



In the waning days of World War II, the US turned worn-out bombers into missiles targeting Germany. It didn't go well.

The Remote Control Bombers

By Walter J. Boyne



The United States Army Air Forces dominated the skies over Germany in 1944 with conventional weaponry. However, a late-war spurt in German scientific activity inspired a futuristic American response: The US would use remotely piloted bombers, loaded with explosives, to target hardened German targets.

The result was a pair of top-secret programs, the AAF's Aphrodite and the Navy's Anvil. War-weary B-17, B-24, and PB4Y-1 bombers were stripped of standard equipment and laden with explosives, so that they could be guided by a "mother plane" to dive into a heavily defended target.

It seemed like a good idea at the time, but failed badly in practice. The effort is today remembered largely for killing Navy Lt. Joseph P. Kennedy Jr., the son of the former ambassador to Great Britain and the brother of future President of the United States John F. Kennedy.

Aphrodite and Anvil came about through a combination of desire to match advanced weapons being employed by Germany, to equal contemporary British advances, and to thriftily employ bombers that were no longer suitable for routine combat missions.

Lt. Gen. Jimmy Doolittle was then commanding Eighth Air Force. He approved the Aphrodite project in June 1944, and the Navy's Anvil was developed along a parallel path.

By that date, Nazi Germany was facing defeat on every front. In desperation, it sought to change the course of the war with the introduction of spectacular new weapons.

The greatest Nazi successes were to come with the crude but relatively effective V-1, a pulse-jet cruise missile with a 1,900-pound warhead, and the radical V-2, the first ballistic missile. (The V-2 was far more expensive and carried roughly the same size warhead, but could not be defeated in flight.) Both missiles caused extensive British civilian casualties and were a heavy burden on morale for a nation engaged in its fifth year of World War II.

The Allies were therefore conducting preventive attacks under Operation Crossbow, intending to forestall deployment of both the V-1 buzz bomb and the V-2 ballistic missile. Crossbow was intended to destroy German long-range weapons by every means, including the destruction of factories, launching sites, and of course, missiles in flight. Concern about

Left: A converted B-17 used in Aphrodite and a sequence of photos from a test of the remotely controlled bomber.



A B-17 before it was stripped of all nonessential parts and made into a flying bomb. This aircraft fell short of its target during its Aphrodite flight.

British losses and the adverse effect of the V-weapons on British morale was so great that Gen. Dwight D. Eisenhower, supreme allied commander, directed Crossbow have absolute priority over all other air operations, against the strong advice of Lt. Gen. Carl A. Spaatz, commander of US Strategic Air Forces in Europe.

Assault Drones

Spaatz was convinced the bombing operations being conducted under Crossbow were ineffective in that the typical target size of a V-1 or V-2 launching area did not warrant the massive expenditure of bombs being used. Later, Crossbow was recognized as a failure in its efforts to reduce German V-1 and V-2 launches, even though it consumed almost 21 percent of the Allied strategic bombing effort during its course. Spaatz proposed that attacks should be concentrated on major targets, such as the Pas-de-Calais electrical grid, and the development of a new bombing technique against hardened targets.

Under his urging, Gen. Henry H. "Hap" Arnold directed Brig. Gen. Grandison

Gardner to begin experiments with explosive-packed bombers flying under radio control. At the same time, Spaatz initiated an in-theater experiment, which became known as Aphrodite (sometimes coded with other names such as Anvil or Castor) to use radio-controlled bombers as guided missiles.

What we now call unmanned aerial vehicles or remotely piloted aircraft were earlier simply called pilotless aircraft. They were of immediate interest to the American military services. Considerable effort was made with autonomous cruise missiles presaging the Nazi V-1 as early as World War I, when the famous Kettering Bug was built and tested.

In the post World War I years, both the US and Great Britain experimented with full-size aircraft flown under remote control, but the most successful efforts were those inspired by the Hollywood character actor Reginald Denny, whose line of radio-controlled target drones frustrated American gunners for years. His Radioplane firm manufactured more than 17,000 target drones, all flown with



A pilot with the Aphrodite project sits inside one of the stripped-down bombers. Once airborne, the crew had to bail out.

reasonable precision under radio control from the ground. The US Navy conducted radio-control experiments during the 1930s, during which the aircraft, a Curtiss N2C-2, was controlled from the air by a mother aircraft. The AAF adopted the concept and subsequently flew Culver PQ-8 and PQ-14 target drones usually flown from a Beech C-45 mothership.

Thus it was not completely extraordinary that someone should suggest that war-weary B-17s and B-24s could be adapted for this purpose.

Things moved swiftly during World War II, and after Doolittle approved the plan on June 26, the 562nd Bomb Squadron began work. In a parallel effort, the US Navy began to modify Consolidated PB4Y-1s to become assault drones, under Anvil.

The 562nd quickly stripped worn-out Flying Fortresses of all nonessential equipment, and tried to make the cockpit as easy as possible for a volunteer pilot and flight engineer crew to both use. Here was the trick: The pilot and flight engineer would get the stripped-down bomb trucks airborne, and then they had to bail out.

Two television cameras were set up to allow a view of the main instrument panel and the ground to be transmitted to the mother ship, and radio remote-control equipment developed for the Azon guided bomb was installed. The entire aircraft was then packed with 20,000 pounds of the powerful British Torpex explosive. This changed the center of gravity and the flying characteristics of the drone.

The operational concept called for the drone to take off and fly to an altitude of 2,000 feet, where control would pass to the mother ship. It was at this point that the crew would bail out.

Ideally, the mother ship would then fly the drone to the target area, where it would attack through the enemy defenses, bringing a huge weight of explosives on an important target. Each mission was a major effort, as escort aircraft, observation aircraft, and decoy aircraft were all employed to cover the mother ships and their drone "babies."

In an incredibly short time, the 562nd had prepared 10 drones plus four mother ships—and completed training for the volunteer crews.

The first Aphrodite mission came on Aug. 4, 1944. It was an utter failure, as were the next 18 attacks. On most missions, control failures caused the drones to crash, usually into the sea. Sometimes the bomb-laden drones fell back on English soil. More rarely, they hit somewhat near an intended target.

In their initial operations, a rivalry developed in which both the AAF and the Navy teams kept their methods private, not sharing all the information that they might have. Neither team had the expertise on hand to evaluate their instructions on how to load, wire, arm, and successfully detonate the huge loads of Torpex. The Torpex went aboard the aircraft in individual boxes weighing about 60 pounds. These had to be stored, stacked, and wired in such a way that they detonated simultaneously on impact.

The AAF apparently followed traditional means in both arming and detonation techniques. Operation Aphrodite might well have been forgotten by now, if the Navy had done the same.

Instead, a new electronic safety device was incorporated in the Navy arming system. According to the accounts in *Aphrodite: Desperation Mission*, by Jack Olsen, essential ground personnel were aware of a fatal flaw in the system that could allow movement of the control switch to not only arm but detonate the explosive. When the vital discrepancy was pointed out, the official Navy reaction was that the device had been designed by experts and was not to be altered in the field.

Joe Kennedy Jr., Aphrodite Pilot

On Aug. 12, 1944, a single drone aircraft of the Navy's Anvil program was assigned to attack the already destroyed site at Mimoyecques in France. Unfortunately, the former AAF B-24, converted first to Navy PB4Y-1 designation, and then given the drone designation BQ-8, exploded over the Blyth Estuary in Britain. Two men were killed in the premature explosion, Lt. Wilford J. Willy and Lt. Joseph P. Kennedy Jr.

Kennedy was on his second combat tour as the pilot of a PB4Y-1 on anti-submarine patrol, and might have chosen to return home. However he was intrigued by Anvil and volunteered to fly the takeoff and hand-over of the BQ-8. Each of the converted aircraft was essentially an experiment, in which new equipment and new explosive mechanisms were integrated with the wiring of the drones. Kennedy's aircraft was packed with 21,700 pounds of Torpex.

There was an amazing political juxtaposition at play, as Kennedy's BQ-8 was followed in flight by a de Havilland Mosquito carrying another prominent

American, Col. Elliot Roosevelt, the son of the US President. (Roosevelt specialized in reconnaissance work and ended the war with 300 combat missions and a Distinguished Flying Cross.)

Anticipating bailout in about 10 minutes, Kennedy turned control of the BQ-8 over to the mother ship, which had completed one turn by remote control when something detonated the Torpex. The BQ-8 and its crew disappeared in a blinding flash of light, with scattered wreckage falling over Blythburgh, in Suffolk. More than 50 people were injured on the ground.

Spaatz, Doolittle, and Arnold were all too aware of the political sensitivity of the incident as Roosevelt's Mosquito returned, damaged, to base. The Navy launched a board of review. The possibility that Kennedy had caused the explosion by prematurely arming the system was rejected, and he was posthumously awarded the Navy Cross, the Distinguished Flying Cross, and the Air Medal. Willy received the Navy Cross.

What caused the explosion may never be known, but given the complexity of wiring new radio control equipment into a war-weary airplane, and the well-known assessments of the arming system by Navy personnel, it is probable that the controls Kennedy operated while preparing to bail out somehow triggered the explosion.

Despite the lack of success, the members of the Aphrodite team were undeterred by their succession of failures and pressed to have the concept developed for the conclusion of the war against Germany and for introduction into the war against Japan. Their enthusiasm was not dampened by the discovery that attacks on well-defended targets such as the submarine pens at the German archipelago Heligoland were costly failures.

The entire Aphrodite experience of playing catch-up with British and German science was in fact a naïve tribute to the iron clad security and true nature of US science at the time.

The full weight of American (and emigrant) science and industry and about \$5 billion had been devoted to the Manhattan Project to develop the atom bomb, and to the Boeing B-29 to deliver it. These programs reduced primitive experiments such as Aphrodite to footnotes in history. ■

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