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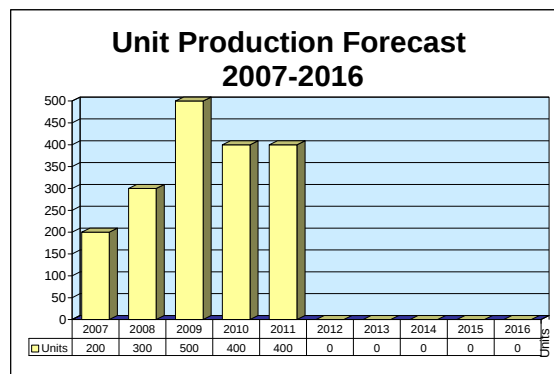
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ADDs - Archived 6/2008

Outlook

- Under U.S. Army FY08/09 procurement program, some \$51.8 million has been budgeted for ADDs purchases through FY11
- An estimated 1,800 units are likely to be produced over next five years
- Demand driven by deployed U.S. Army troops in Iraq and Afghanistan



Orientation

Description. The Army Data Distribution System (ADDs) is a hybrid of the Enhanced Position Location Reporting System (EPLRS) and the Near Term Digital Radio (NTDR).

Sponsor

U.S. Army
Communications-Electronics Command
Fort Monmouth, NJ
USA

Status. Class 2 terminals in production and in service.

Total Produced. Approximately 16,411 ADDs components have been produced through 2006.

Application. ADDs supports U.S. Army data communications requirements in the five tactical battlefield functional areas: maneuver control, fire support, air defense, intelligence/electronic warfare, and combat service support. ADDs also provides an automatic capability for relative navigation, identification and position reporting, and data communications interoperability with other services and allies.

Price Range

EPLRS: \$30,000

NTDR: \$12,000

Contractors

Prime

Raytheon Co

<http://www.raytheon.com>, 870 Winter St, Waltham, MA 02451-1449 United States,
Tel: + 1 (781) 522-3000, Fax: + 1 (781) 860-2520, Prime

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Technical Data

Design Specifications

Enhanced PLRS User Unit (EPUU). EPUUs can be assigned to all units in the division and corps that participate in near-real-time data communications, identification, and position location and navigation. The basic unit is a man-portable battery-operated lightweight transceiver with an integral communications security (COMSEC) device. The primary soldier interface for man-pack and vehicular use is the user readout (URO), which serves as a control unit for the EPUU and provides navigation aids and limited data services to users with no other data terminal.

The EPUU is formed by taking a regular PLRS user unit, replacing the RCA 1802 CMDS chip with an NCS 800 microprocessor, and adding a small universal interface box that interfaces with other tactical data systems in the battlefield.

EPLRS Airborne Applications. Features of EPLRS that are particularly supportive of airborne missions include corridor guidance and the provision of accurate bearing and range with respect to other EPLRS units or fixed sites that have been identified at the NCS. Some examples of specific uses include the provision of reference locations, guidance in moving friendly units, or supplying corridor guidance through an area where friendly artillery fire may be landing.

EPLRS Grid Reference Unit. The EGRUs aid in the position location function by establishing the military grid reference coordinates or absolute locations (registration) for overall system accuracy and in the relaying of ADDS messages. The EGRU can employ GPS data or survey markers to verify location. Typical position accuracy is 15 meters CEP (circular error probability). Approximately 12 EGRUs can be allocated per division.

Operational Characteristics. An ADDS network expands and contracts, forming and reforming as its complex net of linkages adjusts to battlefield demands. The network's management capability can automatically route data to the proper destinations. By changing connections and building new links, it can update routing assignments almost instantaneously. All the radios in the network act as relays, interconnecting

other units. Should a relay operation be temporarily impaired, network management automatically switches transmissions to an alternate relay.

ADDS is responsible for cooperative identification, which automatically informs attack forces of all friendly units equipped with ADDS. Assaults can be launched without endangering allied forces. ADDS also pinpoints safe corridors for passing through a hostile environment.

Net Control Stations (NCSs) are located in each brigade and at the rear of the division (as well as with each Corps signal battalion) to manage the data distribution function and supply position location navigation and identification services. The NCS operator specifies data communication requirements (including response time and message traffic needs) for each tactical area.

The EPLRS provides communication paths for each battlefield functional area of the Army Tactical Command & Control System (ATCCS): air defense, combat service support, fire support, intelligence/electronic warfare, and maneuver control. It is also the data delivery system for supporting the Maneuver Control System.

TDMA. Time Division Multiple Access (TDMA) is the relatively risk-free technique used by ADDS to allow numerous users to exchange information almost instantaneously over a shared channel. An encrypted message is divided into digital data portions that are intermingled, sorted in assigned time slots, and subsequently transmitted in short bursts during a time set aside for their release. At receiver terminals, the intermingled data fragments are put back together in the same order as originally mixed.

To counter jamming, the TDMA signal can employ frequency hopping and time-slot scrambling, as well as pseudo-noise spread spectrum or error detection and correction coding. The system is designed to operate by hopping across eight frequency channels, but it can also operate on any subset of those frequencies. Data security comes from several methods, ranging from direct encryption of all digital data exchanged within the network to limiting system database access to selected users.

Variants/Upgrades

Smaller NCS-E. The U.S. Army needed to be able to house a downsized NCS in an S-250 shelter that could be carried on a 1.5-ton CUCV light truck. This downsizing effort included the following: conversion of all the EPLRS software programs to Ada to include real-time EPLRS, improved simulation EPLRS, and all software support programs; integration and test of ATCCS common hardware and software into a Proof of Design NCS shelter (using an Army Standard Integrated Command Post Shelter); and fabrication and test of two EDMs of the downsized NCSs. A slightly larger electronic shelter, designated the S-710, has been

developed by Gichner Shelter Systems for both the CUCV and HMMWV series of tactical light trucks.

EPLRS/GPS. The U.S. Marines and Navy began planning to integrate the NAVSTAR global positioning system to its PLRS radios through an interface unit. The GPS mode is used to automatically update the PLRS system, thereby eliminating the lengthy survey process to determine the location of the PLRS reference node as is now required. The GPS/PLRS system improves situational awareness and flexibility of combined arms operations, especially in the areas of fire support coordination and maneuver control.

Program Review

Background. In January 1996, the U.S. Army awarded a contract to a team led by ITT for development of the Near Term Digital Radio (NTDR). ITT had received a \$5 million increment of a \$10.7 million contract calling for the company to design, develop, and produce 200 radios, as well as provide installation, training, and equipment for them. The contract, which provided for an option buy of 950 radios, had a total value of \$23.4 million.

Marking a significant boost to EPLRS production, Raytheon announced in October 2000 that the U.S. Army had established a requirement for more than 33,000 units. This would cover the needs of airborne units and help the service implement its digitization efforts within the First Digitized Corps. In response, Raytheon increased EPLRS production rates from 120 radios per month to a 2001 target of 180 units per month. Subsequently, the company began promoting the system in Europe as an export to approved governments. A company spokesman cited the beneficial compatibility with the Joint Tactical Radio System (JTRS) as central to all discussions with potential European customers.

Around the time of this announcement, Raytheon also made public the news that it had completed systems engineering and prototype development of the EPLRS Lite, or E-Lite. The company delivered the first two of 10 E-Lite prototypes to the U.S. Army project manager for tactical radio systems for evaluation at several installations. The new system would reportedly be smaller and less expensive than the original EPLRS.

Start of Operational Testing Kicks Program into High Gear

In August 1999, Raytheon Systems' Command, Control, Communications and Intelligence Division awarded a \$169.5 million (potential value if all options are exercised) modification to a firm-fixed-price multiyear contract for 1,736 EPLRS receiver/transmitters for the U.S. Army, Navy, and Marine Corps.

In 2000 and 2001, \$53.8 million and \$81.4 million, respectively, was spent for procurement of ADDS. In 2001, the NTDR was used in various Army test exercises, such as the FBCB² (Force XX1 Battle Command Battalion/Brigade and Below) Field Test 3 at Fort Huachuca, and the Fourth Infantry Division's Division Capstone Exercise (DCX-1) at Fort Irwin.

A total of \$63.2 million was allocated in FY02 for ADDS procurement. Most of this funding went to the acquisition of 1,076 EPLRS User Unit Receiver Transmitters and 20 EPLRS Network Managers for the Army.

In FY04, \$40 million was budgeted for the procurement of 1,295 ADDS EPLRS units.

The FY07 defense budget request indicated dwindling funding for procurement of EPLRS under the ADDS procurement program after FY06, but did leave the door open to additional funding if the need should arise. A remark was added to the document that may hint at just such an occurrence: "The current acquisition plan does not call for procuring additional EPLRS in FY06 and

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beyond. However, Army Transformation and wartime contingencies can be filled in compliance with DA (Dept. of the Army) guidance.”

For FY05 and FY06, the ADDS procurement program received over \$300 million in supplemental funding, presumably to support the military forces engaged in action in Iraq and Afghanistan.

Significant News

Pentagon Requests over \$50 Million for Procurement – The U.S. DoD’s FY08/09 budget request to Congress included \$51.8 million in funding for ADDS procurement in the FY07 through FY11 time period. (U.S. DoD, 3/07)

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Funding

U.S. FUNDING						
	FY07 <u>QTY</u>	FY07 <u>AMT</u>	FY08 <u>QTY</u>	FY08 <u>AMT</u>	FY09 (Req) <u>QTY</u>	FY09 (Req) <u>AMT</u>
P1 (Army) ADDS, EPLRS (BU1400)	-	4.9	-	7.9	-	15.7
	FY10 (Req) <u>QTY</u>	FY10 (Req) <u>AMT</u>	FY11 (Req) <u>QTY</u>	FY11 (Req) <u>AMT</u>		
P1 (Army) ADDS, EPLRS (BU1400)	-	11.6	-	11.7		

All \$ in millions.

Funding levels for ADDS procurement obtained from U.S. DoD FY08/09 Procurement Programs.

Contracts/Orders & Options

<u>Contractor</u>	<u>Award</u> <u>(\$ millions)</u>	<u>Date/Description</u>
Raytheon	34.8	Jun 2002 – Modification to FFP contract for the EPLRS Receiver-Transmitter Production Contract. Work was performed in Fullerton, CA (50%), and Forrest, MS (50%), and was completed by August 30, 2004. The U.S. Army Communication-Electronics Command Acquisition Center, Fort Monmouth, NJ, was the contracting agency. (DAAB07-97-C-C775)

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Feb	1989	Field testing of developmental EPLRS radios
Jan	1990	Hughes awarded low-rate production contract for EPLRS
Jun	1993	First overseas operational use in joint exercise with Kuwaiti forces
Late	1994	EPLRS System Improvement Program award

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<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Jan	1996	Contract award to ITT to build 200 NTDRs as possible replacement for EPLRS
	1997	Delivery of first five NTDRs; three divisions equipped with ADDS
Aug	1999	Raytheon awarded contract for 1,736 EPLRS units for U.S. forces
	2001	Raytheon increases EPLRS production to 180 units per month for new U.S. Army requirement of 33,000 units
	2001	NTDR participates in FBCB ² Field Test 3
	2002	2nd IBCT (Initial Brigade Combat Team) and 1st Cavalry Division issued NTDR
	2005	\$291.3 million added to procurement budget for ADDS
	2011	Last year for procurement funding under latest budget

Worldwide Distribution/Inventories

At present, this is a **United States Army, Navy, and Marine Corps** program only.

Forecast Rationale

The next five years should see steady production of the Army Data Distribution System (ADDS) under the service's procurement program.

Over the past few years, demand for the system has been driven by our troops overseas. In fact, as the needs of deployed troops in Iraq and Afghanistan became more pressing, 2005 saw one of the biggest funding boosts in the program's history. Congress approved over \$290 million in supplemental funding to the budget for 2005 and 2006. This boosted production of ADDS systems, particularly the Enhanced Position Location Reporting System (EPLRS) element, well into the several hundreds. While production will perhaps not remain at these previous levels, EPLRS will still be in steady demand through 2011, with anywhere from roughly 200 to 500 units produced every year.

As the major component of the ADDS, EPLRS is designed to provide U.S. forces with improved interoperability and situational awareness and to help prevent friendly fire incidents. The component is an ultra-high-frequency tactical radio that provides crucial battlefield data communications and is the primary means of secure, real-time data distribution for sensor-to-shooter links. EPLRS procurement in the next few years consists of purchasing receiver/ transmitter units, network management systems, and retrofit kits. It is being fielded to U.S. Army Stryker Combat Brigade Teams (SCBTs), among others.

Based entirely on the FY08/09 U.S. defense budget, some 1,800 ADDS units of the EPLRS are likely to be procured through 2011.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program	High Confidence					Good Confidence			Speculative			
	Thru 2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Raytheon Co												
ADDS <> United States <> Army												
	16,411	200	300	500	400	400	0	0	0	0	0	1,800
Total	16,411	200	300	500	400	400	0	0	0	0	0	1,800