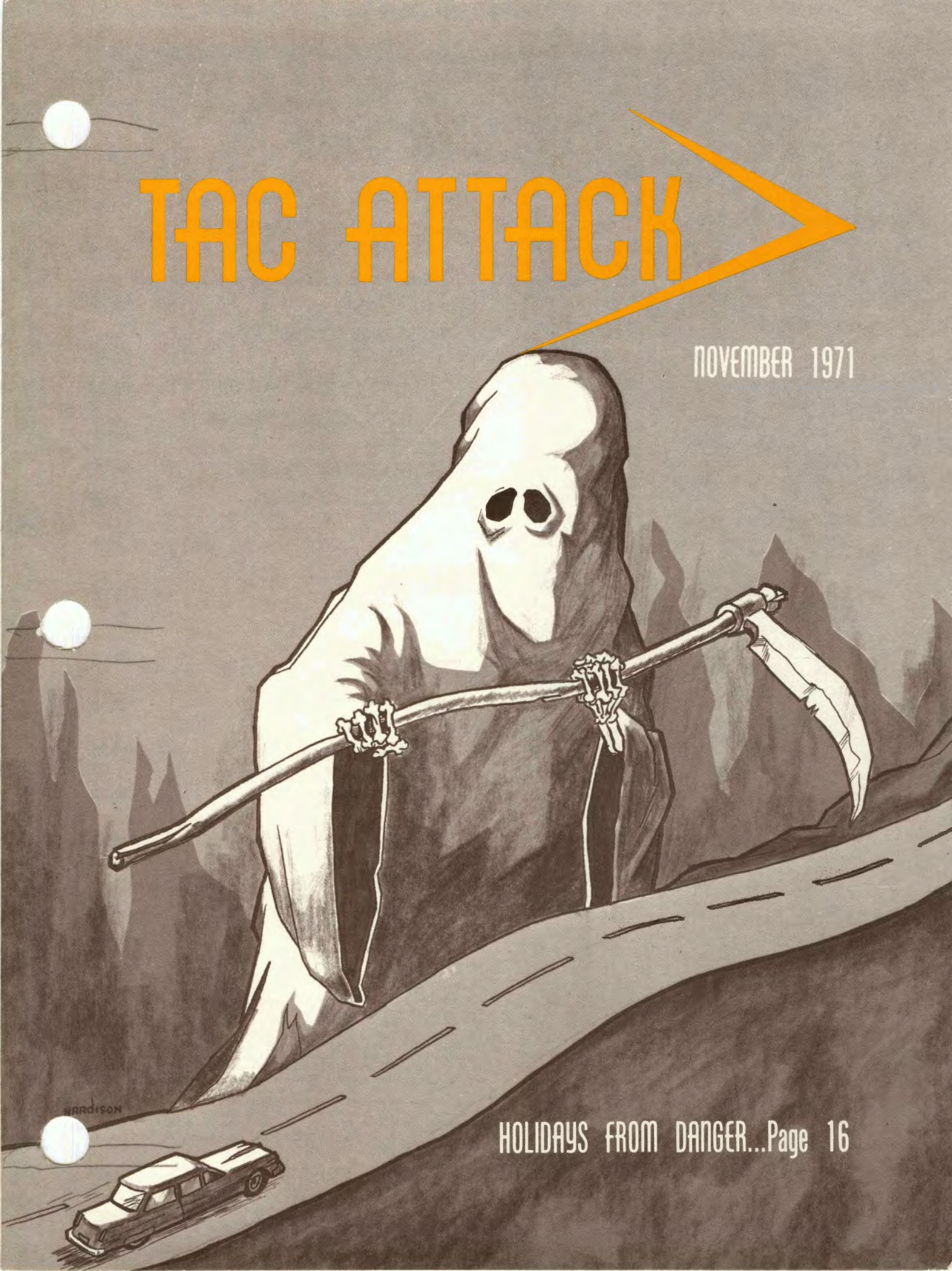
TAC ATTACK

NOVEMBER 1971



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for efficient tactical air power

TAC ATTACK

NOVEMBER 1971
Vol. 11, NO. 11

Tactical Air Command

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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.

Contributions of articles, photos, and items of interest from personnel in the field are encouraged, as are comments and criticism. We reserve the right to edit all manuscripts for clarity and readability. Direct communication is authorized with: The Editor, TAC ATTACK, HQ TAC (SEPP), Langley AFB, Va. 23365.

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Angle of ATTACK

Read the Signals

As we enter the Holidays From Danger period of 1971, many highway fatalities have already been recorded for the year than were experienced for the total year of either 1969 or 1970. There can be no pride in that statement . . . only indignation.

The philosophy that "all accidents are preventable" is not a tongue-in-cheek approach to accident prevention. Rather it is a cold, hard fact. Somewhere in the history of each accident the point at which the accident could have been prevented is exposed.

Vehicle accidents cannot be prevented by an all encompassing edict passed out from on high. Some accidents can be prevented by increased education, some by increased supervision, and some by more stringent methods. It is quite possible that some accidents can be prevented by a change in method of supervision. The point is that each accident has its own separate and distinct preventive factor. However, there is one common thread that links all accidents . . . people. And most people go about their daily lives in a generally predictable fashion.

In at least twenty-five percent (and perhaps more) of the vehicle accidents, the people involved signaled that an accident was on the way. The means frequently used to provide the signal were moving traffic violations. Perhaps the individuals were signaling in other ways such as erratic job performance, careless first aid injuries, non-moving traffic violations, non-reportable traffic accidents, or unexplained behavior. So, in effect, a trend or indicator was established but not detected.

We have a comprehensive trend analysis program for the machinery we operate; however, we are woefully lacking in a "people trend analysis program." The attempt is not to make each supervisor and safety specialist a psychoanalyst, but there is sufficient information within the present structure to detect a trend in an individual.

The immediate supervisors and unit safety personnel should analyze each first aid injury report, moving and non-moving traffic violation, and non-reportable (to higher headquarters) accident report with the individual in mind. The immediate supervisor should be able to detect sudden or even subtle attitude changes in his people. A series of actions, or in some cases a single action, may be indicative of a trend. In other words a cut finger reported as a first aid injury combined with a speeding ticket or a shift in attitude can be a danger signal . . . a trend.

Once identified, the trend can be reversed by an application of any of several methods. Which one depends upon the individual who provided the danger signal. In some cases a counseling session may be sufficient, or perhaps an assignment to a PMV control unit is the answer. Of course there are always those individuals who demand, because of their performance, a severely restrictive measure to stop the trend. Whatever method is used it must be a sincere people-to-people approach in order to be effective. Lip service will never do the job.

The signals are often there. We must learn to read them, and then take prompt and appropriate action . . . it may save a life.

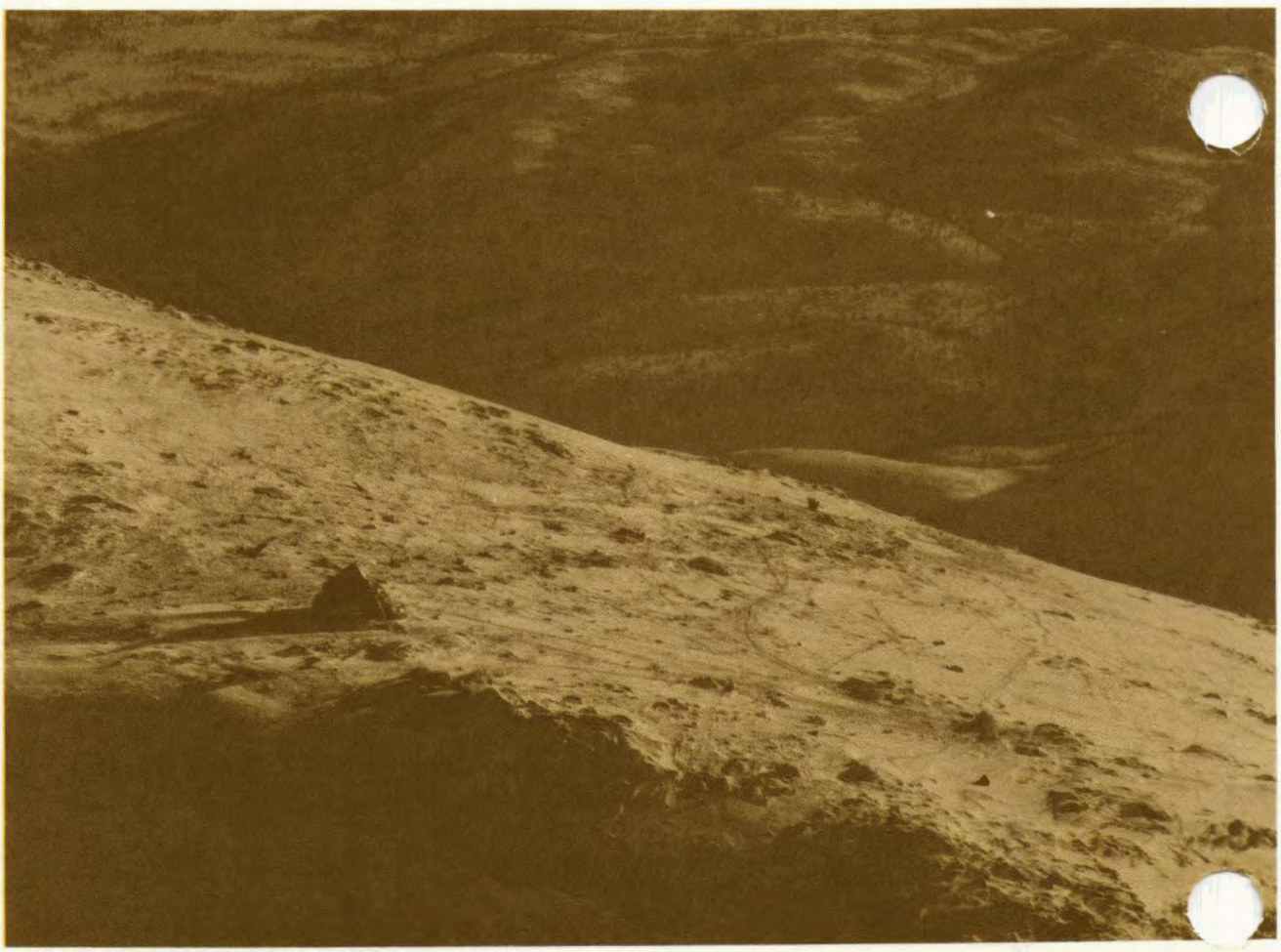
GERALD J. BEISNER, Colonel, USAF
Chief of Safety

YOUR TWO CENTS WORTH

Information Source: Flight Safety Foundation Accident Prevention Bulletin 71-9, September 1971.

After an airline accident, which occurred while the pilot was attempting an ILS approach, a suggestion was presented to the Flight Safety Foundation to add a "terrain profile" below the final approach course on the Instrument Approach Procedure Charts. The thought behind the suggestion was that straight lines from the runway to the final approach fix (as depicted now) may lull some into thinking the terrain is flat whereas a graphic presentation of the terrain would remind the pilot of the real world below.

The idea was presented to FAA where the following action was taken:



Air Traffic Service and the Flight Standards Se[illegible]have jointly completed a comprehensive study, evaluating the "cartographic/economic" and "operational" feasibility of publishing composite terrain profiles on Instrument Approach Procedure (IAP) charts.

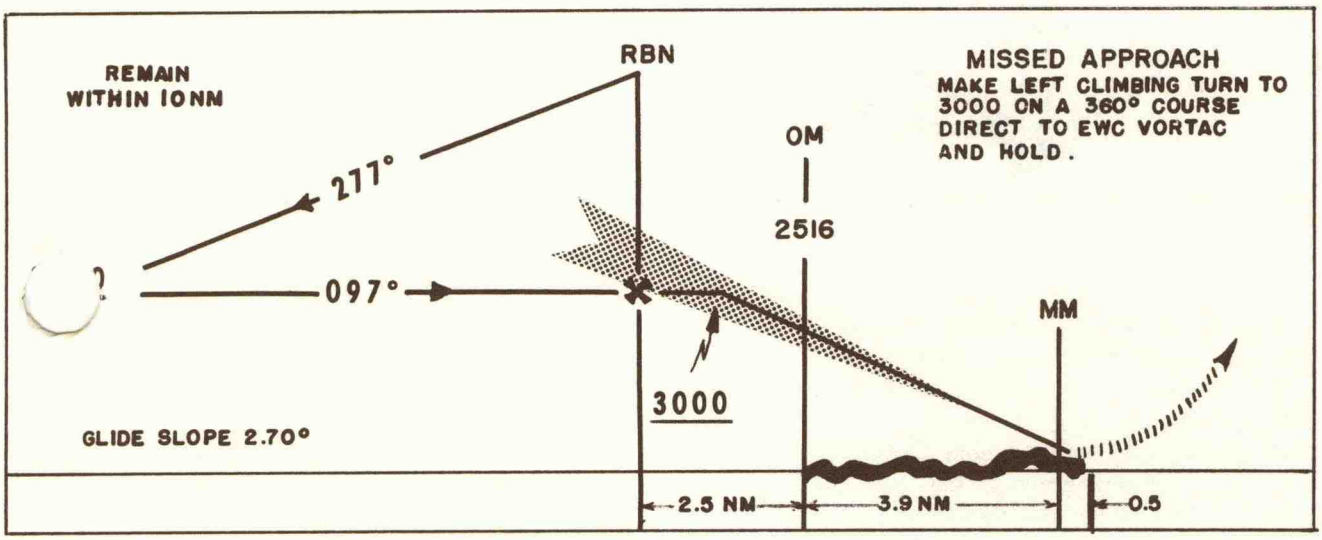
Three representative airports were selected for the study:

A. Greater Cincinnati Airport, Covington, Kentucky – Runway 18.
B. Greater Pittsburgh, Pittsburgh, Pennsylvania – Runway 10L.
C. Minneapolis – St. Paul International (Wold-Chamberlain Field) – Runway 29L.

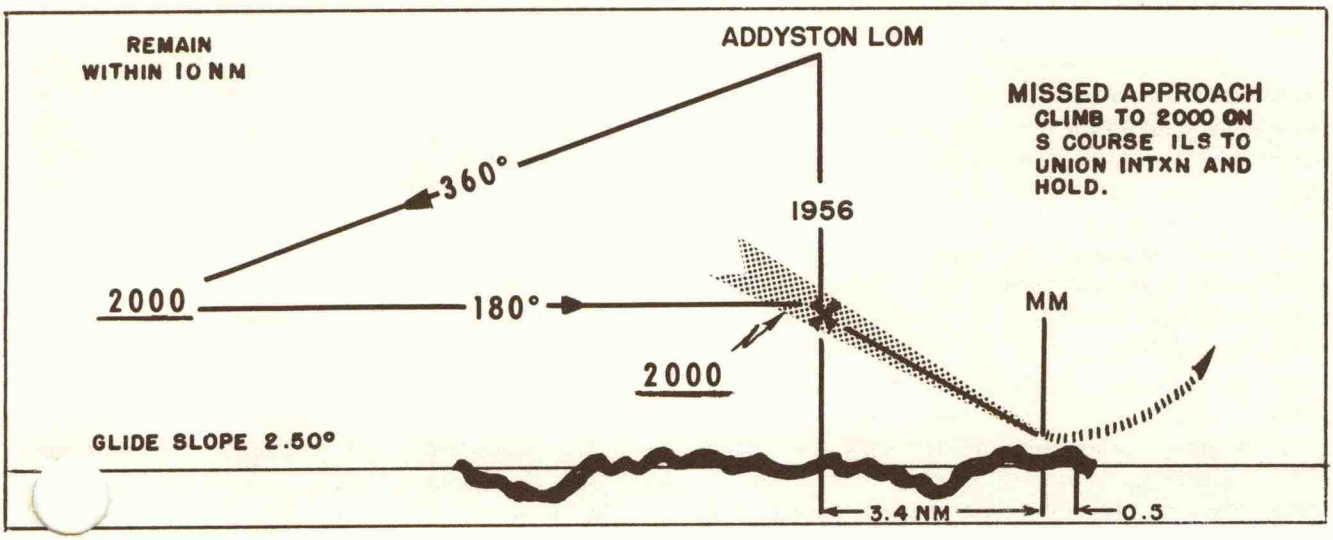
Composite terrain profiles were constructed for each of the airports following . . . an area 2 miles wide at the threshold expanding to 3 miles wide at 9.5 miles from the threshold. Individual composite terrain profiles were constructed for areas on either side of the runway centerline, using the segment method proposed. These two profiles were then "composited" retaining the highest terrain elevation for each segment.

For maximum accuracy, construction of the profiles was made using large-scale (1:24,000) Geological Survey topographic maps. The profiles were then reduced approximately 20 times to the 1:500,000 scale of the IAP charts. The results:

ILS RUNWAY 10L GREATER PITTSBURGH

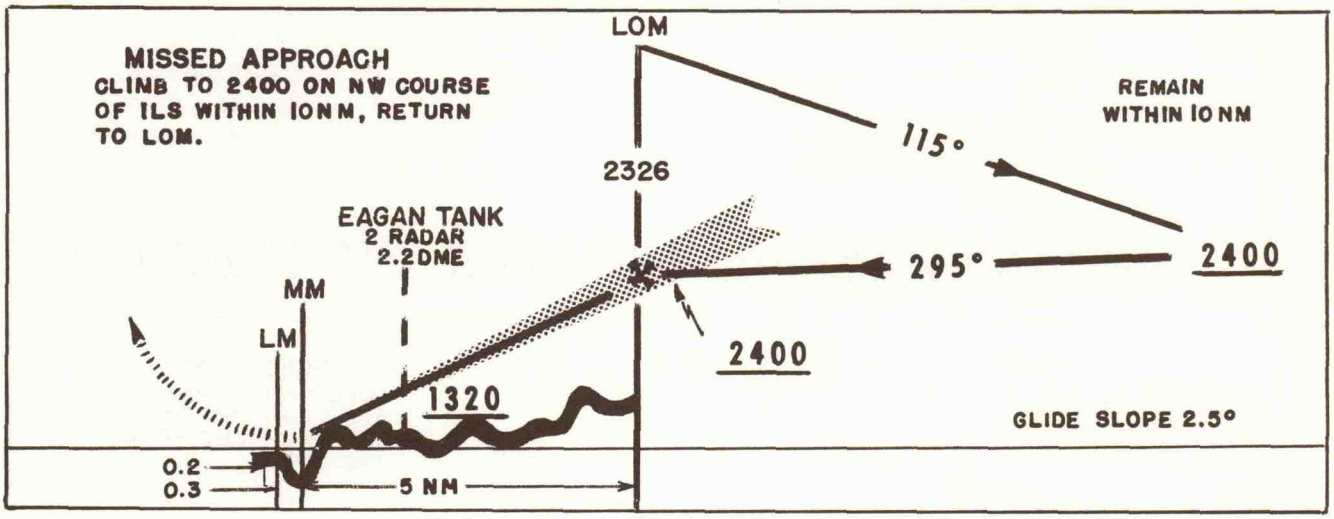


ILS RUNWAY 18 GREATER CINCINNATI



YOUR TWO CENTS WORTH

ILS RUNWAY 29 MINNEAPOLIS



Due to the high cost of construction of the profiles (research, selection of source materials, etc.) and the limited number of manhours or work available at the National Ocean Survey, it was agreed to shorten the distance out from the threshold of 9.5 miles to the distance from the threshold to the Outer Marker (about 5.5 miles). This did not alter the effects of the study.

Based upon the above construction and analysis of the final results (depiction of the profiles on the IAP charts), the following conclusions were reached by Flight Standards and Air Traffic Services:

1. *The relatively small scale (1:500,000) of the* IAP charts renders a portrayal too small to be of significant *meaningful value to the pilot.* The most that can be said for the IAP portrayal is that the terrain is rough but does not depict actual terrain conditions.

2. The "composite" profile does not represent a true picture of the actual approach terrain. As a "composite" profile representing the highest terrain elevations within the selected area, it could prove misleading to the pilot.

3. Flight Standards feels that a more meaningful and economic method of informing the pilot that precipitous terrain or high terrain/obstacles exist in the final approach area is to place a prominent note on the IAP chart. Some Flight Standards procedures specialists are presently placing caution notes of this type on instrument approach procedures, which are subsequently published on the charts. Two sample charts follow showing cautionary notes.

CAUTION: 1460' terrain 3 NM south of airport on approach course.

CAUTION: Precipitous terrain underlying this procedure. Turbulence of varying intensities may be encountered. 4008' terrain 6 NM ENE of airport, higher terrain beyond 10 NM E through S.

The above facts and conclusions reached by the Air Traffic and Flight Standards Services were brought before the Flight Information Advisory Committee (FIAC) for discussion and action. FIAC agreed, after carefully considering all of the factors brought out by the study, that portrayal of composite terrain profiles on IAP charts does not serve any meaningful operational purpose and any further study should not be pursued.

In view of the foregoing, we do not intend to show "composite" terrain profiles on Government-produced Instrument Approach Procedure Charts.

The evaluation was returned to the Flight Safety Foundation which offered the following observations.

The terrain sketches required 38 manhours to draw precise profiles (one on centerline, one right, and left of centerline), consolidated into a single composite and reduced to chart size.

Expensive? Yes. So are accidents. Therefore the real question is, "Would the representation of profiles on instrument approach charts be of significant assistance to pilots in executing instrument approaches safely?"

The Flight Information Advisory Committee concluded that "portrayal of composite terrain profiles does not serve any meaningful operational purpose and further study should not be pursued."

FSF does not agree with that conclusion, but at the moment it is just one opinion against another.

We would like your reaction to the suggestion of portraying terrain profiles on the charts. Would the profiles be useful? Are the caution notes adequate? Let FSF know what you think so that we may know whether to pursue the idea further . . . or just accept the Flight Information Advisory Committee conclusion.

The difference in opinion between the FSF and the FAA represents the two sides of the coin.

Obviously, FSF is attempting to amass a USER viewpoint. As TAC pilots (most certainly USERS) your opinion is very important. What do you think of the terrain sketches? Are they useful?

Provided below is a "cut-out" opinion form. State your opinion, make any remarks that you feel are appropriate, then cut out the form, slip it into an envelope and address it to: The Editor, TAC ATTACK, Hq TAC/SEPP, Langley AFB, Va. 23365.

After the forms have been received TAC ATTACK will extract the information and pass it along to the Flight Safety Foundation. Your opinions are valued and here's a chance to get in your "two cents worth."

☐ Yes, I like the "Terrain Profile" feature and feel it would enhance safety.

☐ No, I do not feel the "Terrain Profile" feature is necessary. The notes on the IAP chart are sufficient.

Type Aircraft_____

Approximate total flying hours_____

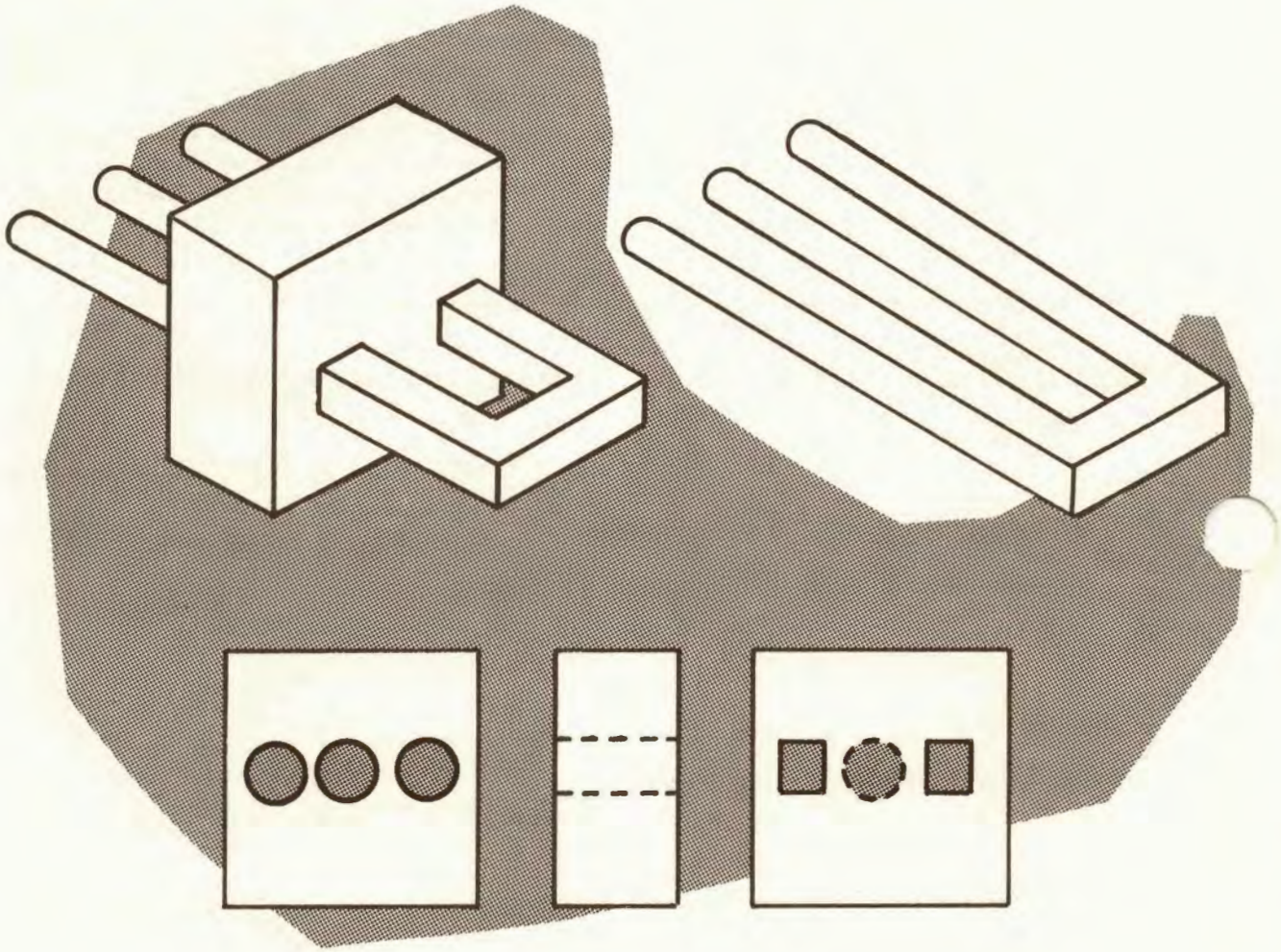
☐ Yes, I like the "Terrain Profile" feature and feel it would enhance safety.

☐ No, I do not feel the "Terrain Profile" feature is necessary. The notes on the IAP chart are sufficient.

Type Aircraft_____

Approximate total flying hours_____

Archeologist UNCOVERS Engineering Miracle

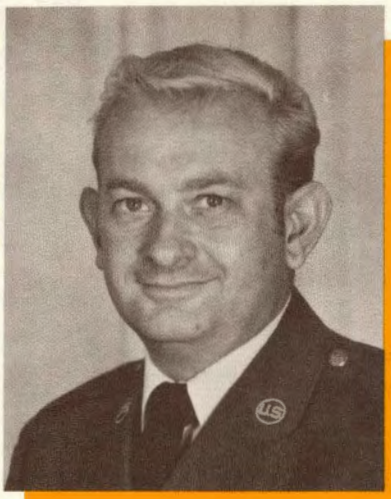


An archeological find which may be of major significance to the engineering community was unearthed by R. A. Thingfinder during an archeological expedition to the South American jungles. Concerning the discovery Dr. Thingfinder was reported to have said, "This object (pictured above) will prove to be as important an archeological discovery as the Rosetta Stone . . . if we can figure out what the damn thing is used for."

TACTICAL AIR COMMAND

Maintenance Man of the Month

Technical Sergeant John S. Fay, 479 Field Maintenance Squadron, George Air Force Base, California, has been selected to receive the TAC Maintenance Man Safety Award. Sergeant Fay will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.



TSgt Fay

TACTICAL AIR COMMAND

ew Chief of the Month

Sergeant Nicholas L. Nickolich, 442 Tactical Fighter Training Squadron, Nellis Air Force Base, Nevada, has been selected to receive the TAC Crew Chief Safety Award. Sergeant Nickolich will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.

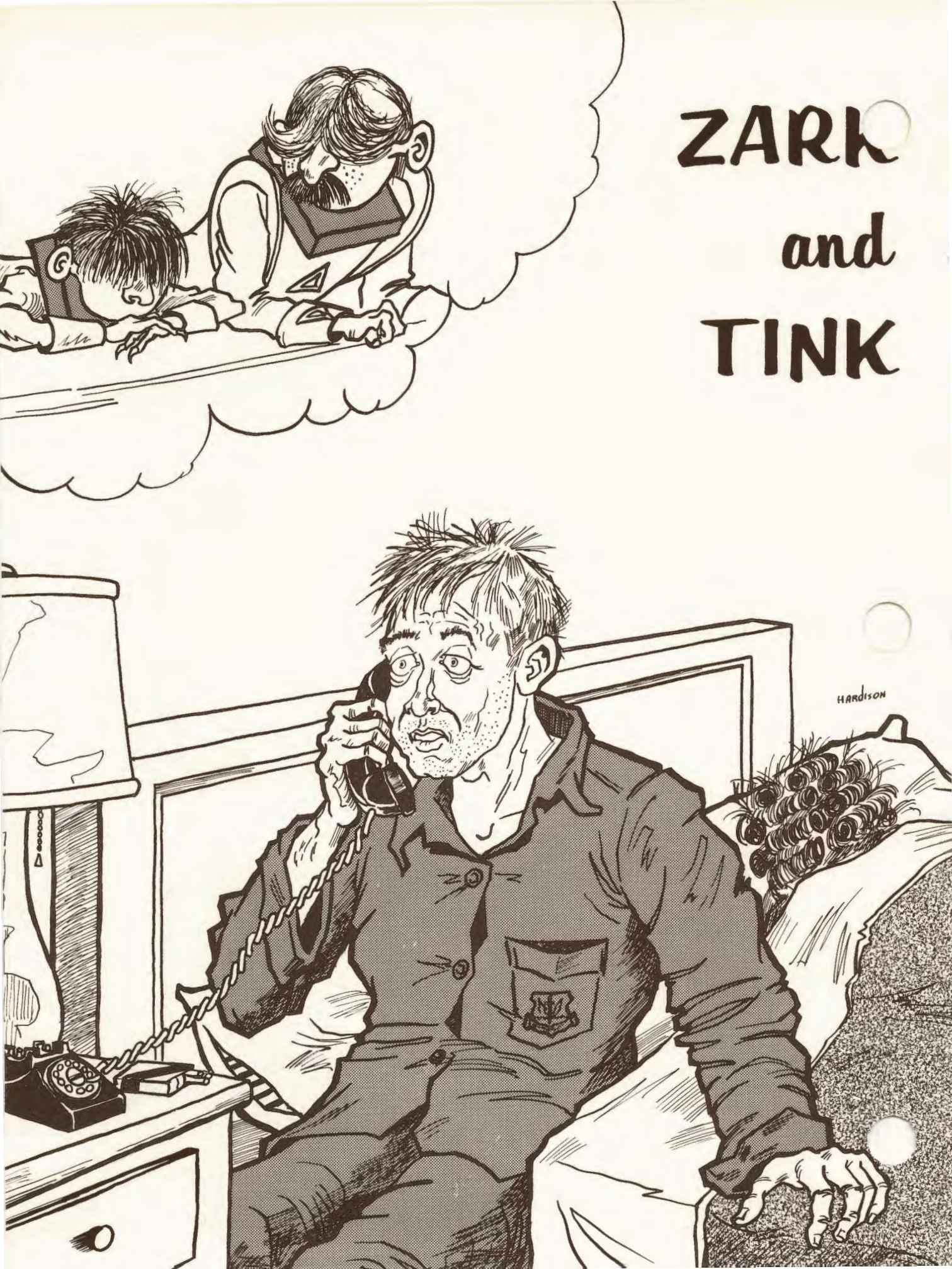
Sgt Nickolich

TACTICAL AIR COMMAND

Ground Safety Man of the Month

Technical Sergeant Lorene Noblitt, 4th Supply Squadron, Seymour Johnson Air Force Base, North Carolina, has been selected to receive the TAC Ground Safety Man of the Month Award. Sergeant Noblitt will receive a letter of appreciation from the Commander of ical Air Command and a Certificate.

TSgt Noblitt


ZARK
and
TINK
HARDISON

...observe a recall

Once again the dimensional orbits of the two worlds have moved into perfect syncronization and our two observers, Zark and his son Tink, are in position.

"What's all the commotion down there, Dad?"

"Hmmm . . . looks like they're exercising the recall plan."

"Exercising?" said Tink.

"Yes son, exercising."

"Looks like an awful lot of trouble to go to just to get a little exercise . . . in school all we do is . . . "

"No, no, Tink, not that kind of exercising; what I mean is they're implementing the recall plan."

"Implementing, I know that one . . . it's like a tool to dig . . . "

"No, Tink, not a tool," Zark said through clenched . "Implement. . . y'know, kick it off. . . get it off the ground . . . make it happen; are you with me, boy?"

"Oh, yes Sir," Tink beamed, "you mean start it."

"You got it, Tink," Zark shouted, "I'm proud of you, boy."

"Dad?"

"Yes, son."

"What's a recall plan?"

With a controlled smile Zark patiently explained, "When the need comes about they call everybody up on the telephone and have them report to their duty stations."

"Do they call them twice?" said Tink with a puzzled expression.

"Eh . . . what's that, son . . . un . . . no, each man is called once."

"You mean they don't call 'em once and then recall 'em again?" said Tink still puzzled.

"They just call them once," Zark explained with a high degree of irritation, "like I said the first time . . . just once."

"Then why don't they call it a CALL plan instead of a RECALL plan?"

"Good grief, boy, don't you ever run out of ridiculous questions?"

Tink paused for a moment then asked, "What does man do when he gets a telephone call?"

ou mean after he gets through swearing?"

"I guess so, Dad."

"Well, he rummages around to see if he can find his recall roster, gets mad at his wife when he can't find it and winds up calling the guy who just called him to find out who he's supposed to call."

"What happens then?"

"He calls the next man down the line; unfortunately, it usually is the wrong number and he wakes up some irate civilian."

"Gee, it sure sounds like loads of fun; what happens next?"

"Well, after several other phone calls he finally gets the right man on the line and informs him of the recall."

"Sounds like a smooth operation," said Tink, "is that all?"

"No, son, there's a lot more. Then he jumps into his uniform, runs out of the house and gets in his car waking up all the neighbors, then races out to the squadron."

"You mean he doesn't shave?"

"No, Tink."

"He doesn't eat?"

"No, Tink."

"Well, what does he do when he gets to the squadron?"

"He hotfoot's it to the nearest telephone to call his wife . . . to tell her to bring out the bag he forgot to pack."

"Gee, those guys really have a lot of fun don't they, Dad?"

"They certainly do, Tink."

"There's one thing that I'm kinda confused about though," said Tink.

"What's that, Son?"

"Well, what happens if the telephones don't work?" said Tink with a puzzled expression.

Zark smiled knowingly, "No problem, Tink; if the telephones are on the blink they use the no-phone recall plan. That's where everybody jumps in their cars then drive around notifying people. It's all well planned."

"Oh, I see," said Tink . . . "How do they know when to start the no-phone recall plan?"

"That's an easy one, son; . . they get a telephone call."

The Crown Prince of ILLUSION

Reach into your repertory of "hairy stories" and the chances are very good that the hairiest of all will concern a battle with the crown prince of illusion, vertigo.

There are are only two categories of pilots when it comes to experiencing the sensations of vertigo, those who have . . . and those who will. It transcends all barriers including those of experience or lack of it, pilot ability (assumed or real), aggressiveness, sex, race, creed, or horsepower. It happens in all airplanes at all altitudes in all kinds of weather, or in no weather at all.

Take the C-130 episode. The big machine broke ground number two in a three-ship formation fifteen seconds behind lead for a night drop. The weather was severe clear, no clouds, no haze, no moon, and no sweat. Join up was normal as the flight turned out over water and descended to a [illegible]sand feet for the low level. The [illegible]nation lights of lead seemed to wink on and off as number two jockeyed for the correct vertical position. The stars twinkled, the ground lights twinkled . . . or was it the other way around? The only visible horizon was the one displayed on the attitude indicator. The ground was the sky and down was up and everything seemed to be turning. Number two suddenly went into a 60 degree right bank and a high rate of descent. This abrupt movement startled the copilot who thought everything was going along great up to this point. "What are you doing?" he shouted over the interphone. The answer was a series of grunts and curses as the AC transitioned to instruments, leveled the wings, and stopped the rate of descent (getting helpful control pressure inputs from the copilot). "Take it a minute and let me get my head straight," he told the [illegible]pilot. Later the aircraft rejoined the [illegible]nation none the worse for wear [illegible]rtunately), but with two confirmed believers (one re-confirmed).

In this incident adverse weather was not a factor, but the absence of a visual reference was the key that opened the door for vertigo. The eyes, the ears, and the seat of the pants joined forces to create a false sensation. The combined sensory perceptions told the pilot that the aircraft was turning left. His immediate reaction was to counter the imagined movement by reversing the direction of turn. All of his senses told him that this was the correct thing to do. His instruments (and the copilot) told him differently.

Unfortunately, not all of the missions in which spatial disorientation played a part ended with merely a lesson. Vertigo can be a smasher of machines and as deadly a killer as a thunderstorm. Change the airplane, throw in a smidgin of weather, and . . .

It was a beautiful night, just the kind you remember. The pilot of this single seat fighter was number two in a four-ship night refueling mission. There was no moon; the stars overhead and the lights on the ground merged together, blurred and indistinct through the cirrus. The weather was more of a restriction to visibility than a real cloud layer. Everything seemed suspended in liquid, like flying in a fish bowl. Sound like a beautiful setting? It was! Only one thing was missing . . . the horizon! The only things the pilot had available for orientation were his visual contact with lead and his aircraft instruments.

He had been flying loose formation on the left wing, and had been experiencing mild attacks of vertigo. Although the vertigo continued to worsen, he didn't advise his flight lead. Another flight already in the refueling area reported the weather unsuitable for refueling. The flight lead initiated a right turn to RTB. As lead started to turn away, number two had difficulty keeping him in sight. Shortly thereafter he lost sight of lead completely. He initiated an abrupt turn to execute his lost wingman procedures. The abruptness deepened his spatial disorientation. His sensation of vertigo, already bad, got worse when he lowered his head and attempted to set his IFF in response to center's instructions for a separate clearance. At this time he felt like he was in a descent, so he pulled back on the stick. His ADI now showed the word "climb." As you jocks know — that's a 30 — 45 degree climb! He then felt a buffet on the flight controls warning him of an approaching stall so he unloaded the aircraft. At this point he became completely disoriented and elected to eject. He later said that he lost confidence in his instruments and didn't believe them. As a result, a smoking hole was all that was left of an expensive airplane.

Vertigo is a killer. In this case the pilot survived but the airplane was a casualty.

Can it happen to you? Yes! Like so many of the situations a pilot faces, spatial disorientation can be overcome only by understanding and practice. Take your precautions now. When you're practicing under the bag, do you really practice, or is one peek worth a thousand crosschecks? That peek won't be available in the real situation!

Is the rule that "unusual attitudes are no time to be closing your eyes" one you use on annual instrument checks? If it is, you're only cheating yourself. Practice is the only thing that gives you the proficiency and confidence you need to overcome spatial disorientation.

CHOCK TALK ...incidents and incidentals

chock talk

Two Loose Nuts

The single ship A-37 was climbing through 16,000 feet in the soup when both attitude indicators, the BDHI, and the J-2 compass failed. The spare inverter was selected but no luck. The pilot checked the circuit breakers and they appeared normal. Glancing at the needle and ball verified his feeling that the airplane was in a right turn. As he applied pressure to roll the wings level he noticed the right engine rpm was indicating 101.5 percent and the oil pressure was low. He shut down the engine and glanced at the needle and ball which told him he was in a left turn. The airspeed was decreasing rapidly and he reacted abruptly by shoving the nose over and attempting to level the wings. The needle went rapidly from the left side of the case to the right side and the airspeed was building up fast. He was still in the soup as he passed through 10,000 feet out of control . . . he punched out.

This accident didn't happen. The pilot did lose his primary attitude instrument but gratefully he wasn't confronted with the dilemma of a needle and ball instrument approach . . simply because the weather was clear.

All of the other factors were there. A loose nut had shorted out a part of the AC transformer terminal wiping out the attitude indicators.

Another loose nut had failed to police up his work area and his FOD found its way to the electrical terminal.

Two loose nuts in one airplane is too much.

Lugs

The F-4 crew on a cross-country had their travel pod separate from the aircraft because the pod was installed with improper lugs. The pod was never recovered. A one-time inspection at their base failed to reveal any other pods with the wrong hardware. Could be that they got it from your base! Why not check and see? Next time it might be your new suit and sports jacket!

Lugs Again or SCORE: Murphy 2 PODS 0

One F-4 outfit found out the hard way that it's possible to hang a pod improperly. The result in this case was a bent main gear door which struck the pod during gear retraction. The ALQ 101-4 pod was hung on Station 8 with lugs configured for missile well installation. This allowed the pod to extend aft of the pylon sufficiently to interfere with the gear door during retraction. This unit is now marking pods following buildup so that they are readily identifiable as to which station the pod is configured to fit.

The Nose Knows

The F-100 pilot lowered the nose to the runway. As the nose wheel touched the jock heard a thump and the nose continued its journey to the concrete. He deployed the chute and maintained directional control with differential braking. The pitot boom was chewed up and ingested into the engine causing FOD damage and a loss of airspeed indications. The aircraft slid for some 6500 — 7000 feet before it stopped and the pilot stop cocked the throttle and made a quick egress. Analysis revealed materiel failure of the drag brace assembly. The hydraulic cylinder casting failed at mid-point and allowed the drag brace to fold the opposite way.

Checklist Again

During a target support mission in a T-Bird the pilot up front was operating the ECM pod when all of the control panel lights went out. He glanced at the left wing and it became immediately clear why the lights went out . . . The ECM pod was missing. Ten minutes later the chaff dispenser departed in a like fashion. Neither had been deployed due to a cockpit actuation.

After landing it was discovered that two cannon p which should have been disconnected, according to

with a maintenance slant.

checklist, were connected. The release buttons on the stick were hot as a result. Neither pilot pushed the buttons and a check for stray voltage didn't turn up anything. No one knows for sure what caused the stores to depart the airplane. However, one fact is known. Had the loading checklist been accomplished properly by the armament technicians the incident would not have occurred.

We were lucky again . . . neither of the falling objects destroyed any property or injured anyone . . . but how long can our luck hold out?

Screwdrivers Aren't Expensive

The electrical technician was required to make a final adjustment in the electrical compartment located behind the rear cockpit of the TF-104 while the engine was running. As he was doing so he dropped his screwdriver and . . . you guessed it . . . it was sucked into the intake. Scratch one engine.

One wonders what the electrician's final thought was as he saw his screwdriver feed the engine. Whatever it was it should have been his first thought.

One also wonders why the supervisors allowed maintenance to be performed around an engine that was running with no intake screens installed.

Screwdrivers aren't expensive but the thoughtlessness that leads to an engine destruction is extremely costly.

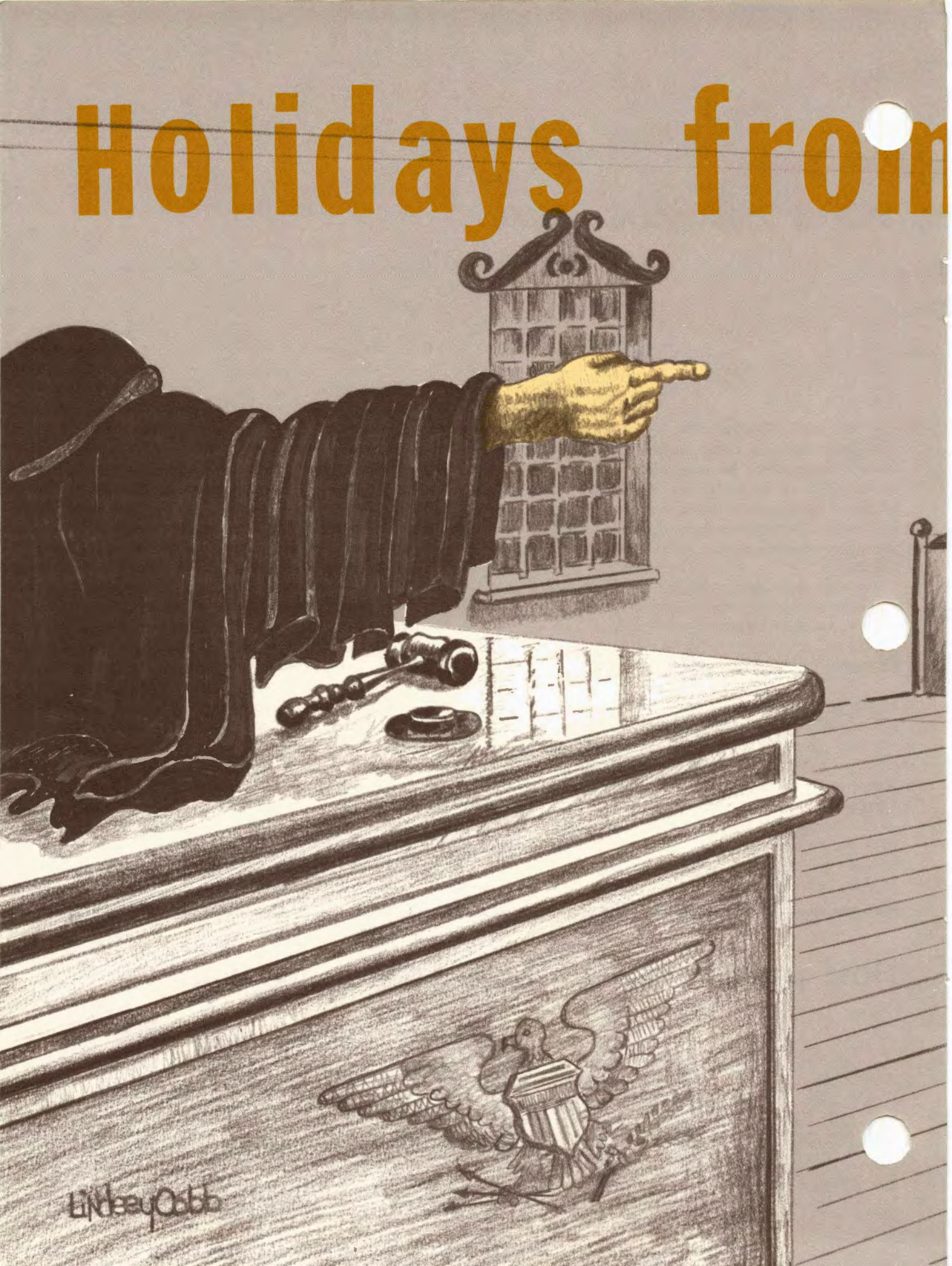
What Happened to the Book?

The F-105 landed and deployed the chute but nothing happened. The jock managed to get the Thud stopped with generous brake applications and the result was a hot brake situation. The blowout plug worked as advertised while the tire was being cooled in the hot brake area. Luckily the only damage was a blown tire.

Things were put in motion when the drag chute door was secured improperly at a transient facility (TAC). The incident could easily have been an accident with the addition of a little water on the runway or even a high speed tire blowout during the landing roll. All because transient maintenance didn't use the book to install the drag chute. A pity . . . the proper use of tech data has never been more important.

This unit has changed the cross-country checklist so that the jock either installs or supervises the installation of drag chutes while cross country.

Hey! pass it along... nine others are waiting.


Holidays from
Lindsay Cobb

Danger

The gallery was quiet; they knew what the sentence would be. They had heard it all before . . . had seen it . . . had experienced it themselves . . . they knew.

Perhaps the man knew also. The grimace on his face seemed to indicate that he suspected it as he stood to receive the sentence.

The man in the long black robe pointed a gnarled finger at the accused. The gallery cringed and became even more subdued. The fingertip quivered as the robed man's voice boomed, "Having been found guilty you are sentenced to a . . ."

The crowd in the gallery grew wide-eyed and each held

HOLIDAYS FROM DANGER

his breath for what he knew was coming next . . . The robed man swallowed, paused for a brief moment, then continued, ". . . sentenced to a (choke) Ground Safety lecture."

The guilty man screamed.

Some in the crowd began crying, others were moaning in a kind of rhythmic chant, while some leaped up and began clawing their way to the door.

The guilty man fell on the floor and began sobbing pitifully, "Why me? Why me?"

The sounds of the hysterical crowd and the sobbing man were smashed to silence under the pounding gavel of the man in the robe.

Once again the voice blasted, "Why you?" and again more loudly, "Why you? Listen again to the evidence and answer your own question."

Officers scooped the quivering man from the floor and ground him into the chair as the man in the robe leaned forward grasping the edges of the high bench.

"Remember last Thanksgiving?"

The man stopped quivering and began to rub his hand.

"Ah . . . yes, I see you do," said the robed one.

"You were really quite impressive waving that carving knife around like a latter-day Genghis Kahn . . . and I'm sure the turkey cheered at your masterful carving technique as you sliced your hand neatly between the thumb and forefinger."

A gasp came from the gallery. The man in the robe continued, "Your family thought it was really a stroke of bad luck to have such a beautiful Thanksgiving dinner ruined by an accident. In your own mind you were convinced the knife had deliberately and wantonly attacked you."

"Knives are evil," chanted the crowd in the gallery.

"And how about Christmas?" the robed one continued. "You do remember Christmas, don't you?"

The man's face went blank then he scratched his head knocking his hair-piece to the floor which exposed his totally bald head. He scrambled to retrieve it as the voice behind the bench continued.

"Yes . . . I see it's coming back to you. It was a nice Christmas tree . . . so green . . . so pretty . . . so . . . so Christmas. And those sparkling lights that were hand down by your Grandmother were incredibly beauti especially the first time you plugged them in and the two bare wires touched. What a brilliant, though momentary, light. But thanks to your foresight you had a couple of spare fuses around the house and a few strands of scotch tape mended those wires perfectly. The decorated tree, with all its lighted splendor, was a sight to behold . . . right out of a storybook . . . that is until Christmas Eve . . . the night of the fire."

"Oh, the poor man," someone in the gallery moaned.

The robed one cast a stern look into the gallery and continued, "At least it didn't burn down your house and you did manage to salvage a few of the gifts under the blazing tree, at the expense of your hair and several layers of skin. Your family wasn't too unhappy spending Christmas day by your bedside in the hospital."

"Ho — Ho — Ho," said some sadist in the crowd and was immediately mobbed by those around him.

The sound of the gavel stirred the mob to submission as the man in the robe continued.

"I'm sure you remember New Year's Eve."

The man grinned sheepishly.

"Very well, I see that you remember at least a part of it. You were a great host at the combination New Year's-Welcome Home From the Hospital Party. booze flowed freely and you were pouring with a flour Your powers of persuasion were fantastic. Take that good friend of yours who wanted to take a taxi home . . . you convinced him that he was perfectly capable of driving home . . . even in the snow. I'm sure he'll thank you properly himself . . . if he ever comes out of the coma. Yes, you were the perfect host. Your family certainly appreciates the fact that you drove another friend home yourself because he was too drunk to drive. It's a shame the police spotted you. Unfortunately, those balloon tests are fair and, yes, the fine for DWI is pretty stiff."

"Down with the fuzz," the crowd shouted.

The police officers in the court rose slowly from their chairs and started to move toward the crowd.

"Long live the protectors of law and order," said the crowd changing chants quickly.

The man in the long black robe leaned back in his chair and surveyed the convicted man. "Your holidays were certainly filled with excitement last year but what about this year; are you going to take a holiday from danger?"

The convicted man bounded from his chair spurting a series of "Yes Sirs." Then he paused for a moment and asked, "Your Honor, when must I receive the sentence . . . the (shudder) Ground Safety lecture?"

"Mister," the judge said rising from the ber "You've Had It!" →

Tactical Air Command

UNIT ACHIEVEMENT AWARD

Our congratulations to the following units for completing 12 months of accident free flying:

27 Tactical Fighter Wing, Cannon Air Force Base, New Mexico
15 August 1970 through 14 August 1971

4429 Combat Crew Training Squadron, Cannon Air Force Base, New Mexico
15 August 1970 through 14 August 1971

778 Tactical Airlift Squadron, Pope Air Force Base, North Carolina
16 August 1970 through 15 August 1971

464 Tactical Airlift Wing, Pope Air Force Base, North Carolina
19 August 1970 through 18 August 1971

779 Tactical Airlift Squadron, Pope Air Force Base, North Carolina
19 August 1970 through 18 August 1971

177 Tactical Fighter Group, Atlantic City, New Jersey
21 August 1970 through 20 August 1971

127 Tactical Reconnaissance Group, Selfridge Air Force Base, Michigan
23 August 1970 through 22 August 1971

121 Tactical Fighter Wing, Lockbourne Air Force Base, Ohio
26 August 1970 through 25 August 1971

178 Tactical Fighter Group, Springfield MAP, Ohio
26 August 1970 through 25 August 1971

524 Tactical Fighter Squadron, Cannon Air Force Base, New Mexico
1 September 1970 through 31 August 1971

43 Tactical Air Training Squadron, England Air Force Base, Louisiana
4 September 1970 through 3 September 1971

DOOLITTLE'S Instrument First

By C. V. GLINES

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The name Jimmy Doolittle is synonymous with accomplishment in the world of aviation. As the famous airman nears his 75th birthday, he is aviation's undisputed elder statesman. No other individual has made so many achievements and accomplished so much in a field of endeavor during a single lifetime.

Winner of every major aviation trophy and award of any significance, he is perhaps remembered best by those around the age of 50 as a racing pilot who set many speed records in the 20s and 30s. Those who served during World War Two recall him as the Medal of Honor winner who led the first daring air raid against Japan and later commanded the Eighth Air Force in Europe.

Others will remember him for his famous firsts – first to fly across the United States in less than 24 hours, first to fly an outside loop, and first to takeoff, fly a set course and land without seeing the ground.

It is this latter achievement that history will note as his most significant. Ironically, few pilots flying the gauges today know that it was Jimmy Doolittle who was first to prove a pilot could fly blind. Fewer still know that he was chosen to conduct the experiments, not solely because of his flying skill, but because he also possessed the scientific knowledge gained through studies at the Massachusetts Institute of Technology where he had earned master's and doctor's degrees in aeronautical science.

It was during the summer of 1928 that Doolittle first became involved in blind-flying experimentation. Although flying had come a long way by that time, it still not considered a reliable form of transportation.

country had been connected by hundreds of miles of air ...s and commercial passenger lines were being ...blished. But airplanes couldn't fly safely through bad weather and many pilots who attempted to do so became tragic statistics. Unfortunately, many pilots had nothing but contempt for weather flying and considered it a blight on their professional records if they refused to try. Others firmly believed that successful weather flying would always depend on the man with the greatest skill at flying by the seat of his pants.

The average man-in-the-street was convinced that airplanes were never meant to fly on schedule and that if people wanted to meet schedules, they should take the train. Anyhow, airplanes were getting to be so fast that they could overcome the time differential by waiting out the weather and then racing the distance when the weather cleared.

Doolittle's own experience and his studies at MIT had proved these to be foolish views. He was sure that weather flying could be licked by the design of proper instruments. In researching the subject, he discovered that Captain David A. Myers, an Army Air Corps flight surgeon, had experimented with the Jones-Barany rotating chair used in testing all military pilots during their annual physical exams. Myers found that after the rate of rotation became steady a normal pilot, with eyes closed ... not tell which way he was turning. If the rate of ...tion was slowed down and stabilized at a lower speed, the pilot thought rotation had stopped. When rotation actually was stopped, he thought he was turning in the opposite direction.

Thus, it was that vertigo, or the false sense of motion, was discovered and explained why so many early-day pilots became completely confused and crashed when flying in clouds.

When Captain William C. Ocker, a test pilot who had experimented with turn-and-bank indicators in 1918, took the Myers test, he decided that here was proof no pilot could ever fly blind, no matter how good he was.

Ocker designed a lightproof box containing a bank-and-turn indicator and a magnetic compass and mounted it on the front of the Jones-Barany chair. The pilot placed his face against an opening in the box and watched the instruments. With very little practice, he could correctly identify the direction and rate of rotation. After the rotation ceased and the compass stopped oscillating, he could then determine his heading. Myers and Ocker patented their "instrument trainer" and it was used to teach a few pilots to fly solely by instruments before they learned to fly under normal visual conditions.

In this time period, Daniel Guggenheim, famous ...strialist and philanthropist, established the ...million Daniel Guggenheim Fund for the purpose of promoting the art, science and business of aviation. Flight safety and reliability were important considerations. One phase of the Fund's work was to study means of assuring safe and reliable flight despite weather conditions.

A Full Flight Laboratory was set up at Mitchel Field, Long Island, in mid-1928. Doolittle, fresh from a second trip to South America to demonstrate aircraft, was borrowed from the Army to head the laboratory with Professor William G. Brown of MIT's Aeronautics Department as his primary assistant.

Their first task was to study work previously done in fog flying. Tethered balloons had been used with some success, but Doolittle quickly abandoned this idea.

A "lead-in cable" idea was tried out. This was a system consisting of an electrified cable strung around a landing field, which led to a landing area. It required very sensitive sensing equipment in the airplane and it was necessary to make a difficult precision turn into the field at low altitude. This was also abandoned.

And so was the idea of dragging weights on aircraft equipped with long tail skids, which had been attempted by others.

Doolittle and Brown centered on the low-frequency radio range that had been developed by the U.S. Bureau of Standards and the Army and was in limited use. If it could be adapted into a form of homing beacon it seemed to offer the most promise.

Doolittle settled on the purchase of two aircraft for test flights. One was a rugged Consolidated NY-2 training plane fitted with a specially reinforced landing gear with long oleo strut action. The other was a Vought Corsair 02U-1 that would be used for cross-country navigation practice.

When the airplanes arrived, the Army assigned Lieutenant Ben S. Kelsey to fly with Doolittle as safety pilot during practice runs. Doolittle describes what happened next:

"As the preliminary practice flights progressed, it soon became apparent that even with the very stable and sturdy NY-2, the available instruments were not adequate. For determining heading when maneuvering and when landing, the compass, due to the northerly turning error was entirely unsatisfactory and the bank-and-turn indicator, though excellent for its purpose, was more a quantitative measuring instrument. Also, at the moment of touchdown in a blind landing, it was imperative that the wings be level with the ground. This was not easy to assure, particularly when the wind was gusty. What was needed was an accurate, reliable and easy-to-read instrument showing exact direction of heading and precise attitude of the aircraft, particularly for the initial and final stages of blind landings.

"Two German artificial horizon instruments — the

DOOLITTLE'S Instrument First

Anchutz and the Gyrorector – were studied but were not deemed entirely satisfactory. I sketched a rough picture of the dial for an instrument which I thought would do the job and showed it to Elmer Sperry, Sr., a great engineer and inventor who headed the Sperry Gyroscope Co. It was, in substance, a directional gyro superimposed on an artificial horizon.

"Mr. Sperry advised that a single gyroscopic instrument could be built but recommended, for simplicity of construction, two separate instruments. I agreed, so Mr. Sperry assigned his son, Elmer, Jr., to work with us and be responsible for their design and fabrication. Out of this work came the Sperry artificial horizon and the directional gyroscope which still, with their improved descendants, are on the instrument panel of every airliner and military plane today.

"As time progressed, literally hundreds of blind and simulated blind landings were made. To make a lan the plane was put into a glide at 60 mph, with some power on, and flown directly into the ground. Although this was about 15 mph above stalling speed, the landing gear absorbed the shock of landing and, if the angle of glide was just right, the airplane didn't even bounce. Actually, after a while, it was possible to make consistently perfect landings by this method. To assure just the right amount of power in the glide, a mark was placed at the proper place on the throttle quadrant.

"Excellent cooperation was obtained from the companies and individuals we worked with during this period. Among them were the Pioneer Instrument Co., the Taylor Instrument Co., the Radio Corp. of America, and the Bell Telephone Laboratories, who installed the modern radio transmitter and provided miniature earphones with molded plugs. Very valuable help was also received from the Bureau of Standards, which designed and installed most of the ground and airborne radio navigation equipment.

"It was during the radio phase of our tests that we concluded that while aural signals were satisfactory for rough aerial navigation, it would be much better if we had a visual indicator in the cockpit for the precise directional control needed during the final phase of blind landing. The Bureau of Standards, working with the Airway Radio Division of the Department of Commerce, designed a semiportable two-leg range, which was used as a homing beacon and a fan-type marker beacon. The homing range was installed on the west side of Mitchel Field. The marker beacon sat along the leg of the homing range and was located on the east side of the field.

"In the plane cockpit was an indicator connected to the radio set consisting of a pair of vibrating reeds. If the pilot was to the right of the radio beam, the left reed vibrated more vigorously. If on course, both reeds vibrated through the same arc. As the airplane approached the radio station, the amplitude of vibration increased. A single reed started to vibrate as the fan-type marker beacon was approached. It reached maximum amplitude then quickly dropped to zero when the plane was directly overhead, rapidly built up to maximum again, and then tapered down as the airplane pulled away. The homing range indicator also had a distinct null (period of silence) in the headset when the airplane was directly over the range station.

"As the tests progressed, the instrumentation and equipment was continually improved until toward the end of 1929, during the final stages of the flight tests, there was a total of 11 instruments, besides the normal engine instruments, being used.

"Considerable thought was given to the locatio

arrangement of each instrument in order to facilitate reading and reduce pilot fatigue. Fatigue led to errors and reading errors could not be tolerated in instrument landings."

Concerning altimeters Doolittle said, *"The conventional barometric altimeters of the day measured, at best, to the nearest 50 or 100 feet. It would be handy if an altimeter were available that, near the ground, would measure to 10 or even 5 feet.*

"The Kollsman Instrument Company developed such an instrument and I was very pleased, on August 30, 1929, to take Paul Kollsman and his new instrument up on its first test flight in the second 02U, which was purchased after the crash of the first. Mr. Kollsman held the sensitive altimeters in his lap during the flight and it performed perfectly. We promptly installed it in the NY-2.

"What made this instrument so valuable then was that it had two hands and a multiplication factor of 20 between them. The fast moving hand made one complete revolution for each 1000 feet change in altitude, which meant a movement of about 5/32 inch for 20-feet altitude. This was an order of magnitude more accurate than earlier altimeters.

"We experimented with sonic and radio altimeters, fog penetration lights and fog-dispersal methods. None of these experiments were really successful at the time. One fog-dispersal experiment using a giant blow torch seemed like it had possibilities, however, and we encouraged its inventor to install his equipment at Mitchel to wait for a foggy day. The morning of Sep 24, 1929, was perfect for such a trial and Mr. Guggenheim and all our associates were hurriedly called to witness the demonstration. The equipment was fired up even though some of those we wanted to see it, including Mr. Guggenheim, couldn't get there quickly. We were afraid the fog would burn off so we fired up the equipment but the fog did not disperse.

"Though we were all disappointed, we were there and the fog was there, so I decided to make a real fog flight. The NY-2 was pushed out of the hangar and warmed up. The ground radios were manned and the radio beacons turned on. I taxied out and took off. I came through the fog (on top) at about 500 feet and made a wide swing coming around into landing position. By the time I landed 10 minutes after takeoff the fog had just started to lift.

"About this time, Mr. Guggenheim, along with several other people, arrived so we decided to do an 'official' under-the-hood flight. I'd just made a real flight in the fog so I wanted to go alone but Mr. Guggenheim insisted that Ben Kelsey be taken along as safety pilot. The fog had lifted considerably by this time and he was afraid there might be other aircraft in the vicinity.

"We both got into the plane and the hood over my cockpit was tightly closed. I taxied out and took off toward the West in a gradual climb. At about 1000 feet, I leveled off and made a 180-degree turn to the left, flew several miles, then made another left turn. The airplane was now properly lined up on the west leg of the Mitchel range so I started a gradual descent. I leveled off at 200 feet and flew level until I passed the fan marker on the east side of the field. From this point, I flew the plane down to the ground using the instrument landing procedure we had developed. Despite all my previous practice, however, the approach and landing were sloppy."

The landing may have been sloppy by Doolittle standards, but it was a safe landing and Ben Kelsey never once touched the controls. The date — Sep 24, 1929 — went into the record books as the day that pilots won a great battle against the weather. In the nearly 11 months of the experiment, a unique group of blind flying instruments had been designed, tested, and improved. Among them were an artificial gyro, a directional gyro, a more precise barometer and a short-range visual-landing-beam system.

The 15-minute flight of Jimmy Doolittle that September morning marked the end of the seat-of-the-pants era in aviation. Although it did not represent a final solution to the problems of flying solely by the use of instruments, it was a start.

At the end of 1929, the Guggenheim Fund Trustees decided that further experimentation could best be made by other organizations and closed out backing of further research. The Full Flight Laboratory was disestablished and the NY-2 was flown to Wright Field, Ohio, for further instrument landing experimentation.

Jimmy Doolittle returned to Army duties briefly and then resigned his regular commission in the Air Corps. He went to work for Shell Oil Co. and pioneered the development of 100-octane gasoline, which is his second greatest aviation achievement of lasting significance.

But his greatest accomplishment, without doubt, is his victory over the weather that had been aviation's worst enemy. It had been not only the enemy of all pilots but also a barrier to all scheduled air operations. The enemy was licked and the barrier torn down on that foggy day on Long Island in September 1929.

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About the Author: C.V. Glines, the author of this article and 17 books on aviation subjects, is the Editor of AIR LINE PILOT. He is also Colonel C.V. Glines, USAF (Ret), who served as Chief, Public Affairs, Alaskan Command . . . his last assignment before retirement after 27 years of service.

TAC TIPS ...interest items, mishaps

George Revolted

The C-130 (another command) was on an IFR flight at FL190 in VFR weather with no turbulence and had just received clearance to descend, at pilot's discretion, to 5000 feet. Pilot disconnected altitude hold and rolled in a descent with the autopilot pitch control. Aircraft initially went to approximately 2000 fpm rate-of-descent and continued to increase in nose-down pitch attitude. A slight weightlessness, negative-G, was felt and the pilot rotated pitch control approximately one-fourth turn to reduce nose-down attitude. At this point aircraft pitched down abruptly. The copilot, an instructor pilot in the right seat, grabbed the yoke and disconnected the autopilot. The aircraft immediately pitched violently nose up and copilot attempted to counteract the excessive nose-up condition with nose-down trim. Copilot (IP) then reached for the elevator trim switch at which time aircraft pitched abruptly downward. Trim switch was turned off, power reduced to IDLE and aircraft recovered from nose-low condition to level flight. Violent maneuvers resulted in major injury to one passenger. An emergency was declared and aircraft landed with no further problems. Total elapsed time of the violent maneuver was 8-12 seconds. Aircraft was operationally checked on the ground approximately 12 separate times but was unable to duplicate malfunction. Aircraft was visually checked by air and ground crew personnel for evidence of any overstress condition with negative results. Authority was received to perform an inflight operational check of aircraft, excluding use of autopilot. This was accomplished with satisfactory results. Aircraft was cleared for one time flight to home base. Auto pilot components were removed from aircraft for bench check on E-4 type autopilot mockup. Operational check of autopilot components revealed defective gyro pilot servo control and flight controller.

(From CROSSFEED)

Fire Extinquisher Agent-Discharged

When the writers of emergency procedures gather they freely admit that it is impossible to reduce all possible emergencies to the written word. Even the most fertile imagination could not conceive of some of the actual problems that confront us; for instance, how about an emergency procedure entitled "Fire in the Headliner." If you're a fighter jock this could be retitled "Fire Between the Ears." But, if you're a FAC IP on a training mission in an 0-2 "Fire in the Headliner" is a definite possibility. Of course (as always) there's an incident to back this up.

After an hour into the training mission the 0-2 pilots noticed white smoke coming from the top of the aft fire wall. An emergency was declared and while enroute to the patch flames were noted and a fire extinguisher was expended. The aircraft landed and another fire extinguisher was used to snuff out the remaining smoldering material.

Investigation was inconclusive but they think the plastic lining of the fiber glass insulation above the headliner caught fire due to a (suspected) electrical short and the fire was supported by grease on the flap screw.

with morals, for the TAC aircrewman

Blasted Canopy!

Two F-4s on a scramble (another command) were cleared onto the runway. As Number Two passed behind Lead, Lead added power to move into the takeoff position. Unfortunately, Number Two was in the process ›sing his canopy at the time. The canopy separated the aircraft and struck the wing. Not only was the equipment damaged, but a sortie was lost.

Give Yourself a Break with the Brakes

An F-4 from another command landed on a 10,000 foot wet runway. Twelve hundred feet after touchdown, or 2000 feet from the approach end, the pilot applied brakes and shortly thereafter the left main tire blew. The aircraft braking antiskid system was found to be fully operational. The antiskid cannot protect against a skid if hydroplaning is occurring when the brakes are applied. Judicious use of brakes, even when equipped with an antiskid system, would seem to apply here. An additional note of interest is that, except for the departure end ay, only one other taxiway was available – at ximately the 5000 foot marker.

PCA

The FAA announced that the expansion of the positive control area is proceeding on schedule. In the latest move, the PCA has been expanded in southern and eastern United States. **Effective 14 October 1971 all airspace from 18,000 feet MSL up to and including FL 600 within the 48 contiguous states and the District of Columbia, excluding Santa Barbara Island, Farallon Island, and the portion south of Lat. 25°04'00"N will become positive control area.** The requirements for operating in PCA are listed in FLIP (Planning and IFR Sup.).

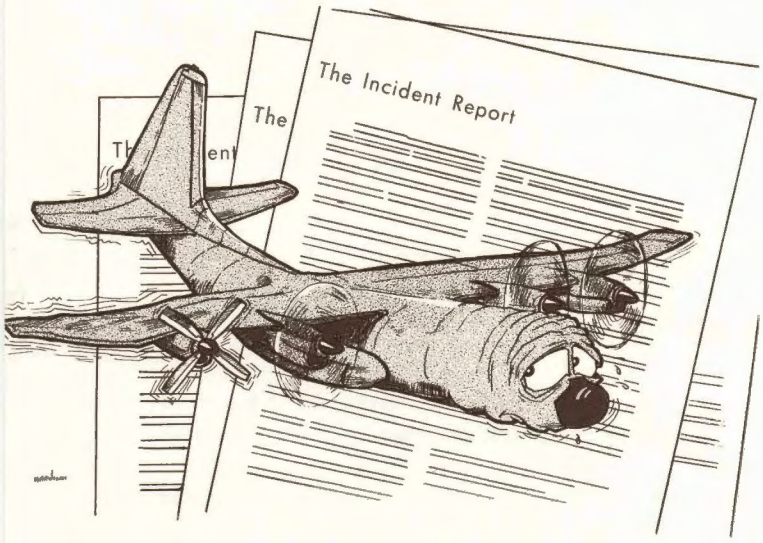
An Open Cockpit—and No Scarf

Everything was going great until the front seat jock in the T-Bird noticed that the canopy locking handle was not in the locked position. He informed the other pilot then attempted to lock the handle and wouldn't you know it . . . the canopy departed for parts unknown. Lots of noise, dust, and wind blast resulted but the jocks got it on the ground OK.

Investigators determined that in all probability the canopy lock was never secured. All of the mechanical gadgetry associated with the canopy system checked out fine. The warning light circuitry was good also.

Could it be that a small item on the Before Takeoff Checklist was missed?

THE INCIDENT REPORT... what good is it ?



By MAJ DICK PEDERSEN
FLIGHT SAFETY
HQ TAC

Back in April of this year a piece of paper floated out of Norton AFB and impacted the many-motor bases with the force of the second shot heard 'round the world.

Wailing, moaning, teeth gnashing, and hair pulling were common occurrences in the various safety offices as the result of the bombshell. It was even rumored that several safety officers were talking of suicide.

That diabolical piece of paper was an emergency change to AFR 127-4 which required that an incident report be submitted when an engine was shut down or failed while intent for flight existed. It all sounds rather innocent but consider the impact on the multi-engine folks (no not F-4s) . . . the C-130 fleet is a good example. Notice the change to the reg required a report for an engine shutdown . . . one . . . ichi . . . uno . . . The previous requirements called for an incident report if two or more engines were shutdown unless damage outside the engine resulted.

In the land of the great Herky the shutdown of a single engine is not an uncommon occurrence and to generate a piece of paperwork each time one of the birds landed with one prop standing at attention was almost too much to bear. One safety officer was observed scribbling the following remark on his "trend analysis" board: "Incident reports (C-130) will become voluminous to the point of being totally useless." The man who scribbled those words was afflicted with a severe case of limited vision.

Originally the emergency change to AFR 127-4 was published in order to gain crossfeed information from multi-engine aircraft operating with the same engine as jet fighter aircraft. For example, several items have been identified on the J-57 engine from KC/C-135 and [illegible] aircraft that can assist the F-100/101/102 fighter who use the same engine. Consequently, a partial objective of the change in reporting has already been achieved and will, no doubt, continue to provide valuable information.

In TAC, with the C-130 T-56 turbo prop engine, not as much information of a crossfeed nature is gained from other commands, simply because, within the Air Force, the C-130 has almost exclusive title to the T-56 engine. Additionally, since numerous systems are tied to the prop/gear box/engine drive train, engine shutdowns are not always related to engine problems. However, this fact does not reduce the efficiency of incident reporting within TAC.

To TAC and system users (C-130) the single engine shutdown reporting is valuable as documentation to correct long known and accepted deficiencies. In past years the acceptance may have been due to the excellent performance of the aircraft under reduced power. That's great . . . but the system can be , and has been, improved.

From January through March (before the change) there were three UMR's submitted throughout the TAC C-130 fleet in association with incident reports. This low number of UMRs was hardly indicative of the number of materiel deficiencies throughout the fleet. Since the change to AFR 127-4 was published, coupled with requirement that all materiel caused incidents must

reported via the UMR system, the numbers of incidents and associated UMRs have steadily increased (as shown on graph). Now a more realistic picture of "what's happening" is being painted. As a result, those who view the picture have ammunition for the guns of change . . . for improvements in the aircraft systems.

A spinoff of the new incident reporting criteria is a more comprehensive trend analysis capability . . . at the unit level.

Under the old criteria the depth of investigation and follow up of single engine shutdowns (C-130) was dependent, in a large part, on the initiative of the unit safety officer. Now each engine shutdown must be investigated, reported, and a UMR submitted if a materiel malfunction is the culprit. This gets safety, maintenance, and operations deeply involved. It gives them a handle on current problems. Records keeping in safety and maintenance provide a trend analysis within the unit and a review of incident reports from like units provides a possible window into the future. Now it is far simpler to eliminate problems before they become problems.

The new incident reporting criteria also provides a more complete transfer of information to the crew members by means of flying safety meetings and incident read files. It gets them "in the know" regarding current problems, materiel, and otherwise.

So in retrospect, all of the hair pulling was for nought. True, the new criteria imposed an additional workload, but the benefits far outweigh the hardships.

What good is the incident report?

At the unit level the investigative procedures involve maintenance, safety, and operations deeply in the unit's activities . . . all of them.

It force-feeds a unit trend analysis program.

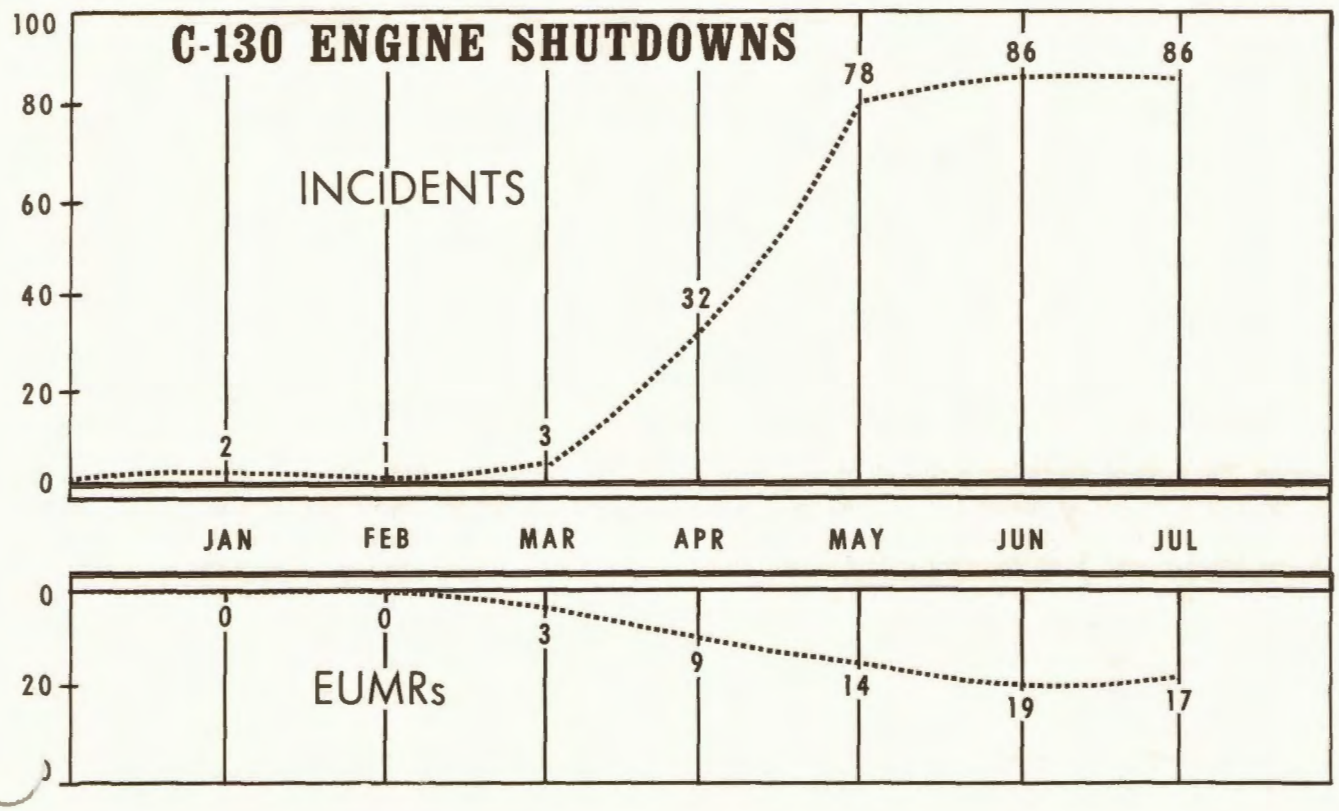
It documents, through the UMR system, materiel problems that may have been long-standing and thrusts the information before agencies that can evaluate and solve the problems.

It provides units with cross-tell information which may signal a potential problem area.

It provides the crewmembers with current information concerning the problems associated with the machines they drag into the air.

It gives higher headquarters a more complete picture of what's happening so that the wheels of change can be put into motion to correct a deficiency . . . whether it be in operations or materiel.

Put them all together and they spell "accident prevention." The incident report is a valuable asset to the accident prevention program. It gives all of us the opportunity to solve the small problems before they turn into the larger problem . . . the accident.



THE COLD IS A SN

By MSgt John A. Ellington
Hq 5WW, Langley AFB, VA.

Summer has left the Northern Hemisphere and spring has arrived south of the equator, placing all of us in a transition phase. Fall is beautiful but winter is rapidly approaching. Some of us like and appreciate our earth's winter weather, but there are those, believe it or not, who just can't seem to migrate far enough south during this season. The truth of the matter is that all of us who will rough it on a winterized latitude circle should use Mother Earth's current rest period to prepare for winter. Our Air Force mission can't wait for spring, and pilots, crew members, and ground support personnel who are unprepared for winter and treat its oncoming wrath lightly may be in for some unpleasant surprises.

Preparing to do battle against winter's unknown should be accomplished by an examination of the mistakes of others. Many a disbeliever has been extremely embarrassed, injured, or even killed because he ignored the documented case of a colleague. Cross-checking with the base meteorologist, a look at recent crew debriefs, and one's own good judgment can save you from the unpleasant surprises that Mother Nature may conjure up during the winter season.

For the unprepared the jet stream could bring a few surprises. The height and location of the jet stream will help you make the best decision when it comes time to pick an altitude for cruise, or if you have to change altitude to avoid headwinds. The normal belief that, "the higher you are the less weather you experience and the farther you can go," may not be too accurate during the winter. You'll burn a little more fuel at a lower altitude, but you might gain enough in the wind department to more than offset the fuel expended. You will also find turbulence at or near the jet stream which you may want to avoid, if you have passengers or an aversion to being physically shaken. Also, selection of alternates will require extra care in winter. You may find your primary alternate too far away because of strong winds. A sure way to ke current on jet stream location is to discuss th

FOR THE PREPARED

phenomena with the base meteorologist when flight planning.

The jet stream certainly can be a hazard to winter flying and must be reckoned with. However, there are several other hazards which bear mentioning.

There are many documented cases stretching the length of aviation history that tell the story of a most ferocious enemy of flying: heavy icing, in the form of freezing rain associated with a stratus type cloud. An accumulation of either freezing rain or drizzle can cause an aircraft to become uncontrollable in an unbelievably short time. In general, there are four such conditions which affect icing and the rate of ice accumulation: 1) air temperature and aircraft temperature; 2) liquid water content of clouds; 3) size of supercooled water droplets in the air; and 4) the collection efficiency of the aircraft component. For structural icing to begin at all, the aircraft temperature must be below freezing and liquid-water droplets must be present at sub-freezing temperatures. Induction icing, however, can occur at temperatures above freezing. The aircraft icing layer is generally considered to exist between 0 degrees and –40 degrees Centigrade, although icing at temperatures below –30 degrees Centigrade is rare.

Frontal clouds usually have a higher icing probability than other clouds, with warm fronts yielding the greatest horizontal extent of icing. Moderate mixed or clear icing may be encountered 200 to 300 miles ahead of the surface frontal position. Light rime has been encountered as far as 500 miles from the surface position of warm fronts; it has been estimated that 85 percent of the observed aircraft icing occurs in the vicinity of frontal zones. These actual observations of icing conditions were in the form of pilot reports, considered a most valuable source of forecasting information by the detachment meteorologist.

The meteorologist behind the counter knows icing accumulation is extremely hazardous to aircraft. He realizes it reduces an aircraft's aerodynamic efficiency by increasing drag, decreasing lift, and adding extra weight. He is also aware that aircraft are equipped with anti-icing and de-icing systems which will generally protect you.

The Cold is a Snap

However, neither system was designed to handle heavy icing and he is there to brief you on areas where this phenomenon is occurring. The rule is: flights should not be planned through forecast or known heavy icing areas.

Winter flying is not all bad but you must know and realize the significant dangers involved. Check with your local meteorologist in your early flight planning stages on destination, alternates, and proposed route weather. If hazardous conditions prevail, select another route.

There are a number of actual cases that apply and could be considered, but I would like to mention an old foe of the flier. This particular hazard possesses the very same thermodynamic structure as its summer cousin. I'm referring to that demon of all demons to flying, the unforgettable thunderstorm. If you've met one of these big fellows face to face at 30,000 feet I think you will agree, but to meet him unexpectedly embedded in, or masked by, thick stratoform frontal clouds leaves an everlasting impression. Winter thunderstorms differ from those of summer primarily from the standpoint that they are harder to locate and may catch you off guard. They are often found in the warmer air of a frontal occlusion or in the warm air forced up over the surface position of a warm front. Any briefing received from your base meteorologist which includes thunderstorms enroute should put you on alert. Remember, thunderstorms embedded in layered frontal clouds associated with frozen precipitation, or heavy snow producing clouds are most difficult to isolate, both visually and on radar.

Flying through winter hazards is no picnic, but if you are in flight and have experienced any of those just mentioned, let's hope the RCR for your destination is favorable.

Ice, snow, or excessive water on the runway is still another winter hazard which demands respect. A number of jocks have found themselves confronted with conditions plainly beyond their control. They have faced that empty feeling of helplessness, locked in a bird which feels free to do its own thing down the runway. There is no stranger experience than a joy ride down the runway in a plane that insists upon twisting sideways or sliding backwards, has no respect for the rapidly approaching end of the runway, and on top of it all has the gall to allow one, if not two, of its gears to collapse. Although RCR is one factor which the detachment meteorologist does not forecast, he can lend valuable assistance on what to expect at destination when flight planning. Be certain to discuss RCR with him, since the type weather forecast for the area will give you a good idea of what you might expect at touchdown.

We have touched on four of the many hazards of winter flying. However, there are still a number of other we should consider which must be dealt with. Probably the most exasperating winter time situation is caused by the poor weather which prevents flying, often for extended periods. Some of the other weather phenomena which play havoc with flyers are: 1) an increase in the number of fronts on the move; 2) an increase in strong surface winds to include persistent gustiness; 3) low ceilings which persist over a larger area; 4) an increase in low and often variable visibility; and 5) cold weather (chill index for flight and ground crew).

The man in the know, when it comes down to what the weather is now and what it will be hours from now, is the meteorologist working behind the counter in the base weather station. You may have noticed I refer to these men as meteorologists. Each is a dedicated professional, highly trained in the theory of meteorology who takes personal pride in every analysis, prognosis, or briefing prepared. He is well aware of all the winter weather hazards, and always goes all out to make certain those concerned are informed. In his profession, communication is the key link between the pilot and meteorologist. This link can be strengthened through more airborne pilot reports and debriefings. The information received is incorporated into the wealth of data on hand, analyzed and passed on to others flying or flight planning.

Prepare now for winter flying, review the weather hazards, and discuss those about which you feel you need additional information with the man behind the counter. Remember, he is your winter ally; don't forget him this winter. Keeping him informed on what's encountered in flight enables him to serve you and others in a more deserving manner. From him you'll get no snow job.

As winter marches down upon us the VFR days will diminish and those borderline days of almost VFR will increase. It signals a time to drag out 60-16 and review the requirements for VFR operations. It also signals a time in which supervisory personnel will have to closely monitor existing and forecast weather conditions in areas where VFR missions are to be flown and exercise positive control of aircraft operations in those areas.

The jocks that are airborne can aid supervisors by quickly reporting deteriorating weather conditions through the command post and base metro.

IPs are going to have to guard against preoccupation with instructional duties to the point where attention could be diverted from safe operation of the aircraft in deteriorating weather conditions.

There is something for all of us to do in planning for the approach of winter. It's up to you not to get caught short. Ed. →

TAC TALLY

MAJOR ACCIDENT RATE COMPARISON

	TAC		ANG		AFRes	
	1971	1970	1971	1970	1971	1970
JAN	1.6	4.8	16.7	5.9	0	0
FEB	1.6	3.9	11.6	2.6	0	0
MAR	3.1	4.6	7.0	1.7	0	0
APR	2.7	4.9	4.9	2.4	0	0
MAY	2.5	6.2	5.7	3.6	0	0
JUN	2.6	5.5	6.9	3.6	0	0
JUL	2.9	5.1	7.1	6.1	0	0
AUG	2.7	5.0	7.8	6.9	2.7	0
	3.2	4.7	7.4	6.6	2.4	0
OCT		4.5		6.8		0
NOV		4.6		6.7		0
DEC		4.6		6.6		0

AIRCRAFT ACCIDENT RATES

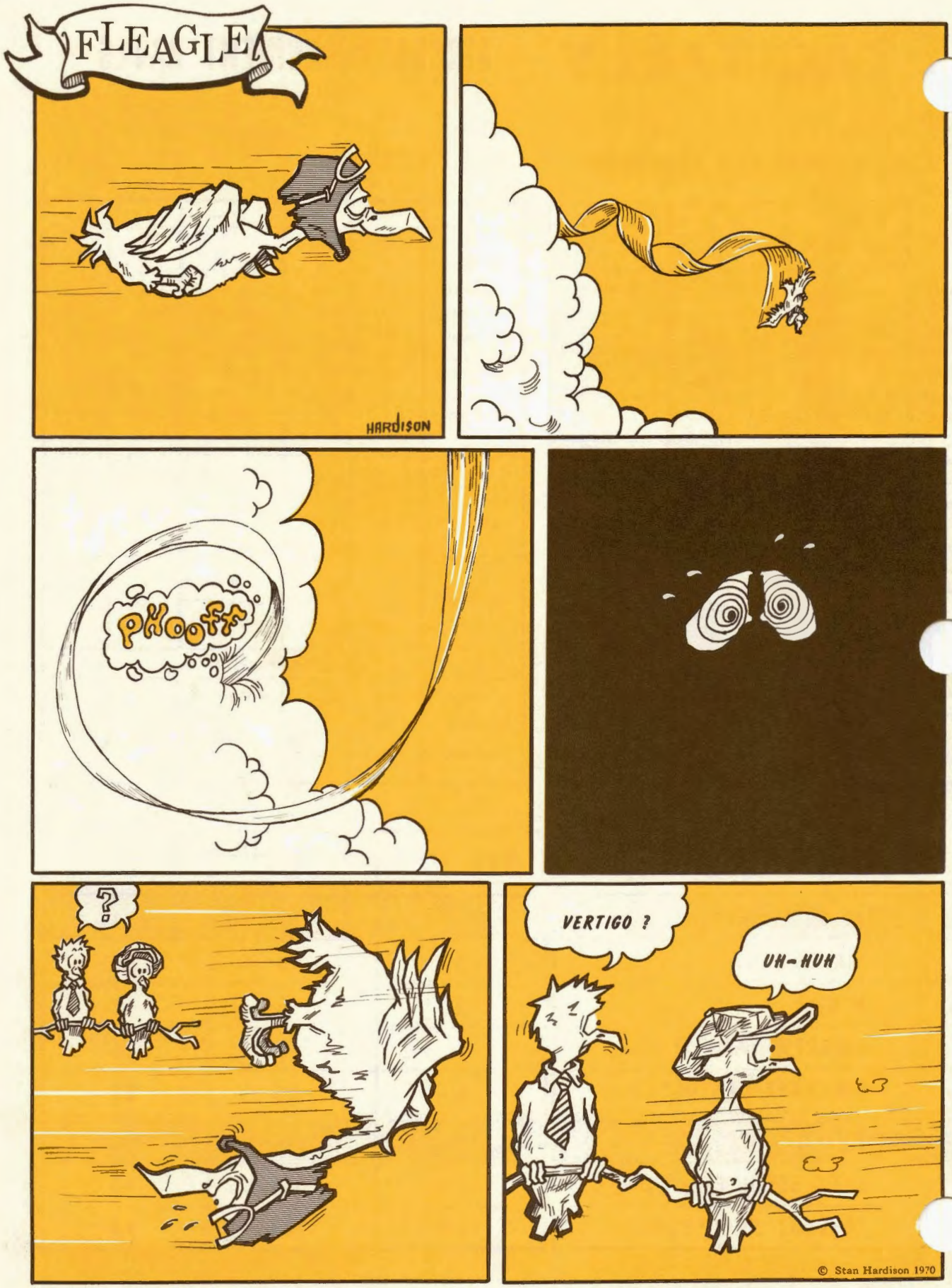
* Estimated

UNITS

	THRU SEPT			THRU SEPT	
	1971	1970		1971	1970
9 AF	3.6	1.5	12 AF	2.1	7.7
1 TFW	7.0	3.5	23 TFW	0	5.3
4 TFW	0	0	27 TFW	0	0
31 TFW	11.3	5.5	49 TFW	0	13.5
33 TFW	0	0	347 TFW	0	N/A
354 TFW	5.3	0	355 TFW	0	N/A
4403 TFW	16.0	0	474 TFW	0	0
363 TRW	0	3.6	479 TFW	3.2	12.4
316 TAW	0	0	67 TRW	0	4.3
317 TAW	0	0	313 TAW	0	0
68 TASG	0	0	314 TAW	0	0
			516 TAW	0	0
			58 TFTW	8.0	14.4
			4453 CCTW	4.9	4.2
			71 TASG	0	0
TAC SPECIAL UNITS					
1 SOW	6.2	6.5	4409 SUPSQ	0	0
2 ADG	0	0	4410 SOTG	5.3	0
57 FWW	6.6	0	4500 ABWG	0	0
			4485 TTS	0	N/A

TAC SUMMARY

	AUG 1971	THRU SEPT 1971	THRU SEPT 1970
TOTAL ACCIDENTS	5	25	33
MAJOR	5	19	28
MINOR	0	6	5
AIRCREW FATALITIES	4	10	26
AIRCRAFT DESTROYED	6	15	25
TOTAL EJECTIONS	7	16	22
SUCCESSFUL EJECTIONS	7	16	16
PERCENT SUCCESSFUL	100	100	73


FLEAGLE
HARDISON
PHOOFF
?
VERTIGO ?
UH-HUH
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