

Pathfinders, Part 2: Mickey Operators, Gee, and D-Day

By John W. Howland

Prior to March 20, 1944, all PFF (Pathfinder) aircraft were based at Alconbury, home of the 482nd Bomb Group. The British developed the original airborne radar system known as the H2S Radar. It was also referred to as the MK II radar and, quite naturally, MK II operators became known as "Mickey" operators. The H2X system replaced the H2S radar. H2X was a U.S. improvement of the British H2S radar. It used a new and shorter microwave length claimed to give a sharper picture of the ground than the British apparatus. After March 20, 1944 the PFF force for the 1st Division was temporarily based at Chelveston, home of the 305th Bomb Group. Two crews from each Group in the Division were sent to Chelveston, ostensibly to learn how to become Wing Leaders. However, our schooling was quite limited and we basically learned by practice flights (between combat missions) and adopting the techniques we developed that worked.

The Pilot and DR Navigator were the principal team members of the PFF. In my case all nineteen of my remaining tour missions were flown in the capacity of lead or deputy Wing Lead with my pilot, James L. Tyson. Mickey operators generally flew with the same crew, but there was quite a bit of flexibility in their assignments. The Group the PFF team was scheduled to lead always furnished the bombardier.

The principal electronic tool of the DR navigator was the GEE Box (Ground Electronic Equipment). Essentially the GEE Box was a cathode ray tube. This forerunner of LORAN was used in combination with a GEE chart that was made up of Hyperbolic curves in three different colors superimposed on a Mercator Projection Chart. The GEE Box measured the time difference in arrival of signals transmitted simultaneously from a MASTER STATION and retransmitted from a SLAVE STATION located 30 to 50 miles from the Master Station. Measurements were in microseconds (millionths of a second) and accuracy of a fix was approximately twenty-five feet at sea level. Time to take a fix was about fifteen seconds.

The GEE Box was indispensable during Wing assembly over England. It should be recalled that more than ten thousand aircraft were competing for the air space over England at the same time. It was critically important that each Group and Wing stay in the air space assigned to it, especially during the early morning hours when the formations were assembling above the clouds. The GEE Box made it all possible.

The range of the GEE Box was limited. I could use it up to the coast of the continent, and possibly a few miles inland. But the Germans did their best to jam the signal and the green grass on the scope grew tall as we flew into enemy territory. As I got to know the GEE Box, I became an ardent fan. For example, In February 1944, (prior to PFF) I discovered one of the Hyperbolic curves on my GEE chart almost exactly paralleled the main runway at Ridgewell. Jim Tyson and I practiced blind approaches to the airport in the following manner. First, I placed the aircraft on the runway GEE line about fifteen miles east of Ridgewell. Let us assume that line was Purple, 32.4. Then, with the Strobe marker, I then set the lower blip at 32.4. When the live top blip drifted right or left I had Jim Tyson correct the heading and bring the live blip back in line. Everyone on the



James L. Tyson - Pilot



John W. Howland - Navigator

plane was working. The copilot watched for traffic, double-checked airspeed, and handled flaps and wheels. The bombardier watched for traffic and checked altitude with his radar altimeter. All others on the plane watched for traffic. The left waist gunner watched for the church tower that always whizzed by just before touchdown. By the time we were three minutes from touchdown (6 miles) at an altitude of 500 ft., we started our final descent at 100 ft/min. If we didn't pick up the runway after 2 minutes, we were ready to abort the landing. But we never had to. The GEE approach only worked at Ridgewell where we just happened to have a runway that paralleled a GEE line. But it was one more tool Jim Tyson and I kept in our bag of tricks to help us survive the English bad weather.

Jim and I first worked out our bad weather approach system during February, 1944. Just four months later we used basically the same procedure of riding a GEE line into a target area. But our target wasn't the runway at Ridgewell. Our new target was the Normandy Beach line on D-Day.

The principal members of the PFF team were the Pilot, DR Navigator, Bombardier and Mickey Operator. Of course, we always had an Acting Wing Commander (AWC) flying in the co-pilot's seat of the lead ship, usually with rank ranging from General down to Major. Typically, the ones who gave us the most problems as we tried to carry out our highly specialized tasks were the lower ranking officers. Prior to the invasion, PFF teams and aircraft were used only on deep penetrations. During March, April and May 1944 we did a lot of flying and a lot of learning. As the DR navigator, I was responsible for obtaining accurate wind and drift data used by Mickey and the Bombardier on the bomb drop. In the process I learned to appreciate Mickey who provided accurate fixes when clouds obscured the ground. By maintaining an air plot between Mickey fixes, I was able to determine our wind condition at altitude that greatly improved bombing accuracy.

On May 29 and May 31, 1944 we spent two days practicing our through-the-cloud bombing technique on a coastline. Our target was a jetty near Skegness in the Wash in north Central England. This is the procedure we practiced over and over for these two days.

1. The DR navigator placed the aircraft on a GEE line that ran approximately at right angles to the beachline.
2. When the live blip of the cathode ray tube drifted left or right of the control blip (pre-set by the Strobe marker of the GEE box), the Navigator would call the pilot and give necessary course corrections right or left to stay on the GEE line.
3. During the early phases of the attack, the Pilot and Navigator worked together to establish the flight path of the aircraft so that it followed the GEE line selected by the Navigator. When the target came into range of the Norden bombsight, the Bombardier took over control of the aircraft from the pilot and made necessary course corrections through the bombsight, which was tied-in to the AFCE (Automatic Flight Control Equipment) of the aircraft.
4. The Mickey Operator, using the H2X radar, measured the range or distance to the target and relayed this information to the bombardier on a continuing basis.
5. The Bombardier cranked all basic data into the Norden bombsight including altitude (from his radar altimeter), course, ground speed, true air speed, temperature, drift, and range (distance to target). As the indices of the Norden bombsight moved towards the release point, the bombardier would crank in distance-to-target data received from the Mickey Operator



Another picture of Sunkist Special a/c #42- 97625. Pictured with the PFF Team Bassingbourn, England May 1944.

Back row: Richard C. Jensen, ETTG, Arnold C. Farmer, TG, Robert Miller, LWG, Charles Churchill, RWG, Henry White, ROG

Front: John Howland, Navigator, James L. Tyson, Pilot, William Doherty, Co-pilot

as well as course corrections received from the DR navigator. If, by chance, the clouds should break away at the last moment, the Bombardier was ready to take over visually, making only a few minor adjustments before the indices met and bombs were released automatically.

From the wartime diary of Pathfinder Navigator

John W. Howland June 6, 1944, D-Day

During the evening of June 5th, at about 2000 hours, we were alerted by the 324th Squadron Commander, Lt. Col. Robert Weitzenfeld. We were informed in the classic manner, "This is it." We knew "it" meant invasion, but we didn't know where "it" was to take place.

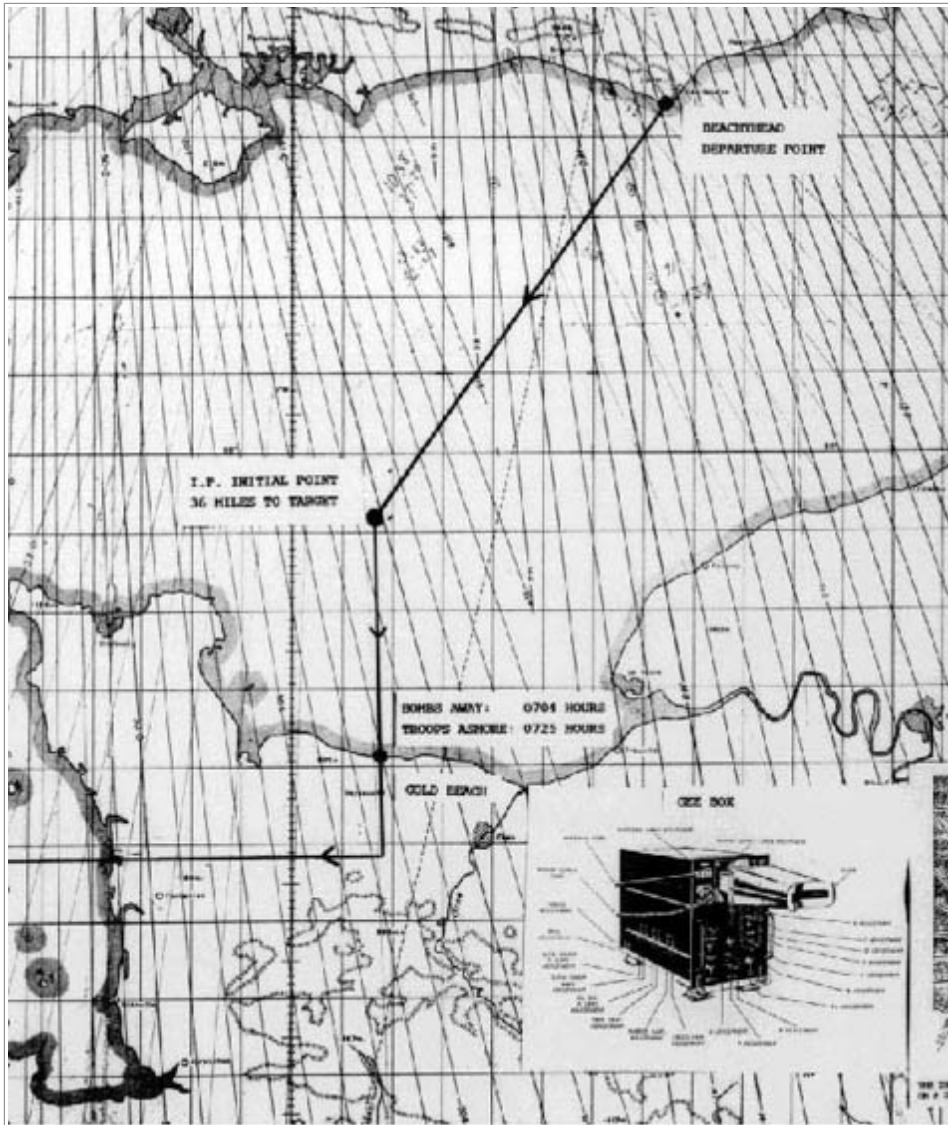
We took off from Bassingbourn with about 17 other PFF crews flying to various Bomb Groups in the 1st Bombardment Division. Three of us, Clark, Tyson and one other PFF team, which served as a spare, headed for the 381st Bomb Group at Ridgewell. We didn't get any sleep, and received our final briefing at 0130 hours. Security was extremely tight. Only Pilots, Navigators and Bombardiers were allowed in the briefing room. All persons briefed were pledged to secrecy until the planes were in the air and the mission was underway. Only then could location of the target be released to the crew.

In a maximum strength effort, the 381st put up two Groups of 18 planes, with a PFF team leading each Group. Jim Tyson and I led the first Group in an attack on enemy defenders of the Gold invasion beach. The PFF team of Carl Clark and Clem Obler led the second Group of 18 planes. Their target was an airport in the St Lo area.

The bomb load for our Group on June 6th was twenty 100 lb. HE demolition bombs in all of the eighteen planes. The load seemed almost puny by comparison with the 2000 lb., 1000 lb. and 500 lb. bombs we had dropped on Pas de Calais on June 2nd, 3rd, 4th and Normandy Gun Emplacements on June 5th. Our principal target June 6th, D-Day, was a gun battery on the beach north of Bayeux. However, our formation consisted of a shallow Vee of Vees with six planes in each Vee. Pilots normally allowed about fifty feet between wing tips. The wingspan of a B-17 is 103'9-3/8". The distance from outside wing tip to outside wing tip of the 18 ship Group formation was over 1,300 ft. There was little likelihood our total of three hundred sixty diminutive 100 lb. bombs scattered along a one quarter mile stretch of beach would wipe out a gun battery. However, we were told the 100 lb. bombs were supposed to make foxholes for the troops.

The weather looked bad, and we were given strict orders to make certain our bombs didn't fall short. Our assigned target area was the GOLD BEACH and we were flying in support of British and Canadian troops.

The assembly went off smoothly and on time. Our three months of practice and training in formation assembly paid off. We left Beachyhead on time, and headed south and west across the English Channel to pick up a GEE line that would guide us in to the target. Mickey operator John Spierling said his radarscope was full of reflections from hundreds of boats in the Channel. Until he said that, I didn't believe it was the real thing. I thought it was just a big practice mission.



The Chart I used was the PEMBROKE-PARIS GEE Chart. This British Chart was prepared by the Geographical Section of the General Staff and is dated July 1943. I selected the N to S green GEE system (Green 32.1, 32.2 etc.) to make the attack. The GEE BOX signal was strong and showed no signs of jamming attempts by the Germans. Further, the GEE line on my chart was ideally situated at right angles to the beachline.

At our 15,000-ft. bombing altitude, we had a solid undercast and were forced to use the GEE-H2X procedure practiced at Skegness. I had my eyes glued to the blips of the GEE BOX keeping us on course. John Spierling gave range and ground speed data to the Bombardier who cranked the information into his Norden bombsight. Charlie Eager, our Bombardier from the 381st BG, looked for a break in the clouds

so he could take over visually. But it never came. Nevertheless, our training paid off. We had confidence the GEE BOX course line was reasonably accurate, and our practice bombing sessions had proved the Mickey Operator and Bombardier could hit the beachline with good accuracy. We did what we were trained to do, and did it to the best of our ability with full confidence in our equipment and procedures.

Bombs were dropped at 0704. Zero hour for landings on the British-Canadian sector Gold Beach below us was 0725 hours. At "Bombs Away" I left the scope of my GEE BOX and came up for air and to look out my window. But all I could see was a solid undercast, and one solitary puff of black smoke in the sky. The collision and accidental explosion of two 100-lb. bombs evidently made this mark as they tumbled earthward and collided in mid air. There was no enemy flak over the beaches or after Bombs Away. Evidently the Germans were saving or using their ammunition on other targets.

The target of Carl Clark and Clem Obler was an airport near St Lo. While making his attack at St Lo, Clem started the approach using GEE. Like our formation, they were not bothered with German flak. As they flew into the target area, Carl brought the formation down to 10,000 feet. They gained contact with the ground and the Bombardier took over visually. Clem abandoned the GEE BOX and leaned over the Bombardier watching the "aiming point" hangar area of the airport with binoculars. Clem describes the action that followed.

"A German truck or weapons carrier came roaring across the tarmac at high speed. I could see the faces of two men clearly as they looked up at us. They came to a screeching halt at the hangar and one man jumped out to open a door. He jumped back into the truck and they drove inside. Just then, our bombs struck the hangar and blew it to pieces." As Clem put it, "The air war becomes quite personal at lower altitudes."

In our formation we didn't see many allied bombers, and no enemy aircraft at all. All bomber formations were routed in line astern. After the target, they had to fly a traffic pattern south across the Cherbourg Peninsula, then a right turn flying about 75 miles west, and then another right turn flying due north past the Jersey and Guernsey Islands, and back to base. It was a thrilling occasion; but for our crew, it was a very easy raid. There was no need for the extra boxes of ammunition we had stashed throughout the plane. We didn't see a single enemy fighter. There was no flak over the target or along our route.

Breaking with PFF standard operating procedures, we didn't return to Bassingbourn, but landed at Ridgewell about 1030 hours and were debriefed. The aircraft were again loaded with bombs and serviced to fly another mission. The lead crews of Jim Tyson and Carl Clark were confined to the operations building. Rumors were rampant including one that, "in the event the invasion went badly, B-17s would be used at low altitudes to drop fragmentation bombs and strafe." The rumors really didn't bother us. However, the lack of sleep for more than thirty hours was wearing us down. We made pallets of flak vests and sheep skin lined flight suits. Using partially inflated Mae West lifevests for pillows, we went to sleep on the floor of the equipment room. Lt. Col. George Shackley awakened us at 1600 hours. The afternoon mission had been scrubbed and we were instructed to return to Bassingbourn.

John W. Howland

PFF Navigator

324th Sq 91st Bomb Group

535th Sq 381st Bomb Group