

OS-FS

MARCH 1962

ATTACK

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OS-FS



A MATTER OF DISCIPLINE



ATTACK

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COVER PHOTO

The T-39 Sabreliner -
A replacement for the Gooney Bird?

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Believe One Who Has Tried It
—Vergil

angle of attack

As one of the youngest professions, aviation is vigorous and growing. This is what makes it so interesting. Many of the early pioneers are still alive and active, yet the dream they helped conceive is almost as old as recorded history, dating back long before the days of Icarus and Daedalus and their fateful flight.

Problems encountered by the early pioneers were many and varied, yet in a way, have changed but little. The forces affecting flight, being physical, certainly haven't changed. Control problems haven't changed too much either. The old crates yawed when you kicked rudder, climbed when you applied aft stick and stalled when you applied too much. So does the F-100, the F-105 and the F-110.

For this reason, many of the earlier aviators have experienced and solved problems that exist and plague others to this day. Much of this information remains locked in their minds because they are reticent or too modest to volunteer information on their achievements.

I hope to tap this vast reservoir of knowledge by requesting many of these individuals to relate some of their experiences. I am certain that we can all profit from lessons they have learned. In addition, I plan to make similar requests of our current pioneers, these great pilots who are dedicating themselves and thereby advancing our profession toward space.

Colonel James K. Johnson
Chief
Office of Safety

ON



GUARD

ASK ANY EXPERIENCED PILOT instructing gunnery at Nellis or Luke and he'll tell you that the final approach is the most dangerous phase of any weapons delivery. He can't cite accident statistics or other data to prove this, but he knows it's true just the same. He's flown enough patterns, had enough thrills and watched enough gunnery students to know. He doesn't need statistics.

Press him for details and he'll tell you that target fixation is the chief reason for this belief. He knows that even the old timers have to guard against trying to salvage a bad

approach . . . that this will cause them to concentrate too hard on getting lined up and result in pressing in too close... and that one reason target fixation is more common with inexperienced pilots is because they misjudge more runs.

True, there are other hazards. For instance, the final approach on a skip bomb or napalm run is never without risk. From the time the pilot levels at an estimated fifty feet until he initiates his pull up, he is in danger of running into trouble.

Usually trouble is caused by porpoising . . . getting into the dreaded JC maneuver so

characteristic of the old F-86F and the F-100. Lighting the AB can start it, or it can result from over-controlling while trying to maintain proper altitude. Excess speed and rough air both help induce it. Once he over-controls, a pilot soon finds himself out of phase with his machine.

If he is lucky, he'll stop the foolishness by aborting the run with a judicious amount of firm back stick. A few orbits of the range may give him sufficient composure to complete the mission, but one thing is for certain, if he continues to fight his aircraft once a JC has developed at 50 feet, he will

never fly another run.

In addition to target fixation, an air-to-air gunner has to guard against getting too low. For some reason this is when the target always seems to get shot off, falling into the attacking aircraft. Easily avoided ... but on a grey day firing on an over-water range, it takes an expert to tell when a run is high, low or level.

The next most hazardous point in gunnery patterns is the pull-up onto downwind. Frequently this is the point where an inexperienced or careless pilot loses sight of the bird ahead, locates the second one ahead, takes appropriate spacing and pulls into the same patch of sky being occupied by the aircraft he's supposed to be following. If he misses it, a good scare is had by all. If he hits ...

The same thing can happen during the turn from downwind to base. On downwind, a pilot usually shifts his attention to the pattern as a whole. Occasionally he loses sight of the aircraft ahead and makes his turn to space himself behind the next one ahead ... It is easy to criticize and warn against this hazard, but until you've had it happen, you cannot appreciate how difficult it is to always avoid it—especially during a hazy day when staring into the sun.

The last and least dangerous area in the pattern is the turn onto final ... even on a skip bomb or napalm run. By this time, spacing is well established and the pilot can devote

his full attention to getting aligned with the target and initiating his run.

However, just recently a gunnery student pulled out too low while turning final on a skip bomb run and clipped several telephone wires.

The wires were just a few feet above target and some 9000 feet short. Damage was slight ... but the accident potential was not; particularly since the student never realized that he had descended too low until after he

had parked on the ramp!

Experienced pilots usually don't have too much trouble judging their height above the ground, even at skip bomb speeds. For this reason they consider this type flying to be essentially routine. This mishap should serve as a warning that it is not. That it is dangerous, and, as with other portions of the gunnery pattern, that it requires complete concentration and attention.





HE FLEW 3442:32 hours without ever so much as scratching paint. The other pilot on board had almost as much flying time. Then he called on the pitch and was told to report base. Approximately two minutes later he called turning base with three down and locked. Shortly thereafter he was sliding down the runway with 3442:35 hours of flying time and, sob, a gear up landing to his credit.

If you think it can't happen to you, guess again! Two pilots waiting to take the active noticed the gear up approach and radioed to take-it-around. Apparently he was concentrating too hard (probably having trouble getting slowed down) and did not hear their calls.

Cause? Technically, it was failure to follow the pre-landing check list. A list that consists of checking the zero lanyard to see that it is attached, then observing fuel quantity and hydraulic pressure, then extending speed brakes, gear and flaps, followed by a check of the gear position indicators and brake pedal pressure.

Review that check list. The first three items

are taken care of with a quick glance in the cockpit during initial approach. Speed brakes (on this particular bird) are extended on the pitch. Gear is lowered on down wind after speed decreases below limit speed.

Generally, smart pilots watch the indicators change from 'up' to 'unsafe' to 'down' during the lowering process, then check their position in the pattern, start flaps down, and begin their turn onto base. They re-check gear indicators, check brakes for feel, and call turning base.

Absurdly simple, quite logical and rather difficult to understand why someone would leave out an item. Failure to use a check list? The pattern itself acts as a check list...besides, pilots have been known to slide multi-place aircraft in, even though one read off the check list and the other supposedly accomplished the checks and actions.

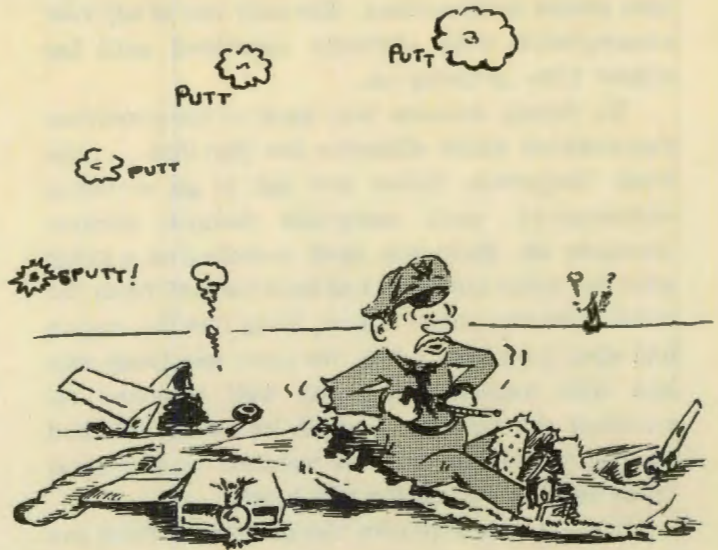
Generally, most gear up landings result because something unusual occurs that interrupts the sequence at a critical time. The copilot has just called off gear down. The pilot reaches for the gear handle as the tower cautions him of

another aircraft in the landing pattern. He looks for this aircraft, finds it and presses the mike button to advise the tower that he has it in sight. Meanwhile, his ever lovin' copilot has proceeded to the next item on the list. Turning base he glances at the indicators, "UP" appears in each window, but all he notices is that they are all alike without a barber pole

Or our hero is flying a fighter that is new to him. He has hundreds of hours in a bird where speed brakes are extended on the break, gear extended on downwind and flaps extended on base. The new bird he's flying requires takeoff flaps on the pitch, gear on downwind, full flaps and speed brakes on base. The wind has whipped up quite a bit of dust and he has trouble getting lined up on initial due to reduced visibility. On the pitch he kicks out speed brakes, concentrating mostly on keeping the runway in sight. On base he remembers he's supposed to have takeoff flaps and selects them, still giving most of his attention to keeping the runway in sight. On base he selects full flaps and concentrates on correcting for a nasty cross-wind . . . holding plenty of power because of a larger flatter pattern. The landing is a surprise.

Next we have Lt Oblivious who, unknowingly, has been skating on thin ice for each of his twelve rated years. Formal checks are for the sissies. He believes in playing it by feel. Anyone who lands gear up just ain't got that feel. He pitches as number four of a flight, puts flaps to takeoff, finds himself a bit closely spaced holds back power and proceeds blithely on around the pattern with gears fully retracted. All the way thru the FEB he keeps shaking his head. Seems he can't figure out why the bird had a normal sink rate on final when gear was up. True, he flew final a shade below recommended speed in order to keep from overrunning number three . . .

The list goes on. Most gear up landings involve a distraction, a break in sequence, careless checking of indicators, reversion to old habit patterns, a malfunction, or a combination of these factors. Cure? Make sure your pattern contains two or more definite gear checks. Then accomplish these checks deliberately, and conscientiously. Never permit any of them to become automatic. You can't afford to.



TAT READ this report from a sister command with just a touch of nostalgia . . . "the aircraft struck the runway right gear first in a tight descending right turn." Hoo boy, we're back to the days of the 20-second pattern--lessee wha' happen. Yup. Right tire blew, both wings buckled, both props . . . BOTH PROPS! What kind of fighter is this? Ulp! a U-3A. How about that?

Some arrival, no? Reading on, we find that our hot hero was making his third landing in the little critter and was flying as first pilot! We'll be kind and make no smart remarks about the lack of skill and cunning--instead will direct your beady gaze to the lack of supervision which preceded this exhibition. Apparently there are those who consider this little machine to be somewhat less than an aircraft. This, obviously, was hardly a proper attitude and the machine gave its all to prove it.

WHEN THINGS START coming apart at the seams it really helps to know what's going wrong. Many emergencies get loused up beyond repair because the pilot misguesses the cause of his trouble. Sometimes he just doesn't have enough information available. At other times he takes the wrong route even tho information for a correct analysis is available . . . reacted too quick. We've gnawed on that bone before and we cheerfully admit that 'tis far easier to see these things from the relative calm of a swivel chair . . . but we have had our share of inflight eye openers . . . scary

vibrations and noises—you know, the usual harmless minor malfunctions. The only one of any real consequence went virtually unnoticed until the engine blew up under us.

We firmly believe that most of the problems encountered while airborne are like that . . . the truly dangerous items are apt to go virtually unannounced until complete failure occurs. Reminds us. Have you ever launched on a crisp cold day when the tires had become 'set' from the cold? Sure can shake a bird, feels like the engine had shed a bucket or two. We knew one troop who had this happen and pretty well wrecked his machine aborting the takeoff. He swore he'd had an engine failure until he watched us skeptical types run the unit on the test block.

How do you separate the dangerous from the harmless? Well, it rather helps to have a real optimistic approach to the profession. You know, things start to happen and you say to yourself, "Now what piddling thing is cutting up now?" and then start checking the clocks. This helps keep you cool during the analysis stage. To keep cool during the action phase you have to have the opposite approach . . . to be so pessimistic that you have developed conditioned reflexes by planning for every conceivable emergency and by drilling yourself on the appropriate corrective

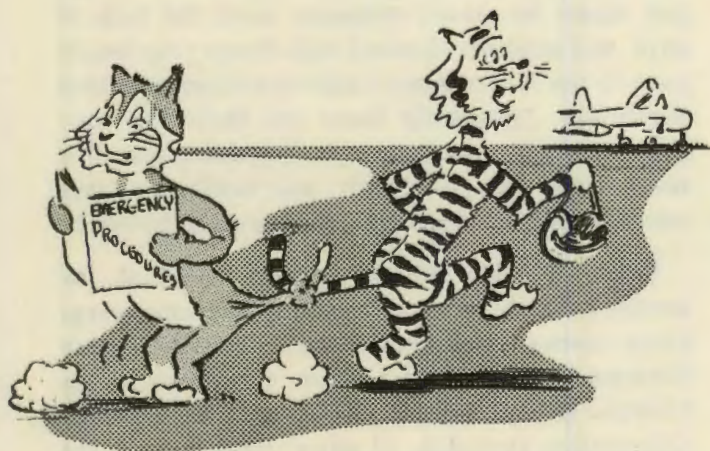
pertinent emergency procedures . . . then get airborne and go into a full scale flap when the air conditioning unit lets out a low moan (just because it's in a jovial mood).

One other way to separate the dangerous from the harmless is to cram. You listen to the other troops, study the accidents and pay close attention to what happened before they met their moment of truth. This will give you a preview on what to expect should you start down a similar road. To pay for all this free knowledge, you are under obligation to pass on your own unusual experiences . . . do this with incident reports, OHRs, or by cornering your safety officer.

One other way to prime yourself with information is thru the Form 781. Quite often it will contain clues to potential trouble—but you must study it and use your imagination or it's no help. We have a for-instance on that one. Seems Old Head went out to fly an F-100 as number two in a two-ship flight. His bird was on a red dash because the AB mechanical shut-off had been reconnected in accordance with a T.O. change but hadn't been checked on the ground or during the test hop which preceded this flight. The red dash requested a check of the AB cut-out point. Apparently this troop didn't realize that a red dash is more serious than a red diagonal and either didn't read this entry . . . or just didn't put two and two together. Old TAT pays almost as much attention to a red dash as he does to a red cross . . . so should you.

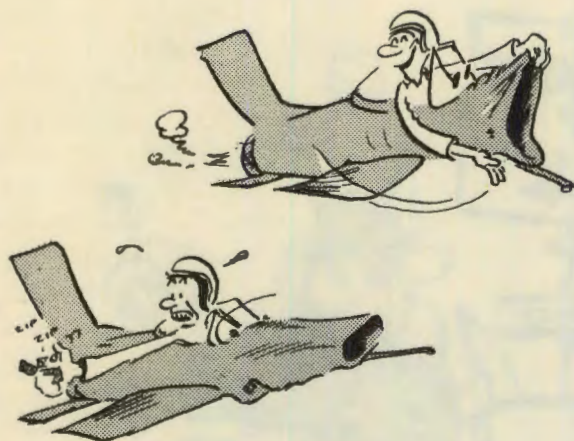
Getting back to our story, shortly after kicking in the AB on the takeoff roll Old Head found himself overrunning his gallant leader. He pulled back the throttle a bit—which is a reasonable reaction—and promptly found himself being left behind. He pushed the go handle forward and was kicked in the pants as the AB relit. This boosted him up where he was starting to overrun his gallant leader again . . . so he eased off power—this second reduction wasn't a reasonable reaction.

Had he studied the Form 781, he should have suspected the cause . . . besides, what's so terrible about overrunning one's leader on take-off? There do be times when gallant leaders are forced to abort takeoffs and get too busy to tell anyone . . . this wasn't one of those times, and



action. Believe it or not, it is possible to combine these two opposing approaches. Unfortunately too many troops combine them the wrong way. They're optimistic on the ground and seldom crack the good book or make a cockpit dry run of the more

once again Old Head fell behind and re-applied power. Well, the AB was tardy and so was the light that was now starting to dawn. He pulled the throttle inboard and then put it outboard to try for a relight. No light. He recycled it again (which is poor procedure) . . . too late to abort, he made a heroic effort to lift the machine over the bird net but snagged it with the stabilator . . . Fortunately, he'll fly again, but the bird won't. Ya get our point?



By the way, the reason he was having trouble overrunning his gallant leader was because that worthy was trying to be just that, gallant! He heard Old Head's AB light when he'd lagged back that first time . . . so, pulled his own throttle back into minimum AB range to help him catch up!

Trying to help a wingman during a formation takeoff usually has an opposite effect. More better to select a takeoff power setting about two percent below max, ignore the guy, and concentrate on keeping your own flying smooth and precise. This will give your wingman something definite. Something he can count on and correct to, not for. There do be a difference.

Just as we were about to send this to the printer a preliminary report came thru on another pilot who had ample information, but found fatal trouble because he couldn't believe the situation was as serious as the symptoms indicated.

The bird was an F-86F. The pilot was well experienced and had almost 1,500 hours in the

machine. Shortly after takeoff he called his wingman and reported a FORWARD FIRE WARNING LIGHT. He declared an emergency, then reported single phase inverter failure, utility system failure and SMOKE AND FUMES IN THE COCKPIT!

A friend read us the report over the phone and at this point we asked if the pilot ejected. He said, "No."

We said, "The bird blew up?"

"Not right away, the main control system failed and it flamed-out. Then two or three minutes later he restarted it."

"You're kidding! Then it blew up?"

"Why you so sure it's going to blow up?"

"He had a forward light and more than enough evidence to confirm a PTO leak and fire. It's bound to blow up just as soon as the fire gets to the forward fuselage tank. The guy was riding a bomb."

"You're right, he was. And it took him along when it blew."

"Too bad. But doggone it, the Dash-One doesn't mince words on this one. If you have a forward fire warning light and confirm it with smoke or other failure you get out and you get out quick. What was this fella trying to prove?"

"I don't know TAT, his wingman said he was on fire and with all the other evidence . . . Maybe he was trying to be a hero. If he was, he made a poor trade altho he almost made it. He went in just two miles from the runway."

Like we said, you have to make your decisions from the facts at hand. You get into trouble if you react too fast to incomplete information. With an actual failure you get into worse trouble if you don't add up the symptoms and react at all. Roughly, we don't make a decision until the first sign of a failure is confirmed by something else. While we wait for that something else, we try to reach a favorable ejection altitude, then try to get in position for a landing. If our confirmation doesn't materialize we make a precautionary landing—if it does, we follow the handbook procedure as closely as we can. The handbook is the best guide we've got and it is generally correct. End of sermon.

TAT

FRUSTRATION IN PARADISE

BILL TYSON swung his sports car down the line of parked cars in the Ops parking lot. "Damn," he muttered, "no parking places as usual."

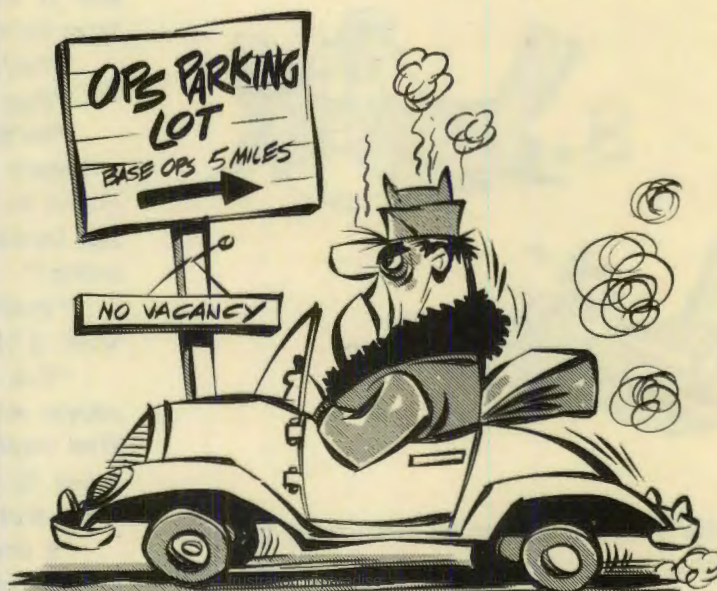
A little farther down he spotted an open slot and turned in to park. There on the curbing was stenciled—RESERVED FOR ASST NCOIC SQDN SUPPLY.

A quick glance at his watch and Bill slid into the spot. Better to get a parking ticket than a chewing from the old man for a late takeoff, he thought as he slammed the door and headed for Ops. Seems like they could make some place available for flight crews to park near Ops. There never is one within shouting distance.

Rushing through the locker room, Bill noticed that every desk jockey who flew eight hours a month had a personal locker. Fuming a bit, he slung his hat at the top of the open clothes rack. This is another place they forget the flight crews, he mused. Wonder why the duty crews around here can't have a little of the convenience too.

His clothes changed, Bill started the serious business of flight planning. This was a personnel transport mission in a T-29 carrying several staff

—REPRINTED FROM COMBAT CREW



officers to a hurry-up high priority conference on the coast. Bill knew it was important and he didn't mind making the trip, but just that morning he had been assured by the Ops officer that there would be no trips for a couple of days. On the strength of this promise he had made arrangements to take care of a few pressing personal problems, those things you just can't get done after five or on Saturday. Oh well, he thought, they will have to wait until the next time I am home, whenever that might be.

Carefully checking the latest

charts on the flight planning table, Bill noticed that they were dated almost two months earlier.

"Hey, McGuire!" he yelled at the airman in charge, "are these the latest charts we have?"

McGuire dropped the copy of the pulp magazine he was reading into the desk drawer and replied, "I was going to get those new charts up today but I couldn't find a razor blade to trim them. I'll get them done tomorrow, captain."

It's always tomorrow around this place, Bill muttered to himself. Wonder how many

times he has used that story since the charts were changed last? Hope there haven't been any frequency or route changes since the last trip. I still have a flight log left over from that one. At least it's more current than Mac's charts.

"Hey, Sam!" Bill yelled at the clearance officer, "who's my copilot?"

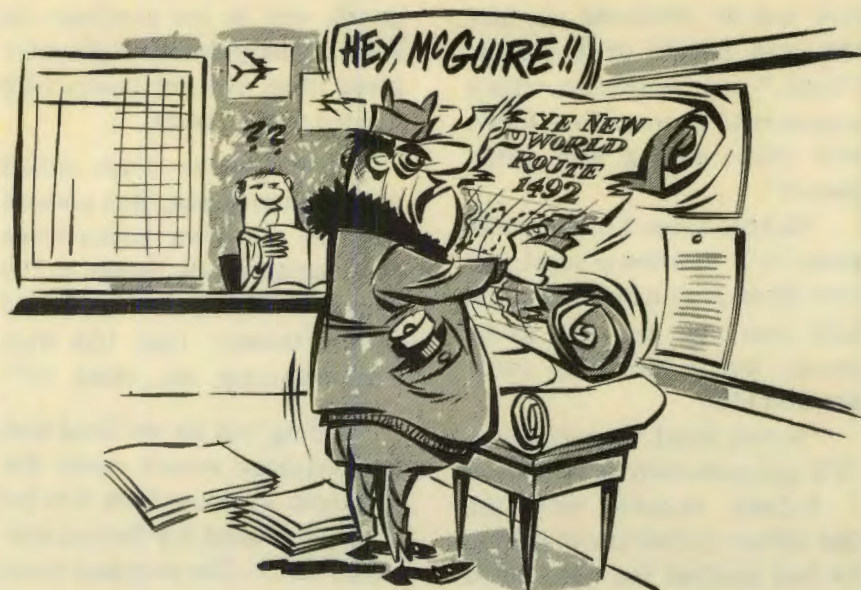
"We got you a major out of Personnel who needs flying time and is checked out for carrying passengers," Sam answered. "He should have been here fifteen minutes ago."

Bill decided he might as well do all the planning himself. Even if the major had been on time, he didn't know the guy and he wasn't trusting anyone he hadn't flown with before. Guess I'd better check the weather and get the winds, he decided, heading for the weather office.

"Yes sir," he heard the weatherman say into the telephone, "we expect to have fairly good weather here through tomorrow. The temperature should be in the 70s and there's no precip in sight."

Bill looked over the surface maps and thought, it may be good around here, but from the looks of that map I'll have a little fun going through some of that stuff. Looks like we're in for a rough ride.

The weather forecaster was still on the phone giving someone the weather they could expect on a weekend outing at the lake. Bill glanced up at a cartoon on the wall outlining the duties of the forecaster. The flight crew was last in line, no



doubt about that. Finally the weatherman convinced the character on the phone that the picnic would be nice and dry and then hung up.

"Good morning, Captain Tyson," he said with a big smile, "where can we tell you about today?"

"Need a little planning weather and the winds from here to LA by way of El Paso and Tucson. Guess about 14,000 feet would be a good altitude."

The forecaster turned and studied his charts. "Probably have a lot of turbulence at that altitude along the route. A higher altitude would be better, something about 40,000," he said.

Funny boy, Bill thought. He hoped someday to get his hands on a '135 or one of the other new jet transports; they would be a big improvement over what he had been allowed to fly—Gooneys, B-26s, C-54s and now T-29s. All good airplanes, but in them you had to get right down there with all the weather.

"Let's see, minimum altitude along the route—hmm, how about 12,000, would that be any better?" he asked.

About that time the phone rang again. The forecaster excused himself and started giving another picnic report. With this, Bill slammed out of the weather office and headed back to the planning room. To hell with that guy, I'll figure out my own weather. Metro will at least give me their full attention if I call on channel 13.

Where the heck is that copilot he wondered. Thirty minutes later the major still hadn't shown—but neither had the passengers. A call to flight scheduling got little information. They suggested he call the major's office and find out if he had left. "Thanks a lot," he snarled into the phone.

The third try got the major's office but he was in the colonel's office and couldn't be interrupted. "Could I have him call you?" asked the girl on the phone. At least the voice was

nice and he wondered whether she was blonde or brunette. "Yeah," Bill answered. "He's supposed to be over here to fly. How about getting him to the phone?"

"Sorry, I can't disturb him when he's with the colonel, but just leave your number and I'll have him call as soon as he comes out," the silky voice assured him.

"Never mind," snapped Bill, "I'll get somebody else to fly."

Fifteen minutes later the Ops officer puffed into dispatch. He had combed the base for a copilot without success. There was nothing to do but wait for the major. Another call to the silken-voiced secretary got the information that the major was on his way. Thirty minutes later he wandered in.

I'm sure lucky that the full colonel passenger is a good Joe, thought Bill. He could really be raising hell.

Bill dialed the motor pool. "Need wheels at Ops for twelve to the T-29s," he stated into the phone.

"Sorry, sir," the voice on the other end advised, "we haven't a thing right at the moment. Should be able to get you in fifteen minutes."

By this time things had really started to get to Bill.

Unplanned trip, no place to park—probably get a ticket in that slot, no locker, no copilot, no charts, no weather, and now no transport. The longer he thought about it the madder he got.

"I'll grab the alert truck, sir," he told the colonel, "and

go on out to the airplane. At least I'll have the preflight complete when you get there." He headed for the door.

As the yellow truck pulled up at the airplane, Bill noticed that the tie-down ropes were still fastened. He turned to the sergeant driving the truck and said, "Doesn't look like they are expecting us, does it?"

Getting out he realized that the airplane wasn't ready for preflight. Jumping back into the truck he headed for the maintenance office. The sergeant there was sympathetic, but no one had notified Maintenance Control. The airplane was in-commission but it would take at least half an hour to get it ready to fly. Bill sent him and his troops running for the bird

ance.

"Roger, Stone 19, clearance is on request. Taxi to runway 36. Winds are light and variable."

Bill took a look at the wind sock at the end of runway 18, a few hundred feet away. "Tower, how about a south takeoff? We are on the north end of the ramp."

"Negative, Stone 19, traffic is on runway 36," the tower answered. "Are you ready to copy clearance?"

Bill rogered their query and proceeded to copy almost all of the complicated low-altitude airways clearance. There wasn't one change from what he had filed. Why couldn't they just clear me flight-plan-route, he wondered as he carefully read back the clearance.



and then used Mr. Bell's invention to give the scheduling troops a few thousand words. It didn't get much action and it made Bill even madder. After another long delay they started engines and called for clear-

With the preflight completed at the warmup pad, Bill called for takeoff clearance.

"Hold your position, Stone 19," the tower came back. "We have a tanker in position on runway 18 for a controlled take-

off time of five eight, time now five three."

This last little gem just about did it. By now Bill was so mad he was boiling. A few well-chosen words to the tower about their "excellent cooperation and service" didn't help his disposition either. The copilot's offer of the pre-takeoff checklist was quickly rebuffed with, "I don't need a checklist to fly this beast!"

As the tanker roared off, Bill headed for the runway, accelerating into the turn for a rolling takeoff. "One nine rolling," he called as the Convair gathered speed. The copilot was yelling something to him but the tower transmission was blocking out the copilot and the copilot was blocking out the tower.

As the transport approached the edge of the runway, the throttles were yanked back and the brakes applied for a hard stop. Bill felt the sudden deceleration and the sharp turn to the left as the tire on that side let go.

"What the heck do you think you're doing?" he screamed at the copilot. He was just launching into a scalding tirade when out of the corner of his eye he saw an F-100 touching down at the spot he would have occupied had the takeoff continued.

"I tried to tell you there was one on final but you weren't listening," the copilot declared.

Punching the mike button, Bill called the tower, "How come you cleared us out on the runway in front of that landing fighter?"



"Stone 19, you were not cleared on the runway," the tower operator replied. "We advised you to hold your position. Are you having any difficulty?"

"Looks like we have a blown tire," Bill replied. "Better get the maintenance troops down here and send some transport for us too."

It was a much subdued Bill Tyson who stood in front of the base commander.

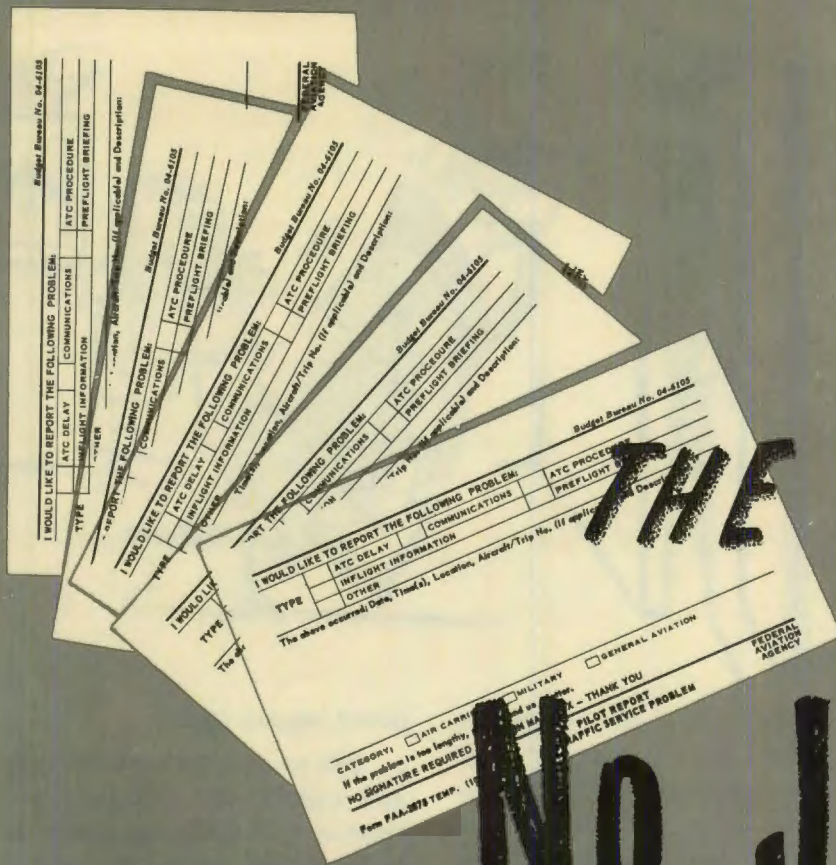
"Captain, what were you trying to do, show your passengers what a hot rock you are?" the colonel started. "You almost wound up as a real hot rock. Had it not been for your copilot, we would have undoubtedly been attending your funeral."

Bill could do little but mumble apologies and promises—apologies for what he had done and promises that it would

never happen again.

Bill picked up the tab for this and rightly so. As a pilot entrusted with the lives of others, he could ill afford to let his temper get out of hand no matter how strong the provocation.

But Bill is human and humans have limitations. How about the others? Will they continue to establish and enforce petty rules designed for their own convenience? Will they continue to ignore the true purpose of their job--support of the flying mission--thru laziness, oversight, misplaced precedence, or ignorance? In short, will the people who caused Bill to lose his self-control continue to harass other pilots? Look around. See if they are still at it. If they are, start corrective action...and the best place to start is with a cold calm honest analysis of how YOU are performing YOUR own job.



THE CARD'S No Joker

The Card's No Joker

YOU ARE CLEARED," the voice said, "to the Home-drome airport via Victor 16 to Virtue, Victor 9 to Love-nest, Victor two, Homedrome. Maintain Flight Level 290, read back."

No sweat, they gave me my flight planned route to the letter. I read back, wiggled a finger at the Tech Sergeant leaning against the power unit and proceeded to nurse the old mill to life.

Three minutes later I was taxiing toward the active humming a tune, fat dumb and happy when the voice broke the spell by saying, "Glib one, this

is Fruitless ground control. ATC is unable to give you a standard jet departure at this time, will you accept a non-standard one? Over."

It didn't take long to come to a decision, so I keyed the mike and replied, "Glib one here, negative."

"Roger Glib one, suggest you return to your parking area, expect considerable delay before I can get your ATC release."

Blackmail, pure and simple blackmail. Once again, a decision wasn't hard to reach. "Understand Fruitless, will

accept non-standard climb, ready to copy."

"Roger Glib one. Left turn after takeoff to intercept the 95-degree radial of the Fruitless omni, climb to 3,000 before reaching Fruitless then climb to 4,000 feet. Maintain 4,000 feet until crossing the Bi Joe intersection. Home on the Surprise low frequency beacon crossing Surprise at flight level 240. Call reaching 240 and leaving 10, 15 and 20 thousand. Contact Garbageville center as soon as practical after takeoff on 248.8 squawking mode 3 code 56, read back please."

There was a distinct smug-

ness to the "readback please," as if the voice dared me to get everything correct. I've developed a pretty good shorthand system, so the voice sounded just a little incredulous when it answered my next transmission with, "Read back is correct! Cleared to runway 25 for immediate takeoff go channel 248.8 monitor guard, over."

I started checking the low altitude chart trying to find Surprise beacon and what was it . . . oh yeah, Bi Joe intersection. Fortunately, I had the foresight to get this chunk of paper out right after I'd saddled up.

The voice again, impatient. "Glib one, are you having difficulty?"

My next thought was hardly fit to transmit, so I checked the impulse and replied, "Negative Fruitless I'm just polishing my glasses."

"Request you expedite, your release time is only good for another minute."

"Oh fine," I thought, "nothing like having someone keep things to themselves. Well, I'd located Bi Joe, Surprise could wait."

Somewhere between Bi Joe and Surprise my receiver went out. Weather was somewhat less than terrible but worse than field grade. I'd finally located Surprise homer on the map. It was some distance from my flight planned route.

I might add that the search for Surprise had caused considerable deviations in altitude and heading and any semblance to a professional climbout was

strictly coincidental. Anyway, when the radio went out, I realized that some other people were operating on a less than professional basis too. My climbout clearance wasn't complete. How was I to get from Surprise to my flight planned route? They'd left me hanging and I'd been sucker enough to buy the clearance!

When I got to Homedrome, wiser and far less gullible. I told my tale of woe to the base ops officer . . . who's a right steady type . . . and doggone if he didn't hand me a little yellow card along with a few words of advice. "Fill this out," he said, "It's addressed to FAA's air traffic service branch and will

help correct some of the problems you encountered. Be sure to tell 'em about being given a non-standard climb and don't fail to include the dangling clearance.

"FAA is trying to improve their air traffic service, and you can help by using these cards to call their attention to problem areas. It's better than the OHR for this purpose because it goes straight to the people who can correct the problem."

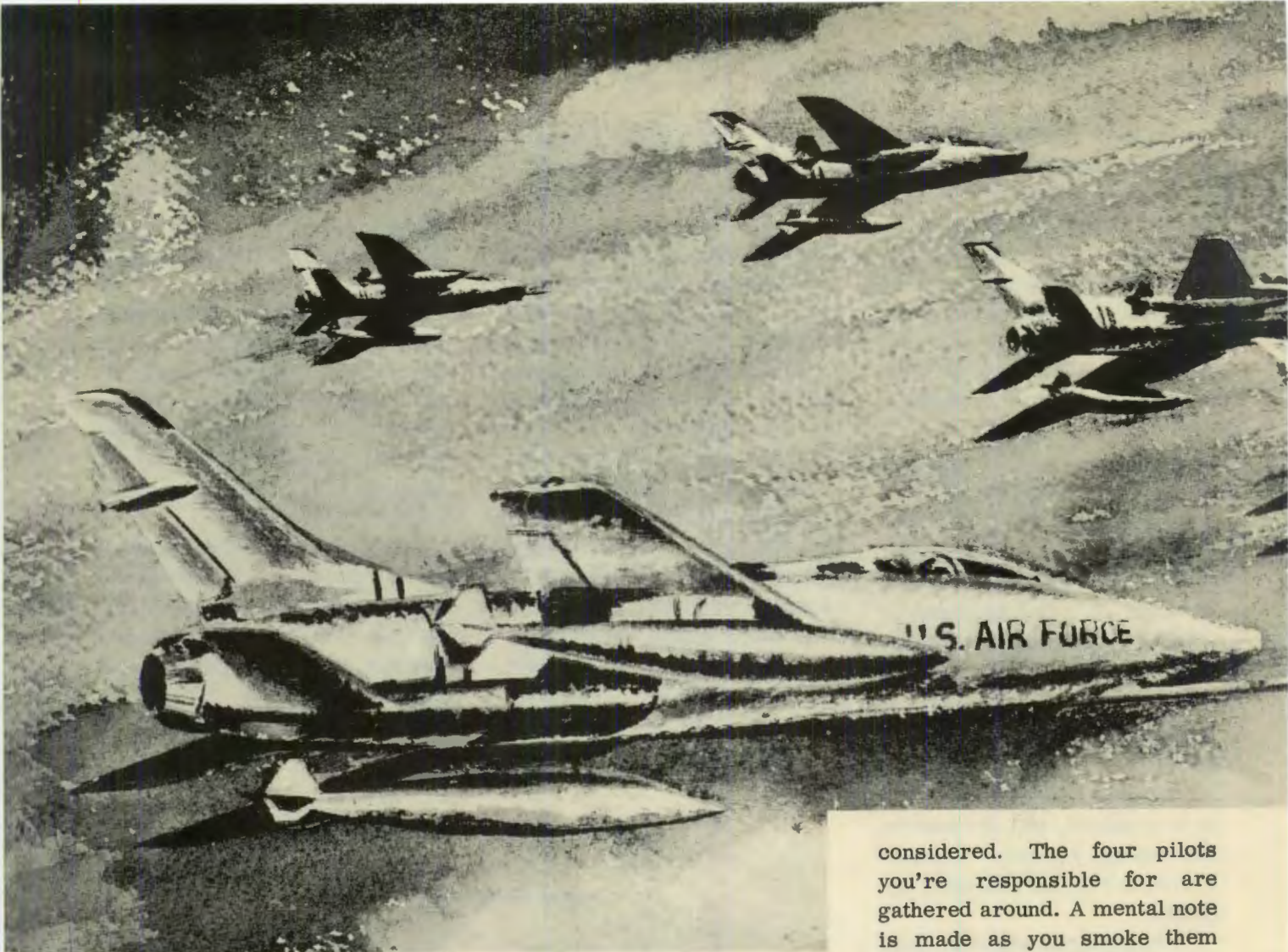
He's right too. These cards are supposed to be kept handy in base ops. If you can't find 'em let the base ops officer know about it. We're all missing a bet if we don't use 'em.

COMMAND DECISIONS.

You have been cleared for a VOR penetration and approach and are starting your penetration turn at 14,000 feet indicated when Approach Control advises that the airpatch is below GCA minimums. You have ample fuel to permit diversion to your alternate provided you don't dawdle . . .

Paragraph 40e, AFR 60-16 states, "An instrument approach will not be started or, if started, not continued whenever the pilot is advised that weather conditions at the airfield to which the approach is being made are below minimums for the approach being made or contemplated except when an emergency exists."

Adding to the problem is the fact that, although you made a complete preflight inspection, you forgot to bring your skyhook----Comments, please!



CHANCES ARE you've always had a slight distaste for the word discipline. You've heard it all of your military life either in the form of a noun or an adjective. It's a necessary part of an orderly life and yet, like insurance, no one really misses it until it's needed.

Let's put you in the position of having to move five century-type birds from west to east for a special headquarters directed mission. You've been told what you have to do, what you have to do it with and when it must be done. This is basically all you need. Because of your rank and

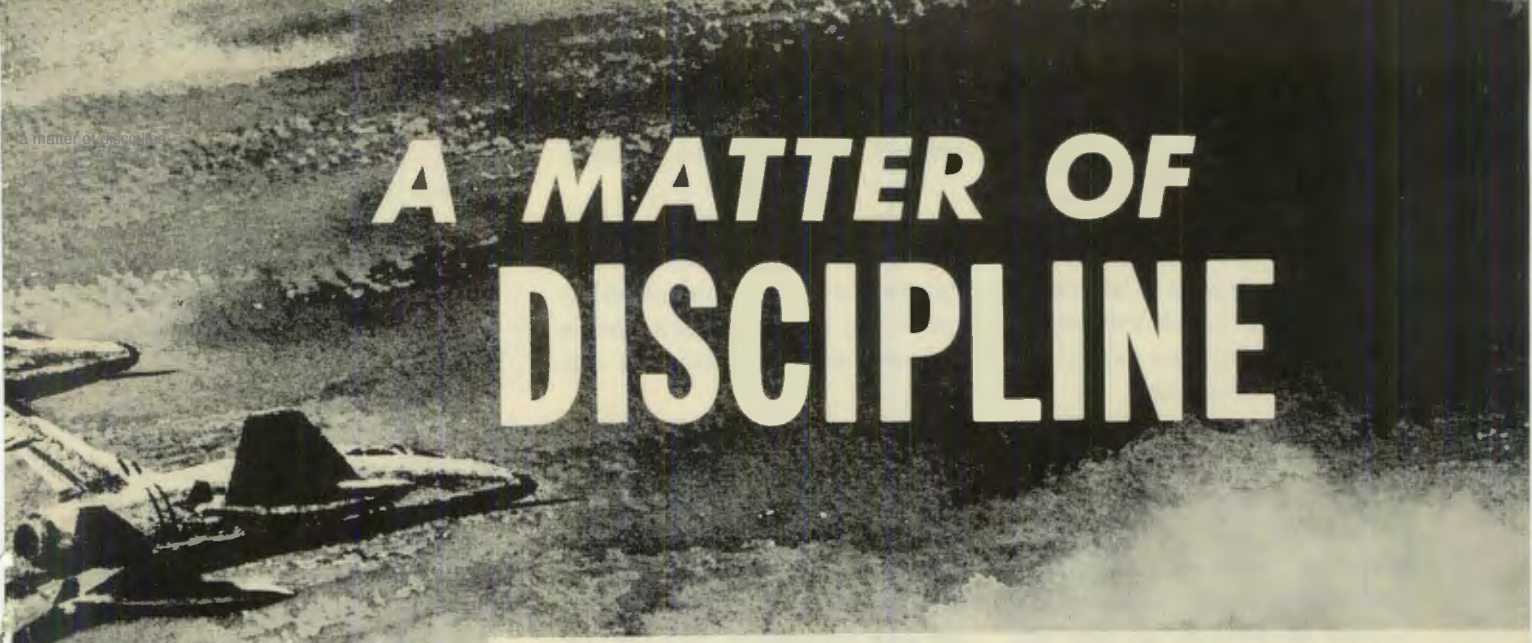
experience you have been placed in charge. You have been given the authority and automatically the responsibility for successfully completing the mission. A mission, incidentally, which involves almost four million dollars worth of aircraft. It must be conducted in an orderly manner. Will discipline help?

Keeping this question in mind let's follow your planning and execution from start to finish.

You start your preflight planning in plenty of time. Distance, headings, frequencies, forecast weather, have all been

considered. The four pilots you're responsible for are gathered around. A mental note is made as you smoke them over for experience. Thomason, Richardson and Harrison all have over 1,000 hours total time. Richardson and Harrison have less than 50 hours in the unit bird but they have a considerable amount of century time. Lt Josephs has less than the magic 1,000 hours total time but he has over 400 hours in the aircraft. All are safe although all are not combat-ready.

You're no nit-picker when it comes to briefing. You give them the bare facts in a friendly, informal sort of way. Hell, they're all rated pilots. Besides, you can still remember how bored you were with the discipline and formal briefings



A MATTER OF DISCIPLINE

you received in the Training Command and swore you'd run things differently if you ever got the chance.

Briefing is completed and clearance filed for Sandstone AFB, a refueling stop. From there, weather permitting, you plan to file for Vips AFB where the special mission is to be conducted.

Call sign for the flight is Tight. At start engines you find you have instrument trouble and you'll have to abort. Also, Josephs has some fuel problems at the end of the runway and aborts. About this time you try to recall the briefing. You're almost sure you covered these eventualities but you don't have a record of it. No-sweat Thomason signed the 175 as alternate flight lead. He's fully qualified and a good troop. The

way things are going though, reminds you somewhat of the tales the older troops have told at beer call about how they used to kick a tire, light a fire and smoke off with the first man to the runway as lead and brief on guard.

Still thinking about how things might have been in the old days you figure there couldn't have been much discipline back then but they sure had a ball. Chances are their accident rate doesn't enter your mind.

Meanwhile maintenance has cured the problems you and Josephs had and after an uneventful flight you join the others at Sandstone.

There is plenty of crew duty time left in which to make the hop to Vips AFB but being weather-wise you decide to check with the rain maker. He unveils a horror picture of a severe weather warning area surrounding your proposed destination. You've been told not to push even if it takes you a week to get to Vips so you decide to RON and wait for the forecast improvements. This is

a decision no one will question.

After a reasonable night's rest you awaken the troops about 0700, pay your BOQ bill and press on for base operations. Some general aspects of the forthcoming flight are discussed during the ride to operations.

While the other troops are having a snack you check the winds and weather at Vips AFB, grab a 21A and your computer, and grind out the necessary poop.

Since the weather at Vips is forecast to be high overcast and 10 miles no alternate is required. Your route of flight will be direct to St Mary's, Clarenceton, and Round Stone, with a penetration off Paw Creek VOR to Vips AFB. The time enroute is approximately two hours and you should have thirty minutes of fuel remaining.

Figuring this as a no-sweat flight you breeze into the snack bar and while you're eating you give the other troops the info you've cranked out.

After having Thomason sign the 175 below your signature you

and the troops stand by while the forecaster briefs you and fills in section D.

On the way out to the aircraft you give the troops a few more aspects of the flight. You advise them of the let-down you intend to make, depending on the weather of course, and which element will penetrate first. Generally the techniques and procedures will be about the same as were planned for yesterday's flight. Actually it's a real no-sweater so why not let the boys sort of hang loose and play it by ear. Remember, you're no nit-picker when it comes to briefing.

Takeoff, join up and climb to flight level 340 are uneventful. You level at 340 and cruise climb as planned to flight level 380. You are now VFR on top. Looking the formation over you note that Tight Two is on your left wing, Tight Three, Four and Five are more-or-less in echelon off your right wing. There is a little jostling around in the formation but all-in-all not bad for a route formation.

About three-fourths of the way from Clarenceton to Round Stone VOR you hear a transmission that shakes you.

"Tight One one, we got a mid-air between two and three. No it must be three and four. It looks like one of them is coming apart."

You ask, "Where are they?"

"Down below us."

You start a turn to the right and catch a glimpse of Tight Four as he goes into the under-cast. Moments later he advises you that he is ejecting. You

haven't seen or heard Tight Three since the collision.

After reporting the accident to center and requesting a fix you realize that there is nothing more you can do at the scene so you proceed to Vips AFB and land.

It is some few hours after you land at Vips that you receive the word that Richardson, uninjured, has been picked up by helicopter. However, Thomason was found dead in the cockpit. He was apparently killed in the initial collision.

As soon as you see Richardson you ask him what happened. He tells you that shortly before the collision Thomason had dropped back out of position. Not wishing to lose mach and have to regain it, Richardson elected to hold position on you rather than on his element leader. This placed him ahead of Thomason and it was from this position that the collision occurred.

He also said that just prior to the accident he had taken his let-down chart from his G-suit pocket and looked over the Vips

AFB penetration. When he looked out of the cockpit again he saw that either he or Thomason was banking into the other and though he broke immediately to the right it was too late.

Richardson said that immediately after the collision he momentarily lost control, lowered the nose to regain it, then extended his takeoff flaps and established a 240K glide. At this point his engine flamed-out. He tried several airstarts to no avail and seeing no place suitable for a forced landing, ejected.

At this point thoughts of Thomason again cause that sinking feeling in the bottom of your stomach. You mentally review the entire operation asking yourself if you failed in any respect.

Perhaps this is the time for a little reminiscing. Go back to the time when the troops you flew with had marched on the drill field as students or cadets. They responded quickly to authoritative commands. They held their position in formation accurately, remained alert and





they looked proud. Their supervisor, or drill instructor, could move them from one area to

another promptly and in an orderly manner. He gave them commands from the position of

attention and in a manner that demanded their attention. Thus he prepared them psychologically for any abrupt maneuver he might order. This was basic discipline.

Air discipline is no different in principal. It too must begin on the ground. If you brief pilots properly and prepare them psychologically they will fly the mission in the same manner and sequence that you brief.

It must be presumed that pilots do not deliberately commit errors that lead to disaster. Yet as a supervisor you must fully realize that if discipline is demanded from your subordinates as a matter of daily routine it will permeate every phase of operations and will reduce avoidable accidents.



SITTING on the ramp, the C-124 seemed huge alongside the fighter aircraft that were parked around her. In a way, she looked like an old brood hen with her chicks. At any other time, the Old Sarge would have been amused by the scene, but not today. To begin with he'd had to chase his cap halfway across the field after a gust of wind caught him by

surprise. Then there was the C-124. It looked like it was being loaded and although he was as anxious as anyone to get the squadron off on their deployment he had reason to believe that the loading operation was premature. In fact, he had been on his way to add a word of caution when the wind took off with his hat.

Leaning against the wind,

holding his hat, he fought his way over to the door of the big machine. There, he hesitated until the aircraft commander waved him inside.

"Hi," the crew chief said, "We'll be getting out of your way in just a bit. Sure do thank you people for all the help on that engine change."

"Glad to oblige," replied the Old Sarge. Then, raising one

eyebrow he casually asked, "How'd you sneak this big rig out on a test hop without us noticing it?"

"We didn't. Shucks, T.O. 1-1-300 lets us big bird boys fly without a test hop for minor stuff like an engine change." The crew chief's tone of voice as much as added an unspoken 'what's the matter dad, don't you dig the T.O.?' ... "Besides," he added, "the transient maintenance officer has given his blessing."

The Old Sarge carefully studied the toe of his GI shoe, then glanced at the heavy crate three airmen were waiting to move into position. Looking the crew chief straight in the eye he said, "I recollect reading the T.O. and you're right, it does give you the go-ahead. By the way, did you get into town while you were here?"

The crew chief made a face and nodded an affirmative while the aircraft commander smothered a slow grin.

"Then," continued the Old Sarge, "you probably noticed the S curve just before crossing that bridge over the creek. That curve is marked 45 mph. When

the road's dry that's safe enough. In fact, you could make it at 50. To me, that speed sign is to be used as a guide. As a driver, I use it to decide how fast I want to go. I don't have to drive it at 45 and I certainly wouldn't drive it that fast when the road's icy. Far as I'm concerned, T.O. 1-1-300 is pretty much the same. The fine print on page one says that the commander, thru his maintenance officer, must determine whether or not a functional check flight is required. This makes it a maintenance engineering decision and the T.O., along with the Dash-Six, is a guide to help 'em make that decision."

He looked over at the aircraft commander and went on, "I've been to town too and I can't blame you people for wanting to get out of here . . . I imagine you're pretty well experienced, 'cause Capt Mack wouldn't release this machine to an inexperienced pilot even tho it was legal.

But, it's my men and my equipment that will be on board when you go . . . and altho I wouldn't mind losing the equipment I certainly don't want to lose any of the men. What I'm

trying to say is this; we replaced the number four engine and we installed a new prop governor on number three. The people who did most of the work had never looked at the innards of a C-124 before. I trust 'em and I'm sure they did a good job. But if they didn't . . ."

He paused, waiting for a reply. This time the engineer was the one who studied his shoe. Both he and the aircraft commander glanced back at the crate, then at a tumbleweed that was blowing across the ramp, and finally at each other. The crew chief pursed his lips and gave a single nod of his head. The aircraft commander sighed sadly and said, "Sarge, you're right. It would be one thing to have a couple of failures when Old Shakey is nice and light and another to have the same things go wrong when she's loaded to the brim . . . the, ah, policy section has just reversed its decision." He grinned and said, "You know, it's possible the extra time lost on a test hop could be some of the most valuable time spent toward getting the mission accomplished."





FIX THE BLAME?

A mechanic may have failed to torque a nut properly, resulting in a discrepancy. Too often the mechanic is admonished for his error, and that is the end of the matter. In a great many cases it is possible to discover the basic WHY behind the personal error and correct the fault at its source. Perhaps it's simply a matter of poor training. Or possibly the maintenance schedule is geared so high that personnel do not have sufficient time to do a first-class job. Perhaps there are personal problems, fatigue problems, or problems of motivation which can be corrected. It is just as essential to try and ascertain the WHY of human failure as of mechanical failure, and Quality Control must appreciate this fact.

—APPROACH

NO TANKS.

An airman second checked the jettison system of an F-100 by punching the panic button without pulling the circuit breaker. The system was AOK, so both drop tanks plunked onto the ramp, right in front of everybody.

The immediate cause of this is obvious... the airman didn't follow established procedures. Why didn't he follow them? Was it because his supervisors hadn't impressed him with the need to follow these procedures to the letter? Was a checklist available? If so, why wasn't it being used?

Again, it would appear that supervisors had not impressed this man with the need to follow a checklist. Perhaps they had stressed this need, but the airman wasn't sufficiently motivated, or just didn't care. If so, he can't be trusted around aircraft. We point this out to illustrate some of the questions that need to be answered when a mishap occurs.

TAC ATTACK

NUTS AND BOLTS

How many times have pilots walked back from a flight because of a misplaced or misused nut or bolt? Statistics indicate that in many cases of engine or control failure a missing nut or bolt was the primary factor.

A short while back, a pilot experienced very sluggish flight controls. After sweating through some anxious moments, he was able to land his million-dollar aircraft without incident.

A great many man-hours later, investigators were able to find where the bolt had come from and to learn why the securing nut had come off. The pilot brought this one back but the aircraft was out of commission for over a week while it was being opened up and inspected.

Then there was the case of a throttle fuel control arm coming disconnected at the fuel control. The cause was easily discovered... The bolt had backed out because there was no nut to keep it in place. Investigation revealed that the elastic stop nut used to secure the bolt had been reused and the nut had no securing qualities at all. But the topper was that even had the nut been a good one, the same incident probably would have happened... someone used a bolt that was not long enough to completely grip the elastic part of the nut!

These incidents took place even though many rules have been established to prevent them. Take the case of the fuel control arm becoming disconnected. There is a definite statement in the maintenance handbook for the aircraft involved concerning the reuse of elastic stop nuts. It reads, "Caution: All lock nuts in engine control systems should be used only once." Regardless of how tight a nut feels when it is re-installed the book says don't...so you should discard



them. A tight feel is not an indication that the locking device is working. It's poor economy to risk a million-dollar aircraft and its pilot just to save the price of a nut.

And there are also rules about using short bolts. After a nut has been tightened, round or chamfer-end bolts or screws must extend the full round of chamfer through the nut. Flat-end bolts or screws must extend at least 1/32-inch through the nut.

Sawed-off bolts that have rough ends should have all burrs filed off before a nut is installed.

Now getting back to rules about elastic stop nuts. Never tap the fiber collar. The self-locking action of elastic stop nuts is accomplished by impressing bolt threads in the untapped fiber.

Elastic stop nuts should never be used in areas where the temperature is higher than 212 degrees C (250 degrees F). The effectiveness of the elastic self-locking nut is greatly reduced above that temperature.

Metallic and other types of self-locking nuts are available for high temperature areas. However, the same rules apply for the installation of these nuts as apply to the elastic stop nuts.

Self-locking nuts should not be used to connect control systems since their movement may result in the nut moving on the surface it bears on. However, they may be used with anti-friction bearings and control pulleys, provided that the inner race of the bearing is clamped to the supporting structure by the nut and bolt.

Remember . . . when in doubt, check T.O. 1-1A-8. It gives strict and explicit rules for use of self-locking nuts . . . and pass the word when you see these items being misused or abused.

FUEL FIRE.

A C-130B was destroyed by fire following an

explosion in the left auxiliary fuel tank. When a newly installed boost pump was checked out, the "B" and "C" circuit breakers popped. The tank exploded when the booster pump switch was turned off and the circuit breakers reset.

To keep this from happening again, the electrical conduit within the tanks has been modified, a Safety of Flight supplement has been published, and Technical Order 1C-130-2-5, maintenance procedures for fuel system electrical components, has been revised. Maintenance personnel should be cautioned to follow maintenance directives precisely and to use extreme care when repairing fuel system electrical components.

REFUELING.

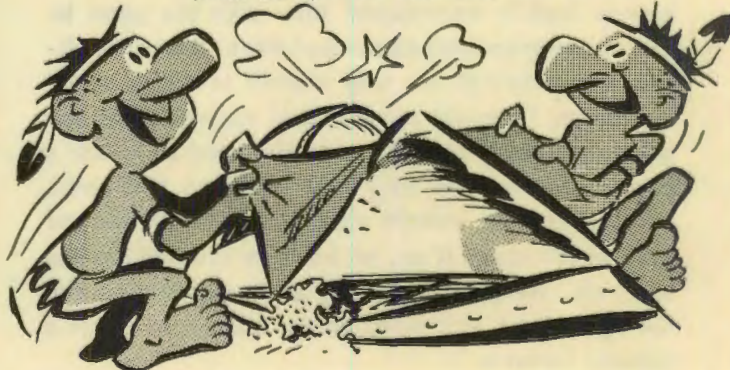
To help prevent servicing errors, one organization is painting the refueling inlets on their aircraft and the hose nozzles on their servicing trucks the same color. The color used matches the color of the appropriate fuel. In addition, they require both the crew chief and the truck driver to certify to the type fuel delivered.

One more attempt to insure a "fuel" proof system of servicing aircraft. What measures are you taking to guard against servicing errors?

SCRATCH ONE CANOPY.

Maintenance men didn't follow the proper T.O. procedures when blending out scratches on a canopy. As a result they weakened the canopy and it later failed. If you follow the T.O. and the part fails, you can blame the book . . . if you don't follow the book, you'll be blamed. It's as simple as that.

NOW LET'S TRY'UM FOR PRESSURE!



C-124A ELECTRICAL WIRING.

To determine the extent that electrical wiring has deteriorated in C-124A aircraft, WRAMA has directed that Aircraft, SN 49-250, be delivered to Hayes Corporation, 2 February 1962, for a complete wiring inspection. Results of this inspection will be sent to all C-124 units.



PLEASE DON'T FEED THE "BIRDS".

It's amazing that our birds aren't all dead considering the rate we've been feeding them a diet that is impossible to chew or digest. It's true, they are a hearty flock and we haven't had too many just up and die, but the medical bills are staggering! The majority of these ailments (FOD) are normally discovered during periodic physical examinations (scheduled maintenance inspections). In reviewing medical reports for the past year, we find that the most frequent ailment is excessive dental damage. This requires, at minimum, a partial plate and often a complete new set of teeth (compressor or turbine blades). Do you realize what a new set of teeth for one of our thoroughbred fowls cost? It's in the neighborhood of \$90,000 and that ain't bird seed! Specialists sometimes prescribe an authorized mixture of peach seeds, apricot pits, or walnut shells to correct some bird disorders. This approved treatment is called carbo blast. It cleans the teeth and innards of birds and makes them feel good again! These crazy birds will eat anything within reach, so let's be careful and keep them from eating things they can't digest. Take stock of the flock, and keep a clean bowel in the fowl.

TAC ATTACK

SEATS FOR THE C-131 AND T-29

SAAMA is conducting an evaluation of seat and cargo floor stresses, and has requested each Command to furnish complete identification data on passenger seats used in C-131 and T-29 aircraft.

Data gained from this evaluation will be used to identify those seats that are suitable for side installation as opposed to the normal forward facing installation.

UNAUTHORIZED ENTRY.

A C-124 had a bad interphone, so a couple of communications specialists were sent out to fix it. They received clearance from the aircraft commander and boarded while the big bird was on the ramp with the engines running. After making a preliminary trouble check, they left the aircraft and the crew taxied it out for run-up.

Just as the crew was getting ready to taxi back to the ramp, in popped the two Com men.

Now Old Shaky is a huge bird and it takes excellent crew coordination to taxi her safely... but even with the best of coordination it is very doubtful if anyone would have spotted this pair had they tried to enter just as the machine was starting to roll. In other words, had this pair tried to get on board unannounced, just a few moments later, they may have been killed or badly mangled.

No one, absolutely no one, should try to board an aircraft when its engines are running unless the man in charge knows about it and gives definite approval.

... An unacceptable number of discrepancies are being deferred to periodic inspection. It is my opinion that the basic concept of the periodic inspection has been distorted to the extent that it has become a major overhaul operation, rather than an inspection phase of our maintenance system. As a result, preventive and minor maintenance on the flight line has become practically nonexistent.

By increasing flight line maintenance, periodic in-dock time will be considerably reduced, existing workloads will be more equitably distributed and weapon system reliability will be greatly increased.

—General Coiner in a message to 9th AF Units

know

Mr. Andre' is an F-104 Production Test Pilot for Lockheed Aircraft Corporation at Palmdale, California. He is familiar with Air Force flying, having spent a few years steering some of Uncle's birds around. We think you'll find his article on acceleration interesting and thought provoking.

before you

go



BY MR. GEORGE M. ANDRE'

The best test of an airplane's performance comes during the takeoff roll, because this is when a pilot has measurable parameters to judge the power output of his engine. Since a number of accidents occur during this phase of flight, let's take a look at the mathematical relationships involving acceleration during the takeoff roll. Only a few variables are involved in these relationships; however, they are extremely important and can affect the takeoff quite drastically. Since the T-bird has been around long enough for us to predict its takeoff performance with a high degree of reliability, let's use it to make some for instances.

Acceleration during the takeoff roll is uniform because the thrust of a turbo-jet engine is nearly constant with speed and only a small amount of aerodynamic drag is introduced. We know that the accel-

erative force in the T-33 will only be reduced about 800 lbs because as the takeoff speed increases thrust is reduced approximately 400 lbs, drag increased approximately 600 lbs, and rolling friction is reduced by approximately 200 lbs. (400 lbs plus 600 lbs minus 200 lbs equals 800 lbs.) From this we know that a uniform acceleration is calculable and predictable at any point in the takeoff roll.

An airplane will accelerate with a certain "g" force, depending on the power available. Since most of us are familiar with a falling body let's review some basic facts concerning the forces involved. A body dropping under the force of gravity will accelerate 32 feet per second. This means that in one second, the object will achieve a velocity of 32 feet per second. It will travel 16 feet in that one second because that is the

average velocity during the period. Since velocity will increase 32 feet per second each second during the period of acceleration, velocity can be calculated at any time lapse by multiplying the time period by the acceleration. (32 feet per second² x 10 seconds equal 320 feet per second.) To illustrate let's assume that a representative acceleration in a T-33 is 8 feet per second². Twenty-five seconds after brake release the aircraft would have a velocity of 121 knots. 8 feet per second² x 25 seconds equals 200 feet per second or 121 knots.

The distance traveled per second increases every second because the average speed is increasing. At the end of five seconds the velocity would be (5 x 8) 40 feet per second, and at the end of six seconds (6 x 8) 48 feet per second. The distance traveled during the sixth second

is 44 feet and the average speed is 44 feet per second. It is important for the pilot to realize that it took only 4 feet to gain a velocity of 8 feet per second at brake release while six seconds later it took 44 feet to increase rolling velocity by the same increment.

The total distance traveled during the takeoff roll can be expressed by the formula, $D = 1/2 at^2$ (a = acceleration rate, t = time). The following chart shows how the takeoff distance and velocity varies in relation to time in a T-bird with an acceleration of 8 feet per second².

Time	Velocity ($V = at$)	Distance ($D = 1/2 at^2$)
1 sec	8 ft per sec	4 ft
2 "	16 "	16 "
3 "	24 "	36 "
4 "	32 "	64 "
5 "	40 "	100 "
6 "	48 "	144 "
7 "	56 "	196 "
8 "	64 "	256 "
9 "	72 "	324 "
10 "	80 "	400 "

The takeoff speed for the T-33 is 120 knots IAS with full tip tanks and crew of two. This is true as long as recommended takeoff procedures are followed. We all know that the bird can be pulled off at lower speeds but a look at the accident reports will show that this technique isn't always satisfactory. Perhaps the term "lift-off speed" should be dropped from our vocabulary, because technically we don't lift the airplane off the ground . . . we establish a take-off attitude and allow it to FLY OFF.

The takeoff speed is the key variable defining the runway needed for a successful takeoff. Suppose we compare the takeoff roll of a T-33 with another bird that has a wing large enough to get it airborne at 60 knots or half the normal T-33 takeoff speed. From the formula $V = at$, we find that with constant acceleration it will take the bird with the large wing exactly 1/2 the time to reach takeoff speed as the T-33, or 12.5 seconds. Plugging 12.5 and 25 seconds into the formula for distance ($D = 1/2 at^2$) we find that the takeoff roll for the T-33 is not twice, but four times as long as for the other aircraft. The distance then varies as the square of the velocity.

This is all good, based on the representative acceleration of 8 feet per second², but acceleration on the takeoff roll will vary with increasing pressure altitude and runway temperature. From the formula

$D = \frac{V^2}{2a}$ we learn that the distance required to accelerate to takeoff speed varies as the acceleration (a) changes. Since takeoff speed for the T-bird is 200 feet per second let's compute some distances for various values of acceleration $D = \frac{(200)^2}{2a}$:

a	Distance
8 feet per second ²	2500 feet
7 "	2857 "
6 "	3333 "
5 "	4000 "
4 "	5000 "
3 "	6666 "

We can see that although the acceleration decreases at a

constant rate the distance required to attain takeoff speed increases at a much faster rate. Acceleration rates for the T-bird on a standard day will be about 6 to 8 feet per second²; however, on a hot day at Lowry we might have accelerations as low as 3 feet per second².

Since jet accelerations are virtually uniform a precise graph of the entire acceleration has been plotted. From this graph, Figure A2-4 in the flight handbook, the desired IAS can be computed for any point in time or distance during the acceleration. This chart is an invaluable aid in determining engine performance. When used properly with the other charts, sub-standard engine performance can be discovered early in the takeoff roll . . . if you are ten knots slow at the 2,000-foot marker you will still have plenty of runway left to abort.

Many accidents have resulted because pilots did not consider the variables involved and their effects on takeoff performance. I recommend that we hide some of the handy gadgets for picking out takeoff rolls to jot on the DD-175 and get back to old fashioned computing. If we do, pilots will soon have a better knowledge of how the takeoff roll is affected by what appears to be unimportant items.

In summary---jet acceleration is virtually uniform. A pre-computed acceleration check is positive. If you don't have it, you'll never get it. If you do, only a thrust loss will hurt you, so GO-GO-GO!

low,
low
go

THE LIEUTENANT CONTINUED to monitor the instrument panel as he listened to the clipped voice over his headset. "Able two, John GCA with latest John weather. Measured 300 overcast, visibility now one mile with light rain and fog. Ceiling is ragged, mobile advises full stop landing."

"A little worse," he thought, then transmitted. "Rodge...able two understands."

A different voice came thru, "Two, Able lead here. I broke out just about minimums."

"Rodge, understand, thanks." He wasn't worried. He had gotten quite proficient at weather flying, and John Air Base had an excellent GCA.

He was transferred to the final controller who gave him very few corrections. Airspeed was close to the money and everything indicated an excellent approach. The Lieutenant concentrated on maintaining headings and rate of descent while the calm voice continued . . . "You are one mile from touchdown approaching minimums, now going 20 feet

above glide path. 217 is your heading. Thirty feet above your glide path as you pass through minimums. 217 is the heading. Right to 220. Two-twenty . . . You are too far left at this time, make a go-around."

As he released his mike button the GCA controller heard Able two transmit, "Roger on the go-around," this was followed by what sounded like a quick indrawn breath.

Shortly afterwards, the controller heard the sound of Able two's engine as he passed over the GCA shack. He appeared to be at full throttle. Then, he heard the voice of the mobile controller say, "Able two, you OK?"

The pilot answered, sounding quite calm, "Rodge, but I think I messed up the gear. I'm going to my alternate. Switching to departure control."

Able two completed the diversion to his alternate without incident, except that his right brake was inoperative and he couldn't keep the big machine on the runway during the latter part of his landing roll. The runway shoulder was smooth, and no damage was done at this time.

Getting out of the cockpit, he looked over his aircraft and found three nasty looking gashes in the wing plus a long rip that opened up the whole underside of the fuselage. Both wing spars were broken. This damage resulted from contact with four concrete fence posts that formerly held up the perimeter fence at John Air Base.

Good reason for the quick drawn breath. Able two had

glanced out to cross check for the ground after proceeding to continue his letdown about two seconds after being given the missed approach. He saw the ground approaching rapidly, immediately hauled back on the stick and applied full throttle. The aircraft responded rather briskly, but not briskly enough to miss the posts.

The accident was attributed to both a malfunction in the GCA equipment and to failure of the pilot to execute an immediate pull-up when GCA told him to go-around.

During the course of the investigation many century series fighter pilots were questioned. Most admitted that they had adopted a practice of relying on GCA for minimum altitude data, rather than monitoring the aircraft altimeter. They contended that the aircraft instrument installation caused too many errors. Apparently no one had taken action to get the system made more accurate. By living with the discrepancy and placing their life completely in the GCA operator's hands, all of these pilots short circuited the system making it impossible for anyone to fix the equipment. For this reason, the cause of this accident should have been attributed to all pilots who had noticed this deficiency and kept quiet. It was inevitable that a GCA unit would eventually malfunction at a critical time with one of these pilots who had, for one reason or another, ignored the altimeter during an approach.

TAC TIPS

FAREWELL.

The gooney's left engine came unglued and then refused to feather. The aircraft commander wisely ordered everyone to put on their chutes—and turned toward the nearest airfield.

The copilot went into the main cabin so he could put his chute on without bumping his elbows and saw that the engineer was having trouble with the jump door. He went back and helped him. Just as soon as they got it open, the engineer leaped out. He later said he looked around and saw the copilot with him and assumed that they were abandoning the old bird. Instead, the reduced crew proceeded to make a successful approach and landing while the engineer hitch-hiked his way in. Proving that you want to make sure it's two and two before you do your adding up!

GAY BLADES.

A number of the J-33 engines being processed under Project Queen Bee have required 100% turbine blade replacement because of turbine rub. Turbine blades stretch when engines are overtemped and then the blades rub. Too many of us do not use correct procedures or techniques to start engines and exceed temperature limitations. Important too, is that many of us are guilty of over-temping an engine and not recording it. This exposes us, as well as our friends, to possible engine failure, serious accident, or incident. We should review the operating procedures and limitations in the flight handbook and then follow the procedures and record all over temperatures.

EMERGENCIES.

When faced with an emergency the earlier you tell the tower, the better the preparations will be . . . and this can well be the difference between life and death for YOU!

A few seconds advance notice gives the fire department and crash rescue team time to start their vehicles and get into position where they can monitor your approach and landing. Then should you fail to cope with the emergency, they will be able to respond immediately, instead of two or three critical minutes later.

WAISTLINE WATCHER.

Conversation between two pilots overheard at a coffee break:

"Have another donut?"

"No thanks, Haven't had my physical . . . besides, these jet cockpits aren't getting any bigger."

GET THE POINT.

Spring and summer weather will bring an increase in temperatures. Since temperatures definitely affect tire performance, it might be well to take an extra good look at those boots before you blast off. Also, you F-100 pilots should look at the Form 781 to check points accumulated. This is particularly important when leaping off for the other coast. A total of 39 points is one too many for even a local flight. In other words, be sure you have the money in the bank before you write the check.



AFSD?

The F-100D Dash-One lists airspeeds that should not be exceeded when you have a known or suspected failure of the electronic equipment cooling turbine. These airspeeds are based on temperature and pressure of an Air Force Summer Day (AFSD). A careful search of the Dash-One did not produce the criteria for this type of day. Several pilots were asked if they knew the temperature and pressure of an Air Force Summer Day. All knew that the NACA Standard Day was 59°F and 29.92 HG at sea level, but only two pilots had ever heard of an AFSD. TAT was queried, and mumbled something about short, short shorts.

Since this criteria concerns operating limitations, you as an operator, should know the answer. Just in case you don't, you'll find it somewhere in this issue of the TAC ATTACK but you'll have to look for it.

FOOD FOR THOUGHT.

An airline captain reports considerable success at combating fatigue by eating frequent snacks--low calorie biscuits--while enroute. An hour before landing he walks the length of the cabin, washes his face, drinks water and eats a gumdrop or chocolate bar for quick energy, then takes oxygen for 15 minutes. His procedure appears to be a great deal more positive than the usual discussion on the affect of fatigue, how to measure it, etc.

Fighter pilots on long hauls will have trouble walking the length of the cabin, washing, etc. But can follow the biscuit, candy and oxygen (100%) routine, and can substitute a good foot stomping session for the walk.

ATTENTION ACCIDENT INVESTIGATORS.

A few of you still are not following instructions when you fill out the cause factors on an aircraft accident report. Your cause factor analysis does not jibe with the categories in block 20 of the AF Form 711b . . . you're being non-standard, are compromising the system and causing excessive head scratching. Don't try to beat around the bush. The factors in block 20 are complete and go straight to the point, so should you.

T-BIRD TROOPS.

Are you reporting inflight communication trouble? You are supposed to record this data on the AFTO Form 781 even if the difficulty seems to correct itself. This will help FAA and the USAF resolve air traffic control communications problems. The earlier survey of this problem has been extended to 31 July of this year. Special emphasis is being placed on T-birds.

TIRES.

The pilot was taxiing back from an aborted takeoff when his century series fighter blew a tire. The wheel and brake were still cool so it appears that under-inflation was the cause of the failure.

Here in TAC we've learned the hard way that a tire failure at the wrong time can be difficult to control. On at least two separate occasions well experienced pilots were killed when they experienced tire failures during takeoff.

Failures are generally caused by under-inflation, by running over a hard object, or by both. Summer weather increases probability of a failure . . . tire temperatures are increased, take-off rolls are substantially longer and aircraft must reach higher true airspeeds in order to lift off. Now is the time to tighten up on overall air-drome cleanliness and to review tire handling procedures. Make certain that the points system is being followed and that pressures are properly maintained and checked using accurately calibrated gauges. The hazard is real and well-known. Let's not re-emphasize it with an accident!

WORRIES GROUNDED.

A recent near-accident involved a pilot who was enmeshed in a great deal of family cares, sickness and dispute. This man carried his troubles into the air, devoting time to his problems that should have been employed for his own immediate welfare. By doing so, he set himself up for an accident. Leave your problems at home. Worries of a personal nature must be "Grounded." Your only problem when airborne is to get safely home again. If problems become insurmountable, or seemingly so, see your flight surgeon.

—*USA Aviation Digest.*

MISSING TOOTH.

About to have an upper rear molar removed? Don't fly afterwards—at least, not without discussing it with your dental surgeon.

The Armed Forces Medical Journal tells about a service man who recently had two molars extracted. As is fairly common, some of the jawbone around the socket of his molars was removed; he was told not to blow his nose or sneeze afterwards. He complied. Trouble is, no one told him not to fly. About a week later he did just that and quickly wound up in oral surgery with a ruptured sinus lining.

C-119 WING HEATER CONTROL.

During a routine periodic inspection on a C-119, a squadron engineering officer decided that it would be a good idea to check manual operation of the wing anti-ice control valves.

First he tried to pull the chains. It was almost impossible, since he could get very little leverage. Eventually he succeeded, but found that his arm was too short causing him to struggle and strain in order to push the actuator forward.

When going thru emergency procedure drills, C-119 crew chiefs simulate pulling these chains, because you have to remove a panel in order to reset the valve. Therefore, it's doubtful if many have ever actually done the job. They should be warned that it isn't easy. Also, these chains should be checked during the 200-hour periodic to make certain that they haven't rusted and that the actuator is free to move. The Dash-6 covers it.

POOR QUALITY CONTROL.

A T-33 from another command ran into a crash truck on takeoff and killed three men. The aircraft was being tested after having its right wing changed. The new wing had been received from the depot with the aileron rigged in reverse. The error had slipped thru quality control at the overhaul depot, had been missed by the mechanics who installed the wing and was overlooked by maintenance inspectors, the crew chief and the test pilot. Obviously, it should have been impossible for this to slip thru—and it would have, if just one man in the sequence had done his job properly.

REMINDER.

The Flight Safety Officer at Robins Air Force Base, Georgia, has developed a handy card called a "Remy Aide" (remedy, reminder, requirement) to be handed to a transient pilot by the alert crew as he straps into the cockpit. The card reminds the pilot to check the attachment of safety belt, shoulder harness, automatic parachute key, zero lanyard, survival kit, arm and leg restraint and helmet connections. The card was devised because a trend in aircraft accidents indicated that proper attention was not being given to cockpit preflight procedures.

TAXI TACTICS.

The pilot said, "The aircraft seemed to slow down and I suspected that my starboard brake was dragging. I applied more power and the aircraft yawed to starboard so I looked that way and noticed that the rocket pod had come in contact with a parked vehicle."

The RCAF FLIGHT COMMENT commented, "Aircrew suffering from tunnel vision. Should be reminded again that most service aircraft have two wings (one on either side of the fuselage) and that headbone swiveling on the ground is just as important as in the air."

(AFSD is 100°F, 29.92 HG at sea level.)

(AFWD is minus 65°F, 29.92 HG at sea level.)

TAC ATTACK



CREW CHIEF OF THE MONTH

Technical Sergeant David U. Shumate of the 4529th Organizational Maintenance Squadron, Nellis Air Force Base, Nevada, has been selected as the Tactical Air Command Crew Chief of the Month for the superior manner in which he has performed his duties as an F-105D crew chief. He has consistently been able to achieve a high-in-commission rate for his aircraft, and as a result, it ranks among the highest in hours flown. On inspections, his aircraft has a considerably lower than average number of quality control discrepancies. Sgt Shumate is punctual and dependable, he uses initiative, along with his accumulated knowledge and experience to accomplish all tasks.

RECOGNITION



MAINTENANCE MAN OF THE MONTH

For his commendable devotion to duty and capable performance, Staff Sergeant Robert M. McCord has been selected as the Tactical Air Command Maintenance Man of the Month. During the past year Sgt McCord, as Chief of the Engine Dispatch Section, has averaged more than three hours of overtime a day in order to meet ever increasing demands on his section. Because of his ability and knowledge, he was selected to represent Nellis AFB and Tactical Air Command at conferences for the J-75 and J-60 engines. An example of his efficiency occurred during the recent J-57 fuel pump problem, when his section removed and replaced 12 fuel pumps in two days. This included engine run-up and leak checks.



OUTSTANDING FLIGHT SAFETY OFFICER

Captain Phillips F. Dulaney of the 121st Tactical Fighter Squadron, Andrews Air Force Base, Maryland, has been selected as the Tactical Air Command Outstanding Flight Safety Officer for the period ending January 1962. When the unit was called to active duty in October 1961, he initiated a dynamic and effective aircraft accident prevention program which helped to continue the accident-free record the unit has maintained since September 1958. The unit has flown more than 2,000 hours since activation in October, and has participated in two deployments, engaged in all phases of weapons delivery and met all operational training requirements in preparation for overseas movement. The majority of flying was accomplished in a high density air traffic area and under adverse weather conditions.

TAC TALLY

1 JAN - 31 JAN

JANUARY TALLY ACTIVE UNITS

UNIT	ACDTS*	INCDTS
831 AD	1	34
832 AD		35
4 TFW		1
108 TFW	1	3
113 TFW		7
117 TRW		
121 TFW		3
122 TFW		1
131 TFW		2
401 TFW		2
354 TFW		4
4510 CCTW	1	2
4520 CCTW	1	23
837 AD	1	
839 AD		2
64 TCW		5
435 TCW		3
442 TCW		
464 TCW		
4505 ARW	1	
4504 MTW		

JANUARY TALLY GUARD AND RESERVE

UNIT	MAJOR	MINOR
452 TCW	1	

MAJOR ACCIDENT RATE

TYPE	1962	1961
ALL	12.4	11.0
F-105	0	0
F-104	90.9	54.1
F-101	76.9	0
F-100	7.3	13.6
F-86	222.2	0
F-84	16.4	97.8
B-66	0	0
T-33	0	0
KB-50	43.5	0
C-119	0	0
C-123	0	21.7
C-124	0	0
C-130	0	0

ACCIDENT FREE

(MAJOR & MINOR)

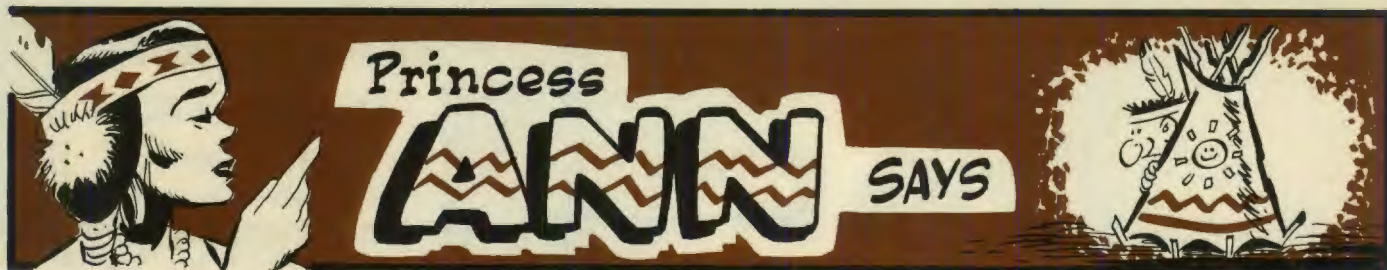
JET

ACTIVE	MONTHS		ANG
474 TFW	10	38	123 TRW

CONVENTIONAL

ACTIVE			RESERVE
4430 ATG	38	62	434 TCW
314 TCW	30	53	302 TCW
464 TCW	11	51	94 TCW

*MAJOR AND MINOR



**Don't
SKATE AROUND
REGULATIONS**



**Good DISCIPLINE
AND SAFETY
GO TOGETHER !**