

GPS mathematician Gladys West helped change the military and lives

By Jared Mccallister, New York Daily News on 02.21.19

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Gladys West is inducted into the Air Force Space and Missile Pioneers Hall of Fame during a ceremony in her honor at the Pentagon in Washington, D.C., December 6, 2018. West was among the so-called "Hidden Figures" part of the team who did computing for the U.S. military in the era before electronic systems. Photo by: Adrian Cadiz

No, the world wouldn't go back to the Stone Age without GPS, but the Global Positioning System pioneered by U.S. Navy mathematician Gladys West has changed the world in increasingly immeasurable ways.

West, now in her late 80s, is the African-American woman who used mathematical and computer calculations to help create the military precursor of commercially used GPS, which is now entwined with our everyday lives.

Whether you are using a smartphone for travel directions or having lunch brought to your front door by an app-directed food delivery service, give thanks to GPS and West — and her game-changing achievements at the U.S. Naval Weapons Laboratory-Dahlgren, in Virginia, during her career there of more than 40 years.

According to GPS.gov, the official U.S. government website about GPS, the technology has created a wide range of opportunities for use and increased productivity in aviation, space, public safety and disaster relief, agriculture and other governmental and commercial fields.

Last December, West was presented with the U.S. Air Force Space and Missile Pioneers Award for her "decades of contributions to the Air Force's space program."

The Air Force — which manages America's GPS satellites orbiting the Earth — is among the institutions that recognize the invaluable impact of GPS and the major contributions of West.

The high-ranking Air Force honor recognizes "the leaders of the early years of the Air Force space program" and salutes "innovators whose vision and perseverance overcame the obstacles of the unknown, those who transformed the cutting edge of technology into operational systems, and those who dedicated their lives to exploring space in support of our national security concerns."

Along with aiding America's space program and military applications, plus millions of smartphone and computer users, the technology aids app-dependent taxi services and a multitude of businesses and customers who have benefited from West's calculations and research at Dahlgren since GPS first went commercial in the 1980s.

Like GPS, jet engines, drones, microwave ovens and even sticky waterproof duct tape, military innovations have revolutionized our everyday lives.

In an interview commemorating the 100th anniversary of the Navy's Dahlgren installation in 2018, West explained that she had finished her mathematical education at the historically black college, Virginia State University, and started a teaching job before leaving education for a position at Dahlgren — where she stayed from 1956 until she retired in 1998.

At Dahlgren, West did the mathematical calculations necessary to create the satellite-run radio navigation system operated by the U.S. Air Force. The system provides geolocation and time information to GPS receivers to accurately determine locations.

Not long after she was hired at the military installation in 1956, West's accomplishments were literally stellar — she took part in groundbreaking astronomical studies that determined the regularity of Pluto's motion relative to Neptune, and other planetary work, in addition to her GPS achievements.

"I did hand calculations on a [mechanical] Marchant calculator — you know, we had to verify data," West said of her work before a computer was installed at the Navy base. "At that time, my title was mathematician, but just as I was coming to Dahlgren, they were getting a new computer in," she recalled, describing the NORC (the state-of-the-art IBM Naval Ordnance Research Calculator), which was arguably the most powerful computer of its day.

With the new computer, West successfully worked on a model to use satellites to precisely measure surface elevations of the Earth and determine specific locations.

The initial GPS use by the military in the mid-1990s included accurate satellite-enhanced navigation for missile launching, communications, troop movements and other activities.

"That was sort of interesting; those are the forerunner of the Global Positioning System," she said of her work. "When you look at the big picture, it was great, you know; but when you're working, you have got to be detailed, making sure you're accurate," she said, adding that she had the opportunity to work with "important, brilliant scientists" while at Dahlgren. There were few black employees at Dahlgren then. West met her husband, Ira, there. The couple has three adult children and seven grandchildren.