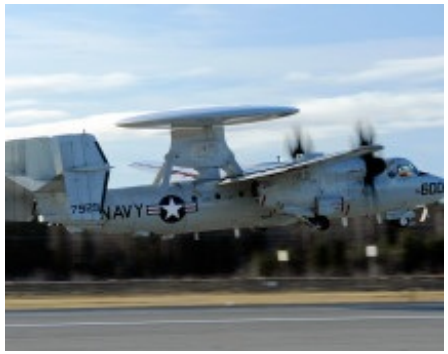
Interview With Capt. John Lemmon, Program Manager PMA-231

E-2D Advanced Hawkeye is ready for full rate production



Written by: Jan Tegler on April 1, 2013

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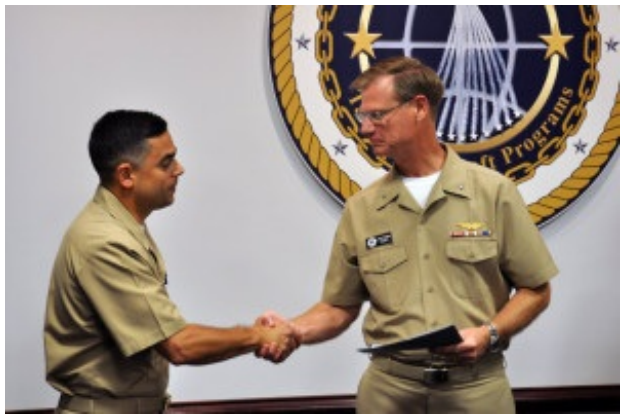
An E-2D Advanced Hawkeye assigned to Air Test and Evaluation Squadron ONE, Patuxent River, Md., takes off during RED FLAG-Alaska 13-1 Oct. 9, 2012, Eielson Air Force Base, Alaska. The E-2D's radar sensor capability delivers critical actionable data to joint forces and first responders. U.S. Air Force photo by Staff Sgt. Jim Araos

In early February the latest version of the U.S Navy's venerable E-2 Hawkeye was declared "suitable and effective" by Air Test Evaluation Squadron (VX) 1 at NAS Patuxent River, Md. VX-1 issued the Initial Operational Test and Evaluation (IOT&E) report after nearly 10 months of rigorous testing, aiding the Defense Acquisition Board in approving the E-2D Advanced Hawkeye for full-rate production next January.



Capt. John Lemmon (left) is congratulated by Rear Adm. Donald Gaddis, program executive officer for Tactical Aircraft Programs (PEO(T)), after assuming command as program manager for the Hawkeye, Advanced Hawkeye and Greyhound Program Office (PMA-231), Naval Air Systems Command, Paxtuxent River, Md., May 29, 2012. U.S. Navy photo.

If the program remains on track, Advanced Hawkeyes should start rolling off Northrop Grumman's St. Augustine, Fla., manufacturing line exactly 50 years after the E-2A entered operational service in 1964. Incorporating a host of improvements, the E-2D is meant to serve as the "digital quarterback" for the Navy's net-centric carrier battle groups.

Capt. John "Chet" Lemmon is the program manager of PMA-231, the team responsible for bringing the E-2D to this milestone. Heading up the program office since last June, Lemmon took the time to speak with DMN about the challenges of IOT&E, the improvement in capability the Advanced Hawkeye represents, and how its upgrades will expand the Hawkeye mission.

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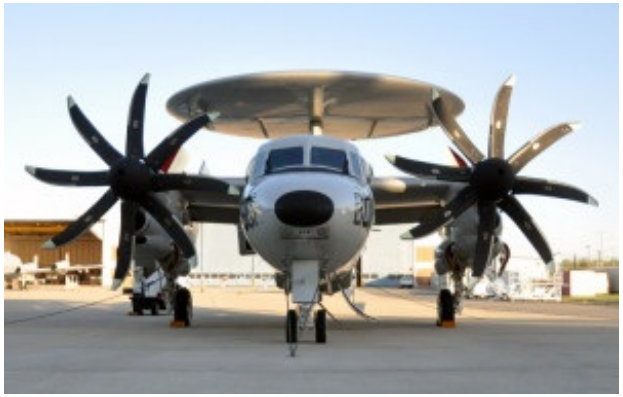
Jan Tegler : When did the IOT&E program for E-2D get under way?

Capt. John Lemmon: The Initial Operational Test and Evaluation (IOT&E) period started in February 2012 and concluded in October 2012. COMOPTEVFOR [Commander Operational Test and Evaluation Force] released the report in January 2013, which assessed the aircraft as operationally effective and suitable for shore-based missions, and recommended that we complete more ship-based testing before we fully deploy squadrons. VX-1 was only able to complete a limited data set of shipboard operations. There were some things for us to work and improve on just like any new system, but overall we were very pleased with the report and its recommendations.

Please explain the challenge of taking the Advanced Hawkeye through IOT&E and bringing it to this point. What were the biggest hurdles?

The preparation for Operational Test included 1115 flights, 3411 flight hours and more than 12,000 test points over a five year period. After that, the program office turned the aircraft over to VX-1, the Operational Test squadron. VX-1 was tasked with independently evaluating the aircraft and its support systems, covering everything from maintenance procedures to airborne tactics, using them like the fleet maintainers and operators would.



The E-2D Advanced Hawkeye is ready for full-rate production. Air Test and Evaluation Squadron (VX) 1 tested the aircraft for ten months during the Initial Operational Test and Evaluation (IOT&E) period. The IOT&E report aided the Defense Acquisition Board in making their full-rate production decision in January. U.S. Navy photo

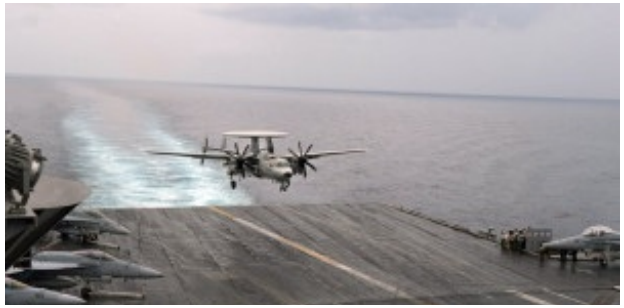
The program office was not as directly involved with Operational Test as we were with Developmental Test. VX-1 executed 320 flights and got just over a thousand hours of operating time on the radar. They

were very thorough, looking at every system on the plane. VX-1 went on detachments to Nellis Air Force Base, Point Mugu, Fallon, Eglin AFB, and Holloman AFB. The logistics of moving people and aircraft to the places they needed to test were extremely challenging. Capturing the performance, recording and assessing the data, performing debriefs, and assembling the test report was a significant accomplishment for VX-1.

With IOT&E complete, what does PMA-231/VX-1 see as the most significant improvement to the Hawkeye? What really stands out capability-wise?

The most significant upgrade is the AN/APY-9 radar, which is the heart of the aircraft. Using AESA technology, the radar has completely new modes of scanning and operation, sees thousands of targets up to hundreds of miles away and is a tremendous improvement over the E-2C. The cooling capacity and power of the aircraft had to be increased to accommodate the more powerful radar. To complement the radar, a glass cockpit and digital architecture was implemented that gives the aircraft more mission flexibility. There's a mission display up front called the tactical fourth operator, which allows the co-pilot to help with tactical functions. Smaller upgrades to the IFF capability and CEC (Cooperative Engagement Capability) boxes round out the package of a dramatically revamped and improved aircraft.

The Black Dart exercise mentioned in a recent press release is quite interesting. What were the goals for the Advanced Hawkeye in that testing evolution?



Black Dart is designed to test the military's ability to counter enemy unmanned aircraft systems. UAS are especially challenging targets when they fly low and slow. We flew Black Dart events in August and were able to compare events with E-2Cs flying out of NAS Point Mugu. The E-2D was tested in

Following successful test and evaluation where the program was rated operationally suitable and effective, Northrop Grumman's E-2D Advanced Hawkeye has been approved for full-rate production by the Office of the Secretary of Defense. Northrop Grumman photo

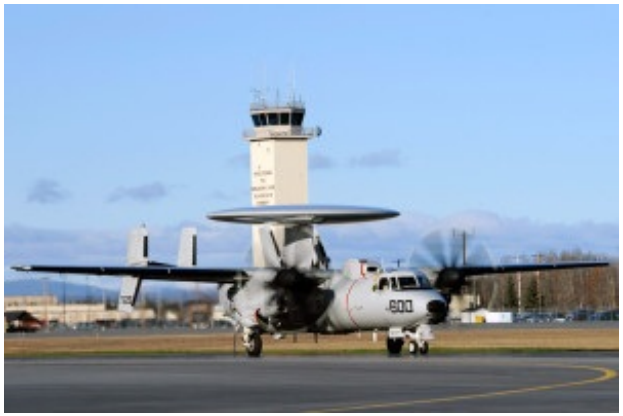
mountainous terrain near Nellis Air Force Base and elsewhere throughout the country and the aircraft performed well. Testing also showed an increase in combat effectiveness due to the E-2D's ability to track small, fighter-size targets in difficult environments. The data showed significant improvements in radar and mission systems performance in overland and littoral scenarios, which have historically been a challenge for the E-2C.

Generally speaking, what do the upgrades mean for the operational employment of the E-2D? How might it be utilized differently from the E-2Cs that will remain in service alongside the E-2D for a few years?

The upgrades to the E-2D platform allow for an expanded mission capability set, which means the aircraft can better support Carrier Strike Group tasking. The E-2D mission set now includes theater air and missile defense (TAMD) and counter-cruise missile capabilities which weren't necessarily possible with the E-2C. The improved communications and sensor performance enable better situational awareness for the entire Strike Group.

The APY-9 radar in the E-2D was designed for increased overland and littoral detection capabilities. The E-2C has a mechanically rotated 360-degree airborne early warning (AEW) radar. The E-2D has two additional modes of the radar, like the enhanced sector scan, that slows the radar down in an area of interest. The APY-9 also has an enhanced tracking sector mode that physically locks down the radar to enable a rapid search/track revisit time. This capability has shifted the concept of operations. The idea of the E-2D is to have two aircraft airborne when required. The E-2C mission of 360-degree AEW coverage is still essential to strike group air defense, and until all the current aircraft are replaced with the E-2D we will still utilize both aircraft in support of the command and control missions in a complementary way.

What kind of learning curve will crews transitioning from the E-2C to the E-2D face?



An E-2D Advanced Hawkeye assigned to Air Test Evaluation Squadron (VX) 1, Patuxent River, Md., taxis down the runway during Red Flag-Alaska 13-1, Oct. 9, 2012, Eielson Air Force Base, Alaska. U.S. Air Force photo by Staff Sgt. Jim Araos

The major difference in the E-2D and the E-2C is how information in the aircraft is gathered, processed and displayed. The glass cockpit has considerably changed how the fleet interacts with that information. When it comes to how the fleet will transition, it's broken into three parts; learning the system differences and similarities, figuring out how the differences will impact the way the fleet uses the aircraft and performs the mission set, and utilizing simulators and aircraft to train. Learning the system differences and similarities and figuring out how that will impact the fleet are both conducted under the guidance of the Fleet Replacement Squadron (VAW-120). Training with simulators and aircraft is led by the Hawkeye/Greyhound Weapons School, which ensures the squadrons are ready to start workups with a carrier air wing and eventually deploy.

The E-2D program has been in progress for a little over a decade and has evolved over that time. How much of the overall upgrade is available on the 9/10 aircraft already delivered and how much will be available when/if full-rate production begins in 2014?

We're still delivering our Low Rate Initial Production aircraft and our tenth aircraft will deliver by the summer of 2013. There are no variants; all E-2D aircraft share a common configuration, including the radar, mission computer and communication. Full-rate production of Lot One has begun.

The program of record remains at 75 aircraft, correct?

Yes.

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