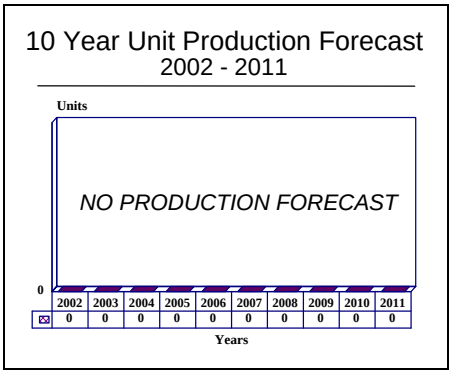
LSDIS/PSTAR - Archived 03/2003

Outlook

- Portable battlefield radar for light infantry forces
- In service, ongoing logistics support
- Limited FMS production complete



Orientation

Description. This is a portable battlefield radar known as the Light/Special Division Interim Sensor (LSDIS).

Sponsor

US Army
Army Missile Command (MICOM)
AMSMI-G, Building 5250
Redstone Arsenal
Huntsville, Alabama (AL) 35898-5000
USA
Tel: +1 205 876 4161
Web site: http://www.redstone.army.mil

Contractors

Lockheed Martin Corp
Ocean, Radar & Sensor Systems
PO Box 4840
Syracuse, NY 13221
USA
Tel: +1 315 456 1990
Fax: +1 315 456 3515
Web site: http://www.lockheedmartin.com
(Prime)

Status. In production, logistics support.

Total Produced. Through 2001, an estimated 160 units had been produced.

Application. Battlefield radar for light infantry forces.

Price Range. Unit costs range from US$40,000 to US$50,000, depending on quantity procured.

Price is estimated based on an analysis of contracting data and other available cost information, and on a comparison with equivalent items. It represents the best-guess price of a typical system. Individual acquisitions may vary, depending on program factors.

Technical Data

	Metric	US
Dimensions		

	Metric	**US**
Radar Height (min/max)	2.3/2.7 m	7 ft, 6 in/9 ft
Antenna	65 x 152 x 15.2 cm	25.5 in x 60 in x 6 in
RT Unit	67 x 47 x 56 cm	26.5 in x 18.5 in x 22 in
Weight	158 kg	350 lb

Characteristics

Component Units	Four	
Frequency	1.22 to 1.46 GHz	
Range ($1m^2$, sw1, Pd=0.8)		
(fixed wing/hovering helicopters)	20 km	12.4 mi
Altitude	0 - 3,000 m	0 - 10,000 ft
Power	1,000 W peak, 50 W average	
	Block stagger, dual PRF	
	19 channels	
Antenna Rotation	10/20 rpm	
Coverage	360º	
Radiation Pattern	Nominal -5º to +28º	
	Adjustable 0º to +5º from nominal	
Target ID	Integral IFF antenna/Helo ID	
Target Classification	Fixed- or rotary-wing (ID rotary wing by type)	
ECCM	2 side-lobe cancelers	
	Automated clear channel search	
	Automated frequency agility	
	Sector blank	
	Strobe-on-jam	
Accuracy	Azimuth: < 2E RMS (fixed-wing aircraft)	
	Range +/- 200 m RMS (fixed-wing aircraft)	
Operator Display	Sunlight readable, remotable 100 m (328 ft)	
Wind Speed	Steady: 88.5 km/hr (55 mph)	
	Gusts: 113 km/hr (70 mph)	
Subclutter Visibility	60 dB	
MTBF	1,000 hr (per MIL-STD-217E)	
MTTR	15 min	
Units	Antenna	
	Pedestal assembly	
	Receiver/transmitter	
Setup time	10 min (max), 2 people	

Design Features. LSDIS/PSTAR is a lightweight battlefield radar for Army light infantry forces. The portable search and target acquisition radar (PSTAR) was selected for the program. The system was designed for front-line forces.

In addition to a standard pulse-Doppler receiver channel, the radar uses pulse-Doppler techniques in a secondary receiver channel to detect and classify helicopters based on the unique signature of their rotor blade returns. An internal identification friend or foe (IFF) capability is used to identify targets, and the electronic counter-countermeasures (ECCM) design reduces the impact of jamming.

A high subclutter visibility ratio enhances the detection of low-flying targets. Side-lobe cancelers and a variety of ECCM techniques make it possible to operate in an electronic jamming environment. The transmitter can operate in a block stagger, dual pulse repetition frequency (PRF) mode using ECCM techniques that include two side-lobe cancelers, a clear channel search capability, frequency agility, sector blanking, and strobe-on-jam operation. The system can be carried by one person.

An automated datalink allows the PSTAR to interface with a command and control network. The portable system can be palletized for delivery by parachute to a combat area. A flat panel liquid-crystal display is

connected to the system by cable and can be remoted up to 100 meters from the radar.

Operational Characteristics. The radar provides air surveillance and detection of rotary-wing and fast fixed-wing aircraft at altitudes up to 3 kilometers and ranges to 20 kilometers. It can detect slow-moving or hovering rotary-wing aircraft through 360 degrees. It is man-portable and can be mounted on a High Mobility Multi-purpose Wheeled Vehicle (HMMWV). The system breaks down into two packages for transport and can be set up in less than 10 minutes. Under "hasty march orders," PSTAR can be disassembled and on the move in two minutes.

It is marketed for contingency forces, air base defense, critical asset protection, border surveillance, and drug interdiction missions.

Variants/Upgrades

No variants have been identified.

Program Review

Background. The US Army procured this portable radar to replace the forward area alert radar (FAAR) with light/special divisions and select air-defense artillery units. The system was selected competitively in November 1990.

The system was an interim sensor for front-line troops until the MPQ-64(V) forward area air defense system (FAADS) ground-based sensor (GBS) was fielded, but the Request for Proposals (RFP) specifically stated that the LSDIS procurement "is not a replacement for, or an alternative to, the proposed GBS."

The radar was the result of independent research and development for a battlefield sensor capable of detecting intrusions by a variety of airborne threats, including parachutists, hang gliders, and ultra-light platforms. This system was planned as an anti-terrorist sensor.

The initial contract award was delayed from December 1990 to June 1991 because of a need to reprogram funding. The overall US procurement was cut back from the original plan to a maximum of 40 units.

On July 22, 1993, the radar passed the production qualification test (PQT), clearing the way for the exercise of a production option for an additional 15 systems. Delivery of the first units to the 101st Airborne Division at Fort Campbell, Kentucky, began in September. The 101st would be the first unit to receive a full LSDIS complement.

In a December 1996 issue of *Commerce Business Daily*, the Army Missile Command, Acquisition Center, Redstone Arsenal, Alabama, announced a pending sole-source requirement for various supplies and services for the inspection and repair of LSDIS depot-level reparable items. The corresponding activities were to be conducted in FY98 through FY01.

In early 1997, the Australian Army selected the PSTAR radar for its Very Low Level Air Defense Weapon Alerting and Cueing System (VACS). The sensor would interface with the Swedish RBS-70 air defense missile. British Aerospace Australia is providing the VACS. The Australians would procure five PSTAR sensors, one for training and four to be deployed with Australian Light Air Defence units of the 16th Air Defence Regiment. Combined with a night sight from Bofors AB, the air-defense system features all-weather, day/night performance. The contract carried an option for two radars for New Zealand.

In late 1999, Lockheed Martin Naval Electronics & Surveillance Systems of Syracuse, New York, reported receiving a US$18 million contract to provide 20 PSTAR systems to the Republic of China (Taiwan). The units would be integrated with a defensive missile system for the ROC. Deliveries were to be completed by mid-2001.

Funding

US Army procurement funding ended in FY96.

Recent Contracts

No recent contracts over US$5 million.

Timetable

Month	Year	Major Development
Jun	1990	RFP released
Jul	1990	Procurement directed
Jun	1991	Procurement contract awarded
Nov	1990	Selection of PSTAR, EMD
1Q	FY92	First Article Test
2Q	FY92	Production Qualification Test begun
3Q	FY92	FAAD C^2I Integration Test begun
Jul	1993	Production Qualification Testing completed
2Q	FY93	Delivery started
3Q	FY93	First unit equipped
4Q	FY93	FAAD C^2I Integration Test ends
mid-	1994	Drop tests completed
2Q	FY95	Planned US Army deliveries completed
	FY99	Order from Taiwan (20)
mid-	2001	Taiwan deliveries completed

Worldwide Distribution

The system received export licenses for 20 countries. Interest has been shown by **Saudi Arabia**, **Jordan**, **Egypt**, **Austria**, **Australia**, **Taiwan**, **Thailand**, **Turkey**, and **Singapore**.

Forecast Rationale

The PSTAR system took advantage of immediate availability, and its ability to meet the required performance standards with minimal developmental effort, to win the LSDIS contract. The Army avoided spending development funds needed for other programs. A production system was available when the contract was awarded, and manufacturing could start immediately. LSDIS met an interim need for a sensor to support front-line forces. Existing battlefield radars were outdated and could not meet the operational needs of a modern Army, especially the detection and tracking of attack helicopters.

The combination of LSDIS and a non-imaging, passive sensor has been popular, which increased the market appeal of the LSDIS/PSTAR to outside the US Army. International customers found the system attractive, and the ability to get export licenses enhanced marketability. Many forces are familiar with the radar, which is a plus in procurement decisions, and it is popular with forces unable to upgrade to the non-RF sensors needed for contingency protection capability.

The operational life of the LSDIS and PSTAR radar will support a small spare and repair parts requirement. Non-RF battlefield sensors are becoming common on the battlefield to meet surveillance needs. Unmanned air vehicles are receiving increased attention as an alternative to ground-based battlefield sensors. Their use in the War on Terrorism has caused the popularity of UAVs to skyrocket.

Ten-Year Outlook

No further production expected.

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