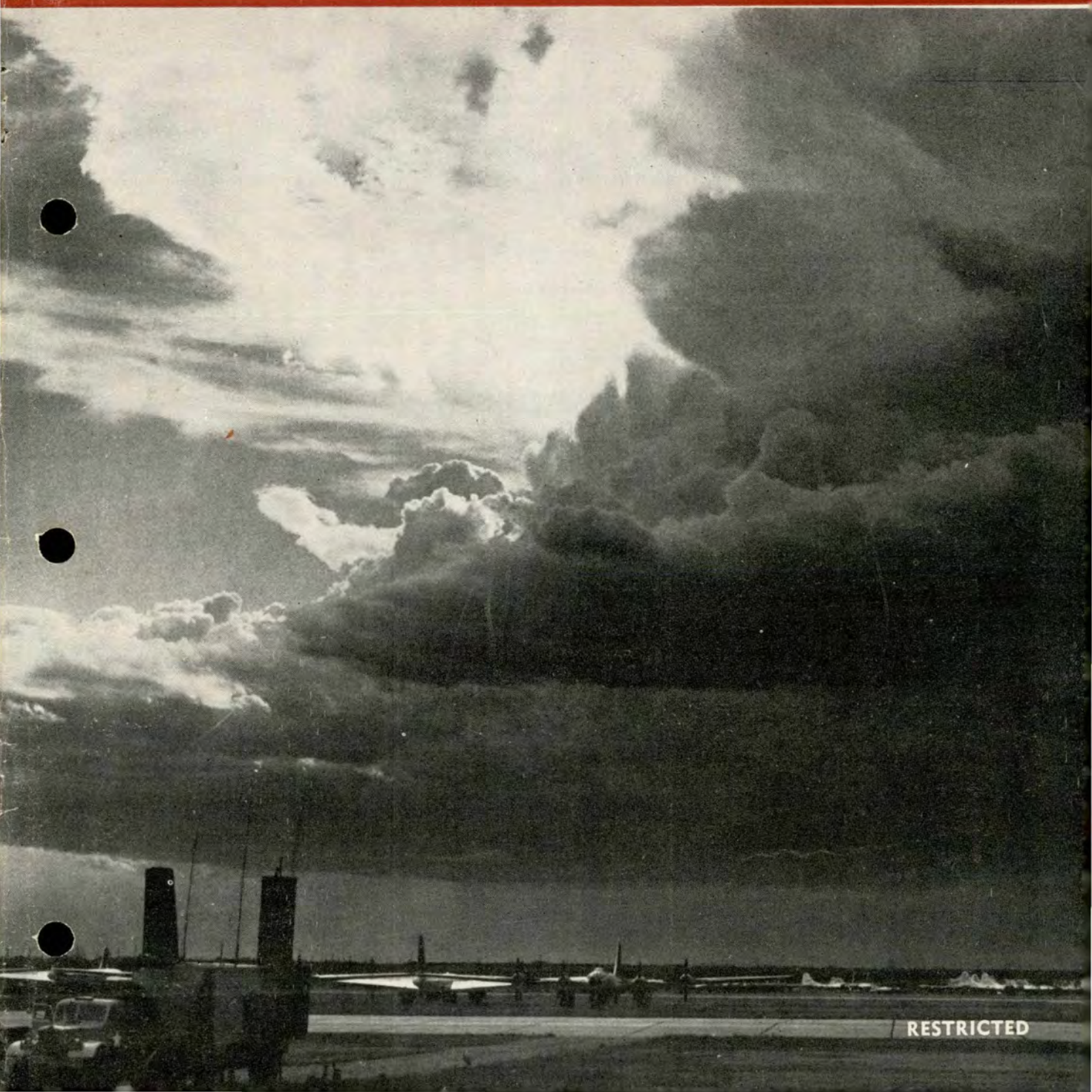
Flying Safety

HEADQUARTERS UNITED STATES AIR FORCE • RESTRICTED SEPTEMBER 1948



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THE COVER PICTURE

This month's cover was shot by our associate editor, Hal Basham, who doubles as chief shutter bug and hypo mixer. Hal took his press type camera with him on a trip out West with orders to "get some pictures for the thunderstorm article" (see page 2). He landed at Tinker AFB, Oklahoma City, just ahead of the storm pictured on the cover.

Incidentally FLYING SAFETY is always looking for good pictures. If you have a shot that tells a FLYING SAFETY story or that you think would look good on the cover, send it along. We will see that you get a credit line on all pictures used.

★

DROP US A LINE

If we know what type of stories and articles you prefer we will be able to give you a better magazine. After you have read this issue drop us a card or letter with any comments or criticisms that come to mind. Mail direct to the Editor, FLYING SAFETY, Office of the Air Inspector, First Region Inspector General, Langley Air Force Base, Langley Field, Virginia.

FLYING SAFETY

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Facts, testimony and conclusions of aircraft accidents printed herein have been extracted from USAF Forms 14, and may not be construed as incriminating under the 70th Article of War. All names used in accident stories are fictitious.

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ANNIVERSARY MESSAGE

THIS MONTH the new United States Air Force celebrates its first anniversary.

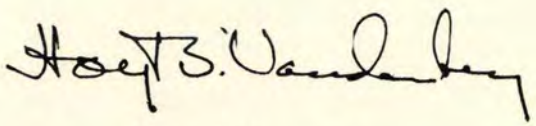
Last year was a history-making period for the Air Force. On 18 September 1947, the Air Force became an autonomous branch of the nation's armed services with equal status to the Army and Navy. This marked the realization of a dream and ambition of America's military airmen which began to take form when air power was established as a major weapon and molder of destiny in World War I.

Close on the heels of the birth of this new independent military arm, the Air Force was able to announce that in October 1947 it experienced the best world-wide safety record ever achieved since the Air Service recorded its first accident in 1908. When the Air Force totaled its accident statistics for 1947, it found that its major accident rate was the lowest of any year for which records are available. This was indeed an enviable accomplishment when it is remembered that in the previous year the Air Force—beset by rapid demobilization, dwindling resources, and deteriorating equipment—suffered an accident rate that rose higher than in any wartime year. Indications are that in 1948 this safety record will be continued—possibly improved.

Realizing that the best defense against accidents was an attack on the causes, the Air Force launched a frontal campaign against costly and tragic aircraft accidents which resulted in the new low accident rates achieved coincidentally with the establishment of the Air Force's independence. Although the Air Force can be proud of turning the accident tide, the war on this scourge of the Nation's peace power is far from won. It will not be won until the Air Force no longer has to suffer expense, injury, and death as a result of human and mechanical frailties.

We have had much accident experience for which we have paid a high price. What we must do is translate that accident experience into accident prevention. If we couple that experience with increased training and a higher degree of proficiency in everything we do connected with flying, we will eliminate the needless waste of lives, aircraft and money. Winning this war against accidents is a challenge to each man on the line and in the hangars to work as though his own life depended upon the quality of maintenance. It is a call to action for each commander to assemble all his forces and fight against inefficiency and haphazard practices. It is an opportunity for each airman to live—by learning how to operate his aircraft safely and to cope with emergencies.

The course ahead for all of us lies in recognizing the presence of problems in safe flight still to be overcome and in using all available experience to solve them. Then, we shall be doubly proud of our service to the nation.



HOYT S. VANDENBERG
Chief of Staff, United States Air Force

K PROJECT

Prepared from material submitted by All-Weather Flying Center, Clinton County AFB, Ohio

AVIATION TOOK ANOTHER gargantuan stride into the future when for the first time in history a "Thunderstorm Safe Speed Chart" was recently made available to airmen by the All-Weather Flying Center at Clinton County Air Force Base in Wilmington, Ohio.

Climaxing two years of exhaustive research on thunderstorm flying during which 1,366 actual flights through storms were conducted, the project report which includes the safe speed chart is the most complete, scientifically accurate treatise on thunderstorm flying ever prepared.

Captain Lou C. Kappel, Chief of Thunderstorm Project, has prepared the speed chart to show at a glance the safe thunderstorm air speeds for most Air Force tactical planes as well as for many Navy and commercial planes.

Findings of the project indicate that many types of aircraft may safely fly thunderstorms, and the safe-speed charts tell the best speed at which they should go through. But to say that many planes may safely fly through thunderstorms barely hints at the complete story.

The story began with establishment of the project back in 1945. The project was divided into two phases—the first conducted at Pinecastle, Florida, where sub-tropical thunderstorms are prevalent—and the second at Wilmington, Ohio, where frontal and pre-frontal storms frequently occur.

The F-61 night fighter was selected as the test plane to be used because of its rugged construction, high service ceiling and it carried radar equipment required for the tests. A network of 55 automatic recording weather outposts was established over which the planes would fly at all altitudes and airspeeds through the storms. Automatic recording instruments and movie cameras in the planes provided accurate data of what went on in the cockpit which could be compared with upper air soundings and cloud echoes recorded by the ground equipment.

The pilots who flew the projects were all volunteers and former instrument flying instructors. All

were able to pass a green card check. At the conclusion of the project the pilots expressed an unanimous opinion that no one should fly thunderstorms unless he had the instrument proficiency required for a green card, an indication that thunderstorms are not to be taken lightly in any sense of the word.

Actual physical composition of thunderstorms includes a number of cells that vary in diameter from one to five miles, depending upon the stage of development of the storm. The average life of such an atmospheric upheaval is between two and three hours. As the old cells die, new ones build up.

It is this cellular composition of the storm that breeds the most prevalent flying hazard associated with thunderstorms—turbulence. Hail, icing and lightning are also hazards, but because of its effect on plane and pilot, turbulence is considered the thunderstorm's greatest hazard. The disturbed angular motions of an airplane in turbulent air, even with fixed stability and proper pilot technique, are dependent not only upon the maximum intensity of a single gust, but also upon the sequence, spacing and intensity of all the gusts encountered.

The solid jolt, familiar to everyone who has flown through rough air, is the work of the sharp edge gust with its steep gradient. A series of these gusts taking place close together will shake an airplane in a manner comparable to an automobile riding over railroad ties. These particular gusts can impose great stress upon aircraft, and this stress increases with the velocity of the gust and the speed of the plane.

Another contributing factor in turbulence is the draft—the huge column of rapidly rising or descending air which is an integral part of the thunderstorm's structure. While the effects of drafts are considered quite spectacular from a pilot's viewpoint —often lifting a plane several thousand feet in a very brief time—the project discovered they are not too important with regard to stress loads imposed upon the airplane.

One common thunderstorm bugaboo — that a downdraft may slam you into the ground — was thoroughly disproved at least so far as thunderstorms over the continental U. S. are concerned. The lowest altitudes flown through the storms were 5,000 and 6,000 feet above terrain and there were no instances where the plane lost more than 2,000 feet even though project pilots made no attempt to maintain altitude, but rode out the downdrafts to determine their intensity. It was noted that in clear areas beneath the storms downdrafts subsided.

The project also disclosed that the lower the altitude at which a plane traverses a thunderstorm, the less severe will be the turbulence. The least turbulence was found at 6,000 feet by thunderstorm project pilots.

Throughout the Thunderstorm Project the pilots were trained to use as little aerodynamic control as possible. This meant corrective action was taken only in cases where major or dangerous displacement of the airplane from straight and level appeared to be taking place.

The tests further illustrated that the pilot is a significant factor regarding the stress loads on the airplane while in severe turbulence. This variation on the basis of NACA statistics ran roughly to 20 per cent from pilot to pilot in the same rough air. In continuous rough air this amplification of load due to control movement can be appreciable and could possibly mean the difference between getting through the storm or falling out of control.

For this reason adherence to attitude flying with as little elevator control action as possible was stressed through the operations. This resulted in prevention of pitch oscillation setting up and ultimately leading to excessive control movement and possible structural failure.

There is a danger of flying certain types of aircraft such as cargo and passenger planes at high speed through heavy turbulent areas for the imposed wing loadings may exceed safe limits and impose dangerous strains on aircraft structures. Also, a heavily loaded plane is subjected to a greater total wing load than a lightly loaded one of the same type. A gust which may be safely endured by the wings of a lightly loaded plane because of its acceleration response, might induce critical or destructive loads upon a heavily loaded one which responds less readily to gusts.

To enable the pilot to determine the best airspeed zone to traverse a storm before he has to fly through it, a line representing a 43 foot per second gust was plotted on the Airplane Velocity - Gust diagram. The values recorded are found at the intersection of

Capt. Kappel, project officer, briefing thunderstorm pilots.

this gust line with the maximum lift, and maneuver lines. No gust greater than 43 feet per second was encountered in all the 1,366 thunderstorm traverses. However, figures based on the total number of thunderstorms which occur in the world every day and the total hours flown by Air Force planes every day indicate some USAF plane somewhere may hit such a gust once every six or seven days.

The same information was worked out for the maximum average gust, 30 foot per second gust, allowing a ten per cent safety leeway to cover amplification of control.

Practical application of these figures is presented on the last page of this article in the ready sight speed charts which show best indicated airspeed for flying through thunderstorms in all major types of Air Force planes.

The 1,366 thunderstorm penetrations by Air Force pilots and some 300 previous ones by NACA were executed without a major accident or fatality. This record was achieved largely through the technique and procedures evolved for thunderstorm flying. The technique was based on two fundamentals:

Get the plane ready before hitting the storm, and once in the storm *FLY ATTITUDE!*

It is always possible to get the plane ready to fly through a storm before it is reached since thunderstorms telegraph their proximity by lightning, radio static, etc. When a storm is ahead the pilot should slow down to best penetration speed, check instruments, lights, pitot and carburetor heat, de-icing and oxygen equipment, safety belts, mixture, rpm's, manifold pressures, etc. Then by the time he hits the storm he will be all set and won't plunge blindly into it and then have "everything happen at once."

Once in the storm the key is to maintain a relatively level attitude and not chase altimeter or airspeed other than to keep within safe limits. Thunderstorms must be flown principally with gyro instruments and airspeed, but the pilot must not chase airspeed indications or excessive attitudes may result. This "attitude" flying is possible as long as the gyros do not spill, and *not one single case of a flight gyro tumbling* during thunderstorm penetrations by the F-61's was reported during the entire project. Every standard type flight horizon, both vacuum and electric, was used with the same results.

Of greatest benefit to pilots is the new set of flight procedures for traversing thunderstorms which was evolved from phase two of the project. Below is the entire procedure as outlined by the All Weather Flying Center. The importance of each of the three phases of procedure, "Before Take-Off," "Approaching the Storm" and "In the Storm," cannot be over emphasized.

Briefly the procedures are:

Before Take-off

1. Check the Thunderstorm Speed Chart for best penetration speed for the type airplane you are flying.

Radar to guide planes into heaviest part of thunderstorm.

2. Make a thorough analysis of the weather situation to determine the possible and probable location of thunderstorms.

3. Prepare flight plan making intelligent use of information gained in weather analysis.

4. Try to select the "softer" altitudes.

5. Make a complete check of aircraft to insure proper operation of all flight instruments, radio and navigation equipment, pitot and carburetor heat, panel lights, oxygen, safety belts, wing and propeller de-icers and anti-icers, etc.

Approaching the Storm

1. Get airplane "ready."

2. Slow down to penetration speed. Increase rpm for gyroscopic stability. If flying jet aircraft extend dive flaps. This will tend to keep the airplane from quickly picking up too much speed in unusual attitudes.

3. Mixtures rich. Pitot and carburetor heat on.

4. Uncage gyro instruments and check for proper settings. Check vacuum pressure and make mental note where pump switch is located.

5. Be sure altitude control is turned off if auto pilot is being used.

6. Tighten safety belts.

7. Turn off any radio equipment rendered useless by static. Make sure trailing antenna is reeled in.

8. If at night, turn cockpit lights full bright or put on dark glasses to minimize blinding effect of lightning.

Hail damage to F-61 spinner.

Some of the F-61's used in thunderstorm research.

In the Storm

1. Devote all attention to flying the aircraft.

2. EXPECT turbulence, precipitation, lightning, etc., and do not allow them to cause undue concern.

3. Use proper control technique (fly attitude).

4. Maintain original heading—it's the quickest way out. Don't make any turns unless absolutely necessary.

5. Remember that sound planning, proper procedures plus, above all, common sense and an intelligent outlook will see you safely through.

This procedure for flying through thunderstorms was evolved through trial and error, practice and experience. It represents an outstanding contribution to all weather flying. The pilot who follows the procedures outlined above will be a safer pilot in a thunderstorm.

One qualification must be placed on the findings of the thunderstorm project. All experiments and tests were made in the United States. The findings are accurate for flight in this country. Operations in other climatic zones must interpret these findings in the light of their specific situations.

Pilots who arm themselves with the information in this report and utilize the safe speed charts will enter any thunderstorm prepared to fight a familiar foe with the latest weapons available thanks to the all weather flying center and "Thunderstorm Project."

THUNDERSTORM FLIGHT SCALE

The scale below gives the best available speed range for Air Force planes to fly through thunderstorms.

In the lower red limit of the scale the airplane will be in a stalled attitude. The upper red limit indicates the limit maneuver factor is exceeded and structural failure may occur.

THE BLACK ZONE IS THE BEST FLYABLE ZONE

The white is the warning zone, safe but approaching the danger limits. On jet aircraft this warning zone has been extended since the problems of acceleration and deceleration are more acute than those in propeller-driven planes.

The top scale, marked *Average* for each type of plane, indicates safe speeds for thunderstorms containing the maximum average gust encountered by the project for average thunderstorms. The lower one marked *High* is for the highest recorded gust experienced during the project, or for the severest thunderstorm encountered.

TYPE	DESIGN GROSS WEIGHT	LIMIT MANEUVER LOAD FACTOR	
			TRANSPORT SPEEDS 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330
C-46	36,000	3.0	AVE.
			HIGH
C-47	26,000	2.86	AVE.
			HIGH
C-54	62,000	2.5	AVE.
			HIGH
C-74	145,000	2.67	AVE.
			HIGH
C-82	42,000	3.3	AVE.
			HIGH
C-97	130,000	2.67	AVE.
			HIGH
YC-99	265,000	2.5	AVE.
			HIGH
DC-6	87,500	2.5	AVE.
			HIGH
			FIGHTER SPEEDS 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560
F-47	14,000	8.0	AVE.
			HIGH
F-51	8,000	7.33	AVE.
			HIGH
F-61	28,000	5.67	AVE.
			HIGH
F-82	20,000	7.33	
			JET FIGHTER SPEEDS 125 150 175 200 225 250 275 300 325 350 375 400 425 450 475 500 525 550 575 600 625 650 675
F-80A	10,000	8.0	AVE.
			HIGH
F-84	13,000	7.33	AVE.
			HIGH
			BOMBER SPEEDS 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540
B-36A	278,000	2.67	AVE.
			HIGH
B-50	140,000	2.50	AVE.
			HIGH
B-29	120,000	2.67	AVE.
			HIGH
B-17	56,000	3.5	AVE.
			HIGH
B-25	26,000	3.67	AVE.
			HIGH
B-26	27,000	3.85	AVE.
			HIGH
			JET BOMBER SPEEDS 150 170 190 210 230 250 270 290 310 330 350 370 390 410 430 450 470 490 510 530 550 570 590
B-45	82,600	3.0	AVE.
			HIGH
XB-46	91,000	3.0	AVE.
			HIGH
XB-47	125,000	3.0	AVE.
			HIGH
XB-48	102,000	3.0	AVE.
			HIGH

THUMP!

To WALK AWAY from a hard landing without writing it up in the Form 1-A could easily cost the life of the next pilot to fly that plane.

An F-84B pilot wrinkled his wings upon landing after a very hasty letdown from altitude. He did not report the hard landing and it remained for an on-the-ball crew chief to discover the damage. The sway braces on both tip tanks were missing and the left tip tank was leaking fuel. Further inspection revealed buckling of the right wing and wrinkles on the underside of both wings.

The pilot had been on a local night proficiency flight. For 40 minutes he had cruised around at 25,000 feet. Flying was called off because a ground fog was moving in on the base, so the pilot hurriedly descended to the field.

He peeled off at about 300 mph at 1,000 feet and flew a normal traffic pattern. Landing lights were turned on during the final approach and the airspeed was kept above 170 mph until he was over the end of the runway. He then cut the power and landed with very little flareout from the steep glide he had been maintaining. The result was a severe jolt as the wheels touched down.

After the damage was discovered the pilot recalled that he had experienced a momentary shudder of the airplane during flight. He had made a sharp turn to look around but could not see the lights of any other planes although he thought he had flown through prop or blow wash.

That this turbulence could have been the cause of the wrinkling was discounted by accident investigators. The fact that the buckling was prominent only on the underside of the wings showed they were caused by downward movement of the extreme tips of the wings caused by the excessive negative "G" forces during the hard landing.

It is known that when an airplane encounters severe turbulence in flight, both negative and positive "G" forces are present, thus exerting stress so as to make buckling evident on both upper and lower wing surfaces.

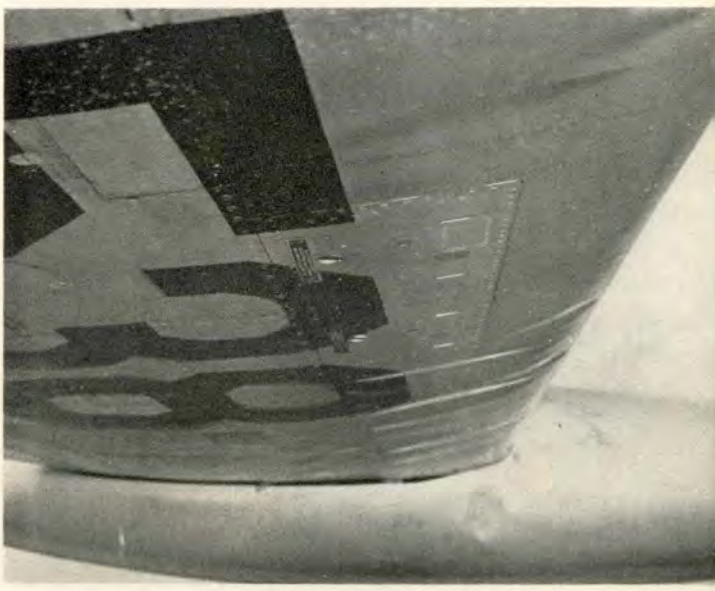
The accident was attributed to 100 per cent pilot error.

The pilot's rapid letdown into the traffic pattern may well have contributed to his poor landing. He had not allowed enough time for the changeover from high speed and steep angle of descent to the slower speed and proper angle of glide for a safe landing. This was further aggravated by the weight of fuel aboard. He had about 350 gallons of fuel in the internal tanks plus 40 to 50 gallons in each tip tank.

It is now group policy at this pilot's base that pilots participating in night altitude flights will fly at an altitude of about 5,000 feet for sufficient time to become adjusted to traffic pattern speeds and approach attitudes. Also, at least one turn around the field allows more time for pre-landing checks, observation of runways and other traffic.

In the same vein, depth perception on landing can be poor if a pilot has been careless about his use of oxygen on an altitude flight. If there is any doubt about the proper functioning of the oxygen system, the pilot is advised to cruise for a while at a lower altitude before attempting to land.

All pilots at this base have been briefed as to the importance of writing up hard landings. Doing so will not leave to chance the discovery of possible structure failure.



ONCE IS ENOUGH!

(EDITOR'S NOTE: These are experiences of pilots who knew better but had to undergo a bit of a shake-up to have the safety lesson sink in. The authors of the following stories remain anonymous at their own requests. If you have had a "Once Is Enough" experience, share it with other airmen by sending it direct to the editor, FLYING SAFETY, First Region Inspector Gen-Inspector, Langley Air Force Base, Langley Field, Virginia. We will withhold your name on request.)

GEOGRAPHY LESSON

I LEARNED MY LESSON well enough and forcibly enough for any 10 normal men so I'll pass it on for the other nine. Unfortunately, I can't pass along some of the gray hairs that came with it.

It all happened (or almost happened) during the first part of the war in a very mountainous South American country. I was assigned to fly an old Army cavalry colonel to a city which was cozily nestled back among the mountains. The maps, which weren't at all accurate, coupled with the haze which seriously restricted visibility constituted a rather uncomfortable situation. I wasn't too sure of our location so I was sticking to the coast line. The colonel, who had spent several years in that country and apparently knew the geography in detail, volunteered his assistance which I accepted in lieu of something better.

As we flew over a certain plantation, he recognized it and told of his friendship with the owner. He also recognized a nearby town, and a river which didn't appear on the map (this wasn't unusual, however). In fact, he had our position "pin-pointed." He suggested that rather than go a hundred miles out of our way and approach the city through the east pass (the one that I was familiar with) we cut inland to go in from the northwest. I wasn't too enthusiastic about the idea but he seemed to know that country (which was more than I knew). I did know the terrain was higher that way. But it could be done, so inland we went.

He directed me around the right side of some mountain that he called by name, then around another; over a small settlement where he claimed a very cute senorita lived, then around another mountain. As the terrain became higher I started a gradual climb, still following the directions of my passenger-navigator. The haze was getting pretty thick when he directed me between two mountains. I still remember his words, "The city is in the valley just on the other side." The ground was climbing pretty fast now and we were having to hump to climb faster, headed between the two mountains. Just as I got well into the "pass" I looked up and saw the dead end staring at me. To say I was scared would be a gross understatement. I was petrified. I "firewalled" everything, and was just able to stay above the treetops. My heart was in my mouth and my stomach full of butterflies as the sweat began to flow.

The thought of bailing out entered my mind but the leaves and branches flying past the window carried it away. I glanced at the airspeed and saw it hovering around 110 and a few more hairs turned gray. By this time I had gotten far enough in this blind alley to see that the mountains formed a small horseshoe with this canyon as the only exit. I started around the inside of this bowl in a steep turn, clipping treetops as I went. By this time the airspeed was on the low side of a hundred.

Well, I completed reaming out that clearing and started back out the same way I had come in. When I regained my faculties I looked around for my "navigator" but he was sitting low in the rear seat where he finished the trip. I went back out to the coast and followed it around to a known checkpoint, then took the long way in. Incidentally we were about 75 miles from where my navigator thought we were.

The moral to this story can be applied to almost any situation, don't go busting into something unless you know well what you are doing.

MAINTENANCE MALADJUSTMENTS

ERRORS MADE BY maintenance personnel caused 11 per cent of all USAF accidents last year. These errors involved principally installation of the wrong parts or improper adjustment of correct parts and failure to perform adequate inspections.

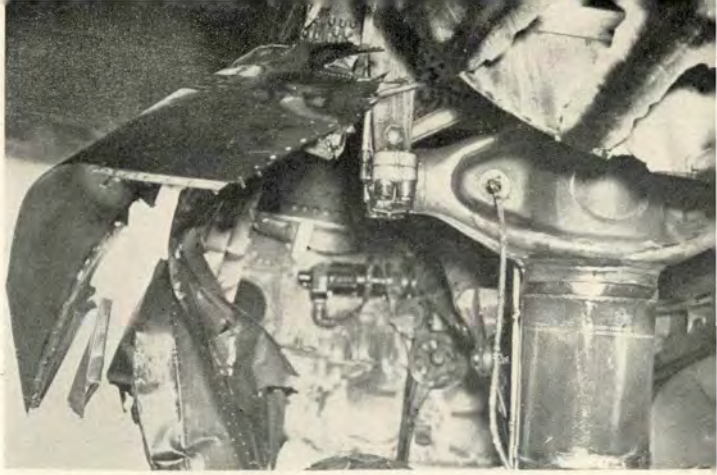
The explosion which riddled the engine nacelle of a B-29 as shown in the top picture occurred a few seconds after the pilot noticed the manifold pressure of the No. 2 engine begin to drop. The engine was feathered and the fire blown out, but major damage resulted.

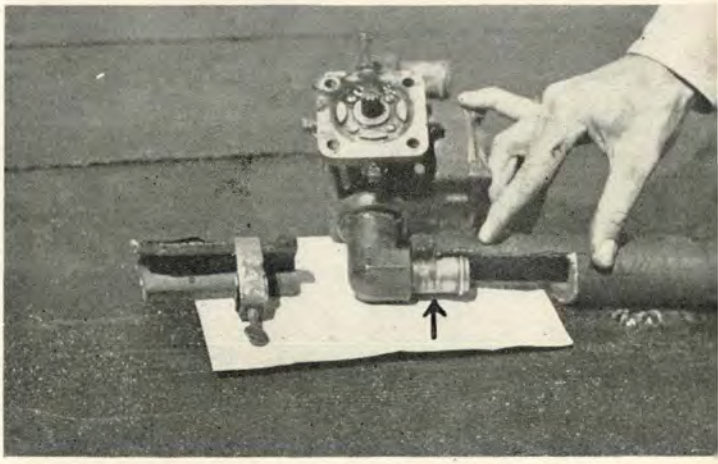
Improper maintenance was to blame. The main fuel line from the engine driven fuel pump to the fuel flow meter had become disconnected. The hose clamp had been tightened on the position indicated by the finger in the second picture. It should have been fitted to the hose nipple connection shown by the arrow.

The importance for maintenance personnel to comply exactly with technical orders is illustrated by the bellied-in B-26 Invader. After all emergency procedures failed to extend the left main gear, the pilot was forced to land wheels-up.

The bottom photo shows what investigators found. The left gear was held in the up and locked position because of a maladjustment of the landing gear uplock. The T.O. calls for an overlap of 5/16". In this case the adjustment was 8/16" in the down position and 9/16" in the up position. The photo shows the part in down lock position and the excessive override is readily apparent. This caused severe binding between the latch cap and segments.

These are but two of hundreds of accidents that have been traced to carelessness on the line. To say that the Air Force is built on teamwork is not just to recite an old saw. Tragic deaths, millions of dollars' worth of equipment destroyed because some team member fails to do his job underscores in red the urgency of 100 per cent team work.





PILOTS UNLIMITED

By CAPT. JOHN J. HERBERT, JR., *Flying Safety Staff*

THE 47TH BOMB GROUP, Light, Night Attack, commanded by Col. Willard F. Chapman has established an enviable peacetime record. During nearly 15 months of operation this group now stationed at Biggs AFB, El Paso, Texas, has not had a single major or minor aircraft accident. And they have really done some flying, too—3,858 hours of day and night formation with a total of 16,129 hours flown from March 1947 until March 1948.

Luck you say! Well, read on and take a look at the checkout requirements which the pilots of this famous World War II group must demonstrate to an experienced instructor pilot. To start with, each pilot must satisfactorily complete a prescribed ground school course. And "pilot" means from the Group CO on down the line.

Complete schooling covering TO's, mock ups, pilot training manual, radio equipment, emergency procedures and flying regulations is given prior to flight checkout.

A B-26 (formerly the A-26) questionnaire as long as your arm is the final examination and must be satisfactorily completed by each new pilot regardless of his past experience in the Invader.

With ground school behind him the B-26 pilot-to-be is given a complete cockpit orientation and then required to pass a blindfold cockpit check with a 100% score.

After completing the cockpit check, the pilot is assigned to a flight instructor, who surveys his student's Form 5 and interviews the student to ascertain the pilot's experience level as pilot or copilot in each multi-engine type aircraft flown.

The instructor then gives the student a complete familiarization ride demonstrating stalls, slow flying, single engine operation including single engine stalls and single engine go-arounds, takeoff, inflight, and landing characteristics.

In no case will the student pilot log less than 10 hours dual instruction with a minimum of 10 day takeoffs and landings and three night takeoffs and landings before checkout.

Operation of fuel, hydraulic and electrical systems comes next with the student required to demonstrate the emergency procedure in the event of failure of any or all of these systems.

There is only one way to fly a traffic pattern and that is the right way. So the budding flyboys of the 47th must demonstrate to the satisfaction of the instructor pilot that they know how to fly the local circuit.

When the newly assigned pilot shows promise he is checked out on cross-country. Two navigational flights are made as student pilot with an experienced first pilot. The student flies in the left seat and is required to make a minimum of two strange field landings.

Newly assigned graduates of advanced flying schools or pilots who have recently returned to active duty after an absence of over six months are required to take instrument flight tests in the B-26 in accordance with AF Regulation 60-4. All other pilots whose instrument tickets are current when assigned to the 47th are given an instrument proficiency recheck in the B-26. Every pilot in the 47th is required to pass the green card instrument check before assignment as unlimited first pilot.

Nose wheel trouble has never plagued the 47th. Capt. J. B. Story, Flying Safety Officer, thinks that the SOP in handling the gear and flaps in this group is the sure cure for nose wheel trouble. The gear is never lowered at speeds in excess of 150 mph. Landings are made with a maximum of 38° flaps and about 15" hg. These three points are stressed during transitional checkout. The 38° of flaps with power on allows a more nose-high attitude in landing, eliminating the possibility of striking nose wheel first.

Lt. Col. Delwin D. Bentley, Deputy C.O., is high in his praise of the maintenance crews.

"They're the best in the business," he says. And he should know, having been a squadron C.O. of a Marauder outfit in Europe during the war. Maintenance people are made and not born. The 47th makes them with a splendid on the job training program at Biggs AFB.

With the procurement of B-45's a reality, Colonel Chapman, Maj. George Thobault, Capt. Ralph Mitchel and Maj. Paul Neafers were ordered to Muroc for training in the jet bomber. Meanwhile, the people at Biggs are taking a six weeks' course through the B-45 mobile training unit. The pilots, besides learning the flight characteristics of the jet, pursue the same course of instruction as the mechanics who will service the B-45.

"It will be a long, tough grind," says Colonel Bentley. "But we are setting up the same rigid requirements for the B-45 that we have for the B-26."

The 47th Bomb Group has demonstrated by its record that an outfit can operate at peak efficiency and still maintain a zero accident rate. Just as a high accident rate invariably results from haphazard operations, the splendid safety record of this outfit is a direct reflection of a high degree of administrative and operational efficiency. More power to the 47th and its pilots unlimited.

Men like T/Sgts. Stokes and Lipps keep B-26's in air.

but for the Grace

A GREAT MAN once said, "God must love the common people, he made so many of them." A junior officer in the Air Force, one of the thousands who do the flying and fighting in the tactical units, goes about his duties today secure in the knowledge that a Grace beyond human knowledge does stand watch.

This pilot, call him Lt. Jordan, walked away from the F-80 pictured on the opposite page after another plane forced him to attempt a go-around from an emergency landing.

The flight began as a local formation training hop from an Eastern airbase. Approximately 40 minutes out at 20,000 feet Jordan noticed his power unit running rough and notified the flight leader. The flight leader and his other wingman started back to the base escorting Jordan home.

Reaching the vicinity of the field Jordan called the tower for landing instructions and advised them of his difficulty. A letdown was made in preparation for a landing on runway number five. Some five miles from the runway on the initial approach Lt. Jordan again called the tower saying his engine was vibrating excessively. The tower replied that he was cleared for landing and advised that a B-25 on the base leg was being instructed to go around.

Jordan flicked his eyes over the panel and licked his lips briefly as the field rushed underneath. He made his pull-up and lowered his gear. He was okay now.

Major Slatterly and Captain Bleek in the B-25 were returning from a 400-mile jaunt up the coast. They had been a little late getting off on the return trip and it would be a close race with the clock to get back by quitting time.

Reaching the field they entered traffic behind a landing B-17. The pilot slowed the Mitchell down in an attempt to stay far enough behind the landing Fortress, but to no avail he was forced to pull up and go around.

As they turned on the second base leg the two B-25 pilots noticed an F-80 several miles out on the approach. The turn onto the final was made and the approach set up when the tower called for a second go-around, directing the B-25 to make a 360 degree turn to the right.

From here on the story is muddled. Both B-25 pilots swore they received no instructions to go around, pleading poor reception because of heavy traffic on B Channel. However, testimony of both tower operators was another story.

Both tower operators swore they heard an acknowledgment of the go-around order in the form of a question, "Tower, did you say make a 360 to the right?"

The mobile control officer's testimony was interesting also. He stated that when Lt. Jordan requested the tower to send the B-25 around shortly after his peel-off the tower advised him that the B-25 had been instructed to go around. Immediately after this transmission the mobile control officer saw the B-25 nose drop drastically as the plane went ahead and made a landing. Both the F-80 pilot and the Mobile Control Officer heard the go-around order which the B-25 pilots did not receive because of "jamming" on B Channel.

One tower operator continually advised the B-25 to go around all the way down the final approach while the other operator held a red light on the plane throughout the approach.

As Lt. Jordan pulled up in his breakaway he sighed in relief. He was in perfect position for a landing even if his ailing engine quit altogether. His relief was short lived.

As he rolled around where he could see the field he noticed the B-25 still on the final approach. Hastily he called to the tower to send the Mitchell

around and received the reply that the B-25 had been ordered to go around.

Jordan continued his approach, watching the B-25 apprehensively. The F-80 was eating up the distance rapidly. Too rapidly. The Mitchell was not going around! The B-25 rounded out and touched down directly in the path of Jordan's plane.

Lt. Jordan immediately added power, getting only 87 per cent, and retracted gear and flaps for an attempted go-around. At 300 feet approximately a mile and a half from the field he started a turn to the left. There was loud noise in the engine compartment and the unit quit cold.

The mobile control officer heard Jordan's cryptic "It quit. I'm going in."

Jordan locked his shoulder harness, pulled the battery disconnect switch and shut off throttle and fuel switches. He headed for a fairly open area ahead.

The F-80 lashed down through a fringe of timber, shearing off two trees approximately six inches in diameter, struck the ground and skidded finally to a stop against an embankment. For a moment there was dead silence following the roar of the crash. Slowly the dust settled over the still wreckage. Then miraculously the pilot stirred, freed himself from his harness and crawled from the wreckage. He suffered only minor injuries.

Because another plane failed to heed tower instructions, Lt. Jordan might be dead today. When he happens to pass a field of stones and crosses he knows the source of the small voice that murmurs "But for the Grace of God . . ."

WAR DEPARTMENT
AAF Form No. 54
(Revised 2-18-43)

WAR DEPARTMENT

ARMY AIR FORCES

UNSATISFACTORY REPORT

(See AAF Reg. 15-54 for Information on Proper Use of this Form)

TO BE FILLED IN BY STATION	
STATION SERIAL No.	DATE SUBMITTED

LEAVE BLANK		
A. S. C. SERIAL No.	REFER TO	CLASS

WRITE U.R.

STATION			ORGANIZATION		
SUBJECT OF REPORT	Property Class—Name			Manufacturer	AAF Order or Shipping No.
AIRCRAFT—Model & AAF Serial No.		ENGINE—Model & AAF Serial No.		UNIT OR ACCESSORY—Type, Model and Serial No.	
AIRCRAFT REPORTS ONLY	LAST D. I. R.—Depot		Date	Flying Time Since	Total Flying Time
ENGINE REPORTS ONLY	LAST OVERHAUL—Depot	Hours Since	Depots and Hours At Each Previous Overhaul		
PART	Name		Part Drawing, Serial and Specification No.		
	Time in Use	Quantity on Hand	Quantity Known Defective	No. Previous Failures	
Indicate by "X" Disposition of Exhibit →	☐ Photographed and Prints Enclosed	☐ Held for Instructions	☐ Sent Under Separate Cover	☐ Se	

GIVE COMPLETE DETAILS, PROBABLE CAUSES AND RECOMMENDATIONS B

(Use Only Applicable Spaces Above—Avoid Unnecessary Repetition)

By ELWOOD H. PLYM

Chief, Command UR Control, AMC

JUST AS YOU CAN WRITE to your Congressman regarding bad conditions in this country and suggest remedies or recommend a plan of action—so you can write to AMC about any default in or unsafe condition of Air Force equipment.

In fact the U.R. (AF Form 54) is one of the most vital tools the Air Materiel Command has in accomplishing its mission of providing efficient maintenance, storage and distribution of AF equipment. Therefore, it is of utmost importance for Hq, AMC to act expeditiously upon all Unsatisfactory Reports received, in order to furnish AF field activities and other components with complete corrective instructions or to initiate corrections in production lines.

An Unsatisfatory Report can and should be submitted on anything that is unsatisfactory: whether it concerns the aircraft—components, accessories or equipment; aircraft engines — components, accessories or equipment; armament, photographic, radar, communications, airborne equipment, vehicles, marine equipment, aircraft and shop materials, shop and hangar equipment, tools and test equipment, clothing and flying equipment, storage and shipment, corrosion and deterioration, regulations and directives, office supplies and equipment, etc.

Technical Order OO-35D-54 is the bible to follow when preparing and submitting a UR to Hq, AMC. AMC stresses that prior to submission the UR should be thoroughly checked for completeness especially as to description of the difficulty, probable cause of discrepancy, the local corrective action taken, and recommendations for corrective action. It is essential that the UR has the proper station serial number and that there are sufficient copies so that the original and two (2) will be received at Hq, AMC.

Emergency UR's submitted by teletype, messageform, etc., should later be confirmed by an AF Form 54 having the same station number, date, and TWX or messageform listed.

Also, it is mandatory that Hq, AMC receive all Form 14's and 14A's and accompanying UR's on aircraft accidents in which materiel failure was a factor. (See AF Letter 62-21, 12 March 1945.)

The UR, upon receipt at Hq, AMC, stops at Command UR Control, an office established solely for maintaining effective control over the processing of Unsatisfactory Reports and related material.

Command UR Control determines the division of AMC responsible for processing the UR and they slap a control number on it, post it by station, station serial number, date and AMC control number, and then forward it to the aforementioned division whose headache it becomes.

When the UR arrives at the division it gets posted again and is assigned a special guardian angel in t

ROUTING SEND ORIGINAL AND TWO COPIES DIRECT TO COMMANDING GENERAL, HQ. AIR SERVICE COMMAND, PATTERSON FIELD, FAIRFIELD, OHIO.

☆ U. S. GOVERNMENT PRINTING OFFICE : 1943 16—34619-1

form of an engineer or technician.

This engineer or technician, after receiving his protege, classifies it as a new project (if the failure or discrepancy was not previously reported from any source), repeat project (if the failure or discrepancy had previously been reported and a project already established, or non-project (if the Unsatisfactory Report concerns a failure or discrepancy for which corrective action must be taken by an activity beyond the jurisdiction of Hq, AMC). Within five days the UR is back where it started from at AMC (Command UR Control) with indications on the routing form as to the action to be taken by the engineer. Several things may happen to the UR after that.

If an Unsatisfactory Report is classified as a new project, it may involve engineering research and development or action by the contractor. Such UR's are forwarded by the engineer or technician to the affected laboratory at Hq, AMC or the contractor responsible for the item, where by coordination corrective action is determined. Upon completion of the project corrective action may require the issuance of a Technical Order, an entry in the UR Digest, Technical Order OO-10-1 or an individual reply to the activity originating the Unsatisfactory Report.

If the Unsatisfactory Report concerns a defective item which had not previously been reported to Hq, AMC, it is usually necessary to obtain the item as a U.R. Exhibit before corrective action for the reported failure can be determined. Before an Unsatisfactory Report Exhibit is shipped, it should be well identified including the name of the station, station serial number of the U.R., and in every instance attach a copy of the U.R. to the exhibit. In all cases, the shipping ticket should list the station serial number of the Unsatisfactory Report.

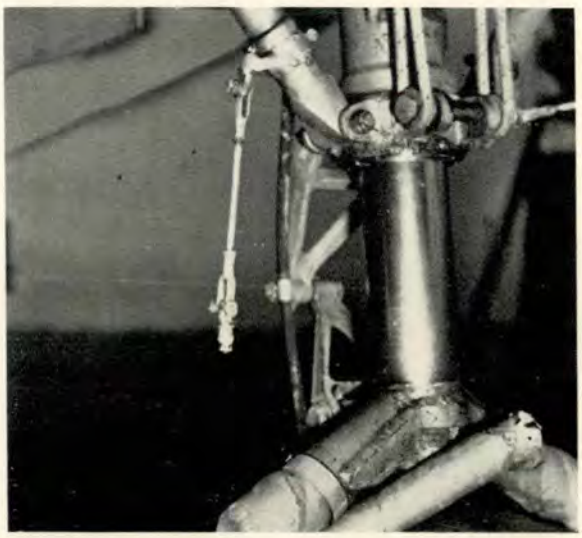
If the Unsatisfactory Report is classified as a repeat project, in means that corrective action has already been determined or is in the process of determination. Exhibits for such Unsatisfactory Reports are not required, since an identical exhibit has already been received as a result of the first Unsatisfactory Report. For this reason, an exhibit that is small enough to be mailed as an inclosure to an Unsatisfactory Report, should not be shipped to Hq, AMC unless officially requested. If an exhibit is not requested, it does not mean that the U.R. is being ignored by Hq, AMC.

If the Unsatisfactory Report is classified as a non-project, the responsible engineer or technician forwards it with his recommendation to an activity beyond the jurisdiction of Hq, AMC for action deemed necessary.

Action is taken on all UR's within five (5) days after they are received by Hq, AMC. Some UR's can be and are processed immediately, while others require extensive research and investigation, the length of time depending on the nature of the reported condition.

To aid in providing Service Activities with the best equipment obtainable, it is recommended that the submission of Unsatisfactory Reports be accomplished whenever the opportunity occurs. An unsatisfactory item, condition, method, or system is of no value to anyone.

It is also recommended that all interested personnel arrange to review Training Film No. TF-19009 which outlines the processing of Unsatisfactory Reports.



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- - - BUT NOT THE BOLDEST

IT IS A LONG TIME since anyone has been taught to fly by the seat of his pants. But today's Air Force, with its safety regulations, radio navigation aids and highly specialized equipment which take the guesswork out of flying, had its evolution in the painful experiences of pioneer airmen who depended more on guts than on gages.

The experiences of most any of the old-time military aviators will tell the story of how our Air Force has developed its high standards of safety, its emphasis on training and refinements in planes and equipment. One such pilot is Warrant Officer Chester F. Colby who first soloed as a staff sergeant in 1919 in a Curtiss Jenny. Since then Colby has amassed a respectable total of well over 11,000 hours flown in 91 different type and model airplanes.

Mr. Colby began his flying career at Mitchel AFB. In those days the C.O. could authorize flight training for members of his command who he thought could fill the bill. His Commanding Officer at Mitchel selected one officer and four enlisted men as potential pilots.

"If you didn't solo within four hours," says Colby, "you were considered to be hopeless in those days."

After building up the staggering total of 85 hours, Colby was tapped as an instructor for the Observation School at Ft. Sill, Okla. Captain Walter Krans and Major Clarence Tinker were Colby's first two students. Both of these men wore generals' stars in World War II.

While planes and rules have changed a lot since those early days, Colby believes pilots then and now pull the same kind of boners—buzzing, maneuvering the plane beyond sensible limits, ignoring rules and regulations. Student pilots of today, on team rides, who test each other's intestinal fortitude, are not doing anything new.

Colby cited a few incidents which occurred in the 1920's. Two students went aloft in a DH-4 to settle an argument. The boy in the front seat kicked the airplane into a spin, telling the other student that the first one to touch the controls to effect a recovery was yellow. Result? Both those brave men luckily escaped without a scratch but the DH-4 was salvaged for kindling.

Another student got on the tail of a buzzard while flying a DeHaviland. The buzzard reefed it in a wee bit too tight for the DeHaviland which promptly spun. Some foolish pilots today make the same low-speed, tight turn on the base leg.

When it became apparent that airmen couldn't always walk away from a crash, the parachute was introduced. In 1922, Colby strapped on his first chute. This model came packed with tissue paper between the folds of silk. The paper had the same purpose as our pilot chutes attached to the jumping bags of today. Colby tells about a C.O., later a general, who wrote to the War Department requesting that parachutes be done away with since they encouraged pilots to abandon government property. Although Colby has never qualified as a caterpillar himself, he says, "I've had one foot over the side several times."

The radio aid to navigation which today's flier takes for granted had interesting beginnings.

A few months after the installation of the first radio range in North Carolina, Colby was flying a C-9 transport in the area of Greensboro. He had been following the beam and thinking of the great strides that had been made in navigation when suddenly a voice came over the head set "This is Greensboro Radio, severe thunderstorm north of Greensboro, we're going off the air." There was Colby, high and not dry, without radio facilities, all because the folks on the ground were afraid that their brand new radio range station might be damaged by lightning with them in it.

When the storm had passed, the range operator returned from his hideaway in the nearest barn to his switchboard and put Colby back on the beam.

Aside from torn fabric and split props incurred during the earlier days when any race track was a landing field, this veteran pilot has had only one major aircraft accident. It was during the summer of 1927 that he wrapped up a C-1 transport. Colby was flying supplies to tornado stricken residents in Rock Springs, Texas. While he dragged a pasture for landing, the engine quit and Colby, making the best of a bad situation, crash landed the C-1 in a cedar brush patch. No one was hurt, but the C-1 was more than somewhat dented. During the past 21 years, Colby has not had a single accident in 7,800 hours of flying.

To what does an old-time pilot like Colby give credit for such a clean record?

"Flying is like anything else a man will do," he explains. "There are certain chips stacked against you. If I don't feel that the hand I hold is better than the odds against me, I don't bet. The pilot who neglects his flight planning is certainly playing the 'chump' to say the least. My pet peeve is the pilot who shows up about 15 minutes before take-off time, hardly looks at a weather map, doesn't check his maps, load or airplane, and *thinks* he's ready for a thousand mile trip."

A few excerpts from the log of a cross-country from San Antonio to Boston, flown by Sgt. Colby in 1924, make a good yardstick to measure the tremendous strides made in aviation since that flight was made.

"San Antonio to Dallas, Texas, 248 miles, elapsed flight time 3:45."

"Picked up railroad and inter-urban which parallels course."

"Engine spitting, showing effect of commercial gas."

"Flying field recently plowed. Unsuitable for landing."

"Radiator water blowing back on spare tire."

"Landed in pasture."

"Removed four fence posts and took off."

"Engine ran smoothly as long as left wing was held low. Removed spoonful of rubber from carburetor."

"Another radiator leak."

"Landed at Bolling. Field hard and in good condition."

As Colby puts it, we've come a long way. Where we go from here depends upon how well we align experience with initiative.

Flying Safety BRIEFS . . .

SUPER SUIT

An overwater, light flying suit of many facets—a flying garment incorporating a life preserver vest and emergency sustenance kit—has been unveiled by Air Materiel Command.

The versatile three-in-one garment, developed by AMC's Aero-Medical laboratory, underwent its first successful "live" test recently in a parachute jump from a C-47 aircraft over Indian Lake, Bellefontaine, Ohio.

The same experiments saw initial testing of an improved pack and metal accessory container for the twin-tube, one-man life raft and a new accessory container for the six-man A-3-A life raft.

Designed especially for use by pilots in tropical areas, the new flying suit features integrated neck and chest flotation bladders and leg pockets for survival kits and rations.

This eliminates need for both the conventional B-5 "Mae West" life preserver vest and a separate ration kit and, by combining three functions in one garment, greatly reduces both weight and bulk.

The suit's circular neck bladder and rectangular chest bladder are inflated by an actuating cylinder with one ounce of carbon dioxide, and will right the wearer to a 10-degree-from vertical angle within three seconds after hitting the water. Location of the bladders makes it virtually impossible for an injured airman to float face down if he should lose consciousness.

To compensate for possible leakage, the suit is also provided with an oral inflation valve.

The garment is made of basket-weave nylon. Pockets, located in the trouser legs at the back of the calves, contain emergency sustenance articles. A strap under the instep of each foot prevents the trouser legs from working up while immersed in the water.

In the Indian Lake experimental jump, the tri-purpose suit was worn by 1st Sgt. Lawrence Lambert of the Aero-Medical laboratory test division. Two other jumpers, Second Lt. George C. Finn and Sgt. Harry J. Brickheimer, also of the test division, were equipped with regulation B-5 life vests. All three men wore B-8 and QAC type parachutes.

Engineers said the experiment indicated that the

new-type suit would provide adequate buoyancy and freedom of motion for aircrewmen in the event of bail out.

A VERY RARE BIRD

Almost extinct today is a bird that used to be quite common in the Air Force — the Screwtail Swivel-squat, the bird that does not believe in the importance of a flying safety program.

Progress in eradicating this destructive species is exemplified by the flying safety programs of two numbered air forces discussed in a recent issue of the Tactical Air Command's Flying Safety Bulletin. The article related in part:

"Ninth Air Force has stated that at their stations the Flying Safety Officer will be selected for his assignment because of his aggressiveness, personality and experience. He will also hold the grade of Captain or above. They further state that this officer's assignment will not be on a temporary basis and that he will have no additional duties of a permanent nature. The station flying safety officer will also be considered a staff member and have direct access to the Commanding Officer on matters pertaining to Flying Safety.

"Ninth Air Force has further stated that a thoroughly indoctrinated alternate Flying Safety Officer will be available at all times in the absence of the regularly appointed one, and that any change in FSO will be reported to Headquarters, Ninth Air Force.

"An Administrative Officer is to be assigned the Ninth Air Force Flying Safety Section to review Flying Evaluation Board Proceedings and to process Forms 14, thus allowing the Flying Safety Officer and his assistant to spend more time in the field.

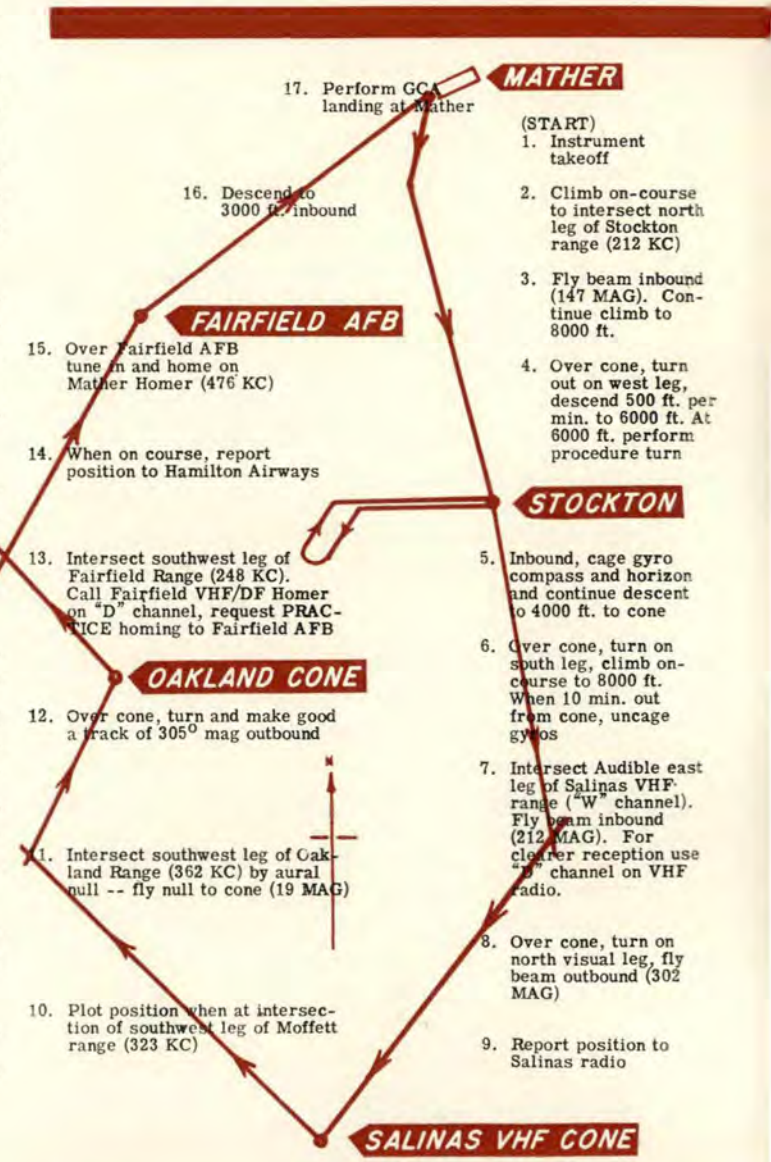
"Twelfth Air Force recently held a Commanders' Conference during which an appreciable length of time was spent enlarging upon their Flying Safety Program. It was explained that Flying Safety is not accomplished by the Commanding Officer alone. It is a program which must gather impetus as it goes down the channel of command from the group through the squadron, through the flight, and to the individual."

Wing Flying Safety Officers at Twelfth Air Force stations are required to be of field grade and assigned the job as primary duty.

A campaign like the ones being conducted by these two air forces might well be waged on a world-wide scale. Such a campaign would no doubt further reduce the ranks of the Screwtail Swivel-squat, that very rare bird.

INSTRUMENT MISSION

One method a base can use to increase instrument flying proficiency is to prepare a definite plan for local hooded flights. It is possible to include in a two-hour hooded flight use of all standard radio aids and let-down procedures. Such an instrument mission was prepared for pilots at Mather AFB by the base Flying Safety Officer and Instrument Board. The scheme, which may be adapted locally by any base, enables the pilot to make full use of an instrument practice period rather than just stooge around with the hood up.



IT IS NOT ALWAYS the pilot who pays. There were four casualties in this accident but the pilot of the F-80 got out with a slight burn on one finger. The four people killed were civilians in a passing automobile. The F-80 failed to become airborne successfully because the pilot failed to take into consideration a rough runway and critical atmospheric conditions. The people in the car were killed because they failed to heed the traffic signal.

The F-80 had landed at a central airbase for refueling. After his plane was serviced the pilot started up and taxied out to take off on runway 270 as directed by the tower. As the F-80 taxied onto the runway the tower operator flicked a switch which turned on a red traffic light on the highway that bordered the west side of the field. A sergeant driving along the road saw the light change just as he passed it so it was known that the light was working.

The F-80 pilot put down 80 degrees flaps, advanced throttle to 100%, put I-16 on and released brakes. The first half of his roll was normal, but just past the mid-point of the runway he struck a bump and became airborne briefly. The plane settled on the runway than struck another bump again becoming airborne.

The pilot was right at the end of the runway so he retracted gear. The plane settled into the ground just past the end of the runway and started sliding.

As it slid across the highway the right wing tip and wing tank smashed into an automobile that had run the red signal light. The plane slid sideways another 300 yards, bursting into flames. The pilot hastily abandoned ship as the fire started to swirl up around him.

As he ran from the wreckage he saw the burning automobile back on the highway and ran toward it. He received his injury trying to pull a passenger from the burning car.

The crash trucks reached the scene of the accident in less than a minute after the crash, and observing the pilot near the car, the crash and fire crew directed their attention to extinguishing the flames enveloping the automobile. By the time the fire trucks got to the plane it was burned beyond all hope of salvage.

Of course the Air Force cannot always enforce traffic regulations outside the boundaries of its reservations, but it behooves all commanders, flying safety officers, public information officers and operations personnel to insure that all possible warning signs, lights and other cautions are placed on roads that cross the path of planes taking off and landing.

It is the personal responsibility of every jet pilot to ask for information and take into consideration every factor affecting takeoff characteristics of his plane. Field elevation, wind, temperature and condition of the runway are all important and should be checked personally by every pilot before every takeoff.

VIOLATION!

A TWO-WEEK ACTIVE DUTY TOUR for a First Lieutenant Reserve officer turned out to be an expensive proposition. It will cost Uncle Sam $6,260 to undo the doing of this pilot, who with 30 hours in an AT-11, decided to make a bomber pilot out of the crew chief assigned to the airplane.

After filing a local clearance, the pilot and crew chief checked the airplane, cranked up and taxied out for takeoff with the pilot at the controls. Engine runup proved satisfactory and the first takeoff was made.

A steady climb was maintained to 6,000 feet. At this altitude, the airplane leveled off and the pilot proceeded to practice air work. After 30 minutes or so of stalls and turns, the pilot decided to shoot a few landings. He did. Three full-stop landings to be exact.

While taxiing back for the fourth takeoff, the pilot was queried by the crew chief as to the possibility of his making the next takeoff. The fact that the sergeant had a civilian license and about 150 hours of light plane time cinched the deal.

The crew chief in the right seat advanced the throttle. The AT-11 rolled straight down the runway—for about 450 feet. Another few feet and the panic was on. The pilot took over just after the airplane had started a violent groundloop to the left. He advanced the left throttle, retarded the right one slightly and threw in a dash or two of right brake. This corrective action was effective. In fact, not only did the airplane stop turning to the left, but it promptly went into a 180° groundloop to the right sliding tail end first to a halt.

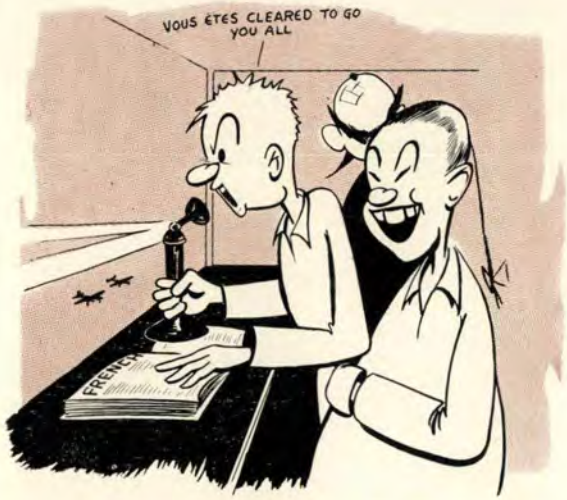
These two people made a good pair. What one lacked in experience, the other matched with lack of judgment.

For a deliberate violation of AR 95-15 and AF Reg. 55-8, the pilot is getting around via the heel and toe method pending final action of the local flying evaluation board.

AIR COORDINATION

"A Venezuelan pilot flying an American plane making a bad weather approach to a Chinese airport where a Czech controller is operating a British landing aid device should feel as happy in the cockpit as a baby in the cradle."

That's the big order which has been given to hundreds of technicians from a score of countries. They form the base of the International Civil Aviation Organization which has adopted standards and recommended practices for personnel licensing, rules of the air, aeronautical charts and maps, air traffic spacing practices and meteorological codes. The standards, adopted in Montreal by member nations including the United States will help to insure safety and regularity for international air travel.



GOODBYE TO MASKS

With the advent of pressurization the present standard USAF pressure demand oxygen system is gradually becoming a piece of equipment for emergency use only insofar as new bomber, cargo and transport type airplanes are concerned. However, pressurization of smaller type airplanes, such as fighters, is still in need of being developed to the point that will make regulators and masks dispensable. The problems remaining which include the development of simplified equipment for utilizing liquid oxygen are being studied by the Aero Medical Laboratory, AMC, and indications are that they will be satisfactorily solved, according to AMC Technical Data Digest.

SLOW SIMPLICITY VS FAST COMPLEXITY

Every time a new piece of equipment is added to an airplane, whether it be a safety feature, a navigational aid or any device, the airplane becomes more complicated, harder to maintain, and becomes more susceptible to mechanically-caused delays. The amount of equipment carried on a modern airliner or bomber is astounding. It carries a power plant sufficient for a small town, radio equipment on a par with that of a small broadcasting station, and more air conditioning equipment than a deluxe theater. Structurally, today's airplanes are practically trouble-free, but each of the many complicated systems cause an increasing number of delays between flights.

SNAKES GROUNDED

One of the recommendations made by the Air Line Pilots Association to the President's Special Board of Inquiry on Air Safety was that the transportation of poisonous reptiles by air be prohibited in the interest of safety. As a result steps have been

taken to eliminate the dangerous practice. The tariff rules of members of the Air Traffic Conference have been amended to "prohibit the transportation of harmful or poisonous reptiles as baggage under any circumstances."

SOLO FROM THE START

The British are giving much thought toward the training of pilots to fly powered airplanes without dual instruction in the air. They have been experimenting with a spinproof, German-developed high-wing parasol monoplane which cruises at 53 mph and is neutrally and directionally stable. It is powered with a 51 hp engine and will take off at 31 mph using a 55 yard run.

LIFE RAFT CONTAINERS

A new container for one-man life raft accessories, designed by James J. Martin, Aero-Medical sea survival unit, is made of light metal and contains complete survival equipment. It is attached to the life raft which is in turn attached to the jumper's life vest by a cord to insure against loss. Formerly supplies were strapped into the raft and loss hazard was high.

The one-man life raft accessory kit includes two wooden hand paddles, signal mirror, Permutit kit, Vinylite water bags, day-night distress signals, radar equipment, sponge, bailing bucket, sea anchor and repair kit. The improved design for the one-man raft pack features a quick release zipper which can be opened with a touch of the fingers. Total weight of the raft, pack, case and accessories is 18¼ pounds.

A similar carrying container for the A-3-A multiplace life raft, which inflates in descent, has also been tested. The accessory kit, suspended from the raft by two six-foot-long suspension lines, incorporates

complete survival equipment for six men. The life raft and kit assembly combined measures 33" x 13" x 15".

The survival equipment includes such items as distillation kits, permutit kits, emergency drinking water, "A" rations, life raft charts and books, chap sticks, sunburn ointment, first aid kits, hand energized flashlights, emergency signaling mirrors, wrist compasses, police whistles, Vinylite bags, survival manuals, sponges, Scripture books, paulins, 72 and 48 inch oars, sails, fishing kits and flares.

MEDICAL SAFETY

FLASH BURNS

RECENTLY AN F-47 AIRPLANE at an overseas base was being flown on a combat proficiency mission. After breaking off the first combat run, the pilot started to climb back to original altitude. At 18,000 feet engine failure was experienced and fuel pressure dropped to zero. Tanks were switched and emergency boost pumps were turned on. This produced strong gasoline fumes in the cockpit.

The pilot opened the canopy, turned the boost pumps off, placed mixture control in idle cut off position, but did not turn the fuel selector valve off. Large quantities of gasoline streamed from the airplane. Since altitude was around 13,000 feet, the pilot elected to make a parachute jump.

After this decision was made an explosion occurred in the aft portion of the ship and the empennage was blown off. The pilot immediately bailed out and made a successful parachute landing in a field. He sustained a few abrasions and cuts and suffered only first degree burns of face, wrist, lower legs and arms. The Medical Officer's Report of this accident contained a statement that a flying suit was worn with the sleeves and pants legs zipped, oxygen mask was in place on the face and gloves were worn on the hands.

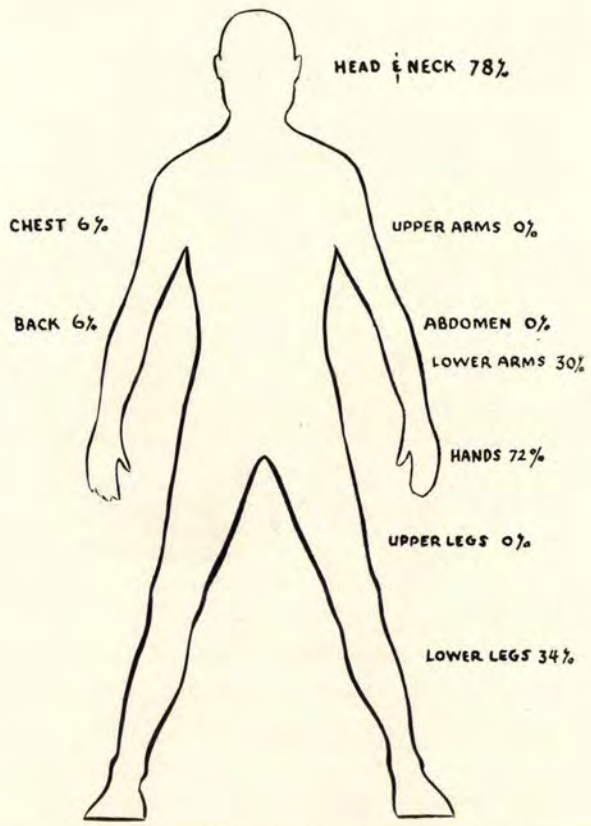
This accident report points out just how important it is for pilots, especially men flying fighters, to use flying clothes the way they were designed to be used. Rolled up sleeves, no gloves, and oxygen mask hanging loose in this case would certainly have produced extensive third degree burns with probable permanent disfigurement after long periods of hospitalization.

For a good many years it has been called to the attention of medical officers and flying personnel the rather unusual fact that in many cases flash fires from aviation fuels will fail to ignite clothing while at the same time producing third degree burns on exposed body surface areas.

The routine use of light gloves, helmet and goggles will protect the areas most likely to be burned by flash fires. In any case, the practice of stripping down to shorts and rolling up sleeves while flying should be discouraged.

In a study of 50 survivors of accidents in which fire occurred, the hands or feet of 45 of the 50 were burned.

New flying clothes and equipment are easy to get, that old hide takes a long time to replace. A little protection in advance may save an airman's skin. Pilots should give attention to this subject and particularly to the necessity of protecting exposed surface areas during takeoff runs with a full internal and external fuel load.



SITE OF SECOND AND THIRD DEGREE BURNS IN FLASH FIRES

WELL DONE

TO

CAPTAIN THOMAS G. FLYNN, JR., Offutt AFB,
Fort Crook, Nebraska

It began as a normal familiarization flight in the AT-11 for a reserve pilot. Captain Flynn and Second Lieutenant Jack R. Blough made four normal landings then went up for some airwork.

Upon returning to the field Captain Flynn made his pre-landing check and discovered that the right main gear was not fully extended. He immediately returned the switch to the "gear up" position and tried the electrical system again. The right gear still failed to extend fully.

Captain Flynn then tried the manual system for lowering the gear without success. The unit engineering officer and the station accident officer were summoned to the tower, and for the next hour every method of lowering the gear listed in appropriate tech orders for the aircraft was tried. A second aircraft was dispatched to fly formation with and observe the gear of Captain Flynn's plane. Captain Flynn went up in the bombardier section to observe the gear and determined that the gear was swinging freely.

A belly landing was decided upon, but Captain Flynn was unable to raise either the left or right gear. Again complete emergency procedures were attempted to try to get the gear up, but to no avail. The pilot elected to make a one wheel landing, and all crash emergency equipment was readied.

Captain Flynn made a slow approach using full flaps. He set the plane down gently on the left wheel and maintained perfect directional control to the last possible moment while holding the right wing up with aileron.

The wing slowly settled to the runway as the airplane lost speed and the plane swung around 180 degrees to the right. There were no injuries to personnel.

The accident board recommended that Captain Flynn be commended for his cool-headed acceptance of a dangerous situation, his calm efforts to correct the trouble, his thorough safety precaution steps prior to the crash and his superior flying ability that resulted in a minimum of damage to the plane. He was commended by the Commanding General, Second Air Force, for his exceptional performance of duty.

THE UNGARBLED WORD

By S/SGT. WILLIAM J. FRECH
Hqs. 1st AACS Wing

HAVE YOU, as a pilot or a ground radio operator, ever stopped to wonder why so many transmissions to and from the ground are being constantly repeated and why so many mistakes are made and time wasted because the sounds uttered don't make sense?

The entire problem of radio outpourings can be boiled down to the method of speaking into a microphone. And there we have the definition of mike technique. Too many pilots and ground operators disregard the fact that a microphone is an instrument and that, as any other instrument, it must be used properly to obtain the best results. Proper usage isn't difficult. It merely requires a bit of thought and practice.

Before delving into the subject of proper mike technique and analyzing some of the practices that should be eliminated from usage, there is one important habit that must be acquired by microphone users—*courtesy*. Before the mike button is ever pressed to make a transmission the user should listen first! How many times have you made a transmission and been interrupted by another person who just picked up his mike and began to talk? Every time this happens it completely disrupts a frequency. The interrupting party must be asked to stand by and the interrupted party must be asked to repeat. Thus time is wasted and the accuracy of the transmission is decreased, sometimes with tragic results. Think about that when you pick up your mike the next time. Listen first! If all is clear then go ahead.

In any radio transmission or reception the prevailing conditions such as atmospheric interference, crowded frequencies, courtesy and other influences must be considered. However, disregarding these and utilizing a theoretical frequency where none of the foregoing conditions exist, let us see what can be done about mike technique.

In the interests of developing and using proper voice procedures we can classify the subject according to the rate of flow of speech into the microphone. Under that classification the majority of speakers generally fall into two categories—the fast speakers and the slow speakers. Each method of speaking has its faults making it unacceptable for use on any frequency. An important point to remember, regardless of how you speak, is *not* to hold the microphone against your lips. It slurs your words and produces an unintelligible mutter.

Taking the first of our categories, let's see why speaking too fast is considered poor technique. Have you ever been engaged in conversation with a person who spoke with a rapid-fire delivery — each word rolling out so fast that it collided with the word preceding it? In the course of conversation you probably had to ask him to repeat time and again for a full comprehension of what he said. If such is the case in ordinary conversation place yourself at the receiving end of this type of person speaking into a

mike. Here you not only have the ordinary difficulty of understanding fast speech but also the fact that a radio receiver will not reproduce all of the sounds of fast speech.

We could turn to the science of physics for a technical explanation of why all voice sounds aren't reproduced accurately when the rate of flow of speech is too fast, but that isn't necessary. It should be sufficient to know that there are two kinds of voice sounds in speech. There are the vowel sounds which are low pitched and the consonant sounds which are high pitched. When speech is reproduced via a microphone into a receiver these sounds vary and often the consonant sounds, which you remember are high pitched, sound very much alike at a fast rate of speech. Similar consonants, such as s and f, sh and th, b, d, t and k sound identical over the air (for example: shot, fought, thought). Accurate reception depends upon the listener subconsciously guessing what is being said. This is fairly easy if one knows roughly what to exepect, but more difficult if the words are unfamiliar. For this reason, anyone using aircraft radio should whenever possible stick to what is expected and use standardized phrases and the phonetic alphabet to distinguish letters.

Remember, the faster you talk the higher will be the resulting pitch of your voice with the probability of consonants sounding alike.

However, on the other hand, don't slow down to the point of exasperation. That is the other extreme. The slow speaker, by virtue of his slowness, imparts a sense of hesitancy and doubt to the listener. Naturally this feeling isn't desirable on the part of an operator or pilot who is seeking or giving information that, in many instances, is vital. Imagine yourself making a GCA run and having a controller speak—slowly with long breaks between words. Would you be as apt to rely upon his directions as upon the directions of a controller who spoke steadily with a note of confidence in his voice and without interruption? I think not. Just as the fast speaker takes up unnecessary time with repeats so does the slow or hesitant speaker.

Following are a few hints to help you save time and increase the accuracy of your transmissions:

1. Use your normal speaking voice — enunciate each word clearly.

2. Be consistent. Don't vary your voice by shouting one moment and the next changing to a barely audible whisper. Speak with a steady intensity, phrasing your words in the same rhythm which you would use in speaking to a person in the same room.

3. Don't shout, microphones garble it. And *don't hold the mike against your lips.* Both methods will produce an unintelligible noise.

LETTERS TO THE EDITOR

Dear Sir:

Having been a devotee of FLYING SAFETY since its initial issue, I'm one of your most avid readers and I'm certain that the effect of your excellent and hardhitting publication on my piloting has been beneficial. Now after accepting all this advice from you I would like to offer a small portion.

In the past three years there have been quite a few accidents attributable to the reluctance of the landing gear on A-26's, B-25's, and P-61's to come down and lock. Efforts to get the main and nose gears to lock have necessitated all sorts of convulsions and contortions. It seems that every one is smitten with the idea that if the aircraft is dived at an alarming rate followed by a sharp pull out or zoom, the gear will just naturally go into place even though the wings have a tendency to depart. 'Taint so.

As a member of a Bomb Group, equipped initially with A-20's and later given the A-26 (Invader), I had ample occasion to observe the methods used to get recalcitrant gear down and locked. What with the German propensity for filling hydraulic lines with holes, our group had many, many aircraft landed safely by shaking the gear down. Naturally, we initially tried the dive and zoom theory till we were blue in the face with the normal results. About then a lad returned to base unable to release his bombs and with the complete hydraulic system clobbered. He rejected the idea of a belly landing, being the cautious type, and began trying everything. Naturally he went through the approved solution (totally ineffectual) with everybody on the base in the tower fighting for the "mike" to give him the ungarbled word. Getting more disgusted by the minute, he showed his thoughts by reversing the procedure, namely: pulling the aircraft up to stalling speed and just before she stalled, slamming the stick full forward. The aircraft's nose whipped down and both main gear socked home and locked. It took one more try and then the nose gear was secure and successful landing was made. No one hurt except for the casualties suffered in the brawl in the tower.

We had the answer then and there were never any more belly landings as long as the up-lock pins could be released mechanically. This main gear up-lock release was one of our first recommended modifications for the A-26's which at first had no such mechanical device. The whole procedure works somewhat more effectively if the up-lock pins are released at the same time the stick is shoved forward.

This system is infallible because a man, whose ankle had been smashed, with one engine feathered, flying around an airport with a 500-foot ceiling, using this technique shook his gear down and saved himself, crew and plane. If he could, there is no reason others cannot use this same method with consummate success.

WILLIAM J. GREENE,
Captain, USAF

P. S. It works even better if you have hydraulic pressure to help out.

★

Dear Editor:

It seems to me that it would be a good thing if all pilots were given a course in elocution or just plain how to talk. If they'd use the phrasing suggested in the Radio Facility Charts they'd get their messages over with less chance for error and we wouldn't have to ask them to repeat.

J. BENTON,
Corporal, AACS

Roger. Turn to page 26.—ED.

SAFETY QUIZ

1. What airborne equipment is required to fly GCA approaches?
   A. Special radar AN/APS-10.
   B. Glide path receiver.
   C. Standard HF and/or VHF radio equipment.
   D. Marker beacon indicator.
2. Navy GCA stations can be worked by AF aircraft on which of the following VHF frequencies?
   A. "A" Channel 116.18 Mcs.
   B. "B" Channel 126.18 Mcs.
   C. "C" Channel 138.88 Mcs.
   D. "D" Channel 140.58 Mcs.
3. Effective maximum search range for present GCA equipment (AN-MPN-1) is
   A. 15 miles.
   B. 25 miles.
   C. 30 miles.
   D. 45 miles.
4. Effective altitude of antenna pattern for present GCA equipment (AN-MPN-1) under normal conditions is
   A. 10,000 feet.
   B. 4,000 feet.
   C. 3,000 feet.
   D. 6,000 feet.
   E. 5,000 feet.
5. To contact the GCA facility for a letdown, ordinarily initial contact should be through
   A. Control tower.
   B. Plan 62.
   C. VHF/DF.
   D. Radio range station.
6. The following secondary radio facilities may be used in conjunction with GCA to assist in location of aircraft and placing aircraft in the pattern:
   A. VHF/DF, radio range, radio beacon.
   B. Aircraft radio station.
   C. Radio teletype station.
7. The pilot repeats back to the GCA operator
   A. everything he hears.
   B. headings and altitudes.
   C. headings and altitudes, merely acknowledging other information with "Roger."
   D. nothing at all.
8. Ordinarily all turns in a GCA approach are made at
   A. 1½° per second, ½ needle width.
   B. 3° per second, 1 needle width.
   C. 6° per second, 2 needle widths.
   D. As steep a bank as possible.
9. When aircraft has been turned onto GCA final approach and it is evident that aircraft is approaching letdown point, the pilot should
   A. continue along at cruising speed.
   B. slow aircraft to just above stalling speed and put full flaps down.
   C. slow aircraft to approach speed, lowering desired amount of flaps to complete the approach, adjusting power accordingly.
10. The GCA glide path is designed to intersect the runway at what distance from the touchdown end of the runway?
    A. 0 feet.
    B. 1,500 feet.
    C. 500 feet.
    D. 1,000 feet.
    E. 2,000 feet.

★

1—C, 2—D, 3—C, 4—B, 5—A, 6—A, 7—C, 8—B, 9—C, 10—D.

WHY?

FOUR AIRMEN ARE DEAD because a pilot relied on his memory rather than use the checklist.

A pilot with nearly 2,000 hours started the engines of a C-45 and taxied out for takeoff. Several people on the ground saw the plane become airborne in a very steep climb. "Look at that guy trying to climb straight up," one observer shouted. At about 150 to 200 feet in the air the plane stalled, fell off on the left wing and then plunged to the ground in a vertical dive. It crashed into a parked storage C-47 and exploded.

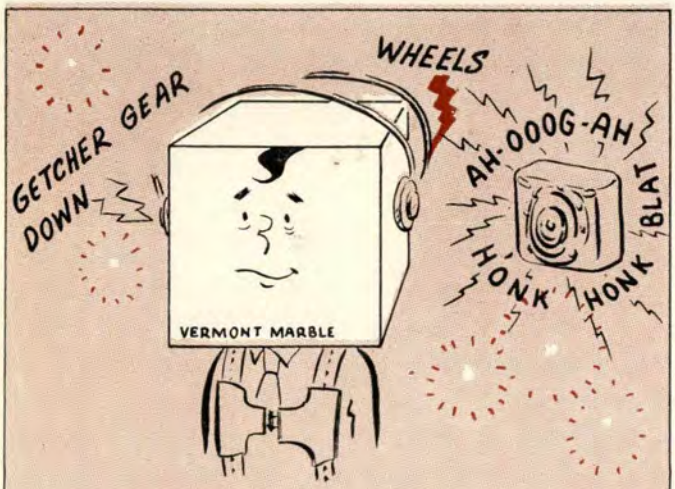
The pilot, engineer and two passengers were killed.

Investigators found that the pilot had not removed the control locks before attempting to take off. Although the C-45 was almost completely demolished, enough remained of the control column to indicate that the lock was still in place. A standard checklist was found in the wreckage and the first item on the before-take-off check read: *Check controls for freedom of movement.*

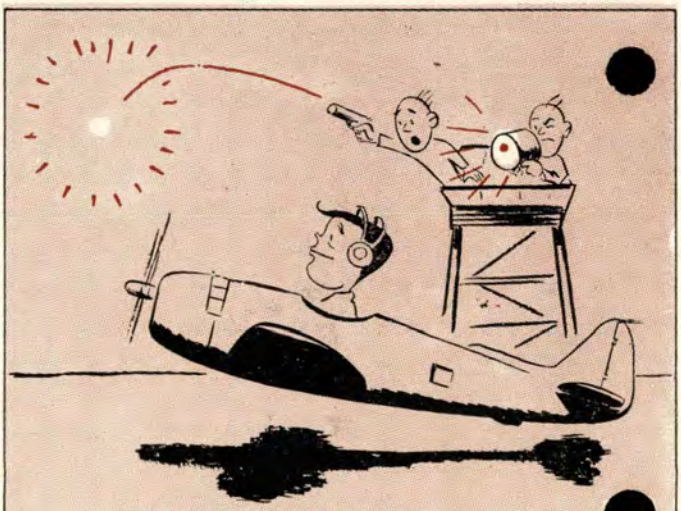
Some pilots continue to knowingly violate safety regulations and endanger lives by ignoring the checklist. They take off and land day after day relying solely on their memories for their checks. Coupled with this dangerous practice is that of rolling down the runway almost to flying speed before placing their hands on the control wheel. WHY?

Mal Function

Flying thru the air alone
Mal thinks Mal is steaming stone.

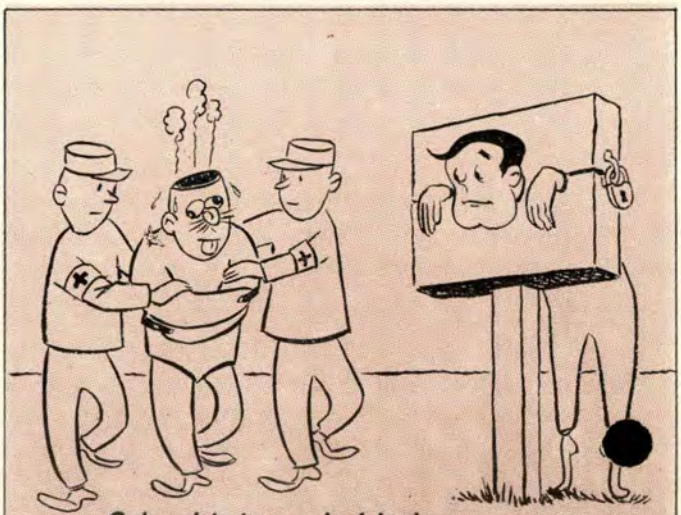


Fancy thoughts that know no fears
Cause head of stone; no brains, no ears.



Tower tries to remedy;
Mal's marblehead, alas, can't see.

Mal makes dandy belly flopper
C.O. promptly blows his topper.



Colonel is in need of lock-up
Mal's head gets treated to a stock-up.

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