

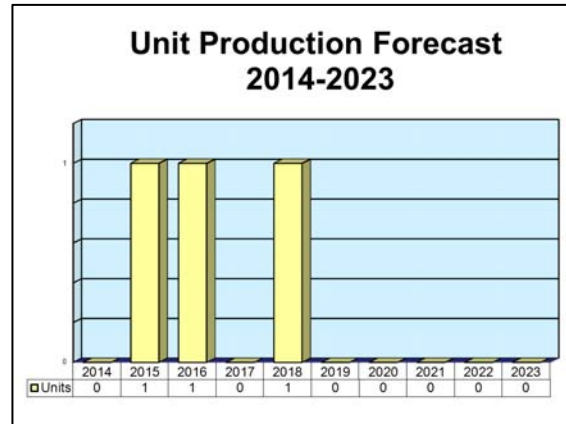
ARCHIVED REPORT

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ASR-11 (DASR)

Outlook

- FI estimates that Raytheon will sell about three ASR-11 radar systems in the coming decade
- This forecast is being driven by the United States' need to replace aging terminal-area surveillance radar at U.S. civilian and military airport sites
- The FAA is currently replacing and upgrading known obsolete ASR-11 commercial off-the-shelf hardware and software in all FAA ASR-11 systems previously fielded



Orientation

Description. The ASR-11 Digital Airport Surveillance Radar (DASR) is a terminal-area radar providing primary surveillance radar (PSR) coverage to 60 nautical miles, and monopulse secondary surveillance radar (MSSR) coverage to 120 nautical miles. The ASR-11 radar is manufactured by Raytheon.

Note: *The U.S. Department of Defense has given the ASR-11 Digital Airport Surveillance Radar the nomenclature GPN-30.*

Status. Available for sale.

Application. Airspace surveillance in the airport terminal area.

Price Range. Unit installation cost will probably run between \$2.7 million and \$3.8 million, depending on setup and ancillary equipment, excluding buildings and power equipment.

Sponsor

Raytheon
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 C4I Systems
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Contractors

Prime

Raytheon Integrated Defense Systems, C4I Systems	http://www.raytheon.com/businesses/ncs/c2s/AirTrafficManagement/ , 1001 Boston Post Rd, Marlborough, MA 01752 United States, Tel: + 1 (508) 490-3045, Fax: + 1 (508) 490-3322, Prime
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Comprehensive information on Contractors can be found in Forecast International's "International Contractors" series. For a detailed description, go to www.forecastinternational.com (see Products & Services/Governments & Industries) or call + 1 (203) 426-0800.

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

Technical Data

PSR (Primary Surveillance Radar) Antenna/Pedestal

- Two feedhorns for switchable high/low-beam patterns
- Dual-drive motor/gearbox assemblies, dual azimuth encoders
- Switchable linear/circular polarization with separate orthogonal weather data feed

PSR Transmitter

- Low voltage (42V) for safety
- Instantaneous startup
- No tuning or setup required

PSR Signal Processing

- Pulse interference suppressor rejects external in-band interference with negligible sensitivity loss
- 4 CPIs at staggered PRFs and cycling RF frequencies
- 5 pulses per CPI
- Velocity response >1,000 knots
- Configurable M of N binary integrator typically set to 2 out of 4 detections
- Target recognition algorithm used for enhanced range resolution

PSR Weather Processing

- Dedicated weather channel (dual) with reporting latency independent of target tracking
- Multiple-time-around returns and anomalous propagation suppression

PSR Combiner

- Combines plots/targets from associated MSSR
- Dual and independent plot and track combiners

PSR Maintainability

- Extensive variable system parameters allow detailed, simple, and effective adjustment to optimize performance for a wide variety of site conditions
- A-Scope, B-Scope and PPI display of more than 40 operator-selectable pre-programmed test points
- Most line replaceable units (LRUs) replaceable from the front – without RF or DC cables to disconnect
- Automatic fault location to one LRU with 90 percent probability

PSR Basic System Parameters:

- Frequency: 2,700 to 2,900 MHz (1 MHz steps)
- Pulsewidth (long): 89 μ sec (long), 1 μ sec (short)
- Pulse compression ratio: 89:1
- Antenna gain: > 33.5 dB
- Azimuth beamwidth: 1.40 degrees
- Polarization: Linear and circular
- Antenna rotation rate: 12.5 rpm
- Coherent processing interval: 5 pulses
- Subclutter visibility: > 42 dB
- Instrumented range: 60 nautical miles
- Target tracking capacity: > 1,000 targets

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- MTBF: > 40,000 hours per channel
- Availability (PSR and MSSR system): 99.999 percent

MSSR (Monopulse Secondary Surveillance Radar) Antenna

- Large vertical aperture antenna (LVA) with optimum sum and difference patterns for precision resolution of azimuth
- 12 dipoles per column for enhanced elevation plane roll-off and high-altitude cover

MSSR Interrogator/Receiver

- Solid state
- Dual channel with automatic reconfiguration on failure
- Most LRUs replaceable from the front
- Signal processing can maintain a Pd of better than 99 percent at 130 Hz PRF
- Interrogator, extractor, tracker, formatter in one cabinet
- Amplitude monopulse processing provides inherent stability
- Basic and enhanced Mode S with clustering
- Operates on SSR Modes 1,2,3/A and C
- Interlace patterns – single, dual, triple and sector
- In-house purpose-designed exclusive VLSI MSSR decoder technology
- Unique and proven false target suppression (less than 1 false alarm per scan) – 64 fixed and 64 dynamic reflecting surfaces with ray tracing
- Receiver side lobe suppression
- RF changeover unit (sum, difference, and control) phase-matched to allow replacement without recalibration
- Control and monitoring integrated with the PSR for remote single-workstation operation
- Automatic fault location to one LRU with 90 percent probability

MSSR Basic System Parameters:

- Frequency: 1,030 to 1,090 MHz
- Antenna gain: 27 dBi
- Antenna beamwidth: 2.4°
- Antenna sidelobes: Sum 28 dB; difference 26 dB
- Transmitter output power: 33 dBW; duty cycle 6 percent peak (4.2 percent average)
- Target detection efficiency: 99 percent
- Code validity: 99.7 percent
- Split rate tolerance: 4.00 sec average; 8,000/sec peak in main beam
- Reliability: > 30,000 hours MTBF per channel

Program Review

In September 2008, the United States Air Force awarded Raytheon a contract to produce approximately 116 fully operational "turnkey" ASR-11 systems. In the summer of 2009, Raytheon received a DASR contract modification from the U.S. Air Force. (See **Contracts/Orders & Options.**)

In April 2012, Raytheon announced that the U.S. Navy had purchased two ASR-11 systems from Raytheon Company. The new radars are being installed at

military bases in New River, North Carolina and Quantico, Virginia.

According to an FY15 U.S. Federal Aviation Administration budget document, the FAA is currently replacing and upgrading known obsolete ASR-11 commercial off-the-shelf (COTS) hardware and software in all FAA ASR-11 systems previously fielded to ensure the continued operation of the radar system through its designated life-cycle.

Funding

The ASR-11 is funded by Raytheon Company.

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ASR-11

Source: Raytheon Co

Contracts/Orders & Options

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
Raytheon	679.00	Sep 2008 – Indefinite delivery/indefinite quantity contract from USAF for a maximum of \$679 million for the Digital Airport Surveillance Radar, a joint U.S. Department of Defense and U.S. FAA activity to replace existing radar facilities at military and civilian airfields worldwide. The contract is for approximately 116 fully operational "turnkey" ASR-11 systems, consisting of site activation activities including engineering and technical support services, site surveys, site preparation, dismantling of existing radars, and all activities related to the production, transportation, installation, and checkout of the new radar systems. Spare parts and technical assistance are also included in the contract. 853rd ELSG/PK, Hanscom AFB, MA, is the contracting activity. (FA8730-08-D-0001)
Raytheon	9.88	Aug 2009 – Contract mod from USAF for the DASR. At this time, no funds were obligated. 853rd ELSG/PK, Hanscom Air Force Base, MA, is the contracting activity. (F19628-96-D-0038)
Raytheon	Unknown	Apr 2012 – The U.S. Navy purchased two ASR-11 systems from Raytheon Company. The new radars will be installed at military bases in New River, NC and Quantico, VA.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Sep	2008	U.S. Air Force awards Raytheon a contract for approximately 116 fully operational "turnkey" ASR-11 systems
Aug	2009	USAF awards Raytheon \$9.88 million DASR contract modification
Apr	2012	U.S. Navy purchases two ASR-11 systems from Raytheon Company

Worldwide Distribution/Inventories

The ASR-11 has been purchased by the **United States**.

Forecast Rationale

Forecast International projects that Raytheon Company will sell approximately three ASR-11 radar systems in the forecast period. This demand is being driven by the United States' need to replace aging terminal-area surveillance radar at U.S. civilian and military airport sites.

The most recent ASR-11 sale was announced in the spring of 2012. On April 23, 2012, Raytheon

announced that the U.S. Navy had purchased two ASR-11 systems from Raytheon Company (the new radars are being installed at military bases in New River, North Carolina and Quantico, Virginia). Look for the FAA to continue replacing and upgrading known obsolete ASR-11 commercial off-the-shelf hardware and software in all ASR-11 systems previously fielded.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program	High Confidence					Good Confidence			Speculative			Total
	Thru 2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Raytheon Integrated Defense Systems (Prime)												
ASR-11 Military <> Worldwide <> Department of Defense												
	0	0	1	1	0	1	0	0	0	0	0	3
Total	0	0	1	1	0	1	0	0	0	0	0	3