The Incredible Story of the QH-50 DASH

The First Unmanned Helicopter Turns 50

By Samuel S. Evans

Gyrodyne QH-50C on the USS Andersen in the Gulf of Tonkin, August 1964.

On Sunday, September 26, 2010, Peter P. Papadakos and his wife, Barbara, arrived at after driving over 2500 miles from their home in . The bulk of the load in the bed of their Ford F250 pick-up and in the specially constructed trailer it pulled was a disassembled QH-50D DASH (Drone Anti-Submarine Helicopter); but packed all around the components and parts that would assemble into a fully restored unmanned aerial vehicle were decades of aviation history. This particular QH-50 was Navy Bureau Number (you can't have a "tail number" with no tail) DS-1757. Judging from its log book, it had a rather bland past. It entered the service with the Navy in 1969 and with only a few flight hours to its credit and some limited time deployed at sea, it was mothballed with the rest of the QH-50 fleet in 1970. However, the story behind the development and deployment of the QH-50 DASH is much larger than this lone aircraft.

The Founder

The story of the QH-50 starts with its founder, Peter J. Papadakos. Born in 1914, the senior Papadakos spent his early years in America. As a young child, Peter grew up in Portland, Oregon, and later Norfolk, Virginia, where his family owned several restaurants. At the age of seven, his father was asked to return to Greece to run the family olive farm. Moving from America to a one room, dirt floored cabin on a 40 acre olive farm was a traumatic event for Peter. He vowed to return to America.

At the age of ten, Peter broke his leg in an accident involving a farm cart. The broken leg resulted in a serious infection, which almost cost him his life. The resulting reduction in mobility caused him to focus more on his school studies than farm work. He excelled in school and never lost his dream to return to America.

After completing his high school education in Greece in 1933, he informed his father he was returning to to pursue his dream of becoming a pilot and designing his own airplane. He moved to New York and worked in a relative's Greek restaurant to pay for his tuition to attend New York University. Although it took him 8 years of part time studies, when he graduated, he carried a Bachelor's Degree in Aeronautical Engineering and had soloed in a Stearman biplane. While in college, he also worked part time for five years at aircraft manufacturer Curtiss-Wright in Brooklyn. Upon graduation he moved to their factory where they made P-40B Warhawks.

In 1945, he went to work for Bell

DS-1757, a QH-50D, was installed in Penn State's Hammond Building on September 30th.

The Gyrodyne GCA-2B was the first US compound helicopter.

The DSN-1 (later QH-50A) was an unmanned version of the YRON-1. First unmanned shipboard landing was on December 7, 1960.

The YRON Rotorcyle was a one-Marine reconnaissance helicopter. Peter J. Papadakos is shaking the pilot's hand.

Aircraft, working on the P-39 Airacobra, and two years later moved to Grumman to work on rocket guidance systems. Peter founded Gyrodyne Company of America (GCA) in 1946 with the intent to produce a helicopter with better performance than any of the time. In 1949, he learned of the bankruptcy of Bendix Helicopter and was able to purchase the company with $5,000 he borrowed from a friend. Bendix Helicopter had developed a one-man coaxial helicopter, the Bendix Model K, but had attempted to control yaw using downwash on the vertical tail. Bendix's lack of success in controlling this helicopter resulted in the loss of government contracts and their eventual bankruptcy. Peter believed he could fix the control problem and bought Bendix.

He consolidated Bendix assets and leased a hangar in Massapequa, New York and converted the 5-seat Model J into the Gyrodyne GCA-2B compound helicopter. This aircraft had a gross weight of 5400 lb and was powered by a 450 horsepower radial engine, as well as a 95 hp engine on each side powering a propeller for forward thrust. Peter used this aircraft to win over investors at air shows, while he continued to improve the design.

With new funds from investors, he purchased 500 acres of land on the North Shore of Long Island, New York. He converted a former flower nursery into a facility for manufacturing aircraft and aircraft parts. The former bulb storage facility became the main building for engineering, drafting and machine shop work. To keep his company working Peter's machine shop took on work for Republic and Grumman. Peter even sold off surplus flower bulbs when business was slow. Peter also used innovative pay techniques in order to entice skilled machinists to stay with his company. Most of the 50 or so part time employees held other jobs while working at Gyrodyne in exchange for company stock; they made $5.00 an hour, which was paid out in shares at $5 per share.

At the facilities now called "Flowerfield," Gyrodyne engineers continued to improve the 2B. At one point they literally cut the Model 2 in half to make improvements, without Peter's knowledge. In June 1951, Gyrodyne received its first contract from the U.S. Navy Bureau of Aeronautics to investigate the flying qualities of the compound helicopter.

During this time, the non-compound Model 2C was developed, and, eventually, a miniaturized version, called the Rotorcycle. The Rotorcycle answered a Korean War requirement for a small helicopter to be loaded into a tube for air-drop to a downed airman behind enemy lines. The intent was the pilot would "snap" the helicopter together and fly to friendly lines. As the development of the Rotorcycle was completed in 1957, after the Korean conflict had ended, the vehicle did not go into production. However, the Rotorcycle did introduce a critical innovation. It incorporated a new means for yaw control; the tip brake. This simple innovation solved the issue of lack of yaw control in low speed autorotation, which was a problem for coaxial helicopters up to this point. This concept, which improved directional control characteristics, consisted of very small

A DSN-1 (QH-50A) on a hover fixture at Gyrodyne in 1965.

QH-50C, loaded with Mark 44 Warshot torpedoes, lifting off from a destroyer deck.

flap at the end of each blade that could be deployed or retracted by inputs to a long rod running through the rotor blade. The ability to easily and rapidly adjust drag on the blades allowed for much-improved yaw control. Mr. Papadakos later stated that the tip brake "made the coaxial possible" for Gyrodyne.

Growth of Gyrodyne

In an attempt to find a mission for the Rotorcycle, it was modified to make it more robust to make it useful as a Marine reconnaissance vehicle. It went through several engine iterations, finally settling on one developed by Dr. Ferdinand Porsche himself, the Porsche YO-95. At 4500 rpm, the 72 horsepower engine created adequate lift to carry a Marine with weapons and gear for a recon mission. The Marines bought a dozen of the YRON-1 Rotorcycles to test and fly.

In 1960, the design was modified to be flown remotely; the QH-50 drone helicopter was born. As the value of the QH-50 became apparent, Gyrodyne quickly became a major defense contractor, with over 700 employees. Peter no longer had to make components himself in the machine shop and his role changed from machinist to a more traditional role as company owner/manager, with Gyrodyne producing as many as 100 aircraft per year.

The turbine-powered QH-50 allowed the Navy to extend the guarded perimeter of its ships from the growing fleet of Soviet fast-attack submarines, which numbered over 300 by the mid-1950s. Using torpedoes mounted on the QH-50, Navy destroyers could counter a submarine threat before it could come within striking distance of a U.S. naval ship or convoy. The QH-50 was named the Drone Anti-Submarine Helicopter (DASH) and the DASH program was born, making its operational appearance with the U.S. Navy fleet in 1962. DASH received its approval of large scale production after President John F. Kennedy watched a DASH demonstration aboard ship during a Navy firepower demonstration off the West Coast in June 1963. The helicopter took off in moderate seas from its parent destroyer and delivered a torpedo close enough for the presidential party to see. Later in 1963, Secretary of Defense Robert McNamara approved budgeting for enough QH-50 aircraft to provide two plus one backup aircraft for each of the Navy's 240 Fleet Rehabilitation and Modernization (FRAM) destroyers.

Because of its flexible platform and available payload, through the years the QH-50 took on many alternate missions. One such critical mission in the Vietnam War was its use as an airborne observation and reconnaissance platform. The QH-50 "Snoopy" was loaded with real-time television cameras, transmitters and transponders. This configuration made it useful for replacing Marine recon and spotter teams that were normally sent ashore. The use of "Snoopy" undoubtedly saved many Marine's lives.

The DASH program was quite successful in accomplishing its intended purpose of extending the life cycle of WWII era destroyers. It gave another decade of life to the important, but aging, destroyers at a critical point in history. As with any military weapon system, changes in technology, employment concepts or even foes, can certainly influence program longevity. With operations in Vietnam draining production funds, DASH operations ceased fleet-wide in November 1970. Although the QH-50 was the basis of numerous experimental programs to mount reconnaissance, surveillance and even weapons systems on this platform, it never found a new large-scale employment mission.

Eventually all remaining QH-50s were transferred to Naval Air Station China Lake and White Sands Missile Range for use as target drones. There the drones continued their service by improving next

DS-1694, a QH-50D with the Snoopy sensor package, at Gyrodyne in New York before heading to Vietnam.

Peter P. Papadakos with DS-1757 in Las Vegas, prior to making the trip to Penn State.

generation anti-aircraft missiles and air defense systems. The U.S. Army used the QH-50 extensively in Stinger and Sergeant York testing and evaluation. Finally in 1996, the U.S. Army took control of the remaining assets and flew them in tests until May 2006. The few QH-50s that remained at that time were scheduled for final delivery to the ranges at Fort Irwin, California where they would serve their last days as ground targets.

Preservation of a Legacy

At the time of Peter J. Papadakos' death in 1992, the QH-50 program was mostly ended, but the influence of his life reached well beyond just the QH-50. The hospital he died in was built on land next to Flowerfield. He had donated this property decades earlier to build the State University of New York, Stony Brook and was recognized by then-Governor Nelson Rockefeller, who appointed him a trustee of the university. SUNY Stony Brook as well as its medical center flourishes today as a result of his generosity.

Perhaps his greatest legacy was his son, Peter P. Papadakos. Peter, the son, recognized the need to capture the important history behind his father's life work and founded the Gyrodyne Helicopter Historical Foundation. Up to the official end of the military's association with the QH-50 in 2006, Peter and an energetic team of former Navy DASH-men had been working to obtain and restore remaining QH-50 helicopters for display in museums across the country. Due to their efforts, QH-50s can be viewed in eight museums featuring Navy equipment across the United States. With word of the impending demise of the final QH-50 inventory, the Gyrodyne Historical Foundation took on one final mission. They were able to work with the Army to obtain enough airframes and parts to preserve a few more QH-50s for historical purposes and save them from being range targets. Over the next two years, Peter P. lovingly and painstakingly restored these aircraft to pristine condition. The first he delivered to Penn State University's Vertical Lift Research Center of Excellence. The second awaits delivery (pending completion of its exhibit space) to the Smithsonian National Air and Space Museum.

With the delivery of these QH-50 aircraft ends a largely unheralded, yet highly successful and important development in the rotorcraft industry. Perhaps their association with submarines – "the silent service" – did not allow for the clearly deserved accolades for being arguably the first vertical takeoff unmanned aerial vehicles, developed, flown and operationally deployed 50 years before similar UAVs that have achieved such high acclaim today. That such an innovative and revolutionary vehicle was developed and deployed by a man motivated by the promise of America makes this history even more special. That this important legacy is brought to light by the equally hardworking and motivated son of this aviation pioneer completes this story. Much thanks to Peter J. Papadakos for his innovation, motivation and proliferation. Through his efforts we learned many lessons in the development of VTOL UAV helicopters, bringing the aviation world the first operational unmanned helicopter, the first reusable attack UAV, the first USN destroyer-based-helicopter system, the largest deployed UAV system (758 aircraft on 165 ships), and the only nuclear-qualified UAV ever built (the Mk.57 nuclear depth bomb). Through the efforts of his son these lessons have been brought to light for generations to learn in the future.

About Gyrodyne

In incredible amount of information on the DASH story can be found at the Gyrodyne Helicopter Historical Foundation website: www.gyrodynehelicopters.com. All photos are courtesy of the Gyrodyne Helicopter Historical Foundation. All rights reserved.

DS-1289, a QH-50C, was also restored in 2010 and will eventually be on display at the National Air and Space Museum.

About the Author

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