CHAPTER 3

By the end of Basic Army Training, Gibby's stated preference for armed forces service was an assignment with the Army Air Force. Influenced by Gibby, Mike's path through basic training would bring him to that same decision three months later. George, who enlisted four months later than Gibby and Mike, chose the Army Air Force also and found himself in an accelerated program due to the urgencies of the war. He would actually earn his 'wings' just after Gibby and two months before Mike.

All three followed the same program from classification to basic flight training, specialty training, crew assignment final training and deployment. They were given a series of test batteries and interviews to ascertain their job experience and mental capacity. An important phase of the classification of recruits was the interview which uncovered such civilian experiences as skills derived from employment or hobbies and the extent and type of schooling. The objective was to establish a relationship between civilian occupational experiences and a job specialty that would be most useful to the Army Air Force. After the interview a classifier reviewed the recruit's papers and made a recommended assignment to a Military Operational Specialty (MOS). As a result of these tests and interviews Gibby, Mike and George were sent to basic and preflight training center in Tennessee at the Smyrna Air Field just outside of Nashville, today called Stewart Air Force Base. It is almost certain that staying in close contact with Gibby first through the system again, enable them to game the system to achieve common goals.

Smyrna Air Field, Tennessee

The War Department ordered the construction of a Bombardment Air Base near Nashville on 22 December 1941, shortly after the US had entered World War II. A tract of land consisting of 3,325 acres (1,346 ha) located off US Route 70 in Rutherford County, Tennessee near Smyrna, Tennessee, was selected and acquired by the United States Army Air Forces for use as an Army-Air Force Training Command Base. Six thousand workers erected 200 buildings and an airfield to accommodate the training needs of the Army Air Force.

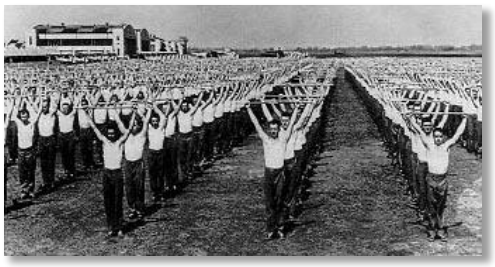
In January 1942, Smyrna Army Airfield was assigned to the AAF Southeast Training Center with the Army Air Force Pilot School (Specialized 4-Engine) activated (phase 3 pilot training). In this phase, cadets flew B-17 Flying Fortress and B-24 Liberator heavy bombers. Pilots graduating this phase were sent on to group

combat training with the Second Air Force. Graduates were commissioned as Flight Officers (Warrant Officers), and those who graduated at the top of their class were commissioned as Second Lieutenants.

PREFLIGHT TRAINING[2] **-** The preflight training period consisted of military discipline and physical conditioning, supervised athletics and the complete processing of assigned students, as well as additional instruction and training as may be practicable to further qualify trainees for instruction as pilots, bombardiers, or navigators. Over time there was a steady increase in the relative amount of time and recognition given to academic subjects, and this phase of the program became the paramount function of the preflight schools. Under the various preflight curricula, students spent four to five hours daily in academic training.

Military training doubtless suffered from this trend, but the development was a logical response to the increasingly technical nature of air combat. Many students entering preflight were so deficient in the fundamentals of mathematics and physics that considerable time had to be given to rudimentary drills, with emphasis upon problems related to performance of flying duties. Theory was reduced to a minimum, and matter inapplicable to aviation was progressively screened out of the courses. The distinguishing feature of the technical curriculum was greater emphasis upon mathematics, target identification, photography, and meteorology.

Since ability to use aeronautical maps and charts was basic to flying operations, an elementary course in that subject was also developed in the preflight schools. The course became increasingly practical as the necessary materials were made available for teaching purposes; a large portion of the allotted hours was reserved for student exercises in simulated operational problems which required use of aeronautical charts. In addition, the subject of aircraft and naval vessel recognition slowly gained acceptance in recognition of its combat importance.



Significant time was allotted to basic military and officer training. One-half of this time was set aside for close order drill, ceremonies, and inspections; the remainder went to classroom or squadron instruction in customs and courtesies of the service, chemical warfare defense, small-arms familiarization, and related military subjects. The West Point code of cadet discipline and honor was regarded as the model for the preflight schools.

Gilbert Rauh was the first of the three boys to be selected for bombardier specialty school. His next stop was Victorville, California. Both George and Mike would follow in a few months.

[2] A more detailed description of pre-flight, BOMBARDIER specialty and combat group training is given in Appendix A.

CHAPTER 3 – STATESIDE TRAINING – A COMMON PATH

From the movie "Bombardier" come these words spoken by General Eugene L. Eubanks,

"Upon him finally depends the success of any mission on which he participates. The greatest bombing plane in the world with its combat crew takes him into battle. Through weather, through enemy opposition, just so he may have 30 seconds over the target. In those 30 seconds he must vindicate the greatest responsibility ever placed upon an individual soldier in line of duty. I want you to know about him and about those who had the faith, the vision and foresight to bring him into being."

WW II BOMBARDIER'S CODE OF SECRECY

Cadets selected for bombardier training were entrusted with one of our nation's most closely guarded military secrets, the famous Norden bombsight. Once a man had completed bombardier preflight training, he was sent to bombardier school where he was required to take a special oath, promising to protect the secret of the sight with his life.

Bombardier school lasted from 12 to 18 weeks during which a student dropped approximately 160 bombs, both in daytime and at night. Precise records were maintained of his hits and misses; the elimination rate was 12%. Upon graduation, a bombardier was transferred to an operational training unit to join a crew being trained for overseas duty. By war's end, more than 45,000 bombardiers had been trained.

THE BOMBARDIER'S OATH

Mindful of the secret trust about to be placed in me by my Commander in Chief, the President of the United States, by whose direction I have been chosen for bombardier training...and mindful of the fact that I am to become guardian of one of my country's most priceless military assets, the American bombsight...I do here, in the presence of Almighty God, swear by the Bombardier's Code of Honor to keep inviolate the secrecy of any and all confidential information revealed to me, and further to uphold the honor and integrity of the Army Air Forces, if need be, with my life itself.

CHAPTER 3 – STATESIDE TRAINING – A COMMON PATH

Duties and Responsibilities of the Bombardier - ***Excerpts from the Pilot Training Manual - B-17 Flying Fortress***

Accurate and effective bombing is the ultimate purpose of your entire airplane and crew. Every other function is preparatory to hitting and destroying the target. That's your bombardier's job. The success or failure of the mission depends upon what he accomplishes in that short interval of the bombing run.

When the bombardier takes over the airplane for the run on the target, he is in absolute command. He will tell you what he wants done, and until he tells you "Bombs away," his word is law.

A great deal, therefore, depends on the understanding between bombardier and pilot. You expect your bombardier to know his job when he takes over. He expects you to understand the problems involved in his job, and to give him full cooperation. Teamwork between pilot and bombardier is essential.

Under any given set of conditions -- groundspeed, altitude, direction, etc. -- there is only one point in space where a bomb may be released from the airplane to hit a predetermined object on the ground. There are many things with which a bombardier must be thoroughly familiar in order to release his bombs at the right point to hit this predetermined target.

- know and understand his bombsight, what it does, and how it does it.
- thoroughly understand the operation and upkeep of his bombing instruments and equipment.
- know that his racks, switches, controls, releases, doors, linkage … are in first class operating condition.
- understand the automatic pilot as it pertains to bombing.
- know how to set it up, make any adjustments and minor repairs while in flight.
- know how to operate all gun positions in the airplane.
- know how to load and clear simple stoppages and jams of machine guns while in flight.
- be able to load and fuse his own bombs.
- understand the destructive power of bombs and know the vulnerable spots on various types of targets.
- understand the bombing problem, bombing probabilities, bombing errors, etc.
- be thoroughly versed in target identification and in aircraft identification.

The bombardier should be familiar with the duties of all members of the crew and should be able to assist the navigator in case the navigator becomes incapacitated.

For the bombardier to be able to do his job, the pilot of the aircraft must place the aircraft in the proper position to arrive at a point on a circle about the target from which the bombs can be released to hit the target. Consider the following conditions which affect the bomb dropped from an airplane:

1. **ALTITUDE:** Controlled by the pilot. Determines the length of time the bomb is sustained in flight and affected by atmospheric conditions, thus affecting the range (forward travel of the bomb) and deflection (distance the bomb drifts in a crosswind with respect to airplane's ground track).
2. **TRUE AIRSPEED:** Controlled by the pilot. The measure of the speed of the airplane through the air. It is this speed which is imparted to the bomb and which gives the bomb its initial forward velocity and, therefore, affects the trail of the bomb, or the distance the bomb lags behind the airplane at the instant of impact.
3. **BOMB BALLISTICS:** Size, shape and density of the bomb, which determines its air resistance. Bombardier uses bomb ballistics tables to account for type of bomb.

4. **TRAIL:** Horizontal distance the bomb is behind the airplane at the instant of impact. This value, obtained from bombing tables, is set in the sight by the bombardier. Trail is affected by altitude, airspeed, bomb ballistics and air density, the first three factors being controlled by the pilot.
5. **ACTUAL TIME OF FALL:** Length of time the bomb is sustained in air from instant of release to instant of impact. Affected by altitude, type of bomb and air density. Pilot controls altitude to obtain a definite actual time of fall.
6. **GROUNDSPEED:** The speed of the airplane in relation to the earth's surface. Groundspeed affects the range of the bomb and varies with the airspeed, controlled by the pilot. Bombardier enters groundspeed in the bombsight through synchronization on the target. During this process the pilot must maintain the correct altitude and constant airspeed.
7. **DRIFT:** Determined by the direction and velocity of the wind, which determines the distance the bomb will travel downwind from the airplane from the instant the bomb is released to its instant of impact. Drift is set on the bombsight by the bombardier during the process of synchronization and setting up course.

The above conditions indicate the pilot plays an important part in determining the proper point of release of bombs. Moreover, throughout the course of the run, as explained below, there are certain preliminaries and techniques which the pilot must understand to insure accuracy and minimum loss of time.

Prior to takeoff the pilot must ascertain that the airplane's flight instruments have been checked and found accurate. These are the altimeter, airspeed indicator, free air temperature gauge and all gyro instruments. These instruments must be used to determine accurately the airplane's attitude.

The Pilot's Preliminaries - The autopilot and PDI[3] should be checked for proper operation; otherwise, it will be impossible for the bombardier to set up an accurate course on the bombing run. The pilot should thoroughly familiarize himself with the function of both the C-1 autopilot and PDI.

If the run is to be made on the autopilot, the pilot must carefully adjust it before reaching the target area. The autopilot must be adjusted under the same conditions that will exist on the bombing run over the target. The following factors should be taken into consideration and duplicated for initial adjustment.

- Speed, altitude and power settings at which run is to be made.
- Airplane trimmed at this speed to fly hands off with bomb bay doors opened.

The same condition will exist during the actual run, except that changes in load will occur before reaching the target area because of gas consumption. The pilot will continue making adjustments to correct for this by disengaging the autopilot elevator control and re-trimming the airplane, then re-engaging and adjusting the autopilot trim of the elevator.

[3] **PDI** stands for **Pilot Direction Indicator**. It was an instrument used primarily in conjunction with the bombsight, typically for coordinating between the bombardier and the pilot during the bomb run.

- The **PDI** consisted of two components: one in the bombardier's station and the other in the pilot's cockpit.
- The bombardier's PDI would indicate the necessary corrections (left or right) for the pilot to make, allowing the aircraft to stay on the correct bomb run path.
- The pilot's PDI would have a small needle that moved left or right, corresponding to the bombardier's adjustments, directing the pilot to align the aircraft accurately over the target.

Setting Up the Autopilot - For the bomb approach, the turn compensation knobs of the autopilot are set so a turn made by the bombardier will be coordinated and at constant altitude. Failure to make this adjustment will prevent the bombardier from establishing an accurate course during the run with the result being considerably large deflection errors in point of impact.

Uncoordinated turns by the autopilot on the run cause erratic lateral motion of the cross hair of the bombsight when sighting on target. The bombardier in setting up course must eliminate any lateral motion of the fore-and-aft hair in relation to the target before he has the proper course set up.

USE OF THE PDI: The same is true if PDI is used on the bomb run. Again, coordinated smooth turns by the pilot become an essential part of the bomb run. In addition to added course corrections necessitated by uncoordinated turns, skidding and slipping introduce small changes in airspeed affecting synchronization of the bombsight on the target. To help the pilot flying the run on PDI, the airplane should be trimmed to fly practically hands off.

Assume that you are approaching the target area with autopilot properly adjusted. Before reaching the initial point (beginning of bomb run) there is evasive action to be considered. Many different types of evasive tactics are employed, but from experience it has been recommended that the method of evasive action be left up to the bombardier, since the entire anti- aircraft pattern is fully visible to the bombardier in the nose.

EVASIVE ACTION: Changes in altitude necessary for evasive action can be coordinated with the bombardier's changes in direction at specific intervals. This procedure is helpful to the bombardier since he must select the initial point at which he will direct the airplane onto the briefed heading for the beginning of the bomb run.

Should the pilot be flying the evasive action on PDI (at the direction of the bombardier) he must know the exact position of the initial point for beginning the run, so that he can fly the airplane to that point and be on the briefed heading. Otherwise, there is a possibility of beginning to run too soon, which increases the airplane's vulnerability, or beginning the run too late, which will affect the accuracy of the bombing. For best results the approach should be planned so the airplane arrives at the initial point on the briefed heading, and at the assigned bombing altitude and airspeed.

At this point the bombardier and pilot as a team should exert an extra effort to solve the problem at hand. It is now the bombardier's responsibility to take over the direction of flight, and give directions to the pilot for the operations to follow. The pilot must be able to follow the bombardier's directions with accuracy and minimum loss of time, since the longest possible bomb run seldom exceeds 3 minutes. Wavering and indecision at this moment are disastrous to the success of any mission, and during the crucial portion of the run, flak and fighter opposition must be ignored if bombs are to hit the target. The pilot and bombardier should keep each other informed of anything which may affect the successful completion of the run.

HOLDING A LEVEL: Either before or during the run, the bombardier will ask the pilot for a level. This means that the pilot must accurately level his airplane with his instruments (ignoring the PDI). There should be no acceleration of the airplane in any direction, such as an increase or decrease in airspeed, skidding or slipping, gaining or losing altitude.

For the level the pilot should keep a close check on his instruments, not by feel or watching the horizon. Any acceleration of the airplane during this moment will affect the bubbles (through centrifugal force) on the bombsight gyro, and the bombardier will not be able to establish an accurate level.

For example, assume that an acceleration occurred during the moment the bombardier was accomplishing a level on the gyro. A small increase in airspeed or a small skid, hardly perceptible, is sufficient to shift the gyro bubble liquid 1 degree or more. An erroneous tilt of 1 degree on the gyro will cause an error of approximately 440 feet in the point of impact of a bomb dropped from 20,000 feet, the direction of error depending on direction of tilt of gyro caused by the erroneous bubble reading,

HOLDING ALTITUDE AND AIRSPEED: As the bombardier proceeds to set up his course (synchronize), it is absolutely essential that the pilot maintain the selected altitude and air- speed within the closest possible limits. For every additional 100 feet above the assumed 20,000-foot bombing altitude, the bombing error will increase approximately 30 feet, the direction of error being over. For erroneous airspeed, which creates difficulty in synchronization on the target, the bombing error will be approximately 170 feet for a 10 mph change in airspeed. Assuming the airspeed was 10 mph in excess, from 20,000 feet, the bomb impact would be short 170 feet.

The pilot's responsibility to provide a level and to maintain a selected altitude and airspeed within the closest limits cannot be over-emphasized.

If the pilot is using PDI (at the direction of the bombardier) instead of autopilot, he must be thoroughly familiar with the corrections demanded by the bombardier. Too large a correction or too small a correction, too soon or too late, is as bad as no correction at all. Only through prodigious practice flying with the PDI can the pilot become proficient to a point where he can actually perform a coordinated turn, the amount and speed necessary to balance the bombardier's signal from the bombsight.

Erratic airspeeds, varying altitudes, and poorly coordinated turns make the job of establishing course and synchronizing doubly difficult for both pilot and bombardier, because of the necessary added corrections required. The resulting bomb impact will be far from satisfactory.

After releasing the bombs, the pilot or bombardier may continue evasive action -- usually the pilot, so that the bombardier may man his guns.

The pilot using the turn control may continue to fly the airplane on autopilot, or fly it manually, with the autopilot in a position to he engaged by merely flipping the lock switches. This would provide potential control of the airplane in case of emergency.

REDUCING CIRCULAR ERROR: One of the greatest assets towards reducing the circular error of a bombing squadron lies in the pilot's ability to adjust the autopilot properly, fly the PDI, and maintain the designated altitude and airspeeds during the bombing run. Reducing the circular error of a bombing squadron reduces the total number of aircraft required to destroy a particular target. For this reason, both pilot and bombardier should work together until they have developed a complete understanding and confidence in each other.

_____

SOUTHERN CALIFORNIA LOGISTICS AIRPORT

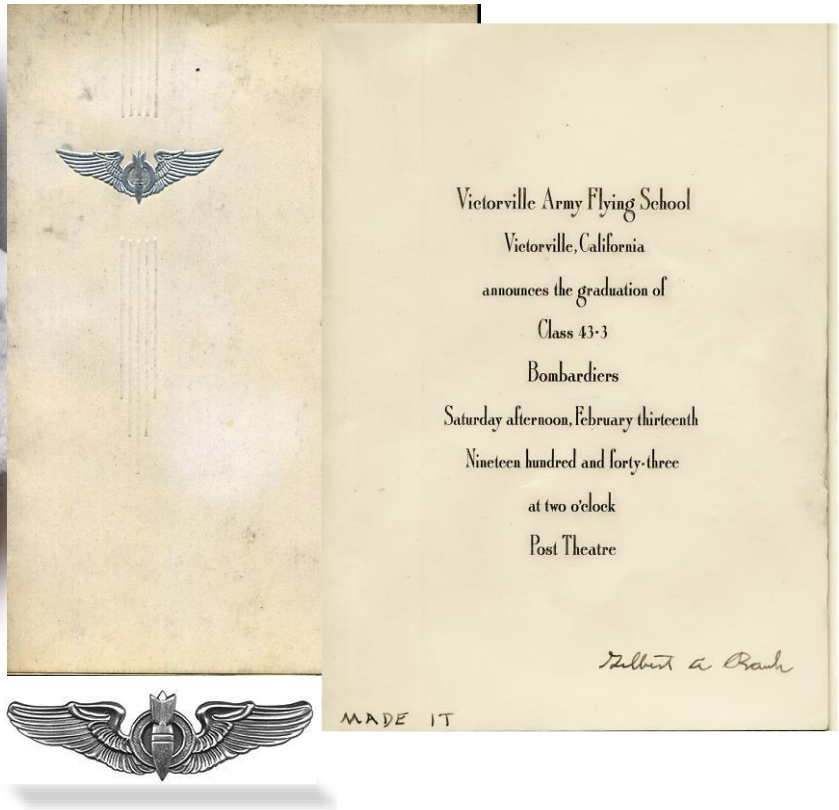
Southern California Logistics Airport (IATA: VCV, ICAO: KVCV), also known as Victorville Airport, is a public airport located in the city of Victorville in San Bernardino County, California, USA. It is located on the former site of George Air Force Base.

GEORGE AIR FORCE BASE

George Air Force Base (GAFB) covered 5,339 acres (21.6 km²) which included two runways (9,116 and 10,050 feet), 6.3 million square feet (580,000 m²) of ramp space and associated facilities; 1,641 units of housing; 14 dormitory buildings with 1,400 bed capacity; a hospital with a dental clinic; and various office and industrial structures. George Air Force Base (AFB) was located in Victorville, California, in the Mojave Desert approximately 90 miles northeast of Los Angeles.

George AFB, originally called the Victorville Army Air Field, was constructed between 1941 and 1943 as a flight training school. After World War II, the base was placed on standby status and used for surplus aircraft storage. The base was reopened in 1950 under the command of the newly created U.S. Air Force and renamed George Air Force Base. Flight training remained the primary mission of this base throughout its history and a number of bomber, glider, single engine, twin engine, and jet fighter aircraft were flown.

Gibby was the first of the three boys to graduate bombardier school earning both his wings and an officer's commission as Second Lieutenant[4]. It was now February 1943.



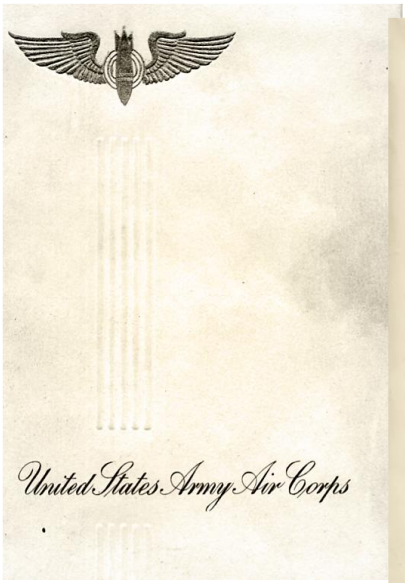
[4] In the United States, Second Lieutenant is the normal entry-level rank for most commissioned officers.

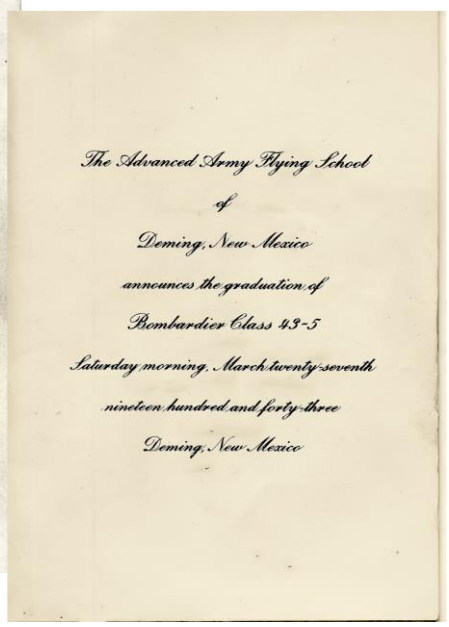
In the Army and Marine Corps, a second lieutenant typically commands a platoon-size element (16 to 44 soldiers or Marines). In the Army, the rank bore no insignia other than a brown sleeve braid on blouses and an officer's cap device and hat cord until December 1917, when a gold bar similar to the silver bar of a first lieutenant was introduced.

Air Force ranks duties of the second lieutenant are mainly focused in the supervision of flights of different sizes depending on his field of career. He may also perform duties as a flight commander or as an assistant flight commander. He may work as well in different administrative positions in squadrons, groups or wing level.

CHAPTER 3 – STATESIDE TRAINING – A COMMON PATH

George was transferred from Victorville to the Deming, New Mexico bombardier training facility in late 1942 and would earn his wings and officer's commission in the fifth graduating class of 1943 in mid-March.





Mike graduated Victorville bombardier school with his wings and commission in the seventh graduating class of 1943 in mid-May.