

OCTOBER 1963

TAC ATTACK

TAC Attack October 1963 Wet Sweat



WET SWEAT

TAC ATTACK



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Trainee gets a lift while attending TAC's Sea Survival School

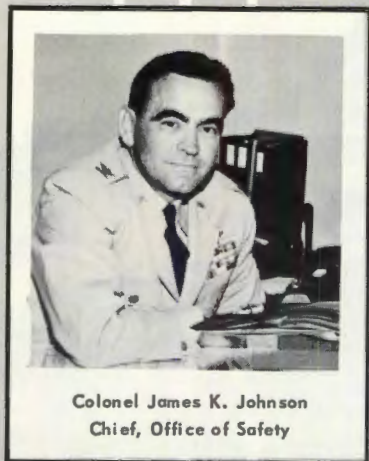
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Angle of Attack

*That should be considered long which
can be decided but once*

- Syrus



Colonel James K. Johnson
Chief, Office of Safety

When the leader of a European acrobatic team flew into the ground during an inverted pass while practicing his solo act back in 1960, most observers attributed it to an accident. They believed the pilot, a major, inadvertently let his F-86E get too low. Possibly so, but the major was a superb pilot who, even at high speed, knew precisely how close he was coming to the ground.

The previous evening he had discussed the feasibility of dragging the tail of his bird while inverted! Other pilots warned him it couldn't be done . . . that the aircraft rotates about its wing and that once the tail touches, the pilot is unable to rotate the aircraft into a climb. The major refused to believe this. He was too confident of his own skill and judgment. The pilots who talked to him that evening are certain he ignored the warning and found out the hard way that he couldn't change the laws of aerodynamics.

If my memory is still good, Count Von Hagenburg proved the folly of this exact maneuver at Cleveland back in 1937. The count miscalculated and let his Jungmeister get too low during an inverted pass. When the tail touched the grass he corrected, causing it to dig deeper. The count was one of the world's better acrobatic pilots and his speciality was inverted flying. His aircraft, the Jungmeister, ranked as the best acrobatic aircraft of all time and it is a credit to the aircraft and the count's skill that he walked away from the crash.

The major apparently hadn't heard about the count's embarrassing landing (there are always those two percent) so he lost his life reproving what had already been learned. He also proved something else for all of us to remember . . . that the ability to judge tangibles such as speed and altitude is not nearly as important as having the good judgment to stay clear of trouble in the first place.

WHICH WAY?

BY CAPTAIN OSCAR J. LOVRAK
4524 CCTS NELLIS AFB, NEVADA

MANY VOR and TACAN users don't really know all the idiosyncrasies of this equipment. As a result, some have made more than a few major navigational errors. One thing is primarily responsible—the TACAN/VOR bearing indicator is not reliable when the aircraft master compass malfunctions. The RMI rotating compass card depends on the aircraft master system to orient it to magnetic north and the number two needle, in turn, requires an accurate reference to magnetic north before it will give correct readings.

Altho the number two needle



of the VOR relies on magnetic north and can confuse a pilot when his aircraft master compass system malfunctions, he can still use it as long as AC power is available.

With a slave gyro out of phase, the ID 250 compass card is unreliable, yet the number two needle will show the magnetic bearing to the station. For example, if an aircraft is due east of an omni-station, the number two needle will point to 270 degrees on the RMI card even tho the card is not indicating the proper heading. However, the needle will not indicate the correct angle between the nose of the aircraft and the station and this tends to be confusing.

A slave gyro malfunction does not affect the course selector bar of the ID-249 since it gets all of its input, including magnetic north reference, from the ground station itself. This is because the ground station transmits two signals which are in phase at magnetic north. At any other direction, the signals are a fraction of a cycle out-of-phase. The aircraft receiver measures the phase difference between incoming signals and converts it into useable readings.

THE ID-249 (Course Deviation Indicator) and the ID-250 (Radio Magnetic Indicator) operate independently of each other. It is possible for one to function normally even tho the other has failed. With VOR, the CDI to-from indicator and alarm flags of the ID-249 are DC powered. If the compass card or bearing indicator has failed, the pilot can use the ID-249 to determine his bearing to the station by rotating the course set knob until the CDI centers and TO is in the to-from window. The magnetic bearing from the aircraft to the station can then be read in the course selector window. Inciden-

tally, if this equipment does fail, it constitutes more than a no-sweat operation and you are obligated to tell ARTC that you have a slaved gyro or navigational aid difficulty. ARTC can then schedule an alternate method of navigation and let-down.

The principle behind TACAN is much the same as with VOR. The unit gets its information by making a phase angle measurement from the ground station. The number two needle is subject to the same failures that affect the VOR number two needle and losing the aircraft master compass system or its components makes the entire ID-250 subject to the same errors as are experienced with omni.

In the F-100 and other aircraft with the J-4 master compass systems, the pilot can easily learn the peculiarities of his navigational aid. He can do this on the ground or in the air. With the TACAN tuned to a ground station, he can deliberately fail the magnetic compass sensing equipment by selecting the DG position of the J-4 compass control box. By rotating the slaved gyro needle, he can observe the indications of the number two needle. He'll find that it will no longer point to the station but will remain fixed on the ID-250 compass card and will rotate with it. Next, he should note the action of the CDI. Will it stay exactly where it should and give proper azimuth indications? If it does, he can use it to determine his bearing to the station in the same manner as with omni. A word of caution, the TACAN ID-249 differs from the VOR ID-249 in that the TACAN system requires both AC and DC power. Therefore, the entire TACAN navigational system is inoperative when either AC or DC power is lost, except the trans-

former-rectifier unit will compensate for aircraft DC power source failure and the TACAN should continue to operate.

The old bird dog is still found in many Air Force Aircraft. This navigational aid (ARN-6) requires both AC and DC power for all functions other than the antenna position. But it is completely divorced from the aircraft compass system. This means that when the slaved gyro or ID-250 compass card is unreliable, the number one needle will still point to the station. ADF radio beacons have been eliminated from the Enroute High Altitude Charts and are almost entirely forgotten, but they still make an important backup for both navigation and let-down. The Enroute Supplement lists all navigational aids for a particular checkpoint, and you can get the proper frequency from it.

To summarize:

- * An aircraft compass system failure, resulting in erroneous slaved gyro indications, renders the number two needle unreliable. The VOR/TACAN Off Flags will remain out of sight and a strong identification signal will be heard, yet bearing indications can be wrong.

- * With an isolated aircraft compass system failure, when the TACAN or VOR systems are functioning properly, use the ID-249 for navigation or bearing information.

- * The VOR to-from indicator, course deviation indicator, and alarm flags are DC powered, while the entire TACAN system requires both AC and DC power.

- * The ADF (number one needle) points to the station as long as it receives AC and DC power, despite aircraft compass system failure.



LAST SUMMER, TAT visited the Library of Congress during a quick trip thru the Capital and saw one of the Gutenberg Bibles . . . a most impressive work of art. Printed on clean white vellum with bright red initials and clear black letters, it looked as if it had just come off the press of some modern, high quality printing shop instead of being the product of a craftsman who printed it about the time Columbus was making his famous sightseeing trips.

Small wonder this book established a long unequalled standard for excellence, while furnishing one of the key elements of that inverted pyramid of knowledge which forms the foundation for our space age. It proved that Herr Coster's invention, the printing press with movable type, was practical and speeded one phase of man's ability to communicate.

All thru this pyramid of knowledge, other developments by characters named Bell, Marconi, Morse, Wheatstone, Ampere, deForest, Reis, Henery, and others, have advanced all phases of communications. Significantly, many developments in other fields have been triggered by each of these developments.

Yes sir, with all this going on, a fella feels like taking off his hat whenever someone even mentions communications.

Unfortunately all is not roses. The best comm equipment in the world is worthless if it ain't used

correctly. This applies to the handbook on your bird, or the TACAN and UHF sets in it. Correct use covers an even greater area and extends well beyond the cockpit . . . and there are times when the difference between correct and incorrect is so subtle it scares you.

We just finished reading one such case. It involved a couple of Marines making a weather departure from an overseas airpatch. Both were stationed at another base and were not intimately familiar with the departure which required them to hold 3000 feet until 15 miles out, then climb to avoid some large type rock piles about 25 miles out.

The flight leader reported reaching the 15 mile fix at 3000 feet and was told by the controller to "climb restricted."

The leader questioned this, but the controller again said "restricted," so he rogered the transmission and reported maintaining three thousand! Both aircraft hit the mountain, still in formation, directly on course and exactly 3000 feet above sea level. Weather in the area was zero zero. Scratch two very capable pilots plus two aircraft . . . and it's enough to make a grown man cry.

Moral: Don't never trust nobody, and never accept a clearance you don't thoroughly understand.

While on this subject . . . a TAC C-130 crew was involved in a near mess because they misunderstood a tower transmission and taxied onto one end of the

active as another aircraft was cleared for takeoff from the opposite end. Hoo boy, the tower saw what happened in time to get the other aircraft to abort, so no permanent harm was done.

We've seen this happen, to a lesser degree, several times over the years and the real wonder is that it doesn't happen more often. Reckon most pilots get cautious after a scare or two and choose to assume that they are not cleared until they've made certain, doubly certain, that they are.

Back when TAT was a wing safety officer, one of the fighter squadrons produced a right good skit for a safety meeting. As part of the skit they taped some chatter off the tower radio. They went to considerable trouble to keep it realistic, complete with some clown making a radio check on guard right in the middle of a simulated emergency.

Years later we played this recording at a party and all the pilots got quite a kick out of it. On the other hand, not one of the wives was able to understand a fraction of what was going on even after listening to it a second time. To their untrained ears it was merely so much noise and they were unable to sift out any of the separate conversations taking place. This came as a surprise . . . it hadn't dawned on any of us that it took special training to just listen to a radio.

FROM THE LAND of tea and stuff like that there, comes a report from a one-oh-wonder pilot who suddenly found himself without the right windscreen panel. It blew out. The pilot wasted no time getting to lower levels, keeping airspeed below 250 knots. Wind blast and noise were impossible, making radio reception likewise. The helmet visor permitted vision and a safe arrival. One of the hundred herders here in the ivory tower claims he was able to cut noise level to a reasonable level after shedding a canopy by selecting ram air. Said over half the noise was caused by the air conditioning system trying to pressurize God's great outdoors.

We can't guarantee what effect RAM would have on a lost windscreen panel . . . but it wouldn't hurt to try. By the way, this incident illustrates the value of having a good close fitting visor.

TALKING TO THE orange suit types, we found that some are concerned because the numbers racket has created a few problems like eyeballs glued in the cockpit and mechanical flying.

We have noticed the same trend. On three different occasions we've had well-experienced pilots

push a T-bird back onto the runway trying to make good a 120 knot lift-off speed. Twice this caused a mild porpoise.

Near as we can recall, fuel was down to around 720 gallons which put the proper speed at 117, so all three times the bird was really trying to leap reasonably close to the correct speed . . . it had no way of knowing they'd miscomputed. In each case, their takeoffs would have been more accurate than their preflight planning if they had paid less attention to airspeed indications and more attention to other indications.

The numbers racket is no better or worse than the people using it. Used correctly, it will do wonders to get us throttle benders on the ball, glean max training from every minute in the air. Misused it is a mid-air collision hazard.

Proper use? Include the airspeed indicator and altimeter into your normal VFR crosscheck . . . a quick glance at 'em everytime you eyeball thru the cockpit. This will speed up your crosscheck for instrument type work, teach you proper power settings and, in general, accurize your flying.

The system does lend itself to mechanical flying - if you let it. It doesn't need to, if you'll go ahead with your takeoff or other maneuver (assuming you fly a T-bird or other machine you can fly by "feel") then glance at the clocks to see how close you came to your computed speed.

The heavy types, of course, require a different technique . . . but they don't tend to cross you up by skipping off early either.

With the T-type, we've had to use a slightly flatter lift-off attitude than we did before the days when people worried about lift-off speed. We now find the flatter attitude quite comfortable.

THE DAY WAS CLEAR, with near perfect visibility, particularly at altitude. A TAC F-100 pilot reported his progress shortly after swinging an en-route checkpoint at FL 330. The center acknowledged and advised that they had radar contact.

A reassuring phrase, "in radar contact." It suggests a darkened room where sharp eyes are carefully monitoring the progress of blips on a radar scope and occasionally radioing someone to warn that they can expect another aircraft to cross their path five or ten miles away.

In similar manner, an IFR clearance at FL 330 suggests that a comfortable space around one's aircraft has been reserved at this level - NOT SO! Which helps explain why the F-100 pilot suddenly

saw a huge B-52 whisk briskly by about 200 feet to his left, just slightly low.

The B-52 crew had been operating VFR on top at FL 320 and a few minutes after narrowly missing the F-100 called in to report at FL 360. Normally, crews should call before changing altitude on a VFR on top clearance, but radio chatter had tied up the channel and the B-52 crew had elected to climb and then call.

The radio chatter is a clue as to why there was no warning from the radar people. They were busy. At present, radar advisory service is a bonus the controller hands out WHEN HE HAS TIME. It is not an obligation.

Keep these things in mind when flying: In VFR weather, an IFR clearance does not insure clearance from other traffic and radar controllers can not advise you of all conflicting traffic. Instead, keep your head up and LOOK. It is small comfort to have been in the right after plowing into another aircraft at over 500 knots!



THE AVERAGE ACCIDENT investigator soon gets over being amazed by the sequence of goofs, errors, weather, poor luck and what-have-you that usually precede the average accident. Usually, if someone had removed any one item, the accident would have been avoided.

Knowledgeable throttle benders (knowledgeable because they read the ATTACK faithfully) should be on the lookout for these sequences and more important do something to stop the sequence when they see it. Need a few instances? We have one. A pilot started an approach knowing the ceiling and runway visibility were variable and close to minimums. He also knew

that GCA was out, along with the middle marker on the ILS. He didn't know that the hotline and Telautograph between weather and the controller were out or he might have felt stronger about a stacked deck. It was fatally stacked.

Unfortunately, you can't always spot a stacked deck. Take the case where some sloppy maintenance really stacked one on a hundred herder from another command . . . pure luck kept him from bashing the bird badly.

He was dealt an Ace of Diamonds on the bombing range when he kicked in the AB to start a LADD. He got a "good chute" along with the AB light-up. The chute was immediately whipped off.

He planned for a no-drag-chute landing and painted her on at the proper speed about 900 feet down the active. He lowered the nose and started braking at 120 knots, decided braking action wasn't effective and turned off the anti-skid. Turning off anti-skid made deuces wild and when our hero reapplied brakes he blew a tire and got a deuce. He hit the panic button to jettison the garbage. Both 450s went, along with the type VII pylons, but the centerline pylon did not . . . giving him a King of Diamonds.

He pressed the button to extend the tail hook, but it didn't release, adding a Queen of Diamonds. He concentrated on keeping the bird straight using nose gear steering and right brake, rolled past the BAK-9 and hit the MA-6A webbing at 20 knots; too slow to take the cable, for the Nine of Spades. By now it was pretty obvious that fate had dealt herself four Jacks with a deuce in the hole, so our hero didn't have to bet his Ace . . . and got off with minor damage to the bird.

Now that we've had our fun, let's dig in the dirt. The drag chute was lost because the door latch spring was weak and corroded. The chute doors were not positively locked and the latch shook open when the AB lit up. The tire failed because the pilot locked the wheel after turning off a perfectly good anti-skid system. The centerline pylon failed to jettison because the circuit wire was broken after it chaffed against a hole where it passed thru the speed brake island.

The tail hook didn't release because a maintenance "technician" left the circuit breaker out after working on the system. The report stated that the individuals who performed "maintenance" on these systems were receiving special indoctrination. TAT agrees with that, whatever it is.

—TAT—



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B-52 n.d.t. program by William R. Winters, Magnaflux Corporation

Technician tests main landing gear outer cylinder on a B-52

B-52 N.D.T. Program

By WILLIAM R. WINTERS
Magnaflux Corporation

THROUGH THE USE of pulse ultrasonic and eddy current methods, test technicians recently sought out corrosion fatigue cracks on the inside of B-52 main landing gear outer cylinders without disassembling the gear or interference with the SAC mission.

Almost 300 aircraft were tested at their assigned SAC bases and at various modification sites with no disruption to the existing operational or maintenance pro-

grams.

To execute the test program, Air Force planners—under the direction of Project Liaison Manager Ben Conte—divided test personnel into teams, composed of Air Force personnel from Ogden Air Material Area, Oklahoma City Air Material Area and the testing specialists from the Materials Testing Laboratory Division of Magnaflux Corp., Chicago.

Each team was equipped with

an ultrasonic unit and an eddy current instrument.

Origin of the program dates back to the failure of several landing gear strut cylinders, which occurred when aircraft were on the ground under normal load conditions. Though no aircraft were critically damaged as a result of these gear failures, Air Force officials had to take immediate maintenance precautions on any gear where failure was imminent.

Study of failed gear showed that corrosion fatigue cracks were developing along the flash line on the ID of the main cylinders.

Major problem facing SAC engineers was the task of making aircraft available for inspection without reducing SAC's combat capability. Evaluation of discontinuities in the gear metallurgy had to be so precise that only those aircraft in real need of maintenance would be taken off flying status. Laboratory testing, which would have required gear removal and replacement, would have taken the planes out of service and rendered them immobile for more than 48 hours each.

The Air Force invited four independent testing companies to demonstrate their approach to the problem and their test capabilities at Hill AFB, by performing non-destructive tests on landing gear cylinder sections containing known defects. Three qualifying firms were then invited to submit bids on the project, showing approach, test execution, and time factors.

Forty-eight hours after they had been notified of contract award, a team was assigned to the project and joined their Air Force counterparts at Hill AFB for initial briefing. Within four days, the test program was under way.

To execute the ultrasonic

phase of the program, each team was assigned to cover from three to five SAC bases. Work began almost simultaneously at four locations throughout the United States.

Cylinders under test were forged of 7079T6 aluminum, measured 36 inches long and 11 1/2 inches in diam, with a wall thickness of 3/4 inch. There are four such cylinders per aircraft.

In operation, a two-man civilian crew performed ultrasonic inspection on accessible areas of the cylinders along the flash line while a two-man Air Force team followed up with eddy current units equipped with specially designed probes to scrutinize an area of complex configuration where another component joins the main cylinder at a forked recess.

Initial ultrasonic test time was four hours per aircraft; but as the project progressed and operators developed familiarity, time was cut to three hours. Test crews worked 12-hour shifts, seven days per week. The ultrasonic and eddy current test techniques made the entire project feasible under existing SAC security conditions.

Because of gear configuration and conditions under which tests were to be conducted, the technical service section of the test equipment manufacturer was asked to come up with special 5 Mc miniature transducers. These were used to generate 45 deg and 60 deg shear waves into cylinder walls.

In tooling up for the job, the equipment people prepared test blocks for each ultrasonic team to use for calibrating their equipment. Curved sections, 3 by 5 inches, were cut from a previously failed landing gear cylinder, and machine cut with three intentional defects along the vertical axis on the ID. The cuts were 1/8

inch deep by 9/16 inch long, 0.050 inch deep by 3/4 inch long and 3/16 inch deep by 11/16 inch long.

The test units were standardized by obtaining an 80 per cent saturation response from the side of the 1/8 inch groove in the test standard. This calibration procedure was followed for both the 45 deg and 60 deg angle waves.

In testing, cylinders were cleaned of dirt and grease for four inches along the flash line. Deep surface imperfections on the outside surface were noted visually and recorded. As an acoustic complaint, S.A.E. 20 oil was brushed onto the surface. The test area was then scanned with both the 45 deg and 60 deg transducers. All indications of cracks were confirmed by removing the oil couplant from the cylinder, and retesting. This procedure eliminated the possibility of a false indication as a result of the oil couplant.

Test results were noted on specially prepared report forms that contained sketches of the cylinders being tested. In accord with the Air Force specifications, all cracks of 1/16 inch depth or greater were noted. Cracks measuring 1/8 by 1/8 inch were considered severe enough to require removal of the cylinder from the aircraft. Location and severity of noted defects were drawn on the sketch pads by the operators.

To eliminate the possibility of grounding planes unnecessarily, testing was executed with extreme care, and all discerned defects were reevaluated. Gear cylinders containing serious defects were removed from the aircraft and shipped to OOAMA for further evaluation and disposition. Gear assemblies were removed on three aircraft.



SEG NEWS

4450th Standardization Evaluation Gp.

Know your Stdn Evaluators

Major Wheeler was born and raised in Boise, Idaho. He entered the service in 1942 and received his pilot wings in November 1943 at Pampa, Texas. As an aircraft and flight commander in B-24's, he completed 40 combat missions in the Pacific Theater in 1944 and 1945. After World War II, he returned to civilian life for 5 years before being recalled to active duty during the Korean conflict. His flying experience has been in 4-engine aircraft and includes C-54s, C-124s, B-29s and C-130s. The C-130 is his true love and he has been with the turbo props since they were first delivered to the 463rd Troop Carrier Wing at Ardmore, Oklahoma. He left the Blue Eagle Squadron (773d TCS) in February 1961 for assignment as Chief of the Troop Carrier Branch in the 4450th SEG.



MAJOR JACK W. WHEELER - CHIEF,
TROOP CARRIER BRANCH

F-105 FLIGHT MANUAL REVISION

SEG representatives recently attended the F-105 Flight Manual Conference at Farmingdale, N.Y. A conference of this type develops into a big production with representatives from PACAF and USAFE plus 35 experts in fields ranging from RAC Life Sciences Research Division to plain Thunderchief pilots.

The important point in mentioning this conference is that the 847s submitted by pilots in the field were primary grist for the conference mill. The manual

changes varied from correction of misspelled words to complete re-writes of some sections. Several parts of the F-105 B/D-1A were downgraded in classification and moved to the basic manual. The interior cockpit check was streamlined and improved. The emergency procedures section came under hard scrutiny and the bold face steps were reduced in some cases. All of these plus numerous others were a direct result of changes suggested via the 847 route.

NEW FIGHTER GRADING DOCUMENTS

A new twist is being added to the 60 series grading manuals which have been undergoing a major rewrite. After analyzing the data from over 27,000 flight checks administered during the last 18 months, it became apparent that the final grade was being unduly influenced by the scores from ground check items. Armed with this kind of information, the SEG Commander directed the F-100 evaluation team to research the entire subject of grading criteria. After a whole lot of statistics dredging and soul searching, the F-100 evaluators recommended that:

- * A more realistic ground item vs. airborne item ratio be provided.
- * A penalty point system must be used to provide item importance weighting.
- * A certain amount of subjectivity should be included in appropriate areas.
- * A determination of more realistic achievement levels must be made.

The new wrinkle of using a penalty point system means that some items must be graded as either satisfactory or unsatisfactory. If an item grade, in the S or U category, is satisfactory, it will not influence the overall score. If an unsatisfactory item grade is awarded, penalty points will be added to the points possible. The relative importance of the item determines the number of penalty points applied.

The new grading criteria should provide more meaningful check data to commanders and supervisors at all levels.

NO MO SFO

TACR 51-1, dated 26 June 63, prohibits practicing simulated loss of engine (SFO) in single engine jet aircraft and further requires that precautionary landing patterns (PLP) be terminated at or above 1500 feet AGL. So how do we go about grading the PLP? Obviously the old grading criteria, which was based mostly on the projected touchdown point and airspeed, is not too appropriate for an approach terminating 1500 feet above the ground. What else is there, you ask? Plenty!

Let's take the typical fearless examinee, put him in the pilot's seat X miles from home plate at Y altitude, and whisper softly over the interphone, "you have simulated emergency Z." Does the examinee immediately relate to the examiner all of the appropriate corrective action he would take were

the type emergency real? Does the examinee position the throttle appropriate to the type emergency being simulated? Does the examinee assume the correct glide airspeed if required? Does the examinee immediately head for the nearest suitable airfield? Does the examinee set up a pattern which ensures landing ASAP? (Not necessarily the old SFO pattern.) Does the examinee conserve altitude until definitely committed to a landing? Does the examinee use sound judgment throughout the entire simulated emergency?

Still think there's nothing worth grading? All grading documents for single engine jet aircraft will soon reflect the new look in simulated inflight emergencies. This new approach will basically evaluate the pilots reaction and thinking process resulting from exposure to a realistic problem. In many ways this evaluation is more desirable than evaluating a canned SFO flight maneuver.

TILTING WITH TAT

We have just read a most interesting piece of journalism penned by our striped amigo - good ole TAT in the August 1963 TAC ATTACK. We in SEG are most sympathetic with the tiger's sincere endeavors to emphasize classic goofs which continue to rip up our equipment and our people. In fact, we're all for him in this respect. But, occasionally, he gets a little too excited and steps into the quicksand - just far enough to where someone must throw him a branch so he can pull himself out!



We refer to the article on the C-119 IP who, not too long ago, plunked his bird onto a 5,000 foot

runway, losing his gear and tail end enroute. TAT seems to have some very pointed views concerning this one and, although we don't want to pick nits with our feline buddy, we feel that we should set a few things straight before some of our newer C-119 drivers or, for that matter, perhaps some of the more experienced types, are led astray by some of the "facts" reported.

First of all, TAT apparently feels that this mishap was caused by the pilot following the Dash-1 procedures to the letter and therefore, flew his final approach at an airspeed which was somewhat less than that required to compensate for gusty surface winds. The facts are that the pilot computed his approach airspeed as 108 knots with 40° of flaps. This would place his gross weight for landing in the neighborhood of 57,000 pounds. The speed he computed is 30 knots above or approximately 138% of stall speed and should have been more than adequate for normal APPROACH SPEED. The accident investigation revealed that when he turned final, the pilot immediately slowed his aircraft to approach speed but flew the final at 110-115 knots to take care of airspeed fluctuation. The C-119 Dash One says that final approach should be flown at 120 knots until COMMITTED TO LAND and then at approach speed (or stall speed plus 30 knots) as a minimum. In this respect, fellow C-119ers, we feel that the Dash One airspeeds for final approach are more than adequate to provide for gusty winds or what-have-you! After all, at a gross weight of 57,000 lbs, 120 knots on final, even with 0° of flaps, is more than 140% of stall speed. It is next to impossible to put down on paper the exact point on final where the pilot should abandon the 120 knots figure and slow to approach speed. This point must be determined by the pilot prior to each landing, dependent upon surface conditions, weather, aircraft configuration, etc., etc., etc. In other words, the slow-down point is determined by pilot's judgment based on his experience, knowledge of his airplane and his own ability. So you see, the pilot did not follow his Dash-1 recommendations "to the letter," did he?

While we're on this airspeed bit--the tiger said he had "found not one word on adding airspeed to compensate for wind gusts" in the C-119 Dash-1. Just in case we haven't shown clearly that 120 knots is mucho plenty to take care of most gusts, we'll get technical for a second and ask him (and any others who have agreed with him) to refer to T O 1C-119G-1, page A6-2, "Landing Distance Curves," lines 25 through 29!

Now let's discuss for a moment the stdn/eval program being "one of the better teaching devices." Gentlemen, we SEG'ers are happy to read things like this but, to be factual, we are not the teachers. One of our jobs, along with our cohorts in the training shop, is to provide the teachers with a clear, accurate and timely package with which to teach and then to evaluate for commanders the results of this teaching. You all know by this time, we rely heavily on the experience, suggestions, know-how and even complaints from our brothers in the field to feed the improvement machinery of our program and, if the stdn/eval program provides a "good teaching device," it is because of the coordinated efforts of all of us. Remember this, we will have wasted many hours of honest effort and will surely suffer a severe setback if we fail to adhere to the handbooks, manuals and other materials as they are published. As we have said for a long time - if the book is wrong, we'll change the book; in the meantime, unless safety of flight is involved, we'll follow the book! While we agree that very little of anything that is printed is a substitute for good judgment, we believe that the importance of constantly reviewing, studying and following procedures as outlined in current manuals and directives CANNOT BE OVER EMPHASIZED.

EDITOR'S NOTE: One of the nice things about our job is that we get to utter the last word. Having long supported SEG's fight for better pilot handbooks and closer adherence to them, we'll wave aside the branch and attempt to muddle our own way out of the quicksand. We cheerfully admit to having erred on the C-119 approach speed. After reviewing the good book a third time, we located the 120 knot speed. It was given on the traffic pattern diagram, but was not included in the text. Apparently the IP had the same problem. Which brings us back to one point in our original article . . . the business of subjugating common sense in an attempt to follow a rather complex book to-the-letter. You can't always be certain you have the right letter!

Perhaps when Utopia is reached all handbooks will be simple enough to permit everyone to understand all phases. At present, Utopia ain't this close. For example, this dumb tiger has been reading the T-bird handbook an average of four times a year for the past ten years and refers to specific parts of it almost weekly, yet we still find ourselves taking a wrong interpretation from time to time. Yes, we believe in following the book -- but not blindly or against our better judgment.



chock talk

BENT STEMS

After two aircraft on an overseas base ended up with flat tires, someone found that both Shrader tire inflation stems had broken off about an eighth inch above their hex wrenching area.

This sounds like someone bent the stems when they put air in the tires, and proves that you have to use a certain amount of care even in a straightforward operation like this.

F-4 FIRE WARNING SENSORS

The right engine fire warning light of an F-4 came on after the pilot retarded throttle to start letting down. His wing man checked for fire but observed none. The pilot shut the engine down and made a single engine landing.

The fire warning system was checked and one of the sensing elements found faulty. Apparently a small scar on the sensing element was induced during maintenance work in the engine bay section and caused the false indication.

Maintenance personnel must be extremely careful when they pull engine bay doors and should thoroughly check sensing elements for scars, pinching or cracks before reinstalling the doors.

We will have a lot of these birds around for awhile, so let's not start having a run of false warning lights.

TAKING CHANCES

Altho TAC and other F-100 users have had some bitter experience with J-57 engine main fuel manifolds - leaks and distorted spray patterns have caused several accidents-one J-57 propulsion branch was completing periodics on their engines without a fuel manifold test set. In fact, their test set had been out of commission for several months. A

"can do" attitude is a fine thing, but it can be carried too far . . . particularly when it increases the risk in an all too risky business.

F-100 PITOT SYSTEM ICING

From time to time an F-100 pilot finds his airspeed indicator off or not working at all. Most incidents of this nature are caused by pitot system icing and can be prevented with proper inspection and operating procedures.

Draining pitot static lines every seven days - or whenever the bird has been in a heavy rain - is a minimum requirement. The pitot system should be drained more often if local conditions dictate. Commanders and maintenance officers are expected to use their judgment and require more frequent drain checks during rainy seasons or in humid climates. Pilots should write up flights thru rain so maintenance people will know the pitot system needs a check.

During High Wire, the pitot heat shut-off valves are being deactivated on all F-100, so the pitot boom will be heated continuously whenever the engine is running. Aircraft not modified should be identified so pilots will know to turn on the system before flying thru visible moisture.

Modified aircraft must have this switch turned on to get maximum anti-icing.

MICRONS

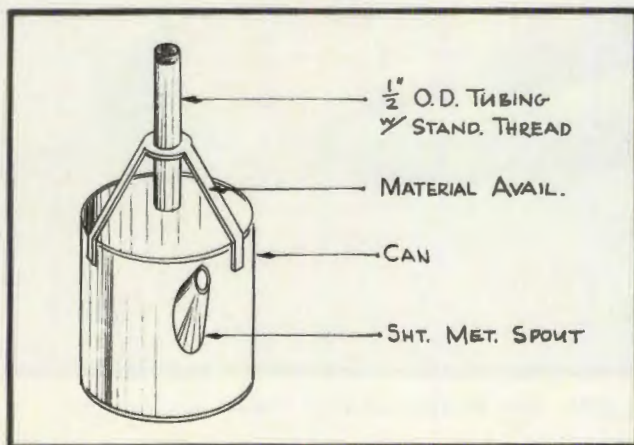
We haven't done any nit-picking about terminology for quite a while, so it's time for a brief discussion of a term that many people don't really understand: "micron." Some people, for instance, think it's a millionth of an inch; actually it's a millionth of a meter, which is about 40 times bigger. Very few people, even though they may know the right numbers, have a good mental picture of the size of a micron.

Your first reaction to this startling bit of news may be to ask a question: "So what?" Well, your conception of the size of a micron does have a practical application in aircraft maintenance. The filtration capability of hydraulic filters is determined by the minimum size of the particles they will trap, and the size is expressed in microns. The regular system filters with permanent metal elements used in the F-4 will stop 10-micron particles.

The radar system filters in the F-4 will stop 5 microns. The tech orders and other publications have pointed out the uselessness of visually inspecting to tell if such a filter is clean. Apparently some maintenance people have trouble really believing this. If it's clogged up with particles, they think you ought to be able to see them. Perhaps comparing 5 and 10 micron particles with some more familiar objects may help bring home the need for using such methods as pressure drop tests to inspect these filters.

The period at the end of this sentence, for instance, is about half a millimeter in diameter; that's 500 microns. A grain of table salt is a cube 200 microns on a side. This paper is 100 microns thick. A human hair is about 60 microns thick. All of these you can see, but just barely. Now look at them compared to the 5 and 10-micron particles we are talking about.

—McDonnell Field Support



OVERFLOW RETAINER

T/Sgt Michael J. Parot suggests this container be screwed into the oxygen overflow vent of aircraft being serviced with liquid oxygen. It has been successfully used by the 20th TFW in USAF. According to Sgt. Parot, it won't save any money, or time... but just might prevent a nasty accident. You'll have to agree, it sure beats trying to catch the stuff in a pan on the ground.

SPECTROMETRIC OIL ANALYSIS

At present, four TAC bases (Myrtle Beach, Seymour Johnson, George and Nellis) are cooperating with ASD on a spectrometric oil analysis test program.

These bases take oil samples from selected J57, J75 and J79 engines at ten-hour intervals and send them to the Navy at Pensacola, Florida. The Navy runs an analysis on each sample and records the result on individual engine history cards. As each sample is recorded, the card for that engine is reviewed to see if a trend is developing.

Thru their analysis, Navy technicians are able to tell the amount and type of metal particles being carried in the engine lubricating oil. Too much metal indicates a component is starting to fail, while the type of metal tells, to a degree, which component it is. Therefore, if the contaminate level on a specific engine increases, the base will be notified so they can remove the engine and repair it. Ideally, the analysis will also tell them where to look to find the failing part.

Industry has used spectrometric oil analyses to monitor reciprocating engines and gear trains. The Army and Navy have found the technique quite useful for preventing failure in their reciprocating engines and also in helicopter gear boxes. The Air Force used it successfully on a limited scale with some reciprocating engines, so it should work quite well with jet engines and may soon become one of the more effective tools for preventing engine failures.

PUTTING ON THE PRESSURE

A set of external tanks was installed, fueled and the aircraft declared ready for flight. A roving inspector then asked the crew chief to check the pressure of the main landing gear tires. The gage read 50 PSI shy of that required for the aircraft gross weight. That's hardly shy enough to catch a pilot's eye on preflight but certainly enough to cause tire failure on takeoff. A perfect setup for a maintenance error accident.

QUESTION OF THE MONTH

When cannibalization is performed, what percentage of extra man-hours is normally required?

- | | |
|---------|---------|
| a. 100% | c. 200% |
| b. 75% | d. 50% |



Wet Sweat

wet sweat

Parachute water landing demonstration.

FROM OPERATION Big Splash, in 1961, to an official Air Force school listed in AFM 50-5 . . . that's part of the story about TAC's Sea Survival School.

The 1963 term will end during late October. By then, more than 2000 students, including Army, Navy and Marine personnel, will have completed the six day, learn and live obstacle course.

The school program starts with classroom lectures on the proper techniques for overwater bailout, ditching procedures and lessons on how to use all items of personal and survival equipment, including the solar still and signal devices. Students then take a written exam and hit the water for practical application. That's where the 300 yard swim, in poopy suit, helmet and life preserver, separates the men from the boys.



Raft entry drill. Dark glasses simulate darkness or blindness.

The students experience most of the rigors of an overwater bailout, including being dragged by their parachute (simulated with an LCM) and hours of loneliness in a dinghy. They witness several overwater jumps by highly qualified instructors and are pleasant-

ly surprised at how soft a water landing is when they use their equipment properly. For an unforgettable experience, they are plucked from the water by helicopter.

The schedule is fitted tightly to the basic requirements for sur-



The school's floating classroom.



Preparing to board the six-man raft.

Photos Courtesy of
Photo Lab Det 2 - 4444th R.T.S.



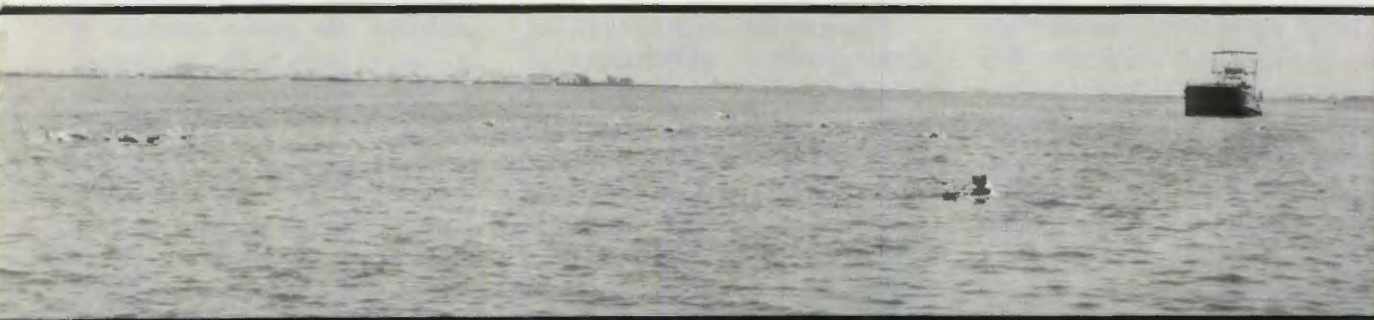
Student gets his free chopper ride.

vival and leaves no time for frills. The instructors take their mission seriously and students quickly adopt the same attitude. Apparently, firsthand experience brings home the full picture of a personal do-or-die situation. At any rate,

we've yet to find a graduate who would bad-mouth the curriculum even after being prodded. "Very realistic and definitely worthwhile," are the most common comments.

We don't know how much it

costs to keep Captain Wayne E. Williams and his professional assistants in business thru the summer sessions but, from what we saw, it's time and money well spent.



300 yard swim. Note the difference in student performance.

Single Standard



Capt Bill Bateman is one of those buoyant individuals who can rationalize something good out of complete chaos ...he also has a curiosity that would make a cat seem disinterested. In fact, he is downright nosey, but his good humor keeps anyone from resenting it too much. Actually, I don't know why I'm talking about Bill, because my story really isn't about him. It's about Troutman. In fact, we were talking about Troutman when Bill breezed into the locker room. Yogi, his name isn't Yogi, it's Bob Santee, is a big, barrel chested red head and as good a troop as I've ever met. He reminds people of Yogi Bear. Bill, I think it was, started calling him that and the name stuck.

Where was I? Oh yeah, Yogi was just saying how the old man couldn't do that when Bill walks in and asks, "Can't do what?"

"Ground Troutman! That's what." Yogi wasn't in what you'd call a benevolent mood and he really gnashed out his answer.

Old Bill whistled, "Ground him? What for?"

"He saw him do a low roll out at the gunnery range this morning. He didn't waste any time. Major Herman was waiting for us when we pulled into the parking area."

Major Herman is our ops officer and a darn good head. You can really depend on him, particularly when it comes to hitting targets and backing the Old Man.

"Was it a good roll?"

"Bat man, you know damn well

it was a good roll. Four points, perfectly level and right by the tower. Have you ever known Troutmen to make a bad roll?"

Bill allowed that he hadn't. After all, Troutman was just about the sharpest stick and rudder pilot in the Air Force. He really ought to be in the Thunderbirds. I asked Yogi what he intended to do. Yogi frowned, "I'm going to bounce the old man. With the gunnery meet coming up, this will queer any chance we might have."

Bill shook his head. "I doubt if it will do much good. If I were you I'd talk to Major Herman first. He thinks like the old man and might save you some trouble."

That made sense, so Yogi and I finished getting out of our gear and, leaving Troutman glum and worried in the lounge, cornered Major Herman. He took us into one of the briefing rooms, shut the door and said, "I know what you're going to say, but hear me out. The Col knows what he's doing. It won't hurt Troutman to sit on the ground and shuffle papers for awhile and we'll have another chance at the gunnery meet next year."

"I was in an '86 outfit once that was full of characters. We had one very similar to Troutman who could really do low altitude aerobatics. Everyone pretty much envied him. In a way, I still do. Another was noted for being dependable. He never aborted. If the nose gear failed to retract, he would use the ground retraction release and somehow manage to get it up. He knew the bird better than North American. He could tell if it was the oil pressure gage that was out, or whether it was an actual oil loss just from watching the gage go to zero.

"A third pilot was an efficiency expert. He could strap in and make

his cockpit checks as he started the engine. If you've ever started '86s you can appreciate this trick. I've seen him give a new pilot a supervised start, dash back to his own bird and get it running and ready before the student was thru making his pretaxi checks.

"We also had a young second balloon who dished out of a roll and bought the farm. As I recall, the investigators reported that he had always been a borderline pilot.

"We had one troop run out of oil fairly close to a good field. He decided it was the gage and pressed on. Fifteen minutes later he was floating down in his chute. The aircraft almost hit a house full of people.

"Still another got a hot start

trying that efficiency trick. He completely ruined the engine and his chance for making captain. I heard he finally made it on this last go-around...his longevity finally won out.

"There is only one difference between these pilots...the first three were successful violators. The others were not. I'd say the Colonel isn't going to let the result of a violation temper his reaction to the violation itself. He's a fair man. He'll consider all violators in the same light and young Troutmen is lucky he isn't faced with an Article 15 instead of 30 days on the ground.

"Tell me, Yogi, could you still respect the Colonel if he let successful violators gain added

stature while letting the unsuccessful ones wallow in the depths of humiliation?"

Yogi thought that over a bit and agreed, even tho we do lose our chances for getting C Flight on the gunnery team. Really, no one can afford double standards, not any more.

I told Bill about Major Herman's little speech and that it sounded just a little like he might have been the old man himself talking.

Bill laughed, "In a way it was. The Col used to be CO of that '86 outfit Major Herman was in and I've heard that Herman used to be quite a rock until the Col cooled him down."

TAC TIPS

GOOD CATCH

From the USAFE Airscoop: Right at liftoff speed, the wingman's F-100 ingested a large bird, throwing the J-57 into convulsions. The wingman aborted, snapped down the hook and snatched the BAK-9 cable at 37,000 (count 'em) pounds. That is 8,743,000 foot pounds of energy arrested in about 1000 feet. When asked about the ride, the wingman commented, "Like Guzzler's Gin . . . smooth!" Incidentally, the DD-175 said this was to be a round robin . . . indeed!

On the other side of the barrier (fence), the Airscoop says: "At 145 knots on takeoff the pilot felt a sudden loss of power and aborted. He deployed the drag chute but it streamered. He put down the hook, but had already crossed the BAK-6. The tanks kept

him from snagging the MA-1, so the nose gear collapsed. A common sequence for landing and takeoff emergencies, even tho pilots know the barrier is a true friend and asks only a minimum of preparation. Still, repeated failures are induced by extended speed brakes, unjettisoned external stores, retracted tail hooks. Why, when most pilots can rattle off the emergency procedures like a pre-recorded message?

"Perhaps it's because of clutch factor. So, just assume you'll be no Coolstone when your turn comes, and plan accordingly. The plan would depend on the bird, but must contain at least the bare minimums such as 'push the tail hook button.' Then you can sit back and enjoy the clutch."

TAC TIPS

PLAN FOR LIVING

When you review safety regulations, equipment, and procedures, some startling points come to light. Generally they are irritating because they imply that your judgment and ability are lacking. Most safety equipment is uncomfortable and inconvenient. Almost without exception, check lists and other similar procedures are time consuming and to some extent degrading. Safety regulations are self-sustaining and the feeling that if a master circuit breaker is safe then a master circuit breaker circuit breaker is twice as safe.

Wouldn't it be nice to walk out to a good aircraft, crank up and press on with a mission where you flew just for the fun of it? Well, you're not getting paid to have fun!

There is only one reason for any safety regulation or procedure. That reason is to either maintain or increase the combat effectiveness of the USAF. There are only three things you can do:

- * Follow the rules.
- * Follow the rules and try to get them changed.
- * Get out and save the AF money, time, and airplanes.



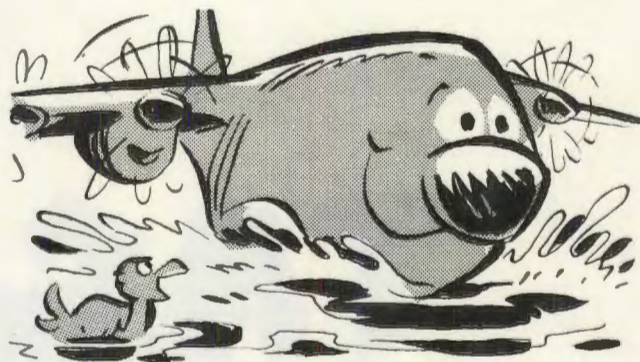
F-100 FIRE HAZARD

Shortly after takeoff a wingman noticed fuel streaming from his leader's F-100. The leader successfully aborted the mission and inspectors found

that the low pressure fuel filter draincock was being held partially open by the engine access door. One ear of the draincock was being depressed by the door. Draincock ears were shortened to cure the trouble. Leakage can't be detected unless the engine is operating since a hydraulic lock is formed in the lines above the filter when the engine master switch is off.

STANDBY

In addition to dual controls, the F-4C will have an attitude indicator in the rear cockpit connected to the same electrical source as the one in the front cockpit. So, the rear indicator can serve as a standby only if the front indicator fails internally. However, for a last ditch standby, radar scopes in each cockpit present a horizon line that can be used. The roll indication will be true, but you can't make small pitch corrections on it since the scale is 60 degrees per vertical inch.



WATER WORRY

Two C-130s from another branch of the service launched during heavy rain. Just prior to lift off, both plowed thru a six to eight inch deep lake on the runway. Arriving at destination, both crews had trouble getting the nose gear of their aircraft to extend. One crew used a crow bar to pry open the nose gear doors which had been bent enough by the water to jam them. The other crew had no crow bar and dove their big machine to 305 knots, letting airloads rip the offending doors off. Normal landings then followed.

FERRY TALE

Once upon a time there was a big iron bird called a See One Thirty. This is a strange name, and good for a long story involving a lot of hokum . . . but it has nothing to do with this story, which isn't very long and which is definitely not hokum.

Anyway, this See One Thirty Bird was at an overseas birdpatch feeling very poorly because of a fuel leak in its number two tank. Both the number two and number three tanks had been emptied while the birdkeepers scratched their heads. Finally, the head birdkeeper decided to bring the See One Thirty home to super market alley to better patch up its leak. He promptly released it for the one time flight.

The See One Thirty's own private keeper started getting it ready to go. Needing fuel in the number three tank to operate the GTC, he adjusted the switches on the single point refueling panel, setting the refuel-master switch to the refuel position and each individual tank switch to refuel. He started transfer by placing the crossfeed valve on four and number three engine tank to crossfeed with number three boost pump off and four boost pump on.

The One Thirty Bird was on an incline with its left wing lower than the right, so when the single point panel switches were set to refuel, fuel started to flow to the one and two tanks instead of to number three.

With number one at 5000 pounds, number two at 4000 pounds, three still empty and four at 4000 pounds, the big See Bird tipped slowly to the left until the number one prop was all that was propping it up. This was definitely not punny since the number one prop makes a darn poor prop. One corner of the blade bent, even tho the weight was slight enough that one man was able to lift the left wing a couple of feet until fuel balance was regained.



Moral: don't set both the single point refueling panel master switches and the individual tank switches to refuel on a sloping ramp, or you, too, may find yourself replacing an engine and prop.

TAGGED

While getting a drink well out over the cold sea, an F-100 pilot noticed the KB-50's left jet engine start to bob around on its mount . . . "Good grief,"



thought he, "that thing's going to fall off in my face!"

Immediately, he retarded throttle and rolled to get out from behind . . . too late, the engine bounced off the left side of his nose, kissed the wing and headed for Davy's locker.

The F-100 troop got another pilot to look him over. Damage appeared negligible, so he hooked up on the starboard hose, finished getting his drink and proceeded to complete the mission.

SIF SAVE

Each month, the 5th Coast Guard District sends us an unusually well written and informative summary. In the last issue, the summary reported a rescue at Seymour Johnson that should be of interest to all pilots. Weather in the Seymour area was 700 scattered, 1200 scattered, 1700 overcast, two and a half miles in rain and fog. Tops were at 6000 feet. At 1610 hours, Washington Air Defense Sector alerted the Norfolk DF net because they had lost radio contact with an F-102 and the F-102 was squawking emergency about 60 miles from Seymour.

Cherry Point Tactical Air Control Center concurred. Six minutes later the F-102 made a left hand triangle and the Rescue Center requested Seymour to launch one. At 1618 an F-102 was airborne under WADS control. At 1622 the intercept was accomplished 22 south of Seymour with visual contact at 1624. At 1640, both aircraft were safely at Seymour.



OL' SARGE

Or Sarge

THE OLD SARGE brushed the crumbs off his desk and dumped them in the waste basket. Reaching into the brown bag, he pulled out an apple which he proceeded to inspect with studied care. "Now that's what I call an apple," he remarked. "It's almost as good as the ones I used to get back in the good old days."

Tommy was sitting in the visitor's chair. He shifted a bite of sandwich to a talking position and mumbled, "You're the last one I expected to hear talking about the good old days." When the Old Sarge's eyebrows shot up, he added, "Not that you aren't old."

"Careful now, you'll find yourself eating that lunch out in the cold. How come you never expected to hear me tell about the good old days?"

"Aw, you're different. For instance, I've never heard you run us younger guys down because we have to use torque wrenches and stuff to do what you older fellas once did by feel . . ."

"Whoa up, Tommy! Did you ever stop to look at how things have changed? Back in the good old days, if you want to call 'em that,

a bolt was a bolt and almost all of 'em were made of the same type steel. Now-a-day they're made of everything from aluminum to super steels. A mechanic just can't tighten 'em by feel without being in danger of not getting one tight enough or stripping a thread. And don't let the old timers fool you. They broke their share of fittings twisted off their share of studs and pulled out their share of inserts. Back in those days, we had a hard time finding a torque wrench. If we'd had as many as you do now, more of us would've used 'em . . . figgering they'd save us from having fuel leaks, oil leaks and lost tempers. They may seem like a nuisance, particularly when they aren't handy, but they save work in the long run."

"Really tho, one of the biggest reasons for using torque wrenches and being so super careful today is the equipment itself. Just look at the F-5 engine . . . it weighs two or three hundred pounds and develops about 3500 pounds thrust. That's the equivalent of 3500 horsepower. Compare that with the prewar aircraft where a 300 pound engine would be doing good to grind out 200 horsepower."

"Gee, I hadn't looked at it like that."

"But," the Old Sarge continued, "that doesn't have anything to do with apples. You just don't buy apples at the supermarket like I used to swipe off the tree next door. 'Specially this time a year. Darn near green, hard as a rock

and guaranteed to remove any loose teeth you might have, but boy were they good!"



Answer to Question of the Month:

100%

THE TRIP OUT was a classic. I don't think we missed a single checkpoint by more than a minute and this included our climbs. Fuel was equally close. We arrived at our first stop 84 pounds below schedule; however, when we checked the servicing figures they indicated that the totalizer was 72 pounds off. This put us exactly 12 pounds below schedule!

The next two legs ran almost as close...and then we missed. It was on the return trip and on our longest leg. The SID made a slight dog leg to a fix a little over 200 miles out. We arrived at the fix six minutes early. Since this was beyond normal tolerance and considerably worse than our previous performances, I started re-checking to find out why.

To begin with, we used the wrong temperature when we computed our climb. We also deliberately assumed a zero wind for the climb, figgering this as padding. Actually, it was a 25 knot tailwind. We'd gotten lazy and didn't compute for a higher than standard temperature at flight level, so the indicated airspeed we flew was giving us a higher true airspeed than we had used for computing our time enroute.

Replanning the leg, using correct figures and stuff, my new calculations put us there one minute early. It doesn't take five minutes longer to run off winds on an E6B, to take climb temperature and climb wind into account and to compute and fly an indicated airspeed that is corrected to existing temperature...yet, the end result is a flight plan that clicks with satisfying precision. Further, if it fails to click, you can accuse, with some degree of assurance, the weather man of giving you inaccurate wind data.

TAC ATTACK



Since adopting my policy of computing all possible variables, I've found old Stormy to be a lot more reliable than I believed possible. I've also found fewer aircraft with nonstandard fuel appetites.

I have noticed that fuel consumption is higher than standard when flying a leg from the center

of a high pressure area into the center of low pressure area... and as yet, have found no logical or easy way to compensate properly. When I do I'll use it, because this precision bit has me bugged. It's also one of the few ways left to get some fun out of this flying business... try it.

BOUND TO HAPPEN

We've been afraid that sooner or later we'd put the right credit line in the wrong place and, sure enough, we done it in the September issue. Captain Clarence L. Webb of the 1st Air Commando Wing should have been credited with ANY TIME, ANY PLACE on page two. While credit to Airscoop should have been for BODY IN MOTION on page eight. . . . And after all the hollering we've done about using checklists!!!

Our apologies to all concerned.

N Aids V Crossword Puzzle

Contributed by: Capt WILLIAM B. THORBURN
Instrument Training Officer
934th Troop Carrier Group
St Paul, Minnesota

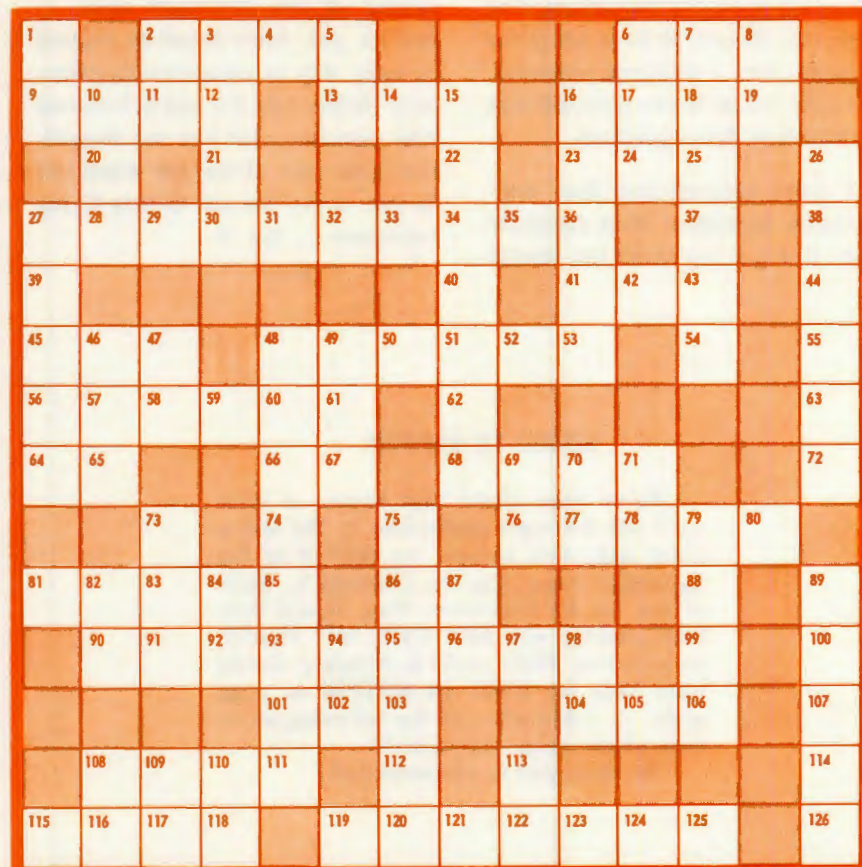
HORIZONTAL

2. Infinite bearings.
6. Mean Sea Level (Abbrev.).
9. Tacan Final Approach Fix.
13. ID-250.
16. ON and Off indicator (ID-249).
23. /SIF.
27. Tacan course from Initial to Final Fix.
41. Receiver position for Radio Range.

45. Air Traffic Control (Abbrev.).
48. Outbound bearings.
56. Fly line—Victor Airways!
68. From here to there.
76. Tone/ switch (Sound your 'Z').
81. Tacan distance is measured range.
86. AN/ARN-6 must be to track ADF.

VERTICAL

90. TO-FROM feature of ID-249 indicates .
101. Visual-Omni-Range (Abbrev.).
104. ID-310.
108. To receive, VHF switch must be .
115. AN/ARN-6 must be on for ADF.
119. RMI indicates heading and .



1. Heading Indicator (Gyro).
3. Correct Kollsman Setting on Altimeter gives Sea Level reading.
- 7&79. The GCA controller will bring you around another time if you are not within.
10. Surveillance Radar.
15. Expect to Hold at this fix on TACAN.
16. Mandatory Reporting Fix.
- 26&89. UHF and VHF radio signals are .
27. Correcting for wind to maintain course results in .
46. A full deflection on ID-249, on VOR, is equal to degrees.
48. RMI gives both Magnetic and bearing.
49. Maintaining constant distance track between 270 and 300 degrees, is flying an/a
73. It is nearly impossible to DME.
75. Tracking is maintaining .
94. Without Radio Receivers you will not IFR.
108. If east of station, 270 degrees in course selector, TO-FROM flag reads .
109. Fan Marker-without compass locator.
113. To receive Distance information, AN/ARN-2 1 must be on position.

OFF

IT HAD BEEN one of those days. Altho I didn't hack myself apart shaving, or dent any fenders coming to work, almost everything else went sour. By quitting time I was pretty well beat.

I had a night flight scheduled and got to ops about half an hour early so I could check the reading file and have plenty of time left over to get everything squared away. The major I was flying with wasn't around, but when I asked for the flight folder, the duty officer said the major would meet me out at the bird, that he was already down at ops filing our 175. He also mumbled something about the major wanting to get off early, but I was headed for personal equipment by then.

By the time I got to the aircraft, the major had it preflighted and was in the front seat, ready and waiting. I apologized for being late, even tho I really wasn't. After he briefed me on the mission and gave me a copy of the Form 21A, I scrambled into the aft seat, hurriedly strapped in and went thru the check list.

During the climbout, the major turned the machine over to me and told me to make radio calls while in control. Four or five minutes after we crossed the first checkpoint he asked if I'd reported our progress to the center. I hadn't. The whole flight was like that. I couldn't get concerned about holding altitude, headings, or making required checks on time

On the final leg, center gave me holding instructions that differed from the published pattern. I was thinking about the correct way to enter the holding pattern, and for some reason went into the published pattern... or at least started into it, before the

14,000 at any time during the flight.

I've never experienced anything quite like it before and hope I never do again...and I'm not sure I know what caused it. I had plenty of sleep the night before, no parties, no cold, nothing out of the ordinary except my performance during the day had been substandard. I'll admit that I had worked rather hard that day and several days before.

Had I been solo and augered from some dumb stunt it would have been a real headscratcher. I can hear the board now, "Old Bill wouldn't pull anything like

DAY



major told me I was wrong.

The letdown was a mess and the GCA worse, altho I did get reasonably close to the runway. After we shut down I found I'd flown the whole flight with the parachute leg straps unfastened.

The whole flight had an unreal quality to it...as if it was a dream. A bad dream. I checked out the oxygen system afterward, but both the regulator and my mask were OK. Actually it shouldn't have mattered since cockpit altitude didn't exceed

that. He's a far better head than that!"

I'm not sure how you can fit this into safety...except most people do have off-days when their performance is subnormal. If they could recognize one of those days, certainly they should avoid flying or doing anything else that requires concerted attention. They'd have a time explaining why they didn't want to fly to the ops people, but not if the ops officer was an understanding guy.

GRND/EXPL SAFETY

NO QUICK CURE

Forty of the forty-eight explosive accident we've had this year were caused by someone making a mistake and accidentally firing ordnance. Some of the more common firings involve:

- * The explosive bolts used to actuate the F-105 arresting hook.
- * BDU-23/B modified practice bombs. These were exploded both on the flight line and in the ammunition storage area.
- * ARD 446-1, ARD 863-1, Mk 3 Mod O, Mk 1 Mod bomb ejection cartridges.
- * Cal. .50 ammunition and 2.75" rockets fired from aircraft in arming and dearming areas.
- * Ejection seat cartridges and rockets.

With 83% of these accidents caused by personnel error on the flight line, we have an obvious starting place for our efforts to reverse the trend. We find that most, if not all, of the personnel errors resulted because someone did not consider what could happen if they took a certain action . . . later, after it is too late, investigators have trouble understanding why the individual couldn't foresee the result before he committed the error.

Altho these causes can be charged off to carelessness, more accurately they are due to someone hurrying, trying to save a little time by cutting corners, day dreaming, or just not checked out well enough to understand the particular system.

The most effective cure is for supervisors to continually remind the working people about how important it is for them to pay strict attention to their actions. They must stress safety by setting a safe example and insisting on subordinates following that example. A one-hour-for-safety-each-month program does very little to prevent such accidents, regardless of the number of posters and slogans posted around the working area. No, safety must be a continuing day-to-day activity . . . an attitude which starts with supervisors and is adopted and followed by every man in an outfit.

ON GUARD

So far this year, seven people in TAC have been killed in small car and sports car accidents, while four have been killed driving normal Detroit Iron. A casual glance around any TAC base is proof enough that most people drive standard cars . . . making the sports car score even more lop sided. What's the problem? Are the sports car buffs killing themselves by driving too fast, or what?

As a matter of fact, they are! No less than four lost control at high speed and either rolled their cars or ran into something solid. (One hit a bridge abutment at an estimated 100 mph!)

Another troop bashed a bridge after he apparently fell asleep. The cure for this sort of mayhem is rather standard . . . but must come from within. Your supervisor can't ride with you to insist that you drive at a reasonable speed, but you should drive as if he were with you.

In two of the accidents, someone else was in the wrong, someone driving a heavy car. But, if someone smashes into you and your MG with their heavy car, you're generally in no position to worry about who was at fault.

Having driven a Porsche for the past ten years, I'd say the only answer to this problem is DEFENSIVE DRIVING. Altho many times I've had people deliberately place me in danger, more often they've done it unintentionally. The small size fools them into thinking my car is further away than it actually is—or they don't see it at all. It didn't take many trips onto the shoulder to teach me to expect other drivers to come at me head-on while they were trying to pass, or to pull out in front of me. I also learned to never, never drive alongside another car—much less alongside a bus or truck, on a multi-lane road. Most have their mirrors set too high.

Fortunately, the little cars are exceptionally nimble and have superb brakes but many of us get into the extremely dangerous habit of cutting safety margins so that we NEED the better brakes and faster steering. This is asking for trouble. Give yourself plenty of margin, as much as you once reserved for Detroit Iron, and you'll stand a better chance of surviving—but more important, resist the temptation to open her up to clean out the plugs, or to show off.

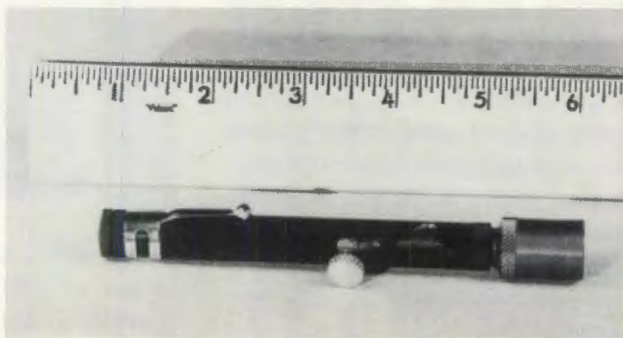
Incidentally, four TAC people have died on motorcycles this year—essentially they made the same goofs the sports-car-set did . . . nuff said?

things to come

Photos Courtesy of Photo Lab Det 2 - 4444th R.T.S.



5½ inches of good signaling



One to zero by Braille.

Ever try carrying the regular day-night flares in your G-suit pocket? At times it's a bit rough on suits and legs and besides; they weren't meant to be stowed that-a-way.

Check the photos for a pen-type rocket flare gun that's about to be purchased by the Air Force. At present it's being evaluated by an Air Force-Navy board with the idea of bulk purchase. TAC PE is pressing for an attachable, floatable, bandoleer arrangement to hold the gun and flares for each ejection-type crewmember. They also want them in survival kits.

We've fired the little jewel and think it's AOK. You like maybe? Well, don't rush down to BEMO and expect to draw one right now . . . patience, lad.

Also shown is the zero lanyard coupler. One like it should be available soon, but, not until it's modified to a UR proof item. It should be a boon to us one-armed fighter pilots on nite and weather formation penetrations. Here again . . . patience. Money for purchase is earmarked.

TEMPERAMENTAL TURBINE

BY CAPT WALTER BOSTWICK
F.S.O. HQ TAC OFFICE OF SAFETY

ALL OF US practically grew up with reciprocating engines and it's easy to establish some sort of rapport with a rattle-bang-wheeze type machine whether it's in an automobile, motor scooter or an aircraft. But a jet engine is a different breed of cat. Although most pilots have a speaking acquaintance with a turbojet's innards, it is still an impersonal piece of machinery. Since a lot of you will spend a considerable portion of your lives depending on the good nature of a single jet engine, this article will try to help keep you and your engine friendly forever.

Basically, the jet engine has a cold section and a hot section. As long as the cold section stays cold there isn't much you can do for it, so don't worry. Now the hot section, as you may have guessed, is hot. Just how hot is important so remember these three temperatures:

Hot.

Too hot.

Gone (when the hot section is gone, the best thing for you to do is follow it).

There are a few things you can do for your hot section, and this is the part we'll discuss.

Engine manufacturers would like to make hot sections hotter. If the maximum allowable EGT can be raised, the thrust to weight ratio will go up accordingly, and a good thrust to weight ratio sells engines. Almost every component



of Air Force aircraft has a safety factor of 50%. For example: If maximum allowable G's are 7.5 you can probably pull about 11 before the bird comes completely unglued. This isn't the case with turbine blades. If max allowable EGT is 700C, and you try to get 1100 for any length of time, you'll reach the aforementioned "GONE" long before the sweep hand orbits your watch. Until turbine blades are made of Unobtainium*, engine operation is going to be primarily limited by temperature.

Let's look at a typical hot section failure. When a turbine blade fails for any reason, the turbine loses efficiency and slows down. The fuel control can correct the change in RPM only by adding fuel, and this in turn raises the EGT. The increased EGT then

**Unobtainium - The material you can't possibly do without and absolutely cannot get.*

induces failure of more turbine blades, then stress rupture and burn off of all the blades results. This sequence of events can happen in just a few seconds. With any luck at all you can get the fire out and bail out at your convenience.

There are several types of hot section failures and many causes for each. You should know a little about all of them.

CREEP FAILURE: When a heated metal part is stressed, it stretches, and after some finite time period, it will fail. The time to failure will vary with the material, the stress and the temperature. It is because of CREEP that operating time limits are established for hot section rotating parts. These time change criteria are based on the temperatures that are expected to occur within the engine. Every time these temperatures are exceeded, more creep damage results than was

programmed. The key factor about CREEP is that all damage is cumulative, and that after a given amount of CREEP the part will fail.

STRESS RUPTURE: Stress rupture is kind of like "Instant Creep," and results from short-time, high temperature operation. Dramatic is probably the best word to define the results of Stress Rupture. It generally stems from some failure or malfunction in the engine.

THERMAL SHOCK STRESS: When temperature variations are rapid and extreme, expansion and contraction within the parts will be uneven because the cross section area of each part varies in thickness. This causes internal stresses that in turn cause cracking and distortion within the part.

FATIGUE: Vibration and variations in the loads which are imposed on engine parts cause fatigue failures. Fatigue generally will start at a small stress concentration, such as a nick in a blade, and grow into a large crack. Temperature variations will speed fatigue growth and subsequent failure.

Now that you know some of the horrible things that can happen, how do you prevent them?

It's up to the fuel control to control your RPM and EGT, but face it, fuel controls don't work right all the time. Engine overspeeding (which will also affect creep thru increased stress) really isn't much of a problem these days, and RPM requires only cursory attention. Temperature variations are common and it will pay your insurance premiums to keep one eyeball aimed at the EGT gage. Here's where you normally get problems:

Start - Any start will cause some thermal shock and hot sec-

tion parts are designed to withstand it. However, hot starts are pretty grim and if the temperature is just a "little bit" over the max allowable, don't forget it, write it up!

Climb - It's easy to get a slight overtemp on climb-out and hard to monitor EGT when you're Green 16 in the weather. But it's the minutes of slight overtemperature that add up to creep failure at some later date.

Maximum Performance - When someone is just about to pull lead on you, and you have the throttle bent all the way forward, it takes real will power to check the EGT gage and pull back on the throttle. It's a lot better to lose a peacetime rat race than to fly a 30,000 pound century-series glider.

Compressor Stalls - Even the frequent chugs and occasional bangs that don't cause any change in EGT are really rough on the engine. A suave throttle technique will prevent most compressor stalls and taking rapid action to slightly reduce power will stop those that sneak up on you.

All of this boils down to a few simple facts and procedures:

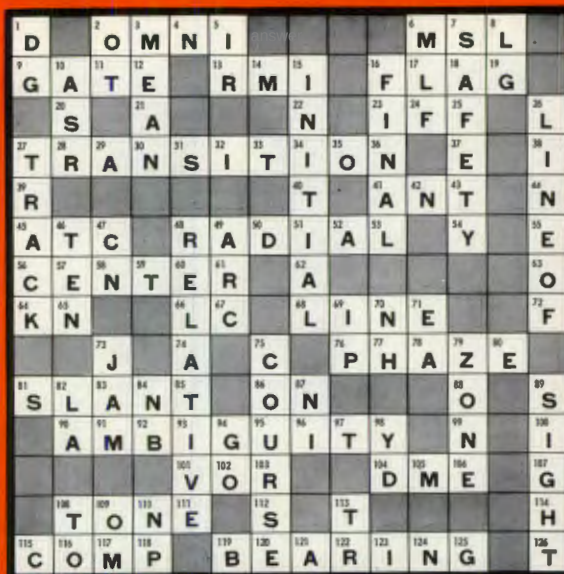
* High exhaust gas temperatures will result in engine failure.

* You must make every effort to keep EGT within limits.

* Each time temperature limits are exceeded, even momentarily, write it up.

* If you eject, the odds are about 9 to 1 that you'll survive. These are pretty good odds, but remember you can only lose once.

Answer





MAINTENANCE MAN OF THE MONTH

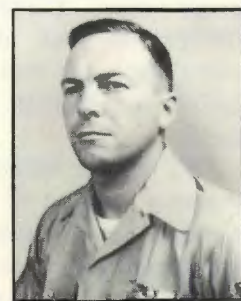


Staff Sergeant Fredrick C. Bell of the 431st Air Refueling Squadron, Biggs Air Force Base, Texas, is selected as the Tactical Air Command Maintenance Man of the Month. His resourcefulness has enabled him to fabricate numerous special tools and equipment for the field maintenance section which have increased unit effectiveness. Among these are a reciprocating engine buildup stand which permits the engine to be easily suspended and rotated, and a jet engine test stand with a mobile fuel supply. This unit received favorable publicity in a well known service bulletin.

Sergeant Bell's initiative and his outstanding ability to accomplish difficult tasks expeditiously and dependably are valuable contributions to the maintenance effort of his organization.

RECOGNITION

CREW CHIEF OF THE MONTH



Technical Sergeant George H. Canfield, Jr. of the 464th Troop Carrier Wing, Pope Air Force Base, North Carolina, has been selected as the Tactical Air Command Crew Chief of the Month. As Flight Engineer on a C-123, Sergeant Canfield inspected the tires through the gear pin access door, after several touch and go landings and found he could not rotate the right wheel. He removed the gear access door but was still unable to turn the wheel because the brake assembly was frozen.

Radio contact was established with the Chief of Maintenance and a hydraulic specialist. Suggestions were relayed to Sergeant Canfield who volunteered to enter the wheel well through the 17 X 11 inch access. After considerable time and effort inside the well, without parachute or headset, he remedied the situation.

Sergeant Canfield demonstrated a high degree of professionalism and devotion to duty under dangerous conditions and undoubtedly avoided major damage to a valuable aircraft.

Pilot of Distinction



Major Matthew R. Biggs of the 463d Troop Carrier Wing, Langley Air Force Base, Virginia, has been selected as the Tactical Air Command Pilot of Distinction. Returning from a night mission in a C-130, Major Biggs found he could not lower the nose gear. The discrepancy was a

broken fulcrum arm on the gear actuating cylinder which allowed the gear to rest on the wheel well doors. Emergency action for this type of gear failure was not covered in the Dash One; however, he had previously noticed that when another C-130 aircraft slowed to airdrop speed, its nose wheel doors opened and the gear started to extend, only to retract again. With the concurrence of his wing commander, Major Biggs climbed to a safe altitude and slowed the aircraft to drop speed. The gear doors opened and the nose gear extended and locked. A normal landing was accomplished.

Major Biggs' excellent knowledge of his aircraft's systems, coupled with his keen observation, enabled him to avoid a major accident and save the Air Force a valuable aircraft.

TAC TALLY

A COMPARISON OF TACTICAL AIR COMMAND ORGANIZATIONS

MAJOR ACCIDENT RATE 1 JAN - 31 AUG		
TYPE	1963	1962
ALL	11.5	14.0
F-105	37.4	42.0
F-104	31.9	32.4
F-101	20.9	19.4
F-100	12.1	18.4
F-86	0	78.4
F-84	25.1	17.4
B-46	0	0
B-26	10.7	40.6
T-39	0	0
T-33	0	4.4
T-29	0	23.0
KB-50	0	13.2
C-130	1.7	0
C-123	5.8	11.7
C-47	0	6.6
U-10	14.9	105.2
T-28	34.5	0

AUG TALLY GUARD AND RESERVE		
UNIT	MAJOR	MINOR
514 TCW	1	
102 TFW	2	1
123 TFW	1	
127 TFW	1	

ACCIDENT FREE (MAJOR & MINOR)			
JET			
ACTIVE	MONTHS		ANG
355 TFW	12	8	108 TFW
388 TFW	10	7	121 TFW
CONVENTIONAL			
ACTIVE			RESERVE
516 TCW	19	81	434 TCW
463 TCW	27	32	435 TCW

AUG TALLY ACTIVE UNITS		
UNIT	ACDNTS*	INC DTS
4 TFW		8
12 TFW		1
15 TFW		2
27 TFW		1
31 TFW		16
354 TFW		18
355 TFW		9
388 TFW		4
401 TFW	1	7
474 TFW	1	1
479 TFW	1	7
TARC		2
4510 CCTW		30
4520 CCTW		16
516 TCW		2
314 TCW	1	2
463 TCW		
464 TCW	1	
4505 ARW		2
4442 CCTS		
SAWC	2	3
363 TRW		6
839 AD		1
831 AD		5
366 TFW		10
836 AD		6

TAC Tally

*MAJOR AND MINOR

In August the regular and reserve forces split the bill with five major accidents each. But, the regulars took the lead with two minors against one for the reserves.

Regular forces lost one T-28 which was crash-landed after its engine failed. The pilot suffered major injuries. The nose gear of a YC-123 sheared during an assault landing. A C-130 ramp door was damaged on a ground proximity extraction. Number two aircraft, an F-100D, split-s'd out of night formation and crashed. The pilot was killed. Another F-100D crashed 700 feet past a rocket target, for another fatality.

The reserves lost an RB-57 and pilot because the control yoke and ejection trigger stowed after an inadvertent canopy jettison. Another RB-57 crashed on takeoff, for an undetermined reason, fatally injuring both crewmembers. After three flameouts, an F-86H pilot set up a pattern for a drag strip. The pattern was not successful; the ejection was. Another 86 pilot sacrificed his right wing to the target tow bar, ejected and was rescued by a fishing boat. A C-119 crew crash-landed after they lost an engine and jettisoned their cargo. One crewmember received major injuries. The pilot forgot the cowl flaps on the dead engine.

In the minor league, the regulars damaged the horizontal stabilizer on an F-104 during a tactics mission and collapsed the nose gear of a C-123B on an assault landing. A reserve F-86H received damage in the main fuel cell when a starter turbine disintegrated. The trend? Upward!

THERE ARE MANY INSTANCES OF MISSED APPROACHES, DIVERSIONS AND MINIMUM FUEL CONDITIONS WHICH RESULT FROM RADIO FREQUENCY INTERFERENCE AND CONGESTION!

Princess ANN

THE MODERN LONG RANGE, SHORT ENDURANCE JET AIRCRAFT REQUIRES A SWIFT, ACCURATE AND ALMOST INSTANTANEOUS COMMUNICATIONS SYSTEM

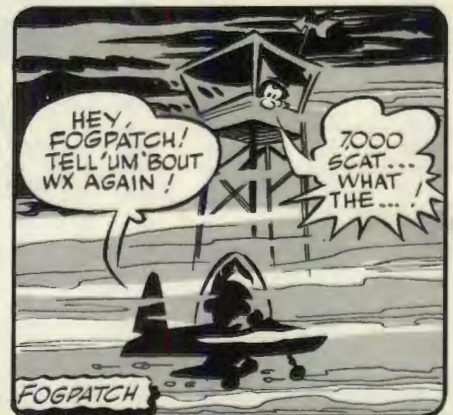
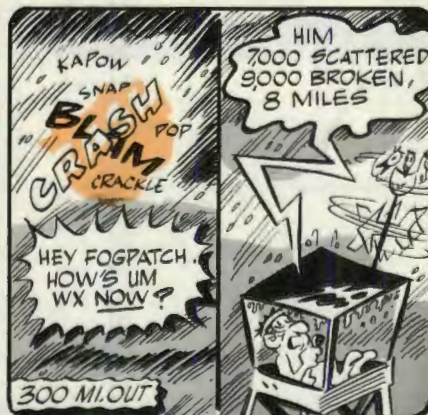


THIS COMPLEX EQUIPMENT MUST BE IN PERFECT WORKING CONDITION AT ALL TIMES. GUARD OR EMERGENCY FREQUENCIES MUST BE AVAILABLE WHEN NEEDED— SOME LIVES MAY DEPEND ON IT!

BUT THIS IS NOT ENOUGH!



DESPITE CONTINUOUS IMPROVEMENT, THERE IS STILL A GREAT NEED FOR GROUND PERSONNEL TO KEEP PILOTS INFORMED OF WEATHER CHANGES AT THEIR DESTINATION WHEN CONDITIONS DETERIORATE!



REMEMBER, AIR AND GROUND COMMUNICATIONS ARE FOR YOUR SERVICE, BUT YOU HAVE TO COMMUNICATE TO COOPERATE!

TSGT HIRSCH 10-63