# A Remarkable Discovery –
## *(World-War II history 'grounded' in acoustics)*

**Laymon N. Miller**, Fort Myers, Florida
**Brian Thompson**, Cheshire, England

*Note: The English one of us (Brian Thompson) is an engineer with a most unusual hobby. This is a story of his somewhat accidental adventure into acoustics. In the real world, he is maintenance manager of a large English plant in the international brick manufacturing business. The American one of us (Laymon Miller) is a retired acoustician. You could say that this story had its beginnings at his age of 23-27, working at the Harvard Underwater Sound Lab (HUSL – Ted Hunt's "Navy Lab") during World War II, 1941-45. We have not yet met each other in person, but e-mail and airmail brought us together for this truly unique and fascinating development. However, there is still a tiny missing piece in the puzzle. Maybe a reader somewhere can fill it in: Who is J.B.S? If his/her 'thing' (dated '5/43') had worked according to design, we would not have been able to tell this story.*

**The Pub Team.** Brian Thompson lives in the northern part of England known as the Peak District, not too far from a sparsely settled, largely moor region of peat that has become a silent graveyard for crashed or demolished aircraft from two wars and even a post-war era of additional flight vehicles, such as helicopters, gliders, and balloons. It includes several U.S. aircraft. He estimates that originally there might have been as many as 200 of these crashed aircraft remains. He is in the third family generation who has taken an interest in finding and trying to preserve some of the relics of those old aircraft. His grandfather was one of the first on the scene of a 1948 crash after World War II. Aside from the recognizable scraps taken by memento seekers, most parts were so damaged and corroded that there hardly remained any useful artifacts worthy of museum pieces.

Nevertheless, when Brian "had plenty of time on his hands with little to do until the pubs open," he set about looking for some of those long-lost salvageable trinkets that still remained but were now largely covered by earth. He started this interest in 1980 at the age of 20. Many other townspeople also acquired an interest; and many of their findings migrated to a new home, mounted on the walls of the local popular pub (see Figure 1). Some of their recoveries included such things as propellers, wheels, gears, a piston, an old engine block, a bomb shackle, a rusted tailpipe, a flight instrument, and other assorted devices. The proprietor of the pub was glad when the Manchester Air and Space Museum eventually offered to take a lot of them off her walls.

Brian remembers that, in 1980, metal detectors were relatively new, but he'd bought one to help locate some of the buried wreckage. One of his fascinating pursuits was the wreckage of the U.S. Navy PB4Y-1 No. 63934 patrol bomber (a B-24 Liberator), found only 4 miles from his home. It was part of the American group designated Patrol Squadron VB-110, and was based at the RAF Dunkeswell airfield in Devon, England, having arrived only a few months earlier from the U.S. Years later, after considerable research and effort, Brian located and communicated with the pilot of that plane, Lt. George Charno, USNR. Lt. Robert Wissman was co-pilot, and on this particular flight, there was a crew of eight plus a passenger (see Figure 2).

**Project Anvil.** Two PB4Y-1s of VB-110 were modified as pilotless flying bombs to be launched against high-priority targets in occupied Europe. Known as Project Anvil, the initial goal was to take out a German V-2 installation in occupied France. A PB4Y-1 was fitted with remote control gear, a forward-looking television camera to be used in the final run to the target, and 21,000 pounds of explosives. Since there was no time to develop remotely-controlled takeoff equipment, the aircraft was to be flown to an altitude of 2000 feet by a pilot, who would arm the explosives, hand the aircraft over to remote control from another aircraft and then bail out.

The first operation took place on August 12, 1944. The two pilots flying the PB4Y-1 were Lt. Joseph P. Kennedy, Jr (JFK's older brother) and Lt. Wilford J. Willy. The PB4Y-1 was accompanied by a Lockeed PV-1 control aircraft and a USAAF B-17 to monitor the television transmissions. However, the PB4Y-1 exploded 20 minutes after takeoff, killing both pilots. A fusing system malfunction was apparently to blame for the accident.

**Anti-Submarine Patrol.** It was December 18, 1943, and Lt. George Charno's crew had been on a 14-hour anti-submarine patrol over the Bay of Biscay. With darkness, foul weather, poor visibility, and unreliable radio communications, the plane was running on its last few minutes of fuel, and the crew could not find a suitable landing field within range. There were five planes in their bomber group that night and they were all trying to find any emergency landing field. The other four planes of that mission failed to return at all. With his plane carrying a load of high explosives, Lt. Charno, at the last possible minute, ordered his crew to jump as he set the plane on autopilot to head for the ocean, then he bailed out. Due to a high headwind and one inoperative engine, the plane did not reach the ocean. Instead, it crashed but did not burn, since no fuel remained. The crash was sufficiently 'soft' (minimum speed into the peat earth) that the remaining depth charges did not explode. A similar 'soft' crash of a PB4Y-1 is shown in Figure 3. All of Charno's crew members parachuted safely with minor injuries, 150 miles from their home base.

*Figure 1. The 'pub' team during one excavation with a Rolls Royce Mark 3 Merlin engine from a Defiant night fighter. The exhaust pipes were full of bullet holes. the pilot had bailed out after getting lost. The engine was buried 16 feet deep . The team's 'authentic' recovery equipment consisted of a Willy's Jeep and a six-wheel Dodge. Brian Thompson is at left end holding a cup of coffee. Note the ground, which means it was probably another 'soft' landing. (1980 photo)*

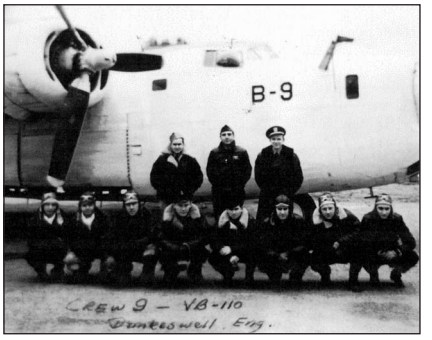


*Figure 2. Lt. George Charno's Crew 9 of the Liberator PB4Y-1, No. 63934 of the U.S. Navy's VB-110 Bomb Squadron stationed at RAF Dunkeswell Base, England. (1943 photo)*

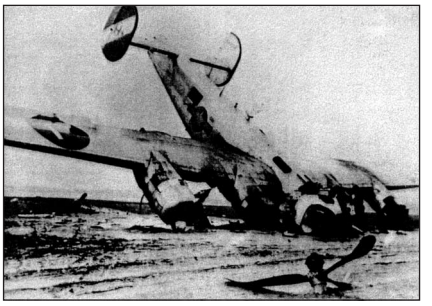

*Figure 3. USAAF B24 in a position similar to that of the PB4Y-1 No. 63934 in its 'soft' crash on the night of December 18, 1943. Photo credit, David Smith; taken from the article "Flying Bomb USN."*

**A Lucky Find.** Brian had been at that wreckage site several times before, each time wanting to go again in hopes of finding something more worthwhile. On this last occasion, he was making still wider circles around the site; eventually, he was getting tired and sat down to rest beside a stream. As he put his detector on the ground, it started to roll down the sloping embankment toward the water. He ran down to get it, catching it in the nick of time. In his own words, "climbing back up the bank, I was surprised to get a strong reading from

the detector." A few shovelfuls later, "I was faced with a motorboat propeller, bronze and shiny, not the usual thing to find on a wreck." He knew that motorboats were not usually carried on planes; yet, this was a Navy plane and it might be possible. "All sorts of ideas" were going through his mind. The propeller, shown in Figure 4, was firmly attached to something, so he kept digging – with an adrenaline rush.

As the hole got bigger and deeper, ground water began to trickle in and fill up the hole, and he had to dig a trench for the water to drain off into the stream below. The propeller extended off the end of a fat rusty conical shell. He kept digging and the shell was still there. He began to realize that he was looking at what appeared to be the tail end of a torpedo that was nose-down deeper in the earth.

He removed the tail section shown in Figure 5 and found lots of debris inside the body section: broken battery pieces, switches, tangled wiring. He was then about six feet into the ground. The shell of the body section shown in Figures 6 and 7 had been bashed in and torn open as though an earlier recovery team might have applied an external explosive charge in an attempt to destroy it so that it could never be used or identified.

With another two or three feet of digging, he believed he had come to the nose end of the torpedo, still under mud. The nose section was separated from the body section and standing upright at the bottom of the excavation hole. That is what Brian was standing on during the early part of this digging; actually he was unknowingly standing on the fuse of the nose cone of the unexploded torpedo. He later remarked, "I could have easily been the first Briton in space had it gone off."

He dug a wide enough hole to be able to push the torpedo body section over onto its side and roll it down to the water's edge, where it was more easily cleaned. While he was cleaning out the inside of the body section, he came across two leather sacks that ruptured and covered him with green dye. That was probably fluorescein, a tracer dye, which would have risen to the surface of the ocean and been visible from the air to show that the torpedo had hit its target. That is, if it had actually hit a target and exploded instead of landing in that soft marshy field in England.

The nose section shown in Figure 8 was filled with a gray material and was too heavy to move easily. Brian noted that there was no obvious detonator, and the whole thing seemed to be too short to be a real torpedo, so he decided that it was some sort of test dummy. With hammer and chisel he chopped out some of the gray material in the nose that he considered to be 'ballast,' until the head was light enough that he could lift it. He then did find what he believed to be a "fuse pocket" up in the center of the nose after he had removed more of the ballast. It took three trips for Brian to take his various souvenirs home to clean up. He believed

*Figure 4. When first seen, this was believed to be a motorboat propeller. After removal and cleaning, it was obviously a torpedo propeller.*

*Figure 5. Remains of tail cone (propeller removed), which was corroded and damaged beyond repair. Note the two triangular-shaped rudders.*

the tail cone and the body section were too damaged to try to restore. The brass propeller and a small brass detonator were cleaned up and brightly polished.

When he got home, he showed off his prize catch to his dad, a former quarry worker who was experienced with explosives. His father explained that the 'ballast' that he had been chopping out of the war-head was likely the torpedo's 92 pounds of highly explosive Torpex (TORPedo EXplosive). Needless to say, Brian is very happy to be here to tell this story.

**What is It?** Brian then began a lengthy, serious investigation to find what this thing was and how it got there. That is when he obtained the photograph of the crew of that PB4Y aircraft back in 1943. Everyone knew that this short torpedo-like thing did not belong as a normal weapon carried by a B-24 Liberator. That was still a mystery. Brian even has a 1986 letter from a British authority saying that classified information about it could not be released until fifty years after the event. So, in 1998, the intrepid Brian tried again and found his answer: It was the U.S. secret acoustic homing Mark 24 Torpedo. We called it 'Fido' the Mark 24 'Mine' to try to keep its true identity a secret.

In the year 2000, Brian got a computer and continued his search on the Internet. Somehow, four years later, in his rummaging through the Internet, he came across a picture of Laymon Miller and the Mark 24. There is only one such picture in existence. How did he find it? Miller now lives at the Shell Point Retirement Community in Fort Myers, FL. Shell Point had a monthly

*Figure 6. Torpedo body section found in 6 feet of earth. Tail cone was already removed. The torpedo had been in this acidic peat environment for about 40 years.*

*Figure 7. Torpedo body shell with hole inside after being unearthed and cleaned. The white line is a 12-inch-long hacksaw blade for size comparison.*

*Figure 8. Torpedo nose section with fuse pocket in center after the fuse was carefully removed. Brian had been standing on the nose about 8 feet down while digging out the body section. After he got it out of the ground, he chopped away at some of the nose 'ballast' to make it light enough to pick up. He learned later that he had been chopping at 'Torpex' explosive. Marks on the detonator indicated that it had tried to detonate when it hit the ground, but the 'soft' landing in the peat probably didn't provide a sharp enough impact to fully operate. The nose probably kept its shape because of the inside full of Torpex.*

newsletter called the *Courier*. The editor of the *Courier* was asking for articles to commemorate Veterans Day, November 11, 2004. Miller sent in a story about "The Second December 7." The story was about Fido – and what it did on December 7, 1942, one year to the day after Pearl Harbor.

Since the article had no photograph. Miller believes that the *Courier* editor wanted something to spice up the article and started surfing the Internet until he found a photo of a yellow-painted cutaway section of the Mark 24 at the Naval Undersea Museum of the Keyport Torpedo Station in Keyport,

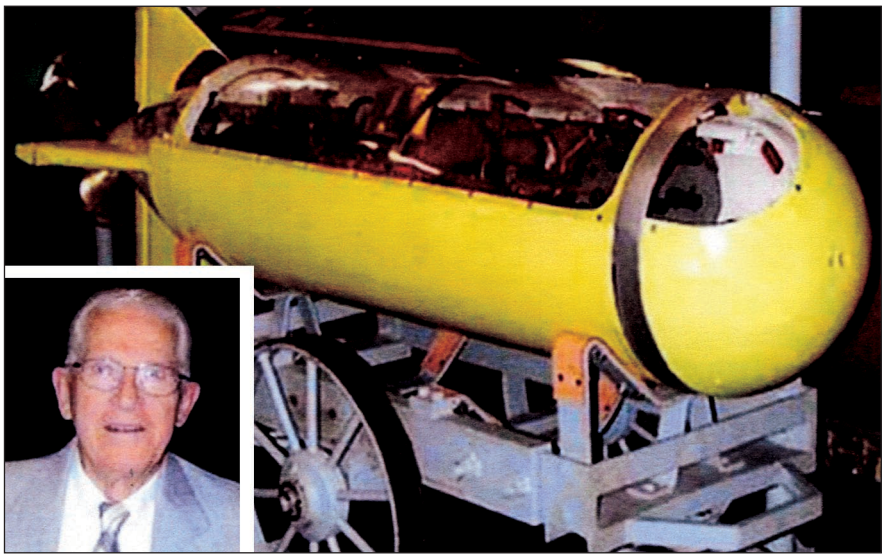

*Figure 9. Cutaway Mark 24 mine from the Naval Undersea Museum at the Keyport Torpedo Station, Keyport, WA (inset of Laymon Miller). Brian found this photo via web search; Miller had never seen this photo until it appeared with his article in the Shell Point Courier in 2004.*

WA. Miller had never seen that photo until it appeared with his article in the *Courier*. Brian, in searching for Fido, or Mark 24, through the wonders of the Internet, came across the *Courier* article that mentioned Fido and had its picture (see Figure 9).

**A Surprise Package.** On June 7, 2007, Miller unexpectedly received a neatly packaged four-page typed letter from England, from a person he didn't even know – Brian Thompson. The letter contained 26 pages of enclosures, five full-page color photographs, and 14 smaller photographs. Much of Brian's letter is summarized above in his own words. It is an eloquent, exquisitely interesting story of some past technical history. At the end of his letter, he asked, "Where did that photo come from? I thought I had the only Mark 24 in existence." We have been in follow-up communication with each other ever since. We almost had a chance to meet each other last August in Florida, but a conflict in dates made it impossible. Maybe sometime later.

For the newcomer to torpedo warfare, Fido, or the Mark 24 Mine (or torpedo) was the highly secret World War II joint effort of Bell Labs and the Harvard Underwater Sound Lab (where Miller worked during the war). Its secrecy was declassified in 1996 when Robert Gannon wrote his book, *Hellions of the Deep – Development of American Torpedoes in World War II* (The Pennsylvania State University Press, University Park, PA).

Gannon tells this story. It was a moment of glory when, on December 7, 1942, the acoustic homing 'FX-4' (Fido, Experimental No. 4) was air-dropped from a Navy plane outside Boston Harbor and made the first successful attack on an underwater target that simulated submarine noise. With a vital production effort by Western Electric (the manufacturing branch of AT&T) and a few other groups, it was in military service four months later – delivered to both the British Royal Navy and the U.S. Navy. The first two enemy submarines were sunk by two British pilots in March 1943, and the first sinking by an American Navy pilot took place in May 1943, using the first production run of the Mark 24.

The Fido that Brian uncovered did have a detonator mechanism that failed to explode when the torpedo hit the soft peat earth. If it had exploded, we could not have provided this story. The top of the fuse mechanism and the small primary booster are shown in Figures 10 and 11. The brass booster carries the following stamped or etched information:

MK 9 COMP. B BOOST
FOR MINE MK. 24
NMD/Y DATE 5/43
INSPECTOR J.B.S.

Does anyone have a clue about this bit of information? What is "NMD/Y", and who and where is "INSPECTOR J.B.S."?

Brian Thompson, explorer and adventurer, concluded his letter to Miller with this:

*"I bet you never dreamed when testing your mine that one day somebody would pull one out of a mountain!"*

**Addendum.** In those early days of testing for air droppability in 1942, the torpedo would be taken to the Naval Air Station at Quincy, MA, and loaded onto a Navy plane to be flown to the Nahant site for dropping – north of Boston Harbor. Later, when rough seas and harsh weather made tests in the open ocean very difficult, the torpedo runs were moved inland to Lake Quinsigamond, a large, deep lake near Worcester. During the latter half of 1942, four Fido vehicles were outfitted for a series of field-proofing runs; they were identified as FX-1 through FX-4 (FX = Fido experimental). On the very first airdrop of FX-1, it sank and was lost. Not trusting an airdrop again so soon, FX-2 was allowed to just slip into the water and make its run. After a few perverse and unsuccessful attempts at Nahant, it was taken to Lake Quinsigamond. That is also when a 'beeper' was developed to help locate lost torpedoes. (Reference: *National Council of Acoustical Consultants, Quarterly Newsletter*, Spring 1996.)

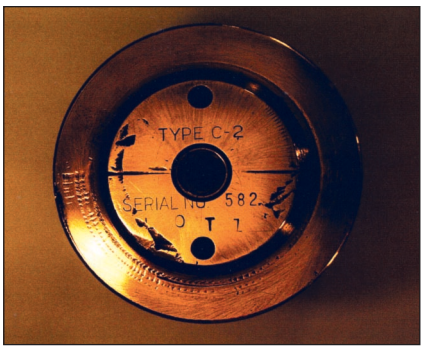


*Figure 10. Top of brass fuse after removal and polishing. It had not operated when it crashed on December 18, 1943, nor when being unearthed. more than 60 years later. It was probably damaged enough in the crash to make it safely inoperable.*

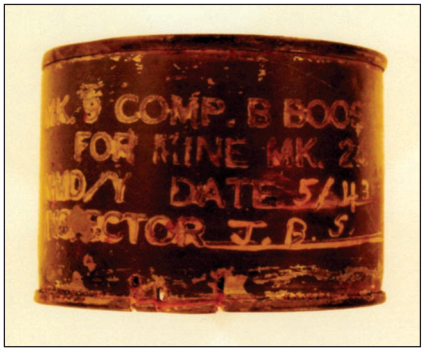


*Figure 11. Small booster cap held enough explosive to set off the Torpex in a real submarine hit. Does anyone know "Inspector J.B.S or the meaning of "NMD/Y?"*

In its first run at Lake Quinsigamond, FX-2 attacked the artificial target but then ran up on the beach as it was attempting a turnaround for another attack at the target. We joked that it was probably headed for a noisy tree. It suffered little damage and was prepared for another run a day or two later. At that next run, everything was set up and the torpedo was launched. It went under the surface and was lost from view. Three minutes passed. Nothing happened. It should have reached the target by then. Four minutes . . . still nothing. Five minutes. Ten minutes. We had to accept the inevitable; it was lost. Back at the lab that night, the field crew tried to reconstruct the day's events. Someone remembered hearing, shortly after the torpedo was released, a small motorboat way out across the lake in the opposite direction from the intended simulated target. The incident was soon forgotten as other work continued.

Nearly two years later, a photograph appeared in the *Worcester Sunday Telegram*. It showed a fisherman and his son huddled over a strange looking short cylindrical shell with fins and a propeller. It had bobbed to the surface near where they were fishing. Frightened, they called the local bomb squad. Then the Navy was notified. Finally, FX-2 was returned to our lab. Apparently, when that small motorboat started up that day two years earlier, the torpedo homing system heard it better than our intended noise target. It headed for the motorboat, but came into shallow water along the edge

of the lake and dove into the mud. It stayed there, stuck in the mud for two years. Wave action finally helped it slip loose, and it rose to the surface to frighten the two fishermen. In a later lab test, with a new set of internal batteries, the homing system still worked.

**A Commemoration.** Recall Robert Gannon's write-up (above) about December 7, 1942. That was indeed a momentous event in the history of the American acoustic homing torpedo. Miller later wrote it up for the *Shell Point Courier*, under the head "The Second December 7." Then, arranged by family members and a friend in Washington, as a complete surprise to Miller, he received a U.S. flag that had flown over the Capitol on December 7, 2007, commemorating the anniversary of "The Second December 7." Miller's expressed wish – that about 400 others from the Harvard Underwater Sound Lab could share in this story of the flag. Alas, there are few survivors of that event in this limited look-back into history 65 years ago.

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