

DAP-PC

JULY 1964

TAC ATTACK

TAC Attack July 1964 TLC for Safety



T. L. C. FOR SAFETY



TAC ATTACK

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COVER PHOTO

A model of the F-111 with the wings in the GO position.

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*Whatsoever thou takest in hand, remember
the end, and thou shalt never do amiss
—Ecclesiasticus VII.36.*

Angle of Attack



Colonel Eugene S. Williams
Chief of Safety

Desert Strike is now history. Every ops plan for this operation contained the usual caution about not compromising safety to accomplish the mission. Clearance minimums for simulated strafing passes were set at 200 feet . . . high enough to be safe, yet low enough to be realistic.

Before the operation started, General Sweeney sent a message to all commanders stressing the importance of keeping every phase of the mission safe and to keep the statement, "Safety will not be compromised" from becoming a trite slogan. He specifically warned against pressing simulated attacks to the extent that pullout minimums would be violated.

I am certain all commanders stated and restated this policy to their aircrews, yet during the operation one F-100 pilot flew thru some wires, another was killed when he flew his aircraft into the ground, and ground observers reported many instances of minimum altitude flying.

There can only be one answer . . . lack of self-discipline. No competent fighter pilot is going to hit the ground or fly low on this type operation unless he is deliberately pressing below the minimums.

For years, those of us who have been with fighter aviation have worked to convince the public and the rest of the military that fighter pilots are serious, determined, and dedicated professionals. And most of them are. However, an irresponsible few take advantage of freedom from direct supervision which is characteristic of our trade, and proceed to undo all of this work. We have them to thank for each new restriction that is placed on our operation.

What are your Intentions?



PLODDING ALONG on a cross country last summer in the two seat Shooting Star, we discovered the heading indicator was out. No real problem, every-

thing else looked good and we pressed on by keeping the CDI centered as we passed from one VOR to another. Destination was in the Southeast and, as usual, the

forecast read "thunderstorms in the area." Since there were quite a few bumpers in sight, we told the center of our trouble and asked for vectors around them plus a no-

gyro letdown and GCA. Sure is great having all these modern conveniences . . . radar to help you get down and to keep you out of those big bad thunderbumpers. Really beats the old bird dog and prayer technique.

A check with Metro painted a reasonable picture . . . there was a thunderstorm over the field and it was about 200 and a quarter in hard rain, but radar showed it was moving off and there were no more in view. A pretty standard summertime situation. We held off our approach until the weather was up to 1000 and three. As we passed 15,000 on our penetration, I noted that we no longer had enough fuel to make it to our alternate. The weather was solid, but smooth, and I was relaxed and enjoying that "No sweat, I'll break out soon" feeling. But, when we leveled off on a base leg and were still in thick clouds and hard rain, the flight lost a little of its glamor. Turned on final . . . still in it . . . four miles, three . . . two . . . one . . . nothing but dark grey and then the controller's voice lost its calm and I heard, "The field is below minimums. Take it around. What are your intentions?"

Fortunately my next comment didn't go out on the UHF or the FCC would still be after me. Intentions? Good question. There was an Air Force base about 40 miles away, so we decided to go there. "How's the weather at Studentsville?"

"They are closed."

"How about the municipal airport?"

"They are above minimums. Would you like a vector to intercept the ILS localizer?"

"Rog . . . give me the ILS frequency and final approach course."

Obviously we made it, but if you have never tried a no gyro ILS in

a thunderstorm, don't. As I pried my fingers off the stick, I remembered what a scrawny old fighter pilot had once told me. "Son," he said, "if you want to live a long time in this flying business, remember there are a few people who are trying to kill you . . ." Since my own goofs had helped make a bad situation worse, I decided to get my 20-20 hindsight working and see just what had happened.

First, pressing on without a compass when I knew there were thunderstorms in the area was stupid. Then, milling around waiting for the weather to improve was equally dumb . . . although I had an alternate, I let myself become mentally committed to land at my planned destination. About the only smart thing I had done was to check over the area and have a couple of bug-out airfields in mind.

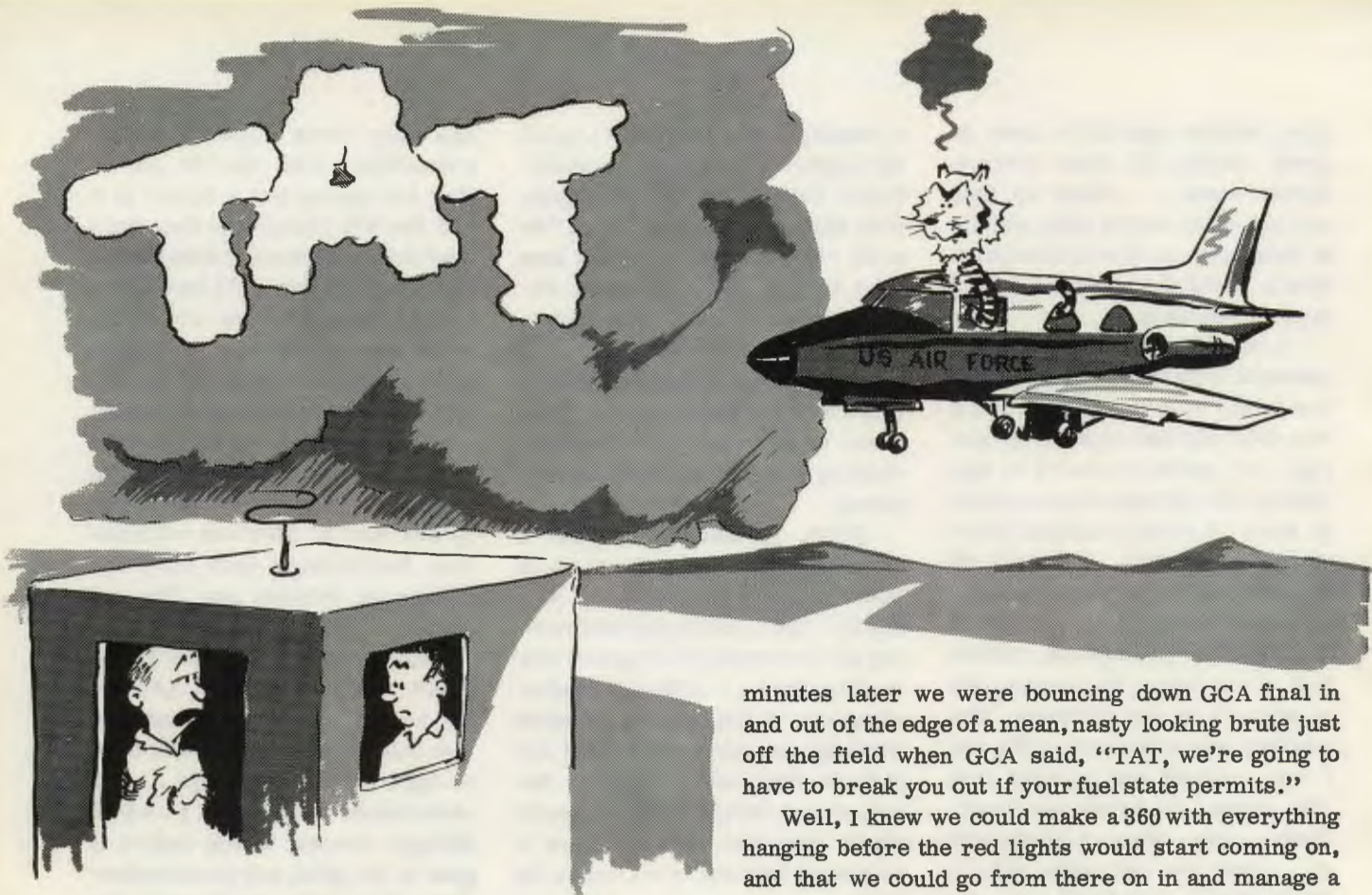
Then the weather man, and our friends who are supposed to pass weather info to the pilot, took a shot at me. Although they couldn't do much about the weather going sour, a little extra effort on their part would have given me the word before I got on GCA final. It was pretty obvious to me the field was below minimums when I reached minimums and couldn't see the runway!

The controller got on the firing line next. Studentsville being closed had caught me off guard. Just the day before, a Saturday, I had seen transient maintenance troops at the TAC base where I had RON'd working like mad on some of Studentsville's little birds. I had talked to some of the pilots at the club and they said Studentsville flushed a whole covey out every weekend. So, I called to check on things and found that the weather had been VFR and

that they were closed only to transients. Now there's closed like the runway has a crater in it and there's closed like they don't want to spend money on transients. One thing for sure, if I had known why Studentsville was closed I would have opened it in a hurry. A safe landing and a violation is a hell of a lot more fun than busting minimums without a compass! I didn't ask the controller why the field was closed and nothing required him to offer the information, but it might have made the difference between my life and death.

My old fighter pilot friend didn't really mean what he said, but he had a point. Weather men live only to help you, but they have to fight a lot of hardships . . . an observation has to be passed through several hands before it gets to the pilot, and most weather shops I've seen are hurting for people. And the controller's every action is regulated. He has neither the authority nor the experience to pass suggestions to the pilot or to modify the facts with explanations.

The point to remember is to be suspicious of everybody and everything. Think of the many minor mistakes you make in every flight - airspeed off a few knots, a few seconds off on target time, a landing 500 longer than you want. If you make mistakes regularly, it's pretty obvious that nearly everyone will make some too. Air traffic controllers are human and may overlook important bits of information. Above all, don't forget that all support people work for you, the pilot. You may not win many friends among weather men and controllers, but it's better to be a disliked old man than a popular corpse.



... he says he'd rather fight than switch.

DESPITE A DELAY getting off and the usual headwinds going west, we arrived at a bomber type base with a reasonable amount of fuel sloshing around in our tanks. Center held us at altitude until we were right on top of our destination, then passed us down into the low altitude structure on a radar vector to a GCA final. They promised to keep us clear of several thunderstorms sulking around the perimeter of the field. They did, too.

Being old and suspicious, we had TACAN tuned in and were keeping fair track of our approximate position. After a bit, the controller cleared us from 6000 to 4000 and mentioned he was spacing us behind other IFR traffic. We were over 20 miles from the TACAN and headed out on a tangent ... humm. "Roger, understand we're cleared to 4000, departing six this time ... ah, how long do you think it'll be before you have us on GCA final?"

"Oh about 20 or 30 minutes."

Yike! We can't hack that. "Be advised we only have about 15 minutes fuel left at this altitude."

"Stand by one!"

It pays to be suspicious. But that wasn't all. After rearranging his plans, the controller dropped us to a lower altitude and handed us over to GCA. Some

minutes later we were bouncing down GCA final in and out of the edge of a mean, nasty looking brute just off the field when GCA said, "TAT, we're going to have to break you out if your fuel state permits."

Well, I knew we could make a 360 with everything hanging before the red lights would start coming on, and that we could go from there on in and manage a closed pattern with almost enough fuel to taxi ... BUT who wants to play that kind of game with thunderstorms in the area? "Ah negative, fuel doesn't permit."

"TAT, unless you declare an emergency, I still have to break you out."

If I declared an emergency, I'd have to write up an explanation. He still hadn't said why he wanted to break me out. I thought of the four passengers riding this one out ... "I am declaring emergency fuel." There! Try blackmailing someone else! The next morning I whipped out a real quick letter to the boss. It took me about 15 minutes ... much, much, less time than it takes to write out a statement for an accident board.

THUMBED THRU last month's effort to see how it came out and am still looking for my store bought teeth. You find the darndest things in this flying fish wrapper. As a matter of interest, I made a rather quick check with the people in personnel, but they don't have me on their lists to South you-know-where, or any other place ... therefore, rumors to the contrary, you lads are still stuck with this moth eaten tiger for awhile. Sure I'm sure. In a moment of panic, I even checked the obituary section of the Air Force Times!

A YOUNG TIGER from another command . . . another command my foot, he was from another branch of the service . . . was dashing along in an F-4 on a TACAN approach. Shortly after entering the clouds at 8000 feet, 250 knots, with pitot heat on, his trusty RIO in the aft seat of the beast said, "Check airspeed."

Airspeed was 220 knots.

A few moments later the RIO said, "Check airspeed."

This time it was passing thru 150 knots. The pilot added power to full military, noted the attitude gyro indicating 7 degrees nose up, wings level. Vertical speed was 100 foot per minute climb. When the airspeed reached 80, the RIO ejected! Just like that. The son of a gun didn't even say goodbye!

When the airspeed hit zero the pilot did likewise. Good grief, Charlie Brown . . . reminds me of the Air Force lad who punched from an F-84 after sunlight hit the fire warning light and made it sparkle.

About three years ago one of the T-bird types here at Langley lost his complete pitot static system during a letdown but managed to sneak under a 1000 foot overcast by holding known power settings. Airspeed, rate of descent and altimeter were all inoperative.

Not long ago Lt Danny Michales, a good head navy type, helping us blue suiters fly Phantoms down at MacDill, was on an IFR flight when he noticed the TAS start to decrease. He checked mach, it was decreasing too.

He upped power to 100% but airspeed continued to decrease. He rechecked pitot heat. It was still on. All else looked normal, so Danny checked the angle of attack. It seemed normal, at about 5.5 to 6 units. He throttled back to the normal cruise power setting and held 7 units angle of attack. In the holding pattern he flew 9 units, with 8 during penetration.

Passing 5000, airspeed returned to normal. If it hadn't he would have continued to use angle of attack readings, switching to the indexer for final approach. Good show.

At times it takes good headwork to remember that more than one instrument in the cockpit can give reasonably fair indications for the same thing. It pays to learn the full capacity of each instrument, and its readings during most phases of flight.

Along this line, I flew with a troop the other day who has learned this lesson well. On one leg of the flight - in actual weather - he fitted an old form 21a over the flight director so it covered everything but the needle and ball.

He flew rather well that way . . . and eventually pulled out another form 21a and put it over the slave gyro compass set up. He did right well staying on course using nothing but the old mag compass, needle, ball, airspeed, and rate of climb.

Then TAT had a go at it . . . time to change the subject!

ACCELERATING THRU 290 knots a One Oh Wonder pilot found his bird in a violent left yaw with the rudder locked hard over. He pulled the bird up to 3000 feet and slowed it down. As airspeed dropped below 290 the rudder returned to neutral. He held the speed below 290 knots, burned out fuel and made an uneventful landing.

A hydraulic specialist installed the rudder feel cylinder backwards and compounded the error by not following the TO properly when he checked out the system.

The pilot, bless his professional hide, had read about a similar incident that occurred several years ago and remembered what to do.

Yup, the first incident was caused by the same Murphy. See, it does pay to read safety magazines!



ONE OF THE ATTACK artists ended up helping to chart Desert Strike and if this issue reaches you on time you can thank the hard working troops at the TAC Printing Plant for a herculean effort.

He came in bright and early this morning, well tanned and full of stories about rattlesnakes. Someone asked, "How did you get back?"

"On one of our C-130s, with two jeeps and about 24 others."

"Jeeps?"

"No sir, troops. By the way, what would you think if a pilot told you that a prop was acting up and that he might have to feather it and land before getting to where you were going?"

"Was this on the passenger briefing before takeoff?"

He nodded.

"Well it couldn't have been serious or he wouldn't have taken off ... or he shouldn't have ... but to answer your question. I certainly wouldn't include that in a passenger briefing."

"Well, I don't think I would either. I was sitting next to a non-rated lieutenant and every time the engine sound changed he'd jump up and go look out the little window. I know he didn't know what he was looking for, but he looked anyway. He got sick, too ..."

Aircraft commanders could do well to remember that a lot of people in the Air Force have little more than a nodding acquaintance with aircraft ... don't worry them needlessly by telling them of minor malfunctions. If the malfunction is serious enough to warn them about it, then it should be fixed before takeoff.

A TAC F-100 TROOP went dart hunting one day in May, but much to his surprise and right before his eyeballs, when he turned on the gun safety switch three rounds went whistling out into space. He didn't have the trigger depressed ... in fact, when he did depress it nuthin' happened.

Back on the ramp a trouble shooting crew found that the shooting was caused by two each loose washers and nuts that had stumbled their way into an electrical terminal board. Searching further, they found the firing anvil on the fired gun had shorted out after three rounds, keeping it from firing any more. Needless to say, the dart got away.



... I pointed them just like you said.

This little episode underscores the wisdom of having your bird pointed at exactly nuthin' when you turn on the gun switches. It also underscores the need for keeping loose material in trash bins instead of leaving it to float around in our airplanes.

MOST OF US who fly high in the sky don't sweat thunderstorms too much even when the weather wag calls for a moderate amount of activity. No problem, at altitude you can usually see plenty of ways to sneak around 'em ... unless at night or caught in a high cirrus deck. In that case we just get the controller to vector us around 'em.

'Course, one of the troops in the office came back from a haul complaining because the controller tried to vector his letdown right into the center of the only gnashing smashing brute in the area.

I, for one, rationalized, figuring this to be an isolated case ... then an incident report came across my desk on a T-39. The type of machine doesn't matter, since the wrong kind of thunderstorm can play hail with the toughest of 'em.

Anyway, this T-39 type was cruising blissfully at 28,000 in a cirrus deck after being told by one center to expect vectors around storms. When transferred to another center, he checked and the other center reported they were not painting any thunderstorm activity. However, the little liner soon bumped into heavy rain followed by hail and two severe lightning strikes. The pilot's windshield shattered and there went cabin pressure and all semblance of tranquility.

After making an emergency descent they limped to a nearby airbase and contacted the watch supervisor at the center. He explained that the center was controlling traffic on beacon mode and that the radar WON'T PAINT WEATHER ACTIVITY WHEN OPERATED ON THIS MODE. No wonder they were not painting any storms!

Next time you expect thunderstorms and ask a center if they have anything on their scope ... also ask if they have their set on normal mode, which is the only mode the scope will paint storm activity.

FOR QUITE SOME TIME the good heads in SEG have been hammering away on dash ones, forging them into more effective tools of the trade. This tiger has been one of the more enthusiastic observers of this program. I particularly appreciated the way they chopped the fat out of the BOLD FACE emergency procedures. Most, as you know, are now within reason and a knowledgeable pilot can remember and follow them under the stress of an emergency.

The latest improvement complements the streamlined BOLD FACE procedures and is designed to give a pilot better knowledge of everything that can affect each emergency so he will be better able to judge courses of action. This, I think, is a marked

vote of confidence in those of us who fly.

In essence it says, "Look, we realize that your brain is more versatile than the best computer our engineering talent has been able to come up with. We want to make full use of that brain, and make full use of YOU, particularly when multiple emergencies come up. For this reason we are going to list all the factors we can think of which affect the more serious emergencies and then rely on you to evaluate the situation, make decisions and take action."

And that is exactly what they did. In the last F-105 dash one they listed the factors affecting serious emergencies as part of the discussion. In addition, they defined, "land as soon as possible," "land as soon as practical" and "jettison as required." These are pretty good definitions, and since all of you don't have access to the '105 dash one, I'll give you a rundown.

JETTISON AS REQUIRED...if the pilot thinks external stores will compromise handling characteristics, he should jettison tanks. Normally, empty drop tanks do not adversely affect handling characteristics and may be retained.

LAND AS SOON AS POSSIBLE...land the aircraft without delay at the nearest suitable airfield. Reduce gross weight by jettisoning external stores.

LAND AS SOON AS PRACTICAL...burn out excess fuel and land after getting the bird below maximum emergency landing gross weight.

Incidentally, more recent dash ones now have section three arranged in a more logical sequence. Starting emergencies, takeoff emergencies, inflight emergencies and landing emergencies in that order.

Anyway, 'tis a tip of TAT's old hard hat to SEG... uh, now where in thunder did I put that fool hat?

CAPTAIN BILL ACKER from down at MacDill, picked up a T-bird fresh off the mod line for rocket seats. He arrived home after dark, entered traffic and put down the alighting gear...well, he tried to put it down but was only a tad over 66 per cent successful. The nose gear was reluctant.

Bill recycled the gear three times, then tried the emergency extension. The nose gear still failed to show safe. It was too dark to see anything from the tower and he didn't have enough fuel to wait on the foam treatment. So with crash equipment standing by, he brought the bird in and held the nose off until he had just enough control to ease it gently onto the runway. The gear held and he carefully brought the bird to a stop on the active. Someone tried to put in the downlock pin, but it wouldn't go.

Someone hollered to shut it down, but Bill refused... instead he asked them to stack spare tires under the nose to support it, and then shut down.

A 4-1/2" screwdriver shank was jammed in the linkage and hydraulic pressure was all that kept the nose gear from folding. Once the power was cut, the gear was free to swing. Good head, Bill, you know your bird.



It's only two bucks a day.

NOT LONG AGO we read a couple of OHRs on crew rest. Seems some C-130 crews were forced to sack out in transient quarters located on a well known Army base adjacent to the Air Force air patch where they'd landed after flying all night.

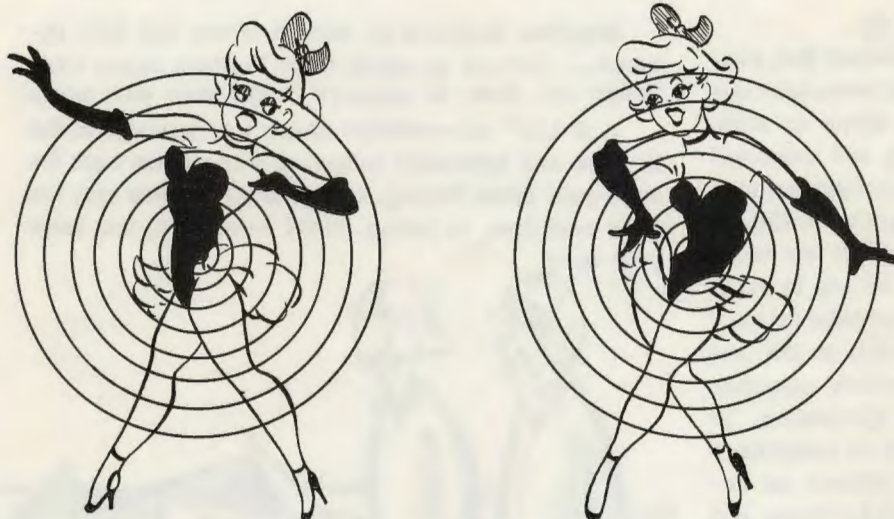
The quarters were like World War Two, with Army sound effects added. I've been quartered at the same place... a loud speaker starts full blast in the wee early hours and continues until late evening... troops count cadence right outside your window to make sure you stay awake as long as they are awake, whistles blow, people come in and out of the open bay barracks and shake it from stem to stern. In short, it fits Sherman's description.

All this would qualify as minimum adequate back in the Big War. In this day and age it doesn't hack the program. Back in the Big War we did most of our flying in the daytime or early evening... we didn't try to ignore the clock. What would be minimum satisfactory in World War Two is completely, hopelessly, inadequate for a 24 hour operation.

The people who own this base, and many bases with similar facilities, often classify such quarters as adequate. However, commanders of units who launch aircraft into these places have the authority to say, "for your people perhaps, but not for mine," and then authorize their people to find quarters off base.

We keep telling our people they are professionals... I think we should treat them like professionals.

—TAT—



TWIN TORNADOS

BY CAPT JAMES W. HAERER TAC Office of Safety

MOST PILOTS have heard of prop wash or jet wash and have a certain amount of respect for it, particularly if they happen to be flying a light aircraft. Actually, the hazard is misnamed. Air spills off the wing tips in a circular pattern to create twin tornados that are the source of most of the disturbed air behind an aircraft in flight. So instead of prop or jet wash, it is the wing tip vortices that creates all the excitement. Last year, these tornados caused accidents that destroyed a U-3B and U-6A in one command. And, at the risk of shattering the complacency of some big machine drivers, let's see what has happened this year.

A highly qualified TAC bent-wing pilot was number three in a VFR landing pattern when visibility was limited by a rain shower. In an attempt to keep the field in sight, he ended up too close behind the number two man on his final approach. 'Bout 2000 feet from the runway, he encountered turbulence from the wing tip vortices and his aircraft was forced into

the ground despite all of his attempts to control it. The aircraft was destroyed but the pilot climbed out of the wreckage unhurt.

Another well qualified TAC aircrew encountered this phenomenon during a formation troop drop. While attempting to maintain position on the left wing of the lead C-130, the pilot allowed his aircraft to drift into the wing tip vortex of the lead aircraft. This caused a sharp roll to the right which he was unable to correct with full opposite aileron and rudder. Suspecting a stall, he let the nose drop and added full power and full flaps. As the aircraft dropped out of wing position, the vortex continued to shove the right wing down and pushed the aircraft across and under the leader and right wingman as they were dropping two sticks of paratroopers. Four men were killed and two more injured before the frantic crew could bring their machine under control.

The wing tip vortices are a real problem for all pilots. As we've

indicated, they are a pair of counter rotating horizontal tornados that extend aft, down and slightly outward from the wing tips. You've seen a hint of their existence when you've pulled streamers off your wing tips during a hard turn on a muggy day. They are caused by high pressure air on the bottom of the wing as it attempts to escape around to the area of lower pressure above the wing. As the aircraft moves forward it stretches this end-around movement into a high velocity spiral that gets larger and slower as it is left behind by the aircraft.

The intensity increases with increases in angle of attack, speed and wing loading. The granddaddy of all would be behind a heavily loaded century bird pulling max G at max speed. However, the big problem really appears on the other end of the spectrum at the low airspeeds (where angle of attack is high) of the landing pattern.

There are three reasons. An aircraft that encounters vortex turbulence at low airspeed has less control available for countering the rolling moment. Airspeeds in the pattern - especially with fighters - are generally slow enough that heavy turbulence can cause one or both wings to stall. This is further aggravated if the aircraft uses spoilers for roll control. Last, there is usually limited altitude left for a recovery.

On a calm day, the wing tip vortices can linger for quite some time after an aircraft has passed. If a light breeze is blowing, it can cause the lingering turbulence to drift. Calm or not, the best way to stay out of these twin tornados is to take adequate spacing... and remember, the other guys thought it wouldn't happen to them too.

COFFIN CORNER



Rocket ejection seats are here to stay...the F-84F, F-100 and F-104 are fully equipped, and testing is complete on the F-105. Most pilots watched the evolution of the rocket seat eagerly. The RAF demonstrated a zero altitude ejection and the US Navy had many saves when their pilots punched after having trouble on a carrier. Whenever the Air Force had a fatal low altitude ejection, the board invariably recommended immediate installation of rocket seats. Somehow, while we were waiting for the rocket seat, the seat took on the air of a cure all. The phrase "Zero Altitude Capability" became common and the movies of the sled tests demonstrated beyond any doubt that it was possible. Safety of Flight Supplements were published and many briefings given, all saying about the same thing: Zero altitude ejections are possible.

They are possible, but current statistics indicate they aren't always successful. This is because an ejection is a highly complex bit of business. You might have to grope for the ejection seat trigger, the automatic seat belt or butt snapper might malfunction, or you may be in a poor position when the chute starts to deploy . . . any of these things can fatally delay your ejection sequence.

On some emergencies you will have little choice. For instance, if your engine loses all thrust on take-off and you are too low to even think about an air start and can't hope to snag the barrier or slide to a stop on reasonably smooth ground, you'd be foolish if you didn't eject immediately, regardless of altitude. Under such conditions, an ejection is your only hope. The rocket seat gives you a chance to make it. And the sooner you go the better. As a matter of fact, two TAC troops proved this just recently. They ejected at about 150 feet after the engine of their F-100F failed on takeoff. Both made it.

Yes, the seat is good. But don't try to prove it if you don't have to. Occasionally a report will come in where a pilot is faced with an emergency that calls for ejection and the ejection fails to save him. Too often, the ejection failed because the pilot procrastinated . . . he stayed with the bird too long and shot his chances. We had one pilot who lost an engine on GCA final. At the altitude and configuration, he couldn't hope to get an airstart in time to prevent a crash. His choice of action was cut and dried, yet he paused long enough to call GCA and tell them he had an emergency! It was a fatal call. Even with the more capable rocket seat it would have been foolish.

It is impossible to write a set of rules for every emergency situation . . . but it is possible to make some general rules.

For example, generally speaking you wouldn't want to eject from an aircraft at 40,000 feet. However, if it was about to explode, or if you were unable to control it and it was about to go supersonic despite retarded throttle and open speed brakes, you could eject at that altitude.

Normally, you should make your decision and eject above 2000 feet if possible. However, if the emergency occurs below that altitude in an aircraft that won't hold altitude and your other choices of action look risky; it is better to eject than it is to wait for one of the alternatives to miraculously improve. Remember, even with the rocket seat, the area below 500 feet is still called coffin corner.



SEG NEWS

4450th Standardization Evaluation Gp.

Know your Stdn Evaluators

TSgt Cannon is a native of Boone, North Carolina. He entered the Air Force in June 1951 shortly after graduating from high school and received basic training at Lackland AFB, Texas. Sgt Cannon was stationed at Camp Kilmer, N. J. until June 1952 when he was transferred to Goose Bay, Labrador, for a fourteen month tour. Returning to the United States in August 1953, Sgt Cannon was assigned to the 3rd Aerial Port Squadron at Pope AFB, N. C., where he cross-trained into the loadmaster field. Pursuing this field as a career, Sgt Cannon remained at Pope AFB until June 1963 when he was selected as an SEG evaluator. Sgt Cannon was recently awarded the Air Medal for meritorious service performed as a loadmaster during missions conducted in the South Viet Nam area.



TSgt HERMAN C. CANNON

ANOTHER REMINDER!

When the wife asks you to stop by the commissary to pick up a few items, chances are you ask her to make a list! Then, when you finish pushing the basket down the aisles, you're pretty confident that you haven't forgotten anything. Just take a look at your desk and you will see other memory aids - the daily calendar pad, the list guides with phone numbers, the planning guide. If you're especially efficient, you'll have a notebook in your pocket that you use to jot down reminders.

Now then, doesn't it seem odd that the man who will not trust himself to remember a phone number or a half dozen grocery items will trust himself to remember over a hundred required items during his exterior/interior inspections? This may seem a lot

of trouble to go thru to prove a point, and perhaps it's not necessary for a lot of people to remind them again and again, but check lists are printed for a good purpose and they are important! Don't become a statistic!

HOW ABOUT THAT!!!

Even with all of the ingenious devices designed into the present day aircraft, man still is the most miraculous mechanism. Scientists tell us that in seventy years of life the average human eats over 100 tons of food and spends five full years just putting this food in his mouth. If his weight is average, every day his heart beats 103,680 times, he moves 750 major muscles, and utters an average of 4,800 different words.

The average person blinks his eyes 25 times per minute, and scientists say that each blink lasts an average of one fifth of a second. Thus, the pilot of an aircraft flying 400 miles an hour, during a three hour flight, flies approximately 100 miles with his eyes shut!

A human body can take a lot of punishment and still function. Man can get along without his gall bladder, spleen, appendix, and bladder; can give up one kidney, two quarts of blood, both eyes, and all of his teeth and still live.

It's tragic though! One accident can throw a monkey wrench that will stop this wonderful mechanism cold.

So you can see that every item on a checklist, every chin strap and every 1/2 second in the ejection sequence is an important part of the flight. Therefore, it is important that you know the capabilities of all of your equipment, its limitations and your limitations. This knowledge may be vital in order to make that next hundred miles with your eyes closed.

IF THE SHOE FITS - - - - - !

What seems to be the trouble in the written examinations area? A pointed question? - To be sure! A review of recent SEG visits shows that trouble does indeed exist - to the degree that entire units are being declared marginal and even unsatisfactory because of written exams! Now, we don't want to take anything away from units or individuals who consistently receive high scores on written examinations. Most people, for that matter, do just fine and are not having difficulty. Apparently, this problem rears its ugly head in one or two organizations at a time and causes the roof to fall in.

How does a failure rate of 66.6% strike you? In one unit, eighteen out of twenty-seven combat ready pilots who took a written, failed it! Pretty sad, huh? Digging further into the records, we found that a good percentage of the aircrews who failed their writtens failed, not because of bold face procedures as you may have suspected, but for overall low scores -- missing more than 15 out of 100 questions!

You know, before the StdN/Eval program altered the method of handling written examinations . . . in the "good ole days" if you like . . . crew members visited the StdN Boards once or twice a year to take written exams that contained questions which, for the most part, they had never seen before. As a matter of fact, too many of these written exams were made up from questions thought up by one or two people based on what they individually thought should be in

a particular test. Usually, for an uncomfortable period before the day of the exam, crew members dug into the books, scraped around for answers to problems they could not solve themselves, and in general, "sweated out" the written. That was the really tough way to get a written. But even then we didn't have failure rates that in any way approached the 66% figure!

With the birth of Standardization and Evaluation in TAC, SEG published master question files for each crew position and aircraft employed by TAC and stipulated that no other questions would be used for making up written exams for formal credit. The questions in these files were compiled from the suggestions of a great many individuals at a good number of bases. The majority of the question files have been in the field long enough to have all the dirty laundry thoroughly scrubbed, and represent the best questions available on any particular weapons system. Most organizations reprinted these question files, minus answers, as study guides and passed them out to all aircrews.

Grabbing the AFR 60-9 sledge by the handle, most units have been trying to hammer home the importance of memorizing bold face emergency procedures, not just so writtens can be passed magna cum laude, but so the procedure will be at an aircrewman's fingertips in case one of those bad times comes up.

So, what's wrong? The books are available, the questions to be asked are available, and supervisors are attempting to pass out the clue. What's the story about leading a horse to water?

Probably all of us, including this writer, have messed up now and then and put the mark in the wrong spot on the answer sheet or didn't read the question exactly right - but miss over 15 questions out of a 100? For gosh sakes! It looks like someone isn't doing his share, doesn't it? We consider the written examinations to be a departure point for assessing the overall knowledge of an aircrew. In a sense, the result of a written examination is an indication of the effort a man is putting into his job as an aircrew member . . . and if he flunks, you might well want to look at his performance in other areas. Failure not only indicates a serious lack of knowledge on the individual's part, but also indicates that he has failed to use tools placed in his hands; tools which were designed specifically to help him do his job. Let's face it, there just ain't no excuse for sumpin' like that!



CHOCK TALK

chock talk

SAFETY REMINDERS CAN'T BE OVERDONE

Many a busy supervisor finds it exasperating to learn that his instructions, apparently meeting ready acceptance by the workers at the time, are being ignored a short while later. If he tried to find the reason, he would be surprised to learn that it is not a case of obstinacy. They just simply forget.

Human personality is made up of so many contradictory forces and influences, we find ourselves slipping back into old ways of doing things without conscious awareness. We do things naturally and easily only thru ways that have become a habit. Psychologists tell us that it takes about seven years to firmly establish a new habit or to rid ourselves of an old one.

The supervisor who keeps these facts in mind, who finds new and interesting ways to tell the same old story, will be most successful in helping us form the safe habits we need.

—American Airline Maintenance Letter

THE ACCIDENT CHAIN

A couple of days after a maintenance crew from another command installed an APU in one of their big birds, the positive pole of the DC generator contacted the APU housing, arced and set fire to fuel in the APU drip pan. The flight crew put out the fire before any appreciable damage was done.

The DC generator on the APU was improperly

installed . . . looking at it from the generator end, the electrical contacts were at ten o'clock instead of 12. This allowed the contact points to touch the metal housing. However, this still wasn't enough to touch off the mishap. The rubber cover which protects the generator leads had slipped off, spilled fuel had been allowed to collect in the drip pan, and the APU drip pan drain was clogged, which prevented the spilled fuel from draining.

This mishap vividly illustrates how one or two oversights can start forming links to the chain of events leading to an accident. Eliminate one or two links and the accident won't occur. However, leave the key links in place (the improperly placed contact points and the stopped up drain) and eventually the other links will fall into place.

TORQUE TROUBLE

A maintenance crew replaced one cylinder on a recip engine because the threads were stripped in the spark plug insert. The new cylinder logged a little over six and a half hours before a flight crew shut the engine down after observing smoke coming from it during flight.

Three of the holddown studs to the new cylinder were found broken off. Altho safety types could find no discrepancies in the local procedure for installing cylinders, this one still sounds an awful lot like over torque.

LOOSE NUT

The throttle wouldn't come all the way back so a TAC T-bird pilot couldn't get power below 82 percent. He tried positive and negative Gs without shaking it loose. Finally, he set up an SFO and shut the engine down using the main fuel shut off switch. He reports it took about eight or ten seconds to flame it out using this switch. The landing was a success and investigators had no trouble locating the trouble. A 10-32 self locking nut was wedged between the head of a pin in the throttle linkage and the floor of the aircraft. Our old enemy, FOD struck again.

F-105 GONE GUN

Shortly after lift off, the ejector rack gun fell off the outboard pylon of an F-105. This gun is held in place by torque and a set screw. When the gun was properly torqued, the threads of the set screw were striking the top thread of the liner assembly and the flat point of the set screw didn't contact the locking ring around the top of the liner assembly. The set screw soon wore enough to allow the ejector rack gun to unscrew.

This is not the first such gun to get lost . . . and chances are the others were lost from the same cause. F-105 maintenance men should check for this possibility, and where necessary, grind the set screw to insure a positive lock against the flange of the liner assembly.

FLUTTER BIRD

Right after a C-119 crew leveled their flying haybarn, it started to vibrate. The vibration was rather severe - shaking the whole aircraft and the control column. The pilot pulled the autopilot emergency disconnect handle without effect. He declared an emergency and requested a straight-in approach. Headed back toward the field, the crew reduced power on number two, then feathered it, all without effect. They restarted two and feathered number one. This seemed to reduce the vibration slightly, so they left it feathered and completed their emergency approach and landing.

The vibration quit on the flare just before touchdown. The excitement was traced to an elevator trim tab bolt that was not installed as per the dash two. The trim tab developed a flutter and this induced the vibration. This was a simple goof that could have induced a serious accident under slightly different circumstances.

TAC ATTACK

T-33 LAME LINE

A T-bird crew made some unscheduled changes in their traffic pattern after the pilot found he couldn't move the gear handle into the down position. After breaking out of traffic, they declared an emergency and orbited high key while the aft seat pilot looked over the dash one. Just before initiating the dash one procedure, the aft pilot noticed that the oxygen line between his regulator and blinker was binding the gear lever linkage. He was able to move the line enough to get it out of the way.

The line was routed inboard of the interconnecting linkage between the gear handles and near the aft pilot's left rudder pedal. It was apparently bent outboard by the aft pilot's left foot. The TO does not specify how this line will be routed, and most aircraft have it routed outboard of this linkage. Anyway, it's an item to check, since there are always a few big footed pilots.



NO GREASE

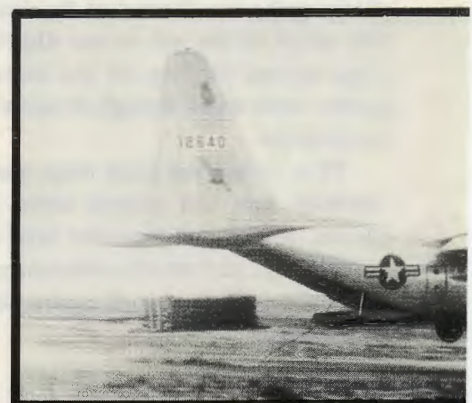
An F-104 pilot felt the right brake grab as he completed a landing rollout. After turning off the runway, the right wheel started to drag badly so he shut down and called for maintenance. Smart move. The wheel drag was caused by bearing failure and bearing failure was caused by lack of grease. Before you start bad mouthing someone for sloppy maintenance, read on.

The unit installed a new axle and bearing and repacked the bearings of all possessed aircraft. After one landing, they re-inspected their wheel bearings and found 'em without grease!

The particular batch of grease (batch number 287-3) was not up to standards.



JATO shortens the



Ground proximity extraction is the

TLC

FOR SAFETY

BY LT COL PAUL L. SMITH
839th Air Division
Sewart AFB, Tenn.

IT'S LATE at night. You're dodging thunderstorms and the lightning flashes can be seen breaking sharply across the windshield. You're IFR with a big cargo on board. A few minutes ago, you had to shut down number 1 due to a prop low oil warning light. Suddenly a red light flickers and comes on steady. Three is on fire!

You and the crew go through the shutdown procedures. You declare an inflight emergency and ask for clearance to the nearest base. It is reporting 200 and 1! The descent clearance comes quickly, which is good because you can't hack this altitude with that load. As you approach the field, you call for checklists. Flaps won't come

down! That's right--we lost the entire utility hydraulic system. That means the gear can't be lowered normally either. Back to the emergency section while GCA picks you up. Better make a straight in run because of the load. Should have thought of that sooner. Going to be close. Looks like that cross wind is going to be rough on approach. Can't seem to hold track. We're breaking out - too far left - go around - full power - she won't-----crash!

This is one that the crew walked away from. How? They were flying a C-130 flight simulator. It belongs to the 4442nd Combat Crew Training Group, Sewart Air Force Base, Tennes-

see. The crew? Could be locals from the 314th Troop Carrier Wing, or MATS, or Coast Guard, Navy, Marine, or even Pakistani, Indonesian, Canadian or British. They couldn't cope with the emergency? Well, maybe not the first time. That's what caused the simulated crash from which the crew could walk away and try again. Their instructors, a pilot and a flight engineer, pour it on to insure that they will know what to do when inflight emergencies occur.

Training begins in a classroom of the 304th Field Training Detachment. Hydraulics, props, engines, the electrical system (that monster), APG, the whole nine



takeoff roll . . .



the latest way to deliver the goods.



The co-pilot pulls the fire control handle on number three.

yards, complete with mockups and tests - even a final - provide a three-week schedule of pretty stiff academic background.

Now, the course becomes more interesting as we start our ten simulator lessons. These huge replicas of a 130 cockpit cost a bunch and they really take a beating. Shifts run from 0600-0900; 0900-1200; 1200-1500; 1500-1800; 1800-2100; and have run even more than that. The flow of students seems to be never ending as these beauties roll on. Each log as much as 3500 hours every year and down time is surprisingly low.

The new simulators have motion, noise, lightning, fire, smoke, crash horns, and will soon have a visual VFR traffic pattern available on remote TV, all built right in to make life really interesting. A console outside allows a monitor to follow your flight on a huge board while you are flying instruments. Emergencies arise at all sorts of uncomfortable times as your instructors pull this and that circuit breaker as part of the learning process. The motion, combined with the electrical smoke, is realistic enough to have accounted for a few cases of simulated airsickness!

When the simulator flight check is finally completed, you begin the real fun. Nine rides in the big bird itself. At last you feel that tremendous power under you that gave the Hercules its name. For once you know that here is an aircraft that hasn't been loaded down beyond its capacity to react. It takes a little doing at first to pull that nose up. Its climb attitude would be a stall in many other aircraft. Engine out landing? No sweat. Same as any four-engine approach! Two out? Well, if they are both on the same side, better keep the speed up somewhat and

avoid drag until your landing is assured. The first penetration is a new experience as you stand 60-75 tons of aluminum on its nose and come down the slide just like a T-33.

The 4442nd, commanded by Colonel Merle C. Brown, has an outstanding flight safety record. In two years of continuous operation with more than 40,000 flying hours, they have had one accident due to a facilities deficiency. How many flying training units do you know that can fly that much over a two year period without any pilot or maintenance error accidents? Oh, they have had their interesting moments. Five times they have experienced a landing gear failure. But five times, by effecting close coordination between their airborne crew and a ground team, they have managed to chop through the bulkheads and get the gear down and chained for a safe landing. They have had other interesting incidents but the gear bit is the biggest sweat.

We started this article with a simulator emergency. Let's end it with an actual one the school experienced recently. While on a transition flight out of the local area, the crew found they couldn't get the right main gear down. Turned out later that the gear motor and gear box had failed. They went through the Section III procedures with no success. Meanwhile back at Sewart, Lt Colonel Harry Howton, the Operations Officer; Lt Colonel George Taylor, the DM; Captain Ron Trickey, the Flying Safety Officer; and Mr. Red Packard, Lockheed Tech Rep, along with some of their old "A" Model heads, went to the tower. Conversing between the aircrew and the tower, the two groups decided it would be necessary to go to the recent Safety of Flight

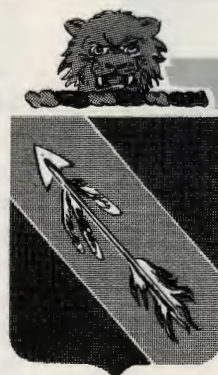
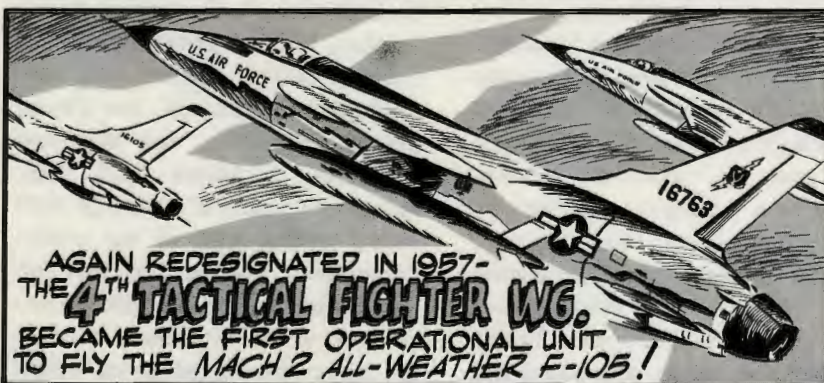
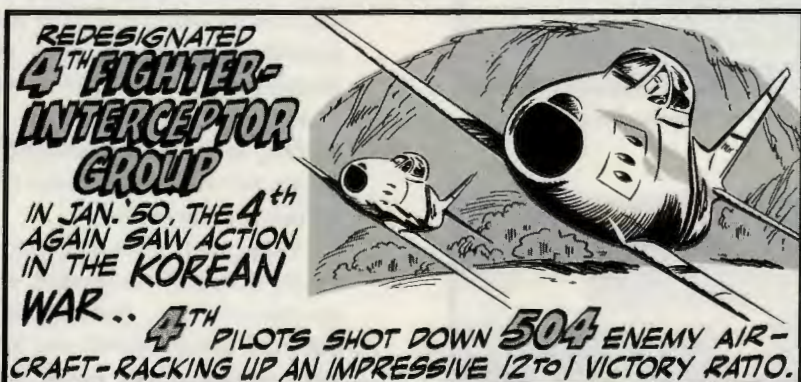
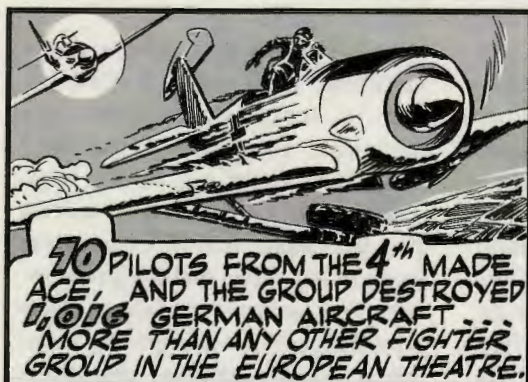
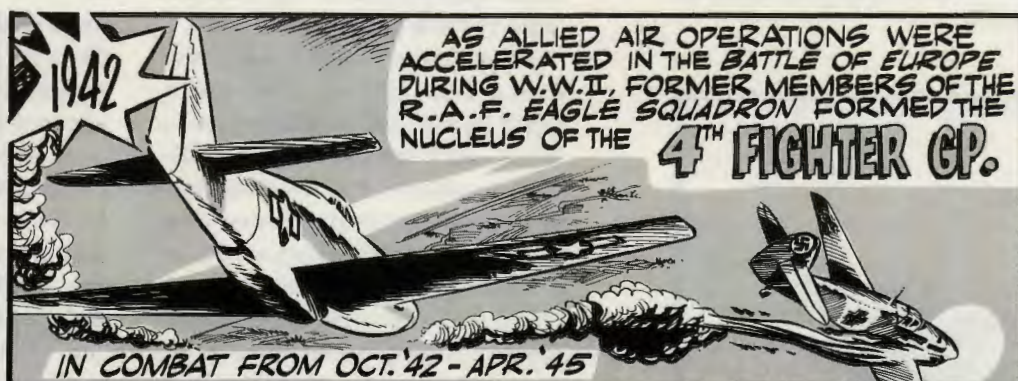
Supplement Number 15 and chop through the wheel well to free the gear. This supplement resulted from an earlier problem of the same kind in Evreux. While Captain Patrick O'Sullivan, the instructor, flew, Sgt. Magarity, the instructor flight mechanic, got the crash axe out and went to work. He cut an access hole to the rear track and disengaged the vertical torque shaft. Then he cut a similar one near the forward track and disengaged that vertical torque shaft. At this point after two hours

of step by step emergency procedures had been accomplished, the gear finally free fell down. Sergeant Magarity then went back to Section III for instructions on chaining the gear with 10,000 and 25,000-pound tie-down chains and Captain O'Sullivan touched down safely. It was another example of the fine team work begun under Colonel Charles Phillips, now with TAWC, and continuing under Colonel Brown.

To give you an example of the across-the-board ability of these

people, they recently passed a TAC Stan/Eval with an outstanding rating. They were given 24 evaluation check rides and had 103 written exams given to their crews. These were not just the supervisory people. This was an across-the-board show with flight checks averaging 80.6 and writtens 97.7 for a total average grade of 89.1! Scores like this are bound to reflect a fine safety record. Colonel Brown's T.L.C.* keeps it that way.

* T.L.C. - Tender Loving Care



IN ADDITION TO THIS DISTINGUISHED HERITAGE - WING PERSONNEL ALSO INHERIT THE MOTTO: **"FOURTH BUT FIRST"**

A DATE WITH

DORA

a date with Dora



There's something new in the airplanes business . . . DORA. General Dynamics, builder of the F-111, has come up with a device that should bring a little joy to every pilot's heart. DORA (Dynamic Operator Research Apparatus) is a sophisticated F-111 simulator that records nearly every switch position, instrument reading, stick and throttle movement, and aircraft response. While all this may not be so fantastic in itself, two factors make DORA the nicest little girl to come along in years. First, the F-111 is still in the design phase and the lessons learned with DORA can be applied to the aircraft while it is being built. The second, but most important factor, is that TAC pilots are doing the flying. Most aircraft in the past have been built to meet the requirements established by brainy specialists in the research and development business. But, let's face it, while these specialists are certainly well qualified in their area, no one knows better what a tactical aircraft ought to be and how it ought to work than the tactical pilots who are going to fly it.

Here's how DORA will fit into the picture. TAC pilots fly missions in DORA and perform all the cockpit chores through both the low and high speed ends of the performance envelope. Missions are repeated so

the pilot gets proficient and his performance is fairly dependable. As DORA records all switch positions, stick and throttle movements, all mistakes are uncovered. Now this may be a little embarrassing but it's the pay off on the whole program. Except for random flubs that we all make once in a while, most incorrect cockpit actions are caused by poor cockpit design. If typical pilots consistently operate a switch incorrectly, the switch is installed incorrectly and ought to be changed. One of the aims of DORA is to spot these areas and get them changed before they get into the airplane. Another fruitful area is cockpit procedures. For example, if pilots continually forget a step on the check list or omit actions in flight, then the procedure must be changed. Moving further, the whole business - cockpit layout, switch design, procedures, techniques - can be designed around the actual capabilities, likes and dislikes and techniques of TAC pilots.

Money, red tape, and inertia permitting, improvements in the F-111 can be made before they show up as accident board recommendations and before we get the aircraft and start playing that old, old modification and TO game that has cost us so much in the past.

TAC TIPS

ONE OH WONDERS

ADC reports the AMA teams are about a third the way thru their inspection of F-101 main landing gear struts. The team is finding about 12% cracked and in need of replacement. The end result is going to be a shortage of replacement struts. ADC remarked that there isn't much to be said about landing the bird since everyone takes a lot of pride in his touchdown but reminded pilots that slower taxi habits could improve things...especially when taking corners.

Spinning the bird around on one strut or making fast turns imposes heavy twisting loads and side loads. Keeping it slow over the rougher straight-aways also helps the gear to stand up. Don't taxi at a speed where the bird tends to gallop and try to keep brakes from chattering, especially when taxiing heavy. To our way of thinking, this is good advice for all pilots, regardless of the bird they fly.

F-100 AIRSPEED ERRORS

Three F-100 pilots climbed up to the holding pattern to practice multiple approaches. It was a good day for it... the weather extended from 2500 feet on up above them and scattered rain showers in the murk added zest to the exercise... more than they reckoned on. About 40 minutes after liftoff Lead, we'll call him Blue Lead, reduced speed to lower gear and flaps for a slow speed penetration... all three birds had MN-1A centerlines, and Blue Two didn't have modified speed brakes.

Lead noticed his bird was reacting rather sloppy and asked for an airspeed check from Blue Two and Blue Three. Speeds differed by 40 knots! They cancelled the penetration and started climbing, reaching VFR on top at 29,000. At this altitude, they managed to join up with Rescue Flight and determined that Blue Lead and Blue Two had bad airspeed while

Three's was OK. Shortly both Blue Lead and Blue Two lost all airspeed indications. Rescue Four led Blue Lead down and dropped him off over the runway threshold. Rescue Three started down with Blue One and Two, only to lose his airspeed. Blue Three took the lead and dropped Blue Two off on the first pass and then landed in formation with Rescue Three.

All of these birds had the pitot static system drained and checked on preflight and all pilots had used pitot heat since engine start. After landing, the drain plugs were removed and no water came out. The pitot booms were warm. However, about a minute later water started dribbling out of the front opening of the boom. Apparently it had entered the system when they flew thru rain, then froze at altitude when power was reduced to slow for the penetration.

All F-100 pilots should be alert to this possibility and should avoid flying at low power settings after having encountered rain showers in-flight.

A-1 SPIN TEST

An A-1 H and J spin evaluation report advises that the handbook procedure which calls for neutral aileron recoveries is not satisfactory. The bird takes from one to three turns to recover from an incipient spin and from four to six turns to recover from a fully developed spin.

Pro-spin aileron (stick with the turn needle) speeds up the recovery quite a bit. The optimum recovery is to retard throttle to minimum cruise or less, rapidly apply full rudder in the opposite direction of the spin and aileron with the spin. Move stick slightly forward of neutral as the rotation stops. Then relax forward stick to prevent negative G and neutralize aileron and rudder. Recovery will take from one to two turns in incipient phase, two to three turns in a fully developed spin.

BENO-GRAMS

When someone goofs, corrective action is too often limited to a Beno-Gram . . . there will be no more this, be no more that, etc, etc, ad nauseum. This may get the supervisor off the hook, but does it really correct the problem? Usually, when someone goofs or breaks a rule or regulation there is a reason why. Take a positive approach, dig out that reason and eliminate it. This is the best way to reduce personnel errors. The next time you find yourself drafting a Beno-Gram, remember what happened to the original . . . the 18th Amendment.

WHOA MAN WHOAH

An F-4 troop landed from a GCA approach during a rain shower. He lowered the nose and tested brakes at about 75 knots. Both pedals went to the floor! He turned off anti-skid, they still went to the floor. He left the anti-skid off and tried to disengage it with the paddle switch. The pedals still went to the floor, but as he released them the brakes suddenly grabbed. This blew the right tire. He was still going about 60, and the bird veered right. Holding the paddle switch down, he was able to get enough left brake to maintain control. At about 20 knots the left tire blew out and the bird went off onto the right hand shoulder, coming to a stop without damage. A faulty anti-skid control box apparently caused the problem.



STIFF STICK

As big as the F-4 is, you'd think a fellow would have no problem finding a place to store goodies. Such is not the case. Old McDonnell has beat the boys to it and has already filled that bird from stern

TAC ATTACK

to stern. Not long ago, a pair of enterprising lads reasoned they could store some stuff under their seats, (since they normally flew with 'em about half up).

They very carefully crammed shoes, tooth brush and so on under each seat, then lowered the seats to tenderly squish the gear enough to hold it in place. No sweat on the aft seat, but the front one is another story. The torque tube connecting the control sticks goes under the front seat and these lads flew their whole flight with a mighty stiff set of ailerons. The moral is obvious.



BIRD STRIKE

A T-38 pilot added power for a low-go at an auxiliary field only to have the right engine stall. He brought the right engine back to idle and completed the go around. Climbing out of the pattern he advanced power on the right engine, but it refused to go above 75 percent, stalled and ran rough. The pilot shut it down, brought the bird back home and landed.

The engine had sucked up a bird and had a badly damaged compressor.

CORNERSTONES OF SAFETY

At the TAC Commander's Conference, the Director of Safety asked TAC Commanders to help him point our safety program in the right direction by furnishing information on problem areas. He then discussed some of the areas that have already been identified for us thru accidents and asked the commanders to put some of their best people to work correcting them. This has become known as Project Cornerstones. As of this writing, the response to this project has been very rewarding.

Continued cooperation and review should do much to eliminate accidents at their source.

O₂ FOR 130s

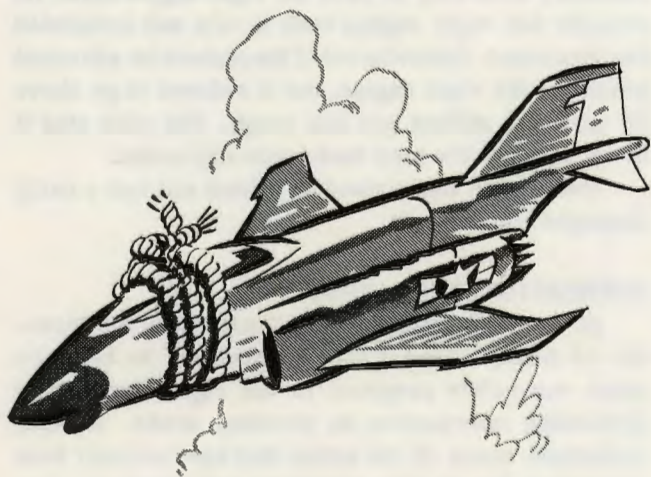
On two occasions an oxygen regulator in a C-130E has been accidentally bumped to the emergency position. In both cases this went undetected until the pilot noticed the low quantity light. The problems of no oxygen, no pressurization, and no airport are obvious and a fix is in the mill to put a guard over the switch. But, 'til then, frequent in-flight checks of the regulator switches looks like the best way to keep out of trouble.

RAIN CHECK

Weather forecast look a little bleak? No sweat, you are well current and can hack a GCA right down to minimums? For your information, Buster, make sure you'll get a precision GCA by checking the let-down plate, a current Enroute Supplement and NOTAMs. Just 'cause the place has radar available doesn't mean it will be precision radar!!

BLOOP

A T-39 crew climbed to FL430 to avoid thunderstorms but let their airspeed drop to about 160 knots when they leveled. Number two engine flamed out when the pilot tried to ease the throttle forward. He got it restarted OK at 24,000. The pilot's handbook says flameout may occur if airspeed gets below 180 indicated above 35,000 . . . and obviously it ain't kidding.



F-4 LOOSE LIDS

Just at liftoff, an F-4 pilot saw his canopy come open about an inch and a half . . . it stayed there three or four seconds then swiftly departed the aircraft.

The unit reported several previous aborts on this aircraft due to canopy not closing or locking. In each case rigging was checked. Pilot did not remember hearing the canopy lock or recall specifically checking the warning light due to distractions associated with an IFR departure. He did remember checking the master caution light and seeing the unlock light come on after the canopy opened.

The navy has reported one canopy lost on takeoff along with five canopies that inadvertently jettisoned in flight. The navy recommended the rear canopy be closed first to check the unlock warning lights in both front and rear cockpits . . . however, the last inflight loss occurred after this policy was in effect. It went off at 13,000 feet, 300 knots with no warning light before or after. The canopy control was about a half inch aft of full forward and the only discrepancy noted was a bad micro switch on the warning light circuit.

Apparently, the thing fell off because the handle was not full forward and the valve slightly cracked. This might restrict flow to the up lines and eventually let the canopy unlock.

WELL I'LL BE DIMMED

A T-33 student flamed out on the taxi strip at one of our air patches because he inadvertently turned off the main wing tank when he turned off the leading edge tanks during descent. He did not monitor the fuselage tank gage and failed to see the low level warning lights because it was equipped with a "cats eye" type light (incorrect light) and the light was dimmed. The main wing warning light was also dimmed.

Some pre-flight.

BALLS O' FIRE!

An F-100 pilot took a GCA monitored weather departure so as to remain clear of areas of heavy precipitation. Climbing through 5500 feet a brilliant flash and explosion seemed to fill the cockpit. A ball of fire, originating at the base of the control stick, ran up the stick and disintegrated. Oh my! Although the pilot felt a mild shock thru his right hand and arm, all electrical equipment continued to operate normally and the only aircraft damage was a small burned spot on the right wing tip. Lightning strikes are one of the hazards of thunderbump flying, and if you have to get even near a thunderstorm, be prepared. Get the cockpit lights turned up, hope for the best, and expect great balls o'fire.



MAJOR LEWIS shoved his sunglasses up onto his forehead and sat down. "Man, it's hot in this country . . . almost too hot to go fishing."

"Sounds like you plan to wet a line this weekend," the Old Sarge observed. "I thought you'd be too busy shooting firecrackers."

"That's right, Saturday is the Fourth. I almost forgot it."

The Old Sarge shook his head. "Sir, I hate to say this, but I'm afraid you're getting old."

"How so?"

"Almost forgetting the Fourth. Next to Christmas, that's the most important day in the year."

Lewis looked thoughtful. "Yeah, but that was back when a dollar would buy enough firecrackers to last all day. Now you can't even buy 'em in most places, let alone shoot 'em, without getting in trouble with the law."

Captain Green snorted. "You can't very well complain. Fireworks caused a lot of accidents and you safety crusaders are the ones who got the law makers to ban them."

"Maybe." Lewis countered, "But I quarrel with you on both counts. I have no statistics to back me up, but I'm willing to bet that most fireworks accidents were caused by people, not the fireworks. Shucks, it isn't an accident

when someone gets cut by flying glass because they drop a lighted firecracker into a pop bottle. They make a bomb and then are surprised to find it acting like a bomb. I could go on, but you get my point. All fireworks are potentially dangerous . . . but they don't need to be dangerous if the people who use 'em appreciate this and use reasonable care.

"I admit they were probably banned most places in the interest of safety . . . but I sure didn't have anything to say about it 'cause that isn't my idea of how to keep things safe. Using that philosophy, we'd have to quit flying to get a safe operation."

"I was just kidding," Captain Green laughed, "and you sure don't have to explain your ap-

proach to safety . . . I particularly like the way you've been working on sports accidents by giving handouts that tell how to water ski properly, how to skin dive and do things like that. You have the right idea."

"I'll second that, sir." The Old Sarge added, "Most of the people we have in the Air Force are active and like to do things. You aren't discouraging them with your program, you are just lending a hand, and feeding 'em info to help keep them from having to learn on their own, the hard way."

"Thanks for the vote of confidence. There are times I wonder if I'm on the right track."

The Old Sarge grinned, "Like when some young lieutenant tries to go over a jump on a slalom ski."

Lewis laughed, "I'd like to have a movie of that one. I can imagine how he must have popped out of that ski when the skeg hit the jump. He sure won't pull that one again . . . but someone else will. There are always those who act on impulse or who fail to think things out. The rest of us can learn a lot just watching them make all the mistakes!"



THE PILOT:

THE APPROACH WENT quite well. There was very little wind and the night air was beautifully smooth. On the go, Sandfield control told us to turn left to 160 degrees and climb to 6000 feet, then sent us to another frequency for GCA. I made the change, heard Gordie check in and acknowledge, "Rog Two, you're five by five. Sandfield GCA, Red One here."

"Red One, I have radar contact southeast of Sandfield. Turn right, heading two ten, maintain six thousand for downwind."

I establish a 30 degree right bank and repeat the information, concentrating on the instruments and ignoring everything outside the cockpit. I hear the controller's voice again. "Red One, if contact is lost for any three minute period maintain a position VFR and contact Sandfield Tower on two five three point five."

"Roger." It won't be hard to maintain VFR tonight. There isn't a cloud in the sky, the moon is full and almost straight overhead. Earlier we had refueled off a tanker and it had been little different than a day hook up.

"Sandfield, Red Two; be advised IFF is Red Two's."

Good boy, Gordie, I forgot to tell him. He's probably skin painting me by now, tho. We're ghosting quietly along with the birds clean. Gordie is somewhere behind, flying chase and looking for other traffic.

"Roger Red Two, Red One perform landing cockpit check."

Airspeed is a little slow, and I'm not ready to start dragging gear. But I'll answer anyway because it makes the controller happier. "Roger GCA. Red, let's go 85 percent."



"Red One, turn right to three zero zero, descend and maintain five thousand, base leg."

I repeat the information and call, "Red, speed brake, now!" We descend in a rush of wind noise from the open speed brakes.

"Red One, at completion of the low approach, will you wish another GCA?"

I need another let down so I call, "Ah, negative. We'll climb back up and request another penetration."

"Roger, One." He sounds disappointed. Must be bored tonight or has squares to fill. I check the clock, eight twenty five . . . it seems much later.

We're steady at 5000 and speed is on the button. I call speed brakes in and thumb the switch forward. The cockpit gets quiet again, but it's time to extend the gear. I call gear down and push the handle down. The main gear clunks solidly in place and I glance at the indicators . . . SMASH! The

aircraft is slammed violently, noise fills the cockpit and I glimpse an aircraft going away to the right from beneath me. Gordie! We've collided. I add power and turn toward Sandfield, calling Mayday over the air.

RPM is still at 90 percent and dense smoke fills the cockpit. I hear my voice call, "I'm ejecting!" I start to pull back on the stick but suddenly realize I don't know what attitude I'm in. I reach for the handles, miss, reach again. The new seat! I reach lower, find the handle and pull. It doesn't move! I grab the other handle and pull with both hands. The canopy goes and I waste no time squeezing the trigger.

Free of the aircraft, I reach for the lap belt but am buffeted and snapped about. Have I slipped thru the harness? I look up and see the chute fully blossomed above me.

I don't imagine we'll ever know exactly what happened because Gordie didn't eject. Actually that isn't correct. We know what happened, thanks to some superb accident investigating but we don't know why it happened. The investigators picked up most of Gordie's airplane and put it back together. Tire marks, paint marks and other evidence show that he slid across in front and slightly below my bird going from left to right in about a 45 degree left bank. His stabilizer smashed a hole thru the left side of the nose section of my bird, and as he crossed on under, my nose gear wiped off his vertical stabilizer. He overran me while closing from the left, then tried to avoid my aircraft by breaking left instead of pushing down and crossing under.

At first we thought he missed the signal to extend the gear. His gear was still up and locked. However, the GCA tape indicated that

I called Mayday just five seconds after I called gear down. In that five seconds I had moved my hand from the throttle to the gear handle and back and had reacted to the crash. So it looks like the collision was set up before I dropped the gear. In fact, the deceleration probably saved my life, causing Gordie to hit my nose section instead of the wing or tail section.

Buy why? Gordie was a pretty good pilot . . . a superb instrument pilot, what caused him to goof?

THE INVESTIGATOR:

During the investigation, we tried to answer this question and found a few pertinent facts. Altho Captain Gordon, or Gordie, was rated a pretty good pilot, like most of us he wasn't perfect. On his last Stan/Eval flight the evaluator recommended corrective action because Captain Gordon did not cross under during tactical turns but attempted to maintain position with power changes.

We also found that most pilots have been closing from chase position to wing position once they turn onto GCA final. TAC Manual 55-84 only allows this on full-stop wing landings. If Captain Gordon had anticipated the turn onto final . . . the flight was on a right hand dog leg to final when the collision occurred . . . this would account for the initial rate of closure leading to the accident. Another possibility, and there is some evidence to support it, is that Red One overshot his turn by 30 to 40 degrees and that Captain Gordon rolled out on the correct heading, then attempted to regain formation position and misjudged.

Proper chase position is 500 to 1000 feet back, slightly low. In this position, the chase pilot is able to look around for other aircraft without having to concentrate

too much on the mechanics of flying formation.

Instrument chase rides are risky at night. When flying loose formation, it is harder to pick up a change in speed or position than when flying close. Reduced references at night compound this problem. The loose formation is necessary, since a pilot can't fly close formation and look around. As a result of this accident, TAC has specifically banned night chase missions.

One other factor, a big one that points at supervisors, is fatigue. Captain Gordon flew the early morning mission and was expected to get some rest before flying the evening mission. A recap of his schedule indicates that fatigue undoubtedly reduced his capability and may indeed have been largely responsible for the accident. Captain Gordon sacked out at around 10:15 the night before he died. He rolled out at 0300 hours for a 0425 briefing, ate breakfast, was briefed and airborne at 0630. He landed at 0815, debriefed and left Ops at 0900, arriving home at 1030. His wife said he intended to sack out until 1415, but doesn't know if he slept or not. Anyway, he was briefed for his last mission at 1530. With an 1830 takeoff. He crashed two hours later.

Not everyone sleeps properly in the daytime. Few pilots have enough gumption and good sense to tell an Ops Officer that they are too tired and sleepy to fly a mission. Captain Gordon did mention to another pilot that he didn't feel like flying, but didn't say why. The important point is that a good Operations Officer doesn't put his pilots into this position. He doesn't put them on the opposite ends of his schedule, regardless of crew rest regs.

TAC GROUND/EXPLOSIVE SAFETY

TOKYO RAIDERS

Every year the Tokyo Raiders Traffic Safety Award is awarded to the major air command with the best traffic accident prevention program and record. TAC was the runner-up for 1963, placing second to MATS. Brigadier General Robbins, the Director, Aerospace Safety for USAF, stated in a letter to the Commander TAC, "Your achievement in traffic accident prevention made a substantial contribution to the overall improvement shown by USAF during 1963." Every member of TAC deserves part of the credit for this achievement. Let's keep it up and bring home the bacon in 1964.

LEARNED FROM EXPERIENCE

You can't prevent electrical accidents with codes and underwriters' rulings alone. No, not as long as we take a drill that has a three wire lead and grounding plug and we take an adapter and use it with the ground wire a-dangling!

When we put an adapter into a two slot outlet and don't check to see that we've gotten a good ground we're setting ourselves or someone else up for an accident. Actually, it isn't an accident, it's ELECTRICIDE.

Some other ways to commit ELECTRICIDE are using a two wire extension to power a three wire drill, to have cords running all over the shop with half exposed terminals on broken plugs, or men in wet shoes happily drilling away.

Why have all the rules if no one follows 'em? The life of a man is an awful high price to pay for not having a proper extension cord.

A TWO WAY STREET

Like most safety people, a lot of the stuff we write is aimed at supervisors. We tell 'em to look out for problems we observe or show 'em what they can do to keep things running smoother and safer. You'd almost get the impression that we think supervisors are the

only ones who can read, or the only ones who can goof off enough to find time to read!

The truth is that MOST of you are supervisors. You supervise any time you work with someone who has less experience than you - regardless of whether you're giving him OJT. So unless you are fresh out of Basic, you are a supervisor and we are talking to you. As a supervisor you have responsibilities toward the people you supervise.

On the other hand, ALL of us are supervised, with responsibilities toward the people who supervise us. It's a two way street. The supervisor outlines what he wants, the supervised tries to stay within the outline. Because we are in the military, the outline often extends beyond normal duty hours. Always, this is for the benefit of the service, and our country. Like when you're getting ready to go on leave . . . your supervisor has to know where you're going in case he needs to call you back. He'll caution you not to drive too long or too fast and might even have you attend a special lecture or movie. He does this because he needs you back all in one piece. You're no good to him dead or in a hospital and experience has shown that the things he has cautioned you about cause a lot of accidents.

Once you are on the road, it's up to you to follow his advice. If you don't, if you press on until you are dog tired, crowd the speed limits and take other chances, you might get away with it and no one will know. However, every year a few troops who try it DON'T get away with it . . . and the rest of us have to work a little harder to fill in until they recover or until a replacement is trained.

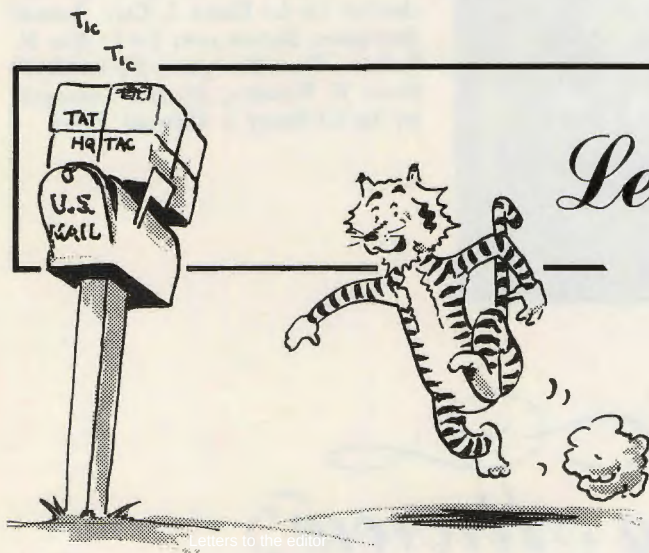
As a supervisor you have an additional responsibility along this line. If you come back from leave bragging about how many miles you averaged, or talk about how fast you made the trip, you are setting someone else up for the kill . . . the people who work for you and with you. Like it or not, you set an example for them. The longer you stay in the service and the more rank you get, the more people you will effect. Keep this in mind and set a good example for your benefit and theirs.

PLASTIC GAS CANS

If you are carrying gasoline in a polyethylene plastic container - DON'T...not even if the guy who made it says it is OK for gasoline. At around 150 degrees Fahrenheit, according to experts from the National Fire Protection Association, gasoline and other flammable liquids will permeate polyethylene. In other words, they'll leak right thru the stuff. Be-

lieve it or not, it gets hotter than that in your car trunk this time of year. It can get that hot under your boat seat, too. That isn't all, next winter when that plastic gets cold it can split at the slightest provocation.

Play it safe and use a good metal can for gas and other fuel. Save the plastic for water.



Letters to the Editor

THE TANKER

Where con trails zoom across the sky,

The KB-50 once did fly.

She was the proudest in the land,

This mighty tanker made by man.

With black smoke swirling from her jets,

Her crews flew proudly you can bet.

Her reels in trail, they numbered three,

The most welcome sight a fighter could see.

With a tally ho they'd plug right in,

Take on their fuel, and be gone again.

She was the back bone of her command,

Giving fighters the range to foreign lands.

Her days of glory now are o'er,

But her once great name lives evermore.

Of fighting men so brave were they,

Who flew the KB-50-J.

Dear TAT

Just finished your April issue. Congrats on another fine publication. I especially enjoyed the story by Major Massoni on Fox Able. Sure brought back a lot of old memories, since I'm an ex-KB-50J refueling operator.

With the phase out of the old reliable, I'm going into crypto repair. I'm sure I'll find my new career field interesting but after four and a half years in tankers . . . it sure won't be like flying.

Incidentally, I wrote a poem about the KB-50, in case you're interested.

A1C JAMES L. COLLUM
401st Combat Support Group
England AFB, Louisiana

Dear James

Enjoyed reading both your letter and poem. Altho your new job certainly won't be as exciting as filling 'em up over the oceans of this old world, in its way it is just as vital.

Wish you luck.

TAT

TAC ATTACK



From left to right, top row, SSGT Jose D. A. Gallegos, Jr., Crew Chief; SSGT Bobby E. Gambrell, Loadmaster; TSGT Glen C. Anderton, Flight Mechanic; 1st Lt Denis J. Cole, Second Navigator. Bottom row: 1st Lt Roy N. McCann, First Navigator; Flt Lt (RAF) David W. Parsons, Aircraft Commander; 1st Lt Henry J. Clement, Pilot.

Outstanding Aircrew

A C-130 crew from the 314th Troop Carrier Wing, Sewart Air Force Base, Tennessee has been selected for the Tactical Air Command Aircrew Achievement Award for the period ending 30 April 1964.

Shortly after leveling at 19,000 feet, the forward cargo door blew out, tearing off a large section of the fuselage. The door and pieces of the fuselage struck the number one and two propellers and the right horizontal stabilizer. The assistant crew chief, A2C Gary D. Back, was sucked out of the aircraft and fell to his death. Several hydraulic lines were torn loose and normal brakes, landing gear and flap systems were rendered inoperative.

The pilot immediately complied with established emergency procedures and feathered the severely damaged number two propeller; however, one blade did not feather and caused a violent vibration. The co-pilot advised Air Traffic Control of the emergency and then helped fly the aircraft, coordinating radio calls and crew efforts. The first navigator accurately fixed their position from the nearest emergency airfield and monitored

course and terrain clearance during descent and landing.

The second navigator and the loadmaster, at considerable risk, crawled past the gaping hole and passed parachutes forward for the rest of the crew. The flight mechanic and the crew chief also crawled past the hole to diagnose the hydraulic damage and manually extend the main landing gear and flaps. The co-pilot read TO instructions over the interphone.

After the pilot determined that the aircraft could be controlled down to 150 KIAS, he decided a safe landing could be made. He descended below a 4000 feet overcast and flew a precise traffic pattern. After touchdown, he held the nose off as long as possible, shut down number three to avoid asymmetrical power and stopped the aircraft on the runway by judicious use of reverse thrust.

The calm, professional manner in which this crew handled an extreme in-flight emergency befits the high requirements established for this award.

PILOT OF DISTINCTION



For his professional response to a serious inflight emergency in an F-100D, Captain Stephen C. Cucci, of the 354th Tactical Fighter Wing, Myrtle Beach AFB, S. C., has been selected as the Tactical Air Command Pilot of Distinction.

Immediately upon retracting gear and flaps after takeoff, Captain Cucci discovered he could not move the control stick fore and aft. At that time the aircraft was in a climbing attitude 1000 feet above the ground at 250 KIAS. Aileron and rudder control were normal. He initiated a turn to avoid overflying populated areas. After starting the turn, partial stick movement became available and he found attitude control was effective aft of the neutral position. Elevator trim worked only in the free range of the stick.

Captain Cucci declared an emergency and was visually checked by two other airborne pilots, but they could see no cause for the difficulty.

After he determined that he could land the aircraft safely, he flew the approach so as to avoid a large city and made a successful landing.

Investigators determined that a foreign bolt with nut intact, lodged in the right forward bell crank assembly and restricted stick movement.

Operational Achievement Awards

ASAULT AIRLIFT AIRCREW (CREW E085) 773 TCS Langley AFB, Va.

Maj C. E. Armstrong
1st Lt R.A. Williams
Capt T. A. Henwood
SSGT W. A. Burlin
A2C E. G. Driscoll

Acft Comdr
Pilot
Navigator
Flt Engineer
Loadmaster

TACTICAL AIRCREW

Capt Roger E. Johnson
31TFW, Homestead AFB, Fla.

TACTICAL RECON CREW

Capt Charles L. Lustig
20 TRS Shaw AFB, S. C.

SPECIAL AIR WARFARE AIRCREW

Capt James H. Elliott
603 Fighter Squadron, 1st Air Commando Wing
Hurlburt Field, Fla.

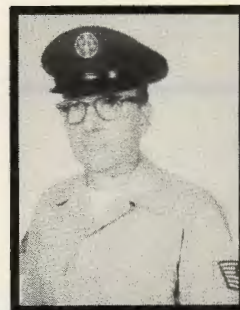
772 TROOP CARRIER SQDN Langley AFB, Virginia

481 TACTICAL FIGHTER SQDN Cannon AFB, New Mexico

16 TACTICAL RECONNAISSANCE SQDN Shaw AFB, South Carolina



MAINTENANCE MAN OF THE MONTH



CREW CHIEF OF THE MONTH

Staff Sergeant Peter R. Gardner, of the 4510th Combat Crew Training Wing, Luke Air Force Base, Arizona, has been selected as the Tactical Air Command Crew Chief of the Month.

The superior manner in which Sergeant Gardner maintains his F-100F aircraft was recently reflected by two outstanding Quality Control spot checks followed by a letter of commendation from the Chief of Maintenance. Although Sergeant Gardner performed the additional duties of assistant flight chief, his comprehensive inspections and conscientious efforts contributed to 41 hours of flying time and 100 per cent schedule effectiveness for his aircraft during one twenty-five day period.

In his capacity as assistant flight chief, Sergeant Gardner closely monitors the maintenance in progress on all aircraft in the flight. He also helps supervise an aggressive OJT program that has resulted in rapid upgrading of inexperienced personnel.

Sergeant Gardner is one of the most highly qualified maintenance technicians in his squadron. His extensive knowledge of the aircraft, pride in his performance and his aggressive attitude reflect the qualities of a professional airman.

R e c o g n i t i o n

Master Sergeant Stephen G. Plank, of the 4510th Combat Crew Training Wing, Luke Air Force Base, Arizona, has been selected as the Tactical Air Command Maintenance Man of the Month.

As night line chief, Sergeant Plank supervises twelve personnel who average placing sixteen aircraft in OR status each night. During a recent 90 day period, this NCO and his men raised their squadron in-commission rate from 61 per cent to well above 80 per cent. His average duty day consists of at least eleven hours and he often works longer unless all possible jobs are completed. Consequently, his untiring efforts and dedicated attitude have helped place his section among the top maintenance sections on the base. Sergeant Plank expends a great deal of effort promoting harmony and cooperation between the flight line and assisting shops as evidenced by the attitudes of supporting specialists.

Sergeant Plank has augmented his expert knowledge of aircraft maintenance with more than three years of advanced study in aerodynamics and stress analysis and is therefore confidently consulted by his superiors, as well as his subordinates, concerning special problem areas.

His outstanding loyalty and devotion to duty are equaled only by his concern for maintaining safe, mechanically sound aircraft for his wing to fly.

BEST MAINTENANCE RECORDS

The following individuals were selected for the month of May:

TSGT CLARENCE G. EASON
12TFW, MacDill AFB, Fla.

SSGT RAYMOND H. WEBB
4411CCTG, Shaw AFB, S. C.

SSGT LLOYD ROBERTS
4500ABW, Langley AFB, Va.

TAC TALLY

A COMPARISON OF TACTICAL AIR COMMAND ORGANIZATIONS

MAJOR ACDNT RATE		
TYPE	1964*	1963
ALL	13.9	10.3
F-4	10.3	0
F-105	37.4	23.5
F-104	21.4	33.3
F-101	31.1	13.7
F-100	19.8	12.7
F-86	0	0
F-84	30.3	22.8
B-66	0	0
B-26	133.1	8.6
T-39	0	0
T-33	0	1.6
T-29	0	0
KB-50	0	4.1
C-130	1.6	1.9
C-123	10.0	4.6
C-47	0	0
U-10	58.0	11.7
T-28	0	37.6

ACCIDENT FREE			
MAJOR & MINOR			
JET			
ACTIVE	MONTHS		ANG
23 TFW	20	16	121 TFW
12 TFW	12	13	140 TFW
CONVENTIONAL			
ACTIVE			RESERVE
463 TCW	35	90	434 TCW
4500 ABW	35	45	349 TCW

MAY TALLY		
UNIT	MAJOR	MINOR
474 TFW	1	
479 TFW	1	
4520 CCTW	3	
3 TFW	1	
363 TRW	1	
4453 CCTS	1	

With 12 major accidents and 12 fatalities, the month closed on a cheerless note. The F-105s led the list. One came apart on pitchout for landing. The pilot was killed. Another F-105 had gear trouble after takeoff. The pilot was unable to maintain flying speed and crashed in a housing area. Four civilians as well as the pilot died. Another F-105 caught fire in flight and the pilot ejected OK. An F-105F pilot left the range with bingo fuel. He experienced a rapid loss of fuel en route home and ran out while turning a high final at an auxiliary field. The pilot ejected successfully. An F-4C descended into the ground from what appeared to be a stall after an over-the-shoulder release . . . two fatalities. Returning from a Desert Strike mission, an RF-101 pilot noted rapid loss of fuel. He tried to make an auxiliary field but flamed out on final approach and landed short. The pilot received major injuries. The engine of an F-100D compressor-stalled in the dart pattern, lost oil pressure and thrust so the pilot ejected over the water. He made it alright. An F-100D pilot flew into the ground on his first simulated strafing pass during Desert Strike. Fatal. An F-104 gave out with a violent explosion passing thru 28 thousand. Flight controls became sloppy, the engine flamed out and the pilot ejected successfully. The cargo in a C-123 shifted rearward after an unsuccessful extraction attempt. The pilot was unable to overcome the resulting nose high attitude. Four crewmen were killed in the crash. A U-10A crashed while turning final approach but no one was injured. One C-119 pilot landed short, sheared the gear, slid down a hill and came to rest in the trees . . . No injuries were incurred. Another C-119 pilot lost an engine just after takeoff. Unable to maintain altitude, he landed gear down in an open field. The gear sheared, fire broke out and two lives were lost.

* 1 JAN - 31 MAY 1964



Know Your EJECTION PROCEDURES!

IF YOU ARE EVER FORCED TO EJECT FROM AN AIRCRAFT, YOU MUST CRAM THE RESULT OF MANY HOURS OF PREPARATION INTO A **SPURT OF ACTION!**

... AT LOW ALTITUDE, BACK-UP THE AUTOMATIC EQUIPMENT BY ATTEMPTING TO OPEN THE SEAT BELT AND THE CHUTE RIGHT AFTER YOU LEAVE THE AIRCRAFT!

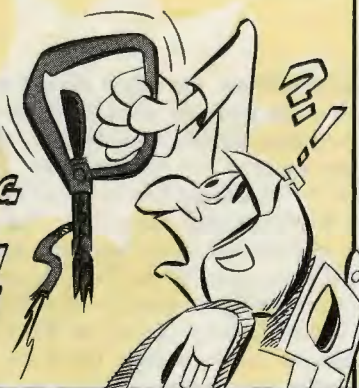
... YOU CAN'T BEAT THE EQUIPMENT UNLESS IT MAL-FUNCTIONS!

WHAT MAIN PROBLEMS FOR FLYBOY WHEN SHOOT'UM OUT GUNPOWDER SEAT, PRINCESS?

EJECTING! EVEN WITH THE LATEST EQUIPMENT IT IS SELDOM WITHOUT DIFFICULTIES!



UNDER STRESS, MANY PILOTS HAVE TROUBLE LOCATING THE EJECTION TRIGGER!



GET A GOOD MENTAL PICTURE OF THE TRIGGER POSITION ONCE THE ARMREST IS RAISED

THIS COULD SAVE YOUR LIFE!



TAC REG 50-20 REQUIRES ANNUAL EJECTION SEAT DRILL IN A SIMULATOR.. OR DISARMED SEAT!



PILOTS SHOULD ALSO PRACTICE USING THE PARACHUTE QUICK-RELEASE, AND SHOULD HANDLE, OPERATE AND BECOME FAMILIAR WITH EVERY PIECE OF EQUIPMENT THEY MAY BE EXPECTED TO USE - FROM EJECTION TO RESCUE!

DON'T LET YOURSELF BE PLACED IN A LEARN-OR-DIE SITUATION!



00000 HESITATE - AND YOU ARE LOST!