

Flying the Curtiss SB2C Helldiver

by Randy Wilson

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I think I first saw the Ghost Squadron's Curtiss SB2C Helldiver while attending the Breckenridge, Texas air show in 1985. It was still in pieces and in the process of being rebuilt by Nelson Ezell's crew, with money being raised by the West Texas Wing of the CAF. When the Helldiver returned to service in 1988, I had a chance to fly both the FM-2 Wildcat and A6M2 Zero in shows with the SB2C, and I must admit that as a one-of-a-kind, the SB2C was always a bit special to me.

The "Beast" was usually flown by Cols Mike Wells, Howard Pardue or Nelson Ezell after its restoration, but by 1995, the West Texas Wing was often faced with too many commitments and not enough pilots, and I was asked to help campaign the Helldiver. Naturally, the first show that I was to fly was only a couple of weeks away, so the paper began to flow between the Wing, CAF Headquarters and the FAA's Lubbock offices.

The Helldiver falls into the category of an aircraft with more than 800 horsepower registered as an experimental aircraft, the type never having qualified for a commercial registration in civil service. Thus, the pilot must possess a document called a Letter Of Authorization (LOA) stating that he is qualified to fly that specific make and model of aircraft. Having already obtained LOAs in the Wildcat and Zero, I obtained the appropriate letters of recommendation for the SB2C, and Col Mike Wells conducted a ground school and full systems and cockpit checkout. On September 7, 1995, with a temporary LOA for training in my pocket, I strapped into the Helldiver's cockpit and took off for my first flight in the Beast.

Lifting off from Graham, Texas, where the SB2C is based with the Cactus Squadron, I verified my earlier impression – the Beast is a big, heavy plane. While the Wildcat, Zero and even the AT-6/SNJ Texan trainer seem eager to fly by about 60-65 knots, the Helldiver needed almost 80 knots before it lifted off. During the takeoff roll, acceleration seemed slow, until the throttle was advanced the last five inches of manifold pressure, to 45 inches, when the Beast seemed to gather itself up and really get serious about getting into the air. Once in the air and climbing, the gear was raised, power reduced to 35 inches and 2300 rpm, cowl flaps and oil cooler doors adjusted, and course was set for nearby Breckenridge, where I planned to practice landings and takeoffs, after a bit of air work.

After finding that the Beast didn't really like to be slowed much below 80 knots without sinking rapidly, I made my first approach for landing at 95-100 knots, having slowed to about 130 knots and lowered the gear on downwind. The landing checklist included the usual: fuel on fullest tank, boost pump on, tail wheel locked, prop set to 2300 rpm and flaps as needed. Holding about 90 knots over the approach end of the runway with full flaps, the Beast touched down on the mains with little tendency to bounce. Several more landings, including some three-point, proved that the Helldiver could operate out of as little as about 3000 feet, although a longer runway prevents undue wear and tear on the brakes and the pilot's nerves.

The Beast has probably one of the most complicated hydraulic systems of any single-engine World War II plane. The system operates the landing gear, flaps, dive brakes, cowl flaps, oil cooler doors, bomb bay doors and wing fold mechanism, and has a primary and secondary circuit, and valves designed to help isolate combat damage. The landing flaps and dive brakes take some getting used to, as they are operated by the same lever – moved back for flaps and forward for dive brakes.

To extend the dive brakes, the lever is moved forward until it stops, and one waits for the dive brake warning light to illuminate on the instrument panel. Once the light is on, the lever can be move further forward, causing the dive brakes to extend above and below the trailing edge of the wing. If pushed forward quickly, the result is about like running into a brick wall, and it is no problem to loose 30-40 knots in a few seconds. The dive brakes are great when rapidly closing to join up with a flight and also make rapid descents from cooler cruising altitude down to hotter pattern heights easy on the engine and the crew.

With the basic familiarization training flights completed, the next day I flew to Lubbock, Texas, where John Boatright of the FAA tested my knowledge of the SB2C's systems and operation and then climbed into the gunner's seat for a check ride. I should note that the rear cockpit does not have any flight controls, but John just asked if the intercom worked and rode calmly through the stalls, balked landings and takeoffs as if he road in the back of a Helldiver everyday.

With training completed and paperwork in hand, the Beast and I departed the same day for our first air show in Wichita, Kansas, stopping in Fort Worth to pick up Col Ted Short, West Texas Wing Operations Officer and back seater for this mission. The plane was a hit in Wichita, especially when we folded the wings to taxi into a tight parking space. Letting no grass grow under the new pilot, we were off to Smyrna, Tenn. for another show the next weekend. With normal cruise power of 28 inches and 1900 rpm, the Beast indicated about 155-160 knots air speed while burning 70 gallons of fuel an hour. With 355 gallons in three tanks, flights of over 4 hours are possible with VFR reserves.

In the past three years, the Beast has carried me to air shows as far away as Frederick, Maryland, in addition to numerous appearances closer to its base in Graham, Texas. Checking in with Air Traffic Control while flying back East was interesting as they often came back with "Say again your aircraft type!" After about the third reply of Curtiss SB2C, one controller replied "You are not in my computer!" When I told him it was the only one still flying, he noted that could explain the lack of an entry, and proceeded to visit for a couple of minutes about the plane's history. Not all controllers are as friendly, as I was once accused of being in a washing machine by a Baltimore controller, who had no idea how noisy a Wright R-2600's 1,900 horsepower could be, just a few feet in front of the cockpit.

Back in Texas, on a mission to a Helldiver squadron reunion in Fredrickberg, Texas at the Nimitz Museum, I had a passenger, Mr. Jerry Crisman, who had been a gunner in SB2Cs during WWII. Imagine my surprise when Jerry calmly asked me over the intercom if he had told me about landing an SB2C on a carrier from the back cockpit! It is a fascinating tale and is included as a sidebar to this article.

So, what is the Beast really like to fly? Actually, it is a pleasant and enjoyable plane, once it gets up to speed, with much lighter controls than one would think looking at its size and weight. The numerous systems keep you busy during takeoff and landing, and the Beast requires constant adjustment of the rudder trim with changes in speeds. Duster turns and photo passes at shows require keeping the power and speed up and pulling a few Gs, and the Beast tends to run away from the other U.S. carrier bomber, the Grumman Avenger, if you aren't careful. Where the real work starts is once we land at an air show.

"Say mister – is this the plane that President Bush flew? Helldiver? Never heard of that one!" These are just a few of the comments from air show visitors when they see the Beast. When told that it is the only one still flying in the world, they often want to tour the plane. So, in addition to handling the West Texas Wing PX carried in the bomb bay, the two man crew, with any assistance we can get, also handles tours up and over the wing of the Beast, letting folks look into the cockpit and gunner's compartment of the last one flying. Sometimes I think the real rating is Beast pilot, historian and tour guide.

Flying the Helldiver is a rare privilege and one that really drives home to me the motto of the Confederate Air Force – *Keep 'em flying!*

<http://rwebs.net/avhistory/history/lessons.html#AFSONG>

Lessons That Live as told by A.A.F. Pilots

Wrong Number

When things start to let go for an Army test pilot

Panic Over Chame Bay

A P-39D pilot's training mission teaches a lesson

Official Song of the Army Air Forces

All three verses and chorus

The Pilot's 23rd Psalm

by Captain J. D. Olive, with humor

High Flight

John Gillespie Magee, Jr.'s classic poem

Wrong Number



The spreader bar came loose and trailed out behind, flapping in the breeze.

Ignorance is sometimes blamed for the troubles that pilots get into. Ignorance is never an excuse because the training program is thorough. Most generally errors in judgement, plain boners and faulty planning, plus the lack of alertness, give an appearance of ignorance.

It was an out and out boner, and the fact that I lived to become an older and vastly wiser pilot is a direct tribute to the Lady that's known as Luck. Shortly after I finished flying school I was detailed to assist in the flight testing of overhauled planes. Upon reporting to the test line one afternoon, the operations clerk informed me that number so-and-so was ready for an initial check hop. I wandered out and climbed into a shiny overhauled job. The engine cranked readily, checked on both switches, and the controls were free.

I took off and climbed to 2,000 feet, leveled out and made a brief check of general flying qualities, noting that the left wing was slightly heavy. My first maneuver was a whip-stall from the nose straight-up attitude. As the nose dropped sharply, a pair of 8-inch slip-joint pliers came from nowhere on the floor and hovered momentarily before my nose. I snatched them out of space, pocketed them, and made a mental note to raise hob with the responsible mechanic for being so careless as to leave them where they might jam tile controls. Next I went into a fast dive and as I did so, the spreader bar which connected the upper and lower ailerons of the left wings came loose and trailed out behind, flapping in the breeze. I decided I'd better get down from there in a hurry.

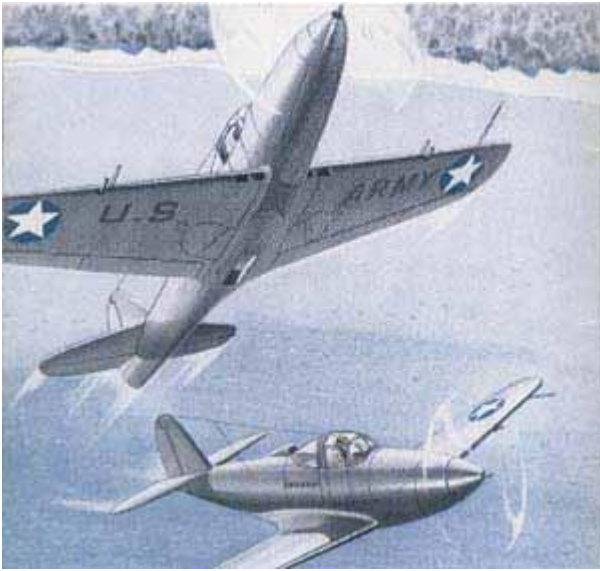
I made a landing approach, coming in "hot" to assure lateral control and consequently bounced when the wheels hit with the tail high. I hit the throttle to ease down again and imagine my surprise when the entire throttle quadrant dropped loose and dangled on the control rods which ran up through the fire wall. As I hit the ground again, the oil filler cap came off and I was blasted with hot engine oil.

Here was a clear case of plane failure and stupid ground work. Oh yeah!

As I reached the line, burning to crucify the inspector who had passed on a plane in that condition, the clerk ran out. "Lieutenant," he yelled, "you took the wrong plane. I said number so-and-so but you took number this-and-that. This plane hasn't even been finished by the assembly department!"

Yes, sir. I had been flying a plane that was literally falling apart! And the horse was 100% on me.

Panic Over Chame Bay



I made a dive on my 'enemy' and in pulling up I lost him under my wing.

Always fly your plane through maneuvers; don't let it take care of itself while your are looking at something else. If you do get into trouble, keep calm and use your head about getting out. Panic is many a young pilot's undoing.

I was on a practice individual combat mission over Chame Bay, Panama, and my opponent and I were both flying P-39D's. The planes were fully loaded with combat ammunition, including 2,000 rounds of .30 calibre in each wing, giving this ship a very risky stall and spin characteristic.

We'd been scrapping several minutes and the combat, unnoticed by either of us in the thrill of the fight, had dropped from 10,000 feet to 5,000 feet. I made a dive on my "enemy" and in pulling up I lost him under my wing. In my eagerness to find him again, I completely forgot about altitude.

Suddenly I felt an alarming looseness in my controls and at the same time I became aware that my plane was pointing almost straight up. I reacted immediately by pushing forward on the stick — a ridiculous maneuver since I was in a vertical position at stalling speed. When I realized I could never push over straight, I attempted to drop a wing and roll out.

The plane stalled out completely; it was upside down and refused to respond to the aileron controls. I had a feeling that it was sliding vertically downward, tail-first. It had no tendency to spin; yet at the same time it refused to respond to my efforts to get a wing down. Next I tried to pull the nose through as in a loop, but my position, hanging upside down on my safety belt, prevented me from doing anything except pull straight up on the stick instead of to the rear.

By this time panic had me in its grip and I felt an almost uncontrollable impulse to release the emergency handle of the door and bail out. I realized, however, that the engine was still churning away at 40 inches of mercury so I cut the throttle back and concentrated on pulling the stick to the rear.

Slowly the nose of the plane fell through, and as it picked up speed I eased it out of the dive, expecting to snap into another stall at any second. When I finally straightened it out, although my altimeter showed that I was at 800 feet, I felt as if the waves of Chame Bay were lapping at my belly.

The lessons learned from this harrowing experience, which really lasted but a few seconds, have burned deep in my mind during the ensuing weeks. When I get into actual combat, I know I'll not make the same mistakes again.

Official Song of the Army Air Forces

Off we go into the wild blue yonder,
Climbing high into the sun;
Here they come, zooming to meet our thunder,
At 'em boys, Give 'er the gun!
(Give 'er the gun now!)
Down we dive, spouting our flame from under,
Off with one hell-uv-a roar!
We live in fame or go down in flame.
Nothing'll stop the Army Air Corps!

Chorus:

Here's a toast to the host of those who love the vastness of the sky,
To a friend we send a message of his brother men who fly,
We drink to those who gave their all of old,
Then down we roar to score the rainbow's pot of gold.
A toast to the host of men we boast, the Army Air Corps!

Minds of men fashioned a crate of thunder,
Set it high into the blue;
Hand of men blasted the world asunder;
How they lived God only knew!
(God only knew then!)
Souls of men dreaming of skies to conquer
Gave us wings, ever to soar!
With scouts before and bombers galore.
Nothing'll stop the Army Air Corps!

Off we go into the wild sky yonder,
Keep the wings level and true;
If you'd live to be a gray-haired wonder
Keep the nose out of the blue!
(Out of the blue, boy!)
Flying men, guarding the nation's border,
We'll be there, followed by more!
In echelon we carry on.
Nothing'll stop the Army Air Corps!

High Flight

Hailed as the first classic of the Second World War, *High Flight* was written by John Gillespie Magee, Jr. on September 3, 1941. Magee was a 19-year-old Royal Canadian Air Force pilot, who was killed in a flying accident on December 11, 1941.

**Oh, I have slipped the surly bonds of Earth
And danced the skies on laughter-silvered wings;
Sunward I've climbed, and joined the tumbling mirth
Of sun-split clouds — and done a hundred things
You have not dreamed of — wheeled and soared and swung
High in the sunlit silence; hov'ring there,
I've chased the shouting wind along, and flung
My eager craft through footless halls of air.**

**Up, up the long, delirious, burning blue
I've topped the wind-swept heights with easy grace
Where never lark, or even eagle flew —
And, while with silent lifting mind I've trod
The high untrespassed sanctity of space,
Put out my hand and touched the face of God.**

Is Aerial Warfare Doomed?

By Lieut. John Edwin Hogg, U.S.N.R.

Originally published in the **November 1934** issue of **Modern Mechanix and Inventions**.

Original Editor's Note - Statements by aviation enthusiasts that airplanes will wipe out cities, destroy fleets and armies, and win the next war prompted this article by Lieut. Hogg, noted writer on military topics. In it he makes startling revelations about the effectiveness of the airplane as a military weapon. The observations and opinions expressed in this article are those of the author and should not be construed as reflecting the official views or opinions of the United States Navy Department.

Startling Statements About Aerial Warfare

During the World War airplanes sank no battleships, destroyed no city, and failed in every attempt to bomb or gas an enemy out of a military position.

The first 30 days of any major war will see the complete elimination of air forces of belligerent powers.

No aviator entertains the thought that he is going to fly over the enemy anti-aircraft battery in time of war - and live to tell the tale.

Air raids over London and Paris during the four years of the World War destroyed less than \$5,000,000 worth of property and killed fewer than 700 enemy civilians.

It would take 75,000 bombers to carry the load of bombs equivalent to the weight of shells carried by the 15 battleships of the U. S. Navy. The cruising radius of those bombers would be only 500 miles. A battleship can travel 15,000 miles, regardless of weather.

A shell will drill through heavy armor plate, or through concrete walls. It explodes inside to produce a shattering, internal explosion. A aerial bomb, having no such power of penetration pops off like a paper firecracker against whatever it hits.

It would take 28,000,000 pounds of phosgene to "wipe out" an area the size of New York City. To accomplish this the enemy would have to have 14,000 large bombing planes and 280 naval airplane carriers to bring the planes within striking distance of New York.

Dire predictions of the terrible destruction and wholesale slaughter by airplanes in the next war are popular subjects for writers of leading magazines and newspapers. Alleged experts with little regard for facts have told us that the airplane is invincible and invulnerable and has doomed to the scrap heap practically every other weapon of war.

Battleships are to be bombed off the seas. Cities and enemy military positions are to be demolished with bombs and poison gas hurled from the sky, with the odds for victory 100 per cent in favor of the aerial attacking forces.

During the World War airplanes sank no battleships, destroyed no city, and failed in every attempt to bomb or gas an enemy out of a military position. The airplane of today is somewhat improved. It can fly faster and farther. It can go higher and carry slightly heavier loads. Essentially, however, it is still the same old airplane of the World War period. It cannot operate in all weather. It cannot rise vertically. It cannot stand still in the air. Its cruising radius and carrying capacity is still very limited. It is highly vulnerable and cannot be adequately armored. In short, it retains all its inherent limitations. In a military sense it offers at best only a hit and run method of fighting. It can take nothing. It can hold nothing. It cannot stay and fight!

The natural hazards of military aviation even in times of peace are recognized by every government in the form of increased pay to the men who choose aerial duty. The mortality of peacetime naval aviation averages 100 per cent every five years.

Anti-aircraft Guns Stopped Raids

The hazards of military aviation in time of war will be infinitely greater. Indeed, it is not difficult to find many intelligent flying officers in both the United States Army and Navy who predict that the first 30 days of any major war will see the complete elimination of the air forces of belligerent powers. This estimate, of course, may be too high. Nevertheless, our own War Department conservatively estimates that 25 per cent of our air service personnel and equipment will go out of action during every 90 days of actual war conditions.

There was no such thing as an effective anti-aircraft gun during the early stages of the World War, but no sooner were major aerial bombing raids attempted before anti-aircraft guns made their appearance. The first such guns were crude and ineffective. Their improvement, however, was very rapid, and they, more than fighting airplanes, put an end to the major German air raids over London and Paris. Toward the end of the war it was almost certain death for any aviator attempting to fly over an enemy anti-aircraft battery.

Improvements in anti-aircraft guns and gunnery have advanced in recent years beyond any improvements in aircraft. Rangefinders and fire directors have been developed to perform feats of apparent magic instantly and accurately beyond the average human imagination. Among scores of both army and navy aviators, I have yet to meet even one who entertains the thought that he is ever going to fly over an enemy anti-aircraft battery in time of war-and live to tell the tale.

German Raids Cost Millions

The German Zeppelins of the World War period carried about ten times the load of bombs that any airplane can lift today. The Gotha bombing planes carried two tons, which is about the same load that a good bomber can get off the ground nowadays. Unopposed as these raids were except by airplanes and crude anti-aircraft guns, the whole series of air raids over London and Paris during the entire four years of the war destroyed less than \$5,000,000 worth of property. They killed fewer than 700 enemy civilians, which is about the number killed in London traffic accidents every year.

London and Paris were far from "blown off the map" when the war ended and Germany had paid dearly for a series of aerial offensives of very questionable value. She lost 486 trained air men in the Zeppelins and airplanes that were brought down by the enemy. The air raids had cost her tens of millions of dollars; all for the privilege of killing some 700 non-combatant civilians, and smashing up \$5,000,000 worth of enemy property. From a military viewpoint these air raids accomplished less than nothing.

Editorial champions of aerial military supremacy are forever writing about the terrors of bomb-dropping from altitudes above the range of modern anti-aircraft guns. They close their eyes to the fact that no aerial bombing can be effective unless the aviators can clearly see the target they are trying to hit it is a well-established fact that any bomb-dropping from an altitude of more than about 4000 feet is notoriously inaccurate. The lower a bomber can fly the greater becomes its bombing accuracy, but there will be no low-altitude bomb-dropping in any future war. The modern anti-aircraft machine gun discourages that. These guns, throwing a veritable hailstorm of 50-caliber bullets, are effective up to 7,500 feet, and will pierce a quarter of an inch of boiler plate at that height.

A large bombing plane may carry two tons of bombs. It would take about 5000 of the largest modern bombing planes to carry the potential load of destruction represented by the shells in the magazines of a battleship, and the battleship has a cruising radius of 15,000 miles anywhere on the seas compared with the bomber's 2-ton load and 500-mile cruising radius. Moreover, a battle fleet or a battery of field artillery can STAY AND FIGHT as long as it remains afloat or as long as transportation lines can be kept open. The bombing plane must quit as soon as its two ton load of bombs is dropped.

All the military bombing planes in the world today would have to wait for favorable weather, and would then be capable of only a comparatively short overseas flight with half the load of shells a battleship can carry 15,000 miles regardless of weather. It would take roughly 75,000 bombers to carry a load of bombs equivalent to the weight of shells in the magazines of the 15 battleships of the U. S. Navy, and the cruising radius of those bombers would be only about 500 miles away from a base of operations.

Gas Terrors Are Myths

Gas distributed over vast areas by airplanes is another horror-myth overworked in defiance of the laws of physics by aviation enthusiasts. There are gas masks that are effective against all gases. It takes unbelievable quantities of gas to build up an effective concentration over even a limited area. It takes, for instance, 300 pounds of phosgene to gas an area of 100 square yards effectively. This

means that it would take 28,000,000 pounds of phosgene, very evenly distributed, to "wipe out" an area the size of New York City, if there were no gas masks. To accomplish this an enemy would have to have 14,000 large bombing planes and 280 naval airplane carriers to bring these planes within striking range of New York. Does anyone think for a moment that Uncle Sam would be whittling a stick while any oilier nation is building 14,000 bombers and 280 airplane carriers?

Some editorial writers claim that an air fleet that could destroy every important British city in a single day, and that the United States may be bombed or gassed from the air by an enemy air force brought to within striking distance in airplane carriers of the submarine type. Such statements are without foundation of fact.

There is not in the world today a sufficient number of bombing planes to destroy a city the size of London in a month even if we assume that the British would "sit and take it" while the bombs and gas were being showered upon them. As for "conquering" the United States with an air attack brought to us in submarine carriers, consider' the facts of the subject.

Air Attack on New York Impossible

Submarines have been built to carry as many as two very small, folding-wing scout planes. Our Navy has one such submarine. By complete alteration of design, building a larger submarine than any ever built, and leaving out all conventional submarine fighting equipment, it would be possible to build a submarine airplane carrier capable of housing two large bombers. Having noted that 14,000 bombers would be needed to gas an area the size of New York, the enemy seeking to attack America's, largest city with an underseas air fleet would have to have 7000 submarine carriers. Such a fleet could be built for about \$70,000,000,000, and a crew of 700,000 highly-trained men and officers would be needed to operate it .It costs about \$500 an hour to operate a single, large, modern submarine. Hence, it would cost about \$714,000,000 per day to operate this diving aerial armada. No nation on the face of the earth today could finance such an operation. As an act of war such an attack would have about the military significance of a honeybee attacking an elephant!

Bombing Is Guesswork

By some mysterious appeal to human imagination the aerial bomb has been propagandized as a terrible weapon of destruction. A shell is infinitely more destructive. The aerial bomb is dropped at a target and hitting the target is largely a matter of guesswork. There is mightly little guesswork about hitting a target with a shell over ranges up to 25 miles. A bomb and a shell may carry identical charges of high explosive but still the shell is by far the more deadly. Regardless of the altitude from which it is dropped the bomb will attain a velocity of only about 500 feet per second in falling. The shell, on the other hand, is fired from a piece of artillery and has a velocity of about 3000 feet per second. A shell thus has the power of penetration that the bomb lacks. A shell will drill through heavy armor plate, or through concrete walls. It explodes inside to produce a shattering, internal explosion. A bomb, having no such power of penetration pops off like a paper firecracker against whatever it hits. It can produce only an external explosion that is largely wasted upon the atmosphere.

In an experimental bombing conducted by the United States Army, using the condemned Pee-Dee. River bridge in North Carolina, for a target, the few 600-pound bombs that made direct hits on the concrete and steel structure dented the bridge but failed to render it impassable. Finally, 1100-pound bombs had to be used to break a single span. Had this trial target been an enemy military position defended by airplanes, modern anti-aircraft guns, and batteries of anti-aircraft machine guns, it is highly improbable that the "attacking" air force could have landed so much as a single bomb upon the bridge.

Japanese Aviators Failed

Japan is said to have an air force equal to, or possibly superior to that of the United States. Yet in the recent Japanese military maneuvers in China her air forces accomplished nothing even remotely approaching the predictions so frequently heard from aviation enthusiasts. The aviators did accomplish many important military functions such as scouting, intelligence work, and the like; but even that work was hampered or often completely frustrated by the fighting efficiency of Chinese aviators. Bombing and gassing operations were virtually ineffective. In one instance 6000 pounds of Japanese bombs were rained down at a group of Chinese snipers on top of an old wooden Observation tower 150-ft. high. After the Japanese aviators had, dropped all their bombs the old tower 'wasn't even shattered, and the Chinese snipers were still in action.

Since the development of aviation has pointed out .the possibility of civil populations being attacked with bombs and poison gas, popular fancy seems to have eloped with the baseless theory that wars will be so waged in the future. It would be the most useless, extravagant, and illogical method of attempting to win a war. The objective of any war is the subjugation of military forces, hence any attack upon civil populations would be like going after a swarm of bees scattered all over a state, instead of attacking the hive. The aerial bomb that might be dropped upon a cathedral could be used to far better advantage against an enemy supply train. The pound of gas that might be used to strangle non-combatants sitting by the fireside would be far more effective in an enemy military camp.

Doughboy Will Win War

The next war, if it comes, will probably be fought very much like previous wars of history. It will be won by the nation that can make the most intelligent and effective use of every available weapon. It will be won by the side that can close the seas to the enemy, and finish the last decisive battle on land with its soldiers on enemy soil. Weapons, whether they are tanks, battleships, airplanes, bombs, poison gas, artillery, or other devices, are only stepping stones toward the goals of winning a war. Every act of war is merely paving the way for the doughboy with a rifle, and a bayonet in his hands. It is the doughboy that in the final analysis brings a beaten military power to the peace conference.

Where is Our Air Power?

By Col. Roland Birnn, U. S. Army Air Forces

Originally published in the **June 1942** issue of **FLYING and POPULAR AVIATION**.

WHERE is American air power? The question is born of impatience. It bobs up nervously, repeatedly, in disregard of President Roosevelt's reminder of time, distance, enemy geographical advantages and other factors in this "new kind of war." It persists in the face of daily battle victories by United States flyers and other triumphs in which American planes figure.

The feeling seems to be that in the first four months of~ the war alone American aircraft plants must have turned out more planes than were in the entire Japanese air force at the start. The qualitative superiority of our aircraft has been established beyond question. Why indeed has not our air power made itself felt more decisively?

The complete answer cannot be given, of course, without betraying priceless information to the enemy. But Hitler and the Japanese know that American air power is on the way. It is rising as inexorably as the tide, even though not as rapidly as any of us would like.

Unfortunately, it is spread thin for the moment. With due regard to the familiar military principle that to try to be strong at all points may result in being superior at none, it has to be spread all over the map at this early stage because of the very nature of a conflict which covers the entire globe for the first time in all history. The enemy is throwing punches at us from many directions and may throw more from others. We will have to take some on the shoulders or the less vulnerable parts of our strategic anatomy, while we get in position to uncork our terrific right. But we can't take many on the chin. So we have to spread out the important defense to guard that chin, and spreading it out takes planes, many of them.

Neither the Japanese nor the Nazis will be told anything they do not already know by a quick look at our world wide efforts, necessities and problems in this year of preparation for offensive blows to come. Although generally known, these tend to be overlooked at times or are obscured in the day by day drama of the war.

With the spotlight on the other side of the world, it was easy to forget that upon American air power, in conjunction with sea power, rests the primary responsibility for keeping control of the Atlantic. Army and Navy planes patrolling the skies from Iceland to the Panama Canal and to South America testify to the whereabouts of much of our aerial strength. The House Military Affairs Special Committee on Aviation thus outlined our task in the Atlantic:

"The importance of air power and the development of large air forces by potential enemies have forced our acquisition of outlying offshore bases for strategic defense uses. We must make it most difficult, if not impossible, for hostile bombers to reach our cities and strategic defense areas.

"Through building up defense air bases at Newfoundland, Bermuda, Puerto Rico and upon various islands in the West Indies southerly to Georgetown in British Guiana, we are screening the entire Atlantic coastline of the continental United States and the Caribbean area with air bases designed to prevent any air or surface invasion of the United States or the Panama Canal Zone from the east or

south.

"When our program of construction is completed at these outposts and they are adequately manned with first-line planes, it is the judgment of our special committee that raids on our strategic areas by an enemy in force will be most difficult.

"Through the acquisition and completion of Naval and air bases at these outposts, we augment our security in two ways: First, by permitting effective air defense (that is, striking the enemy before he can take off to bomb our vital establishments); second, by denying access to the enemy of these offshore areas themselves as bases from which to attack us."

Lieut. Gen. Henry H. Arnold, the Army Air Forces commander, indicated the magnitude of this particular phase when he stated (shortly before war engulfed the United States) that in the North Atlantic region, "we are garrisoning eight large bases and four radio and weather stations where 20 to 30 men will maintain emergency staging fields."

On the other side of the Atlantic, Lord, Beaverbrook has reported that last year alone the United States supplied some 2,000 military aircraft to underwrite the security of the British Isles and to add to the striking power of the RAF.

Hundreds of Curtiss Kittyhawk and Tomahawk fighters in Britain's offensive in the desert against the Nazi Afrika Korps roared a partial answer to the question of the whereabouts of our air power last winter.

India is claiming the attention of our air strategists. Farther east the colorful American Volunteer Group of former Army and Navy pilots, flying early model P-40 fighters, were inflicting damage to the enemy. Although forced back from the Burma Road by overwhelming numbers, they licked from the start five times and more their weight in Japanese aircraft.

In the Southwest Pacific, almost at the world's most distant area from the United States, American air power has written a blazing chapter in warfare against odds made overwhelming by enemy treachery and by distance. In Australia, as well as in Java and the Philippines, we were called on to contribute the major share of the aerial effort to curb the invaders.

Beyond all these commitments, heavy demands had to be met at the same time to bolster defenses of the home front. Secretary of War Stimson made this clear when he announced a few weeks after Pearl Harbor that aerial defenses of both Hawaii and our own west coast had been made stronger than at any previous time.

Alaska is another story which, because of the North Pacific's strategic importance cannot be revealed at this stage. Iceland is another outpost whose story cannot be told.

Likewise veiled by wartime necessity are operations of the Ferry Command extending across the Pacific as well as spanning the North and South Atlantic to tie together all the far-flung fighting fronts of the United Nations.

At home, mounting air power is too familiar to require more than a mention of the 1942-43 production goal of 185,000 planes and the announced official objective to expand the Army Air Forces alone to possibly 2,000,000 men.

Every American has thrilled at the triumphs of American flyers and planes in the Pacific; over the

hammer blows struck by long range Army heavy bombers; by the manner in which Navy carrier-based fighters disposed of 16 out of 18 enemy bombers in a single brief engagement; and over the amazing exploits of Gen. Douglas MacArthur's little air "force" on the Bataan peninsula.

Of sharper significance for the future are summaries of accomplishments covering extended periods. After less than 12 weeks, the War Department was able to report that the Army Air Forces had probably sunk 19 Japanese vessels and seriously damaged 31 others.

Army planes, along with antiaircraft artillery, had shot down a minimum of 245 Japanese planes, while the foe accounted for but 48 in the air even though the Japanese were in overwhelming numerical superiority in almost every encounter. The five-to-one ratio was maintained by the AVG'S in Burma who in the same period definitely sent 165 enemy planes crashing while losing only 31 of their own aircraft. Heavy losses sustained by both sides from the destruction of planes on the ground were excluded because accurate figures for the foe were unobtainable and disclosure of our own losses in this category would assist the enemy.

Most reassuring of all portents of the future has been the record of the heavy four-engined bombers on which offensive calculations are largely based. The limited number of B-17 Flying Fortresses which were called on to carry the ball against appalling difficulties in the Philippines and then the Netherlands Indies lived up to every advance expectation that they would strike body blows.

It was not until they were able to operate from bases in the Indies beyond the immediate reach of the foe that they really began to function. Their score thereafter must have caused some wincing in Tokyo (and Berlin as well). Only the factors of distance and time prevented our sending sufficient fighting planes to support the bombers when the enemy finally moved in close.

A tabulation from official communiques shows that in the approximately seven weeks between January 5 and February 25 they definitely sent to the bottom one Japanese cruiser, a destroyer and five transports besides downing 31 or more enemy planes in aerial combat or raids on air fields.

Hit and sunk or put out of action were an enemy battleship which was twice heavily bombed in the Southern Philippines' Gulf of Davao, four cruisers and 11 additional transports.

The tabulation is ultra-conservative. What the War Department had to say in reporting on all American Army Air Forces operations applied particularly to the long range, high altitude heavy bombers. This statement said that "it is particularly difficult to confirm sinking of vessels by aerial action, because the pilots and observers are often at too great an altitude or are flying at too great a speed to know in every instance the results of an attack." The reports were confined to those enemy vessels where the observed damage was so great as to leave little doubt of ultimate destruction, or where direct hits were scored.

Equally gratifying has been the demonstration of the ability of the heavy bombers to take care of themselves. One was shot down on February 2, in a raid on the Borneo oil port of Balikpapan, but the formation of four accounted for nine enemy fighters. A week earlier, another was shot down in the Battle of Macassar Strait, but the five in this formation sank one transport, set fire to another and shot down two or three enemy planes.

The heaviest loss of heavy bombers was on January 19, when a formation of five was intercepted by enemy fighters. Two B-17's were shot down that day and one was damaged, but they accounted for nine Japanese fighters. In a substantial majority of the attacks the big bombers returned undamaged

to their bases.

The record of the P-40 fighters has been as impressive. A relative handful of A-24 Army dive bombers proved their worth in the baptism of fire for this type in the air and sea battle of the Java Sea on the eve of the Japanese invasion of the island of Java.

Unfortunately, the time and distance factor prevented a well balanced air force there; one with its quota of pursuit planes to allow the bombers to operate and be serviced with a minimum of damage from the enemy air force.

Altogether, at the outset of this first World War of the Air, facing the most formidable military undertaking in modern history, American air power, thin as it is, already is making some grimly reassuring, preliminary reports on its whereabouts. The advance guard of this air effort is plugging the leaks in the dikes; sometimes being overwhelmed or lost in the process, but allowing the tide of air power to rise and rise, until our strategists, gauging the time and place, release this pent up tide in a roaring flood strong enough, effective enough, to overwhelm our enemies.

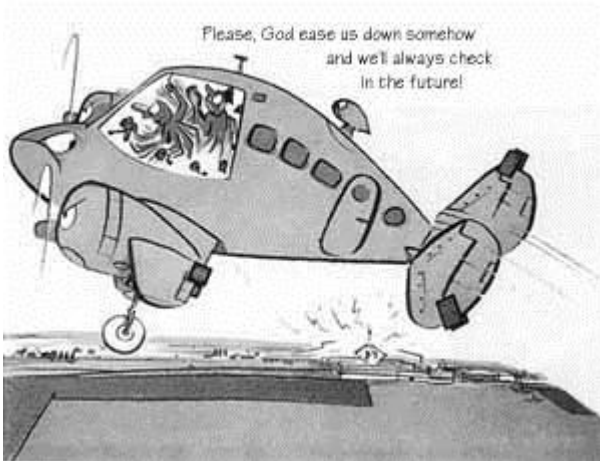
Editor's Note: The only change to the original article's punctuation or spelling was to correct the spelling of Philippines.

It seems that every aviator goes through a period early in his career, somewhere between 300 and 800 hours of flight time, where he knows everything and can't be taught anymore - or at least so he thinks. With the great expansion of air forces required by America's entry into World War II, this phenomenon reared its ugly head especially in the U.S. Navy, where operational accidents by newly trained aviators seemed to skyrocket.



The cartoon character originally named "Dilbert Groundloop" was conceived by Capt. Austin Doyle, USN and Lt. Cdr. Robert Osborn, USNR in the weeks after Pearl Harbour, with Osborn being the artist. The name was quickly shortened to just "Dilbert" and in a series of one panel sketches on flyers and in training pamphlets, Dilbert quickly became a sort of anti-hero as the classic head-up-and-locked pilot just looking for an accident.

Older experienced aviators knew to avoid the brightly colored primary and basic trainers, but it was hard to know what a "700-hour stage" pilot might do, such as Dilbert.



The classic "kick-the-tires and light-the-fires", too hurried to worry about a preflight inspection sort of accident seemed a normal event for Dilbert.

Although Dilbert represented the worst of commissioned aviators, his "cousin", Spoiler, helped teach enlisted ground crewmen how not to foul up, too. Here, Spoiler's indelible marshalling signals are no help to the pilot.



The following short narrative was supposedly written by a fifth-grade student, when and where not known. It has bounced around naval and aviation circles for years and has been included in at least one book. One has to wonder if some Army Air Corps type didn't pose as the "fifth-grader", eh? Enjoy.

A Naval Aviator

I want to be a Naval Aviator when I grow up because it's fun and easy to do. Naval Aviators don't need much school. They just have to learn numbers so they can read instruments. I guess they should be able to read maps so they can find their way if they are lost. Naval Aviators should be brave so they won't be scared if it's foggy and they can't see or if a wing or motor falls off they should stay calm so they'll know what to do. Naval Aviators have to have good eyes so they can see through clouds and they can't be afraid of lightning or thunder because they are closer to them than we are. The salary Naval Aviators make is another thing I like. They make more money than they can spend. This is because most people think airplane flying is dangerous, except Naval Aviators don't because they know how easy it is. There isn't much I don't like, except girls like Naval Aviators and all the stewardesses want to marry them so they always have to chase them away so they won't bother them. I hope I don't get airsick because if I do I couldn't be a Naval Aviator and would have to go to work.

A fifth-grader (?)

One of the great books about aviation, in my opinion, is Ernest K. Gann's ***Fate Is The Hunter***, first published in 1961. The final chapter is about a flight captained by Gann in a DC-4 from Hawaii to Oakland, Calif. with a stop in Burbank. On that flight Gann and his crew experienced an unusual vibration. Unknown to them, another DC-4 mysteriously crashed on the same day.

Gann went on vacation after the flight and before reporting back to work, bumped into the airline's head of maintenance, a man named Howard, at a Chinese restaurant. The last few paragraphs of the book are one of the best descriptions of the concept of **fate** in aviation I've ever read. If you have not read this book you should.

From ***Fate Is The Hunter*** by Ernest K. Gann, with comments by the editor in brackets::

He approached me slowly and his eyes were so filled with mischief I wondered if he had preceded all of us to the Chinese wine. A hand flew upward in a gesture which might have been made by Sloniger [one of Gann's previous captains and teachers]. The hand executed the beginning of a chandelle and landed lightly on my shoulder.

"Let me touch you," Howard said. "When we eat I'd like to sit at your side. Maybe some of your luck will drip on me."

He caressed my shoulder and then my arm as if I were some pagan statue and I was exceedingly embarrassed.

"Yes, you're the living proof that it doesn't pay to be overly smart."

My embarrassment turned to bewilderment. I didn't know Howard well enough to exchange insults.

He led me to the table. "Please . . ." He pulled out a chair and bowed me into it.

[Howard then explained that an examination of the vibration Gann had reported was "a masterpiece of innocence".]

"Did you know we grounded every DC-4 in the world because of you?" he asked.

"I've been sailing. . ."

"Never giving a thought to vibration, of course."

"Thank you for completing my picture of blessed ignorance." He frowned and his hands fluttered uncertainly. "But I will never understand your nonchalance. Listen to me very carefully. I've spent too much time on this investigation to miss the finale."

It soon became obvious that Howard's detective work had included my personal anticipations. Even what I had said to the crew and passengers had been remembered and considered.

"Although we can never be absolutely certain, we now believe the Eastern Airline crash at Bainbridge was caused by unporting. Do you know what that is?"

I confessed that I had never heard of it.

[Howard explained that unporting could be caused by a missing elevator hinge bolt, like that missing on Gann's DC-4, and cause an uncontrollable nose-dive, if the plane were flown at certain speeds and center of gravity loadings.]

"Did you slow down when you first noticed the vibration? You did not because you had no fear of it. But if you **had** been the nervous type, if you **slowed** down, the center of gravity would have changed. That would have been quite enough to complete the process of unporting which had partially begun."

"The vibration really wasn't very bad."

"It doesn't take much. But let us assume another pilot would have reacted in the same way. It would only have postponed the inevitable. As soon as the time came for a normal power reduction and it was accomplished, importing would begin. But not you. In the past you had lost all four engines so many times, the prospect of losing one gave you relatively little concern. So you sat there, fat, dumb, and happy, and you canceled all power reductions. This brilliant decision saved your life the **first** time that day."

I could think of nothing to say but a series of well . . . well's. Howard held up one finger and then raised a second beside it. "This was not enough," he said, and I saw that he was exasperated. "You landed at Burbank and disembarked twenty-one passengers. God alone knows why, but you took on just enough fuel to make up the difference in losing their weight. Even so your center of gravity would have been changed enough so that unporting was more likely than not. **But . . .**"

He moved a third finger up beside the others.

"You were in a hurry to reach Oakland so you could go about your silly sailing. As a result, and don't try to deny it because the figures are in the logbook, you used full gross weight cruising power all the way and your speed was correspondingly high. . . ." He paused, touched at his mustache, and stared at me incredulously. Then he spoke very slowly, clipping off each word as if he intended to impress

them on my memory forever. "I would look at you quite differently if I thought you had planned what we eventually discovered. We had some long sessions with our slide rules and we found, my friend, that you had arranged the **only possible combination of power, speed, and weight** which would blockade the chances of unporting."

Later, when the wine had mellowed us both, I asked Howard if his slide rule could measure the fate of one man against another's.