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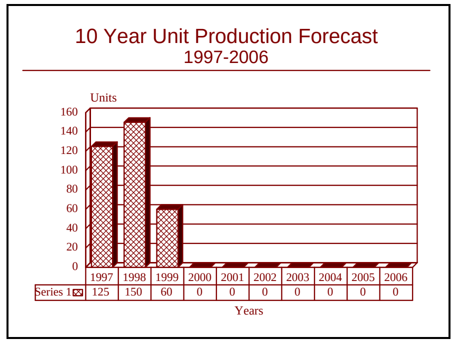
ADDS - Archived 6/98

Outlook

- ADDS is the practical integration of the EPLRS and JTIDS systems
- Army still determining whether to use EPLRS or NTDR radios
- RDT&E funding extended through 2000
- ADDS is in initial low-rate production; orders likely to increase after all testing and initial fielding are complete



Orientation

Description. The Army Data Distribution System (ADDS) is a hybrid of the Enhanced Position Location Reporting System (EPLRS) and the Joint Tactical Information Distribution System (JTIDS).

Sponsor

US Army
Communications-Electronics Command
Ft Monmouth, New Jersey (NJ)
USA

Contractors

Hughes Electronics Corp
Hughes Aircraft Co
Surface Systems
1901 W Malvern Avenue
Fullerton, California (CA) 92634
USA
Tel: +1 714 732 3232
Fax: +1 714 732 0286
(Prime contractor for EPLRS)

GEC-Marconi Electronic Systems Corp
164 Totowa Rd, Box 975
Wayne, New Jersey (NJ) 07474-0975
USA
Tel: +1 201 633 6000
Fax: +1 201 633 6167
(Prime contractor for the JTIDS Class 2M terminal)

Logicon Inc
3701 Skypark Drive
Torrance, California (CA) 90505
USA
Tel: +1 310 373 0220
(Engineering support services)

Lockheed Martin Tactical Systems
(formerly Loral Federal Systems Co)
1801 SR-17C
Oswego, New York (NY) 13827
USA
Tel: +1 607 751 2000
Fax: +1 607 751 2597
(Program support)

MITRE Corp
202 Burlington Road
Bedford, Massachusetts (MA) 01730
USA
Tel: +1 617 271 7382
Fax: +1 617 883 6308
(Program support)

Rockwell International Corp
Collins Avionics and Communications Div
350 Collins Road NE
Cedar Rapids, Iowa (IA) 52498
USA
Tel: +1 319 395 5100
Fax: +1 319 395 5429
(Subcontractor to GEC-Marconi for JTIDS terminals)

Sierra Cybernetics Inc
Brea, California (CA)
USA
(ADDS support)

Teledyne Inc
Teledyne Brown Engineering
300 Sparkman Drive
Huntsville, Alabama (AL) 35805
USA
Tel: +1 205 726 100
Fax: +1 205 726 1033
(V&V support)

Lockheed Martin Corp
Government Communications Systems Dept
Camden, New Jersey (NJ) 08102
USA
Tel: +1 609 338 3000
Fax: +1 609 338 2741
(UYK-43/44 computers)

Status. JTIDS is in full-rate production of Class 2 terminals. Over 93 2M(ADDS) terminals have been produced to date. In March 1996, the Army ordered 325 EPLRS units for the ADDS program. The first EPLRS systems have been delivered.

Total Produced. At the beginning of 1997, 2,679 ADDS systems had been produced.

Application. ADDS will support US 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 will also provide an automatic capability for relative navigation, identification and position reporting, and for data communications interoperability with other services and allies.

Price Range. Estimated costs are: NCS, US$2.5 million; EPUU, US$30,000; JTIDS terminals, US$320,000.

Technical Data

Design Specifications. Each ADDS system is made up of the following components: Net Control Station- EPLRS (NCS-E), Enhanced PLRS User Units (EPUUs), EPLRS Grid Reference Units (EGRUs), EPLRS Pilot Control Display Panels (PCDPs), host system data interfaces (1553B for avionics and vetronics applications, TACFIRE-FSK to support the Fire Support nets, X.25 interface for future and emerging C^3 systems), JTIDS Class 2M terminals, EPLRS Test Sets (EPTSs), and required Test Program Sets (TPSs).

Net Control Station - EPLRS (NCE). The NCS-E — since nomenclatured the TSQ-158 — is the heart of ADDS and carries out the automated net management and control functions of the system. These will be deployed with each separate brigade, with the division, and with each Signal Corps battalion. The typical configuration will be four NCS-Es controlling 250 EPUUs each. Further NCS-Es may be available in the divisional rear should there be a need to ensure operational continuity by assuming net control in case of sudden loss or disablement of the division's NCS-E or during planned displacement. The NCS-E computer dynamically assigns time slots to EPUUs for transmission, relay, and receipt of messages and calculates position location. This satisfies needline requirements and position location accuracies (two independent paths are chosen for each needline).

The NCS was originally formed by taking the PLRS master unit and adding a JTIDS Class 2M terminal and additional data processing capabilities via a third UYK-20A computer. Apparently, the Army has abandoned efforts to integrate JTIDS terminals into the regular NCS, instead opting for separate controllers for the management and control of JTIDS nets. These will be called NCS-Js, and there will be three deployed to each division in addition to the five NCS-Es. The EPUUs will be compatible with JTIDS. The NCS-E now will use three UYK-44 and one UYK-43 computers (the UYK-7 was replaced due to substantial shortfalls). The position location and tracking functions as well as the navigational aids database are handled by the UYK-43. Two of the UYK-44s fulfill the net management function, with the third being responsible for the reporting functions and the display control for the system. The Display Control Station features a 22-inch display screen. Additional equipment includes the Enhanced Command Response Unit (ECRU) which is the NCS equivalent of the EPUU (see below), the crypto control unit, cartridge magnetic tape unit and a UGC-74 teletypewriter. The net management process is fully automatic. The current NCS-E fits into an S-280 shelter that is normally transported by a five-ton truck. Approximately four NCS-Es are to be allocated per division.

Enhanced PLRS User Unit (EPUU). EPUUs will 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 man-portable and is a battery-operated, lightweight transceiver with an integral communications security (COMSEC) device. The primary soldier interface for manpack 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 URO contains an alphanumeric keypad and readout display.

The EPUU is formed by taking a regular PLRS user unit, modifying it with a hardware change (replacement of 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. The original division allocation was from 700 to 1,000 EPUUs per division with about 10 percent of the units assigned to high data rate users. This has now been reduced to between 325 and 400 EPUUs per division. The manpack unit consists of the EPUU configured with a battery box, antenna and URO. Prime power requirements are 28 Vdc, 14 watts. The unit weighs a relatively light 24 pounds including battery. The basic EPUU is used in all configurations: manpack, vehicular or aircraft.

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. For helicopter and light fixed-wing aircraft without an integrated cockpit with databus, head-up display, or common input device, the EPUU is integrated with a Pilot Control Display Panel (PCDP) in lieu of the URO and an airborne power adapter (APA). A MIL-STD-1553B databus interface is employed for the EPUU in integrated cockpit applications.

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 will be allocated per division.

JTIDS Class 2M. The JTIDS terminals, which can also serve as Identification Friend or Foe (IFF) systems, will be assigned to users who rely on a high volume of inter-service communications the data feed needs of which cannot be satisfied by the EPUU (such as those associated with TACFIRE, ASAS and SHORAD). Within ADDS, JTIDS will be fielded in a ground-shelterized or vehicular-mounted configuration and will be used as a component of the NCS-J or as a separate terminal. The JTIDS Class 2M terminal is apparently the result of a recently approved effort to specifically tailor the JTIDS terminal to satisfy Army-unique requirements and is expected to significantly reduce the size and cost of the regular JTIDS terminal. The 2M terminal is a single box design utilizing ambient air for cooling and 28-volt unregulated power. The first Class 2M terminal was formally accepted by the Army in early 1988. In addition to the 2M terminal, the Army JTIDS program consists of Dedicated JTIDS Relay Units (DJRUs) and Net Control Station-JTIDS (NCS- J). A typical division area may have 16 Class 2M terminals.

Typical ADDS Deployment. The estimated ADDS equipment requirements for a typical division are four NCS-Es, 325 to 400 EPLRS User Units, 12 EGRUs, and 16 JTIDS Class 2M terminals.

Air Force Link. In manpack, vehicle-mounted, or heliborne configurations, the EPUUs will provide user-to-user data communications, identification, and position/navigation services to Army units on the ground. Using the JTIDS interface, links can be established with Air Force aircraft flying in support of division and corps operations.

Operational Characteristics. An ADDS network will be able to expand and contract, form and re-form as its complex net of linkages adjusts to battlefield demands. The network's management capability can automatically route data to the proper destinations, and can update routing assignments almost instantaneously, changing connections and building new links. All the network's radio units will be able to act as relays, interconnecting other units. Should a relay operation be temporarily impaired, network management automatically switches transmissions to an alternate relay. All this activity occurs in near real time, more rapidly than human sensory systems can perceive.

ADDS will also be responsible for cooperative identification, where it will automatically inform attack forces of all friendly units equipped with ADDS, thus allowing the launching of assaults without imperiling allied forces. ADDS will also point out safe corridors for passing through a hostile environment.

Net Control Stations (NCSs) will be located in each brigade and in the division rear (as well as with each

Corps signal battalion) to manage the data distribution function and to 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 NCS automatically designates two independent routes for each needline and assigns sufficient time slots to accommodate the specified response time. The software design allows for the continuation of data communications along established needlines if an NCS is suddenly disabled. Should this occur, the division's reserve NCS or adjacent brigade's NCS automatically takes over net control.

The EPLRS will be the primary radio for the US Army for the distribution of digital data on the tactical battlefield, and plays a key role in that service's ambitious digitization program. It will provide communication paths for each battlefield functional areas of the Army Tactical Command & Control System (ATCCS): Air Defense, Combat Service Support, Fire Support, Intelligence/Electronic Warfare, and Maneuver Control, and will be the data delivery system for supporting the Maneuver Control System (see separate report).

The Fire Support function will benefit from the ability of ADDS to simultaneously distribute mission support information and artillery fire requests to multiple destinations. The Air Defense function especially will be enhanced since a key factor in effective air defense operations is reliable automatic netting for the distribution of air track and command control data. Also crucial is the ability of the system to provide real-time aircraft IFF in a particular air defense sector. Positive identification and a quick response to hostile aircraft will be substantially enhanced by ADDS, as will logistics support services (guiding recovery vehicles to disabled tanks, for example).

<u>TDMA</u>. Time-Division Multiple Access (TDMA) is the technique used by ADDS to allow numerous users to exchange information almost instantaneously over a shared channel easily and with less risk. 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. The speed of the TDMA technique is considerable: EPLRS data assigned to more than 500 time slots can be sent or received every second (for JTIDS, 100 time-divided data fragments a second). By this means, numerous discrete messages from multiple sources can be stacked and sent sequentially. The slowest update rate for a unit's position is once per 64 seconds, while the fastest rate is twice per second. The expanded processing capability supplied by the ADDS provides the adaptive network management that automatically will assign the time slots and route the messages. EPLRS also automatically corrects disrupted circuit paths.

The operating frequency is 420-450 MHz UHF. Terminal data rates include multiple circuits with selectable individual data rates up to 1200 bps simplex and 600 bps duplex with total terminal data rates to 2500 bps. JTIDS is capable of providing real-time data at 56,000 bps.

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

<u>VHSIC Insertion</u>. Hughes has developed a Very High Speed Integrated Circuit (VHSIC) signal and message processor module to increase data transmission capability. According to FY92 congressional testimony, transmission capacity with VHSIC is 3,600 bps compared to only 1,200 bps without it. All EPUUs in a network must have VHSIC to operate at the higher data rates. VHSIC will also be inserted into the Secure Data Unit module. Hughes has planned to begin VHSIC insertion concurrent with full-scale production.

<u>Smaller NCS-E</u>. As currently configured, the net control station is housed in an S-280 electronic shelter carried on the back of a five-ton cargo truck. The Army wants to be able to house a downsized NCS in an S-250 shelter that can be carried on a 1.5-ton CUCV light truck. This downsizing effort includes 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. UYK-43 computers have already been substituted for the obsolescent UYK-7s, which proved to be unable to handle the task. Scheduling documents indicate development should be complete. Most likely, the downsized NCS will be transported by the HMMWV (Humvee or Hummer in civilian parlance). To meet that need, a slightly larger electronic shelter, designated the S-710, has been developed by Gichner Shelter Systems for the both the CUCV and HMMWV series of tactical light trucks.

<u>EPLRS/GPS</u>. In 1991, the Marines and Navy began planning to integrate the NAVSTAR Global Positioning System (GPS) to its PLRS radios through an interface unit. The GPS mode would be 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 would improve situational awareness and flexibility of combined arms operations, especially in the areas of fire support coordination and maneuver control.

Program Review

Background. ADDS, or JTIDS/EPLR Hybrid as it is also called, began as a product improvement of selected production PLRS components combined with JTIDS Class2M terminals. (See separate PLRS report.) The program was initiated by the Army in recognition of the potential of PLRS and JTIDS to satisfy the critical need for distributed data communications in support of Army battlefield automated systems while simultaneously retaining the position location, identification, and automatic reporting features of PLRS. Due to the additional data handling requirements associated with the Forward Area Air Defense System (FAADS) program, the Army decided to go with the Enhanced PLRS system.

<u>Development</u>. Development work has been carried out in a five-phase program. Phase 1, completed in June 1980, consisted of system definition and concept evaluation, and testbed planning for Phases 2, 3, 4 and 5. Phase 2 established a testbed that demonstrated the basic PLRS/JTIDS interoperability and was successfully completed in June 1982. Phases 3 and 4 were completed in March 1987 and included design, development and testing of the EPLRS; detailed net management simulation and system performance analysis; software development and testing; system integration in testbed configuration; formal system test, and user mission area demonstrations; and environmental surveys. Phase 5 was initiated in April 1985 and comprises: completion of EPLRS development and evaluation; development and implementation of full integrated logistics support package; completion of general qualification and environmental, reliability and maintainability testing; extensive TT/IOT&E at designated Army field sites; and parallel development of VHSIC EPUU/1553 EPUU interface.

<u>Program Problems</u>. Midway through the program, ADDS encountered problems concerning the EPLRS radios, not to mention funding cuts. EPLRS field tests that ran in February 1989 showed some technical problems that needed to be resolved. According to a report issued in early 1990 by the DoD's Operational Test & Evaluation office, while EPLRS tests showed the viability of the concept, there were technical concerns including NCS reliability and sufficient communications connectivity between EPUUs in a net or between EPUUs and the NCS in field operations. According to the OT&E report, problem areas that needed to be addressed before operational testing could begin included confirmed communications connectivity of the EPUUs in field operations, continuity of operations with two representative field nets, reliability and maintainability, user-friendliness, and performance in jamming conditions. The OT&E report further stated that it could not confirm operational effectiveness or suitability until the developmental issues were resolved and adequate operational tests executed. The poor results shown in the field tests run in early 1989 prompted Congress to deny US$48 million in FY90 funds for low-rate initial production.

Apparently Hughes was able to apply a quick fix to its work and managed to get its low-rate initial production contract in January 1990. The initial US$107 million contract included 101 user units and four NCSs. The contract also included three options totaling US$103 million for up to 1,742 more user units and four NCSs. One difference in the revised fielding plan was that the low-rate production contract would support the conduct of meaningful tests at the division level in the 1993-94 time frame, rather than tests at the brigade level using limited EDMs as originally contemplated.

ADDS was stymied in 1995 due to uncertainty regarding its component efforts, EPLRS and JTIDS, and the extent of each one's involvement in the program. The slippage of JTIDS's schedule pushed that of ADDS back, with the testing that would lead to full-scale production postponed from 1994 to 1995 to 1996. While ADDS remains linked to the fates of these programs, it has faced bigger challenges.

In 1995 ADDS found itself without funding beyond FY96. Back in early 1994, the Army had been unable to convince the Office of the Secretary of Defense to overturn a recommendation that would cut US$57.1 million from ADDS in FY95. The recommendation was based on the observation that the Army was not strongly enough committed to the program. The Army, however, spoke out in support of ADDS. Citing ADDS as an essential element of battlefield digitization, the Service requested additional funding — though only US$9.6 million for procurement and US$5.6 million for R&D. Without this funding the program could in no way transition from low- to full-scale production, the Army said.

As of 1997, RDT&E funding for ADDS is extended for another three years at least. The latest documents show available funds until 2000. In 1997, the program got an extra $14.163 million due to an adjustment in the Near Term Digital Radio program.

Doubts Over EPLRS. The Army's Signal Center has, for a few years, expressed interest in next-generation technology that would sidestep EPLRS, for example, Local Area Networks (LAN). The center claims that new data radio technology has already eclipsed EPLRS and at a more reasonable price. In preparation for a showdown, contractor Hughes has expressed every intention of remaining on the cutting edge of this technology. The company plans to introduce Integrated Communications System Controller software which routes transmissions over whichever media are most appropriate, including satellites, Mobile Subscriber Equipment, SINCGARS, as well as EPLRS. Hughes has also indicated that digitized voice capability for EPLRS may not be far off, and has already made great strides in development for dual-use applications.

Prior to the US$57.1 million cut made for FY95, oddly enough, the House Appropriations Subcommittee had okayed an US$8 million plus-up for EPLRS, and US$15 million to the ADDS program for upgrades of existing EPLRS. By employing modernized hardware upgrades that would reduce the size, weight, and unit cost while boosting expandability and power, the Army hoped to quell criticism that EPLRS was too expensive and not the most efficient system for the job. The resulting EPLRS SIP (system improvement program) was set up within Project D370 - EPLRS/JTIDS in 1994. Hughes was granted a sole-source contract award for this work. The project also included the development and operational testing of the downsized NCS-E (Net Control Station-EPLRS), as well as the creation of software for the NCS-E.

The suitability of EPLRS to serve as part of the post-Cold War ADDS will be determined by a few criteria. Initial Operational Test & Evaluation (IOT&E) of EPLRS is one factor. IOT&E began in 1994; operational testing was continued through 1996, focusing on the downsized NCS-E. The revised ADDS Operational Requirements Document (ORD) is another factor. The Army's Training and Doctrine Command (TRADOC) is rewriting the ORD to reflect the dramatically altered geopolitical climate (since the ORD was first conceived), and the new requirements thus placed on the Army Data Distribution System. The ORD is not likely to be completed until after IOT&E; it will not impact testing or production, the Army says, but will help determine whether EPLRS is the right/best system for the current ADDS program. A third factor will be a comparison of EPLRS' performance with that of a new system in the works: the Near Term Digital Radio (NTDR).

In April 1996, a Joint Staff official said, "At one time, EPLRS was going to be what the Army would field as a data distribution system...They have now had a tendency to move away from that into a near-term digital radio. So as a result, only a small section of the force will be fielded with EPLRS (*Inside the Pentagon*, April 11, 1996)."

This is no big surprise, however. The Army has stated all along that it plans to replace EPLRS with the NTDR by 1999, and later replace NTDR with a digital radio.

Near Term Digital Radio. At the same time it was striving to improve EPLRS, the Army wanted to explore alternatives to this system. Perhaps some company, even then-sole-source contractor Hughes, could come up with a better, less expensive system. Each EPLRS system, it was estimated, would cost about US$30,000; the Army wanted to pay, perhaps, a third of that. This new program would take an NDI (nondevelopmental item) approach. It was likely this lack of commitment to the ADDS systems currently on the table that prompted the US$57.1 million cut in the ADDS 1995 budget.

In January 1996, the Army awarded a contract to a team led by ITT for development of the Near Term Digital Radio as a potential replacement for EPLRS. ITT has received a US$5.07 million increment of a US$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 also provides for an option buy of 950 radios, which would bring the total value up to US$23.4 million.

The NTDR features open architecture, which all the services look for in their goal of creating systems that are flexible and interoperable. The NTDR, says Sanders, a subcontractor on the ITT team, will provide an integrated data transport system to meet the US Army's evolving data communication requirement. Its initial configuration will include a wideband UHF RF subsystem, an advanced channel access waveform, sophisticated dynamic mobile networking, and distributed network management. The RF subsystem (power amplifier, antenna and transmit/receive module) will be provided by Sanders. The radio will operate at 14.4 kb/sec full-duplex over packet-switching networks and possess Internet Protocol addressability. Team leader ITT expects the system to evolve into a multimode, multiband data communications device (*Journal of Electronic Defense*, March 1996). Encryption will figure in communications security, but NTDR will also feature spread-spectrum low-probability-of-detection/interception waveforms.

Other team members include BBN, Motorola, SICOM and Group Technologies. ITT, Sanders and Motorola are also teamed on the SPEAKeasy II program; they intend to integrate SPEAKeasy technology into NTDR as soon as it becomes available, according to Sanders. Two competing teams were led by EPLRS contractor Hughes and General Dynamics.

The NTDR program operates under Project D370 - EPLRS/JTIDS (within the ADDS PE). Following an NDI approach, the program began in 1996 with the development of program hardware and software for NTDR. An option award is scheduled to be made in FY97. The first five radios are scheduled to be delivered in October 1997.

It remains to be seen whether NTDR will be a complete replacement for ADDS EPLRS units, or a less costly adjutant or substitute for some EPLRS applications. The testing performed on both systems will likely be the main determinant. The Army's Phase I plan calls for the acquisition of 200 NTDRs for technical testing as well as IOT&E. Based on the results of Phase I, Phase II will procure NTDRs for fielding to Force Package I.

Operational Testing. The operational testing and evaluation of EPLRS and JTIDS is so important to the future of the ADDS program, and therefore to the Army's battlefield data digitization efforts, that it has been organized as a separate project within the ADDS PE (though not a new start).

Project D2QT - EPLRS/JTIDS Operational Test finances the direct costs of planning and conducting OT&E of both systems by the Operation Test and Evaluation Command (OPTEC). OPTEC then provides the Army leadership with an independent test and evaluation of the effectiveness and suitability of the systems.

Operational testing is conducted under conditions resembling — as closely as possible — those encountered in actual combat. Typical user troops trained to use the system are tested. Testing of the EPLRS downsized NCS-E ran through 1995. Testing and evaluation began for JTIDS (Class 2 modem) during 1996 and are continuing throughout 1997. Hughes began low-rate production in 1990 for the delivery of 1,301 EPLRS radios and eight net control stations to the Army for technical and operational testing requirements.

Funding

US FUNDING

	FY95		FY96		FY97		FY98(Req)	
	QTY	AMT	QTY	AMT	QTY	AMT	QTY	AMT
RDT&E (Army)								
PE#0603713A								
ADDS	-	5.3	-	6.5	-	3.8	-	22.9

	FY99(Req)		FY00(Req)		FY01(Req)		FY02(Req)	
	QTY	AMT	QTY	AMT	QTY	AMT	QTY	AMT
ADDS	-	10.9	-	5.5	-	-	-	n/a

Recent Contracts

Contractor	Award ($ millions)	Date/Description
GEC-Marconi	20.4	Jun 1994 — FVI to an FFP contract for 16 Class 2M JTIDS terminals and associated data for the Army. Completed by Jan 1997. (F19628-86-C-0035)
ITT	5.7	Jan 1996 — A US$5.7 million increment as part of a US$10.7 million FFP/CPIF/time & materials contract to design, develop and produce near-term digital radio (NTDR) prototypes. Contract reflects quantities of NTDR radios, network management terminals, installation kits, testing, and training and logistics support for 200 radios. An option for up to 950 additional radios is provided.

Hughes	10.0	Mar 1996 — Increment as part of a US$20 million FFP Ltr Ctrc for 325 Very High Speed Integrated Circuit (VHSIC) System Improvement Program (SIP)EPLRS users units (VS-EPUU) initial spare parts and associated data. To be completed Dec 1997. (DAAB07-96-C-C762)

Timetable

Jun	1980	System definition and concept evaluation completed (Phase 1)
Mar	1982	Phase 3/4 initiated (prototype and interface with other systems)
Jun	1982	Phase 2 successfully completed
	FY83	NSA approved a security architecture which allowed the ADDS to provide secret service to the JTIDS users and either confidential or secret service to the EPLRS users
	FY84	Continued Phase 3/4 development contract efforts for PLRS security upgrade, net management software, and interface units for selected battlefield automated systems. Breadboard designs of all PLRS modifications completed; JTIDS Class 2 prototype terminals integrated into the ADDS testbed; Contractor Development Tests (CDT) of breadboard PLRS modifications initiated
	FY85	Continued Phase 3/4 developmental contract; Phase 5 contract awarded to fabricate PLRS modification kits, integrate JTIDS terminals, and conduct the final ADDS test and demonstration phase
Apr	1985	Phase 5 initiated
	FY86	Phase 3/4 effort completed software/firmware, interface, and net management developments; also modified PLRS hardware for CDTs of prototype ADDS. Continued Phase 5 effort; began development of ADDS Integrated Logistics Support (ILS) package; conducted JTIDS portion of ADDS testing during joint Army/Air Force DT/OT II; awarded contract for VHSIC insertion, NCS trainer, and Enhanced PLRS Test Set firmware design development efforts; terminated effort to integrate the JTIDS terminal into the NCS; program schedule realigned following problems on PLRS production contract
	FY87	Completed Phase 3/4 development effort; Phase 5 effort continued fabrication of PLRS modification kits to support TT/IOT&E; initiated development of an NCS-J prototype
3Q	FY87	ASARC IIIA (PIP of PLRS hardware to NCS, EPUU, EPTS)
4Q	FY87	DSARC III (JTIDS Class 2 production)
Mar	1988	First Class 2M JTIDS terminal formally accepted by Army; ADDS/EPLRS Product Qualification Testing — Contractor (PQTC) completed
	FY88	Continued Phase 5 development effort; initiated and completed ADDS/EPLRS TT; completed VHSIC insertion effort, EPTS development efforts and modification of PLRS; initiated Low Rate Initial Production Phase B of EPLRS
Feb	1989	Field testing of developmental EPLRS radios
Jun	1989	Hughes finished full-scale development of EPLRS
Jan	1990	Hughes awarded low-rate production contract for EPLRS
Summer	1990	Initiated JTIDS Class 2M technical tests
	1992	Completed JTIDS System Technical Test/Initial Operational Assessment
Jun	1993	First overseas operational use in joint exercise with Kuwaiti forces
2Q	1994	JTIDS Class 2M Milestone III; IOT&E for EPLRS slated for summer
4Q	1994	EPLRS System Improvement Program award
FY96		Operational testing of both JTIDS and EPLRS continues
Jan	1996	Contract award to ITT to build 200 NTDRs as possible replacement for EPLRS
Oct	1997	Delivery of first five NTDRs scheduled

Worldwide Distribution

At present, this is a **US Army** program only.

Forecast Rationale

The goal of the digital battlefield is to harness the capability to identify, track, communicate with, and determine the precise location of friendly units deployed across a given area. Even though EPLRS units were available, the Army decided not to field any during Operations Desert Shield/Desert Storm. However, the Marine's PLRS is understood to have performed very well, validating the EPLRS concept.

Army officials are now seriously questioning whether or not EPLRS is the right system for their Data Digitization System. EPLRS was part of the pre-Cold War conception of ADDS; the requirements of a battlefield data digitization have changed. Technology advancements, such as ITT's Near Term Digital Radio, may well be able to do the job of EPLRS more efficiently and more economically. The NTDR will be acquisitioned as an non-developmental system.

Procurement quantities have decreased over the last few years, to reflect both changes in force structure and budgetary realities. However, ADDS has managed to recover some funding lost in previous years. In an adjustment to budget year 1997, $14.163 million dollars have been restored due to certain adjustments in the NTDR program which is also included under the same PE number. This funding has been applied towards JTIDS/EPLRS integration and testing.

With Army plans to downsize to a force of 18 divisions (12 active, six reserve), the number of EPLRS radios allocated to a division have been reduced from the figure of 500-550 to between 325 and 400 per division. This would total between 5,850 and 7,200 radios for the 18-division force.

In addition to these divisions, there will still be a sizable number of independent infantry, armor, artillery, air defense artillery brigades and armored cavalry regiments, among reserve and national guard forces, as well as training requirements. Whether some or any of these units will receive ADDS over the long term remains unknown.

It would appear that these units will require ADDS hardware, if they are to be integrated as part of the Army's Total Force concept, though on a much smaller scale. The need for the Pilot Control Panel will also be reduced considerably, since many of the older non-MIL-STD-1553 databus-equipped helicopters and fixed-wing aircraft will be retired by the end of the decade.

The first NTDRs are scheduled for delivery in October 1997, when they will undergo testing. The Army will need to procure EPLRS units at least until 1998, perhaps longer: a data distribution system is essential to the functioning of ADDS, and ADDS is essential to the Army's battlefield data digitalization efforts.

In spite of which system is ultimately selected (EPLRS or NTDR), the ADDS program itself has full support. JTIDS, appears to be progressing on schedule with IOT&E well under way. The Army has stated its commitment to the overall ADDS program, which is essential to its digitized data operations planned for the next century. RDT&E funding has been extended to the year 2000. The forecast does not include any predictions for the NTDR system.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

			High Confidence Level			Good Confidence Level			Speculative			
Designation	System	thru 96	97	98	99	00	01	02	03	04	05	06	Total 97-06
ADDS	NEAR TERM DIGITAL RADIO (US ARMY)	0	50	100	50	0	0	0	0	0	0	0	200
ADDS	TACTICAL TERMINAL (US ARMY)	125	75	50	10	0	0	0	0	0	0	0	135
ADDS	Prior Prod'n:	2554	0	0	0	0	0	0	0	0	0	0	0
Total Production		2679	125	150	60	0	0	0	0	0	0	0	335