FLYING SAFETY

UNITED STATES AIR FORCE

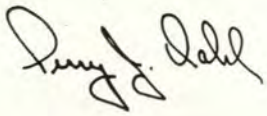
MAY 1957

the emergency...

File Thirteen

May is the month for FLYING SAFETY to feature "The Emergency." Your attention is invited to page one and to the accident briefs on pages two and three. . . . A recent FTAF brief carries an interesting item as follows: A student placed his helmet on the wing of his aircraft while putting his chute in the cockpit. The mask picked up some JP-4 residue that was on the wing. This, combined with oxygen during the ensuing flight, resulted in first and second degree burns on one side of the pilot's face. . . . There have been several incident reports lately which indicate that pilots are not aware of the altitudes required to be maintained, when flying VFR or one on top. For those of you who are in doubt, get with the PIF and read Par 32d, AFR 60-16. . . . Next month's subject will be the "Crew Station." Among other important items will be a word or two regarding external removal of canopies during an emergency. There have been cases where the first people to arrive at the crash scene were unable to free the pilot because they didn't know how to open the canopy from outside the cockpit. You will get the word on what is being done to help eliminate this possibility.

'til June,



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USAF PERIODICAL 62-1

MAYDAY means trouble—big trouble. And May is the month during which we're set to take a searching look at the MAYDAYS that seemingly stalk the trade, at the problems behind MAYDAY and a good, long look at "The Emergency" which always precedes the pilot's call for help.

What makes for MAYDAY? Let's start with the set of circumstances that every Air Force flight begins with, namely, the qualified man or men in the readied aircraft cleared for the takeoff roll. What factors make for the emergency that may or may not lead the pilot to call MAYDAY? Is luck a factor? Or is there in every emergency situation a certain something which can be done before the MAYDAY comes around? Luck is for gamblers, not for you. It may be there but the man who depends on luck in this business never wins. The laws of failure are not the laws of chance. MAYDAY means that something or someone has failed. It starts with you.

You are given an airplane to fly. You've got to know this airplane inside and out. There shouldn't be a single rumble in your bird that doesn't give you a message. You've got to learn its language, the sounds and signs with which it warns the knowing listener that something is wrong. More than that, somewhere within the four million brain cells with which you think and learn (and remember what you have learned), you should have catalogued and ready for

MAYDAY!

instant use, all of the factors involved in the flight of your particular aircraft. No matter how hard pressed you are for time, this is important.

This means you should foresee any emergency that might arise and have in mind a plan of action to take. Speed alone—the speed with which things can go wrong—establishes this necessity. When the red light goes on there isn't much time for you to meditate. All the choices available to you in that time of emergency should be obvious immediately. You should know exactly what you can and can not do.

Too many men have wondered when they should have known. The history of pilot and aircrew reaction to an emergency situation, too often tells the story of a failure to hear the aircraft's warning voice, a failure to see that trouble is imminent and a failure to know just what to do when the warning light comes on suddenly.

That's why we've declared this to be the month to feature MAYDAYS, to let you know that luck is no substitute for knowledge, that trouble begins right where it ends—with you—and that, in flight, a poorly educated guess is worse than ignorance. You might just guess you can do something that can't be done and that, my friends, is not professional. And a professional pilot is what you've got to be! You've got to know yourself and you've got to know your airplane. There isn't any other way to keep from yelling MAYDAY loud and clear when you don't know why in the world this one gray day had to dawn.

Mayday • Mayday

A FLIGHT OF three F-86Fs departed on a cross-country and it was an uneventful flight until they reached their destination. At that time the leader experienced UHF transmitter failure and visually instructed a wingman to take over.

The flight entered initial and the pattern and approach appeared to be normal. Two of the aircraft landed but the pilot who had radio transmitter malfunction, initiated a go-around. He advised the tower by rocking his wings that he was remaining in closed traffic. On downwind he was cleared by the tower to land and he acknowledged by again rocking his wings. After rolling out on final, however, he was advised that his gear appeared down but the gear doors were still open. He continued on course roughly parallel to the runway, toward the control tower. His airspeed was very slow and apparently he was attempting to get a gear check by the tower. Just before passing it, his aircraft started a diving left turn. He recovered partially but his airspeed was obviously too slow and he contacted the ground in a wings-level attitude. The '86 began breaking up on ground contact and was totally destroyed. The Air Force lost another pilot.

Comments: Investigation revealed that this pilot had an unsafe gear indication but there were no power difficulties. This is an example of how an inflight emergency distracted the pilot to such an extent that his aircraft was stalled into the ground.

■ ■ ■

THIS ACCIDENT happened during the landing phase of flight when the pilot of a T-Bird overshot the runway and intentionally retracted the landing gear. The pilot took off on an IFR flight, 1000 on top. Upon leveling off at 25,000 feet, the fire warning light came on, went off, then came on again. The pilot reduced power and the light went out. A few seconds later, fuel fumes were detected in the cockpit. The pilot declared an emergency and returned to the field. Weather was 2000 feet and two miles in haze and smoke. The pilot sighted the runway from 5000 feet over the range station and attempted a traffic pattern to the downwind runway. He was too high and too fast but elected to crash land at 200 knots IAS. The aircraft was damaged. Neither pilot was injured.

The final evaluation of this accident was supervisory error in that the IP did not follow the Dash One procedures to determine if a fire did exist. An additional cause factor was poor technique in the traffic pattern.

Essentially, the evaluation read like this: The presence of fuel fumes in the cockpit plus an indicating fire warning light would indicate a dangerous situation. However, the statements of both pilots indicate that raw fuel fumes were detected several seconds after the fire warning light illuminated and immediately after the throttle was retarded. It is not unusual to detect fuel fumes momentarily in the T-33 aircraft, following power reduction. It is significant that neither pilot reported the presence of fuel fumes during the remainder of the flight.

A prolonged fire presents the danger of destroying control push rods but the danger of explosion is at the time of primary ignition. The fact that the pilot continued to operate the aircraft engine indicates that he did not believe that an explosion was imminent and that there was some doubt that a fire did exist. After several minutes of operating at reduced power setting, the pilot would have had definite indications if a fire actually existed.

The procedures outlined in T. O. 1T-33A-1 regarding fire warning and overheat lights are considered adequate. The caution, "The lights may come on because of a short circuit," as well as the step procedure to determine if a fire exists are the result of the aircraft operational history.

If a fire does exist, the procedure is:

- Throttle off.
- Main fuel shut-off switch closed.
- Elect to bail out or crash land.

After declaring an emergency, the pilot accomplished a letdown and arrived over the range station at an altitude of 5000 feet. From this point, he had the runway in sight. A straight-in approach permitting a GCA would have been expeditious and would have been directly into the wind which was recorded at 10 knots with gusts up to 21 knots. Electing to establish a traffic pattern and land downwind indicates questionable judgment by the IP and the pilot. Improper technique was employed by the pilot throughout the traffic pattern in that excessive airspeed was maintained as the aircraft approached the runway. Under the existing conditions a deliberate crash landing was considerably more hazardous than a go-around or a close-in procedure to the active runway.

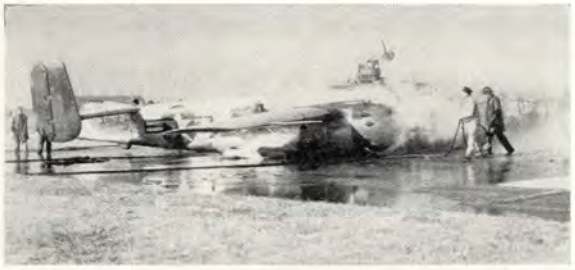
WHILE TWO F-89s, on a scramble mission, were passing through 20,000 feet, the leader heard a strange thrashing noise in his aircraft. He called to his wingman and asked him to fly under his aircraft to see if something might be hanging from it. Number Two closed on the lead aircraft at an excessive rate and flew under the leader and the tail of his aircraft struck the right wing of Number One. The lead aircraft went into an uncontrollable spin. The pilot finally ejected but the radar observer was unable to remove his safety pin and was killed in the crash. Number Two aircraft pitched up violently after the collision and became uncontrollable; both the pilot and observer ejected successfully.

Comments: Another case where an inflight difficulty plus pilot carelessness resulted in a major accident. The leader was so intent on identifying an unfamiliar sound that he neglected to see the rapidly closing wingman. The wingman was so absorbed in signs of damage to the lead plane that he failed to provide adequate separation.

■ ■ ■

AN F-84F PILOT experienced partial loss of power while flying at 34,000 feet on top of a broken to solid overcast. Switching from normal to the emergency fuel system failed to remedy the situation. He let down through a hole in the overcast and recognized his position to be 14 miles northeast of his home base. At an altitude of 2000 feet, 70 per cent RPM was maximum available. In this situation, the pilot had to make a quick decision. At this time the pilot's wingman advised him to pull up and bail out. The F-84 was observed to pull up, but the pilot made no effort to eject. The pilot then transmitted that he would attempt an emergency landing on a small abandoned Army airfield. Lining up with an access road to the airfield, he lowered flaps and continued his approach with the gear retracted. The '84 struck trees several hundred feet short of the airfield, exploded and disintegrated. The pilot was fatally injured.

Comments: The accident investigating board determined that a clogged, low-pressure fuel filter caused the loss of RPM. The pilot, with only 19 hours 30 minutes in the F-84F, chose to descend through an overcast and attempt an emergency landing on an extremely short strip rather than eject. There are times when the ejection seat is the wisest and safest way out of a bad situation. This is one of those times when the trigger should have been squeezed.



It was one of those weekend trips when nothing goes right. The pilot was on his way to Boontown, near Philadelphia, in a T-33. He made a refueling stop at Alpha Air Force Base without official orders. A discrepancy was filed against him. "This," he said in his incident report, "was the beginning of my bad luck." From here on the ride was rough.

Published four years ago in FLYING SAFETY, this pilot's report is reprinted now because it underlines the deadly fact that a series of little errors can lead to a big emergency. The lessons you can learn from this account still apply.

Remember, this happened as it is told. Only the names were changed to protect the human factor, a handful of men whose tendency to err almost resulted in a fatal accident.

In God We

BEFORE TAKING off from Alpha, I checked all the NOTAMS and even the Airman's Guide for anything on Boontown. Everything looked okay, so I took off. When I arrived over Boontown, however, the tower told me the people who were supposed to meet me there were at Oakville. "Great," I said, "but my clearance says land at Boontown."

"Well, you can land here if you wish," the tower came back, "but we only have 3100 feet of runway because of a construction job going on." I told them the NOTAMS didn't say anything about that. "It's true, anyway," they said, so I changed my flight plan to land at Oakville.

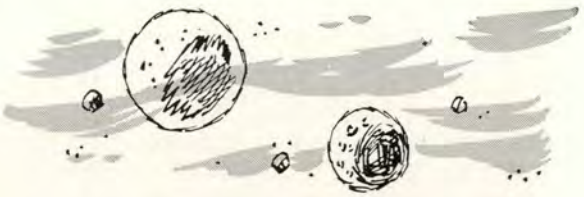
There I came over the airport, called on initial, called on the pitch and then base leg. As I turned onto final, the runway ahead looked six inches long. I called to ask how long it actually was and they said 4000 feet. The shortest runway I'd ever landed on was 5000 feet.

That wasn't all. I had about 360 gallons of fuel aboard. At this end of the runway was a fence, a road and some large colonial type houses with tall, peaked roofs. I don't think they'll need any coal this winter. I warmed them up pretty well with my tailpipe coming in. Somehow I pitched at the right spot and turned on base and final at the right places, a perfect approach for landing. I landed just down from this end of the runway with plenty of room to stop.

Now, since the longest runway at Oakville is only 4000 feet, I told them not to put more than 60 gallons of fuel in each tiptank. I'd go on to Lima AFB and get refueled there in the morning.

"Roger," they said. But after making out my clearance the next morning, I walked on out to the aircraft and found that they'd put the full 230 gallons in each tip. The runway looked even shorter than it had the day before. In addition to the construction at one end, there was a hill at the other, and what had been

Here is an article that a pilot took time to write after a rather hair-raising experience. There are many lessons to be learned here, not the least of which is "Share your near-miss tales."



Trust . . .

The T-33 is a real, good bird, but when you goof around like I did, watch out!

three tall, sturdy oak trees. Now there were only two. Someone had chopped the middle one down. But there were high tension wires to fill this gap.

I cranked up and taxied out, sitting there for a while at 92 per cent, burning out some of my fuel. There was practically no wind, but fortunately, it was fairly cool.

The Takeoff

Finally, I said to myself, "Well, I think I can make it." I pulled my flaps up, moved onto the runway and ran 'er up to 100 per cent with the brakes on. Releasing the brakes and starting the takeoff roll, I discovered something else. Not only was the runway just 4000 feet, and cut off by the trees it was also *uphill.*

As the airspeed came up to around 100 mph, I put the flaps down to 30 degrees, brought the nosewheel up and finally staggered off between the two remaining oak trees, clearing the high tension wires only by inches. I was on my way.

Misreading my radio compass, however, I missed Lima AFB by 20 miles or more. Even then, when I finally found the field, I landed ahead of my ETA—with winds almost 180 degrees opposite those on which I'd been briefed.

It was now Sunday afternoon and, although I hadn't planned it this way, I'd have to do some night flying to get back in time. It was then that I remembered I had no flashlight. I tried to find one at Lima but everything was closed. Base ops had none. Personal Equipment had none. So—at last I told myself, "Well, I won't need one anyway." I filled out my clearance and went to the airplane.

There I sat in the cockpit waiting for ARTC clearance with an APU plugged in, standing by on the radio. When the clearance came, I copied it down, repeated it back to the tower and signaled to the crew chief to watch for the start. It was a good one. I looked back to signal the crew chief to pull the APU. Reached over to throw the battery switch on — and then out of the corner of my eye I happened to catch a glimpse of a red flag. The canopy pins hadn't been pulled. I called the crew chief. And this is where I really slipped up.

I took my hand away from the battery switch. It was off. (After the pins had been pulled, I just forgot the switch.)

It was still off as I climbed out on course and broke into the overcast at about 6000 feet. It was off and forgotten as I continued climbing on up to 35,000, my assigned altitude. There were none of the layers that the weather office had predicted. It was a solid overcast all the way up and not a bit lighter at 35,000 feet. This didn't make things any easier.

As all of you know who've tried to tune in a station on the ARN-6 radio compass in the T-33, when you are in visible moisture or precipitation, in clouds or in the vicinity of a thunderstorm, the static is so complete on the set that you can't identify the station. All you can do is crank the handle close to the kcs and hope you've got the station you want. That's what I hoped. I did some guessing too. I knew I had an effective headwind of approximately 80 mph so I continued on course until by dead reckoning I should have been pretty close to Leetown, North Carolina.

In the meantime I'd made another mistake. I hadn't been briefed on ice, I was supposed to be clear of all clouds, no visible moisture—but as it turned out I had taken off IFR into possible icing conditions. The airplane started to get sluggish. Looking out at the tiptanks I saw about seven inches of ice cones sticking out on the leading edges of the tanks. Then I remembered that I hadn't turned the pitot heat on. I reached down to turn on the right console lights so I could see the pitot heat switch.

Then I looked back up at the flight indicator, straightened out my wings and reached down again to locate the switch. I felt it, took a quick glance down (flying in bumpy weather with my left hand), straightened the wings again, took another quick check of that switch just to make sure I had the right one, and pressed it.

Not knowing it, I hit the emergency fuel checkout switch instead and the sudden surge of fuel drowned out my flame.

Never in my life have I felt so lonely. It was quiet, real quiet—the

After I got a start, I looked back to see if the APU was pulled. I never did turn the battery on.

derndest quiet I've ever heard. There I was at 35,000 feet on solid instruments with my first flameout in an aircraft with which I wasn't too familiar (I had only 150 hours in the T-33). And I began to panic.

I was just about ready to begin an airstart when it suddenly occurred to me that an airstart shouldn't be tried above 25,000 feet. I had 10,000 feet to lose. I decided to lose it quick, make an airstart and come back up again. I lowered the dive flaps and lowered the nose to pick up that 25,000-foot level as fast as I could, paying strict attention to the RPM. At 25,000 feet I drained the tailpipe, the hardest thing in the world to do when you're on instruments.

Then I hit the airstart switch. The RPM had dropped to 20 per cent. The lights dimmed, the radio went out and I had no more electricity. I knew that as soon as the electrical power failed I'd be flying by the airspeed, period. But the needle and ball are the last of the gyro instruments to go out. I went immediately to airspeed needle and ball and RPM, trying to keep the RPM up to the desired 10 per cent. It wasn't easy to see the instruments, however. I certainly missed my flashlights then. I loosened my shoulderstraps to lean forward over the stick. I must have been three inches from the panel. Even at that I wouldn't have seen very much if it hadn't been for constant flashes of lightning. Every now and then a sheet of lightning would come just in time to help me get out of a tight spiral. My windshield was a solid sheet of "St. Elmo's" fire.

Well, I pulled up the dive flaps so I could get the desired RPM and the airspeed necessary to hold it without losing too much altitude. And I made seven panic airstart attempts! Nothing happened. It wouldn't start.

In the vicinity of Leetown, the highest mountain is somewhere around six to nine-hundred feet. I knew that long before I got that low I'd have to get out of this thing, if it didn't start. As I passed through 10,000 feet, I tried another airstart, going this time directly by the checklist to make sure I didn't forget anything. Still nothing happened. I hit the panic button again and started to get out, moving baggage, maps, everything else away so I could pull the yellow handle on the right hand side and blow off the canopy. I had already practiced putting my feet in the stirrups and lowered the seat as far as it would go. I was ready to leave. And all I could think of for a moment was my wife, waiting for me at base ops. She was sure going to be mad about this. I was standing her up.

I managed to control myself a few moments more and tried to think of the reasons why I wasn't getting an airstart. There were two of them, I decided. Number one: It wasn't getting fuel. I discounted this because I knew the fuselage tank had fuel. Number two: It wan't getting any spark. Probably my battery had gone dead on the first airstart—could have been old, wornout. Then I thought, "Maybe the battery switch is off. No," I said, "the battery switch is ON. I remember turning it on at Lima. Well—" I told myself then, "don't be so dern stupid. Check it!" I reached over then and found that the switch was OFF.

Close to God

I turned it on. The radio came back on, the lights went on, and the instruments began to bobble around. Right then I felt like I was pretty close to God again. On the next airstart, she fired right up—just as though nothing had ever happened, just as though that's the way it was written in the book.

I was around 8000 feet so I rode on down to 6000 and got enough RPM and airspeed to get my throttle around the horn. My radio was operating now so I immediately started calling in the clear for any D/F station that read me, to give me a call on guard channel. Sierra AFB answered and said they were reading me loud and clear. I told them to please notify all appropriate agencies that I had flamed out and had come all the way down through Green 5 from 35,000 to 6000 feet, with no radio contact. Also, I told them that I was going to climb back up to at least 25,000 feet to an altitude consistent with good fuel usage.

They answered, "Stand by." Then, added, "ARTC advises that you remain at 6000 VFR. They have heavy traffic in that area."

I called Sierra and said, "You can tell ARTC that I'm lost. I don't know exactly how much fuel I have left and I'm going up to 25,000 feet or higher to an altitude consistent with good fuel usage."

They answered, "Roger. Stand by."

So I stood by a little longer and they came back with, "ARTC insists that you remain at 6000 VFR."

I called back that I could not remain there and that I was going up to 25,000 feet. "I've declared an emergency and if they have other traffic in the area, have them get it cleared out."

They said, "Roger. Stand by."

And, finally, they came back with "ARTC clears you to 25,000 feet."

As I climbed up through 14,00[illegible] feet I gave Sierra my first tone for a steer. My heading to Sierra was about 201 degrees.

I had been pretty proud of my instrument flying prior to the flameout. I had been holding my heading within three to four degrees either side and my altitude to within 100 to 200 feet in bumpy weather at 35,000. I was really proud of it. But, after the flameout and after I had climbed to 25,000 feet, Sierra would occasionally ask for my present altitude. I would say, "27,000 feet." They would call me about five minutes later and I'd say, "22,000 feet." I couldn't hold my altitude within 5000 feet.

I called Sierra and asked what the weather was down there. They answered that they were okay and for me to come on down. I called them once more and requested their weather. Again they answered, "We're okay. We can get you in fine. Come on down." I called a third time and they answered. "There's no sweat." So I called again and said, "I *demand* the weather." Sierra answered, "We have a 700-foot overcast with 100 sc[illegible] tered, visibility one mile, with ra[illegible] and fog." I immediately started a

one-eighty and told them that I was sorry but I wasn't going down there, and began calling for any other D/F homer that could read me.

Samtown, South Carolina, tower called me and said Apple Valley D/F homer was reading me, but that they had a weak transmitter and I could not read them. There was a long distance telephone line open between Apple Valley and Leetown for this emergency, however, and they'd be glad to relay any steers from Apple Valley to me. Apple Valley's weather was 3000 feet overcast. I transmitted for one minute for a steer. They came back with a heading of 110 degrees. I called Sierra and told them I was going to Apple Valley and to stand by for any D/F steers.

Echo Radio called and said, "We understand that you're having a little difficulty. Can we help you?"

"Roger," I said. "I have a heading of 201 degrees to Sierra and 110 to Apple Valley. Get out your maps and rulers and tell me where I am and how far it is to Apple Valley."

It was solid overcast all the way up and not a bit lighter at 35,000 feet.

They called back in two or three minutes to say that I was about 175 miles from Apple Valley.

I looked at my fuel gages. I had plenty—enough to mess around a bit and that was fortunate. I kept getting steers from Apple Valley and some from Sierra, then I'd transmit them to Echo and they'd spot me again.

But I was back in the soup at 25,000 feet and couldn't tune that radio compass. Here's another error. I had no map of the Apple Valley area. I had a Radio Facility Chart but I couldn't get it out of the map case. It was lodged between the East and West Handbooks and the Jet Letdown Book. I even tore the cover off the West Handbook trying to get it out. I had no way in the world of knowing the frequency of the range station at Apple Valley so I called and asked them to give it to me. I had to ask four times before they were convinced that I was in trouble. I tuned as close to the kcs as I could get. I flicked over to the compass position. I noted that the tune for the max needle was deflecting when the station identification letters were sounding. I heard an "M" and a jumble of static, then a "P" so I figured I had the right station tuned in.

Echo Radio had me in pretty close to Apple Valley. The compass needle was reading about four or five degrees off my nose. When the needle swung to the full rear position, I called the tower and told them where I was and asked for the heading of the range leg where I was to make my letdown. They said to make a standard jet penetration. After calling them two or three times I finally got out of them that they wanted me to let down on the southeast leg on a heading of 140 degrees.

I turned back in 180 degrees to the range station and hit it, tracked out for a minute or a minute and a half, and made a high-speed letdown at 325 mph, made my jet penetration turn and started back in.

At an altitude of 3000 feet, I figured to break out under the overcast. At 3000, however, I was still in the soup so I called for anybody who could read me and asked them to give me a call.

Finally, Lima tower answered that they could read me, but weak. I was reading them fine and said so, and asked for the minimum altitude and weather. They answered, "3000 overcast, with five miles visibility." I kept on at a 320-degrees heading and broke out about 1100 feet over the ground and called back to ask the heading from the station to the field.

If I hadn't been in a sweat when they told me, it wouldn't have been a puzzle, but when they said the heading from the range station to the field was 140 degrees, I was lost—really lost. I nearly gave up again, right there. I was now heading 320 degrees and I couldn't figure out why they wanted me to turn. I was just about to hit the panic button again when it occurred to me that the field was between me and the station.

I drove on in just under the ragged edge of the overcast until finally I saw the blinking light, the double white with the green on the back, flashing from the beacon at Apple Valley. I called, then switched over to tower frequency and said that I had the field in sight. Believe me, it never looked so good.

At Last

Down on the ground again, I sat there for 15 minutes before I could even get out of the cockpit. I had made all the errors I cared to make.

Back there when I had reached down for the pitot heat switch I had, of course, hit the checkout switch instead. I couldn't make an airstart at first because my battery switch was off. A flashlight might have helped me, too. I've always carried a flashlight prior to this trip. (I've been carrying one since 1942.) This is the only time I ever forgot to turn on the battery switch and it is the first time I ever had a flameout. It's the first time I ever hit the checkout switch while in flight and it's the first time I ever hit it without being prepared for such a thing.

It is not the first time I have made a flight without maps of the complete area, but it is one of those things—you never expect to make better than a 180 and come back to an area that you don't ordinarily hit. All the same, it was a mistake. I should at least have had a jet handbook.

And as soon as I discovered my flameout, I should have called ARTC immediately to let them know that I was in an emergency. But it was one of those times when pride jumped in and said, "To heck with it. Don't let anyone know you've had a flameout, especially since you did it yourself. You can get back up before you reach 20,000 feet—no sweat."

As you can see, each of these little details in themselves would not have placed me in serious trouble. It was the accumulation of all these errors during one flight that nearly ended my Air Force career. ▲

Here's hoping you never have to get a flamed-out jet into an airfield. But if you ever do, here are a few tips that may stand you in good stead.

...on the short

THE MAGIC word came over the UHF monitor in Operations — "Flameout!" And the effect was electrifying.

The pilots cast inquiring glances at each other: Who is it? What is his position?

Then came the answer: "Green Flight, go to emergency channel and keep quiet."

The boys in Ops pressed closer. Captain Dief, the Ops Officer, switched to guard channel.

"Mayday here — Mayday! Clark Tower, this is Green Lead. I'm flamed out. I'm coming in to the south—right now—so clear the field. Green three, are you with me?"

"Five square," came the answer. "Roge, you handle the conversation from here in."

This told the pilots in Ops all they needed to know. They started for the ramp in a dead run, the incessant ringing of the crash phone giving length to their strides.

Green flight had just taken off and Sam Croner was leading. There were only three T-Birds in the flight so Captain Croner had briefed for a V-formation. They had taken off to the north. Sam held it down to pick up climb speed, then rolled in to his first turn just before reaching the town of Mabalacat.

As he rolled level, Brink slid underneath, already reversing his bank to close on the outside wing. In no time at all, Lieutenant Brinkman socked it in. A glance to the right showed that Lieutenant Baker was closing nicely.

The leader held steady to allow No. 3 to position before the turn away from him. Then, as Captain Croner was looking his wingman right in the eyes, it happened! Poof! No steam! Nothing sensational, just the stark and sudden realization that there was no fire in the pot. His first concern was over the ability of the wingmen to clear him. This was solved as swiftly as the thought. They were in close, but properly. The prescribed stack-down had given them enough room to slide right by. As soon as the wings were clear, Captain Croner pitched into a chandelle toward the field. "I'm fat for bailout," he thought, "but maybe I can take it home." As soon as the runway came into sight, he knew he had it made. That's when he called the tower.

Things didn't go well for Sam Croner that day. In retrospect, they hadn't for several days. He was in his second day of the silent treatment at home, and now his second love was giving him some of the same.

He found himself on a wide base leg, with plenty of altitude. Level off, set up at published glide speed and try for an airstart, he mused. Got over 10 per cent rpm — that's good. Now—all tanks on—hit the ignite and hold it a moment. Okay. Now put

He pounded his hand against his helmet and wondered, "What's wrong with my thinking?"

Capt. Harry J. Tyndale
666th AC&W Sq.
Mill Valley AF Sta. Calif.

end...!

He still had plenty of airspeed and altitude, landing was assured.

the fuel to it! A look around to the outside, then a call from Dale Baker: "Get rid of the tips!" Oh yes, we mustn't forget the little things. Sam dropped a wing for a schoolyard check and since there was none within miles, he reached up and depressed the shielded red button. As he did so, he popped the stick to take the weight off the shackles.

His calm glance at the tips revealed nothing. Nothing? This is a hot circuit, wired directly to the battery. It *can't* malfunction!

Three more tries just proved that things are not always what they seem. The airstart had been equally unsuccessful. He still had the right airspeed though and plenty of altitude. The landing was assured. Sam was shook, though. The tips should have gone. He ran the back of his fist down the circuit breaker row and tried again. No good. He ran through another airstart. He tried to find the armament switches to set up a bomb-button jettison. The twisting for vision put him in a near vertical bank, scaring him. "The heck with this stuff —I've got the field made if I pay attention, so take the tips home!"

Another airstart, another try of the button. On final by this time, still fat, but pounding his clenched hand against his helmet, wondering, straining for thought. "What's wrong with my thinking? It can't all be the Bird, I know better than that. I'm doing something wrong. What is it? Why can't I get anything to work? Never

mind, don't distract yourself. Just land the airplane and we'll figure it out on the ground. Get the gear down now, you're high and hot. Test the flaps — well, these two things are working all right anyway. Get the rest of the flaps down or you'll never stop it."

At this time, Sam was about a mile out, at 800 feet. "Never have been so high and fast, this close," he thought. Nevertheless, just moments later he was startled by his rate of descent. "I'll never make it," he thought. And with that, he pulled the gear up. The same instinct had produced a back pressure to break the descent. This was brought forcefully to his attention by a sickening burble. "Now, you've done it, you dumb cluck. A hundred feet to go, and you're already stalled. But, I've got 120 knots; it shouldn't stall yet. You're playing for your life now. Let it drop. Save the control to keep the nose out of the dirt. That's it. Play it right on down. Now, get the nose up and hang on. Stay awake. The tips will blow for sure. Get out in a hurry. Don't breathe. Flash! Fire! Wow! What a shot. Get your head up, keep it straight. No fire, yet. Full left rudder. There, she's straight. But, will it never stop?"

It did—and no fire. Sam was out in a flash. Captain McAdory, the runway control officer, came up in a screeching jeep. "You okay?"

"Rodge," answered Sam, "providing my back isn't broken." He meant it, too, and was making a cautious toe-touch check.

Captain Johnson drifted quietly into the Flight Surgeon's office. The Doc was tapping each of Captain Croner's vertebra with his fingers.

"How do you feel, Sam?" he asked quietly.

Captain Croner strained to look upward from his bent-over position. "Oh, Hi, Bill. No sweat. I got a real jolt on the first bounce but it seems to be all right."

Major Wiemer, the surgeon, concurred, but added that Sam was not to fly until after an X-ray check.

Within two hours, Captain Johnson had explained exactly why Sam had fallen short of the runway. It was as simple as A-B-C, if you had the inside story. The published speed for gliding is an optimum figure, Sam learned. The flameout procedures call for tank jettisoning, so the recommended gliding speed is selected to favor this configuration.

Gliding distance, or ratio as it is popularly known, is a product of angle of attack. Our index for angle of attack is indicated airspeed. The engineers determine the angle that has the best lift to drag ratio. (Eleven parts lift to one part drag, for example.) In the T-33 aircraft, you know this term to mean 11 miles forward, for each mile of altitude.

The engineer then determines the exact amount of dynamic pressure (airspeed) required for this angle to lift the weight selected. In consideration of the fact that most flameouts result from fuel mismanagement, or outright starvation, the weight s[elected] is usually on the light si[de]. The pilot's handbook then appears with a recommended indicated airspeed for gliding. Indicated speed is specified (because this is in reality a reading of the dynamic pressure present at any time) and that is what the airplane flies on. It is a fact then that one IAS will locate one particular angle of attack at one particular weight. That same angle of attack will give more lift if desired, but it takes more speed to do it. Remember? Lift increases as the square of the airspeed. You use the rule every day when you add five knots for each thousand pounds of fuel over standard, on final. You do this for the very same reason—to maintain the most favorable angle of attack for that approach.

He felt his toes and knew he was all right.

The same rule, applied to gliding speed, will make good the gliding ratio, regardless of weight. Yes, a 15,000-pound T-Bird will glide exactly as far as an empty one, so long as the airspeed is corrected to provide a glide at the one proper angle of attack.

If you glide at a slower speed, the attitude may look all right but t[he] sink rate will be much higher. S[am] Croner couldn't detect it until he was within 200 feet of the ground. Maybe you could, but as Sam puts it, it's a small point to bet your life on. Since the facts are available, it is less painful to learn the details of the profession.

The rest of the malfunctions that day took a little more time to account for. The drive shaft for the main fuel control had sheared, and the centrifugal governor had shut off the fuel flow. The cook switch, although alerted, had not detected this.

If Captain Croner had tried an emergency airstart, he'd have flown home under power. However, the emergency procedures are designed to save the majority and suggest a manual try only if there is time available after the automatic try .

How much time is time? A flameout shakes you—restart failures make you wonder—and a salvo button malfunction on top of these can break you into pieces. You get the feeling that you're running out of time. When such a compounding of mechanical failures put your talents test, will you be in a state of mind cope with them? ▲

PANIC-PANIC-PAN

"I'VE GOT a red light on! I'm bailing out!" said the somewhat hysterical voice over the radio.

The flight leader looked around to see his Number Three man hitting the silk. The chute opened successfully and the pilot looked okay. The airplane also looked okay—no smoke, no fire or anything else. It went into a long, shallow dive and exploded as it hit the ground.

The accident investigation board reached the conclusion that the light which came on was a fuel boost light and hardly a cause for hysteria. By reducing throttle and rechecking instruments, the pilot could have returned to home plate. Or, he could have landed at an auxiliary field located less than five miles away. Even if the engine had stopped altogether, he could have made it into the auxiliary field without too much difficulty.

Why? What caused this accident? It could be summed up in one word: PANIC. This pilot was really shook. He couldn't think; he couldn't analyze, but through his state of confusion he was able to make an ejection from a jet aircraft. The basic fact that his instinct for self-preservation allowed him to operate the ejection procedure properly is a strong point. He probably went through numerous dry runs and was well indoctrinated as to what action or procedure to take when bailout was necessary, and this is good. This pilot knew the proper ejection procedure. He practiced it and knew it so well that even in a severe case of panic he did it successfully.

However, the situation of a red light coming on was new to him. Being an inexperienced pilot he became shocked—shocked into the reality that he was in danger. Immediately, he became confused and was swimming in a pool of distorted gages, procedures, questions and . . . no answers except "bail out!"

Another similar accident occurred when a pilot, while flying in a formation of four, called clearly over the radio that he had a flameout and was ejecting. The instructor tried to aid him in restarting but as he turned to help his wingman, all he could see was a big, white parachute. The flight had plenty of altitude and there would have been ample time to try an airstart; and, again, there was a field within gliding range. Why?

What caused this pilot to bail out so quickly? No attempt to make an airstart was made and yet as soon as an unusual situation happened, over the side he went!

Some troops go the other way during their panic seizure. They either do nothing at all or they do everything wrong. Their minds are complete blanks and they can't remember even the basic emergency procedures.

Panic is something we kid about and talk about, but like the weather we do nothing about it. . . . "What happened to Sam?" "He hit the panic button and bought the farm." Nevertheless, a lot of the time it's quite true. Anything different, unusual, out of the ordinary or strange, causes panic. The mind becomes confused because there isn't an immediate answer. A pilot is taught procedures until it runs out of his ears. Some—he remembers, some partially forgets, and others he forgets entirely; thus in doing the latter, he becomes confused and often gets one procedure mixed up with another. This usually is quite true in three main cases: He is either a new pilot (one still in or just out of training), a behind-the-line pilot or a pilot flying an airplane more or less new to him. The new pilot is unsure. He is feeling his way along, like a toddler learning to walk, and almost anything will upset him. The behind-the-line or way-behind-the-line pilot usually isn't too current. He flies as much as possible, but other duties keep him strapped to a desk. He becomes careless on procedures and gets caught with his pants down. The transitioning pilot often does not know his bird. Flying an unfamiliar airplane is foolhardy, especially jets. You may get away with it for a while but take one emergency-type incident and a new piece of real estate is purchased. These three types aren't the only guilty individuals but they are the ones usually the quickest to panic.

Panic in its true form doesn't creep up on an individual or turn on an amber light to forewarn you of an impending danger. It doesn't tap you on the shoulder with a gentle hand and say, "I believe you are going to have a little difficulty, 'ol boy, let's start getting a little panicky."

Panic hits you like a bolt of lightning. It strikes unmercifully. One minute you are calm, with a light-hearted feeling, enjoying the world. Then, cold sweat pops out on your brow and you feel as if the whole world has crashed down on you. Everything closes in. You can't think. You have a feeling of icy fingers crawling up and down your spine and all that was real now turns into a nightmare. The altimeter reads in miles per hour and the airspeed indicator gives you the outside temperature. What is going on? Panic!

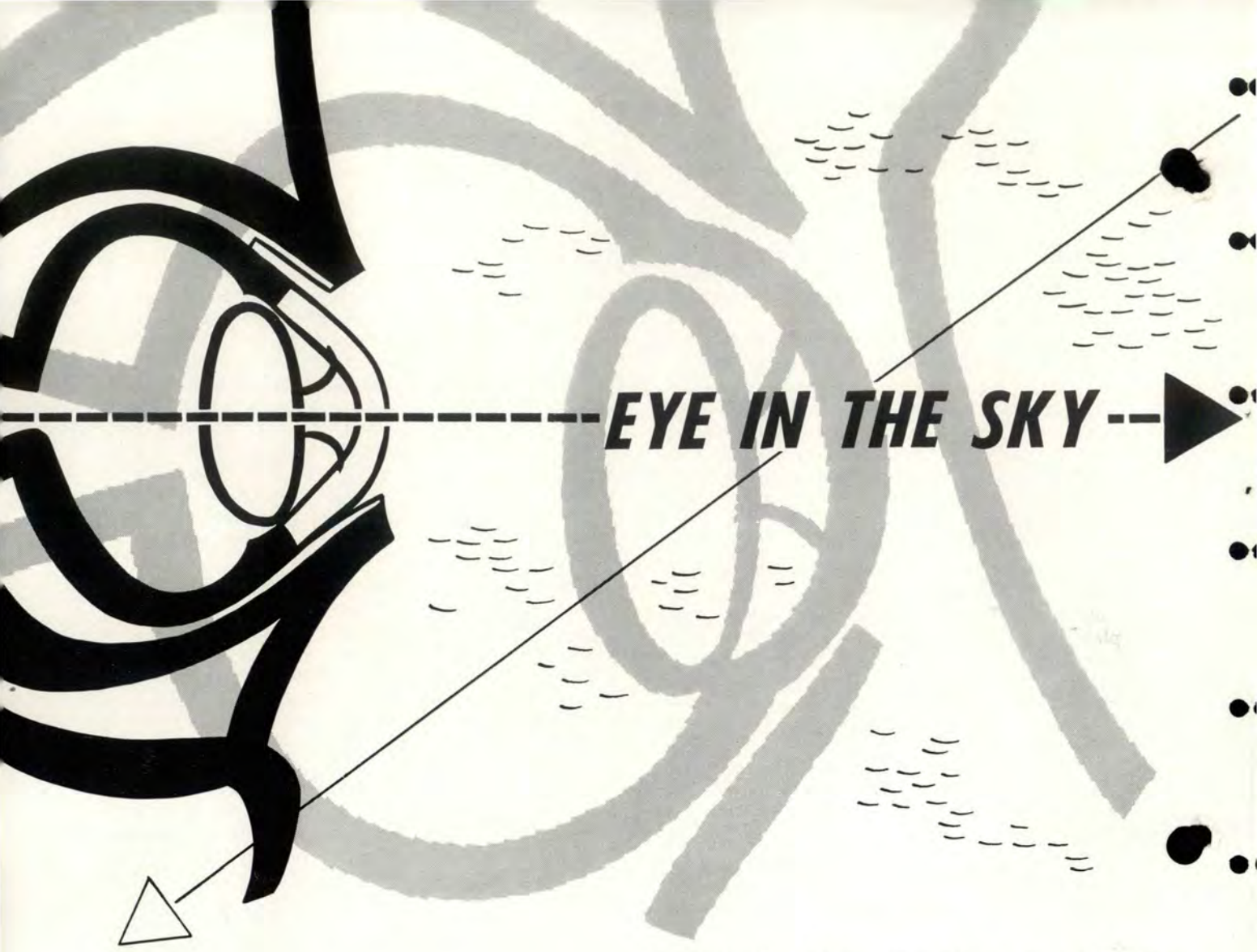
Panic can be combated but not while it is taking place. The antidote must be taken well in advance of the poison. Panic is brought on by ignorance. The pilot must be well versed on his airplane before he flies it. He has to have all the answers.

Probably the most outstanding problem is making sure that you know the airplane. Take a look at the Pilot Operating Procedures once in a while. Check yourself on the questionnaire and carry a little emergency procedure card with you when you fly. It is not necessary to know how many RPMs the engine turns over nor is it necessary to know the composition of a rubber type seal. But, when a warning light comes on, let it mean something. Let it tell you its little tale: "I'm a red light. You're low on fuel . . . better land!" Or, "Your boost pump is out and you'd better switch to an auxiliary tank or you're going to flame out!" That's what your lights are trying to say to you. If it is a fire, the fire warning light will tell you to "Get out!"

It's just good, common sense to learn the basic fundamentals, the operating and emergency procedures. Get to know the cockpit, make it an old friend. Call all of the gages, switches, handles and lights by name, and treat them as you would your best friend. For—unlike your friends sitting elsewhere — these items always will be around when you need them.

Above all, there is no substitute for knowing your aircraft. Being in familiar surroundings is the best way to eliminate that deterrent to common sense—Panic! ▲

PANIC-PANIC-PAN



EYE IN THE SKY

Dr. Walter F. Grether, Aero-Med. Lab. WADC

Here are some interesting facts about your ability to see other aircraft. There are certain times when your eyes just cannot do the job very well.

WHETHER YOU are the pilot, another crewmember or just a passenger, you probably feel safest when the weather is CAVU and visual flight rules are the order of the day. But there is one type of accident for which your chances go way up when the weather is fair. That is the possibility of a mid-air collision.

IFR procedures are designed to keep you a safe distance from other aircraft. Under VFR you are depending on your visual powers and alertness for safe separation. Human vision is a remarkable and wonderful sense. But unfortunately it has certain weaknesses which make it unreliable as a collision warning device. This article describes the most important weaknesses of human vision as they relate to aircraft collisions. This information may help you to reduce your chances of colliding with another aircraft under VFR conditions.

Before digging into the subject of vision itself, let's take a closer look at the mid-air collision problem. Both military and civilian aviation groups have become increasingly alarmed about mid-air collisions and are working hard to find solutions. In November, 1955, the Civil Aeronautics Administration and the Illuminating Engineering Society jointly sponsored a symposium on mid-air collisions, held at Indianapolis, Indiana. From the papers presented at this symposium we can conclude that:

- Mid-air collisions and near-misses are on the increase because of increasing flight speeds and the density of aircraft traffic.
- Most collisions occur during daylight hours in VFR weather.
- A pilot may fail to see another aircraft on a collision course in time

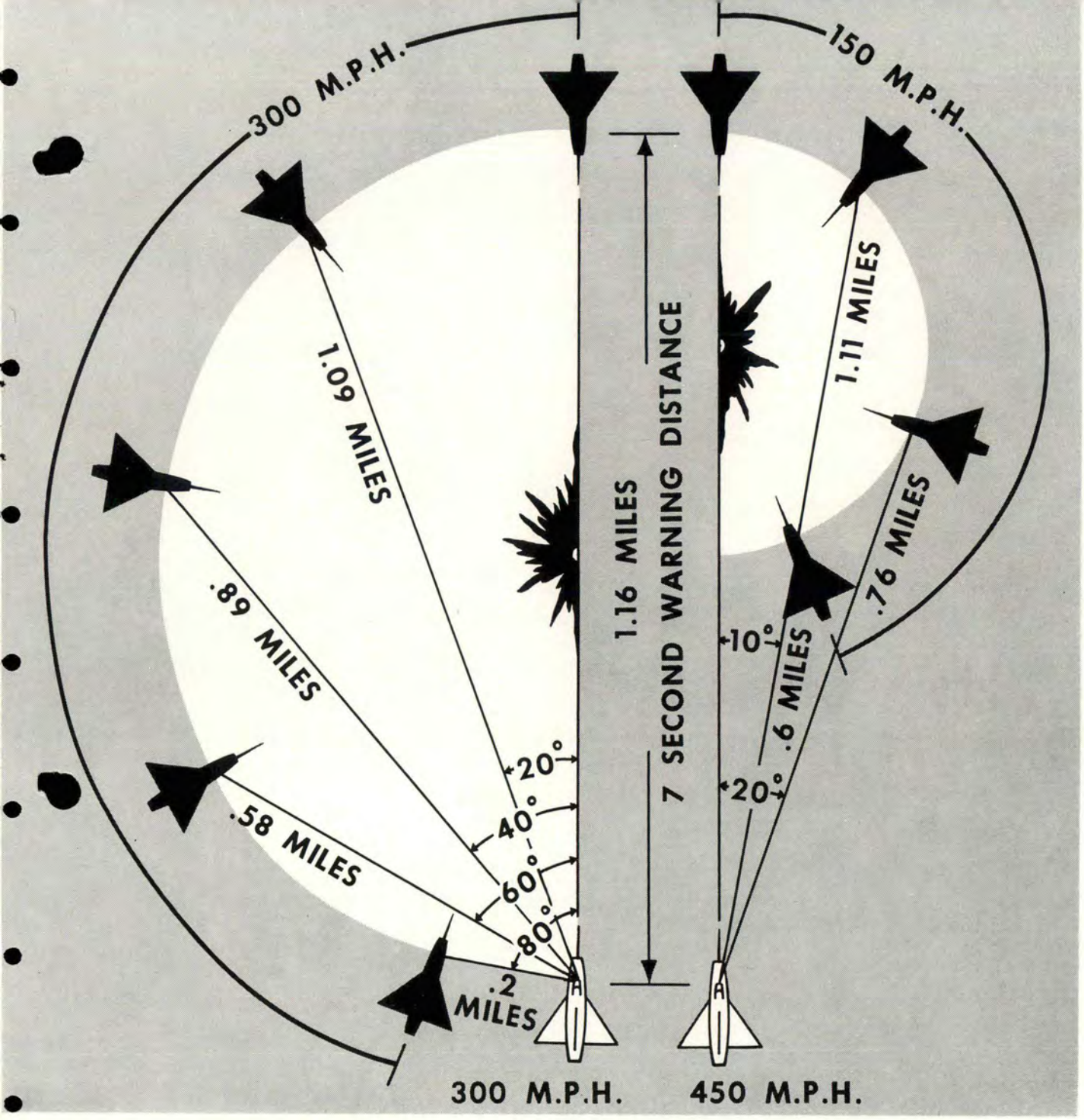


Figure 1. Distances at which other aircraft would appear seven seconds before collision for the two-speed combinations shown.

to avoid it, even though he is looking outside (rather than at his instruments) and visual conditions appear to be favorable.

It is obvious that a pilot cannot see an approaching aircraft if it is obscured by clouds or haze. Similarly, we cannot expect him to see an aircraft which overtakes him from the rear or approaches from some other direction to which he is blind (above, below or behind a windshield post). But with clear air, daylight and an approaching aircraft not hidden by a blind spot, why can we not depend on the pilot's vision to detect the other aircraft in time to avoid a collision? In most cases, of course, one or both pilots will see the other aircraft in time to take evasive action. But there can be, and are, cases where even though the pilots in both planes are alert, their 20/20 vision is not good enough to avoid a collision. Let's see what there is about human vision which permits this to happen.

Seven Seconds

First, let's examine the question of how far away a pilot must detect another aircraft in order to avoid a collision. There is no easy or single an-

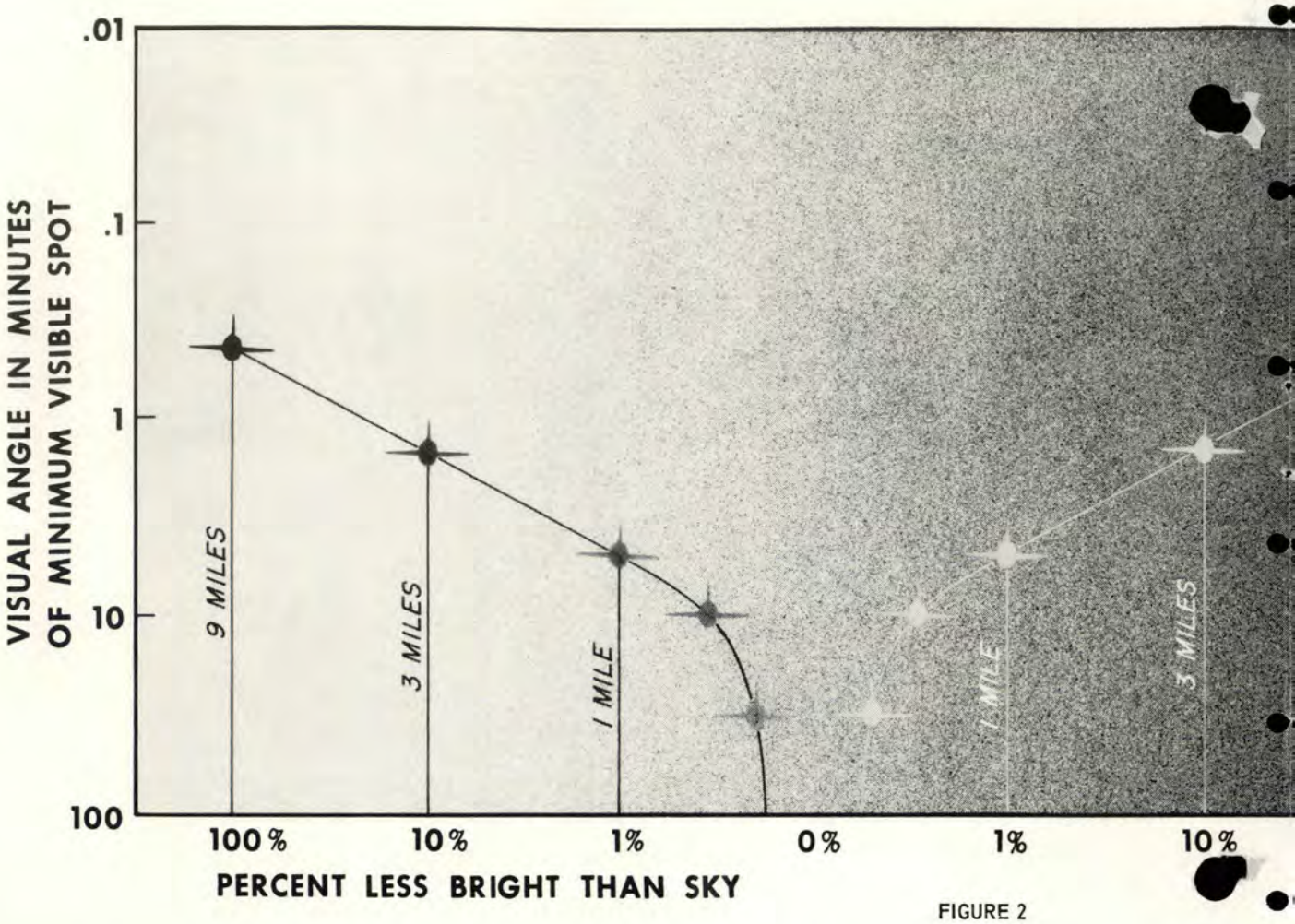


FIGURE 2

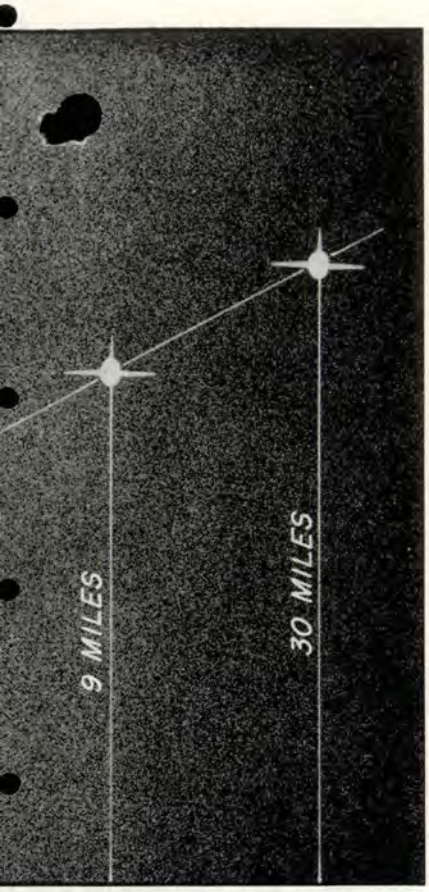
swer to this question. The answer depends on several variable factors. There is a time lag for the pilot to make a decision. There is a further time lag for the aircraft to be displaced from the line of flight. Assuming we have a large aircraft, seven seconds is a rough but reasonable estimate for the combined pilot and aircraft lag. The other variables are the speeds of the two aircraft and the flight path angles.

Distances between aircraft which will give seven seconds warning time are shown in Figure 1 for two speed combinations and a variety of flight path angles. Both speed combinations give a closing speed of 600 miles per hour for a head-on approach. At this rather conservative closing speed the head-on seven seconds warning distance is 1.16 miles. For many of our modern jets the closing speeds, and therefore the seven seconds warning distance, would be about double these values. Figure 1 further shows how the zone of greatest collision hazard changes with relative aircraft speed. The faster you fly, relative to other aircraft, the less you need worry about aircraft off to the side.

There are quite a number of factors which determine how far away a pilot can see another aircraft. Some of these factors are obvious and well known to pilots. Take size, for example. The larger the airplane the farther away you can see it. Even more important is the amount of daylight. In dim light, such as we have at dawn and dusk, aircraft are hard to see. At night we must rely on external lighting to make aircraft visible. Against the blackness of night external aircraft lights show up at a great distance and pretty well take care of the collision hazard. Against the brighter skies of dusk, dawn and daylight, however, external lights are much harder to see and are of little or no benefit for preventing collisions. Why aircraft visibility is increased by external lights at night, but not in the daytime will be explained later. Some other obvious factors which cut down aircraft visibility are glare from the sun, dirty windshields and canopies and windshield angle in relation to the line of sight.

Visual Acuity

Seeing an aircraft is basically a problem in visual acuity. For an aircraft to be visible, its angular size (visual angle) must exceed the threshold angle for visual acuity. In this case we are talking only about visual acuity for seeing a spot against a uniform background. We call this minimum visible acuity as opposed to minimum separable acuity (which applies to the minimum gap the eye can resolve). As a rough rule of thumb we say that the threshold visual angle is about one minute of arc. This means that a round spot must have an angular size of one minute at the eye in order to be visible. At one mile distance, one minute of arc is 1.5 feet. As is so often the case, we encounter some difficulties when we try to translate this rule of thumb into



size and distance for visibility of an approaching aircraft.

Aircraft aren't nice round spots and the size and shape depend upon the angle from which you see them. But let's say we have an aircraft with a 10-foot fuselage cross section, coming head-on. If we ignore the wings and tail, which add very little to visibility when seen head-on, we come close to having a round spot. A 10-foot spot will give us a one-minute visual angle at about seven miles. Seven miles is about right for the maximum distance for spotting a small to medium size aircraft, such as a large fighter. For a large bomber viewed broadside, this distance may be more than doubled.

If we can see a fighter aircraft at seven miles, then why should we have a collision hazard under VFR conditions? The one minute of visual angle and seven-mile distance apply only when we have highly favorable conditions as follows:

- We have daylight lighting.
- The pilot's eyes are focused for distant vision.
- There is high brightness contrast between the aircraft and background (sky, clouds or earth).
- The pilot is looking directly at the other aircraft.

As we depart from the above conditions the threshold angle and visibility distance will change. Most changes will be in the direction of reduced visibility distance. Only conditions which increase contrast (such as glint from the sun and external lights at night) will increase the distance.

The need for daylight lighting conditions is obvious and well known. Visual acuity diminishes as the amount of light is reduced. At night we must rely on external lights to make aircraft visible.

Not so well known is the difficulty of the human eye in focusing for distant vision when looking into the sky. To focus for the proper distance, the eye needs sharply defined objects to focus on, which are lacking in a clear sky. This focusing difficulty is usually called "altitude myopia," since it results in the pilot being focused for near vision when he should be focused for distant vision to see other aircraft. When this occurs he will not detect aircraft at maximum distance even if all other conditions are favorable.

Contrast

Let us see how visual acuity and viewing distance are affected by contrast. The approximate relationships are shown in Figure 2. By contrast we mean the brightness difference between a target spot and the background against which the spot appears. Normally this difference is expressed as a percentage of the background brightness. If the spot is darker than the background the contrast cannot exceed 100 per cent, and has a negative sign.

If the spot is brighter than the background, the contrast is positive in direction and approaches infinity as a limit. As will be seen on the graph, our rule of thumb of one minute visual angle holds only when contrast is at the highest point.

As contrast approaches zero the threshold visual angle becomes very large. At zero contrast the threshold angle becomes infinitely large, and the visibility distance for a target of fixed diameter becomes zero. As shown in the illustration the threshold visual angle becomes very small as high values of contrast are reached. In fact, the stars we see at night are effectively point sources, with no measurable visual angle.

Let's see now what kind of visual contrast values we can expect to meet when trying to see other aircraft for avoiding collisions. The background will either be earth, sky, clouds or haze, at or near the horizon. All of these may be relatively light or dark, depending on weather, time of day, azimuth angle and other factors. Likewise, the brightness of the threatening aircraft can change through a considerable range. Likely as not the other aircraft will appear as a dark spot against a lighter background of haze.

If lighted by the sun the other aircraft may instead appear lighter than the background. Sometimes glint from the sun will make the aircraft appear as a very bright spot, visible at great distance. The main point is that under some conditions the aircraft and the background will have very nearly the same brightness. This condition of low contrast means very low visibility distance. Under some combinations of lighting conditions the visibility distance will be less than the 1.16 miles required to give a seven-seconds warning at 600 miles per hour closing speed.

There is another characteristic of human vision which is probably even more important in relation to the collision hazard. This is the reduced visual acuity in the periphery of the eye. In fact our threshold visual angle of one minute holds only for a few degrees at the very center of our visual field. Go out only ten degrees from the center of vision and the threshold angle has gone up to about 10 min-

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About the Author

Walter F. Grether holds a Ph. D. in Psychology from the University of Wisconsin. He has been with the Aero-Med Laboratory at WADC since 1945. In 1953 he received the Longacre Award for outstanding contributions in the design of instruments for easy reading.

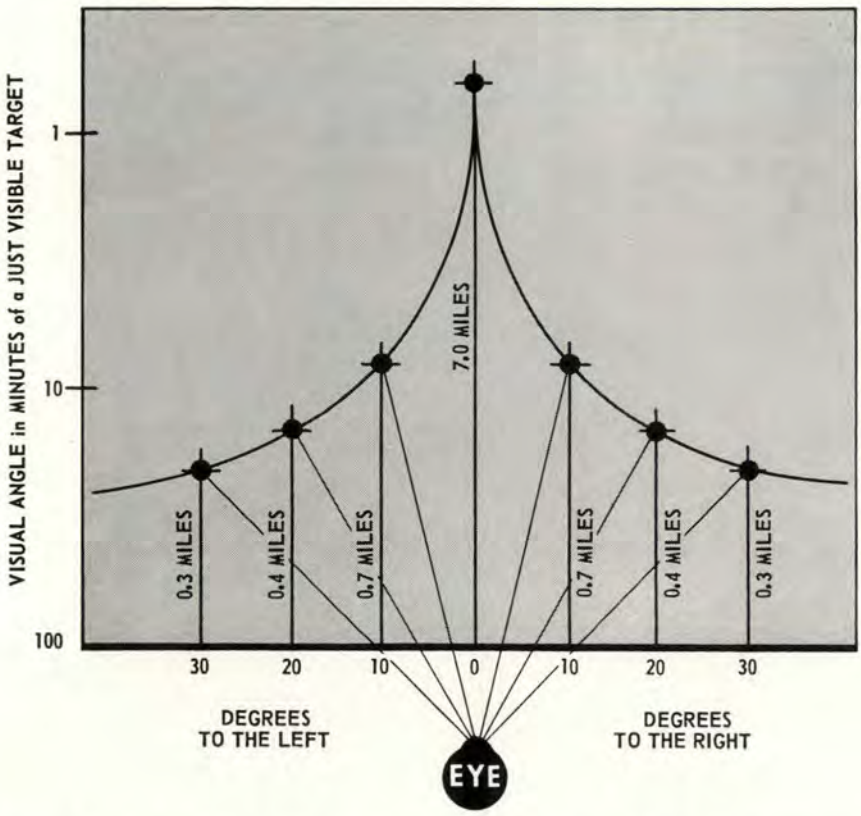


Figure 3. The effect of offset viewing angle on detection distance for fighter size aircraft.

utes of arc. At 30 degrees out the threshold angle is way up to about 30 minutes. Even this value is for high contrast. For lower contrast values the visual acuity becomes even poorer.

Viewing Angle

From Figure 3 we can see that the pilot will pick up another aircraft at maximum distance only if he happens to look or fixate his eyes within a very few degrees of its position. In scanning the sky he may easily fail to look in the particular direction from which another aircraft is approaching. Each look or eye fixation normally takes about .5 second. At very high closing speeds this means a relatively few fixations between the time another plane could possibly be seen until it is too close to be avoided. It is easy to see that there is a considerable element of chance here as to whether a pilot will happen to look at the right place at the right time. Unless he does, another aircraft can sneak in close before he will see it. Even for very favorable contrast conditions the pilot must fixate within about five degrees of a target aircraft, of fighter size, to pick it up at our critical distance of 1.16 miles. The combined effects of low contrast and off center vision give us very poor visual acuity, to say the least.

From the foregoing, it is easy to see why a pilot's vision under VFR is not an adequate safeguard against mid-air collisions. Whether or not a pilot will see another aircraft in time to avoid it will depend on the particular light and contrast conditions and the way he scans the area ahead and to the sides.

From the information about human vision presented here, what suggestions can we make for reducing the collision hazard through pilot scanning techniques, aircraft exterior points, lights or similar means?

Assuming that a pilot is alert and watching for other aircraft, there is not much more he can do, except to be sure that he makes good use of the time spent in scanning. He should scan systematically over the entire area from which threatening aircraft are most likely to come. Normally this will be the area fairly near the horizon. The distance he should scan on either side from dead ahead will depend somewhat on his own speed.

For very fast aircraft the greatest danger area is in a fairly narrow angle directly ahead. For slower aircraft the danger area extends much farther out to either side and includes the rear. The pilot should be careful to avoid spending too much time scanning a limited area, causing him to neglect other areas which should be covered.

Exterior Paint

Although exterior painting of aircraft might be considered as one solution to VFR collisions, it actually has little to offer. Black paint would improve somewhat the visibility against light backgrounds, as would white paint against dark backgrounds. But for either the black or white there will be (as for natural aluminum) some conditions of light and background where the contrast (and hence the visibility distance) is too low for collision avoidance. Use of colors—such as red, orange or yellow — likewise would not offer sufficient gain to justify their use, since, at extreme distances, the color is not visible. Even at closer range the color may not be visible if the observer sees the shaded side of the aircraft. Under special conditions of low brightness contrast, there would be some improvement of visibility from the use of colors such as orange or neon (fluorescent) red. These colors show up better than aluminum against the blue of the sky. But the overall benefits of any possible exterior painting are rather minor.

External lights on aircraft, as already mentioned, can be seen at great distances at night. Especially with the new rotating beacon type of anti-collision lights there is very little problem about VFR collisions at night.

Can lights also solve the problem in the daytime? It doesn't seem likely. The intensities required for collision lights to give adequate collision warning in daylight appear to make this solution prohibitive.

In summary, then, the human eye has some basic limitations which make it unreliable as a collision warning device under daylight VFR conditions. Very little seems possible in the way of improvement of visual detection through new or changed equipment. A better understanding of these limitations should help to avoid the hazards of mid-air collisions. ▲

Just a Triggerman

YOUR CHANCES of ejecting safely from your jet aircraft are getting better all the time. A study of 759 ejections reported through 1955 showed that 77 per cent were successful and since the advent of the automatic lap belts and automatic-opening parachutes, the odds have gone up considerably. In fact, to date, the successful attempts have gone up to 84 per cent.

This article is written to familiarize you with the various types of such automatic equipment and to impress upon you the advantages of using them. It also should serve as somewhat of a morale builder, because, with this equipment, about all you have to think of during the ejection is pulling the trigger.

In order to obtain the most advantages from the automatic features of this equipment, both the lap belt and parachute combination must be worn and properly connected. They are compatible and were designed to operate as a "team."

Parachutes

There are two types of automatic-opening parachute devices. The F-1A timer opens the parachute automatically in two seconds when you are below a pre-set altitude. This pre-set altitude is dialed into the timer by personnel of the personal equipment section, and depends on the terrain over which you are normally flying. Usually it is set at 14,000 feet above the ground.

The newest timing device is the F-1B. With this the parachute deploys one second after seat separation (below the pre-set altitude).

Regardless of the type installed in your parachute, it is the answer to bailing out—either way up high or way down low.

For ejections at altitudes where the oxygen quantity will not sustain life, the aneroid feature of the timer will allow you to free-fall and will automatically open the parachute at a pre-set altitude. It also precludes injuries associated with parachute opening shock at high altitude.

Below the pre-set altitude, the chute will open automatically in one or two seconds, following seat separation. This is much faster than you could operate it manually. Remember, however, the fully automatic features of the parachute will function only when the lap belt is opened automatically. This will be explained later. Of course, you can still operate the chute with the D-ring and you can start the automatic timer by pulling the green apple that is tied directly into the timing mechanism.

Lap Belt

Pilot procedures in using the automatic opening parachute is not a problem. Such is not true, however, of the automatic seat belts.

There are three basic types of belts and each type requires a somewhat different hook-up procedure.

Before getting into the details of the belts, it may be in order to say that until you have become completely familiar with the automatic belt and have been convinced of its ability to do a job for you, there may be a tendency to distrust it and feel that the only way to be sure is to open

it manually. This is a mistake. By manually opening the belt you destroy not only the automatic feature of the belt, but more important, you disengage the automatic parachute opening mechanism. The only way to have the automatic features of the chute going for you is by allowing the belt to first open automatically. When the belt opens automatically—and only automatically—it actuates the timing device on the parachute. When you open the belt manually you must pull the D-ring or the green apple attached to the parachute timer in order to deploy the chute.

The three basic types of automatic belts are shown on the following pages. They are the MA-1, the MA-3 and -4, and the MA-5 and -6. Each opens automatically, either one or two seconds after ejection. Whether you have a one-second or a two-second belt depends on the type of initiator installed in your aircraft. (With the M-4 initiator you have a two-seconds belt; with the M-12, a one-second belt.)

Regardless of how fast you may think you can react, you just can't open the belt faster manually than it can open automatically. And as previously mentioned, only by letting the belt open via the automatic method can you accomplish the automatic opening of the parachute.

By opening the zipper, you can identify type of timing device. If it's an F-1A, it is for two seconds; the F-1B is for one second.

The type MA-1, MA-3 and MA-4 automatic safety belts have a cartridge operated device designed for use with the same webbing as used with the standard B-18 (manual) safety belt, but differs in the center section or release portion. Upon ejection the M-4 or M-12 initiator supplies gas through a high pressure hose which actuates a piston inside the belt, retracting the latch tongue and releasing the link. The release incorporates a key which is attached to a lanyard. This lanyard is connected directly to the automatic timer of the parachute. The key is inserted in the belt-locking mechanism; thus the lanyard is anchored at one end to the belt and the other end to the parachute timer. (These belts cannot be locked without using the key. This is a feature of design so that the pilot will not neglect to tie the automatic parachute into the system. When the belt is opened manually, the key is ejected and the parachute timer is not armed for automatic operation.)

Following ejection of the seat, the belt opens but the key remains firmly locked in the belt release. As the pilot separates from the seat the lanyard actuates the timing device of the parachute, and you are in business.

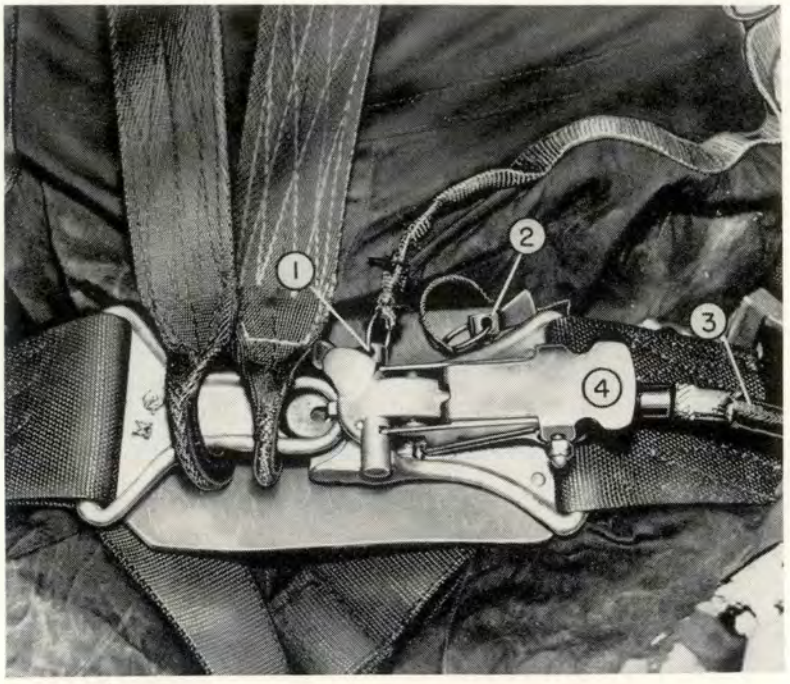
The MA-5 and MA-6 belts function the same as the others; the big difference is that they are designed to retain a ring-type anchor for actuating the automatic parachute, in place of a key. This type of belt is easier to hook up because there is no need to worry about inserting the key. All that is required is to slip the locking link over the ring-type anchor (see illustration). Unlike the belts that require keys, this one can be closed and locked without the automatic chute being tied into the system.

As with this belt and all others, if the safety belt is opened manually, the parachute must be opened manually. Also, the ring-type anchor must be hooked to the belt for the parachute to deploy automatically.

Actually, the automatic lap belt and parachute have saved many a life. They have been thoroughly tested and are reliable. Take care to hook yourself into the system properly. Then, if and when you ever encounter an emergency situation and have to go—RIGHT NOW—all you need be is a trigger man. ▲

MA-1 AUTOMATIC OPENING SAFETY BELT

• LOCKED

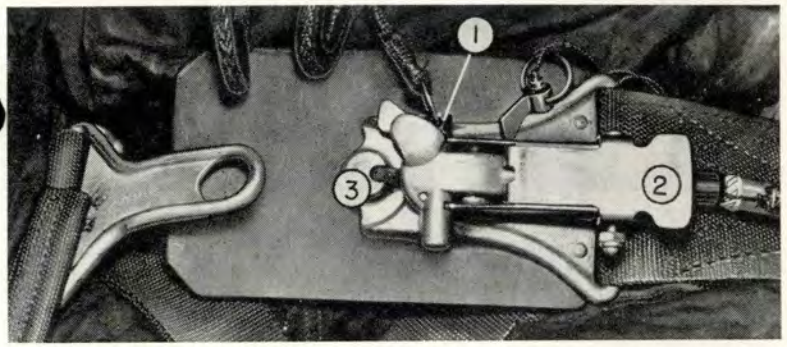


1. Belt locking key (attached to automatic parachute arming lanyard) inserted in belt locking mechanism.

WARNING

- This key must be used when an automatic parachute is worn, in order for the parachute to function automatically if ejection is necessary.
- Lanyard must be outside parachute harness and not fouled on any equipment, to permit clean separation from seat.

2. Belt locking key (attached to belt). Used to close belt only when automatic parachute is not worn.
3. Initiator hose.
4. Manual release lever closed



AUTOMATICALLY OPENED •

1. Belt locking key (from automatic parachute arming lanyard) retained in belt locking mechanism.
2. Manual release lever closed.
3. Belt latch opened by gas pressure from initiator.

• MANUALLY OPENED

1. Belt locking key ejected from locking mechanism when manual release lever is opened.

WARNING

If automatic parachute is worn and belt is manually opened during ejection, parachute will *not* open automatically upon separation from seat.

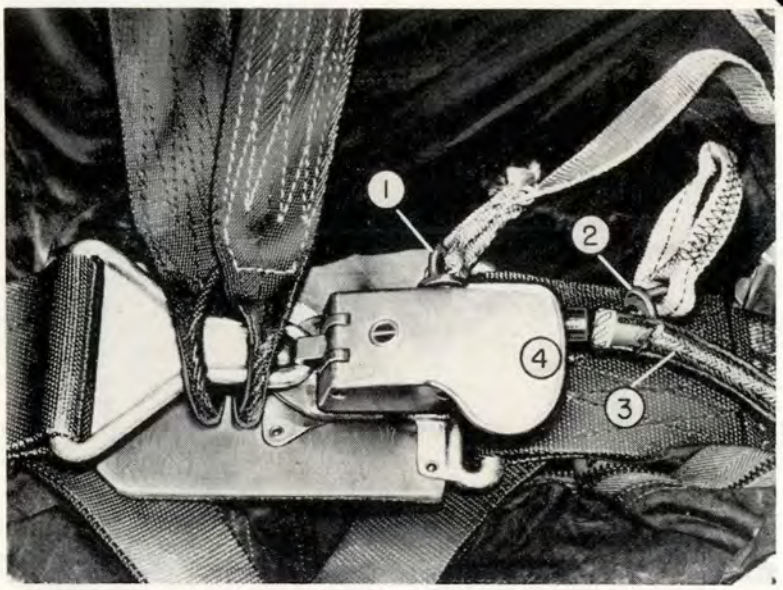
2. Manual release lever opened.
3. Belt latch opened by manual release lever.

NOTE

Manual release lever can be used to unlock belt at any time, even if automatic-opening sequence already has been initiated.

MA-3 AND 4 AUTOMATIC OPENING SAFETY BELT

• LOCKED

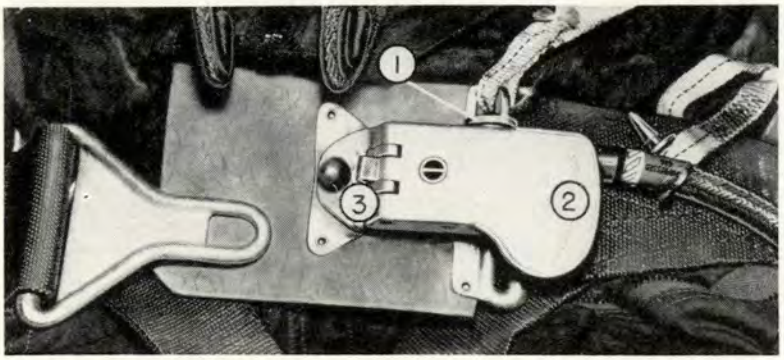


1. Belt locking key (attached to automatic parachute arming lanyard) inserted in belt locking mechanism.

WARNING

- This key must be used when an automatic parachute is worn, in order for the parachute to function automatically if ejection is necessary.
- Lanyard must be outside parachute harness and not fouled on any equipment, to permit clean separation from seat.

2. Belt locking key (attached to belt). Used to close belt only when automatic parachute is *not* worn.
3. Initiator hose.
4. Manual release lever closed.



AUTOMATICALLY OPENED •

1. Belt locking key (from automatic parachute arming lanyard) retained in belt locking mechanism.
2. Manual release lever closed.
3. Belt latch opened by gas pressure from initiator.

• MANUALLY OPENED

1. Belt locking key ejected from locking mechanism when manual release lever is opened.

WARNING

If automatic parachute is worn and belt is manually opened during ejection, parachute will *not* open automatically upon separation from seat.

2. Manual release lever opened.
3. Belt latch opened by manual release lever.

NOTE

Manual release lever can be used to unlock belt at any time, even if automatic-opening sequence already has been initiated.

LOCKED •

1. Initiator hose to automatic release mechanism.
2. Shoulder harness loops over swivel link.
3. Anchor (from automatic parachute arming lanyard) slipped over swivel link.

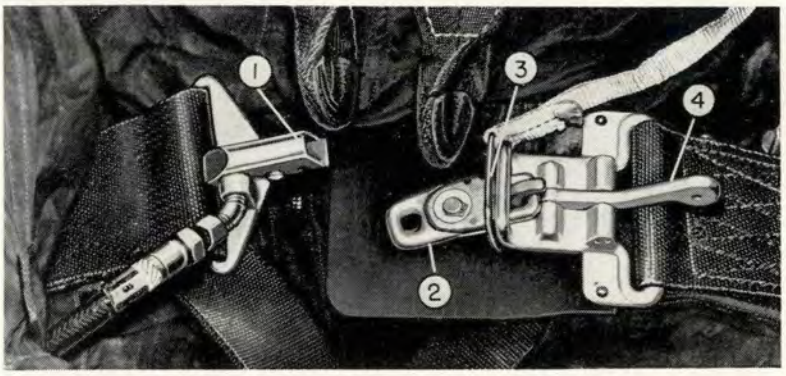
WARNING

- Although not necessary to close belt, anchor must be installed when automatic parachute is worn, so that parachute will function automatically after ejection.
- Lanyard must be outside parachute harness and not fouled on any equipment, to permit clean separation from seat.

4. Manual release lever closed.

• AUTOMATICALLY OPENED

1. Automatic release mechanism actuated by gas pressure from initiator, detaching swivel link on automatic release side.
2. Swivel link retained by manual release lever.
3. Anchor (from automatic parachute arming lanyard) retained by swivel link.
4. Manual release lever closed.



MANUALLY OPENED •

1. Swivel link released by manual release lever (automatic release mechanism not actuated).
2. Anchor (from automatic parachute arming lanyard) freed from swivel link.

WARNING

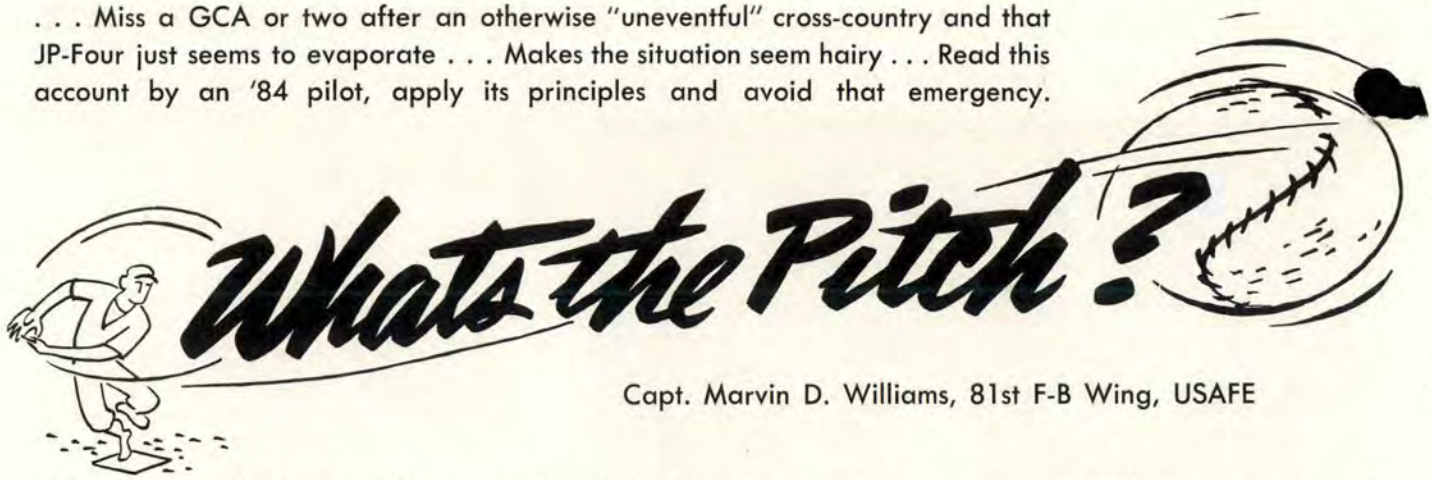
If automatic parachute is worn and belt is manually opened during ejection, parachute will not open automatically upon separation from seat.

3. Manual release lever opened.

NOTE

Manual release lever can be used to unlock belt at any time, even if automatic-opening sequence has been initiated.

. . . Miss a GCA or two after an otherwise "uneventful" cross-country and that JP-Four just seems to evaporate . . . Makes the situation seem hairy . . . Read this account by an '84 pilot, apply its principles and avoid that emergency.



What's the Pitch?

Capt. Marvin D. Williams, 81st F-B Wing, USAFE

YOU ARE FLYING your '84F in a GCA pattern prior to landing on a strange runway, with everything running according to Hoyle and looking rosy. The weather is reported 400 overcast and ¾ miles visibility; no wind, altimeter 29.90, landing runway 260 degrees, 8000 feet long, GCA minimum 300 feet and ½ mile for jet aircraft. Your final controller checks in loud and clear, and that time has come to hurtle your little pink body at the ground. He lets you know that you're approaching glide, on centerline.

Upon reaching the glide path area he asks you to set up a rate of descent for your type aircraft, suggesting 650 feet per minute, so down you go! You've decided that a final approach speed of 180 knots should be about right for the gross weight involved and intend to hang right onto it. Final control has stated that you need not acknowledge any further transmissions so you settle back to enjoy the ride to touchdown.

"Six-nine-eight, your range is four and one-half miles, heading 260 degrees. Going high on glide path, increase your rate of descent. Steer right 262 degrees, holding high on glide path. Your range is four miles, heading 262 degrees. This heading is bringing you back to centerline nicely, still high on glide path. Your range is three and one-half miles, heading 262. You're holding 100 feet high on glide path, increase your rate of descent. Your range is three miles, still holding high on glide path, heading 262. Turn left, heading 260 degrees. You're on centerline, range two and one-half miles. You're returning slowly to glide path, heading 260, range two miles. Heading 260 degrees is holding you on centerline nicely, still high on glide path. Range one and one-half miles. Turn one degree right, heading 261 degrees, range one mile, high on glide path, on centerline. Six-nine-eight, you are too high to complete this approach safely. Pull up and climb to two thousand feet heading 330 degrees. Contact approach control on channel one five. Acknowledge. Over."

The pilot acknowledges and pours on the go-juice. All didn't go so well. He established his 650 feet per minute rate of descent on schedule, but as soon as GCA said that he was going high, he changed to 950 feet per minute. At a low altitude this is a pretty rapid descent. Even at this rate of descent the pilot found that he only paralleled the glide path, so he went to 1050 feet per minute. This is a real thrill. Try it sometime. Fortunately, the final controller knew the pilot couldn't complete a safe approach, so he called it off. The pilot was most happy to comply with the suggestion and to try again.

This may seem like a far-fetched situation, but let's take a short gander at the stage settings.

This pilot's home station had a good GCA unit installed and had been working high performance machinery for a good while. A pattern had been established to comply with safe practices. One minor point that has become a major consideration in the past few years is the little difference between selection of a glide slope angle. This pilot's home station had a beautiful approach terrain-wise, the kind you dream about but seldom see. Therefore, a glide slope of two degrees was selected and this pilot had found that with this slope it took about 650 feet per minute to stay on glide path under the conditions that he flew GCA. It didn't seem out of the ordinary at all for this GCA operator to suggest 650 feet per minute rate of descent. This is the same wording which his own unit used. Much to his surprise, however, the 650 didn't work out. Glide slope angle had reared its ugly head. The strange GCA unit had worked a good number of jet aircraft but its main use was with conventional fan machinery. Its glide slope three degrees — a minor point? Let's look.

At the stated conditions, 180 knots, no wind, a two-degree slope gives you 637 feet per minute rate of descent. What does a three degrees slope do to you under these conditions? 953 feet per minute. Is it any wonder the pilot couldn't get back on the glide path? He could have made it back if he had suspected the steepness of the slope, couldn't he?

Flying a glide path is a consideration of the degrees of slope, the true airspeed and the amount of wind available. A change of five knots, airspeed or wind, will change the rate of descent by approximately 26.5 feet per minute on a three degrees slope, while the five-knot change on a two degrees slope amounts to approximately 17.2 feet per minute change.

The charts shown here involve speeds for high performance aircraft but, with a little figuring, can be adapted to any type of bird.

The degree of the glide path should be listed under "Remarks" in the Radar Section of the Radio Facility Chart. By utilizing the wind conditions and the glide slope, plus the final speed that the pilot intends to use, GCA should be a drop in the bucket. Try these charts with your GCA unit. Saving one approach would be well worth the trouble by eliminating the hunt and seek system of getting on the glide path. ▲

Rate of Descent Table

2 DEGREES SLOPE 17.226 FT/MIN FOR 5 KT. CHANGE

Kts TAS	15TW	10TW	5TW	0	5HW	10HW	15HW	20HW	25HW	30HW	35HW
175	672	655	637	620	603	586	569	551	534	517	500
180	689	672	655	637	620	603	586	569	551	534	517
185	706	689	672	655	637	620	603	586	569	551	534
190	724	706	689	672	655	637	620	603	586	569	551
195	741	724	706	689	672	655	637	620	603	586	569
200	758	741	724	706	689	672	655	637	620	603	586
205	775	758	741	724	706	689	672	655	637	620	603

2¼ DEGREES SLOPE 19.952 FT/MIN FOR 5 KT CHANGE

Kts TAS	15TW	10TW	5TW	0	5HW	10HW	15HW	20HW	25HW	30HW	35HW
175	755	735	715	695	675	655	635	615	595	575	555
180	775	755	735	715	695	675	655	635	615	595	575
185	795	775	755	735	715	695	675	655	635	615	595
190	815	795	775	755	735	715	695	675	655	635	615
195	835	815	795	775	755	735	715	695	675	655	635
200	855	835	815	795	775	755	735	715	695	675	655
205	875	855	835	815	795	775	755	735	715	695	675

2½ DEGREES SLOPE 22.214 FT/MIN FOR 5 KT CHANGE

Kts TAS	15TW	10TW	5TW	0	5HW	10HW	15HW	20HW	25HW	30HW	35HW
175	838	816	794	772	750	727	705	683	661	639	616
180	860	838	816	794	772	750	727	705	683	661	639
185	883	860	838	816	794	772	750	727	705	683	661
190	905	883	860	838	816	794	772	750	727	705	683
195	927	905	883	860	838	816	794	772	750	727	705
200	950	927	905	883	860	838	816	794	772	750	727
205	971	950	927	905	883	860	838	816	794	772	750

2¾ DEGREES SLOPE 24.229 FT/MIN FOR 5 KT CHANGE

Kts TAS	15TW	10TW	5TW	0	5HW	10HW	15HW	20HW	25HW	30HW	35HW
175	923	898	874	850	826	802	777	753	729	705	680
180	947	923	898	874	850	826	802	777	753	729	705
185	971	947	923	898	874	850	826	802	777	753	729
190	995	971	947	923	898	874	850	826	802	777	753
195	1020	995	971	947	923	898	874	850	826	802	777
200	1044	1020	995	971	947	923	898	874	850	826	802
205	1068	1044	1020	995	971	947	923	898	874	850	826

3 DEGREES SLOPE 26.481 FT/MIN FOR 5 KT CHANGE

Kts TAS	15TW	10TW	5TW	0	5HW	10HW	15HW	20HW	25HW	30HW	35HW
175	1006	980	953	927	900	874	847	821	794	768	741
180	1033	1006	980	953	927	900	874	847	821	794	768
185	1059	1033	1006	980	953	927	900	874	847	821	794
190	1086	1059	1033	1006	980	953	927	900	874	847	821
195	1112	1086	1059	1033	1006	980	953	927	900	874	847
200	1139	1112	1086	1059	1033	1006	980	953	927	900	874
205	1165	1139	1112	1086	1059	1033	1006	980	953	927	900

REX SAYS

I WAS FLYING a T-33, nearing the end of an instrument training flight. I was in the front seat, preparing to turn on initial, and as I tried to advance the throttle, found out it wouldn't move.

The throttle setting was 85 per cent as I called the pilot in the back seat and told him of the difficulty. He looked down at his throttle and found that the fluorescent light from the upper left console had come out of its bracket and had jammed in the throttle slot forward of the actual throttle. He pulled the light out and put it where it belonged, and the flight was terminated without further incident. We concluded that this light must have become disconnected because of the rough air we had encountered during letdown.

REX SAYS — *Investigation of this incident revealed that the light was normally mounted in a socket located on the left canopy rail. Inspection showed that the friction bearing was missing from the socket, thus allowing the light to fall free with very little pressure.*

So here is something else to check in your Tee-Bird, especially if you are going solo. Give a tug on the removable lights and if they are not real secure, best remove same and stow in safe place.

★ ★ ★

MINE WAS the Number Two ship in a flight of two T-33s — both solo. We had picked up one of the T-Birds from IRAN and were returning to home base.

We decided to RON at a Naval Air Station, for which the Radio Facility Chart had listed an "Emergency Arresting Gear" on the end of the runway. We assumed this to be a crash barrier (Air Force type).

The lead ship touched down and I was right behind him. About 800 feet from the end of the runway we suddenly were confronted with what we thought was a crash barrier ready to be tripped. There were two cables lying across the runway with wood or rubber cylinders to hold them a few inches off the runway.

The lead ship and I hit the brakes at the same time. If the runway had been wet or icy, there would have probably been a pair of mangled T-Birds, with pilots to match.

REX SAYS — *When you see the words "Emergency Arresting Gear" in connection with a Naval Air Station, don't confuse this with a jet landing barrier. The word from the Navy is that you can pass right over their cables—no sweat. So when you see those cables coming up at you, don't get shook and bust up your bird, attempting to avoid 'em.*

★ ★ ★

I WAS RETURNING from a transition flight in an F-86 and as I turned on initial as a single, was told that I was Number One following a flight of four. I approached the peel-off point and saw an aircraft on base about 200 feet below me, then loked and saw another on a wide base. I pitched out and made a wide pattern and took spacing to land on the right side of the runway. The approach and landing were normal, no comment was made throughout the pattern. On my landing roll I looked out to the left and noticed an F-86 almost in line abreast. It turned out that I had landed between the No. 2 and No. 3 men of a flight of '86s.

REX SAYS — *It appears as if the flight of F86s made such a large pattern that even the mobile control officer lost sight of them. I'm certainly not an advocate of the wrap-'em-tight technique but there is a limit as to how wide a pattern should be. If a formation pitches and goes out so far that mobile can't keep track of them, that's just a hair too far.*

Quick, Gridley, check our Rex Riley posters! Maybe he covered an accident like this.

I WAS CRUISING at 8000 feet in a C-119, when, suddenly an explosive sound occurred, followed by a rushing of air.

A check was made of the aircraft and it was found that the nose gear tire had blown out and was flat. I proceeded to a nearby Air Force base to land. I notified the tower of the situation and requested that the runway center be sprayed with foam. All loose equipment in the cargo compartment was tied down and the radios were strapped into position. The extra crewmembers were instructed to seat themselves in the rear of that compartment. I was going to burn off fuel before landing but the Wing Flying Safety Officer advised that the aircraft would be more tail-heavy with the greater amount of fuel on board. Upon landing, the nose gear was held up until the airspeed was between 50 to 60 knots. I do not remember whether I lowered it or if it fell through. The aircraft was steered by use of rudders and the nosewheel steering was not used at any time during the landing roll. As the aircraft slowed down, a moderate vibration set up in the nose section and I applied brakes. All switches were then turned off.

***REX SAYS**—Well, you can see by the picture that we can chock up another nice save for foam. If you have ever ridden through a nosewheel malfunction landing in a C-119, you can appreciate how foam contributed to keeping this bird in one piece.*

REX SPECIALS

THERE HAVE BEEN some reported incidents where explosions have occurred in the oxygen mask, and it was suspected that possibly the ingredients of the "Chap Stick" mixing with oxygen, caused the trouble. In order to get a firm reading on this, the Office of the Surgeon General was asked for an opinion. Here is the answer we received:

"This headquarters has no information that would relate lip ice, vaseline and similar products to flash fires in oxygen masks. The explosions involving oxygen and grease or oil, reported in the past, have all occurred when oxygen under tremendous pressure came in contact with the lubricant. Oxygen is delivered to the mask at extremely low pressures, compared to the above. Therefore, since no hazard is felt to exist relative to these products and the oxygen mask, no recommendations are made concerning materials which should or should not be used as anti-chap agents."

★ ★ ★

A RECENT, FATAL accident during a GCA has aroused serious concern over the lack of the pilot's ability to communicate with the controller during the final approach. With present GCA radio procedures, the pilot can not communicate with the final controller because the latter has his transmitter keyed continuously. Starting the first of this month, tests will be conducted for 60 days to determine whether or not such communication is actually required during this phase of the Ground Controlled Approach.

In this testing period, the final controller's phraseology will be: "Now on final." "Do not acknowledge further transmissions. You may contact me on this frequency any time I am not transmitting."

This means that the controller will use the conventional push-to-talk, cockpit operation. He will "un-key" his transmitter any time that an actual transmission is not required. These breaks will of necessity be brief since the controller will still be required to transmit at least every five seconds to assure you of good radio contact. During these periods you may contact him to furnish or request information pertaining to emergency or impending emergency situation, only. Otherwise, any lengthy or unnecessary transmissions may prevent his issuing pertinent instructions at a critical time.

Remember you are required to position the UHF selector switch in Transmit/Receive plus Guard position at all times while aircraft are being operated in connection with a flight. Positioning your UHF receiver in this manner will allow the radar controller to override any transmissions by you in the event that control instructions must, in the interest of safety, take precedence over any transmission you may be making.

***REX SAYS**—Your cooperation in these tests and your comments—pro and con—will be greatly appreciated. They will help AACS give you better service.*

Flying the C-45H

Capt. Vernon W. Garner, March AFB, Calif.

ALL RIGHT, maybe the title does strike you as being funny but at least I've succeeded in getting you to read the first line of this article.

I suspect your first thought as you noticed the title was, "What's this magazine coming to—wasting good paper and time printing an article about that old crate?"

Every month we pick up our magazine and read some expert's advice on how to fly the latest models. And these articles are good, don't get me wrong. I never read one but what I try to apply some of the advice to my own flying, regardless of the type of aircraft. But the thought occurred to me recently that perhaps more pilots like myself would benefit from an article about the airplane that is flown most of the time.

I think I can safely say that the C-45 is the most widely used administrative aircraft in the Air Force today. And certainly, the "old crate" is what most of us staff pilots fall back on when time grows short for 60-2 requirements or when we must get checked out in something in a hurry before that birthdate comes around.

"But—what the heck—anyone can fly this thing! About 75 per cent of us were weaned on the T-9, T-10 or T-11, this isn't much different."

True, but did you ever stop to think that complacency is the pilot's worst enemy, safety-wise? Very possibly, the biggest reason for many of the C-45 accidents in the past few years has been just that—*Complacency.*

Many of us have gone from a combat crew to a staff job and consequently have gone from the B-29, B-50, B-36 or the B-47 into a smaller administrative aircraft. We pass the standardization ride okay and away we go, hot pilots once more. We log an average of eight to ten hours per month with two or three landings. Nothing to it. At least there is nothing to it until our complacency catches up with us one day and we "goof," or have an emergency.

You're flying along on a Saturday afternoon listening to the football game and you let the nose tanks run dry. ". . . Moments of sheer terror." Well, boy! This is one of them. There you were peacefully cruising along when all of a sudden you have an emergency. The terrifying quietness of both engines suddenly quitting is enough to shake the stoutest of hearts. Sure, all you have to do is reach down and turn both tanks to main and both booster pumps on. Seems like an eternity before they catch, doesn't it? And they have been known to never catch. If you're lucky enough to have them take hold, all tarnation breaks loose — props overspeed, aircraft lurches forward, to say nothing of the deafening noise. You forgot to retard the throttles which would have prevented all of this.

Then, there is the fellow who was flying over Florida one night and all of a sudden he noticed the oil temp had risen to 100° Centigrade. Nothing he could do would bring it within safe operating range, so the engine was feathered, an emergency declared and a single engine landing was made.

After checking the engines for tw[illegible] hours the next morning, with no clu[illegible] as to the trouble, it was discovered that the oil cooler by-pass valve was open. During flight, one of the pilots had reached down to adjust the cabin heat and had mistakenly opened the valve. The pilot on this flight was one with considerable experience and thought he was real sharp — none other than yours truly.

Recently while conducting an annual standardization check, I closed the mixture on one engine to test the pilot's single-engine procedure. Everything went fine. He feathered the correct engine, until the step where the ignition is turned off. You guessed it —he turned the ignition off on the opposite engine. Again, it gets mighty quiet. So maybe he had "check-itis," but who can guarantee that he wouldn't make a similar blunder when confronted with an actual emergency.

The fact that staff pilots are cast in the "unglamorous" position of flying a non-tactical aircraft is certainly no basis for relinquishing flying safety vigilance. The C-45 should be flown in no less a professional manner than the most exacting tactical aircraft.

On another standardization chec[illegible] flight, the pilot displayed one of the best examples of non-professionalism in flying that I have witnessed in some time. Among other things he couldn't find a published frequency in the Facility Chart; he gave an improper VFR position report and ran the nose tanks dry, causing both engines to lose power simultaneously. He was not aware that the aircraft had a low frequency command receiver installed, and descended to 2500 feet although he was cleared only to 5500. Of four attempted landings, three necessitated a go-around. This pilot had close to 2000 hours and had recently been checked out in the C-45H. And the sad part is that this chap wasn't confronted with any type of an emergency—except the pilot-induced type.

The C-45 is going to be with us for a long time. It is easy to fly and is extremely forgiving, but it expects no less than our best in performance and safety-consciousness. It is just as important to know your emergency procedures, too, because, although i[illegible] doesn't make as big a splash as son[illegible] other aircraft, it's big enough! ▲

CROSS FEED

LETTERS TO THE EDITOR

Silence

I have just read your article on "The GCA Angle" in the December issue of FLYING SAFETY.

It seems to me that if you want us to pull up and go around (unless we are VFR at GCA minimums), the simplest way to achieve this is to have the controller quit giving instructions when we reach GCA minimums.

Major Fred Peterman
Hq 16th AF, APO 285, NY.

Probably nothing would make a guy pull up like SILENCE *during the GCA final but I think the general consensus is that, just in case you have to get it, the present system is more advisable.*

★ ★ ★

World of the Warrior

The article in your February issue entitled "The World of the Warrior," infers that the Air Force is not a fighting force. There is a great deal more to the Air Force than fighting. Many of the officers must be used to procure equipment, handle money, administer the unit and perform many other tasks.

The pilot, too, is a specialist. He is paid to do his job. Each job, regardless of whether it is fighting or not, is important to the mission. We don't need the warrior to the degree he speaks of, for the weapon largely does the job. The pilot is a technician accompanying the missile. He does not need leadership as much as does the supply man or the staff officer. I resent very much trying to set a particular group up as an elite or some such thing when every officer is doing his job and is just as dedicated.

Leadership means the leading of men. It does not mean flying, or bombing — just leading men. When you finally get an airplane so technical that the presence of the pilot is a hindrance to the technical functioning of the aircraft, you can hardly list leadership as a pre-requisite. Actually the requirement for leadership is more prevalent in the ground jobs (such as adjutant, supply and maintenance squadron commander, air police) than in the air.

I suggest that we not get carried away with the belief that the pilot is something special. Such propaganda is not good for the others who also serve. I do not desire to get into any literary arguments with the author so will be satisfied with saying only that I am yours for a better Air Force.

Signed Ex-Colonel

. . . More

First, let me say that I was very interested in Col. Ritchey's article with regard to the new officer. I believe in what he says must be done, and I will be the first to sign up. The fact, however, that he recognizes the problem and that I recognize it as do many other officers, doesn't mean that it will be solved. There are just too many officers in the Air Force who are after the money, a soft job and three square meals a day, who do not want to rock the boat. It is my belief that as long as so many are motivated by that philosophy, we'll never make it.

Now, don't get me wrong. I'm an officer—at least I am what everybody chooses to call an officer these days. I am also a romanticist—enough to like the military life so long as it is military, and the heck with the welfare gimmicks. YET I'M getting out. O-U-T ! Why? Because there's no advantage to being a regular officer. I can get more real military activity in the National Guard. Since I've been in, I haven't been in one military ceremony, no social gathering where military protocol existed, no get-togethers of the squadron, and, finally, my Commander has never visited me or asked me to call, or in any way showed that he was interested in me until last month when I refused to go indefinite. At that time he called me in and said, "I'm required to interview you and try to get you to extend, however, it's probably a little late—and so on."

I could write a small book about this business but I sincerely doubt that it would be read any sooner than this letter will be published. The one thing this country needs is an Elite Air Force. Not a theoretical but a real type of fighters. If I had my choice I'd take a group of officers who weren't sure how much their pay is; didn't know when they were eligible for retirement; didn't know for sure what the emoluments for servicemen are, never read the *Air Force Times*, but instead who could fly, shoot, and were ready, willing and able to take on Ivan or anybody else when The Big Man said "go."

Yes, I liked the article, but now that the Colonel has posed the problem, is he going to come on again and tell us what to do about it? Or would it do any good?

Name Withheld by Request

. . . and More

Colonel Ritchey's article, "The World of the Warrior," published in the February issue of FLYING SAFETY, was excellent and struck a significantly responsive chord.

As Director of Operations of an Aviation Cadet Program during the Korean War, and afterwards, I found that the young man who wanted to fly and fight was our best bet. He trained harder, complained less and seemed oblivious to the pay, the G.I. Bill, retirement benefits and civilian education opportunities. Also, he sang the loudest, marched straightest, played hardest and he couldn't have cared less for PX's, Day Rooms and career incentives. He seemed to be a special breed, bent on a life of adventure with his new sky-bride in an F-100 airplane.

He is the "warrior" of whom you wrote so eloquently. We honor him by selecting him, training him and commissioning him. We insult his sense of duty, honor and willingness to fight and die for his country, by insisting that increased pay, fringe benefits and soft reading lounges are things he cherishes most.

Lt. Col. Henry F. Nau
320th Bomb. Wing (M)
March AFB. California

Colonel Ritchey's article, "The World of the Warrior," published in the February issue, has generated a bit of interest throughout the Air Force. Space limitations prohibit our printing more than these three letters; however, they represent a cross-section of the expressions and comments to the editor.

★ ★ ★

Six Bits Worth

Here is a photograph of a grim reminder to all pilots, which, if strategically located in base ops, should have a beneficial effect on all local "Mal Functions."

The construction is simple. The base is made of cardboard file dividers and scotch tape. The aircraft is a standard plastic kit, completely assembled, minus decals. To avoid bloodshed, we cut the canopy and used only the windshield. The cockpit unit had the pilots and seats cut out prior to assembly. After completion, the model was placed in a stew pan of boiling water for a few seconds (more or less) and final shape was molded with the hands. It was then cemented to the base with the same cement used for construction. Decals applied after completion.

The entire cost: about 75 cents.

M/Sgt. Richard M. Valentine
Tech Insp Div. ATC IG
Scott AFB, Illinois

Thanks for passing along the idea, Sarge. Seventy-five cents isn't much for such a grim—though effective—reminder!

★ ★ ★

For F-84F Pilots

Several months ago FLYING SAFETY published an article titled "Sizzling Strips" and referred to what is called a "well established procedure" for jet takeoffs. The first sentence in those "well established procedures" could cause takeoff accidents in the RF-84F/K and the F-84F, which are the types our unit operates. It reads: "Get sufficient airspeed working for you and then lift the nose slightly off the runway."

In the current RF-84F Pilot's Handbook, the takeoff technique set forth in Section II includes the following:

"Leave control stick in neutral until takeoff speed is reached. This reduces drag to a minimum."

In the latest RF-84F Pilot's Handbook, the above-stated step is included plus another step which states:

"When takeoff speed is reached, use necessary stick travel to pull airplane off the ground."

It has been noted within this wing that raising the nose before takeoff speed is reached, or not raising the nose high enough when takeoff speed is reached in the RF-84F/K, results in takeoff runs that are from 500 to 1500 feet longer than the computed distances. By leaving the nose on the runway until takeoff speed is reached, as indicated in the Pilot's Handbook, and then pulling back on the stick until the airplane comes off the ground, the takeoff distances required are the same as the distances computed from the handbook.

Our organization is permitted to attempt takeoffs that are computed to be up to a maximum of 90 per cent of usable runway length. Any technique that will increase the actual takeoff distance is dangerous and such a technique, as far as the F/RF-84F/K aircraft are concerned, is indicated in your article.

As an example, our runway at Larson is 10,000 feet long and we're capable of carrying enough fuel to use much more than that in the summertime. For example, a pilot computes his takeoff roll to be 9000 feet, the maximum he is permitted to attempt. During the takeoff roll he checks his acceleration 3000 feet down the runway and finds it to be normal. Then, at 110-120 knots he raises his nose off the ground six inches to a foot. This immediately reduces his acceleration rate by adding drag and will ultimately add more than 1000 feet to his takeoff roll if the temperature is high enough. By raising his nose off the ground early, the pilot has unknowingly committed himself to the barrier which (being manually operated) is kept standing at the 10,000-foot point.

On the other hand, suppose our pilot did leave the nose of the aircraft on the ground until he reached his takeoff speed and then raised it slightly. In this case the aircraft will not fly off the ground immediately and barrier engagement is imminent unless he pulls the stick back much farther in order to become airborne. This is because the RF-84F/K, as all other swept-wing fighters, requires a large angle of attack at slow speed compared to straight-wing aircraft in order to develop enough lift to fly.

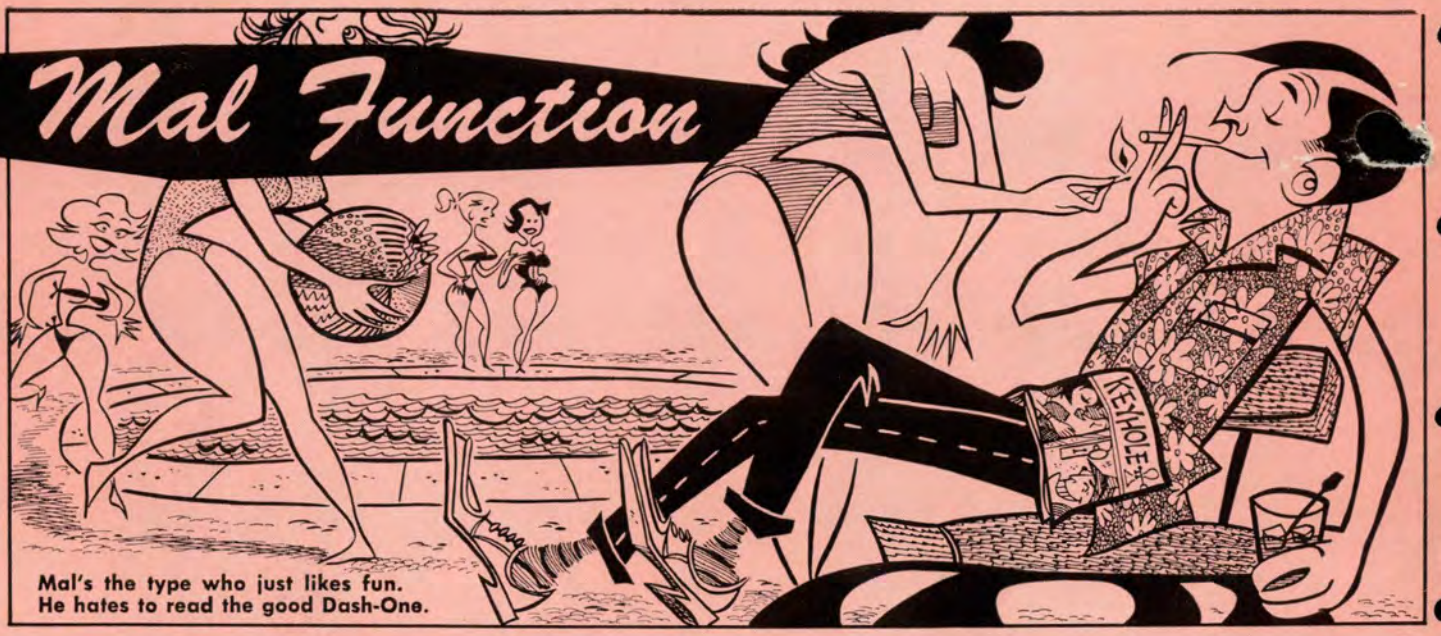
We desire that your article on "Sizzling Strips" be corrected to indicate that the "well established procedure" outlined therein is not applicable to the F/RF-84F/K aircraft. It may be advisable to do more research in the Pilot's Handbooks and determine all the aircraft for which that procedure is not recommended.

Capt. William D. Baisley
71st Strat. Recon. Wg. (Ftr)
Larson AFB, Washington

Thanks for the info about the '84F.

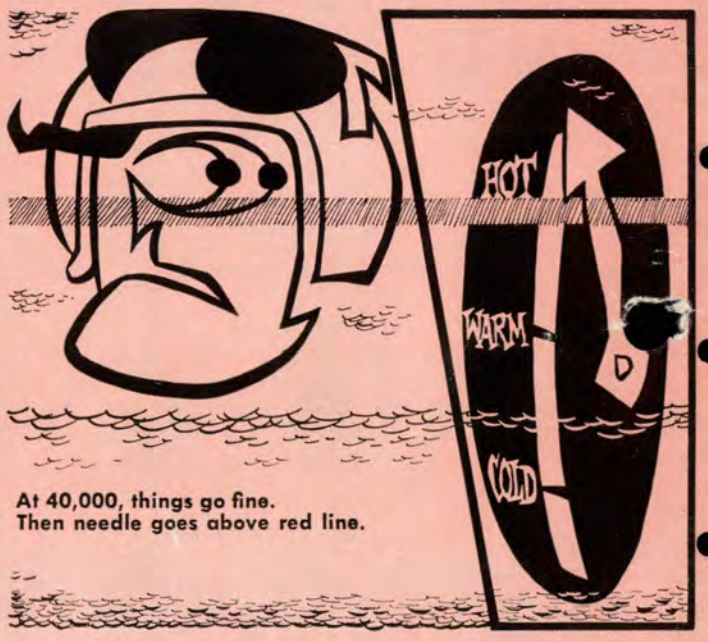

E
is for
emergency
And the surest, safest way to cope with an emergency is to know your equipment. Keep a copy of your questionnaire handy and review it often. Also, go through the Dash-One occasionally, and while you're sitting in your aircraft, mentally practice the emergency procedures.
Oh! The gal is Dani Crayne.

Mal Function



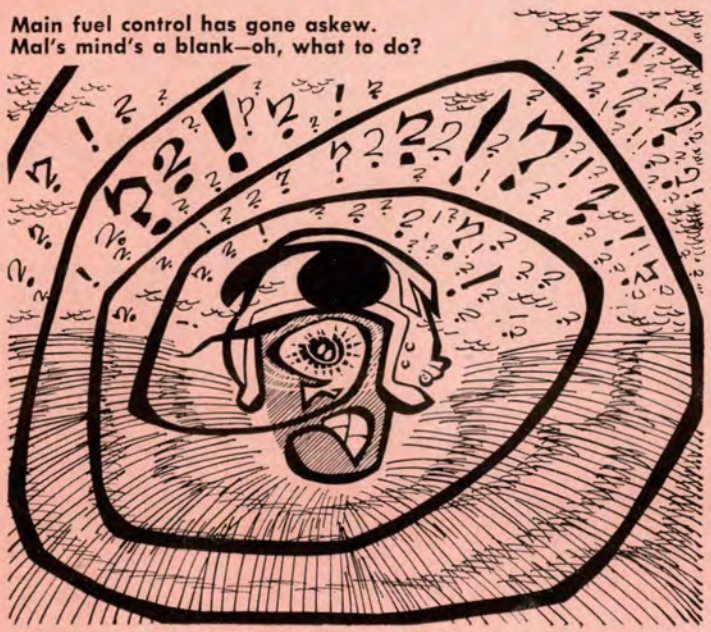
Mal's the type who just likes fun.
He hates to read the good Dash-One.

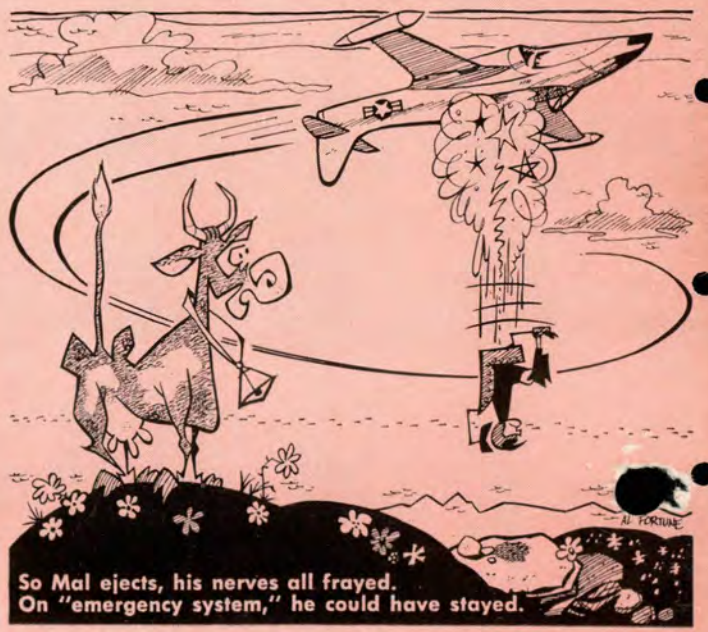
He stays up late—enjoys the club.
The scene gets set for him to flub.



At 40,000, things go fine.
Then needle goes above red line.

Main fuel control has gone askew.
Mal's mind's a blank—oh, what to do?





So Mal ejects, his nerves all frayed.
On "emergency system," he could have stayed.

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