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STRIKE TESTED

Pushing the Envelope with VX-23



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Student Pilots Complete F-35C Carrier Quals Aboard USS Nimitz

New Technology in Helmet Eliminates Green Glow

By Commander, Joint Strike Fighter Wing Public Affairs



An F-35C Lightning II assigned to the "Raiders" of Fighter Attack Squadron (VFA) 125, waits to taxi on the flight deck of aircraft carrier USS Nimitz (CVN 68).

U.S. Navy photo by MC3 Christopher R. Jahnke



The U.S. Navy F-35C program's first Category 1 students completed night carrier qualifications aboard USS Nimitz (CVN 68) July 18, using the latest organic light-emitting diode (OLED) advancements for the F-35C helmet mounted display system (HMDS).

During previous carrier detachments, F-35C students without previous night carrier experience were not allowed to complete night carrier arrestments due to complications from the helmet's "green glow" created from liquid crystal display (LCD) technology in the Generation III HMDS. This glow made it difficult to see the full resolution of the night vision video feed and hindered pilots' ability to distinguish the carrier's lighting environment during low-light combat configuration.

In an interview last August aboard USS Lincoln (CVN) during Operational Testing I, then-commanding officer of Strike Fighter Squadron (VFA) 125 Capt. Tommy Locke said, "There are some complexities with the green glow that we deal with now, but we only do it with experienced pilots. In that really dark environment, you can't get the display down low enough where you can still process the image on



U.S. Navy photo by MC3 Christopher R. Jahnke

One of VFA 125's F-35Cs launches off the flight deck of aircraft carrier USS Nimitz (CVN 68) during student night carrier qualifications in July.

“The improved Generation III helmet, with OLED technology, works as advertised and is on its way to being fully implemented into the F-35C community.”

the display and once you bring the display up high enough where it can, that information conflicts with the outside world.”

The new OLED technology reduces green glow-induced pilot disorientation by only illuminating the active pixels and providing a crisper picture. All VFA-125 and VFA-147 Category 1 pilots were able to successfully complete their initial night carrier qualifications aboard USS Nimitz using the OLED-updated HMDS. Category 1 pilots are newly-winged aviators who have no previous night carrier experience and have never flown a fleet aircraft. They are the priority for receiving OLED technology and it will eventually be provided to all F-35C pilots.

“All of our Category 1 pilots successfully completed their night carrier qualifications during the squadron’s latest detachment to USS Nimitz,” said VFA-125 Commanding Officer, Cmdr. Adan Covarrubias. “The improved Generation III helmet, with OLED technology, works as advertised and is on its way to being fully implemented into the F-35C community.”

The OLED solution requires both hardware and software updates to the HMDS and the display management computer, helmet (DMCH) in the aircraft. These modifications are completed in-house by Navy personnel.

The advancement of these capabilities enhances a pilot’s situational awareness and reduces workload during low-light night carrier landings. When combined with the F-35C’s stealth technology, state-of-the-art avionics, advanced sensors and weapons capacity and range, the latest HMDS provides pilots with an advanced aircraft interface that offers unprecedented air superiority and advanced command and control functions through fused sensors. These state-of-the-art capabilities give pilots and combatant commanders unrivaled battlespace awareness and lethality. 🦅



Sailors signal that a VFA-125 F-35C is ready to launch from USS Nimitz.

U.S. Navy photo by MC2 Ian Kinkead



The Raiders land their F-35C on the flight deck of USS Nimitz.

U.S. Navy photo by MC3 Olivia Banmally Nichols



Sailors inspect a VFA-125 F-35C before it launches.





U.S. Navy photo by MC3 Olivia Bannally Nichols

An MH-60S Seahawk helicopter, assigned to the "Indians" of Helicopter Sea Combat Squadron (HSC) 6, and a VFA-125 F-35C land aboard USS Nimitz.



U.S. Navy photo by MC3 Christopher R. Jahnke

VX-23 Tests New F-35 Helmet Mounted Display

By Lt. Cmdr. William "Carney" Bowen III

During F-35C Lightning II Developmental Test III in August 2016, three Navy developmental test pilots determined the "green glow" level associated with the liquid crystal display (LCD) Generation III Helmet Mounted Display System (HMDS) was deficient and resulted in unsuitably high workloads during low-light night carrier landings to the USS George Washington (CVN 73).

In response to this deficiency, the F-35 Joint Program Office funded the rapid development of a prototype HMDS that uses organic light emitting diode (OLED) technology to eliminate the green glow associated with display projection.

In October 2017, Air Test and Evaluation Squadron (VX) 23's F-35 Carrier Suitability Department completed an evaluation of the prototype OLED HMDS culminating with two "Salty Dog" pilots executing low-light night carrier landings to USS Carl Vinson (CVN 70).

Both pilots reported favorable results with the prototype OLED HMDS—noting a total absence of green glow and a pronounced reduction in overall workload during the low-light night carrier-landing task as compared to legacy aircraft. Consequently, the OLED HMDS became a Program of Record in 2018.

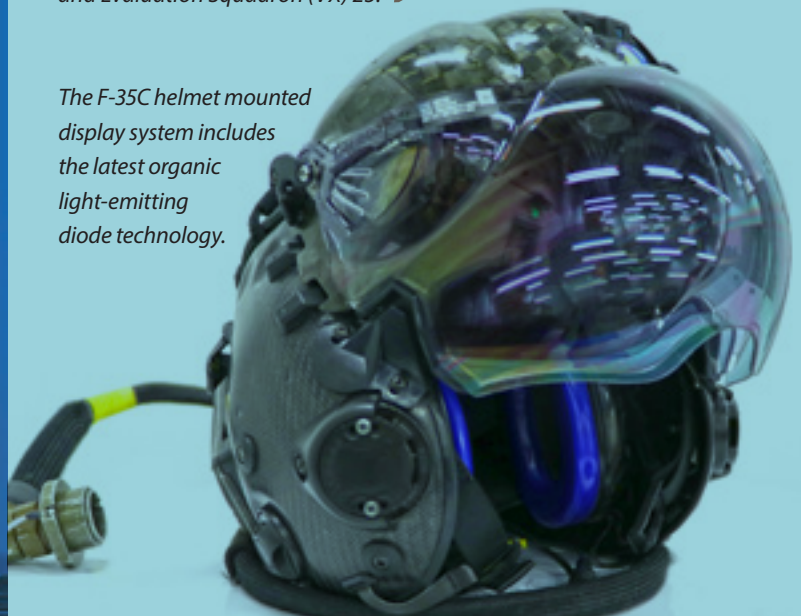
In March 2019, the same two VX-23 pilots evaluated the production representative version of the OLED HMDS. In addition to verifying the production representative, OLED HMDS performance met or exceeded that seen with the prototype during low-light night flight test.

At the same time, a number of off-nominal catapults and arrestment test points were executed at the Naval Air Station Patuxent River, Maryland, TC-7 and MK-7 test sites to verify the new OLED HMDS could survive the carrier environment.

Following these successful test events, Strike Fighter Squadron (VFA) 125 and VFA-147 took Category 1 students aboard USS Nimitz, where they successfully completed their night carrier qualifications using the OLED-updated HMDS.

Lt. Cmdr. William "Carney" Bowen III is an F-35C test pilot with Air Test and Evaluation Squadron (VX) 23. 🦅

The F-35C helmet mounted display system includes the latest organic light-emitting diode technology.



U.S. Navy photo by Lt. Cmdr. Lydia Ellen Bock