Advanced Flying School at Kelly, and moved its MB-2's (now designated NBS-1's), its HP 0/400 and its Caproni to Langley. The air crews flew the aircraft to Langley, and the rest went by train.

The Group and Squadrons established their headquarters on the flight line. The Group had been at Langley only one month when the 49th Squadron was detached for duty with the Army Ordnance Proving Ground, Aberdeen, Maryland. This move turned into a six-year separation of the 49th from the Group.[49]

Contemporary with the Group's arrival at Langley , the 2d Wing was reactivated[50]. This Wing had been established in 1920 and deactivated in 1921. All of these changes – activations, deactivations, reactivation, changes of unit designations and unit movements – were symptomatic of the difficulty the Air Service had, from 1919 to 1923, deciding how to organize and fit into the overall Army of the 1920's.

As of October 1922, the Group was comprised of the 11th, 20th, 49th(detached) and 96th bombardment Squadrons, the 59th Service Squadron, and the 2nd Photo Section. Group aircraft consisted of twenty-seven NBS-1s, and one HP 0/400. It is not known if the one Caproni was still assigned. There are indications that it was retired in late 1922 or early 1923. Three of the twenty-seven NBS-1s were on detached duty with the 49th Squadron.[51] In June 1923, the HP 0/400 was scheduled for a fly-by and landing in Washington, DC, for a Shriners' convention. On take off at Langley, the aircraft lost power in one engine, came down hard on one wheel, broke the axle, crashed into a railroad spur a the end of the airfield and nosed over. The pilot was thrown free and killed. This event marked the end of the HP 0/400 in the Group.[52]

A new radio and repair maintenance section was established. While operating with the 1st Provisional Air Brigade in the bombs-against-ships trials, Group NBS-1s were equipped with radios for command and control. The radios were retained and experimenting in their use continued at Langley with only marginal success. The radio sets then available had a maximum range of 40 to 50 miles. Their use was further plagued by electrical interference and shielding.

The Group used the balance of 1922 and early 1923 for organizing and training. It would be over a year before the Air Service developed a standardized training program. In the meantime, the Group devised its own. The Group program included three and nine-ship formation flying, bombing and gunnery practice, and cross-country flying.

Air crews were particularly interested in the most effective formation bombing patterns, the air defense formation, and methods used for air-to-air communications. The shortcomings of the DH4B as a bomber were discussed, especially the lack of range and speed. These discussions were undoubtedly the forerunners of the continual requests by bombardment personnel for faster, higher flying, and long-reaching bombardment aircraft. The NBS-1 was a step forward. It could carry up to 2500 pounds of bombs but was still limited in speed (98 mph) and range. Bombing and gunnery practice were limited by available ranges and targets for air-to-air gunnery.

Cross-country flying was emphasized with trips to Mitchel Field, New York; Wright Field, Ohio; and Cincinnati, Ohio. All of the cross-country trips were made under good weather conditions and in daylight. Aids for night flying and night navigational were yet to come. In fact their were severe limitations in most navigational aids, including aerial maps. The Group spent much time flying in the vicinity of Langley Field, identifying alternate landing fields, and trying to develop aerial navigation strip maps.

In June 1920, the Air Service began publishing circulars detailing experiences gained during WW I. Many of these circulars filtered down to the Group and pertinent information found its way into Group training programs.[53]

In November 1922, Air Service issued a directive making the use of parachutes mandatory by all personnel flying in an aircraft. Up until that time, their use was optional, and many macho air crew members frowned on their use.

At the beginning of 1923, nearly half of the buildings at Langley were still temporary WW I construction. Permanent structures included twenty-six two-family officers quarters, two brick airplane hangars, a large airship hangar, two bachelor officers quarters (Lawson & Dodd Halls), a seaplane hangar, a boat house, and an officers club. Still on the list to be constructed were a hospital, more hangars, barracks, and mess halls. Construction at Langley was an ongoing activity. It was after 1935 before Langley Field had paved runways. [54]

Bombs Against Ship Trials, 1923

After the 1921 bombing tests, Gen. Patrick, Chief of Air Service, negotiated with the Navy to conduct more tests against de-commissioned U.S. warships. Gen. Patrick's intentions were not to prolong the controversy over effectiveness of aerial bombs against seacraft, but simply to get more training and experience for bombardment crews, and to increase their efficiency. The Navy agreed to provide two obsolete ships that were to be scrapped under terms of the Five-Power Naval Treaty signed at the Washington Naval Conference. The designated target ships were the decommissioned battleships *USS New Jersey* and the *USS Virginia*. Gen. Mitchell was recalled from an official visit to Europe and placed in charge of the tests. Mitchell reactivated the 1st Provisional Air Brigade. The 2nd Bombardment Group, as a whole, was detached to the Brigade in August 1923, and given the principal bombing role for the trials.

An advanced party was dispatched to the Cape Hatteras, North Carolina, landing field to assist in preparations for the Air Brigade's arrival in late August.

Congress had approved the test and specified that not less than $50,000 of the Air Service appropriation for fiscal year 1924 be used for bombing tests against obsolete naval craft [55]

Mitchell wanted to test his bombing operations against radio-controlled ships, with steam up, a full magazine, and with several live animals aboard. He suggested the ships be maneuvered near the Diamond Shoals Lighthouse off Cape Hatteras. Mitchell's plan was to establish an auxiliary airdrome on Cape Hatteras and, thereby, give his personnel experience in operating from an advance base. His plan was to sink one ship as quickly as possible. The trial against the second ship was to include a succession of attacks to test smoke bombs, to lay a smoke screen over a maneuvering ship, and among other things, determine the effects of gas on animals aboard the ship.

Much of Mitchell's plan evaporated when the Navy refused to radio control the ships, have steam up, have the magazines full, or have live animals aboard the ships. Additionally, the War Department specified that the test commence with a bombing from 10,000 feet. The Navy anchored the *New Jersey* and *Virginia* off Diamond Shoals Lightship and stood by.

The decree for bombing from 10,000 feet was a major problem for the Group. The standard NBS-1 could not bomb from 10,000 feet. It just could not lift a 2,000-pound load that high. The Group had assembled six new NBS-1's, with superchargers, at Langley in mid-July 1923. Testing of these six NBS-1's proved to be unsatisfactory. Frantic work ensued to solve the problem. Group personnel worked night and day to modify the superchargers and get the aircraft to 10,000 feet with a 2000-pound bomb load. 1st Lt. Carl A. Cover moved the radiators of one supercharged NBS-1 from beside to beneath the motors.[56] This "fix" seemed to solve the problem. A modified supercharged NBS-1 with twelve 100-pound bombs could go to 10,000 feet in fifty-four minutes. With two 1100-pound bombs it took eighty-five minutes. For the time being, this modified, supercharged NBS-1 was the only Group aircraft capable of going to 10,000 feet with a 2000-pound bomb load.

With around-the-clock work continuing, the Group got five more NBS-1's modified before the test deadline. The Group, less the six modified NBS-1's, deployed to Hatteras Landing Ground on September 4. The supercharged NBS-1's were left at Langley under the command of 1st Lt. Charles B. Austin. The tests were scheduled to begin the morning of September 5. Lt. Austin's flight of six supercharged NBS-1's were to take off from Langley, climb to 10,000 feet, and be the first to bomb. After Austin's attack, the balance of the Group, with the non-supercharged NBS-1's would bomb from 6000 feet.

Fog at Langley on Wednesday, September 5th, lifted enough by 0 6:00 A.M. to allow Austin's flight to take off. Each NBS-1 carried four 600-pound demolition bombs. One plane was delayed, so only five attacked the *New Jersey* at 8:40 A.M. The flight then landed at Hatteras.[57]

A flight of seven NBS-1's followed, led by Capt. Lloyd L Harvey. This flight bombed from the assigned altitude of 6,000 feet with 2000-pound demolition bombs. After this attack, Gen. Mitchell flew by the *New Jersey*, saw that the ship had settled considerably, and concluded that it was doomed. It would soon go down!

Mitchell diverted the second 6,000-foot-altitude attack from the *New Jersey* to the *Virginia*. 1st Lt. Harrison G. Crocker, led this attack by seven NBS-1's, each with two 1100-pound bombs. This was a devastating attack that decimated the ship, and within thirty minutes the *Virginia* was gone beneath the waves.

Capt. Harvey was ordered to re-attack the *New Jersey*. The bombing was not good. Capt.

A 96th Bomb Sqadron insignia was applied to the nose of this Curtiss-built NBS-1. (Courtesy U.S. Army / P.M. Bowers)

Harvey's bombs stuck in the racks, causing a late release, and his two bombs overshot the target. A final flight of two aircraft was dispatched. Each aircraft carried two 1100-pound demolition bombs. The first plane placed its bombs near the ship, one about ninety feet away and one alongside. The one alongside was a "dud." The second aircraft hit the *New Jersey* "dead on" with its first bomb. Before the pilot could come around for the second run, the *New Jersey* turned over and sank.[58]

In the 1921 and 1923 trials, crews of the 2nd Bombardment Group made up the primary attacking units. Group crews sank three ex-German warships, and one decommissioned U.S. battleship in 1921, and two decommissioned U.S. battleships in 1923. The experience from these two trials confirmed the necessity to improve bomb racks, bomb release mechanisms, bomb sighting devices and the fuzing of ordnance. Improvement of the Sperry bombsight was discussed and some modifications suggested. A few of the aviators felt that the Sperry sight had its limitations above 15,000 feet altitude. The air crews also felt that bombing in formation would have been more effective than the single aircraft attacks used. Something was learned about the physical vulnerability of targets and the type of bomb to be used, but not enough. The 1100-pound bomb appeared to have done as much damage as the 2000-pound bomb. With the 1100-pound bomb the NBS-1 had two tries at the target, but only one with the 2000-pound bomb. The Group realized more experimentation and experience were needed with the superchargers on the NBS-1. One obvious requirement was the ability to bomb from altitudes higher than 6,000 feet. The supercharger of 1923, gave the NBS-1 the capability to reach 10,000 feet. However, in 1923, nobody knew what the use of superchargers would do to fuel consumption or how they would affect the aircraft's range. All these unknowns had to be sorted out in the coming years.

1924-1926

In this two-year period, the Group and its Squadrons received official insignias. The Group aircraft inventory decreased from the original 27 NBS-1's to fewer than 20. There were no new buys of aircraft during this time and no replacements for crashed aircraft. The 11th Bombardment Squadron did have its aircraft inventory augmented by the addition of four Sperry M1A Messengers, but these administrative aircraft did not enhance the Group bombardment capability. Using a new night landing system, the Group embarked on extensive cross-country flights and night flights. In 1924 the Chief of Air Service initiated an annual bombing and gunnery match, and the Group participated in each match. The competition was hosted by the Air Tactical School at Langley, with much of the support coming from the Group.

Group and Squadron Insignia

One significant occurrence in 1924 was authorization of a Group insignia. During World War I neither the 1st Day Bombardment Group nor the Squadrons had official insignias approved by the War Department. In 1919, the 11th, 20th, 96th, and 166th Squadrons resurrected their wartime insignias and had them painted on their DH4B's. The aircraft deployed on the Mexican border had these insignia on their fuselages as did the aircraft used in the bombs-against-ship trials. Although insignias were used from 1919 to 1923, they had not been officially unauthorized.

The 1st Day Bombardment Group had an insignia during WW I; however, it was not displayed on any aircraft. The insignia was a composite of subordinate unit insignias. It was a four-leaf clover surrounding a diamond, with a squadron insignia depicted in each leaf of the clover, the Photo Section insignia in the center and the Intelligence Section insignia on the stem of the leaf. This insignia was not carried forward in the 1919 reactivation.

Design of a Group insignia began at Kelly Field. Walter Myer and Jack Davies, officers in the Group, initiated the design. This design was submitted to the War Department in mid-1923. Neither Meyer nor Davies was as versed in the history of the Group as they should have been. Each thought the Group had earned five WW I campaign credits when, in fact, only three were earned — two offensive and one defensive.[59]

Excerpts from Adjutant General of the Army's Memorandum G-4 DTD 1.17-24:

The Secretary of War approves the following Coat of Arms and *DISTINCTIVE INSIGNIA* for the 2nd Group (Bombardment) Air Service.

"The Second Group (Bombardment) assumes a Chief (Top) for its service in the World War, dividing it into Five Pallets to represent the five major offensives in which it participated in that war: Cantigny, Aisen-Marne, St. Mihiel, Chateau Thierry, and Meuse Argonne, and tinctures them green and black, the old colors of the Air Service which it bore during the War. The Chief is Scalloped under each pallet, leaving each one standing out like an individual shield. The Chief bears a White fleur-de-lis in the center, as a symbol of France, in which country these battles were fought.

The Shield itself is gold and charged in Fess (Center) with Four Aerial Bombs in Blue, one of the two principal colors now designated for the Air Service. The four bombs represent the four combatant squadrons.

The Motto appearing on the Scroll in base will be 'MORS ET DESTRUCTIO' or 'DEATH AND DESTRUCTION', the dual purposes sought by a Bombardment organization in action . . .

The Insignia will be manufactured in bright metal, and will not exceed 1 1/4" in height. It will be worn by both officer and enlisted personnel on the uniform, as set forth in the attached regulation."

The insignia has remained the same since its approval January 17, 1924, but the motto was changed in 1940, as explained in Chapter VII.

On March 3, 1924, insignias for the 11th, 49th and 96th Squadrons were approved by an Adjutant General Office memorandum. The 49th and 96th Squadron insignia were the same as used in WW I. The 166th Squadron had been combined with the 49th Squadron. Its WW I Squadron insignia was dropped and the 49th's Wolf Head insignia retained. Of the four squadrons, the 49th was the only one to have, what was previously, a pursuit squadron insignia. The WW I 11th Squadron insignia was modified slightly. This modification involved the addition of a cane for the comic character, Jiggs, and enlargement of the bomb he carries. The authorization for the 20th Squadron insignia came in June 12, 1924. The original insignia had a derby-hatted, crouched figure about to toss a round bomb. The figure was soon referred to as the "Mad Bolshevik." By 1922, the international scene was fraught with the emergence of Bolshevism. The possible association, even inadvertent and unintentional, of a U.S. Air Service squadron with Bolshevism was an unsettling incongruity. A new design retained the essence of the original — a figure tossing a round bomb. The figure was changed to resemble an Italian bomb-thrower, standing on a flying bomb upon which eleven iron crosses are inscribed — the official number of enemy aircraft shot down in WW I. Soon thereafter, the so-called Italian figure was dubbed "Pineapple Pete." The nickname still holds today.

Each Group aircraft soon sported the Group insignia on the nose and a Squadron insignia either forward of the pilot position or midway between the engines and the tail.

The Air Service annual bombing and gunnery competition at Langley attracted the best pilots, gunners, and bombardiers in the Air Service. The Group played a key role in these competitions, both as a supporter and a competitor. In the early years, awards were not presented to individual winners. Not until 1928, when the Distinguished Aerial Gunner (DAG) and Distinguished Aerial Bomber (DAB) medals were created, did individual winners received an award. The DAG and DAB were made retroactive to 1925. At the end of competition in 1928, the medals were awarded for 1925 through 1928 in one ceremony. Among those receiving awards were the following:[60]

Lt. L.L. Berry*	1925
Lt. C.E. Shankle	1925
Lt. R.W. Douglass*	1925
Lt. H.L. George*	1926
Lt. E.E. Harmon*	1926
Lt A.E. Puryear*	1926
Lt. W.T. Larson*	1927
Lt. J.E. Parker	1927
Lt. J.F. Whitely*	1928
Lt. J.J. Williams	1928
Lt. E.E. Partridge	1928
Lt. W.M. Lanagan*	1928
Lt. O.J. Bashey	1928

(* = 2nd Bomb Gp)

The Air Service undertook a concerted effort to make night flying a regular part of flying training. Experimentation with night flying began in 1922, but it wasn't until 1923 that the Air Service installed electrical navigation aid equipment on selected aircraft and landing fields.

The Air Depot at Fairfield, Ohio had responsibility to supply night-flying equipment for 80 DH4B's, 60 NBS-1's, and 12 MB-3A's. The depot shipped the equipment to various air bases along with installation instructions. The Group began installing the equipment on its NBS-1s, and started a night flying training program. The training involved night landings, night navigation, mostly round-robins from Langley, and night formation flying. By October 1924 modification of the airplanes was complete, and crews had enough experience to make a six-ship, night formation flight to Mitchel Field, New York. Although other Air Service single aircraft had made night flights as early as May 1922, the Group was the first to launch and assemble a night formation flight, proceed to a destination several hundred miles away and land without incident. The Air Service, in its eagerness to gain publicity, was able to get a press release describing this memorable night flight. The press called attention to the aircraft carrying two electric landing lights on the wings, and a red and a green running light on the wing tips, and a white running light on the tail. It was also noted that the aircraft carried four parachute flares and four wing-tip flares.[61]

All this while, the 49th Bomb Squadron was detached to the Army Ordnance Proving Ground, Aberdeen, Maryland. The 49th took part in developing night flying and night bombing techniques, testing various sizes and shapes of bombs, and participating in public service affairs. In the latter instance, the 49th provided protection to bridges and cities adjacent to frozen rivers during several winters. The Squadron bombed ice floes and ice jams that were endangering bridges or threatening to flood shorelines along several cities. The rivers attacked were on the east coast within a 400 mile range of Aberdeen. The 49th received several commendations for this service.

In 1925, through arrangements with the Army Adjutant General's Office and the Army General Staff, the Air Service Chief was able to get a formal training program down to the Air Service tactical units. The 2nd Bomb Group immediately implemented this long sought-for program. The training program was divided into four periods of varying length as follows:

lst period – three months. Officers one hour per day ground instruction to include theory and practice of bombing, gunnery, navigation, night flying, photography, use of parachutes, supply, maintenance, and methods of operations and organization. Flights in the mornings using dummy bombs, camera guns for gunnery. Flying instruction to include navigation, cross-country flying, night flying and aerial photography. Enlisted men to be given courses in airplane mechanics, armament, communications and administration.

2nd period – four months. Devoted to unit air training, formation flying and cross-country flying. Practice dropping bombs from various altitudes with different kinds of bombs.[62] Bombing raids conducted on simulated targets at distances of 250 to 400 miles from home base.

3rd period – two (2) months. Operate summer camps and provide instruction for Organized Reserve, Reserve Officer Training Corps (ROTC) and National Guard.

4th period – two (2) to three (3) months. Combined unit formation cross- country flights, combined or provisional unit participation in Army or Air Service maneuvers, and participation in combined operations.[63]

The benefits of the 1925 Air Service training program were put to the test in October 1925. Since he had taken command of the Air Service, he had wanted to conduct an annual maneuver involving his air units. Finally in 1925, Gen. Patrick obtained authority from the War Department to assemble all available pilots and planes of the 1st Pursuit Group, 2nd Bombardment Group, and 3rd Attack Group at Mitchel and Langley Fields for maneuvers in October. The assembly consisted of forty-five planes, all the up-to-date fighting ships the Air Service could muster. The first part of the maneuver from Mitchel Field involved the aircraft defending the north-east coast against a theoretical attack by a hostile fleet of four airplane carriers and four hundred planes. For the second part of the maneuver, the Air Service force moved to Langley Field to defend against an enemy landing in Chesapeake Bay. Both Gen Patrick and Gen. Fechet, Mitchell's replacement as Asst. Chief Air Service, declared these maneuvers highly successful and recommended that similar events be held annually.[64]

The experience gained by the Group on the Mexican border and during the bombing against ship trials served it well in this maneuver. The Group's ability, under the command of Maj. Lewis Brerton (See Appendix 6), to deploy and operate under field conditions was particularly noteworthy. The Group met all of its tactical requirements and was the leading unit in the maneuver.

The Group was designated to be the first unit to receive new material and aircraft under the provisions of the Air Corps Act of 1926. Anticipation ran high but as the year wore on, it became apparent that Congress would not act quickly on the needed appropriations. The Group's NBS-1's were wearing out. Equipment failures in the aircraft accounted for extensive maintenance and repair. The inventory of NBS-1's was down to twenty from the original twenty-seven assigned.

In April 1926, still under the command of Maj. Brerton, the Group took part in the second annual Air Service maneuvers at Fairfield, Ohio. These maneuvers involved a land and air battle between two opposing forces, the Red and Blue force. Blue was to the north of the Ohio River and Red to the south. Brig. Gen. Fechet, Asst. Chief Air Service, commanded the Blue air force which consisted of the 1st Pursuit, 2nd Bombardment, and 3rd Attack Groups, totalling 45 officers, 67 enlisted men and 47 airplanes. Additionally, one observation group, represented by two officers and one plane, was assigned for the maneuver.

On April 22 the 2nd Bomb Group's NBS-1's attacked bridges over the Ohio River at Cincinnati. The next day the 2nd was up again for attacks against other bridges across the Ohio river. On April 24th the Group attacked the rail yards at Kenton, Ohio. Gen. Patrick, Chief of the Air Service, was quite pleased with the exercise and the ability of the units to sustain four days of combat activity far from their home bases. The Group returned to Langley Field on April 27th without incident. [65] The Group's effective and accident-free performance during the maneuvers brought praise from both Gen. Patrick and Gen. Fechet.

During the maneuvers, Group air crews made the point to Gen. Fechet that the NBS-1 was a good airplane, much better than the DH4B, but just wasn't the kind of bomber the Air Service needed. What was needed was a bomber that could fly above 15,000 feet, to a long distance and carry more than 2000 pounds of bombs. Although dissatisfied with the speed, ceiling, range and bomb load of the NBS-1, the Air Service could find nothing better.

Back at Langley, the Group assisted the Air Tactical School in hosting the 1926 bombing and gunnery matches.

News was received in July 1926 that Congress had passed a new law redesignating the Air Service to the Air Corps and authorizing a five-year improvement program. The Act aroused mounting expectations in the Group — there would be a sizeable increase in personnel, new aircraft, and now as an Air Corps, there would be more independence from the Army. Perhaps what Billy Mitchell had said was about to come true! By November 1926, it was apparent that despite The Act things were not going to change very fast.

1927-1929

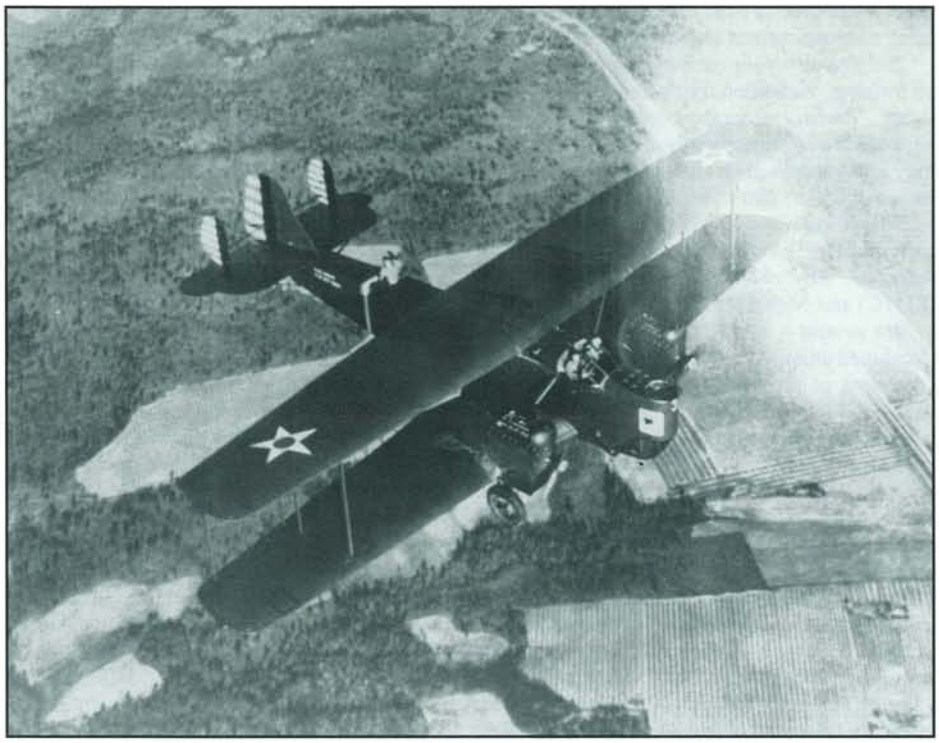
In May 1927, Maj. Brerton led twenty NBS-1's, one LB-5 and two C-lB Douglas transports to San Antonio, Texas, for combined maneuvers with the other Air Corps tactical units. Half of the Group proceeded to San Antonio via the northern airways and the other half via the southern airways. The maneuvers were a complete success.

After engaging in maneuvers for approximately ten days, the Group returned by the northern and southern airways with each half of the Group reversing its original route. The return flight was marred by two accidents, both of which involved tragic deaths. Shortly after take off from Augusta, Georgia, one NBS-1 developed motor trouble and in attempting to return to the field, the pilot lost control and spun in at the perimeter of the airfield. The plane burst into flames and the pilot and crew of three were burned to death.

Leading the other half of the return flight, Maj. Brerton, with Lt. Bridge and two enlisted men in the LB-5, lost a propeller on one motor

following takeoff from Columbus, Ohio. Maj. Breton ordered the crew to jump. Lt. Bridge and one enlisted man parachuted to safety. For reasons that are not known, the other enlisted man never left the airplane and was killed when it crashed.[66]

After return from the maneuvers, the Group was informed that the 11th Bombardment Squadron would be reassigned to the west coast. This action was the result of the 1926 Air Corps Act. Under the five-year expansion program authorized by the Act, three new bomb groups were to be formed, but the number of squadrons per group was reduced from four to three. The new groups were the 9th Bombardment Group on the east coast, and the 7th and 19th Bombardment Groups on the west coast. Accordingly, the 11th Bombardment Squadron, without equipment, sailed from Norfolk, Virginia to the west coast. The destination was March Field, California. No sooner had the 11th arrived than it was deactivated on July 31, 1927. Squadron personnel were used to form the newly activated 54th School Squadron of the 13th School Group. To meet the growth authorized by the 1926 Act, the training capability of the flying schools was increased significantly. Personnel were drawn from other Air Corps units to man the flying training schools.[67]

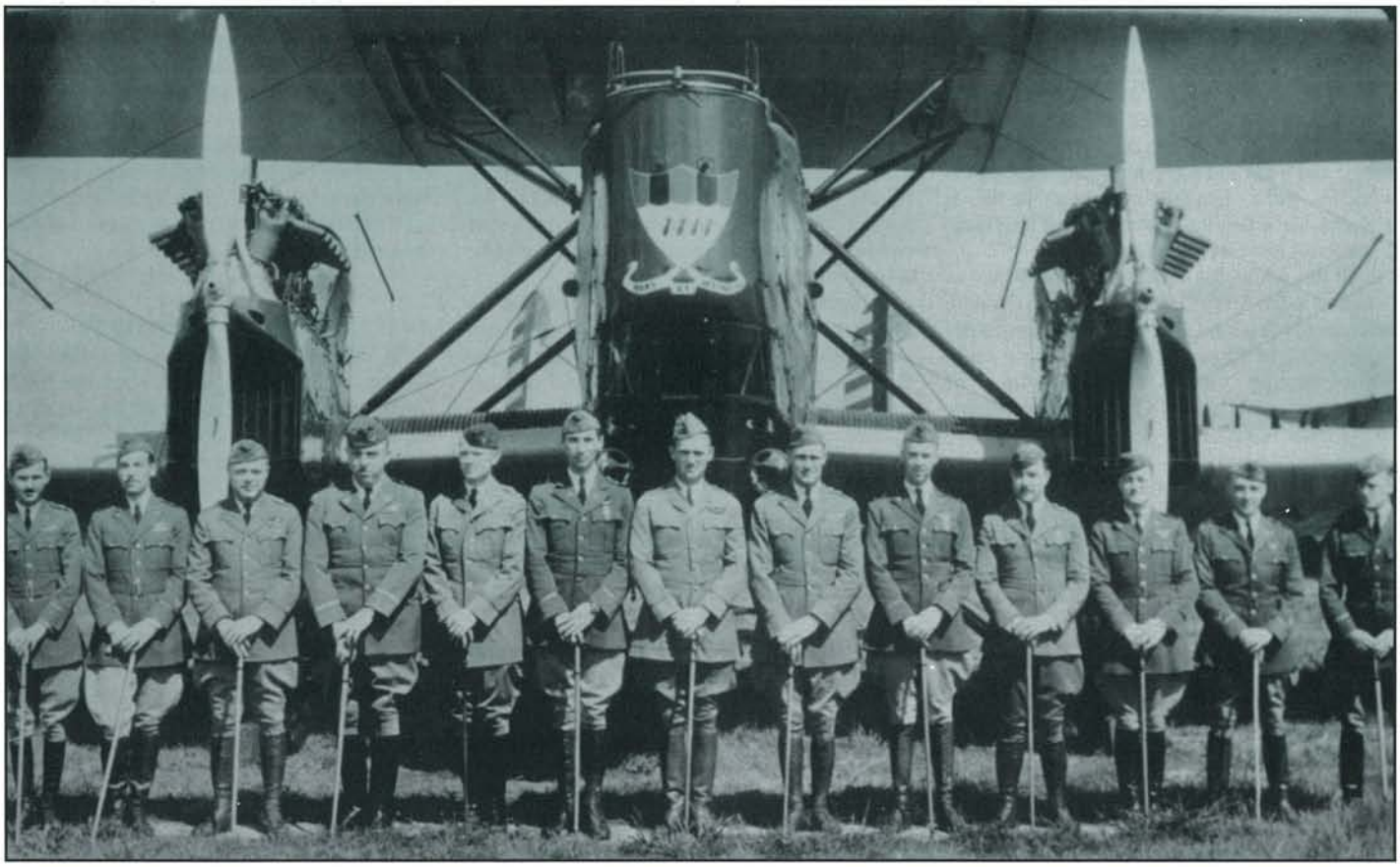


Martin NBS1, Circa, 1927. (Courtesy of Eighth Air Force Museum)

The 11th Bombardment Squadron was reactivated on June 1, 1928, less than a year after its inactivation, and assigned to the 7th Bombardment Group. Although no longer a part of the 2nd Bombardment Group history, the 11th continued its performance of excellence and served in the Pacific theater during WW II. The 11th added ten more campaigns and two Distinguished Unit Citations to its WW I honors.

Pee Dee River Bridge

The Group always welcomed an opportunity to attack real targets. Such an opportunity presented itself in December 1927. North Carolina wished to demolish a bridge that was soon to be inundated by water from a new dam. The State



LB5A. L to R: Lt. Beaton, Lt. Melville, Capt. Sellers, Lt. Behucke, Capt. Peak (Medic), Lt. Blaufuss, Maj. Knerr (Commanding), Lt. Kennedy, Lt. Johnson, Lt. Fair, Lt. Brinly, Lt. Wolfin Barger, Lt. Malone. (Note. Capt. Sellers was CO of the 20th Squadron in WW I.)

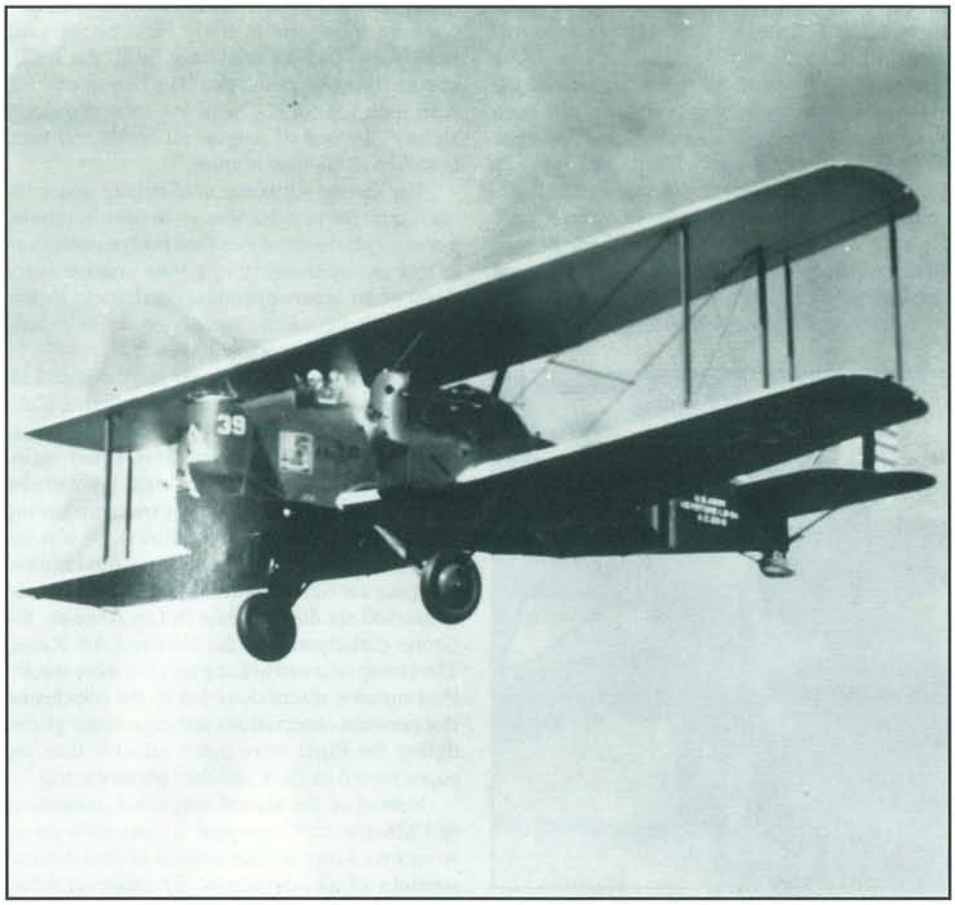
turned the bridge over to the War Department for bombing, artillery and demolition tests, by the Air Corps, Field Artillery and the Corps of Engineers respectively. On December 18, the Air Corps formed a provisional squadron, most of which came from the Group. Capt. Asa Duncan, the Group Commander, took 28 officers, 60 enlisted men, and 8 NBS-1s to Pope Field, North Carolina, the operating base for the bridge demolition project. A rigorous schedule was developed for five and one half days of bombing to begin on Monday December 18. The schedule called for twenty missions a day of two planes each to be dispatched at twenty minute intervals. The crews flew at least five and sometimes seven or eight hours per day. The Group target was the 20 foot wide, 400 foot long west span of the bridge and its approach. The bridge was solidly constructed of reinforced concrete with piers sunk in bedrock. Over the five and one half days of test operations, the Group dropped sand-loaded bombs, 300 and 600-pound demolition bombs and 1100-pound bombs. The sand-loaded bombs were used for practice. Several direct hits were made by these bombs in the early stages of the operation. Attacks with the 300 and 600-pound demolition bombs were less than satisfactory. These lighter bombs just couldn't knock the bridge down. Bombing in formation, with three bombers in a "V", also proved unsatisfactory. The three-plane formation was too small to offset any error of judgement on the part of the lead bomber. The last two days of the operation, Friday December 23; and Saturday December 24th, were much more successful. On Friday, the Group made five direct hits with three 600-pound bombs and two hits with 1100-pound bombs. The two larger bombs demolished three sections of the approach and damaged the floor of the west span. Seven bombs were dropped on Saturday December 23. The Group scored hits with 1100-pound bombs on the pier at the west end of the bridge. This last attack dropped the entire west span into the river and rendered the bridge impassible. This ended the Group's operations and the flight returned that afternoon, December 24th, to Langley Field just in time for Christmas.

Army field artillery shelled the east end of the bridge, made several direct hits, but never succeeded in making that portion of the bridge impassable.

These bridge attacks provided a wealth of information on bombing tactics and gave some idea of how different size bombs affected reinforced concrete structures. Many of the lessons learned at the Pee Dee bridge operation were incorporated into the Air Corps Tactical School curriculum at Langley. The Group's operation also demonstrated the need for improved bomb aiming devices, for more training in the dropping bombs, and greater efficiency in formation bombing.[68]

Air Corps Bomber Inventory-1927

By the end of 1927, the NBS-1 bomber was obsolete and its numbers were being depleted. After the maneuvers in May, a flight crew from the 20th Squadron was assigned to perform further flight tests on the prototype Keystone Bomber, the XLB-5. In one of the first flight tests, a propeller failed and the five-man crew had to bail out. The XLB-5 crashed and burned. It was apparent that XLB-5 needed more development work and better propellers to pass its air worthiness tests.



96th Bomb Squadron LB-5A, 1928.

The Air Corps inventory of NBS-1 and MB-2 aircraft was sixty-nine in 1927. One hundred thirty had been purchased between 1921 and 1923. About fifty percent of the original buy of the of these two bombers had crashed or been damaged so severely they were dropped from the inventory. Out of the sixty nine in the Air Corps inventory, the 2nd Bomb Group had thirteen NBS-1's. The balance of fifty-six was distributed among various Air Corps bases, Middletown Airfield, Aberdeen Proving Ground, San Antonio Flight schools, and the overseas departments in Hawaii, the Philippines and Panama. Nine of the NBS-1s were in the Philippines.

The Group also had eight of the dismal single engine LB-1's.[69] (See Appendix 8B) Group flight test of the LB-1 showed it to be entirely unsuitable as a bomber, and they were withdrawn in late 1927. The LB-1 airframe, equipped with two engines mounted on the lower wing, became the prototype of the much better Keystone bomber.[70]

1928

1928 marked the year the Group began to reap some benefits of the 1926 Air Corps Act. In addition, the 49th Squadron was returned from Aberdeen Proving Ground. Its return brought the Group to the authorized strength of three squadrons.

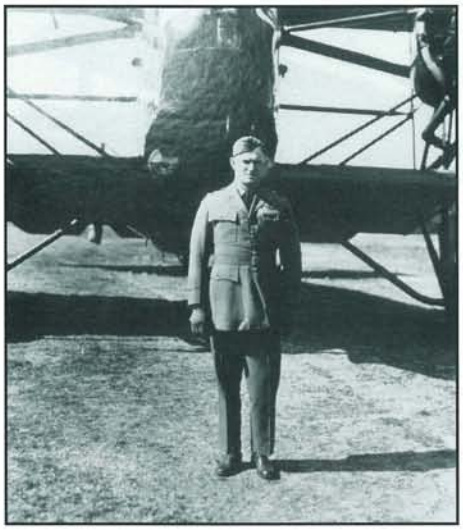
During the year, the Group received and began to train in the newly acquired Keystone bombers. From 1928 through 1935, some variant of the Keystone bomber was the mainstay of the bomber force. During their use, the Group had LB-5, LB-5A, B-3A, B-6A', LB-7 and LB 10 models and series of the Keystone. From an outward appearance, the different models of the bomber looked much the same to the casual observer. The differences between models were in the type of engines, the warp of the wings, the cockpit configurations, and either single or twin tail structures. At no time between 1928 and 1935 was the Group equipped with all the same model aircraft.(See Appendix 8B)

The Keystone bomber, though more modern than the NBS-1, still did not give the aviators the kind of bomber they wanted, and dreamed about. It was only marginally better than the NBS-1. It did have night flying aids, a radio, slightly better bombing aids, improved engines with superchargers, slightly better bomb lift capability, and a range just a little more than the NBS-1. The Keystone was still an open cockpit bomber with fixed landing gear and speed in the 120 mph range. It was far from the aircraft crews dreamed of — one with enclosed crew positions, retractable landing gear, a 4000 pound bomb load, a 1000 mile range, a 20,000 foot ceiling, and speed of 150 mph. The Keystone seemed to be the best bomber that aircraft state of the art could produce at the time.

Maj. Hugh Knerr commanded the Group from July to November 1927 and again from February 1928 through August 1930. (See Appendix 6) It was under his command that the Group transitioned from the NBS-1 to the Keystone.

In June 1928, Group pilots ferried eleven NBS-1's to Kelly Field to be turned over to the Advanced Flying School for student use. The eleven NBs-1's were all that remained of the Martin bomber inventory; two more had been lost between the 1927 inventory and the June 1928 ferry flight to Kelly Field. The route to Kelly was via the southern airways and all aircraft arrived safely. These eleven aircraft were the survivors of the original 27 assigned to the Group in 1921. The air crews took great care in nursing these old birds to Kelly.

Subsequent to June 1928, the Group began getting the new LB-5's and LB-5A's. The LB-5's were soon sent to Kelly Field because the time-worn NBS-1's could not fulfill the multi-engine flying training role. The Group was left with nine LB-5A's. Check out moved quickly and by the end of August all crews had been qualified in the new bomber.



Major Hugh Knerr, 2nd bomb Group C.O., 7/27-11/27 and 2/28 - 8/30, 1928. (Courtesy of Eighth Air Force Museum)

The Group set some challenging goals for itself with the new bomber — to drop bombs on a real target, like the Pee Dee bridge operation; to test Group mobility in a long cross-country flight under severe operating conditions; to pioneer high altitude tactical flying; or to experiment with other new techniques.[71].

In September Maj. Knerr led the nine LB-5A's across the continent to Los Angeles, California. Throughout this, first-of-a-kind, transcontinental formation flight, Maj. Knerr maintained contact with his other eight bombers by radio. Command and control by radio during such a transcontinental formation flight was another first. Because of bad weather, sand storms, and poor servicing facilities, the out bound trip consumed six days. While in Los Angeles the Group participated in the National Air Races. The Group returned to Langley after three weeks. Post-mission discussions led to the conclusion that personal observations and experience gained during the flight were more valuable than the paper record of facts and data about the trip.[72]

Instead of the annual combined maneuvers in 1928, the Air Corps sent a composite group to various Army service schools to give demonstrations of air operations. The 2nd furnished the bomber part of the composite group. Four aircraft from the Group put on a two-day bombing demonstration at Fort Benning, Georgia. The bombers dropped 100-pound bombs on an ammunition dump. Other demonstrations were given at Aberdeen Proving Ground and West Point.

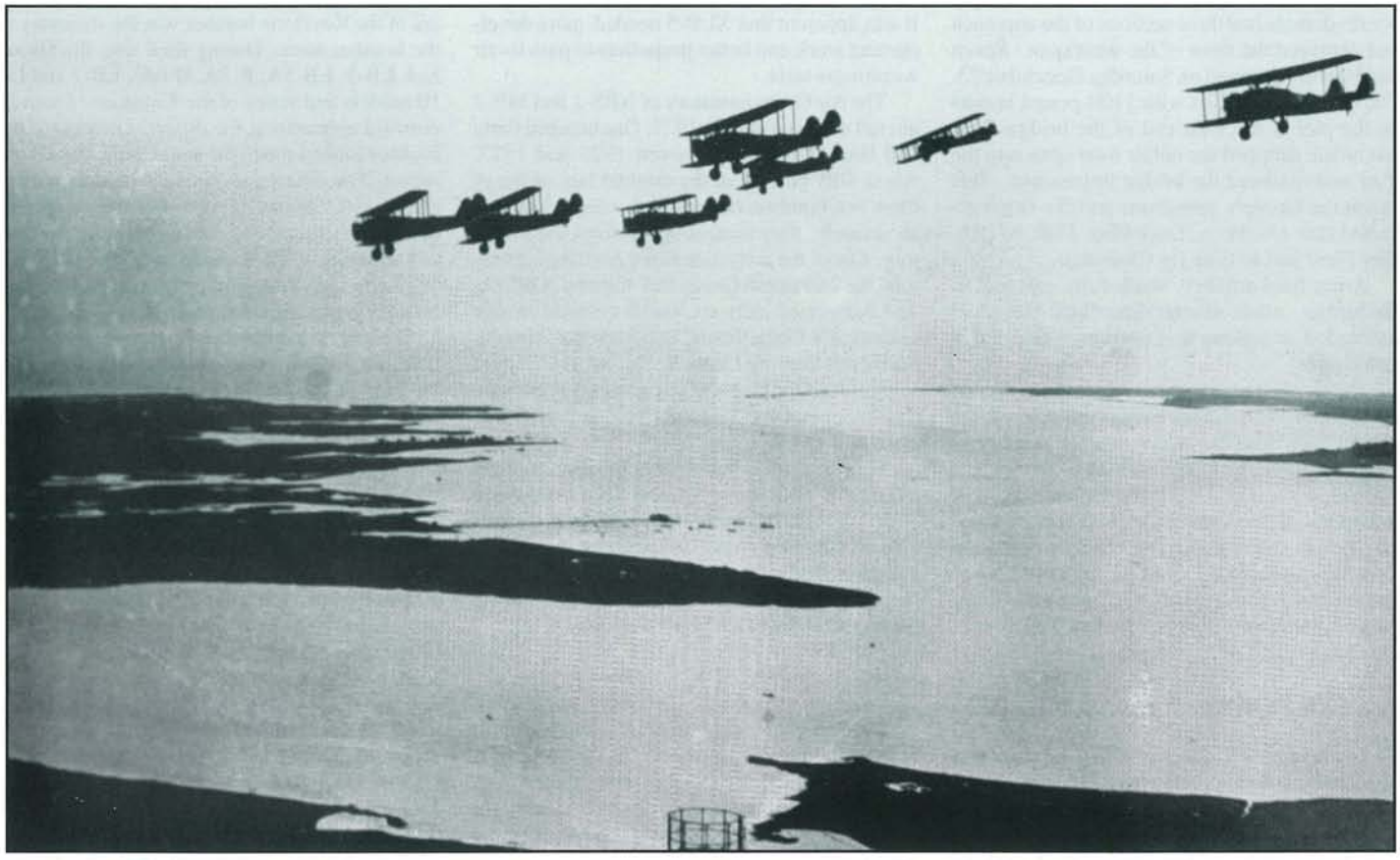
The Group took part in an air show at Langley Field for the Air Corps Tactical School. Congressmen, government officials, and newsmen flew to Langley for the event. It was a dynamic display with the climax coming when pursuit, attack, and bombardment planes hit ground targets with live ordnance then passed in review at 200 feet over the airfield. [73]

As the year passed, the Group practiced more cross-country single-plane and three-plane navigation and formation flights. Courtesy flights were made to cities within range of Langley that were opening new airfields or were holding aerial demonstrations.

1929

Training in the new Keystones continued, but delivery of the new bomber was very slow. Aircraft production could not keep up with the demand for bombers from the three new bombardment groups authorized by the Act of 1926.

In May, the Air Corps convened another major maneuver. This maneuver was different from those of prior years in that it involved opposing forces, including ground forces. The maneuver area was the state of Ohio. A line north and south across the state between Columbus and Dayton, was the boundary between the warring forces. The Red Force was to the east of the line and the Blue Force was to the west. The Air Corps contributed 275 officers, 225 enlisted men and 200 airplanes under the command of Gen.



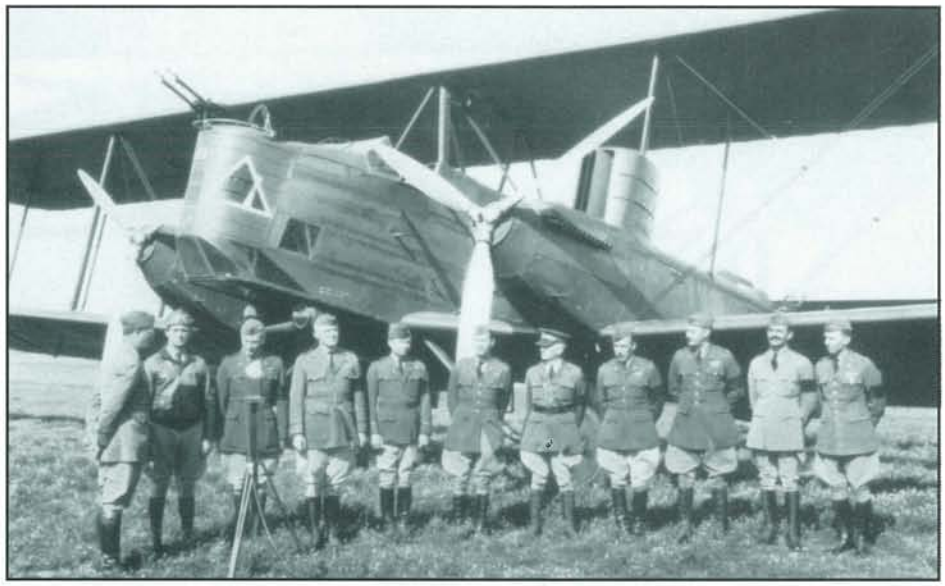
2nd Bomb Group maneuvers over Langley Field at 5:08 A.M., 5/16/28.

Foulois. The Group, under Major Knerr, was a principal participant in the exercise. In addition, the 11th Bombardment Squadron and 95th Pursuit Squadron from the new 7th Bombardment Group, Rockwell Field, California participated. The maneuver involved extensive use of maneuver observers in the attacking and defending aircraft. The observers used a density-of-attack-formula to declare which planes were shot down, and which missions were successful or unsuccessful.

The first use of in-flight refueling for operational support of a maneuver took place during this exercise. Following the endurance flight of the "Question Mark" in January 1929, when the practicality of in-flight refueling was first demonstrated, the Assistant Secretary of War/Air, Mr. Davison, wanted to show the public the practical application of aerial refueling. He directed that during the maneuver, a bomber fly non-stop from Dayton to New York City and back. 1st Lt. Odas Moon, pilot; and 1st Lt. Eugene Eubank, copilot; of the 2nd Bomb Group, flying a Keystone bomber, departed Dayton May 21 for New York city. Additional crew on board were 1st Lt. John P Richter, refueling officer; Mr. Bradley Jones, Navigator; and 1st Lt. Charles T. Skow, radio operator. Capt. Ross G. Hoyt of the 2nd Bomb Group piloted the refueling tanker aircraft. Hoyt's crew included Sgts. Robert A. Brewer and Wilbur J. Simmons, refueling equipment operators. A transport piloted by 1st Lt. Leroy M. Wolfe and carrying a National Broadcasting Company (NBC) crew followed the flight. The first refueling was to take place over Washington, DC, while the incident was broadcast by the NBC crew in the transport. The bomber, followed by the transport, would continue to New York City where the bomber would drop flashlight bombs over Manhattan, as the NBC crew broadcast the mock attack. From New York city the bomber would fly to Atlantic City, drop a parachute flare, proceed to Washington, DC for the second refueling and return to Dayton.

Bad weather forced a change in the itinerary. On the way from Dayton to Washington, DC, the weather was such that the first refueling was done in the vicinity of Uniontown, Pennsylvania. Because of the weather, the transport, with the NBC reporters, could not follow the bomber. Lt. Moon pressed on to New York City. He flew up Broadway to Central Park, turned south and dropped a flare that lighted the bay, ships in the harbor, and the Statue of Liberty After dispensing two more flares, the bomber circled and disappeared. Lt. Moon then proceeded to Bolling Field, Washington, DC where he and his crew spent the night. While over New York City, the antiaircraft units at Governors Island tried to intercept Moon's aircraft but they were without searchlights and although they could hear the bomber they couldn't see it.

The Air Corps quickly improvised a new plan for the following day. All three aircraft, the bomber, the refueler and the transport, assembled at Bolling Field and flew to New York. The bomber took on a load of fuel over the city. To further impress the viewing public, Moon and Hoyt repeated the performance through four dry refueling exercises. In the meanwhile, the NBC crew in the transport, broadcast a running account of the refuelings. Subsequent to this demonstration, all three aircraft landed at Mitchel Field and remained overnight. The next day the bomber and refueler aircraft returned to Dayton and the ongoing maneuvers. [74]



Curtiss B-2, 96th Squadron, Memorial Day 1929. L to R: #2-Major Knerr; #4-H. Arnold. (Courtesy of Eighth Air Force Museum)

The final actions of the maneuvers occurred on May 25. The Group finished the maneuvers with a bang! All participating aircraft-pursuit, bombardment, and attack were loaded with live ammunition and bombs for an attack against a large enemy supply concentration. The target, in the vicinity of Fairfield, Ohio, was cordoned off by a regiment of soldiers. The 2nd's target was a dummy ammunition dump. The Group, attacking with 100- pound demolition bombs, literally overwhelmed the target. The military and civilian observers saw a bluish-white pattern of bursts in the target area and heard the explosions of both the bombs, and the dummy ammunition dump. All participating aircraft then swept low over the field and landed. The maneuvers ended on Sunday May 26.

The maneuver gave the Group opportunity to add to its kudos. It demonstrated the first tactical use of in-flight refueling by a combat unit, its ability to fly a long distance — Ohio to New York — and bomb a target, and on the last day demonstrated the effectiveness of formation bombing.[75]

The next major event of 1929 occurred in July when Maj. Knerr led nine LB-7s on another coast-to-coast, cross-country flight. The formation took off from Langley Field on July 5th for San Diego, California. The flight of nine bombers was the entire aircraft inventory of the Group. The Air Corps five-year expansion program was still moving at a snail's pace. The 7th Bombardment Group at Rockwell Field, San Diego didn't even have hangars for its puny complement of bombers.

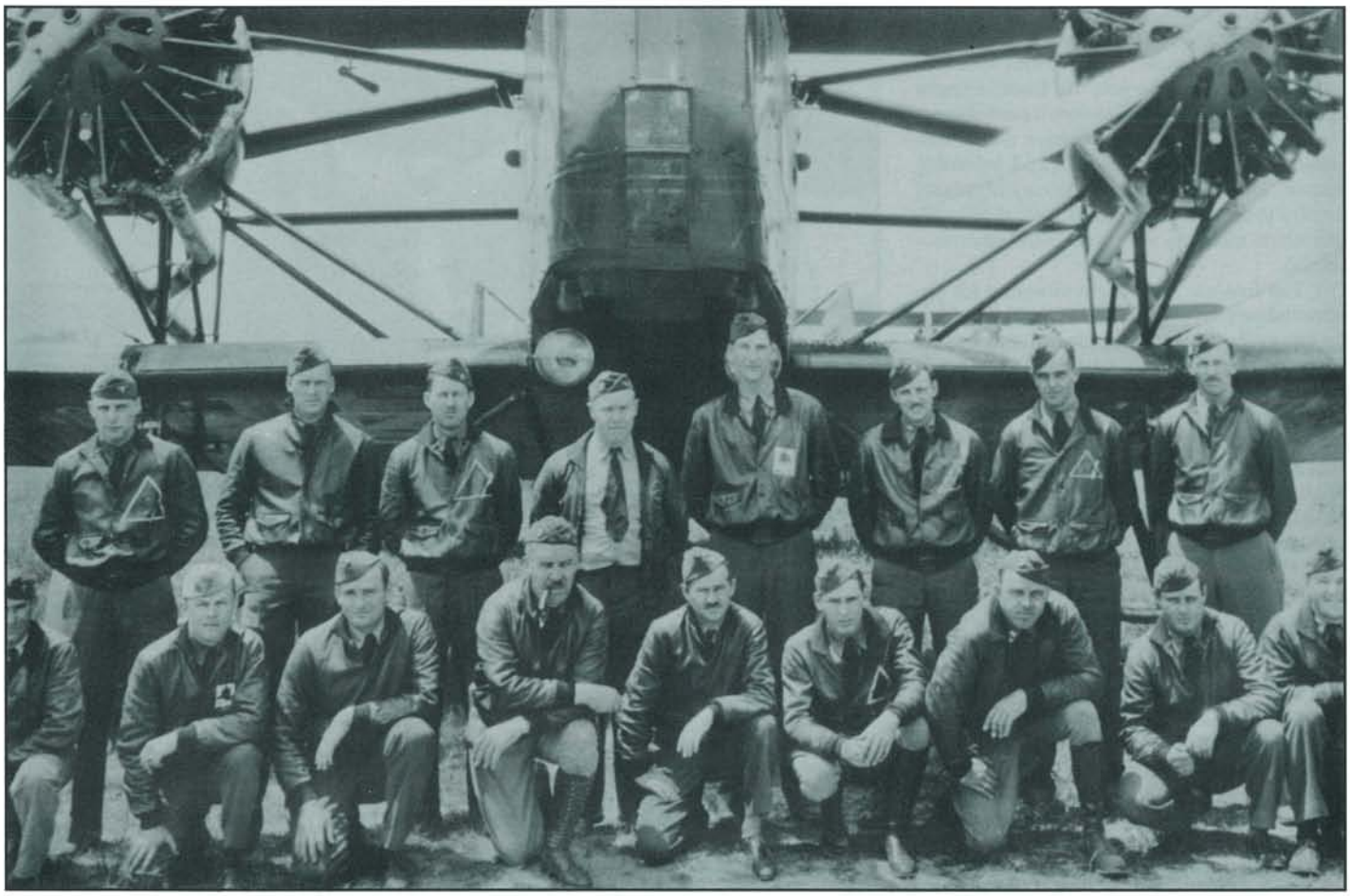
The Group formation flew day and night, and after forty-one hours elapsed time and thirty hours flight time, put its wheels down on Rockwell Field. The previous year it had taken the Group six days, albeit in bad weather, to fly across the continent. The record time was another aerial feat for the Group.

This flight demonstrated the Air Corps capability to deploy forces from one coast to the other and be ready for combat action. Transcontinental flights by single Air Corps aircraft had become routine. But cross-country flights by formations of aircraft, stopping only for fuel, were exceptions to the norm. Only the Group had done that — twice.

The last major event of 1929 for the Group was its participation in Mexico's six-day Aviation Celebration in Mexico City. The Chief of the Air Corps directed that a composite unit of pursuit, bombardment, attack and observation aircraft be dispatched to Mexico City, from December 10 to 15, as a part of the United States' participation in Mexico's Aviation Celebration.

A flight of four planes, a P-1 pursuit, an A-3 attack, an 02H observation and a B-2 bomber, under the command of Maj. C. L. Tinker, Assistant Commandant, Advance Flying School, Kelly Field, was designated as the composite unit. The Curtiss B-2 Condor was from the 96th Bombardment Squadron. The B-2 crew, with Lt. James M. Gillespie, pilot; Lt. Ernest G. Schmidt, copilot; and S/Sgts. Capp and Brenur, gunner/mechanics; left Langley December 3. They landed and remained over night at Atlanta, Georgia. They took off the following morning en route to the composite unit assembly point, Brownsville, Texas. A few miles from Clearwater, Alabama, one motor caught fire. Lt. Gillespie couldn't find a suitable place to crash land so he ordered the crew to jump. All got out of the aircraft safely, but Lt. Schmidt's parachute failed to open until just before he hit the ground, and he was killed. A tragic event. Lt. Schmidt had graduated from Advanced Flying School just a little over a year previously and was regarded as an up-and-coming pilot. The B-2 crashed nearby.

After word of the crash reached Chief of the Air Corps, the Group was ordered to provide a replacement bomber and crew. A 20th Squadron LB-7 with Lt. Marvin Burnside, pilot; Lt. Marion Huggins, copilot; and Sergeant H.L.West and Corporal Plato Miller, gunner/mechanics; left Langley December 6. The LB-7 arrived at Brownsville, Texas in time for the composite unit



Officers of 96th and 20th Squadrons in front of LB-7, 1929. Names unknown. (Private Collection)

flight to Mexico City. The unit flew from Brownsville to Tampico, Mexico and then to Mexico City. In Mexico City, the composite unit put on several spectacular aerial demonstrations and made low level fly-overs for the crowd at the Aviation Celebration. The American contingent was treated royally by their Mexican hosts. Parties, receptions and local sight- seeing were the order of the day.

The composite unit left Mexico City December 15, returned safely to the U.S. and their respective home bases.[76]

The Curtiss B-2 Condor, that met its untimely end on December 4th, had been the first of several B-2's delivered to the Group for flight testing. This B-2, #29-28, was delivered on October 10, and had flown sixty-nine hours before the accident. In early 1930 all the B-2's assigned to the Group were withdrawn and reassigned to the 11th Bombardment Squadron at Rockwell Field, California.[77]

1930-1932

The Group made its third transcontinental flight to California in 1930. The destination was Mather Field, near Sacramento, California. The mission objective was to join other Air Corps units for maneuvers. This was the first time that the new bombardment units — the 7th and 19th Bombardment Groups — had participated with the 2nd in Air Corps maneuvers. Previous Air Service/Air Corps maneuvers had been held either in Ohio or in the vicinity of Mitchel Field, New York. The 1930 maneuvers emphasized the movement of units from the 2nd Wing, at Langley and the 3rd Wing, at Barksdale Field, Louisiana. One hundred fourteen Air Corps planes participated, of which twenty four were bombers. Brig. Gen. William E. Gilmore directed the maneuver. He said the maneuver was the largest concentration of air force units in the United States.

Two innovations were introduced during these maneuvers. Radio was used extensively in ground control and direction of airborne units. Tactical units were diverted from pre-planned objectives to new objectives. All of this was done successfully by radio. The second innovation was Maj. Henry H. Arnold's use of cargo aircraft to move supplies from Rockwell Field to Mather Field. Mather Field had been inactive and had no equipment. Maj. Arnold, as the provisional Wing S-4 (Supply), used three C-2A's, one C-1 and one LB-7 as his transport fleet. The transports completed thirty six flights from March 3 to April 1, to haul 36,548 pounds of cargo. For 1930, this was a feat.

The Group furnished 21 LB-7 bombers, 39 officers and 63 enlisted men for this maneuver. Maj. Knerr still commanded the Group's maneuver unit.[78]

The air units flew each day between March 23 and May 4. One of the big events of the maneuver was a formation flight by the Group's twenty-seven LB-7's over San Francisco, San Francisco Bay, Oakland and Berkeley, California. For the civilian onlookers this was, indeed, a great demonstration. The Group returned to Langley on May 5th. The Group did not fly close formation on the return but flew close enough to be in radio contact with the Group and Squadron commanders.[79]

B-3A Keystone bombers were received in June 1930 and some LB-7's were transferred to other bombardment units. Training continued in bombing and gunnery on the Mulberry range. Cross-country flights were taken to various cities on the east coast, especially where new airfields were being opened. Experiments were conducted with over water flights up to 100 miles to sea.

The lessons learned through the Group's pioneering transcontinental flights in 1928, 1929, 1930 found their way into other Air Corps units. This was especially true about the use of airborne radio for command and control of aerial operations. Additionally, the Group had clearly demonstrated the tactical feasibility of long-range mobility. Three Group bombers had taken off from Rockwell Field on a combat maneuver to engage a potential enemy within hours of completing the transcontinental formation flight from Langley in 1929. The work done by the Group, starting in 1928, to perfect a capability to move, re-equip and fight, ultimately became a hallmark of Air Corps training.

Maj. Knerr was transferred to the Office, Chief of the Air Corps, and after a brief period with an interim commander, Maj. Bert Dargue, a rugged aviator who had won the 1926 MacKay Trophy, took command of the Group September 24, 1930. (See Appendix 7)

In 1916, Bert Dargue commanded the 1st Aero Squadron as part of the U.S. forces under

General Pershing that went on an expedition into Mexico in pursuit of Pancho Villa. In 1921, Dargue was chosen by Maj. Gen. Mason Patrick, newly designated Chief of the Air Service, to be his personal flying instructor. In 1926, Dargue commanded the record-breaking Pan American Goodwill trip that involved flying 22,000 miles, over the uncharted jungles of Central America, along the rugged west coast of South America, across the Andes from Chile to Argentina, and return along the east coast of South America, through the Caribbean and back to the United States. For this feat, Dargue and his accompanying aviators were the first recipients of Distinguished Flying Crosses (DFC's). Subsequent to President Coolidge awarding the DFC's, Bert Dargue was awarded the 1926 MacKay Trophy.

As commander, Maj. Dargue instilled a sense of dedication and professional commitment in the Group. Dargue was an aviation pioneer in both thought and action. His command was characterized by low key leadership. He had the same desires and dreams as Billy Mitchell, but unlike Mitchell, worked within the system to achieve them.

At Langley Field most of the senior officers had their offices in the big, comfortable, red-brick base headquarters building. Prominent on the flying line, in less than spacious offices, were the aviation pioneers, Claire Chenault, Robert Olds, Clayton Bissell and Bert Dargue. As commander of the 2nd Bomb Group, Dargue had his office in the sparse control tower, as close to his men and their flying machines as he could get.

Maj. Dargue was not known at Langley as a hot pilot and he never claimed to be one. When he flew as Group commander, he chose the top rear gunner's cockpit in one of the Group's Keystone bombers as his command position, where he could control the Group formation by hand signals from an open cockpit. Although all of the aircraft were equipped with radio, he had less than full confidence in the radios of that time and preferred to rely on visual command signals.

There is no doubt that Maj. Dargue envisioned the day when the United States would be able to launch swarms of bombers in an offensive against an enemy. This vision was reinforced by his insistence that all flying elements operate on precise time schedules.[80]

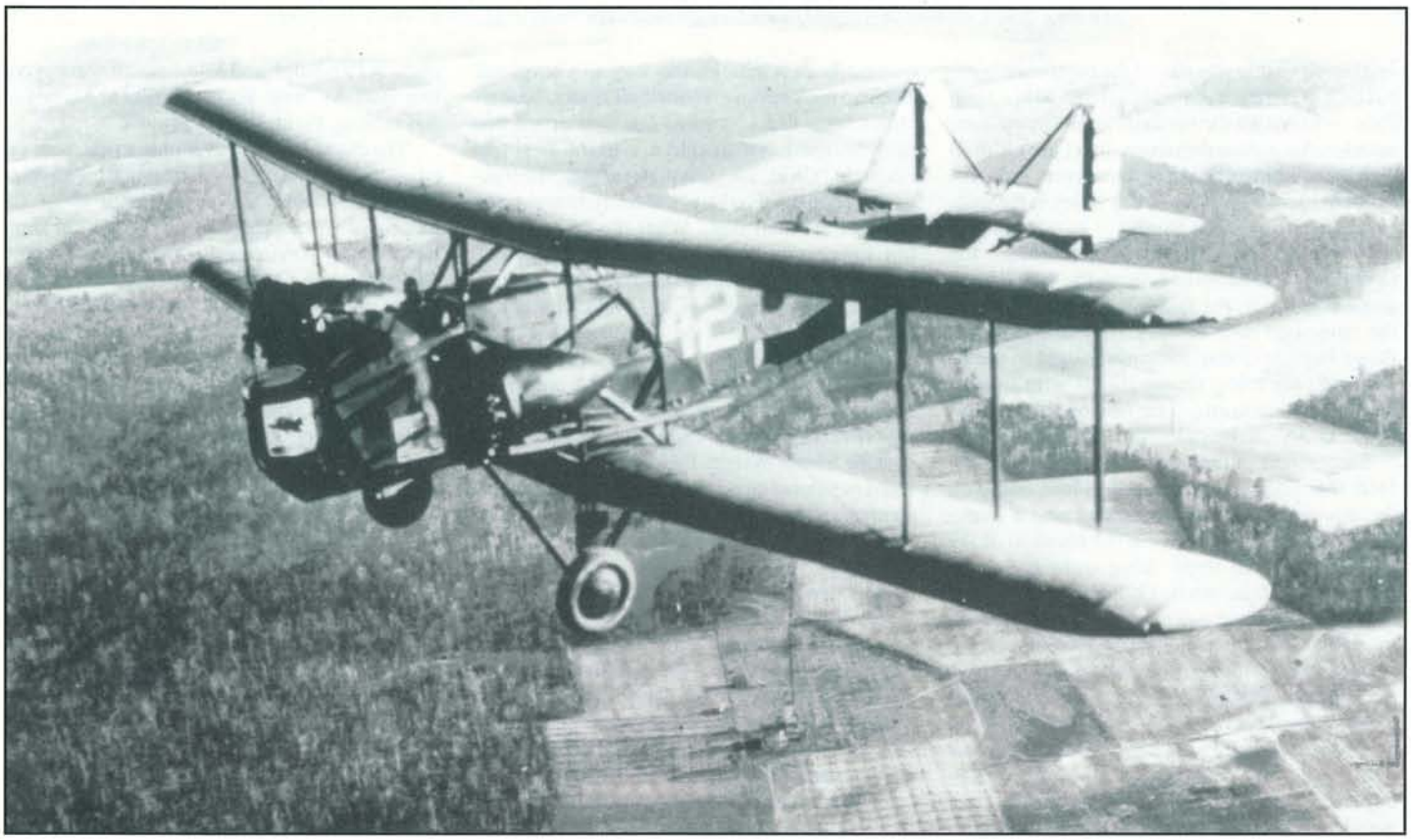
Gen. Lawrence S. Kuter, a former member of the 2nd Bomb Group, recalls an example of Dargue's insistence on promptness. General Kuter reflects: "Captain Eugene Eubank[81] was in command of the 49th Bombardment Squadron. I (Kuter) was his operations officer and second in command. Captain Eubank made it clear to all of us that, if any element of Major Dargue's group ever missed exact timing or under any circumstances failed to meet precise Group schedule, it better not be an element of his squadron. One morning the Group was scheduled for a formation exercise. Captain Eubank was away, and, acting as squadron commander. I (Kuter) was called on for a quick decision about timing. The Operations Order specified,[82] Cockpit 0745, start engines 0750, chocks away 0759, taxi out 0800. On this mission Major Dargue was scheduled to command. At 0750 Major Dargue wasn't there — regardless of his absence we started engines. At 0800, still no Major Dargue, we taxied out for take off. As we started our take off I caught sight of Major Dargue in winter flying suit, running out from the operations office toward the formation, his heavy parachute banging behind as he ran. Remembering Captain Eubank's dictum that the 49th would never be the cause of a Group delay, I pushed the throttles wide open. We took off leaving a very senior commander on the ground sweating and puffing in his heavy flying suit with parachute dragging behind. I was keenly aware that he was 'The MAJOR' whom I had left stranded on the flight line. Throughout the one and half hour flight I pondered my fate.

We landed at 0930, taxied back to the flight line and cut engines. There was 'THE MAJOR' waiting. Major Dargue said: ' Lieutenant Kuter, I am afraid I will have to conclude that you did the right thing. If I had been in your position, I doubt that I would have had the courage to do what you did. That is all.' And that was all — no further recrimination, reassignment nor any indication of upset or ill feeling!"[83]

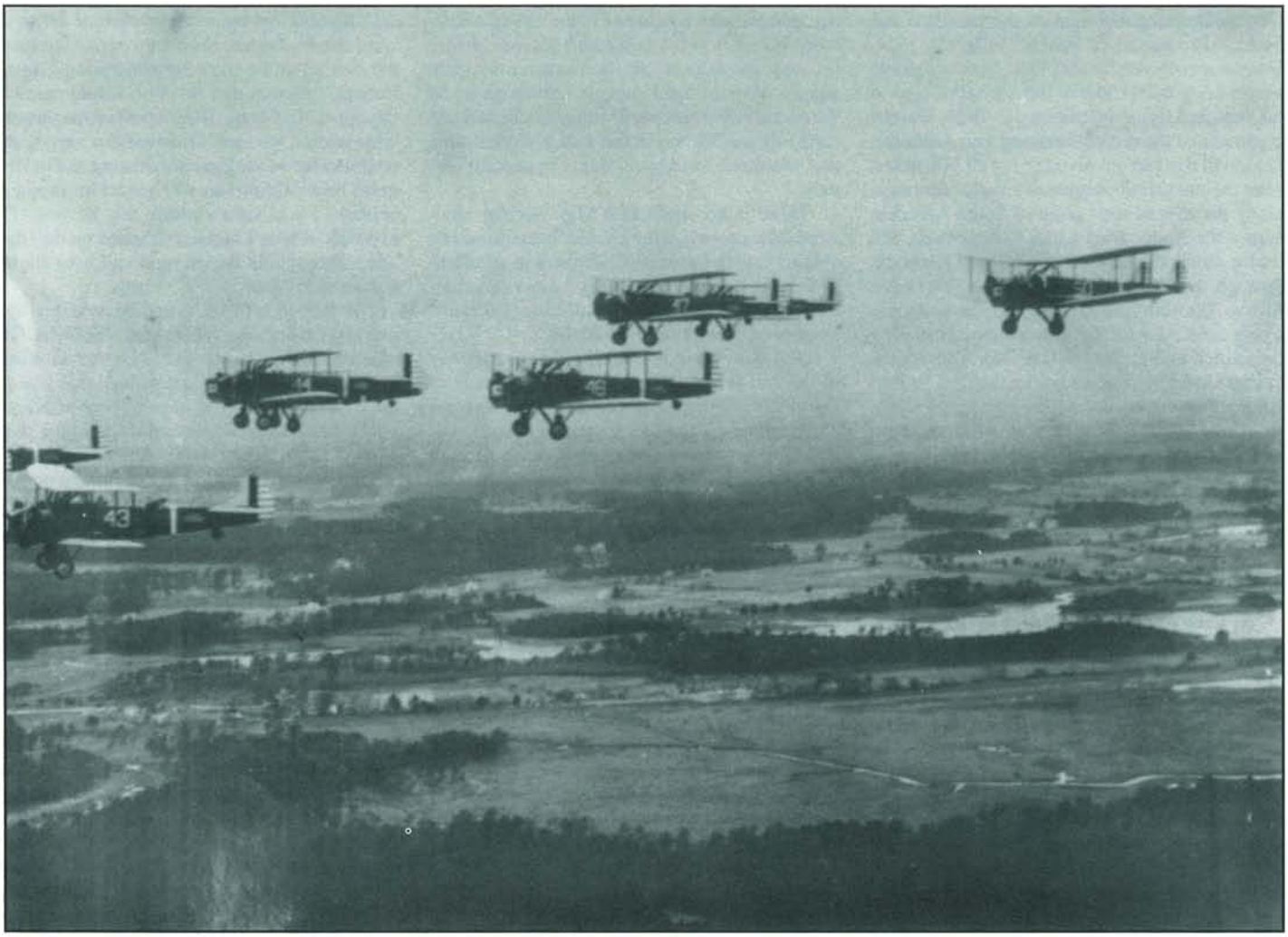
In 1931, The Group engaged in three significant events — the maneuvers of 1931, the attack against the decommissioned *USS Mt. Shasta*, and sinking of the derelict ship, Haines.

The Assistant Secretary of War for Air, Mr. Davison, directed that Air Corps maneuvers be in the form of demonstrations to acquaint the American people with the Air Corps and afford them a clearer idea of the Army's air effort.

Maj. Gen. Foulois, Chief of the Air Corps, was anxious to test an air division organization and these directed maneuvers gave him the opportunity. He mustered all available aircraft from the active duty units, the nineteen National Guard squadrons, and the instructors, students, and airplanes from the Advanced Flying School. The



Major Hugh Knerr in 20th Squadron LB-7 leading flight to Mather Field, CA, March 23, 1930. (Courtesy of USAF, Arnold Engineering Development Center)



LB-5A's, 20th Squadron, May 1, 1931 near Langley Field. (Courtesy of Eighth Air Force Museum)

2nd Bomb Group was part of the composite bombardment wing commanded by Maj. John Pirie — himself a former 2nd Bomb Group commander. As a demonstration force, the air division was to perform aerial maneuvers and give aerial demonstrations over key cities in the eastern half of the United States.

When the maneuver was announced, the Group was transitioning from the LB-7 Keystone bomber to the B-3A Keystone. Prior to the maneuver date of May 16, the Group had flown but one Group formation flight in the B-3A, and only a few Group flights with smaller numbers of aircraft. The last of the twenty-seven B-3A's to be delivered, arrived on May 5. Early flight in the new B-3A's disclosed defects that had to be corrected before going on the maneuver. The major defect was a weakness in the gasoline tanks at the location of the sight gauge. All upper wing tanks had to be removed and reinforced. Ground crews worked around the clock to make the repairs. This work grounded all the aircraft for a week before departure, depriving the aircrews of needed practice and understanding of the aerial demonstrations planned for the maneuver. The Group had to work out the difficulties during the actual demonstrations. The Group was scheduled to depart on May 14th but was delayed by bad weather between Langley and Cleveland, Ohio. The Group left Langley on May 15th and bucked head winds all the way to Cleveland. The trip took seven and one half hours. The air crews were tired, stressed and concerned that they would have to make a night flight to Fairfield, Ohio, the assembly point. Instructions were received to remain overnight and proceed the next day. What the aircrews did not know was that bad weather between Fairfield and the demonstration cities of Chicago, Boston, Atlantic City, Philadelphia and Washington D.C. set the maneuver back one day.

The Group provided thirty B-3A and B-5A bombers, all with the modified fuel tanks. Fifty six officers (56), plus 4 additional officer pilots detached from Wright Field, Ohio, and 60 enlisted personnel comprised the 2nd Bomb Group element. Of the 60 enlisted men, 46 were mechanics, 10 were radio operators and 4 were support clerks.[84]

The Group arrived at Fairfield, Ohio at 12:40 A.M. May 16. The aerial demonstration maneuvers got underway on May 17th.

During the course of the demonstrations, the plans were changed and Gen. Foulois was ordered to New York with his air division to simulate defense against an invading fleet. Because of the large number of aircraft participating, the force had to be dispersed to various airfields on the east coast. Maj. Arnold, the G-4 (supply) for the original maneuver, had preposition supplies at Pittsburgh and Middletown, Pennsylvania; Buffalo, New York; Aberdeen, Maryland; and Bolling Field, Washington DC.

The change in maneuver plan worked out satisfactorily. Maneuver demonstrations were made over Boston, New York and Atlantic City. The maneuver was declared a success with a simulated victory formation flight over Washington, DC on May 30. Gen. Douglas MacArthur took to the air in Capt. Ira Eaker's aircraft to lead the air division on the triumphant formation. The 2nd Bomb Group formation followed Gen. MacArthur's plane. The Group was in a clover leaf formation which presented a dynamic view to the ground on-lookers. The clover leaf formation was a column of squadrons, each squadron in three-plane elements , with the elements arranged in a " V" formation.. This type formation was much easier to fly, maintain station, and impress the ground observers.

The event was covered widely by the press. It was said: "Few activities of the National Defense in time of peace have ever commanded the newsreel footage or the attention of the broadcasting companies that the Air Division has over so great a period." [85]

The Air Corps was congratulated by President Hoover on its remarkable performance. Gen. Foulois proposed a similar maneuver for 1932 but the money was not forthcoming.

Maj. Dargue served as the air division radio

communication center when the division was in the air.

The Group's flying element returned to Langley on May 30th and by June 5th all other deployed personnel had returned.

The Group received commendations for a "job well done" from the Assistant Secretary of War for Air and Gen. Foulois.

In 1931 the Group acquired another real target — a World War I cargo vessel, the *USS Mount Shasta*. The *Shasta* had been tied up for ten years in the James River, Virginia. The U.S. Shipping Board made the hulk available to the Army for the Langley Field bombers to attack and sink. Maj. Dargue told reporters the operation would show how long bombers required to take off and intercept an enemy ship, and would test bombing accuracy and effects. Dargue cautioned, however, not to expect anything sensational. The operation was for bombing practice and no heavy ordnance would be used. The nine Keystone bombers selected for the mission would carry only 100 and 300-pound high explosive bombs and 30 pound phosphorous bombs.

The *Shasta* was towed to sea at a point sixty miles off Currituck Light and one hundred ten miles southeast of Langley. The Coast Guard cutter, *Mascoutin*, followed with observers and a bevy of reporters. The Air Corps liaison officer on board the *Mascoutin* radioed that the weather was bad, the seas were running very high, and bombing should be delayed one hour from 11:00 A.M. to 12:00 noon. Maj. Dargue and his flight had to penetrate a very rough frontal system and almost became completely separated.

The Coast Guard released the *Shasta* early, and in the rough seas it drifted considerably. Dargue's bombers, now reassembled after frontal penetration, had difficulty locating the *Shasta*. Running low on fuel, the bombers could not use too much time in a search. They returned to base to try again the next day. In the meantime, the Navy offered to lend flyers and planes to sink the *Shasta*. Their offer was rebuffed. The next day the bombers found the *Shasta*, but scored only two direct hits and one of them was a 300-pound dud that didn't explode. The live 300-pound bomb was accurate, but did very little damage. The *Mascoutin* and another Coast Guard cutter, the *Carrabassett*, sunk the *Shasta* with gunfire.

The operation was a flop. Maj. Dargue said the unit went through all hell in getting to the *Shasta*. What he didn't say was that none of the bombers were equipped for all-weather flying, and it was an aviation feat that the flight was able to survive the weather penetration as a unit and eventually get to the target. Neither did he mention that the Group was allowed to use only 100 and 300-pound practice demolition bombs. If the aircraft had been loaded with 600 or 1100-pound demolition bombs, the *Shasta* would have succumbed after the first hit. Newspaper correspondents described the operation as inaccurate bombing.

It was probably a bitter pill for Maj. Dargue to be put in the position of trying to sink a ship under near-impossible weather conditions using under-sized practice bombs.

In October 1931, the Coast Guard was towing an old vessel, the *Haines*, to sea to be sunk. En route the *Haines* began to falter and list, and it sank in a fishing channel off Plum Tree Island. This unplanned sinking created a hazard to boats and the Group was requested to destroy the under-the-water hulk. The 49th Squadron was given the job. It wasn't easy. The flyers could hardly see the outline of the hulk in its watery grave. To solve this problem, a ten foot float was anchored directly over the Haines to give the 49th a good aiming point. The 49th attacked with six aircraft. The bomber crews made two practice runs with sand-filled bombs, then made a bombing run with a mix of 100 and 300-pound demolition bombs. After the attack, the area was inspected. The *Haines* was gone; only a few splinters marked its position. It was very difficult to tell a 49er anything about bombing for the next couple of months.

During the Air Corps bombing and gunnery matches from 1929 through 1931, the average circular error — the average distance from the center of target to bomb impacts — in 1929 was 200 feet; in 1930 was 194 feet; and in 1931 was 150 feet. The 49th Squadron's average circular error on the *Haines* was 25 feet.

The maneuvers, exercises and transcontinental flights by the Group between 1927 and 1931 yielded technical data, proved or disproved theories, uncovered new ideas, afforded training not attainable in any other way, and otherwise contributed to the progressive advancement of Air Corps bomber tactics, unit deployment, and combat engagement techniques. Requirements for an improved bomber, capable of speed in excess of 150 mph, ceiling up to 20,000 feet and bomb load in the 3,000 to 4,000 pound range, were repeatedly verified. The theory of bombing in formations of group or squadron size as opposed to single aircraft or three ship formations, was proven to be accurate. Bomber protection through the use of multiple aircraft formation was verified. Bombing of targets, especially well constructed targets, needed a density of heavy bombs dropped by at least a six- airplane formation. Effectiveness of bomber formation operations was directly dependent on the efficient use of radio communications. To this end, the Group was in the forefront of requests for improved radios and antennas. The lessons learned by the Group did not fall on deaf ears. The Air Corps Tactical School, also located at Langley, had a continuing dialogue with Group aviators. Many of the theories involving bombing tactics and procedures and radio communications found their way into the Tactical School curriculum. In addition, many of the School instructors were drawn from the Group.

1932-1933

These were the beginning years of the depression. Money was short and as a result no major maneuvers were scheduled during this time period. These were the years of the forced furloughs for those military personnel whose pay exceeded $1,000 per year. The pay cuts that replace the furlough practice came in 1934. The lean years had other effects. Officer strength averaged 13-15 officers per squadron including the 59th Service Squadron. Enlisted strength ranged from a low of 125 to a high of 130 men per squadron. The manning goals of the 1926 Act were far from being met.

Even with low pay, life at Langley could be pleasant, relatively speaking. To compensate for fund shortages, Maj. Dargue scheduled many on-base picnics and recreational activities for the Group personnel. Emphasis was placed on improving the enlisted men's day rooms and barracks, much of it by self-help and volunteer work. The enlisted men in the barracks had their beds side-by-side with no double deck bunking. Officers' wives took on projects like equipping day rooms with comfortable furniture, curtains and drapes. The officers wives also provided durable curtains for windows in the barracks.

Although prohibition was in full force, the supply of hard liquor was plentiful. Each month the Base was visited by bootleggers from North Carolina and Maryland. The North Carolina bootleggers brought in "white lightning" in five gallon water jars, and the Marylanders brought gin in one gallon tin containers. The price was cheap, about seventy five cents a quart.[86]

The bachelor officers were quartered in Lawson Hall. Each officer had comfortable, individual quarters. Daily routine was commonly flying in the morning and ground school in the afternoon. Wednesday and Saturday were half-duty days, and Sunday was a day off. A band was assigned to the Group in late 1931. In February 1933, the band was reassigned to the 2nd Wing at Langley.

Throughout 1932 many of the B-3A's were transferred to other units and the Group received B-6A's as replacements. The primary difference between the two aircraft was in engine horsepower. The B-6A had greater horsepower. In late 1932, five Y1B-9A's were assigned to the Group. The Y1B-9A was an all-metal, twin-engine bomber with 630 horsepower engines and a top speed of 186 mph; almost 80 mph faster than the B-6A.

Although no Air Corps maneuvers were scheduled for the year, the Group did deploy to Hebron and Princess Anne, Maryland for a two-week field exercise. The purpose of the exercise was to have an Air Corps mobile tactical unit spend at least two weeks in the field, operating without the assistance of formal base facilities. On May 31, ten B3-A/B6-A's, and one C-4 and one C-12 transport aircraft, were used to move supplies and personnel to Hebron and Princess Anne to establish the two field exercise camps. The two camps were twenty miles apart.

On June 1, the Group deployed to the camps. Group Headquarters, 49th Bomb Squadron and the 59th Service Squadron operated from Hebron. The 20th and 96th Squadrons operated from Princess Anne. For the next fourteen days Group personnel lived in tents and operated their aircraft from these "bare bones" airfields. Simulated bombing missions were flown, several daylight cross-country exercises and one night exercise were flown. Forty nine officers and two hundred sixty six enlisted men deployed.

The field exercise built on the past experience of the Group on the Mexican border, bombing ship trials in 1921 and 1923 and the three transcontinental flights. The experience was added to the operational heritage that the Group passed on through the Air Tactical School at Langley, and through the spread of Group per-

Pineapple Pete *was applied to the nose of this 20th Bomb Squadron Keystone B-6. The photograph was taken at Newark Airport, Newark, New Jersey. Note the ying and yang wheel cover markings which appear to be in black and white. Similar trim was applied to the fuselage and cowl scallops. (Courtesy of Fred Bamberger via P.M. Bowers)*

sonnel as the nucleus of newly formed units during the expansion for WW II.[87]

While on this exercise, the Group was advised it would receive a new annual training program directly from the Chief of the Air Corps. Previous annual training programs had come, indirectly, through the Army Adjutant General's office. The program arrived in mid-July.

Subsequent training programs up through FY 1940 were similar in content and thrust. For this reason this first program is summarized here.[88]

Annual Training Program FY 1932-1933[89]

Objectives: This training program is so drafted to produce and maintain within the 2nd Bombardment Group:

a. The will and ability to reach the objective.

b. The ability to hit and destroy the target.

c. The ability to neutralize hostile pursuit and avoid antiaircraft attacks.

d. The ability to function smoothly and efficiently as a component part of a task force.

e. A thorough and practical working knowledge on the part of all officers concerned, the Command and Staff duties and responsibilities appropriate to their own and next higher grade.

f. A high degree of morale and discipline throughout all echelons of this command.

g. A constant state of preparedness for any emergency in which this Group may be designated to participate.

h. Teamwork

i. Individual proficiency in the operation of and care of all equipment.

j. Trained junior officers

k. High degree of physical development

l. The necessary number of specialists required by each unit.

m. A proficiency in infantry drill of a standard requisite to the precise parading of troops at military ceremonies.

Flying Period

Scheduled flight training will be conducted from 9 A.M. to 11:30 A.M. – Monday, Tuesday, Thursday, and Friday. 7 P.M. to 9 P.M. on Monday, Tuesday and Thursday of each week. Make up 1:30 to 3 P.M. – Monday, Tuesday and Thursday. Meetings – Wednesday 8 to 10 A.M.; 10 A.M. to 11 A.M.; 11 A.M. to noon.

Saturday Programs

1st and 2nd Saturday – ground inspection of organizational personnel and equipment. 3rd Saturday – aerial review. 4th Saturday – Group tactical inspection.

Flying Time

Total pilot time allotted to each pilot of this Group for the current fiscal year amounts to 205 hours. Flying time to be divided into: Instrument flying-7 hrs; individual flying-44 hours; night flying-10 hours; aerial bombing-10 hours; formation maneuvering-36 hours; combat exercises-23 hours; aerial tactics-44 hours; cross country flying-31 hours.

The last half of 1932 was spent implementing the new Air Corps training program. Occasional single aircraft or three-aircraft formations were dispatched to areas in Ohio, Pennsylvania, Maryland, New York, North and South Carolina, Georgia and Florida to perform aerial maneuvers over new airfields. Time was spent photographing aerial routes from which strip maps could be developed. There were still no adequate aerial maps. The common maps used were Rand McNally state maps. These maps showed rivers, mountains, and railroads but no highways.[90]

The airfield parking aprons, taxiways, and runways at Langley remained unpaved. Ground crews worked on pounded earth aprons which could be either dusty or muddy, depending on the weather. The flying field was grass-covered, pounded earth. It was several years before asphalt or bituminous paving would be undertaken.

Radio 1927-1931

Although radio communication was introduced in the 1921 bombing trials against ships, the use of radio as standard communications gear didn't progress beyond the experimental basis from 1921 through the early 1930's. By 1927 air crews still placed greater reliance on visual signals, such as rocking of wings and arm waving, for air-to-air communication. The Air Corps Materiel Division worked with the Army Signal Corps and industry to find reliable signal equipment for the aircraft. Early on, telegraphic signals (Morse code) was fairly effective. The rush of the wind in open cockpits and the sound of the engines made the use of voice transmissions most difficult. It wasn't until aircraft were built with enclosed cockpits that real advances were made in voice communication.[91]

Effective radio transmissions are dependent on antennas, and they presented problems for use in aircraft. Early mast antennas had and effective range of 50 to 75 miles. Trailing wire antennas had greater range but were easily severed and difficult to use in formation flying. Radio communications had been used in the transcontinental flights and during maneuvers, but these were all relatively short-range applications. An interesting anecdote epitomizes the state of radio communications for military aviation at the time.

Returning from the transcontinental flight to Rockwell Field in 1929, the Group landed at the Denver municipal airport. One LB-7 didn't make the morning take off because of motor trouble. The rest of the flight took off and some crews tuned to the powerful General Electric radio station KOA at Denver to listen to music and other entertainment while droning along. About 125 miles east of Denver, the flight heard station KOA say: "This is station KOA Denver calling D0-1 commander's ship of the air fleet that left Denver this morning. The plane remaining in Denver because of motor trouble requests that a spare magneto be returned to the field." The pilot of the stranded LB-7 had called KOA and asked that the message be transmitted knowing someone in the flight would be listening to KOA. A Mrs. J. C. Traw of Flagler, Colorado had turned on her radio at 9:15 A.M. just in time to catch the KOA announcement and the plane's reply: "Message received and thanks very much KOA." Then she heard KOA repeat its original announcement. She was unaware that the transmitters from the in-flight aircraft could not reach Denver, but she knew KOA had not heard the reply. Listening to the crews talking to one another, she heard one say: "Maybe someone will phone them." Mrs. Traw made the call and told KOA that a plane was returning with a spare magneto. The beleaguered LB-7 pilot at Denver got the message. Both LB-7's were off the ground on the way to join the Group by noon that day.[92]

1933-1934

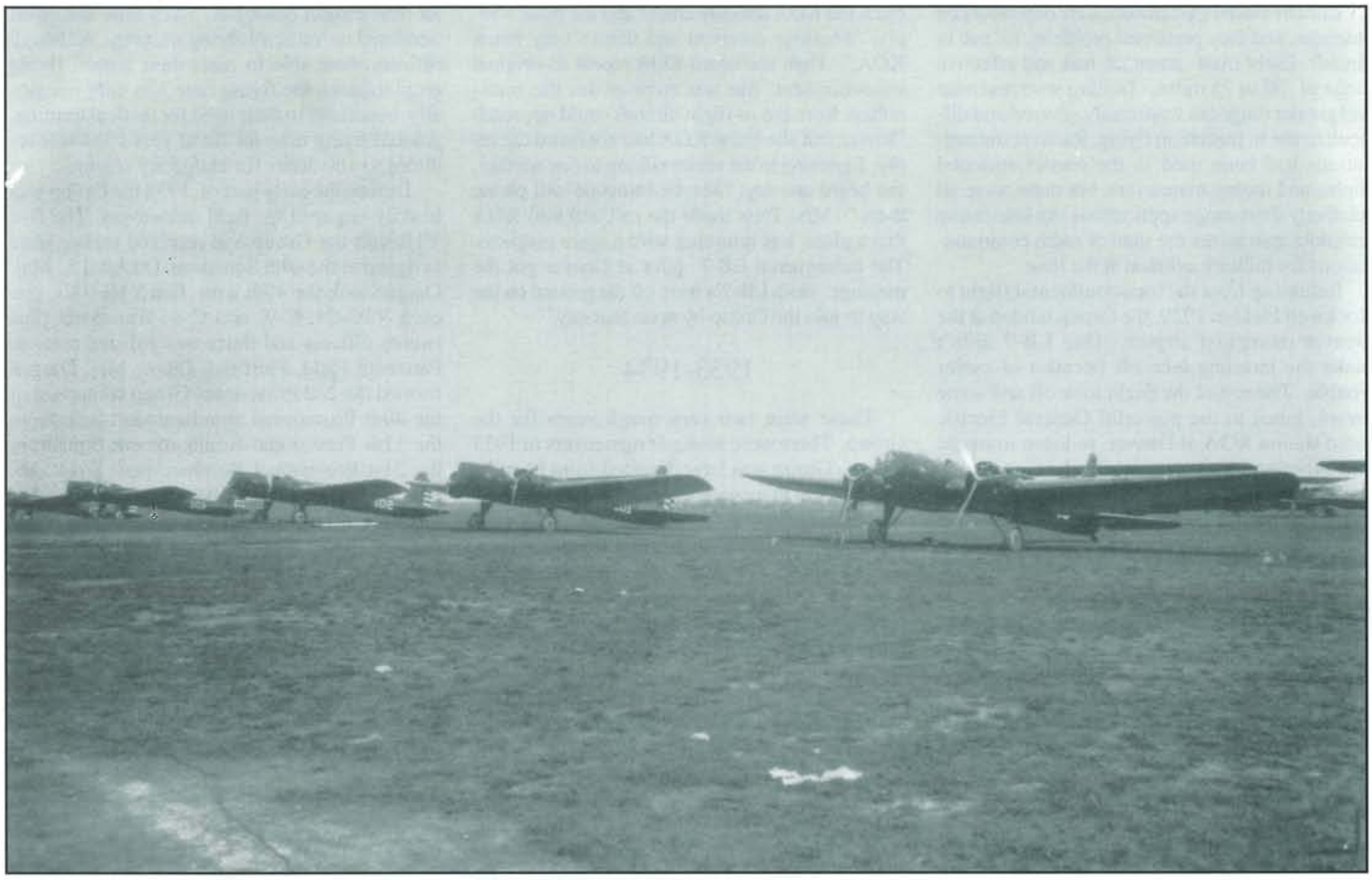
These were two very tough years for the Group. There were multiple maneuvers in 1933 and the Group was later diverted from its military mission to manage part of the Civilian Conservation Corps (CCC) program. The CCC program took almost fifty percent of the officers and approximately thirty five percent of the enlisted men. Many officers were unable to meet the annual training requirements, and fell far short of the required 200 hours flying time for the year.

In 1934, the Group was again called abruptly to national duty when the Air Corps was given the job of flying the U.S. mail. The air mail project consumed much time and effort unrelated to military flying training. Although officers were able to meet their annual flying requirements, the flying time was only marginally beneficial to their need for tactical training. Annual flying time for fiscal year 1934 was reduced to 180 hours for budgetary reasons.

During the early part of 1933 the Group was heavily engaged in field maneuvers. The five Y1B-9As the Group had received earlier were assigned to the 49th Squadron. On April 5, Maj. Dargue took the 49th with five Y1B-9A's, one each Y1C-24, C-9, and C-14 transports plus twenty officers and thirty-two enlisted men to Patterson Field, Fairfield, Ohio. Maj. Dargue formed the 2nd Provisional Group composed of the 49th Provisional Bombardment Squadron, the 11th Provisional Bombardment Squadron, the 31st Provisional Bombardment Squadron, and the 8th Provisional Attack Squadron. Another provisional group, all pursuit aircraft, was formed by the 17th, 27th and 94th Provisional Pursuit Squadrons. The two Provisional Groups were subordinate to the 1st Provisional Wing commanded by Brig. Gen. H.C. Pratt.[93]

The purpose of this field maneuver was to exercise army antiaircraft units in the Ft. Knox, Kentucky area, and to develop tactics for use by bombers attacking antiaircraft defenses in daylight and at night. Additionally, the Air Corps would

The 96th Bomb Squadron leading a flight of Keystone B-6's over Langley Field, VA. Circa 1932. (Courtesy of Eighth Air Force Museum)



Boeing Y1B-9A's all assigned to the 49th Bombardment Squadron, 1933. (Courtesy of Eighth Air Force Museum)

field test camouflaged aircraft. All the Y1B-9A's were camouflaged prior to the exercise.

The attacking force included the fastest bombardment and attack aircraft in the Air Corps. In this exercise, elements of the 1st Pursuit Group, together with antiaircraft batteries, defended Ft. Knox from an attacking force based at Patterson Field.[94] The entire operation was under field conditions. Personnel lived in tents and were fed from field kitchens. These exercises were designed to be realistic and intense. Bombers flew one daylight and one night mission each day. The bombers made simulated attacks against antiaircraft defended areas under assumed wartime conditions.

A total of 109 officers and 260 enlisted men were assigned to the 1st Provisional Wing. The 2nd Bomb Group accounted for about twenty per cent of this force. Maj. Dargue did an outstanding job of pulling his Provisional Group together into a coordinated bomber force. This was no easy job. The 11th Squadron was flying B-2 Condors, the 31st Squadron was flying Douglas Y1B-7's and the 49th Squadron flew the Boeing Y1B-9A's. The aircraft flown by the 31st and 49th Squadrons had a speed differential in excess of sixty miles-per-hour over the B-2s flown by the 11th Squadron. The problem of coordinating time schedules for this diverse force was understandably difficult. True to his reputation, Maj. Dargue demanded split-second time schedules.

Group crews were proficient in night operations and landings, and had perfected techniques for night bombing. The 11th and 31st Squadrons were not proficient in night flying or in night bombing. The Group and the 49th Squadron made sure that all the bomber crews were proficient in the night flying and bombing demanded by the exercise.

The pre-exercise training was hindered by extremely unfavorable weather. Despite the weather, Maj. Dargue had his 2nd Provisional Bombardment Group ready for the exercise when it began on May 15, 1933.

Between May 15 and May 24, the Provisional Group met all of its day and night mission schedules. The day and night missions meant that rest and sleep were matters of chance rather than schedule. It was a demanding exercise and any break down in commitment and teamwork could result in something less than the complete success that was expected.

The 49th Squadron, lead unit in the exercise, commanded by Capt. Eugene Eubank, received commendations for its outstanding work. Brig. Gen. H. C. Pratt, the Provisional Wing Commander wrote to Capt. Eubank:

"1. I wrote to express my deep appreciation to you and your officers and enlisted men of the 49th Bombardment Squadron for your very excellent performance of duties of your squadron, connected with the activities of this Wing during the Anti-Aircraft-Air Corps Exercises. All missions were executed with precision and intelligence, in spite of the numerous unfavorable conditions caused by weather and difficulties with equipment.

2. It is desired particularly to congratulate your enlisted men for the excellent way in which they carried out the very difficult work of maintenance of equipment.

3. I hope I may again have the pleasure of serving with you and your command.[95]"

The 2nd Provisional Group disbanded at Patterson Field on May 25. All 2nd Bomb Group personnel returned safely to Langley. Once back at Langley they found that the 20th and 96th Squadrons were gone. They had left Langley May 4 for March Field, California for the Air Corps Command and Staff exercises. The two Squadrons, with Capt. G. P. Johnson commanding, departed Langley 07:30 A. M. May 4th with 30 B-6As, 36 officers and 113 enlisted and arrived at March Field 3:00 P.M. May 7. All units from the east coast were delayed in their transit by bad weather. Those taking the southern route, which included the 2nd Bomb Group squadrons, ran into sand and electrical storms that caused them to land early or delayed the next-day departures. Some had motor troubles and were delayed for maintenance. Five aircraft from the 9th Bombardment Group took the northern route and were delayed in the Salt Lake City area by snowstorms. All forces had arrived by May 9th.

The Air Corps had secured War Department approval to form a Provisional GHQ Air Force for the maneuvers. The plan had been to swiftly concentrate all units around Puget Sound, Washington for several weeks of training. However, funds for 1933 maneuvers were limited and Brig. Gen. Oscar Westover, Assistant Chief Air Corps, and commander of the GHQ Air Force (Provisional), decided it would be cheaper to run the bulk of the maneuvers from March Field, followed by a brief staff exercise in the Puget Sound area.

Three hundred fifty (350) officers, 530 enlisted men and 280 eighty airplanes participated

in the March Field exercise. The 2nd Bomb Group provided ten percent of the officers, twenty-one percent of the enlisted men, and eleven percent of the aircraft.

The exercise ran from May 8th through May 29th. The maneuver units, including those from the Group, dispersed from March Field most days to airports in Los Angeles, Riverside, and San Diego areas, and stood by on alert for the daily operations order. All of these orders were issued by either ground radio or airborne command post radio. From May 12 to May 26, the GHQ Air Force attacked airdromes, aircraft carriers, and other targets, intercepted and defended against aerial attacks, engaged in aerial combat — pursuit against pursuit — and operated as composite forces against targets of opportunity.[96]

During the exercise, it was noted that the 2nd crews use of radio for aerial command and control, their ability to operate as a unit at night, and superior formation flying, set them apart as a well trained and highly effective bomber force. The bombardment elements of the 1st Wing — the 7th and 19th Bombardment Groups — learned a great deal from the Group's representatives.

On May 29th a staff of nine officers and twenty one enlisted men from the Group were selected to assist in the command post exercise in the Puget Sound area. This force departed in six B-6A aircraft on May 29th and landed the same afternoon in Seattle, Washington. The exercise concluded in time for 2nd Bomb Group personnel to leave Seattle June 4 for Langley. They returned via Boise, Idaho, Cheyenne, Wyoming, and Chicago, Illinois.

In the meantime, the 25 officers and 90 enlisted men departed March Field on May 29th in 24 aircraft for Langley via El Paso, Texas, and Fairfield Ohio. The Group was finally reassembled on June 9 at Langley. All aircraft and personnel had returned safely.[97]

Civilian Conservation Corps (CCC)

For the next six months Group combat effectiveness was seriously degraded by its involvement in the Roosevelt administration's CCC program. When the west coast contingent from the 1933 maneuver returned from March Field, CCC recruits had already arrived at Langley Field.

The CCC was established in April 1933 and Langley Field received its first contingent of CCC personnel on May 24. At first CCC personnel were quartered in a hangar on the flight line and in warehouses adjacent to the flight line. Later they set up a tent city on the west side of the airfield under Air Corps supervision,. Here they began their first training which included the rudiments of close order drill and physical training.

The Group was called on to furnish officers and enlisted men for supervision and training of CCC personnel. All Group training was severely curtailed. The reduced flying training program was consolidated in the 49th Squadron. Officers available for Group duties dropped below fifty percent of assigned strength. As the CCC recruits were formed into field units, they were moved to camps in Virginia, Maryland, West Virginia and North Carolina. Officers and enlisted men from the Group, detailed to CCC duty, accompanied these CCC field units. The Group headquarters furnished 3 officers and 3 enlisted men; the 20th Squadron 7 officers and 17 enlisted men; the 49th Squadron 6 officers and 15 enlisted men; and the 96th Squadron 7 officers

49th Squadron B-6A, 1935. L to R: Unknown; Unknown; Lt. Kennedy, Pilot; Cadet McCune Bombardier; T/Sgt Simons, Gunner. (Courtesy of Air Force Museum, WPAFB Collection)

2nd Bombardment Group, 49th Squadron, B-6A. Ground crew from L to R: Cpl. Moore; Pfc. Mazza; Captain Choate, Pilot; Cadet Templeton, Bombardier; Gunner and Radio operator names unknown. (Courtesy of Eighth Air Force Museum)

and 20 enlisted men. Group personnel were detached for CCC duty from June 2, 1933 through February 1934. When first detached, the officers and men were told they would be in the field approximately six months until reservists were called to active duty to replace them.[98] Air crews assigned to the CCC camps could not get their flying time and, as a result, lost their flight pay. [99]

The final blow to Group manning came when the Air Corps announced it could no longer retain reserve flying officers on active duty because of fund shortages. The Group lost several reserve officers to this new decision. With all these losses, the ratio of air crews to available aircraft went far below the minimum required to man the thirty B-6A's and five Y1B-9A's. From July to December 1933, flying was at a minimum, and only a few aircraft were launched each day. There were no scheduled practice bombing exercises, few cross-country flights, no gunnery practice, and very little of the annual training program was accomplished. With all these disruptions and diversions, and the mandatory furlough pay cuts, 1933 was a depressing year. It did end, however, on an encouraging note. In December President Roosevelt authorized the War Department to recall to active duty sufficient reservists to replace the active duty personnel detached to the CCC program. The Group had all its personnel back for duty by the end of February 1934. The detached air crew members hadn't flown for almost eight months. Before the Group could set about regaining combat readiness, another diversion struck.

On February 9, 1934, the Air Corps was assigned the task of flying U.S. mail. The Group's five Y1B-9A's were withdrawn and sent to the units designated to fly the mail. The Group was assigned a support responsibility for the mail operations, and was to send officers, enlisted men, and aircraft to various airfields to supervise operations and provide logistical support. Again, the Group had to suspend training. Air crews and mechanics were put on alert awaiting orders. Capt. Eugene Eubanks was in command of the Group at this time.

The Air Corps Chief announced that the B-6A's were too slow to maintain air mail deliver schedules. In a few urgent instances they were used to ferry mail, but were used extensively for logistics support, primarily to carry personnel and equipment to various air mail operating locations. Many Group pilots and enlisted men were assigned to control points and intermediate stops along air mail routes throughout the eastern zone. Those not so deployed were kept busy on the logistic support missions. During March and April the Group had only six or seven officers present for duty and as few as three B-6A's.

The air mail support operation was a demanding assignment. Officers and enlisted men worked twelve to eighteen hours a day, seven days a week. The B-6A's were kept in operation day and night. Despite the exhausting schedule, the detached duty, and the hazards of day and night flying, frequently in bad weather, the Group discharged its support responsibility without loss of life or aircraft. Regardless of the Air Corps' less than successful record in this inappropriate role, the Group viewed its support operation as a success.

The military air mail operation ended in early June 1934. Group support operations began to wind down in early May and by June 10 all personnel and aircraft were back at Langley. It had been almost exactly a year since the Group had to abandon the annual training program. Planes were soon going over the Mulberry Island bombing and gunnery range.

In August the Group sent eleven B-6A's to Fort Benning, Georgia, to take part in the annual demonstration for West Point cadets.

Maj. Willis B. Hale became Group commander in June 1934, and soon thereafter was detailed to the staff of the GHQ Air Force (Provisional) as the bombardment officer for the June/July command post exercise. Brig. Gen. Oscar Westover again commanded the Provisional unit. The command post exercise was a military operation, simulated on paper, and commonly called a "paper exercise." Among other things, it involved the simulated movement of the 2nd Bomb Group as the bomber defense force. Maj. Hale took several Group Headquarters and Squadron officers to serve as staff personnel for the exercise.

After the exercise, Army Vice Chief of Staff, Maj. Gen. Hugh Drum was convinced that creation of a GHQ Air Force was inevitable. Gen. Drum's comment was: ". . . . someone must decide what forces are going to be used, at what places they will operate, and what the objectives will be for those forces." [100]

The balance of 1934 was spent training in accordance with Air Corps Annual Training Program, to regain air crew proficiency and combat readiness. At the end of 1934, the Group, including the 59th Service Squadron, had 54 officers, 14 flying cadets, 580 enlisted men, and 30 B-6A aircraft assigned. To have enough air crews for 30 airplanes, flying cadets were used as second pilots.

1935-1937

This was a period of great change for the Group. It became part of the new GHQ Air Force established in March 1935. It lost some experienced personnel to the GHQ Air Force staff; and several others moved to positions of greater responsibility and influence within the Air Corps. The Group received its first modern, all metal bombers, and shed the Keystone bomber. The 96th Squadron received the MacKay trophy. Langley Field received improved parking aprons and ramps, and the landing ground was transformed into paved runways. New officer and enlisted men quarters were built, and there were promotions and a pay increase.

On December 31, 1934, the Army Adjutant General issued orders authorizing establishment of the GHQ Air Force effective March 1, 1935. The headquarters for the GHQ Air Force was to be at Langley Field. This portended many changes for the 2nd Bomb Group. Among the first and most welcome of these changes was authorization for temporary officer promotions. Most officers, from 2nd lieutenant with over three years service in grade, to lieutenant colonel were promoted one rank. These promotions were great morale boosters after the long, lean years in grade and the forced furloughs and pay cuts of 1933 and 1934.

The Air Corps announced that it would authorize between forty and fifty regular commissions beginning in July 1935. This meant that some of the reserve officers, who had been released in 1933, would be able to come back to active duty. Further, the flying cadet graduates could now be commissioned at the end of their training and not have to serve a year of active duty before being commissioned. [101]

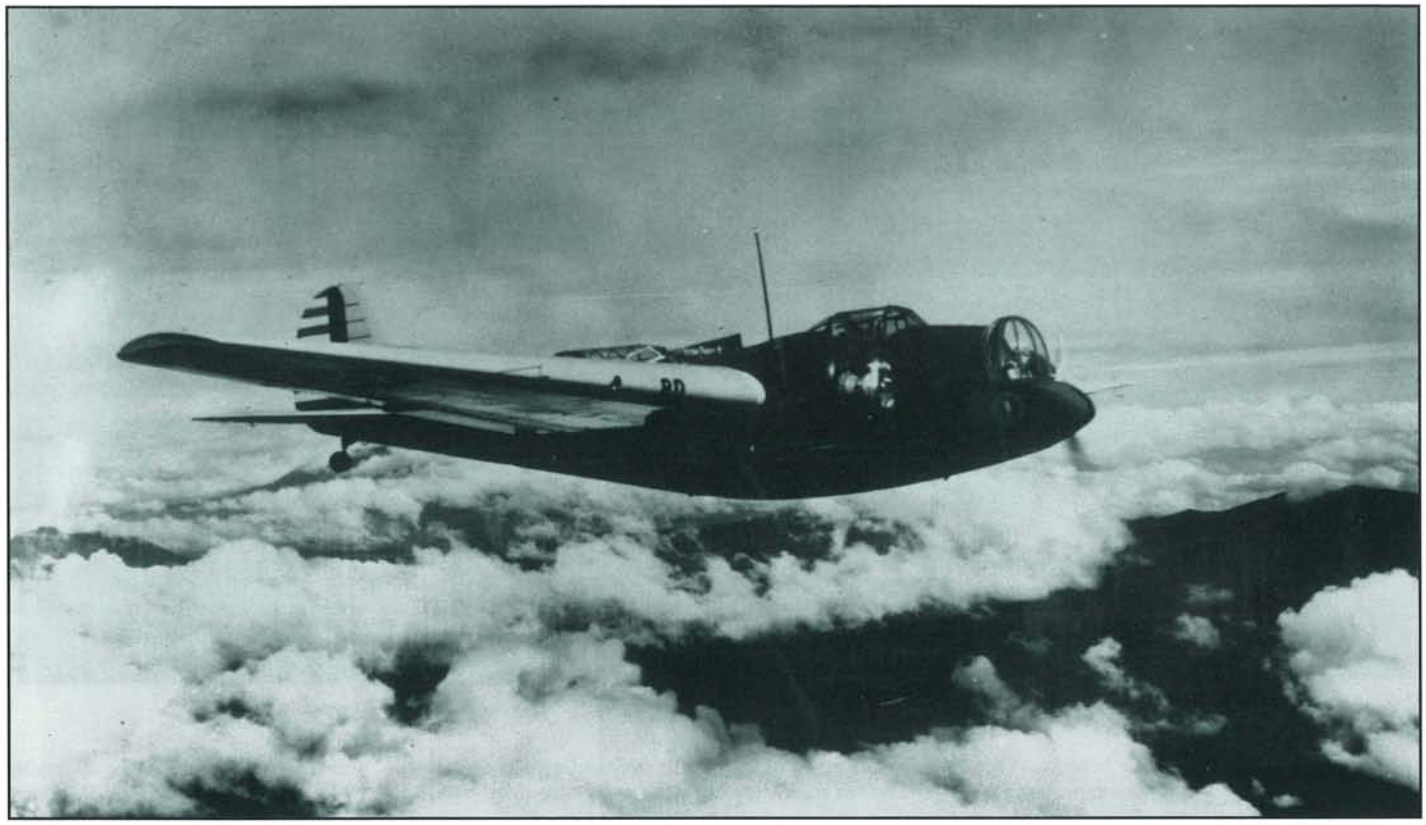
Former Group commander, Maj. Hugh Knerr, became Chief of Staff for GHQ Air Force. Under the temporary promotion policy, Maj. Knerr was promoted to colonel on March 2, 1935. Maj. John Pirie, Group Commander 1923-1924, became Chief of the Air Corps office and was promoted to colonel. Maj. Willis B. Hale, Group Commander from June 1934 to April 1935 was promoted to lieutenant colonel. Maj. Charles B. Oldfield was promoted to lieutenant colonel. Maj. Bert Dargue, former Group Commander and now at the flying schools in San Antonio was promoted to colonel. Needless to say there were smiles all around.

Establishment of GHQ Air Force created four levels of command at Langley — GHQ Air Force; 2nd Wing Headquarters; Langley Base Headquarters; and Headquarters 2nd Bombardment Group. Langley Field became the home of two generals, many colonels and lieutenant colonels, and numerous majors. There was much shifting of married officer quarters — conforming to the old adage "rank has its privileges." Few, if any, officers or enlisted men were forced off base because the building program, begun in 1934, was able to absorb the new and higher ranked personnel.

In addition to Group personnel transferred to the GHQ Air Force staff, several officers were transferred to the newly formed 2nd Wing. The 59th Service Squadron was transferred from the Group and its authorization of enlisted men was increased to maintain GHQ Air Force and 2nd Wing assigned aircraft. The Group's three squadrons lost enlisted men to build-up the 59th. Within a year, however, the three squadrons was back to an average of 125 enlisted men per squadron.

After a long interlude, the Group resumed participation in maneuvers and exercises. The Group dispatched all 27 of its B-6As, 39 officers and 114 enlisted men to support a 4th Corps maneuver scheduled to run from January 4 to February 4, 1935. While returning from the maneuver, bad weather forced down many Group aircraft across the southeastern states. It took almost ten days to get them all back to Langley.

In June 1935, GHQ Air Force conducted a series of field exercises throughout the United States. The Group participated in one of these. The 96th Squadron, supported by the 20th and the 59th Service Squadrons deployed to Byrd Field, Virginia in an exercise that was to test mobility and gain experience in field operations. The 96th deployed 12 B-6A's, 17 officers, 9 flying cadets and 51 enlisted men. The 20th deployed 4 B-6A's, 8 officers and 20 enlisted men. The bulk of the 59th Service Squadron deployed in a motor convoy. During the exercise, air crews flew day and night missions, conducted several mock bombing missions over North Carolina, and flew a formation bombing mission against ground targets on the range at Mulberry Island.



B10-B, 96th Squadron en route to Panama flying over Caribbean, 1936. (Private Collection)

On October 2, the Group gave a formation bombing demonstration during the annual Ordnance exercise at Aberdeen Proving Ground, Maryland. This demonstration was the last field deployment for 1935.

In 1935, the Air Corps began equipping its four bombardment groups with the new and modern Martin B-10 and Douglas B-12 bombers. (See Appendix 8B.) The plan was to equip one bombardment group at a time as the new aircraft came off the assembly lines. The 2nd and 9th Bomb Groups of the 2nd Wing were the last to be equipped. The 2nd began receiving its B-10B's in December. The 9th, at Mitchel Field, New York, didn't get the B-10B until early 1936.

The Air Corps used the Martin YB-10 during the air mail operation, and it had proven to be a worthy aircraft. It was considered to be a "slick" airplane, and was a substantial improvement over Keystone B-6A's in performance and striking power. Powered by two Wright engines, the B-10 carried a crew of four, provided internal storage for 2260 pounds of bombs, and mounted one machine gun in a nose turret, one in the rear cockpit, and one in the floor behind the bombay. The B-10's maximum speed was 207 miles mph. It cruised at 169 mph, had service ceiling of 21,000 feet, and a range of 600 miles. In addition to being all metal, with enclosed crew compartment and retractable landing gear, the B-10B had a much advanced instrument panel in the pilot's cockpit. The cockpit had the new directional gyro, artificial horizon, Kollsman altimeter, and a lighted instrument panel. There was one significant drawback; the engine instruments were located in the engine nacelles, instead of being on the pilot's instrument panel. They were difficult to see in bad weather and at night. Still, Group aviators thought the B-10B better than any previous aircraft they had flown because of superior performance, and the enclosed cockpit with advance flight instrumentation.

As the B-10B's arrived, the B-6A's were ferried to the Advanced Flying School at San Antonio, Texas. The arrival of the B-10 was accompanied by a new Table of Organization (TO), that authorized 13 aircraft, 36 officers, and 167 enlisted men per squadron. The Group headquarters was redesignated the Headquarters and Headquarters Squadron, 2nd Bombardment Group.

The Group learned the results of the Air Corps bomber competition (fly-off) in late 1935 between the Douglas B-18 Bolo, and the Boeing Model-299; the prototype to the B-17. Following the crash of the Model-299 at Wright Field on October 30, 1935, the Air Corps awarded the production contract to Douglas. Approximately a year later, the Air Corps awarded a contract to Boeing for thirteen Model-299s, later redesignated as YB-17s. The Group also learned that the YB-17 production would likely be assigned to the 2nd Bomb Group[102]

Although not too much was known about the capabilities of either the B-17 or the B-18 it was a common feeling among Group aviators that the B-18 would not satisfy the strategic bomber requirements, but probably would be better than the B-10B.[103]

Airfield improvements continued at Langley during 1936 and included the addition of paved engine warm-up aprons in front of the hangars. Group flight line personnel no longer had to stand in mud in wet weather, or choke on dust in dry weather when working on aircraft.

The Group exceeded Air Corps standards for flying proficiency by almost fifty percent for fiscal year 1936 (beginning July 1, 1935). The training program called for forty-five hours of navigation and thirty hours of instruments for each pilot. The pilots averaged ninety-one and a half hours in navigation and fifty-eight hours on instruments.[104]

Link trainers (instrument flight simulators) were installed at Langley in 1936 and Group pilots, literally, wore them out. With the B-10B instrumented cockpit and the link trainer, pilots became quite proficient in blind instrument flying. These training efforts bore fruit later in the year when the 96th Squadron captured the 1936 MacKay trophy.

On the B-10B's the second pilot acted as navigator, bombardier and gunner. The navigation school, re-established at Langley in early 1936, concentrated on training all second pilots as dead reckoning/celestial navigators. 1st Lt. Douglas Kirkpatrick and other members of the Group devised a method of dead reckoning navigation on instruments to avoid collisions during formation ascent and descent through an overcast.

Officers were still required to perform the duties of all officer crew positions — pilot, navigator, bombardier, and radio. Due to shortages of officers, units were allowed to substitute enlisted men in some positions. Within the Group many enlisted men were trained as radio operators and a few as bombardiers. If officers were not available to be trained in the navigation, bombardier or radio positions, flying cadets and enlisted men could be trained to temporarily fill these positions provided funds and allowances permitted. [105]

Night cross-country navigation problems were reduced in 1935-1936 by installation of airway and airfield flashing light beacons. The en route flight beacons flashed, then emitted a

Officers of the 20th, 49th, and 96th Squadrons in front of a Y1B-9A, Langley Field. (Courtesy Eighth Air Force Museum)

Morse code that identified each beacon. The airfield beacons had a single sweep beacon for civilian airfields or a double sweep beacon for military airfields. Both beacons had a pulsating green light. A crew member from the 1936 time period said: " I remember when they came out with a new method of navigation at night, where they had these lights along the route you were flying. I remember there was a route between Maxwell Field, Alabama, and Langley Field, Virginia and they had codes, and you would read the code and identify where you were ....when you flew at night you were trying to look at these codes and lights, if you weren't careful you would find yourself on your back".[106]

Another navigation aid introduced at the time was the radio range station installed along major airways and at airfields. Radio range stations were of value in airway route flying, but their primary advantage and use was for navigating instrument approaches to airfields in bad weather. The use of radio ranges had been pioneered by Capt. William C. Ocker, Capt. James Doolittle and 1st Lt. Albert F. Hegenberger between 1929 and 1932. However, the U.S. government was not able to begin nation-wide installation of radio ranges until 1934; too late to be of help in flying the mail. After receiving the instrumented B-10B, the Group did noteworthy work in perfecting the use of radio ranges for safe overcast penetration by aircraft in formation. Another innovation was the work of 1st Lt. Douglas M. Kirkpatrick, and other Group officers, in developing an instrument approach to bombing, using dead reckoning navigation. Accuracy of this technique was dependent on having a visual navigation fix within a few miles or minutes of the target. Pin point accuracy was not possible with this approach, but bombs dropped by a closely knit formation, or in trail across an enlongated target increased the probability of saturating the target in the first instance or hitting it in the second instance.[107]

Lt. Col. Charles B. Oldfield commanded the Group during all of 1936. The outstanding performance of the Group in that year was due primarily to his leadership. Additionally, Col. Oldfield was instrumental in preparing Maj. Robert Olds to succeed to command of the Group in 1937.

From January 31 to February 16, 1936, the Group conducted winter test maneuvers at Concord, New Hampshire. The purpose of these maneuvers was to test the B-10B on the ground and in the air, and determine the effectiveness of Group personnel under field conditions, in severe winter weather. The Group deployed 9 B-10B's, 15 officers and 100 men to an austere base near Concord, New Hampshire. There are many severe winter locations in the United States, and Concord, New Hampshire ranks high among them. Ground maintenance and servicing of the aircraft proved particularly difficult, but the B-10B performed beyond expectations. All scheduled missions were made on time and without incident. The air crew members were particularly appreciative of the enclosed crew compartments. Recommendations from this exercise included improved air crew winter clothing, specialized winter clothing for maintenance crews, and improved ground engine heaters for the aircraft. For personnel comfort and efficiency, it was recommended that a tent heater be developed.[108] The experience gained by the Group during this 1936 New Hampshire exercise found its way into winter field deployment procedures used by tactical units in World War II.[109]

The 1935-1936 winter on the east coast was particularly severe. Many communities suffered from the extreme cold and freezing, or heavy flooding. The Group flew humanitarian missions during this period. Between March 19 and March 22, the Group deployed all of its B-10B's to Phillips Field, Maryland. This move involved 45 officers, 100 enlisted men and 30 aircraft. Operating from Phillips Field, the Group dropped over 8,000 pounds of food and medical supplies to flood-isolated communities in western Pennsylvania. The Group next directed the 49th with 13 B-10B's to fly mercy missions; dropping food and medical supplies to marooned inhabitants on islands in the frozen Chesapeake Bay. The 49th Squadron operated from Langley and was directed by ground to air and air to ground radio.

The winter field tests and humanitarian missions were flown while the Group was transitioning from the B-6A to the new B-10B. The fact that the Group had no operational downtime and was able to provide aircraft for each mission speaks well of its operational proficiency and the excellence of its command and control procedures.

When GHQ Air Force had unusual missions to accomplish it did not have to look or go very far. From GHQ Air Force headquarters to the Group's location on the flight line was only a few blocks.

In mid 1936, GHQ Air Force involved most of its units — 1st Wing, March Field; 2nd Wing, Langley Field; and 3rd Wing, Barksdale Field, Louisiana — in a series of field exercises and maneuvers. The Group was tasked to support the Second Army maneuvers. The Group flew bombing attacks against Ft. Knox, Kentucky, and against Army ground forces deployed in Michigan. A force of eighteen B-10B's from the 49th and 96th Squadrons flew a simulated bombing assault on Chanute Field, Illinois on August 1. A week later three B-10B's from the 49th Squadron flew a night mission against Ft. Knox, Kentucky. On August 9, a formation of fifteen B-10B's from the 49th and 96th Squadrons, together with attack units from Barksdale, and pursuit units from Selfridge, were flown to Selfridge Field, Michigan to participate in an aerial review near Allegan, Michigan.

For the Air Corps, and the 2nd Bomb Group, the high point of the Second Army maneuvers came from a mission for which the 96th Bombardment Squadron won the 1936 MacKay Trophy. (See Appendix 5.) On August 13, 1936,

Capt. Richard E. Nugent led three B10B's from Langley to attack ground forces in Michigan. With more than 600 miles to fly and the attack scheduled for 10:00 P.M., Nugent took off from Langley Field at 4:30 P.M. The three planes soon ran into dense haze under a overcast. Employing procedures developed by the Group, Nugent went on instruments with 1st Lt. Joseph A. Miller navigating. Nugent's wing men, 1st Lt. Edwin G. Simenson and 2nd Lt. Berton W. Armstrong, flew tight formation until they encountered thunderstorms and heavy fog. When the wing men could no longer see the navigating lights on Nugent's aircraft, they separated. Weather was better near Camp Custer, Michigan. Nugent circled just below the clouds, and radioed his position to this two wing men. Within fifteen minutes the three aircraft were again in formation. Using overcast penetration techniques developed by the Group, Nugent led his flight up through the clouds and toward the target. Again, using cloud penetration bombing attack procedures, Nugent and his formation glided down through the clouds straight for the target. The formation released its flares (simulated bombs) at 8,000 feet over the target at 9:58 P.M. — two minutes off the scheduled bombing time. Nugent's flight proceeded to maneuver in the area and work with Army searchlight batteries. After the searchlight maneuver was completed, the flight landed at Selfridge Field.[110]

This bombing feat was, indeed, a tremendous accomplishment when one considers that Nugent's formation flight departed Langley Field, flew 600 miles through bad weather, penetrated the weather without losing formation integrity and bombed the scheduled target within two minutes of the scheduled time. For this most unusual feat of airmanship and leadership, Capt. Nugent was selected to receive, for the 96th Bombardment Squadron, the 1936 MacKay Trophy. Gen. Malin Craig, Chief of Staff U.S. Army, made the trophy presentation at Langley Field later in the year.

In the spring of 1936, pilots and mechanics of the Group ferried nine new B-10B's from the Martin factory in Baltimore, Maryland to Panama. They were led by Lt. Col. Charles B. Oldfield. Their route took them via Brownsville, Texas, Mexico, and the Central American countries to Panama.

The rest of 1936 was spent training in accordance with the Air Corps annual training program. The annual training directive increased individual annual flying hours to 210 , and gave more emphasis to instrument flying, navigation, bombing, and radio work.

Weekends at Langley usually brought respite from the heavy demands of training and operations. Married crew members caught up with family affairs and household chores. The bachelor pilots usually signed out one of several training aircraft and went cross-country on a training flight. It was not unusual for a junior bomber pilot to check out one of the surplus old P-12 fighters[111]. One young Group lieutenant remembers checking out a P-12 and together with other bachelor pilots from the 8th Pursuit Group flew up to New York for an international polo game between the U.S. and Argentina. They flew to New York in a loose formation, peeled off and landed within the polo grounds. They taxied up to the bleachers where they were ushered to good seats. At the end of the polo match, they took off like the Lafayette Escadrille and swooped low over the polo field as they departed on their way back to Langley.

On another weekend jaunt, several Group pilots took a formation of three B-10B's to Boston for a World Series baseball game. One of the extra pilots on board had a rather wild Friday night and was not in the best condition for the trip. He decided to take a recovery nap in the bomb bay of the B-10 piloted by Skip Adair. The three aircraft were flying in loose formation at 5000 feet. As they approached Cape May, New Jersey, they encountered some icing and Adair's copilot reached to pull on the carburetor heat. Instead he pulled the bomb bay door release lever by mistake! Crew members in the other planes watched incredulously as a human form fell out of the bomb bay and plummeted toward the water below. The inebriate remembers having the best dream of his life. He thought if he was dreaming, it didn't matter whether he pulled the rip cord on his parachute. *If* he wasn't dreaming, he *Really* needed to pulled his rip cord. He recovered in time to pull the cord at about 500 feet, made a few swings and splashed into the drink. The B-10's circled the fallen comrade. The flight had attracted the attention of a local Coast Guard patrol boat. The boat crew witnessed the splashdown and went to the rescue. They pulled the very shaken, very wet and very sober pilot out of the water. After the flight was assured that their crewmate had been rescued, they continued to Boston. The next day back at Langley, they were reunited with their errant buddy.[112]

1937 began with high anticipation over the imminent arrival of the YB-17. (See Chapter VII)

GHQ Air Force had continued interest in rapid deployment of its bomber force over long distances. In the summer of 1934, while GHQ Air Force was still a provisional organization, Lt. Col. Henry "Hap" Arnold was directed to form a squadron of B-10's and fly from Bolling Field, Washington DC, to Fairbanks, Alaska. The purpose was to demonstrate that the Air Corps could fly great distances over land and reinforce a distant part of the United States. The round trip mission was completed without mishap. Between this 1934 Alaskan trip and early 1937, there were several successful transcontinental deployments associated with GHQ maneuvers. It was a foregone conclusion that the GHQ Air Force had mastered transcontinental deployments. One long-distance deployment that had not been tested was over water. The Group was given this task.

On February 6, 1937, Maj. Jasper K. McDuffie, 96th Squadron Commander, led nine B-10B's on an over water flight from Miami, Florida to Albrook Field, Canal Zone, Panama. The flight provided training in navigating over water, and simulated reinforcement of the Panama Canal Zone defense.

An Air Corps Douglas OA-5 flying boat, commanded by Capt. Archibald Y. Smith, accompanied the flight. The OA-5 was to provide air sea rescue for the bomber formation should it be required. The OA-5, commonly referred to as a "Duck", could not fly as fast as the B-10B's, so it left Miami one hour prior to the departure of the B-10B's. The Duck would be overtaken by the B-10's about halfway across the Caribbean.

The 96th Squadron made the 1,100 mile trip from Miami to Albrook Field in eight hours on Saturday, February 6, 1936. The Flight left Albrook for Miami on February 9. About half way back to Miami, Capt. Cornelius Cousland, piloting B-10B #90, developed engine trouble and could not maintain altitude. There followed twenty minutes of solemn three-way radio transmissions between McDuffie, Cousland and Smith, assessing the situation, and considering options and probabilities. One of the latter was the looming prospect of a ditching. That prospect took on a somber reality when aircraft # 92 reported seeing Cousland ditch. That news hardly had time to sink in, when Cousland called and said he was rejoining the formation. What's going on here? Surely he hadn't taken off from the water. As Cousland explained later in Miami, he did in fact have an engine failure, he lagged behind the formation and lost altitude. Just when it seemed he faced the inevitable splash down, he struggled to re-start the engine and some "black oil goo" bubbled from the exhaust, and the engine started with roar. A mechanic in plane #92 had mistaken a huge whitecap for the splash of Cousland's crash in the water.

Back over Miami, after safely navigating 2,200 miles over water, albeit with a scare, the formation prepared to land. The pending successful conclusion to the trip was marred at the last moment. One B-10B crew received faulty landing instructions from Miami control tower and wrecked the aircraft on landing. Although they had successfully navigated 2,200 miles over water, the successful termination of such a flight would have to wait another time.

On March 1, 1937, Lt. Col. Robert D. Olds assumed command of the Group and successfully led it up into the era of the "strategic bomber."

Numerous early airmen in the Group risked their lives and their military careers during these interim years between the two great wars. These men undertook delicate and dangerous missions; worked long, arduous hours under trying conditions; accepted extended periods without promotions while taking assaults on their pay; demonstrated the vulnerability of capital ships and hard targets to aerial bombardment; proved the feasibility of projecting air power through long-range deployment over land and water; refined the techniques of aerial navigation and instrument flying; developed techniques for accident-avoidance weather penetration by aircraft formations; continued to improve the accuracy of aerial bombardment; enhanced aerial refueling; made the first use of radio for command and control of air forces; and defined the requirements for a strategic bomber and pressed state of the art technology for its development and improvement. Finally, they dreamed of, then argued for greater autonomy, even the independence of air power. That dream, first conceived in 1920, didn't become a reality until 1947.

Readers might conclude there is undue fawning over the achievements of the Group during these early years of military aviation. It is true that those at the beginning of an era frequently have the advantages of a monopoly over unoc-

occupied and unexplored territory, and the Group had the advantage of being the only heavy bombardment unit during part of that time. It is likewise true that unexplored horizons attract the talented, the venturesome and the visionary. This was particularly true of early military aviation. It was a powerful, almost addictive, lure to the young men of the time. Those who took advantage of an open field, deserve no less acclaim for their illustrious deeds. The vindication of their accomplishments comes from the length and the depth to which their influence has spread through the annals of U.S. military aviation. A look at Appendix 6 should suffice. Few, if any, Air Force units can boast a more impressive alumni.

Perhaps a fanciful "What if?" conclusion to this chapter about two former members of the Group, Bert Dargue and Frank Andrews, will be forgiven.

As a Major General, Bert Dargue was ordered to Hawaii to head an investigation into the lack of preparedness at Pearl Harbor on December 7th, 1941. He was killed en route on December 12, 1941, when his plane crashed into a mountain in California. The cause of the crash was never established. Seventeen months later, Lt. Gen. Frank Andrews, flying to England to take command of American Air Forces in Europe, was killed when his plane crashed in Iceland.

It is interesting to speculate on the course of aerial warfare during World War II if Frank Andrews had survived to take command in Europe and Bert Dargue had survived to take command in the Pacific — both officers in a position to lead the greatest air forces in history which their colleague Hap Arnold was building.[113] Fortunately, the Air Service and the Air Corps had developed worthy successors.

In a letter to the President of the Second Bombardment Association, Maj. Gen. Eugene Eubanks USAF-Ret offered some comments that are apropos. He wrote: "The 2nd Bomb Group is literally the mother of Bombardment Aviation in the Air Crops and the Air Force. The instructors at the Tactical School who laid down the principles upon which the air war in WW II was fought all came from the 2nd Bomb Group. Among them were Ken Walker, Harold George, Larry Kuter, Curt LeMay and Jack Davis.[114]

Endnotes:

[1] Ed Note: Existing records reflect two dates August and Sept. 18 as the date of reactivation. Source: Combat Squadrons of the Air Force, dtd. 1963, and Maurer, Maurer"A viation in the US Army 1919-1937". 1987. Office of Air Force History, United States Air Force, Washington, DC. p. 101

[2] Ibid, Hinkle p.3 & Maurer p. 100

[3] Ibid, Hinkle p4 Ed Note: Here again the exact dates of reactivation and deployment to the field do not correlate. The date for 20th reactivation is August 14, 1919 but yet they are depicted as deploying to the Mexican border on June 10, 1919, approximately one month before reactivation.

[4] Ibid, Hinkle p. 4

[5] Maurer, Maurer; Aviation in the US Army 1919-1939. p 100

[6] Ed Note: Ibid, Maurer lists the 6th, 9th 11th,90th and 96th squadrons p. 101; Ibid, Hinkle lists 11th bomb, 12th observation, 20th bomb, 96th bomb and 104th surveillance squadrons p. 4

[7] James C. Fahey: U.S. Army Aircraft 1908-1946, 1st ed,1946. Ships and Aircraft 1265 Broadway, New York, NY. p. 8

[8] Ibid, Maurer p.102

[9] Ibid Hinkle; p 4

[10] Ibid, Maurer p. 102

[11] Letter from James F. Sullivan, 6336 Shane Lane, New Port Ritchey FL., 34653, ltr to Editor Second Bombardment Assn dated July 28 and Sept. 1, 1992. Sullivan was a private assigned to 96th Bomb Sq at Douglas AZ.

[12] Ibid Hinkle p. 7

[13] Ibid, Maurer p. 102

[14] Ibid, Hinkle p. 7

[15] Ibid, Hinkle pp 8-10 & Ibid Maurer pp 103-105

[16] Ibid Maurer p. 103

[17] Ibid, Hinkle p. 42

[18] Ed Note: The DH4 had a bomb lift capability of approximately 250 pounds

[19] Ibid, Sullivan

[20] Ed Note: It was common practice in the 1920's for army organizations to recruit directly from the civilian population. In other words, if the 1st Day Bomb Gp was short enlisted personnel they had a better chance of filling their vacancies if they directly recruited the people.

[21] Ibid, Fahey pp 9 & 15.

[22] Walker, Dale E,: The Bombing at Virginia Capes, Journal American Aviation Historical Society, *Vol 16 No. 3, 3rd quarter 1971.p.171*

[23] Ibid, Sullivan

[24] Underwood, J.:"Post War use of Handley Page in the US" Journal American Aviation Historical Society, *Vol 21, #1, 1st quarter 1976. p. 46*

[25] WD Circular No. 67, 1921 & Letter Forty-Ninth Bombardment Squadron, Air Corps, Office of Squadron Commander, Langley Field, Virginia, dated October 1, 1937.

[26] "USAF Unit Lineage and Honors," (The Albert F. Simpson Historical Research Center, USAF, Maxwell AFB, AL, 21 Nov 1977)

[27] HQ Second Wing GHQ Air Force, Langley Field, Virginia-History July 1915-April 1938. Maxwell AFB History Center. p. 4

[28] 2d Bomb Wing (Heavy),Barksdale AFB, Louisiana "Summary History of the 2d Bombardment Wing (Heavy), 1981. p 2

[29] Ed Note: Paper status means the name exists only. No personnel nor equipment assigned.

[30] Ibid, Walker, p. 172

[31] Journal American Aviation Historical Society, Summer 1986.pp 122-123.

[32] Ibid, AAHS Journal Vol 21 #1, 1976. p. 47

[33] Ibid, Walker p. 172

[34] Green, Murray: "Father of US Aerial Reconnaissance - George Goddard." The Retired Officers Magazine, *March 1990. Ed Note: All the photos in this chapter VI concerning the tests against Naval ships in 1921 and 1923 were the work of Goddard and the Army Air Service Photo School, Langley Field, Virginia.*

[35] Ibid Maurer p. 117

[36] Ibid, Maurer pp 117-118

[37] Ibid, Walker p. 173

[38] Ed Note: The 1st Provisional Air Brigade is mentioned here, as opposed to just the 2d Group, because all planes of the Brigade, SE 5's, the DH4B and the Martin MB-2 were used.

[39] Ibid, Maurer p. 119

[40] Journal American Aviation Historical Society, 1976 p. 49

[41] Ibid, Maurer p. 120

[42] Ibid, Walker p. 174

[43] Ibid Walker p. 174

[44] Ibid, Maurer p. 120.

[45] Ibid, Walker p. 171

[46] Ibid Maurer pp. 122-123

[47] Ibid, Maurer p. 115

[48] Ibid, Combat Squadrons USAF WW II

[49] Ibid, Combat Sqdns of Air Force WW II, Maurer, 1968

[50] Ed Note: The 2d Wing was an organizational subdivision of the GHQ Reserve. It bears no historical lineage with the current 1993 2d Bombardment Wing. The 2d Bombardment Wing is an organizational growth of the 2nd Bombardment Group and has all the lineage and honors of the 2nd Bombardment Group.

[51] Ed Note: There is no source for the exact number of aircraft assigned, but 27 aircraft is about the correct number. There weren't enough flying officers assigned to fly any more than 30 aircraft.

[52] Ibid, Journal AAHS vol 21 #1 1976 p. 46.

[53] Ibid Maurer p. 77

[54] Langley Field-The Early Years. Office of History 4500th Air Base Wing, Langley AFB., VA., 1977. p. 48

[55] Ibid Maurer p. 124

[56] Ibid, Maurer p.126

[57] Ibid, Maurer p. 126

[58] Ibid Langley-Early Years p. 48 & Maurer p. 127

[59] Albert F. Simpson Historical Research Center, Maxwell Field, AL.

[60] Ibid, Langley Early Years p. 54

[61] Ibid, Maurer pp 156-157

[62] Ed Note: Bombing altitudes were 3000, 6000, 8000 and 10,000 feet. Bombs used were primarily sand filled 100 and 300 pound practice bombs.

[63] Ibid, Maurer pp. 75-76

[64] Ibid, Maurer pp. 78-79

[65] Ibid Maurer pp 79-80

[66] HQ 2nd Wing GHQ AF, Langley Field, Virginia - History July 1915-April 1938, Maxwell AFB History Center. p. 5

[67] Simons, W. E. 2nd Bombardment Group, The Early Years. Friends Bulletin, Vol. 12 No. 2 Summer 1984 p. 4

[68] Ibid, Maurer pp. 225-226 & Langley Early Years p. 54 & HQ 2nd Wing GHQ AF p.5

[69] Olmsted, Merle: Air Corps Inventory *1927. Journal American Aviation History, Vol 18 No. 4 4th qtr 1973. pp 255-259*

[70] Aircraft of Langley AFB 1917-1977. *Office of TAC History, Headquarters Tactical Air Command, Langley Air Force Base, Virginia p. 48*

[71] Ibid Maurer p. 223

[72] Air Corps Newsletter, October 6, 1928 pp. 365-366

[73] Ibid Maurer p. 242

[74] Ibid, Maurer pp 244-245.

[75] Ibid, HQ Second Wing p. 6

[76] Air Corps Newsletter Vol XIII No. 17, December 21, 1929 pp441-443

[77] Ibid, Aircraft Langley p. 65

[78] Letter 20th Bombardment Squadron. Subject: Organization History, dated June 3, 1936, Langley Field, Virginia

[79] Journal American Aviation Historical Society Vol. 26 No. 1, Spring 1981. Back cover pictures formation of 20th squadron LB-7's over Yerba Buena island in San Francisco, California Bay-1930 May maneuvers.

[80] Ed Note: The great formations in the 8th and 15th Air Forces in Europe and the 20th Air Force in the Far East during World War II depended on exact timing. When the timing was off, aircraft were lost, crews were killed or wounded and the planned density of bombs never got to the target.

[81] Captain Eubanks was commander of the 2nd Bomb Group December 1933 - May 1934. At the time of Gen Kuter's reflection, Captain Eubanks was commander of the 49th Bomb Squadron.

[82] It was the 2nd Bombardment Group developed Operations Order that eventually became the standard for both the 8th, 15th and 20th Air Forces in WW II.

[83] General Laurence Kuter, USAF-Ret: Major General H. A. "Bert" Dargue - A lesson in Leadership. *Air Force Magazine, February 1929. PP 80-82*

[84] Waldron interview June 9, 1994.

[85] Ibid Maurer p. 248

[86] Waldron interview June 9, 1994

[87] Ibid Hq Second Wing GHQ History p. 8

[88] Ed Note: All training programs fiscal years 1934 through 1940 were similar in basic objective and intent

of outcome. It is also remarkable that the training programs for combat units 1942 through 1945 were of similar construction-the only difference being the amount of time each phase would take.

[89] *Microfilm reel B0042 frames 0837-0842, Albert F. Simpson Historical Library, Maxwell Field Alabama*

[90] *Ibid Waldron interview June 1994*

[91] *Ibid Maurer pp 231-235*

[92] *Ibid Maurer p.235.*

[93] *Air Force Museum, Friends Bulletin, Summer/Fall 1986, Vol. 9, No's 2 & 3. pp 24-32*

[94] *Ibid Friends Bulletin F' 86 Vol 9 no's 2 & 3*

[95] *Air Corps News Letter Vol XVIII N0. 7 July 31, 1933. p. 120*

[96] *Ibid Maurer, p. 292*

[97] *Ibid HQ Second Wing GHQ Air Corps History p. 9*

[98] *Letter from Lt. Gen Troup Miller, 240 Halah Circle NE, Atlanta, GA 30328 dated February 1986*

[99] *Ibid Maurer p. 348-349.*

[100] *Ibid Maurer, p. 325*

[101] *Ed Note: The commissioning of cadets on graduation from 1935 onward up through 1939 still was a function of money availability. There were still one or two flying cadets assigned to the squadrons of the 2nd Bombardment Group as late as 1939.*

[102] *Ibid, Maurer p. 354*

[103] *Ibid, Waldron Interview June 1994.*

[104] *Ibid Maurer p. 378*

[105] *Frame 875, Reel B0042 Micro film Simpson Library*

[106] *Sacramento Air Logistics Center - Oral History Interview No._ of Major General Russell L. Waldron, USAF Ret working in cooperation with Office of History Sacramento Air Logistics Center, January 21, 1983 p. 13.*

[107] *Ed Note: Bombs in train means bombs falling one after the other with a separation of a second or two between each bomb release. Salvo bombing means dropping all bombs at once with only a minimum of separation to avoid bombs colliding in the bomb bay.*

[108] *Ed Note: This tent heater recommendation was lost someplace in the shuffle. 2nd Bomb Group crews deployed in North Africa and Italy during winter months had no issue tent stoves. Improvisation and ingenuity with a 50 gallon oil drum and 100 octane fuel, despite an occasional explosion filled the bill!*

[109] *Letter, 20th Bombardment Squadron GHQ Air Force, Subject: Organization History, dated June 3, 1936, Langley Field, Virginia.*

[110] *Ibid Maurer pp. 400-401*

[111] *The 8th Pursuit Group was equipped with P-26 (Peashooter) fighters. The P-12 had been replaced by the P-26. Several of the excess, old P-12's, were available for weekend flights.*

[112] *Taped Interview with Edward A. LePenske - a retired United Airline Captain. LePenske was on the flight and this incident has remained a vivid memory.*

[113] *Ibid Kuter p. 82*

[114] *Letter Major General Eugene Eubanks dated 1979. address 4917 Revenswood Dr #555, San Antonio, Texas.*

Chapter VII

Emergence of the Strategic Bomber

From the earliest days of military aviation, air power enthusiasts had crude visions of a strategic bomber. As early as WW I, aviators, who were tethered to the battlefield as little more than airborne artillery, sought unsuccessfully to range beyond the battlefield with a bomber that could strike targets in Germany. Following that war, the struggle for such a bomber ebbed and flowed between the early visionaries and the impediments of political will, inadequate funding, a collapsing economy, and the imbedded, archaic military thinking. Progress was made but it was sporadic and never to the satisfaction of the professional aviators, who had that insatiable appetite all warriors have for the latest weapons. They yearned for the airplane that would fly higher, faster, farther, and carry a heavier load. The Air Corps Act of 1926, the slow but continuing improvements in aircraft technology, and the spreading enthusiasm for aviation in general — much of it from the development of commercial aviation — increased the fervor of the air power proponents for their cause. They pressed even the primitive technology to the limits of its capabilities to prove their own convictions, and to demonstrate, with irrefutable evidence, some of the strategic capabilities of the bomber. The bombing trials against large naval vessels, endurance and distance records, military exercises, aerial refueling, and numerous other firsts created a momentum that could not be ignored.

By the early to mid-1930's, the development of such bombers as the Douglas Y1B-7, the Keystone B-2 *Condor,* and the Boeing B-9 gave promise that the all-metal, enclosed cockpit, multi-engine, long-range bomber was within reach. The first strategic bomber was about to emerge and it did so as the Boeing B-17 *Flying Fortress.* It was none too soon. The clouds presaging WW II were rising perceptively across the Pacific as Japan started it's conquest of the Asian rim and across the Atlantic where the specter of Hitler's Naziism was casting an ominous shadow over Europe. This chapter traces the evolution in aviation technology leading to the development of the first U.S. strategic bombardment capability.

Later there is the story of how the 2nd Bombardment Group demonstrated and perfected a

The U.S. Army awarded Boeing a contract for 200 Thomas-Morse MB-3A aircraft to be produced in 1921-22. (Boeing Photo)

strategic bombing concept and set world records while performing operational training in those early bombers. Finally, there is a presentation on how the United States Army Air Corps in general, and the 2nd Bombardment Group specifically, dramatically changed to meet its future wartime requirements, ending with the dispersal of key personnel and trained airmen to form new heavy bomber units which would soon become part of the U.S. Army Air Forces.

Aircraft Development

Gradus ad Parnasum - a term every serious piano student learns to mean small or gradual steps towards Mount Parnasus. Small steps of mastery lead to greater mastery. That is precisely what happened with the aviation industry after WW I. In late 1918, Boeing was the low bidder in a proposal for production of the Thomas-Morse MB-3A, single-seat pursuit aircraft. The Army placed an order for 200 of these aircraft with Boeing, giving the Company momentum in aircraft development and production.

Boeing had also been blessed with an Army contract to modernize 111 de Havilland DH4 biplanes between March 6 and July 1, 1920. Heretofore airplanes were primarily built from wood and fabric. However, some aircraft companies in Germany began manufacturing welded metal tube fuselage structures. After WW I, the Army studied a captured Fokker D. II with a welded tube steel fuselage. Boeing obtained a subsequent contract with the Army to modify 186 DH-4s to replace the wooden fuselage structure with an arc welded tube frame. The modified aircraft were redesignated as DH-4Ms. These modifications took place between June 1922 and late 1923.

Boeing continued through the 1920s with a series of orders from both the Air Corps and the U.S. Navy for many fighters; most notably the P-12 and F4B series, of which a total of 313 were built, thus keeping the Company's design and production capability active.

Though deep in the throes of the *Great Depression,* Boeing continued to pursue new aircraft designs. Each innovation paved the way for future designs. On May 6, 1930, Boeing flew its sole all-metal Model 200 *Monomail.* This airplane featured a radial engine enclosed with an anti-drag cowl ring, circular cross-sectional semi-monocoque metal fuselage, a cantilevered all-metal wing, and retractable landing gear. These design features greatly reduced drag and improved the aircraft performance. This single-seat aircraft had a 220 cubic foot space for cargo and mail. It had a top speed of 158 mph and cruised at 135 mph at 60% power. By way of contrast, the DH-4s had a top speed of 118 mph and cruised at 104 mph. On August 18, 1930, the Model 221 *Monomail* made its first flight. This airplane was similar to the Model 200, but had provisions for six passengers and 750 lb. of cargo. This was followed by the Model 221 A with two additional passenger seats and adjustable trim tabs for the elevators. These trim tabs precluded the requisite post-flight resetting of the horizontal stabilizer to achieve the desired longitudinal trim. Both the Model 221 and 221A were flown by Boeing's airline - Boeing Air Transport.

In 1931, Boeing made a major leap in fighter technology with the P-26 *Peashooter.* This monoplane aircraft made the transition from wood and fabric to metal in fighters. Initially the Army ordered 111 of these aircraft under the designation of P-26A. With the follow-on P-26B and P-26C series, the production total came to 136 aircraft. The relatively high landing speeds of the P-26A led to the addition of wing flaps on the P-26B and P-26C series. Flaps would appear on subsequent Boeing aircraft. All of these aircraft had been withdrawn from Air Corps service before the opening days of WW II for the United States. However, a Philippine air force P-26A was credited with downing a Japanese fighter during the early attacks on the islands.

Also in 1931, Boeing developed the B-9, America's first all-metal monoplane designed specifically for the bombardment role. The airplane capitalized on the structural concepts of the *Monomail,* and became America's first twin-engine, cantilevered, low-wing airplane. While a technological advancement in airframe design, it was underpowered with the 600-hp Curtiss V-1570 *Conqueror* in-line engine, or the 575-hp P&W R-1860 radial engine on the Y1B-9 and YB-9, respectively. Top speed for the B-9 series airplanes was 173.5 mph - putting them in the same league as the fighters of the day. The aircraft cruised at 147.5 mph and could carry two 1,100-lb. bombs. A crew of five manned these aircraft.

While the B-9 did not go into large-scale production, its concept led to a much better design from the Glenn L. Martin Company of Baltimore, Maryland. The privately funded Martin aircraft was designated the XB-907. The Army tested Martin's aircraft, which was powered by a pair of 600-hp Wright SR-1820-E engines, under the Army designation of XB-10. Success of this testing resulted in orders for 118 B-10s,

While United Air Lines had the exclusive contract for the Boeing Model 247, one of these aircraft was flown by famed aviators Col. Roscoe Turner and Clyde Pangorn in the 1934 MacRobertson air race from London to Melbourne, Australia. This ship came in third. (Boeing Photo)

The XB-15 flew after the B-17, but its wing design, used in the B-17, had been proven earlier on the famed Model 314 flying boats purchased by Pan American World Airways and known as Clippers. *This ship was the second in a series of 12 and still carried the experimental NX registry number on its tail. (Boeing Photo)*

B-10As and B-10Bs, all of which were equipped with the more powerful 675-hp Wright R-1820-19 engines, and a nose turret with a single 0.30 caliber machine gun. These were followed by a subsequent buy of 32 B-12s, with 775-hp Wright R-1690-11 engines; and a single XB-14 powered by two 950 hp R-1860-17 engines.

Although Boeing lost the production contract for the B-9, it capitalized on the design to produce an all-metal, low-wing airliner known as the Model 247. United Air Lines ordered 60 of these 10-passenger aircraft before its first flight on February 8, 1933, giving Boeing a major boost during the *Great Depression.* United Air Lines stipulated that all 60 of these aircraft would be purchased by them, thereby cutting out the competition. The structural design of the model 247, combined with the military features of the XB-15 that followed, were precursors to the design of the B-17.[1]

Trans Continental & Western Airlines (T&WA, later Trans World Airlines or TWA) in a counter to the move by Boeing and United Air Lines encouraged Douglas Aircraft to come up with a better aircraft. Douglas did and came up with the Douglas Commercial Model 1, or DC-1. This aircraft first flew in less than five months after the Boeing Model 247. Both the Model 247 and DC-1 were twin-engined, all-metal airplanes with enclosed cockpits and passenger compartments. The Douglas aircraft carried 12 passengers while the Model 247 only carried 10. The second generation Douglas transport was the DC-2 which carried 14 passengers.[2]

Project A - The XBLR- 1

In 1934, the Army Air Corps, under *Project A,* approached Boeing and Martin to develop a truly large bomber capable of carrying a 2,000-lb. bomb load 5,000 miles. The Army was seeking an aircraft with a wing span of about 150 feet with a gross weight of 60,000 pounds, not so much for carrying the payload, but for the fuel required to attain the range. The Boeing design prevailed and the Company was awarded a contract in June 1934 to build the highly-secret *Experimental Bomber Long Range,* or XBLR-1. Boeing did a lot of design work both on paper and in the mock-up shop before the airplane emerged as the XB-15. The XB-15's wing design first appeared on the famed Model 314 *Clipper* flying boats of Pan American World Airways. (See Appendix 8B for the specifications of the XB-15)

The XB-15 had conventional landing gear comprised of two main gear and a tail wheel. A major innovative was the use of dual main wheels to support the plane's 70,706-lb. maximum gross weight. The XB-15 was powered by four P&W R-1830 *Twin Wasp* engines which produced 1,000 hp for takeoff and 850 hp at 2,450 rpm at 5,000 feet. Time proved these engines to be woefully inadequate to power a bomber, and the airplane was relegated to transport service and was eventually redesignated as the XC-105 in 1943. Its defensive armament consisted of six machine guns — two 0.50 caliber and four 0.30 caliber. In general terms, the XB-15 was 20' longer, 3' higher, 45' greater in span, and 13 tons heavier than the B-17. The XB-15 was the largest airplane built in America to date. Its innovative features included: two 100-volt AC generators powered by a gasoline engine(or *put-put*) which later found its way onto the B-29 *Superfortress;* a flight engineer's station; crew sleeping quarters; a galley for preparing hot meals; and wing crawl spaces giving access to the engines for in-flight servicing of the engine accessories.

The XB-15 took to the air for the first time 28 months after the Boeing Model 299, the prototype for the B-17. On October 15, 1937 the sole XB-15 lifted off from Boeing Field with Boeing test pilot Edmund T. "Eddie" Allen and Maj. John D. Corkille at the controls. After testing at Boeing and Wright Field, the XB-15 became part of the inventory of the 2nd Bomb Group.

A Multi-Engine Bomber[3]

Military appropriations were lean in the mid-1930s, so the Air Corps chose to have a "fly-off" (flight competition) for the next generation bomber, and to have each manufacturer finance its entrant. In May 1934, the Air Corps issued Air Corps Circular 35-26, announcing a competition for a new multi-engine bomber. Each entrant was to be flown to Wright Field, near Dayton, Ohio, in late 1935 for evaluation. The specifications required the multi-engine aircraft to be

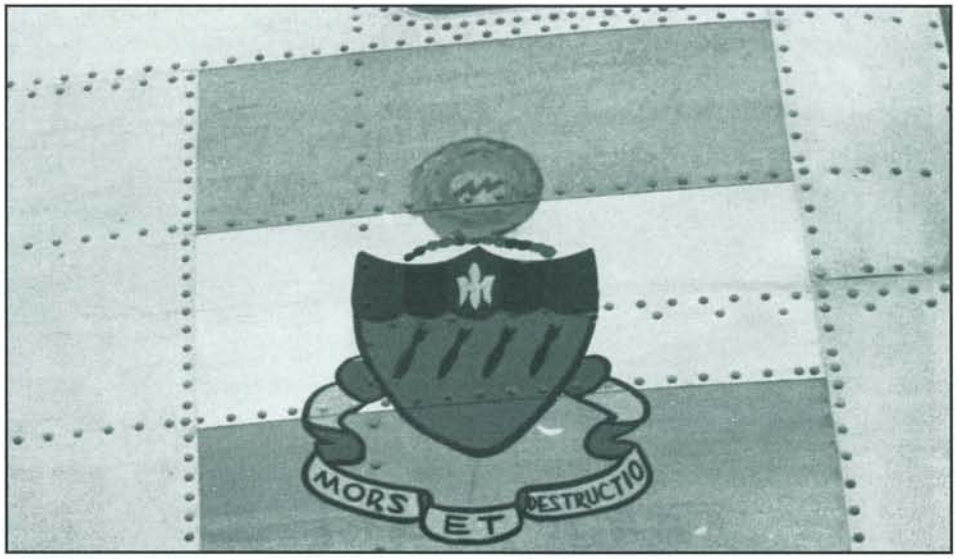
capable of carrying a 2,000-lb. load not less than 1,020 miles and if possible 2,200 miles at a top speed of at least 200 mph and preferably 250 mph. Douglas Aircraft decided to adapt its DC-2 transport into a stubby deep-fuselage aircraft called the DB-1 (for Douglas Bomber One). In production, these airplanes became known as B-18 *Bolos* because the fuselage profile resembled that type of knife. Boeing, with the concurrence of the Air Corps, opted for a totally new four-engine airplane, identified as the Model 299. It was based on the structural design of the Model 247 airliner, together with the military features and engine arrangement of the XB-15.

Boeing set a Herculean goal for its design team to complete design within three weeks! Edward C. Wells, a Stanford University School of Engineering honor graduate, who had shown his mettle in designing the empennage for the Model 247, was assigned to design the fuselage. Design innovations included an enclosed, heated cockpit, and bombs to be carried internally.

The Model 299 airplane featured a circular cross-sectioned all-metal semi-moncoque fuselage with a raised cockpit, bomb bay and radio compartment, retractable landing gear, a bolted and riveted *Warren truss* wing structure with square-sectioned tubes for the spars, round-sectioned tubes for the ribs, and a reinforced corrugated wing inner skin with a sheet metal covering assembled as: inboard wing sections bolted to the fuselage; symmetrical outboard wing sections bolted at the aileron/flap joint; close-cowled engines; and cantilevered sheet metal vertical and horizontal stabilizers. This durable structural concept proved its worth in combat for damage resistance and field reparability. This series of airplanes was the first American bomber to feature wing flaps.

Development of the Model 299 began on September 26, 1934 under direction of Clairmont Egtvedt, Boeing's Vice President of Engineering. The Company's Board of Directors approved $275,000 for the project — almost half of the Company's cash assets! To put things into perspective, the average engineer made about $0.65 per hour in those days. The company expended 153,080 engineering man hours on the preliminary design of the Model 299. Eventually design costs rose to $660,000!

Preliminary design for the Model 299 was completed on June 18, 1934, and construction began on August 16. The final design, which followed completion of the air frame, began in April 1935. The airplane rolled out of Boeing's Plant 2 factory in Seattle, Washington, on July 17 and made its first flight on July 28, 1935. Boeing was not in the habit of naming its aircraft, but 23 year old Richard L. Williams, on the staff of the Seattle Times, started a trend. He was assigned the task of writing the caption for a picture of the Model 299 at its roll out on July 17. Impressed by the 299's size and bristling armament, he wrote: "Declared to be the largest land plane ever built in America, the 15 ton flying fortress, built by the Boeing Aircraft Company under Army specifications, today was ready to test its wings . . . ."[4] Boeing's public relations department liked the name so much that it began using it in their press releases and the name stuck.



The original 2nd Bombardment Group insignia, Mors et Destruction, *was applied to the left side of the forward fuselage on this B-18A* Bolo. *(Courtesy of D.W. Menard)*

Wright Field Fly-Off

By August 20, 1935, the airplane was ready for its trials at Wright Field. Under the command of Boeing's chief test pilot Leslie R. Tower, the airplane set a world's speed and distance record on the way to Dayton, averaging 252 mph and setting a non-stop distance record of 2,100 miles. Also aboard the aircraft were Louis Wait, copilot, C.W. Benton, Jr., a Boeing mechanic, and Henry Igo, a Pratt &Whitney service engineer. They arrived two hours earlier than the Air Corps' calculated ETA. According to Les Tower, the airplane used only 63% of its available power in cruise. At the time, it was the largest land plane in the United States.

Early testing of the Model 299 at Wright Field was very promising, however, on October 30, 1935, the airplane was lost on take off when the crew failed to disengage the control locks. The locks were engaged and disengaged by a simple lever on the aisle stand in the cockpit. Aboard the aircraft were Tower and four men from the Air Corps Materiel Division — Maj. Ployer P. Hill, pilot and Chief of the Flying Branch, 1st Lt. Donald L. Putt, copilot, John B. Cutting, engineer, and Mark H. Koogler, mechanic. [5]

The aircraft got to an altitude of 300 feet before becoming uncontrollable. Standing between the Army pilots, Tower noticed the engaged control lock too late. The airplane lost altitude and crashed. Lts. Robert K. Giovannoli and L. F. Hannon, observing the flight from the ground, rushed to the rescue. Lt. Giovannoli rescued Tower and Hill but they succumbed to their injuries — Hill within a few hours and Tower several days later. Giovannoli was nominated for the *Cheney Award* for his heroism, but he was killed in a subsequent airplane crash before it could be presented. Lt. L. F. Hannon was honored for the rescue effort when Maj. Gen. William E. Cole presented him with the *Soldier's Medal*. Putt continued his career as a test pilot and served in numerous technical programs, retiring from the USAF as a lieutenant general in 1958. Cutting and Koogler survived the crash.[6]

As a result of the crash, the Army contract was awarded to Douglas for the production of 75 B-18 *Bolos*. The crash of the Model 299 resulted in the development of the flight crew checklist — a feature found on almost every subsequent airplane.[7]

The Douglas B-18 *Bolo*[8 9]

Between 1937 and 1941, the Douglas B-18 *Bolos* made up about half of the entire bomber fleet of the Air Corps. After the United States entered World War II, these airplanes were used for antisubmarine patrol. In 1936, the Air Corps placed an initial order for 131 B-18s. This was followed by a second order in 1937 for 177 B-18As. In mid-1938, a subsequent order for 40 additional B-18As brought the total for this series to 217 aircraft. The B-18A order cost approximately $12,000,000. After these aircraft were replaced by B-17s in 1942, 76 B-18s were converted into B-18Bs with an SCR-517-T-4 ASV (anti-ship vessel) radar added in the nose and magnetic anomaly detection (MAD) gear installed in the tail. Two B-18C conversions, similar in nature, were also accomplished. Both the B-18Bs and B-18Cs were dedicated to antisubmarine patrol.

Deliveries of the B-18s to the Air Corps began in the first half of 1937. The first four aircraft went to the Materiel Division at Wright Field, the Technical Training Command at Chanute Field, Illinois, the Aberdeen Proving Ground, in Maryland, and Lowry Field, Colorado. The first three operational aircraft were assigned to the 7th Bombardment Group at Hamilton Field, California. These were followed by another 30 aircraft. The remaining 94 B-18s were distributed among the 5th Bombardment Group at Luke Field, Hawaii, the19th Bombardment Group and 38th Reconnaissance Squadron at March Field, California, the 18th Reconnaissance Squadron at Mitchel Field, New York, and the 21st Reconnaissance Squadron at Langley Field. Several B-18s from the initial factory deliveries eventually found their way into the inventory of the 2nd Bombardment Group.

Based on a production run of 220 aircraft, the B-18 cost only 59% of that for a B-17 ($58,500 vs. $99,620). Cost was one of the de-

termining factors in the Army decision to buy the B-18s instead of the B-17.

The B-18s had a crew of six, including, two pilots, a navigator/bombardier, and three gunners. The plane's maximum bomb load was 6,500 lbs., and it had a nominal range of 850-900 miles. Defensive armament consisted of three 0.30 caliber machine guns, with one each located in the nose, dorsal turret and ventral hatch.

Col. Follett Bradley, Chief of Staff GHQ Air Force, flew a B-18 from Randolph Field, Texas to Langley in February 1937. Favorable winds at 9,000 feet allowed him to make the trip in the record time of five hours and forty minutes, at an average ground speed of 275 mph. Maj. James P. Hodges was the copilot. They were accompanied by Sgt. Moran, crew chief, and Pvt. Gimter, radio operator.

In September 1938, the 96th Bomb Squadron received its first B-18A to service evaluate against their B-18s. The crews were immediately impressed by its increased comfort features as compared to previous bombers, however, the B-18s proved no match for the B-17s to follow.

On December 7, 1941 the B-18s and B-18As were the most numerous American bombers deployed overseas. A total of 112 of these aircraft, over half of the production run of 220, were stationed at bases overseas with bomber and reconnaissance units.

The YB-17

Fortunately, the Air Corps had been sufficiently impressed with the previous performance of the Model 299 that it awarded a contract to Boeing for 13 airplanes, which were initially designated Y1B-17s. (The number 1 in Y1B was a funding source designator, representing F-1 funds authorized for test allocations.) On November 20, 1936, prior to the airplane's first flight, the airplanes were redesignated as YB-17s. The YB-17s were generally identical to the Model 299 except for the landing gear, engines, crew and minor armament changes. The landing lights were fared into the wing leading edges rather than in protruding cylindrical mounts as on the Model 299. The earlier P&W R-1690 *Hornet* engines were replaced with Wright R-1820-29 *Cyclones,* thereby increasing the available horsepower from 750 to 1,000 per engine. Subsequent versions of the R-1820s would muster up to 1,200 hp. This change from P&W to Wright engines was also a result of the anti-trust break up of the aeronautical giant known as United Aircraft and Transport Corporation.

The Air Corps contract called for 13 Y1B-17s and a static test article. Evaluation of the static test aircraft at Wright Field went so well that it was converted to operating status, designated as the sole YB-17A, and given serial number 37-269. It was used as a flying test bed for the development of the turbo-supercharger which improved performance at higher altitudes. Turbo-superchargers were installed on all subsequent production B-17s.

YB-17 Deliveries

The B-17 was the largest and most complex aircraft in the Air Corps inventory. There were those on the Army's General Staff who would have much preferred that more funds be expended on medium bombers which could be controlled by local field commanders than for extremely large airplanes whose mission they could not fathom. However, Air Corps visionaries sold the strategic bomber on the basis that it could serve as a weapon for hemispheric defense. It was capable of being flown from one coast to the other, if required, to meet an enemy threat.

The aircraft's newness and complexity sometimes added to the woes of its operators, as happened in the crash of Model 299 at Wright Field on October 30, 1935. The Army's chief test pilot, Maj. John J. Corkille, came to some embarrassment at Boeing Field in Seattle on December 7, 1936. Prior to taxi out for takeoff in YB-17 s/n 36-149, a Boeing mechanic warned Corkille of a potential brake heating problem following prolonged taxi. The major took off after a long ground taxi requiring heavy use of the brakes. He immediately retracted the gear before allowing the brakes to cool sufficiently. The hot brakes seized and began heating the No. 2 and 3 engine nacelles. Soon the engines overheated and Corkille had to shut down the inboard engines. When he landed on the seized brakes, the airplane promptly stood on its nose. Fortunately there was minimal damage to the airplane and no personnel injuries, except for some bruised egos. This incident was a factor in establishing a regulation that to be a pilot in command of a B-17 required 10 years of service and 2,000 hours flying time. Incremental lesser requirements were imposed on the copilots, and navigators — all of whom were then rated pilots. This restriction changed the career paths of several junior pilots of the day.[10]

Maj. Corkille took the first YB-17 to Wright Field, Ohio for Army flight testing. The remaining 12 aircraft went to Langley Field for assignment to the 2nd Bomb Group. (See Appendix 10.)

YB-17s to Langley

Maj. Barney M. Giles flew aircraft s/n 36-150 to March Field, California on February 9, 1937, where he and Maj. Caleb V. Haynes were checked out in the airplane by Maj. Corkille. Maj. Giles then flew to Barksdale AAFld on February 26. The 1,800-mile second leg took about eight hours. The next to Pope Field near Ft. Bragg in North Carolina took six hours. Early on Sunday morning, March 1, a blanket of snow 6 to 8 inches deep fell on Langley, delaying the scheduled 10:00 A.M. arrival until 2:00 P.M. The arrival was planned to coincide with the first anniversary of the establishment of GHQ Air Force at Langley under the command of Maj. Gen. Frank M. Andrews. On hand for the arrival were Gen. Andrews and Lt. Col. Charles B. Oldfield, Group commander. The 96th Bomb Squadron crew that delivered this first aircraft were: Maj. Giles, pilot; Capt. Cornelius E. O'Connor, copilot; 1st Lt. William O. Senter, navigator; M/Sgt. Floyd B. Haney, crew chief; S/Sgt. Arthur Jolly, assistant crew chief; and T/Sgt. Charles E. Moslander, radio operator.[11]

Both M/Sgt. Haney and T/Sgt. Moslander received commissions in 1942. Sgt. Haney was lost on a flight across the southern Atlantic. Sgt. Moslander retired from the Air Force as a captain.

Maj. Caleb V. Haynes and crew from the 49th Bomb Squadron delivered the second airplane, s/n 26-151. They took the same route as Maj. Giles did with the first airplane.[12] (See Appendix 10 for lists of delivery crews.)

One Army report stated, "Majors Barney M. Giles and Caleb V. Haynes brought the first big bombers through from Seattle without incident. To date the necessary flight checking of subsequent combat crews had been given first priority and, as an indication of the schedule being followed, the flight logs of the two airplanes reveal that, up to April 3, they were flown in the two preceding weeks 141 hours and 50 minutes

The first YB-17 Flying Fortress *arrived at Langley Field on March 1, 1937. Here, the pilot, Maj. Barney Giles, is being greeted by Lt. Gen. Frank Andrews, GHQ - Air Force Commander. (Courtesy of USAF/Air Combat Command Historian)*

to complete the piloting qualifications for Lt. Col. Robert Olds and another three officers." Those officers were Capt. Edwin S. McReynolds, Capt. Cornelius W. Cousland, and 1st Lt. Warren H. Higgins. These qualification flights included:[13]

- Familiarization flights and landings 8.5 hours at night
- Performance flights on one, two, three and four engines
- Landing at March, Barksdale, Maxwell, Pope, Langley, New Bolling, Old Bolling, Phillips and Mitchel Fields
- 0.30 and 0.50 caliber gunnery from all stations
- Bombing runs from 5,000 to 8,000 feet
- Aerial photography to spot bomb hits

Maj. Vincent J. Meloy was checked out in the YB-17 by Majors Giles and Haynes. Beginning with Maj. Meloy's delivery flight on March 27, this and all subsequent flights went directly to Langley. Meloy's aircraft, s/n 36-152, was assigned to the 20th Bomb Squadron. [14]

In 1937, the acting chief of staff for GHQ - Air Force was Lt. Col. Follett Bradley. He described the objectives of the air soldier as follows:[15]

"Although we don't like to put it so bluntly, the war-time mission of the soldier is to destroy. We train during the years of peace to destroy our enemy in war - to destroy his soldiers, his property, his will to attack us. Our national policy is one of defense. Our geographical situation, with friendly neighbors North and South, and vast oceans East and West, is such that an enemy must cross those oceans in tremendous force to impose his will upon us. Although Bombardment Aviation in Europe may be an instrument of aggression, with us it is a powerful agency of defense. Bombardment Aviation can destroy nearly anything built by men. It can destroy ships easily and an enemy must come to us in ships..."

Key strategic thinkers fell in love with the B-17. General Henry H. "Hap" Arnold was quoted as saying, " It had only one predecessor of equal importance in air history. That was the first military aircraft of the Wright Brothers, in which Lt. Tom Selfridge was killed in 1908."[16]

YB-17 s/n 36-149 was assigned to the Materiel Division at Wright Field for flight testing. In the summer of 1938, Lt. William C. Bentley flew the aircraft to Langley Field, arriving in the middle of a raging thunderstorm where the violent updrafts flipped the giant plane onto its back. Bentley broke out beneath the clouds and regained control of the aircraft. A post-flight inspection showed a few popped rivets and slightly bent wings, otherwise the airplane stood up admirably. [17]

Also of importance was delivery of the sole XB-15. Maj. John J. Corkille took delivery of this airplane on December 2, 1937, and flew it to Wright Field for inspection and testing. This ship was subsequently assigned to the 49th

The crew of the first YB-17 for the 2nd Bombardment Group, s/n 36-150, consisted of (l-r) Maj. Barney M. Giles, Capt. Cornelius E. O'Connor, 1st Lt. William O. Senter, M/Sgt. Floyd B. Haney, T/Sgt. Charles B. Moslander, and S/Sgt. Arthur Jolly. (Courtesy of W.O. Senter)

Bomb Squadron where it carried the Squadron insignia and the number 89.

2nd Bombardment Group YB-17 Assignments and Markings [18]

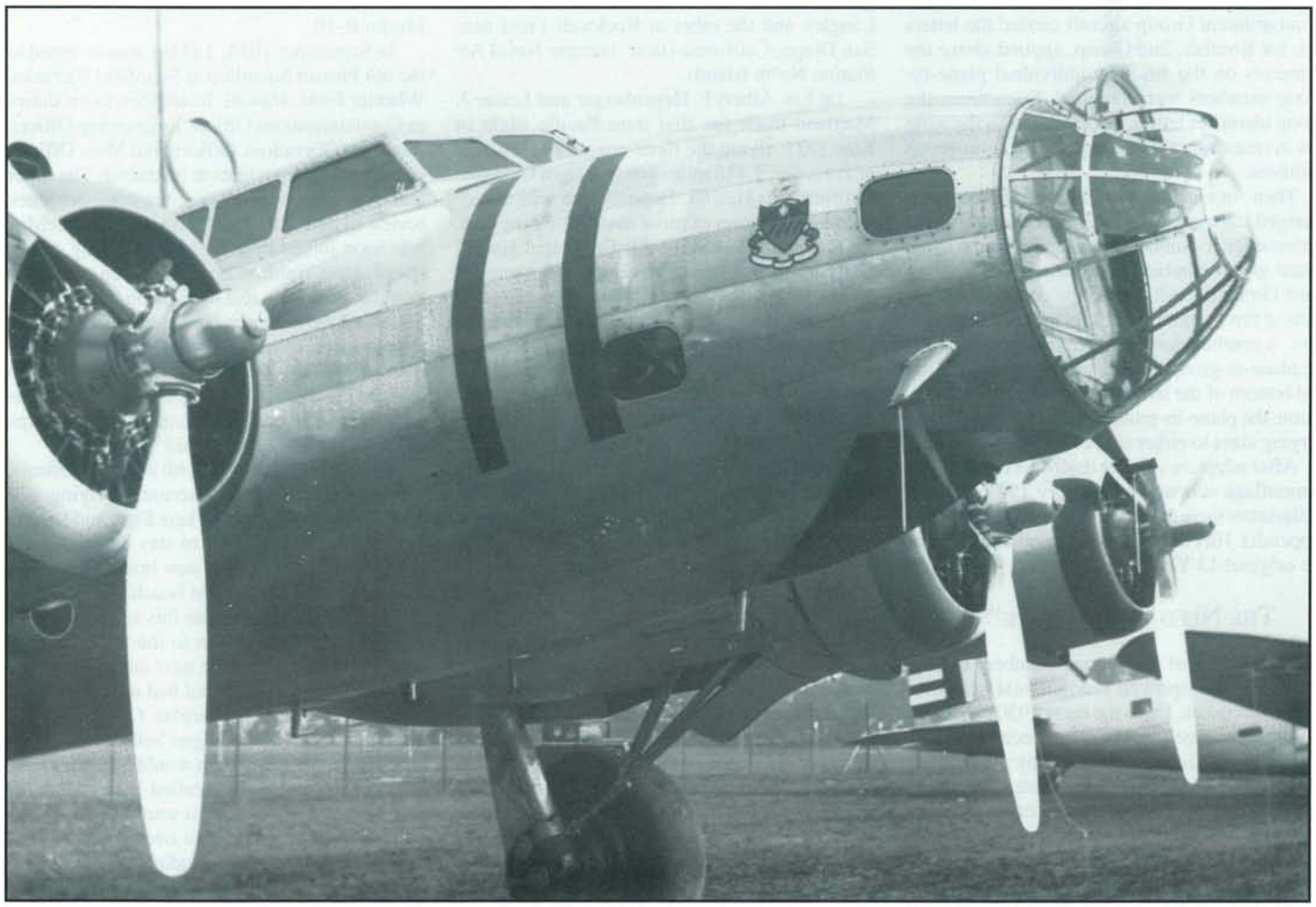
In keeping with the markings standard of the day, all YB-17s carried the red, white, and blue rudder trim. Four large national insignia (consisting of a white star within a blue disk and a red dot centered on the star) were placed on the tops and bottoms of both wings. The national insignia were centered 13 feet inboard from each wing tip and tangent to the aileron cutout. The rudder stripes were designed in 1926 by C. N. Monteith, a former Air Service engineer, who was then chief engineer for Boeing. The rudder stripes were applied to a few Boeing test aircraft and were subsequently adopted by the Army later that year.

Between 1937 and 1941, the YB-17s transitioned through three identification systems prescribed by GHQ Air Force. With a knowledge of these identification systems, one can place a relative date on photographs revealing the tail markings.

In 1937, when the YB-17s went into service with the Group, the only identification, aside from the national insignia, were the individual aircraft plane-in-group numbers and colored cowl rings — with each color representing a different squadron. The plane-in-group numbers were applied to either side of the vertical fin, top right and lower left wing tip, and sometimes repeated on the wing leading edge just outboard of the outboard engines.

GHQ Air Force adopted another identifica-

This B-17B, ship No. 60, carries the later 2nd Bombardment Group markings which placed the plane-in-group number above the 2B on the vertical tail. The 2B60 was repeated on top of the left wing. The two red belly bands indicate this was the squadron lead ship. Note the 96th Bomb Squadron insignia on the nose. B-18s were parked in the background at Langley Field. (Courtesy of theUnited States Air Force)



Later markings for the 2nd Bombardment Group's YB-17s resulted from a transfer of aircraft within the Group. Here one of the original YB-17s became ship No. 11, carried the Group insignia on the nose and had the tri-color (red/white/yellow) cowl rings denoting it was Group flagship at the time. It shared the ramp with a Group B-18. Note that the spinners had been deleted. (Courtesy of Paul C. Schmelzer)

The XB-15 and YB-17, s/n 36-158 with plane-in-group number 82 also from the 49th Bomb Squadron, shared the ramp in Rhode Island on April 20, 1939. (Courtesy of Harlan C. Wood/D.W. Menard)

tion system in December 1937, which was effective for all non-training aircraft. This system consisted of a pair of letters. The first identified the mission-, i.e. B for bomber. The second letter identified the group; i.e. B for 2nd Bombardment Group, E for 5th Bombardment Group, G for 7th Bombardment Group, etc. Hence the 2nd Bombardment Group aircraft carried the letters BB, for Bomber, 2nd Group, applied above the numerals on the fin. The individual plane-in-group numbers were retained. Sometimes the group identifier letters were applied on the wing tips in characters smaller than the plane-in-group numbers.

Then, in early 1941, GHQ Air Force again changed the marking system to replace the cumbersome letter-number group identification to the actual group number. Hence the 2nd Bombardment Group aircraft carried the code 2B on their vertical fins in addition to the plane-in-group numbers. A combination of the group designator and the plane-in-group number were applied to the top and bottom of the left wing tip; e.g. 2B60. In addition, the plane-in-group number was applied, in varying sizes to either side of the nose.

After adoption of olive drab over neutral gray camouflage scheme in February 1941, the unit designators were painted in black on the tail. (See Appendix 10A for assignment and markings of the original 13 YB-17s.)

The Need To Navigate[19, 20]

The advent of long-range bombers created the need for improved navigational skills for military aviators. Up to the early 1930s, air navigation was largely a matter of local flying or cross country flights navigating by pilotage using maps obtained from local state, and county governments to find the roads, railroad tracks and other salient features on the ground. Dead reckoning was a little-used and generally poorly developed skill which was employed as a last resort. It soon became apparent to some Air Corps thinkers that if their dreams of a long-range strategic bomber were to come to fruition, planning and training in navigation were necessities.

There were individuals who had extrapolated from the work of the ancient Phoenician men of commerce and other mariners to establish the rudiments of air navigation. Two Air Corps navigation schools were established in 1933 - one at Langley and the other at Rockwell Field near San Diego, California (later became Naval Air Station North Island).

1st Lts. Albert F. Hegenberger and Lester J. Maitland made the first trans-Pacific flight in June 1927, flying the three-engine *Fokker Bird of Paradise,* 2,418 miles nonstop from Oakland, California to Hawaii. Hegenberger was an advocate and pioneer of aerial navigation over land. He recommended to the Air Corps that Harold Gatty teach long-range navigation to Army pilots.

Harold Gatty, from Tasmania, was a graduate of the Royal Australian Naval College. He went on to study navigation under Lt. Commander Phillip V. Weems in the U.S. Navy. (Weems is famous for the *Weems plotter* used in navigation to this day.) Gatty was well known at the time as the around-the-world navigator for millionaire Wiley Post when they flew the famed Vega 5B, *The Winnie Mae,* on a globe-circling trip, in eight days, fifteen hours and fifty-one minutes during June and July 1931. In July 1935, Post made the same trip solo, using navigation learned from Gatty, and cut 21 hours from the trip.

Gatty was assigned to the Army Air Corps as a senior navigation research engineer. He was a natural for this assignment, and traveled back and forth between Langley and Rockwell Fields passing on his navigational knowledge to a cadre of junior Air Corps aviators. Gatty, taught celestial navigation, imparting his lore of the sea to his students. Shipboard celestial navigation was a laborious task requiring up to 40 minutes per fix. Such time-intensive efforts were not practical in an airplane moving at 100-200 mph. Gatty attempted to teach his short cuts to the Air Corps students but this left a lot to be desired. Gatty eventually left to pursue other interests.

At this opportune time two Air Corps personnel emerged who were excellent instructors and superb mathematicians. Thomas Thurlow, also quite knowledgeable in astronomy, had been assigned to Wright Field. Thurlow was the navigator for Howard Hughes in his around-the-world flight. The other was Norris B. Harbold, a West Point graduate. Between them they perked up the Air Corps Navigation School at Rockwell Field. (Harbold retired as a major general.)

The schools at Langley and Rockwell Fields had produced about a dozen navigators each. A few were lost in the bureaucratic shuffling associated with reassignments, however, the bulk of them were sprinkled throughout operational units where some of their training rubbed off on their fellow aviators.

Part of the navigation school was an instrument-equipped Douglas 0-2. This aircraft had an instrument panel in the rear cockpit. Pilots got about 25 hours training in this airplane - a real plus when combined with the navigation school.

At about this time, Lt. Curtis E. LeMay was assigned to the Air Corps Communications School located at Selfridge Field, Michigan. By fate, the hangar that housed the school burned to the ground and LeMay was reassigned as a student to the new navigation school at Rockwell Field. Following his training, he was among the Army pilots assigned to fly the mail in 1934 where he honed his newly-acquired navigation skills. Later he went to the Blind Landing School at Wright Field, where he transitioned into the Martin B-10.

In September 1934, LeMay was assigned to the 6th Pursuit Squadron at Schofield Barracks, Wheeler Field, Hawaii. In addition to his duties as Communications Officer, Engineering Officer, Assistant Operations Officer, and Mess Officer, he was made a navigation instructor. The latter task was little more than a one-hour-per week review as part of the local ground school. LeMay was soon joined by a Kelly Field flying school friend, John Waldron Egan. Between them they saw the need for a real navigation school. They discussed the matter at length and waited for an appointment with the district Air Corps Commander — Colonel Delos C. Emmons. The two intrepid lieutenants made their case and Emmons authorized the establishment of an Air Corps navigation school in Hawaii.

This full-time course, with a dozen students, ran for three months, alternating flying and ground school. The school kept Egan and LeMay burning the midnight oil to stay ahead of their eager students. (LeMay's new bride, Helen, had visions of strolls along the beach with her dapper aviator husband, but alas this was but a dream for she accompanied him to the beach only to watch him prepare for the next day's class.) For the flying aspect the school had one, and later a second twin-engine Douglas OA-4 *Dolphin* amphibian. LeMay and Egan believed that realistic over water navigation would be a great benefit. They found a place called Bird Island, located about 150 miles west southwest of Oahu, which could be used as an over water navigation check point. Through judicious presentation of their case, they sold its use to their commander. The navigation school was a great success.

Lt. LeMay rotated back to Langley Field in December 1936 — timing that just preceded

arrival of the YB-17s. The folks at Langley were most impressed with LeMay's work in Hawaii and wanted him to establish a new navigation school at Langley. However, LeMay gave an excellent sales pitch stating that Egan was a far better instructor and that he, LeMay, needed to find out about bombers. LeMay was assigned to the 49th Bomb Squadron as Assistant Operations Officer under Maj Caleb V. Haynes.[21] There are some who seem to remember that LeMay also taught some navigation classes at Langley although this is not brought out in LeMay's autobiography. This may have been an additional duty. It is known that under the stringent YB-17 pilot qualification requirements, LeMay had to spend considerable time as a navigator.

Langley Field Upgrades

Langley Field underwent some up-grading, including completion of packed-soil landing strips in 1936 just in time for arrival of the YB-17s. Later in 1941, a comprehensive system of concrete runways, aprons and taxiways, along with additional hangars, was completed such that the base could accommodate 52 heavy bombers and 276 fighters.[22]

Reserve Pilots go to Airlines[23]

Four Air Corps Reserve pilots from the 2nd Bombardment Group departed to pursue careers with the airlines in mid-1937. These included Lts. Mathias F. Junger, Robert R. Reed. and Lowell F. Johnson from the 96th Bomb Squadron who went with Eastern Air Lines, and Lt. Edward A. "Eddie" LePenske, from the 49th Bomb Squadron who went to United Airlines. Lt. LePenske recalls playing bridge on Wednesday nights at the home of Lt. Curtis E. LeMay and remembers LeMay as being extremely business-like. Lt. LeMay was known for his promptness and on one occasion when he did not show at the squadron precisely at 1 P.M., Lt. LePenske drove to LeMay's quarters and found him sprawled on the floor badly burned beneath a heat lamp. LePenske drove LeMay to the base hospital where he remained for several days recuperating. Subsequently, while flying as a Douglas C-54 (DC-4) *Skymaster* captain in the Pacific with United, LePenske delivered a 50-lb. watermelon to Harmon Field, Guam, home of the XX Bomber Command. A special party was thrown at the Officers' Mess and the place was filled with senior officers. Captain LePenske was greeted by two individuals - the base commander and former 49th Squadron mate and the other his flying school instructor. Across the room was Maj. Gen. Curtis E. LeMay who made no eye contact nor any sign of recognition. Could it be that LeMay resented LePenske because he had decided to go civilian rather than remain in the service?

Proving The Bomber[24]

The 2nd Bomb Group established a demanding training schedule as each squadron received its complement of two YB-17s. Concurrently,

Three of the 2nd Bombardment Group's YB-17s which flew over New York City as part of the American Legion convention program on May 24, 1937. (Courtesy of the United States Air Force via Boeing Photo)

YB-17, s/n 36-150, with plane-in-group number 60 flew over Washington, D.C. (Courtesy of Gordon S. Williams)

each squadron lost its complement of Martin B-10s.

Lt. Col. Olds and Maj. Giles took airplane s/n 36-151 to Bolling Field in Washington, D.C. on March 9, 1937, where it was viewed by certain dignitaries. A rope barrier kept visitors 200 feet from the aircraft. Only senior officers and members of the House and Senate Military Affairs Committees were permitted an intimate view. The airplane was such an attraction that it remained there four days.

On May 16, 1937 Lt. Col. Olds led a formation of four YB- 17s on an 11-hour flight north from Langley to Augusta, Maine; west to Cleveland, Ohio; and back to Langley via Pittsburgh, Pennsylvania and Richmond, Virginia. The formation passed over 20 cities and 11 states, while flying approximately 1,700 miles.

The next major public display of the *Flying Fortress* came on May 24, 1937 when GHQ Air Force put on a display over New York City for the American Legion Convention. Lt. Col. Olds led a flight of six YB-I7s on this mission. Lt. Col. Olds had an NBC radio hook up which broadcast the highlights of the review.

The Air Corps put one YB-17 on display at Treasure Island as part of the *1937 Golden Gate Exposition* in California,

Interception of the *USS Utah*[25]

The U.S. Navy reportedly held two view regarding the Army's bombers — one was as an extension of land-based naval guns and thus a defensive weapon for Navy fleets, and the second, as a siphon drawing off appropriated funds that otherwise might be available to maintain a larger surface fleet. For the Navy to support the former thesis was admission that their fleets were vulnerable to enemy aircraft.

In August 1937, the 2nd Bombardment Group took part in a joint U.S. Army-U.S. Navy exercise off the coast of California. The Presidential directive authorizing the exercise, confined the operation to a 500 mile limit off shore. Because the participating bombers would use flour-filled practice bombs, the War Department stated that the exercise was to test bombing methods, not bombing effects. The target was the *USS Utah* which was the flagship of a 12-ship task force — two battleships, one aircraft carrier, and nine destroyers — steaming in the Pacific under the command of Comodore Walter E. Brown.

A Naval patrol wing of 30 aircraft was commanded by Rear Admiral Ernest J. King. Brig. Gen. Delos C. Emmons commanded the Army's air force of 30 B-10s, 7 B-17s and 3 amphibians. The Air Corps flew out of Hamilton Field, California.

Navy scouting planes reported the position of the Navy task force which was protected by fog. A 1° error in the reported position of the ships precluded the Army from finding the target. The Navy blamed clerical error for the erroneous position report. The Army was ordered to await a new report the following morning prior to taking off. Instead the Army crews took off again that same day and began a search on their own for the fleet.

The lead B-17 was flown by Maj. Caleb V. Haynes. 1st Lt. LeMay was the lead navigator, and 1st Lt. Douglas M. Kilpatrick, Jr. was the lead bombardier. Also aboard the aircraft were Maj. Gen. Frank Andrews and Lt. Col. Robert Olds.

The Captain of the *USS Utah* broke radio silence in the belief that the exercise had been terminated for the day. Using a track established by Lt. LeMay, the aircraft spotted the target within 15 minutes and commenced their attack from an altitude of 600 feet. Maj. Haynes believed that the Navy had deliberately used the fog to conceal the fleet; while Gen Andrews, being somewhat benevolent, thought that an actual enemy would use clouds and fog as camouflage. Although there were numerous misses, several flour bombs found their mark.

Other Achievements With The *Flying Fortress*[26]

During the first two weeks in October 1937, the Group was engaged in a series of performance evaluations. Each aircraft, loaded with fourteen 300-lb. bombs took off at 2:00 A.M. and flew until dawn when the bombs were dropped. Much of the flying was done off the coast. On the first night out, the crews experienced gale force winds which added to the navigational problems. Despite the weather, they maintained their navigation legs at 20 to 50 miles off the shoreline while cruising at 200 MPH. Crews had sandwiches and hot coffee at their disposal and Arctic sleeping bags for catching naps. As a result, the crews were well rested and alert. These missions were 12 hours or longer in duration which allowed the crews to gain valuable experience in long-range cruise control.

During 1937, the 2nd Bombardment Group put the new *Flying Fortresses* through their paces. Nay sayers had predicted that the YB-17 was too much of an airplane for the crews and that the plane would require exceptionally large airfields from which to operate. The personnel at Langley proved both to be myths. In a little over a year and a half the Group logged 9,293 accident-free hours in all types of weather. The distances flown were in excess of 1,800,000 miles - or the equivalent of 72 trips around the earth's equator. The Group flagship had flown into 45 airfields during that time.

Air crew assignments were based on seniority and experience. Pilots assigned as aircraft commanders of the Group's YB-17s,were as follows:

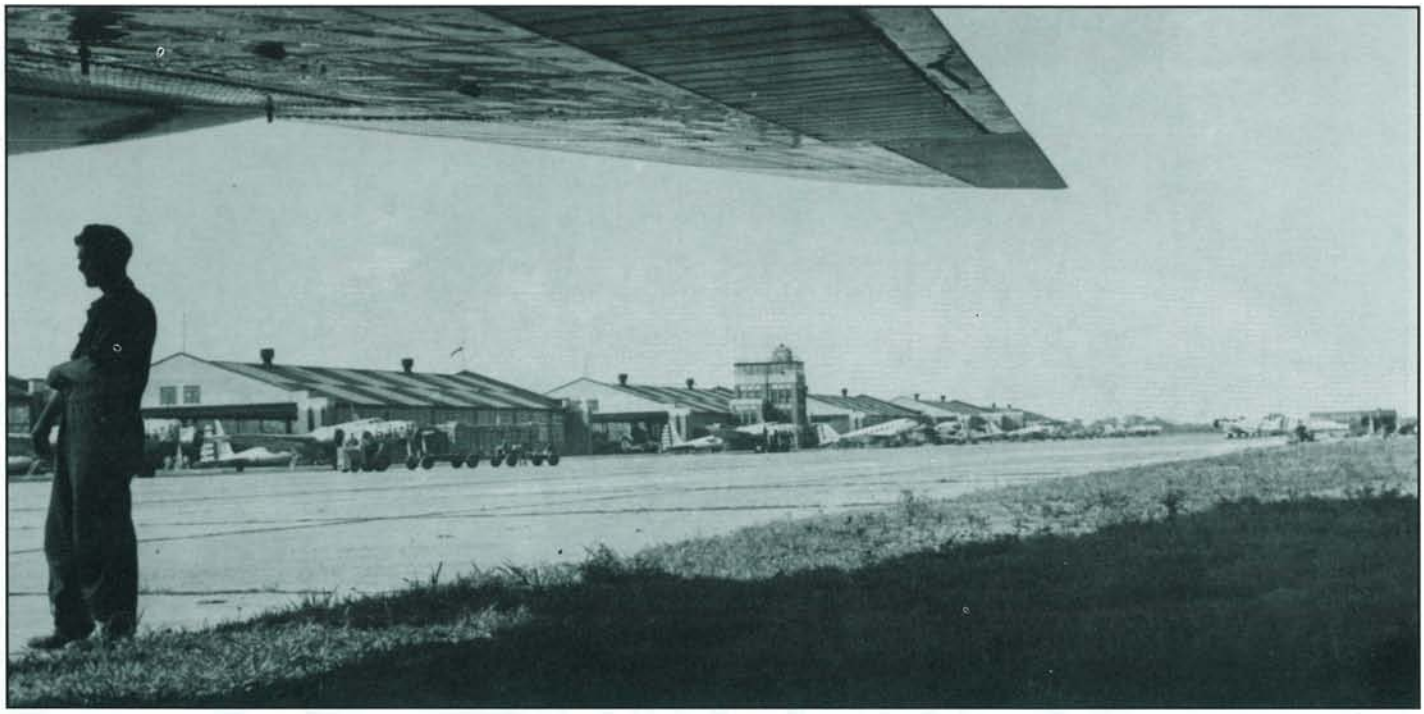
A/C No.	A/C Commander
10	Lt. Col. Robert Olds
51	Maj. Vincent J. Meloy
62	Maj. Harold L. George
80	Maj. Caleb V. Haynes
63	Capt. Hilbert M. Wittkop
81	Capt. R.B. Williams
60	Capt. C.B. McDaniels
82	Capt. William D. Old
53	Capt. Alva L. Harvey
61	Capt. Darr H. Alkire
52	Capt. Neil B. Harding
50	Capt. Ford J. Lauer

The Group also had a number of other qualified personnel as alternate aircraft commanders. These individuals were as follows:

Maj. Edwin R. McReynolds
Capt. B.W. Chidlaw
Capt. J.S. Mills
Capt. R.E. Koon
Capt. C.E. O'Connor
Capt. F.H. Robinson
Capt. Robert F. Travis
1st Lt. Curits E. LeMay
1st Lt. John . Egan
1st Lt. E.L. Tucker
1st Lt. W.H. Higgins
1st Lt. William A. Matheny
1st Lt. William C. Bentley
1st Lt. Frederic E. Glantzberg

Four other pioneering Group B-17 pilots, Maj. Barney M. Giles, Maj. John K. McDuffie, Capt. Cornelius W. Cousland, and Capt.

Lt. Col. Harold George (standing at right) and his crew posed beneath the nose of their YB-17 at Langley Field. The master sergeant, with all of the service hash marks on his sleeve, was most likely Col. George's crew chief, M/Sgt. Floyd B. Haney. (Courtesy of the United States air Force/Air Combat Command Historian)



Langley Field flight line with YB-17s and a Douglas C-33, and the ever-present mechanic. (Courtesy of Roy Love, Jr.)

Archibald Y. Smith were transferred to other units during 1938.

The Group made a number of record-breaking flights late in the year:[27]

Miami-Langley Field	5 Hours
Kelly Field-Langley Field	5 Hours
Wright Field-Langley Field	1 Hr 45 Min

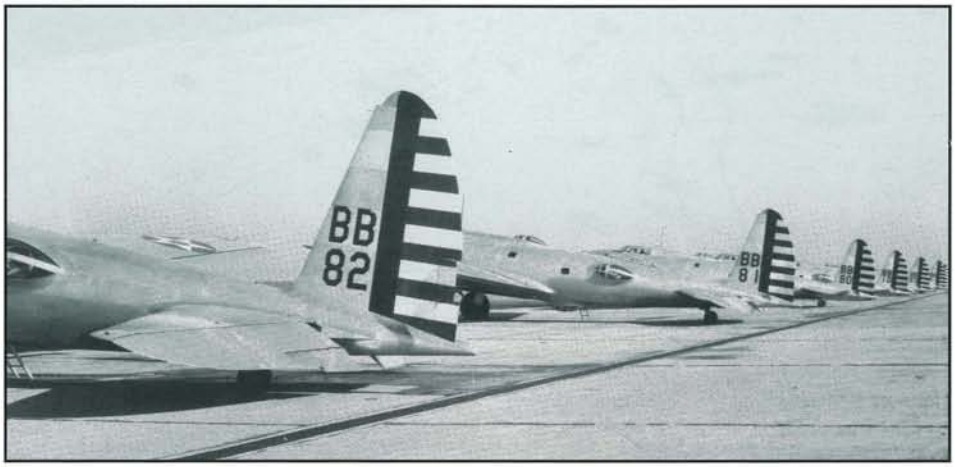
Hollywood Lights[28]

In 1938, the Group was privileged to parade its premier bomber before the celluloid audience. Under the command of Lt. Col. Robert Olds, all 12 of the Group's YB-17s were dispatched from Langley to California to participate in the movie *Test Pilot*, starring none other than Clark Gable, Spencer Tracy, Lionel Barrymore and Myrna Loy. Gable subsequently entered the Army Air Forces and went through the full Officers' Candidate School course in Miami, Florida. He rose to the grade of captain and served as a photo officer. He went to gunnery school and developed aerial gunnery films both in the States and overseas in England while serving with the Eighth Air Force. Gable flew actual combat missions as part of his duties.

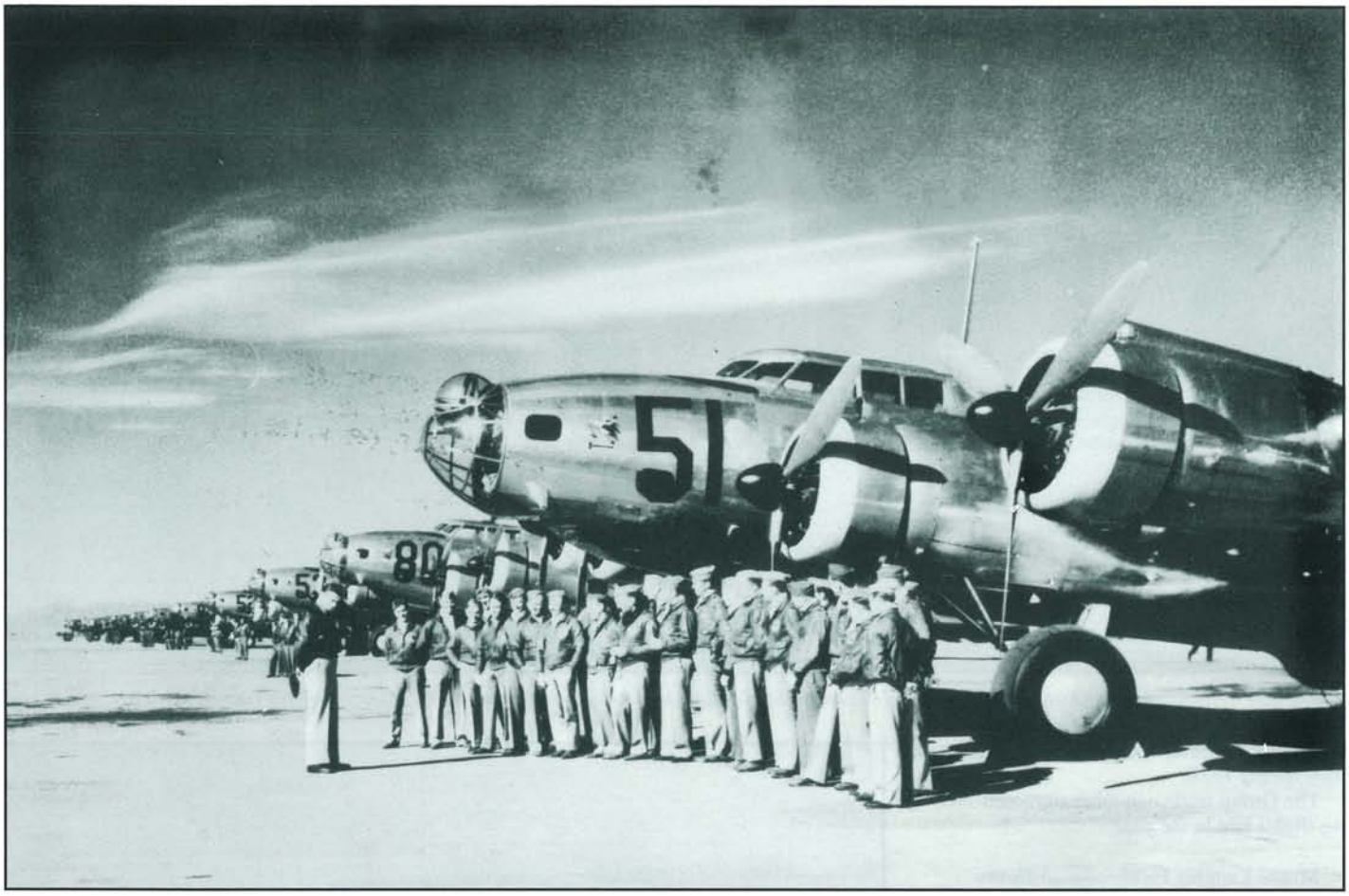
Test Pilot was based on a story by Frank Weed. Directed by Victor Fleming and produced by Louis D. "Bud" Lighton, the film was started in December 1937. It took three months to shoot, with seven weeks being dedicated to outdoor filming. This MGM film was released in April 1938. *Test Pilot* was nominated for three Academy Awards - Best Picture, Best Original Story, and Best Film Editing

The technical advisors were Paul Mantz and Al Menasco. Mantz is a household name in Hollywood aviation circles and his museum lives on today as the *Talmantz Museum* (which was jointly organized by Frank Tallman and Paul Mantz). Paul Mantz died in a plane crash while filming the movie *Flight of the Phoenix*. Frank

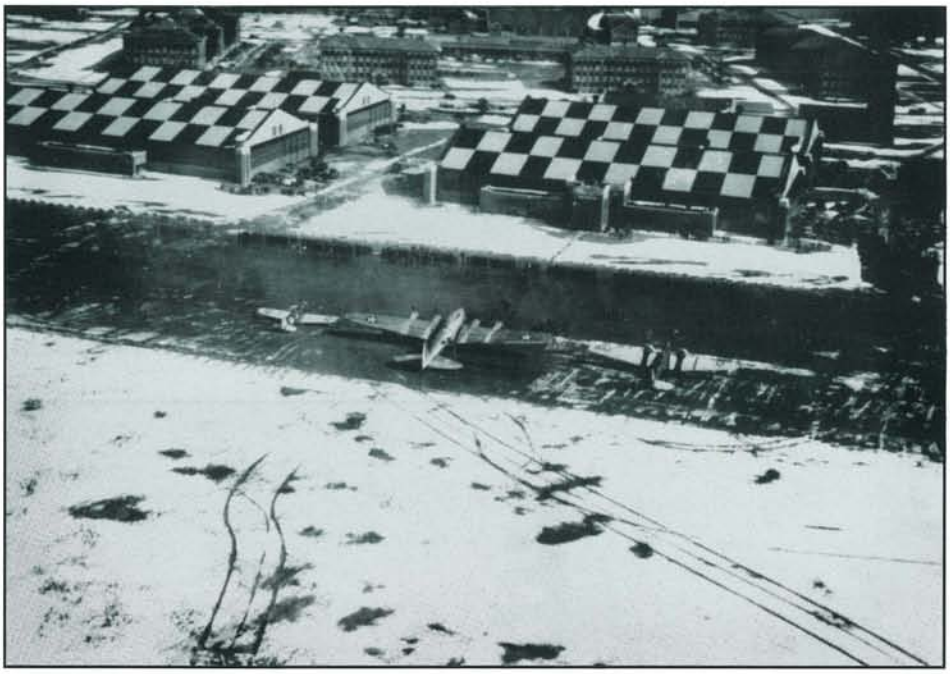
The six YB-17s from the 2nd Bombardment Group were running up their engines at March Field in 1938 for filming the movie Test Pilot. *(Courtesy of P.M. Bowers)*



Line up of tails of the 2nd Bombardment Group YB-17s participating in the filming of the movie Test Pilot *at March Field. (Courtesy of the United States Air Force/P.M. Bowers)*



This scene was used in the movie Test Pilot *in which Spencer Tracy briefs his crews. (Courtesy of William H. Montgomery)*



A consolidated PB-2, Boeing YB-17, and Martin B-10 shared the snow-covered ramp at Langley Field. Note the red and white checkered hangar roofs. (Courtesy of the United States Air Force/Air Combat Command Historian)

Tallman also subsequently died in an airplane crash. Menasco designed and manufactured aircraft engines and landing gear.

The lead aircraft in the film was ship No. 51, flagship of the 20th Bomb Squadron, flown by Maj. Vincent J. Meloy, the Squadron commander. This aircraft was used for all of the high altitude filming, with footage being shot by Ray June from an accompanying B-18 *Bolo*.

In the film, a model of a YB-17 was crashed. Spencer Tracy was then filmed inside a wrecked Douglas DC-2 fuselage as part of the crash scene.

Operating from March Field, the USAAC employed over 100 aircraft from the 2nd, 7th and 19th Bombardment Groups for the movie. They put up 60 ships for the final fly-by scene.

Timing for the release of *Test Pilot*, one of the all-time box office hits, could not have been better, because the film caught the public's imagination, and served as both an excellent recruiting film and a vehicle to gain public support for America's growing war effort.

On January 6, 1938, Col. Olds flew from Langley Field to March Field, covering 2,317 miles in 13 hours and 27 minutes, while fighting severe headwinds. Three days later on the return flight, he reduced the flying time by 2 hours and 26 minutes. This flight demonstrated that the Group was equipped and prepared to send reinforcements to either coast for hemispheric defense.[29]

Argentina Goodwill Flight of 1938[30]

In February 1938, the Air Corps was offered an excellent opportunity to demonstrate its long-range flying capabilities. In a goodwill gesture, the U.S. State Department requested that a flight be made to Buenos Aires, Argentina, to honor the inauguration of President Roberto M. Ortiz. A thorough plan for the mission was issued on February 11. It designated the administrative organization and staff, named the crews and their as-

signed aircraft, prescribed the dress for operations, informal wear and for formal events, set the intinerary — times, routes, landing fields and facilities, authorized the financing, including funds for reciprocal intertainment, gave the plan for messing and billeting, included the meteorological plan, prescribed the communications plan — call signs, frequencies, navigation aids, radio stations, emergency frequencies and procedures, and position reporting, and detailed the supply and engineering plan, including the item by item parts inventory for a 78 hour fly away kit.

On February 15th, a six-ship flight took off at two minute intervals from Langley Field for Miami, Florida. Lt. Col. Robert Olds led the mission. His lead navigator was 1st Lt. Curtis E. LeMay.

The second leg to Lima, Peru, was 2,695 miles. Col. Olds briefed his crews to assemble over Colon, Panama where they would make the determination if the weather would permit continuation to Lima. This leg was accomplished in 15 hours and 32 minutes. Mechanics from Pan American Grace Airways (PANAGRA) serviced the aircraft during their 7-hour layover. They had to adjust a propeller on Maj. Vincent Meloy's aircraft that delayed his departure.

Five of the B- I7s took off and headed south for Santiago, Chile. They made their eastward turn to cross the Andes near the highest peak in the range called *Aconagua*. The third leg, which took the planes to Buenos Aires, was 2,200 miles, which they covered in just over 12 hours. The five aircraft assembled over Buenos Aires and landed at El Polomar Field at 11:30 A.M. on February 18, 1938. Maj. Meloy arrived later that day. That evening, Col. Olds delivered the letter from President Franklin D. Roosevelt to President-elect Ortiz. The aircraft flew over the city as part of the inaugural ceremonies on Sunday, February 20th.

This ambassadorial flight was scheduled to leave El Polomar on Tuesday, February 22nd. Capt. Archibald Y. Smith's plane experienced minor damage when it broke through the concrete as it was being moved from the gas pit. Five of the aircraft departed for Santiago, Chile for their first overnight. Smith's plane caught up with the flight that evening. Then Smith' airplane experienced a broken starter at Santiago and he was again delayed one day in catching up with the formation in Lima, Peru.

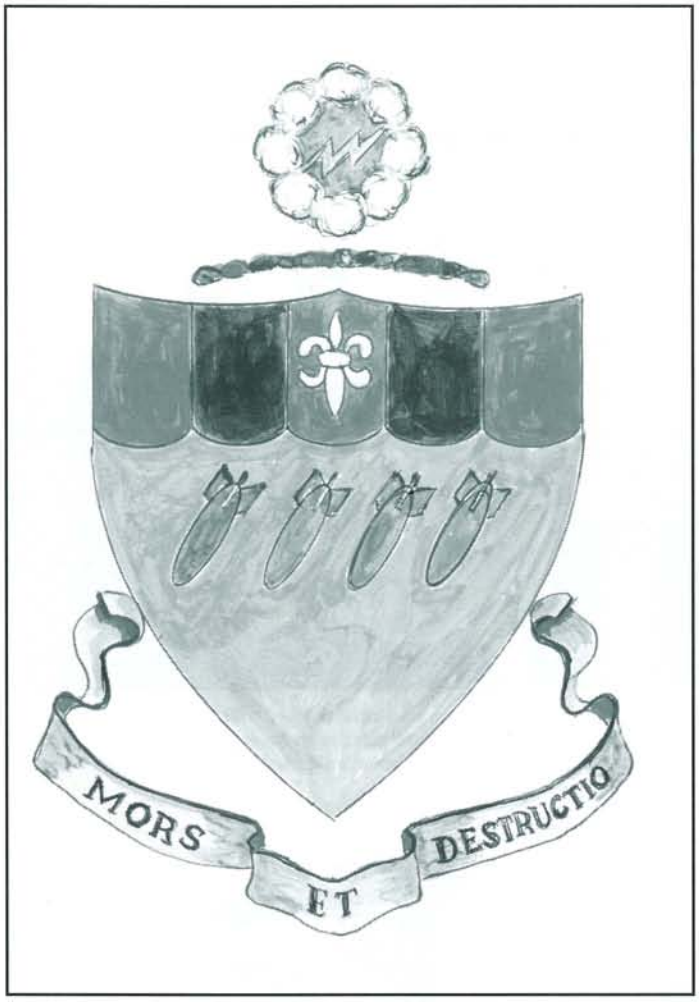
The next stop was Panama where the airplanes spent the day for servicing. The aircraft departed on Sunday, February, 27th and flew directly to Langley, making the trip in 10 hours and 45 minutes. The formation was greeted by Maj. Gen. Frank M. Andrews bearing a handful of congratulatory telegrams and messages.

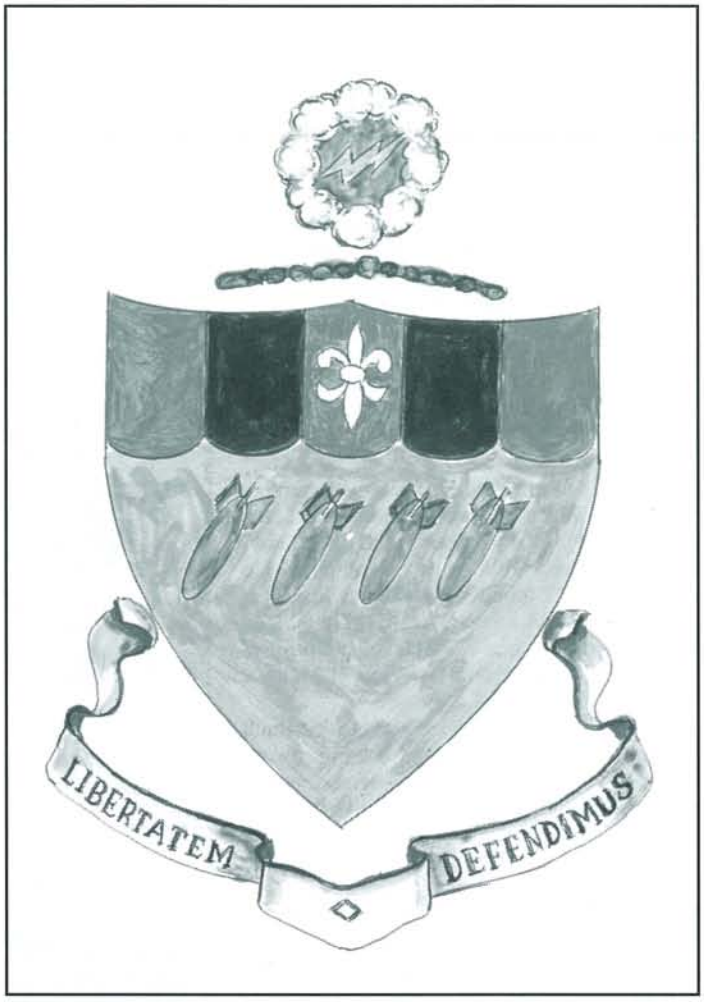
For their efforts on this 11,952-mile flight, Col. Olds was awarded the DFC and the 2nd Bombardment Group received the National Aeronautic Association's *Mackay Trophy*. At the awards presentation, Secretary of War Harry H. Woodring stated: "This flight of over 10,000 miles was accomplished with a high degree of skill in pilotage, navigation and maintenance proficiency on the part of the officers and men participating, and reflected a superior standard of performance on the part of the entire 2nd Bombardment Group in the field of normal training and maintenance and in the preparation for and execution of this flight." (See Appendix 11 for listing of flight crews.)

Col. Olds wrote a thorough, 41 page report on the mission, including 7 pages of conclusions drawn from the experience, and covering such subjects as personnel, equipment, facilities and public relations. He assessed the performance of the YB-17s, including performance comparison with the twin engine Martin and Douglas B-18 aircraft.[31] (See Appendix 11A.) Among his conclusions, he stated: " The motto of the 2nd Bombardment Group *Mors et Destructo* [Death and Destruction] incited certain curious comment during the Good Will Flight. It is as inappropri-

On November 7, 1939, Secretary of War, Harry H. Woodring, presented to Mackay Trophy for 1938 to Lt. Col. Olds in recognition of the 2nd Bombardment Group's Goodwill mission to Buenos Aires, Argentina for the inauguration of President Roberto M. Ortiz. (Courtesy of the United States Air Force/Air Combat Command Historian)

General George C. Marshall (r) bids bon voyage to Lt. Col. Robert Olds as he prepared to depart with six YB-17s on the Buenos Aires, Argentina Goodwill Flight on February 15, 1938. (Courtesy of the United States Air Force/Air Combat Command Historian)





As a result of the 1938 Goodwill mission to Argentina the motto of the 2nd Bombardment Group was changed from Mors et Destructio *to* Liberatem Defendimus.

ate in time of peace as in the time of war." He recommended that the " . . . . inscription on the shield and insignia be changed from ' Death and Destruction' to 'Aggressors Beware.'" The motto and Group insignia had been adopted on January 24, 1924. Subsequently, at the suggestion of the White House, the War Department changed the motto to *Liberatem Defendimus* — Liberty we Defend. This change was not effected until April 15, 1940. The Group insignia remained unchanged.[32]

Florida Field Exercises[33]

The three-year term for Brig. Gen. Gerald C. Brant as commander of the 2nd Wing had expired and he was transferred to the Air Corps Technical School at Chanute Field. His replacement was Col. Henry B. Claggett, base commander at Selfridge Field, Michigan. Col. Claggett flew to Langley to assume his new command just before a major field exercise.Tactical units of the 2nd Wing flew to Florida for a series of field exercises. The Florida National Guard loaned the deployed units cots, tents, and lumber to make their quarters. The bulk of the units arrived on March 14, 1938. The Headquarters and tactical units from the 2nd Bomb Group, the 21st Reconnaissance Squadron, and the entire 8th Pursuit Group, all came from Langely. The 17th Pursuit Squadron from the 1st Pursuit Group came from Selfridge Field, and the entire 9th Bombardment Group and the 18th Reconnaissance Squadron came from Mitchel Field, New York. A list of participating aircraft and most of the personnel is shown in the chart above.

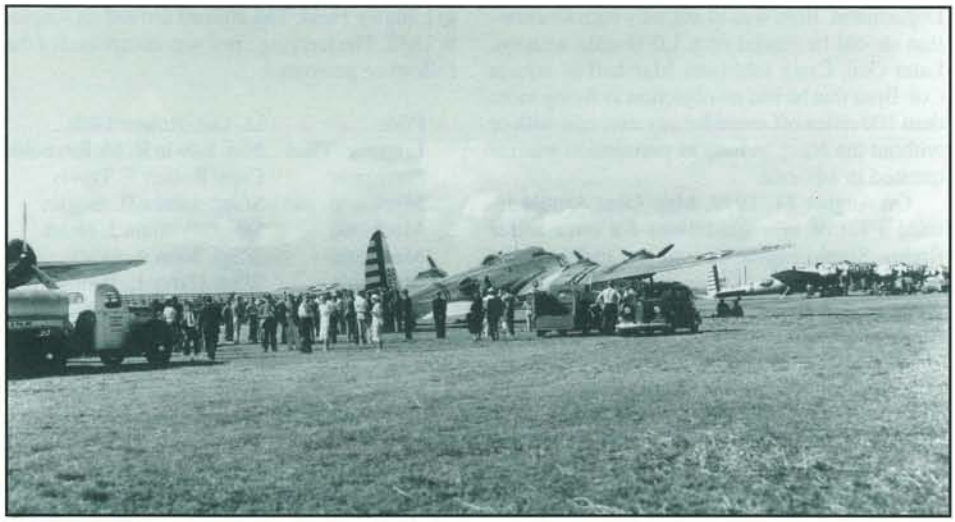
Unit	A/C Type	No. of A/C	Officers	Enlisted	TDY Base
2nd BG	B-17	9	55	225	Orlando
	B-18	3			
	A-17	2 (for utility purposes)			
9th BG	B-10Bs	21	37	220	Lakeland
8th PG	PB-2*	22	25	143	Sarasota
17th PS	P-35**				Tampa
18th RS	B-18				Tampa
21 st RS	B-18				Tampa

*Consolidated Aircraft built the PB-2s
**Seversky Aircraft built the P-35, predecessor of the Republic P-47 *Thunderbolt*.

Bad weather on the route to Florida created a near emergency for the 17th Pursuit Squadron. The Squadron was forced to land near Huntsville, Alabama. As the pilots circled the area in thicking weather and deteriorating visibility, quick-thinking state policemen ordered the towns folk out to the airfield with their automobiles to shine their headlights on the runway. The Squadron got down safely.

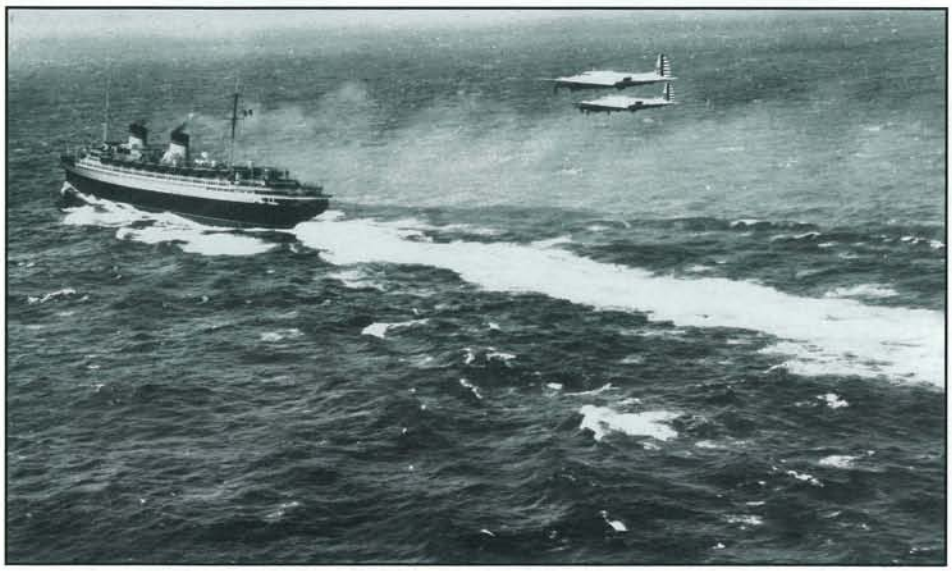
The Florida training exercise consisted of fighter intercepts on the incoming bombers, photo reconnaissance, gunnery, and bombing practice. A mixture of oil and aluminum dust was used to make bombing targets on the water over the ocean.

Sunday, March 20, 1938 was proclaimed



Open House was held in Orlando, Florida as part of the field exercise held there in March 1938. Note the gasoline truck from the Standard Oil Company, based in Miami, Florida. (Courtesy of the United States Air Force)

This 2nd Bombardment Group YB-17 participated in the May 1938 GHQ-Air Force maneuvers. Its colors were Dark Green, Dark Olive Drab, and Sand over White. (Courtesy of the United States Air Force/Don Spering)



YB-17s, numbers 81 and 82, piloted by Capt. Cornelius W. Cousland and Capt. Archibald Y. Smith, respectively, were captured on film with the Italian Liner SS Rex by Air Corps photographer Maj. George W. Goodard from aboard airplane number 80 piloted by Maj. Caleb V. Haynes. (Courtesy of United States Air Force)

Visitors' Day by Col. Claggett at the five airfields hosting the exercise units. All of the aircraft were on display during the afternoon and the pilot and crew stood by to answer questions. It was estimated that more than 20,000 visitors came to the Tampa field alone.

The Floridians rolled out the red carpet for the visiting airmen. Tampa's hospitality was returned when the officers hosted a reception for the city officials on the evening of Friday, March 25.

At the end of the exercise, the Group's B-17s were used to transport the personnel and equipment of the 17th Pursuit Group back to Selfridge Field. The bombers then returned to Orlando to effect their own redeployment.

Interception of the *SS Rex* and other Overwater Flights[34]

In a further attempt to prove long-range airpower, Maj. Gen. Frank Andrews arranged with an Italian shipping line to use one of its inbound vessels as a practice target for interception. Lt. Col. Ira C. Eaker was in command of the Air Corps Information Division and was in charge of the publicity for this mission.

On May 12, 1938 a formation of three Group B-17s departed Mitchel Field, New York, at 8:30 A.M. to intercept the Italian liner *SS Rex* which was 725 miles out to sea. The crew of the lead aircraft, No. 80, included Maj. Vincent J. Meloy, flight commander, Maj. Caleb V. Haynes, pilot, and 1st Lt. LeMay, navigator. Airplanes No. 81 and 82 were piloted by Capt. Cornelius W. Cousland and Capt. Archibald Y. Smith, respectively. Aboard aircraft 81 was C.B. Allen from the New York Herald Tribune and Maj. George W. Goddard, the Air Corp's top photographer. On ship 82 was Hanson W. Baldwin, military and naval correspondent from the New York Times.

Maj. Haynes led the formation out to sea from Sandy Hook at a speed of 170 mph. The formation made its track based on a radio report from the ship at midnight. The airplanes flew low until 10: 00 A.M. when a break permitted LeMay to get a good speed check and drift. At 11:00 A.M. the three ships entered a weather front and separated for safety reasons. They rejoined 10-15 minutes later. LeMay estimated interception at 12:25 p.m. They flew through rain squalls and began to doubt the outcome of the mission. Capt. Cousland was first to spot the *Rex*. He radioed Maj. Haynes and gave him a bearing of 12 o'clock. Within two minutes the three B- I7s were over the ship at precisely 12:25 P.M.

Appropriate radio announcements were made, Maj. Meloy talked with the ship's captain, and using a 4x5 *Graflex,* Maj. Goddard photographed two of the aircraft over the ship. Despite the adverse weather, the flight successfully intercepted the *SS Rex* and made it back to Mitchel Field at 4:30 P.M.

General H.H. Arnold described the aftermath as follows:

> "Somebody in the Navy apparently got in touch with somebody on the General Staff, and in less time than it takes to tell about it, the War Department sent down an order limiting all activities of the Army Air Corps to

within 100 miles of the shoreline of the United States."

Subsequent operations were limited to within 100 miles unless authority for greater distances was requested in advance. Three Air Corps leaders, Lt. Col. Ira C. Eaker, Lt. Col. Robert Olds and Lt. Col. Carl Spaatz, along with others, believed the Navy was responsible for this constraint. Several attempts by Maj. Gen "Hap" Arnold to obtain a written copy of the order from the War Department were unsuccessful.

The passage of time made the order even more of a mystery. Some even thought that Army Chief of Staff, Gen. Malin Craig had imposed the order on the Army either because the interception flight had encroached on the Navy's mission or maybe as a safety precaution.

The Air Corps had previously placed offshore flight restrictions on itself. The presidential order authorizing the interception of the *USS Utah* called for a 500-mile limit, however, the Army imposed a 300-mile limit on its aircraft. In November 1937, the Group participated in an exercise in the Chesapeake Bay area. Lt. Col. Carl Spaatz, the 2nd Wing Executive Officer, issued an order restricting the B-10s to a distance of 100 miles offshore, while the B-17s were permitted to fly as far 200 miles out to sea.

In December 1938, the War Department asked Maj. Gen. Andrews to comment on a Navy plan for a joint exercise in New England where flight operations were to be restricted to 100 miles from shore. Andrews dispatched his Chief of Staff, Col. George Brett, to see Maj. Gen. George C. Marshall, Deputy Chief of the War Department. Brett was to ask why such a restriction should be placed on a 1,000-mile weapon. Later Gen. Craig told Gen. Marshall to inform Col. Brett that he had no objection to flying more than 100 miles off shore for any exercise with or without the Navy as long as permission was requested in advance.

On August 24, 1939, Maj. Gen. Arnold issued a set of new guidelines for over water flights. Single-engine aircraft and multi-engine aircraft incapable of flying on half of their engines were restricted to a 30-mile limit except for three conditions:

- an airplane capable of operating from the water accompanied the flight
- safety vessels had been stationed along the route
- or he specifically authorized any deviation

In addition, Gen. Arnold authorized multi-engine aircraft capable of flying on half of their engines to fly any distance up to half of their normal range limit, however, local commanders could impose tighter restrictions for safety reasons.

XB-15 Goes To Langley[35]

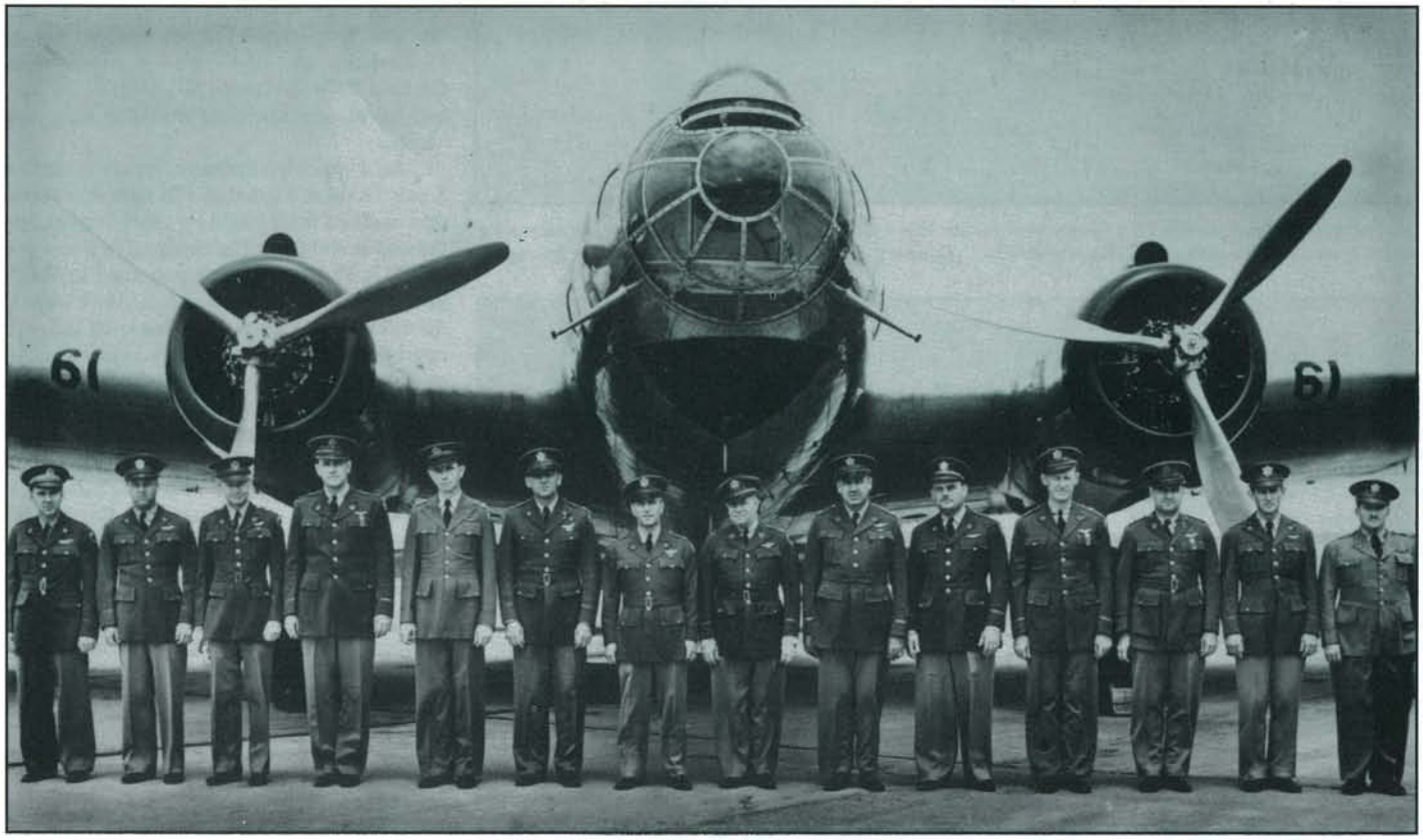
In August 1938, the 49th Bomb Squadron sent T/Sgt. Adolph Cattarius, and S/Sgts. William J. Heldt, Harry L. Heins, and David L. Spicer, and Corporals James E. Sands and Ityner to Wright Field for an introductory maintenance course on the XB-15. A flight crew was dispatched to Wright Field to bring the behemoth to Langley Field. The aircraft arrived on August 8, 1938. The ferrying crew was comprised of the following personnel:

Pilot	Lt. Col. Robert Olds
Engineer/Pilot	Maj. Edwin R. McReynolds
Navigator	Capt. Robert F. Travis
Mechanic	S/Sgt. James H. Boyles
Mechanic	S/Sgt. William J. Heldt
Mechanic	S/Sgt. John A. Piper
Mechanic	S/Sgt.Harry L. Hinds
Mechanic	S/Sgt. David L. Spicer
Mechanic	Sgt. Avrill Foreman
Radio Operator	PFC William B. Bistor

The XB-15 was placed in squadron service along side the YB-17s.

Colombia Goodwill Flight of 1938[36]

A second South American goodwill flight, this time to Bogota, Colombia, was made between August 3 and 12, 1938. Three B-17s under the command of Maj. Vincent Meloy made this trip to attend the inauguration of President Dr. Eduardo Santos. This was also the commemoration of the 100th anniversary of Bogota. Secretary of State Cordell Hull wrote a letter to Secretary of War Harry H. Woodring stating: "It gives me great pleasure to inform you that the visit of the United States Army planes to Bogota in connection with the inauguration of President Santos, August 5 to 9, has proven the occasion of many favorable comments. Special Ambassador Caffney has informed me that the Colombian President himself expressed gratification



The officers of the three YB-17s which made the goodwill flight to Bogota, Colombia in August 1938 were (l-r): 1st Lt. Edwin L. Tucker, 1st Lt. Torgils G. Wold, Capt. William A. Matheny, 1st Lt. William C. Bentley, Capt. Carl B. McDaniels, Capt. Alva L. Harvey, Maj. Harold L. George, Maj. Vincent J. Meloy, Maj. Caleb V. Haynes, Capt. Ford J. Lauer, 1st Lt. Federic E. Glantzberg, 1st Lt. Curtis E. LeMay, 1st Lt. Richard S. Freeman, and 2nd Lt. James H. Rothrock. Missing was Maj. Charles Y. Banfill. (Courtesy of the United States Air Force)

with the visit, and the Ambassador has commented most favorably on the decorum, dignity, and general conduct of the visitors."

Three aircraft departed Langley Field at 9 A.M. on August 3, 1939 and arrived at Miami, Florida at 2:35 P.M. This route was 850 miles long, and included four dead reckoning legs. Each aircraft navigated separately and effected a rendezvous over Jacksonville, Florida at 12:30 P.M., then flew in loose formation to Miami.

During the next day and a half, required maintenance was carried out on the aircraft. On the second evening, the officers were guests at a dinner sponsored by the Miami Rod and Reel Club. 1st Lt. Frederic E. Glantzberg, the Group public relations officer, made a short speech regarding the purpose of the mission. (See Appendix 6.)

The flight took off at 3:05 A.M., August 5 for Bogota. Again, each aircraft navigated separately then rejoined over Barranquilla, Colombia for the final leg into Bogota. Strong head winds forced them to arrive 30 minutes late. The field elevation at Bogota is 8,660 feet. The crews were met by a throng of approximately 3,000 people. They were greeted by Ambassador Jefferson Caffery, American Delegation Charge de Affairs Winthrop S. Greene, and U.S. Naval Attaché Capt. John C. Munn, USMC. Quarters were at a premium and only the three aircraft commanders got a hotel room. The other officers were put up in private homes, while the enlisted men stayed at a single home.

Two days of festivities and Olympic Games tryouts were attended by the officers. The inauguration took place on Sunday, August 7. Plans had called for only four officers to attend with the American ambassador, but at the behest of the president-elect, accommodations were made for all of the officers to attend.

Maj. Meloy suggested a tribute be paid to the victims of a July 24 disaster in which 64 died and 80 remained hospitalized after a Colombian Air Force airplane crashed into a crowd attending a dedication ceremony at a new military parade ground. The American Legation arranged for a military band, a detachment of cadets from the military school, the Colombian president, Ambassador Caffery, and the entire flight crew to participate in the tribute. A wreath was laid at one of the cemetery's receiving vaults and Maj. Meloy made a brief speech. This ceremony preceded the 3:00 P.M. inauguration program. While the entire ceremony lasted only 15 minutes, the effects were lasting.

All members of the Group crew attended a party at the Grenada Hotel which was hosted by the Colombian Air Force.

Security for the B-17s was provided by 60 infantrymen from the Colombian Army, supplemented by 10 Secret Service men. In addition, one crew member was inside their respective airplane throughout the visit.

A short 283-mile hop was flown on August 9th. The formation departed at 9:15 A.M. and made a flyover of the city of Bogota. Because of bad weather predicted along the planned route, the flight took an alternate route suggested by 1st Lt. Torgils G. Wold using radio, celestial, and dead reckoning navigation. The detour took them 50 miles out of the way and they landed at France Field, Canal Zone at 1:00 P.M. They were met by Brig. Gen. George A. Brett, commander of the 19th Wing.

On the morning of August 10, Brig. Gen. Brett and Maj. Gen. David L. Stone, Commanding General of the Panama Canal Zone, made a short flight over the Pacific side of the Panama Canal in one of the B-17s. Maintenance crews spent the day going over the aircraft in preparation for the flight back to the U.S. Heavy rains pelted the field throughout the afternoon and well into the night.

Despite the torrential rains the field was still firm and on August 11, the formation took off at 8:35 A.M., and flew seven legs, two by dead reckoning, en route to Miami, Florida. The aircraft again flew individually, then made a rendezvous over Clenftiegos, Cuba, for the final leg into Miami. The formation met the XB-15, flown by Lt. Col. Robert Olds, and the entire formation landed at Miami, at 2:48 P.M. The B-17s had flown 950 miles that day.

After spending the night in Miami, the formation departed for Langley Field at 9:35 A.M., flew along the airline routes, and arrived at 1:45 P.M. Lt. Col. Olds arrived later that afternoon in the XB-15. (See Appendix 12 for Bogota flight crews.)

Chilean Earthquake Relief Flight of 1939[37]

A devastating earthquake struck Chile on January 24, 1939 resulting in the loss of about 1,000 lives. Maj. Gen. Frank M. Andrews anticipated the need for the 2nd Bomb Group aircraft and had them readied. He canceled the alert when he learned from the Panama Canal Department that they would send aircraft. Argentina had also responded quickly by sending aid via rail and air. However, more aid was urgently needed and the American Red Cross sent a request to President Roosevelt for assistance in transporting the relief supplies. Late in the afternoon, on Wednesday February 1st, orders arrived at Langley to prepare for the flight.

Maj. Caleb V. Haynes was the pilot of the XB-15. His crew is identified in Appendix 13.

A back-up B-17 was prepared in the event that the XB-15 was not able to fly. Another B-17, to be flown by Capt. Hilbert M. Wittkop was also readied in the event that one B-17 could not carry all of the supplies. By Friday, the XB-15 had been stuffed with all 69 cartons of medical supplies, weighing 3,250 pounds, and a dejected Capt. Wittkop would remain behind.

Maj. Haynes got the XB-15 airborne at 6:35 A.M., on Saturday. He leveled above a cloud deck at 5,000. The clouds dissipated as they cleared the coastline near Cape Lookout, North Carolina, just in time for Capt. Sanford to take a drift check. They identified Palm Beach, Florida to the west. When they reached a point five miles east of Miami Beach at 11:45 A.M., they set a course direct to Panama. At 6:55 P.M., they sighted the entrance to the Panama Canal and landed at France Field ten minutes later. The crew was in the air again at 4:00 A.M., the next day and reached Lima, Peru at 12:50 P.M. During their 9-hour layover, a PANAGRA crew helped service the aircraft.

The XB-15 was met at the Santiago airport just after 7:30 A.M., Monday by Lt. Col. Ralph H. Wooten, U.S. Army Attaché to Chile, the commander of the Chilean Air Force, and members of the Red Cross. In the 49-hour, 18-minute trip, the crew flew 4,933 miles in 29 hours and 53 minutes.

Because of a fuel shortage at Lima, Peru, Maj. Haynes ordered a fuel load of 4,000 gallons (a YB-17 was limited to 2,492 gallons). The XB-15 left Santiago on Thursday, February 9 at 6:10 P.M., and flew direct to France Field, Panama in 19 hours and 55 minutes. Orders from Langley told Maj. Haynes to remain in Panama until Monday and fly on to Miami for another overnight. They were scheduled for an arrival at Langley at 11:00 A.M., but got there at 10:30. They were radioed to circle until 11:00 A.M., because time was required to assemble the military formation on the ramp for a formal reception. Maj. Gen. Andrews greeted the crew informally when they deplaned then had them line up in front of the aircraft for the formal reception by W.D. Millner, Langley Field Red Cross Director, who read a message from Norman H. Davies, Chairman of the Red Cross. At the closing of the ceremony, 52 airplanes, from both Langley and Mitchel Fields, took off and assembled into formations for a fly by.

Maj. Gen. Andrews had planned to present Maj. Haynes with the DFC, but the event was reserved for Secretary of War Harry H. Woodring. Maj. Haynes and his crew took off in the XB-15 at 12:45 P.M., and flew to Bolling Field for the presentation ceremony. The citation was read by Gen. Malin Craig, Army Chief of Staff. The presentation was made in the presence of Maj. Gen. Henry H. "Hap" Arnold, officials of the American Red Cross and the Chilean government.

Other XB-15 Flights of Distinction[38]

Maj. Caleb V. Haynes, commander of the 49th Bomb Squadron, personally used the XB-15 for many missions assigned to his squadron. Francisco Sarabla, a famous Mexican aviator was killed when his plane crashed into the Potomac River. Maj. Haynes used the XB-15 to fly the body to Mexico on June 10, 1939.

As part of the Air Corps 30th Anniversary Celebration, a series of flights were flown from both Wright and Langley Fields during July and August 1939 to best previous international records. Of the six international records established, five were performed in the XB -15.

The XB-15 set two world records at Wright Field on July 30, 1939, when Maj. Haynes and Capt. William D. Old, flew the airplane as follows:

	Payload	Altitude
•	22,046 pounds	8,228 feet
•	31,164 pounds	6,561 feet

The latter flight eclipsed a previous Russian weight-lifting flight by more than one ton.

On August 1-2, 1939 the XB-15 established a new record while averaging 166 mph. The aircraft carried a 4,409-lb. payload a distance of 3,107 miles while flying a closed course between Patterson Field, Ohio and MacChensey Airport, near Rockford, Illinois. The flight took 18 hours, 40 minutes, 47 seconds. An additional 13 minutes were required for takeoff, interception of the course track, and landing.

Goodwill Flight to Rio de Janeiro, Brazil, November 10-26, 1939[39]

The War Department directed the 2nd Bomb Group to proceed with a flight of seven B-17s to Rio de Janeiro so as to arrive on November 14 to participate in ceremonies celebrating the 50th anniversary of the founding of the Brazilian Republic. Maj. Gen. Delos C. Emmons, Commanding General, GHQ Air Force, was the flight commander.

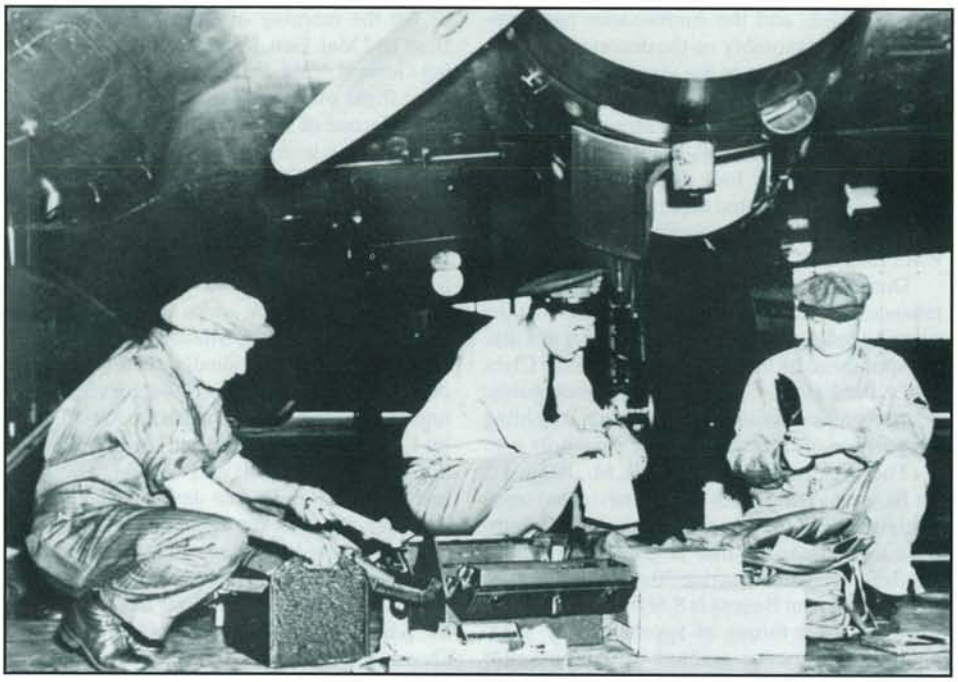
The Group Headquarters Squadron and the 20th Squadron each furnished one airplane and crew. The 49th furnished two planes and crews, and the 96th furnished three airplanes and crews. The flight took off from Langley Field at 9:05 A.M., November 10, and proceeded on the planned route with overnight stops at Miami, Florida, Albrook Field, Panama Canal Zone, Lima, Peru, Asuncion, Paraguay, and Rio. A flight of five airplanes arrived at Rio November 15, one day behind schedule, having been delayed a day at Asuncion because of bad weather at Rio. One airplane from the 49th sunk into the soft ground at Asuncion, damaging three propellers. Replacement propellers were flown from Rio to Asuncion by the Brazilian Air Force. The damaged airplane was repaired and arrived in Rio November 19.

One 96th Squadron plane lost all on-board navigational aids on the flight from Lima to Asuncion. A high overcast even prevented the use of celestial navigation. These complications delayed the crew's arrival in Asuncion by approximately one hour. This airplane was still without a radio compass for the flight to Rio two days later. When the weather at Rio indicated an instrument approach might be necessary, the crew flew to an alternate field with better weather. The weather at Rio didn't clear enough for this crew to join the ceremonies at Rio until November 17.

The flight departed Rio on November 23 on the home-bound route that took it to Natal, Brazil, Paramaribo, Dutch Guiana, (one crew had to return to Natal for engine repairs and arrived at Paramaribo four hours after the rest of the flight), to Maricaibo, Venezuela, with an en route intermediate stop at Carapito, Venezuela, and from Maricaibo direct to Washington D.C. to discharge passengers and return to Langley. Adverse weather was forecasted along the U.S. eastern seaboard, for the flight from Maricaibo to Washington D.C. The plan was to fly to Jacksonville, Florida, check the weather and determine whether to land or continue to Washington D.C. The weather turned favorable and the flight proceeded, except for one airplane that had engine troubles because of bad gasoline obtained at Maricaibo. This crew stopped over at Jacksonville. Another plane landed at Jacksonville to pick up Brazilian passengers from the ailing airplane, before continuing to Washington D.C. The six airplanes remaining in the flight arrived back at Langley early that evening after logging approximately 11:35 each for the day.

In addition to the stated purpose of goodwill, these flights were valuable for training in hemisphere mobility, for the lessons learned and for the information gathered about terrain, weather, navigational aids, and airdrome facilities and services. Among the reports on each segment of the mission plan, were insightful observations, conclusions and recommendations. Supplies of 100 octane fuel were marginal in quantity and quality. The Air Force did not have sufficient knowledge of South American navigation aids, and services from established airdromes or emergency fields for extended operations. Maps for aeronautical purposes were inadequate and in short supply. From each such international mission, additional items of equipment and supply were identified for better crew performance and aircraft maintenance and servicing. This, despite the fact each airplane had a 70 hour flyaway kit aboard. Each airplane was given a forty hour periodic maintenance inspection before departure. A twenty hour progressive inspection was made by the crews at Lima and Asuncion. There was little or no U.S. military infrastructure in these foreign countries to support such operations, so the flights to South American were heavily dependent on commercial airlines for service and support. Language, in this case Spanish and Portuguese, was frequently a barrier to arranging for local services.

The trip report illustrates how thoroughly officer flight crew members were cross-trained. It was required at the time that flight crew officers be qualified in all flight officer positions — pilot, navigator and bombardier. But cross-training went beyond these specialties. Capt. Alva L. Harvey, Capt D. W. Lyon, and 1st Lt. Torgils G. Wold, all flight crew members, served as supply and engineering, communications, and weather officers, respectively, for this mission and wrote very professional reports. 1st Lt. LeMay was the operations officer.



Crewmen were checking their tools and survival gear in preparation for their departure on the goodwill flight to Rio de Janeiro in November 1939. (Courtesy of the United States Air Force/Air Combat Command Historian)

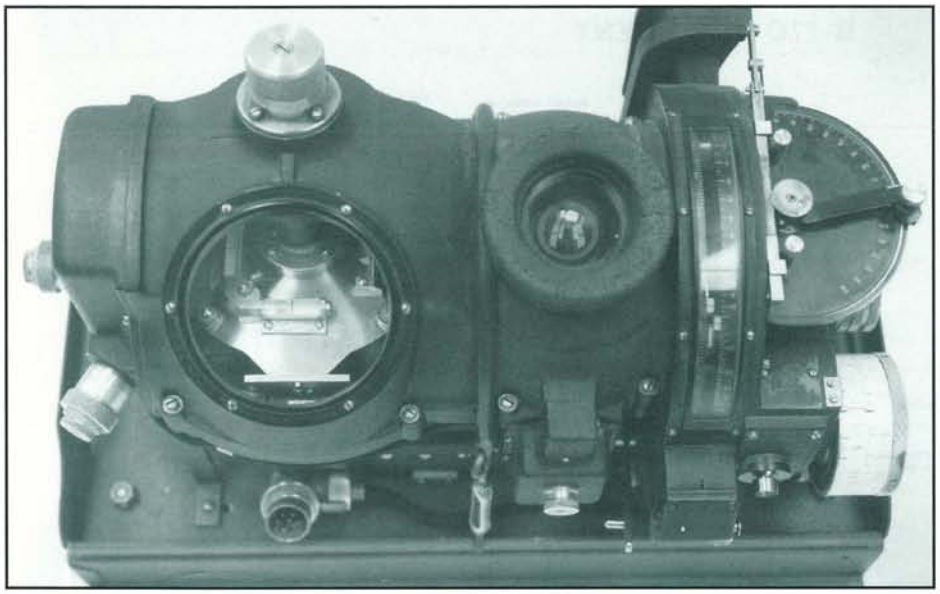
Evolution Of The Bombsight[40]

After WW I, the Army Air Corps employed various versions of a bombsight designed by Lt. Commander Harry E. Winpress of the Royal Naval Air Service. In fact, Gen. Mitchell used the Mk III series of this sight during the 1921 bombing tests from Langley Field. These sights, when in perfect working order and under ideal conditions, were quite accurate up to 8,000 feet. Above that altitude the dispersion was unacceptable.

In October 1931, the U.S. Navy tested a new bombsight which gyroscopically stabilized the sighting telescope regardless of the airplane's rolling, pitching or turning moments. The device synchronized the bombardier's inputs for altitude, ballistics, drift, and airspeed, and calculated the precise moment for bomb release . When these parameters were properly synchronized, the vertical and lateral cross hairs etched into the glass of the viewing mechanism, remained on the target until the calculated bomb release point. This bombsight was an aiming device which was connected to the aircraft's autopilot. After making several calculations, the bombardier made only three manual adjustments at the beginning of the bomb run. This device, which had recently been invented by Carl L. Norden, came in a compact package which was manageable both in size and weight. Army officers witnessed these tests and began a protracted battle to obtain them for their bombardment aircraft.

By 1934, several of these Norden bombsights were released by the Navy for Army testing. The 7th Bombardment Group at Hamilton Field, California tried them on B-10s; while the 5th Bombardment Group in Hawaii tested them on Keystone bombers.

Refinements were made to the bombsight by 1935. It took the efforts of Col. Hugh J. Knerr, Chief of Staff GHQ Air Force at Langley to obtain some of the newer units for testing on the 2nd Bombardment Group's B-18s. While the B-17 *Flying Fortress* was a superb airframe, there was a need for highly accurate bombing equipment. Lt. Col. Robert Olds recommended that



This view of the famed Norden bombsight was quite familiar to the bombardier. The rubber boot for the eyepiece gave the bombardier his distinctive black eye. (Courtesy of A.T. Lloyd)

This 20th Bomb Squadron B-17B, No. 40, sports the Pineapple Pete *insignia on the nose, white cowl rings, a large No. 40 on the forward fuselage, 2B40 along the wing leading edge at the joint between the inboard and outboard wing panels, and the No. 40 on the wing tip. The unit was visiting Lowry Field, Colorado when this picture was taken. (Courtesy of Norman E. Taylor)*

these new bombsights be obtained in an expeditious manner for installation on the B-17s. It took until 1939 for the Army to obtain Norden bombsights for its bomber force! The Norden bombsight was so highly regarded that it was not installed on the B-17Cs supplied to the Royal Air Force – a less capable Sperry bombsight was delivered on these airplanes.

The Norden bombsight was capable of placing a bomb within a 100-foot circle from an altitude of 20,000 feet. Bombardiers were more glib about its accuracy, and stated that they could place a bomb inside a pickle barrel from that altitude. When asked about the bombardiers' claim, Norden once replied: "Which pickle would you like to hit?"

In early 1941, Norden bombsights were produced out at a rate of 800 units per month. By the end of 1943 the production rate increased to 2,000 per month. By 1945, Norden had produced 43,292 bombsights, with 6,500 of them going to the U.S. Navy.

Arming For Aerial Warfare

During the 1930s the world started to boil over with conflicts. The Japanese began to rape and pillage the Asian Continent. The Germans tested their war machines in Spain during the Spanish Revolution. The United States recalled its ambassador to Berlin on November 14, 1938. On that day Maj. Gen. Arnold was called to the White House for a meeting with President Roosevelt. Others present at the meeting were: Harry Hopkins, chief of the Works Progress Administration; Louis Johnson, Assistant Secretary of War; Herman Oliphant, General Counsel of the Treasury; Robert J. Johnson, Solicitor General of the United States; Gen. Malin Craig, Army Chief of Staff, and Brig. Gen. George C. Marshall, Deputy Army Chief of Staff. The President had previously been in consultation with the American ambassador to France, William C. Bullitt, and was briefed on the precarious state which existed in Europe. The Germans had an air force almost double that of the combined British and French air forces. The meeting centered on air power and President Roosevelt wanted those present to develop a plan for producing 1,000 aircraft, and new factories to build another 10,000 aircraft per year.

At that time the U.S. Army Air Corps had a mere 1,600 aircraft in service. Existing aircraft plants could produce 88.2 planes per month. The Air Corps had 22,287 personnel - about double the strength of the cavalry.[41]

New B-17 Series

As a result of testing by the Air Materiel Division, at Wright Field, and operational suitability exercises performed by the Group at Langley Field, a whole family of B-17s emerged to be America's first true strategic bomber. A total of 12,731 of these aircraft were produced.

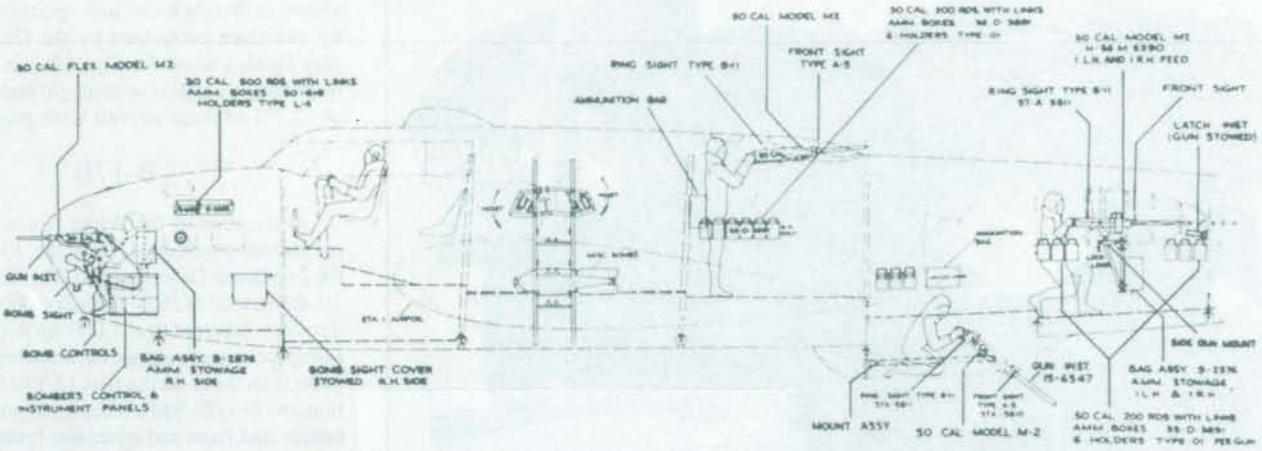
B-17B

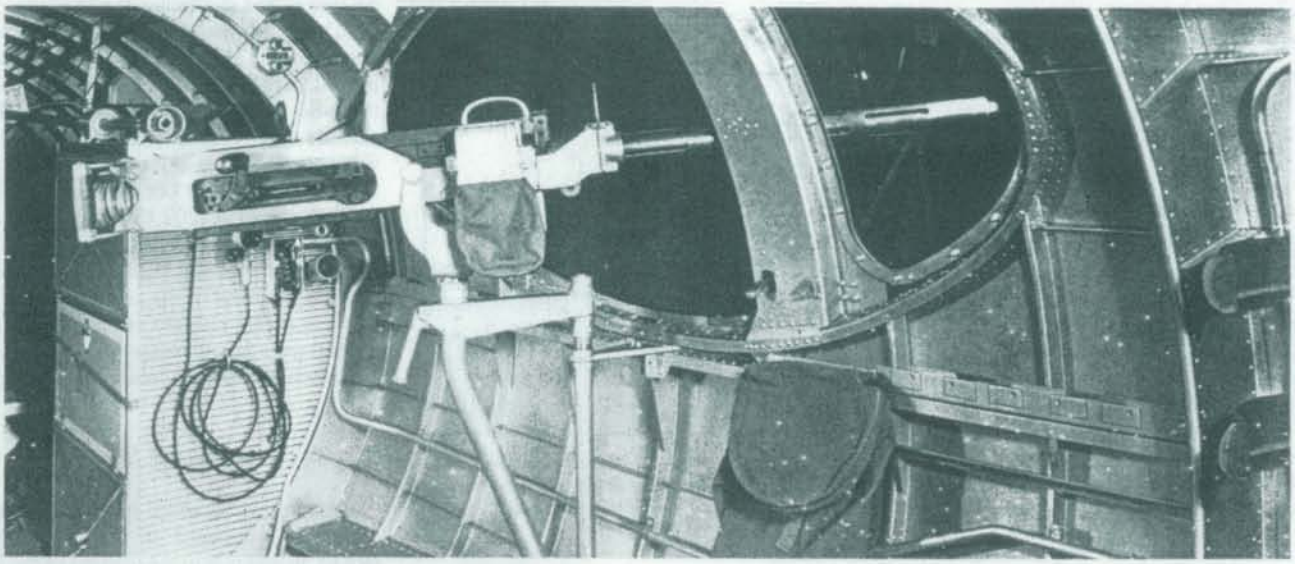
At the time of the White House conference on aircraft production, only the 13 YB-17s of the 2nd Bomb Group existed. The Army ordered 10, then a total of 39 B-17Bs from Boeing. These airplanes featured four 1,000-hp R-1820-51 turbosupercharged engines each mustering 250-hp more than those on the first 13 YB-17s. In addition, the B-17Bs had a redesigned nose, enlarged rudder and flaps and hydraulic brakes. The flap enlargement came about by moving the ends of the inboard wing panels outboard by five main rib spaces and shortening the ailerons. In addition, the sheet metal tail cone was replaced by one molded in clear Plexiglas. The navigator was moved from behind the pilots to a new station in the nose. Provisions for external bomb racks, capable of carrying up to 2,000 pounds of bombs, were also added. Each of the first 10 B-17Bs was valued at $246,000; whereas the follow-on buy was priced at $207,150.00 per airplane. The first B-17B was delivered on October 20, 1939, and the last departed the factory on March 30, 1940. By the end of the production run Boeing had lost about $12,000 per airplane. These 39 aircraft were distributed among the 2nd, 7th and 19th Bombardment Groups.[42] (See Appendix 14.)

B-17C

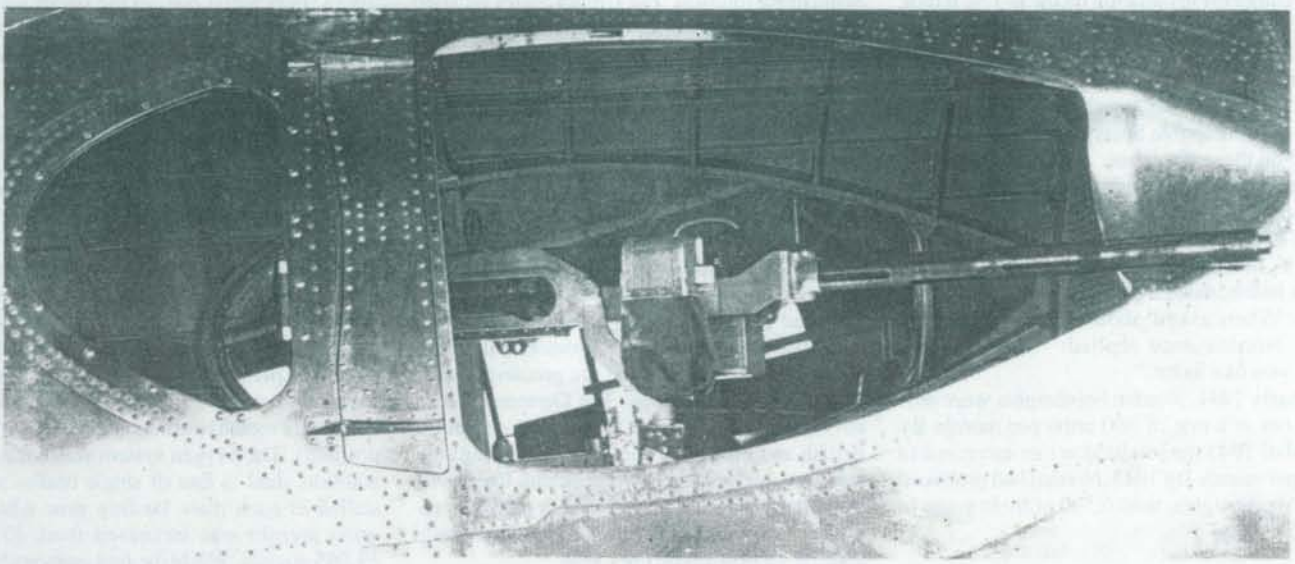
Next came an order for 57 B-17Cs, 20 of which were destined for the Royal Air Force (RAF). In addition to the features of the B-17Bs, these airplanes were equipped with a metal bathtub (a sheet metal box on the under side of the fuselage with an opening for a pivot-mounted machine gun) which replaced the earlier belly blister, and flush side gun positions in lieu of blisters. The single nose socket gun was replaced by three 0.30 caliber guns installed: one in the nose piece, and the other two in the right and left side windows. While the top guns were 0.50 caliber, the bathtub could house either 0.30 or 0.50 caliber guns, with the former being the preferred installation, because the latter created too much noise when fired from the metal bathtub. Improved Wright R-1820-65 engines were also incorporated. There were revisions to the fuel system to permit any tank to supply fuel to any engine. So-called self-sealing fuel tanks were installed. Protective armor was added to the crew positions. The oxygen system was improved. In addition, dual in lieu of single brakes were installed in each main landing gear wheel. The gross weight was increased from 37,997 to 39,065 pounds. While the fuel capacity between the B-17Bs and B-17Cs went up a mere eight gallons, the range increased from 3,000 miles to 3,400 miles. Deliveries of the B-17Cs were made between August 5 and November 29, 1940. These aircraft, equipped with Sperry bombsights,

B-17C ARMAMENT



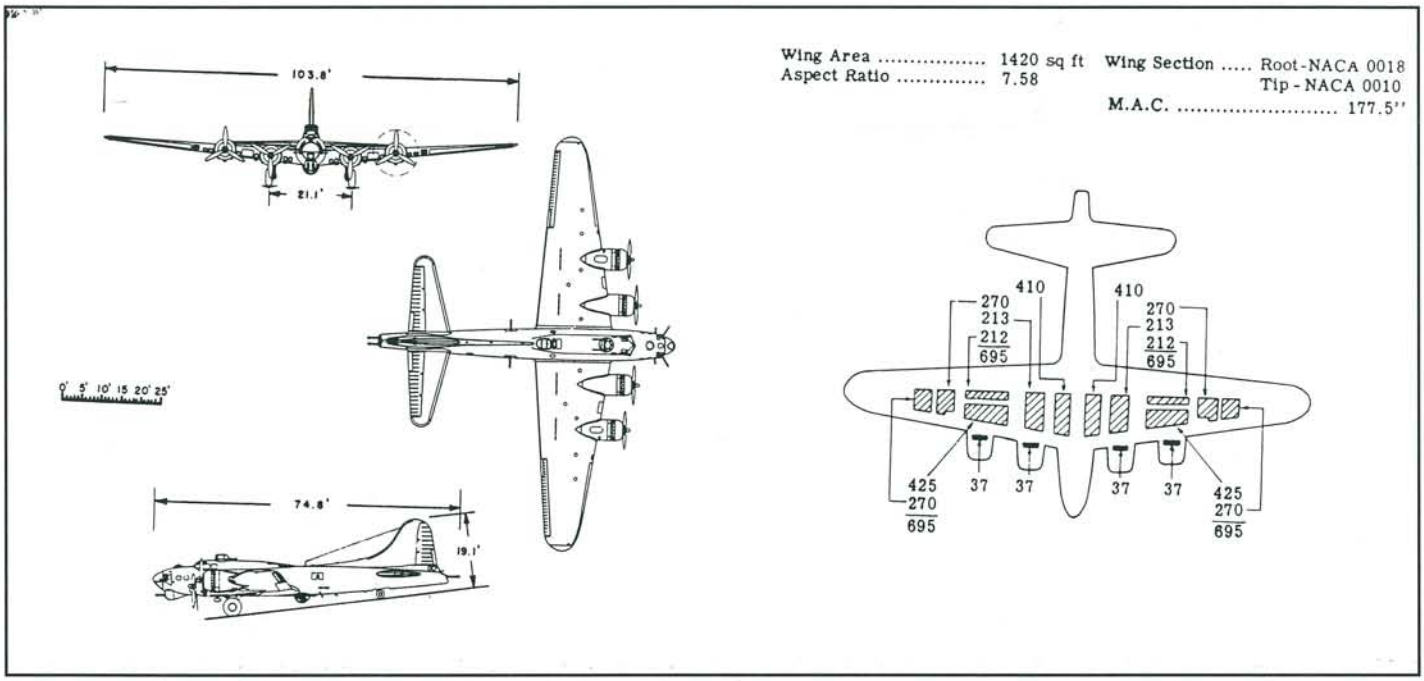


Inside view of waist gun on a B-17C. *(Boeing)*

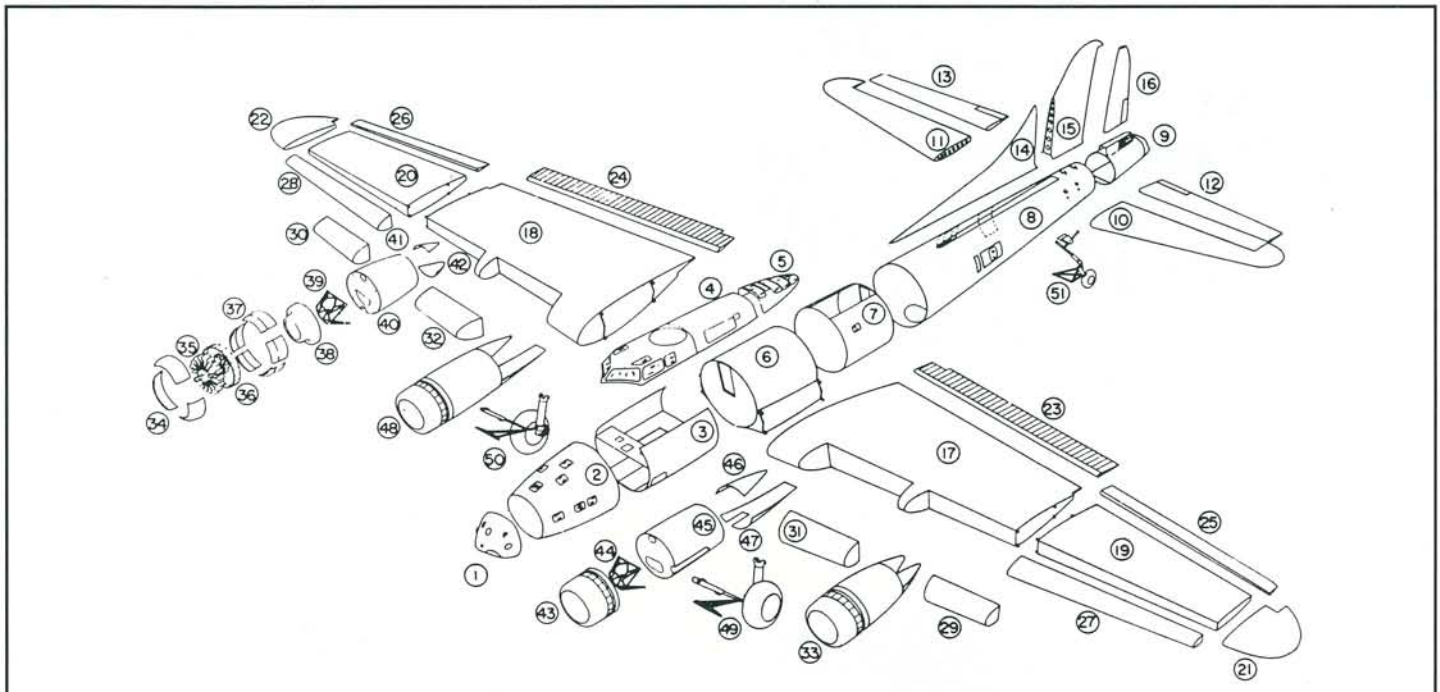


Outside view of same gun mount. *(Both photos Boeing 12287)*

While this inboard profile drawing depicts the armament for the B-17C, it is typical of the installations for the YB-17, B-17B, B-17C, and B-17D. Note that the seats behind the pilots were for both the navigator and aircraft commander.

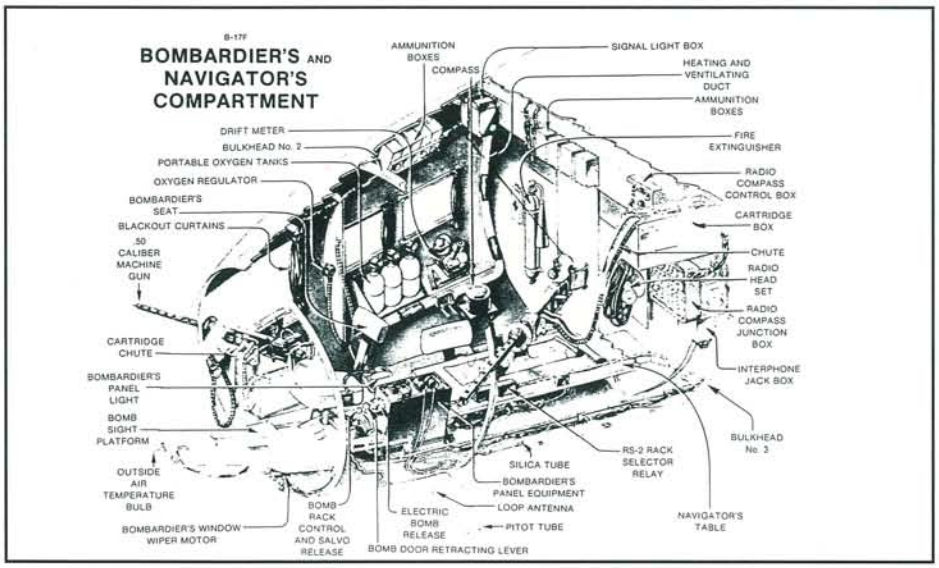


All fuel for the B-17s was carried in the wing. The two tanks in the outboard wing panel were added with the later F series and continued through the G series airplanes. They were known as Tokyo Tanks. *Each engine was served by a 37-gallon oil tank located in the aft end of each nacelle.*

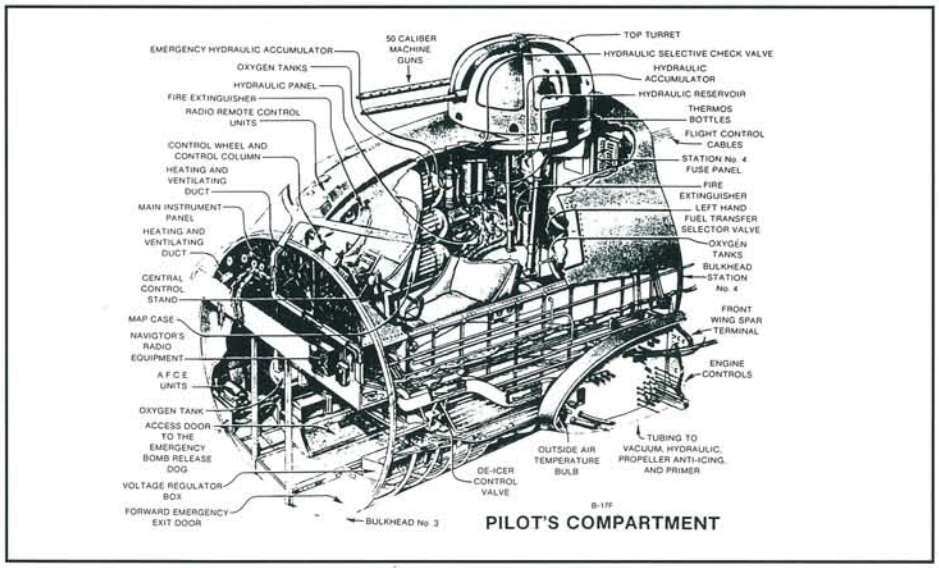


1- Nose inst.
2- Fuselage assy. sta. 1 to 3
3- Fuselage assy. sta. 3 to 4
4- Pilot's cockpit enclosure
5- Top gun fairing inst.
6- Fuselage assy. sta. 4 to 5
7- Fuselage assy. sta. 5 to 6
8- Fuselage assy. sta. 6 to 11
9- Tail gun enclosure
10- Stabilizer assy. L.H.
11- Stabilizer assy. R.H.
12- Elevator assy. L.H.
13- Elevator assy. R.H.
14- Dorsal fin assy.
15- Fin assy.
16- Rudder assy.
17- Inb'd. wing assy. L.H.
18- Inb'd. wing assy. R.H.
19- Outb'd. wing assy. L.H.
20- Outb'd. wing assy. R.H.
21- Wing tip assy. L.H.
22- Wing tip assy. R.H.
23- Flap assy. L.H.
24- Flap assy. R.H.
25- Aileron assy. L.H.
26- Aileron assy. R.H.
27- Leading edge assy. L.H.
28- Leading edge assy. R.H.
29- Leading edge assy. L.H.
30- Leading edge assy. R.H.
31- Leading edge assy. L.H.
32- Leading edge assy. R.H.
33- Nacelle assy. no. 1
34- Engine ring cowling
35- Engine inst.
36- Cowl flap inst.
37- Engine accessory cowl outer
38- Engine accessory cowl inner
39- Engine mount assy.
40- Nacelle assy. no. 4
41- Nacelle fairing upper
42- Nacelle fairing lower
43- Power plant inst. no. 2
44- Engine mount assy.
45- Nacelle assy. no. 2
46- Nacelle fairing upper
47- Nacelle fairing lower
48- Nacelle assy. no. 3
49- Landing gear inst. L.H.
50- Landing gear inst. R.H.
51- Tail gear inst.

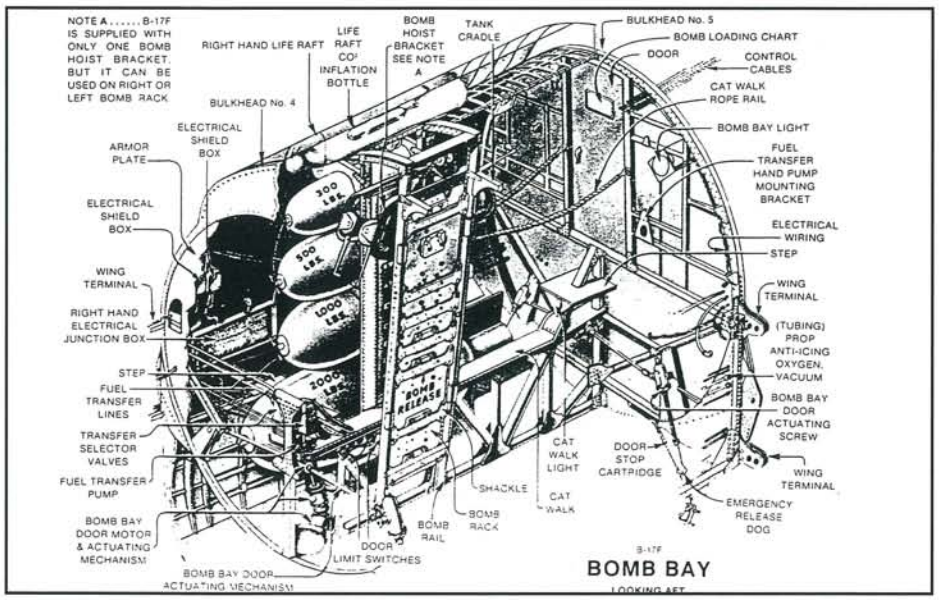
This exploded view of the B-17F reveals its major production subassemblies. The outboard wing panels and horizontal stabilizers were symmetrical and fully interchangeable left to right. The fuselage cross-section was perfectly circular from Section 1 through 8.



The next five cutaway drawings reveal the equipment carried in various compartments. Above, is equipment carried in the nose: Bombardier's/Navigator's compartment. (B-17F Training Manual)



Equipment carried in the flight deck: Pilot's compartment. (B-17F Training Manual)



Equipment carried in the bomb bay. (B-17F Training Manual)

first saw combat with the RAF as *Fortress Is*. Shortcomings in the armament were soon proven and these early airplanes were relegated to RAF Coastal Command Duties. One B-17C was delivered to the 2nd Bomb Group on March 30, 1940.[43] (See Appendix 14.)

B-17D

Next in the line were 42 B-17Ds. Externally they appeared identical to the earlier B-17s with the exception of cowl flaps. Both the top and bottom gun positions had twin .50 caliber machine guns instead of the earlier single guns. True self-sealing fuel tanks were installed. A low-pressure oxygen system was installed. The 12-volt electrical system was replaced by a 24-volt system. The B-17Ds were delivered between February 3 and April 29, 1941. Most of these aircraft found their way to the Pacific.[44] The 49th Bomb Squadron was equipped with the B-17D in November 1941.

The urgent need for heavy bombers caused Consolidated Aircraft of San Diego, California to challenge Boeing with an airplane of its own known as the B-24 *Liberator*. Dubbed by ardent *Fortress* adherents as "the box the B-17 came in," the B-24 soldiered, with great distinction, side- by-side with the B-17s throughout of the war. Deficiencies in the early *Liberators* relegated them initially to Coastal Command and ferry service duties by the RAF.[45] Eventually a total of 18,197 *Liberators* were built (43% more than B-17s) through the cooperation of five factories — Consolidated of San Diego, Consolidated of Fort Worth, Texas, Ford of Willow Run, Michigan, Douglas of Tulsa, Oklahoma, and North American of Dallas, Texas. Ford Motor Company used its automobile assembly line process to build 10% of the total production run as knock-down kits for other manufacturers to assemble.[46]

B-17E

Initially, the B-17 was sold by Air Corps planners as an airplane for hemispheric defense to be employed for long-range reconnaissance and coastal defense. As such, the need for heavy defensive armament was not a major concern. However, when the early *Fortresses* were pressed into combat by both the RAF in Europe and the USAAC in the Pacific they were found to be sorely lacking in defensive capability. Three major features which were added beginning with the B-17E, and carried forth throughout the remainder of the production run, were the top turret, ball turret and tail gun positions. In addition, the waist gun positions were modified. All of these armament features underwent refinements to meet the changing combat environment in both the European and Mediterranean Theaters. The USAAF dropped the B-17s from the Pacific and China-Burma-India Theaters in favor the B-24 *Liberator* because of the latter's greater range and payload, and the fact that fighter opposition and flak were generally not as great.

The B-17E was the first definitive combat aircraft in the series. Major externally visible features included a larger diameter aft fuselage and larger vertical fin. The horizontal stabilizers

were enlarged and the wing span was increased from 33' 9 " to 43'. The flush-mounted waist guns were replaced by an opening window which afforded the gunners a better view. A powered Sperry top turret with twin 0.50 caliber machine gun was installed. The bathtub installation was replaced by a Sperry ball turret equipped with two 0.50 caliber guns. A pair of 0.50 caliber machine guns were installed in the tail position - the gunner sat, usually in a kneeling position, on a bicycle seat!. A single 0.50 caliber machine gun could be installed in the radio compartment. Five hundred twelve of these aircraft were produced. America was still emerging from the *Great Depression* and supplier shortages caused a delay of 150 days in the delivery of the first airplane on September 27, 1941. The delivery schedule was not met until the 353rd aircraft on April 16, 1942. The last B-17E was delivered on May 28, 1942, 49 days ahead of schedule.

B-17F

Next in the series was the B-17F. These were externally similar to the B-17Es but had a blown Plexiglas nose piece which afforded greater visibility. This series had an increased bomb load capacity and several systems and radio modifications. A number of these aircraft were built with provisions for external bomb racks located beneath the inboard wing sections. Other manufacturers were called in to help produce the airplanes. These were Douglas of Long Beach and Vega in California. Boeing-produced B-17s were designated B-17F-BO, while the Douglas and Vega aircraft were identified as B-17F-DL and B-17F-VE, respectively. A total of 3,735 B-17Fs were produced between May 1942 and March 1943. Prices on the B-17Fs varied between $310,816 and $402,617. As combat experience dictated, engineering changes were made and these were subsequently incorporated on the production line. So numerous were these changes, that a Block Number program was introduced to separate the variations in the airplanes. In order to keep the production lines flowing smoothly, blocks of airplanes were built to a common configuration and a series of aircraft modification centers were developed to incorporate the engineering changes.

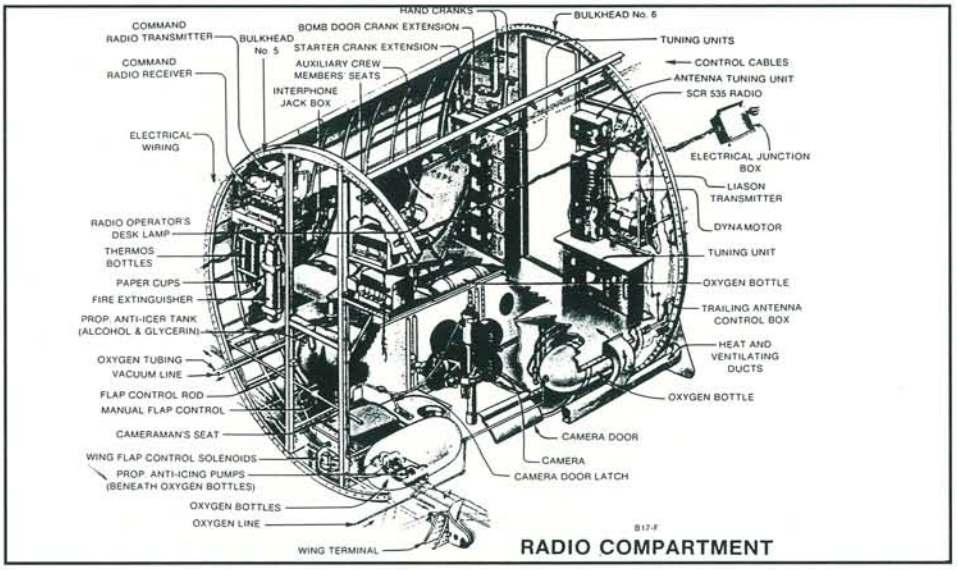
B-17G

The B-17G was externally similar to the B-17F with the addition of a chin turret. As with the B-17F, the B-17Gs underwent numerous production changes to keep up with recommendations from the field. Late-series B-17Gs had staggered waist windows to reduce interference between the gunners.

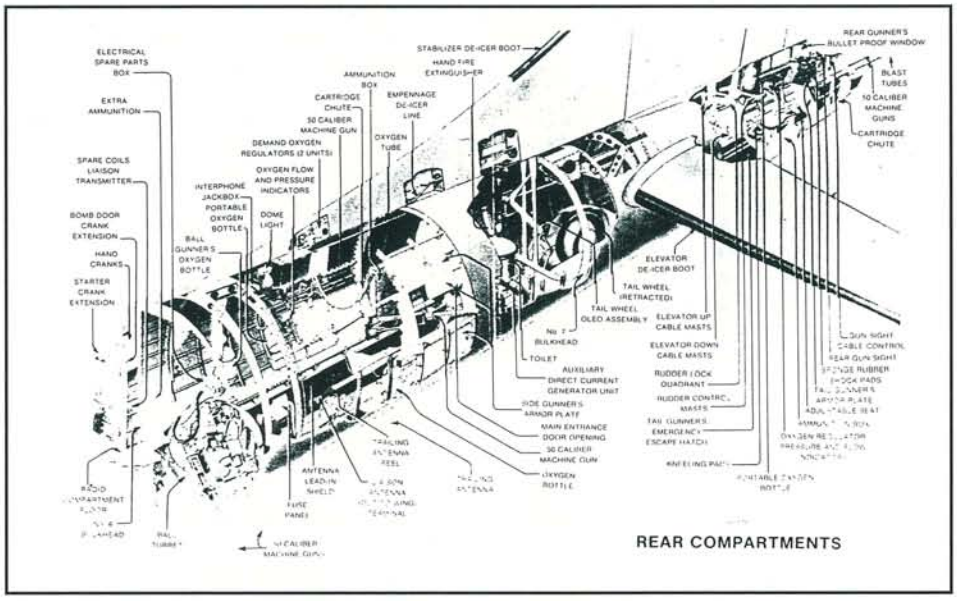
A total of 8,680 B-17Gs were delivered between September 4, 1943 and July 29, 1945. At its peak, Boeing rolled 16 B-17Gs out of the factory per day. Over the entire production run, a total of 12,731 B-17s were built by the three manufacturers.[47]

To The Four Winds

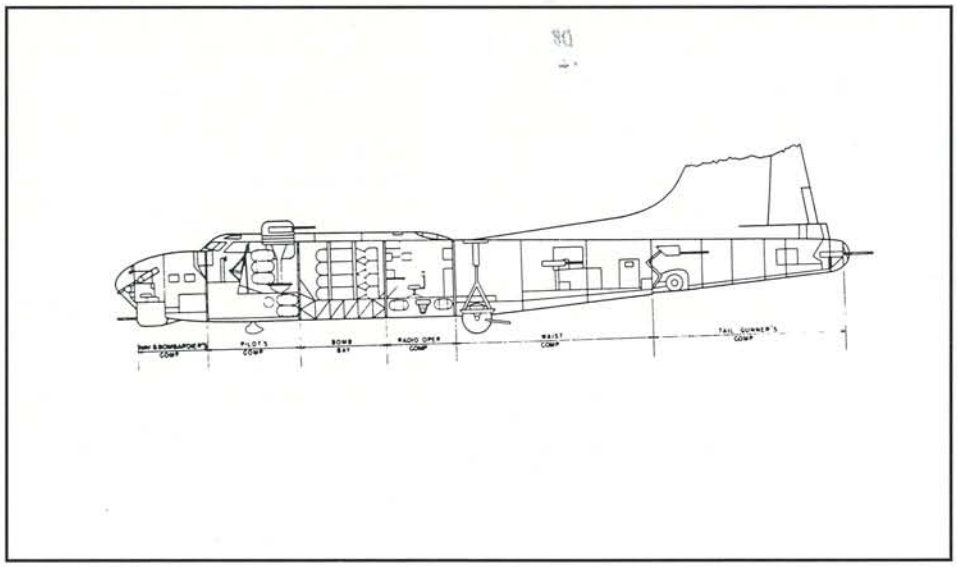
The 2nd Bomb Group had been the preeminent bombardment group of the U.S. Army Air



Equipment carried in the radio compartment. (B-17F Training Manual)



Equipment carried in the rear compartment. (B-17F Training Manual)



The inboard profile shows the major crew compartments of the B-17G; which was typical for the B-17E through B-17G series airplanes. (Boeing Photo)

Corps during the 1920s and 1930s. It developed the fledgling bomber into a viable weapon. It took America's first true strategic bomber, the B-17 *Flying Fortress,* and proved its worth.

With the speed-up of America's defense industry, many key officers were assigned duties as Air Force Plant Representatives. These people kept tabs on America's *Arsenal of Democracy.* John D. Corkille was promoted to lieutenant colonel effective March 15, 1941, and was assigned to Boeing Aircraft in Seattle, Washington.

While the units assigned to Langley remained fairly consistent from 1935 until 1940, thereafter the highly trained Group personnel were scattered to the winds to form the nucleus of many new heavy bombardment groups. The normal complement of the Group was increased substantially. By February 1940, the growth in personnel placed an inordinate burden on the base facilities.

With the war clouds in Asia and Europe gathering, the core of the 2nd Bombardment Group was gutted to provide the initial cadre for many emerging bombardment units. The Group's pioneers found themselves in numerous bombardment groups, wings and bomber commands. Names of prominent 2nd Bomb Group personnel are repeated on the initial cadre rosters of more than one newly formed unit. This indicates that the 2nd was used extensively to furnish organization and training cadres for new units until replacements could take over. Many 2nd Group personnel were then assigned to another new unit to repeat the process.The 21st Reconnaissance Squadron was reassigned in September 1939. Beginning in January 1940, Langley Field gave birth to five new groups as follows:[48]

41st Reconnaissance Squadron (Long Range), was constituted on December 22, 1939, and activated at Langley as part of the 2nd Wing on February 1, 1940. In addition to B-18s and B-18As, the Squadron was equipped with B-10s, the sole XB-15, and a Grumman OA-9. The unit was activated as the 41st Reconnaissance Squadron (Heavy) on February 1, 1940. Among the seven 2nd Bombardment Group personnel assigned to the 41st were Maj. Caleb V. Haynes, Squadron Commander, and Capt. Curtis E. LeMay. In August 1941, the Squadron was deployed to Newfoundland Airport, Newfoundland, Canada, where it was attached to the Newfoundland Base Command. On April 22, 1942, the unit was redesignated as the 429th Bomb Squadron.

25th Bombardment Group (Heavy), was constituted on December 22, 1939, activated at Langley Field on February 1, 1940, and trained in B-18 s and A-17s. The 25th moved to Borinquin Field, Puerto Rico on November 1, 1940. Maj. Theodore J. Koenig was the first commander. He was succeeded by Maj. William B. Sousa. Two prominent Group officers followed — Lt. Col. Caleb V. Haynes on January 7, 1940 and Maj. Alva L. Harvey on June 1, 1941. Thirty officers from the 2nd were transferred to the 25th.

29th Bombardment Group (Heavy), was constituted on December 22, 1939 and activated at Langley Field on February 1, 1940. The initial cadre came from the 49th Squadron. A total of twenty-seven officers from the 2nd Bombardment Group were assigned to the 29th, including Maj. Vincent J. Meloy, former commander of the 20th, who became the first commander of the 29th. On May 21, 1940 the 29th moved to MacDill Field, Florida. Maj. Charles W. Lawrence succeeded Maj. Meloy as 20th Squadron commander on January 15, 1941. The 29th flew antisubmarine patrols until June 1942 then moved to Gowen Field, Idaho where it transitioned into B-24s and became an operational training unit. Later the 29th transitioned into B-29s and operated out of the Marianas Islands.

12th Bombardment Group (Light), was constituted on November 20, 1940 and activated at McChord Field, Washington on January 15, 1941. The Group was formed by a cadre from the 2nd and from the 8th Pursuit Group (also stationed at Langley Field), and the headquarters organizations of the 2nd Wing and GHQ Air Force. The 12th trained in B-18 *Bolos,* B-23 *Dragons* and PT-17 *Kaydets.* The 12th flew coastal patrol operations after December 7, 1941.

34th Bombardment Group (Heavy), was constituted on November 20, 1940 and activated at Langley Field on January 15, 1941. Also activated on that day was the 1st Reconnaissance Squadron (Heavy) as a component of the 34th Bombardment Group, under the command of Maj. William A. Matheny. The 1st Reconnaissance Squadron was subsequently redesignated as the 391st Bomb Squadron. The 34th Group was commanded by Lt. Col. John W. Monahan with the following 2nd Bombardment Group personnel assigned to key positions: Maj. Robert B. Williams, Capt. Ford J. Lauer, Capt. Curtis E. LeMay, Capt. Torgils G. Wold, Capt. John R. Sutherland, Lt. K.M. Welborn, and Lt. Warren S. ("Fightin' Joe") Wheeler. Capt. Lauer led the 4th Bomb Squadron; while Capt. Sutherland commanded the Headquarters and Headquarters Squadron. The 18th Bomb Squadron was attached to the Group's 96th Squadron, at that time. The 34th trained in B-17s, and in December 1941 began flying antisubmarine patrols off the east coast. Thereafter the Group was sent on a series of moves — first to Westover Field, Massachusetts on May 29, 1941; to Pendelton Field, Oregon in late January 1942; to Davis-Monthan Field, Arizona in mid-May 1942; to Geiger Field, Washington on July 4, 1942; to Ephrata, Washington on December 1, 1942; and to Blythe, California on December 15, 1942. (While the unit was stationed at Pendelton, the Group operations officer was Lt. Col. Curtis E. LeMay.) The unit transitioned into B-24s in January 1944. Maj. Monahan, the first commander of the 34th, was followed by Lt. Col. Harold D. Smith in early March 1941, and Lt. Col. Ford J. Lauer on January 9, 1942. Lt. Col. Lauer was replaced by Lt. Col. Ralph E. Koon on February 12, 1942.

41st Bombardment Group (Medium), was constituted on November 20, 1940, and activated at March Field, California on January 15, 1941. The Group trained in B-18 *Bolos* and A-29 *Hudsons.* The unit later transitioned into B-25 *Mitchells* and flew antisubmarine patrols off the west coast until October 1943 when it deployed to Hawaii. Its first commander was Capt. Lawrence H. Douthit, followed on June 1, 1941, by Lt. Col. Archibald Y. Smith, from the 2nd Bomb Group. As a captain, Col. Smith flew one of the ships which intercepted the *SS Rex.*

43rd Bombardment Group (Heavy), was constituted November 20, 1940, and activated at Langley Field on January 15, 1941. Its first commander was Lt. Col. Harold D. Smith, from the 2nd Bombardment Group. Also activated on the same day at Langley was the 13th Reconnaissance Squadron, a component of the 43rd Bombardment Group. The Squadron was subsequently redesignated as the 403rd Bomb Squadron. Several of the 43rd's 65th Bomb Squadron had come from the 96th Squadron, including the squadron commander, 1st Lt. James H. Rothrock. The 43rd trained in B-17s, B-18s, A-29s , and LB-30 *Liberators.* The Group relocated to Bangor, Maine on August 28, 1941 and flew antisubmarine patrol until February 17, 1942, when it deployed to Sydney, Australia.

A second Air Corps expansion occurred after the December 7, 1941 attack on Pearl Harbor. At that time several other bombardment groups were formed with a number of key personnel having previously served in the 2nd Bomb Group. These units included the following:[49]

90th Bombardment Group, was constituted on January 28, 1942, and activated at Key Field, Mississippi, on April 15, 1942, under the command of 1st Lt. Newman W. Enlow. A month later at Barksdale Field, Louisiana, the unit was commanded by Col. Eugene P. Mussett, from the 2nd Bomb Group. The unit trained in B-24s and deployed to the South Pacific.

92nd Bombardment Group, was constituted on January 28, 1942, and activated at Barksdale Field, Louisiana, on March 1, 1942, under the command of Col. James S. Sutton, formerly of the 2nd Bomb Group at Langley. The Group trained in B-17s and deployed to England. Col. Sutton commanded the Group until May 2, 1943.

97th Bombardment Group, was constituted on January 28, 1942, and activated at MacDill Field, Florida on February 2, 1942, under the command of Col. Cornelius W. Cousland. The unit trained in B-17s and flew the first American heavy bombardment mission from a base in England on August 17, 1942.

100th Bombardment Group, was constituted on January 28, 1942, and activated at Orlando Field, Florida, on June 1, 1942. While its forming commander is unknown, Col. Darr H. Alkire, from the 2nd Bomb Group took command on November 14, 1942. The Group trained in B-17s and deployed to England. Col. Alkire commanded the Group until November 14,1942.

303rd Bombardment Group, was consti-

tuted on January 28, 1942, and activated at Pendelton Field, Oregon, on February 3, 1942, under the command of Col. Ford J. Lauer, of the 2nd. He was followed on May 29, 1942 by Col. Warren H. Higgins also from the 2nd. The Group trained in B-17s before deploying to England.

304th Bombardment Group, was constituted on January 28, 1942, and activated at Salt Lake City AAB, Utah, on July 15, 1942, under the command of Col. Ford J. Lauer. He was followed by Lt. Col. Dale 0. Smith on September 29, 1942, when the 304th exchanged designations with the 2nd Bomb Group at Langley.

307th Bombardment Group, was constituted on January 28, 1942, and activated at Geiger Field, Washington, on April 15, 1942, under the command of Capt. Bill Jarvis and replaced by Col. William A. Matheny of the 2nd Bombardment Group on May 23, 1942. This 307th trained in B-17s and then B-24s before deploying to the Pacific. Col. Matheny commanded the Group until May 22, 1943.

1940 Inspection Tour[50]

During early February 1940, Brig. Gen. George C. Marshall, Chief of War Plans for the Army General Staff, made an inspection tour of the newly reorganized units in Puerto Rico and the Canal Zone. The units were part of the proposed increase under the Army Expansion Program, which was considered necessary to strengthen the defense of the Panama Canal. Gen. Marshall was accompanied by Col. George H. Brett, GHQ Air Force Chief of Staff. They traveled aboard a Group B-17 flown by Maj. Harold George and Capt. William A. Matheny.

As soon as Gen. Marshall boarded the aircraft, the engines were started and the chocks were pulled. Gen. Marshall was briefed on the flight plan and the navigation check points. The crew called Marshall's attention to each checkpoint which was made precisely on time. On the leg between Point Borinquen, Puerto Rico, and the Canal Zone, oil pressure was lost on one engine. It was shut down, the propeller was feathered, and power was brought up on the other three engines. This operation was done so smoothly that Gen. Marshall had not noticed any change. Col. Brett invited the general to the cockpit where he pointed out the feathered propeller and explained the inherent safety provided by four engines. While Marshall made no comment, he was impressed and the Air Corps gained a staunch supporter of four engine bombers.

Training, Training, Training

The most important peace time mission of a military organization is training to accomplish its wartime duties. This section describes selected and illustrative training and operations of the Group between 1939 and December 7, 1941 when the Pearl Harbor attack harshly and irrevocably thrust the U.S. into WW II.

The Air Corps Technical School continued to turn out trained technicians in a number of critical skills. Training was an integral part of the daily routine for the 2nd Bombardment Group at Langley Field. Between February 1939 and February 1940, there was a large influx of basic trainees assigned to the base. During that time, the base population increased from 2,572 personnel to 5,849. Many of these new inductees found their way into the Group for their training. Among those early trainees were Cyril Biros and Bradley Soloman.

Cyril Biros spent his first five and a half weeks of basic training at Langley beginning in September 1939. Along with about 100 other trainees, Biros was billeted in one of the Group's old hangars under the supervision of a sergeant and a corporal. The work was hard for these new airmen. Each day there was drill, work details, history of the Air Corps, drill, classroom academics, drill and inspections. On occasion the base commander would show up with his swagger stick and scare the wits out of the new troops. The best part was the monthly reward – a $21 pay check! After basic training, Biros was assigned to the Headquarters Squadron, 2nd Bombardment Group where he met many of the dignitaries of the unit. In July 1941 he was transferred to the newly formed 43rd Bombardment Group which moved to Dow Field near Bangor, Maine.

Bradley Soloman had it a bit easier during his stint in basic training because of his prior experiences. He had three years of Junior ROTC in high school, three years of Citizen's Military Training Camp and a tour with the CCC. Upon arriving on base in September 1939, he was assigned to the Base Headquarters, 1st Air Base Squadron and was soon selected to be an assistant drill instructor during his basic training. Soloman was assigned to the 96th Bomb Squadron and thirty days later departed for Aviation Mechanics School. Upon completion of technical school training, he returned to Langley and was assigned to the 49th Bomb Squadron. In 1940 he achieved Aviation Mechanic 2nd Class and in January 1941 he made Aviation Mechanic 1st Class and was promoted to corporal. By May he was promoted to sergeant and became a crew chief on one of the B-17s.[51]

Of the 211 aviation cadets to graduate from Kelly Field, Texas in May 1940, 91 were assigned to the 2nd Bombardment and 8th Pursuit Groups at Langley. These new second lieutenants, the largest such group to date to descend en masse on the base, found themselves thrust into an old peacetime army with duty hours from 7:30 A.M. to 3:30 P.M. Wednesday afternoons was reserved for physical training while Saturday mornings were for inspections, drill, and occasional parades. Every Saturday night there was a formal dance at the officers' club which called for military mess dress or a civilian tuxedo. Being the home of GHQ - Air Corps, the place was crawling with colonels and generals, requiring extreme discipline and military courtesies. However, since most of the second lieutenants were bachelors, the senior officers' daughters provided an ample supply of dates.

It was still peacetime for the United States and the regulations governing qualification as a B-17 pilot still pertained. This meant that the newly arrived bomber pilots were being cross trained as navigators and bombardiers on the B-18s while the glistening B-17s were reserved for the old heads! The hot shot pursuit pilots in the 8th Pursuit Group were upgrading from P-36s to P-40s and gave no end of grief to the junior bomber pilots.

On March 19, 1940, the Group instituted a new system of training operations. Between 7:30 and 10:30 A.M., flying was the primary function. Administration took place for the remainder of the day. Flying training for the day got off to a late start because of a series of SNAFUS — the bombsights could not be obtained from a locked room at the 96th Squadron because of a missing key; the Ordnance Department was late in delivering the bombs to the flight line; and an A-17 patrol ship was late because of an inoperative radio. Despite these setbacks, the Group managed to drop 31 bombs that day. At 11:00 A.M., that day Maj. H. B. Crocker planned a trip to Mitchel Field, New York in YB-17 number 10 to transport four officers and four enlisted men to that field. Engine malfunction forced abort of the take off and necessitated replacement of the No. 4 engine. Maj. Crocker departed the next day at 7:25 A.M., in another B-17. At the request of the Base Supply, Lt. Mussett departed at 2:05 P.M., in a B-18A loaded with oil for the 3rd Observation Squadron which was operating out of Columbia, South Carolina.

Monday, March 25, 1940, Lt. William Matheny flew B-17B No. 40 on a bombing mission. Upon returning to base, he was unable to get the landing gear to completely extend. Brig. Gen. Emmons ordered him to proceed to Patterson Field, Ohio where he landed safely at 2:30 P.M., but while taxiing the landing gear retracted which buckled the left wing and bent two propellers. There were no injuries to the crew. The following day Maj. Crocker flew to Patterson Field to inspect the damaged airplane and bring the crew home.

Saturday, April 6, 1940 was *Army Day.* The weather was cold and the visibility was 10 miles. No bombing was conducted that day, but one tracking mission was flown. B-17B No. **60** was placed on display in front of the 49th Bomb Squadron's hangar for the *Army Day* visitors. Maj. Carl B. McDaniels flew a safety flight in B-17 No. 4 from Mitchel Field to Langley.

The weather on Wednesday, April 24, 1940 was warm with fog and rain, a ceiling of 500 feet, and four miles visibility. Three bombing missions were flown that day with a total of 53 bombs being dropped. Capt. William Matheny took off in B-17 No. 80 to ferry an auxiliary power plant *(put-put)* for the XB-15 which was down a Albrook Field, Canal Zone. Matheny took off at 9:15 A.M., and arrived at Miami at 2:30 P.M. The following morning he took off at 5:30 A.M., and arrived at Albrook Field at 12:30 P.M.

West Point cadets got a glimpse of the capabilities of bombers at Langley Field, on Monday, July 1, 1940. Six Group B-17s, in conjunction with aircraft from the 25th Bombardment Group, loaded with 100-, 300- and 600-lb. demolition bombs attacked a target in the outline shape of a battleship. This was one of the most effective bombing missions flown to date. Each cadet was also given a 20-minute hop in a B-17B which surely must have been an eye-opener for them.

The weather on Wednesday, July 3, 1940, was cool and clear with high broken clouds, when one B-17B each from Headquarters, 20th and

96th Bomb Squadrons, conducted a high altitude gunnery mission at 30,000 feet. The purpose of the flight was to test the operational capabilities of the machine guns and the reactions of the crews to the altitude. The cold took its toll and some of the enlisted gunners were unable to perform their combat functions. One enlisted man was hospitalized after the flight. The high altitude gunnery tests were resumed with B-17B No. 10 on Thursday, July 11.

Wednesday, July 24, 1940, several YB-17s and B-17Bs were transferred from the 2nd to the 25th Bombardment Group. Maj. George and Capt. Donald R. Lyon departed Langley at 8:45 A.M., for Buffalo, New York and Mitchel Field in B-17B No. 10.

On Friday, July 26, all available B-17s and B-18s at Langley were flown and personnel practiced for an inspection and aerial review. Similar practice was conducted on Saturday and Sunday. Then, on Monday, all B-17 and B-18 aircraft were moved into position on the ramp at 7:30 A.M. President Roosevelt arrived on post at 2:47 P.M. After an inspection, the aerial review began using all available B-17s and B-18s. Tuesday was proclaimed a post holiday.[52]

Lt. Theodore Swanson, a graduate of flying school Class 40-D, was assigned to the 96th Bomb Squadron. He recalls flying BT-14s, A-17s, B-18s, B-17s, and B-25s. During the second half of the year he was tasked with giving B-25 instruction to a number of National Guard pilots. This became a harrowing experience because the guardsmen attempted to fly the B-25 like their stubby old North American 0-47s. Performance differences between these two aircraft are shown below:

Parameter	0-47	B-25
Empty Weight	5,980 lb.	17,870 lbs.
Gross Weight	7,636 lbs.	27,000 lbs.
Max. Speed	221 mph	315 mph
Horse power	1 - 975 hp	2 - 1,700 hp

The Guard pilots would glide the B-25s at 95 mph — a mere 1 mph above stall speed! When the 96th Bomb Squadron commander, Maj. Alkire, wanted to know how the students were progressing, Swanson said: "I wish you would go fly with them!" Lt. Swanson departed shortly thereafter to get married. When he returned, the guardsmen had gone — ahead of schedule.[53]

Between Monday, August 5 and Friday August 8, 1940, ten B-17Bs from the Group participated in an exercise. Maj. Harold George led the formation on a 5:30 A.M. take off for Alpena, Michigan, passing over Charleston, West Virginia; Cincinnati, Ohio; Findlay, Ohio; and Mount Clements, Michigan. The purpose of the circuitous route was to give training to student navigators. A planned pursuit interception was thwarted when the formation was within 25 miles of Alpena and weather forced them to divert to Selfridge Field, Michigan. The bombers were serviced and the crews were fed and quartered for the night. Mechanical problems held three of the B-17Bs at Selfridge the next morning, but six managed to depart for Alpena. The aircraft took off at 7:30 A.M., and arrived at 9:30 A.M., Two of the ailing ships managed to get off later in the day and arrived at Aplena at 2:30 P.M. To prevent spotting by pursuit aircraft, all of the B-17Bs were camouflaged with tree branches shortly after arriving at Alpena. Latter the camouflage was removed and the crews stood formation for inspection with their aircraft. The crews were fed and quartered at a nearby fairground. Nine B-17Bs departed Alpena the next day and participated in a wing review at Selfridge. All ten B-17Bs departed for Alpena later in the afternoon where they remained over night. On Thursday, B-17B No. 41 departed for Langley Field at 5:30 A.M., but was forced to land at Patterson Field due to weather. The remaining nine B-17Bs took off at 9:00 A.M. for Patterson Field, passing over Sault St. Marie, arriving at 11:27 A.M. After lunch, nine of the aircraft departed for Langley, where they arrived at 4:45 P.M. Lt. Ragsdale, in ship No. 41, remained at Patterson until 5:20 P.M., when he took off for Cheyenne, Wyoming, ferrying personnel from Langley Field Air Base Headquarters. On Friday, the first priority at Langley was given to performing necessary maintenance on the B-17Bs.

The weather was cool with light rain and a 1,000-foot ceiling, and visibility of 2 miles on August 16, 1940. A formation of eight B-17Bs, with 28 officers and 48 enlisted men under the command of Maj. Robert B. Williams, departed Langley for Barksdale Field to form the 49th Provisional Squadron. Lt. Walsh departed at 8:05 A.M., in B-17B No. 62 to act as the advance agent for the unit. Maj. Williams departed an hour later leading a flight of six aircraft. Capt. Matheny, in B-17B No. 42, blew the tail wheel tire on takeoff and aborted. After it was replaced, he took off at 11 A.M. All aircraft arrived safely at Barksdale later that day.

On Sunday, August 18, 1940, six officers and 48 enlisted men departed Langley Field in three B-18As for Mitchel Field, to set up a headquarters for the 1st Composite Bomb Group which was to participate in First Army maneuvers that week. On Monday, nine B-18s arrived at Mitchel from Barksdale Field. They were followed the next day by eight B-17Bs from March Field. On Wednesday, the weather was cool with a high broken ceiling and 10 miles visibility. A total of 15 missions were scheduled for the day. The weather closed in and the Wednesday missions 10 through 15 were canceled by order of Headquarters First Army. Weather forced cancellation of flying operations on the following day and maintenance work was accomplished in preparation for the flights back to the home stations on Friday. The command post was closed at 3:40 P.M., and free passes for the Worlds Fair Games were given to officers and enlisted men who were able to attend.

On Sunday, September 15, 1940, Langley Field crews flew a large number of B-17s, B-18s and pursuit aircraft to Washington D.C., for the dedication ceremony of Washington National Airport. They were joined by aircraft from units across the United States. A mass flyby was scheduled for Wednesday, September 25, but weather precluded the event. The dedication and aerial review were rescheduled for Saturday, September 28. President Roosevelt was present for the dedication and commended the 2nd Bombardment Group for its participation.

On Sunday the 29th, the Group started preparing ten B-17Bs for transfer to the 7th Bombardment Group at March Field, California. On Tuesday October 10, the ten airplanes, under command of Maj. Harold George left for California. The B-17s were replaced by B-18A *Bolos*. From this date the 2nd Bomb Group was without any of the four-engine bombers with which they had trained so well and established so many world's records.

Group training continued at Langley and on October 21, 1940 it established a flying training schedule calling for 150 flying hours per B-18 aircraft per month.[54]

Canadian Rescue Operation[55]

On November 18, 1940, a Royal Canadian Air Force (RCAF) B-18 crew was forced to abandon their aircraft, in the middle of the night on a flight between Newfoundland and Montreal. The crew had been flying on routine coastal patrol from the Newfoundland Airport when weather closed the field. The crew orbited the area for three hours before being directed to proceed to Montreal, 900 miles away, where the weather was better. While flying near Megantic, Maine, about 200 miles from Montreal, the aircraft entered severe icing conditions forcing the crew to bail out about midnight.

It was learned later that there were only five chutes aboard the airplane for six crew members. Each of the three enlisted man was given a chute. The copilot and navigator/bombardier strapped themselves together and jumped using one parachute. The pilot exited last with the one remaining parachute.

The following afternoon, November 19, the U.S. received a request from the RCAF to assist in the search for the downed crew. The 2nd Bomb Group received verbal orders from the 2nd Wing to provide six B-18s. Three more came from the 18th and 41st Reconnaissance Squadrons. The flight of nine aircraft was to arrive at St. Hubert Airport, Montreal, Quebec, by dawn November 20. The flight departed for Montreal around 6:00 P.M., under the command of Maj. Harold George. They arrived at St. Hubert's at 7:00 A.M. Around 11:00 A.M., RCAF Wing Commander B.W. Coleman arrived at St. Huberts from Ottawa. He explained that he was advised by the U.S. War Department that the U.S. search planes would not arrive before noon on the 20th! What a testament to an aviator's call to duty.

Weather precluded any search activities that day. Maj. George and Wing Commander Coleman proceeded to Ottawa where quarters, messing, and transportation were arranged. The officers were billeted at the Queens Hotel, while the enlisted personnel stayed at the Ford Hotel. After flying all night and being up half the day, the search crews were finally quartered at 3:00 P.M.

The RCAF had limited quantities of 100 octane fuel. This necessitated it be placed in tanks reserved for takeoff and landing while other tanks were serviced with 80 octane fuel to be used in cruise.

The search began on November 21 over an area of about 30 x 50 miles. Maj. Ritchie of the 2nd Bomb Group spotted three parachutes and reported their position. Weather precluded search

activities on the following day, November 22. With the sighting of the parachutes, the search area was reduced to 8 x 12 miles. Because of the terrain and reduced size of the search area, the missions were restricted to three aircraft at three-hour intervals. Capt. Thomas L. Mosley discovered the aircraft crash site on November 23. Weather again prevented search operations for the next two days, and continued to plague the search aircraft. Ice, which formed on the aircraft, was crudely removed by use of ropes and a rubber hose. The remaining ice had to be thawed in a hangar owned by Canadian Colonial Airways. The hangar, filled with RCAF Lockheed *Hudsons,* had to be emptied to accommodate two B-18s at four-hour intervals. Only four B-18s could be deiced on November 26 so they could participate in the search operations.

It had now been almost eight days since the RCAF crew had gone down in the dark of night, in frigid weather and in rugged terrain. The three chutes sighted by Maj. Ritchie, on November 21, were those of the three enlisted men. In his report on the mission, Maj. George stated in part that: "The chutes of the three enlisted men were found in the trees rather close together — two of the men were found, the other had wandered and apparently became lost in the wild and dense underbrush. The pilot landed in the middle of one of the few remote lumber camps, about one and one-half miles from East Lake over which the plane passed after the men jumped. Time and space factors prove to the undersigned that the two officers strapped together either hit the ground between the lake and the lumber camps or landed in the lake with their parachute unopened." Maj. George concluded that personnel lost in the Northeastern part of the hemisphere could live for an extended period of time if given certain emergency items.

On November 28, the U.S. search airplanes were placed, two-at-a-time, in the hangar for deicing and when removed, promptly started and dispatched back to Langley Field. This was a 12-hour operation.

One B-18 suffered a broken starter and another a sheared fuel pump drive shaft. The parts were ordered by telegram and it was requested that the parts be sent by air express to Burlington, Vermont for transshipment by Canadian Colonial Airways. American Customs had been advised of the situation; however, an agent at Burlington held up the shipment because the parts did not have an export license! After extensive teletype communications the agent agreed to release the parts provided that Maj. George promised that the airplanes for which they were intended would return to the United States. As a result of the bureaucratic haggling, a weather window for air transport of the parts was lost and the parts had to be shipped to Montreal by rail. The shipment was lost for a day.

Total flying time for the search operation was 230 hours. The mission taught some valuable lessons. One was that when operating away from the home station, the flight crews should be augmented by three staff personnel — an officer for operations and weather support, one for transportation and messing, and one for engineering and supply.

Other conclusions and lessons learned as drawn from Maj. George's report, were:

Maintenance must be carried out with some form of protection from the elements.

Deicing fluids and alcohol are not enough to prepare an airplane for take off under severe weather conditions.

Wing covers (like one set borrowed from Canadian Colonial Airways) are a necessity.

The airplane heaters were generally unsatisfactory because of the unprotected water/steam lines. The RCAF B-18s had asbestos-covered lines.

The engine starters were not rugged enough for such harsh operating conditions.

If air crews, like those being searched for, were to have any hope for survival, they must be equipped with some sort of emergency kit designed to be attached to the parachute harness. The RCAF contemplated immediate action in this regard.

Runways were hard to see in the snow. Small evergreen trees were cut, nailed to poles, and staked every couple hundred feet along the runway to mark its boundaries.

The new, light-weight flying equipment was thoroughly tested on this operation and proven to work well.

St. Hubert's had an excellent weather forecasting operation which is a necessity for safe operations. The station operated using teletype versus radio for war-time security.

Because of the potential involvement of the U.S. in the war, it was recommended that some Air Corps officers and enlisted personnel be sent TDY for three to four weeks to observe RCAF coastal patrol operations.

The Arnold Line[56]

There was an urgent requirement for movement of key personnel and priority cargo across the Atlantic Ocean before the formal entry of the United States into WW II. To meet this need the Arnold Line was formed as a joint British-U.S. operation that originated with British Overseas Airways and Pan American World Airways under the auspices of the RAF Return Ferry Service and the USAAC Ferry Command. The first flight, on June 21, 1941, was a civilian contract operation. The first military flights began on July 1 using B-24As, replete with neutrality markings which consisted of large American flags applied to either side of the nose and on the top and bottom of the fuselage. These flights were conducted out of Bolling Field by the 26th Air Transport Wing. The Air Corps also needed crews who were experienced in long range navigation in general and over water operations specifically. The best place to turn was the 2nd Bomb Group with its vast assets. A summary of the personnel assigned to these operations is contained in Appendix 15. The huge XB-15 was also appropriately involved in these operations. The Arnold Line operation ceased on October 18, 1941 when weather became a major impediment.

Training Continues

The Group borrowed a B-17C from Wright Field, and used it on January 14, 1941, to conduct a high altitude gunnery training mission at 30,000 feet.

Sunday, January 18, 1941 was Inauguration Day and the Group, augmented by nine B-18s from the 22nd Bombardment Group, formed an element in the aerial review. Other units participating were the 8th and 31st Pursuit Groups, 7th, 19th and 27th Bombardment Groups, and aircraft from the *USS Wasp.* The aircraft took off at 11:00 A.M., flew several passes over the Capitol starting at 1:30 P.M. then departed for their home stations.[57]

The USAAC expansion program, which began in February 1940, took a severe toll of Group personnel. As of February 7, 1941, Group officer strength was below 20 per squadron. Another split in Group personnel was to take place soon. Despite the shortage of personnel, the Group expended great effort in training during 1940 with very credible results:[58]

- 9 officers qualified as Dead Reckoning Navigators
- 13 officers qualified as Celestial Navigators
- 16 enlisted bombardiers qualified as 3rd Class Bombardiers
- 13 officers qualified as 3rd Class Bombardiers
- 11,500 practice bombs were dropped in combat exercises to maintain qualification
- 352 demolition bombs were dropped in combat exercises and demonstrations

Gunnery training resulted in the following ammunition being fired:

356,000 rounds - .30 caliber
28.000 rounds - .50 caliber
38.000 rounds - .22 caliber
87,650 rounds - skeet ammunition

At 5:20 A.M., on March 20, 1941, 12 B-18s under the command of Lt. Col. Harold L. George headed south to participate in another major exercise in the Miami, Florida area. When the formation was about an hour and a half out of Langley, Col. George's airplane suddenly went into a climbing turn with all controls jammed except the ailerons. The crew rapidly donned parachutes and stood by to bail out. Some control was regained and when they were within five miles of Ft. Bragg, North Carolina, the crew — T/Sgt. A.R. Jester, S/Sgt. T.F. Snyder, S/Sgt. R.S. Nephew, S/Sgt. J.H. Walsh, Lt. C.W. Uhr, and Lt. D.A. Homby, except for Col. George, and copilot Maj. Donald R. Lyon — bailed out. With the loss of weight, the ship righted itself and Col. George ventured aft to assess the damage. He found that the left elevator had torn off the aircraft. He and Maj. Lyon attempted a few maneuvers and determined they had reasonable control of the aircraft. They lowered the landing gear and flaps and reduced speed to near stalling and were satisfied they could safely land the airplane. They landed at Pope Field near Ft. Bragg. A local newspaper stated that the pilots had saved the American taxpayers $50,000. An investigation revealed that the elevator had torn away and became temporarily jammed against the rudder. Except for Sgt. Walsh, who sprained his ankle and remained in the hospital for two days, the crew bailed out safely and returned to Langley aboard a transport aircraft. They were

duly inducted into the *Caterpillar Club* (an organization of those who have saved their skins by hitting the silk). Shortly thereafter a set of published instructions mysteriously appeared.[59] (See chart to the right.)

In June 1941, B-17s from Langley were ferried to Westover Field, Massachusetts for the 34th Bombardment Group.

On Wednesday, August 13, 1941, the 2nd picked up three B-17Bs and a fourth the following day.

Aircraft were being ferried everywhere and by August 19, 1941, the Group was down to nine aircraft — three B-17s, five B-18s and one BT-14!

In October 1941, the 20th Bomb Squadron began to transition into twin engine B-25s. In late October and early November, the 49th Squadron was equipped with fifteen B-17Ds. In late November and early December, the 49th prepared to move to Newfoundland to replace the 41st Reconnaissance Squadron (which later became the 429th Bomb Squadron of the 2nd Bomb Group). The 49th ground echelon left Langley by rail at midnight November 23/24. Sgt. Bradley Soloman remembers their departure, particularly the 15 railroad cars loaded with baggage and squadron equipment. The air echelon followed on December 1, taking off in its recently assigned B-17Ds for Mitchel Field, the first leg of the trip. The timing of the move resulted in another of the many, many unfortunate consequences of Pearl Harbor. The two echelons of the 49th were still separated on December 7, 1941.

The weather was clear with unlimited visibility on Sunday, December 7, 1941. At 2:30 P.M., Eastern Standard Time the attack began on Pearl Harbor. The Group's log entry solemnly stated: "Hickam Field very hard hit. Loss of personnel and airplanes seem to be considerable. The whole Pacific afire with Japs."[60]

Day of Infamy Carnage

Records of the attack on Pearl Harbor reveal there were 234 aircraft assigned to stations in Hawaii, of which 76 were destroyed. There were 53 bombers and attack aircraft assigned, and 20 of these were destroyed. The 53 bombers included 24 B-17s, of which 6 were destroyed and 2 were damaged. Both the damaged aircraft were repairable, but one was salvaged for spare parts. The 24 B-17s were assigned 6 each to the 5th and 11th Bombardment Groups, and the 38th and 88th Reconnaissance Squadrons. The two bomb groups had 12 B-17Ds and lost 5 of them to the attack. The two reconnaissance squadrons had 12 B-17Es, and were en route to and in the vicinity of Oahu at the time of the attack. They lost one B-17 destroyed and the 2 damaged.

In the Philippines, it was Monday, December 8, 1941, when the Japanese attacked. One of their victims was the 19th Bombardment Group stationed at Clark Field on Luzon. That Group was equipped with 35 *Flying Fortresses* — 6 were B-17Cs and 29 were B-17Ds. On December 6, sixteen (16) of these aircraft deployed for maneuvers to Del Monte Field, Mindinao, some 600 miles south of Manila. These airplanes escaped the Japanese attack. Of the remaining 19 B-I 7s at Clark Field, three were airborne on coastal patrol, and twelve were destroyed in the attack.[61]

Instructions to all Passengers in B-18 and B-18A Airplanes

1. In case of engine failure or other minor trouble such as loss of wing or wings, loss of propeller, fire, etc., the following procedure will be carried out:
   a. Remove all loose radio equipment and tools.
   b. Ask pilot for Form I and fill out same.
   c. Send radiogram to Corps Area Headquarters requesting permission to make an emergency jump.
   d. Check altitude and position, being sure to include this information in the above mentioned radiogram.
   e. Make a list of best telephone numbers in the vicinity.
   f. Notify pilot that you are ready to jump.
   g. JUMP.
2. After leaving ship proceed as follows:
   a. Count ten (it may be necessary for some passengers to carry slide rule to accomplish this. If necessary it will be included in the bundle of spare radio parts and tools carried.)
   b. Pull rip cord. This is quite essential.
   c. The usual procedure here is for the parachute to open.
   d. If step b. or c. or both, are omitted, immediately upon landing the passenger will proceed to the Post Operations Office, secure and fill in Form 1131 (Request for Sympathy) and mail same to the Chief of Chaplains, U.S. Army, Washington, DC. This will be accompanied by an Unsatisfactory Report on the parachute used.
   e. The Form 1, radio, spare parts, tools, etc., will always be carried by the passenger on his jump.
   f In some cases the Booklet "How to Swim in Three Easy Lessons" will be found very helpful.

From the total of 59 B-17s in Hawaii and the Philippines, the Air Corps lost 19 destroyed and 1 damaged and later salvaged, or one third of the forces. It was certainly a serious, but not a fatal blow. Months of struggle to survive would ensue while frantic efforts were made to replenish and replace the losses. The 2nd Bombardment Group at Langley would share heavily in these efforts and never recovered as a unit from the immediate after effects of Pearl Harbor.

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While similar to the North American AT-6 Texan, *the BC-1s had a larger rudder and an oil cooler vent located higher on the left side of the forward fuselage. This Blue and Yellow ship carried the BB tail code for the 2nd Bombardment Group and the 49th Bomb Squadron insignia on the waist. These aircraft were used for administrative transportation. (Courtesy of the United States Air Force/Air Combat Command Historian)*

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Chapter VIII

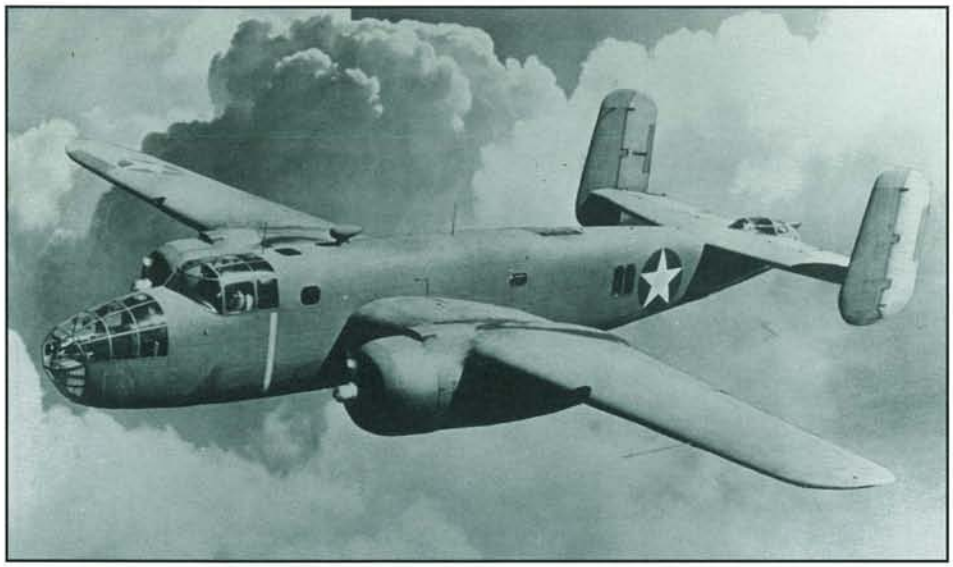
2nd Bombardment Group Begins WW II Operations

December 8, 1941 to February 1, 1942

When Pearl Harbor suddenly propelled the U. S. into WW II there were far too few military aviation units available to meet the nation's war time needs. There were immediate competing priorities to fight the war, protect the nation, and mobilize, train, and equip an aerial war machine. The 2nd Bomb Group had been one of the best trained and equipped bombardment units in the Air Corps, but starting in early 1940, much of its talent and equipment had been scattered to the four winds to form the core of other units. Within a few days after Pearl Harbor the Group was a shell of its former self.

Pearl Harbor plunged the unit, like the nation, into a high state of confusion and anxiety. The paucity of reliable intelligence about enemy actions and intentions spawned a wild set of rumors. One such rumor had the Japanese fleet steaming from the Pearl Harbor attack to the U.S. west coast. Another had the French Vichy Government fleet departing Marseille to attack the east coast. These and other rumors abounded creating a mixture of fact and fantasy that confused the military response to the immediate emergency. Events large and small that befell the Group over the next several months confirmed how poorly prepared the nation was for the crisis that had been thrust upon it.

On December 8, there were only two squadrons - the 20th and the 96th - at Langley. The 20th Squadron was equipped with North American B-25's and was engaged in planning a secret mission. The 96th, with a mix of B-17B and B-17C's and a few B-18's, was engaged in routine training. The 49th, with a full complement of 15 B-17D aircraft, had departed Langley on December 1, 1941 on its way to Newfoundland. The ground echelon of the 49th had departed Langley in late November and was



The 2nd Bombardment Group operated some North American B-25 Mitchells *on antisubmarine patrol from Langley Field during 1941. These aircraft were in the 20th Squadron. (Courtesy of the United States Air Force)*

making its way by train and ship to Newfoundland.

The 20th had been preparing since November 1941 for the secret operation code named "Project Indigo".[1] Project Indigo required movement of the 20th Squadron to Iceland. It was not known what the Squadron would do in Iceland. The supposition was antisubmarine patrol. Because of "Indigo" high priority, the 20th received a full complement of eighteen North American B-25's right off the production line.[2] On December 8, Maj. Dale O. Smith, 20th Squadron Commander, assumed that the orders for " Indigo" would remain unchanged and advised his personnel to continue preparing for the move to Iceland.[3] In the words of Maj. Smith: "In the evening of December 8th I was kept awake with one phone call after another. Most of these were from the olympic eminence of the Munitions building in Washington, DC. " The Munitions building was the HQ of the War Department and the Army General Staff. It seemed to Maj. Smith that top military leaders were rushing about yelling and gnashing their teeth. It was well known that the 20th Squadron was up to strength, trained, and ready to move. To Maj. Smith the flood of communications he was receiving suggested that "Project Indigo" had been scrubbed, and plans were being made to use the 2Oth in some other fashion in the war. In the early hours of December 9, Maj. Smith received orders to move the 20th as soon as possible to Mitchel Field, Long Island, New York to guard New York city against the Vichy fleet.[4]

Maj. Smith tried to advise Mitchel Field by every means available that his Squadron was coming. Telephone, teletype, and even Western Union were all busy with priority traffic. He led the Squadron from Langley to Mitchel Field without any one at Mitchel knowing they were coming. The Squadron arrived at Mitchel to be greeted by the Base Commander, a colonel, who said, "We don't have room for your squadron here and I have received no orders concerning your move!" With that the colonel left. The Base Operations Officer was more understanding. He found parking spaces for the B-25's. Maj. Smith and his crews left the flight line to find breakfast but the breakfast hour was over and not a single mess hall was open. The crews had to wait until the noon meal. Things did not get any better. The 20th was provided no barracks, and it took much argument with the Base Commander to get even a hangar where cots could be set up. Some of the officers slept in chairs or on the floor at the officers club.

In the midst of this confusion and frustration, Maj. Smith received another change of orders. The air echelon was to depart immediately for Hamilton Field, California. Now it looked like the unit was on its way to the real war in the Pacific. Wrong! As the Squadron was lined up on the taxi way, props turning, and waiting takeoff clearance, the Control Tower called and said the mission had been canceled by the Commanding General, Eastern Defense Command and they were to return to their parking spaces.

The next day the Eastern Sea Frontier ordered the 20th on an Atlantic Ocean sweep to search for the invading French fleet. It was a dreary, overcast day. Maj. Smith had six B-25's loaded with 100 pound bombs, the only bombs available locally. He led the six on a sea sweep four hundred miles out over the Atlantic. None of the crews were equipped with survival gear. Depending on visibility, the six aircraft flew surveillance corridors ranging between 50 and 100 miles in width. They found white caps and a few fishing boats but no French Navy. The return to base was uneventful except that Long Island was like a brilliant jewel in the midst of the night scape; except for a black hole which marked the location of Mitchel Field. Not a single light shown at Mitchel. Maj. Smith called the tower for landing instructions and asked that the landing field lights be turned on. The reply: "Sorry Mitchel is totally blacked out, orders from the Base Commander." No amount of pleading would get runway lights turned on. Maj. Smith ordered the rest of the flight to land at the fully lighted La Guardia Airport while he landed at Mitchell without runway lights. The black out order remained in effect, so thereafter Maj. Smith made sure that his flights returned during daylight.

Patrols continued each day. Once the Navy complained that one of their destroyers had almost been sunk by one of the 20th's B-25's. Maj. Smith asked the Navy if the ship had fired the colors of the day. The Navy replied it had not. After that Navy vessels quickly fired the recognition flares whenever the patrolling B-25s came near. As Maj. Smith said: "The Army Air Force had finally gotten the Navy's attention."

Enemy submarines sunk more and more allied shipping, and the 20th's mission intensified. Unfortunately, the B-25 was a poor sub hunter. Its two big engines drank so much fuel it had little range and carried no depth charges.

On New Years day 1942, the 20th suffered its first crew fatality. Lt. Charles Van Euwen took off at dawn with a full load of fuel and 100-pound bombs, and a crew of four. Shortly after take off the aircraft lost power Van Euwen, in order to avoid a built-up area of homes and schools, dove his aircraft into a quarry where the bombs exploded. The local people were grateful for this act of heroism and held a memorial service for the crew.

Late in January 1942, after over a month of tough living conditions, hazardous flying and no German submarines or French Navy vessels sighted or sunk, the 20th was ordered back to Langley. Despite a few patches of bad weather on the way, the Squadron flew formation back to Langley. As the flight neared Langley the weather cleared and they were in bright sunlight. Maj. Smith tightened up the formation and the 20th Squadron came sweeping low over the field. Although their guns had not been fired in anger, and they had rarely dropped bombs, they felt they had been at war and were ready for larger responsibilities and more difficult tasks.[5]

The 49th Squadron became a true victim of the confusion and disarray induced by Pearl Harbor. Its ground and air echelons were caught in transit to a new assignment on December 7th. The 49th had been ordered to Newfoundland to relieve the 21st Reconnaissance Squadron of its anti-submarine patrol over parts of the North Atlantic. The personnel in the ground echelon left Langley about midnight November 23/24 by train with fifteen box cars of equipment and gear including, guns, armor plating, bomb bay fuel tanks, and footlockers. They trans-shipped out of the Brooklyn Naval Yard on November 26 for St Johns, Newfoundland, arriving December 1. The next day they went by train back to Gander Air Base. They were still at Gander on December 7, where they learned by radio of the Japanese attack on Pearl Harbor. They waited for the air echelon to come. They were waiting when the 21st Reconnaissance Squadron came through Gander on its way back to the United States. (President Roosevelt's son, Elliot, was an aviator assigned to the 21st Reconnaissance Squadron.) Still they waited. They waited for three weeks in December. The air echelon never came. The two echelons were never reunited. Whatever Squadron cohesion, team work, and esprit de corps had been attained through training were lost. Several days later they were informed that the air echelon had been diverted from Mitchell Field to the Pacific Northwest.