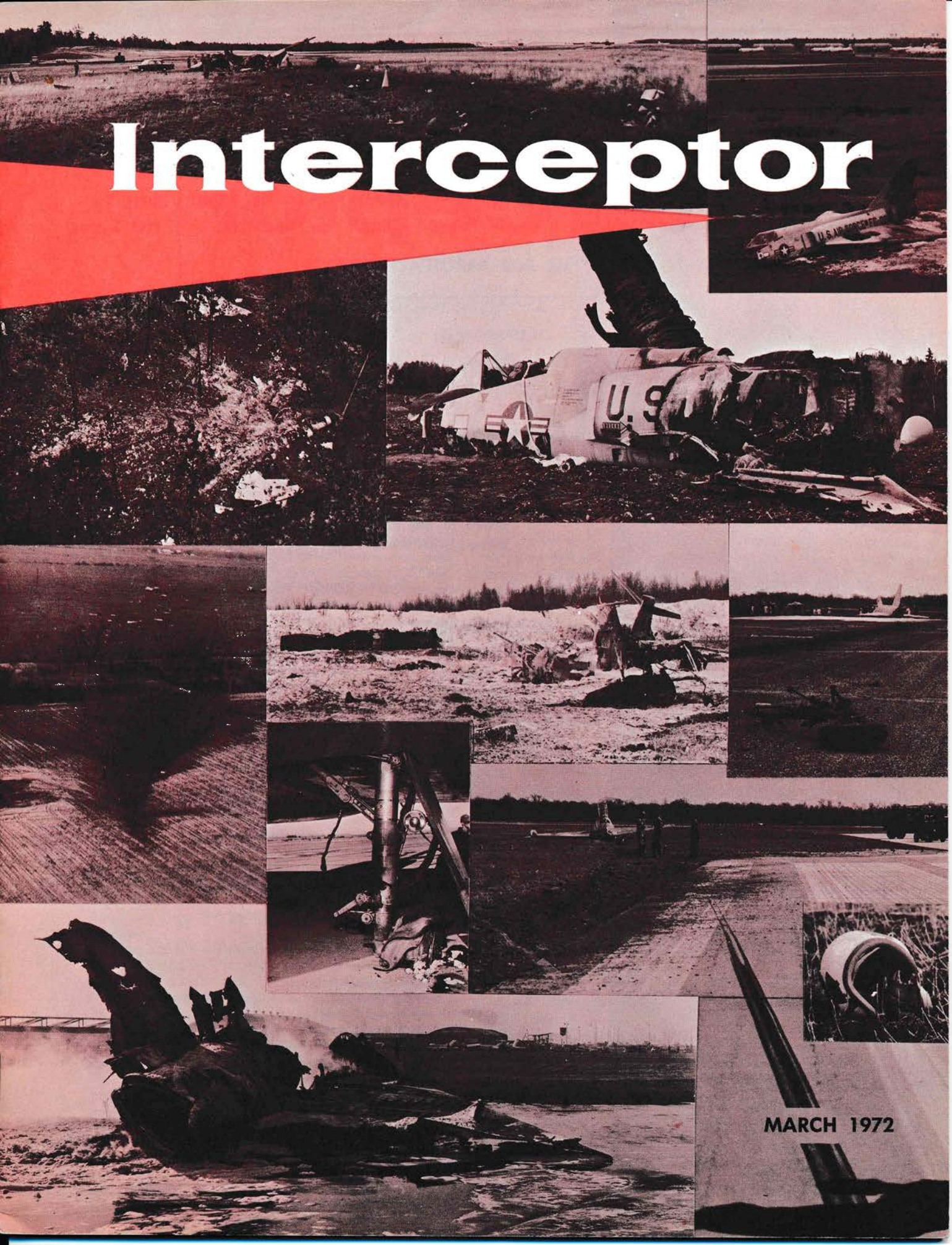
Interceptor



MARCH 1972

Interceptor

FOR THE MEN RESPONSIBLE FOR AEROSPACE DEFENSE

VOL 14
NO 3

SPOTLIGHT

Important things that are supposed to happen do not happen, especially when people are looking; or, conversely, things that are supposed to not happen do happen, especially when people are looking.

H. Allen Smith,
Claude Fetridge's Infuriating Law

DEPARTMENTS

SPECIAL FEATURES

OUR COVER

Our cover highlights our feature article, "1971 Accident Review."

"A Fighter Pilot is a special breed of cat. He must be a tiger — aggressive, independent, confident, capable — but most of all, he must be self-disciplined."

The Air Force recently lost two valuable aircraft under somewhat inconceivable circumstances. Both aircraft had been engaged in authorized ACT and when it was over the "loser" called off the fight by rocking his wings and flying straight and level. Unfortunately, this didn't satisfy the winner who decided to shine his "image" by buzzing his unsuccessful adversary — just to show that he had just been "had." This ace foolishly pulled under the "loser" and attempted a rolling climb; however, he misjudged the "miss distance," collided with the target, and all three aircrew members were forced to eject.

The cause of this accident is obvious. A well-thought-of individual, supposedly mature and disciplined, apparently was not. In a split-second, he succumbed to an immature impulse and his professional incompetence and lack of self-discipline cost the Air Force some very expensive hardware. Besides risking the lives of all crew members concerned, his amateurish flying shattered his professional image and compromised the professional image of this command.

Why, then, did he do it? This is the crux of the problem.

The impulse to deviate from established standards is something that every fighter pilot must continually reject. We know this — but sometimes a lapse of acute awareness foolishly feeds our ego and manifests itself in an attempt to demonstrate, for our own satisfaction, that fighter pilots do it better.

Frankly, I don't know of many fighter pilots who haven't gone through periods when they thought they were the hottest things with wings and fallen victim to this insidious temptation. Sometimes a couple of good scares and some sage advice from the "old heads" helped them along the road to becoming well-developed, highly-skilled, and responsible airplane drivers. Those who didn't listen to their mentors eventually forfeited their wings, died in crashes, or were relegated to nonprogressive careers.

A Fighter Pilot is a special breed of cat. He must be a tiger — aggressive, independent, confident, capable — but most of all, he must be "self-disciplined." He must be capable of making split-second decisions. But in his split-second thinking, he cannot and must not, forget that the temptation to bend the rules will always be there to provide the impulse to prompt him into a foolish and reckless act.

Yes, the Air Force recognizes that the fighter pilot is a unique individual. For one thing, the fighter pilot label entails a enormous responsibility; he is his own brother's keeper and only time and the absence of mishaps can validate the title of being a "good" fighter pilot.

Most old heads know this; they know the true mark of a professional is how well he does his job — how effectively he accomplishes his mission. Not how steep he can make a maximum performance climb, not how tight he can fly a traffic pattern, nor how close he can buzz the ground, nor how well he can demonstrate his obvious capabilities to a yielding target or to an audience of bored spectators. It takes a lot more talent than this to be a disciplined professional.

The fighter pilot in the accident described herein succumbed to the same impulse that every fighter pilot faces. For a moment he couldn't resist it and now the consequences are irreversible.

Learn a lesson from this one. The next time you're in a situation and you're tempted by an irrational impulse — stop and think about it.

COL JOHN M. VARGO
Chief of Safety

HOT LINE

UNKNOWN FORCE. Recently one of our F-106s blew a tire right at liftoff during a wing takeoff. The pilots didn't feel the tire blow, but lead saw it and told them to keep their gear down. He checked them over and found that the tire was intact and not deformed, so they retracted the gear and burned off the drop tank fuel. The approach end engagement was successful although the blown tire disintegrated during the landing. Investigators couldn't come up with a known or suspected cause of the tire failure, but they touched all bases when they (1) briefed the last chance crews on the advantages of increased vigilance when checking for cut tires. (2) They encouraged everyone to be even more diligent in preventing foreign object damage by picking up *all* litter on the taxiway and ramps. (3) They also reminded all the pilots that it is easy to inadvertently get on the brakes to provide steering during formation takeoffs. After it was all over, the pilots thought that it would have been nice if there had been some way to burn out the drop tank fuel without raising the landing gear. Yes, it would.

WHY LANDING LIGHTS? For those who have wondered why we are told to turn on our landing lights for landing, we've discovered one or more good reason. We are all aware that we should turn on the landing lights when in the landing pattern so that other pilots can see us and so the tower and/or mobile can see that our gear is down (most fighters have the landing lights mounted on the gear). The Flight Safety Foundation Bulletin recently reported that the National Research Council of Canada has come out with this interesting bit of information: "One airline has been using a landing light from 10,000 feet to landing, and we have seen geese on radar take avoiding action when their path intersects that of an approaching aircraft with lights on."

NONSTANDARD TERM REVISITED. In answer to a letter from one of our readers, our research department has checked all official references and can find no authority to substantiate the definition that a "Pontius Pilate" is an Italian aeronautical rating.

MILITARY RADAR CAPABILITY. Last month in our discussion of radio out emergency IFF/SIF procedures, we mistakenly stated that ". . . FAA *and* military radars would automatically alert controllers whenever they pick up a Mode 3 Code 7700 squawk." ALSAFECOM 1/72 recently appeared to correct us and ALSAFECOM 08/71 (our reference last month). It says ". . . military radars do not . . . automatically alert controllers when an aircraft transmits Mode 3 Code 7700. They do display an 'Emergency' signal on the scope whenever a pilot has activated the basic IFF by selecting the IFF Master Control Switch to the 'Emergency' position. Therefore to alert both FAA and military radars, a pilot should select both Mode 3 Code 7700 and the 'Emergency' position of the IFF Master Control Switch."

SAFETY FROM THE TOP. During a recent staff meeting at ADC Headquarters, Lt General Thomas K. McGehee, ADC Commander, reemphasized the importance of flying safety throughout this command. Addressing himself specifically to the subject of the flying hour program, he cautioned commanders and operations staff officers at all levels against placing undue emphasis on flying out the allocated flying time to the detriment of a safe, effective operation. While General McGehee acknowledged that reaching a planned goal generally results from good management, problems involving limited logistical support, maintenance manning, and marginal weather are more than adequate reasons for commanders not to push their organizations beyond prudent safety considerations just to achieve an allocated flying hour goal. He stated that Commanders should try to reach these goals, but they should remember that flying time is only a goal and not a hard and fast requirement.

THANKS A LOT. We really appreciate your response to our call last month for back issues. Some of those you sent were becoming collector's items. Now here's one for you archivists and bibliophiles: we can complete our files if we can come up with the February 1963 issue. The first response wins a matching pen and pencil set. Be the first on your block to have one.

1971 accident summary

The accident picture, which had improved in 1970, deteriorated in almost all categories last year. Although ADC's total flying time was reduced by 13%, the number of accidents went up from 9 to 12 for a 33⅓% increase. This raised the ADC rate per 100,000 hours of flying time from 3.4 in 1970 to 5.2 in 1971. We had four ejections in 1970 and 10 last year. Where all the ejections in 1970 were successful, only six of the ten crew members in 1971 survived. The F-106 accident rate went up from 9.7 to 10.2, while the F-101s experienced only one accident last year. The B-57s marred their perfect record of the year before by having two major accidents which resulted in four fatalities. The F-102s and C-121s maintained their accident-free status for another year (this is the third in a row for the "Connies"). On the bright side, both ADC and the Air National Guard recorded zero accidents in the T-33 for '71. (We acknowledge the use of a couple of skillful flamed-out landing to preserve this figure.) Cause factors last year covered all categories except Maintenance Factor (see Figure 1). The following is a brief summary of the events of each major aircraft accident in ADC last year. Following this is a look at the Air National Guard's accident experience in 1971.

F-106 DESTROYED

During an afterburner climb the pilot heard a low frequency hum, but it quit when he climbed through 8,000 feet. A short time later he heard a slight "pop" and noticed the fire warning light on. His wingman confirmed a fire in the left wing root area. He stopcocked the throttle and turned off the left Fuel Shutoff Switch, but the fire warning light blinked and stayed on. His wingman told him he was still on fire. The pilot headed the aircraft toward an unpopulated area and ejected. Witnesses on the ground said that they heard a louder than normal noise when the pilot lit the afterburner.

Primary Cause: Materiel factor. The afterburner flame pattern was distorted and burned through the inner liner and the tailpipe. (See Down and Out, "F-106 Engine Fire," INTERCEPTOR, September 1971.)

U-10 DESTROYED

The pilot had completed a flight demonstration of aerodynamics to three Air Force Acadmey cadets and was descending to enter the traffic pattern. After making a 360° turn for spacing, he found that he was unable to level his wings. Full throws of the wheel had no ef-

fect and the left aileron stayed full up. As the airplane spiraled out of control toward the ground, the pilot found that he could decrease his rate of descent with power. Just before impact he applied full throttle to raise the nose, then cut the fuel and ignition switches. The aircraft hit the ground in a 20 degree dive and a 30 degree left bank. There was no fire and the pilot and students escaped with injuries.

Primary Cause: Materiel failure of the left aileron cable under the instrument panel due to wear. (See We Point with Pride, INTERCEPTOR, July 1971.)

F-106B DESTROYED

During the unusual attitude portion of an instrument/transition training, the Instructor Pilot put the plane into a 30-40 degree nose high altitude and told the pilot in the back to recover. The pilot started a nose down, zero "G" recovery. As the nose came down, he applied aileron to roll the wings level.

The roll was accompanied by yaw. This surprised him and he neutralized the aileron and put in some rudder. The aircraft yawed and then rolled inverted. The Instructor Pilot called for full forward stick and neutral ailerons. The airspeed was 150 knots and the turn needle was deflected. The IP took control, applied full forward stick and full aileron into the spin. They felt negative "Gs" and twice the airspeed built up over 150 knots, but they still held the controls in the recovery position. The aircraft did not recover and the crew ejected at 9,000 feet.

Primary Cause: Pilot factor in that the Instructor Pilot allowed the aircraft to be flown into an out-of-control condition, then applied recovery procedures which were nonapplicable. (See Down and Out, "F-106 Control Loss," INTERCEPTOR, May 1971.)

F-106B DESTROYED

When the UHF failed, the crew aborted the mission and headed for home. When they were about 15 miles out, the IP first felt a mild explosion and the aircraft began several violent maneuvers. The IP held the stick and rudders neutral, then applied corrective controls, but these actions had no effect. The aircrew ejected at 9,000 feet and the aircraft hit the water in a flat, slow, counterclockwise rotation. Both crewmembers were picked up successfully.

Primary Cause: Materiel failure of the right speed brake door or hinge assembly. (See Down and Out, "F-106B Control Loss," INTERCEPTOR, September 1971.)

B-57 DESTROYED

The functional check portion of the flight went off without any reported problems and the crew was cleared down from FL240. The range control radar followed the plane's skin paint until it went off the scope over a lake. There were no distress calls, but when the aircraft did not return, authorities began an

ADC MAJOR ACCIDENT CAUSE FACTORS

CAUSE FACTORS		F-101	F-102	F-106	T-33	OTHER	TOTAL
PILOT	70			2			2
FACTOR	71			2			2
SUPERVISORY	70						
	71			1		1	2
MATERIEL	70			2	1	1	4
FAILURE	71			2		1	3
MAINTENANCE	70			1			1
FACTOR	71						
UNDETERMINED	70			1			1
	71	1		1		2	4
OTHER	70					1	1
	71			1*			1
TOTAL	70			6	1	2	9
	71	1		7		4	12

Figure 1

This table shows a breakdown of ADC's major accidents by aircraft and cause factor comparing 1970 and 1971 figures.

***Lightning strike.**

intensive search effort. They found pieces of personal gear and debris floating on the water and, later, divers located the wreckage at the bottom of the lake. Neither crewmember had attempted ejection and both were fatally injured.

Primary Cause: Undetermined. The most probable cause was materiel failure within the longitudinal control system causing the aircraft to go out of control. Investigators suspect a nose-down stabilizer actuator stall combined with elevator control linkage separation at some point between the control column and the aft bell crank assembly. (See Down and Out, "Lessons Unlearned," INTERCEPTOR, December 1971.)

F-106 MAJOR

After an uneventful functional check flight for a fuel control change, the crew was descending to RTB. As they let down through 6,500 feet, they were startled by a bright flash and a loud bang. They saw pieces of the aircraft flying past the canopy. A check of the instruments showed that the MA-1 fire control, pitot static, and angle of attack systems were knocked out. With no airspeed or VVI the crew called for an alert aircraft to be scrambled. They then joined up on him, ran a stability check, and landed on his wing without further incident.

Primary Cause: Lightning had struck the aircraft, blowing off the radome and both forward electronics bay doors. (See We Point with Pride, INTERCEPTOR, September 1971.)

B-57 DESTROYED

Preparation for the night target mission was standard with no apparent malfunctions. Witnesses said that the takeoff roll was about 1,400 feet longer than computed and that the climbout was flatter than normal. About two minutes after takeoff, the EWO called the tower saying they had heading difficulties, but he didn't say any more about the problem. Three minutes later the plane crashed into a wooded area, killing both crewmembers. The only discrepancy found in the AFTO 781 was that the standby compass drifted 45 degrees either side of the aircraft heading.

Primary Cause: The most probable cause is spatial disorientation caused by a pitot static malfunction which caused a low indicated airspeed for the actual speed. (See Down and Out, "Lessons Unlearned," INTERCEPTOR, December 1971.)

U-10 MAJOR

While taxiing back to the ramp after a sailplane towing mission, the aircraft left the taxiway, caught the main landing gear in a ditch, and nosed over. The result caused major damage to the aircraft. The pilot was taxiing the plane with main landing gear in the "castering" configuration and a gust of wind contributed to his sideward vector.

Primary Cause: Pilot factor in that the pilot allowed the aircraft to leave the taxiway.

Contributing Causes: Airfield in that a ditch approximately eleven inches in depth existed immediately adjacent to the taxiway. Supervisory in that the terrain immediately adjacent to the taxiway was not properly inspected and repaired as necessary.

F-106B DESTROYED

During the join-up after takeoff, the wingman overshot lead. He pulled up, over and ahead of the lead at 3,000 feet in a right rolling turn with the speed brakes open. As he crossed to the right of the lead, he rolled into approximately 135 degrees of bank. The nose fell through in a modified "split-S" until it reached 20-30 degrees below the horizon and the bank angle decreased. The nose then pitched up, yawed violently left, then right, and appeared to start a flat spin to the left just prior to impact. Both pilots ejected, but their sink rate was so high and their altitude was so low that their chutes never fully opened. They were both killed on impact.

Primary Cause: Supervisory Factor in that the Instructor Pilot allowed his aircraft to progress to a Point where overshoot was inevitable. During the overshoot

rolling maneuver, an engine malfunction diverted the attention of both pilots resulting in a control loss.

F-106 DESTROYED

While in level, unaccelerated flight as a target for a second F-106, the pilot noticed the flashing fire warning. He called the interceptor to join on him and look him over. The wingman told him that there was a thin trail of white smoke. The fire warning light came on steady and both hydraulic systems failed. The wingman called that darker smoke and flames were coming from the left side just above the wing root. The pilot extended the ram air turbine, but the controls did not respond. The wingman told him that he now had a serious fire. With the aircraft out of control, the pilot ejected at 12,000 feet at about 325 KIAS with the aircraft rolling to the right. Ejection forces and airloads caused his arms to flail about breaking his right shoulder. He was rescued from the water without further injury.

Primary Cause: Undetermined. The most probable cause was listed as a materiel failure of an engine component or an engine malfunction that resulted in the fire. (See "Pacific Plunge," INTERCEPTOR, February 1972.)

F-106 DESTROYED

The F-106 pilot completed a successful intercept on an F-4 and was in trail 500 to 1000 feet behind the target aircraft. The F-4 rocked his wings indicating that he was calling off the engagement. At this time, the F-106 overtook and passed the F-4 on the right and slightly low. When the F-106 pilot was ahead of the F-4, he pulled up in front knocking off the nose of the Phantom and part of his own wing. The F-4 crew ejected immediately and sustained minor injuries. The F-106 pilot found that he could not control his aircraft below 230 knots; he ejected and was rescued uninjured.

Primary Cause: Pilot Factor in that the F-106 pilot maneuvered his aircraft in such a manner that he collided with the F-4.

F-101 DESTROYED

As he climbed through FL360 the pilot saw the right engine fire light come on. He shut down that engine and started to RTB. A short time later, the left fire warning light came on and the oil and hydraulic pressures began fluctuating. Then the utility hydraulic pressure dropped to zero while both fire warning lights stayed on. He retarded the left throttle to 80 percent and squawked emergency. The right engine fuel flow was around 5500 pounds per hour (with the engine shut down) and the EGT ranged from 800-1000 degrees. The left oil pressure was fluctuating and both fire lights were still on. At 6,000 feet with the airspeed down to 250 KIAS, he ejected over an uninhabited area and was rescued uninjured.

Primary Cause: Undetermined. The most probable cause was a failure of the 16th stage bleed heat and venting duct or Marmon clamp forward of the pneumatic check valve in the right engine bay.

AIR NATIONAL GUARD

*The Air National Guard had enjoyed a 50% decrease in the number of accidents in 1970, compared with 1969. This trend reversed in 1971 when they experienced a 125% increase.** The F-101s jumped*

ANG MAJOR ACCIDENT CAUSE FACTORS

CAUSE FACTORS		F-101	F-102	T-33	OTHER	TOTAL
PILOT FACTOR	70					
	71	1	1			2
SUPERVISORY	70		1	1		2
	71					
MATERIEL FAILURE	70	1				1
	71	2	3			5
MAINTENANCE FACTOR	70					
	71		2			2
UNDETERMINED	70		1			1
	71					
OTHER	70					
	71					
TOTAL	70	1	2	1		4
	71	3	6			9

Figure 2

This table shows the major aircraft accidents in the Air National Guard by cause factor and aircraft for 1971 as they are compared to the previous year.

from one to three and the F-102s, from two to six, raising the total from four in 1970 to nine last year.

There were nine ejections last year as compared with two the year before. All of these nine ejections were successful; however, one pilot died from injuries sustained when his parachute opened. The Guard suffered six fatalities in 1971 as compared to one in 1970. Pilot Factor, Materiel Failure, and Maintenance Factor accounted for the Primary Cause of all the ANG accidents (see Figure 2). The following briefly summarizes each National Guard major aircraft accident for 1971.

***1971 rate is based upon estimated figures since, at press time, all ANG flying times figures had not been submitted.*

F-101 DESTROYED

During a coupled practice intercept the autopilot overshot the target. As the pilot attempted to help the autopilot recover the dot, the aircraft rolled abruptly 150 degrees to the left. It then went into a violent negative "G" maneuver with such force that it yanked the control stick from the pilot's hands. After buffeting and other uncontrolled gyrations, the pilot got hold of the stick and tried to recover. He cut his burners and deployed the drag chute, but as the aircraft nose went below the horizon, the plane went into a flat spin. Further recovery attempts were unsuccessful and the crew ejected at 15,000 feet. They were recovered uninjured after about 10 minutes in icy Atlantic waters.
Primary Cause: Materiel failure in the autopilot coupler system. (See "Luck and the Lobstermen," INTERCEPTOR, April 1971.

2-102S DESTROYED

An F-102 was the target for four other Deuces to practice rocket beam attacks. The first flight of two got too far in front for a safe intercept and broke off the attack. GCI gave the second flight heading correcrections to improve their attack geometry. The target pilot saw the Number 2 aircraft and cleared it in, thinking it was Number 1. When he saw the lead interceptor coming straight at him, it was too late to avoid the collision and both aircraft fell into the ocean. The target pilot ejected and was recovered with minor injuries, but the interceptor pilot was fatally injured. There were several cause factors listed for this accident. They ran from supervision and adherence to directives to ground control problems. (See Down and Out, "Tragedy of Errors," INTERCEPTOR, October 1971.)

TF-102 DESTROYED

While on a practice intercept at 35,000 feet, the crew heard a thumping sound. The aircraft then yawed, flamed out, and several warning lights came on. The control sticks froze when the hydraulic system failed, but the pilot deployed the ram air turbine and regained control. They set up a glide, but their tries for an airstart were unsuccessful. Although they were over a busy traffic pattern, their UHF radio had failed and they feared colliding with other aircraft. They ejected at about 6000 feet and were rescued with minor injuries.
Primary Cause: Materiel failure of the engine accessory angle drive adaptor assembly. That failure was caused by a failure of the locking tabs on the key washer.

F-102 DESTROYED

The pilot was chasing a stan evan flight at 35,000 when he felt his aircraft yaw. A check of his instruments showed that he had flamed out and that all of his accessory section components had failed. He put out the ram air turbine and tried several airstarts, but none were successful. His UHF radio failed and the field was obscured with a broken layer so he ejected as he passed through 8,000. He was later picked up uninjured.
Primary Cause: Maintenance Factor in that at some repair/overhaul facility (investigators couldn't determine which one) the accessory drive gear was installed without enough clearance between the mating bevel gear shaft. This caused an overload on the gear which caused it to fail. Ed. Note: The IP in the brief above and the pilot in this one are the same guy. (For this and the TF-102 accident above, see Down and Out, "History Recycles," INTERCEPTOR, August 1971.)

F-102 DESTROYED

While climbing through 12,000 feet in formation enroute to the intercept training area, the Number 2 aircraft flamed out. The pilot set up a glide and pressed the ignition button — no light. He switched to the emergency fuel system, attempted to match the throttle position with the decreased engine RPM and again pressed the ignition button — still no light. He tried a normal ground start, but this, too, was unsuccessful. The pilot ejected at 3500 AGL and was rescued uninjured.
Primary Cause: Materiel failure of the main fuel line ferrule at the outlet side of the fuel flow transmitter. This caused fuel starvation to the engine and made a restart impossible.

F-101B DESTROYED

When the aircraft had rolled on the takeoff run, observers saw a large ball of flame come out of the left engine tailpipe. They then saw the pilot terminate his afterburners. He rolled about 9,000 feet down the runway before he put out his speed brakes and drag

chute. He began heavy braking when he reached the 9900 foot mark. The right wheel locked and the tire blew. The pilot did not extend his hook and the aircraft went into the overrun. The right main gear hit a depression in the overrun, collapsed, and came loose. The plane pivoted about 90 degrees to the right and came to a stop 352 feet into the overrun. When the aircraft settled on the drop tank, it ruptured and burst into flames. The aircrew had begun a normal ground egress, but flames came under the partially opened canopy and they both died before they could escape. *Primary Cause:* Pilot Factor in that the pilot did not promptly accomplish handbook procedures during an aborted takeoff. The explosion occurred when the left engine ingested a bird.

F-102 DESTROYED

After having completed an intercept training mission, the pilot lost AC power and was descending to land. He declared an emergency and had another F-102 join up on him. They climbed to FL280, switched to Guard channel, and contacted approach control. At this time his oil pressure dropped to 10 psi. Approach control made radar contact and cleared him to land at an emergency field. The two planes crossed over the emergency runway at FL240. The pilot set his throttle and used speed brakes to control his airspeed. When he lowered his gear at 14,000 feet, his wingman told him that he saw a lot of fluid coming out of the wheel well and then called that flames were coming out from between the nozzle and the engine shroud. The pilot shut down the engine and ejected. He made a soft parachute landing, was picked up by helicopter, and taken to the nearest hospital. He died several hours later from internal injuries sustained when his chute opened. *Primary Cause:* Maintenance error, most probably at depot level, in that the engine accessory angle drive adapter was improperly assembled. (See "Injured Until Proven Healthy," INTERCEPTOR, January 1972.)

F-101 DESTROYED

The night launch looked normal until liftoff. Immediately after the F-101 broke ground, observers saw flashes of yellow orange flames coming from the afterburner area and heard "thuds" or muffled bangs. The aircraft pitch angle increased to an unusually high angle as it "mushed" through the air. It yawed to the right as it settled and hit the ground in a 90 degree bank and 15 degree nose low. Neither crew member attempted to eject and both received fatal injuries.
Primary Cause: Materiel Factor. Fire of an undetermined nature in the left engine bay most probably caused by a 16th stage bleed air leak near a hydraulic fitting. This leaking hot air caused a hydraulic leak under pressure that resulted in an uncontrollable fire.

F-102 DESTROYED

About five minutes after takeoff during climbout, the pilot reported to Center that he was having flight control difficulties and was returning to base. Center lost radio contact with him about the time his blip went off their radar screens. The pilot ejected at about 12,000 feet and was rescued with bumps, cuts, and scratches. The pilot's helmet apparently separated as the chute opened. The marks found on his helmet indicated that it was pulled off his head by the upper connector link of the left rear riser. The aircraft went into a 35 degree dive and crashed into mountainous terrain.
Primary Causes Flight control malfunctions caused by a component or components unknown. ★

ON ANY SUNDAY?....

FACTS Driver traveling north, stopped for stop sign prior to intended right turn. Began turn. Struck by eastbound motorcycle in its own lane.

INJURIES Cyclist fractured skull, sustained brain damage. Still in coma, not expected to regain consciousness.

FACTS Driver's car traveling west, intending to make left turn at intersection. Driver saw eastbound motorcycle, but assumed sufficient time to make turn. Signaled, started turn, struck by motorcycle in its own lane.

INJURIES Cyclist fractured femur and skull, sustained cerebral damage. Has no speech, little use of right arm. Not employable.

FACTS Driver's car southbound, attempting left turn into private driveway. Struck on left front by oncoming motorcycle in its own lane.

INJURIES Cyclist fractured left tibia and fibula 8" above ankle, requiring bone graft; shattered left knee, requiring removal of knee cap.

FACTS Driver's car coming off stop sign from shopping center, crossing four-lane highway to turn left. Struck broadside by motorcycle in its own lane.

INJURIES Cyclist sustained multiple fractures upper and lower jaws; upper lip avulsed; all teeth lost; fractured wrist, both cheek bones, nose. Permanent facial injuries.

The following article caught our eye last fall. We were going to print it then, but we decided to wait until people started to dust off their machines this spring. Our experience shows that beginning in May we can expect a dramatic increase in motorcycle accidents, so we wanted you to know about it.

Here's how ADC fared on the motorcycle scene last year: We had 48 mishaps, lost 1507 man-days, and this computed out to a wasted dollar value of $178,000.

In the majority of the cases we reviewed, loss of control on the part of the operator was the primary cause. In some cases, the driver was "victimized" by hazards he didn't expect, such as a deer on the highway or someone pulling over into his lane. But in over 70% of the accidents, the driver "wiped out" when he strayed off the high-

. . . . *You'd better believe it — all the rest of the week, too*

way and got onto the soft shoulders and "lost it" all by himself.

We also had cases where people weren't familiar with motorcycle operation or got confused about which controls did what. (It seems that English bikes, American bikes, and Japanese bikes all differ as to where the clutch, gear shifts, and brakes are located.) One guy got all fouled up and accidentally hit the steps in front of the barracks, flew over the handlebars, and hit his head. This is great fodder for cartoons, but not funny in the end result.

At first glance we might have been able to rationalize that most of the accidents resulted from driving too fast. Not so. Only five accidents considered speed as a factor. And only one guy was really bombing it! The others were exceeding rather low speed limits by five or ten miles per hour.

Drinking wasn't much of a factor, either. Apparently we've got a bunch of clean-cut men in uniform riding cycles these days and they know that drinking and two-wheel vehicles don't mix. Again, only five of our bashes mentioned booze as a contributor and only one had a blood content approximating intoxication.

We also took a look at safety equipment and found that over 90% of the drivers and riders (including the two fatalities,) were wearing the minimum required legal safety equipment — helmets and face shields. Most of the people who had an accident got beat up around the legs and ankles.

Out of our study we could only conclude that motorcyclists get hurt because the motorcycle is inherently unstable and the driver isn't as protected as he would be in an automobile. Bike riders get injured more often and more severely from low speed crashes which car drivers can survive unscathed. Most significant in any 2-vehicle accident — the motorcyclist always comes out second best!

So the facts are pretty clear. If you ride a motorcycle, you're going to fall off it or be thrown off it some day, and you're going to get hurt. It may not be your fault, but you're still going to get hurt. And, when you fall off, you can look forward to spending 34 days getting back on your feet (that's the ADC average time spent in convalescence).

Even if you're not drinking, wear a helmet, and drive within the speed limit, you still stand a chance of falling off and getting hurt. It's sort of like skiing, it's fun, but sooner or later even the experts fall down.

Safety tips? Well, we could fill a book about all the things we've tried to draw your attention to, so we'll only give you the one we think is most important. DRIVE DEFENSIVELY AND EXPECT THE UNEXPECTED.

Nationwide accident statistics for 1970 were recently compiled, analyzed, and published by the National Safety Council. The following are extracts pertinent to motorcycles, which, by definition, include also motor scooters, motorized bicycles, and motorized tricycles.

The total number of motorcycles on the road has risen for each of the past 11 years at a rate faster than the total for all motor vehicles. In 1970, there were 2,514,450 registered motorcycles, an increase of 11.5% over 1969. The increase for all motor vehicles was only 3.2% that year.

The total number of fatalities in *all* motor vehicle acidents has risen 10 of the past 12 years. One exception was 1967. Another was 1970, when the deaths for *all* motor vehicles decreased by 2.1%.

Motorcycle deaths in 1970 increased 19%.

Another way of highlighting the problem is a comparison of the death rate per 100,000,000 miles traveled. The motorcycle rider death rate was 23, yet the overall motor vehicle death rate was 4.9. (The latter figure includes pedestrian and other nonoccupant deaths.)

No statistics were available concerning nonfatal injuries. However, the emergency room of any major hospital can furnish those frightening figures.

United Services Automobile Association has some data of its own to support the obvious picture. In 1970, of those cases sufficiently serious to warrant presentation to the Executive Committee of the Board of Directors, 11% concerned injury to cyclists. In the first half of 1971, the number has increased to 19%.

Who is to blame? We have a point of view well worth your consideration. It may not be the full answer — in fact, it probably is not

— but assuredly is part of the answer.

What you, the automobile driver, may *think* about people who drive motorcycles in traffic is, by all odds, very important.

It is true that motorcycles have four inherently dangerous aspects:

- They are unstable, in that they have only two points of contact with the ground.
- They have very little traction with two tires.
- They offer virtually no protection to their riders.
- They do not stand out well in traffic where the car is dominant.

Many motorists who don't or can't drive motorcycles, however, tend to get downright emotional about these little machines, and emotions, particularly hostile emotions, have absolutely no place in traffic. Such sentiments are undoubtedly nurtured by the rotten public image a few roughneck gangs have imparted to the entire motorcycling world.

Most cyclists are excellent defensive drivers, because they know the extreme vulnerability of their machines and themselves. They also enjoy the advantage of knowing automobiles, whereas most automobile drivers don't know a thing about riding a motorcycle, or about the types of problems such a machine can get into.

The problem we are specifically addressing is one, however, over which the motorcycle operator has no control. *He is not seen.*

An automobile driver in traffic expects, and therefore sees, masses and shapes not unlike that in which he sits. Between his object, his car, and another car he can creditably judge distances if he is an experienced driver. Put something the size of a motorcycle in front of him, and it's almost not there at all. And most drivers follow too closely.

If the motorcycle stops, or if it skids or falls, the odds strongly favor the car's maiming or killing the cyclist. The car, with its mass and speed, simply cannot stop in time, no matter how excellent its driver's reflexes.

You know a motorcycle has inherent vulnerability. You know that at 50 miles per hour you can't stop your car in fewer than 180 feet. Why, then, tailgate or turn into the path of a motorcycle where you'd never do so to another car? Why? Because it takes a special awareness, an unusual watchfulness, *not* to.

We have found no rules of thumb about how to be careful of motorcycles, at least none supported by studies. Therefore, we beg your indulgence and good sense if we manufacture two.

When following a motorcycle, stay *twice as far* back as what you *feel* is normal or comfortable. When nearing intersections or exit/entrance ramps, take a second longer to look than you normally do when all you expect is cars. At night, double these.

This probably will lead to at least a few letters supporting or castigating motorcycles and their operators. That is not the point, and we see little sense in engaging in the enormous debate which has been under way for years.

People who know nothing about motorcycles, but who hate them anyway, cannot be swayed. People who sell motorcycles will favor anything, including driver training in schools, which lends apparent public suppoprt and thus greater sales. Medical people working in emergency rooms will never be persuaded to think kindly of a machine which so easily accounts for human mutilation and death. And avid motorcycle operators, believing in the "freedom and individuality" of their machines, won't change their minds, no matter what.

One major element in the situation did change, however. We bowed to the awesome statistics this summer, and radically realigned the motorcycle insurance rates to make them more nearly commensurate with the risks. Although liability rates were decreased by about one-fourth, Medical Payments coverage rates were increased about threefold. This was not prompted by likes or dislikes; it was a matter of business.

Motorists should not take a false sense of satisfaction from this action, though, because the number of motorcycles on the road is not likely to change simply over a rate change. Nor is the potential for fatal accidents likely to decrease, unless motorists double their alertness for trouble while driving. ★

"Who's to Blame," AIDE Magazine, courtesy USAA (United Services Automobile Association) 945.-1110.

Single Engine

On 27 October of last year the Pennsylvania Air National Guard's 112 Fighter Group, stationed at Pittsburgh, logged a new milestone in flying safety. When Captain William Gadd landed his F-102 that day he logged the 50,000th flying hour since the unit's last aircraft accident. That was back in '63 and all of the 50,000 hours were flown in single engine jets.

Two weeks later the 112 reached yet another

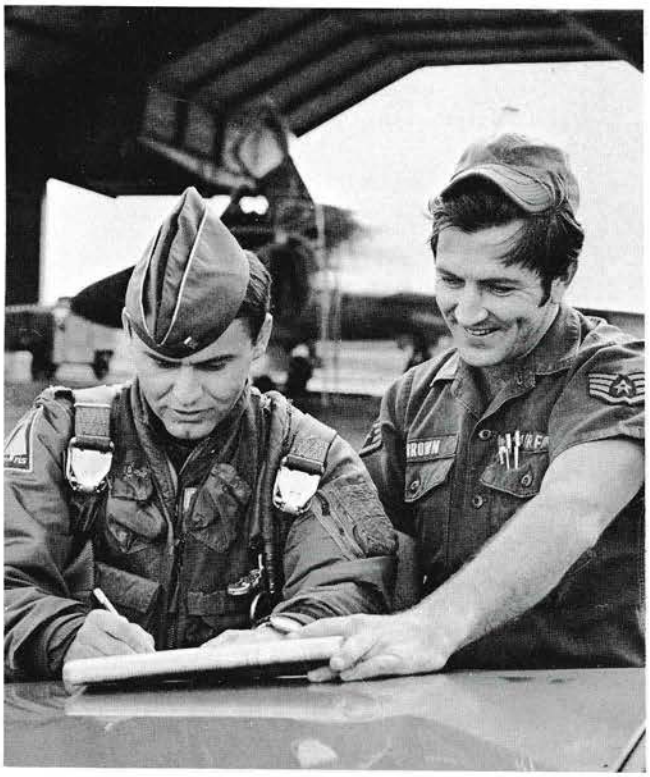
Crew Chief TSgt Earl Ferricks helps Captain William Gadd unstrap and congratulates him on logging the 112 Fighter Group's 50,000 hour of accident free single engine jet fighter time.

Double Record

seldom attained goal when Lt. William Campenni landed his F-102 completing 100,000 hours of single engine jet time since the unit's last jet fatality.

These records represent eight years and 11 months without any kind of an aircraft accident and "The Keystone Kops" haven't had a fatality in a jet since 1956. Both of these enviable records were amassd in T-33, F-84F, F-86L, and F-102 aircraft.

As with any flying safety achievement, maintenance played a key role in the 112's impressive safety record. In all flying operations good maintenance is essential.

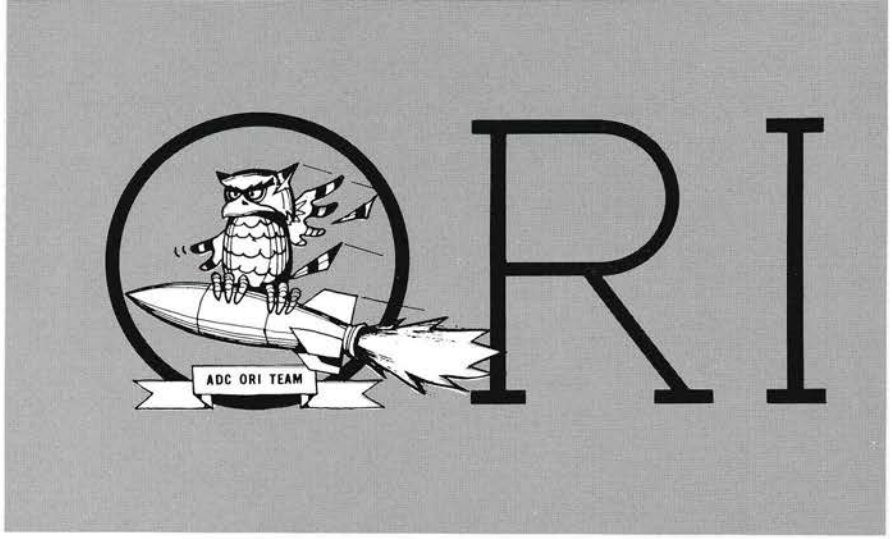


Lt. William Campenni logs the 112th's 100,000 hour of single engine jet flying time without a fatality. "The Keystone Kops" recently passed their 16th year without a jet fatality.

PHOTO BY CAPT BILL WARD, 87 FIS

FIGHTER PILOTS DO IT BETTER

The fighter pilot has certain characteristics which give him a distinct individual identity. The ideal fighter pilot puts his all into everything he does. He has a "can do" attitude. He displays enthusiasm and instills this feeling in those about him. The fighter pilot believes the job should be done the right way and only one time, the first time. He tries hard to be the very best at everything he does. He expects others to do the same. The fighter pilot tries to be an expert in his field, always seeking new knowledge and experience. He tries to broaden his experience by not confining himself to one narrow channel. The fighter pilot believes in himself. He has a tremendous amount of pride in himself and in everything that he does. He works hard and plays hard; always a competitor in both, to the very best of his ability. When he discovers a problem he always comes up with the answer. Although he thinks for himself he never fails to seek the advice of those who might lead him to the right answer. He respects those who have earned respect. He is more than willing to help those who need help. Do "fighter pilots do it better?" Yes, they do everything better! But nowhere above does it state that fighter pilots fly aircraft or engage in aerial combat. You don't even have to fly to be characterized a fighter pilot. A fighter pilot is more than a flyer. A fighter pilot is an attitude and people with that attitude, no matter what their station in life or their job, really do it better.



OPERATIONAL READINESS INSPECTION TEAM

HQ, ADC

MOBILITY – FRIEND OR FOE

Unit preparedness to deploy under applicable OPlans is presently being evaluated during ORIs. By now, each unit should have a mobility plan containing details peculiar to the physical layout of its airfield. In addition, each unit should, by this time, have conducted several mobility exercises, and should also be planning to conduct at least one no-notice practice exercise per month. Since the exercise is now an ORI event, each unit's plan will be evaluated, as a minimum, once each year. Therefore it is imperative for units to insure that their plans are complete and their exercises realistic. Here is a small scenario of what may be a common approach to the unit mobility exercise.

"Capt Swoft here."

"Yes, sir — a mobility exercise? COLLEGE what? Immediately, sir!"

Sergeant, simulate recall and recall the mobility control team members; we'll have to set the center up at 0800."

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"It's 0800, where is everyone?"

"Lt Shaft moved it back an hour, sir, he said he hoped everyone would get the word."

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"Is the processing line set up yet? Where's the legal officer?"

"He's at the gym, sir, said he'd be over as soon as he showered."

"What about finance?"

"At the coffee shop. They said they'd run him down."

"How is the marshalling coming?"

"Good, sir, we're using the substitute area today since they're washing an aircraft in the primary area. All shops should know where it is."

"How is the processing line shaping up?"

"OK now, we couldn't get hold of everyone at CBPO so we'll have to simulate their parts."

"We'll also have to simulate processing the crew chiefs, they're needed on the afternoon go."

"How about the aircraft for the exercise?"

"Munitions services say that in an actual situation they would have been loaded 20 minutes ago."

". . . and the equipment?"

"We got some of it, sir, they need the AGE for this afternoon and most of the shop boxes were empty but we were able to get a lot of reparables so they got experience moving equipment."

"How did the processing go?"

"The people who showed up went through and we

"Now all we have to find is the War Reserve Supply Kit."

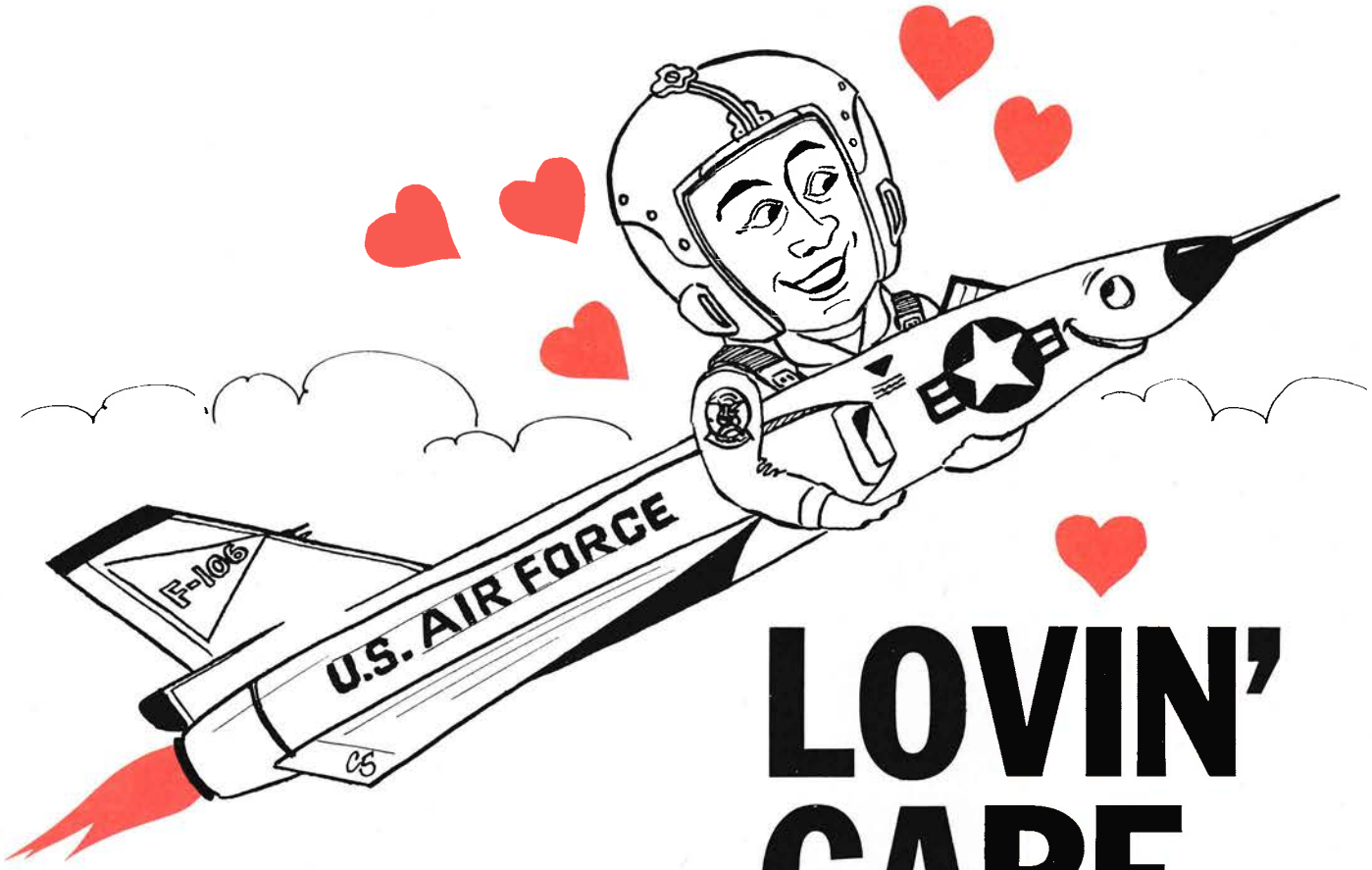
finished in 45 minutes. Say, we still haven't found a scale."

"OK, I'll get on that before the next exercise."

Sound like your mobility exercises? We hope not. Having a practice in which only the key people participate does little good. Not only do the non-participants fail to learn their tasks but the unreality of the situation may not be recognized. Are the mobility control center and the processing and marshalling areas large enough for an actual mobility exercise; are your time frames realistic; have you enough equipment to marshall *and launch* mobility aircraft? We can't afford to bring in C-141s for your exercises but everything up to that point should be thoroughly practiced. Remember: "The more functions you simulate in an exercise, the more you stumble during an ORI."

JAMES M. THOMAS, Colonel, USAF
Director, Operational Inspection

give it lots of



LOVIN' CARE

by ROGER G. CREWSE ☐ Hq ADC/SEY

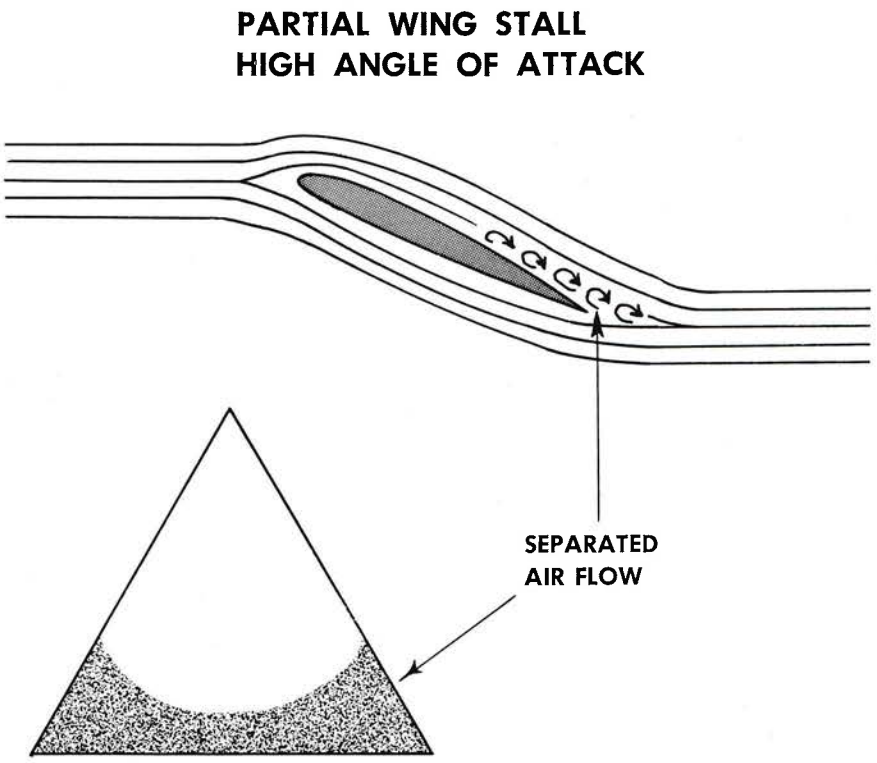
Since taking over as Chief of ADC's Safety Education and Analysis Division in 1959, Mr. Roger G. Crewse has presented his knowledge, expertise, and 15 years of fighter pilot experience to our operational units in a unique and highly informative way. Roger has a way of dispensing with the "frills" and getting down to the "nitty gritty" in terms that his fellow fighter pilots readily understand. Most "Deuce" jocks vividly remember his treatise on "F-102 Compressor Stalls" and there are few F-101 crews who will forget "the Crewse approach" to pitchup. More recently, Mr. Crewse has travelled to the F-106 squadrons to discuss "Control Loss" with aircrews. Numerous "Six jocks" have since reported using Roger's words to great advantage in the ACT program and one pilot who recovered from a spin admits using the instructions he remembered from the "F-106 Control Loss" briefing.

If you happened to miss Roger when he came by your squadron or would like to refresh yourself on this critical subject, we present this "typical Roger Crewse briefing with frills trimmed off" in his own inimitable style. Maybe the next time you've got the "pointy end" going sideways, you'll recall what he has said here and be able to "save your bird."

F-106 out of control maneuvers have definitely reduced in frequency during the past year, but they continue to occur. We have pretty well established that the recovery procedures now listed for post-stall gyrations/spins work as advertised. This is good, of course, and because the procedures do work, we have prevented two and possibly three major accidents in the last fourteen months. The basic problem, however, the one that really needs attention, is how to avoid the out-of-control condition in the first place. This article will discuss situations where control losses have occurred, and can occur, with little or no warning; and the symptoms which may precede the control losses under conditions of max maneuvering.

The F-106 does not have *one* symptom that can always be counted upon to telegraph to the pilot that a loss of control is imminent. If this were true, the job of knowing when enough is about to be too much would be much easier.

Through the examination of some forty control losses, we have noted aircraft actions which will usually be present to some degree depending on the maneuver, and which will presage an impending loss of control. Some of these symptoms are quite subtle. Some are much more noticeable and, unfortunately, under certain conditions, they combine. The trick is to expect the specific one for the maneuver you have entered and then notice it when it occurs. This must be done even though you may be in the kill, kill, kill mode, with the adrenalin glands in the full go configuration. Most of our control losses have occurred right when the "lossee" is in the position for the kill whether it be in ACT or with the dot buried, pressing on; or he is in a stalemate and decides a double shunt is called for.



The first control loss entry we will discuss, and perhaps the simplest of them all, is one entered from coordinated flight. The aircraft can be in any attitude, e.g., steep turn, high climb angle, inverted . . . makes no difference. But the aircraft is essentially in coordinated flight, not rolling, and *at a high angle of attack*. The first symptom, of course, the classic one, is an increasing buffet level. Now light — moderate — heavy buffet is a very subjective judgment. What may be light buffet to one pilot may be quite heavy to another, but, regardless of how it feels, as the buffet increases, so does the angle of attack. Buffet is a sure indicator that separation of the air flow is occurring on the wing. In other words, part of the wing is stalling.

The buffet level may increase to a point, then start to decrease. Don't rely on this symptom, since it has never been reported by any of our aircrews who have lost control; but its cure, if you do experience it, is to go forward with the stick. At this point, the center of lift is moving forward. Much of the wing is stalled inboard from the tips, and stick forces may actually be lightening since the aircraft has a tendency to pitch up. The G forces will be decreasing with a constant back pressure, because total lift production is decreasing. If you intend to hold a G level, or even increase it at this point, a rather interesting ride will follow — almost immediately.

A good way to get into a serious situation, wings level, high altitude, low airspeed, is to move the stick briskly aft. Chances are, even if you stop stick action and reverse it, an overshoot will occur which will take

you flat beyond the stall level.

Going back to our unaccelerated stall, along with the decrease in buffet level as you increase the angle of attack, a yawing motion will begin. It will be minor at first, but gradually increases in intensity. Finally, the yaw will cause a rolling motion to begin. The reason the aircraft is starting to yaw is because vertical stabilizer effectiveness has been reduced to practically nil. Separation of the air flow in the aft portion of the wing, the large downwash angle over the wing, with low energy air in the vicinity of the rudder, causes the vertical stabilizer to be blanked out as a stabilizing device.

The rolling motion is caused by the yaw. As the wing is yawed into the relative wind, a roll, of course, results very much as if you had applied rudder.

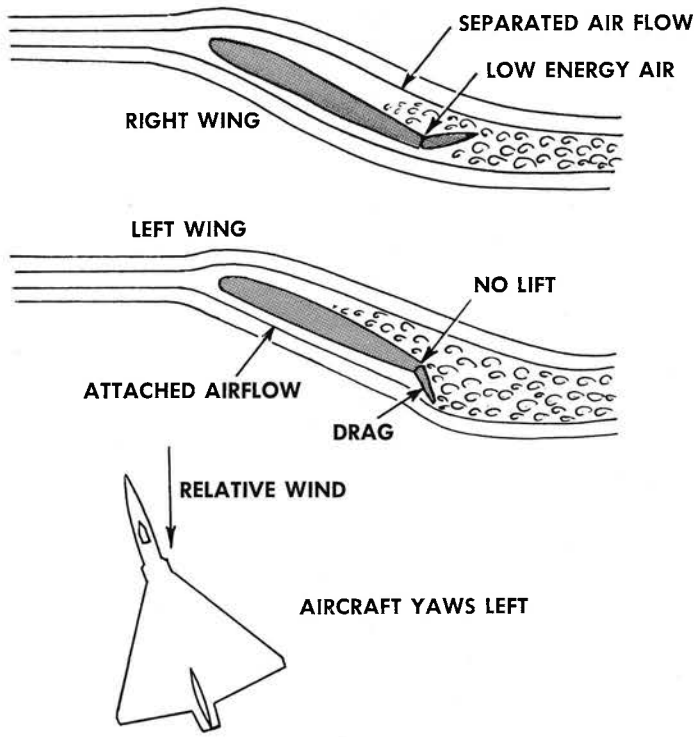
The next step, if the angle of attack continues to increase, will be a roll off against the direction of a steady bank; or, if wings are level (either inverted or right side up), an increase in yaw rate with an accompanying roll. Right at this point, you have probably been "had." If any control inputs other than forward stick are introduced, the aircraft will pitch up rapidly, yaw violently, and the name of the game is to recover. Those control losses which have occurred here are primarily the result of the pilot's attempting to fight the roll or yaw with aileron or rudder. What was really needed was forward stick while holding all other controls neutral. These pilots were far beyond max maneuvering capabilities of the aircraft and were not aware of it.

Here are actual examples where the control loss entry was from situations such as those described above:

• The pilot was committed on a front intercept at 37,000 feet against a target at 40,000. Speed was .93M. Contact was at 33 miles, followed by lockon at 28. The pilot forgot to select armament. He was also flying in auto. This was the first auto attack the pilot had ever flown in the F-106. He became engrossed in the scope presentations and did not watch his airspeed or adjust his throttle. When the countdown did not occur, the pilot began to realize that something was wrong. At five miles from the target, he decided it was time to get out of there. He depressed the momentary interrupt and applied left aileron. The aircraft yawed violently to the right and entered a spin at 39,000 feet. Recovery was made at 15,000 and a much wiser pilot flew home.

• This pilot was on a high altitude front attack against a target at flight level 490. He got a contact at 25 miles and locked on at 19. He was slightly left of the course to intercept. He corrected right to center the dot. The radar broke lock at 16 miles and he locked on again at 10 miles. He pulled up to center the dot, and at about five seconds to fire, the dot went to the right. He used rudder to center it as he felt the aircraft was very near a stall. He was in what he described as moderate to heavy buffet. The nose continued to yaw left and right and the pilot continued to use rudder to keep it centered. At approximately 47,000 feet, at fire time, he saw he had 140 knots, but the airspeed was decreasing rapidly. The aircraft yawed, rolled rapidly to a 90 degree left bank, shuddered, and the pilot noted zero airspeed. Recovery was made between 25 and 30,000 feet.

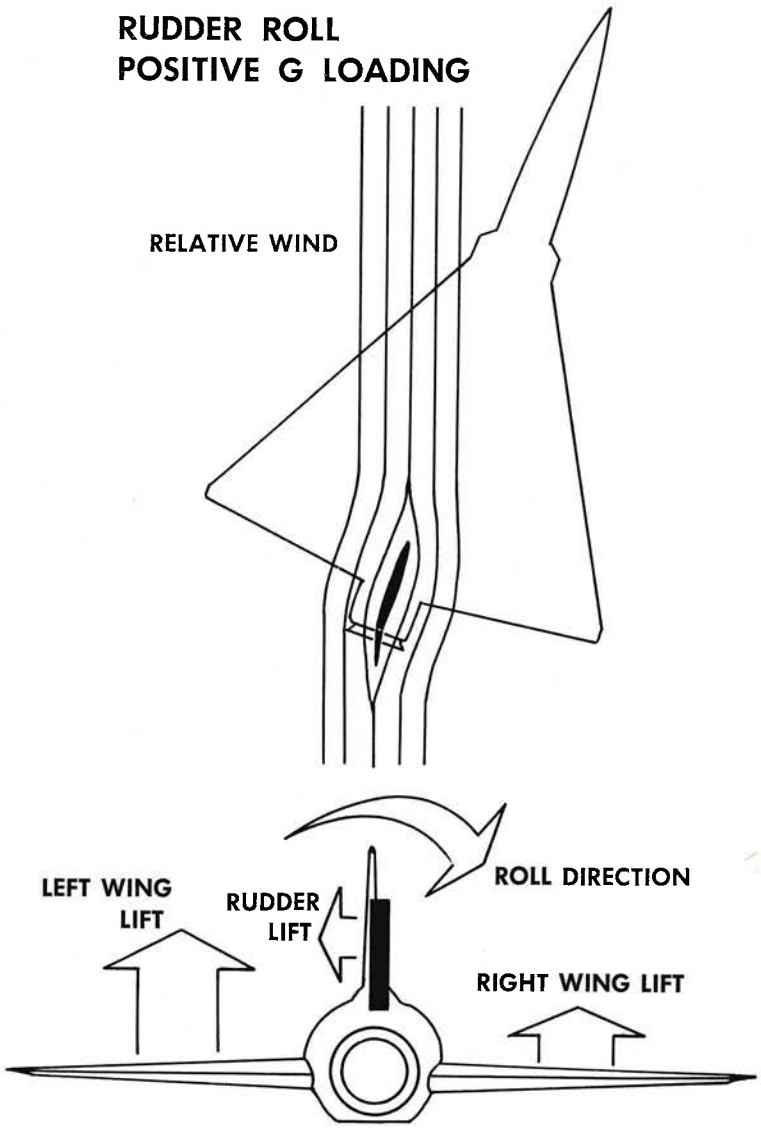
ADVERSE YAW AT HIGH ANGLE OF ATTACK WITH RIGHT STICK



The next control loss situation concerns those which occur when the aircraft is being rolled at a high angle of attack. A rudder reversal (during which the majority of control losses have occurred) with a loaded aircraft from, say, 90 degrees right bank to 90 degrees left bank is typical. The control loss usually occurs as the aircraft approaches the wings level position, whether the roll is over or under.

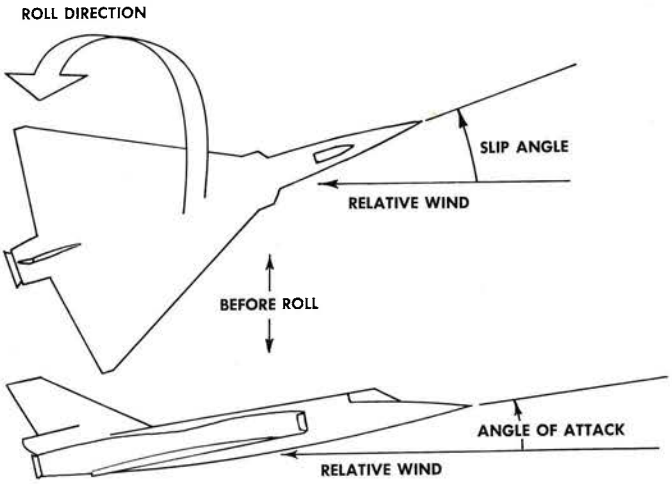
In the first place, this maneuver is performed because the aircraft is at high angle of attack, and adverse yaw would occur if ailerons were used for the maneuvering. High G loadings are usually present so that the aircraft will roll at a high rate. Lots of Gs are not necessary, however, for a high angle of attack to be present. If the airspeed is low, of course, the angle of attack can be extremely high with only one G. Adverse yaw would certainly occur if ailerons were used.

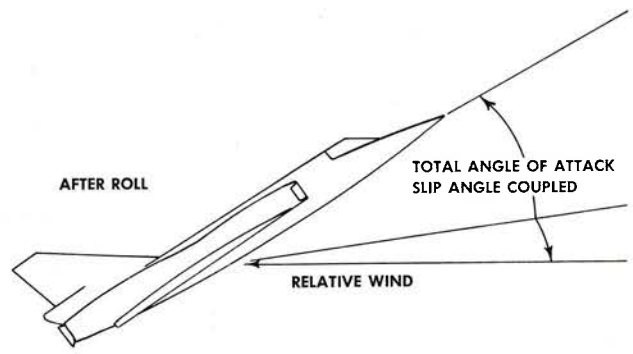
The roll usually starts as advertised with mild or moderate buffet present. As the wings near the level attitude (right side up or inverted), aerodynamic coupling will occur The slip angle you introduce to start the roll couples aerodynamically in part, to the already high angle of attack which made this method of maneuver necessary in the first place. Here the symptoms are very subtle. A sudden increase in buffet will occur, but it is not of a magnitude that will really get your attention unless you are waiting for it. If you are, then you will feel it. Chances are, if you are at high enough altitude, the airspeed will be decreasing at the same time. If you maintain the same G level by the "old feel," you also will be increasing the angle of attack yourself. If some back pressure is not released at this point, the aircraft will suddenly snap into the direction of the roll. When this snap roll occurs, you have just had your control loss.



The snap roll occurs because the downgoing wing has stalled. The upgoing wing has not. The tremendous lift differential between the downgoing wing, which is stalled, and the upgoing wing which is still flying, will result in an increased roll rate. So fast is this roll, that one we saw on scope film couldn't be measured — just estimated. It even watered the eyes of those of us looking at the film.

A good procedure during high angle of attack rudder reversals, for pilots who are in the learning phase, is to unload the aircraft slightly as the wings level attitude is approached. This procedure will neutralize the effects of aerodynamic coupling. Then, after you have gone beyond wings level about 10 or 15 degrees, bring it back in. The undesirable aspect of this procedure will be that the roll rate will reduce





slightly as you unload the aircraft. But the procedure will avoid that extremely rapid roll rate produced by a snap roll. It will also give you some room for error while you are getting the feel of your bird under these unfamiliar flight conditions.

Mechanical rudder reversals, where the aircraft is loaded up while in a bank, and then full rudder is introduced with all controls held steady until reversal is complete, may change your way of life so fast you will scarcely recognize it. Mechanical rudder reversal should be avoided. Fly the airplane. Don't let it fly you.

We spoke earlier of control losses which specifically occurred during rudder reversals, but they have also occurred during normal high angle of attack rudder maneuvering. If the aircraft is rolled fast enough, at a high enough angle of attack, the downgoing wing, which is having its stall angle of attack reduced by the side slip necessary to start the roll, is also having the angle of attack increased because of the rate of roll. If the increase in the angle of attack is sufficient, or if the initial angle of attack was high enough, the downgoing wing may start to stall. This, of course, causes it to lose lift. The pilot will note the phenomenon by a tendency for the aircraft to increase its roll rate, although there has been no increase in control inputs; or the aircraft may tend to keep rolling after the rudder is taken out. In either condition, a snap roll is very near.

Once again, these are quite subtle symptoms, and if the pilot is not expecting them, he may not notice them. If this tendency for auto-roll is present and the pilot attempts to combat it by opposite aileron or even opposite rudder which would seem reasonable under the circumstances, all sorts of exciting things may happen. If aileron is used to combat it, a yaw increase into the roll will occur, caused by the aileron deflection. The stall angle of attack of the downgoing wing will decrease further and the roll rate will increase, due to the increased side slip angle. The net result may be a snap roll, because the downgoing wing suddenly gives up and stalls. The avoidance of this maneuver is simple: forward stick with all other controls neutral.

But you must be sensitive to the symptoms when they do occur and expect them to occur when the maneuver may border on the limits.

Examples of control losses associated with rudder rolls are as follows:

- The student pilot was in one aircraft with an instructor pilot in the other. The instructor demonstrated a rudder roll. The student pilot then attempted one. He was in approximate 90 degree bank. He loaded the aircraft up to moderate buffet and introduced full left rudder. As the wings neared level, a snap roll resulted, followed immediately by a post stall gyration. Normal recovery was initiated. The instructor pilot advised the student pilot that he had used aileron which had caused his problem, and to try the roll again. The student pilot increased his airspeed slightly, placed the aircraft in a 90 degree bank, and started a rudder reversal again. He loaded the aircraft to moderate buffet, introduced full left rudder, and, as the aircraft approached the wings level position, it again snap rolled to the left. This time a fully developed spin resulted which was very difficult to recover from using the procedures we had then.
- During an ACT engagement, the pilot executed a hard left turn in pursuit of the other aircraft. The turn was entered at 30,000 feet at

approximately 350 knots. The pilot increased the load to approximately 5 Gs and applied left rudder. A sudden left snap roll resulted, followed by a fully developed spin. The pilot stated that just prior to the snap roll he felt a slight uncommanded increase in roll rate.

• During ACT, another pilot initiated a hard left rudder roll at engagement. When he had reached approximately 70 degrees angle of bank, he attempted to reduce the roll rate and found that the aircraft wanted to keep rolling. To stop the roll he held rudder and slight aileron against it. The aircraft immediately yawed sharply, pitched up, and entered a spin.

• The pilot was on a high altitude snap-up mission with a late lock on and high angle off. As he attempted to maneuever the aircraft to center the dot, he used aileron at the beginning. He then changed to rudder as airspeed bled off and the buffet increased. The nose yawed abruptly, followed immediately by a snap roll. A spin resulted.

In all types of maneuvering at a high angle of attack, when aircraft actions occur which are uncommanded by the pilot, the only recourse is to unload the aircraft. Zero G is the place to be when you have doubts as to your ability to fly out of a mess. It must be remembered, though, the aircraft will stall negatively. While the negative post stall is not nearly so dramatic as the positive one, the aircraft will not fly while stalled negatively either. If you have zero G, which approximates zero angle of attack, you will not stall. A normal reaction, when the sudden terrible realization that you are about to lose control occurs, is to fire wall the stick with both feet on it if necessary — negative over-stress and negative stall are a distinct possibility if you do so. Tenderly is the way you do it, and zero should be your goal.

In summary, no one has ever suggested that flying a century series fighter at or near the limits is easy. To do it requires knowledge, technique, and skill over and above that required for any other type of airplane herding. The very nature of the maneuvers required by our mission will, inevitably, if pursued *mechanically,* result in a control loss *every* time.

The full capabilities of the F-106 have been explored only in the last few years. The procedures established for our ACT are good ones.

There are "by the numbers" control inputs which cause the aircraft to attain maximum performance. There are "by the numbers" control inputs to recover the aircraft if you slip beyond the limits. There are no "by the numbers" procedures to tell when you are about to slip beyond the limits. Combinations of maneuvers cause combinations of prestall symptoms. The individual characteristics covered above may be so well masked that none are purely evident. For instance, a buffet level which was found to be perfectly acceptable when not rolling, may result in a control loss every time when the aircraft is rolling. Buffet is not a good indication under all conditions. If the aircraft is maneuvered in roll or if there is a slip angle present, *do not* rely totally on buffet to keep you out of trouble.

When rolling, the aircraft may tend to increase its roll rate into the bank without control inputs, but — if you stop the roll, it may immediately try to roll or yaw against the bank. Therefore, to gain control, in addition to stopping the roll, you must also reduce the angle of attack.

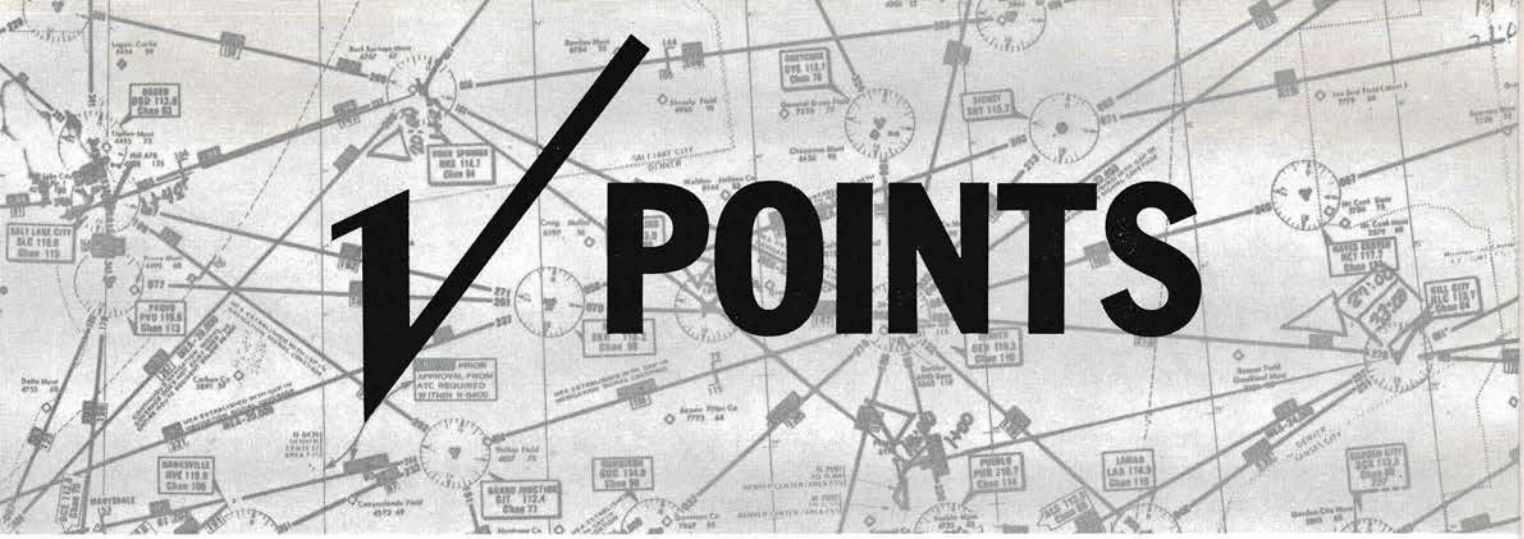
An aileron input at high angles of attack will always cause adverse yaw (yaw against the application). Yet, if you try to stop a rudder roll with ailerons, you roll faster. If ailerons are used in an attempt to stop a roll-out from a steady banked, high angle of attack, level turn, you may yaw into the roll. This may actually increase the overall angle of attack, due to aerodynamic coupling.

Gs are normally an indicator of high angle of attack. But three-quarters of a G may be too much, depending on your airspeed. Bleeding off airspeed also bleeds your G capabilites. Five Gs might have been just fine at the beginning of the maneuver, but only seconds later, with you looking over your shoulder maintaining the load by feel, they may put you right out of control. Gs can only be used as a gauge when there is no change in airspeed.

There is one critical angle of attack where control loss will always occur. This angle of attack can be reached with 6 Gs or one. It can be lowered by the maneuver you are in, but it can never be increased. Critical angle of attack can be reached by aerodynamic coupling with little or no warning. And — the angle of attack is the only thing which affects the aircraft. If the stall angle of attack is reached, a control loss will always occur.

When you fight using a machine, two basics are necessary. You must know your capabilities and limits; and you must know the machine's capabilities and limits — prior to the battle. There is only one way to gain this knowledge and that is through training.

And, finally, as one of our Generals has said, it makes little difference if you get shot down or spin in. We have lost the combat capability of the weapon, and, probably, we have lost you, too. ★



V POINTS

We would sincerely appreciate your inputs mailed directly to:
The Editor, INTERCEPTOR, Hq ADC (SED), Ent AFB, CO 80912

V SAC tankers are still having their troubles with ungrateful receivers. In 1971 they had 39 incidents of damage to the tanker aircraft by aircraft being refueled. These incidents ranged from minor boom damage to a boom that broke in half and hit the tanker elevator. ADC came out with one of the best records for MAJCOMs — they only had two incidents — but the old saying still applies, "If you need the milk, don't abuse the cow." (SED)

V A story a lot of old head F-106 drivers will remember is about a pilot who "slow" opened the armament doors to inspect the missile load. He heard a strange "hissing" sound and flattened himself on the ground just as the doors slammed shut above him. Pilots, up to this time, had been in too much of a hurry to wait while door locks were installed. But in the split-second required for these doors to close under 3000 pounds of pneumatic pressure, the life style of a lot of 'six jocks slowed noticeably. Time has passed and many new pilots have begun flying the F-106. It is quite easy to forget this incident, especially when you're cross-country and your wrinkled suit and checkbook are in the travel pod — inside the armament bay. However, the "Ultimate Weapon" does not forget. Recently, as a pilot "slow" opened the doors, IT HAPPENED AGAIN. They don't pay double flight pay for guys with split personalities. (SED)

V If you gave each pilot in your squadron a written "emergency procedures" test, they would probably all score 100% with verbatim answers. Most pilots have filled out so many of these standard tests — the name of the procedure followed by the appropriate number of blank spaces — that they could do them in the dark. But how many pilots can sit in a dark or dimly lit cockpit and touch all the right switches? The purpose behind a Bold Face procedure drill is to teach a pilot to react correctly in an emergency situation. To do this he must learn the thought behind the procedure, not just be able to mouth words. Current thinking in the USAF IG shop is that required verbatim memorization may have a degrading effect on a crewmember's ability to react quickly and correctly. Training of-

ficers should keep their programs realistic and pilots should practice their emergency procedures in the flight simulator — where you teach your mind and hands to function properly, not just your mouth. (TIG Brief/SED)

✓ The T-33 has been around for a long time, but not all maintenance personnel are familiar with the old bird. There are bases — believe it or not — that do not have T-birds assigned. This fact has been made clear to many T-33 pilots who chose their refueling stops by geographical location rather than by the service available. While many of these bases can give you a "fast turn" due to the absence of other transient traffic, they can also give you a few days wait due to the absence of qualified maintenance personnel. If you break down, you may have to wait while your home base flies in repair parts and personnel. Be smart; shop where you're known! (SED)

✓ Along this same line, we'll pass on the experience of three T-bird crews that recently stopped at a Navy base. (Rex Riley, please note.) When they came out to preflight their aircraft, they found four men standing on the left wing of one bird while another man finished refueling the right tip tank. It seems that after filling the right side almost completely (the left side empty), the right strut "bottomed" and the T-bird began to tip over. So, thinking quickly, the crew chief yelled for four large men to balance the load. When the aircrews were ready to start, the crew chief rolled up a strange-looking power cart — the one they always use for Navy T-33s. However, it would not plug into an Air Force T-bird. With a special adapter, they finally got power, but at 17 - 19% rpm when the starter cut out — the power cut out. As the engine began to unwind, the power cut back in and the EGT went up, up, up! (No wonder the Marines are tough.) When you're out cross-country, you are responsible for the aircraft. Tell the transiennt alert personnel exactly what service you want, and make sure they understand. (SED)

SAGAS SING THEIR SAD SATIRE

TWO-ON-FINAL

One clear night in late 1954, several C-124 Globemasters — the huge MATS transports with a double decker fuselage and a cockpit as spacious as some living rooms — were returning to Westover Air Force Base, Massachusetts, for landing after overseas runs. A calm, mature voice, indicating that the speaker was an old hand in flying business, called the control tower: "Westover Tower, this is 244, 5 miles northeast at 4000 feet, requesting landing instructions." The control tower operator answered: "244 landing direction is northeast on runway 05, clear to enter traffic, call on base leg for further landing clearance." Evidently, radio calls from other aircraft blocked out 244's call on base leg, so the tower operator called: "244, what is your present position — I do not have you in sight." Again, the mature voice calmly replied: "Tower, this is 244, I'm at 1500 feet just starting to turn on the final approach." At this point, a young, high-pitched voice, indicating that the speaker was having horrible visions of a midair collision, excitedly called on the radio: "244, I'm also at 1500 feet in about the same position!"

The "old hand" voice snapped back: "Well, you should be, Knothead, you're my copilot!"

an ounce of PREVENTION

LET DR. "GEORGE" DO IT

If you think that the continual harangue about not taking medicine that the Flight Surgeon hasn't prescribed is just a dodge to keep the AMA in business and the Flight Surgeon on flying status, ponder these facts. Any medicine that relieves the symptoms of a cold either does so by dulling your senses to the symptoms or, in the case of decongestants, helps clear your sinuses by constricting the blood vessels. In doing this, they also constrict the blood flow to the brain. Some patent medicines can make you drowsy, alter your visual perception, cause dizziness, make you more susceptible to vertigo, and upset your stomach. Some of these side effects are so dramatic that the manufacturers are compelled to list them on the packages. So, obviously, when you are taking these medicines, you will not be operating at full capacity. Now, granted, flying isn't *always* the most taxing thing you'll ever do. Pilots can, and have, flown successfully when they have been below par — either from a cold or, in some cases, the medication they've taken to relieve the symptoms. But what happens when that one emergency situation comes up when you are called upon to give 100% of your ability and you can only come up with 85%. Maybe the cold lowers you 10% and the medication another 5%. While 85% is usually a pretty good score, nothing short of perfect may be good enough in this case. An autopsy won't disclose how bad your cold was. You're no hero by trying to fly with a cold. Heroes are the ones that get themselves out of, not into, dangerous situations. The Flight Surgeon is the only one who can really tell you whether you're fit to fly today or not. If you can fly, but need some relief, the Doc knows better than anyone what medicine will not detract from your usual skill and cunning.

NOT QUITE RIGHT

As the safety officer often preaches, "Accidents don't just happen." Sometimes people are the cause and more often than not, pilots are the people. Or to say it in stronger terms — Primary Cause: Pilot Factor. And here again it's very impersonal unless you are either the pilot or his commander. Oh boy, does it get personal then! This all has to do with an airplane who recently made a formation approach, he in his nylon and his aircraft without his warm body. He landed OK; the aircraft bashed. Although his bash was caused primarily by a material problem, the pilot could have done a lot to prevent it. Seems he flew this same aircraft prior to his sad experience and had indications of things not being just right, but the 781 sure didn't reflect something wrong. This story could go on forever, but if the point hasn't already been made by now, we'll be in trouble again. You, too. All we have to do is gaze in the mirror to see who has been there before — we've learned, hopefully. So, when things are NOT QUITE RIGHT, make your thoughts known in the 781 so that someone else will be aware that problems exist. This way, the next guy in the barrel gets a fair shake. That's what makes this story rather ironic — he was the next guy.

THE WAY THE BALL Bounces

ACCIDENT RATE

	ADC	ANG
1 Jan – 31 Jan 1972	0.0	0.0

MAJOR ALL AIRCRAFT

ON TOP OF THE HEAP

MO	ADC	MO	ADC	MO	ANG
52	49 FIS Griffiss	35	4713 DSES Otis	106	112 Ftr Gp Greater Pitt
46	57 FIS Keflavik	34	5 FIS Minot	61	169 Ftr Gp McEntire
41	4650 CSS Richards/ Gebaur	28	2 Fis Wurtsmith	59	142 Ftr Gp Portland
40	552 AEW&C McClellan	24	95 FIS Dover	56	124 Ftr Gp Boise

ACCIDENT FREE

CUMULATIVE RATE

ACCIDENTS FOR JAN / CUM TOTAL

	ADC	ANG
JET	0.0	0.0
CONV	0.0	0.0

BOX SCORE

UNITS DIRECTLY UNDER HQ ADC

			20 AD	21 AD	23 AD	24 AD	25 AD	26 AD	ADWC	552	4600	4650	4677 4713	ANG
F-101	0	0												
F-102	0	0												
F-106	0													
T-33	0	0												
B-57	0													
EC-121	0													
CONV	0	0												

RATE = MAJOR ACCIDENTS PER 100,000 FLYING HOURS ALL RATES ESTIMATED

MINOR ACCIDENTS THIS PERIOD — 0
MINOR ACCIDENTS CUMULATIVE — 0

we point with PRIDE

Colonel Oscar Bayer
ADC/DPR
Ent AFB, Colorado

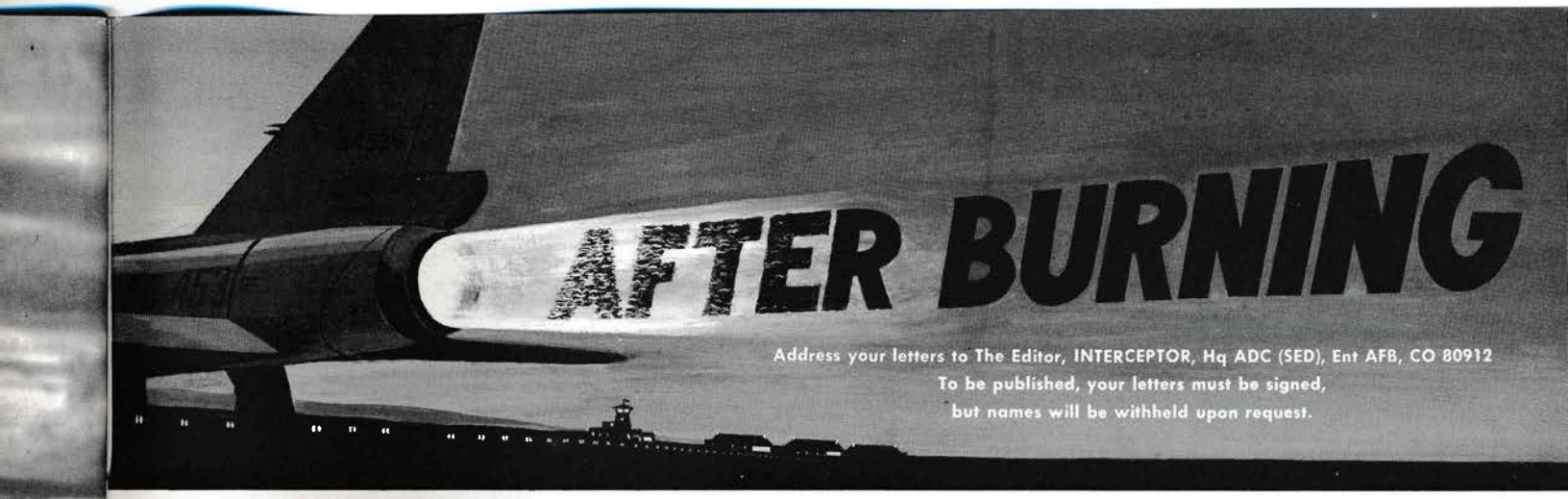
T-33 "CLOSE" PATTERN

Colonel Bayer was on a typical T-33 target mission in support of an Air Division exercise. The deployment to the staging base and the two target sorties flown while there had been uneventful and he had just begun his flight home. As the aircraft reached climb airspeed, Colonel Bayer made a 180° turn to a northeasterly climb heading. Then at approximately five minutes after takeoff, the uneventful mission ended — an explosion ripped a one foot diameter hole in the side of the aircraft.

Colonel Bayer immediately checked the cockpit instruments. The RPM was still at 100% and the other instruments were normal, but the amber overheat light was illuminated. He was at 2,600 feet AGL, 260 knots, and still climbing. A moment later the engine began to vibrate to such a degree that the instruments became impossible to read. He turned the aircraft back toward the runway (still only six miles away) and retarded the throttle to idle.

With a few minor turns, Colonel Bayer aligned the T-bird on a high, straight-in, final approach. He extended the speed brakes to slow the aircraft to gear lowering speed, and shortly thereafter the engine seized. He placed the gear handle down, noted three unsafe indications, and turned on the emergency hydraulic system. As the T-33 crossed the overrun, the gear locked and indicated safe. At the end of the landing roll, Colonel Bayer turned off onto a taxiway, stopped, and egressed. Total time from explosion to evacuation: approximately two minutes.

Colonel Bayer's extremely rapid assessment of this emergency situation and his quick reactions prevented the loss of an irreplaceable ADC aircraft. For his cool judgment and demonstrated superior airmanship, we point to him with pride.



AFTER BURNING

Address your letters to The Editor, INTERCEPTOR, Hq ADC (SED), Ent AFB, CO 80912
To be published, your letters must be signed,
but names will be withheld upon request.

STARLIGHT SCOPES

On this Squadron we fly the McDonnell Douglas F4K and for some time now we have been trying to interest our own service in equipping the 'back seater' with a starlight scope.

At present the Army seems to be making greater use of this type of system than the RAF. In an effort to get some information on the subject we have written to the manufacturers, but they have been less than helpful. However, all is not yet lost. The cover of INTERCEPTOR magazine for December 1971 (Vol 13 No 12) shows a starlight scope fitted to an F-106. So, obviously, Air Defence Command leads the way.

Would you consider putting us in touch with the American manufacturers or letting us have a brochure or articles that amplify the subject so that we will be better informed when pursuing this matter through out own Service channels? Can you say from experience whether you have found that the scopes are as useful and effective as you would wish? Any information or observations that you can give would be very welcome.

Flt Lt B. J. Clifford, RAF
No 43 (F) Squadron
Leuchars, Fife, Scotland

***Although it appears that we have our F-106s equipped with a Starlight scope, we do not. The scope you saw is a day-use telescopic sight. However, we have forwarded your letter to TAC ATTACK. Since Tactical Air Command uses this instrument, we are sure their publication staff can help you. Cheers.**

ADIOS, FIGHTER PILOTS

Inasmuch as my retirement date of 31 January is just about upon us I would like, if possible, to use your fine publication to make a couple of final points (no, this is not a "poison pen" letter). First, I would like to tell you what a pleasure it has been doing business with you people in the Safety business over the years and to commend you for the fine job that has been done with your magazine. Having spent nearly ten years commanding interceptor squadrons I can attest to the fact that the INTERCEPTOR has always been oriented towards the troops who fly the birds and turn the wrenches.

Secondly, to the many friends I've made in the nearly 20 years I have spent in the command I would like to say "thanks" for a most enjoyable association. My address, until some time this summer, will be at 1008 Adobe, Great Falls MT 59404, telephone 761-4259 (no collect calls, please). Our ultimate destination is the Coeur D'Alene/Spokane area. But wherever it may be, the latchstring at the Crain household will always be out and there will always be a Martini or two available.

Third, and this is the toughest bit, I would like to bid a special adios to the fighter types, those who fly them and those who maintain them. I consider it a distinct privilege to have been in the fighter business for over 29 years and to have had the opportunity to be associated with a truly rare and wonderful breed of cats. Gentlemen, you are the greatest and may you never change.

Colonel Franklin C. Crain
1008 Adobe
Great Falls, Montana 59404

***We know that the guys who worked for and with you have exactly the same sentiments about you. It's been a pleasure and stay in touch!**

USAFSO, BRAZIL

A staff officer of the newly formed Brazilian Air Force Air Defense Command has requested assistance in obtaining information on high speed, high altitude flight. Specifically, the officer brought in a copy of an ADC pamphlet and asked if we could obtain the rest of the series. The booklet is ADCPI 62-13 and the title is INTERCEPTOR, High Speed Aerodynamics Part I, dated May 66.

Would it be possible to obtain a copy of the rest of this series or a copy of a more up-to-date treatment of the subject? The BAF will be taking delivery of the Mirage next year and could use any information possible on air defense. Anything you could supply would be a help and would be greatly appreciated. Thank you for your attention.

Major Ray R. Brewer
Operations Advisor
US Mil Gp, USAFSO/SCBRAF-P
APO New York 09676

***It is possible and the rest of the series is on the way.**

MYTHICAL TAIL NUMBERS

In your January '72 issue of INTERCEPTOR, I noticed on the cover page that there was a tail number on the aircraft pictured. This is entirely against Air Force Regulation 127-4, para 20-h, page 13.

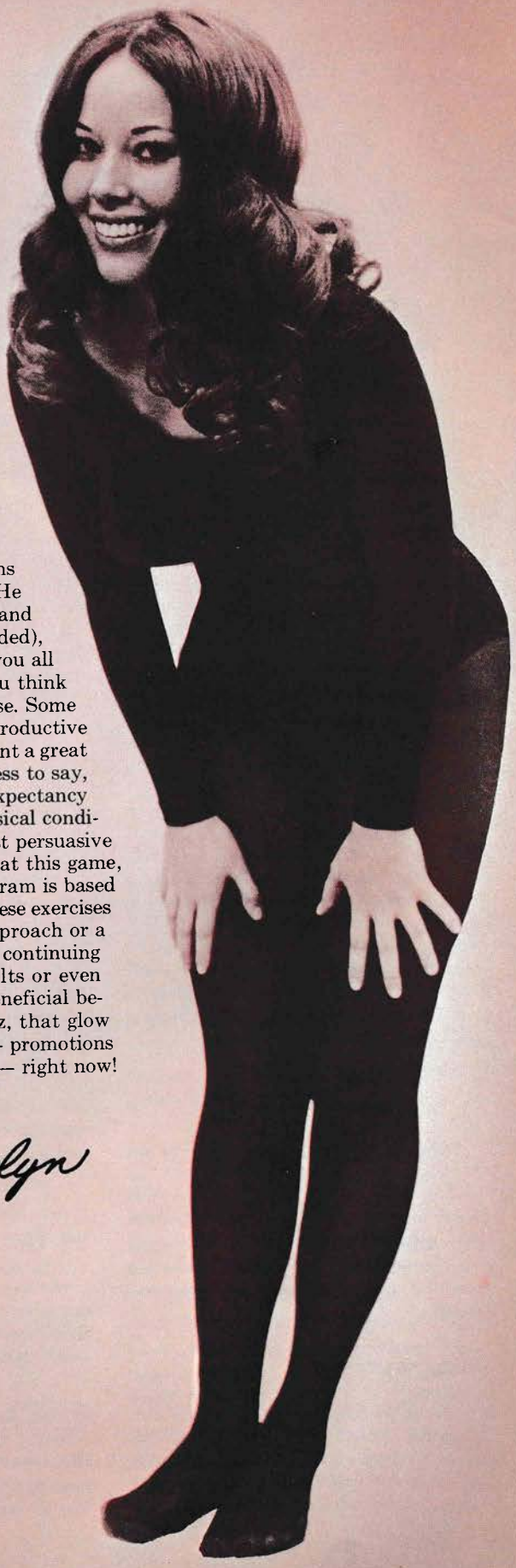
I have been in ADC for two years and have read your magazine every time I've had a chance. And have enjoyed your many articles.

I probably wouldn't have noticed the number, but the last three numbers belong to one of our aircraft.

Sgt John Henry
Box 118C, 95th FIS
Dover AFB, Delaware

***Names, places, and numbers in our magazine are fictitious. This is one of those close coincidences we occasionally see. To be perfectly technical, our cover picture showed only four digits on the tail, in reality there are five.**

* U.S. GOVERNMENT PRINTING OFFICE: 1972-784-031/8



Men – are your belts shrinking? Does each purchase of new pants for you become a bigger bargain because you're getting more material for your money? Have those sighs from the girls on the beach turned to guffaws? Do you find that everything you do takes more effort? Is your time to climb out of bed increased and your endurance before getting back in shortened? Well, if you want to regain that Apollo-like body, increase your stamina, feel better, and live longer, don't run to Dr. Doobetter's magic elixer of life and perennial youth tonic. No, just try Dr. Ken Cooper's Aerobics Program. Now I'm not going to stand up here and insult your intelligence by trying to convince you of the beauty and grace you will experience as you run your daily mile and a half through a sun-dappled glen. You realize as well as I do that maintaining physical fitness is hard work, but let me give you some cold hard facts that could possibly motivate you with that extra resolve to persevere. Last month, Dr. Don Novicki, one of those great physically fit flight surgeons we have here told me about his case files for the past six months. He really had some "attention getters." Of the 22 flyers in this command who were suspended from flying (notice I said suspended, not just grounded), six had cardio-vascular diseases or metabolic conditions. Of course, you all know that means coronary artery disease or diabetes mellitus. If you think that these people were "old heads," you are indeed in for a sad surprise. Some of these pilots were in their thirties and could have had many more productive years in the cockpit. From a monetary standpoint, these losses represent a great loss in "the long green" to those ex-flyers and to Uncle Sam. Needless to say, the individual also feels a certain sense of personal loss when his life expectancy is decreased by about a quarter. The obvious question is: "Will physical conditioning prevent or halt the progression of these diseases?" In my most persuasive voice, the answer is an unequivocal yes. However, if you want to win at this game, you have to play by a well-prescribed set of rules. The aerobics program is based on a progressive, graded series of exercises and regular repetition of these exercises is mandatory to continue a good level of fitness. Usually a group approach or a goal-oriented program (100 or 500 miles clubs) help the old psyche in continuing with programs. It's not easy and you may not see immediate results or even dramatic results in the long run (please excuse the pun), but it's beneficial beyond any shadow of a doubt. So if you want to feel that old pizazz, that glow of youth (or maybe we should appeal to the more basic motivations – promotions and flying pay), get with Dr. Cooper's guaranteed aerobics program – right now! You make me so happy when you do something good for yourselves.

–Carolyn

PHOTO BY SGT RICHARD THOMAS