



DEFENSE INFORMATION SYSTEMS AGENCY

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IN REPLY
REFER TO: Joint Interoperability Test Command (JTE)

29 Feb 12

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of Network Equipment Technologies (NET) Promina 800 with Software Release 4.x5.03, Version 95.55 and NET Promina 400 with Software Release 4.x5.03, Version 105.55

References: (a) DOD Directive 4630.05, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004
(b) CJCSI 6212.01D, "Interoperability and Supportability of Information Technology and National Security Systems," 8 March 2006
(c) through (e), see Enclosure 1

1. References (a) and (b) establish the Defense Information Systems Agency (DISA), Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification.

2. The NET Promina 800 with Software Release 4.x5.03, Version 95.55 and NET Promina 400 with Software Release 4.x5.03, Version 105.55 are hereinafter referred to as the System Under Test (SUT). The SUT meets all of its critical interoperability requirements and is certified as interoperable for joint use within the Defense Information Systems Network (DISN) as a Deployable Network Element and Fixed Network Element as set forth in Reference (c) with some limitations, which are discussed as follows:

- The SUT is certified for joint use within the DISN with the following access interfaces: Digital Transmission Link Level 1 (T1) Channel Associated Signaling (CAS), Primary Rate Interface (PRI), Signaling System 7 (SS7), European Basic Multiplex Rate (E1) CAS, PRI, SS7, and EIA-530 Serial.
- The SUT also has two transport interfaces that are certified for joint use within the DISN: EIA-530 Serial, and Trunk 3 (T1 only).
- Additionally, the Asynchronous Transfer Mode (ATM) Optical Carrier Level 3 (OC-3) transport interface is certified only with the Promina 800. The Promina 400 does not have an ATM OC-3 interface and, therefore, was not certified for that interface.
- The T1 access interface of the Primary Rate Card (PRC) with Primary Voice Secure (PVS) is only certified for clear channel mode over the Trunk 3 transport interface.
- The T1 access interface of the Primary Voice Secure - Enhanced (PVS-E) is certified for Channel Associated Signaling and clear channel mode with 9.6 Kilobits per second compression over the Trunk 3 transport interface.

- The SUT is interoperable in mated pairs with the Promina NX-1000 provided both the SUT and the NX-1000 are loaded with the same certified Software Release 4.x5.03 version 95.55.

The SUT meets the critical interoperability requirements set forth in Reference (c) and testing was conducted using test procedures derived from Reference (d). No other configurations, features, or functions, except those cited within this report, are certified by the JITC. This certification expires upon changes that affect interoperability, but no later than three years from the date of the Unified Capabilities Approved Products List memorandum.

3. This finding is based on interoperability testing, review of the vendor’s Letters of Compliance (LoC), and DISA Certifying Authority (CA) accreditation. Interoperability testing was conducted by JITC at the Global Information Grid Network Test Facility, Fort Huachuca, Arizona, from 12 September through 10 November 2011. Review of the vendor’s LoC was completed on 29 November 2011. DISA CA granted accreditation on 15 February 2012 based on the security testing completed by DISA-led Information Assurance (IA) test teams and published in a separate report, Reference (e). The Certification Testing Summary (Enclosure 2) documents the test results and describes the test network.

4. The SUT Interoperability Test Summary is shown in Table 1 and the Capability and Feature Requirements used to evaluate the interoperability of the SUT are indicated in Table 2. The interoperability test status is based on the SUT’s ability to meet:

- DISN services for Network and Applications specified in Reference (c).
- The overall system interoperability performance derived from test procedures listed in Reference (d).

Table 1. SUT Interoperability Test Summary

DISN Access Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 CAS (AMI/SF) DTMF, MFR1	No ¹	Certified	Met all CRs and FRs.
T1 CAS (B8ZS/ESF) DTMF, MFR1	No ¹	Certified	Met all CRs and FRs.
T1 PRI (ANSI T1.607/T1.619a)	No ¹	Certified	Met all CRs and FRs.
T1 SS7 (ANSI T1.619a)	No ¹	Certified	Met all CRs and FRs.
E1 CAS (HDB3) DTMF, MFR1	No ¹ (Europe only)	Certified	Met all CRs and FRs.
E1 ISDN PRI (ITU-T Q.931/Q.955.3)	No ¹ (Europe only)	Certified	Met all CRs and FRs.
E1 SS7 (ANSI T1.619a)	No ¹ (Europe only)	Certified	Met all CRs and FRs.
Serial (EIA-530)	No ¹	Certified	Met all CRs and FRs.
DISN Transport Interfaces			
Transport Level	Critical	Status	Remarks
Serial (EIA-530) SA-TRK	No ²	Certified	Met all CRs and FRs.
T1 TRK- 3	No ²	Certified ³	Met all CRs and FRs.
ATM OC-3	No ²	Certified ⁴	Met all CRs and FRs.

JITC Memo, JTE, Special Interoperability Test Certification of Network Equipment Technologies (NET) Promina 800 with Software Release 4.x5.03 Version 95.55 and NET Promina 400, Software Release 4.x5.03 Version 105.55

Table 1. SUT Interoperability Test Summary (continued)

Features And Capabilities			
Features And Capabilities	Critical	Status	Remarks
Synchronization	Yes	Certified	Met all CRs and FRs.
Network Management	Yes	Certified	Met all CRs and FRs.
Security	Yes	Certified	Met all CRs and FRs ⁵ .
NOTES:			
1 The UCR does not stipulate a minimum Access interface requirement for an F-NE or D-NE.			
2 The UCR does not stipulate a minimum Transport interface requirement for an F-NE or D-NE.			
3 The TRK-3 Transport offers T1, E1 and Serial back plane interfaces; however, only the T1 interfaces was tested and is certified for joint use within the DISN.			
4 The ATM-OC3 Transport interface is only certified for joint use within the DISN with the NET Promina 800 only. The ATM-OC3 transport interface is not supported by the NET Promina 400.			
5 Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report, Reference (e).			
LEGEND:			
AMI	Alternate Mark Inversion	ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
ANSI	American National Standards Institute	MFR1	Multi-Frequency Recommendation 1
B8ZS	Bipolar Eight Zero Substitution	PRI	Primary Rate Interface
CAS	Channel Associated Signaling	Q.931	Signaling Standard for ISDN
CR	Capability Requirements	Q.955.3	ISDN Signaling Standard for E1 MLPP
D-NE	Deployable Network Element	SA -TRK	Symmetric Asymmetric-Trunk
DISA	Defense Information Systems Agency	SF	Super Frame
DISN	Defense Information System Network	SS7	Signaling System 7
DTMF	Dual Tone Multi-Frequency	SUT	System Under Test
E1	European Basic Multiplex Rate (2.048 Mbps)	T1	Digital Transmission Link Level 1 (1.544 Mbps)
EIA	Electronic Industries Alliance	T1.607	ISDN – Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
ESF	Extended Super Frame	TRK-3	Trunk-3
F-NE	Fixed Network Element	UCR	Unified Capabilities Requirements
FR	Feature Requirements		
ISDN	Integrated Services Digital Network		

Table 2. SUT CR and FR Interoperability Requirements

DISN Access Interfaces			
Interface	Critical	Requirements Required or Conditional	References
T1 CAS (AM/SF) DTMF, MFR1	No ¹	<ul style="list-style-type: none"> • DS1 Interface Characteristics (C) • DS1 Supervisory Channel Associated Signaling (C) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.4 • UCR Section 5.9.2.3.4
T1 CAS (B8ZS/ESF) DTMF, MFR1	No ¹	<ul style="list-style-type: none"> • DS1 Clear Channel Capability (C) • DS1 Alarm and Restoral Requirements (C) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.4 • UCR Section 5.9.2.3.4
T1 PRI (ANSI T1.607/T1.619a)	No ¹	<ul style="list-style-type: none"> • E1 Interface Characteristics (C) • E1 Supervisory Channel Associated Signaling (C) • E1 Clear Channel Capability (C) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.5 • UCR Section 5.9.2.3.5 • UCR Section 5.9.2.3.5
T1 SS7 (ANSI T1.619a)	No ¹	<ul style="list-style-type: none"> • E1 Alarm and Restoral Requirements (C) • MOS (R) (F-NE Only) • MOS (R) (D-NE Only) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.3.1
E1 CAS (HDB3) DTMF, MFR1	No ¹	<ul style="list-style-type: none"> • BERT (R) (F-NE Only) • BERT (R) (D-NE Only) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.3.1
E1 ISDN PRI (ITU-T Q.931/Q.955.3)	No ¹	<ul style="list-style-type: none"> • Secure Transmission (Voice and Data) (R) (F-NE Only) • Secure Transmission (Voice and Data) (R) (D-NE Only) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.3.8
E1 SS7 (ANSI T1.619a)	No ¹	<ul style="list-style-type: none"> • Modem (R) • Facsimile (R) • Call Control Signals (R) • Alarms (R) (F-NE Only) • Alarms (R) (D-NE Only) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1.1
Serial (EIA-530)	No ¹	<ul style="list-style-type: none"> • Call Congestion Control (R) (F-NE Only) • Call Congestion Control (R) (D-NE Only) • Call Congestion for TDM Transport (R) (D-NE Only) • Voice Compression (C) (F-NE Only) • Voice Compression (C) (D-NE Only) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.3.4 • UCR Section 5.9.2.2 • UCR Section 5.9.3.1
DISN Transport Interfaces			
Interface	Critical	Requirements Required or Conditional	References
Serial (EIA-530) SA-TRK	No ²	<ul style="list-style-type: none"> • MOS (R) (F-NE Only) • MOS (R) (D-NE Only) • BERT (R) (F-NE Only) • BERT (R) (D-NE Only) • Secure Transmission (Voice and Data) (R) (F-NE Only) • Secure Transmission (Voice and Data) (R) (D-NE Only) • Modem (R) • Facsimile (R) • Call Control Signals (R) • Alarms (R) (F-NE Only) • Alarms (R) (D-NE Only) • Call Congestion Control (R) (F-NE Only) • Call Congestion Control (R) (D-NE Only) • Call Congestion for TDM Transport (R) (D-NE Only) • Voice Compression (C) (F-NE Only) • Voice Compression (C) (D-NE Only) • Delay (R) (F-NE Only) • Delay (R) (D-NE Only) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.3.8 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1.1 • UCR Section 5.9.3.5 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.3.4 • UCR Section 5.9.2.2 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.3.3

Table 2. SUT CR and FR Interoperability Requirements (continued)

DISN Transport Interfaces			
Interface	Critical	Requirements Required or Conditional	References
T1 TRK-3	No ²	<ul style="list-style-type: none"> • DS1 Interface Characteristics (R) • MOS (R) (F-NE Only) • MOS (R) (D-NE Only) • BERT (R) (F-NE Only) • BERT (R) (D-NE Only) • Secure Transmission (Voice and Data) (R) (F-NE Only) • Secure Transmission (Voice and Data) (R) (D-NE Only) • Modem (R) • Facsimile (R) • Call Control Signals (R) • Alarms (R) (F-NE Only) • Alarms (R) (D-NE Only) • Call Congestion Control (R) (F-NE Only) • Call Congestion Control (R) (D-NE Only) • Call Congestion for TDM Transport (R) (D-NE Only) • Voice Compression (C) (F-NE Only) • Voice Compression (C) (D-NE Only) • Delay (R) (F-NE Only) • Delay (R) (D-NE Only) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.4 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.3.8 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1.1 • UCR Section 5.9.2.1.1 • UCR Section 5.9.3.5 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.3.4 • UCR Section 5.9.2.2 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.3.3
ATM OC-3 NET Promina 800 only	No ²	<ul style="list-style-type: none"> • ANSI T1.105 (R) • GR-253-CORE (R) • MOS (R) (F-NE Only) • MOS (R) (D-NE Only) • BERT (R) (F-NE Only) • BERT (R) (D-NE Only) • Secure Transmission (Voice and Data) (R) (F-NE Only) • Secure Transmission (Voice and Data) (R) (D-NE Only) • Modem (R) • Facsimile (R) • Call Control Signals (R) • Alarms (R) (F-NE Only) • Alarms (R) (D-NE Only) • Call Congestion Control (R) (F-NE Only) • Call Congestion Control (R) (D-NE Only) • Call Congestion for TDM Transport (R) (D-NE Only) • Voice Compression (C) (F-NE Only) • Voice Compression (C) (D-NE Only) • Delay (R) (F-NE Only) • Delay (R) (D-NE Only) 	<ul style="list-style-type: none"> • UCR Section 5.5.3.4.2 • UCR Section 5.5.3.4.2 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.3.8 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1.1 • UCR Section 5.9.3.5 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.3.4 • UCR Section 5.9.2.2 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.3.3

Table 2. SUT CR and FR Interoperability Requirements (continued)

SUT Features And Capabilities			
Feature/Capability	Critical	Requirements Required or Conditional	References
Synchronization	Yes	• Timing (R)	• UCR Section 5.9.2.3.7
Network Management	Yes	• Management Option (R) Local Management (Front Panel and/or External Console) (C) ADIMSS (C) • Fault Management (C) • Loop Back Capability (C) • Operational Configuration Restoral (R)	• UCR Section 5.9.2.4.1 • UCR Section 5.9.2.4.2 • UCR Section 5.9.2.4.3 • UCR Section 5.9.2.4.4
Security	Yes	• STIGs and DoDI 8510.01 (DIACAP) (R)	• UCR Section 5.9.2.6
NOTES:			
1 The UCR does not stipulate a minimum required DISN access interface.			
2 The UCR does not stipulate a minimum required DISN transport interface.			
LEGEND:			
AMI	Alternate Mark Inversion	F-NE	Fixed Network Element
ANSI	American National Standards Institute	GR	General Requirement
ATM	Asynchronous Transfer Mode	HDB3	High Density Bipolar Three
B8ZS	Bipolar Eight Zero Substitution	ISDN	Integrated Services Digital Network
BERT	Bit Error Rate Test	ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
C	Conditional	MFR1	Multi-Frequency Recommendation 1
CAS	Channel Associated Signaling	MOS	Mean Opinion Score
D-NE	Deployable Network Element	NET	Network Equipment Technologies
DIACAP	Department of Defense Information Assurance Certification and Accreditation Process	OC-3	Optical Carrier Level 3
DoDI	Department of Defense Instruction	PRI	Primary Rate Interface
DP	Dial Pulse	Q.931	Signaling Standard for ISDN
DS1	Digital Signal Level 1	Q.955.3	ISDN Signaling Standard for E1 MLPP
DSS1	Digital Subscriber Signaling 1	R	Required
DISN	Defense Information System Network	SA-TRK	Symmetric Asymmetric-Trunk
DTMF	Dual Tone Multi-Frequency	SF	Super Frame
E1	European Basic Multiplex Rate (2.048 Mbps)	SS7	Signaling System 7
EIA	Electronic Industries Alliance	STIG	Security Technical Implementation Guides
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting DTE and DCE data communications devices	SUT	System Under Test
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange	T1	Digital Transmission Link Level 1 (1.544 Mbps)
ESF	Extended Super Frame	T1.607	ISDN – Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
		T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
		TDM	Time Division Multiplexing
		TRK-3	Trunk-3
		UCR	Unified Capabilities Requirements

JITC Memo, JTE, Special Interoperability Test Certification of Network Equipment Technologies (NET) Promina 800 with Software Release 4.x5.03 Version 95.55 and NET Promina 400, Software Release 4.x5.03 Version 105.55

5. No detailed test report was developed in accordance with the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at <https://stp.fhu.disa.mil>. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at <http://jit.fhu.disa.mil> (NIPRNet), or <http://199.208.204.125> (SIPRNet). Information related to DISN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>. Due to the sensitivity of the information, the Information Assurance Accreditation Package (IAAP) that contains the approved configuration and deployment guide must be requested directly through government civilian or uniformed military personnel from the Unified Capabilities Certification Office (UCCO), e-mail: ucco@disa.mil.

6. The JITC point of contact is Mr. Khoa Hoang, DISN 879-4376, commercial (520) 538-4376, FAX DISN 879-4347, or e-mail to khoa.hoang@disa.mil. JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 1023501.

FOR THE COMMANDER:



For BRADLEY A. CLARK
Chief

Battlespace Communications Portfolio

2 Enclosures a/s

Distribution (electronic mail):

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DOT&E, Net-Centric Systems and Naval Warfare

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Defense Information Systems Agency, TEMC

Office of Assistant Secretary of Defense (NII)/DOD CIO

U.S. Joint Forces Command, Net-Centric Integration, Communication, and Capabilities Division, J68

Defense Information Systems Agency, GS23

ADDITIONAL REFERENCES

- (c) Defense Information Systems Agency (DISA), "Department of Defense Unified Capabilities Requirements 2008, Change 2," 31 December 2010
- (d) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006
- (e) Joint Interoperability Test Command, "Information Assurance (IA) Assessment of NET Promina 800 with software Release 4.x5.03 Version 95.55, and Promina 400 with Software Release 4.x5.03 Version 105.55, (Tracking Number 1023501)." 20 January 2012

CERTIFICATION TESTING SUMMARY

- 1. SYSTEM TITLE.** Network Equipment Technologies (NET) Promina 800 with Software Release 4.x5.03 Version 95.55 and NET Promina 400 with Software Release 4.x5.03 Version 105.55; hereinafter referred to as the System Under Test (SUT).
- 2. SPONSOR.** United States Army (USA), PEO-C3T SFAE-C3T-WIN-INC1.
- 3. SYSTEM POC.** Mr. Cesar Mencia, Deputy Chief INC 1 Tech Management, Murphy Road Building 906, Fort Monmouth NJ, 07703, E-mail: Cesar.Mencia@us.army.mil.
- 4. TESTER.** Joint Interoperability Test Command (JITC), Fort Huachuca, Arizona.
- 5. SYSTEM UNDER TEST DESCRIPTION.**

a. The SUT is certified as a Deployed Network Element (D-NE) and Fixed Network Element (F-NE) within the Defense Information Systems Network (DISN). The SUT has the following access interfaces that are certified for joint use within the DISN: Digital Transmission Link Level 1 (T1) Channel Associated Signaling (CAS), Primary Rate Interface (PRI), Signaling System 7 (SS7), European Basic Multiplex Rate (E1), CAS, PRI, SS7, and Electronic Industries Alliance (EIA)-530 Serial. The T1 access interface of the Primary Rate Card (PRC) with Primary Voice Secure (PVS) is only certified for clear channel mode over the Trunk 3 transport interface. The T1 access interface of the Primary Voice Secure-Enhanced (PVS-E) is certified for Channel Associated Signaling and clear channel mode with 9.6 Kilobits per second compression over the Trunk 3 transport interface. The SUT also has three transport interfaces that are certified for joint use within the DISN: EIA-530, Serial, and Trunk 3 (T1 only). Additionally, the Asynchronous Transfer Mode (ATM) Optical Carrier Level 3 (OC-3) transport interface is certified only with the Promina 800. The Promina 400 does not have an ATM OC-3 interface, therefore, is not certified for that interface. The NX1000 uses the low-bandwidth Signal Channel Link Protocol, to route (and re-route in case of trunk failure) port traffic through the Promina network. The NET Promina network is formed by configuring and linking several nodes together; the NX1000s and/or Promina 400 software release 4.x5.03 version 105.55 or the Promina 800 software release 4.x5.03 version 95.55. To support DISN traffic the SUT uses a PRC and a PVS-E module to interface with T1 channels from a DISN switch and compresses these channels for more efficient transport through the Promina network. These compressed voice channels are then automatically routed across the Promina network to whichever destination is specified by the originating side. The SUT nodes are managed by serial or Ethernet connectivity from any location where network connections to the nodes are available. Management workstations use the Public Key Infrastructure/Common Access Card (CAC) enabled Putty-CAC Secure Shell (SSH) version 2 protocol terminal client emulator, and Pageant CAC interface application, to provide an encrypted communication session. After a secure management session is made to the SUT, administrative tasks such as querying, recording alarms and events, and monitoring the operational state of the node, cards, ports, and trunks, can be performed. Additionally,

site-specific configuration changes to the SUT are accomplished using this same management interface.

a. NET Promina 800. The NET Promina 800 is a dual shelf configured, D- or F-NE that consists of one High Speed Shelf (HSS) and up to seven Expansion Shelves (EXS) or Standard Shelves (STS). The top shelf is configured as the Standard Shelf and contains the Bus Extender Module, Promina Server Module (PSM), and Promina interchangeable cards. The bottom shelf is configured as the HSS that contains the Promina Processing Module cards, high speed trunk cards, and the main switching fabric cards.

b. NET Promina 400. The NET Promina 400 is a single standard configured, D- or F-NE. It consists of one HSS, up to seven EXS or STS, and contains the Promina Logic Module (PLM) card. The PLM card provides the processor platform, clock, and switching matrix for the Promina 400. The PLM is associated with a corresponding PLM Interface card. The PLM has scalable Direct Random Access Memory (DRAM) sizes from 16 to 32 megabytes. This DRAM provides all normal runtime code execution space, stack space, and scratch pad storage. Flash memory provides the data storage of boot code, system runtime code, and configuration database. The flash memory system on the PLM stores a complete image of the boot and runtime code. Flash memory is the storage mechanism for the Promina 400 node configurations that do not have an installed PSM. Flash memory supports self-sufficiency during a node restart without requiring a download from a remote node in the network. The Promina 400 can be deployed with one additional shelf.

The various SUT nodes support many interchangeable cards to support specific configurations and functions. The cards are further described by functional type below:

Transport Interfaces:

Trunk-3 (TRK-3). The TRK-3 module interfaces a sub-rated facility to support full, fractional T1/E1, or Serial service with a separate backplane card for each interface. Only the T1 interface was tested and is certified for joint use with the DISN.

- **TRK-3 Front Card.** The TRK-3 Front Card contains two similar Digital Signal Processor (DSP) engines; one to process proprietary bundle data in the transmit path, and the other for the receive path. A host processor provides support to the DSPs and controls the interfaces to the system software and interface card.

- **T1-Digital Subscriber X (T1-DSX) Interface backplane card.** The T1-DSX Interface backplane card provides a channelized 1.544 Mbps Digital Signal Level 1 (DS1) signal, which is compatible with carrier Direct Access and Cross-Connect System equipment at the DS0 level. It uses programmable signal equalization to meet the DSX-1 pulse template requirements at distances from 0 to 655 feet. The T1-DSX interface requires the use of an external Channel Service Unit for connection to the network interface, which must use the Binary 8 Zero Suppression (B8ZS) method. The

T1-DSX signal operates in either the D4 Super Frame (SF) format, or the Extended Super Frame (ESF) format. Fractional T1 services are fully supported. The T1-DSX parameters are configured through the operator interface. The signal received from the span can be used as a nodal clock reference source.

Symmetric Asymmetric-Trunk (SA-TRK). The SA-TRK module provides asymmetric trunking capability. Asymmetric trunking means the transmit and receive trunk rates do not have to be the same. It provides symmetric and asymmetric trunking rates of 16 kilobits per second (kbps) through 16.384 Megabits per second (Mbps) for the Promina 800 and 16 kbps through 8.448 Mbps for Promina 400. For the Promina 400, the SA-TRK provides intra-domain bandwidth of 2.048 Mbps, 4.096 Mbps, or 8.192 Mbps. Under certain conditions, 8448 kbps is possible; such as an E2 application. Inter-domain bandwidth is identical to intra-domain bandwidth except that there is a 2.048 Mbps maximum for a single call. The physical interface is a serial EIA-530 interface.

The SA-TRK supports efficient transport of one-way and two-way calls. A one-way call is a port-to-port interconnection through the Promina network in which data travels in one direction only. It is desirable for these calls to consume bandwidth on the internodal trunk only in the direction the data is traveling. The SA-TRK allows independently configurable transmit and receive rates to support this application. The SA-TRK supports symmetric full-duplex (two-way) and simplex (one-way) calls in asymmetric trunk mode (the transmit and receive trunk rates differ). The SA-TRK only supports symmetric full-duplex (two-way) calls in symmetric trunk mode, (the transmit and receive trunk rates are the same).

Scream Link eXchange (SCLX) (Promina 800 only). SCLX can interoperate with ATM networks to increase traffic capacity to 64 Mbps over direct virtual trunk bundles. The SCLX provides an intelligent, high-speed transport and aggregation point for the Promina network, allowing access to broadband multi-service networks. The interface card provides an optical interface to Synchronous Optical Networking networks at OC-3c (Synchronous Transport Signal level 3c (STS-3c)) rates or to Synchronous Digital Hierarchy networks at Synchronous Transport Module level 1 rates (each rated at 155.52 Mbps).

Access Interfaces:

PRC. The PRC voice module is a two-digroup, clear-channel interface and Channel Associated Signaling (CAS). The PRC module consists of a PRC front card and a DS-1 interface card that supports the T1 digital voice interface used primarily in North America. The PRC module provides a T1 link with either D3/D4 Super Frame (SF) or Extended Super Frame (ESF), zero suppression for transparent operation, aggregate circuits, clear channel, and CAS operation.

PVS-E. The PVS-E provides local T1/E1 digital interfaces as well as Echo Canceller engines, and is designed to interwork with most of the existing Promina voice

products. The PVS-E module uses the Network Voice Exchange (NVX) Interface T1/E1 rear interface card to provide a four-port T1/E1 interface. The PVS-E supports the following features:

- The PVS-E/NVX module is interoperable with PrimeVoice products including the PVS.
- Up to 96 calls in T1 mode and 120 calls in E1 mode are supported using G.711 with or without echo cancellation or with 8 kbps/9.6 kbps G.729 compressed calls with or without echo cancellation.
- Up to 75 Department of Defense (DoD) Secure Communication Device (DSCD) calls are supported.

The PVS-E provides Primary Rate Interface (PRI) support similar to the PRI support provided by the PRC.

High Density T1/E1 (HD T1/E1): The HD T1/E1 module is a four-port T1/E1 card that works in any Promina 400/800 expansion shelf slot. The HD T1/E1 module has the following features: four Registered Jack-45 rear interface ports and supported rates of 1.544 Mbps, 1.568 Mbps, and 2.048 Mbps.

Quad Asynchronous/Synchronous Data (QASD). The QASD module supports the following:

- Asynchronous/synchronous capability for all four full-duplex ports when configured with Data Circuit-Terminating Equipment (DCE)/Data Terminal Equipment (DTE) interface cards.
- Asynchronous data transmission from 75 bps to 19.2 kbps, on any (or all) of four ports.
- Synchronous port speeds of 12, 12.8, 16.8, 24, 57.6, and 64 kbps.

Universal Synchronous Data (USD). The USD module supports the following:

- Two independent synchronous data ports with V.35 or EIA-449/422 (DCE/DTE) interfaces at rates from 1.2 kbps to 1.344 Mbps. The V.35 and EIA-449 serial interfaces were not tested; therefore, not certified for joint use within the DISN.
- An EIA-530 (DCE) interface at rates from 1.2 kbps to 1.344 Mbps.

High Speed Synchronous Data (HSSD)-2/2B. The HSSD-2/2B module supports the following:

- Transmit and receive timing.
- Dual EIA-530 DCE rear interface at data rates from 1.2 kbps to 1.544 Mbps.

Although the HSSD-2/2B module is offered, it was not tested; therefore, is not certified for joint use within the DISN.

High Density Data-four port (HDD4). The HDD4 module supports synchronous, asynchronous and 1 bps speed modes with the following features:

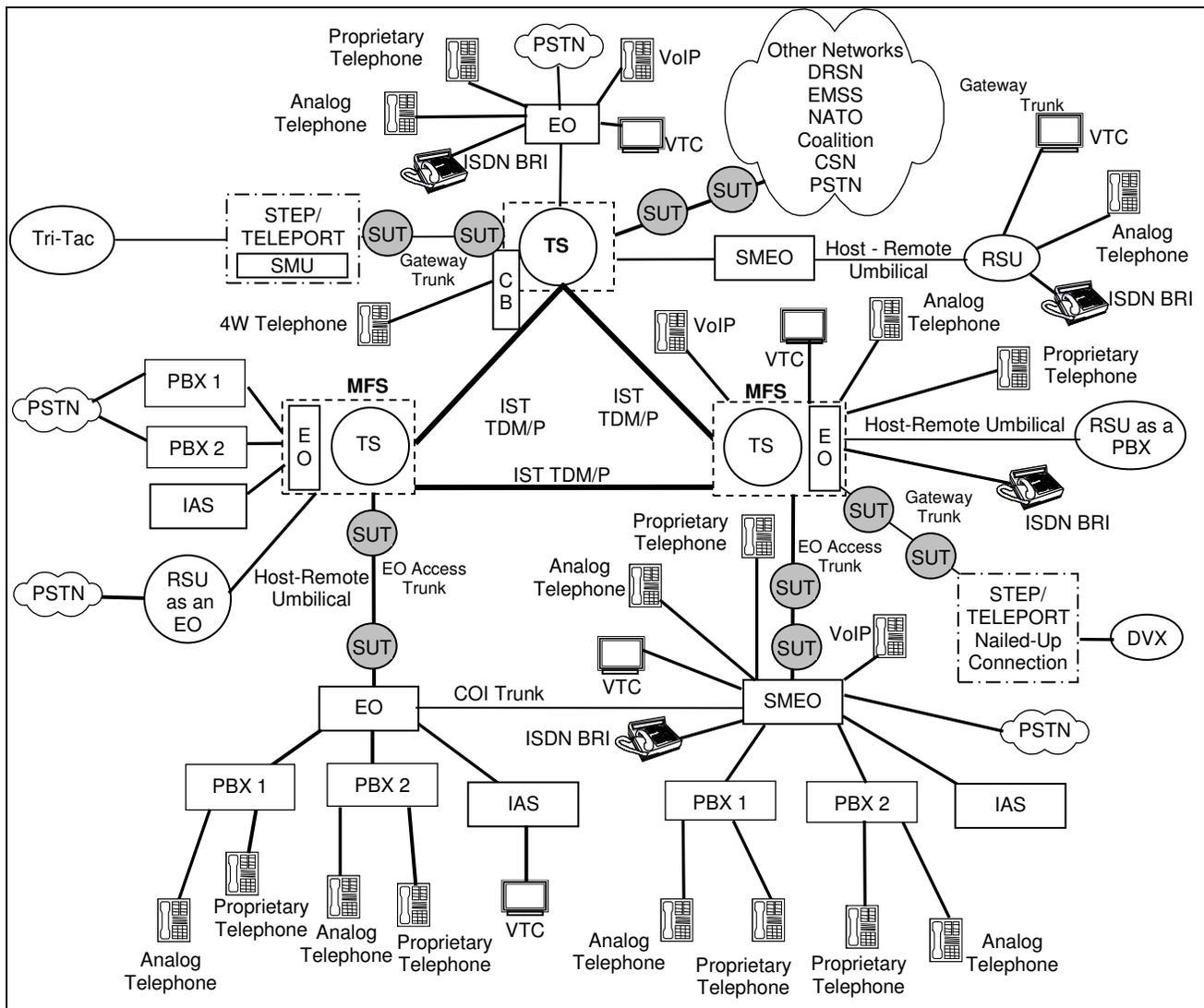
- When using 1bps mode supports any rate from 75 bps to 2.048 Mbps and both synchronous and asynchronous rates may be selected.
- In asynchronous mode, only 9.6 kbps data rate is explicitly supported. HDD4 supports Normal (default) 56/64 kbps formats.

Shared Resources:

PVS. All Promina PrimeVoice cards act as server modules to provide voice compression to any voice channel configured accordingly. The PVS card is the version of the Promina Series 12-channel card that supports transmission of DSCD encrypted voice and facsimile, in addition to the normal modem, fax, and voice compression capabilities of standard PrimeVoice compression cards.

PrimeVoice Echo Canceller (PVEC). The PVEC-32 module provides background noise control for the Promina digital voice ports. Unlike voice compression, echo cancellation can be single-ended; one site can be using PVEC echo cancellation while the other site uses an external canceller or no cancellation. The PVEC module is designed to comply with International Telecommunications Union - Telecommunication Standardization Sector (ITU-T) recommendations G.165 and G.168.

6. OPERATIONAL ARCHITECTURE. The Unified Capabilities Requirements (UCR) DISN architecture in Figure 2-1 depicts the relationship of the SUT to the DISN switches.



LEGEND:

- | | | | |
|------|---------------------------------------|---------|---|
| 4W | - 4-Wire | PBX | - Private Branch Exchange |
| BRI | - Basic Rate Interface | PBX 1 | - Private Branch Exchange 1 |
| CB | - Channel Bank | PBX 2 | - Private Branch Exchange 2 |
| COI | - Community of Interest | PSTN | - Public Switched Telephone Network |
| CSN | - Canadian Switch Network | RSU | - Remote Switching Unit |
| DRSN | - Defense Red Switch Network | SMEO | - Small End Office |
| DISN | - Defense Switched Network | SMU | - Switched Multiplex Unit |
| DVX | - Deployable Voice Exchange | STEP | - Standardized Tactical Entry Point |
| EMSS | - Enhanced Mobile Satellite System | SUT | - System Under Test |
| EO | - End Office | TDM/P | - Time Division Multiplex/Packetized |
| IAS | - Integrated Access Switch | Tri-Tac | - Tri-Service Tactical Communications Program |
| ISDN | - Integrated Services Digital Network | TS | - Tandem Switch |
| IST | - Interswitch Trunk | VoIP | - Voice over Internet Protocol |
| MFS | - Multifunction Switch | VTC | - Video Teleconferencing |
| NATO | - North Atlantic Treaty Organization | | |

Figure 2-1. DISN Architecture

7. REQUIRED SYSTEM INTERFACES. The SUT Interoperability Test Summary is shown in Table 2-1 and the Capability and Feature Requirements used to evaluate the interoperability of the SUT are indicated in Table 2-2.

Table 2-1. SUT Interoperability Test Summary

DISN Access Interfaces			
Interface & Signaling	Critical	Status	Remarks
T1 CAS (AMI/SF) DTMF, MFR1	No ¹	Certified	Met all CRs and FRs.
T1 CAS (B8ZS/ESF) DTMF, MFR1	No ¹	Certified	Met all CRs and FRs.
T1 PRI (ANSI T1.607/T1.619a)	No ¹	Certified	Met all CRs and FRs.
T1 SS7 (ANSI T1.619a)	No ¹	Certified	Met all CRs and FRs.
E1 CAS (HDB3) DTMF, MFR1	No ¹ (Europe only)	Certified	Met all CRs and FRs.
E1 ISDN PRI (ITU-T Q.931/Q.955.3)	No ¹ (Europe only)	Certified	Met all CRs and FRs.
E1 SS7 (ANSI T1.619a)	No ¹ (Europe only)	Certified	Met all CRs and FRs.
Serial (EIA-530)	No ¹	Certified	Met all CRs and FRs.
DISN Transport Interfaces			
Transport Level	Critical	Status	Remarks
Serial (EIA-530) SA-TRK	No ²	Certified	Met all CRs and FRs.
T1 TRK-3	No ²	Certified ³	Met all CRs and FRs.
ATM OC-3	No ²	Certified ⁴	Met all CRs and FRs.
Features And Capabilities			
Features And Capabilities	Critical	Status	Remarks
Synchronization	Yes	Certified	Met all CRs and FRs.
Network Management	Yes	Certified	Met all CRs and FRs.
Security	Yes	Certified	Met all CRs and FRs ⁵ .
NOTES:			
1. The UCR does not stipulate a minimum Access interface requirement for an F-NE or D-NE.			
2. The UCR does not stipulate a minimum Transport interface requirement for an F-NE or D-NE.			
3. The TRK-3 Transport offers T1, E1 and serial backplane interfaces; however, only the T1 interface was tested and is certified for joint use within the DISN.			
4. The ATM-OC3 Transport interface is only certified with the NET Promina 800 and is not supported by the Promina 400.			
5. Information assurance testing is accomplished via DISA-led Information Assurance test teams and published in a separate report, Reference (e).			

Table 2-1. SUT Interoperability Test Summary (continued)

LEGEND:			
AMI	Alternate Mark Inversion	ISDN	Integrated Services Digital Network
ANSI	American National Standards Institute	ITU-T	International Telecommunication Union–Telecommunication Standardization Sector
ATM	Asynchronous Transfer Mode	MFR1	Multi-Frequency Recommendation 1
B8ZS	Bipolar Eight Zero Substitution	OC-3	Optical Carrier Level 3
CAS	Channel Associated Signaling	PRI	Primary Rate Interface
CR	Capability Requirements	Q.931	ISDN user-network interface layer 3 specification for basic call control
D-NE	Deployable Network Element	Q.955.3	ISDN Signaling Standard for E1 MLPP
DISA	Defense Information Systems Agency	SA -TRK	Symmetric Asymmetric-Trunk
DISN	Defense Information System Network	SF	Super Frame
DTMF	Dual Tone Multi-Frequency	SS7	Signaling System 7
E1	European Basic Multiplex Rate (2.048 Mbps)	SUT	System Under Test
EIA	Electronics Industries Alliance	T1	Digital Transmission Link Level 1 (1.544 Mbps)
ESF	Extended Super Frame	T1.607	ISDN – Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
FR	Feature Requirements	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
F-NE	Fixed Network Element	TRK-3	Trunk-3
HDB3	High Density Bipolar 3	UCR	Unified Capabilities Requirements
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange		

Table 2-2. SUT CR and FR Interoperability Requirements

DISN Access Interfaces			
Interface	Critical	Requirements Required or Conditional	References
T1 CAS (AMI/SF) DTMF, MFR1	No ¹	• DS1 Interface Characteristics (C)	• UCR Section 5.9.2.3.4
T1 CAS (B8ZS/ESF) DTMF, MFR1		• DS1 Supervisory Channel Associated Signaling (C)	• UCR Section 5.9.2.3.4
T1 PRI (ANSI T1.607/T1.619a)		• DS1 Clear Channel Capability (C)	• UCR Section 5.9.2.3.4
T1 SS7 (ANSI T1.619a)		• DS1 Alarm and Restoral Requirements (C)	• UCR Section 5.9.2.3.4
E1 CAS (HDB3) DTMF, MFR1		• E1 Interface Characteristics (C)	• UCR Section 5.9.2.3.5
E1 ISDN PRI (ITU-T Q.931/Q.955.3)		• E1 Supervisory Channel Associated Signaling (C)	• UCR Section 5.9.2.3.5
E1 SS7 (ANSI T1.619a)		• E1 Clear Channel Capability (C)	• UCR Section 5.9.2.3.5
Serial (EIA-530)		• E1 Alarm and Restoral Requirements (C)	• UCR Section 5.9.2.3.5
		• MOS (R) (F-NE Only)	• UCR Section 5.9.2.1
		• MOS (R) (D-NE Only)	• UCR Section 5.9.3.1
	• BERT (R) (F-NE Only)	• UCR Section 5.9.2.1	
	• BERT (R) (D-NE Only)	• UCR Section 5.9.3.1	
	• Secure Transmission (Voice and Data) (R) (F-NE Only)	• UCR Section 5.9.3.8	
	• Secure Transmission (Voice and Data) (R) (D-NE Only)	• UCR Section 5.9.2.1	
	• Modem (R)	• UCR Section 5.9.2.1	
	• Facsimile (R)	• UCR Section 5.9.2.1	
	• Call Control Signals (R)	• UCR Section 5.9.2.1	
	• Alarms (R) (F-NE Only)	• UCR Section 5.9.2.1.1	
	• Alarms (R) (D-NE Only)	• UCR Section 5.9.3.5	
	• Call Congestion Control (R) (F-NE Only)	• UCR Section 5.9.2.1	
	• Call Congestion Control (R) (D-NE Only)	• UCR Section 5.9.3.1	
	• Call Congestion for TDM Transport (R) (D-NE Only)	• UCR Section 5.9.3.4	
	• Voice Compression (C) (F-NE Only)	• UCR Section 5.9.2.2	
	• Voice Compression (C) (D-NE Only)	• UCR Section 5.9.3.1	

Table 2-2. SUT CR and FR Interoperability Requirements (continued)

DISN Transport Interfaces			
Interface	Critical	Requirements Required or Conditional	References
Serial (EIA-530) SA-TRK	No ²	<ul style="list-style-type: none"> • MOS (R) (F-NE Only) • MOS (R) (D-NE Only) • BERT (R) (F-NE Only) • BERT (R) (D-NE Only) • Secure Transmission (Voice and Data) (R) (F-NE Only) • Secure Transmission (Voice and Data) (R) (D-NE Only) • Modem (R) • Facsimile (R) • Call Control Signals (R) • Alarms (R) (F-NE Only) • Alarms (R) (D-NE Only) • Call Congestion Control (R) (F-NE Only) • Call Congestion Control (R) (D-NE Only) • Call Congestion for TDM Transport (R) (D-NE Only) • Voice Compression (C) (F-NE Only) • Voice Compression (C) (D-NE Only) • Delay (R) (F-NE Only) • Delay (R) (D-NE Only) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.3.8 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1.1 • UCR Section 5.9.3.5 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.3.4 • UCR Section 5.9.2.2 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.3.3
DISN Transport Interfaces			
Interface	Critical	Requirements Required or Conditional	References
T1 TRK-3	No ²	<ul style="list-style-type: none"> • DS1 Interface Characteristics (R) • MOS (R) (F-NE Only) • MOS (R) (D-NE Only) • BERT (R) (F-NE Only) • BERT (R) (D-NE Only) • Secure Transmission (Voice and Data) (R) (F-NE Only) • Secure Transmission (Voice and Data) (R) (D-NE Only) • Modem (R) • Facsimile (R) • Call Control Signals (R) • Alarms (R) (F-NE Only) • Alarms (R) (D-NE Only) • Call Congestion Control (R) (F-NE Only) • Call Congestion Control (R) (D-NE Only) • Call Congestion for TDM Transport (R) (D-NE Only) • Voice Compression (C) (F-NE Only) • Voice Compression (C) (D-NE Only) • Delay (R) (F-NE Only) • Delay (R) (D-NE Only) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.4 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.3.8 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1.1 • UCR Section 5.9.3.5 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.3.4 • UCR Section 5.9.2.2 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.3.3

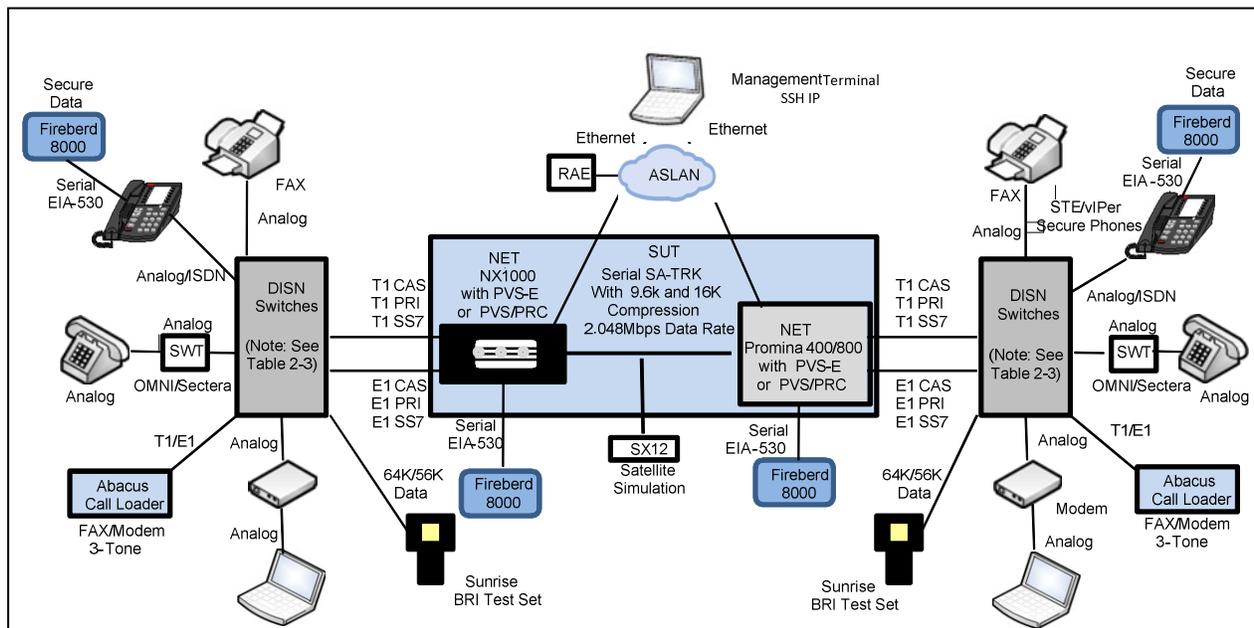
Table 2-2. SUT CR and FR Interoperability Requirements (continued)

<p>ATM-OC-3 NET Promina 800 only</p>	<p>No²</p>	<ul style="list-style-type: none"> • ANSI T1.105 (R) • GR-253-CORE (R) • MOS (R) (F-NE Only) • MOS (R) (D-NE Only) • BERT (R) (F-NE Only) • BERT (R) (D-NE Only) • Secure Transmission (Voice and Data) (R) (F-NE Only) • Secure Transmission (Voice and Data) (R) (D-NE Only) • Modem (R) • Facsimile (R) • Call Control Signals (R) • Alarms (R) (F-NE Only) • Alarms (R) (D-NE Only) • Call Congestion Control (R) (F-NE Only) • Call Congestion Control (R) (D-NE Only) • Call Congestion for TDM Transport (R) (D-NE Only) • Voice Compression (C) (F-NE Only) • Voice Compression (C) (D-NE Only) • Delay (R) (F-NE Only) • Delay (R) (D-NE Only) 	<ul style="list-style-type: none"> • UCR Section 5.5.3.4.2 • UCR Section 5.5.3.4.2 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1 • UCR Section 5.9.3.8 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1 • UCR Section 5.9.2.1.1 • UCR Section 5.9.3.5 • UCR Section 5.9.2.1 • UCR Section 5.9.3.1 • UCR Section 5.9.3.4 • UCR Section 5.9.2.2 • UCR Section 5.9.3.1 • UCR Section 5.9.2.1.2.1 • UCR Section 5.9.3.3
SUT Features And Capabilities			
Feature/Capability	Critical	Requirements Required or Conditional	References
Synchronization	Yes	<ul style="list-style-type: none"> • Timing (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.3.7
Network Management	Yes	<ul style="list-style-type: none"> • Management Option (R) • Local Management (Front Panel and/or External Console) (C) • ADIMSS (C) • Fault Management (C) • Loop Back Capability (C) • Operational Configuration Restoral (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.4.1 • UCR Section 5.9.2.4.2 • UCR Section 5.9.2.4.3 • UCR Section 5.9.2.4.4
Security	Yes	<ul style="list-style-type: none"> • STIGs and DoDI 8510.01 (DIACAP) (R) 	<ul style="list-style-type: none"> • UCR Section 5.9.2.6
<p>NOTES:</p> <p>1 The UCR does not stipulate a minimum required DISN access interface.</p> <p>2 The UCR does not stipulate a minimum required DISN transport interface.</p>			

Table 2-2. SUT CR and FR Interoperability Requirements (continued)

LEGEND:			
ADIMSS	Advanced DISN Integrated Management Support System	ISDN	Integrated Services Digital Network
AMI	Alternate Mark Inversion	ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
ANSI	American National Standards Institute	Mbps	Megabits per second
ATM	Asynchronous Transfer Mode	MFR1	Multi-Frequency Recommendation 1
B8ZS	Bipolar Eight Zero Substitution	MOS	Mean Opinion Score
BERT	Bit Error Rate Test	OC-3	Optical Carrier Level 3
C	Conditional	PRI	Primary Rate Interface
CAS	Channel Associated Signaling	Q.931	Signaling Standard for ISDN
D-NE	Deployable Network Element	Q.955.3	ISDN Signaling Standard for E1 MLPP
DCE	Data Circuit-terminating Equipment	R	Required
DIACAP	Department of Defense Information Assurance Certification and Accreditation Process	SA -TRK	Symmetric Asymmetric-Trunk
DoDI	Department of Defense Instruction	SF	Super Frame
DP	Dial Pulse	SS7	Signaling System 7
DS1	Digital Signal Level 1	STIGs	Security Technical Implementation Guides
DISN	Defense Information System Network	SUT	System Under Test
DSS1	Digital Subscriber Signaling 1	T1	Digital Transmission Link Level 1 (1.544 Mbps)
DTE	Data Terminal Equipment	T1.105	Synchronous Optical Network (SONET) – Sub-ST5-1 Interface Rates and Formats Specification
DTMF	Dual Tone Multi-Frequency	T1.607	ISDN – Layer 3 Signaling Specification for Circuit Switched Bearer Service for DSS1
E1	European Basic Multiplex Rate (2.048 Mbps)	T1.619a	SS7 and ISDN MLPP Signaling Standard for T1
EIA	Electronic Industries Alliance	TDM	Time Division Multiplexing
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange	TRK-3	Trunk-3
ESF	Extended Super Frame	UCR	Unified Capabilities Requirements
F-NE	Fixed Network Element		
HDB3	High Density Bipolar Three		

8. TEST NETWORK DESCRIPTION. The SUT was tested at JITC’s Global Information Grid Network Test Facility, Fort Huachuca, Arizona in a manner and configuration similar to that of its DISN operational environment. Testing of the system’s required functions and features was conducted using the test configurations as shown in Figures 2-2 through 2-6.

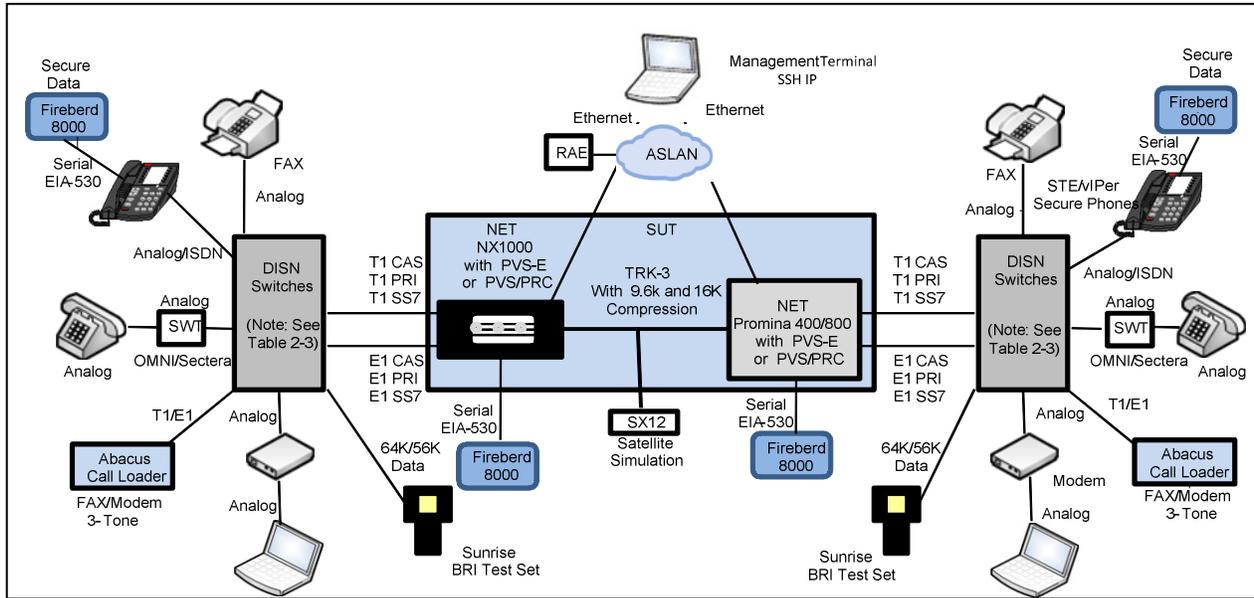


Note: The required ancillary equipment that is not shown is a condition of fielding for Information Assurance, which is covered under a separate report, Reference (e).

LEGEND:

ASLAN	Assured-Service Local Area Network	PRC	Primary Rate Card
BRI	Basic Rate Interface	PRI	Primary Rate Interface
CAS	Channel Associated Signaling	PVS	Prime Voice Secure
DISN	Defense Information System Network	PVS-E	Prime Voice Secure-Enhanced
E1	European Basic Multiplex Rate (2.048 Mbps)	RAE	Required Ancillary Equipment
EIA	Electronic Industries Alliance	SA-TRK	Symmetric Asymmetric-Trunk
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange	SSH	Secure Shell
FAX	Facsimile	SS7	Signaling System 7
ISDN	Integrated Services Digital Network	STE	Secure Terminal Equipment
IP	Internet Protocol	SUT	System Under Test
K	Kilobits per second	SWT	Secure Wireline Terminal
Mbps	Megabits per second	SX-12	Simulator, Data Link
NET	Network Equipment Technologies	T1	Digital Transmission Link Level 1 (1.544 Mbps)

Figure 2-2. SUT Test Configuration with SA-TRK between NX1000 and Promina 800/400

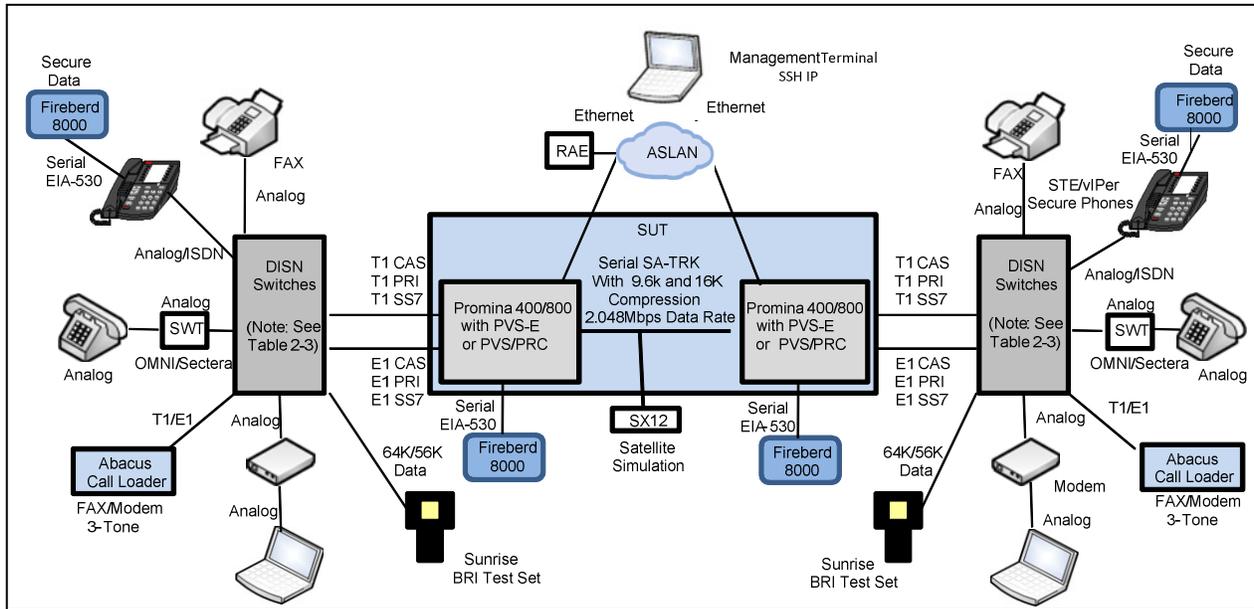


Note: The required ancillary equipment that is not shown is a condition of fielding for Information Assurance, which is covered under a separate report, Reference (e).

LEGEND:

ASLAN	Assured-Service Local Area Network	NET	Network Equipment Technologies
BRI	Basic Rate Interface	PRC	Primary Rate Card
CAS	Channel Associated Signaling	PRI	Primary Rate Interface
DCE	Data Circuit-terminating Equipment	PVS	Prime Voice Secure
DISN	Defense Information System Network	PVS-E	Prime Voice Secure-Enhanced
DTE	Data Terminal Equipment	RAE	Required Ancillary Equipment
E1	European Basic Multiplex Rate (2.048 Mbps)	SA -TRK	Symmetric Asymmetric-Trunk
EIA	Electronic Industries Alliance	SSH	Secure Shell
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange	SS7	Signaling System 7
FAX	Facsimile	STE	Secure Terminal Equipment
ISDN	Integrated Services Digital Network	SUT	System Under Test
IP	Internet Protocol	SWT	Secure Wireline Terminal
K	Kilobits per second	SX-12	Simulator, Data Link
Mbps	Megabits per second	T1	Digital Transmission Link Level 1 (1.544 Mbps)

Figure 2-3. SUT Test Configuration with TRK-3 between NX1000 and Promina 800/400

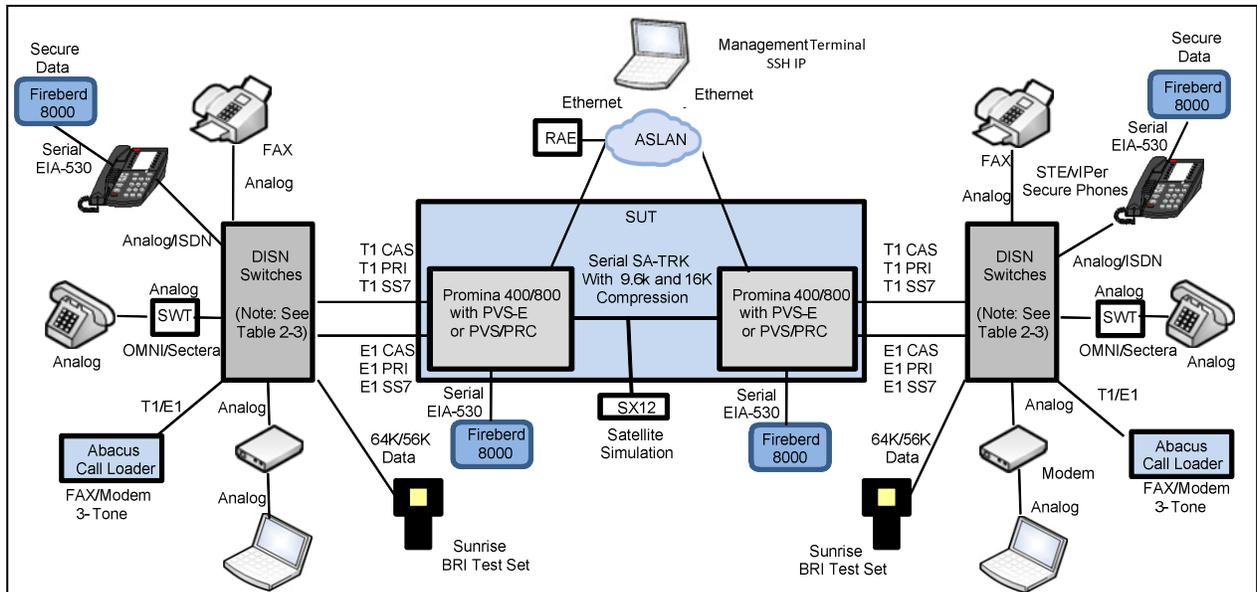


Note: The required ancillary equipment that is not shown is a condition of fielding for Information Assurance, which is covered under a separate report, Reference (e).

LEGEND:

ASLAN	Assured-Service Local Area Network	PRC	Primary Rate Card
BRI	Basic Rate Interface	PRI	Primary Rate Interface
CAS	Channel Associated Signaling	PVS	Prime Voice Secure
DISN	Defense Information System Network	PVS-E	Prime Voice Secure-Enhanced
E1	European Basic Multiplex Rate (2.048 Mbps)	RAE	Required Ancillary Equipment
EIA	Electronic Industries Alliance	SA -TRK	Symmetric Asymmetric-Trunk
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange	SSH	Secure Shell
FAX	Facsimile	SS7	Signaling System 7
ISDN	Integrated Services Digital Network	STE	Secure Terminal Equipment
IP	Internet Protocol	SUT	System Under Test
K	Kilobits per second	SWT	Secure Wireline Terminal
Mbps	Megabits per second	SX-12	Simulator, Data Link
		T1	Digital Transmission Link Level 1 (1.544 Mbps)

Figure 2-4. SUT Test Configuration with TRK-3 between NET Promina 800/400 and NET Promina 800/400

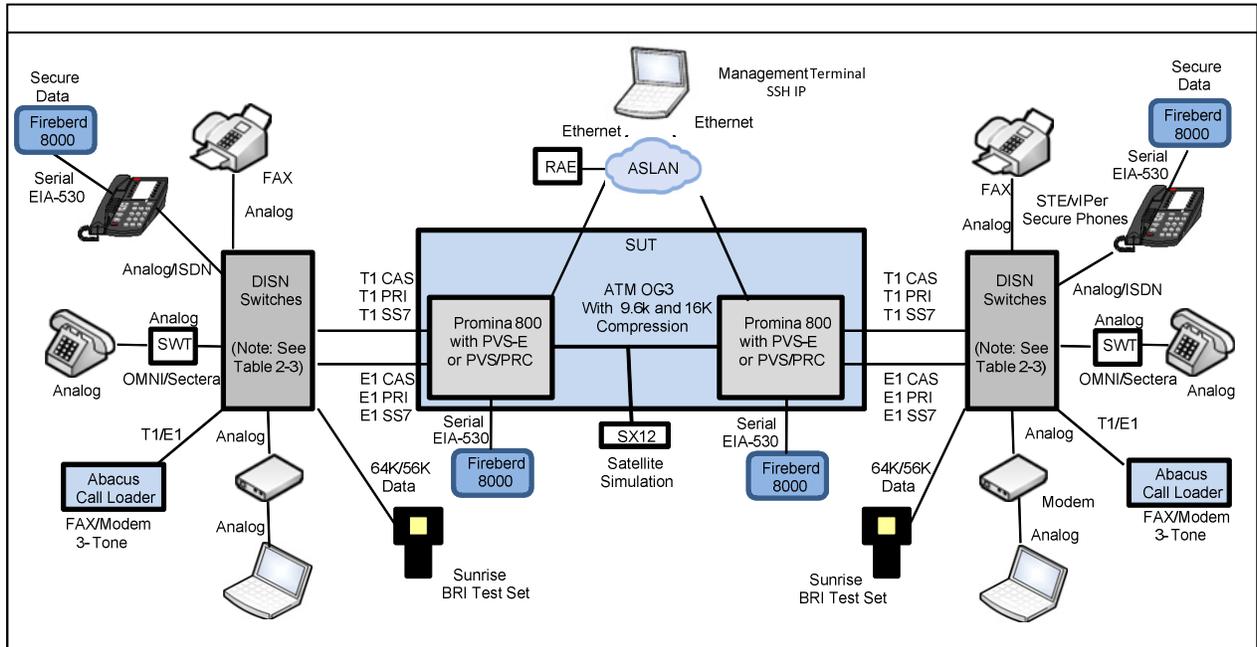


Note: The required ancillary equipment that is not shown is a condition of fielding for Information Assurance, which is covered under a separate report, Reference (e).

LEGEND:

ASLAN	Assured-Service Local Area Network	PRC	Primary Rate Card
BRI	Basic Rate Interface	PRI	Primary Rate Interface
CAS	Channel Associated Signaling	PVS	Prime Voice Secure
DISN	Defense Information System Network	PVS-E	Prime Voice Secure-Enhanced
E1	European Basic Multiplex Rate (2.048 Mbps)	RAE	Required Ancillary Equipment
EIA	Electronic Industries Alliance	SA -TRK	Symmetric Asymmetric-Trunk
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange	SSH	Secure Shell
FAX	Facsimile	SS7	Signaling System 7
ISDN	Integrated Services Digital Network	STE	Secure Terminal Equipment
IP	Internet Protocol	SUT	System Under Test
K	Kilobits per second	SWT	Secure Wireline Terminal
Mbps	Megabits per second	SX-12	Simulator, Data Link
		T1	Digital Transmission Link Level 1 (1.544 Mbps)

Figure 2-5. SUT Test Configuration with SA-TRK between NET Promina 800 and NET Promina 800



Note: The required ancillary equipment that is not shown is a condition of fielding for Information Assurance, which is covered under a separate report, Reference (e).

LEGEND:

ATM	Asynchronous Transfer Mode	PRI	Primary Rate Interface
BRI	Basic Rate Interface	PVS	Prime Voice Secure
CAS	Channel Associated Signaling	PVS-E	Prime Voice Secure-Enhanced
E1	European Basic Multiplex Rate (2.048 Mbps)	RAE	Required Ancillary Equipment
EIA	Electronic Industries Alliance	SA-TRK	Symmetric Asymmetric-Trunk
EIA-530	Standard for 25-position interface for DTE and DCE employing serial binary data interchange	SSH	Secure Shell
FAX	Facsimile	SS7	Signaling System 7
IP	Internet Protocol	STE	Secure Terminal Equipment
ISDN	Integrated Services Digital Network	SUT	System Under Test
K	kilobits	SWT	Secure Wireline Terminal
Mbps	Megabits per second	SX-12	Simulator, Data Link
OC-3	Optical Carrier level 3	T1	Digital Transmission Link Level 1 (1.544 Mbps)
PRC	Primary Rate Card		

Figure 2-6. SUT Test Configuration with ATM OC-3 between NET Promina 800 and NET Promina 800

9. SYSTEM CONFIGURATIONS. Table 2-3 provides the system configurations, hardware, and software components tested with the SUT. The SUT was tested in an operationally realistic environment to determine interoperability with a complement of DISN switches noted in Table 2-3. Table 2-3 lists the DISN switches which depict the tested configuration and is not intended to identify the only switches that are certified with the SUT. The SUT is certified with switching systems listed on the Unified Capabilities Approved Products List that offer the same certified interfaces as the SUT.

Table 2-3. Tested System Configuration

System Name		Software			
Avaya CS2100		SE 09.1			
Alcatel-Lucent 5ESS		5E16 BWM 09-0002			
Nokia-Siemens Networks EWSD		19d Patch Set 46			
Avaya S8720		CM 4.0 (R014X.00.2.731.7 Super Patch 14419)			
Equipment					
Required Ancillary Equipment		Public Key Infrastructure			
Site Provided		Management Workstation		Windows XP SP 3	
				Putty-CAC 06.33.10	
				Pageant 06.33.10	
SUT		Hardware		Cards	Software/Firmware
		NET Promina 400	Single Shelf	Front	PLM (0)
SA-TRK (2)	Rev. R				
SA-TRK	Rev. S				
PRC (4)	Rev. M				
TRK-3 (5)	Ver. 4.4.99 Rev. R				
PSM (6)	Code 17.5.3 Ver. 95.55 Rev. E				
USD (7)	Rev. M				
PVS/12 (8)	Ver. 3.06 rev. E				
PVEC (9)	Rev. K				
PVS-E	Rev. A				
HD T1E1 (10)	Rev. B				
Back	PLMI (0)		Rev. A		
	SACD 530 (2)		Rev. E		
	SACD 530 (3)		Rev. E		
	DS-1 (4)	Rev. C			
	T1 DSX (5)	Rev. D			
	PSMI (6)	Rev. A			
NET Promina 800	Expansion Shelf	Front	530 DCE (7)	Rev. C	
			HD T1E1 (10)	Rev. A	
			BX (16)	Rev. H	
			BX (17)	Rev. H	
			PRC (20)	Rev. M	
		TRK-3 (21)	Rev. K		
		PSM(22)	Code 17.5.3 Ver. 95.55 Rev. D		
		USD (23)	Rev. M		
		PVS/12 (24)	Ver. 3.06 Rev. E		
		PVEC (25)	Rev. K		
	PVS-E (26)	Rev. A			
	HDD4 (27)	Ver. 1.7 Rev. A			
	Back	BX 1-2 (16)	Rev. A		
		BX 1-2 (17)	Rev. A		
SACD 530 (18)		Rev. E			
SACD 530 (19)		Rev. C			
DS-1 (20)		Rev. C			
T1 DSX (21)		Rev. D			
PSMI (22)	Rev. A				
530 DCE (23)	Rev. C				
NVX T1E1 (25)	Rev. B				
530 DCE (27)	Rev. A				

Table 2-3. Tested System Configuration (continued)

System Name	Hardware			Cards	Software/Firmware	
NET Promina 800/400 Rel. 4.x5.03 (continued)	NET Promina 800 (continued)	High Speed Shelf	Front	SX-2 (0)	Rev. H	
				PPM (5)	Code 4.95.55 Boot 94.36 Rev. B	
				PPM (7)	Code 4.95.55 Boot 94.36 Rev. B	
				SCLX (9)	Ver. 3.65 Rev. DO	
				SX-2 (15)	Rev. H	
			Back	SX 1-2 (0)	Rev. A	
				PPMI (5)	Rev. C	
				PPMI (7)	Rev. C	
				SCLX (9)	Rev. BO	
				SX 1-2 (15)	Rev. A	
	NET Promina 800/400 Rel. 4.x5.03 (continued)	Expansion Shelf		Front	BX (16)	Rev. H
					BX (17)	Rev. H
					TRK-3 (18)	Rev. K
					PSM-E (22)	Code 17.5.3 Ver. 95.55 Rev. D
					PVEC (26)	Rev. K
				Back	PVS/12 (27)	Ver. 3.06 Rev. B
					BX 1-2 (16)	Rev. A
					BX 1-2 (17)	Rev. A
					T1 DSX (18)	Rev. D
					PSMI (22)	Rev. A
NET Promina 800	High Speed Shelf		Front	SX-2 (0)	Rev. H	
				PPM (5)	Code 4.95.55 Boot 94.36 Rev. B	
				PPM (7)	Code 4.95.55 Boot 94.36 Rev. B	
				SCLX (9)	Ver. 3.65 Rev. DO	
				SX-2 (15)	Rev. H	
			Back	SX 1-2 (0)	Rev. A	
				PPMI (5)	Rev. C	
				PPMI (7)	Rev. C	
				SCLX (9)	Rev. BO	
				SX 1-2 (15)	Rev. A	
				SBI-2	Rev. A	
LEGEND:						
5ESS	Class 5 Electronic Switching System			Rel.	Release	
BWM	Broadcast Warning Message			Rev.	Revision	
CAC	Common Access Card			SUT	System Under Test	
EWSD	Elektronisches Wähler-system Digital			USD	Universal Synchronous Data	
NET	Network Equipment Technologies			Ver.	Version	

10. TEST LIMITATIONS. None.

11. TEST RESULTS

a. Discussion.

(1) DISN Access/Transport Interfaces. The SUT is certified for joint use within the DISN with the following access interfaces: T1 CAS, T1 PRI, T1 Signaling System 7 (SS7), European Basic Multiplex Rate (E1) CAS, E1 PRI, E1 SS7, and serial EIA-530. The SUT is certified for joint use within the DISN with the following transport interfaces: Serial EIA-530, DS1, and ATM OC-3. The specific requirements and test results tested over all the SUT DISN access and transport interfaces are described in the subparagraphs below:

(a) T1 Interface Characteristics. The UCR 2008, Change 2, paragraph 5.9.2.3, states that the T1 interface shall meet the requirements in accordance with UCR 2008, Change 2, paragraph 5.9.2.3.4. The Sunrise T10 test set was used to measure the SUT DS1 pulse mask to verify compliance to this requirement. The SUT met the International Telecommunication Union-Telecommunication Standardization Sector (ITU-T) G.711 and American National Standard Institute T.102 pulse mask characteristics which meets this requirement. The SUT T1 interface supports both Alternate Mark Inversion and Bipolar Eight Zero Substitution (B8ZS) line coding as required in UCR 2008 Change, 2, paragraph 5.9.2.3.4 which met this requirement.

(b) T1 Supervisory Channel Associated Signaling. The UCR 2008 Change 2, paragraph 5.9.2.3.4, states that the T1 supervisory channel associated signaling interface shall meet the requirements in accordance with UCR 2008, Change 2, paragraph 5.9.2.3.5. Trunk seizure, answer supervision, preemption signals, and all other trunk supervisory information sent and received on a per channel basis was passed transparently through the SUT as required in UCR 2008, Change 2, paragraph 5.9.2.3.5. The SUT met all the requirements with the following exception: It was documented that secure calls placed over the TRK-3 transport interface when compressed at LDCELP 9.6K or G.728 (16K) occasionally stopped processing calls on some of the ports. This was adjudicated by DISA on 29 November 2011 with the following condition of fielding: The T1 Channel Associated Signaling access interface over the T1 TRK-3 transport interface is certified for clearmode only with the Primary Voice Secure (PVS) card. Additionally, the clearmode and 9.6 kbps compression is certified with the PVS-enhanced card.

(c) T1 Clear Channel Capability. The UCR 2008 Change 2, paragraph 5.3.4.7.7, states that the T1 interface shall meet the clear channel capability requirements in accordance with UCR 2008, Change 2, paragraph 5.9.2.3.4. The SUT is capable of transmitting and receiving B8ZS line coding in accordance with UCR 2008, Change 2, paragraph 5.9.2.3.4 which met this requirement.

(d) E1 Interface Characteristics. The UCR 2008 Change 2, paragraph 5.9.2.3.5, states that the E1 interface shall meet the requirements in accordance with UCR 2008, Change 2, paragraph 5.9.2.3.5-1. Furthermore, the E1 interface shall meet

the requirements of ITU-T Recommendation G.703 and ITU-T Recommendation G.732. Voice signals in the PCM-30 framing format shall utilize the A-law encoding technique in accordance with ITU-T Recommendation G.772 (REV), "*Protected Monitoring Points on Digital Transmission Systems.*" The Sunrise E10 test set was used to measure the SUT E1 pulse mask to verify compliance to this requirement. The SUT E1 interface characteristics in accordance with the UCR were met with both testing and vendors LoC. The SUT supports E1 access via the HDT1/E1 card, but does not support any compression rate with this interface which is not a requirement.

(e) Mean Opinion Score (MOS). The UCR 2008 Change 2, paragraph 5.9.2.1, states that the introduction of F-NEs shall not cause the end-to-end (E2E) average MOS to fall below 4.0 over any 5 minute time interval and the D-NE shall not cause the E2E MOS to fall below 3.6 over any 5 minute time interval. The Sage 960B Multi-Channel Test Set was used to measure the Enhanced Mean Opinion Score (EMOS) of the T1/E1 interfaces supported by the SUT. The average EMOS over all of the SUT's T1 and E1 access interfaces were 4.24 non-compressed. The average EMOS over all the SUT's T1 access interfaces were 4.00 compressed at either 9.6K or 16K which met this requirement. These results include both the PVS and PVS-E compression cards.

(f) Bit Error Rate Test (BERT). The UCR 2008, Change 2, paragraph 5.9.2.1, states that the introduction of an NE shall not exceed the end-to-end digital bit error rate (BER) requirement of less than 1 error in 1×10^{-9} (averaged over a 9 hour period). The UCR 2008, Change 2, paragraph 5.9.3.1 for D-NE, states the introduction of a D-NE shall not cause the E2E digital BER to degrade the Tactical BER below 1×10^{-5} by more than 0.03 percent as measured over a 9 hour period. Testing was conducted on T1 and E1 interfaces as well as serial interfaces. The SUT met this requirement for all interfaces with a recorded bit error ratio of 1×10^{-9} and 1×10^{-5} over an 8 to 15 hour period with multiple tests spanning a 48 hour period with no errors. This was conducted on E1 and T1 interfaces as well as all supported serial interfaces.

(g) Secure Transmission (Voice and Data). The UCR 2008, Change 2, paragraph 5.9.2.1, states that the introduction of NE(s) shall not degrade secure transmission for secure end devices as defined by UCR, Section 5.2.2. The UCR 2008, Change 2, paragraph 5.9.3.8 for D-NE, states the secure call shall complete successfully as a minimum equal to or better than 85 percent of the time when used in the Deployed environment. There were 4,912 secure calls placed between Secure Terminal Equipment (STE), which included the vIPer, STE, Secure Wireline Terminals, Omni, and Sectera. Every combination of secure call placed over access and transport interfaces exceeded the UCR requirement of 85 percent completion. Of all the secure calls placed, 98 percent of them completed successfully which met this requirement. These tests included secure voice, data, fax, and crypto rekey. The SUT secure call test results are shown in Table 2-4.

Table 2-4. SUT Secure Call Test Results

DISN Access Interfaces	DISN Transport Interfaces	Secure Call Matrix (307 calls placed per combination with a 98% completion rate)				
		From / To	STE (SCIP mode)	STE (STU mode)	STE (ISDN mode)	SWT
T1 CAS, E1 CAS, T1 ISDN PRI, E1 ISDN PRI, T1 SS7	Serial SA-TRK T1 TRK-3 ATM-OC3	STE (SCIP mode)	Completed	Completed	Completed	Completed
		STE (STU mode)	Completed	Completed	Completed	Completed
		STE (ISDN mode)	Completed	Completed	Completed	Completed
		SWT	Completed	Completed	Completed	Completed

LEGEND:

ATM	Asynchronous Transfer Mode	SCIP	Secure Communications Internet Protocol
CAS	Channel Associated Signaling	SS7	Signaling System 7
DISN	Defense Information System Network	STE	Secure Terminal Equipment
E1	European Basic Multiplex Rate (2.048 Mbps)	STU	Secure Telephone Unit
IP	Internet Protocol	SUT	System Under Test
ISDN	Integrated Services Digital Network	SWT	Secure Wireline Terminal
Mbps	Megabits per second	TRK	Trunk
OC-3	Optical Carrier level 3	T1	Digital Transmission Link Level (1.544 Mbps)
PRI	Primary Rate Interface		
SA-TRK	Symmetric Asymmetric-Trunk		

(h) Modem. The UCR 2008, Change 2, paragraph 5.9.2.1 states that the F-NE(s) shall support a minimum modem transmission speed of 9.6 kbps across the associated pair of F-NE(s) and D-NE(s). There were approximately 46,800 T1 modem calls placed through the SUT using the Abacus call loader. All modem calls had a transmission rate of at least the minimum 9.6 kbps, which met this requirement.

(i) Facsimile. The UCR 2008, Change 2, paragraph 5.9.2.1, states that both F-NE(s) and D-NE shall support a minimum facsimile transmission speed of 9.6 kbps across the associated NE(s). There were approximately 46,800, T1 facsimile calls placed through the SUT using the Abacus call loader. All facsimile calls had a transmission rate of 14.4 kbps, which met this requirement.

(j) Call Control Signals. The UCR 2008, Change 2, paragraph 5.9.2.1, states that the F-NE shall transport all call control signals transparently on an E2E basis. This requirement was verified via testing and the vendor's LoC. The SUT transparently transported CAS supervision, and Common Channel Signaling protocol to include Multi-Level Precedence and Preemption call control signals, which met this requirement.

(k) Alarm and Restoral Requirements. The UCR Change 2, paragraph 5.9.2.1.1, states that the NE shall be able to propagate Carrier Group Alarms (CGA) upon physical loss of the Time Division Multiplexing (TDM) interface. The NE shall provide the capability of detecting a CGA. When this alarm is detected, all associated outgoing trunks shall be made busy automatically to subsequent customer call attempts. Call attempts on associated incoming trunks shall not be processed. The UCR Change 2, paragraph 5.9.3.5, states that the D-NE shall be able to propagate CGAs, in accordance with UCR 2008, Change 2, paragraph 5.9.2.1.1, upon physical loss of either

the access or transport interfaces. This was verified by capturing the alarm status between the DISN switches and the SUT with the Sage 375A, Ultra-T1 and Ultra E1 test equipment. The SUT is capable of transparently passing the appropriate alarms, which met this requirement.

(l) Delay. Delay occurs when packets take more time than expected to reach their destination. The UCR 2008, Change 2, paragraph 5.9.2.1.2.1, states that the addition of a NE shall not increase the one-way packet delay for each NE used, when measured from ingress to egress and averaged over any five-minute period more than that which is specified under the following conditions:

1. TDM Ingress G.711 (Non-secure calls) to Non-Transcoding ITU-T G.711 Internet Protocol (IP) Egress shall not increase delay more than 50 milliseconds (ms) per NE pair as measured E2E.

2. TDM Ingress ITU-T G.711 (Non-secure calls) to Transcoding IP Egress with compression codec's (paragraph 5.9.2.1.2.3) shall not increase delay by more than 100 ms per NE pair as measured E2E.

3. TDM Ingress ITU-T G.711 (Secure calls) to Non-Transcoding G.711 IP Egress shall not increase delay by more than 50 ms per NE pair as measured E2E.

4. TDM Ingress ITU-T G.711 (Secure calls) to Transcoding IP Egress with compression codec's (paragraph 5.9.2.1.2.3) shall not increase delay by more than 250 ms per NE pair as measured E2E.

The UCR 2008, Change 2, paragraph 5.9.2.1.2.1, states that the addition of a D-NE shall not cause packet loss measured from ingress to egress to increase by more than 0.05 percent averaged over any 5 minute period.

One-Way Delay of the SUT was tested using the Sage 960B Multi-Channel Test Unit for the supported access and transport interfaces. All delay calls had a delay of no more than 37 ms one-way, which met this requirement. The SUT met all requirements per the UCR 2008, Change 2.

(m) Call Congestion. The UCR 2008, Change 2, paragraph 5.9.2.1, states that the NE shall assure that congestion between paired NEs does not affect DSN calls in progress or subsequent calls. The UCR 2008, Change 2, paragraph 5.9.3.1, states that the D-NE shall assure that congestion between NEs does not impact DISN calls in progress or subsequent calls. Call congestion handling shall be met in one or more of the following three ways: dynamic load control signal; software capability which makes congestion impossible; or congestion is not possible in the SUT. Call congestion in the SUT is met because congestion is not possible due to the fact that the TDM cannot saturate the transport link on the SUT.

(n) Voice Compression. The UCR 2008, Change 2, paragraph 5.9.2.2, states that the NE may include voice compression and if so must support at least one of the following standards:

- ITU-T Recommendation G.726, 32 kbps Adaptive Differential Pulse Code Modulation
- ITU-T Recommendation G.728, 16 kbps Low-Delay Code Excited Linear Prediction
- ITU-T Recommendation G.729, 9.6 kbps Conjugate-Structure Algebraic-Code-Excited Linear-Prediction

The SUT supports G.728 (16K) and Proprietary LDCELP (9.6K) Codecs.

The UCR 2008, Change 2, paragraph 5.9.2.2, states that D-NEs may include voice compression, to include the following additional compression standard: ITU-T Recommendation G.723. Voice compression rates of 9.6 kbps and 16 kbps is a feature provided by the SUT. This requirement was met and tested by allocating 6 channels at 9.6 kbps, 6 channels at 16 kbps, and the remaining channels with no compression.

(2) Device Management

(a) Management Option. The UCR Change 2, paragraph 5.9.2.4, states that the NE devices must be managed by at least one of the following: The device may be managed locally by a front or back panel and/or external console control capability shall be provided for local management. The NE may be able to be centrally monitored and managed by the Advanced DISN Integrated Management Support System in accordance with UCR 2008, Change 2, paragraph 5.9.2.4.1. The SUT is managed from a remote client, which can be used to monitor multiple units. The SUT is monitored by a management workstation. The workstation connects to the modules via Ethernet connection and uses Secure Shell (SSH) via pre-shared keys. Administrative tasks are performed via SSH. The SSH interface allows an administrator to configure general settings, monitor operations, create or edit services, and perform maintenance. The SUT is managed by a Management workstation via IP which met this requirement.

(b) Fault Management. The UCR 2008, Change 2 paragraph 5.9.2.4.2, states that NEs may be capable of performing a self-test diagnostic function on non-active and active channels on a noninterference basis and report any failures to the assigned network management system. The SUT supports fault management using a secure management workstation which met this requirement.

(c) Loop Back Capability. The UCR 2008, Change 2, paragraph 5.9.2.4.3, states that NE shall provide loop back capability on each of the trunk side interfaces in accordance with ITU-T Recommendation V.54, "Loop Test Devices For Modems." This requirement is conditional and is not supported by the SUT.

(d) Operational Configuration Restoral. The UCR 2008, Change 2, paragraph 5.9.2.4.4, states that loss of power should not remove configuration settings. The unit should be restored to the last customer configured state prior to the power loss, without intervention when power is restored. The SUT was placed into a power failure condition. The SUT returned to the last customer configured state prior to the power failure, which met this requirement.

(3) Security. The UCR 2008, Change 2, paragraph 5.9.2.6, states that the NE shall conform to the requirements outlined in DoD Instruction 8510.01, "DoD Information Assurance Certification and Accreditation Process (DIACAP)". Security is tested as part of the IA testing and is covered under a separate report, Reference (e).

b. System Interoperability Results. The SUT meets all of its critical interoperability requirements and is certified as interoperable for joint use within the DISN as a D-NE and/or a F-NE as set forth in Reference (c) with the following stipulations: The SUT has the following access interfaces that are certified for joint use within the DISN: T1 CAS, PRI, SS7; E1, CAS, PRI, SS7; and EIA-530 Serial. The T1 CAS access interface over the T1 TRK-3 transport interface is certified for clearmode only with the PVS card and clearmode and 9.6 kbps compression with the PVS-enhanced card. The SUT also has three transport interfaces that are certified for joint use within the DISN: EIA-530 Serial, T1, and ATM OC-3. The Promina 400 does not support the ATM OC-3 transport interface; therefore, only the Promina 800 is certified for joint use within the DISN with the ATM OC-3 transport interface. The SUT is also interoperable in mated pairs with the Promina NX-1000 provided both the SUT and the NX-1000 are loaded with the same certified Software Release 4.x5.03. The SUT meets the critical interoperability requirements set forth in Reference (c) and testing was conducted using test procedures derived from Reference (d). No other configurations, features, or functions, except those cited within this report, are certified by JITC.

12. TEST AND ANALYSIS REPORT. No detailed test report was developed in accordance with the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system, which uses Unclassified-But-Sensitive Internet Protocol Router Network (NIPRNet) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNet at <https://stp.fhu.disa.mil>. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at <http://jit.fhu.disa.mil> (NIPRNet), or <http://199.208.204.125> (SIPRNet). Information related to DISN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>. Due to the sensitivity of the information, the Information Assurance Accreditation Package (IAAP) that contains the approved configuration and deployment guide must be requested directly through government civilian or uniformed military personnel from the Unified Capabilities Certification Office (UCCO), e-mail: ucco@disa.mil.