Flying Safety

HEADQUARTERS UNITED STATES AIR FORCE • RESTRICTED APRIL 1948

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THE COVER STORY

Departing from the usual accident picture, this month's cover shows a formation of P-84 Thunderjets piloted by men of the 14th Fighter Group. The group is the first to be fully equipped with the new planes. Now operating at full strength at Dow AFB, Maine, the 14th's pilots are blazing the trail for other outfits which will fly this type plane. "On Wings of Thunder," page 2 in this issue, tells how pilots and maintenance men have become a team to perform their mission.

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FLYING SAFETY

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AIRPLANES AREN'T CHEAP

IF YOU WRECK a shiny, new airplane you will cost the American people at least the plane's weight in silver!

Airplanes aren't cheap.

The overall cost of producing three experimental jet fighters runs around $232 a pound for the contractor's expense. Add to that the bill for government-furnished equipment and Air Force and NACA experiments and the first three fighters could almost be swapped for their weight in gold. If the Air Force orders 30 production models plus the three experimental fighters, the cost will drop to about $72 a contractor pound. To get anything like a bargain, you have to order 500 production models. Then the price drops to around $14 a pound, which is just about the value of silver.

Why do today's military planes cost so much? The answer calls for a master's thesis, but here are several good reasons:

A 1927 model plane required about one-half man year of engineering effort and $30,000 for development. A 1948 model required as much as 545 man years of engineering effort and $9,300,000 to develop it to prototype stage.

The cost of equipping a squadron increased 39 times in 30 years. In 1918 we bought 10 JN-4 planes (Jennys) for a total of $200,000. Ten B-18's cost $3,685,000 in 1939. To equip a squadron with 10 B-29's in 1946 cost $8,000,000.

After five years of war production a peak rate of 108,000 planes was attained with corresponding low unit costs because of the large volume of production. Today's small orders mean higher unit costs. Today's improved performance adds more to the unit cost — planes are more complex, there are more parts to a modern plane and the parts cost more with wages up, with tooling costs higher, and because high speed planes require refined, expensive materials and microscopic tolerances.

There is a difference in planes wearing out and planes being wrecked. In war or peace planes wear out. But accidents added to normal wear drain millions of dollars from our procurement budget. Each year the Air Force must replace 25 per cent of its equipment to hold numbers level.

In peacetime, requests for dollars to build airplanes for the Air Force are based on the strictest austerity level and actually provide for using each plane about six years. Each aircraft accident reduces that life expectancy.

We hold that most aircraft accidents are a needless waste of lives, equipment and money, and that the American people are entitled to receive the maximum Air Force for each dollar spent therefor, and that, with the intelligent efforts of responsible personnel in all echelons of command, the aircraft accident rate can be reduced. This will aid immeasurably in building the Air Force we must have to defend ourselves from any potential enemies.

ON WINGS OF THUNDER

By LT. HAL J. BASHAM

GUARDING THE NORTHEAST APPROACHES to the United States with the latest operational fighter in the Air Force, the P-84 Thunderjet, are the pilots of the 14th Fighter Group.

The 14th, now operating at full strength from Dow AFB at Bangor, Maine, is the shake-down group, the first outfit to fly P-84's as its primary operational aircraft. It has the unenviable job of ironing out the kinks and eliminating the "bugs."

Since the Thunderjets started to arrive on the field last fall the group has suffered only three major accidents with no fatalities or serious injuries. This record is due largely to the precise and highly exacting procedures adopted by the group for "checking out" pilots in the plane.

Before the first Thunderjet arrived the 14th Fighter Wing, which is the headquarters organization of Dow Field, sent a selected group of pilots from the Fighter group to P-80 school. After graduating from P-80 training and becoming proficient in the P-84, these pilots became the nucleus around which the former P-47 group was built into a Thunderjet outfit.

Because the P-84 is the hottest piece of flying equipment ever turned over to a tactical outfit (it slows down to 200 for gear down and comes in over the fence between 140 and 170), 14th supervisory personnel tackled the problem from a positive angle. From the day he walks on Dow Field a pilot moves, breathes and lives in an aura of safety consciousness.

The problem was simple. The P-84 was brand new, it was the hottest thing on wings, there was no precedent for handling training. The solution was complicated. Pilots, many of whom had never flown jets, had to be made proficient in its operation quickly and safely. Here is how the job is being done.

The day a pilot is assigned to the group he is placed in a special category known simply as *transition*. He graduates from the transition stage to a full-fledged Thunderjet jockey the day he completes the extensive check-out and training program.

Before he begins the program of 12 flights which he must complete to be "checked out," the pilot must read and pass a test on all publications concerning the Thunderjet from the "Pilots Operating Instructions" through "Care and Maintenance of J-35 engine." Then he completes familiarization with the cockpit, ending this phase with a thorough blindfold check. He must show a complete knowledge of the operation of landing gear, electrical, fuel, instrument and hydraulic systems and the emergency operation of each.

After he has learned the preflight check of some 24 items (more for night flying), learned the starting and stopping procedures and mastered taxiing technique, he is ready for his first flight in the series of twelve.

As one pilot put it "You *think* the P-84 off the ground, you *write* it in the air, that's 'write' with a 'W' Mac, and you *think* it back on the ground." If you think the boys who ride the thunder wings are throttle-happy Joes who hop aboard and hit the wild blue yonder with never a care or thought, forget it. Nowhere in the Air Force is there a more serious-minded, safety-conscious group of pilots than in this first Thunderjet group. Before each flight the transition pilot gets a complete briefing on his mission, the weather, radio equipment, condition of

the field (it sometimes snows in Maine), characteristics of the aircraft, and other pertinent matters calculated to help him complete a safe flight.

When the pilot speaks of "writing" the plane in the air, he refers to the log the pilot has to keep on his first twelve flights from takeoff to switch off. Every five thousand feet from 5,000 to 40,000 he has to record such data as indicated airspeed, totalizer in gallons, tail pipe temperature, etc. When he reaches the prescribed altitude for a particular one of the twelve "check-out" flights he must record fuel increment, time increment, fuel pressure, tail pipe temperature, oil pressure, indicated airspeed, totalizer (fuel), etc., for each run he makes over a given course at given altitudes and power settings.

When he is ready to come down he must record fuel at start of descent and at end of descent, time of landing, time engine stopped and fuel remaining.

This logging system was set up as a positive measure for insuring that all pilots will be made permanently conscious of all important problems of fuel consumption, tail pipe temperature, fuel and oil pressures, etc. When the pilot completes the series of twelve flights, keeping this log for operations of each separate flight, he is thoroughly indoctrinated, thoroughly familiar with his airplane. At the completion of the twelfth flight he is "checked out." Only then can he go up and put the plane through its paces at will.

I wandered into a bull session in one of the squadrons, began asking questions and getting some good answers.

I asked what unexpected impressions the pilots got the first time they flew the Thunderjet, how it differed from the conventional airplanes.

"The absence of torque," one chunky little pilot from Oregon remarked. "First time I flew it I stayed in a right turn most of the time because I was holding right rudder to compensate for torque that wasn't there. I had to compensate for my compensation to get the thing out of a right turn."

"Rate of climb got me," a lanky captain from New York state chimed in. "It climbs so fast I thought the indicator was busted."

"What was your big first impression," I asked a former P-47 pilot who had sat quietly listening to the talk up to then.

"That the guys who briefed me were such liars," he replied without hesitation. "They talked so much I had the idea the '84' was hard to fly. It's the easiest plane to fly I ever flew. You take off and just sit there—no props to adjust, no mixtures to lean, no cowl flaps to close, you just sit there and

fly. It's like riding a bullet."

"That's right," chorused half a dozen other pilots. "It's the sweetest thing on wings," was the general consensus.

One pilot suggested that the emergency canopy release should be put down low in the cockpit somewhere so a pilot would have to bend low to pull it, thus protecting his skull. Another suggested the calibration on the oxygen indicator be moved to the top of the unit so the pilot could read it without getting a crick in his neck. Still another long-legged fly boy wanted a fluorescent light on the left side of the cockpit too. He said the light from the one fluorescent tube on the right was blocked off by his knees, leaving the left half of his instrument panel, which contained such important items as airspeed indicator and altimeter, in the dark.

The pilots love the Thunderjet, but the mechanics aren't sure yet.

The ingenuity and dispatch with which engineering and maintenance has overcome the difficulties inherent in beginning operations with a brand new aircraft typify the spirit which has made our Air Force maintenance the envy of every armed service in the world.

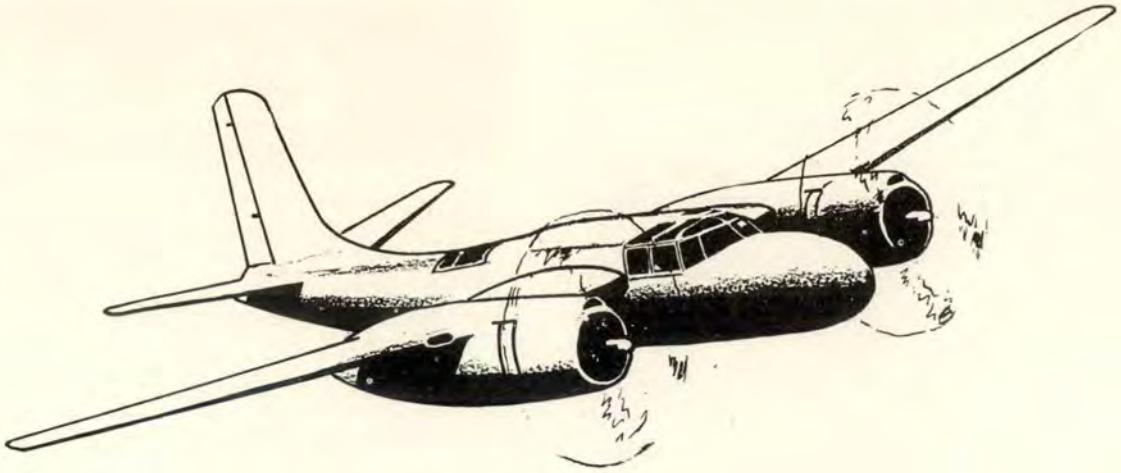
The group started to receive P-84's just as winter settled upon the state of Maine. Through a fluke in the weather, the 14th found itself conducting routine operations at 30 degrees below zero this winter while a special jet outfit making cold weather tests in Alaska had weather up around freezing. Mechanics at Dow worked week after week in the open air in sub-freezing and often sub-zero weather. Already they have set a day by day "in commission" record that exceeds that of other jet planes.

The engineering officer had to work out his own inspection guide for routine inspections on the P-84. The engines have to come out for inspection every 20 hours now (they hope to up this figure to 50 soon) and there are no stands at present available to accommodate them. Maintenance men have rigged up a hoist that holds the engine while the plane is rolled forward away from it. This awkward system is filling the gap until stands are available. The 14th engineering officer has complete drawings for a combination stand and hoist that he believes will save hundreds of man hours a month when and if it is obtained.

Mechanics are given on-the-job training by jet engine school graduates, and the pool of expert engine men is growing. Special emphasis is placed constantly on new and unusual dangers and hazards for which Thunderjet mechanics must be on guard. The tiptanks for the planes had sharp plastic points on the rear when they arrived. When the struts are down, these points are at eye level. The engineering officer cut them off blunt to save eyes, then put through a letter to get approval for the modification. Hooks on the cockpit ladders damaged the lip of the cockpit causing loss of pressurization. The hooks were cut off these ladders.

The "hours-flown" charts are climbing in all three squadrons of the 14th Fighter Group. The pilots are learning, the mechanics are learning. The "bugs" one by one are being eliminated. Other groups which receive later P-84s will profit hugely by the engineering diagnosis of the 14th mechanics, the conscientious flight operations of its pilots, the foresight and safety supervision of its commanders. They are blazing the trail.

Meanwhile defense of the approaches to the Northeastern United States over the polar cap and the North Atlantic are backed up by the men of the 14th Fighter Group, Jet Propelled, and their wings of thunder.



WELL DONE

To

T/SGT. LYLE R. MARSHALL

107th Bombardment Sqdn. (L.) Michigan National Guard

IMMEDIATELY AFTER TAKEOFF from Ft. Worth AFB on a cross-country flight, the pilot and crew chief of a Michigan State National Guard A-26 noticed that the altimeter and rate of climb instruments were not operating. The air speed indicator also gave indications of inaccuracy. The decision was made to return immediately to the Fort Worth field and land.

In preparing to land, it was discovered by the pilot, Lt. John A. Clark, that the nosewheel would not come down, although the main gears extended normally and locked. A dozen attempts to lower the gear were unsuccessful. It was at this point that T/Sgt. Lyle R. Marshall displayed cool ingenuity.

Realizing that the nosewheel gear assembly was probably frozen in the closed position, he suggested to the pilot that he break it loose by smashing the nose gear inspection window and pushing on the gear from above. The pilot nodded assent and Sergeant Marshall broke the window with his hammer. Then with a long-handled screw driver he exerted sufficient force on the nose gear assembly to break it loose successfully. The nose gear was then lowered normally by the airplane's hydraulic system, and the plane was landed safely at Fort Worth.

Said Lieutenant Clark: "this action reflects Sergeant Marshall's alert personal initiative and preparedness. Later in the hangar, he took complete charge of the retraction tests and instrument checks, displaying an intimate knowledge of the airplane and a thoroughness of training."

A certificate of merit was presented to the flight engineer by The Adjutant General, State of Michigan, in recognition of his outstanding services in preventing a very possible and probable airplane accident.

While every example of pilot error resulting in an accident is reported in one publication or another, numerous examples of outstanding feats of airmanship often remain unnoticed. Whenever superior crewing, piloting, or maintenance saves an airplane or crew from disaster, FLYING SAFETY wishes to publish the story to the entire Air Force. Personnel responsible for averting mishaps deserve a "well done" on these pages. Commanders and flying safety officers are invited to report to the editors of FLYING SAFETY such examples of outstanding airmanship.

EGLIN P

By CAPTAIN H. P. ANDERSEN

Flying Safety *Staff*

If it's any good, Eglin will prove it.

The officers and men at Eglin Air Force Base on Florida's Gulf Coast represent the common, everyday user of AF planes and equipment. It's their job, as members of the Air Proving Ground, to operate planes and equipment under the most strenuous conditions to determine if the materiel will fit the job for which it is designed.

This extensive testing of the operational suitability of equipment pays off later. When the airplane, weapon or gadget reaches the tactical or training unit, it is minus many dangerous bugs and its safe limits have been determined.

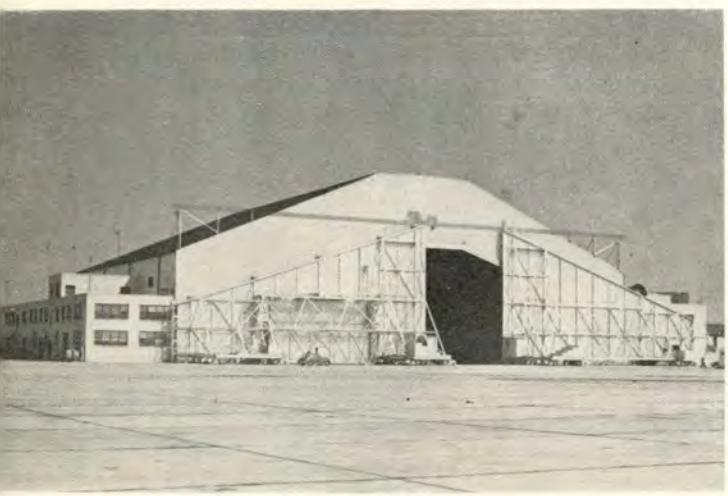
The responsibility of testing all U. S. Air Force combat equipment is a vast one and requires vast facilities. The Eglin installation is big. It covers nearly a half million acres including the former Choctawhatchee National Forest and Santa Rosa Sound. In addition to the main air base there are eight satellite fields, 49 gunnery and bombing ranges, and most spectacular of all, the world's largest man-made combination ice-box and warming oven—the climatic hangar.

Located as it is along the sparsely-settled gulf coast, it was possible for Eglin to train the Doolittle Tokyo raiders without a security leak. Likewise the B-29 was put through daily flight tests at Eglin in 1943 to determine its tactical use and its first attack on Japan in 1944 came as a surprise.

Until the Air Force built the climatic hangar, testing airplanes and equipment under all conceivable operating conditions to be encountered anywhere in the world was an expensive, time consuming task. If extreme cold weather was wanted, men and equipment had to be transported to the far north. Time was lost waiting for just the right degree of cold. Then the designers would have to wait until the next season to re-test if the equipment did not prove satisfactory.

Now the Air Force can make blizzards in July and desert sandstorms in February. Any climatic condition, from jungle heat to polar cold can be simulated the year round in the huge, insulated hangar at Eglin. Localized wind storms up to 100 mph in combination with sleet, snow, rain, dust and sand can lash equipment in test rooms. Artificial sunlight as hot as high noon on the Sahara can be turned on equipment. The hangar can house our largest planes. Engines can be run up and ground-tested, guns can be fired, bombs dropped, and landing gears tested, submitting them to the most severe climatic conditions. It's a fair bet that if a gear will work at Eglin it will be operationally safe at Nome.

The Air Force requires that its equipment operate satisfactorily under all climatic conditions, or be capable of working in extreme cold or heat after minor modifications. Within the temperature range



ROVES IT

of 165 degrees Fahrenheit to minus 70 degrees F. the exact performance of equipment, fuels, oils and armament can be determined for any place on the globe.

When a new piece of equipment arrives at Eglin for test, the first question is: "Will it work?" The next, "if it works, where can it be used in Air Force tactics?" Yet the most searching inquisition concerns the equipment from the user's standpoint. Given a new airplane, Eglin officers know it will fly. But can it be operated by average personnel under field conditions? Every angle is checked—the pilot's, the mechanic's, the bombardier's, the gunner's, the radio operator's.

Even ground equipment such as fire-fighting apparatus gets a thorough going over at Eglin. Recently, crash fire equipment was tested competitively to determine which would extinguish airplane fires quickest. Eglin wants a fire truck which will cut to seconds the time required to blanket the flames and reduce the temperature inside the plane—thereby giving survivors a chance to be rescued.

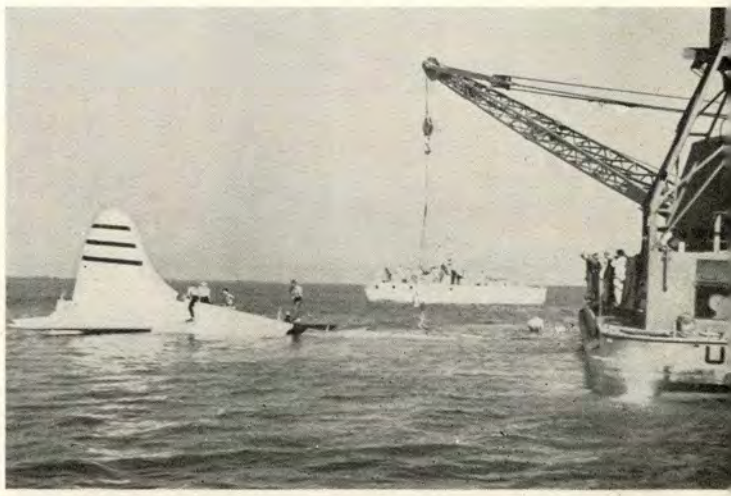
Every test at Eglin is as realistic as it can be made. Here is one air base where pilots do not catch hell for ditching planes or making belly landings—that is, not if they have orders to do so, which they frequently have. As Eglin officers explain it, more can be learned from a test ditching than from interviewing survivors after an emergency landing in the water. Also, when the Air Materiel Command crews get ready to ditch, they have equipped their planes with enough instruments and recording gadgets to emerge with the straight information on how to save lives.

At present, the Air Force leans toward the three-point landing (wheels up) as the best way to ditch an airplane. In the test ditching, three landing attitudes—nose high, three-point and nose down—are being tried with radio controlled "drones." No personnel are aboard, but the Flying Forces are completely instrumented to record every shock. Motion picture cameras encased in waterproof holders will help record the stress on impact and structural damage as it occurs.

As each plane is ditched in Choctawhatchee Bay, barges and crash boats stand by to move in on the B-17 the instant it hits. Floating cranes lift the bomber to a barge deck where it can be examined and instruments removed for careful study.

When the tests have been completed, the U. S. Air Force will have learned what it takes to make planes safe for ditchings.

With its ever increasing testing and development mission, the proving ground has the serious, working atmosphere of an Air Force unit in actual combat. Eglin is the stage for the display of air power. B-29's drop live, earth-shaking bombs, P-80 pilots give chase to buzz bombs and send them spinning into the waters of the Gulf. Rockets, firebombs, parafrags and machine gun bullets rain down



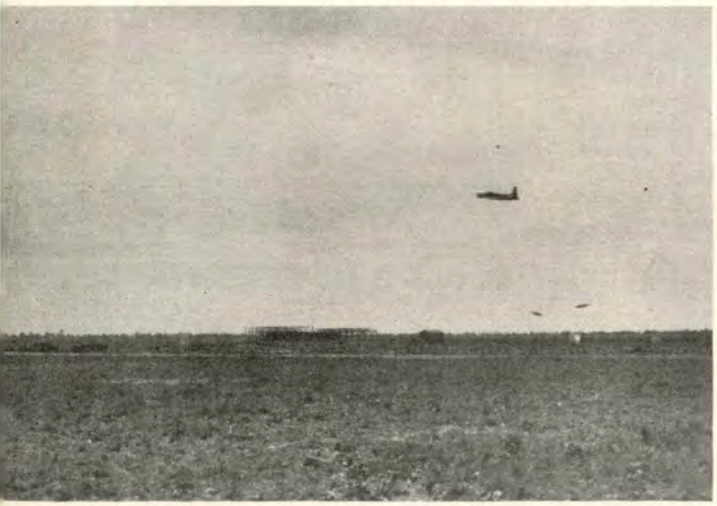
on ground targets with shattering noise, flame, smoke and accompanying destruction.

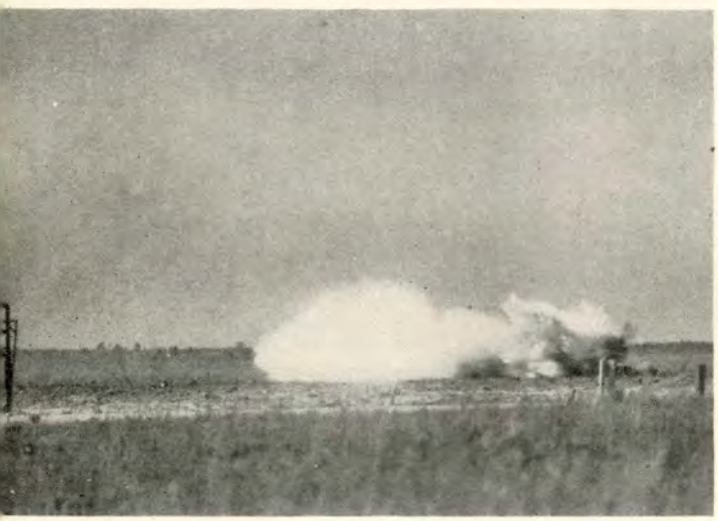
The spectacular testing program is conducted by the Proof Test Group, a unit of APG made up primarily of combat veterans. They are engaged daily in determining the combat suitability of airplanes, arms and equipment. These men are equipped with the latest information and facilities for solving aircraft problems. As they test and prove each new airplane, they learn its performance characteristics, its range limitations, speed and maneuverability. They frequently discover new methods of employing the Air Force's basic weapon, at the same time gaining realistic and safe operating techniques which can be passed on to tactical units.

Besides testing airplanes and weapons, Eglin lends its facilities for the testing of clothing, oxygen equipment, motor vehicles and many other items which may be used in extreme altitudes or temperature conditions. To keep pace with developments in mobile warfare, such items as houses, huts, maintenance stands, repair shops and tools, all designed to be portable by air, are subjected to combat-like conditions to determine their suitability.

Today, with as many as 180 different tests under way simultaneously, many under simulated combat conditions, Eglin continues its mission of insuring that the USAF is provided with equipment that will stand up any place, any time. At Eglin they are only satisfied with the best.

Napalm filled wing tanks are dropped from a P-80, upper left, and quickly engulf the target as the burning jelly spreads.





VIOLATION!

BUZZING AND THE DISASTROUS RESULTS connected with it are as old as the invention of the airplane, but some pilots can't seem to comprehend that buzzing, just like crime, "doesn't pay."

In this case, only one pilot out of the three that were buzzing in violation of AF Regulation 60-16 wrecked his AT-6. However, it could have happened easily to the other two pilots.

Three Reserve pilots were cleared in AT-6's for a formation flight. They assembled quickly after takeoff and headed for the beach for a bit of sport. Upon arriving over the beach, they spread out and started down with a gleam in their eyes.

One of the over-eager AT-6 pilots was skimming along at approximately 30 feet when he spied a few civilian vehicles on the beach and he headed for them. After narrowly missing two vehicles, the "third-time charm" worked and the right wing of the AT-6 collided with the cab of the third vehicle. About eight feet of the right wing was sheared off, including the right aileron. Naturally, the remainder of the right wing dropped and the aircraft bounced and skidded along the sandy beach as it disintegrated. The fuselage finally was torn loose from the wing section and came to rest on its side. Even the engine had sheared from the fuselage as if it was trying to avoid the pilot and his shameful violation.

Luckily, the pilot was able to walk out of the twisted and torn fuselage with only minor injuries. He had fastened his shoulder harness and seat belt. However, his shoulder harness was not "locked" and this permitted the upper part of his body to ram forward sufficiently during the crash to allow his forehead to strike the edge of the cockpit.

The driver of the civilian truck was not injured, though he was badly scared.

Upon witnessing what had happened to their buddy, the other two AT-6 pilots returned to their base and landed.

All three of the pilots are to appear before a flying evaluation board.

The next time you get the urge to go down and "hedge-hop," just pull gently back on the stick and think of the tragedy you can cause yourself and others by a few minutes "on the deck."

KEEP IT CLEAN

By JOHN W. CASEY
Field Service Manager
North American Aviation, Inc.

WITH THE ADVENT of sonic speed airplanes, the need for more careful maintenance must be considered of prime importance. High-speed aircraft, although designed and built as such, are subjected to greater stress than their predecessors, and must necessarily receive greater care and maintenance if flight safety is to remain an actuality.

Preparing for eventual activation of multiple jet bomber squadrons in America's peacetime air arm, U. S. Air Force ground crewmen were given a special B-45 four-jet bomber maintenance and service course at North American Aviation's Long Beach, California, plant. Meanwhile, operative cut-away models, "mechanized" three dimensional drawings and diagrams, and stacks of textbooks and charts are being used by company field service instructors for the training of ground crews to handle the bombers when they are placed in service.

If airplanes are to function perfectly at high speeds, close attention must be paid to the tolerances on all moving parts. Surface controls, for instance, must be checked daily for excessive free play. At speeds approaching sound, even slight free play over the tolerances specified will result in control flutter with possible resultant failure of the surface affected. Hydraulic boosters which help the pilot overcome aerodynamic loads on the movable surfaces must be maintained at specified tolerances if trouble-free service is to be expected.

High speeds create another problem, that of a safe bailout, should the occasion arise. The ejection seat seems the answer to that problem, yet the seat itself is potentially as dangerous as the problem which created it. Harmless as the seat may appear, it is in reality a loaded gun. Not enough may be said or written to warn and caution personnel about the danger connected with its installation, maintenance, inspection, and (should it be necessary) its operation.

Range is the nemesis of jet-propelled airplanes. To obtain range, fuel tanks have been installed in almost every available space in the airplane not required for other essential equipment. Tanks are generally interconnected, the filler on one serving for several. Because of this interconnection, service crews sometimes mistakenly believe that the tanks are full before they really are. By the simple expedient of allowing a few moments for the fuel to seek a common level, more may be pumped aboard, completely filling the tanks. Short-ranging the airplane in regard to fuel supply may lead to disastrous results.

Insignificant as they might seem, tire pressures are highly important. Almost every airplane model has a variety of loadings with variations amounting to several thousand pounds. Improper inflation of tires without regard to airplane gross weight materially shortens tire life and may result in blowouts with consequent damage to the airplane and injury of personnel.

Lubrication at designated periods with correct lubricants will insure proper functioning of moving parts. Many items require daily attention. The cost of neglect sometimes runs high.

Dirt, dust, snow, and frost are enemies of high-speed airplanes. Collection of such foreign material on the surfaces of the airplane can result in severe loss of lift and increase in stalling speed. On jet-propelled airplanes, engine runup in dusty areas is particularly hazardous, because permanent damage to the engine can occur as a result of dirt and pebbles entering the compressor and turbine. Even dust will bake onto the rotor and stator blades; this baked-on dust will result in lowering of available thrust. While a clean airplane is not necessarily a safe one, cleanliness nevertheless contributes greatly toward safety.

Allowing grease, oil, and gasoline to accumulate in the engine compartment of a jet airplane is extremely dangerous. Jet engines, operating at much higher temperatures than the reciprocating type, can easily provide the kindling temperature for such accumulations. Keeping the engine compartment clean will pay dividends on your life insurance.

As the use of turbo-jet power is relatively a new venture insofar as active service is concerned, many new maintenance and inspection problems are being encountered. These problems make it necessary to accomplish more thorough and frequent inspections than are customary on reciprocating-engine-powered airplanes—inspections which in many instances require removal of the engine, necessitating considerable disassembly of the fuselage or other portions of the airplane. As on any moving part, wear and damage will take their toll of the frequently used engine and airplane structural connections. Careful handling and frequent, thorough inspections for leaks, wear, incorrect alignment, and improper fit are imperative on such items as quick-disconnects for liquid lines, control cables, electrical leads, engine supports, and airplane structural connections.

The tremendous heat and terrific pressure developed by turbo-jet engines necessitate close and minute examination during inspection. Hot gases (allowed to escape through small cracks or holes that may develop in the combustion chambers, exhaust cone, and tail pipe), if undetected, will soon cause the airplane structure to deteriorate to such an extent that structural failure will result.

Concerning high temperatures, the blast from the exhaust of the jet can roast a man alive. That area is definitely "out of bounds." The intake at the nose should be considered to be in dangerous territory too, for the suction it creates is enough to pull a man in.

Careful maintenance and ground handling will give gold stars to the ground crew, not to some mother, so remember *Safety in Flight Begins on the Ground*.

LET DOWN TO DOOM

THE WEATHER REPORTS were wrong at the outset. The station at the Western base had forecast VFR flight conditions all the way across the mountains to the destination. About half way along the route a change to IFR had to be made.

The C-47 was at 15,000, high enough to clear all the mountains with a thousand feet to spare when ice was encountered. The pilots, both Majors, kept close check and saw that the rime ice was light and not serious, but the fine snow they were flying through was causing plenty of trouble in other ways.

Precipitation static made the command receiver useless, and the compass was usable only on loop. An approximate position report was given on VHF about 100 miles from destination, but the pilots advised the range station they were not certain of their position because static made an oral null orientation impossible.

Twenty minutes later at approximately five in the afternoon approach control at destination was contacted on VHF and advised the plane was 30 miles northwest of the station on the North leg of the range. The pilot was instructed to begin a normal letdown and report every 1,000 feet. The field was reporting a 3,000-foot overcast, visibility five miles with light rain. The pilot was unable to receive the range except in loop position and started his letdown on aural null. His last altitude report was given at 11,000 feet. Approximately 12 minutes later at an altitude of 10,500 feet the copilot saw rising ground directly beneath the plane and warned the pilot he was approaching a mountain.

The pilot hauled back on the wheel and made a steep right turn to try to avoid the mountain. The plane stalled an instant before it struck at an airspeed of approximately 50 miles per hour. Three passengers were killed and the four crew members received major injuries.

Investigation revealed some interesting facts. The plane had VHF equipment working and the destination had complete DF equipment. The destination also had a Visual Aural Range (called VHF Range in operating instructions in facility chart) yet the pilot let down blind near mountainous terrain without knowing his exact position. The crew apparently still thought they were north of the station at the time of the crash 70 miles to the southwest.

A very strong tailwind had not been taken into consideration in figuring the ETA. The erroneous weather reports set up the accident, but failure to utilize orientation facilities was to blame.

THE PENNANTS ARE FLYING!

AIR FORCE BASES are flying their well-deserved pennants for the best flying safety records achieved throughout the period of October, November and December 1947.

As outlined in AF Letter 62-3, dated 1 July 1947, flying safety awards are given to Air Force bases with the lowest accident rates on each of the major aircraft models being flown in the continental U. S., depending, of course, on the amount of flying being done in the respective model.

White pennants, for example, were awarded on the basis of the lowest accident rate of a particular model flying 1-500 hours. For 500-1,000 hours of flying time logged at a station with the lowest accident rate a green pennant was awarded. The blue pennant was awarded for the best safety record of stations flying a particular model more than 1,000 hours.

Bolling Air Force Base grabbed off three of the blue pennants for the best records in the B-25, C-45, and P-51.

Kelly Air Force Base was a three time winner with two blue pennants for C-47 and C-54 and a white pennant for the AT-6.

The winner of the blue pennant for the "Texan" was Fairfax Air Force Base. They also won the green pennant for the C-45.

The other blue pennants were won by Williams Air Force Base (P-80), by Randolph Air Force Base (PT-13), and by McChord Air Force Base for miscellaneous models.

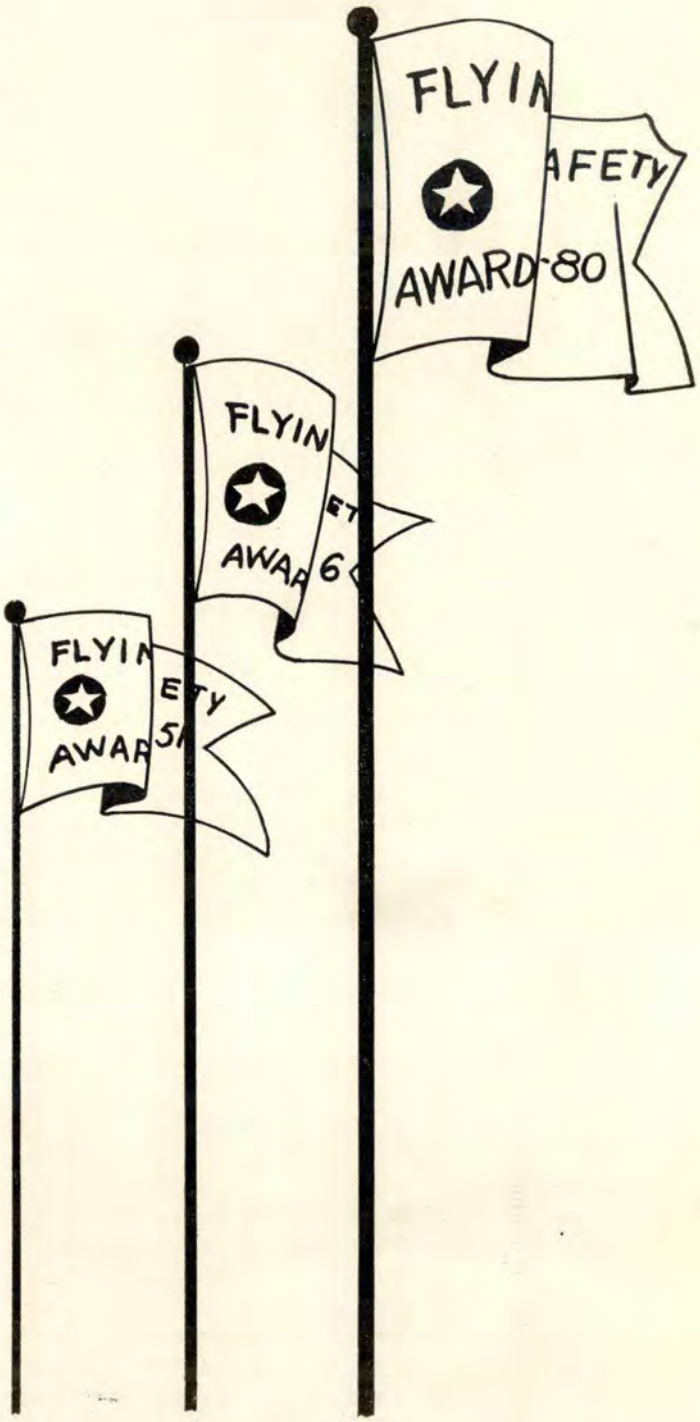
Tinker Air Force Base teamed up with Eglin as they took a white and a green pennant respectively for the A-26. Tinker also won the green pennant for the C-54.

Mitchel Air Force Base won the green pennant for the AT-6.

Other green pennant winners included MacDill (B-17, B-29), Wright-Patterson (B-25), Hamilton (C-47), Langley (L-5), Lockbourne (P-47), Tyndall (P-51), Lawson (P-80), and Bergstrom (misc.).

The other white pennant winners for the different models were: Tinker (A-26), Olmsted (B-17), Stewart (B-25), Murroc (B-29), Miami International (C-45), Keesler (C-46), Biggs (C-47), March (L-5), Turner (P-47), Brooks (P-51), and Clinton County (misc.).

Reserve units were included in this competition and all but one received a pennant for not having a fatality during the three-month period.



SAME OLD STORY

There's an old, old story,
the Air Force knows it's true,
that when you fly when you're out of practice,
danger rides with you.

A LARGE SLICE of the over-size AT-6 accident pie is cut by pilots who don't fly the aircraft often or who treat it like a foolproof toy kite. Pilots whose primary duties are other than flying are particularly vulnerable.

Take the case of the pilot who put plane number one on this page in its unhappy position. He had flown 14 hours in the past three months. He took off VFR from a western airbase for a destination 400 miles away. After awhile, he encountered ground fog and switched to IFR, continuing on course. He flew along for an hour or so thinking about the work he had to get out when he got back to the office. When he looked for his destination, it wasn't there.

The pilot attempted to work an orientation problem while talking on the radio to a range station about his problem. The range couldn't help him, but the talk back and forth kept him from getting a proper fade.

He finally had to make a belly landing out of gas.

Some of the AT-6 crack-ups, which help make accidents in this airplane total more than one-third of all Air Force accidents, occur because pilots can't fly instruments. The two men in the boat are looking at a plane that was lost that way.

The pilot had a total of 20 hours of instrument time in his Form 5. He had flown one hour of instruments in the past six months. Yet he cleared IFR from a west coast base with a 1,000-foot ceiling and scattered clouds at 400 feet. Then he called the tower operator after takeoff to tell him the base of the clouds was at 400 feet. He spun in two minutes later, killing himself and a passenger.

Then there are the innumerable cases of plain old "heads up" flying. Results of two such cases are evident in pictures three and four.

Number three pilot cleared late one afternoon from an Ohio base. He climbed to 8,000 feet to make good his on-top clearance and proceeded. At his destination, he was instructed to letdown and hold at 4,500 feet. He advised the range station that he was low on fuel, but did not say he was practically running the plane on its reputation.

He had broken out over the low cone going in the wrong direction. And he flew 10 minutes going away from the field thinking he was coming in. His engine quit and he switched tanks. Nothing happened. He wobbled as hard as he could to no avail, because he had switched to an empty tank instead of to reserve.

If he had looked down at his gauges he could have seen his trouble. If he had flown his letdown correctly he could have made it in on the tank he ran dry.

Picture number four shows the plane from which a pilot with 1,700 hours walked after trying to make a go-around from a forced landing. The pilot had taken off on a local proficiency flight from

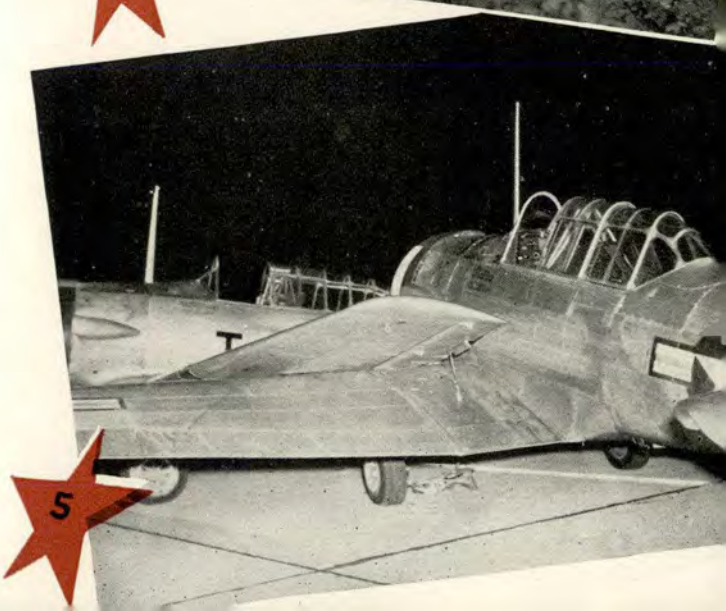
a base on the Atlantic coast. He got lost and ran both main tanks dry while looking for a field. With his reserve tank indicating four gallons, his engine cut out while he was flying a pattern on a small civilian field. He turned into the field at once to land on the short strip.

He landed long without flaps, saw he couldn't stop before reaching the end of the field and gave it the needle to try a go-around. The engine caught long enough to get him up 10 feet then quit again. The plane hit the ground 70 feet from the end of the field, ripped through a fence and across a road to end up as you see it in the cotton field.

The two most frequent types of AT-6 accidents are groundloops and taxi accidents. The two AT-6's snuggled together in picture number five ended up that way when the pilot of the plane on the right taxied into the other trainer.

The planes were shooting night transition. The plane which was struck was in runup position with all wing and tail lights burning brightly. As is true in most AT-6 accidents the pilot of the offending plane did not S-turn as he approached the runup position.

The AT-6 is a safe, highly flyable airplane. It figures in one-third of all Air Force accidents because pilots *ride around* in it instead of *flying* it. The pilot has no copilot or engineer to help keep him out of trouble when he flies the AT-6 in a haphazard fashion. If you fly the plane at all, fly it frequently and treat it with the respect it demands.



HOW SAFE IS G.C.A.?

By LT. EUGENE ALBERTS
1st AACS Wing

REPORTS CONCERNING recent GCA "saves" in which planes have been guided to the runways during inclement weather and under emergency operating conditions have been received from many air bases.

Meanwhile, pilots have differing opinions as to how much reliance they would place in GCA if they had to use the system in an emergency. This is indicated by the questions pilots have asked personnel of the 1st AACS Wing.

The safety factor of GCA or any other aircraft landing aid cannot be expressed as a definite figure or percentage.

A landing aid is basically either safe or unsafe. The successful performance of a landing aid is dependent upon (1) accurate, uninterrupted operation of all equipment used and (2) the varying degree of error introduced by the human element involved.

For practical purposes the mechanical element of GCA has been established as being safe, for it is either operative or inoperative. During a GCA letdown the "blip" reflection from the aircraft is either visible or the equipment is inoperative. Therefore, the GCA crew and the pilot can eliminate the possibility of undetected or partial equipment failure as a hazard to complete safety.

Radar engineers have designed and built safe equipment. AACS, as Air Force operators of the GCA units, assume responsibility for the safe operation of the AACS part of a GCA letdown.

Here are the facts on GCA operators in AACS:

The majority of GCA final directors are master sergeants who were former Air Force pilots and are now Air Force Reserve officers. They recognize and assume their responsibility during the GCA final approach.

A final director must control a minimum of 150 GCA runs, prove his ability to the satisfaction of the AACS detachment GCA officer, and pass tests conducted by a flight crew from AACS Group Headquarters before being permitted to work airplanes making actual instrument approaches.

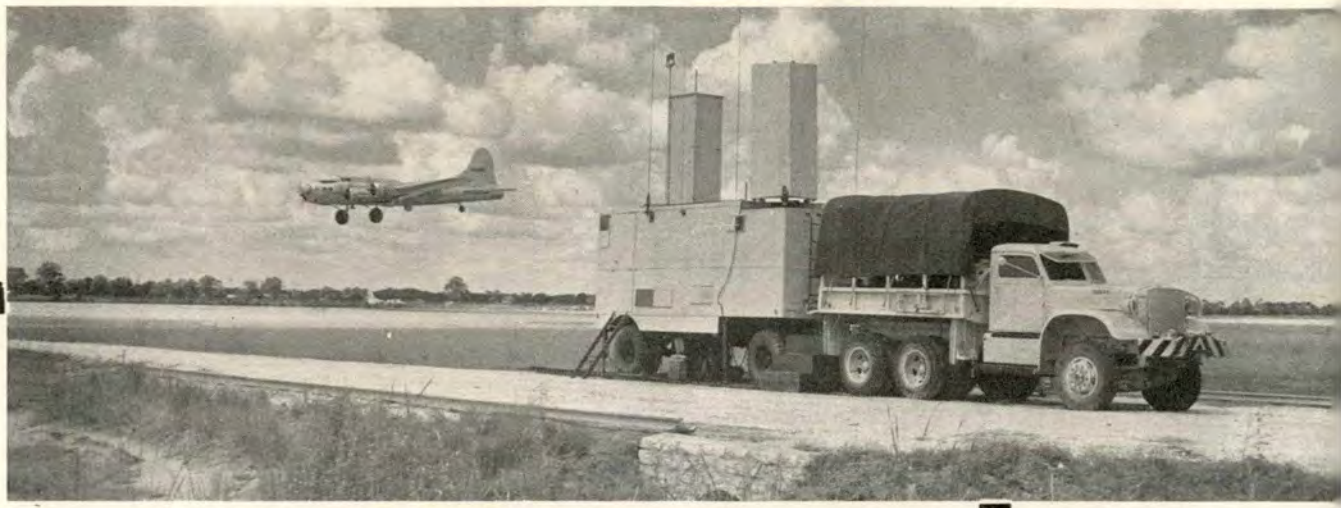
GCA operators are designated as members of numbered teams and are kept together wherever possible as a means of maintaining the utmost efficiency and reducing the possibility of error to an absolute minimum. The team system in athletics or in duty tends to spotlight possible negligence or inattention of any member.

GCA operators are trained to use standardized phraseology as a means of preventing misunderstanding between pilots and ground crews.

Individual instructions for performance of cockpit checks and procedures are issued to pilots when the plane is at predetermined points in the GCA pattern.

Failure of radio equipment during final approach is not critical and is easily detected. Prior to the start of the descent, pilots are instructed by GCA operators to pull up and contact the tower if vocal instructions are not heard for more than a 5- or 10-second interval, depending upon the scene or locality of the letdown.

If, for any reason, the position of the aircraft in relation to the runway and the glide path is not



correct, the GCA operator can inform the pilot that another approach should be worked.

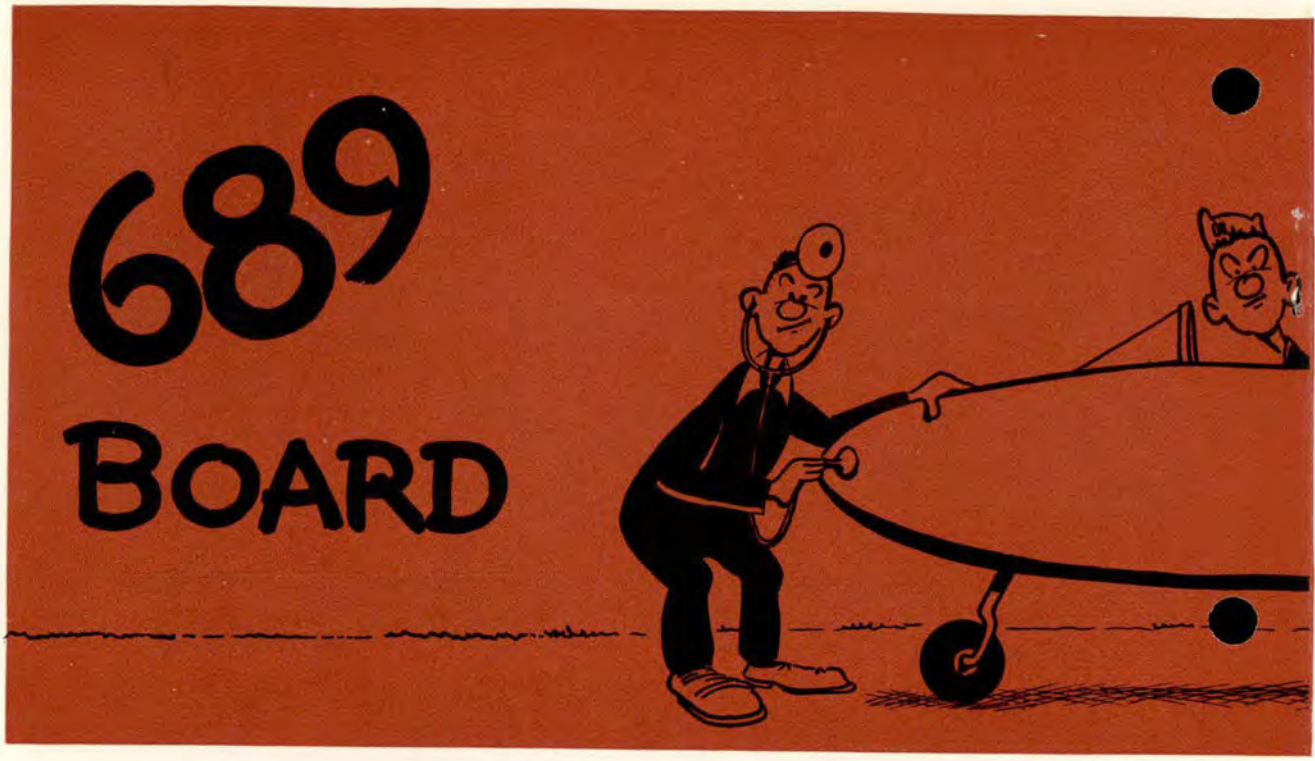
GCA is without doubt as safe as the instrument flying technique and proficiency of any pilot. The safety of GCA *does not decrease* in ratio with decreased accuracy in instrument-flying exhibited by a pilot. On the contrary! One of the outstanding features of GCA is that, within common-sense limitations, a pilot who is out-of-practice in precision instrument flying can be assisted to a successful GCA letdown.

Definite approach patterns have been established at each Air Force base equipped with GCA. The patterns, approved by each base commander and director of operations are based on local terrain contours, and provide for right, left and straight-in approaches of airplanes experiencing engine failure or other trouble.

The pilot is, and will remain, the greatest potential source of human error in GCA or any other approach system.

He is at all times directly responsible for the safety of his plane. It is his prerogative to request a pullup and another approach at any time. GCA is in every respect an assisting or advisory approach facility.

The easiest and the best method of determining "the safety factor of GCA" for yourself is to visit the GCA installation at an Air Force base and watch the crew work some actual or training approaches. The AACS encourages pilots to visit their various facilities. Most pilots are interested in the men and equipment that may someday save their lives. Are you?



By LT. RODGER W. LITTLE

Flying Safety *Staff*

The 689 Board is just one act in a play called "Evolution of a New Type Airplane" but it is an important one, nevertheless.

Essentially, the 689 Board is concerned with the acceptance of a new type aircraft purchased by the Air Force. It consists of representatives from Air Materiel Command, Air Force Headquarters, and the Flying Safety Division of The Air Inspector's office. Also present are the executives of the aircraft company involved and the Air Force resident representative.

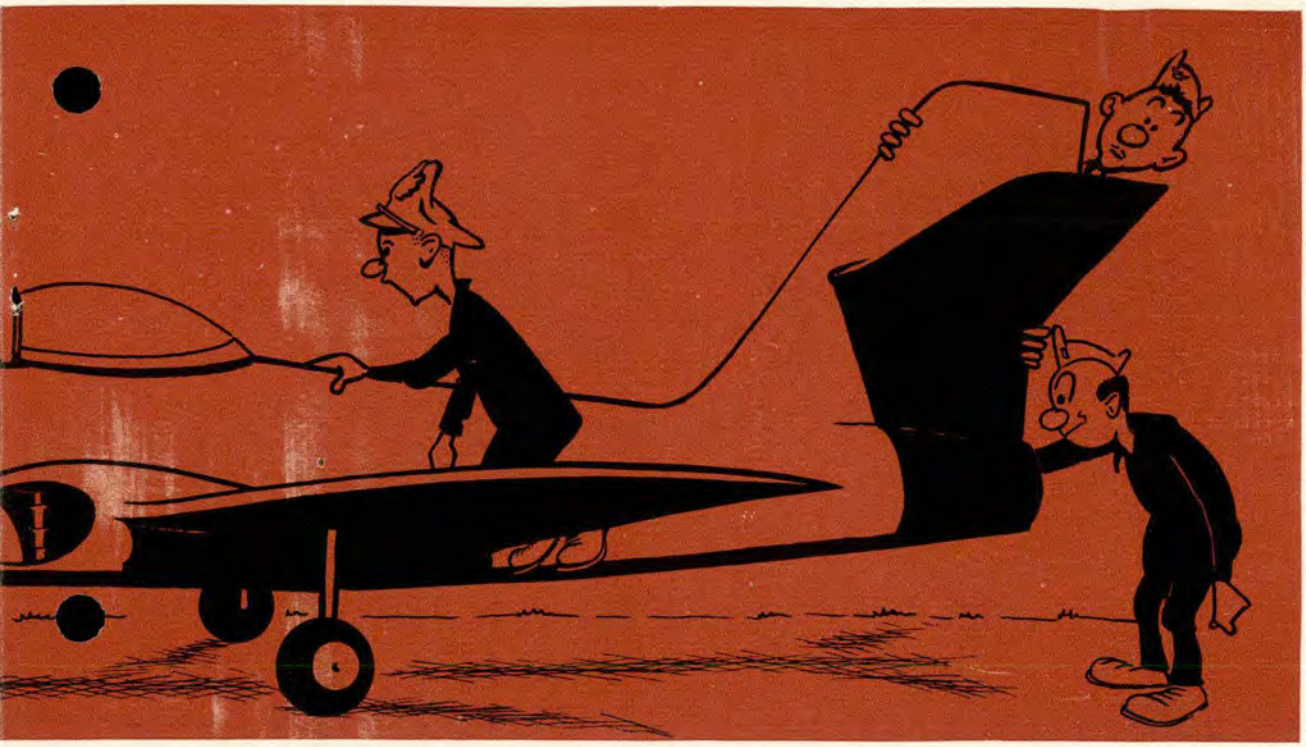
After the board members meet, a pilgrimage is made to the final assembly line for inspection of the first complete aircraft manufactured. On a small liaison type aircraft this inspection may require only two or three hours. On larger aircraft such as bombers it may be two or three days before a complete inspection has been made.

During the inspection, the discrepancies in design, equipment, and engines are noted on special forms with several carbon copies for the various agencies concerned. Cockpit controls, escape hatches, landing gear and flap mechanisms, seats and attachments, fuel, hydraulic, and braking systems, and all emergency systems are thoroughly inspected.

The Flying Safety Division representative is concerned with all parts of the aircraft. His main interest in these is to assure the safety and comfort of the crews who will be flying the airplanes.

Air Materiel Command has its top engineering personnel on hand for these inspections. They are relentless in combing the airplane from nose to tail for deficiencies. Their representatives are familiar with all of the engineering phases of the aircraft. Also, if earlier models of the aircraft have been in use, AMC has a list of the UR's submitted. Air Materiel Command has a special interest in the problems that will face flying and maintenance personnel in the field as these problems will in turn bounce back to them in the form of UR's and will require changes in TO's and modifications on the airplanes. All these mean additional expense to the Air Force.

After a thorough inspection of the airplane, the Air Force resident representative assembles all of the "beefs" and the board convenes to review the faults and recommend appropriate corrections. The



meeting is conducted by the Air Force resident representative at the factory, who is usually a pilot.

The resident representative reads the "beef," the reasons for it, and the suggested remedy. A general discussion follows, then a final decision is reached on whether to alter the design or part of the aircraft involved or to wait pending service tests. Usually, the Air Materiel Command conducts the service tests. In some cases the contractor conducts the tests and investigations and submits a report to AMC. If possible, Air Materiel Command is supplied with a complete aircraft of the type in question or they are furnished with the necessary parts of the aircraft to be tested.

During a recent 689 Board meeting, the representative from the Flying Safety Division made several recommendations pertaining to safety deficiencies of a liaison type airplane. One of the deficiencies noted was the separation of the rudder and brake pedals. The pilot's feet were allowed very little gripping action on the pedals. It was almost impossible to actuate both rudder and brake effectively at the same time. The resulting recommendation was to incorporate the rudder and brake pedals to eliminate this unsafe condition.

In regard to comfort of the pilot, it was noted that the emergency door release handle was located so as to irritate the pilot's right knee. The location of this handle will be changed by the aircraft manufacturer.

A tachometer that reads counterclockwise is quickly noted by the Flying Safety Officer as it does not conform to the standardization of cockpits. Standard reading instruments, their location on the panel, and the location of controls are big items on the safety inspector's list.

An inspection of a new type fighter revealed that there was no provision for an emergency lowering of the flaps. Upon further inquiry, it was found that the test pilot of the company had never attempted a "no-flap" landing and that no one was positive that a safe landing could be made this way. As a result, further tests are being conducted and in all probability the contractor will devise some type of emergency lowering of the flaps in case the normal system fails.

Thus, by a coordinated inspection and review of a new type airplane many of the "bugs" are caught in the beginning. Many lives and airplanes undoubtedly are saved when flying personnel are relieved of the dangerous task of discovering the "bugs" through bitter experience.

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, Field Office of The Air Inspector, Langley Air Force Base, Hampton, Virginia. We will withhold your name on request.)

Stormy Flight

BACK IN 1945 I cleared IFR from a South American field in an A-26 which was scheduled for delivery in Italy. The wheels were barely up after takeoff, when I was on the gages. Two hours later at 9,000 feet I relaxed and thought that instrument flying wasn't half bad. Then, without warning, the plane began to lurch violently and started to gain altitude at a terrific rate.

The large hand on the altimeter wound itself around the dial and stopped abruptly at 20,000 feet. Then I started descending as rapidly as I had gone up.

Using the needle and ball, I leveled the wings and started to pull out of the dive. I finally broke out of the overcast at 1,500 feet with an IAS of over 400 mph and in a 45- to 50-degree dive. By cutting mixture controls, increasing rpm to full low pitch, and pulling back on the control column with both hands, the A-26 finally came out of its downward plunge just above the tree tops. The only damage was a slightly bent left horizontal stabilizer which had hit an overgrown tree in the jungle.

At the first opportunity I made every effort to learn all I could about the techniques to use when flying in thunderstorms. At that time I had never heard of Brig. General Carl B. McDaniel and his article, "Thunderstorm Technique," which appeared in the October 1947 issue of this magazine. —I. M. LUCKY.

Water in Tanks

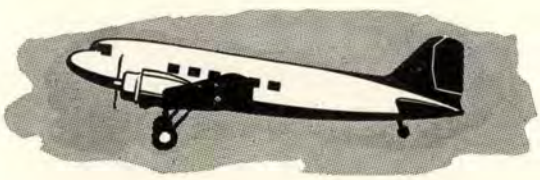
One day, and I'll never forget it, I walked out to a C-47 to fly as first pilot. It had been almost two years since my one and almost only other flight in a Skytrain, when I sat through four landings as a copilot.

I ran the engines up, checked the mags, rolled out on the runway, locked the tailwheel and told the tower I was ready to roll, after showing my copilot where the gear handles were and the sequence of operation.

Somehow, I got the airplane into the air. As we went over the fence, things began to happen — but fast. The right engine started to backfire. The engine seemed to quit momentarily, then come back with a terrific surge of rpm. Then it quit for keeps.

I hit the right engine feathering button and decided to return to the field. A glance at my airspeed indicator caused my ticker to go into high blower. We were doing 105 mph. It suddenly dawned on me that the gear was still down. The copilot had forgotten to release the latch on the floor before he raised the gear handle. I yelled, but he couldn't hear me. I pointed to the release and he started to crank in trim because he thought I was pointing to the rudder trim handle.

Rudder trim comes in handy on single-engine, but not when it's applied in the wrong direction. I got the trim off and gave the crank a half turn in the other direction. I was still screaming "Gear Up" and making with the hand signal when the copilot got out of his seat and made a rapid exit to the rear of the ship.



We made it back to the field and I landed across the runways.

The airplane had not been preflighted that day and had not been flown during the past seven days. Water in the gas tanks had caused the engine to quit. Concrete between the ears had caused me to attempt to fly that airplane with my limited experience in C-47's. What caused the copilot to leave his seat and head for the tail, I'll never know. I haven't caught up with him yet!—NOW CHECKED OUT.

MEDICAL SAFETY

THE EVOLUTION OF A RED STRAP

SOME TIME AGO in northern Florida an accident occurred shortly after nightfall. The plane involved was an A-26 on which both engines fully quit from lack of fuel after a series of mishaps and pilot errors. The plane was flying at fairly low altitude beneath an overcast when the final emergency arose. Two men were killed and one man bailed out successfully.

When the engines cut out at 2,000 feet, the three occupants fastened their chutes. At 1,000 feet the copilot decided to leave the airplane, but could not make the emergency canopy jettison lever work. He opened the canopy in the normal manner and bailed out. As he struck the ground, he heard the plane crash, but did not know until later that the pilot and passenger went in with the airplane.

A review of the action which followed this accident will give pilots an appreciation of how the local flight surgeon acts in their behalf in many instances.

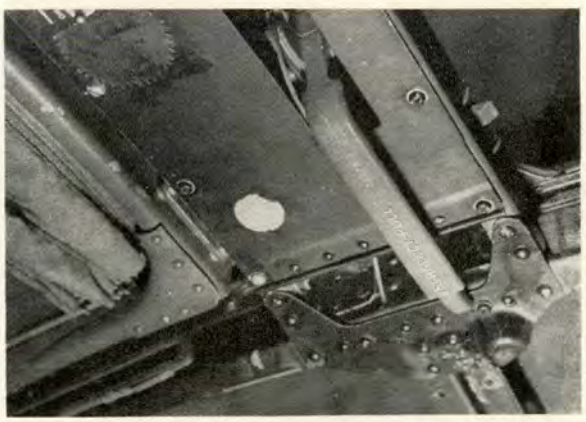
The USAF Form 205, "Medical Officer's Report of Aircraft Accident," which reached FLYING SAFETY contained a significant statement by the flight surgeon:

"Because of the difficulty this crew had with the emergency release, I went out to an A-26 and tested the lever. I found that I could only get two fingers over the lever to break the safety wire which, in turn, would enable me to get a complete hand on the lever to release the canopy. My hands are small; any other person might experience difficulty in trying to release the canopy. The man who bailed out had difficulty with this lever and states that he could not get enough leverage with only one finger to break the safety wire and release the canopy."

With this statement to go on, personnel from FLYING SAFETY inspected several A-26's and found that the evaluation of the situation was not at all exaggerated. It was found that the tip of the emergency lever came over a well which was only 1⅞" wide, and in one position 1" of distance was between the lever and the side of the wall, and 3¼" between the lever and the other side of the wall. The thought was advanced that a pilot reaching into this small space at night or during winter flying when gloves were being worn would find it almost impossible to get his fingers on this lever, break the safety wire, and actuate the emergency release mechanism.

Pictures were made, suggestions for modifications were drawn up and, with the "Medical Officer's Report of Aircraft Accident" attached, were directed to the appropriate Air Staff for study and action. After consideration, Technical Order #01-40AJ-115 was issued. This Technical Order called for the modification of the handle, pilot's inclosure door, emergency release, A-26 series.

If the reader has seen an A-26 cockpit recently, he has undoubtedly noticed the small 4" red assist strap hanging down in full view. This small improvement, which can mean so much when the time to part company with an airplane arrives, evolved from the few sentences appearing on a flight surgeon's report of an aircraft accident. This is only one of the many cases in which the medic concerns himself with improving the margin of safety for pilots and passengers.



FLYING STOVEPIPES

RAM-JET POWERPLANTS are creating new ideas for future military use. These "flying stovepipes" have already spurted through the air like rockets far in excess of the speed of sound. As yet the ram-jet has not been used as the primary source of power for an airplane because a speed of from 300 to 400 miles per hour is required before it delivers any power. It has no static thrust.

Pound for pound, the ram-jet is superior in power production to any other engine we now have. While the rocket produces 12 horsepower per pound, the ram-jet produces 25 horsepower per pound of engine weight. This ratio also overawes the turbo-jet with three and a half horsepower per pound and the internal combustion engine with one h.p. per pound. Fuel consumption per horsepower of the ram-jet is one-sixth that of the rocket but nearly five times that of the reciprocating engine. Obviously, the ram-jets high fuel consumption is an adverse feature that must be improved.

An advantage of the ram-jet is that it has no moving parts such as are required in turbos. It is as simple as its nickname implies. A metal tube open at both ends scoops air at high speed and rams it into the combustion chamber where the fuel is ignited, producing a high-speed discharge of gases at the rear. This in turn causes thrust.

ELECTRONIC TRACKS

Aerial superhighways created by a new navigation and traffic control system called Tricon is the goal of electronics engineers. The system would enable airplanes to fly in five or 10 parallel lanes along these "highways" on paths as clearly defined as railway tracks. Engineers expect Tricon to be able to handle as many as 200 airplanes a minute past one point, based on the airplanes' flying at 300 mph.

The pilot will see the position of his airplane as indicated automatically on the instrument panel. On the ground, the control station at an airway intersection will be notified simultaneously and automatically of the position, altitude and identification of every plane in the sector. An automatic block warning system will warn the pilot if a section of the electronic "track" immediately ahead of his plane is occupied.

POWER PACKAGE

The power package for the new YC-97A Boeing Stratofreighter, including engine, accessories, oil system and turbosupercharger, is interchangeable and can be removed and replaced in about one hour by trained crews.

AUTOMATIC STEERING

An automatic nosewheel steering control is being installed in the All-Weather Flying Division's automatic C-54. (See FLYING SAFETY, March 1948.) The nosewheel will be coupled to the rudder through a servo system so that an impulse causing the rudder to turn will also turn the nosewheel through a proportionate angle on the ground. When the weight of the airplane is lifted from the nosewheel, a safety interlock will disengage the servo unit and allow the nosewheel centering device to function normally prior to the retraction of the gear. The new steering control will hold an airplane on the ILS beam during the ground run on takeoff and landing during the periods when low airspeed renders the rudder ineffective.

STORM ECHOES

Now they've done it. Echos heard by Radar directed at thunderstorms have given a very accurate description of the storms in terms of stage of development, rain intensity, vertical drafts and turbulence, horizontal and vertical extent as well as direction of movement and icing conditions. Soon, instead of hoping that the storm won't be too rough, a pilot will know whether or not to expect a rough ride and at what altitude.

BEAM WITH A FLARE-OUT

A hyperbolic curve has been incorporated into the ILS equipment for experimental purposes at Clinton County Air Force Base. The curve is produced by modifying the upper antenna of the USAFILAS (SCS 51) glide path. A shift in the position of the transmitter allows for a variable rate of descent at touchdown. Heretofore the beam did not correspond to the actual best glide path and flareout of an airplane.

Tests are being conducted to determine the best position of the glide path transmitter in order to obtain the lowest possible rate of descent at touchdown consistent with positive contact with the runway.

BUSY PEOPLE

During the last six months of 1947 the Air Rescue Service was alerted on 787 aircraft incidents involving missing or crashed aircraft and aircraft overdue because of failure to close flight plans. One-third of these alerts were for civilian aircraft. Alerts were received on 290 other emergencies such as missing boats, lost children, emergency aerial evacuation, flood and forest fire emergencies, and delivery of medical supplies to disaster areas. Almost half of these emergencies were civilian. Over 3,000 hours were flown by Air Rescue Service aircraft during this six months period and resulted in 80 lives being saved. Of these 80 lives saved by the USAF Air Rescue Service, 35 were civilians.

Well, Who Did?

WHO CHECKED THE CHECK PILOT?

SURE HE WAS CHECKED OUT, he rode with — er, ah — well he must have ridden with whosis, you know, the guy with all the flying time. What's his name? Quicktrip, yeah that's it, Lt. Quicktrip.

Anyway, the crew chief said he's a pretty hot check pilot. Yeah, he's the fellow who was put on orders because the Training Officer's steno recommended him mostly because he was single, tall, dark, handsome and had 100 hours in twin-engine airplanes and a new convertible.

An amazing parallel can be drawn between the qualifications of the check pilot and what happened to the first man he checked out. This poor lad hit a single, tall, dark mountain. It took 100 hours to find the wreckage and the local mortician envisioned a handsome profit from his diggings.

Ridiculous? Nay, brother, Captain Mountainbopper was well qualified in that airplane, according to the man who had signed his ticket. True, he was weak on single-engine procedure, but with a little help he usually feathered the correct prop. You guessed it. Mountainbopper bopped the mountain because he had feathered the wrong fan.

WHO CHECKED THE CHECK PILOT?

Let's take the case of Willie Warmfront. Willie was hurting for an instrument card. He could feel the hot breath of the flying evaluation board on his neck. He worked like a beaver to find a "right guy" for a quick check ride. Willie didn't do too badly on his instrument check. He identified two out of four quadrants, both of them N's. He hit the high cone, but missed the low cone.

As soon as the ink was dry on his newly-acquired card, Willie trotted off to base operations to get a clearance. He studied the sequences to be sure that the weather was CAVU and would stay that way for the next five days.

Two hours later, Warmfront decided to try out his new card on a couple of small clouds. The card worked! Willie got braver and the clouds got bigger and Willie got scared but the clouds got still bigger. All sorts of things danced through Willie's mind. "Don't panic," he said to himself reverently, sticking his instrument ticket on the panel right before his eyes. "I'm probably flying right behind a Boopsie Cola skywriter whose autopilot is stuck in straight and level flight. If I make a 90° turn, I'll get out in the clear.

Willie turned 90° and decided that either Boopsie Cola had also turned 90° or else he was lost in the soup. It didn't take Willie long to figure that this was no place for Willie on a VFR, with no gas, so over the side he went.

WHO CHECKED THE CHECK PILOT?

And then there is this one which is always good for a couple of bent props. A crew chief was briefed emphatically on one and only one hand signal by a check pilot. "When you see my closed hand, with my thumb extended, move up and down, yank the gear up. Got that?"

Ten minutes later while rolling down the runway, the check pilot poked the student with the closed hand with thumb extended and made an upward motion while saying "Pull the nose off the ground." The crew chief took care of the rest.

WHO CHECKED THE CHECK PILOT?

3 STRIKES

By L. H. MACAULEY
Flying Safety Division

Captain Brad Gordon fingered his tie nervously and reached down to brush off his trousers. As he straightened up he looked toward the ominous door through which he would have to pass to appear before the flying evaluation board. Brad tried to convince himself that he wasn't perturbed about the turn of events which made his appearance necessary, but he was scared.

While he waited for his summons to enter the board room, Brad thought of the three pilot-error accidents with which he had been charged. The first one, he had to admit, was entirely his fault and he wouldn't argue with anyone. After all he had been young and inexperienced when he landed wheels up in that AT-6 down in Georgia. Just out of flying school and he thought he knew it all — but he had realized that he didn't know enough to dispense with the checklist when the trainer screeched down the runway on its belly. He remembered the hot shame and embarrassment that had flooded over him when he climbed out of the crippled plane.

Then there was the second accident more than nine months later. Brad had never been convinced that it was his fault, though the investigating board placed the major part of the blame on his shoulders. He reasoned that the first accident had made a sober man of him and his flying his been practically flawless up until the time he ran into the bad weather that set the stage for the second crash. The whole thing stood out fresh in his mind. He had just been checked out in a P-47 when he was cleared for a short round-robin flight.

The flight was uneventful until Brad was nearing his home station on the last leg. He was advised that weather at his base was above VFR minimums, but was warned that local rain showers had reduced visibility.

He was cleared to land straight-in on the wet, glistening runway. Because he couldn't see too well in the rain, Brad purposely came in high. He touched down over one-fourth of the way down the runway in what he thought was a perfect landing. Suddenly, a blinding sheet of rain opaqued his windshield.

Brad thought quickly. He had landed straight and he figured he'd be better to roll along without using brakes. He might lose directional control on the wet runway. The rain let up a bit and Brad could see the end of the runway rushing toward him. He applied brakes evenly and as the plane slowed down he unlocked the tailwheel. Brad applied more brakes to stop. When he hit the brakes, the heavy fighter skidded on the wet pavement and slithered off the end of the runway. Brad felt a sudden jolt as the right gear sheared.

The accident board wasn't too rough on Brad, but it did remind him that he should have gone around when he landed long in low visibility and on a wet runway. In other words, pilot error with weather as a contributing cause.

The board room door had not opened to admit him yet so Captain Gordon lit another cigarette and walked slowly to the ante-room window. Out on the runway he saw a C-45 running up its engines for takeoff. This sight brought his last accident into sharp focus in his mind. It had occurred only three months ago on this same base.

After a successful combat tour, Brad for the first time drew a desk job. He didn't mind it too much. He wanted to make the Air Force his career and was eager to learn as much as possible. However, it did cut into his flying.

Brad was checked out in the C-45 by a local instructor pilot and he had passed his written examination. Then he flew it by himself for 10 or 15 hours without a bit of trouble. One night Gordon cleared for a local VFR proficiency flight. Every-

thing went all right until his electrical system failed. He checked his generators and they were both on. He hauled out the flashlight and inspected everything in the cockpit carefully and could find nothing amiss.

Gordon got a green light from the tower and reached down for the emergency hand crank. He pushed it in to engage it and turned. But nothing happened. He exerted more pressure, but the crank still wouldn't turn. Now he got worried. He inspected the crank with the flashlight and tried it again. No results.

Brad tried to remember the emergency procedure for lowering the gear and couldn't think of anything he'd forgotten. He reached behind him for the "G" file and found the Pilot's Operating Instructions. While holding the wheel with one hand, he tucked the flashlight under his chin and thumbed through the pages looking for the emergency gear procedures. The T. O. was greasy and torn and the vital pages were missing.

Muttering an oath, Gordon tossed the book behind him and racked his brain trying to remember what to do next. He wished then that his checkout had been more thorough and that he'd actually gone through the emergency procedures instead of receiving the cursory information from the disinterested check pilot and then taking a "paper" test.

With one last frantic tug at the hand crank, Brad decided he would have to bring it in wheels up. He had tried everything he could remember. There must be something jamming the emergency system.

Brad Gordon felt the same burning shame that he'd experienced a long time before when it was explained to him that he'd forgotten to depress the clutch on the cockpit floor before attempting to lower the gear with the hand crank. Of course, it was pilot error again — this time tempered with supervisory error for the incomplete checkout and maintenance error for the faulty electrical system and incomplete "G" file.

"You're next, captain," the clerk announced.

Gordon entered the board room and saluted Lt. Col. Nixon, station operations officer and chairman of the local flying evaluation board. Nixon smiled and waved him to a comfortable chair placed in front of the long table behind which seven members were seated. They don't look so horrible, Brad thought.

"Captain," Col. Nixon said, "the board has

studied copies of Forms 14 of your three accidents and the flight surgeon member has your latest 'six-four.' From these we've tried to get a clear picture of what occurred in the accidents and an assessment of your current physical condition. However, there are still several questions we'd like to ask and we'd also like to discuss some of the phases of your flying experience."

The longer Brad sat replying to queries and discussing his reactions to various things that had occurred in the accidents, the more relaxed he became. The board members were friendly and Brad could detect no inclination on their part to be hypercritical or hostile. Thus, he was as cooperative and truthful as possible. He brought out his personal opinions on the causes for his accidents and they received the close attention of the board.

After a while, Col. Nixon asked Gordon if he had any suggestions to make which he thought might contribute to the prevention of future accidents of the same type he had experienced.

"Well," Captain Gordon replied, "I'm not trying to introduce sour grapes into the discussion, sir, but I do think that a lot of pilots would stay out

of trouble if they received a little more attention from supervisory personnel."

"By that, captain, what do you mean?"

"You see, sir, I'm convinced that in my case two of the accidents could have been avoided if my training and supervision had been more thorough."

"I believe that will be all for now, captain," Col. Nixon told him. "Please step outside and have a seat for a few minutes and we'll inform you of our recommendations in your case."

Gordon saluted smartly and left the room. He slumped into a chair and wiped the perspiration off his forehead. Was this going to mean the end of his flying? He kept telling himself that this couldn't possibly happen to him. But could it?

Two cigarettes and what seemed like two years later, the recorder opened the door and beckoned to Brad. He leaped to his feet and hurried into the room, his face filled with anxiety.

After he was seated, Col. Nixon started to speak:

"Captain, it is the recommendation of this board that" — Brad leaned forward, tense — "you be returned to flying status. Of course, this decision is subject to review and concurrence by higher authority."

Gordon leaned back. It seemed as though the burden of Atlas had been lifted from his shoulders. Then he heard Col. Nixon talking again.

"Captain, you realize that the action of this board in no way absolves you of the responsibility for your part in the accidents. However, we did take into consideration the extenuating circumstances and some obvious discrepancies in your training and subsequent checkouts. We hope through this action you will be cognizant in the future of all the pitfalls which lie ahead of a pilot who is not alert and at peak proficiency at all times. We also hope that this lesson will fly with you through your whole career. That's all."

Stammering a "thank you, sir," Brad Gordon saluted again and left the room almost in a dream. He'd fly again. He'd fly again.

Gordon stepped out into the sunshine. His face assumed a serious mien and he said to himself:

"Damned if I'll ever take anything for granted or accept just anyone's word as the gospel. From now on I'll know for myself — or else!"

LETTERS TO THE EDITOR

Dear Editor,

Request this office be granted permission to reprint "Crash Procedures," by John O. Moore, Medical Research Analyst, Headquarters, United States Air Force, in the Alaskan Air Command Surgeon's Information Letter (which is published monthly).

It is the opinion of the undersigned that this article is of such importance that it should be disseminated to all Medical Department personnel, this Theater.

JOSEPH W. TITUS
WO (jg)
Adm Asst for the Surgeon
HQ Alaskan Air Command

Information appearing in FLYING SAFETY *can be reprinted by any command for wider use, so long as the classification "Restricted" appears on the material copied and its distribution is restricted to authorized personnel.*—ED.

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STALL WARNINGS: Some readers have asked us if the USAF is making use of stall detection indicators, following publication of an article on the subject in FLYING SAFETY (February, page 16). Here's what the Equipment Laboratory of Air Materiel Command has to offer in reply:

"The Equipment Laboratory has made numerous tests and conducted some research on this type of equipment. Of those stall-warning indicators tested, none met the functional ability requirement for all speeds. Some were good at one speed, and others at another. Furthermore, the laboratory considers that there is no need to use a stall warning device on military aircraft now, nor in the foreseeable future.

"Inasmuch as stall-warning indicators are not used on military aircraft, the CAA approved indicator has not been utilized. For information on the indicator, particularly for light planes, it is suggested the CAA be contacted."

★

Dear Sir:

Your sketch of Mal Function on the rear cover of your December 1947 edition of FLYING SAFETY is to be commended. I do not know if Captain Mettler was ever an enlisted crew chief or not but he certainly was correct in this issue.

It is certainly not pleasant to be told in the late afternoon that your ship is taking off in an hour on a crosscountry flight, no information being given as to the number of days you will be gone, if flight lunches are needed, etc. When you land, the pilot or pilots are gone before you have a chance to check the ship, never saying where they can be reached, if quarters are available, if you need money, proposed time of departure. As for the money angle, most G.I. crew chiefs have a few bucks most of the time although it makes them feel better when asked. I must admit that some men abuse the privilege when pilots offer them money by accepting it when they don't need it. Any crew chief should feel that if he is short that the loan is strictly temporary and should be paid back as soon as possible.

The average enlisted crew chief doesn't expect much. Just a little common courtesy is all. The average crew chief will go all out for his pilot if given half a chance, but to be made to feel as though he is only a stooge is the thing that he resents. There are 1,000 ways that a crew chief can make a crosscountry flight a pleasure for the crew and passengers.

You have a very fine publication and all the men here in this squadron enjoy it very much.

T/SGT. BOB DAVIS
4th Emergency Rescue Sqdn.
A.P.O. 182 % P.M.
San Francisco, California

Thanks, Sergeant, for the comments. We agree that congenial crews are more apt to function as teams, and teamwork is always an element of safety. — ED.

SAFETY QUIZ

1. The angle of bank in a standard rate turn (3° per second) is directly related to
   A. true airspeed.
   B. power setting.
   C. rudder pressure.
   D. indicated airspeed.
2. In recovery from a diving spiral, where airspeed is excessive, first
   A. reduce power, level wings and correct pitch attitude.
   B. stop turn and check excessive speed.
   C. pull back on stick and coordinate rudder and ailerons.
   D. stop turn, reduce power and lower nose.
3. Before takeoff, the pilot can determine whether his turn and bank indicator is operating by
   A. turning while taxiing.
   B. reading the vacuum gauge.
   C. checking his alternate suction source.
4. At the start of a standard rate turn (northern hemisphere) from a heading of east or west, the magnetic compass will
   A. indicate a lesser amount of turn.
   B. indicate a greater amount of turn.
   C. show no apparent error.
   D. indicate a turn in the wrong direction.
5. If the regular static line as well as the alternate source are blocked, static pressure can be obtained by
   A. breaking the glass on bank and turn indicator.
   B. breaking the glass of the vertical speed indicator.
   C. alternate source venturi.
   D. switching to an engine driven pump.
6. The general limits of operation of the artificial horizon are
   A. 60° pitch, 90° bank.
   B. 70° pitch, 55° bank.
   C. 80° pitch, 100° bank.
   D. 70° pitch, 100° bank.
7. You are holding in a stack and have received an expected approach time. Your transmitter fails after acknowledging. Your best procedure is to
   A. make your approach immediately.
   B. proceed to alternate immediately.
   C. make approach at expected time.
   D. go to emergency altitude.
8. The instrument which utilizes only static pressure for its indications is the
   A. vertical speed indicator.
   B. airspeed indicator.
   C. turn and bank indicator.
   D. artificial horizon.
9. When using the AAF Instrument Approach System (SCS-51) the accepted procedure for intercepting the glidepath when the needle is above center is to
   A. descend until the needle centers.
   B. climb until the needle centers.
   C. fly level until the needle centers.
   D. switch to another band.
10. While approaching the runway to land using the AAF Instrument Approach System (SCS-51) the localizer needle is deflected to the right. To center the needle the pilot would correct
    A. to right.
    B. to left.
    C. by climbing.
    D. by descending.

★

ANSWERS

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

WHY?

WHY?

THE PILOT OF THIS A-26 was not to blame for this collapsed nose gear.

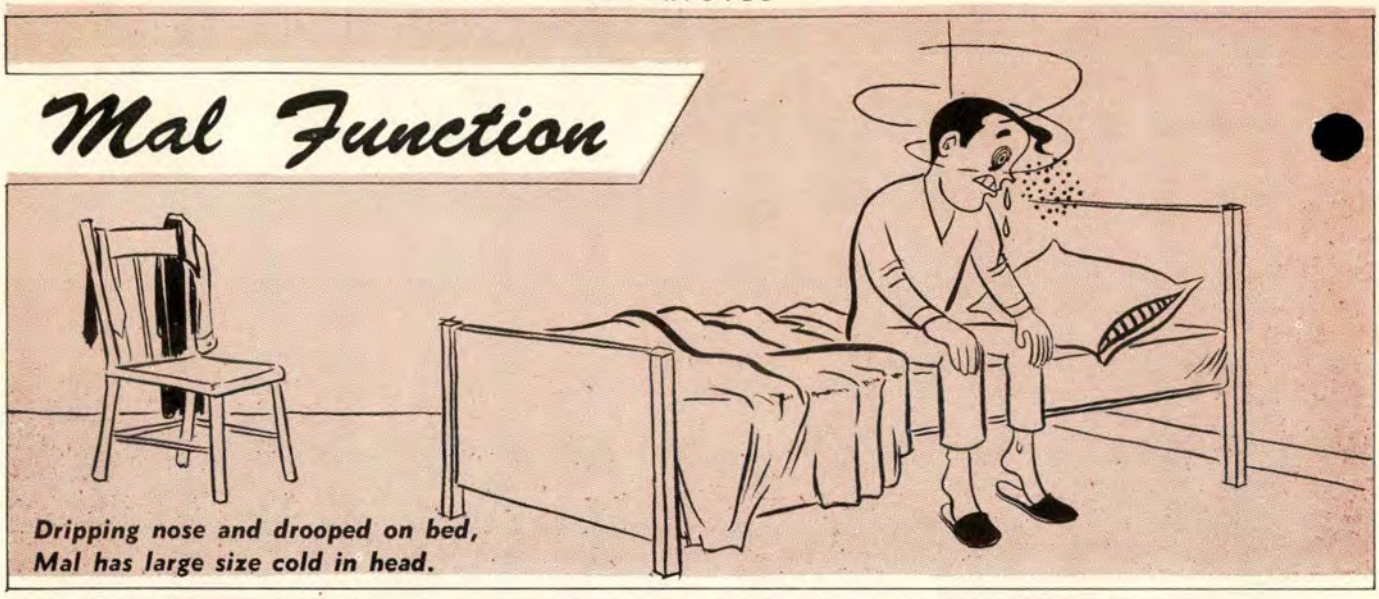
He had made a normal landing and as he neared the end of the landing roll the nosewheel began to shimmy violently. Noting this, the pilot cut the engines and the props had almost stopped rotating when the nose gear collapsed.

Faulty maintenance and materiel failure were the reasons for the collapse of the nose gear.

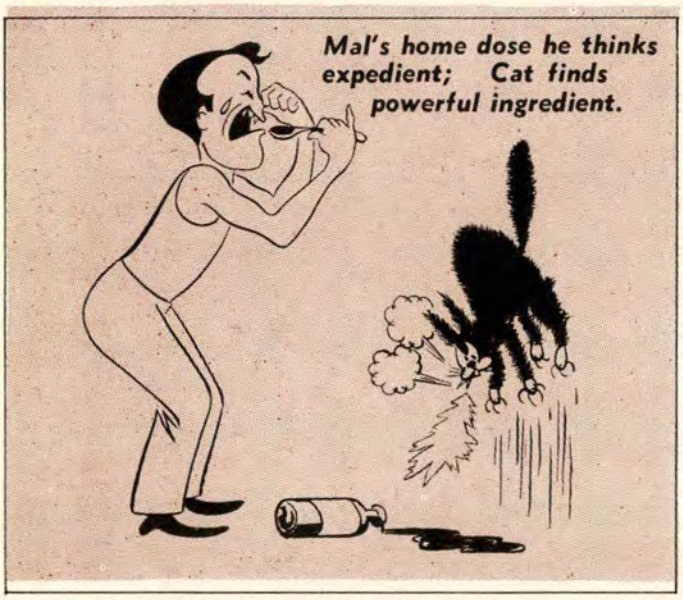
The investigation disclosed that the lock plunger cap nut of the nose gear assembly had not been provided with a pin and spacer, thus the lock plunger became disengaged and allowed the nosewheel to turn excessively.

Also, about 15% of the cross sectional area of the nosewheel cross beam lug was cracked prior to the time of the accident. This cross beam had not been reinforced in compliance with T.O. 01-40 AJ-92.

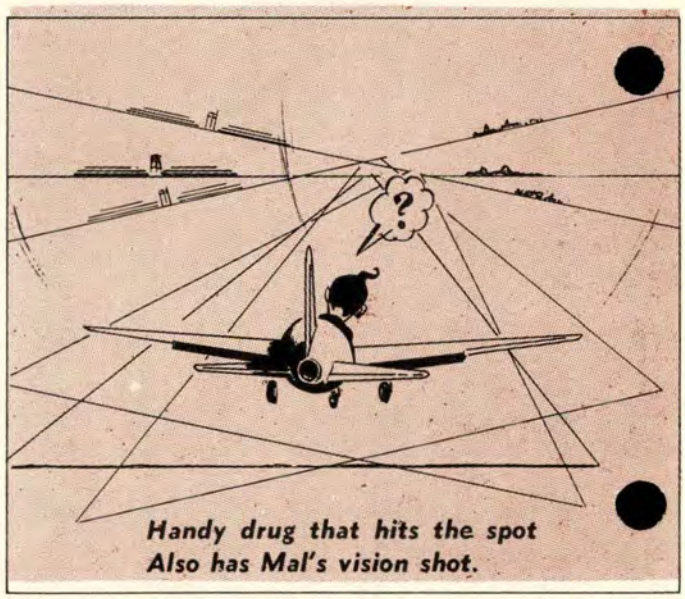
Mal Function



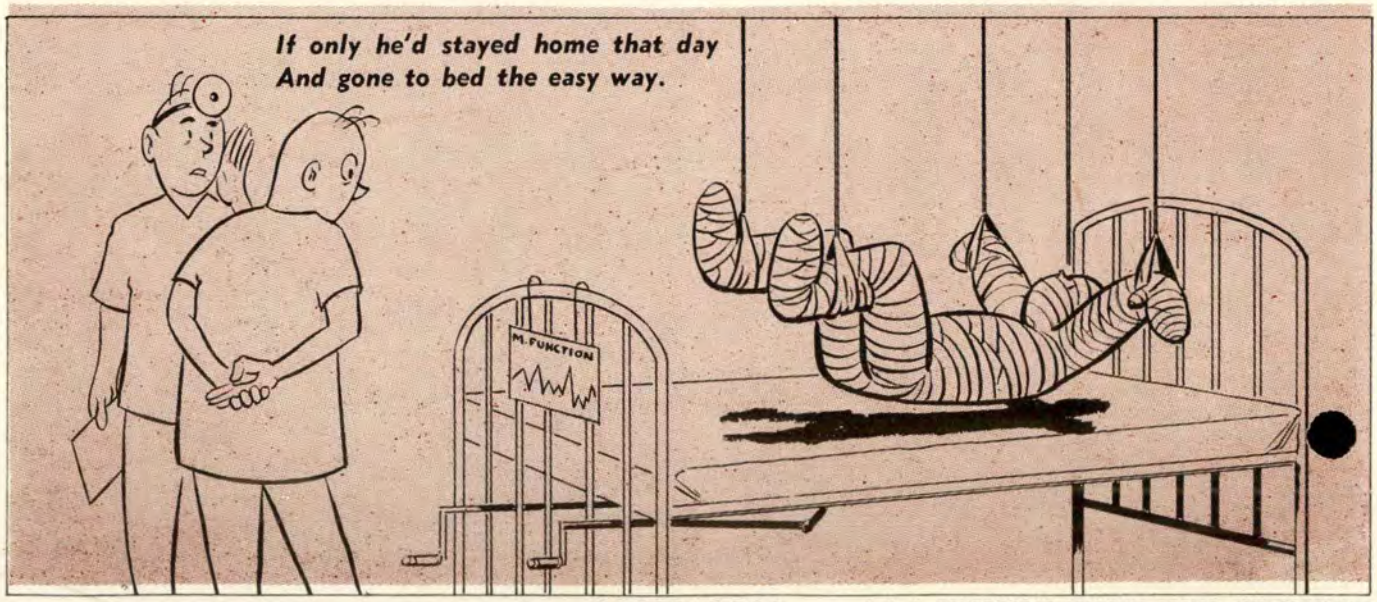
Dripping nose and drooped on bed,
Mal has large size cold in head.



Mal's home dose he thinks
expedient; Cat finds
powerful ingredient.



Handy drug that hits the spot
Also has Mal's vision shot.



If only he'd stayed home that day
And gone to bed the easy way.

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