Raytheon’s SPY-6 Leads Family of Advanced Radars

BACKGROUND
Raytheon’s SPY-6(V)1 Air and Missile Defense Radar (AMDR) is the next-generation radar for the Aegis Combat System deployed on Arleigh Burke-class guided-missile destroyers (DDGs). AMDR includes an S-band radar and radar suite controller, and, at least for the first 12 shipsets, the SPQ-9B X-band high-resolution phased-array radar built by Northrop Grumman. The SPY-6(V)2 and SPY-6(V)3 — based on the same AMDR architecture — are smaller rotating and fixed-face versions called the Enterprise Air Search Radar (EASR).

SCOPE
The AMDR will be installed on Flight III DDGs, except for DDG 127, beginning with DDG 125. Currently, 22 DDGs are planned to be equipped with the AMDR.

TIMELINE
Raytheon was selected to develop the AMDR in October 2013 under a $385 million contract, with $1.2 billion in low-rate initial production (LRIP) options for nine shipsets. The first AMDR was installed at the Pacific Missile Range Facility in Hawaii in July 2016 for final validation testing. In August 2016, Raytheon won the EASR contract that includes production options for 16 radars, a combination of fixed-face and rotating radars for carriers and amphibious ships. LRIP 1 began in April 2017 for three shipsets. A fourth was ordered in April 2018. An order for three more is anticipated this April.

WHO’S WHO:
Scott Spence is Raytheon’s senior director of Naval Radar Systems.

“The sensitivity of the digital active electronically scanned array SPY-6(V)1 AMDR is 70 times more that [of] the legacy sensor, a traditional, monopulse radar. The gain in sensitivity is the product of the power output of the radar’s gallium nitride transmit/receive modules.

The digital beamforming and multibeam processing allow the radar operator to detect smaller targets at greater distances. The radar can perform 360-degree air defense missions while simultaneously providing defense against ballistic missiles.

The SPY-6(V)1 includes four fixed arrays, each with 37 2-foot-by-2-foot-by-2-foot radar module assemblies. Because the radar has proven scalable, a single-face rotating version of the scalable EASR has been designated SPY-6(V)2 and will replace the SPS-48/49 radars. The new sensor adds air traffic control to the common AMDR software baseline for aircraft carriers.

In the expanding family is a three-fixed-face version of EASR that will be installed on future aircraft carriers — beginning with John F. Kennedy (CVN 79) — as well as for the FFG(X) Future Guided-Missile Frigate, all of which are now part of the SPY-6 family of radars. EASR also will be fitted on America-class amphibious assault ships beginning with Bougainville and LPD 17 Flight II amphibious platform dock ships.

The U.S. Navy is looking at a scaled-down SPY-6 for retrofit on Flight IIA DDGs as the ships go through Aegis Modernization. The ships would be fitted with four fixed arrays of 24 radar module assemblies.”