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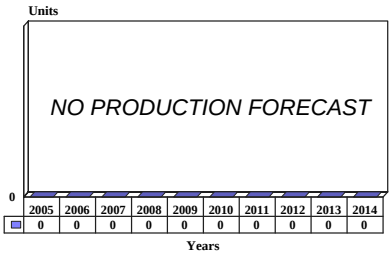
LST-5 Series - Archived 6/2006

Outlook

- Production has likely stopped for last known order for system
- Barring any future activity, this report will be archived next year (2006)

10 Year Unit Production Forecast
2005 - 2014



Orientation

Description. Lightweight, line-of-site (LOS) satellite communications (SATCOM) AM/FM/PM multifunction radio.

Sponsor

U.S. Army
Communications - Electronics Command
Ft. Monmouth, New Jersey (NJ)
USA

Status

LST-5A/B/C: Out of production and service.

LST-5D/E: In service.

Total Produced. An estimated 11,010 LST-5 variants have been produced.

Application. Lightweight satellite terminal developed specifically for the tactical user, although applications can include vehicles, aircraft, ships, and fixed stations, as well as portable manpacks.

Price Range. It is estimated that the LST-5D costs $40,000 per unit (FY2004 dollars).

Contractors

Motorola Inc, http://www.motorola.com, 1303 East Algonquin Rd, Schaumburg, IL 60196 United States, Tel: + 1 (847) 576-5000, Fax: + 1 (847) 576-5372, Prime

Technical Data

	Metric	U.S.
Dimensions		
LST-5B		
Size	9.53 cm x 15.24 cm x 23.62 cm	3.75 in x 6.0 in x 9.3 in
Weight	4 kg	8.8 lb
LST-5C		
Volume	3,426 cm^3	209 in^3
Weight	3.8 kg	8.4 lb
LST-5E		

	Metric	**U.S.**
Size	10.92 cm x 15.24 cm x 27.69 cm	4.3 in x 6.0 in x 10.9 in
Weight	5 kg	11 lb
Dimensions (continued)		
LST-5D		
Volume	5,655 cm^3	345 in^3
Weight	5.3 kg	11.6 lb

Design Features. The LST-5 Series (which has included the A, B, C, D, and E variants) are lightweight AM/FM/PM radios and modems that also feature a satellite communications (SATCOM) capability. The frequency range is 225-399.995 MHz, with channel spacing of 5 kHz and 25 kHz. Operating modes include the following: BPSK, SBPSK, plain text (AM and FM), cipher text (AM and FM), receive and transmit on any of nine preset channels, scan on any two of nine preset channels, beacon (transmit swept tone on any RF frequency), and 75 selective call (SELCAL) codes, with one conference call code. Power output in FM and PM is adjustable in 2 W increments from 2 to 18 W; AM power output is 2 or 5 W. The operational temperature range is -30ºC to +55ºC. Mean time between failures (MTBF) has been tested to 4,000 hours, but has been calculated to reach 5,987 hours.

The LST-5 family is compatible with the following equipment: CSZ-1; KY-57/58; ANDVT; AM-7175/ URC; PTPE-100, 101; DMDG; URC-101, 104, and 110; PSC-3; HST-4; and the GRiD computer. The radios meet U.S. Department of Defense satellite architecture and interoperability requirements.

Operational Characteristics. The use of microprocessor control and erasable programmable read-only memory (EPROM) storage allows for good reliability and ease of operation. The easy-to-read, nighttime-lighted liquid crystal display (LCD) can show various types of information, including relative received signal strength. Only four pushbuttons are required to select all modes of operation, frequencies, bands, and presets.

Variants/Upgrades

LST-5C. This version of Motorola's lightweight SATCOM features full RF power from one 2.25A lithium battery. This capability was made possible through use of a new, efficient transmitter that required less power for an uplink than did previous versions. Weight and volume were reduced, while battery life was increased by 20 percent. The system is upgradeable to include embedded encryption (whereupon it becomes the LST-5E) and embedded encryption plus Demand Assign Multiple Access (DAMA) capabilities (LST-5D).

LST-5E (Encryption). Occupying 281 cubic inches (4,608 cm^3) and weighing 11 pounds (5 kg), this version acts as an intermediate system between the LST-5C and LST-5D, and provides embedded encryption for high-grade, half-duplex data or voice communications over wideband or narrowband channels. It can be purchased all new or as an upgrade to LST-5B or C equipment.

LST-5D (DAMA). This version has an embedded DAMA modem, designed to be reconfigurable and upgradeable to future DAMA standards. It weighs 11.6 pounds (5.3 kg), occupies the largest volume of the series (345 in^3, or 5,655 cm^3), and is available as a new installation or as an upgrade to the LST-5B, C, or E.

Program Review

Background. Motorola began development of an improved lightweight SATCOM terminal in the early 1980s, introducing its LST-5 system in 1984. The company received its first government procurement contracts for its SATCOM terminal in 1987.

In 1989, a Joint Chiefs of Staff (JCS) mandate called for the fielding of secure UHF satellite communications throughout the defense community by October 1996, for which DAMA capability would be necessary, and for the implementation of wide- and narrowband encryption by FY95. DAMA would help alleviate the UHF SATCOM demands among an ever-increasing number of users by establishing a common area of satellite bandwidth automatically allotted to users according to their priority. Upon completion of a given message transmission, the bandwidth would be automatically reallocated.

To address these JCS requirements, Motorola modified its LST-5C variant introduced in 1990, first as the LST-E, to provide embedded encryption (hence the E designation). Reducing the weight and size of the C variant (to 5 lb, 288 cu in), the LST-E embeds the

wideband- and narrowband-capable CSZ-1A (Sunburst II) processor. The first E unit was delivered to the U.S. Army in April 1994; by the mid-1990s Motorola had produced approximately 6,000 LST-A/B/C UHF SATCOMs for the U.S. Army Special Operations Forces and for foreign customers.

Motorola's next variant, the LST-D, responded directly to the JCS requirement for DAMA capability. It incorporates an embedded DAMA modem from Titan Corp. The LST-D provides wide- and narrowband (25 kHz and 5 kHz) DAMA satellite communications with embedded encryption. The LST-5D can be attained by adding a Titan Corp DAMA modem to the E version, or it can be purchased as an entire package.

A joint services program was implemented to achieve the JCS goals. With the U.S. Army as executive agent, Project D456, Tactical Satellite Communications (TACSATCOM) System (within PE#0303142A, SATCOM Ground Environment) was intended to upgrade or replace existing UHF single-channel SATCOM terminals (the LST-5B/C, the PSC-3, and the VSC-7) with a state-of-the-art design featuring embedded communications security (COMSEC) and DAMA capabilities.

Chief Competitor Emerges. Motorola, with its DAMA-enhanced LST-5D and strong history of LST-5B/C/E sales to the U.S. Army, seemed poised to play a leading role in the program. However, the first award, of $163.3 million in 1994, went instead to Magnavox (which was later purchased by Hughes, now Raytheon), which offered its own DAMA-equipped product, the PSC-5 enhanced manpack UHF terminal (EMUT). Magnavox developed the final, winning configuration using its own R&D funds. The PSC-5 unit's internal satellite communications modem is provided by ViaSat Corporation.

Undaunted by the loss of this important U.S. Army contract, Motorola stated that it intended to continue in the UHF SATCOM radio/terminal field, marketing a commercial version of its LST-5D. But military customers did ultimately appear: the U.S. Army, Navy, Air Force, and Special Operations Forces. According to company literature, a release to buy material for 400 units in June 1995 led to initial production of the LST-5D in November of that year. A second release to buy material for 600 units, with a 2,000-unit option, followed in June 1996. The first unit was shipped in August 1996, with full-rate production starting shortly thereafter.

In March 1999, the LST-5D received the Chairman Joint Chief of Staff Instruction (CJCSI) 6251.01 certification from the Joint Interoperability Test Command (JITC). This was the final certification needed to allow the LST-5D to be used on the worldwide Military Satellite Communications (MILSATCOM) DAMA network. As such, the radio has completely met all JCS mandates regarding the move to DAMA networking and promotion of joint interoperability.

Motorola announced in July 2000 that it had created a Remote Control Unit (RCU) for the LST-5D that would enable users to establish communications from ground locations outside the satellite's line of site. The company also offered that the RCU would expand the capability of the LSRU-201D SATCOM radio. For aircraft applications, the RCU reportedly fits into an aircraft's console and can interface with the system's input-output via rear connectors.

In June 2001, the U.S. Customs Service (USCS) announced its intention to negotiate on a sole-source basis with Motorola Inc, Integrated Information Systems Group to procure new, and upgrade existing, LST-5D equipment to support the P-3 airborne early warning (AEW) aircraft retrofit/upgrade program. Units requiring upgrade would be supplied as Government Furnished Equipment (GFE) to Motorola for modification to the current configuration to enhance performance and ensure compatibility. The aircraft modification contractor would install the upgraded and new equipment to achieve a common avionics configuration baseline as previously established by the most recent USCS configuration (P-3 AEW #7). The USCS is believed to have four P-3 aircraft.

Funding

Development/procurement funding figures for the LST-5 Series are not available.

Recent Contracts

No recent contracts have been identified by public sources.

Timetable

Month	Year	Major Development
Early	1980s	LST-5 development initiated

Month	Year	Major Development
	1984	LST-5A introduced
	1990	LST-5C introduced
	1992	LST-5E introduced
Jun	1994	Development of LST-5D begun
	1994	LST-5E delivered to U.S. Army; LST-5D overlooked for crucial Army contract
Nov	1995	Production of LST-5D begun
Aug	1996	First LST-5D shipped
Sep	1996	High-rate production of LST-5D
	1999	LST-5D receives CJCSI 6251.01 certification
Jul	2000	Motorola introduces Remote Control Unit for LST-5D
	2001	LST-5D chosen for U.S. Custom Service P-3 AEW aircraft
	2002	Production completed for LST-5A/B/C

Worldwide Distribution

In addition to sales to the **U.S. Army**, **Navy**, **Air Force**, and **Special Operations Forces**, a number of foreign sales have been made to undisclosed customers. The **U.K.** is one confirmed customer.

Forecast Rationale

Although the LST-5D tactical line-of-site (LOS) satellite communications (SATCOM) multifunction radio has recently been adopted in limited numbers by the U.S. Customs Service, it appears that the potential for new orders has decreased significantly. The systems are no longer being procured by the U.S. military and it appears that no new orders have been placed since 2001.

The LST-5 Series is in use by a number of military and security forces; it is estimated that well over 10,000 LST-5 radios have been produced since its introduction. The earlier versions, the LST-5A, B, C, and E, apparently have not been produced since 2000. The bulk of activity in the coming years will now fall to the LST-5D. It is believed that the series, both new and old versions, has been adopted by U.S. Special Forces. Motorola, the LST-5D's producer, was awarded a $15.8 million contract in June 2003 for unspecified radios for the Baghdad police force, but it cannot be confirmed whether the LST-5 was part of that purchase.

With the apparent lack of any new contracts to spur production, the ten-year production outlook for the LST-5 Series has been dropped. Barring any future activity, this report will likely be archived next year (2006).

Ten-Year Outlook

No further significant production is forecast.

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