

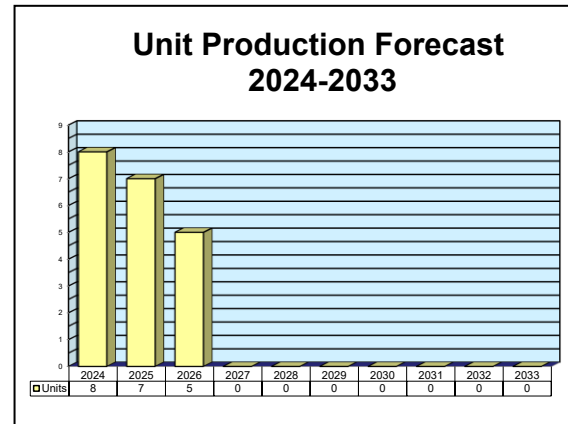
ARCHIVED REPORT

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AAQ-27

Outlook

- By 2026, the AAQ-27 is expected to cease new production alongside delivery of the final V-22 series tiltrotor
- It is possible that the AAQ-27 could be replaced by a newer, updated system or receive upgrades, as indicated by recent U.S. procurement of improved sensor I/O interfaces
- Further international customers do not seem likely



Orientation

Description. The AAQ-27 is a third-generation, mid-wavelength-infrared (MWIR), forward-looking infrared (FLIR) imaging system with three fields of view, designed for navigation, surveillance, and targeting applications.

Sponsor

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Status. In production and service.

Total Produced. As of January 2024, an estimated 454 aircraft sets had been produced. Each aircraft set is believed to require two units.

Application. The main U.S. platform for the AAQ-27 is the V-22 Osprey. The system has also been fitted to the Sikorsky S-70B2 Seahawk and Kaman SH-2G Super Seasprite helicopters.

Price Range. Based on the cost of similar products, Forecast International estimates the AAQ-27 to be priced at \$1.5 million.

AAQ-27**Contractors****Prime**

Raytheon	http://www.rtx.com/raytheon , 2501 W University Dr, McKinney, TX 75071 United States, Tel: + 1 (972) 952-2000, Prime
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Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; rich.pettibone@forecast1.com

Technical Data

Design Features. Based on an update to the AAQ-16B, the AAQ-27 allows pilots to see through smoke, haze, obscurants, darkness, and adverse weather with third-generation image quality and range performance. It incorporates an eyesafe laser rangefinder as well as an indium-antimonide (InSb) staring focal plane array with 640 x 480 detector elements. The staring sensor lacks the scanning mirror and other components of scanning infrared systems, resulting in both improved reliability and reduced volume.

	<u>Metric</u>	<u>U.S.</u>
Dimensions		
<u>Turret FLIR Unit (TFU)</u>		
Size: Height x Diameter	21.9 x 18.4 cm	14.19 x 11.95 in
<u>System Electronic Unit (SEU)</u>		
Size: Height x Length x Width	12 x 25 x 18.6 cm	7.84 x 16.28 x 12.06 in
Array Material	Indium-Antimonide (InSb)	
Detector Plane	640 px x 480 px	
Fields of View		
Wide	30° x 40° (1x)	
Middle	5.0° x 6.7° (6x)	
Narrow	1.3° x 1.73° (23x)	
Weight		
Total System	42.3 kg	93 lb
Turret	~22.7 kg	~50 lb

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The Australian Royal Navy's S-70B Seahawks carry a chin-mounted AAQ-27 unit.

Source: U.S. Navy – MCS 3rd Class Raul Moreno Jr.

Variants/Upgrades

AAQ-27 Retrofit Kit. The AAQ-27A retrofit kit upgrades fielded long-wavelength AAQ-16B systems.

AAQ-27 (3 FOV). The AAQ-27 (3 FOV) offers three fields of view to pilots. This variant was introduced to

meet the mission requirements of the Royal Australian Navy's Super Seasprite and Seahawk helicopters. The AAQ-27 (3 FOV) permits pilots to navigate during low-level missions and detect and identify long-range targets from high altitudes.

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V-22 Osprey Tiltrotor Aircraft: Main Platform for AAQ-27

Source: Boeing

Program Review

Background. The AAQ-27 is a variant of the AAQ-16 long-wavelength infrared (LWIR) developed for the Bell/Boeing Osprey V-22 tiltrotor aircraft. Originally designated the Infrared Detection Set (IDS), then the AAQ-16 (V-22), the device was later renamed the AAQ-27 MWIR staring sensor.

The Osprey comes in two designations: the MV-22 for the U.S. Marine Corps and Navy and the CV-22 version, which is a Special Operations Forces variant being procured by the U.S. Air Force. The USMC began procuring the AAQ-27 in 1987 under a series of three low-rate initial production (LRIP) contracts. Through 1998, 21 AAQ-27 units were ordered for a total of \$25.6 million. In September 1998, Raytheon reported that flight tests of five preproduction models delivered earlier to Bell/Boeing were underway.

AAQ-27 Flies Down Under

In September 1997, the Royal Australian Navy sought to upgrade its 11 SH-2G Super Seasprites with the AAQ-27 MWIR sensor. In 1999, it retrofitted 16 of its S-70B Seahawks with the AAQ-27. This upgrade contract included three spares. In 1999, New Zealand placed an order for four SH-2G helicopters; however, it

selected the AAQ-22 SAFIRE thermal imaging system for these aircraft.

First Deliveries

The AAQ-27's main platform, the V-22, is being produced in three blocks. A total of 29 Block A MV-22s were built, 20 of which are for training and testing. In early 2005, the V-22 completed a three-month operational evaluation. In July 2005, the V-22 was deemed "operationally effective," reliable, and able to be maintained by field mechanics. In September 2005, the Pentagon approved full production, and the following December, the first Block B combat-ready MV-22 was delivered to the USMC.

In September 2000, the USAF took delivery of the first CV-22. The Bell/Boeing team delivered the first two production CV-22s to the USAF in 2005. These two new-build aircraft are production-representative test aircraft and joined three remanufactured CV-22 test aircraft in the flight-test program. In all, Bell/Boeing delivered 19 Ospreys in 2005. In December of that year, Bell/Boeing was awarded the FY07 Lot 11 contract for long-lead components associated with the delivery of 14 MV-22 and two CV-22 aircraft.

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The first combat-configured CV-22 was delivered to the USAF in March 2006. Bell/Boeing delivered 13 MV-22s for the USMC and three CV-22s for the USAF in 2006. Ten of the 13 MV-22s were new-production aircraft; the remaining three were pre-Block A aircraft upgraded to the current Block B standard.

Contracts – 2006-2008

In August 2006, the U.S. Navy awarded a \$200 million contract for three MV-22 aircraft.

In September 2006, Bell/Boeing submitted a proposal for multiyear procurement of approximately 185 Ospreys between FY08 and FY12. In March 2007, the U.S. Navy specified a multiyear procurement of 167 V-22s (141 MV-22s and 26 CV-22s) over the five-year period FY08-FY12.

The following month, the Navy awarded the FY08 Lot 12 contract for long-lead components associated with the delivery of 12 MV-22 and five CV-22 aircraft. Work was expected to be completed in late 2010.

In March 2008, Bell Helicopter announced that the U.S. Department of Defense had awarded the company a \$10.4 billion, five-year procurement contract for the 141 MV-22 aircraft and 26 CV-22 aircraft specified by the Navy in March 2007. At the same time, the company said it had delivered 100 V-22 aircraft to the military. The contract covered the period from FY08 to

FY12. In September 2008, the Navy added five CV-22 aircraft to the contract.

Japan: First International V-22 Customer

In May 2015, the U.S. Defense Security Cooperation Agency (DSCA) revealed that Japan had requested approval for the purchase of 17 V-22B Block C Osprey tiltrotors. A purchase would make the Asian country the aircraft's first international customer.

The announcement was particularly auspicious because it went on to confirm that, like the U.S.'s V-22s, the Japanese aircraft would carry the AAQ-27. As part of the overall request, Japan called for the purchase of 40 of the EO/IR units.

The DSCA announcement was followed up by a concrete confirmation of a purchase in July 2015, when the U.S. DoD announced a Navy-brokered Foreign Military Sale for Japan's purchase of the V-22. Under the deal, Japan was to receive at least five MV-22s by the end of June 2018.

The first MV-22 was reported to be delivered to Japan in September 2017.

In July 2020, the U.S. State Department cleared the way for Indonesia to negotiate a potential \$2 billion purchase of eight MV-22 Block C Ospreys. The potential order included provision for 20 AAQ-27 systems.

Contracts/Orders & Options

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
Raytheon	8.0	Sep 1998 – Contract option from Boeing to provide seven additional AAQ-27 infrared systems. This third and final lot under the LRIP program brings the total number to 21, including two spares.
Raytheon	Not disclosed	Feb 1999 – Contract for the Royal Australian Navy's 16 Sikorsky S-70B2 helicopters, plus three spares.
Bell-Boeing	332.47	Jul 2015 – A modification to a previously awarded FPIF target multiyear contract to provide for the manufacture of five MV-22 tiltrotors and their delivery to Japan. The contract is a Foreign Military Sale. (N00019-14-C-0002)

Worldwide Distribution/Inventories

The U.S. Marine Corps, Air Force, and Navy use the AAQ-27, primarily for the V-22 Osprey. **Australia** equips its Sikorsky S-70B2 Seahawk and Kaman SH-2G Super Seasprite helicopters with the system. **Japan** has ordered the AAQ-27 to equip its V-22s. **New Zealand's** SH-2G Seasprites fly with the AAQ-27.

AAQ-27

Forecast Rationale

In the past, Raytheon Technologies' AAQ-27 mid-wavelength-infrared (MWIR), forward-looking infrared (FLIR) electro-optical system was produced to provide navigational, surveillance, and targeting capabilities to a variety of rotorcraft. However, any further production of the AAQ-27 is forecast solely in support of V-22 Osprey tiltrotor variants.

Until the summer of 2015, it appeared that the U.S. military was going to be the sole operator of the V-22. Therefore, prospects for increasing sales were limited. Then Japan became the tiltrotor's first international customer, briefly opening the door to the potential of further international orders.

In July 2020, the U.S. State Department cleared the way for Indonesia to negotiate a potential \$2 billion purchase of eight MV-22 Block C Ospreys. The potential order included provision for 20 AAQ-27 systems.

Since Japan's order, and the Indonesian Osprey approval, the international community has shown little interest in procuring the platform. The V-22 will almost certainly end its production run with only Japan and the U.S. counted as operators.

In the future, the V-22 could be outfitted with a newer multispectral EO/IR sensor. While it is unknown which system V-22 family operators will prefer, U.S. procurement of a new, more versatile and advanced sensor I/O interface is underway.

The AAQ-27 is expected to exit production alongside its primary platform, the V-22, by mid-decade.

Note: The production forecast indicates aircraft sets. Each V-22 aircraft set is believed to require two AAQ-27 sensor units.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program	High Confidence				Good Confidence			Speculative			Total	
	Thru 2023	2024	2025	2026	2027	2028	2029	2030	2031	2032		2033
Raytheon Intelligence & Space												
AAQ-27 <> United States <> Air Force <> CV-22												
Note: Each Forecast Unit Indicates 2 AAQ-27s												
	55	2	0	0	0	0	0	0	0	0	0	2
AAQ-27 <> United States <> Marine Corps <> MV-22												
Note: Each Forecast Unit Indicates 2 AAQ-27s												
	362	2	4	1	0	0	0	0	0	0	0	7
AAQ-27 <> United States <> Navy <> CMV-22B												
Note: Each Forecast Unit Indicates 2 AAQ-27s												
	37	4	3	4	0	0	0	0	0	0	0	11
Subtotal	454	8	7	5	0	0	0	0	0	0	0	20
Total	454	8	7	5	0	0	0	0	0	0	0	20