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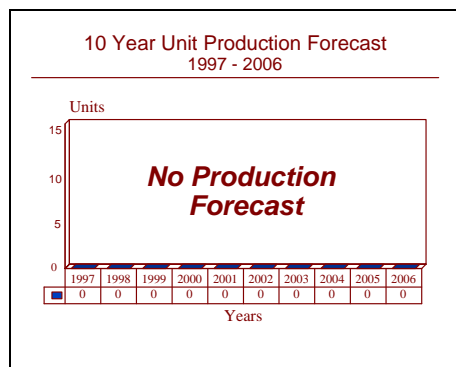
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RTSS- Archived 3/98

Outlook

- Deliveries ended in December 1995
- US military restructuring reduced requirements for the RTSS



Orientation

Description. The RTSS (Red Telephone Switching System) is a secure switch version of the TTC-39(V).

Sponsor

US Air Force
Communications Command
Engineering Installation Division
Tinker Air Force Base, Oklahoma (OK)
USA
(Program Office and Executive Agent for the RTSS)

Defense Information Systems Agency
Arlington, Virginia (VA)
USA
(RTSS Program Manager)

Contractor

GTE Corp
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(Prime Contractor, Developer, and Producer of RED Switch)

Status. In operational service. Production and delivery of RTSS completed by the end of 1995.

Total Produced. It is estimated that a total of 215 systems have been produced.

Application. The RTSS provides secure switching systems for the US Department of Defense (DoD).

Price Range. Cost is estimated to be between US\$3.5 million and US\$5.5 million per switching system (in FY94 US dollars).

Technical Data

Characteristics

	<u>Metric</u>	<u>US</u>
Cabinet Dimensions:	213cm H x 61cm W x 91cm D	84" H x 24" W x 36" D
RTSS Performance Summary		
Total External Lines:	96-1,360	
Call Rate:	7,500 calls per busy hour	
Matrix:	Time division, nonblocking at all precedence levels and for all configurations	
Voice Digitization		
Rates:	64 kbps PCM	
Signaling:	Digital — ISDN; Analog — DC, DTMF, dial pulse, 2-, 4-, and 6- wire loop/trunks	
Routing:	Up to eight routes offered per call, 200 routes per switch, originating and spill-forward control	
Interfaces:	Full interoperability with tactical and strategic systems	
Environmental:	MIL-STD-810B	
Power:	Prime — 120/280 Vac; 50-60 Hz, battery backup	
Cross Talk:	Digital — 105 dB, Analog — 107 dB.	
Inherent Availability:	.99996	
Operating Temperature:	-25°F to 120°F	

Design Features. The secure communications Red Telephone Switching System (RTSS) is a highly secure voice communications system for the DoD and the National Command Authority. The RTSS consists of switching equipment, control consoles, phones, software, and other peripheral equipment. It is modular and all-digital, with all equipment designed to meet EMI/TEMPEST requirements.

Configurations are available in sizes from 96 to 1,300 lines, with switch size to be determined by the number of line termination modules (LTMs) included. The use of an all-digital, time division technique means that there are no blocking problems and that data circuits of up to 64 Kbps can be supported.

The key component of RTSS is the RED Switch, a modified and customized variant of the TTC-39A tactical circuit switch. The RED Switch consists of four subsystems, each of which is installed in EMI- shielded cabinets:

Central Processor Subsystem. This subsystem contains two redundant Litton Data Systems L-3212A 32-bit computers and a controller nest. Its stored program coordinates all RED Switch call processing as well as administrative and diagnostic activities.

Control/Matrix Subsystem. This is the switching element. Key components are the switching controller group, time matrix master timing generator, T1 interface circuitry and common/pooled equipment.

Line Termination Subsystem. The LTM provides the termination circuitry for all external station equipment and trunks. It includes 24 channel modules and T1 channel banks. The LTM cabinet, wherein all line termination circuitry is located, can be locally (alongside cabinet) or remotely (via T1, fiber optic or coaxial cable) located.

Distribution Subsystem. This subsystem consists of terminal blocks, cross-patches, filter assemblies, shielded cable and conduit.

Attendant Console. This includes a screen display/monitor, control console, keyboard and handset or headset from which the operator services calls directed to the attendant for completion and special treatment. Each RED Switch can accommodate six attendant consoles.

Command Service Console. This provides its attendant with such command and control capabilities as: RTSS status inquiry, single key strobe RED and BLACK line access, conference establishment and list displays, all call service attendant functions and record/playback. The equipment consists of a control console, keyboard, display/ monitor units, record/playback units, headset or hand set and interface/control circuitry. Each RED Switch can accommodate ten consoles.

Telephones. The phone sets connect to RED Switch via a digital line, using an ISDN interface protocol. All perform PCM analog-to-digital conversion onboard. The digital approach optimizes voice quality and flexibility for data and remote subscriber applications. There are single-line

and RED/BLACK multi-line (6-, 10-, 20-, and 40-button) telephones. The telephones are being produced by Time & Space Processing Inc. as subcontractor to GTE. About 65,000 Integrated Services Digital Networks (ISDN) telephones are to be produced under current contracts.

Remote Subscriber Unit. The RSU provides service to a multi-line telephone via either a 56- or 64-kbps KG-84 encrypted link. This technique extends service to remote RED enclaves via encrypted digital lines. A Multiple Remote Subscriber UNIT (MRSU) provides service up to 23 multi-line telephones via a KG-81/94 encrypted T1 link.

BLACK Key System. This provides command center console and multi-line subscriber access to BLACK command and control circuits.

Cryptographic Interface System. COMSEC provides the interface and isolation between the RED Switch and BLACK network. The Interfaces include KY-3, VTT/VST, KY-71, STU-II, STU-III, KY-68/78, AND VT, PARKHILL, KY-57/58, KG-84A/C, and KG-81/94.

Maintenance/Administrative Station. This station provides maintenance control, administrative reports

and data base configuration. It consists of a TEMPEST-qualified visual display terminal and an ink jet printer. A personnel computer serves as a mass storage cell for audit trails, metering information and location data, and executing a report generation program for hard copy records of the desired meters and audit trails. The Command Center and Attendant Consoles can access the locator data via a local area network.

Operational Characteristics. The RTSS switches are destined for the National Military Command Center (NMCC), the Alternate National Military Command Center (ANMCC), and the primary command centers of the unified and specified commands. Use of the switches allows users within a secure area (RED enclave) to conduct secure voice communications (up to and including top secret/sensitive compartmented information levels) from non-encrypted telephone sets. The switches can be connected with other RTSS switches to form secure networks. The RTSS switches are able to interface with other government secure voice systems and tactical networks such as TRI-TAC, DSN/AUTOVON and AUTOSEVECOM.

Variants/Upgrades

A Value Engineering Change Proposal (VECP) has been submitted to USAF/ESD to upgrade the processors and enhance the switching controllers.

Program Review

Background. Since 1983, Chrysler Corp's Electrospace Systems has been supplying first-generation SDS-1 secure digital switches for the DoD's Command Centers. The DoD decided to open up a follow-on program for a second-generation, non-developmental item procurement for new digital switches to the industry in 1987. The RED Switch contract was competed between Electrospace Systems, the team of

Atlantic Research Corp/Northern Telecom, and GTE Government Systems. GTE was selected and awarded a US\$51.3 million initial procurement contract in September 1988. The initial contract called for GTE to provide and install two RED Switch with an option for an additional 10 in the first year. It also contained annual operations and maintenance support with options for 19 more years of support.

Funding

Development and procurement funding detail is not broken out in DoD budgetary documents.

Recent Contracts

As of late 1996, no recent contracts relating to this system had been identified and no production contracts are anticipated in the near future. It is possible that some contracts for spares and maintenance may surface towards the end of the decade.

Timetable

	1987	Competition for NDI secure digital switch initiated
Sep	1988	GTE announced winner of RTSS contract
Jan	1991	First RTSS switch delivered
Dec	1995	RTSS production completed

Worldwide Distribution

RTSS and its technology belong strictly to the **US Department of Defense**.

Forecast Rationale

GTE's Red Telephone Switching System (RTSS) contract originally carried contract options for a quantity of up to 300 RTSS switches destined for a variety of Federal agencies through 1995. However, in the early 90s, the Clinton administration was in the midst of a large scale military restructuring and budget cutting campaign that pared down procurement in many areas that were previously taken for granted as having guaranteed funding. Recent geopolitical situations in Haiti, Somalia, and the Middle East have drawn attention to the loss of certain capabilities resulting from such budget cuts. These hotspots have highlighted the US military in action and have shown the US to be straining to respond to the increasing number of world crises.

The massive restructuring of US military forces have decreased the number of overseas bases in the past ten years. Significant reductions across the board in US installations have also decreased procurement and cutbacks are expected to continue. As a result of the downsizing, the DoD's original procurement goal dropped and it is probable that the program topped out at some 215 RTSS systems at the end of the production run in 1995. Delivery orders that have been identified include end-users at ANMCC, NMCC, CINCEUR, CINCFORS, and PACAF (Hickam, Yokota, and Kadena).

It is possible that some contracts for spares and maintenance support may be awarded toward the end of the decade, but no further production is anticipated.

Ten-Year Outlook

No further production of this system is expected.

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