power plant, a change from pistons that chunk up and down or back and forth to an engine that just whirs as rotors spin on a shaft.

The new engine, known as the Wankel or the rotary combustion, solves some of the most serious problems in existing auto engines — stop-start motions of many parts with the attendant vibration and noise and a relatively much lower limit on how fast the engine can turn over — without sacrificing economy, power or durability. When perfected, it may well outlast today's reciprocating engines, put enormously more power in a smaller package, give more miles per gallon and run on the cheapest grades of fuel, as low as 70 octane if such a fuel were available. And even if, by some engineers' standards, the rotary engine is not yet perfected for street use, it is already selling in quantity and seems to be performing well. Most of the unanswered questions come from a lack of numbers — not enough engines driven far enough yet to support a final verdict.

WANKEL'S INGENIOUS MACHINE

Assuming you don't own a Japanese Mazda RX-2 or a German NSU Ro-80, the engine of the car you drive today contains four, six or eight pistons that move up and down or back and forth inside cylinders. The pistons connect to a crankshaft, where their push-pull movement is converted into rotation in the same way a bicyclist's up-down leg movement becomes rotary power at the sprocket wheel.



(1)

INTAKE

The pistons are pushed by the pressure of expanding gases as the gasoline-air mixture burns inside the combustion chambers. To do its share of the work, each piston must go through a four-stroke cycle, each stroke setting off reciprocal actions in the valve train, a long series of parts that open and shut an intake and exhaust valve for each cylinder. With six or eight cylinders and 12 or 16 valves, there is lots of action every second. That means lots of noise and plenty of vibration.

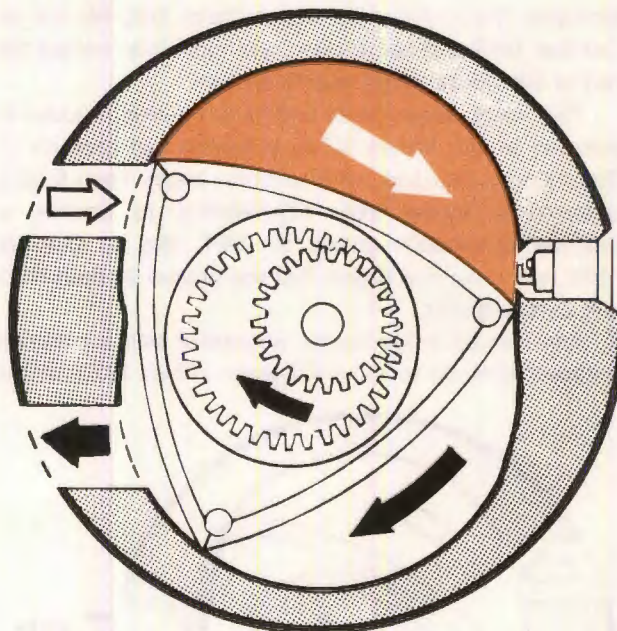
The Wankel has intake and exhaust but doesn't need valves, and it has less than half as many parts as a six-cylinder piston engine. Moreover, the faster it runs, the better it seems to work — smoother, quieter, more powerful.

The accompanying diagrams will help you envision how the Wankel works. A rotor shaped like a slightly fat triangle revolves within a housing that's in the shape of a two-lobed epitrochoid, the outline of an overweight figure 8. Instead of turning in a regular circle, however, the rotor revolves eccentrically on a shaft so that the three apexes of its triangle follow the outline of the epitrochoid. As the

rotor revolves, it creates spaces between itself and its housing that continually enlarge and diminish.

An enlarging area sucks in the fuel charge through an intake port (1). Then the space diminishes, compressing the charge (2) to prepare it for ignition from the spark plug (3). Combustion pushes the rotor on around its eccentric circle, and the diminishing space forces the exhaust through a port just uncovered by the rotor (4). As any side of the triangle is performing one of the intake, compression, combustion or exhaust functions, the other two sides are performing the other functions, so that the four-part process is continuous and smooth.

The Wankel needs no valves because, as the rotor turns, its seals merely uncover ports that supply intake and provide for exhaust. Thus there are no pop-open and slap-shut actions with their accompanying noise and vibration. All movement is perfectly balanced rotational motion — as in an electric motor — and the rotary engine can be operated at speeds that would cause a piston engine to throw itself to pieces. Its higher rpm's can get more horsepower per pound or cubic foot of engine than a conventional engine.



(2)

COMPRESSION

The inventor of this ingenious mechanism is a German engineer, Dr. Felix Wankel, a stubborn and dedicated man who has been experimenting for almost half a century. Long after his theories had been proved sound, development of his idea was hindered by a few simple-sounding mechanical and metallurgical problems that seemed insurmountable until less than three years ago.

Beginning in the 1920's, Dr. Wankel worked with his

Is the Wankel the auto engine of the future?

idea until after World War II when his laboratory was taken over by the occupation forces. By 1951 he was again set up with a small home workshop when a motorcycle maker, NSU Motor Works of Germany, which was considering going into the manufacture of four-wheel vehicles, took an interest in his work and an agreement was signed for joint research and development.

In 1957 a model was completed in which both rotor and housing rotated — impractical to manufacture and install. But within a year the KKM type, having a stationary housing with only the rotor in motion, was completed. By July 1959 endurance tests were under way at NSU on the KKM 250, the true prototype of today's rotary engine. It was confirmed as practical and introduced to the public.

The public took little notice. But Curtiss-Wright, the American aircraft engine manufacturer, acquired an exclusive North American license from NSU-Wankel in October 1958 and had begun experimentation before the rest of the industry paid much attention.

The most popular rotary engine on the market today is installed in the Mazda RZ-2, a subcompact product of Toyo Kogyo Co., Ltd., of Hiroshima, Japan. Toyo Kogyo obtained a license from NSU-Wankel to develop a practical automobile engine in 1961, and by October 1963 had a working engine that was praised by both NSU and Curtiss-Wright.

Addition of a four-barrel carburetor and continuing improvements led to the RX-2 series in May 1970, with a

two-rotor engine of 573 cubic-centimeter displacement capacity in each chamber. Exports of earlier series Australia and Thailand had begun in April 1969, exports to the U.S. began in July 1970. By October 1970 Toyo Kogyo had produced a total to 82,000 rotary-engine cars.

ENGINEERING A BIG CHANGE

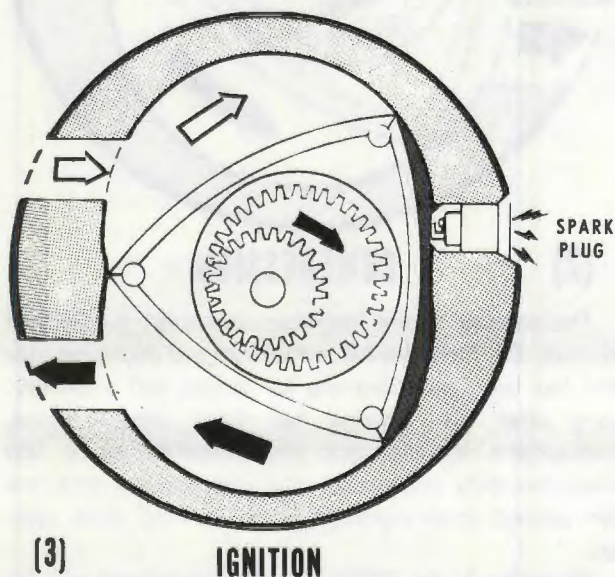
In the meantime Curtiss-Wright was developing its version of the rotary for snowmobiles and other nonautomobile uses, and working with NSU to prepare an engine that would interest the American motor industry.

So far, all American manufacturers have taken an extremely conservative view. General Motors has become partially committed. GM has paid Audi NSU-Wankel and Curtiss-Wright \$15,000,000 for worldwide nonexclusive rights that allow GM or any subsidiary to manufacture and sell the rotary engine without royalties, in any size, for any purpose excepting aircraft propulsion, to any customer. If GM continues with the rotary, it will make three more annual \$10,000,000 payments and a final payment of \$5,000,000 in 1975. Approximately 6/11ths of GM's license fee goes to the German patent holders and approximately 5/11ths to Curtiss-Wright, which holds exclusive rights for manufacture and sale in North America. Ford has negotiated a more limited license.

GM can terminate its license agreement whenever payment comes due — at the end of this year, for example. Nevertheless, it is a fact that rotary-engine research is going full blast at the GM Technical Center at Warren, Michigan, with at least several hundred technical people actively engaged in the project.

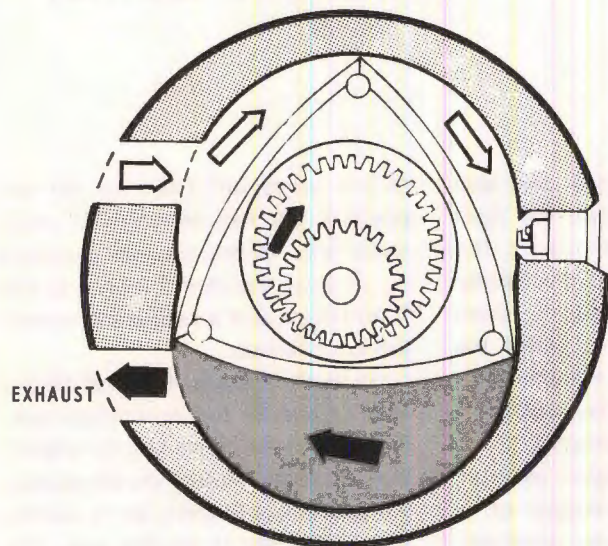
The engineering problems involved in developing such a radically different engine have been formidable. A decade ago the best design Dr. Wankel could come up with put out prodigious amounts of smoke, had high fuel and oil consumption, lacked durability and didn't lend itself to economical mass production. Even so, Toyo Kogyo went ahead with its plans and NSU later installed the engines in its Spyder sports car and its Ro-80 sedan.

A slight change by Curtiss-Wright in intake porting and spark plug positioning plus better seals brought improved fuel and oil economy. But another sealing problem remained, now solved to Mazda's satisfaction but continuing to worry GM. At each of the three apexes on the triangular rotor there must be a sealing device that presses against the mirror-finished inside of the housing. Each seal, a quarter-inch bar as long as the rotor is thick, is spring-loaded to take up any slack caused by heat expansion, imperfect machining and wear. These apex seals are comparable to the compression rings on a piston and, like the rings, are subject to wear from heat



combustion pressure.

Japanese engineers found that their early seals tended to "chatter" as they revolved with the rotor, wearing wavelike patterns on the inside surface of the housing. Redesign solved this problem but the biggest problem, seal wear, remained.



(4)

EXHAUST

Seals in early NSU engines were made of carbon. After an equivalent of 15,000 to 20,000 miles, resealing was necessary, requiring complete engine tear-down, about a day's labor. Toyo Kogyo now used a carbon-aluminum alloy for its Mazda apex seals and claims road mileage of 60,000 to 100,000. (Mazda's warranty is 12,000 miles or 12 months, same as that of American manufacturers.) NSU claims a longevity similar to Mazda's for its present-day titanium-carbide alloy.

These claims don't impress General Motors. Using a very expensive seal material, GM has reportedly achieved mileages of up to 500,000 but is looking for a cheaper material with a life at least comparable to the piston engine, which is generally considered to be 100,000 to 125,000 miles. But as a GM official told CHANGING TIMES: "It's one thing to check an engine on a test stand in a laboratory. It's another — and more valuable — thing to run engines in cars on test tracks and proving grounds. But it's a completely different thing to turn out 20,000 engines a day and hand them over to the public to use — and perhaps abuse — on all kinds of streets and highways, in every climatic condition, and in every conceivable stop-and-go, high-speed and in-between situation."

If the sealing problem can be successfully solved, a recent GM technical paper observed, "this effort will produce a very attractive power plant for passenger car

The cost of tooling up for the rotary's complicated machining is immense. Another GM paper has pointed out, however, that the engine permits a wide range of engine displacements to be built from a common tool investment by varying the width of a single rotor chamber or by building one, two or even three chamber engines. In other words, instead of having a Cadillac engine, several Chevrolet engines and various engines for the other GM products, GM could have one or several plants that turn out a line of GM engines of many sizes to fit the many body weights and styles offered by the various divisions, with tooling cost spread across all the automotive subsidiaries.

GM, obviously concerned about what might happen if several hundred thousand potential car buyers decide to "wait another year" for a rotary, is playing it as cool as possible under the circumstances. Its official public attitude is: "The rotary engine has definite inherent advantages but many questions remain. We have not yet established whether the engine can perform up to our standards of customer satisfaction, whether it can meet the durability requirements of the Clean Air Act, or how much it will cost to build."

Speculation continues, nevertheless. GM is not in the habit of buying just a few of anything, and when it invites large bids for large items and services — castings and machinings, for example — the word leaks out and gives new currency to the conviction that it is on the verge of a revolutionary announcement.

Trade gossip has it that GM will introduce a 185-horsepower rotary next year on a 1974 Vega GT and that a year later the GM rotary will be in its own car, a front-wheel drive, torque converter model larger than the Vega.

GM flatly refuses to confirm any of this. The fact is, says GM, it does not know what it is going to do about the rotary, let alone when.

Ford and Chrysler tell the same story. Admitting that they are busy with research and development, they nonetheless say that they are not yet close to a decision. American Motors feels free to adopt a wait-and-see attitude. If a good rotary is developed by somebody, American can buy it for current production, see how well it sells and develop their own later if they wish.

So the best word for now is this: There's undoubtedly a U.S.-built Wankel in your future, but don't hold your breath. In the meantime, if you're curious, you can drive a Mazda.

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TAC TIPS

. . . interest items,

GOT GAS ?

Two mishaps which bear similar characteristics have occurred in the past few months. The first concerns an incident in a C-47.

While turning out of traffic after a touch and go on runway 32, the left engine on the Gooney Bird quit running. The IP shut it down and declared an emergency while turning onto base leg for runway 18. During the turn, the right engine began to overspeed. Landing was assured so the IP shut down the right engine and deadsticked the powerless Goon to a safe landing.

The cause, fuel starvation! The IP did not monitor the fuel and allowed both engines to use fuel from the same tank, resulting in fuel starvation of both engines.

The next mishap occurred in an O-2. The pilot had filed for a two and a half hour cross-country and was on an approach at the first stopover point. While descending to the downwind leg, the RPM on the rear prop indicated an overspeed condition so the jock shut it down and turned onto downwind. He thought he was at 1000 feet but his actual altitude was closer to 500 feet. He noticed the airspeed dropping and advanced power on the front engine but got no response. He was too low and too far out to make the runway so he selected a grassy area, lowered the gear, and crash landed.

During the landing, the right wing struck a tree just prior to touchdown.

The nose gear impacted and was immediately sheared, then the right main gear hit and was ripped off. The airplane skidded 32 feet and finally came to a stop. Fortunately, there was no fire and rescuers pulled the unconscious pilot from the wreckage. The pilot made it (180 days lost time) but the airframe was destroyed.

Cause? The rear engine gave an overspeed indication because of a malfunctioning tachometer generator cable. The front engine quit because

of fuel starvation! The pilot did not position the fuel selectors to main tanks prior to descent, which caused air to enter the main fuel line to the front engine and subsequently caused the loss of power.

In both mishaps the final results were caused by fuel mismanagement. Fuel was in the tanks but the engines were deprived because the valves were not positioned properly at the correct time. Let's say it another way. The checklists weren't followed.



for TAC aircrewmembers

MiG ACE

Captain Richard S. (Steve) Ritchie blasted his fifth enemy MiG-21 out of the North Vietnamese sky to become the U.S. Air Force's first Vietnam ace, and the first U.S. crewman to destroy five MiG-21 aircraft in Southeast Asia. The record breaking MiG kill followed a spectacular air-to-air battle as Ritchie and his backseater, Captain Charles D. DeBellevue, maneuvered for position approximately 30 miles west of Hanoi. The kill was DeBellevue's fourth, and places him in competition to become an ace. Ritchie and DeBellevue were flying MiG combat air patrol when they received information on "Bandits" threatening a strike force of F-4 Phantoms. "After Chuck picked them up on radar, we made a hard turn to meet them head on," said Captain Ritchie. "The bandits were very high, approximately 4000 feet above us as we climbed. I turned as hard as I could, and I squeezed off two missiles." Evading the missiles, the MiG made a slight turn and Captain Ritchie fired two more air-to-air missiles. "He was pretty far away," continued Captain Ritchie, "and it took quite a while for the missile to catch him. Up there, a minute seems like forever. The MiG went into a thin overcast and when he came out, one missile went by his left. He must have seen it because he immediately broke to the right and that's when the last missile got him. All I saw was a big fireball."

Colonel Scott G. Smith, 432nd TRW Commander, said he "Couldn't be more elated for the Wing, the Air Force, and for Captain Ritchie. To kill a MiG-21 is quite a difficult feat. But to bring down five of the Blue Bandits is an unparalleled achievement."

Ritchie, of Reidsville, N. C., was flying his 338th combat mission when he shot down his fifth MiG. The MiG-ace commented, "It was an entirely different situation, a much higher altitude than any of my other MiG-kills and at a much greater range. I don't think the MiG pilot ever really saw us. All he saw was those missiles coming at him and that's what helped us finally get him. "It was a tremendous effort by the entire flight. I couldn't see him up there as a single ship and have any success in



downing MiGs. It's a team effort — Chuck and I and our wingmen working as a team. And the ground crews. There's no way we could have done it without them. The plane I was flying also has five MiG kills. In fact, I got my first and fifth MiG in it. Its crew chief, Sergeant Reggie Taylor, has really done a wonderful job keeping the airplane ready. He was the first one up the ladder when I landed and you just couldn't believe how happy he was... I think he was more excited than I."

The excitement is just as strong in TAC and now we join with the rest of the Air Force in congratulating our first MiG ace of the Vietnam war, Captain Richard S. Ritchie. Good hunting!

EXTRACTED FROM ALMAJCOM 1433/72

HE LEARNED HIS LESSON

by Captain W. C. White
18 TATS, Dyess AFB, Texas



Several months ago on a RON stopover mission, we were engaged in IF and R flight, just chugging along minding our own business, when the GCA man said, "Traffic 9 o'clock 5 miles," to which I replied, "No joy, we're in the soup," or something equally as suave and debonair. A couple of seconds later he said, "Traffic now 7 o'clock 3 miles passing behind you;" then I said, "Outstanding," since I knew even a C-7A can out run something that isn't

going the same direction. Final controller came in with some good news, "Traffic now paralleling your course closing 6 o'clock, should be VFR." My radio call was beginning to lose some cools as I said, "We're still in the clouds." To ease my student's nerves, some reference was made to the number of C-130s that frequented the skies. We're still quite a way out and at a Caribou's airspeed they could pass under us, touch and go, and almost catch us again. "Traffic now

one mile closing." We were just starting to break out the bottom now, so he should be still a ways below.

Due to my keen eyesight and alertness, I spotted our traffic. I don't remember whether it was the proximity or the intensity of the green light (commonly attached to the right wing of aircraft) that got my attention first, but the second thing that I noticed was the plane attached to it was in a hard left turn. Using my own words, GCA was informed of the near miss and I was informed that I couldn't use words like that over the air. Quick reference to Jane's "All the World's Aircraft" confirmed this to be indeed a C-130 and another look at 60-16 said no, he was not VFR, and definitely within no-no range of our aerospace vehicle.

The student was completing the checklist while I was getting my facts together for the near miss report. A few small diversions and the attitude that "he learned his lesson" kept the report from ever getting written.

The whole thing was brought back to memory about two weeks later when news that a C-130 and T-37 had midaired under what sounded like identical circumstances at the same base.

It's hard to live with the thought that if I had submitted one form, five people may not have died. Maybe writing this will encourage others to submit the proper forms at the proper time.

TACTICAL AIR COMMAND



Maintenance Man Safety Award

Technical Sergeant Donald P. Lindquist, 35 Avionics Maintenance Squadron, George Air Force Base, California, has been selected to receive the TAC Maintenance Man Safety Award for July 1972. Sergeant Lindquist will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



TSGT LINDQUIST

TACTICAL AIR COMMAND



Crew Chief Safety Award

Sergeant Roger W. Hill, 363 Organizational Maintenance Squadron, Shaw Air Force Base, South Carolina, has been selected to receive the TAC Crew Chief Safety Award for July 1972. Sergeant Hill will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



SGT HILL

TACTICAL AIR COMMAND

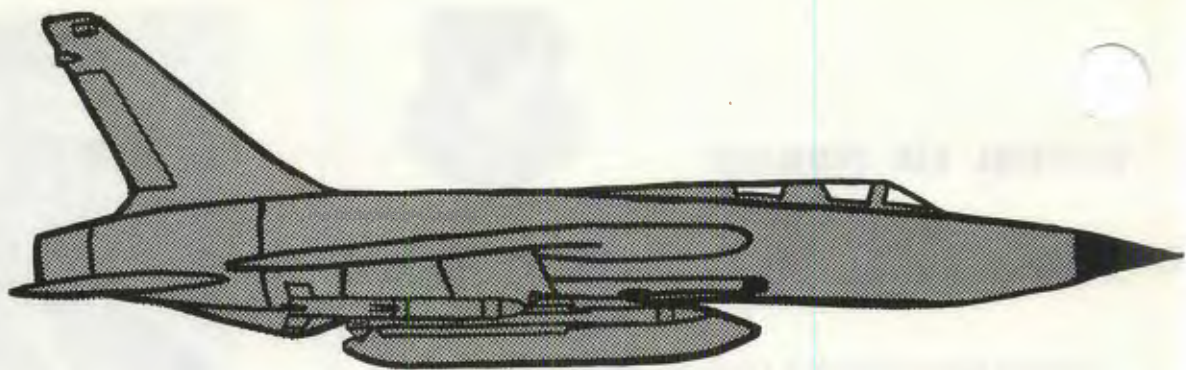


Ground Safety Man of the Month

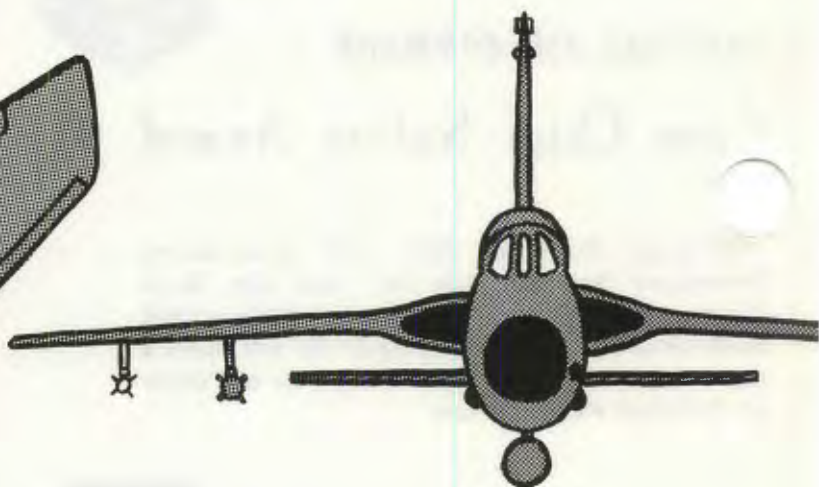
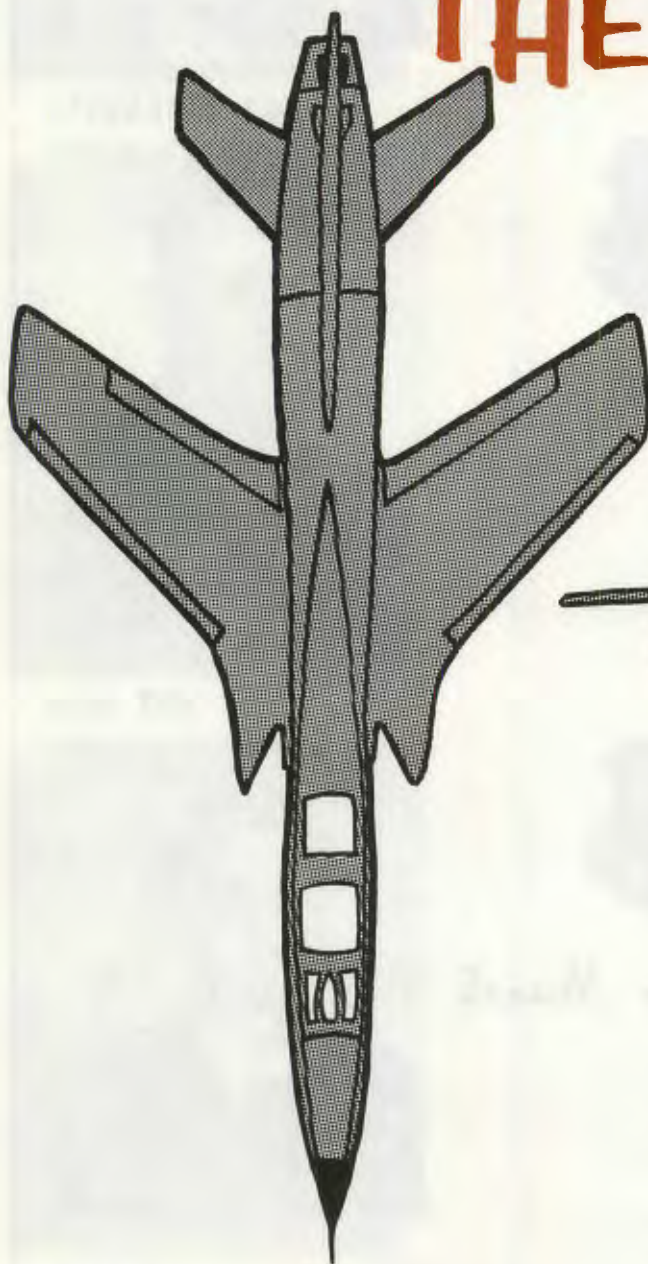
Second Lieutenant Jeffrey E. Fink, 308 Tactical Fighter Squadron, Homestead Air Force Base, Florida, has been selected to receive the TAC Ground Safety Man of the Month Award for July 1972. Lieutenant Fink will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



LT FINK



THE HEAVYWEI



Fighter planes, like the people who fly them, often tend to get heavier as they age (the author is a good example). Each year we add new goodies for the crewmembers to play with between takeoff and landing, and those of us flying the heavyweight champ Thud now see this as a very real challenge to our flying skills.

Although the F-105G Wild Weasel III aircraft is not the heaviest airplane in the world, it probably best illustrates the operational problems created by a constant increase in the capability, and correspondingly, the gross weight of a tactical fighter — the F-105G.

For starters, a short comparison. The "little" F-105D has grown by five feet in length to become a G model. It has gained about 3000 pounds and the basic drag ind

FIGHT CHAMP

by Captain Martin A. Noel, Jr.
561st TFS, Det 1, APO San Francisco 96288

has doubled that of the single seater "sports model" that had to do Mach 2. The two items that have not increased are the ones that Thud pilots wanted: more wingspan and/or more thrust.

It is immediately obvious to a fighter pilot that increased weight and drag means "less turn to the ounce." Weasels (F-105 types) don't spend much time arguing turn radius these days; it has become a rather moot subject for us. The Thud has lost most of its turning ability. But increased weight and drag means other things too; specifically, takeoffs and landings in the F-105G, especially under combat loads, are sporting. Any safety officer will tell you that these particular areas of aviation are not his favorites.

TAKEOFF

Unless you fly the X-15 or a helicopter, you must make a takeoff ground run (that's what the book calls it) in order to fly. At a desert or semi-tropical base with a lofty field elevation in the middle of the summer, and with a full load of ordnance (training or otherwise), you may well wonder, "What am I doing here?" With a 49,000 pound airplane and an engine which produced 26,500 pounds of thrust (in 1960), you have good cause to review the takeoff performance of your Thunderchief.

Without reiterating the procedures in the pilot's dbook, let us talk about what runs through the jock's

mind from brake release until the wheels leave the ground.

As the afterburner lights, we are naturally curious about what is going on inside the engine, so we check the instruments. Because of the operating locations of our present bases, we normally require augmented thrust through water injection. So hit the switch and check the gauges again. Whoops, no water? No, the water injection light is inop but there are other indications to verify injection. The EPR rises slightly, EGT increases, sometimes slowly, often very rapidly. A sensitive Bear (aren't they all?) can usually tell by the feel whether or not the water system has functioned. Of course, if the flame roaring from your tailpipe does not turn from blue to orange, your wingman or the mobile controller can help you determine whether or not the water is working.

As we near the line speed check point, the EGT is usually nearing its peak. When the Bear calls off his airspeed, you can check your tape and then one more glance at the EGT. "What is that?" The EGT warning light is on indicating 660⁰+. A nice thing to know, but we are allowed 660⁰ for one minute and increasing linearly to 675⁰ for 30 seconds with water. Since the EGT normally does not peak until partially through the takeoff roll, and since the entire roll does not exceed one minute, it is unlikely that the tech order limits will be exceeded unless there is a gross fuel control malfunction.

If approaching these limits, we can, after safely airborne, reduce the throttle slightly or dump the water, and write up the system after we land. Dumping the water or pulling the throttle back may appeal to some airplane drivers, but Thud jocks and Bears call it a no-no. Pulling the throttle back is something done BEFORE refusal speed has been reached. Remember the first step in the Engine Fire During Takeoff Procedure: Throttle — maintain TAKEOFF thrust to safe ejection altitude.

Loss of water injection on takeoff roll is something worth thinking about. Computing a no-water line speed and takeoff roll during preflight mission planning will give us a basis for decision making on the runway. If the no-water figures are compatible with the runway (length, temperature, pressure altitude, and slope), we can lose water and continue the takeoff while keeping in mind the reduced acceleration and increased roll. If they are not, however, we know that we can abort as soon as we can confirm that the water did not function.

Loss of water after refusal speed is another situation. At this point we are committed to takeoff, but the total thrust has decreased by 2000 pounds. Losing water about the time you break ground can be very exciting, as can a surging injecting system late in the takeoff roll. The rabbit catcher and overrun will begin to look very big and a real desire to get airborne appears. It is difficult to fight the impulse to pull back on the pole, but fight it, you must.

the heavyweight champ

If you are, without a doubt, about to enter the overrun, jettisoning the inboard stores will reduce aircraft weight by 5500 — 6000 pounds (depending on configuration) and should make the airplane fly. Jettisoning the centerline station is not recommended as it may damage the landing gear, tail hook, or horizontal stabilizer. This means that the "panic button" should not be used, and so you would go for the selective jettison buttons on the right side. However, removing the right hand from the stick at such a critical time of flight could prove challenging, especially at night. Perhaps night takeoffs should be made with some sort of direct lighting on the selective jettison buttons.

"Is this thing a tricycle?" In the 45,000 — 50,000 pound takeoff range, the nosewheel (rotation) speed is 10 knots below takeoff speed. Rotation is defined as the speed at which the nosewheel leaves the runway, so you must start back with the stick sometime prior to that. When, exactly? The Dash One doesn't say, but we all know what happens to a very heavy airplane that flies before it is supposed to. Isn't it exciting enough when things go right? When the nose reaches approximately 10 degrees climb (use the attitude indicator as a guide), hold it there and your challenger for the world land speed record will become airborne.

Since we know that high gross weight and drag make it difficult for a Thud to achieve flying speed, remember that the same two things make it a true ground-lover should the engine falter. For good review, try the sections on engine failure on takeoff and the zoom (YGBSM) maneuver in your trusty handbook.

By the way, did you ever wonder why Thud pilots line up with the tail hanging over the overrun and not 500 feet down the runway?

LANDING

Landing the two seat version of Republic's heavyweight contender is a challenge that most of us accept with a pretty firm determination. If you don't do it right, you can be in for some serious ribbing from "the guys" (not to mention that you become a marked man with the Bears). Two recent landing accidents in which our limited resources were destroyed very pointedly highlight the problems created by constantly landing a Thud which is two tons (or more) over its design gross landing weight. To be blunt, landing gear components are starting to fail.

Because the Dash One does not have a performance section for the G model, we must use F criteria. The design landing gross weight of the F is 33,800 pounds, and

sink rate allowable by the tech order is 540 feet per minute (FPM) at touchdown. The EMERGENCY landing gross weight of the F is 39,550 pounds with an allowable sink rate of only 360 FPM. For any landing weight in excess of 39,000 pounds, we have to subtract 15 FPM for every 1000 pounds over 39,000. All these figures and statistics are fine for the engineers but what do they mean in the plain language of the fighter pilot?

Let us assume that we are returning from a combat mission on which we did not expend any ordnance. We know that the weather at the home base is questionable and that there is only one runway; therefore we can't burn the fuel down very low because we might have to divert to an alternate. Does this scenario sound familiar?

The old Thud is dragging three anti-radiation (ARM) missiles and two drop tanks. The nearest divert base is 150 miles from home, requiring 2500 — 3000 pounds of fuel from missed approach to landing at the alternate. This means that we must be on final at the home base with about 4500 pounds of fuel, or at approximately 41,000 pounds gross weight. This calls for a touchdown sink rate of 330 FPM, which translates to S-M-O-O-T-H. The tech order calls this event a "high gross weight emergency landing;" Thud pilots call it a normal procedure.

How do we transition from gear and flaps down on GCA final to turning off the runway under control in this situation? Performance data tells us that a 41,000 pound Weasel should fly final at 215 knots (K) and touchdown at 182 K. Now I have everyone's attention. What if the flaps won't come down? Add 32 K (15%) to final (247 K) and touchdown (214 K) speeds. Did you know the tire limit speed on the F-105 is 217 K?

Of course no one would attempt a landing under these conditions unless he had to, but it has happened and the likelihood of it happening again is not remote. What this really points up is that we should try to land the F-105G as light as we possibly can until a weight reduction program can be completed. Consideration is being given to such a program presently, and hopefully it will reduce the gross weight of the G model at some future date. Until then, it is up to us to use finesse in flying the US Air Force's Wildest Weasel.

Back to final approach. One of the two accidents we mentioned previously pointed out that landing with fuel in a wing tank (to balance an unexpended ARM) is questionable due to the fire hazard the fuel can create. However, if 1500 pounds or so is not left in the wing tank, 12 percent or 26 K must be added to the approach and landing speeds because the wings are asymmetrically loaded. You can see that we are now back to 241 K final and 208 K touchdown. My purpose here is not to establish policy, but to demonstrate once again that a choice must be made by the pilot. Other things

consider here are crosswinds and/or gusts, as these call for eased approach and landing speeds. If you are one of the kids who always adds 5 K for Momma and each one of the kids, you could be building a corner for yourself in this airplane.

Final approach in the G model is somewhat different than normal. The Good Book calls for a "very flat" approach in the case of heavyweight landings (2.5 to 3.0 degrees is a normal glideslope). As with any airplane, being too flat can get you into trouble; however, a flatter than normal approach is a must in order to land the F-105G without excessive sink. The shortest route to trouble, though, is a steep final followed by an abrupt roundout, hoping to stop the sink with power. Not only is the Weasel heavy, but it is loaded with 80 drag points in this configuration. If you shove the power up at this point, it is already too late.

Thud pilots over the years have discussed whether or not to use speed brakes on landing. Because the G model is heavy, it helps to have the throttle at a high setting on final, and having the speed brakes out will help keep the throttle up, but speed brakes add drag also. Leaving them retracted reduces drag, but the final approach and landing are made at a slightly lower RPM. J-75 acceleration is quite good above 90 percent, but nothing like that of the single spool engines. Whether or not you use speed brakes on final, they should be extended after landing in order to reduce the rollout distance by approximately 4 percent. In transitioning from final approach to landing, be sure to use all the instruments you have (including the one you are sitting on). The tape airspeed can be crosschecked with both standbys and the angle of attack tape (AOA). Remember, the AOA is compensated for gross weight and reads true, regardless of attitude, crosswind, etc.

It is difficult and often inadvisable to make a "dragged-in" approach. Due to the high groundspeed on final, judgment time is reduced and just exactly when to flatten the approach is a point of much discussion. An early "duck" below the glide slope will make a night approach exciting, just as will shoving the nose forward and pulling the throttle to idle over the overrun. These are things to think about on the leisurely trip home after a three or four hour night mission.

Very few Weasel pilots pull the throttle to idle over the overrun; this only confuses the airplane, which believes it is still flying. Rate of sink should be controlled all the way to touchdown by the throttle. Perfect airspeed control will eliminate large power changes at the last minute.

Consistently landing a loaded G model on the first 1000 feet is somewhat akin to a carrier landing in that there is little room for error. It takes a goodly amount of concentration to make each landing the same. Landing fast, especially on short runways (are there any other

kind?), is asking for trouble. But landing too slow will cause a scrape somewhere on the aft section more often than not. Touching down too slow will cause you to exceed the allowable sink rate in many cases.

Now we are on the ground. If the touchdown was below 200 K, we can deploy the drag chute. Remember though, it is the same chute used on the F-105B, an airplane which is several thousand pounds lighter. Pulling the chute at high airspeed creates the most drag. Delaying it for too long will inform you late in the landing roll if it has failed. If you landed fast and the drag bag doesn't open, better have a good story for the ops officer.

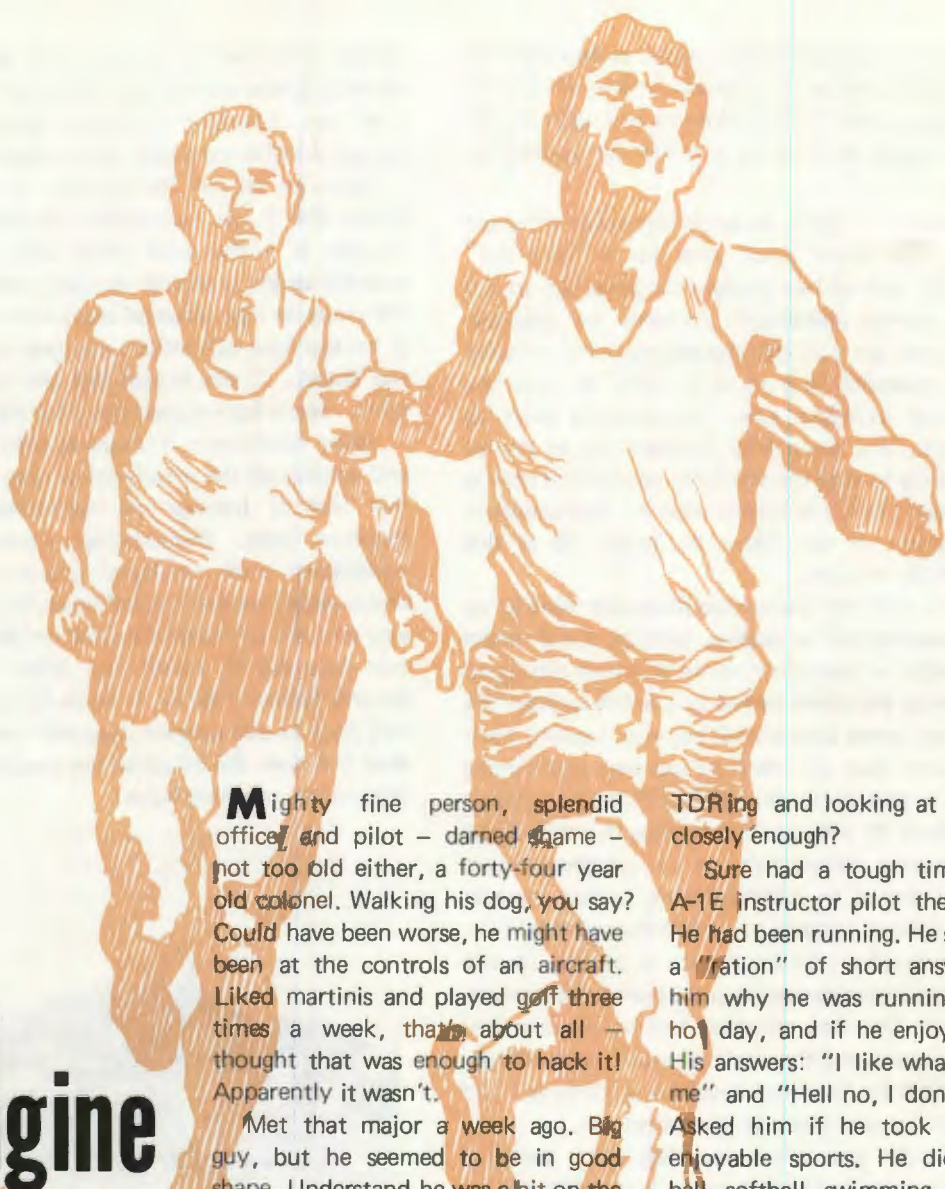
After touchdown it is best to hold the landing attitude and achieve all the aerodynamic drag possible. That extra five feet of fuselage we mentioned earlier can be a bugaboo here. Overrotation either before or after touchdown often results in scraping the bottom speed brake pedal, ventral fin, tail hook, or sabre drain, so when you give the G model the same handful of back stick that you gave the D, watch out. After the nose is on the ground (below 130 K), it helps to bring the stick all the way back to add parasite drag with the slab. Although this does not have the effect of the speed brakes, there can be times when anything helps.



SUMMARY

Although what has been said here is not new, the fact that we are operating the F-105F at high gross weights and near the fringes of its envelope much of the time, calls for serious thought especially in the combat environment. Because our resources are so limited (now nearly irreplaceable), it behooves us to avoid accidents or incidents which will reduce our ability to "Fly and Fight."

Until we can produce a new generation of Wild Weasel aircraft, we, the Thud Drivers, must shoulder the responsibility of doing the job under less than ideal operating conditions. We can do this only through concentration, good judgment, and thorough knowledge of the airplane.



human engine failure

by Colonel William C. Thomas
USAFSOF, Eglin AFB, Florida

Mighty fine person, splendid officer and pilot — darned shame — not too old either, a forty-four year old colonel. Walking his dog, you say? Could have been worse, he might have been at the controls of an aircraft. Liked martinis and played golf three times a week, that's about all — thought that was enough to hack it! Apparently it wasn't.

Met that major a week ago. Big guy, but he seemed to be in good shape. Understand he was a bit on the heavy side, reg-wise, and had trouble handling the Aerobics Journey. Another shame. Wonder if his physical condition had anything to do with the accident? Too bad we can't ask him or any of the other crewmembers. I suppose there is a motor skill involved in landing a tailwheel aircraft — seems as though a guy in good shape should have a better chance of employing that skill. Guess it's tough to hit a tennis ball correctly or land a taildragger properly if you're sluggish, physically. Accident boards almost always ask for TDRs on aircraft engines and sure dig into the wreckage — wonder if we're

TDRing and looking at our aircrews closely enough?

Sure had a tough time with that A-1E instructor pilot the other day. He had been running. He sure gave a "ration" of short answers. Asked him why he was running on such a hot day, and if he enjoyed running. His answers: "I like what it does for me" and "Hell no, I don't enjoy it!" Asked him if he took part in any enjoyable sports. He did — paddle ball, softball, swimming, golf, weight lifting, tennis, boxing, water skiing and others. I commented that those sports should keep him in good enough shape. His answer, "Running keeps me in real shape and I can do it anytime, any place. (Sounds like a motto.) The other activities provide recreation, social outlets, competition and some conditioning." Told him I had trouble with my Achilles tendons. He replied, "Run through the pain." Nice guy?!

Guess the human engine fails for many reasons, just like the metal ones — fine tuning is required for both — sure wish there was an easy way to fine tune this body of mine.

TACTICAL AIR COMMAND AIRCREW MEN of DISTINCTION



MAJ McDONALD



CAPT SLOAN



TSGT BARNES

Major Dale E. McDonald (Instructor Pilot), Captain Ronald V. Sloan (Pilot), and Technical Sergeant James M. Barnes III (Flight Engineer), 11th Tactical Drone Squadron, 355th Tactical Fighter Wing, Davis-Monthan Air Force Base, Arizona, have been selected as the Tactical Air Command Aircrewmen of Distinction for July 1972.

Major McDonald and crew were climbing through 3500 feet on an instrument departure in a CH-3E helicopter when the flight engineer detected smoke. Major McDonald began a descending 180 degree turn back toward the runway as the engineer investigated the problem. Sergeant Barnes reported that there was a fire in the transmission area and that he was attempting to extinguish it. After Major McDonald declared an emergency, Captain Sloan reported that the landing gear was indicating unsafe. At this time the aircraft became very difficult to control and the IP called for assistance from the pilot. About one mile from touchdown Captain Sloan noted fluctuations in the auxiliary hydraulic pressure. He turned the system off, which resulted in improved aircraft control. Despite a vigorous effort, Sergeant Barnes was unable to control the fire and he reported that it was increasing in intensity. Major McDonald quickly briefed his crew on evacuation procedures as the aircraft approached touchdown. On short final, Captain Sloan increased power to maximum and reported that the landing gear was now indicating down and locked. Upon landing, rudder control was lost and the aircraft turned sharply to the right. Major McDonald expertly controlled the aircraft to prevent it from turning over. As the aircraft came to a stop, Captain Sloan placed the speed selector to shut off and then set the parking brake. Major McDonald engaged the rotor brake, turned off the battery and all electric switches, and exited the helicopter after the other crew members. Subsequent investigation revealed that the oil cooler fan bearing failed, causing the fan belt to break and rupture a hydraulic line. The escaping fluid ignited and fed the fire. Rudder control was lost on touchdown when the tail rotor drive shaft burned through.

The demonstration of professional competence, sound judgment, and teamwork exhibited by Major McDonald, Captain Sloan, and Technical Sergeant Barnes during a serious inflight emergency readily qualify them as Tactical Air Command Aircrewmen of Distinction.



Somebody once said, "Even old ideas can be good ideas." In keeping with that philosophy TAC ATTACK is pleased to present a collection of stories published in 1942 by the Army Air Forces under the direction of General "Hap" Arnold. The series is entitled "Lessons That Live" and all totaled there are seventeen stories, all of which will be presented, running in consecutive issues of TAC ATTACK.

The series is introduced by General Arnold and although the authors are anonymous, the narrative accounts of their experiences, told in their own words, are without doubt. . . .

Lessons That Live

A MESSAGE FROM GENERAL ARNOLD

A short time ago I asked all pilots to submit, in narrative form, accounts of their narrowest escapes from fatal accidents. The response was instantaneous and tremendously gratifying.

These narratives have already become dog-eared from intensive study by statisticians, engineers and other specialists in the field of accident prevention. The yield from these studies is a rich harvest of information which will help to make our Air Forces, already the safest in the world, even safer in the future.

I promised to publish some of these narratives and this booklet is the fulfillment of that promise. Of the hundreds of accounts received, all well worth printing, these few have been selected, not because they are the best, but because they are the most typical.

In reading these stories, note well, as I have, that accidents or near-accidents are almost invariably caused by pilot failure rather than machine failure, the weather, or any other factor. This being so, it follows logically that accidents can almost invariably be prevented by better, surer flying. Accidents don't happen; they are caused. Knowing the causes, it should be easy to prevent them.

H. H. ARNOLD
Lieutenant General, U. S. Army,
Commanding General, Army Air Forces.

No. 1 of 17

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



WRONG NUMBER

It was an out and out boner, and the fact that I lived to become an older and vastly wiser pilot is a direct tribute to the Lady that's known as Luck. Shortly after I finished flying school, I was detailed to assist in the flight testing of overhauled planes. Upon reporting to the test line one afternoon, the operations clerk informed me that number so-and-so was ready for an initial check hop. I wandered out and climbed into a shiny overhauled job. The engine cranked readily, checked on both switches, and the controls were free.

I took off and climbed to 2,000 feet, leveled out and made a brief check of general flying qualitties, noting that the left wing was slightly heavy. My first maneuver was a whip-stall from the nose straight-up attitude. As the nose dropped sharply, a pair of 8-inch slip-point pliers came from nowhere on the floor and hovered momentarily before my nose. I snatched them out of space, pocketed them, and made a mental note to raise hob with the responsible mechanic for being so careless as to leave them where they might jam the controls. Next I went into a fast dive and as I did so, the spreader bar which connected the upper and lower ailerons of the left wings came loose and trailed out behind, flapping in the breeze. I decided I'd better get down from there in a hurry.

I made a landing approach, coming in "hot" to assure lateral control, and consequently bounced when the wheels hit with the tail high. I hit the throttle to ease down again and imagine my surprise when the entire throttle quadrant dropped loose and dangled on the control rods which ran up through the fire wall. As I hit the ground again, the oil filter came off and I was blasted with hot engine oil.

Here was a clear case of plane failure and stupid ground work. Oh yeah!

As I reached the line, burning to crucify the inspector who had passed on a plane in that condition, the clerk ran out, "Lieutenant," he yelled, "you took the wrong plane. I said number so-and-so but you took number this-and-that. This plane hasn't even been finished by the assembly department!"

Yes, sir. I had been flying a plane that was literally falling apart! And the horse was 100% on me.



CHOCK TALK

chock talk...incidents and incidentals

...incidents and incidentals

one small step

A gear up incident recently occurred in another command. Fortunately, it was only an incident, not an accident. Had it been almost any other type aircraft than a T-37, the damage probably would have been much more extensive. The story of how it came about is interesting, not only for "Tweet" types, but for all blue suiters. Here's how it happened.

An instructor pilot and his student were on a GCA. When the student tried to lower the gear, the nose gear indicated safe (down and locked), both main gears indicated unsafe, and the hydraulic pressure was zero. Emergency gear extension was tried without success. Finally, after exhausting all options, the instructor pilot landed the airplane on the nose gear and tail skid. You cost conscious types (and who isn't these days?) can eat your heart out at the \$523.80 price tag for that incident — and that includes an inadvertently jettisoned canopy that doesn't otherwise enter the situation. The reason the main gear didn't come down in the first place was a failed hydraulic line which allowed all the hydraulic fluid to escape. This line had been crimped at the upper end. The emergency "blow down" system for the gear failed to work because of severe corrosion of the emergency system teleflex conduit assembly.

Investigation revealed that a right main gear shuttle valve had been replaced two days prior to this incident. The TO requires an emergency extension check after this type of maintenance. Had it been performed, the discrepancy in that system would have been found.

Two separate failures, one (the crimped line) which should never have occurred, and the second, which should have been discovered, combined to cause a potentially serious situation.

You never know when skipping one small step from the tech order or failing to perform required inspections will lead to disaster. That's true for ANY airplane.

again and again and again!

You've all read blurbs in this magazine and others about Murphy, Murphyisms, Murphy strikes again, etc. Well, it should come as no surprise to you that he's done it once more! This time the victim was an F-4. It seems that there is a new type wheel with a built-in drive tube (ASSY NO 5000504) in which a 58 Roller Goodyear 6J9 bearing (P.N. 9534028) can be erroneously installed. Well, you know what comes next...it was installed erroneously! We got away lucky on this one. It only cost us a wheel assembly, tire, brake assembly, pressure plate, rotor, stator disks, and backing plate, a rather upset pilot and navigator, and undoubtedly a perturbed chief maintenance. The only way to get rid of Murphy is to avoid deviations from technical data. Just because something seems to fit doesn't mean it belongs there!

woe is me!

I was working on my aircraft (an O-2) in the revetment, getting ready for an engine run on both engines. I removed the front engine cowling and, knowing that if I placed it in back of the airplane the prop blast would blow it into the rear revetment wall, carefully placed it about 15 feet in front of the aircraft and slightly to the right. Following the checklist carefully (I hadn't worked on prop engines very long), I got everything ready for the engine run. Both engines started right up and I advanced power on both engines, checking the gauges closely. All of a sudden all hell broke loose! I shut down both engines, climbed out, and found that the cowling had been sucked into the front prop. Funny, everybody always warns you about the suction around jet intakes — guess props can create pretty good suction too.

Anonym

with a maintenance slant.

a philosophy

If you work for a man, WORK for him. If he pays you wages which supply you bread and butter, work for him; speak well of him; stand by him and stand by the institution he represents. If put to a pinch, an ounce of loyalty is worth a pound of cleverness. If you must vilify, condemn and eternally disparage — resign your position, and when you are outside, damn to your heart's content; but as long as you are part of the organization, do not condemn it. If you do that, you are loosening the tendrils that are holding you to the institution, and at the first wind that comes along, you will be uprooted and blown away, and probably will never know the reason why.

tail to tail

You've often heard it said that one of the most dangerous traffic situations is two women in two different cars on a head-on approach, attempting to maneuver out of an otherwise empty parking lot. A dented fender is almost always the result. But it seems as if we men may have to readjust our thinking as a result of this accident.

A civil engineer in government vehicle (pickup truck) and a civilian contractor in a private car were driving side

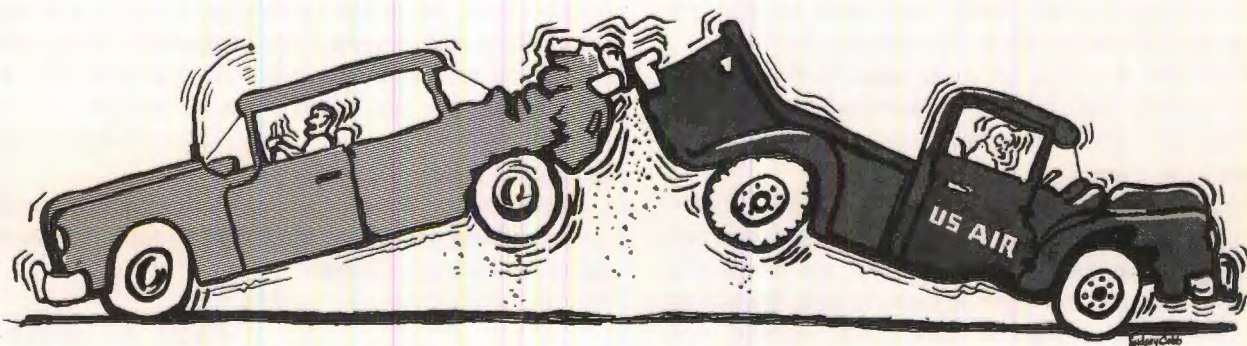
"what was that?"

The right front main gear tire of the C-130 had been changed and the first takeoff and assault landing were normal. While turning off the runway, the pilot heard a noise which seemed to come from the cargo compartment. "What was that?" he said. The loadmaster responded, "The noise came from one of the wheel well areas and it sounded like a brake grabbing." The pilot turned the aircraft again and did not hear the noises, so another takeoff and assault landing were accomplished. While turning onto the adjacent runway after landing, the noises were heard again. This time the flight engineer went out to take a look but could find nothing amiss. After the third takeoff, the loadmaster observed that the right front tire stopped rotating quite a bit sooner than the other wheels. The pilot decided to put her on the ground and let maintenance have a look-see. They found that during installation of the wheel earlier in the day, the inner wheel bearing had not been installed. This resulted in a heavily scored axle and badly damaged brakes.

Metal against metal means heat. The loss of a C-130 and crew due to overheated brakes is still fresh in everyone's mind (or it should be). Although the accident was not caused by materiel or maintenance factor, we must continuously guard against a breach of good maintenance procedures which could bring about the same results.

by side, inspecting a newly resurfaced 10,000 foot runway. Both of them spotted a bump and the engineer whipped the pickup around and headed in the opposite direction to take a closer look. As he reached the bump he stopped. Meanwhile, the civilian contractor, who had continued in the original direction, stopped his car, threw it into reverse, and started backing toward the bump. Seconds later, tail to tail, crunch!

Fortunately a dented fender and a shattered ego were the only casualties of this classic lesson in inattentiveness.



SPO COR

SPO Corner is the direct line from the Systems Project Officers at TAC Safety to you. Since every TAC aircraft type is represented by a SPO, you'll be seeing something about your machine, something which may save you some grief. This direct line has a phone at both ends to answer your questions and suggestions (Autovon 432-7031). Or if something is bugging you and you want to write, the address is TAC/SEF, Langley AFB, Va 23365. We need your feedback.

AERO CLUB X-WIND LANDING TECHNIQUES

Little is written about crosswind landings in light aircraft so lend me an ear, Aero-clubbers, and I'll pass on a few tips.

Perhaps the most important point to remember is — you must know both the aircraft and your own X-wind limitations. Most tech orders and operator manuals address this subject, but when was the last time you evaluated your own ability (preferably under supervision)?

Once you have determined which runway presents the least problem to you from a crosswind viewpoint and are cleared for your approach, the important factor is planning. It may be well to mention here that landing with a quartering tailwind is a no-no!!

It is best to set up a long straight in approach. This gives you time to see the effects of the wind; the bouncing, the control problems and effects, the airspeed fluctuations, and the drift. Now that we have it made — wait a minute; it's not "made" until we're safely in the chocks and shut down. We're still a mile out on final!

You have a choice of many ways to fly this bird to the runway and I'll leave the selection up to you. I'll mention two common ways and let you pick either or any combination thereof.

First, the wing low method. This method feels terrible, but everything looks fairly normal. Quite simply you turn the aircraft into the wind using aileron and hence wing down or low, and then turn it back to align the aircraft with the runway using the rudder. The resulting cross

controlling takes a little work (for lo, the winds are never a steady velocity and direction) and also a little increase in final approach airspeed to insure control responsiveness. During the flare, as you slow to touchdown speed, continue to feed in aileron to insure touching down on the upwind gear first. This method has the added attraction of keeping the upwind wing from being lift by gusty winds. Once on the ground, directional control becomes doubly important and judicious use of nose/tailwheel steering, rudder, and differential braking should bring you to a safe stop. Remember to keep the stick into the upwind wing (or wheel turned into the upwind wing).

Now the crab method. First establish your position on the extended runway centerline on glidepath. Now turn into the wind to kill your drift and keep you on the centerline. Fly this heading until starting the flare over the end of the runway. (NOTE: If you killed the drift you will be over the runway, if not, you didn't kill the drift. Go around! Do not pass, go! Do not collect \$200, but do try again!) As you enter the flare, use rudder to align the aircraft with the runway while keeping the wings level. Touchdown should come shortly thereafter and normality will no doubt prevail once again. This approach looks and feels good, but the rudder must be brought in at the correct moment and there is the distinct possibility of a gust getting under that upwind wing.

So, there are the two pure methods; choose either one or a combination, but remember that it all boils down to good planning and judgment.

Capt Al Mosh

NER



T-33 - STARTER CUTOUT

What does the Marker Beacon Receiver have in common with the T-Bird starter? Easy, it receives it loud and clear (also 75 MHZ marker beacons). If you want to get the jump on an early starter cutout (below about 17 —) to prevent overtemp, or if you want to be sure the starter disengages when it is supposed to (to prevent burning it up), turn the interphone panel marker beacon switch on. (It's the one in the middle.) That buzzing you hear is your starter/ignition working.

Lt Col Lou Kenison

WATCH THAT CHUTE!

Nothing, but nothing, starts the day off better than to be flailing the air in your trusty F-100 when, suddenly, the drag chute deploys. If you have the altitude and airspeed which convert to time, you can analyze the situation, swallow a couple of times, then press on.

The 100 does have a safe/arm device which should allow the chute to jettison immediately if not intentionally deployed. This is a fine feature and it usually works. It has been known to fail, however, and you know where the most critical place for that failure is — yep, right about the time you retract the gear on takeoff.

The R_x for this situation is to monitor the EPR. If you ever do feel that surge of deceleration forces and the EPR is normal, you no doubt have a drag chute trailing at 6 o'clock — so jettison it smartly. If the EPR is way down,

you've lost your AB or worse. Let's hope that's not the case!

Capt Al Mosher

NO COMMENT

Ever so often all F-4 jocks have to trot over to the local egress trainer and, amongst other things, practice their emergency ground egress procedures. In addition to being sure we've got the procedures down pat, we have to decide when we're going to use 'em. Ordinarily, if the situation is such that you're not climbing out at your normal parking spot after a normal landing and taxi-in, emergency egress should at least be considered.

Recently an F-4 lost the left main gear (it hit a barrier deck sheave) and subsequently took the approach end barrier. The aircraft ended up off the runway in pretty sad shape.

The IP (rear cockpit) opened his canopy using the normal lever, and unstrapped from all restraints, using good ole' every day non-emergency procedures. The aircraft commander rapidly went through the emergency ground egress procedures and crawled out; however, he had forgotten to release his harness fittings so his parachute was still with him. He then went back to shut off the still running left engine. The crew members then helped each other off of the aircraft. Neither crew member raised the lower ejection guard prior to egress.

No additional comments necessary!

Maj Burt Miller



**by Capt Jerry E. Albrecht
Hq 5th Weather Wing/DNC
Langley AFB, Va.**

It's that time of year again, a last look at the warm sun while the leaves turn their riotous colors, and then a 3-month visit by that scourge of all airplane drivers, old man winter. This year a few changes have been made which will have a bearing on how this old, cold fellow affects you as aircrew members. Because of the upcoming reductions in weather service, you may no longer be able to talk to your friend, the forecaster, face to face. This lack of person to person contact places a greater emphasis on your ability to recognize the hazards of winter flying.

Old man winter doesn't have any new tricks, just a large bag of well-practiced ones that are bad news for the unwary. Some of the nastier features of winter weather are increased probability of icing, poor visibilities, increased occurrence of strong surface winds and associated low level turbulence, and more frequent precipitation.

Icing is a potential hazard from liftoff to touchdown but most frequently occurs at temperatures warmer than -30°C . Structural icing can be expected any time the temperature of the aircraft skin is below freezing and liquid water droplets exist in super-cooled form, while induction or carburetor icing can occur at temperatures above freezing.

The best way to avoid that sinking feeling caused by a rapidly increasing collection of ice is to completely avoid areas of forecast or observed icing and, if you should happen to discover an unreported area of icing, give a call to your nearest PFSV station so they can pass the word.

Two of the most depressing features of winter weather are low ceilings and poor visibilities, especially after all those VFR approaches of the last few months. While ceilings and visibilities are certainly lower, the most important thing to remember is that when the tower or

GCA tells you that the ceiling is 500 feet and the visibility one-half mile, it doesn't mean you're going to be able to see the runway from one-half mile out. Slant visibility is a different animal, one not yet tamed, but if you realize it, you will be better able to cope with that disturbing feeling while waiting to see those threshold lights. Again, the best way to avoid problems with low ceilings and visibilities is to plan around them, and don't forget to consider the weather at several alternates if destination weather looks shaky.

Winter presents us with yet another problem, strong persistent surface winds and accompanying turbulence. When all that cold air spills out of the polar regions, our problems begin. Remembering to wear long johns is your only problem; you have to consider the effects of gusty surface winds when planning your flight. Particular attention must be paid to crosswinds at departure and arrival points and to turbulence that might be found lurking in an approach zone just for that unwary fellow returning from a trip through the winter sky.

As old man winter settles in, he brings with him a lot of precipitation in any of its several forms of rain, snow, sleet, freezing rain, etc. — all of them bad news for airplanes required to stop on a runway. More rain during the winter increases the probability that some of you will experience hydroplaning on landings. Snow, of course, lowers the RCR, not to mention the visibility restriction it causes. What the CE people do with piles of the stuff they plow off the runways and taxiways causes obstructions that weren't there during the long hot summer. Other forms of freezing precipitation can raise a lot of worried looks on the faces of airplane drivers if encountered during critical letdown or takeoff maneuvers.

I guess what I've been saying over and over is to carefully plan that flight to avoid those known hazards of winter operation, and during preflight get those nasty little ice particles off that bird. Above all, pay attention to your meteorologist, for he is indeed a friend whether he is across a counter or at the other end of a phone line.

WEAPONS WORDS

NONNUCLEAR MUNITIONS SAFETY GROUP

by Lt Col Gordon F. Carmichael
Chief, Weapons Safety
Division, Hq TAC

A munitions specialist assigned the monotonous task of spotting 25-pound practice bombs noticed a signal (spotting charge cartridge) protruding slightly from a bomb cavity and absent-mindedly tapped signal with his fingers. The signal tioned, causing severe lacerations to two fingers and extensive burns to his hand and arm.

An unfuzed 2000-pound bomb fell off a stack in a munitions storage area and exploded low order. The exploding shock-sensitive bomb scattered bombs and people in all directions.

The munitions in the incidents cited above had not been given a detailed safety review by the Nonnuclear Munitions Safety Group and all failed to provide an adequate or expected degree of safety. The Air Force can ill-afford munitions that lack adequate design safety, that have a propensity to become shock-sensitive due to temperature/humidity cyclic variations, or lack positive measures to prevent premature arming or functioning.

It is axiomatic that the handling and delivery of munitions is hazardous. Personnel are willing to opt the risk of working with

munitions so long as there is assurance that adequate engineering effort has been expended to insure the munitions are reliable, reasonably safe to handle, and will function as designed. To help achieve this goal, the Air Force established the Nonnuclear Munitions Safety Group (NNMSG). To quote directly from AFR 127-102, "A group of qualified personnel will be appointed to represent designated agencies having a direct interest and/or responsibility for verifying the safety of all nonnuclear munitions used by the Air Force." The Group chairman is appointed by the commander of the Air Force Systems Command and each major command is assigned one voting representative. Headquarters USAF representation is provided by the Directorate of Aerospace Safety. The Group had its beginning in 1966 but did not become a decisive organization until established as an Air Force body in 1970.

One of the major achievements of the Group was the establishment of 11 new mandatory design safety standards to help engineers maximize safety in new munitions (AFR 127-102, Atch 2). These standards, together with previously established military standards, provide a firm checklist of design/safety parameters which must be satisfied before new munitions will be accepted for Air Force use.

Each new munition developed for

the Air Force is put through a series of exacting safety tests and evaluations to insure all design requirements have been satisfied. The test results and safety evaluations are recorded in a Technical Munitions Safety Study (TMSS), which is forwarded to all major commands for review and formulation of a command position. At a subsequent meeting of the NNMSG, the TMSS is reviewed, additional supporting data may be presented, and each command representative casts his vote for or against the munition. Changes to improve the safety of the munition are frequently recommended and recorded in the minutes of the meeting. The completed safety study, together with Group recommendations, are then forwarded to the Air Staff for approval.

To date, many munitions have been reviewed, some have been approved for limited operational use, several have been rejected, and numerous recommendations have been made and incorporated to enhance the safety of the munitions. The Air Force munitions program has made notable progress in its short 25-year life span; munitions have become more sophisticated, weapons systems more complicated, and through the efforts of the Nonnuclear Munitions Safety Group, munitions now meet the highest safety standards considering design, logistics, and operational requirements. ➤

TAC			WEAPONS MISHAPS			ANG		
AUG 72	THRU AUG		EXPLOSIVE	AUG 72	THRU AUG			
	1972	1971			1972	1971		
12	75	92	TOTAL	1	22	15		
2	22	40	Personnel	1	14	11		
10	33	39	Materiel	0	8	4		
0	20	13	Other	0	0	0		
2	6	2	MISSILE					
0	2	23	NUCLEAR					

letters to the editor

thanks

The response to our plea for help (August issue) in finding back issues of TAC ATTACK was gratifying and successful. Captain Wade, Editor, ATC APPROACH TO SAFETY, was the first one to respond. Colonel J. F. Misenko, TAC DA, was the next to rally, proving our long held contention that even TAC Headquarters types read TAC ATTACK. Colonel W. E. Haymes, Assistant Adjutant General for Air, Virginia ANG, added another copy.

To all a debt of thanks. TAC, rest easy; your file of TAC ATTACK is once again complete. Ed.

the fighter pilot's magazine?

I noted with mixed interest and consternation page 8 of the August 72 issue, the last line of the letter from Lt Col Clements, "...your publication — The Fighter Pilot's Magazine — TAC ATTACK"

Far be it from me to deny Colonel Clements his prerogative to regard your magazine in any way he wishes. As a matter of fact even I, a C-130 navigator type, have been able to detect the unmistakable presence of Fighter Folks within this command. On the other hand, since you did print the statement, does this signal a change in your editorial coverage policy?

Please keep what you've got. Several of us minority groups enjoy TAC ATTACK, too.

Major Ron Hardesty

Directorate of Airlift, Training Division, Hq TAC

There's been no change in editorial policy; TAC ATTACK is your magazine. ED.

talar

In your July issue of TAC ATTACK, you had an article on the TRN-27 (TALAR). I would like to commend you on a very fine article; however, there was a mistake in the paragraph concerning ground equipment. I was involved in the CAT III testing of the TRN-27 at the Tactical Airlift Center for one and a half years.

After using numerous configurations in the ground positioning of the transmitter, it was determined that the transmitter should be placed on runway centerline extension within plus or minus 5 feet, approximately 30 feet prior to the usable runway surface, as now stated in TO 31R4-2TRN27-2. In your article you stated that the distance is "approximately 300 feet prior to the runway and on the extended runway centerline."

All TAC Combat Control Teams are now undergoing training in Conventional Approach Control Procedures. We are using the TRN-25 LF Beacon as a full service NDB, on the objective landing zone. Prior to the mission briefing, we will have approach plates available depicting full instrument approach procedures. If any aircrew have any questions about the procedures used, I'm sure any combat Control Team can clear them up.

Again, I would like to commend you on a fine and informative article. And may I add, it is the first one I have seen since TALAR's conception.

SSGT Robert W. Blowers

Combat Control Team No. 8

Forbes AFB, Kansas

spad reunion

The Fourth Annual A-1E/H Reunion will be held this fall in San Antonio. Spads, Sandys, Hobos, Fireflies, Zorros, Downed and Rescued Crewmembers and any other interested parties are encouraged to attend. It will be held in late October or early November. Send inquiries to Captain Jim Seith, 103 Oak Circle, University City, TX 78148. Expect a flyer with details later on in the year confirming explicit dates and location.

TAC TALLY

MAJOR ACCIDENT RATE COMPARISON

	TAC		ANG		AFRes	
	1972	1971	1972	1971	1972	1971
JAN	0	1.6	0	16.7	0	0
FEB	0.8	1.6	0	11.6	0	0
MAR	1.6	3.1	6.3	7.0	0	0
APR	2.8	2.7	8.1	4.9	0	0
MAY	4.0	2.5	6.3	5.7	0	0
JUN	4.8	2.6	5.1	6.9	0	0
JUL	4.2	2.9	6.2	7.1	0	0
AUG	4.6	2.7	6.4	7.8	2.0	2.7
SEP		3.2		7.4		2.4
		3.2		6.9		2.1
NOV		3.3		6.9		2.0
DEC		3.2		6.4		1.8

AIRCRAFT ACCIDENTS

UNITS

*Estimated

	THRU AUGUST					THRU AUGUST			
	1972		1971			1972		1971	
	ACDTS	RATE	ACDTS	RATE		ACDTS	RATE	ACDTS	RATE
9AF	6	3.4	4	2.3	12AF	10	3.8	5	2.0
1 TFW	2	7.6	0	0	27 TFW	1	6.4	0	0
4 TFW		0	0	0	35 TFW	1	3.8	1	3.6
23 TFW	1	7.3	0		49 TFW	2	9.3	0	0
31 TFW	1	6.3	1	6.4	58 TFW	2	5.3	3	9.0
33 TFW	1	13.8	0	0	67 TRW	0	0	0	0
68 TASG	0	0	0	0		0	0	0	0
316 TAW	0	0	0	0	313 TAW	0	0	0	0
317 TAW	0	0	0	0	314 TAW	0	0	0	0
354 TFW	1	5.1	1	6.0	355 TFW	1	5.0	0	0
363 TRW	0	0	0	0	347 TFW	1	7.4	0	0
4403 TFW	0	0	2	18.0	474 TFW	2	9.2	0	0
					463 TAW	0	0	0	0
TAC SPECIAL UNITS									
1 SOW	1	2.4	3	6.9	4410 SOTG	2	10.6	1	6.0
2 ADG	0	0	0	0	4485 TS	0	0	0	0
57 FWW	3	23.9	0	0	4500 ABW	0	0	0	0

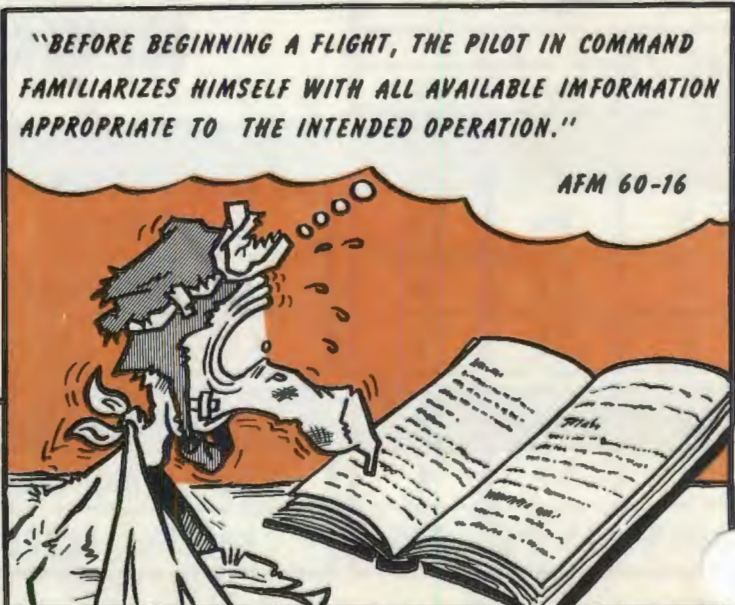
TAC		
AUG 72	Thru Aug	
	1972	1971
5	37	20
5	26	14
4	32	6
4	24	9
2	23	8
2	15	8
100%	65.2%	100%

SUMMARY

ANG		
AUG 72	Thru Aug	
	1972	1971
TOTAL ACCIDENTS	2	15
MAJOR	2	14
AIRCREW FATALITIES	0	5
AIRCRAFT DESTROYED	1	14
TOTAL EJECTIONS	1	11
SUCCESSFUL EJECTIONS	1	9
PERCENT SUCCESSFUL	100%	81.8%



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"BEFORE BEGINNING A FLIGHT, THE PILOT IN COMMAND FAMILIARIZES HIMSELF WITH ALL AVAILABLE INFORMATION APPROPRIATE TO THE INTENDED OPERATION."

AFM 60-16