

TAC ATTACK

SEPTEMBER 1967

the dynamics of **ZOOM**

September 1967 the dynamics of Zoom

for efficient tactical air power

TAC ATTACK

SEPTEMBER 1967

VOL. 7 NO. 9

TACTICAL AIR COMMAND

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TACRP 127-1

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

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Angle of ATTACK



That Almost-Information

A large part of our accident prevention program is based on learning from accident and incident reports and trying to keep the same mishaps from occurring again. In addition, we apply what we learn from hazard reports and unsatisfactory reports to prevent future mishaps.

However, with all these reports, there is still a lot of valuable accident prevention information that we seldom hear about. We don't learn of the many times that our people successfully complete an operation despite a malfunctioning part or a break in the routine. We hear of these occasions only when damage or loss reaches a predetermined value. Therefore we fail to learn from the alert mechanic, skillful pilot, or thorough supervisor who has avoided a mishap after the machinery or a procedure has failed.

That almost-mishap information is difficult to define and identify. We have no procedure for collecting it or studying it. We get some of it as a by-product of our safety awards programs. But through them we hear of only the few spectacular saves that occur each year. In the rest of these saves we never learn what went wrong, how it was kept from becoming a serious loss, or how to keep it from happening again.

At every level of our organization we have the machinery to spread the word... safety meetings, bulletins, newsletters, pamphlets, and... TAC ATTACK. It doesn't matter whether it comes from formal reports, or as a narrative of a close call that didn't require reporting. A magazine article or safety bulletin from one of you troops in the field is the most meaningful and productive to the rest of us.

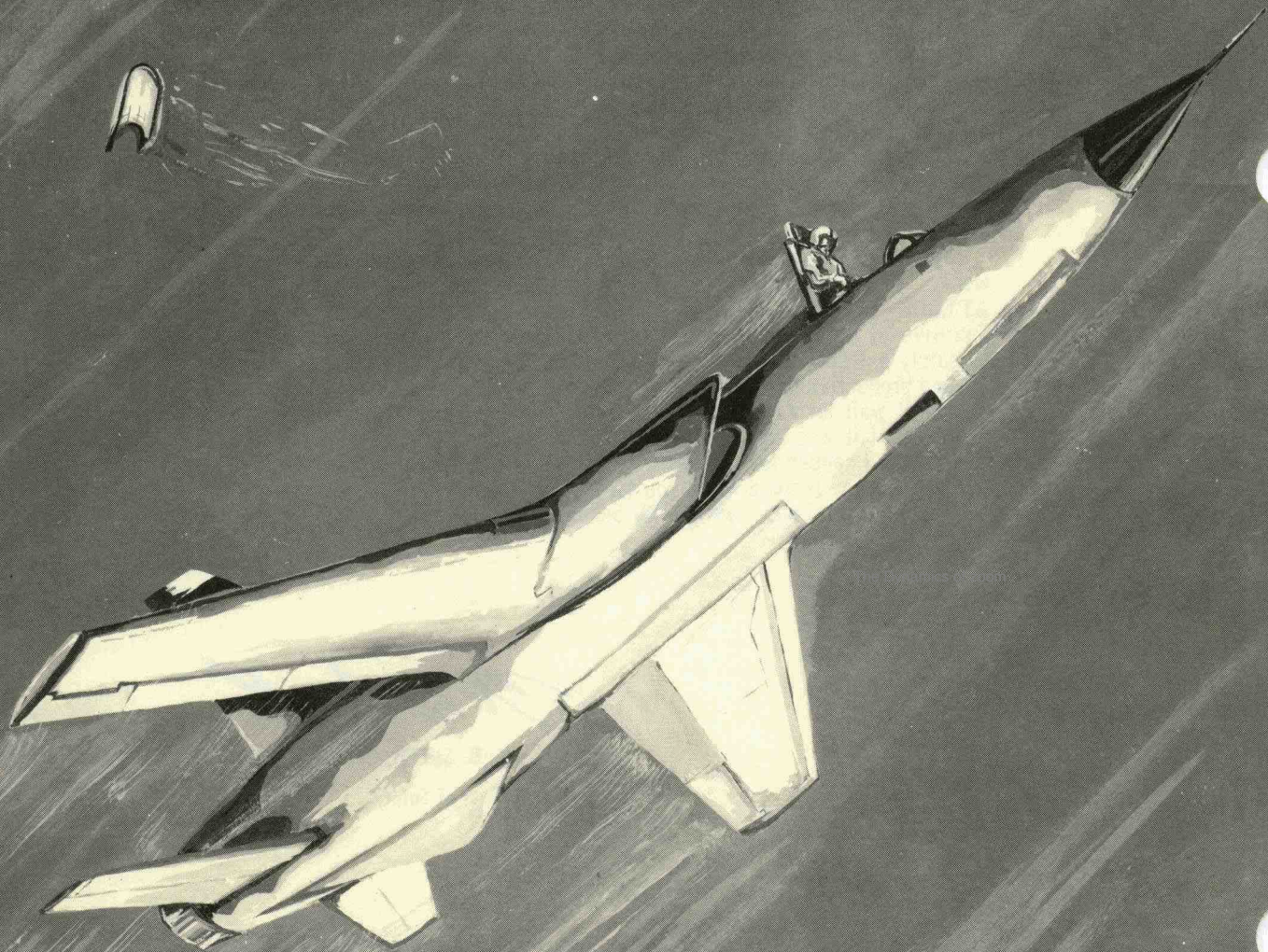
Don't wait for a mishap that is serious enough to be an incident or an accident. If it was hairy enough to tell about later, over coffee or at the bar, it could happen to someone else. And that someone else can sure use the lessons you learned while you were going through it.

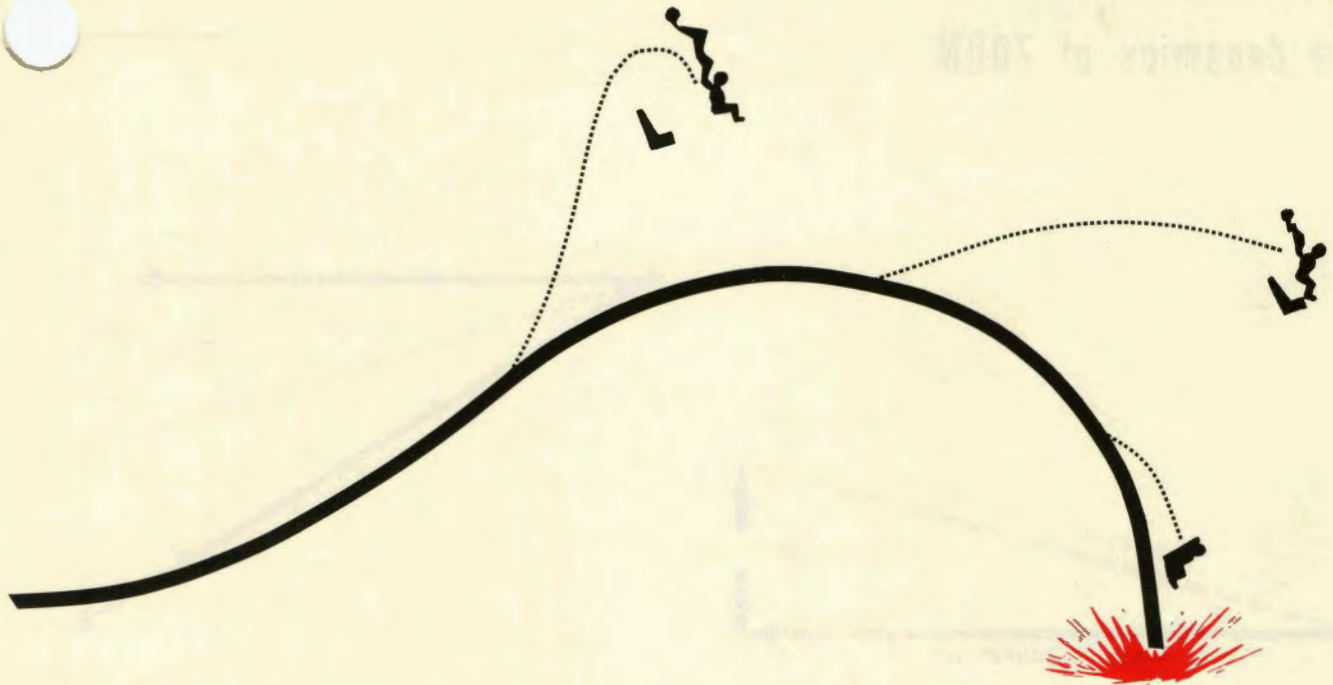
Pass the word on... we can all benefit from it!

H. B. SMITH, Colonel, USAF

Chief of Safety

the dynamics of **ZOOM**





As you pull up from the strafing pass, you push your throttle to full military. You feel the engine respond and see RPM passing 95 percent.

Then suddenly the thrust is gone! RPM is decreasing! Exhaust temperature is 300 degrees as RPM winds down past 90 percent. Fuel flow is 200 pounds.

You pull back on the stick, grabbing for altitude. You race through the airstart procedure.

The flameout occurred about 100 feet above the ground. You had 400 knots. That airspeed carries you to 1500 feet above the terrain while you try to restart the engine. As airspeed unwinds past 190 knots you try your third airstart. Finally, you release the stick and concentrate on ejection. The bird noses over slightly, still losing airspeed and building an impressive, but unnoticed, sink rate.

When you eject, the airplane is about 750 feet above the ground.

Your life-saving equipment all works perfectly. You find the handle and squeeze the trigger without delay. The canopy separates immediately. Your lap belt doesn't open prematurely . . . everything is automatic. You separate quickly from the seat. And your parachute inflates promptly . . . without twisting or looping suspension lines over the canopy.

When you look down, you see that you're descending toward the exploding fireball that was your airplane. You wouldn't do that, you say? You wouldn't wait

until 750 feet after you had zoomed to 1500 feet? More than one recent ejection went just about the way we've described it here.

None of us really meant to wait until we're down to 750 feet. But many of us could be trapped as the pilot was in our example. His attention was primarily on the altimeter. When he saw he couldn't get much more than 1500 feet, he set about ejecting. And by that time, he had little margin for malfunction.

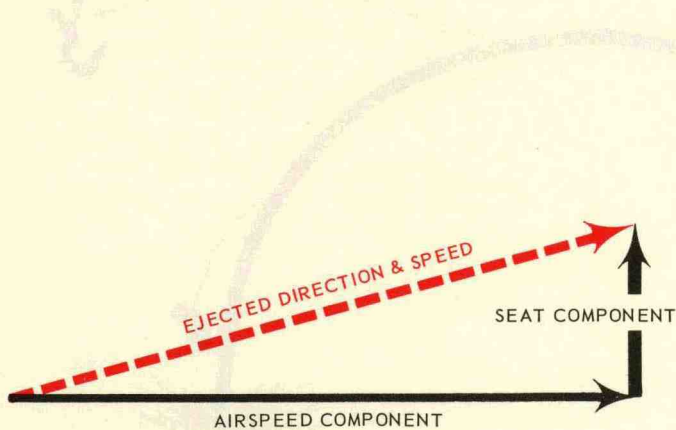
And he could have broadened that margin considerably if he had ejected at 750 or 1000 feet in his zoom . . . before he ever reached 1500 feet!

We don't hesitate to zoom from low altitude as soon as we find ourselves in trouble. But too many of us misunderstand the purpose of the maneuver. Let's examine ejection from the zoom and see what exactly is involved.

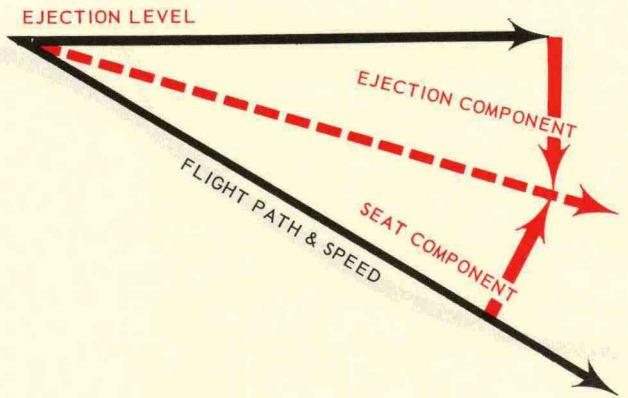
The ejection seat separates you from the airplane with a predictable trajectory. At any given airspeed, this initial trajectory will be essentially the same in relation to the airplane regardless of your altitude, pitch attitude, or bank.

So your movement after ejection in relation to the ground (this is what you're most interested in) will depend on your airplane's direction and speed at the moment you eject. You and your seat are traveling in the same direction and at the same speed as the airplane when you leave it. This direction and speed . . . call it a vector . . . is the most important factor in

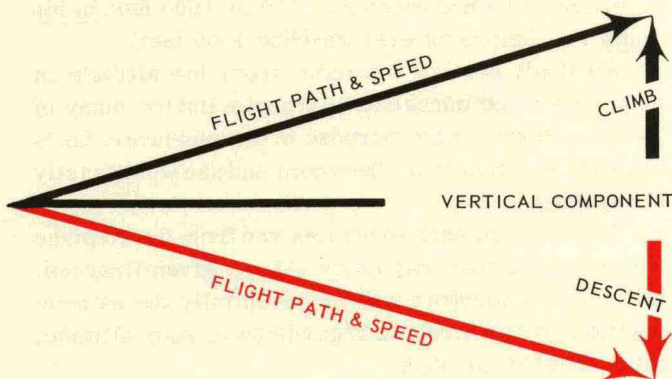
the dynamics of ZOOM



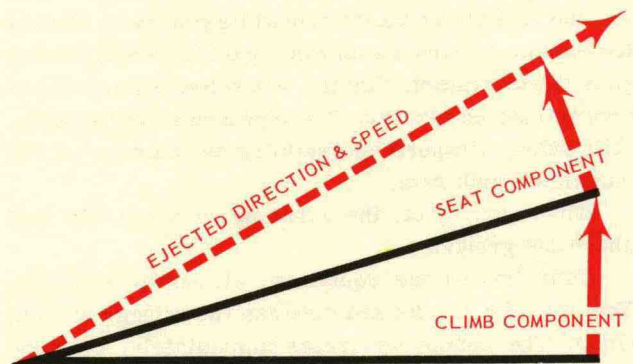
1. In an ejection from a flying airplane, the speed and direction of flight are often more important than the ejection itself.



3. If the initial velocity downward equals or exceeds the initial velocity of the seat, the net effect is like having no ejection seat . . . or even a downward ejection.

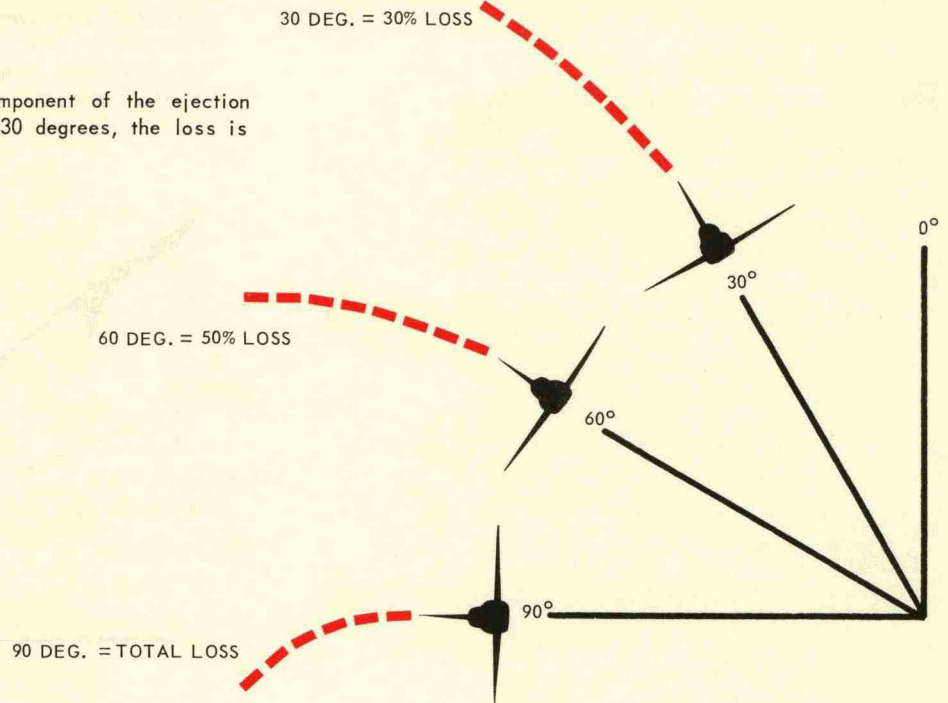


2. If the direction of flight is above or below the horizon, there will be an initial velocity up or down . . . which is added to or subtracted from the initial velocity of the ejection seat.



4. The zoom maneuver provides initial velocity upward. This is added to the initial velocity of the seat, thus increasing the peak height reached by the seat . . . and the total time in trajectory.

Bank reduces the vertical component of the ejection vector. Up to bank angles of 30 degrees, the loss is very small.



determining the success of your low altitude escape.

If your aircraft vector is level and its speed is above about 120 knots, your seat trajectory will be just about what the manufacturer advertises. The seat will go up x feet, at y feet per minute. You will separate from the seat while you are above your ejection altitude. And if the seat is capable of ground-level ejection, you will have a fully inflated parachute before you fall back through the altitude you ejected from.

If your aircraft vector is below the horizontal, and the vertical (down) component of that vector matches or exceeds the upward thrust of your seat . . . the x feet that the seat throws you will not take you above the level at which you ejected. All it can do in this situation is temporarily arrest some of the downward momentum you had when you left the airplane.

But if your aircraft vector at the moment you eject is above the horizon, the vertical (up, this time) component will add to the upward thrust of your seat. Your trajectory will be higher in relation to the ground. **And you'll have more time for the parachute to open.**

In a very low ejection, a level flight path gives you minimum margin for malfunction or delay. You can usually increase that margin by gaining altitude. If you have the airspeed to climb 1500 or 2000 feet, you can climb. And then you aren't faced with that "very low" ejection any more.

But what about the situation from which you can't

climb? Suppose you flame out on GCA final . . . with all the garbage hanging out?

Now you zoom!

And you don't zoom for altitude!

You zoom for an upward vector and a favorable trajectory. You have been descending on the glide path. Any decrease in rate of descent at the moment you eject is in your favor. If you can level the bird, or establish a rate of climb, you're that much better off.

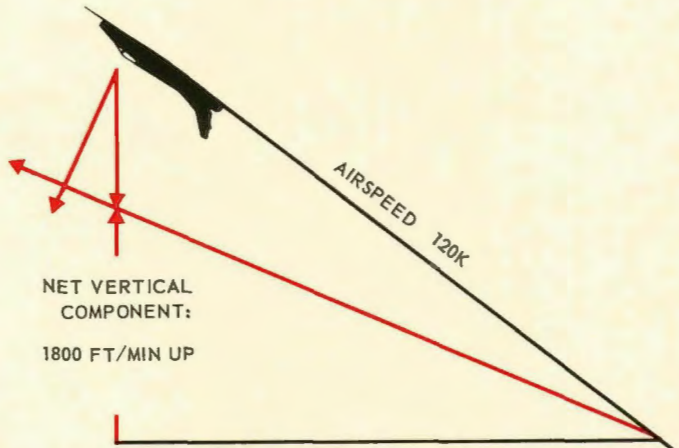
One way to look at it is to say that you add another factor to the manufacturer's specifications. He guarantees that the seat will come out of the top of the airplane at y feet per minute. You must add your aircraft's vertical velocity.

If you're riding a non-rocket type of ejection seat, it will come out of the airplane at about 3600 feet per minute. Any time that your airplane is descending at a vertical speed greater than that, you'll come out of the top of the fuselage, but you won't go up very far . . . you'll just continue to go down at a lesser rate while you wait for the chute to blossom.

The rocket seats in the T-33 and the F-100 give you a boost of about 5400 feet per minute. Even that's not very impressive when you match it against the descent rates that these birds can generate when the engine quits.

But you can decrease that horrendous down vector if you act before the airspeed's all gone. Think of your airspeed as energy available to maneuver with. The

You could eject inverted in a 30-degree climb at 120 knots and still continue climbing. The vertical component of the seat thrust would be 2100 ft/min down. And the vertical component of your aircraft vector would be 3900 ft/min up.



more airspeed you have, the more energy is available to turn the airplane away from its path toward the ground.

Without an engine, that energy dissipates rapidly. You must take advantage of the energy when it can do you the most good. Hold your climb until vertical speed reaches zero (as some of our Dash Ones still recommend), and you'll be going down again before you have time to grab the handle and start the sequence. If you didn't have much energy in the bird when you started, you'd reach the point where you're going down again very quickly.

You may not even be able to establish a climb. But you will seldom be in a situation where you don't have enough energy left in the airplane to decrease your rate of down. Even the heaviest fighters have enough energy on final to zoom to a vector that is more favorable for ejection. Your final approach speed is usually about 130 percent of stall speed for the weight you're carrying. If you zoom off 20 or 25 of that 130, you may not gain any altitude, but you will have rotated your pre-ejection vector upward.

Think about this . . . every final approach you make carries enough energy to rotate the bird to an almost horizontal vector. How else could you make those grease-job landings? And the same goes for a dead-stick approach . . . if you are carrying sufficient energy with you (this usually runs around 240 knots), you can flare your bird to a horizontal vector before

touchdown. So you could do the same thing at a couple of hundred feet, three miles from the runway, when you finally decide the machine just won't make it the pavement. (Need we say it? . . . you should have made a decision long before this!!)

There's no reason why you shouldn't think about all ejections in this manner. The influence of your aircraft vector is not limited to very low ejections. You flame out on initial and hold your altitude while you try an airstart. Your airplane rapidly decelerates until you can no longer hold your altitude. You're slow and sinking, passing 1000 feet . . . that's not a very healthy vector!

You don't need mathematical formulas to understand this vector business. All you need is an understanding of the forces involved. If you key your thinking to the moving geometry of an ejection situation, you won't be trapped as was the pilot in our first example.

A low altitude ejection is a critical and dynamic situation. You must get maximum performance from your equipment. If you have not restricted your thinking to static ideas of altitude, and planned to use every ounce of energy in your airplane to get you moving UP, you will make the right decision . . .

Roll wings level,
Zoom for an UP vector,
And BOOM!

MAINTENANCE MAN OF THE MONTH

Technical Sergeant Robert T. Speller of the 4410 Combat Crew Training Wing, Hurlburt Field, Florida, has been selected to receive the TAC Maintenance Man Safety Award. Sergeant Speller will receive a letter of appreciation from the Commander of Tactical Air Command and an engraved award.

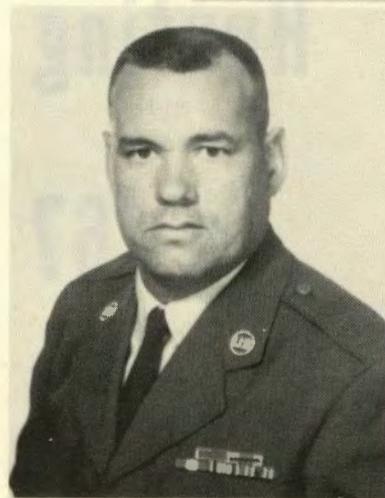


Sgt. R. T. Speller



CREW CHIEF OF THE MONTH

Technical Sergeant Willie O. Moore of the 4410 Combat Crew Training Wing, Hurlburt Field, Florida, has been selected to receive the TAC Crew Chief Safety Award. Sergeant Moore will receive a letter of appreciation from the Commander of Tactical Air Command and an engraved award.



Sgt. W. O. Moore



by Major J. M. Lowery
Hq TAC (OSF)

Good Hunting in '67

Not many years ago Americans had to hunt for survival. Today hunting is one of our major pastimes. The urge to hunt appears to be a basic human instinct. Like the tiger, man is a born hunter.

Most hunters are at a loss to explain why they like to hunt. They say they've been doing it since boyhood. As men, they still enjoy the outdoor adventure.

With our more civilized outlook on this form of recreation, several basic rules of conduct have evolved...hunting ethics. Many of these rules of ethics are written into our game laws. For example: it is unlawful to spotlight deer at night; shoot deer that are swimming a river; shoot from an airplane or automobile. Sporting ethics demand that you give the game animal a sporting chance. You can summarize this as respect for the game you hunt.

The hunting habits of an individual go through an interesting evolution. As youngsters we often hunt with a single purpose: to kill. The "kill" hunger is a sure sign of youth. A young boy generally feels that the measure of a man is the weight of his game bag. With maturity, the enjoyment of hunting comes more from the challenge of the stalk, comradeship of fellow hunters, and love of the out-of-doors. The actual number of animals killed becomes unimportant. (Most fishermen will agree with this concept.)

The true hunter's love of his sport is usually based on the sporting qualities of the game he is hunting. The respect a guy has for wildlife will be reflected in the way he hunts.

For example: hunting ethics demand that you make every possible effort to avoid crippling game. If you wound an animal, you must make every effort to recover it.

How many times have you seen or heard of the long-shot artist? He shoots at a deer across a canyon. "Probably 600 yards," he says. "Think I hit him, too!" Very few people are skilled enough to make a clean kill at long range. And very few people will walk 400 or 600 yards to see if they really did critically wound, or kill, the critter.

Down south, a quail hunter would never think of shooting birds on the ground. Yet how often do you hear someone bragging about all the birds he got in one shot.

The hunter who respects the game he's hunting knows the animal's habits. He knows the law and strictly observes it. He would rather come home empty handed than shoot a duck after official quitting time... or shoot a deer he has momentarily blinded with his automobile headlights... or shoot at geese with a rifle.

What does all this have to do with hunting safety? Everything! The hunter who doesn't thoroughly know the animal he is hunting is the guy who shoots a horse thinking it's a cow elk. The guy who is over eager shoots a fellow hunter emerging from a thicket.

A couple of years ago a deer hunter shot a fellow hunter who was sitting in a tree, still-hunting for deer. Seems the still-hunter's form looked like a bear.

The desire for a kill or a heavy game bag causes the hunter to shoot too quickly for positive identification.

The "game hog" puts his loaded rifle or shotgun in the car. If he sees something while driving out, he's going to be ready.

Some of our European neighbors suffered through our growing pains years ago. As a result, the Germans have very strict rules on hunting. To get a license you must attend a 15-hour school and obtain a certificate of completion. Then you must meet a board of Jaegers (professional hunters). They have the final say on your qualifications and eligibility for a hunting license. Before you buy your license, you must have liability insurance. You can't just buy a gun and head the woods.

Before you can hunt alone in Germany, a pro-

fessional hunter (or the lease holder) must thoroughly check you out on the land boundaries. Act greedy or immature... and you're all through hunting. As a consequence, hunting accidents in Germany are very, very rare.

Fortunately, many of our states are beginning to offer, or require, hunter education. New Mexico, for example, has had at least two hunters killed in shooting accidents every year since 1956 (four in 1962). After much effort, they established hunter safety schools for new as well as experienced hunters. It paid off. In 1966 there wasn't a single hunting-associated gunshot accident in the entire state.

The novice, greedily seeking free meat, is the guy who generally causes the problems. Hunting is for recreation, sport, comradeship, enjoyment of nature, and harvesting of the surplus game crop.

Here are some of the rules of safety as outlined by the National Rifle Association:

1. "Treat every gun as if it were loaded." Except when preparing to shoot, or when actively hunting, you should leave the bolt open. Unload all guns during coffee breaks, lunch, rest, etc. A loaded gun leaning



Don't stack loaded guns against trees, fences, or your car.

against the car, or a tree, can very easily fall and discharge into the group.

2. "Always point the muzzle in a safe direction." We are all guilty, on occasion, of inadvertently violating this rule. Be especially careful when hunting with children. TAC's only hunting fatality last year involved a 12 year old boy who accidentally shot his Dad. The boy was trying to load his (rusty) 20 gauge shotgun. He forgot to watch where the barrel was pointed and his Dad forgot to supervise the loading operation.

3. "Be sure of your target." Don't snap shoot. Know your game animal and positively identify it before you shoot. The guy who takes a "sound" shot (shoots toward a noise in the brush) is a potential murderer...not a hunter.

4. "Keep your finger off the trigger and the safety ON until ready to shoot." When hunting in Germany it's common practice for the Jaeger (professional hunter) to occasionally turn around, take your gun and pull the trigger to see if the safety is on. This is a good practical lesson to use with your son (or any new hunter). It really gets the point across if the gun goes off.

5. "Unload all guns before putting them in an automobile." It's illegal to shoot from a vehicle, anyhow.

6. "Know and respect your zone of fire." Hunters should agree beforehand on the area of fire each shooter will cover. Consider also the range of your weapons.

7. "Alcohol and hunting don't mix." Forget this one rule and you're sure to forget all before...and after.

For your own self preservation carry some ele-

mentary signaling devices in case you get lost. Sig mirrors don't cost much. Neither do penguin flares.

Also make up a small first aid kit. They are useful for burns, headaches, cuts and a thousand other major and minor problems. If you hunt in snake infested areas, carry one of the new anti-toxin kits.

When you go hunting, let your wife or friends know where you're going and when you'll return. If the plan changes, call home and tell somebody. While afield, carry minimum survival items...compass, some food, cord or rope, matches, first aid kit, even a police whistle.

Hunting satisfaction, good sportsmanship, and gun safety education go hand in hand. Rod and Gun Clubs can help a lot by establishing hunter training and gun safety schools for youngsters as well as inexperienced adults. By study and actual demonstrations, the rules of safe gun handling can be easily learned by anyone. The complete, competent sportsman knows his game and where to find it.

Keep these statistics in mind:

72% of all hunting accidents happen at ranges under 50 yards.

53% of all hunting accidents occur with clear visibility and open cover.

38% of all hunting accidents involve one or more persons under 19 years of age.

66% of all hunting accidents occur while hunting small game.

75% of all hunting accidents involve shotguns.

Careless gun handling is the greatest cause of hunting mishaps.

So enjoy this year's hunting season. But for your family's sake, don't end up in Ground Safety's IN basket...as a statistic!



Supervise the learner in your hunting party full time until you're sure he follows all the rules.

check your CONNECTOR



The F-4 crew had climbed out after takeoff and leveled at Flight Level 290 when the canopy seal deflated. Their cockpit rapidly depressurized. The instructor immediately asked Center for clearance to descend. Center came right back with clearance.

The student had been doing the flying. But as they started down, his control over the airplane began to get pretty sloppy. The IP took control and pressed rapidly down to more dense air. As they passed 10,000 feet, the student's reactions began to return to normal. He said he had recognized his hypoxia symptoms, but not until he was too far gone to reconnect his oxygen hose.

Yes, the hose from the student's mask had separated from his CRU 60-P connector. The connector was in need of lubrication. It was very difficult to lock the mask hose securely to it. Although it appeared to lock in position, the hose would fall out of the connector when the student moved around.

This student learned a valuable lesson . . . at the cost of an aborted sortie, but with no serious injury to himself. Had he been in a single-man airplane it could have been a whole lot worse.

Check your connector!!



CHOCK TALK



hot stuff!

A C-130 from another command was on the wash-rack as the dock chief and his crew prepared to wash it. They were using air pressure from an MC-2 compressor to force cleaning solvent from 55 gallon drums into the fluid reservoir.

All went well until the transfer hose blew off the standpipe on the drum. As solvent sprayed into the air, the wind caught it. The spray turned to fire as it crossed the gas-driven compressor, and blew against the side of the airplane.

The men on the scene had the fire extinguished in less than five minutes. But in that short time, the fire did \$96,000 of damage to the aircraft.

Several factors teamed up to cause this accident:

- The dock chief placed the compressor downwind from the flammable solvent transfer point.
- He was transferring the solvent by pressurizing the drum, a prohibited procedure.
- And when he decided to transfer the fluid in this unauthorized manner, he failed to clamp the hose to the drum so it wouldn't blow off.

Perhaps more basic to the cause, though, is a general misunderstanding of the highly flammable nature of the cleaning solvent. T.O. 1-1-1 contains notes on using PD 680 solvent for cleaning engines, but it doesn't stress the flammable nature of the fluid. It is generally considered a "safety" solvent. But it will release vapors as flammable as those from gasoline when it is heated above its flash point.

And this solvent has a flash point lower than most kerosenes. When it ignites, it burns with an extremely hot flame...in this accident, the burning solvent melted the aluminum aircraft skin.

Aluminum melts at about 1220 degrees Fahrenheit!

same old story

While the F-4 crew was climbing out from a low-level nav leg, the aircraft commander suddenly saw the left engine fire warning light staring at him. He promptly pulled the left throttle back to idle, and the light went out.

After a few minutes he tried advancing the throttle again, but the fire warning light came back on. He pulled the throttle back to idle again and headed for home.

Although there had been no fire, the warning light had been telling the truth. Maintenance men checking into it after landing found that hot gasses had been escaping between the combustion chamber case and the turbine casing.

The investigators also found why the gasses were escaping. Some bolts in the area had been improperly torqued during a recent T.O. compliance.

residue

It was only seconds after takeoff when a practice bomb fell from the Phantom's SUU-20 dispenser. Although it fell on the barren desert and no one was hurt, the crew abandoned the mission and landed.

On the ground, inspectors found the racks open on Number 6 station. But the ejector cartridge had not fired. When they tore down the release mechanism they found an accumulation of residue from earlier firings. It had built up on the beveled surface of the sear to the point that the rollers could not positively lock. Semilocked, the release mechanism vibrated open during takeoff.

The SUU-20 involved had been used only six times since the last cleaning.

...incidents and incidentals with a maintenance slant.

sharp-eyed crew chief

While he was preflighting his Phantom, the overseas crew chief discovered an air leak. Checking, he found the in-line from the RAT had chafed through at the Adel clamp next to the BLC duct. The spacer was too long, positioning the line against the duct.

The Quality Control folks in the unit recommended that the spacer either be filed down or replaced with shorter one.

aw, c'mon guys

The C-130 pilot had just started engines to run some checks following maintenance on the landing gear. But after only about two minutes of operation Number Two flamed out.

The maintenance people inspected the engine and found damage to the compressor section. Thread

marks on the blades showed that the engine had swallowed a small screw or bolt. They accounted for all components in the vicinity of the intake. It was pretty certain that the damage wasn't caused by loose engine parts.

It's possible that the bolt or screw was lifted from the ramp and drawn into the intake. But the unit frequently programs sweepers and FOD walkdowns through the entire area.

The engine shop had performed maintenance on the engine the day before. And then they performed a thorough inlet inspection and a ten-minute runup.

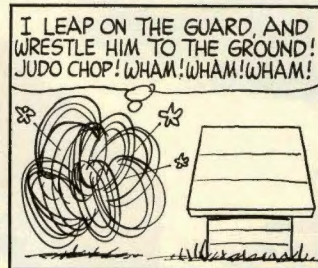
The unit identified another very possible source of the FOD. A loose bolt could have fallen from the engine intake plugs when they were installed after the runup.

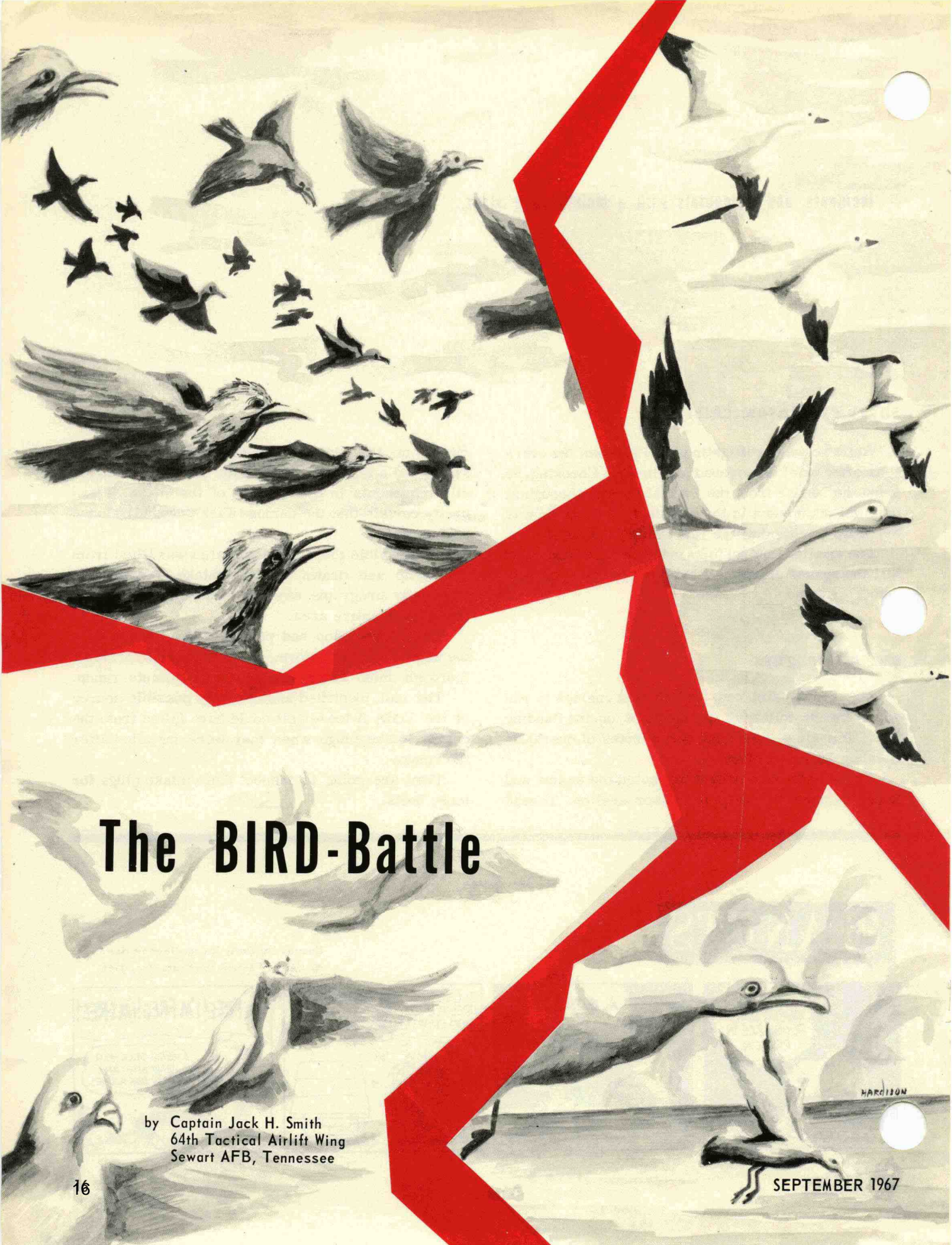
They are going to inspect their intake plugs for loose bolts.



PEANUTS

Courtesy of Daily Press, Newport News, Va.
© United Feature Syndicate, Inc. 1966





The BIRD-Battle

by Captain Jack H. Smith
64th Tactical Airlift Wing
Sewart AFB, Tennessee

HARRISON

This bulletin is based on first hand reports from airlift crews recently returned from action over Midway, Kadena, and Eglin. To date in 1967, we can report that the C-130 Hercules is continuing to prove itself more than a match for its perennial enemy, the BIRD.

Unfortunately, because of the enemy's vast numerical superiority, our efforts have had little effect upon his total operation. He produces new models with great ease.

We, however, are finding ourselves in short supply of our two most formidable anti-BIRD weapons: wing leading edges and pylon tanks. Until such time as a more easily replaceable anti-BIRD weapon can be procured, all aircrews should avoid engagements with the enemy whenever possible.

To facilitate implementation of this policy, the following guidance is furnished:

- Although occasionally sighted at relatively high altitudes, most BIRDS are low level types. They rarely operate above 3000 feet.

- Many of the larger, more effective types are water based. Therefore, increased activity can be expected in the vicinity of rivers, lakes, ponds, swamps, and islands.

- BIRD tactics are unpredictable. However, reports indicate that DUCK type BIRDS usually dive to avoid collision. Anticipate this. (Do not dive with them.)

- BIRDS conduct operations year round. However, in temperate climates, activity is heaviest in Spring and Fall, as most units rotate north and south with the seasons.

It is hoped that through increased aircrew vigilance and improved intelligence, further battle damage can be eliminated until such time as more economical weaponry than aircraft components can be procured.

Special Note: The next 75 days constitute the high-hazard period of the year. The enemy's southward rotation each Fall produces the greatest number of engagements. This period also produces the largest losses to our forces engaged in the BIRD-battle. Expect intense and determined activity in the vicinity of any airfield in the following general regions: East Coast, Ohio Valley, Great Lakes, Mississippi Valley, Missouri Valley, Northwest Coast. Activity is usually very low. Few engagements occur above 1000 feet.



In a 45-day period, C-130s emerged victorious from four major engagements. The score:

C - 130



Chicken Hawk One Confirmed Kill



Black Footed Albatross (Gooney Bird) One Probable Kill



Unknown (probable Gooney Bird) One Probable Kill



Starlings Forty Confirmed Kills

BIRDS



C-130s Four Damaged (classified less than minor)

a 2nd look at...

BEING PREPARED

The T-33 pilot was in and out of the clouds during his short, 75-mile trip. Cleared to descend, he sighted the field as he passed 2000 feet. Tower had cleared him to land on the short runway... 6300 feet. There was another runway, 8600 feet long, but it was closed until further notice.

He landed about 900 feet down the runway, raised the flaps, closed the boards, and promptly got on the brakes. But he didn't feel he was getting much braking action. He started leaving tire marks on the runway 1100 feet from the threshold, and he was still doing 35 or 40 knots when he went into the webbing barrier.

There was no overrun! When the T-bird finally came to a stop, some 220 feet beyond the barrier, its wheels were 14 inches deep in the mud. The fuel counter read 542 gallons. The bird actually had 573 gallons in the tanks.

The latest runway condition reading (RCR) was 16 ... wet runway. But the pilot had not asked about it, was never told. And his tires were smooth!

Computed landing roll distance should have been 4050 feet. Add the 900-foot touchdown, and subtract from the 6300 feet of available runway... you find that he should have had 1450 feet of runway ahead of him when he stopped.

The investigating officer looked at the T-bird's tire marks on the runway. They were light and constant, unchanged from initial brake application until the bird rolled into the barrier. He found no indication of burned rubber in the tire marks.

He concluded that the primary cause of the mishap was lack of effective braking action due to the smooth tires hydroplaning on the wet runway. Contributing, he said, was pilot technique in applying that braking action.

When we take a second look at this near-accident, several factors attract our attention. Didn't this one

start long before the pilot tried to use his brakes?

The pilot did not know what the RCR was until sometime after his chariot came to that inglorious stop in the mud. He didn't ask the forecaster for it, and didn't ask Tower for it before he committed himself to land. And neither of them offered the information.

Had he known that the wet runway would extend his stopping distance almost 50 percent, it's safe to guess that he would have thought a bit more about several other factors.

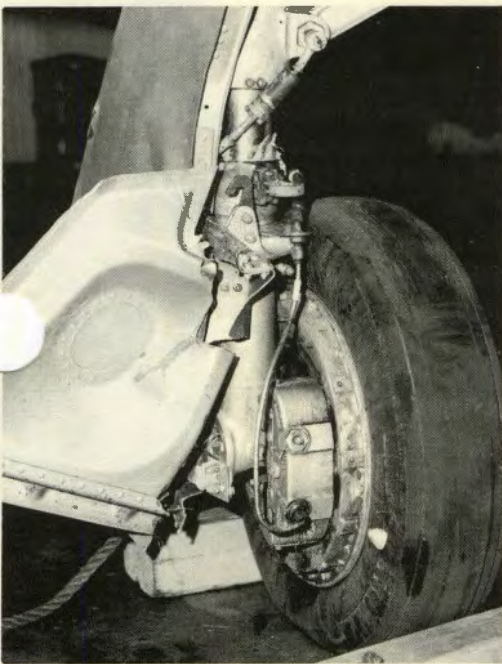
The FLIP IFR Supplement would have told him that the long runway at his destination was closed. And a quick look at the field diagram on the letdown plate showed that the runway he would land on had a barrier... but no overrun. That much information, with the knowledge that he was wearing slick tires, should have triggered some study of the stopping distance chart.

There he would have learned that the 4050-foot stopping distance was based on a hard stop with flaps full down for aerodynamic drag. And, of course, those stopping distance charts are based on controlled tests... using tires with tread on them.

At that point during his preflight preparation the alarm bell should have been ringing... it's only a short hop, the airplane will be unusually heavy. Touchdown will be fast, rollout unusually long.

In short, this pilot failed to prepare himself to the extent that he could exercise intelligent judgment. All the information he needed to tell him that it would not be completely routine was available to him.

You could call it pilot technique. But it was his technique at the flight planning table that bit him long before his wheels touched down on the wet runway.



Compare this T-bird pilot's preparedness and judgement with another recent incident:

An F-4 RTU type on GCA base leg found right engine RPM hanging up at 73 percent. He continued the pattern, using additional power on the left engine. When he was all established on glide path, his right engine overheat light came on. He pulled the right throttle to idle and pushed the left to full military. The overheat light went out.

He momentarily considered raising his flaps to the one-half position... single-engine landing configuration. But rather than make a configuration change at this critical point... he was now at 300 and 1/4 mile... he brought the right throttle back up. As the power came in, the overheat light

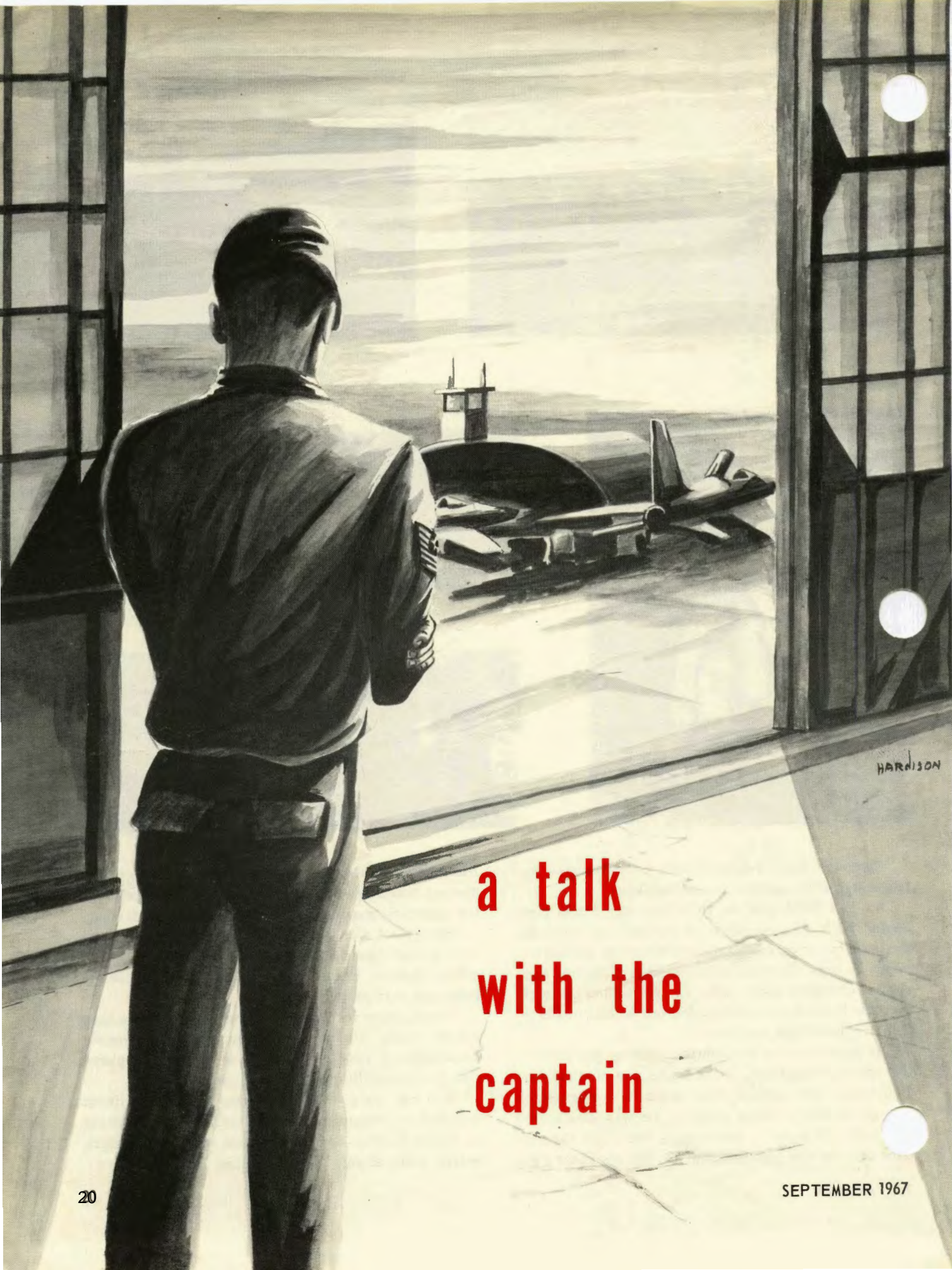
illuminated again. He controlled his Phantom to a normal touchdown and then immediately stopcocked the offending engine. This time the light remained on.

This pilot was prepared. Had he waited until he was in that tight situation to evaluate the courses of action open to him... he could not have reacted in time and correctly.

Preparation for flight takes many forms. It covers a wide range, from general preparation... complete knowledge of your airplane... to specific preparation for a specific mission on a specific sortie.

You may survive routine flying for years without detailed and comprehensive preparation. But without it, you'll be wide open when those moments of stark terror come along.





HARRISON

**a talk
with the
captain**

he had second thoughts after the emergency on the flight line

I thought I'd have a pretty good chance of talking to the Captain... hitting him on a Tuesday like this. He usually doesn't have any meetings on Tuesday. After he goes through the morning mail, checks the reports from the night crew, and like that . . . he's free. You know, it's gotten to where everybody looks for him prowling around on the flight line on Tuesday mornings.

So this morning I told Kelly to run the first launch for me. I was going in and brace the boss on this overtime he was having us NCOs pull on afternoon and night shifts.

When he announced it last spring, he made it sound important. Like we would be contributing something big to the total effort. He's not a bad talker . . . gotta give him that. He can put it over when he wants to.

So we went at it...the outfit was short of experienced maintenance types, he'd said. And the only way we would be able to oper-

ate the way this outfit is used to doing, would be for those of us with a few years behind us to double up. The way he laid it out...and calling in just a few of us Techs and Masters . . . he got my support before he was half way through his pitch.

As a matter of fact, I can remember when you guys...yeah, you guys sitting right around this table...were calling me finky names behind my back, and not sitting with me here at the club. Just because I thought the Captain was right...that we should back him all the way until we got some more people back from overseas to lighten the load.

You were all saying that it was just the same old drill . . . fill the outfit up with a bunch of recruits and then make us carry the whole load. Us with 18, 20 . . . maybe 24 years in already!

Well, most of you didn't know that I'd been wrestling with this thing for several weeks.

Kelly knew it...didn't you?

And I'd talked to you about it, Stan.

But that was about all. It was pretty much between me and the Captain. I'd been the one that backed him up. It had to be me that went in to him.

I knew all your gripes. Sure didn't have to go to each one of you and hear them all again...

This was the first year you didn't get to coach your kids' Little League team, Eddie. I knew that.

And you, George, and Simonetti...you'd just bought that gas station and you didn't trust the night man you hired.

It wasn't very different for me. This was the first summer that the Old Lady and I didn't have any of the boys at home. We were planning to do a lot of fishing. You know...quiet fishing.

Well, I had my pitch pretty well rehearsed. I thought I was ready for the Captain. But I had to wait. He was on the phone for a long time. Then he had to go over to Wing for something.

When he came back he told me to go in and sit down. And I waited some more.

The Captain was just coming back through the door when we both heard the shouting out on the line. And then the sirens. I saw the fire trucks about the same time.

So, of course, we both ran out.

I guess most of you know what it was. Those two kids in George's shop...Martin and Russo? It wasn't their fault, turned out. But they were the ones on the scene.

They had been dispatched to 935 to check an auto pilot write-up. After they applied power to the bird, they checked that the servo and interlock circuit breakers were in. Russo was in the cockpit and Martin was handing tools up the ladder to him.

Right about then, smoke started pouring out from behind the left panel. I guess it was pretty dense smoke for a couple of minutes, the way they told me about it.

Well, Russo told Martin to run and call the fire department. And fat little Martin took off! Some of the guys who saw him going across the ramp said later they never thought he could run that fast!

And Russo sat there in the cockpit, pulling circuit breakers, before he bailed over the side and pulled the power unit cables out of the airplane.

By the time the trucks got there, the smoke had quit. And Russo was smart enough to keep the firemen from pouring foam all over the bird. Gotta hand it to both of them...they did it all right when they were in trouble!

Russo was climbing back into the cockpit when I got to the ladder. He was hollering for someone to hand him a screwdriver...said the panel was awful hot and he didn't know if something was still burning.

Well, he had the right panel spotted...checked it while the smoke was coming out.

And you all know what we found when he pulled the panel. Somebody had tried to drill through the panel to replace a worn fastener. The drill had gone all the way through the metal and then into this bundle of wires. But then the drill bit broke off. And about an inch and a half of it stayed in the wire bundle.

No telling when it happened. It was some time ago. That piece of drill bit was all corroded. It had worked around in the wire bundle for a long time...and finally worn through the insulation on at least a couple of wires. No telling how many, really. By the time we got to it, the insulation was burned for

eight or ten inches in both directions!

Thank God the bird was on the ground when it finally wore through! We might be out in the hills tonight...picking up pieces instead of sitting here where we are!

When all the shouting and excitement was over, I went back to the desk in the line shack and had a long talk with myself. My first thought was that I'm mighty proud of Russo and Martin. They're pretty young troops...only been here a couple of months, I guess. And they may have been excited, but they sure knew what to do!

And then I got to thinking about this business I was going to see the Captain about. It kinda ties in with them...training.

What I mean is...somebody's been talking to these two guys. I guess it's you, George. And others in your shop that've been around for a while. Just during the bull sessions...and when things are slow on the night shift. Those two kids knew what to do!

Compare them to whoever it was that broke off that drill bit behind the panel...and didn't bother to see where it went. He just didn't understand how serious a thing like that could be.

So after a while I looked at my watch and I realized that I'd sat there right through lunch. I got up and went out to my car to go home and eat. Figured the Old Lady would be all upset about me being late.

And while I'm walking across the parking lot, still wrapped up in my own thoughts, the Captain comes up behind me. He grabs my arm and asks what I wanted to see him about.

I told him, "Nothing, Captain...nothing."

This sad tale came to us through the grapevine from an old friend of TAC ATTACK, Senior Master Sergeant George M. McGinnis. He's somewhere in Southeast Asia ... we're not sure where.

Thanx, George ...

HASTE can HURT

The other day I was talking to an old friend who was here on TDY. He told me a tale that proves the old saying, "Haste Makes Waste." Now Tom may have stretched this tale a wee bit, but it's still plausible. It certainly could have happened as he told it.

It seems one day a Herky was making a landing on one of the short dirt strips up country and she hit something on the approach that wiped out the main gear. This old bird came to rest right smack in the middle of the strip.

Now, it was essential to get the strip open as quickly as possible. There was plenty of equipment being flown in. The only thing available to move the aircraft belonged to an engineer outfit, so they volunteered to move the bird. They dispatched a crew and a large bulldozer with necessary cable to do the moving job. The head man cleared the area and he and his crew went to work.

The first thing that struck their eyes as a towing point was the nose gear. They hooked on to the nose and pulled it out ... the nose gear, that is.

Next they went around to the rear and ran a cable through the paratroop doors and out to the

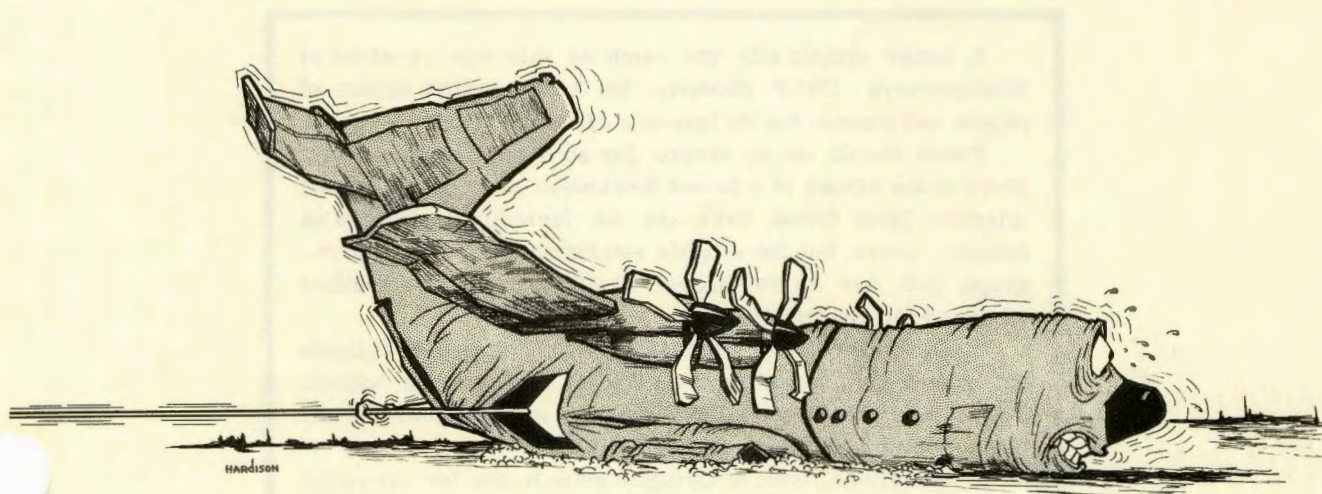
dozer. The operator took a little run for it to get it started. Guess what? Yep, that cable cut right through the side structure and out of the cargo door ripping out hydraulic components and wiring as it went.

Defeated, they went again to the nose and ran a cable through the cockpit swinging windows. You can imagine what happened there!

At this point one of the crewmembers suggested they consult the aircraft Dash Two tech order for an anchor point. Sure enough, there it was ... attached to the 75,000 pound tiedown points in the cargo floor. They used this and successfully removed the old aircraft from the airstrip ... but not before she was reduced to Class 26 material. All because of HASTE.

Old Tom didn't elaborate on whether anyone was injured during this operation, but the potential was surely there.

"Haste Makes Waste" has been proven down through the ages. And it is still true today. Haste only creates havoc with our aircraft and equipment. In almost every accident, haste is a contributing factor.



THAT'S ONE !!

I fly a Cessna on contract for the U. S. Forest Service on fire detection patrol covering a National Forest area.

On October 23, 1966, while I was circling a forest fire at an altitude of 2100 feet MSL, a single engine jet passed directly below me. I was on the upwind side of the fire, just above the smoke tops. The jet approached from the downwind side which I believe would have made it impossible for him to see me in time to avoid collision, had he been a few feet higher. THAT'S ONE!!!

On May 6, 1967, while I was circling left around another forest fire at 2000 feet MSL, a single engine jet passed less than 500 feet from my right wing at my exact altitude. THAT'S TWO!!!

The average elevation in this area is 1000 feet. I would classify both of these cases as a "near miss." I'm a bit worried about "THREE"!!!

It seems to me that these jet and civilian pilots should be informed that: 1. There are better than 15 aircraft flying in this state for the purpose of detecting and controlling fires. 2. Other pilots should report via radio any smoke or fires they might see, and 3. Stay the hell away from them!

Might I suggest that some educational material be put in circulation to notify pilots of the dangers of flying near smoke.

We pilots fighting fires are a bit too busy while circling fires to scan the skies continuously for 400-mile-per-hour assailants.

Thank you for any consideration that might eliminate "THREE."

A letter essentially the same as this was received at Headquarters USAF recently. We have omitted names of people and places, but the lesson is still very valid.

There should be no reason for an Air Force pilot to fly close to the smoke of a forest fire unless he is on a directed mission. Most forest fires are not formally designated as disaster areas, but the altitude and distance criteria in paragraph 5-6, Air Force Manual 60-16, provide an excellent standard for you to use.

If, for any reason, you feel it's necessary to investigate the source of smoke on the ground, use extreme caution. There may be civilian light aircraft in the vicinity of the fire and smoke.

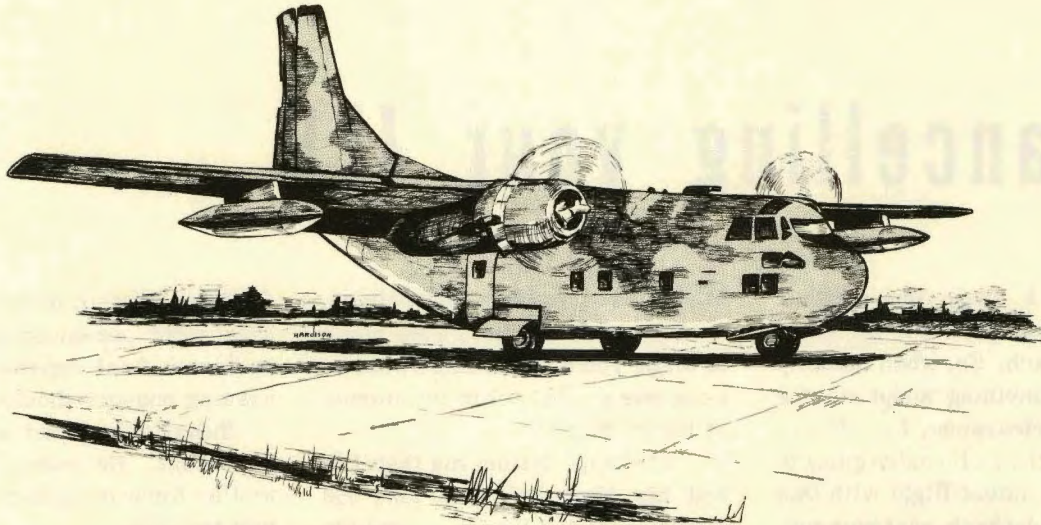
A mid-air collision is too high a price to pay for curiosity!

TACTICAL AIR COMMAND

**PILOT
OF
DISTINCTION**



Captain A. A. Brashear



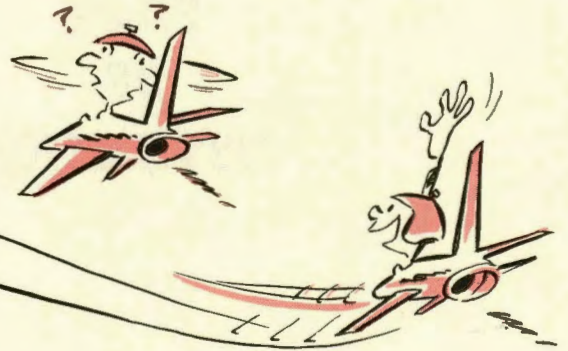
Captain Alfred A. Brashear of the 4408 Combat Crew Training Squadron, Hurlburt Field, Florida, has been selected as a Tactical Air Command Pilot of Distinction.

Captain Brashear was making a simulated single engine approach to Hurlburt Field in a C-123 when the middle rudder bracket broke. The rudder jammed well past full right deflection. The aircraft continued to descend in a yawing right turn, almost out of control. Captain Brashear felt no response when he actuated the emergency gust lock release or the trim. He applied full power to both engines, but this caused a violent right skid and serious loss of airspeed and altitude. At 100 feet above the ground, Captain Brashear reduced power, preparing for a

crash landing. He immediately felt control returning. By experimenting with differential power he was able to increase airspeed and level off in a shallow right turn. Aileron or elevator movement aggravated the situation, but he was able to hold minimum airspeed and altitude in a constant, shallow right turn. This long arc of flight carried the aircraft to nearby Eglin AFB. By the skillful use of nose wheel steering, brakes, and differential power, Captain Brashear successfully landed the aircraft.

Captain Brashear's rapid evaluation and correct action in a critical low-altitude emergency readily qualify him as a Tactical Air Command Pilot of Distinction.

Sideslip



Sideslip characteristics are normally good. However, a critical limit exists beyond which the maneuver may progress into uncontrolled flight. The out of control condition is severe.

cancelling your IFR...

Well, I knew the weather below us was good enough for a VFR approach. So, when Sideslip didn't say anything about staying on the IFR clearance, I . . ."

"Alright! . . . If you're going to discuss my latest flight with this aspiring young back-seat type guy, you'd better make room for me to sit with you." Sideslip, dragging a chair, pushed his way to a place at the low table and established himself in the middle of the conversation.

"Now, Charlie," Sideslip fixed his stare on the man who had been talking when he came up. "Brief me on what you've been telling these guys . . . so I won't ruin your story."

Embarrassed, Charlie started through the story again. But before he had passed the first pop-up and the photos of the first target, Side-

slip interrupted him three times.

"Charlie, how'm I ever going to teach you to think like a pilot so I can use you to back up my stories at Happy Hour?"

"He keeps telling me that if he had his way, he'd just take the airplane off and land it . . . wobble the throttles and turn the airplane once in a while when I tell him . . . and leave all the rest of it to me." Charlie's whispered aside reached the whole table. "Sometimes I almost believe him."

Sideslip wasn't listening. He was re-living the close call they experienced that afternoon.

It was at the end of the mission. They were about fifty miles out, talking to Approach Control. Center had passed them off after clearing them to descend to 16,000 feet.

"Sideslip One . . . Approach.

Continue descent to five thousand. Turn right one-niner-zero, radar vector to final approach. Report passing one-one thousand."

Sideslip had just entered the undercast. He cursed the controller for waiting that long to give him the turn.

Squared away on the new heading, he reported passing 11,000 feet and continued down.

"Should break out of this stuff before too long, Charlie." Sideslip mused into his mask. . . . wonder how come this business about vector-to-final-approach. I thought I asked for a GCA."

"Didn't you hear him?" Charlie came back without hesitation. "He said the precision radar had just gone off the air."

Sideslip didn't recall hearing anything like that. He grunted an answer that could mean either yes

or no. This navigator-guy in the back seat was getting altogether too sharp, Sideslip thought to himself. When they first teamed up, Sideslip had decided to push him . . . make him feel responsible for as much of the operation as possible.

But Charlie was right on top of it . . . always had been. Seemed like he understood the whole business. Pretty good, Sideslip realized, for a guy who'd been involved in a completely different kind of flying all his life.

They drove along in silence for about two minutes after leveling at 5,000 feet. Sideslip began to wonder how close they were to the field.

"Charlie . . . wake up back there and tell me when we'll be over the runway. Seems like we should be there by now."

"I, uh . . . well . . . Hey!! There it is!" The tone of Charlie's voice showed he had been thinking along the same lines. "Off to the right . . . about a mile!"

Sideslip saw it at the same moment. And then it disappeared again! They were flying through a haze that wasn't quite clouds. He had no idea what their flight visibility was, but they couldn't see much more than a mile on the ground.

And then they were right beside the runway. The haze seemed thinner. Or was it just that they were so close?

"Approach . . . Sideslip One. We're over the field . . . have it sight." Sideslip let it go at that. "Approach should come right back with a clearance to descend.

"Roger, Sideslip One . . . cancelling your IFR clearance at 43. Contact Tower 267.7 . . . local Channel Two."

Sideslip was surprised! He wanted to tell the controller that wasn't what he had in mind. All he meant was that he'd seen the field.

But now someone else was on the channel. It turned out to be a pretty long conversation. Every time Sideslip tried to get a word in, either Approach or the other airplane would cut him out. Sideslip realized he would have to wait quite a while before he could straighten out his clearance.

"I thought about all those birds lined up behind us when we were waiting to take off. They'd be letting down on top of us in a minute if we didn't get out of the way." Sideslip leaned forward, picked up his drink, sat back, and continued.

"So I made up my mind right there . . . honked back the throttles, opened the boards, and pointed the bird toward the pattern. The visibility improved as we descended. Of course, I had my eyes on the runway . . . sure didn't want to lose sight of it."

"And you were mumbling something about . . . 'Who does he think he is . . . cancelling my clearance out from under me?'" Charlie couldn't stay out of the limelight any longer. Everyone at the table was engrossed in the story.

"Well, I'm not sure what I was mumbling . . . guess I was pretty mad at that point." Sideslip nodded agreement toward Charlie. "That controller put me in a tight spot. The weather at our altitude sure wasn't severe VFR! We had seen

the field, but for only a second or two . . . and then we were back in the haze."

"And we weren't lined up for final." Charlie picked up the story. "Sitting up there, 5,000 feet above the runway . . . about all we could do without a clearance was plunge down into the pattern. Sideslip told me to switch to Tower channel. I hated to stick my head in the cockpit while I dialed in Channel Two . . . it was one of those situations when you know there's going to be someone coming up right under you."

"But you saw him first . . ." Sideslip interrupted.

"I know . . . I hollered first . . ."

"It was only a second later that I saw the Gooney Bird, I guess." Sideslip went on. "He must have just taken off and turned out of traffic . . . I don't know for sure. At first I really didn't know if we'd miss him or not!"

"I thought you had over-G'd the airplane . . . but he passed a couple of hundred feet under us."

"You know, Charlie . . ." A smile spread across Sideslip's voice, "I sure thought you were helping me on the stick about the time I saw that Goon."

"But if I learned anything from the whole affair," Sideslip became very serious, looking around the group at the table. "I'm going to think twice about telling a busy controller that I can see the field. That IFR clearance is too precious in a situation like that!"

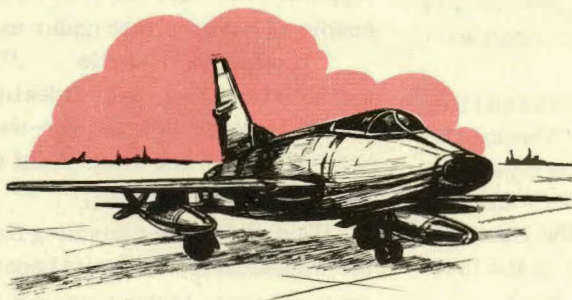
TAC TIPS

THANX, GUYS!

While he was pulling up from a strafe pass, the F-105 pilot lost the inboard aerodynamic counter weight section of his left aileron. But he was not aware of it at the time. It wasn't until they were entering the pattern for landing that his wingman noticed the 10-inch by 24-inch section was missing.

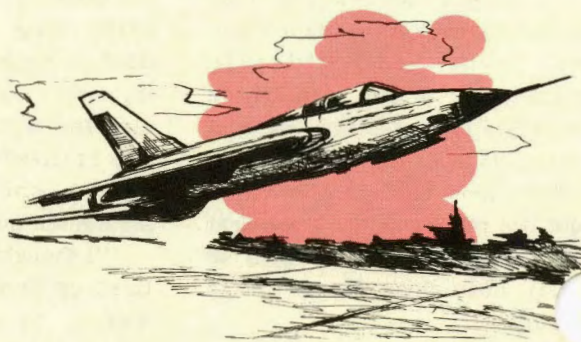
He had not experienced any flight control or trim problem during the flight. And he had pulled no more than 4G during the range period. When the troops on the range found the missing piece of aileron, they could see no evidence of ricochet or impact damage of any kind.

Investigators were able to come up with only one answer to the mystery . . . other pilots had over-G'd the bird on previous flights.



WHA'D HE SAY?

When he got ready to taxi out of his parking spot, the F-100 pilot found that he couldn't advance the throttle. He eased it back a bit . . . and the engine



flamed out! He apparently hadn't brought it all the way inboard after he started.

The crew chief pulled the power unit back to the side of the bird and plugged it in. They had the engine started again in no time.

His flight was taxiing away from him by this time, and the pilot found himself in a bit of a rush. He waved a quick signal for chock removal while he ran around the cockpit flipping switches. When the crew chief held up his arms with a signal, the pilot released brakes and pushed up the throttle. He didn't see the power unit until too late.

He stood up on the brakes, but when the bird stopped, its left wing was sticking into the power unit.

The crew chief had been signalling "hold" not "cleared to taxi"!!

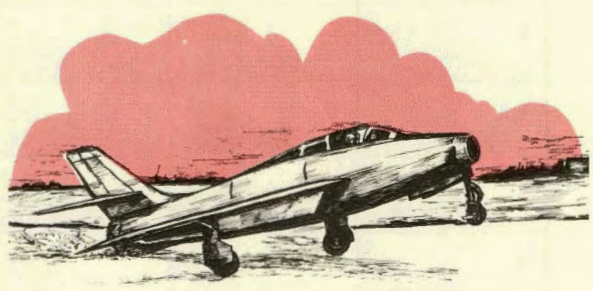
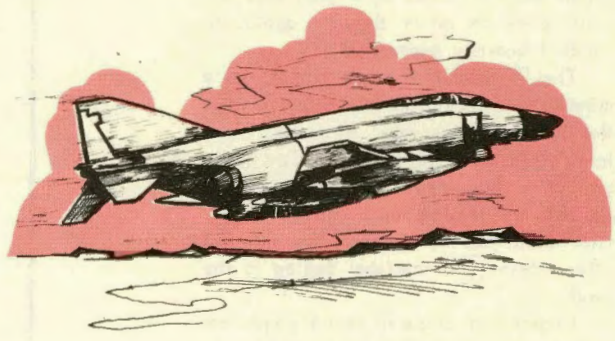
...interest items, mishaps with morals, for the TAC aircrewman

EYE-SAVER

The F-4 crew was flying chase on a live AIM-9 missile firing mission. They were following the flight in a left turn just after the last member of the flight had fired, and they watched the missile hit. It was about ten degrees to their right and 3000 to 5000 feet below them.

Seconds later, something struck their left windscreen. It left only a small scrape mark on the outside of the windscreen. But some shattering occurred on the inside . . . and several small pieces of the windscreen flew back and struck the aircraft commander.

One piece struck his visor. He had lowered it before the firing started.



SNOWBALLS

An F-84 driver touched down hard and dragged his tailskid on landing. The dented, broken, twisted, bent,

buckled, worn, and chafed components of the drag chute compartment required 32 manhours to repair.

He had a hard landing because he was just lowering his flaps as he crossed the end of the runway. A gust surprised him, and he never completed his flare.

The reason for the late flaps was tied to the reason for holding his gear until he was on short final . . . he had only 400 pounds of fuel showing on the meter during his straight-in approach.

And the reason for the 400 pounds was related to a special test mission on the gunnery range. He felt he must complete it. And he had burned a lot more fuel than anticipated while he was waiting to get on the range!

With all that trouble snowballing him toward disaster, it would seem smart to make your approach and landing as carefully routine as possible. ➤

LETTERS

. . . to the editor

Although it did not state so, the article "Using Angle of Attack in the Thunderchief" (July 67) implied that the pilot who dinged his 105 from a steep approach could have done otherwise if he had used his angle of attack gage. I suggest that you correct this implication before you have inexperienced believers pranging F-101s, 104s, 105s, F-4s (and whatever else has an angle of attack gage) short of runways all over the world.

I have been foolish enough to try, and lucky enough to make, "salvages" out of high finals in those airplanes, all of which were followed by a plea from my conscience to never do that again, to which I heartily agreed.

The "Gage" is a dumb animal, not a miracle worker. It can only tell you what the bird is doing now. It doesn't care how steep you are or how close the ground is. It won't tell you that you won't be able to maintain an on-speed indication when you try to stop the descent after making your vertical dogleg to the final.

I agree that angle of attack gages are great - as an aid. But the best thing to tell new guys (and old guys, too, for that matter) regarding safe landings from high finals is "You Can't Get There From Here!"

Maj Robert J. Vanden-Heuvel
Aerosp Research Flt Test Off
Wright Patterson AFB, Ohio

You're right, it did not state so . . . and it wasn't meant to imply so, either.

As a matter of fact, in his third paragraph, Maj. Lowery, the author, said, "Their (century-series fighters) wing loading requires a careful, powered, non-maneuvering, controlled rate of descent."

We agree with you that a too-steep approach is a pretty sure road to disaster. And our point in printing the article was that you will quickly recognize that fact if you understand and use your angle of attack meter on final.

The normal "corrections" for a steep approach . . . pulling off power or diving . . . will quickly produce a change in angle of attack. And if you're keeping track of it, that change will tell you that something ain't right.

-Ed.

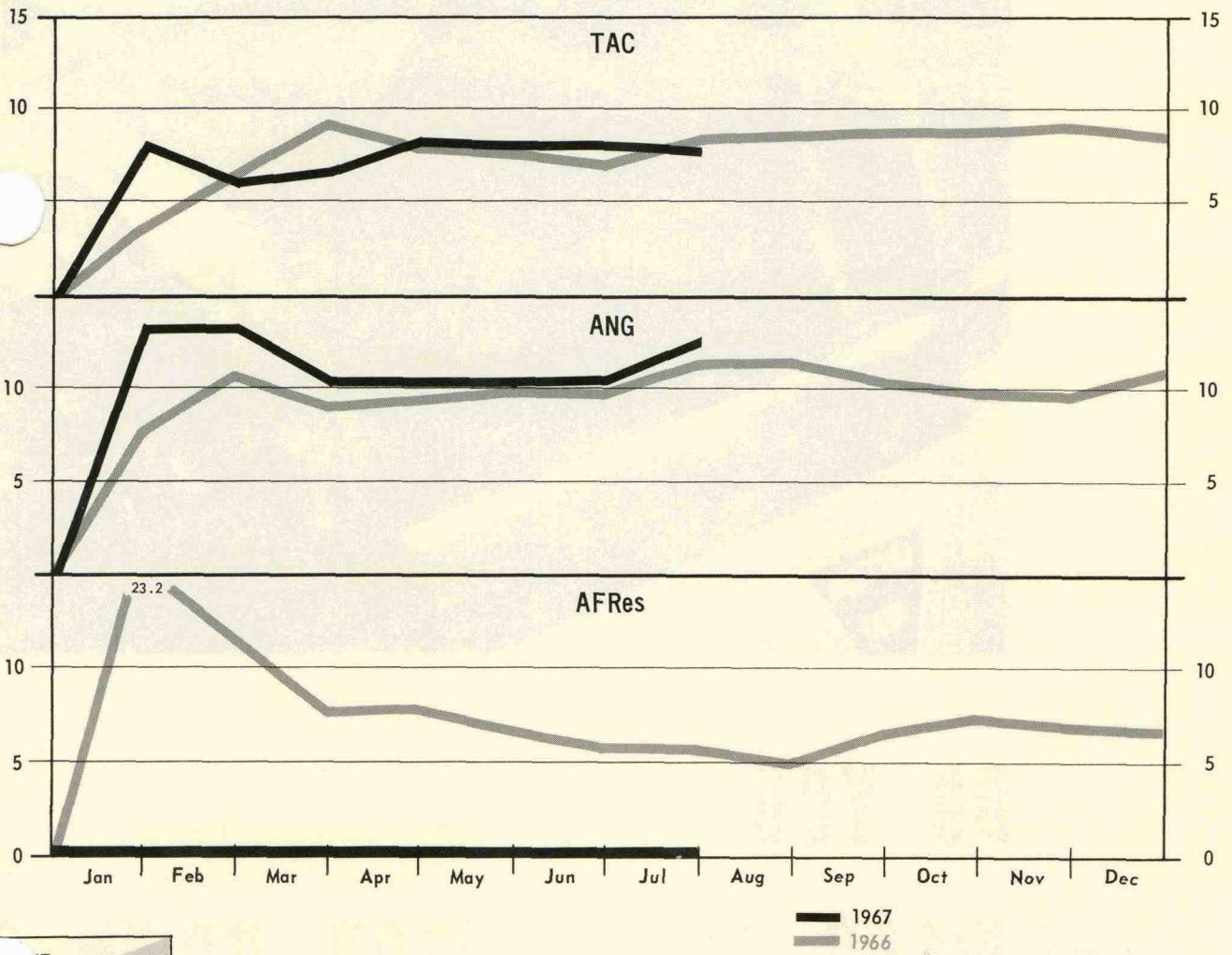
MAJOR ACCIDENT RATE

TYPE	TAC	ANG	AFRES
A-1	19.2 12.2		
RB-66	0 0		
F/RF-84		21.4 12.9	
F-86	— 80.6	12.1 0	
F-100	12.1 14.6	0 15.9	
RF-101	45.3 47.0	27.9 65.2	
F-105	6.6 23.5	0 0	
F/RF-4	12.6 8.2		
C-47	0 0	0 0	
KC-97		0 0	
C-119	0 0	0 0	0 5.8
C-123	0 0		
C-130	0.8 0.8		
T-29	0 0		
T-33	7.8 0	0 10.0	
T-39	0 0		
O-1	0 0		

TAC TALLY

MAJOR AIRCRAFT ACCIDENT RATES based on programmed flying time

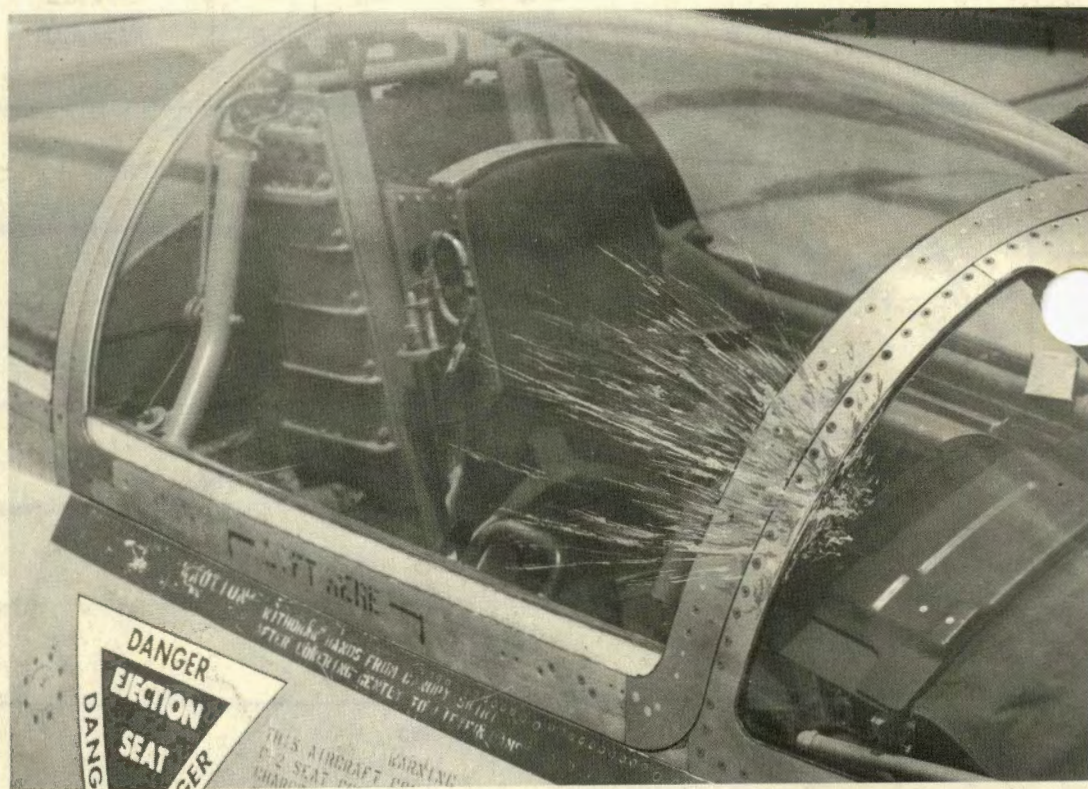
	1967	1966		1967	1966		1967	1966
9 AF	8.0	7.4	464 TAW	3.9	0	516 TAW	0	0
4 TFW	0	12.1	4442 CCTW	10.0	0	4453 CCTW	0	5.8
15 TFW	25.9	5.7				4510 CCTW	7.3	11.8
33 TFW	12.4	14.4	12 AF	7.5	11.3	4520 CCTW	0	11.8
354 TFW	24.8	26.1	23 TFW	5.2	31.4	4525 FWW	21.0	—
4531 TFW	0	—	27 TFW	17.8	9.7	Special Units		
363 TRW	12.5	19.7	479 TFW	9.5	13.9	I ACW	0	14.4
64 TAW	0	0	67 TRW	8.0	34.0	4410 CCTW	6.8	3.5
316 TAW	0	0	75 TRW	16.6	—	4500 ABW	0	0
317 TAW	0	0	313 TAW	0	7.6	4440 ADG	0	0



7
1966

All rates estimated as of 31 July 1967

THIS ONE HIT THE CANOPY
BOW... THE NEXT ONE MAY
NOT.



**DO YOU
WEAR YOUR VISOR DOWN ?**