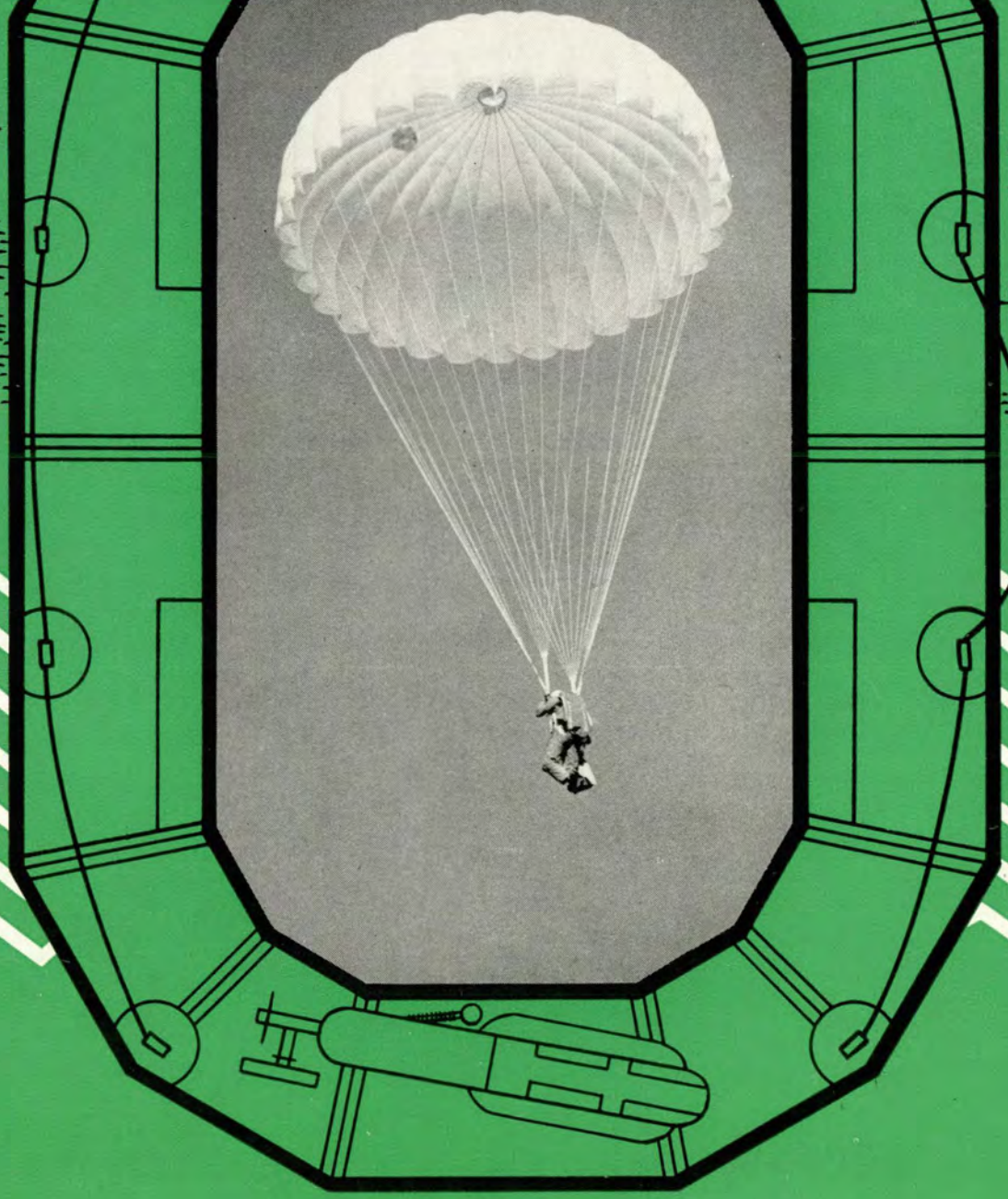
FLYING SAFETY

UNITED STATES AIR FORCE

JULY 1956



It Happened One Night • **Survivalry...the art of.**

FLYING SAFETY

VOL. TWELVE NO. SEVEN

- Learn from the experiences of others. "Survivalry . . . the art of" gives you a first-hand account of how to survive at sea.
- Have you ever flown into the wake of another aircraft? The facts in the article on page 22 may convince you to stay out of this turbulent area.
- The Sarge gets in a good lick in his letter which appears on page 28. Are you guilty?
- The MAINTENANCE REVIEW this month has an interesting article dealing with proper diet for aircrews. Get a copy and give it the once over.

Flying high, wide and fast is the B-66 which will be featured in August issue.

CONTENTS

★ ★ ★

SUBSCRIPTIONS—FLYING SAFETY is available on subscription for $3.00 per year domestic; $4.25 foreign; 25c per copy, through the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Changes in subscription mailings should be sent to the above address. No back copies of the magazines can be furnished.

The printing of this publication has been approved by the Director of the Bureau of the Budget, July 6, 1954. Facts, testimony and conclusions of aircraft accidents printed herein have been extracted from USAF Forms 14, and may not be construed as incriminating under Article 31 of the Uniform Code of Military Justice. All names used in accident stories are fictitious. No payment can be made for manuscripts submitted for publication in the *Flying Safety Magazine*. Contributions are welcome as are comments and criticism. Address all correspondence to Editor, *Flying Safety Magazine*, Deputy Inspector General, USAF, Norton Air Force Base, San Bernardino, California. The Editor reserves the right to make any editorial changes in manuscripts which he believes will improve the material without altering the intended meaning. Air Force organizations may reprint articles from FLYING SAFETY without further authorization. Prior to reprinting by non-Air Force organizations, it is requested that the Editor be queried, advising the intended use in order to obtain the most recent developments and to insure complete accuracy. The contents of this magazine are informational and should not be construed as regulations, Technical Orders or directives unless so stated.

USAF PERIODICAL 62-1

LETTERS TO THE EDITOR

Near Misses

I used to enjoy night flying; in fact, having spent 5½ years as a night fighter pilot, I actually preferred to fly at night, but no more. Why not? In allowing night VFR clearance with today's air traffic, and the widely varying speeds of today's aircraft, we are condoning a condition which only through sheer chance has not resulted in more aircraft fatalities than all other flight situations combined. Within a period of two months and only seven flights, I have experienced three near misses at night and yet no violation of flight rules was involved with the possible exception of that "T" model phrase about a pilot's responsibility to visually clear himself while flying VFR.

It is obvious, I think, that even though I may prefer to file IFR since I just don't believe that night and VFR are compatible, unless everyone else along my route also files IFR no one is protected. My purpose in writing this is not primarily to convince pilots of what they already know, i.e., that it is not possible to safely clear yourself at night; that whether the wing between a red and green light belongs to a C-47 or an F-86 cannot be readily ascertained although ascertaining it for safety purposes is pretty important; that you cannot safely fly VFR at night in mountainous terrain; that even though you can see every light in Los Angeles, the reflection in the haze layer of those same lights renders it impossible to see the clearance lights of other aircraft. All of these examples, I believe, have been experienced by the majority of pilots and yet we continue to tolerate VFR night flying against all rules of good judgment and safety.

I know that CAA facilities or personnel are not sufficient to handle all night traffic on an IFR basis now, or in the near future, but I certainly feel that they should be given that capability in men and equipment as soon as possible. As a further safety feature, I believe that all aircraft should be equipped with a proximity warning device similar to the "tail warning" with which many World War II aircraft were equipped.

Major Ralph A. Secor
Hqs Air Defense Command
Ent AFB, Colorado

Major, we're with you. Night VFR just ain't.

★ ★ ★

Get 'Em Down

Recently I've been led to believe that the Air Force has possibly revised its policy regarding crash landing procedures, in the event of landing gear malfunction.

I was taught that if only one or two gears would extend, it was best to retract all of the gears and "belly it in." However, in recent conversations with newly graduated pilots, I've been told that the best procedure, and the one presently being taught in the cadet program, is to extend all landing gears possible and land, keeping opposite wing up as long as possible. The persons who told me of this procedure were unable to explain the reasons therefor.

It has occurred to me that possibly it has been determined that the deceleration which takes place before the wingtip touches the ground compensates for groundloop tendencies. Or, possibly this is merely due to the difference of conventional and tricycle landing gear.

Can you furnish me with any information along these lines? I realize that the tech orders tell *what* to do but they don't say *why*. I'm interested in both runway and sod landings.

Capt. M. J. Mason
3337th Tech Trng Sq
Scott AFB, Illinois

Suggest you see the article, "Down Boy, Down!", in the February issue of FLYING SAFETY for jet fighter forced landings on unprepared surfaces. Also, for partial gear configuration, analysis of accidents revealed lateral deviation from landing path is not excessive and there is less risk of post impact fire and in general, less damage to the aircraft.

★ ★ ★

"Well Done" Award

I have a request concerning the "Well Done" award featured in FLYING SAFETY. Few people, to my knowledge, have positive, direct knowledge of the proper way of recommending a pilot for this honor. Would you please notify me if an AF regulation covers the procedure? It might be worthwhile to spell out the correct procedure in a future edition of your magazine.

1st Lt Larry J. Larsen
FSO 2233d ARTC Mitchel AFB.

Present procedures established by the Directorate of Flight Safety Research require that recommendations for the "Well Done" award be submitted through the appropriate major command. From time to time, nominations have been received from individuals and isolated units. This necessitates returning the report for resubmission through command channels.

In our daily lives we put great emphasis on practical wisdom. We place our trust in those we say are skilled —the experienced pilot, the experienced seaman, the experienced leader. Abbreviating "experienced" to "expert" provides a shortcut which always hides the fact that expertness comes only through experience and training.

This is especially true in survival where every man must be able to handle himself effectively. Each man has to be an expert. But—how can he gain expertness in a situation that everyone earnestly wishes to avoid—but which no one can guarantee will not come.

Probably the best method is to study survival experiences. Mistakes and successes reported by survivors are lessons which will help each man to be his own expert.

The publication "Airman Against The Sea" (published by the Arctic, Desert, Tropic Information Center, 1955) is based largely on a study of hundreds of survival narratives.

Few Air Force personnel realize that almost all personal and survival equipment developed from 1943 to 1946 was subjected to realistic testing at the Air Proving Ground Command. As a member of the unit which was charged with this responsibility, Dr. George A. Llano, the author of FLYING SAFETY's co-feature beginning on page 6, vividly recalls the vexing questions which plagued efforts to improve various types of sea survival equipment. At that time, he and his co-workers lacked complete understanding because they were unable to examine the official survival accounts which contained the very facts which their own testing methods were unable to reproduce.

For the most part, the words above are those of Dr. Llano. Your Editors have chosen to use this portion of the original story as an introduction to the two feature articles that appear in this issue. The first being, as Dr. Llano suggests, a long overdue account of an actual survival experience. As they say, "Only the names have been changed—."

Dr. Llano's article contains the latest word on many aspects of survival. The inescapable moral of both pieces is that in order to survive, you must know how.

....it

WE ARRIVED at the base at approximately 1500 hours where we were supposed to pick up a C-119 and ferry it to an overseas base. The aircraft was not quite ready so we laid over until the next morning. By 1000 hours we had bought the '119 and went out to check over the emergency equipment.

We had to wait for our loose equipment to be brought out. That gave us a real good chance to look over the emergency gear. Actually, there is not too much that you can check on a dinghy or an exposure suit, but we looked them over as best we could. We checked the Mae Wests to see if the flashlights operated properly, that the oral valves worked, that there were no leaks and that all of the extra equipment was attached. A truck brought out the loose equipment which included the Very pistol, flares, first aid kits and headsets. I had the crew put the first aid kits around the plane and take the Very pistol and flares up front, while I checked over the headsets.

My engineer looked over the aircraft. He checked the prop oil and the data on the Form 781 that had been worked on. He talked to the flight test man in charge of the aircraft and was told that the plane had been flown about 10 hours since the prop regulator had been changed. According to him, it was a good flying aircraft. The engineer checked it over and everything seemed to be OK.

Our engine runup was normal and the aircraft checked out. There was no abnormal indication on the props so we leaped off at 2045Z.

Trouble

About seven hours and 15 minutes after takeoff, our trouble started. It was night—and a black one. The left tachometer began moving up slowly. The engineer came back on the prop control and that seemed to get things under control again. I called my radio operator immediately to tell him to get our position from the navigator and to call Hickam. I wanted him to tell them we were experiencing trouble and for them to alert Air Rescue Service. I did not declare an emergency at this time.

When I finished the call, the engineer told me the prop control was all the way back to the low stop and the prop had stabilized at 2450 rpm. I had the engineer check visually for a prop oil leak but there was none. We discussed the possible causes for a few minutes during which the engineer stated that the prop control felt loose and he believed the prop linkage was broken.

I told the radio operator, who was still making his call to Hickam, to declare an emergency and request an immediate rescue intercept.

After the call, I sent the radio operator, the engineer and the navigator back to prepare for possible bailout. They had their chutes and dinghies back in the cargo compartment. They got them on and checked each other to make sure everything was okay. Then they came back up front. Meanwhile, the copilot and I got into our parachute and Mae West.

About 12 minutes after the prop stabilized at 2450, it started up again. I had briefed the crew that in the event the prop increased again, the engineer was to feather when I called for it; the copilot was to set up the right engine for single engine operation, and I would fly the aircraft. As the prop RPM started increasing again, I put the aircraft into a climb

happened one night!

"I radioed that we were abandoning the aircraft. I put the plane on autopilot. I rang the bailout bell."

and came back on the throttle to slow it down a little. It was going up a lot faster than before.

Then she really went. I guess it was hitting 2700, probably 2800 rpm when I called for feathering. I don't believe the feathering action even slowed it down. The RPM kept increasing to about 3100 rpm, oscillating 150 rpm on either side.

At that time, we started losing altitude, approximately 600 feet per minute. I trimmed it as best I could. I thought at first I wasn't going to be able to trim it all out. I told the engineer to shut the left engine down and see if we could freeze it.

I was hesitant in doing this as I did not know which way that prop would go, if it came off. And if the tip came off and the engine was pulled off its mounts, I didn't know if I could hold the aircraft or not. But it was a last resort procedure and I tried it.

About four minutes after we pulled the fuel-oil-hydraulic shut-off valve, we heard a loud noise. I can't describe it now, but we all heard it. At that time the tachometer hit 3500 rpm and went out. She really wound up! We figured that the engine had frozen and the prop reduction gears had sheared and the prop was spinning free. We were worried.

The worst thing I could imagine was that the prop would come off and cut through that '119 like butter.

I told the copilot to open the forward bailout hatch and to send the rest of the crew to the rear. I was really worried about what that prop was going to do if it did come off. I surely didn't want to get caught with all five of us on the flight deck. With them in the back, they could at least get out of the plane.

I tried to level off but I couldn't get it below 150 feet per minute descent. At 1500 feet indicated, and about 35 minutes after we first experienced trouble, I radioed that we were abandoning the aircraft. I put the plane on the autopilot and in a turn to the left. Then I rang the bell and told the copilot to bailout.

He looked back as if to say, "Is this trip really necessary?", and started moving. He got down on his chest by the bailout hatch and worked his head and shoulders down through the hold. The hatch is about five or six feet deep, and he worked himself down to about his waist and let go.

He fell through very cleanly and waited to open his chute until he was clear of the prop wash. When his chute opened he was on his back, head slightly down.

The crew in the back didn't waste any time either. They had opened up the right rear door and were all set to go. They had taken the six-man life raft and set it in the door ready to be kicked out. When the bell rang, the engineer kicked out the raft, and the navigator went out after it. The radio operator went up to the door and got pretty panicky. The engineer shoved him out and went right behind him .

Hard Way

Me, I had to do it the hard way Instead of going the way the copilot had, I knelt down and tried to make myself go head first. Every time I'd start, I'd grab hold of something. After this happened about three times, I finally just wrapped my arms around me and went out.

I felt myself spinning through the air. Five or six seconds later, I had stopped spinning and was on my back. At this time, I pulled the rip-cord. I think I had about 40 seconds before I hit the water.

The engineer was in for a surprise On the way down, he unfastened his chest strap on the chute and one leg strap. He was just getting ready to unfasten the other one when he hit the water. After hitting the water (where there was about a 30-knot wind), the chute stayed approximately six feet off the water, dragging him

along. He had quite a time getting the other leg strap off, although it didn't take him too long. When he did, he took his dinghy loose from the harness straps and inflated one side of his Mae West.

The waves were pretty high, and they were going over his head all the time and getting water in his nose, mouth and eyes. Finally he got his dinghy out, got it all laid out for inflating, and *it didn't work!* The air started going out right away. He reached over to where the valve was supposed to be and there wasn't anything but a hole. He threw the raft away and inflated the other side of his Mae West.

The Mae West holds you pretty low in the water and the waves kept flipping him over on his face and submerging him. This happened about every ten seconds, and every few minutes he'd get a mouth full of water which made him vomit.

He was out there about five hours, I guess. Air Rescue planes were over us within three or four hours, I think. They spotted our lights. His flashlight worked real good, and they dropped a flare not too far from him. He figured that they knew where he was, if they could just get to him.

It wasn't too long after that that the USS Plymouth Rock came up. They pulled up and missed him on the first pass, then made another. This time they were able to pull him out of the water.

I guess my copilot didn't do much better than the rest of us. His chute started dragging him over the water too. He didn't have time to release any of his harness fasteners on the way down. So when he started being carried over the water, he went for his quick release mechanism. He fumbled with it for a little while. Like a lot of us, he wasn't sure just exactly how it worked.

He went back to the harness fasteners, but they were too tight and he couldn't release them. At that time he grabbed his parachute shrouds, hoping to spill the chute. He was almost successful in doing that. But just as the chute was starting to spill, he got over-confident, released it, and he was off again.

Quick Release

Then he went back to his quick release mechanism. He got them to work this time. The chute left him instantly. He got out of his harness and inflated his Mae West. They say to inflate only one side of your Mae West, but none of us found that one was enough. We had to inflate both sides. Maybe it was because the seas were too rough, I don't know.

His dinghy worked nicely and he climbed into it without any trouble. He pulled in the survival kit and got out the flares and what other things he could see in the darkness. He wasn't quite sure what was in there. He looked for the flashlight that had been attached to his Mae West. It wasn't there. That was a rough break for him, for two of the fellows were rescued right away because they used theirs to signal.

When rescue planes would come over, he would use his flares. The pilots saw the flares but they would lose his position since the flares would last for only about 30 seconds. Because of that and the fact that he had lost his flashlight, he spent the entire night in the ocean.

The water was pretty warm which was very helpful. He filled the raft with four or five inches of water just to keep warm. He managed to stay in the raft all right—except once. He was waving a flare at the ship. He got a little excited and fell out of the raft. But he got back in and sat down and behaved himself.

Shortly after daybreak, he was spotted by the USS Plymouth Rock. They turned back around to get me since I had only a Mae West. In doing so, they lost sight of the copilot momentarily. A B-29 spotted him again, and directed the ship toward him. The B-29 came down to about 200 feet and dropped smoke markers around him. Then the ship's crew saw him and went churning over.

He had no idea of how they were going to pull him aboard. They threw him a lifesaver with a rope attached. He caught it all right, and they played him along the side of the ship, back to the rope ladder. There were two or three fellows hanging on the nets and one grabbed him as he went by. One of them yanked on him but lost his grip, and he, too, ended up in the water. He didn't have a Mae West on and he was scared. I can see why because the seas were really heaving up and down along the side of that ship. He did have a line around his waist, which was attached to the ship, so they pulled both of them back to the rope net and they grabbed hold of it. They got a rope tied around the copilot then, and pulled him aboard.

". . . the dinghy worked nicely and he climbed into it without any trouble. The water was warm."

"... we had a lot of recommendations we've passed on. Most important to know how to swim."

Here's the ringer. Me again. On the way down after my bailout, my first reaction was to go to my quick release. The second reaction was that I didn't remember exactly how it worked. I couldn't remember if there were just two movements in the operation, or whether the first operation was a movement up or down. I decided I just wouldn't fool with it. I didn't remember just how it worked and thought the best thing to do was to go for the harness. I unfastened my chest strap and my left leg strap, and was working on the right leg strap when I hit the water.

Actually, when entering the water, none of us had the feeling of going down very deep at all. I went in the water very calmly. I kept my left hand underneath my right harness as I inflated one side of my Mae West with my right. I was playing it real nice and cool.

Boy, about that time, I felt like someone hooked me on to a fast moving freight. I was jerked clear out of the water. My chute literally ripped off my chest. The next thing I knew, I was ricocheting across the water at a terrific pace. My right ankle was still caught in the harness strap! The lanyard from my dinghy, which I had fastened on my Mae West, had ripped the ring right off.

I was flipped over on my stomach and the water was being forced up my nose. When I would break through a high wave, I would be completely submerged for a period of five to ten seconds. I don't believe I ever came closer to drowning!

A strap from my harness was dragging by my side. I grabbed it and tried to pull myself up so I could get the strap loose from my ankle. Every time I did that, a gust would hit the chute and throw me right back. I'd roll on my stomach and have to fight to get on my back again. One time I tried to bring my left foot over to my right and kick my shoe off. But that ended me up on my stomach again.

After about four such tries, to be very truthful, I just gave up. I was weak. I felt that if I were flipped over on my stomach just one more time, I'd never be able to get on my back again. I don't remember what happened next. I don't remember how long that went on, or when the chute left me. The next thing I do remember is floating in the water. The chute was gone; my right shoe was off, and my ankle was awfully sore. I guess the strap finally just pulled my shoe off and left. As soon as I realized I was free, I really felt good.

I started to sober up then. I realized that I didn't have a dinghy and that I had about 11 hours to go, before it got light. Actually, my first thoughts were that it was too far for a helicopter to come and an SA-16 wouldn't stand a chance landing in that water.

Stay Alive

All I could think of was that it wouldn't be until next morning before they could rescue us. That is—assuming that they could find us and the wind calmed down. I never dreamed there was a surface vessel so close.

The big problem was to stay alive until morning. That began to look like no easy problem. The water was constantly washing into my mouth and nose. When I would swallow a lot of salt water, it would make me sick, and up it would come. The vomiting made me feel better, but it would also make me weak. I tried to conserve my strength by putting my head back, my arms out and letting my legs drag. It never did work. A wave would completely wash over me. Or it would slap me down head first and I'd have to fight to get my head out of the water again. Pretty soon, it got so I was hesitant to let my legs and arms stop at all. With them moving, I seemed better prepared to keep myself from being submerged by the water.

I never had an aircraft actually fly over me, although I could see and hear them. When the USS Plymouth Rock came on the scene, it was hours before I was sure that it was a surface vessel. They turned on all of their lights and all of us spotted them. Fortunately, our last position report had been accurate. It was a good feeling to see that ship out there. My morale really went up!

I tried moving toward the ship. It was actually a futile attempt in that water. But, although the ship was visible only a quarter of the time, I seemed to be submerged less and my morale was higher. I guess with a goal in mind, I had less time to think about my troubles.

The next thing I knew, I was on top of a swell. A floodlight came around and landed on me, swept by me and then came back. It stopped on me! I started waving and yelling. Not that it did any good—they had seen me already but certainly could not have heard me.

The ship came alongside of me and then there was someone in the water holding me. We were being pulled toward the ship. The first thing my hands touched was a rope ladder hanging over the side of the ship. What a wonderful feeling to put my hands on that net!

To sum it all up, we were real lucky. Having circumstances turn out for you the way they did for us is almost unbelievable. There has been a lot of talk about this "Miracle Rescue." But although we made our mistakes, most of us are alive today because we did not panic and of course we had a little luck going for us.

We had a lot of recommendations that we've passed on, but the most important one is "know how to swim!" In water like we were in, a guy who didn't know how to swim well would be in a bad way.

The Old Man had a comment I'll never forget. He said: "You'd all better stay away from high bar stools. I don't want you falling off any of them. We'll give you credit for a week's PT for all that swimming. And, by the way—we're mighty glad to have you back!" ●

Survivalry ... the art of

Dr. George A. Llano, ADTIC, Maxwell AFB, Alabama.

WHEREVER aircrews gather, the conversation sooner or later will turn to some phase of survival, and never more so than when preparing for overwater flights.

Although the acts and techniques of survival and the value attached to survival gear are all wide-open subjects for every wandering opinion, the art of surviving cannot be learned by talk. You either learn it by practice and conscious effort or you don't. Few who've outlived their hardships at sea can recount their successes without some apology for lessons which they failed to heed or for equipment which they failed to use properly. This art of surviving I choose to call "survivalry."

The Air Force has regulations pertaining to survival which are intended to provide for survival training and for personal equipment programs. This training and these programs are expected to keep aircrews proficient and ready in the event of an emergency of any kind.

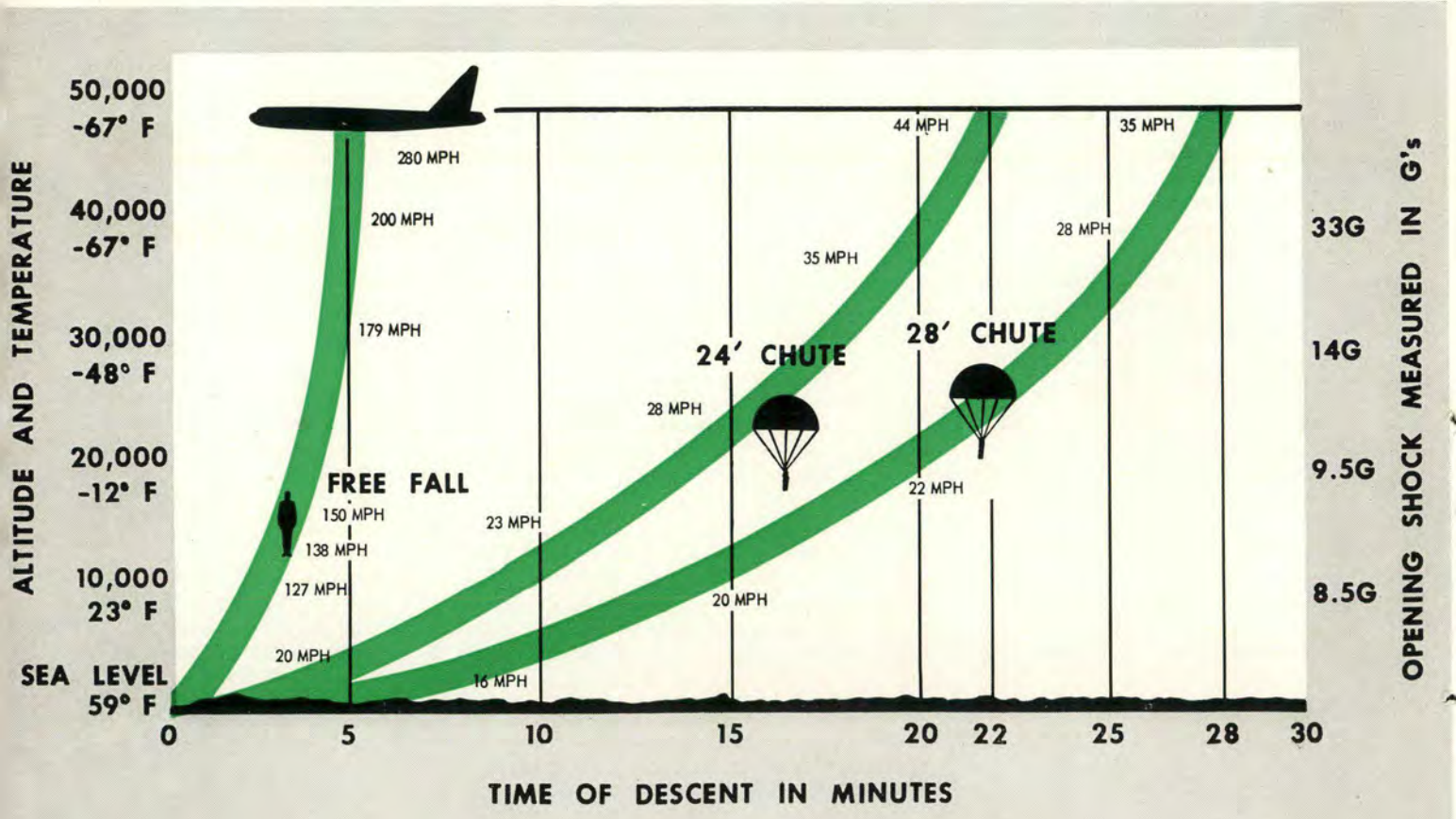
The Air Force Dictionary, scheduled to appear soon, defines "survival" in the following manner: "The primitive act or state of continuing to live, especially by the preservation of one's life against any immediate peril, such as drowning, starvation, dehydration, oxygen deficiency, heat, cold, low atmospheric pressure, bacteria or radioactivity."

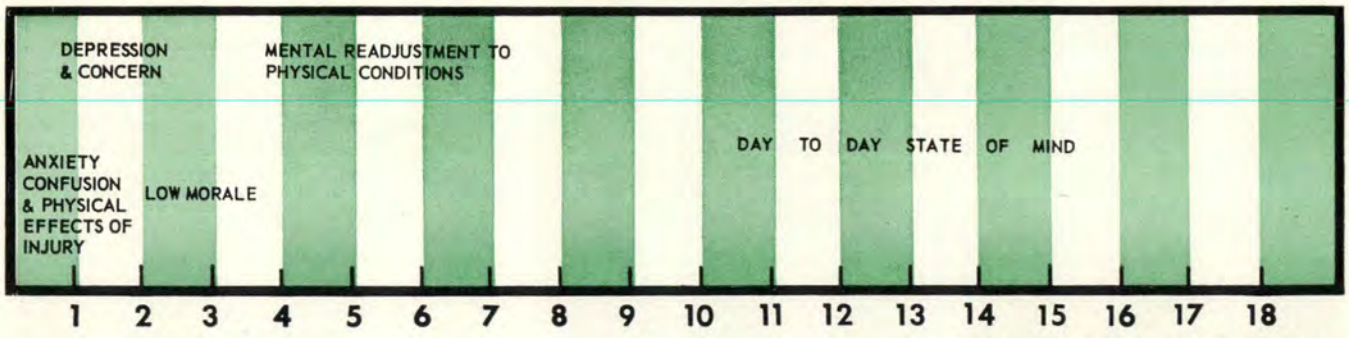
This definition deserves more than casual attention because in its parts the high points of "survivalry" are clearly spelled out. An individual's first reaction to an emergency is always a natural effort for self-preservation, and every man's actions are excited by his desire to live. With training, these primitive instincts can be disciplined into orderly procedures. When the emergency takes place over water, the sequence of events moves rapidly into critical phases that are, to a greater or lesser extent, the test that separates the disciplined from the undisciplined.

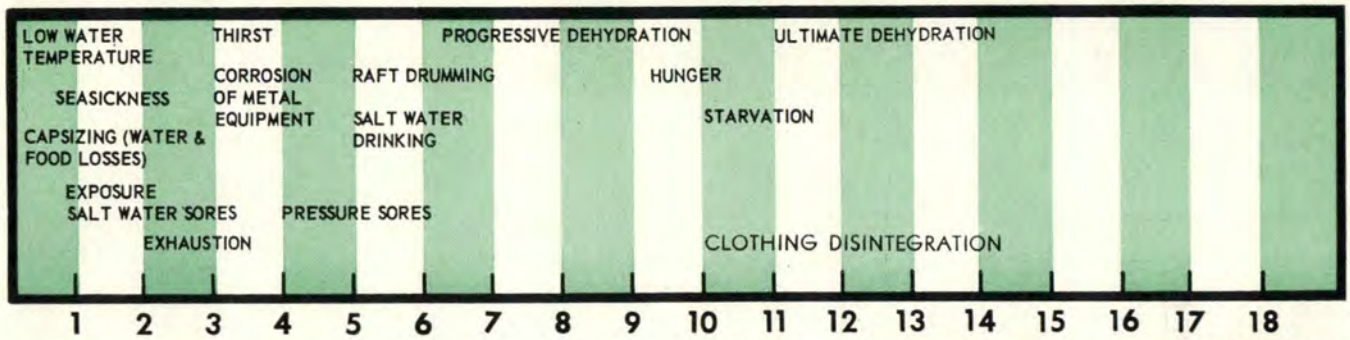
A wit once remarked that experience is the name everyone gives to his mistakes. But fortunately, in "survivalry," mistakes are often rewarding when they provide gainful experience in learning, that is if the error does not end in misfortune. So, consider the errors of your predecessors and thus profit from a rich background of personal experiences with which to meet future eventualities. For those who remain ignorant in spite of experience or training, there is only one hope—luck. Of those who relied on such a fickle fortune, only a few filled out a survival form.

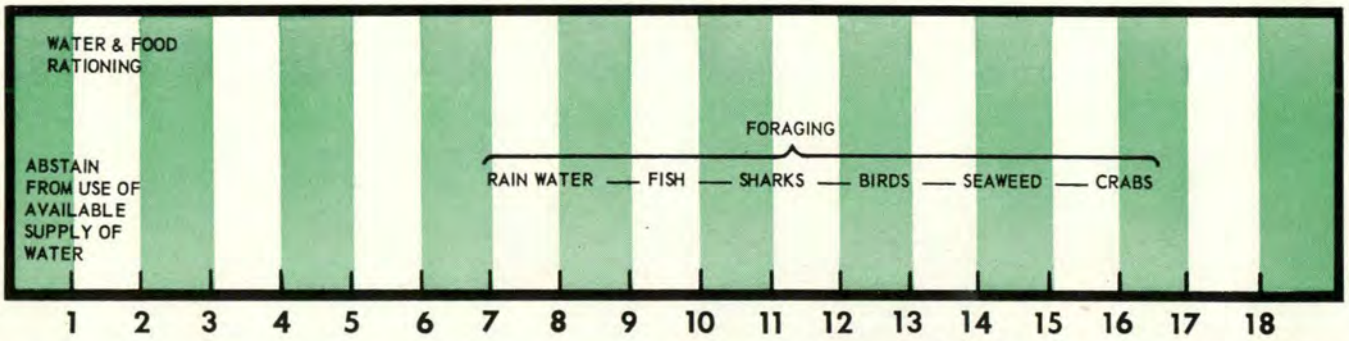
Thus, in line with our theme on the value of experience and with our concern for those who go down over the sea, it seems appropriate to repeat the words of a survivor rescued after three days on the Adriatic Sea: "And

Value of free fall. These are calculated rates of descent for free fall and open parachutes from 50,000 feet for man of 200 lbs.









What happens to you when you are down at sea? Check time in days in relation to phrases in charts above.

last but not least, every man should be exposed to a wide variety of true accountings of actual ditchings. This latter phase (of training) is the one that I believe is likely to be omitted." Would you agree with this statement?

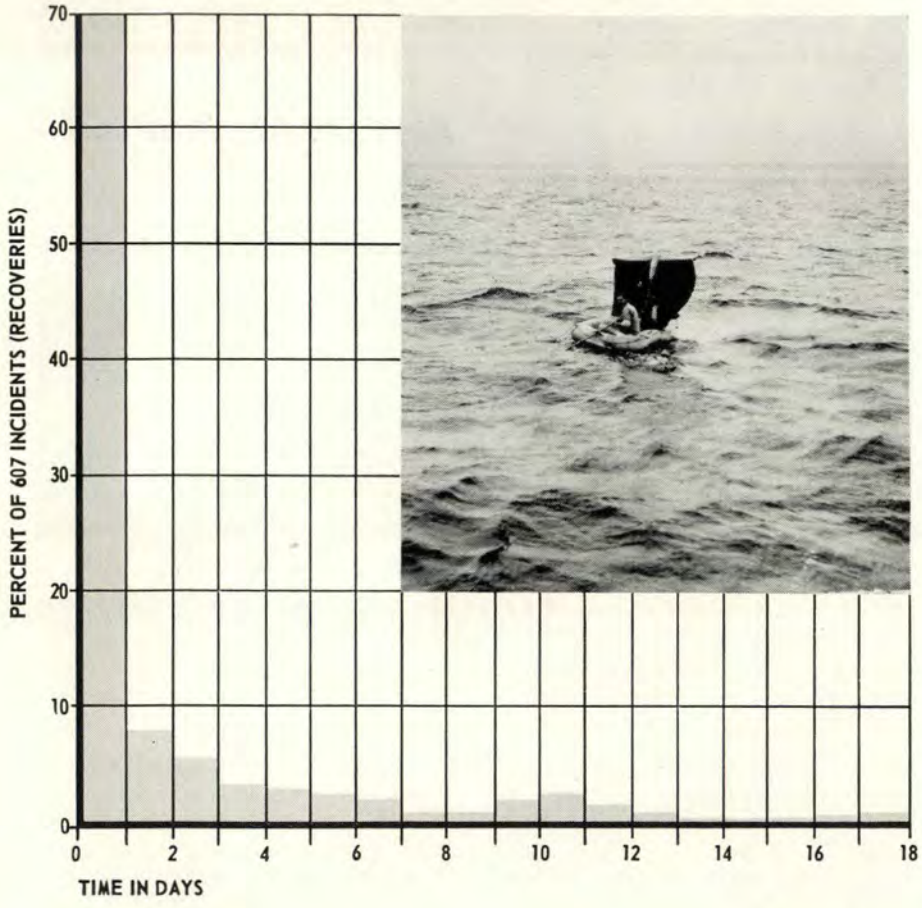
Has the Picture Changed?

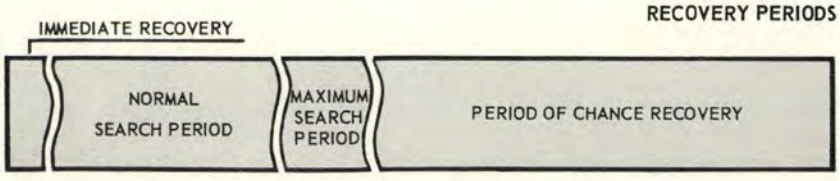
During World War II, survival equipment and training in survival methods mushroomed in many directions. The need was great, and in the absence of experience many ideas were tried which are now judged less useful. The late General H. H. Arnold refers very effectively to some of the problems of his day in the book, "Global Mission."

For the most part, briefing and training on water survival was not too good; men did not know their equipment or how to use it. Emergency equipment was meager or often in no condition to be used. The most favorable part of the survival picture was that through skillful ditching it was possible to get down on the sea safely. Consequently, aircrews held the advantage of starting a survival with all their necessary sea gear. However, human nature being what it is, the probability of human error will always be a critical factor in determining the final outcome of a survival at sea. Certainly, the same difficulties in operating survival equipment were revealed during the Korean War which were so manifest in World War II narratives. In addition,

Be familiar with your personal and survival equipment—in detail. Test your own proficiency.

Charts below show recovery periods in relation to time in days. Life raft is essential item.





the problem of survival is beset by many implicating influences. Aircraft design is becoming more radical and that effect is fully reflected in the more severe demands made on personal equipment. Survival equipment requirements necessary to match a concept of global strategy that cuts across sharply contrasting temperature zones in a matter of hours must eventually settle on the basic environmental needs of man. For irrespective of our mechanical progress, man and the elements are always the same. Since time immemorial a man alone against the sea has had no choice but to fight for existence and to contend with the physical and mental afflictions of heat, cold, hunger, thirst and utter loneliness.

If at high altitude, high speed jet aircraft do not show characteristics for favorable ditching similar to piston type aircraft, then we must revise our whole attitude toward the problem of personal safety. This is evident in the present day development of the partial pressure suit and K-1 helmet, the constant wear anti-exposure suit, the ventilated vest, better means for flotation, new electronic signaling devices, and the diversity of new materials for survival equipment. Finally, since all survivors are heartened by the thought that they are being sought for it is well to consider the improved techniques, operating know-how and doggedness with which the Air Rescue Service carries out its mercy missions. We are launched into an era of stratospheric flight and by tradition committed to an intensive program of personnel safety.

Survival at Altitude

Mach speed, high altitude aircraft of limited cockpit capacity with ejection escape systems present technical difficulties for the use of conventional type personal and survival equipment. The answer so far lies in compactness and minimum issues of the most essential items necessary to meet safety requirements. These requirements are best met by the back-pack high-speed parachute which allows the use of seat packed rafts and accessory items, yet holds the overall increase of the body silhouette to a minimum.

The problem of jet aircraft escape is two-fold. One is inherent to aircraft design; the other is the changing chemical and physical conditions surrounding the earth. At high operational ceilings, atmospheric temperature and oxygen gradients are low

and a constant reminder that man was primarily intended to live on the bottom of the aerial ocean. In any emergency, low atmospheric pressure and oxygen deficiency are matters of the first consideration and the prelude to survival on land or sea.

Above 10,000 feet, the lack of oxygen, low temperatures and opening shock of the parachute in high speed jumps makes it necessary to free-fall into warmer, denser air. With an emergency oxygen assembly and an automatic ripcord release, aircrews can leave the aircraft when warranted. Without oxygen equipment or automatic ripcord release, AFM 64-4 (Oct. 1954) says you can fall from 30,000 feet and retain consciousness provided you get out of the aircraft with a minimum of effort.

Modern escape methods involve a minimum of effort but include psychological and physical factors which have a bearing on the problem of survival in the air.

First, there is the natural anxiety attending any emergency. Second, there is the shock of windblast at extreme altitude which may preclude the possibility of holding the breath. Only when ejection is necessary without the benefit of oxygen equipment and automatic parachute release are aircrews faced with a decision. A partial insight into this problem may be derived from the following experience: "Some may question my reasons for opening the chute so soon at extreme altitude, as the general policy seemed to be a free-fall to a warmer altitude with sufficient oxygen as soon as possible; doing this by either counting or holding your breath as long as possible. I discussed this policy with the flight surgeon. He felt that on bailout with no oxygen, it would be better to open your chute while still conscious, taking your chances on anoxia (hypoxia) and frostbite rather than chance anoxia during a free-fall which might probably prove fatal in the event that you passed out prior to pulling the ripcord. I agreed. This is why I opened my chute when I did.

Above 45,000 feet, the only adequate defense against low atmospheric air pressure and the perils of abrupt decompression is partial pressurization of the body. As heights approach 65,000 feet or higher, body liquids "boil." For this reason pressure suits or a capsule system of ejection enclosing a shielding envelope of more normal air characteristics are the only safe methods by which humans can descend from great heights in safety.

A life raft gives better protection from the elements, greater stability and companionship.

Duress

One incident worth repeating occurred at Eglin Field in 1945 during routine test of a "man from Mars" pressure suit. The writer was instructed by the test officer, Major Peter F. Scholander (now Professor of Zoophysiology at Oslo University, Norway), to take him to the highest simulated flight pressure possible in a low pressure chamber. At a simulated altitude of about 60,000 feet, the special compressor which maintained a normal air pressure within the suit began to smoke. Pete's discomfort was immediate and apparent. We—being mindful of the blood hazard and fearful that he would lose self-control, worked feverishly to compress air back into the chamber. Fortunately, the descent was in time. The survivor, obviously exhausted, admitted that only with the utmost restraint had he controlled his desire to disconnect the offending hose. This experience illustrates that presence of mind when under duress is essential to success in survival.

The most valuable property a man in the water can possess is buoyancy. This obvious truth is stressed repeatedly in all survival narratives. Yet, as late as 1956, Headquarters USAF made an official note of the fact that some aircrew members have drowned after over-water bailouts without proper survival gear. Proper survival gear includes a life raft which is necessary for an existence of any length because it provides a platform on which to relax, to live and to hoard all personal possessions from loss in the sea. Without the means of flotation, but providing a man can swim, how long can he survive? This depends on various conditions. First, with apologies if the question sounds ridiculous, how strong is his feeling for self-preservation? Second, has he strength and lasting power? Third, what is the water temperature?

This we know—that men with high odds against their chances for rescue and non-swimmers have succeeded in being saved. Literally, they clutched at straws—floating wreckage and jetsam from their aircraft. Some made effective water wings of their trousers or shirts if they did not happen to be

The most valuable property a man in water can possess is buoyancy. Ask the experts.

wearing a one-piece flying suit. Others swam 15 to 20 miles before gaining a beach and often spent as many hours in the water. The longest survival swim without support was made by a naked Dutch submariner who reached the Java shore after 35 hours of continuous swimming. The longest swimming period with a Mae West lasted 73 hours. Of the two airmen who struck out for shore in the latter incident, the larger and physically more fit for the ordeal, tired and gave up in the first 24 hours.

Experience in salt water swimming, the ability to adjust mentally and physically to various seas, and above all the faculty to relax, has saved men's lives even under severe sea conditions. Water temperature, however, is a more disconcerting factor because exhaustion is hastened by cold and rapidly diminishes the survival time. Official sources state that immersion below 31 degrees Fahrenheit is considered fatal within one-half hour. But even long immersions in tropic waters can be chilling while in temperate waters below 68 degrees Fahrenheit. Cumulative cold and fatigue will gradually wear down the staunchest physique.

Since we don't have a serviceable all-weatherproof life raft, we can mark the constant wear anti-exposure suit as the principal and most valuable contribution to sea survival. A man on a dry platform, with the ingenuity to forage off the sea, can hold out with greater comfort.

Flotation Gear

The factor contributing most to the success of the previously cited 73-hour survival was a Mae West with a modified headrest which permitted brief periods of sleep without danger of drowning. A serious defect of all pneumatic vests worn under the chute is that the chute must first be removed before inflation.

Most deaths from drowning occur during this phase of the landing when men panic and inflate their vests before getting rid of their chutes. The new water wing flotation gear can now be inflated before the chute is jettisoned. However, the possibilities of unconscious men drowning in the masks of the partial pressure suit is to be considered when the oxygen bottle is strapped to the leg. The issue of individual life rafts is an important concession to safety on the sea, and a necessary accessory for ejection escape systems. Although similar in weight and shape to the C-2 series, the new PK-2 pack seat raft is of better materials, more accessible to the survivor and reasonably foolproof in inflation. The 20-man raft is a happy solution for large crew or passenger lists. Although it crowds more misery into one raft, it also gives better protection from the elements, greater stability, larger supplies of provisions and companionship; for nothing is so desperately monotonous as the sea.

The record for long survival at sea goes to Poon Lim who drifted 133 days on a ship's raft. On a rigid platform, life is relatively comfortable since the unyielding structure acts as a buffer between the man and the constantly oscillating water. Poon Lim did well for himself through foraging and when picked up had lost no apparent weight.

The record for long survival on a flexible life raft was made by Captain Lou Zamperini and a companion in a remarkable 47-day drift of 1200 miles in which the Captain reported a loss of 87 pounds. This loss in weight appears to be more normal for a drift of that length but it is not necessarily related to the ability to forage. Most people appear to regard life on a raft as one of comparative repose. A pneumatic life raft with a three-eighths flexible bottom is like a drum and transmits every bounce of the sea.

Survivors, and more generally lone handers in small rafts, complained of the inability to rest for any but the shortest periods, because of the constant drubbing of waves on their cramped buttocks. Consequently, lack of sleep contributed to their fatigue. This is an unpleasant aspect of pliable rafts but hardly a good reason for black-balling a piece of equipment which can bring you to safety. It is, however, another bit of information picked up through experience. Just ask the experts—Dixon, Pastula, Aldrich, Madden, Zamperini, Rickenbacker, Twining and a host of others who are names on official survival interrogation reports.

A Final Word

Survivor reports show that men who had to rely on printed instructions at sea often fared badly when the emergency occurred at night or under severe weather conditions. It goes almost without saying that aircrews should be familiar with their personal and survival equipment—in detail. If a survivor in a pitching raft at night can lay his hands on the precise item necessary for his use, or replace it with the surety that it will be in place in the morning, then he has learned the first lesson of survival. Test your own proficiency. See if in a given period of time and blindfolded, you can expertly lay out, set up, manipulate, use or replace the various items of the survival accessory kit while sitting in one position. Can you tell the difference by feel between the various first aid items, or unseal a food or signal container?

Crews near the ocean have unexcelled opportunities for testing their raft skills under natural conditions. Those stationed inland should not accept success in a swimming pool as a sign of proficiency; the sea is different. At night, the sea and unfamiliar gear can be both different and strange. ●

What is your feeling for self-preservation? Have you the strength and lasting power?

WELL DONE

Capt. John D. Heller

41st Air Rescue Sq., Hamilton AFB

CAPTAIN JOHN D. HELLER was flying an H-19A helicopter on a rescue search mission with two other crewmembers aboard. They had been searching at an altitude of 500 feet along a coastal mountain ridge for a missing jet airplane. The air was turbulent and required constant attention at the controls. Suddenly a strange noise was heard and a power loss was noted.

Captain Heller immediately turned the helicopter toward a nearby valley, lowered the collective pitch and started a descent in autorotation to a small field. During the descent, the strange banging and grinding noise became louder. Smoke filled the cockpit and cabin at approximately 30 feet from the ground. As the collective pitch was increased for the touchdown, a loud explosion occurred and a flash fire burned the inside top and sides of the cockpit and transmission area.

Captain Heller landed the helicopter without damage and put out the fire by use of the hand fire extinguisher.

Disassembly of the transmission revealed the failure of a ball bearing assembly causing great friction on the drive shaft between the engine and transmission. The drive shaft sheared.

The quick action taken by Captain Heller of going into autorotation and the fact that he knew exactly where he intended to land in this type of terrain displayed excellent judgment and outstanding flying skill. Well Done!

the Voice from Below

Sometimes it seems as if all of the breaks are against a man. A pilot may find himself in a jam through no fault of his own. Such was Mickey O'Hara's predicament.

But Mickey was lucky. When all the chips were down, someone heard him call, "This is an emergency."

This article by Maj. Robert E. Fuerst, 1809th AACS Group, is based on an aircraft "SAVE" made by AACS men on Okinawa, on 3 February 1956. In a letter of appreciation to the Naha DF and GCA crews, the T-33 pilot said, "Performance such as this gives a pilot confidence in the men who operate the radio and radar equipment. It certainly reflects credit on your organization and on the U. S. Air Force."

★ ★ ★

IT STARTED OUT in routine fashion; a typical flight, seemingly just like any other. And when he took off, everything appeared in order. There was no hunch about the trip, no feeling of alarm in his chest.

He was in his twenties, this young Air Force Lieutenant Mickey O'Hara. He was flying a T-33 from Itazuke, Japan, to Kadena, Okinawa. And he was enjoying the flight, watching the colors of the sky as the sun sank toward the horizon.

Mickey pulled his eyes off the glorious sky colors and looked over the cockpit. Everything in order. Ample fuel. Glancing at his watch, he figured it would be another 15 minutes. He spoke to the man in the back through the interphone system. "Eighteen-thirty, Tex. Just about another quarter hour."

"Rog, it won't be long now. I wonder if they still have Nick's band and Thelma at the club."

Mickey grinned and punched a button. "Okinawa Control from Chestnut Green. Do you read?"

"Chestnut Green from Okinawa Control. Read you loud and clear. What is your position?"

"Rog, Okie Control. I'm in a T-Bird about a hundred out. What's the latest weather at Kadena?"

"The 1800 Kadena weather is 700 overcast, two miles, rain showers. Wind northwest at 15."

"Roger, Okie Control. Chestnut Green out."

Mickey whistled. Something must have moved in. They were forecasting 2000 broken with unlimited visibility when he took off.

When you flew to Okie, there were

no alternates. Normally, this wasn't much of a problem in conventional aircraft, for even during poor weather there were temporary breaks. But with a jet it was different. A jet couldn't hold for two hours and wait for a break. A jet was supposed to find pretty decent weather on arrival. Oh well, 700 and two wasn't so bad. As long as it didn't get worse.

It was dark by the time he reached Okinawa. There was no indication of land below; clouds extended as far as he could see and scattered buildups towered over the whole area. He began to get a swing on the radio compass and gave GCA a call.

"Kadena GCA from Chestnut Green, over."

"Chestnut Green, Kadena GCA. Go ahead."

"I'm over King Dog homer, GCA. In a T-Bird. What's the latest weather?"

"Stand by one."

Mickey's eye was caught by a flickering on the panel. It was the compass needle jumping about erratically, sweeping the whole 360-degree circle periodically.

"Chestnut Green, Kadena GCA with your weather. Special observation at 1840. Estimated 600 overcast, one mile, heavy rain. Over."

"Roger. How's Naha?"

"Naha is the same. Six hundred overcast, one mile, rain. We have you on radar now—good radar contact."

"Okay, we'll come into Kadena."

Mickey switched to interphone and said, "Hear that, Tex?"

"Yeah. Have fun."

Mickey began the letdown guided by the voice of GCA. With the compass out, he soon lost all notion of where he was in relation to the field and had to rely completely on the unseen director somewhere down below. He eased the T-Bird lower and lower and worked his way methodically around the pattern.

"Okay, Chestnut Green, turn left to a heading of zero-five-zero. This is your final."

"Roger."

"Continue letting down. Your altitude is good."

He was down to 800 feet and then suddenly GCA said, "Pull up, Chestnut Green! Pull up and go around! We lost you in the heavy rain."

Mickey eased back on the stick and made a go-around. He followed directions for a second approach. As he dropped down to about 700 feet the voice of GCA again barked, "Pull up! Pull up, Chestnut Green!" They lost him again.

He couldn't do this forever. Looking at the fuel indicator he frowned thoughtfully. Once again he started the traffic pattern. This had better be it. He was on final now. One thousand, 800, 700, 600 . . . there was GCA again. "Pull up, Chestnut Green! Pull up immediately! The rain is too heavy and weather returns are blocking you out on our precision scope. We've lost you completely."

Mickey groaned and pulled back on the stick. Glancing at the fuel gage, he shook his head. There was less than 15 minutes fuel. And he was completely disoriented now, not having the faintest idea where he was in this murk. It had turned out to be quite a day. And it wasn't over yet.

Well there was no time to lose. "Kadena GCA from Chestnut Green. I'm declaring an emergency. Repeat, I'm declaring an emergency. I'm down to 12 minutes fuel now. Will you be able to bring me in?"

"Negative, Chestnut Green. Switch to guard channel and contact Naha GCA. I say again, switch to guard channel and contact Naha GCA."

"Roger, GCA. Sayonara."

Mickey punched at the new frequency button and said, "Naha GCA from Chestnut Green. This is an emergency. How do you read?"

It seemed like minutes but it was actually seconds, he supposed, before he had an answer. But what an answer! Clear and confident tones and a voice full of optimism. Mickey felt a little of the tenseness slide away as he listened.

"Roger, Chestnut Green, this is Naha DF. GCA has you on radar and will take over in a moment. You are about 20 miles north of Naha. Turn to a heading of one-nine-zero degrees. This will bring you overhead."

"Roger, Naha, will do."

And in a few minutes, "Chestnut Green from Naha GCA, how do you read?"

"Read you loud and clear."

"Roger, Chestnut Green. You're now about five miles west of Naha. Make a left turn to a heading of zero-five-zero and descend to 1500 feet."

"Roger, GCA." Sneaking a look at his fuel, he added, "Make it as quick as possible, GCA."

"Roger. Naha is way below minimums now. We'll give you a surveillance approach to Kadena. Weather at Kadena is 400 overcast, one-half mile, heavy rain."

"Roger." Mickey wiped his brow with his sleeve and crossed his fingers. The weather was number ten. And he was about out of fuel. If ever a man needed a good break, this was the time!

Mickey watched the altimeter needle as it steadily turned. He was at 700 now. Ought to break out pretty soon. Six hundred. Five hundred. And still as thick as ever. Dark. With heavy rain pounding at him. Now four hundred. Still no ground in sight. What's wrong? It wasn't too late to pull back and zoom up enough for both of them to get out of this rat trap. There should be enough time for that.

Mickey ran his tongue over his lips as GCA said, "You're right on the centerline."

He hesitated and then eased the stick forward. You've got to trust those men down there. Almost at once he was below the clouds, breaking out at about 300 feet. It was raining so hard that he could scarely see.

Lower, lower, lower.

"You're over the end of the runway now."

There it was! He shoved hard on the right rudder and scooted over slightly, then he set the bird down.

Mickey got the T-Bird under control and turned off the runway. "Thanks, GCA," he said. "Mighty nice work."

He flicked to interphone. "Well, we made it, Tex boy.

"Barely. I'll have to buy you a steak for that one though. You know, something's just occurred to me. Kadena must be equipped with the older MPN-1, GCA equipment. That's why the rain cluttered up the scope. With the CPN-4 at Naha, the circular polarization feature eliminates the rain clutter. We'll have to remember that the next time we come here."

Mickey smiled and the smile lingered for some time. The day had started in routine fashion but it sure was ending on a melodramatic note. And the ending was happy, thank goodness. He'd better look up those GCA people and give them a pat on the back. They had done their good deed this night. ●

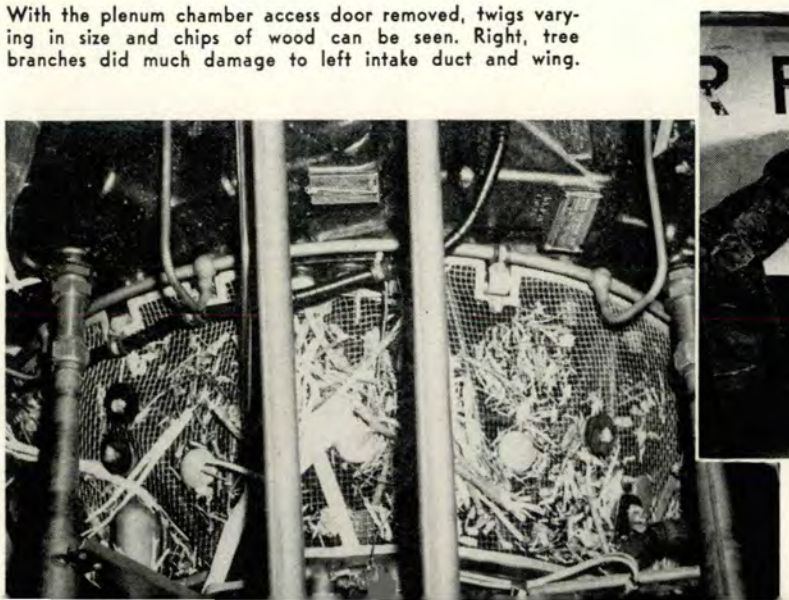
Above, the T-33 flew through the tops of a group of trees, cutting a clean swath. Right, notice the size of some of the limbs. Still the aircraft flew back home. Below, this is the pile of wood that entered plenum chamber through the intakes.

Not Recommended!

FLYING SAFETY doesn't recommend flying through trees with the Tango Three Three; however, for those who love to say "They don't build 'em like they used to," here are some examples of the ruggedness of today's aircraft. The pilot of this bird was simulating a forced landing pattern, using a clump of trees as a runway reference. Pictures speak louder than words so it would be somewhat naive just to say, "He goofed."

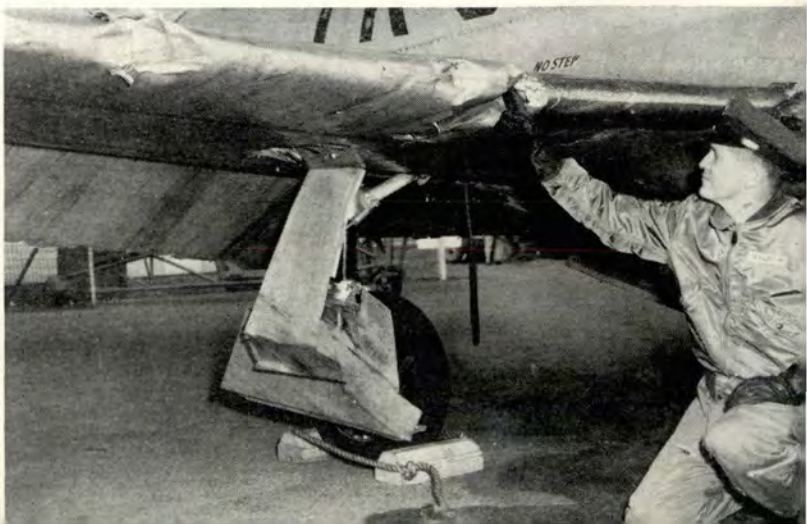
The point is that he flew the T-33 back home, carrying no small amount of timber with it. ●

With the plenum chamber access door removed, twigs varying in size and chips of wood can be seen. Right, tree branches did much damage to left intake duct and wing.



Pictured here are the large trees that sustained most of the impact. Right, damage to vertical and horizontal stabilizers clearly show that the aircraft flew below the trees tops. Note overall shot below.

Left, shows damage to the right intake. Right, indicates the force of the impact. The leading edge, underside and root of the wing were hit hard.



Eight RFC charts covered the U. S. in 1937.

Have you used the Special Edition of the Radio Facility Charts? Did you know you now have a choice of RFCs? Here's the complete story.

SAME BOOK ...NEW LOOK

Albert P. Litwa
ACIC, USAF

HAVE YOU EVER stopped to think what the Radio Facility Chart (RFC) means to you? It's like an insurance policy that pays dividends when the chips are down. It is always there when you need it.

Many conveniences make our daily lives safer for our families in the home. These things are routine because they are so familiar to us. We take them for granted. However, their importance is realized when the convenience of one of these safety measures is lost to us. Likewise, take away your RFC and you will realize its vital importance to aviation.

Air traffic has increased tremendously since the '30s. More highways in the sky were necessary to handle this increase. Consequently, more traffic aids were needed. In 1937, a Radio Facility Chart was produced by the U. S. military—eight handy charts which covered the United States. With each passing year, aerodromes were constructed and more navigational aids were installed; therefore more flight destinations were available. The continued increase in radio aids and the commissioning of new airways resulted in congested charts that fathered the requirement for some other means of presentation. A considerable number of charts were required to adequately portray the expanded airways system. Therefore, the decision was made that a Radio Facility Chart in a bound form would best satisfy the operational needs of the time.

Sometime later, a new airways system (VHF Omni Directional Range —VOR) came into being. Initially, graphic portrayal of the VOR system was combined in the Low Frequency RFC, but as additional airways were established, the charts became hopelessly congested. To overcome this, a separate VOR edition was produced.

The problems involved in the development and production of these charts are many and varied. The matter of deciding what will be included and how it will be presented is a complicated process. Not all information published is required by everyone for everyday use but it is needed by most pilots at one time or another. Por-

trayal and format are based on operational use. Data contained in the RFC is for both in-flight and preflight planning information. Flight planning information and in-flight data of a more stable nature are included in the Supplementary Flight Information Document (SFID).

The United States Radio Facility Chart is produced every two weeks because of the frequency of changes required. There are changes on approximately 75 per cent of the pages every two weeks. The average is about six changes per page. Airways are constantly changing as are radio frequencies and reporting points. The "corrected to" date on the front cover means that data is current as of that date. Therefore, all NOTAMS subsequent to that date should be checked. It takes time to print and distribute the RFCs so an approximate distribution date also is shown. If you are not sure whether you have the latest chart, check the distribution date and add two weeks to it. If it's past that date, check with the base operations officer for the latest copy; the one you have is obsolete.

When there are important changes in the RFCs, they are brought to your attention by a Special Notice on the front cover. If you aren't flying a route regularly, it's a mighty good idea to check the Special Notices before you plan your flight. Those just recently added will be boxed, indicating the effective date. Special Notices also are boxed when there are changes to the existing notices.

There are many changes in Prohibited, Restricted and Warning areas. To avoid a violation, you should check the tabulation pages to see if any changes have occurred or if new areas have been added. You may be using a World Aeronautical Chart that hasn't been brought up to date. If it's an addition or a change, you will see a heavy black box around the area number. This box is shown for two issues, then dropped.

You can see by all this that the RFC was designed for you and is being continually modified to meet your needs. However, needs of different units vary. Major Air Commands each have a specific mission to accomplish. Even though navigation in all types of aircraft is essentially the same, different techniques are used. Cockpit configuration is a major consideration in determining the most suitable style to be used.

Sheet Type RFC

Early in 1953, the Air Defense Command indicated specific requirements for a sheet type RFC which would be particularly suitable for jet aircraft operation.

Development of the Experimental Radio Facility Chart (XRFC) got under way. It was determined that 13 charts were required for United States coverage. One side contained low frequency radio information and the other VOR. The charts were folded to allow each fold to be turned like the pages of a book to permit easier use in the small cockpit of the single place jet.

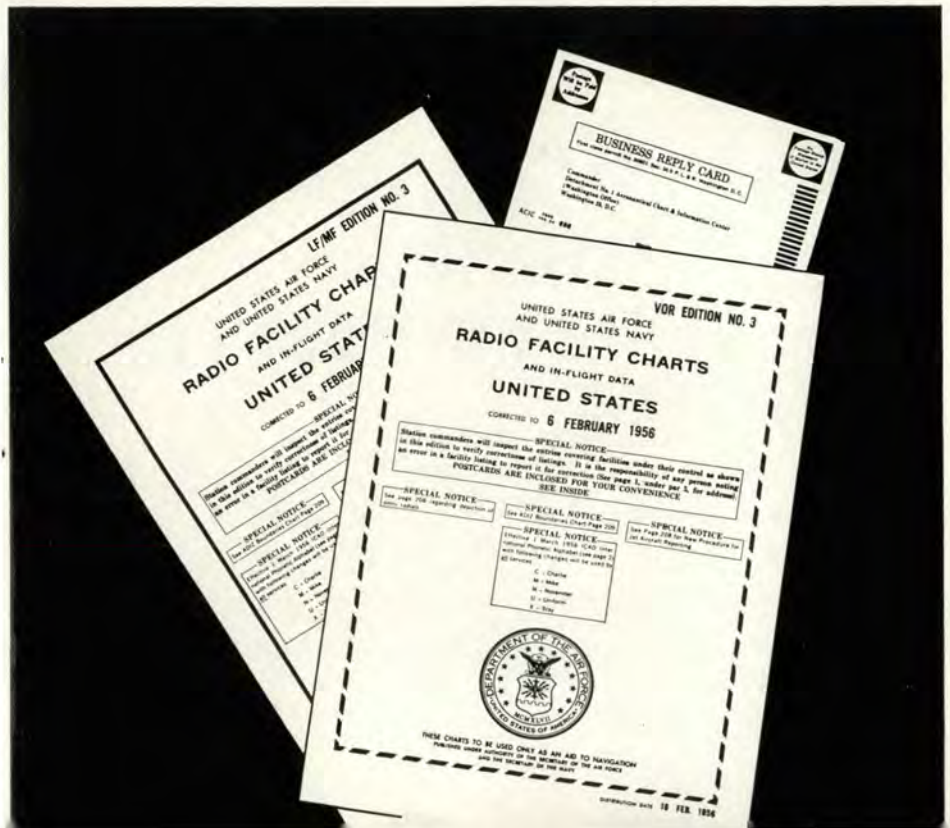
Each fold was indexed to indicate the most prominent and/or major facilities they contained. The charts were designed so that they would fit in individual envelopes which were divided into two sets and would easily fit in the leg pocket of the flying suit. Test and evaluation of these charts proved that they had certain advantages over the book type RFC. Results indicated, however, the requirement for additional detailed data. Therefore, ACIC issued an experimental In-Flight Data Booklet which contained GCA, ILS and other data as required for in-flight use. Even though the XRFC was a definite improvement over the book type RFC, it still was not completely adequate for operational use by all commands. A second test was conducted and many modifications to the existing charts were made then.

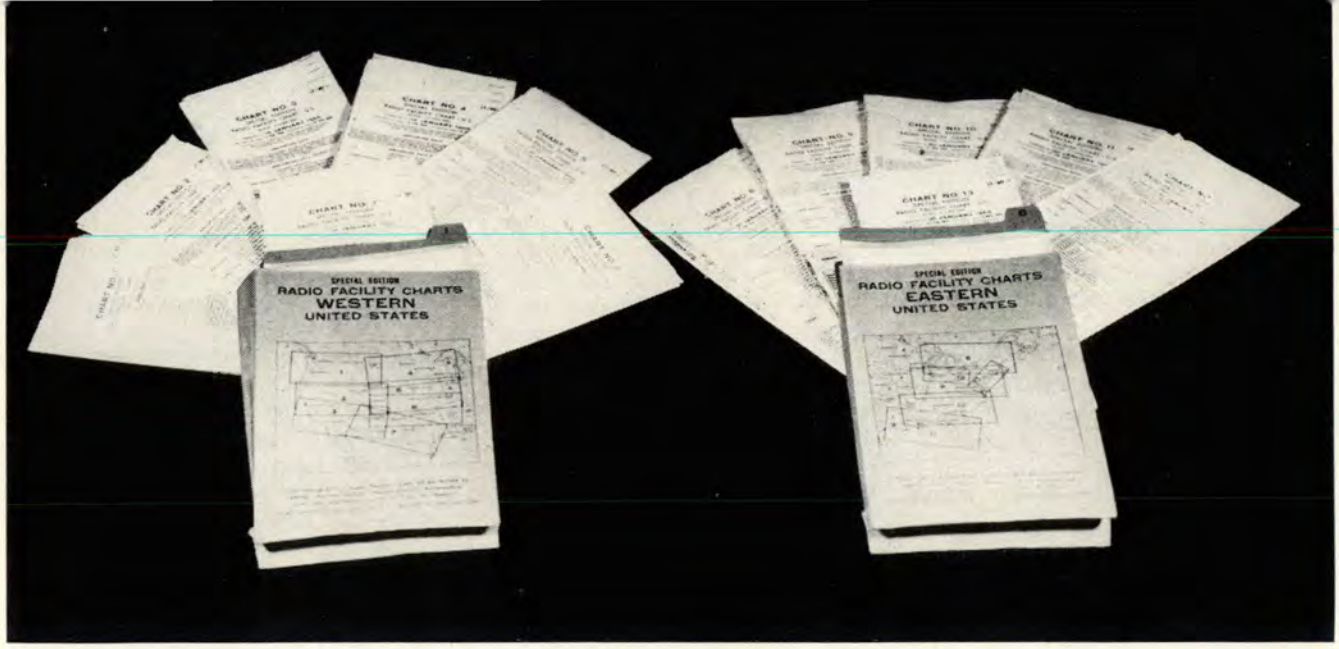
To avoid issuing dual editions of the Radio Facility Chart, Headquarters USAF policy states that if the XRFC (renamed Special Edition) is required by units, the standard book type quantities must be reduced proportionately. Where conversion has taken place, limited quantities of the book type are still available in base operations offices for reference.

In February, 1956, the Special Edition came out with a new look and a new color—red. A new area of coverage is reflected allowing more overlap and consisting of only 11 basic charts, with two blow-up charts referred to as Supplemental Area Charts. The scale of the basic charts is still 1:2,000,000, but now we use the same projection as the JN charts. The Supplemental Charts are at a scale of 1:1,000,000.

The abundance of navigational aids concentrated on individual aerodromes together with the increase in designated airways to provide for increased traffic are the principal reasons for having these blow-up charts. Blow-up charts of congested areas are shown as inserts on individual chart sheets. The areas considered highly

Every two weeks there are changes on approximately 75% of pages of Radio Facility Charts.





The new sheet type RFC is particularly suitable for jet pilots. U. S. is covered by 13 charts.

congested at this time are Norfolk to Boston, and Pittsburgh to Chicago. To include as much area as possible within the sheet limits, some charts are oriented other than North-South, East-West. The textual data are positioned relative to true north so that you are continuously oriented.

Deviations

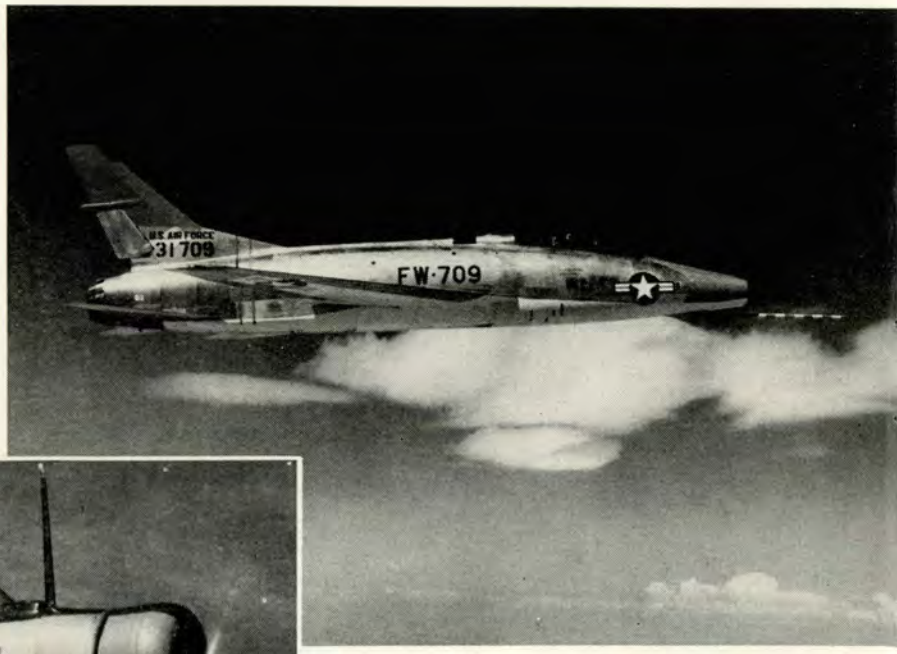
The charts (with the exception of the data panel) contain essentially the same information as the book charts. Omitted are the time zones, minimum crossing altitudes, minimum reception altitudes, aerodromes of less than 5000 feet, talk-to-met stations, all non-standard holding patterns, marine beacons, and there are some other minor deviations.

All aeronautical data are plotted in its true geographical locations, whenever possible. Should it be necessary to displace symbols from true geographical positions to improve readability, preference is given to the accurate plotting of radio facilities. Because of the size of symbols used, when a radio beacon and an aerodrome are located within two nautical miles of each other, then they are superimposed.

Since these Radio Facility Charts are primarily used under instrument conditions, certain facilities are portrayed more prominently than others. Radio Facilities which are part of an airway are given first priority portrayal, along with all Air Force bases and terminal areas. To get the proper effect, data boxes are accentuated by shading two sides.

Aerodromes portrayed on the charts are those active fields at which military landing rights are in effect with a minimum of 5000 feet of hard surfaced runway with either a combination of Jet Fuel, JASU, a published JAL chart, or minimum lighting facilities. All other aerodromes not within this criteria, but with 5000 feet or more of hard surfaced runway, are shown as emergency fields.

Radials always have been shown outbound from VOR stations on airways even though LF radio range courses are shown with inbound headings. But bearings from VOR stations (added to form intersections



Choose the publication that meets your needs. Operational use determines that type for you.

with other facilities) have until recently been shown inbound. It was found that confusion resulted from this depiction since these bearings were in effect radials, too. Pilots called ARTC, stating they were on a 320-degree radial. ARTC would place the aircraft in the northwest quadrant when actually the pilot was in the southeast quadrant on an inbound bearing of 320 degrees. Now all radials are shown outbound. So when you report that you are on a radial, you will be reporting accurately an outbound bearing.

To ease flying in congested areas, blow-up charts have been provided. For those flying through such an area, essential en route information is shown on the primary chart. Only those radio facilities used to establish the airway are portrayed and identified in full. Detailed information, including holding patterns, is displayed on the blow-up box. When the bearing of the holding pattern is not obvious, it is shown.

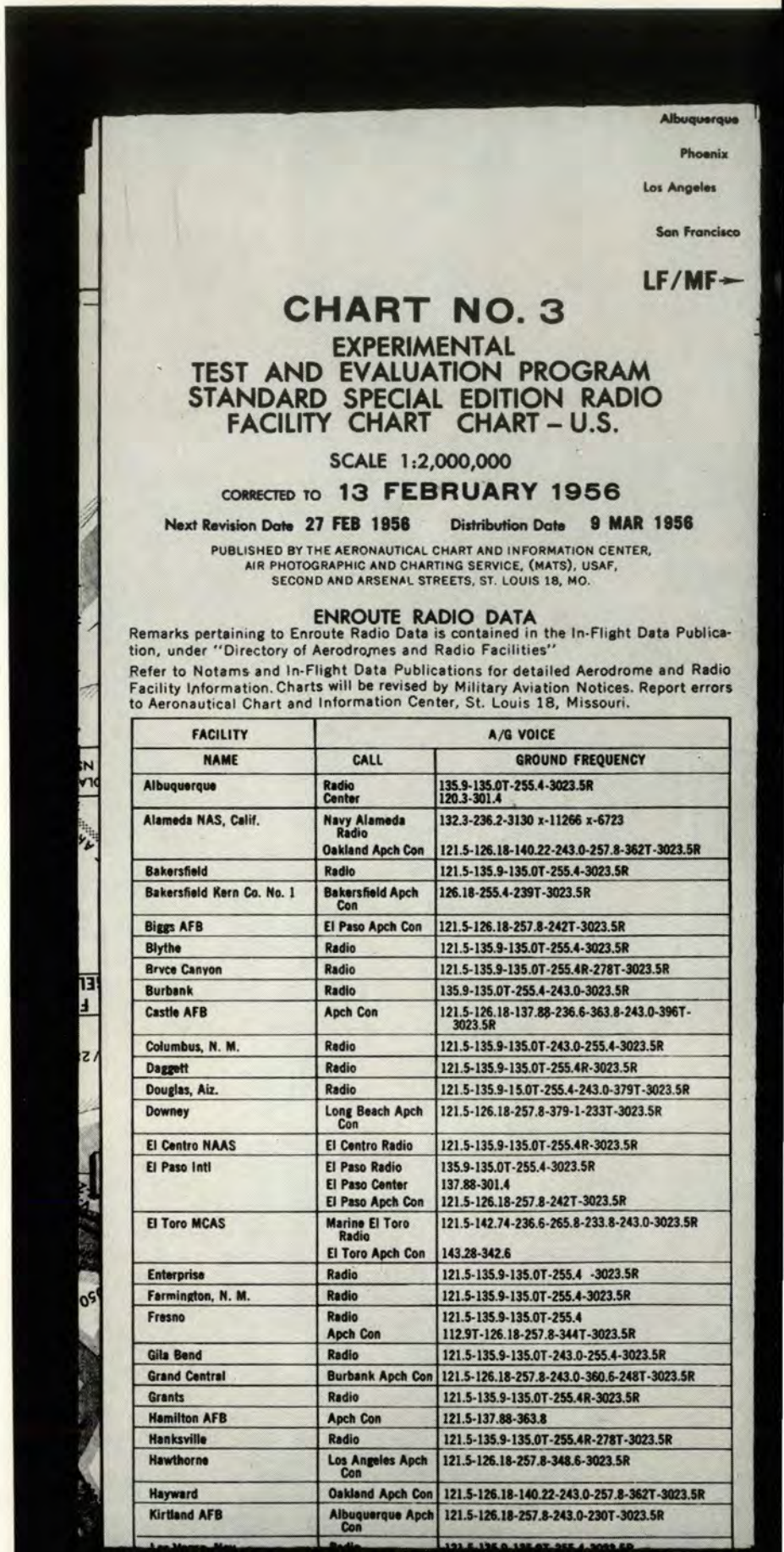
Selected aerodrome data are included on the outside fold of the chart. Only primary tower frequencies for each aerodrome are given.

Each chart is numbered with the date of currency in bold print. In order that you may know if you have the latest chart available, the next scheduled revision date is given along with the distribution date. How soon you will receive your new charts will depend upon distribution channels.

Bulletins

Bulletins, called Military Aviation Notices (MAN), are furnished so that you will have the most current information available. Changes that occur while the charts are being printed are included in these notices. When you get a new MAN, throw the old one away because the new one also includes all of the old changes. So what do you do with them now? Well, if you're not going anywhere, just put them in the appropriate holder (East or West) in the first fold, for use when you make your next flight.

When you plan a flight, first determine the charts you will use, then the approximate route you intend to fly. Refer to your MAN and see if there are any changes along the planned route. If there are, you make a mental note or simply make the necessary change, and put the MAN back in the folder for the next pilot. If you are



Albuquerque

Phoenix

Los Angeles

San Francisco

LF/MF

CHART NO. 3

EXPERIMENTAL TEST AND EVALUATION PROGRAM STANDARD SPECIAL EDITION RADIO FACILITY CHART CHART – U.S.

SCALE 1:2,000,000

CORRECTED TO **13 FEBRUARY 1956**

Next Revision Date **27 FEB 1956** Distribution Date **9 MAR 1956**

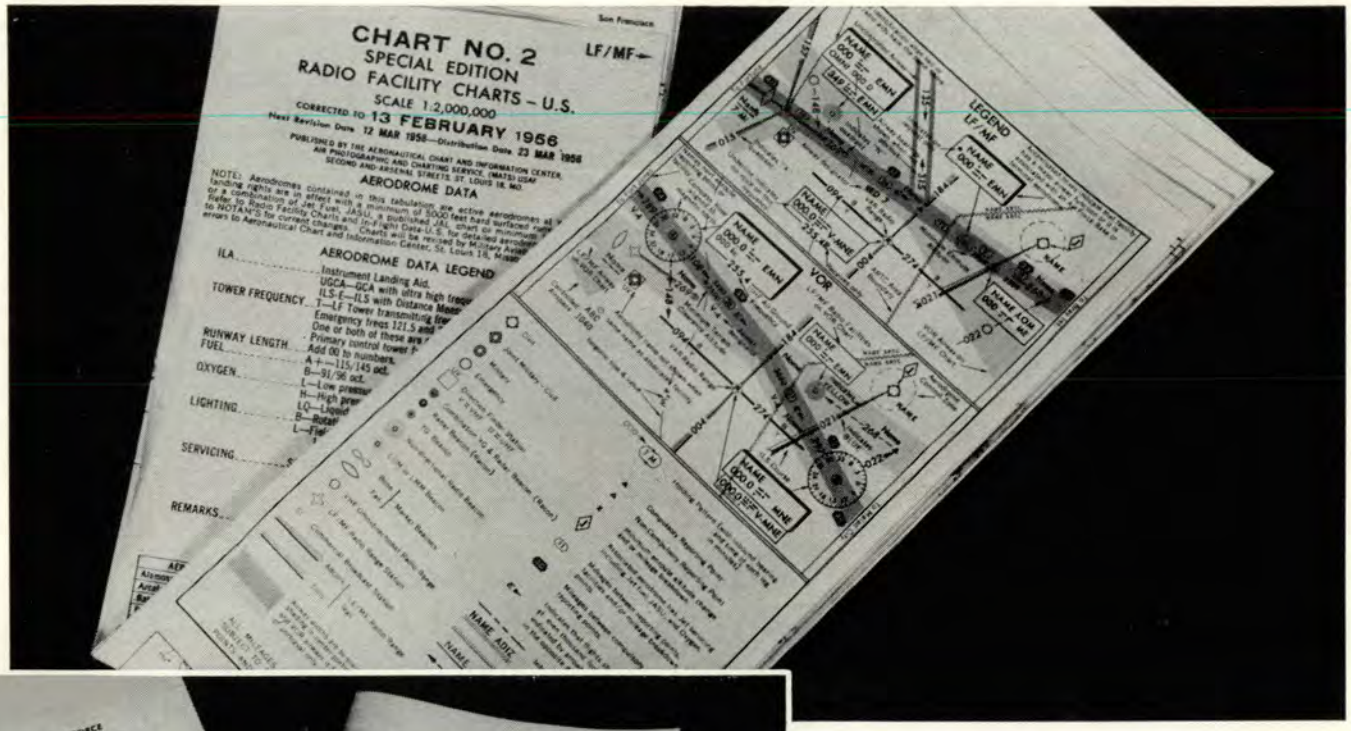
PUBLISHED BY THE AERONAUTICAL CHART AND INFORMATION CENTER, AIR PHOTOGRAPHIC AND CHARTING SERVICE, (MATS), USAF, SECOND AND ARSENAL STREETS, ST. LOUIS 18, MO.

ENROUTE RADIO DATA

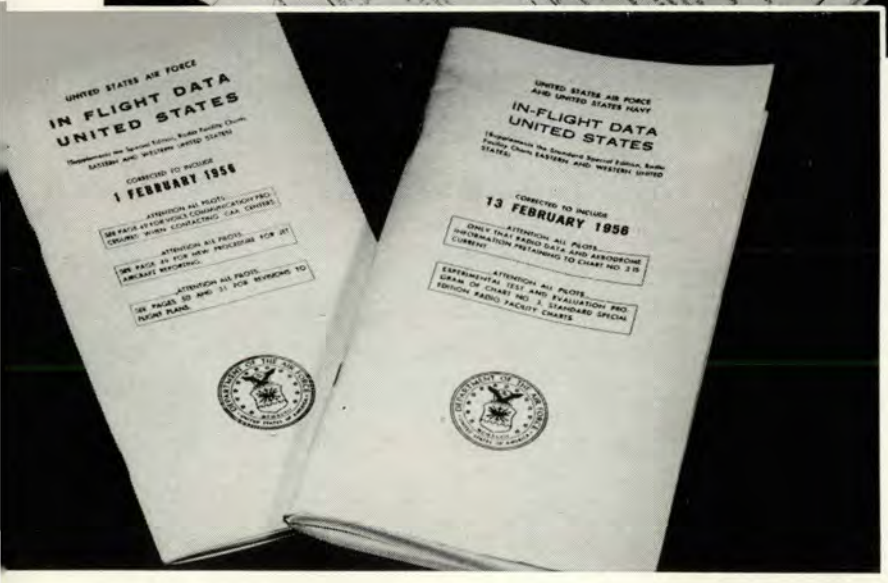
Remarks pertaining to Enroute Radio Data is contained in the In-Flight Data Publication, under "Directory of Aerodromes and Radio Facilities"

Refer to Notams and In-Flight Data Publications for detailed Aerodrome and Radio Facility Information. Charts will be revised by Military Aviation Notices. Report errors to Aeronautical Chart and Information Center, St. Louis 18, Missouri.

FACILITY	A/G VOICE	
NAME	CALL	GROUND FREQUENCY
Albuquerque	Radio Center	135.9-135.0T-255.4-3023.5R 120.3-301.4
Alameda NAS, Calif.	Navy Alameda Radio Oakland Apch Con	132.3-236.2-3130 x-11266 x-6723 121.5-126.18-140.22-243.0-257.8-362T-3023.5R
Bakersfield	Radio	121.5-135.9-135.0T-255.4-3023.5R
Bakersfield Kern Co. No. 1	Bakersfield Apch Con	126.18-255.4-239T-3023.5R
Biggs AFB	El Paso Apch Con	121.5-126.18-257.8-242T-3023.5R
Blythe	Radio	121.5-135.9-135.0T-255.4-3023.5R
Bryce Canyon	Radio	121.5-135.9-135.0T-255.4R-278T-3023.5R
Burbank	Radio	135.9-135.0T-255.4-243.0-3023.5R
Castle AFB	Apch Con	121.5-126.18-137.88-236.6-363.8-243.0-396T-3023.5R
Columbus, N. M.	Radio	121.5-135.9-135.0T-243.0-255.4-3023.5R
Daggett	Radio	121.5-135.9-135.0T-255.4R-3023.5R
Douglas, Ariz.	Radio	121.5-135.9-15.0T-255.4-243.0-379T-3023.5R
Downey	Long Beach Apch Con	121.5-126.18-257.8-379-1-233T-3023.5R
El Centro NAAS	El Centro Radio	121.5-135.9-135.0T-255.4R-3023.5R
El Paso Intl	El Paso Radio El Paso Center El Paso Apch Con	135.9-135.0T-255.4-3023.5R 137.88-301.4 121.5-126.18-257.8-242T-3023.5R
El Toro MCAS	Marine El Toro Radio El Toro Apch Con	121.5-142.74-236.6-265.8-233.8-243.0-3023.5R 143.28-342.6
Enterprise	Radio	121.5-135.9-135.0T-255.4 -3023.5R
Farmington, N. M.	Radio	121.5-135.9-135.0T-255.4-3023.5R
Fresno	Radio Apch Con	121.5-135.9-135.0T-255.4 112.9T-126.18-257.8-344T-3023.5R
Gila Bend	Radio	121.5-135.9-135.0T-243.0-255.4-3023.5R
Grand Central	Burbank Apch Con	121.5-126.18-257.8-243.0-360.6-248T-3023.5R
Grants	Radio	121.5-135.9-135.0T-255.4R-3023.5R
Hamilton AFB	Apch Con	121.5-137.88-363.8
Hanksville	Radio	121.5-135.9-135.0T-255.4R-278T-3023.5R
Hawthorne	Los Angeles Apch Con	121.5-126.18-257.8-348.6-3023.5R
Hayward	Oakland Apch Con	121.5-126.18-140.22-243.0-257.8-362T-3023.5R
Kirtland AFB	Albuquerque Apch Con	121.5-126.18-257.8-243.0-230T-3023.5R



Designed to fit into the leg pocket of the flying suit, each chart page is indexed to show major facilities.



New one in the making. It is a combination of the book and sheet type Radio Facility Charts. It is called In-Flight Data Booklet. Certain units are testing them now.

going to be strictly on instruments and will require a letdown at destination, check to see if there are any changes at your destination and alternate. If changes are necessary, pencil them in; then forget about the changes until you're ready to use them again.

New Chart Coming

So far, two types of Radio Facility Charts have been discussed; however, still a new one is in the making. It is a combination of the book and the sheet type Radio Facility Charts. All the information that is now contained in the book type RFC will be included on either the charts or in an In-Flight Data booklet. The charts will contain all of the aerodromes now contained in the book type with en route radio information on the outside fold. The In-Flight Data booklet will be "beefed" up to include the remaining data. Certain units selected by each ZI Major Air Command are participating in a test program to determine the operational suitability of this new product as a replacement for both the book and Special Edition RFC. Units selected are representative of each command's mission. You should know the outcome of the test by this fall.

Some might ask, "Why not improve the book type Radio Facility Chart?" Well, indications are that a sheet type is preferable. The test should determine which type publication is more suitable.

Radio Facility Charts are published primarily to give air crewmembers information that is essential to their mission. Some of you do write to us stating your needs, but probably many of you do not. Post cards are included in the bound RFC for your comments. Every post card or letter received is carefully screened to determine its applicability to the RFC. The more requests received indicating similar changes, the sooner action is taken. Sometimes action is taken to make a change or addition based on comments contained on only one post card. But there again, if you don't ask, it is assumed that what is published is satisfactory.

Remember, it's our purpose to provide you with a publication which meets your needs. However, its effectiveness depends on its use by you . . . so choose and use your Radio Facility Chart. ●

Self Service Wx

Step right up and help yourself to the latest WX. And down Texas way this is how they do it.

EVERY PILOT his own forecaster, well not actually . . . but almost anyway. A step in this direction has been taken by Major Thomas J. Williams, Base Operations Officer, Randolph Air Force Base.

Realizing that pilots are vitally interested in weather developments, but are only exposed to them during visits with the station weather forecaster, he decided to lend a helping hand, and incidentally lift some of the workload off the forecaster.

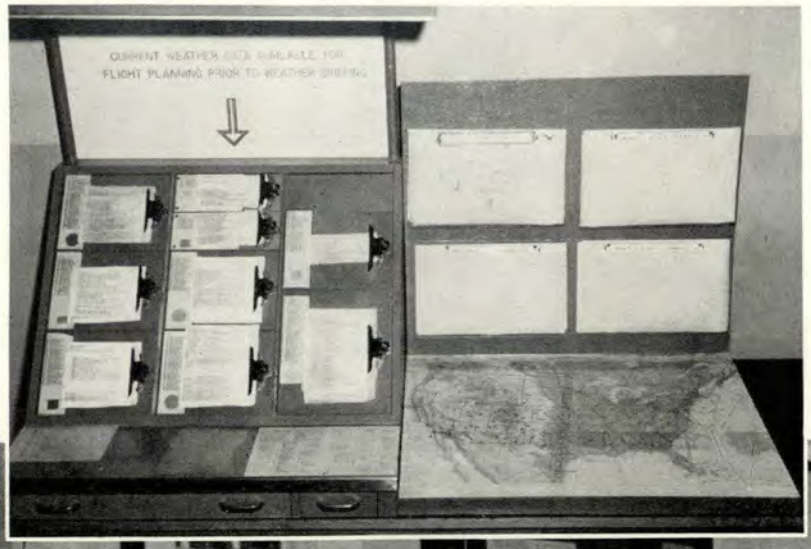
He established a current weather display case in a corner of the flight planning room of base operations. Items that a pilot has for his use include hourly weather sequence clipboards with appropriately colored station identifiers; an up-to-date surface chart; winds aloft charts for all operating altitudes and an airways-weather map of the United States with colored tabs which correspond to the sequence clipboards. An eye-catching sign marked "Pilots" calls attention to this current weather data.

Does it work? In Major Williams' words, "It has worked out very well. It gives the pilot something to stare at. Seriously, though, it relieves the forecaster of continuous elaborate briefings on weather changes and allows him to concentrate on clearances.

"Pilots using the available data feel that the idea pays off. By noting the general weather picture I can often plan my route without ever having to see the forecaster. I can tell if I should file IFR or VFR and can select a suitable alternate. It saves a lot of time, for now I don't have to go to the forecaster before planning my flight. However, I do see him for my actual pre-takeoff weather briefing and clearance.

"Also, by having seen the general weather situation before hand, I feel that I get the maximum benefit from his weather pitch."

Seems like a big step in the right direction. ●



Left, is bargain corner. Display case contains current weather data. Below, pilots use it daily.

SHAKE RATTLE and ROLL

As the title states, this is what you can expect if you fly into the turbulent area behind an aircraft.

CRUISING AT 31,000 feet, the pilot racked his '86 over on its left wing and looked down. Below him, a flight of two other F-86s streaked eastward. He peeled off for a high speed pass. Whizzing underneath them, he zoomed up several hundred feet in front of the unsuspecting jets and slow rolled. He pulled a 4G turn and looked down again. His smile turned to a frozen grimace.

The two F-86s had collided. Why?

★

Four F-84Gs were making a fly-by. They were in echelon to the right. At 250 feet, the lead aircraft, indicating 450-500 knots, pulled up slowly as he passed the reviewing stand. The No. 2 man started his pull-up. His aircraft snap-rolled to the left. Then again. The pilot blacked out temporarily. The G meter read positive 10 and negative 3. The pilot recovered and landed. What happened?

★

The third B-47 of a flight of four lifted off the runway. The tower operator cleared No. 4 for immediate takeoff. The pilot released the brakes and started his roll. He pulled the heavily loaded bomber smoothly off the runway. Then, as if a giant hand was shoving steadily on it, the left wing started to drop. The pilot tried desperately to lift it up. The B-47 mushed back onto the runway. Why?

★

These are just a few of the many stories that can be told about wing trailing vortices. To understand the "why," take a look at Figure 1. It shows the circulation pattern of air currents developed by a six-engined bomber. Notice also the smaller aircraft about to enter this flow pattern.

Statements of pilots who have flown into this wake emphasize in no uncertain terms the severe rolling motion encountered. Jet aircraft, both fighter and bomber types, generate the same pattern of vortices.

Just for the record, here are the definitions most commonly used to describe aircraft turbulence.

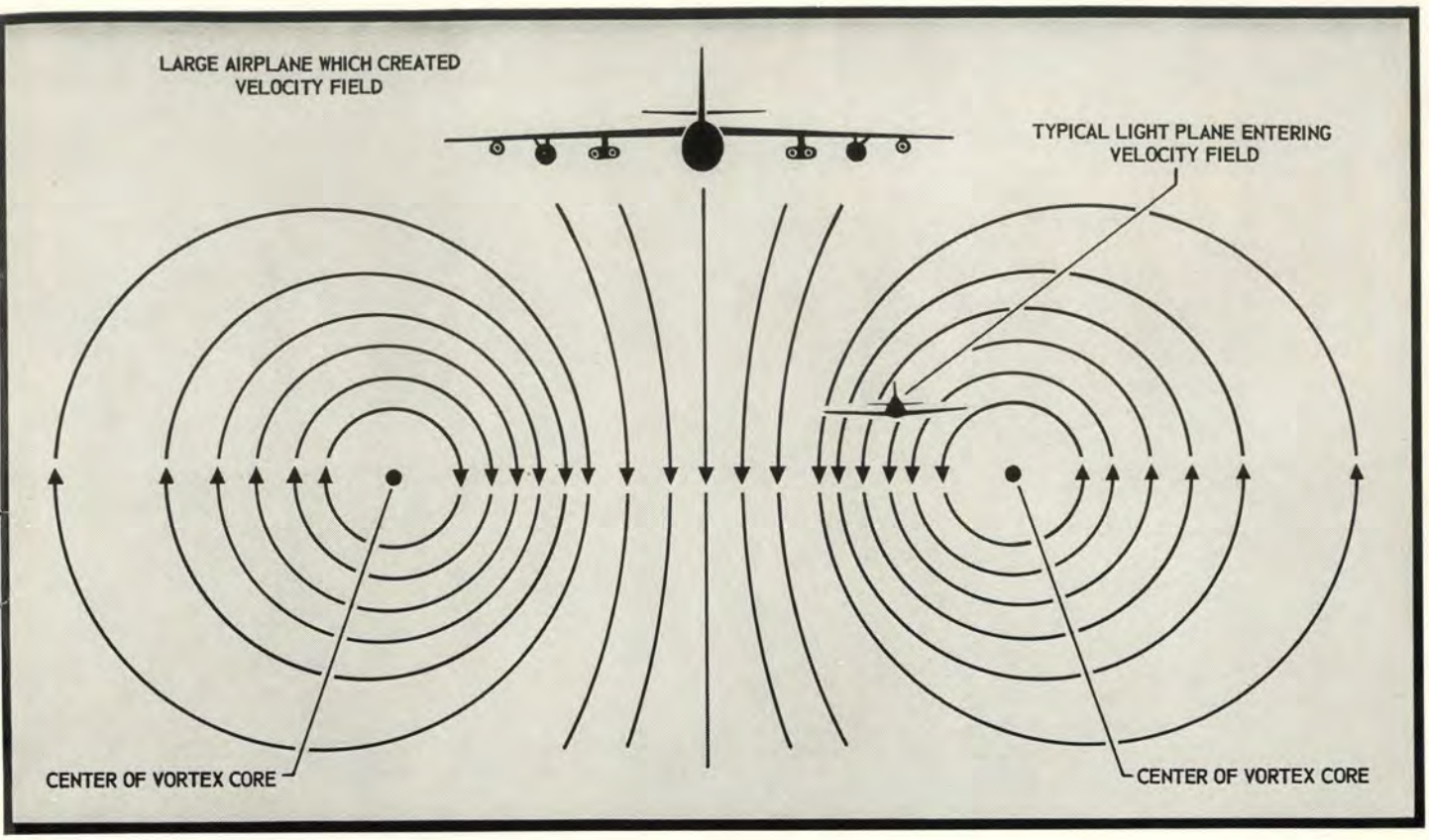
• *Wake*—A track or turbulent portion left immediately after the passage of an object through the air. It is produced by the passage of an airfoil or any other solid body through the air.

• *Wing trailing vortices*—A pattern of air which flows or circulates in clockwise and counter-clockwise directions just behind the trailing edge of the wing section during flight. Flow is inward and in opposite directions around each wingtip.

• *Slipstream*—(Often called prop wash) The stream of air driven astern by the propeller.

• *Prop blast*—Same as slipstream except that inference is generally that the airplane is on the ground.

Reflect back to your primary flying school lessons. Remember when you congratulated yourself on a perfect 360-degree turn and flew into your own "prop wash?" Information now available indicates it was more correctly the lingering wing trailing vortices. Some interesting facts have been uncovered about this phenomena. Paradoxically, aerodynamicists and aviation theorists have yakked about vortices for many years with regard to its effects on aircraft performance, but it has taken a rash of unexplained accidents to bring it into focus.



Wing trailing vortices—sometimes called wake, jet wash, prop wash or slipstream. Avoid it.

Tests performed by the Royal Aircraft Establishment (RAE), Farnborough, England, indicated that the disturbance created by wing trailing vortices will decrease to only half its original force at distances as great as 8000 feet behind the wake generating airplane.

Using a Meteor jet as the vortex generating aircraft and a Vampire jet as the trailing aircraft, the RAE found that a rolling motion was the most severe action encountered. When the Vampire was slipped laterally through the wake, aileron movement required to neutralize the roll was from a maximum of eight degrees in one direction (which is approximately 80 per cent of the aileron travel for this particular airplane) to a maximum deflection of eight degrees in the opposite direction. Time span for the total deflection was four seconds.

An interesting result of the tests was that jet engine nozzle exhaust is not the cause of vortices. During flight, jet engine nozzle exhaust velocity drops to a negligible value 200-300 feet behind the aircraft. This turbulence will be most noticeable during periods of ground runup or initial takeoff roll.

Similar tests by the National Advisory Committee for Aeronautics (NACA) indicate that vortices can persist for periods greater than 60 seconds. No appreciable reduction in vortex strength was noticed for at least 30 seconds. It is significant that an aircraft flying at 10,000 feet at Mach 0.8 will travel five miles in 30 seconds. Atmospheric conditions will tend to influence the dissipation of these vortices.

Other data and theory from the RAE and NACA indicate that control responses of a trailing aircraft will be affected by:

- The wing span and speed of the vortex generating airplane.
- The wing loading of the vortex generating airplane.
- The speed of the trailing airplane.
- Aileron effectiveness.

Wright Air Development Center is currently sponsoring an intensive research project into this phenomena. As specific recommendations are forthcoming they will be brought to your attention.

Knowing the treachery of a wake, what can a pilot do about flying through it? If you are flying a circular gunnery pattern, avoid the wake of the preceding aircraft if possible. The NACA report stated that turbulence created by wing trailing vortices may be a factor in horizontal tail failures of some high speed fighter aircraft.

Don't zoom up in front of a light plane or transport or flight of jet fighters. Why? You're sticking their necks out.

On takeoff, the danger zone of trailing vortices starts at approximately 40 feet above the runway with no crosswind. Below that altitude, ground effect tends to break up the vortex pattern.

Coming in on the final approach, anticipate where you might encounter wake and plan your landing accordingly. Consider the effects of crosswind displacement of the vortex and don't land directly behind a preceding aircraft. Regardless of the type of aircraft you fly—until more information is available, be aware of the hazards of wake. ●

Need some assistance? At your fingertips and only seconds away are many facilities awaiting your request. Time is important. Call for . . .

HELP!

Robert H. Shaw, Research and Analysis Div., D/FSR.

CAST ASIDE your Yankee independence and declare that emergency—NOW! The "I can make it" and "wing and a prayer" thinking belongs to the deep, dark past. No pilot ever reaches the point where he doesn't need help. More of our national flying heroes might be alive today had they recognized and admitted this simple truth.

More aircraft accidents than we care to admit originated with an undeclared emergency. Why wasn't it declared? Because the pilot did not recognize or admit that he needed help. Some try to exhaust all other resources first. The trouble is that after all resources are exhausted, it may be too late for anyone to help.

No Valid Reasons

There are probably deep-seated reasons why pilots are reluctant to declare an emergency. Pride, saving face, admitting a mistake and just plain stubbornness are likely ones. No matter what the reason, in the face of an aircraft accident, none of these are valid.

What is an emergency? Sounds silly—an emergency just happens. It can be defined as a condition calling for immediate action. The action called for depends on the condition, but recognition of the condition is the sole responsibility of the pilot. Simplified, it's the first sign of trouble; if it has a dangerous element, it's an emergency.

Recognition of an emergency is most important, but this is only the beginning. What to do when it happens? Declare it! *How?* By contacting the nearest facility or agency, informing them that an emergency exists and requesting immediate assistance. Use the term "*I declare an emergency.*" When? At once—don't wait. Time is important. Why? The answer seems obvious, but let's look.

Pilot Needs Help

First, the pilot needs help. He can't get it unless someone knows about the emergency.

Second, the right people must be alerted to assist him. The declaration will alert other facilities so that lines of communication can be cleared and relay assistance will be possible. Airspace will be physically cleared and made available to the pilot.

Most pilots know there is a wealth of facilities available to aircraft in flight, whether under ordinary or emergency conditions. At the pilot's fingertip and seconds away (with a complete G file and sound radio equipment) are approach and departure facilities such as Air Surveillance Radar, Emergency Radar Interceptor Procedures, ARTC Lost-Aircraft Emergency Procedures, UHF and VHF Direction-Finder Stations, Radar Advisory Service On Storm Areas and Pilot-to-Forecaster Service, just to mention a few. Some pilots do not realize, however, that although some of the services are available round-the-clock, they must be alerted and *upon request from the pilot.*

This is a fact that cannot be overemphasized. Pilots in contact with a radio range station, encountering trouble in the air, sometimes assume that the radio range station will automatically alert other facilities for him. This is not necessarily the case. The

An emergency must be declared to insure immediate, positive and individual assistance.

pilot must realize that he himself must act as the guiding hand. Any assistance needed *must be requested.*

Another important fact not generally realized is that an emergency must be declared to insure immediate, positive and individual assistance. Most facilities provide for emergencies; the operation of some are limited to emergencies. The important point is that the type of assistance, the speed of the operation and the priority given depends on whether the situation is an actual emergency. It is extremely important, therefore, that these facilities be advised that "This is an emergency."

Pilots must realize, too, that most of the facilities are advisory, *only;* the sole responsibility for safe conduct of a flight still rests with the pilot. He, alone, must decide whether the flight can be made or continued safely with the assistance available.

As previously stated, emergencies in flight, undeclared by pilots, have resulted in many accidents. By the same token, many were prevented because pilots declared emergencies and received assistance. With the advent of high speed and high performance aircraft, emergencies may occur in greater numbers and pilots may be exposed to greater stresses. Let's streamline our thinking and when an emergency occurs, declare it, now! ●

REX SAYS

I'LL BET the Zuni, New Mexico, range station operator has a fine sense of humor. He'd have to. Why? Because of pilots and their air-to-ground communications efforts.

I'm used to flying between Albuquerque and the West Coast. I know that when I'm using UHF, the Zuni operator can receive me and that he will return my call on 353 kc or VHF.

I can tell newcomers flying Green 4 airways everytime. They'll start calling "Zuni Radio" on UHF from the time they are over the range station until they are half-way to Winslow, Arizona, or to Albuquerque. Finally, they catch on. I can almost see them referring belatedly to the Radio Facility Chart.

Then comes a confident positive call. Immediately I switch over to 353 kc. The tired, relieved voice of the range operator politely informs the pilot that Zuni radio does not transmit on UHF.

I know there must be many Interstate Airways Communications Stations—CAA (INSACS) scattered over the States with the same type of radio equipment. I do know that there are many pilots who are attempting to communicate with ground stations that are using incorrect frequencies. All they have to do is check the Fac Chart. Other pilots may urgently need the channel that they are blithely chattering on.

REX SAYS—*Amen!*

★ ★ ★

A FRIEND OF MINE told me of this harrowing experience.

Flying in mountainous terrain is usually turbulent. This is particularly true during summer months. My friend was boring along VFR off airways in a C-47. Mountain tops in the area were 10 to 11,000 feet. No visible weather, yet the Gooney was rolling and wallowing in the up and down drafts. The rate of climb indicator resembled a trapeze artist performing on his swing.

My friend was playing it close. Topping the rock-strewn terrain by a scant 500 feet at the most.

Sure enough it happened. He got trapped in a downdraft which threw the aircraft out of control. He firewalled both engines, heaved back on the control column and hoped. Inexorably, the downdraft pulled him toward the mountainside. Just before it looked like he might prang, the props churned into solid air and the C-47 skimmed over the tree tops and staggered over the crest of the rugged mountain.

REX SAYS—*This sort of flying needs constant year-around surveillance. As the Fac Chart emphasizes, when over mountainous terrain, fly with that 2000-foot clearance. It's good life insurance.*

★ ★ ★

IT WORKS on 75 megacycles and you can twist its face so that it will dazzle you with its brightness or show you only a pinpoint of amber light, yet for a navigational aid, it is hard to beat a marker beacon.

You wouldn't think this innocuous looking little instrument could cause an accident, would you? Call this one the case of the One Dash—but it happened.

Flying westbound on airways and cruising at 12,000 feet, the pilot watched the ADF needle oscillate rapidly and swing definitely to a 180-degrees position. The amber marker beacon light flashed on and stayed on.

The copilot picked up the microphone and made the mandatory position report. He asked for destination weather and the latest winds aloft at 12,000 feet.

Boring on through the solid overcast, radio static and turbulence increased, as the aircraft continued on its course.

Having flown for the past five hours on instruments, both pilots were tired. Strong, shifting winds had played havoc with a constant groundspeed. One leg of the flight had resulted in a 40-knot difference due to a head-

Flying mountainous terrain is usually turbulent. ". . . and the C-47 barely staggered over crest."

wind. Twelve minutes later the audible range signal grew louder.

Suddenly the marker beacon flashed on. The copilot looked at his flight progress log. Must be the range station, can't count much on ETAs with this erratic wind.

He poked the pilot on the right arm and pointed to the amber light. Having received holding instructions from approach control to descend to 6500 feet when over this range station, the pilot retarded the throttles and started a right turn.

Five days later, a ground search party found the scattered parts of the aircraft near the top of a 11,000-foot mountain.

The fan marker transmitter was located between two mountain peaks. Its identification signal was One Dash. Did the pilot incorrectly identify the amber light signal of the fan marker for the range station signal which was 20 miles farther west?

REX SAYS—*Wind drift, erratic groundspeeds, fatigue, atmospheric conditions and probably an inaccurate check of fan marker identification signal all added up to cause this fatal accident. Know where you are!*

★ ★ ★

I'M A PILOT-WEATHER officer. Also, I'm an instructor in our base instrument school which all pilots attend before taking their annual instrument-card examination.

I have discovered that some pilots do not understand how prevailing visibility is determined.

Here's how. The prevailing visibility is that which occurs in most of the four quadrants. If visibility is two miles, three miles, four miles and five miles in each of the four quadrants, the prevailing visibility is not four miles. It's not two miles nor five miles; it's not the most visibility or the least visibility. *It is three miles because you can see at least three miles in more than half the designated quadrants.*

Thus, you could have ten miles or unlimited visibility in one quadrant and have zero zero in the other three and the forecaster is going to have to report zero zero for the station.

REX SAYS—*Well, what do you know about that? Very interesting! Let's get some more info like this in the mail. It's the finer points that separate the professional pilot from the sub-standard one.*

How many copilots are there in the Air Force? Maybe Rex would give us a boost by using this "lament."

"Just a Stooge"
(for copilots only)

I am the copilot, I sit on the right
I'm not important, just part of the flight.
I never talk back lest I have regrets,
But I have to remember what the pilot forgets.
I make out the flight plan and study the weather,
Pull up the gear and stand by to feather.
Make out the forms and do the reporting,
And fly the old crate when the pilot is courting.
I take the readings, adjust the power,
Handle the flaps, and call the tower.
I tell where we are on the darkest of nights,
And do all the work without any lights.
I call for my pilot and buy him cokes,
I always laugh at his corniest jokes.
And once in a while when his landings are rusty,
I come through with "Jove, but it's gusty."
All in all I'm a general stooge,
I sit on the right of the man I call Scrooge.
I guess you think I'm not understanding,
But maybe someday he'll give me a landing.

REX SAYS

"Call Me Scrooge"
(for pilots only)

I am a guy
Who flies in the sky
With a man on my right, all the time.

For I fly with cargo
From here to Chicago
To save the Air Force a dime.

Now this boy on my right
Who holds the flashlight
As I shoot an approach to O'Hare.

Is a guy who's a must
With a terrible lust
To fly from the left handed chair.

He thinks he's a stooge
And he calls me scrooge
Real un-understanding is he.

But if he takes the wheel
And louses the deal
For "No Supervision," they'll hang me.

"See You Tomorrow Sarge!"

Can an aircraft accident be caused by a tired, listless and foodless crew chief? Almost daily, pilots are cautioned about fatigue, but how about "chief" fatigue?

Endeavoring to explore all facets of accident prevention, FLYING SAFETY believes the letter below sums up, with a punch, (ouch!) a responsibility too often shunted aside by pilots — "housekeeping" of their crew members while on the ground. How many times have you said, "See you tomorrow, Sarge?"

★ ★ ★

Dear Editor:

Here's an article I've written that you may consider of sufficient interest to your readers to publish in a future issue. The events described actually occurred in one day. Variations of these events occur almost daily, at various bases of all USAF commands. I do not mean to detract from the excellent service and accommodations proffered at many bases but the following can — and does — happen to crew chiefs and flight engineers, be they assigned to a dependable C-47 or the mighty C-124.

The aircraft lands at an Air Force base which has a steady and quite predictable transient aircraft traffic load. The alert vehicle leads us up and down a myriad of taxiways and finally we arrive on an inactive runway, or perhaps a gravelled area, known locally as the pea patch or boondocks. It seems we are always far, far from operations, transient alert and refueling.

Immediately, a carry-all or sedan arrives to pick up three pilots, a navigator and about 25 passengers. The crew chief leaps out and asks for fuel, oil and perhaps de-icing fluid. "Be right out," is the standard answer. In about two hours the crew returns. "Ready to go, chief?" "Nope, no fuel or oil." The pilot cranks up the radio and calls the tower. The tower operator checks and says, "Be right out." About half an hour later the chief takes off for refueling with fire in his eye. While he's gone, the fuel truck shows up, but it's the wrong octane. Finally, we get off, the chief sans his chow, and by now swearing he is going to quit crewing airplanes and get a job crewing the ground-powered equipment.

About 0100 hours we arrive at another Air Force base and the refueling process is repeated. This time we are lucky. There are only a few aircraft still flying, and we finish in an hour and a half. There'll be no chow at this hour so we hunt a sack. Operations has a driver who doesn't know where the transient airmen quarters are but we finally find them. In the office there is a sign informing us to call the visiting officers' quarters for bedding. This, we do. After the phone rings for five minutes, a sleepy voice says, "Hello." We explain, and the voice states that we are to come to the VOQ (10 blocks) for bedding. We thank him and wearily go to hunt up the nearest bare mattress, put on the B-15 jacket and try to go to sleep.

The next morning, after explaining to the head checker at the mess hall that we are transients and just haven't got a chow pass for his mess hall, we go to the snack bar for coffee and a doughnut. The preflight is completed and off we go.

The moral of this story is that no one can perform his flying duties properly after such mental and physical punishment, be they watching the fuel and oil pressure as a Gooney Bird takes off or running the whole panel on a Globemaster.

These things can and do happen. They have happened to me and to other crew chiefs. Perhaps such events as have been described are why we read in FLYING SAFETY and the MAINTENANCE REVIEW of a crew chief or engineer pulling up the gear on the ground, feathering the wrong engine, or walking into a prop. I don't know.—Anonymous Crew Chief. ●

Dig Down Deep . . .

. . . and come up with enough clams for a subscription to FLYING SAFETY. If you are in any way interested in aviation, here is an opportunity to keep in touch. Whether you fly a light plane or a B-52, FLYING SAFETY has a message for you. You will get your money's worth of information. Just fill in the coupon and send it in. Oh yes, don't forget the three bucks.

Superintendent of Documents
U. S. Government Printing Office
Washington 25, D. C.

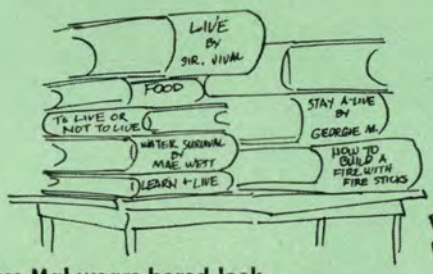
Please send *Flying Safety* Magazine for one year to the following address. Enclosed is a check or Money Order for $3.00. ($4.25 for foreign mailing.)

Name_____

Address_____

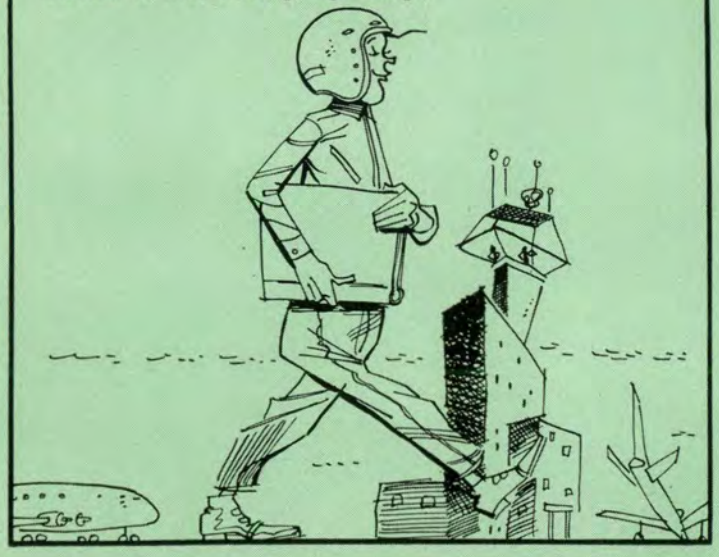
City_____ **Zone**____ **State**_____

Mal Function



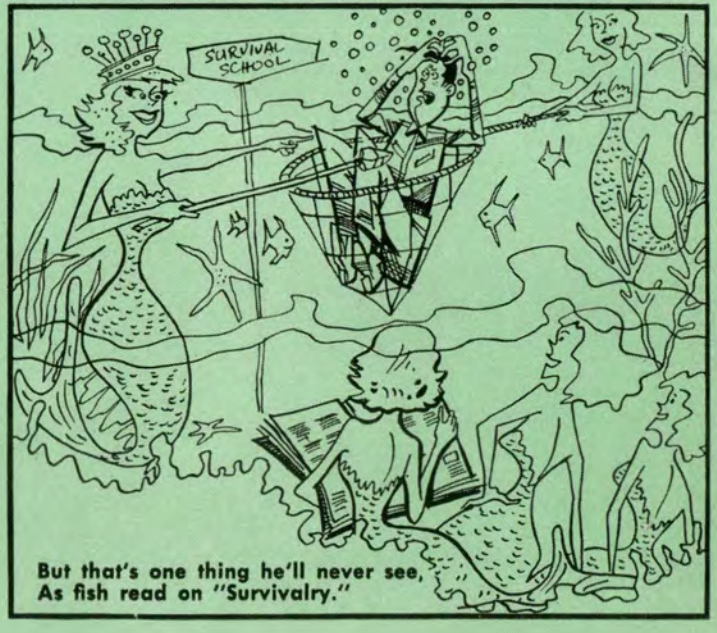
At survival class Mal wears bored look,
Why memorize . . . it's in the book.

The book contains all of the stuff,
On how to live, when going's rough.



Off in the blue our hero blows,
But not for long, so down he goes.

In black of night our boy's insane,
As for the book, he looks in vain.



But that's one thing he'll never see,
As fish read on "Survivalry."

*U. S. GOVERNMENT PRINTING OFFICE . . . 362336