Raytheon

Sea-Based X-Band Radar (SBX) for Missile Defense

SBX — Sensor for the Ground-Based Midcourse Defense System

Key Features and Benefits

- State-of-the-art technology combined with comprehensive software functionality result in the world's most capable Sea-Based X-Band radar
- Optimized for threat acquisition, tracking, discrimination and hit assessment
- Self-propelled, semi-submersible platform affords outstanding stability during elevated sea-state conditions
- Relocation capability maximizes siting flexibility and operational utility
- Discrimination capabilities support battle management decision processes
- Substantial commonality with other Raytheon X-Band radar programs

The Sea-Based X-Band (SBX) radar is a midcourse fire control sensor for the Ground-Based Midcourse Defense (GMD) component of the Ballistic Missile Defense System. Installed on a re-locatable semi-submersible platform for siting flexibility, the radar performs the critical functions of cued acquisition, target tracking, discrimination and engagement hit assessment. By providing the radar with a sea-borne mobility, this sensor can be deployed to support either GMD system testing or to provide radar coverage for possible threat missile launches throughout the world. The SBX homeport is Adak, Alaska, which is located approximately midway along the Aleutian Islands chain.

The GMD System, as well as the SBX component, are being developed under the direction of the Boeing Company, the prime contractor. The radar (known as X-Band Radar or XBR) is being designed, built and tested by Raytheon.

XBR is a mechanically-slewed phased array sensor that uses the most advanced electronic components and software. Its high output power, along with sophisticated signal detection algorithms, allow the radar to accomplish its mission against a host of very small targets and at very long ranges. To protect the radar from the anticipated harsh environments, an air-supported radome was developed using a unique synthetic laminated fabric and innovative assembly techniques.

The radar is mounted on a self-propelled, semi-submersible platform that has been modified and outfitted for the application by Boeing. With a main deck area larger than a football field, the SBX is self-sufficient and contains an infrastructure that will support deployment for extended periods of time.

Raytheon developed the XBR from lessons learned on earlier "Family of Radars" programs, including the Ground-Based Radar – Prototype (GBR-P), located at Kwajalein in the Republic of the Marshall Islands, and the Terminal High Altitude Area Defense (THAAD) radar. Through continued design and producibility enhancements many of the radar components have realized significant performance improvements while undergoing reductions in both cost and risk. One excellent example of this evolutionary development process is the Gallium Arsenide Transmit/Receive (T/R) module, which is the key component of Raytheon's X-Band radar family. Through three rigorous design iterations this microwave module has become known as "Best-of-Breed," and with total usage exceeding 175,000, the realized cost savings to our radar customers has been significant.

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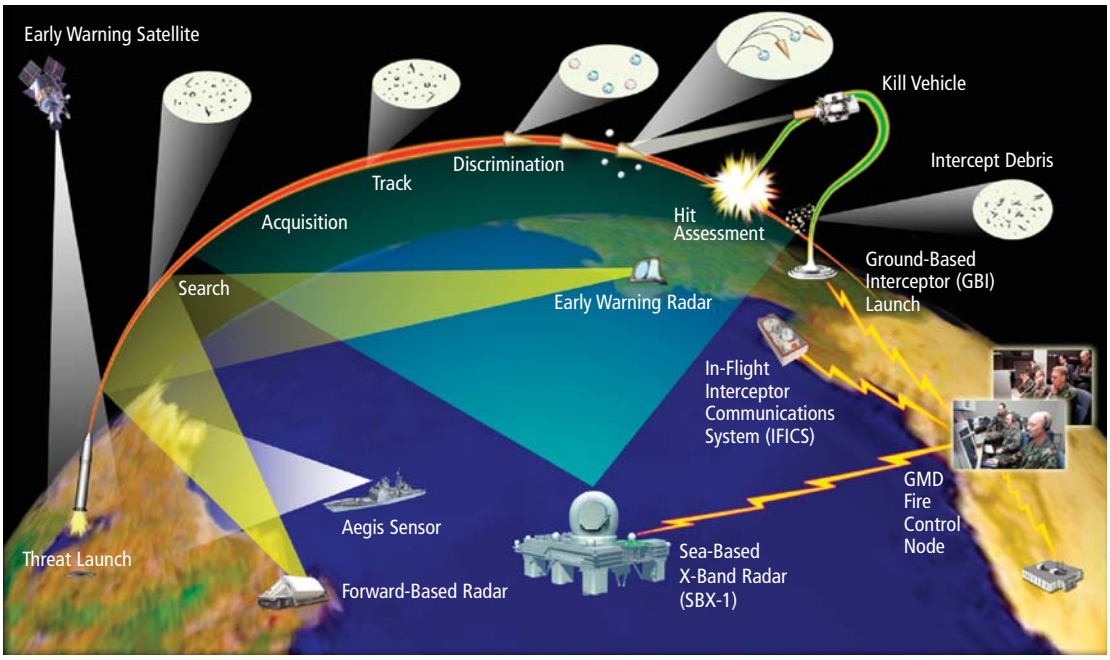
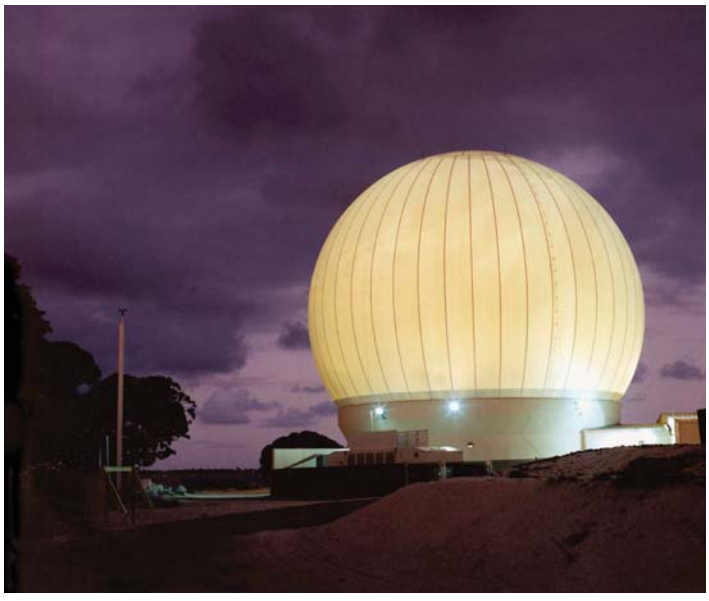


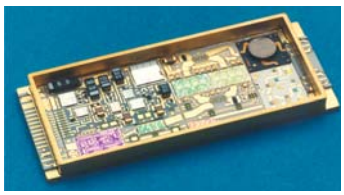
Notional Engagement

- SBX-1 will support midcourse acquisition, track, discrimination and hit assessment
- Performs precision track and midcourse discrimination
- Provides discriminated reentry vehicle to GMD Fire Control (GFC)
- Provides data on all target complexes
- Can be optimally positioned to maximize threat coverage



GBR-P at Reagan Test Site

Specifications	
Physical Aperture	384 m^2
Active Aperture	248 m^2
GaAs Transmit/Receive Modules	>45,000
Phase/Mechanical Beam Steering	
Azimuth Coverage	±270°
Elevation Coverage	2°-90°
Rotating Weight	2,400 Tons
Software Lines of Code	652,000



Best of Breed T/R Module

XBR Array Face Inside of Radome

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Customer Success Is Our Mission