



DEFENSE INFORMATION SYSTEMS AGENCY

P. O. BOX 4502
ARLINGTON, VIRGINIA 22204-4502

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

17 November 2008

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of ADTRAN Total Access (TA) 1500 with Software Release 3.4

References: (a) DoD Directive 4630.5, "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) and (d), 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 ADTRAN TA1500 with Software Release 3.4 is hereinafter referred to as the System Under Test (SUT). The SUT met all of the interface and functional requirements as set forth in appendix 9 of reference (c) using test procedures derived from reference (d) and is certified for joint use within the DSN as a Strategic Network Element (S-NE). No other configurations, features, or functions, except those cited within this report, are certified by the JITC, or authorized by the Program Management Office for use within the DSN. This certification expires upon changes that affect interoperability, but no later than three years from the date of this memorandum.
3. This certification is based on interoperability testing of the SUT and review of the vendor's Letters of Compliance (LoC). Interoperability testing was conducted by JITC at the Global Information Grid Network Test Facility, Fort Huachuca, Arizona, from 22 September through 10 October 2008. Review of the vendors LoC was completed on 17 October 2008.
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.

Table 1. SUT Interoperability Test Summary

DSN Access Interfaces			
Interface	Critical	Status	Remarks
2-Wire Analog (GR-506-CORE)	No ¹	Certified	Met all CRs and FRs
ISDN BRI (U Iterface only)	No ¹	Certified	Met all CRs and FRs
Digital Proprietary	No ¹	Certified	Met all CRs and FRs
E&M Type I, Type II, Type III, and Type V	No ¹	Certified	Met all CRs and FRs
Line Side Loop Start T1 CAS (B8ZS/ESF, AMI/SF)	No ¹	Certified	Met all CRs and FRs
SLC-96 Loop Start T1 CAS (B8ZS/ESF, AMI/SF)	No ¹	Certified	Met all CRs and FRs
EIA-232 Serial Interface	No ¹	Certified	Met all CRs and FRs
ITU-T V.35 Serial Interface	No ¹	Certified	Met all CRs and FRs
DSN Transport Interfaces			
Transport Level	Critical	Status	Remarks
T1 (B8ZS/ESF) Proprietary Signaling	No ²	Certified	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	See note 3.	See note 3.
NOTES:			
1 The UCR does not stipulate a minimum Access interface requirement for a Strategic Network Element.			
2 The UCR does not stipulate a minimum Transport interface requirement a Strategic Network Element.			
3 Security is tested by DISA-led Information Assurance test teams and published in a separate report.			
LEGEND:			
AMI	Alternate Mark Inversion	ISDN	Integrated Services Digital Network
CAS	Channel Associated Signaling	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
CRs	Capability Requirements		
B8ZS	Bipolar Eight Zero Substitution	kbps	kilobits per second
BRI	Basic Rate Interface	kHz	kiloHertz
DISA	Defense Information Systems Agency	LSSGR	Local Access and Transport Area (LATA) Switching Systems Generic Requirements
DSN	Defense Switched Network		
E&M	Ear and Mouth	Mbps	Megabits per second
EIA	Electronic Industries Alliance	SF	Super Frame
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) data communications devices	SLC	Subscriber Line Carrier
		SUT	System Under Test
		T1	Digital Transmission Link Level 1 (1.544 Mbps)
		U	ISDN BRI 2-wire interface
ESF	Extended Superframe	UCR	Unified Capabilities Requirements
FRs	Feature Requirements	V.35	Standard for data transmission at 48 kbps using 60-108 kHz group band circuits
GR	Generic Requirement		
GR-506-CORE	LSSGR: Signaling for Analog Interfaces		

Table 2. SUT Capability and Feature Interoperability Requirements

DSN Access Interfaces			
Interfaces	Critical	Requirements Required or Conditional	References
2-Wire Analog (GR-506-CORE)	No ¹	<ul style="list-style-type: none"> • Analog interfaces in accordance with UCR, section 7.4 (C) • MOS (R) • MLPP (R) • Secure Transmission (Voice and Data) (R) • Modem (R) Analog • Facsimile (R) Analog • Call Control Signals (R) 	<ul style="list-style-type: none"> • UCR App. A9.5.1.2.1 • UCR App. A9.5.1 • UCR App. A9.1 • UCR App. A9.5.1 • UCR App. A9.5.1 • UCR App. A9.5.1 • UCR App. A9.5.1
ISDN BRI (U-Interface)	No ¹	<ul style="list-style-type: none"> • 2 or 4-wire digital interfaces in accordance with UCR, section 7.4 (C) • MOS (R) • MLPP (R) • BERT (R) • Secure Transmission (Voice and Data) (R) • Modem (R) Analog Only • Facsimile (R) Analog Only • Call Control Signals (R) 	<ul style="list-style-type: none"> • UCR App. A9.5.1.2.3 • UCR App. A9.5.1 • UCR App. A9.1 • UCR App. A9.5.1
Digital Proprietary	No ¹	<ul style="list-style-type: none"> • 2-wire or 4-wire digital interfaces in accordance with UCR, section 7.4 (C) • MOS (R) • MLPP (R) • BERT (R) ISDN and Analog Only • Secure Transmission (Voice and Data) (R) • Modem (R) Analog Only • Facsimile (R) Analog Only • Call Control Signals (R) 	<ul style="list-style-type: none"> • UCR App. A9.5.1.2.1 • UCR App. A9.5.1 • UCR App. A9.1 • UCR App. A9.5.1
E&M Type I, Type II, Type III, and Type V	No ¹	<ul style="list-style-type: none"> • E&M Signaling in accordance with UCR, section 7.4 • MLPP (R) • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) • Modem (R) • Facsimile (R) • Call Control Signals (R) 	<ul style="list-style-type: none"> • UCR App. A9.5.1.2.1 • UCR App. A9.1 • UCR App. A9.5.1.1
Line Side Loop Start T1 CAS (B8ZS/ESF, AMI/SF)	No ¹	<ul style="list-style-type: none"> • DS1 Supervisory Channel Associated Signaling (R) • DS1 Alarm and Restoral Requirements (R) • MLPP (R) • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) • Modem (R) • Facsimile (R) • Call Control Signals (R) • Carrier Group Alarms (R) 	<ul style="list-style-type: none"> • UCR App. A9.5.1.2.4 • UCR App. A9.5.1.2.4 • UCR App. A9.1 • UCR App. A9.5.1.1
SLC-96 Loop Start T1 CAS (B8ZS/ESF, AMI/SF)	No ¹	<ul style="list-style-type: none"> • DS1 Supervisory Channel Associated Signaling (R) • DS1 Alarm and Restoral Requirements (R) • MLPP (R) • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) • Modem (R) • Facsimile (R) • Call Control Signals (R) • Carrier Group Alarms (R) 	<ul style="list-style-type: none"> • UCR App. A9.5.1.2.4 • UCR App. A9.5.1.2.4 • UCR App. A9.1 • UCR App. A9.5.1.1
ITU-T V.35 Serial Interface	No ¹	<ul style="list-style-type: none"> • In accordance with ITU-T V.35 (C) 	<ul style="list-style-type: none"> • UCR App. A9.5.1.2.2
EIA-232 Serial Interface	No ¹	<ul style="list-style-type: none"> • In accordance with TIA-232F (C) 	<ul style="list-style-type: none"> • UCR App. 9.5.1.2.2

Table 2. SUT Capability and Feature Interoperability Requirements (continued)

DSN Transport Interface																																																																							
Interface	Critical	Requirements Required or Conditional	References																																																																				
T1 (B8ZS/ESF) Proprietary Signaling	No ²	<ul style="list-style-type: none"> • DS1 Supervisory Channel Associated Signaling (R) • DS1 Clear Channel Capability (R) • DS1 Alarm and Restoral Requirements (R) • MLPP (R) • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) • Modem (R) • Facsimile (R) • Call Control Signals (R) • Carrier Group Alarms (R) • Call Congestion (R) • Voice Compression (C) 	<ul style="list-style-type: none"> • UCR App. A9.5.1.2.4 • UCR App. A9.5.1.2.4 • UCR App. A9.5.1.2.4 • UCR App. A9.1 • UCR App. A9.5.1.1 • UCR App. A9.5.1.1.2 • UCR App. A9.5.1.1.4 																																																																				
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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 para. A9.5.1.2.7 																																																																				
Network Management	Yes	<ul style="list-style-type: none"> • Management Option (R) <ul style="list-style-type: none"> - 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 para. A9.5.2.1 • UCR para. A9.5.2.2 • UCR para. A9.5.2.3 • UCR para. A9.5.3 																																																																				
Security	Yes	<ul style="list-style-type: none"> • DIACAP (R) 	<ul style="list-style-type: none"> • UCR para. A9.6 																																																																				
<p>NOTES:</p> <p>1 The UCR does not stipulate a minimum Access interface requirement for a Strategic Network Element.</p> <p>2 The UCR does not stipulate a minimum Transport interface requirement for a Strategic Network Element.</p> <p>LEGEND:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 15%;">A</td> <td style="width: 40%;">Appendix</td> <td style="width: 15%;">GR-506-CORE</td> <td style="width: 30%;">LSSGR: Signaling for Analog Interfaces</td> </tr> <tr> <td>ADIMSS</td> <td>Advanced DSN Integrated Management Support System</td> <td>ISDN</td> <td>Integrated Services Digital Network</td> </tr> <tr> <td>AMI</td> <td>Alternate Mark Inversion</td> <td>ITU-T</td> <td>International Telecommunication Union - Telecommunication Standardization Sector</td> </tr> <tr> <td>App.</td> <td>Appendix</td> <td>kbps</td> <td>kilobits per second</td> </tr> <tr> <td>B8ZS</td> <td>Bipolar Eight Zero Substitution</td> <td>kHz</td> <td>kiloHertz</td> </tr> <tr> <td>BERT</td> <td>Bit Error Rate Test</td> <td>LSSGR</td> <td>Local Access and Transport Area (LATA) Switching Systems Generic Requirements</td> </tr> <tr> <td>BRI</td> <td>Basic Rate Interface</td> <td>Mbps</td> <td>Megabits per second</td> </tr> <tr> <td>C</td> <td>Conditional</td> <td>MLPP</td> <td>Multi-Level Precedence and Preemption</td> </tr> <tr> <td>DIACAP</td> <td>Department of Defense Information Assurance Certification and Accreditation Process</td> <td>MOS</td> <td>Mean Opinion Score</td> </tr> <tr> <td>DS1</td> <td>Digital Signal Level 1</td> <td>R</td> <td>Required</td> </tr> <tr> <td>DSN</td> <td>Defense Switched Network</td> <td>SF</td> <td>Super Frame</td> </tr> <tr> <td>E&M</td> <td>Ear and Mouth</td> <td>SLC</td> <td>Subscriber Line Carrier</td> </tr> <tr> <td>EIA</td> <td>Electronic Industries Alliance</td> <td>SUT</td> <td>System Under Test</td> </tr> <tr> <td>EIA-232</td> <td>Standard for defining the mechanical and electrical characteristics for connecting Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) data communications devices</td> <td>T1</td> <td>Digital Transmission Link Level 1 (1.544 Mbps)</td> </tr> <tr> <td>ESF</td> <td>Extended Superframe</td> <td>U</td> <td>ISDN BRI 2-wire interface</td> </tr> <tr> <td>GR</td> <td>Generic Requirement</td> <td>UCR</td> <td>Unified Capabilities Requirements</td> </tr> <tr> <td></td> <td></td> <td>V.35</td> <td>Standard for data transmission at 48 kbps using 60-108 kHz group band circuits</td> </tr> </table>				A	Appendix	GR-506-CORE	LSSGR: Signaling for Analog Interfaces	ADIMSS	Advanced DSN Integrated Management Support System	ISDN	Integrated Services Digital Network	AMI	Alternate Mark Inversion	ITU-T	International Telecommunication Union - Telecommunication Standardization Sector	App.	Appendix	kbps	kilobits per second	B8ZS	Bipolar Eight Zero Substitution	kHz	kiloHertz	BERT	Bit Error Rate Test	LSSGR	Local Access and Transport Area (LATA) Switching Systems Generic Requirements	BRI	Basic Rate Interface	Mbps	Megabits per second	C	Conditional	MLPP	Multi-Level Precedence and Preemption	DIACAP	Department of Defense Information Assurance Certification and Accreditation Process	MOS	Mean Opinion Score	DS1	Digital Signal Level 1	R	Required	DSN	Defense Switched Network	SF	Super Frame	E&M	Ear and Mouth	SLC	Subscriber Line Carrier	EIA	Electronic Industries Alliance	SUT	System Under Test	EIA-232	Standard for defining the mechanical and electrical characteristics for connecting Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) data communications devices	T1	Digital Transmission Link Level 1 (1.544 Mbps)	ESF	Extended Superframe	U	ISDN BRI 2-wire interface	GR	Generic Requirement	UCR	Unified Capabilities Requirements			V.35	Standard for data transmission at 48 kbps using 60-108 kHz group band circuits
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5. 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

JITC Memo, JTE, Special Interoperability Test Certification of the ADTRAN Total Access (TA) 1500 with Software Release 3.4

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 DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>.

6. The JITC point of contact is Mr. Edward Mellon, DSN 879-5159, commercial (520) 538-5159, FAX DSN 879-4347, or e-mail to edward.mellon@disa.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 0802306.

FOR THE COMMANDER:

2 Enclosures a/s


RICHARD A. MEADOR
Chief
Battlespace Communications Portfolio

Distribution (electronic mail):

Joint Staff J-6

Joint Interoperability Test Command, Liaison, TE3/JT1

Office of Chief of Naval Operations, CNO N6F2

Headquarters U.S. Air Force, Office of Warfighting Integration & CIO, AF/XCIN (A6N)

Department of the Army, Office of the Secretary of the Army, DA-OSA CIO/G-6 ASA (ALT), SAIS-IOQ

U.S. Marine Corps MARCORSYSCOM, SIAT, MJI Division I

DOT&E, Net-Centric Systems and Naval Warfare

U.S. Coast Guard, CG-64

Defense Intelligence Agency

National Security Agency, DT

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

DEFENSE INFORMATION SYSTEMS AGENCY

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ADDITIONAL REFERENCES

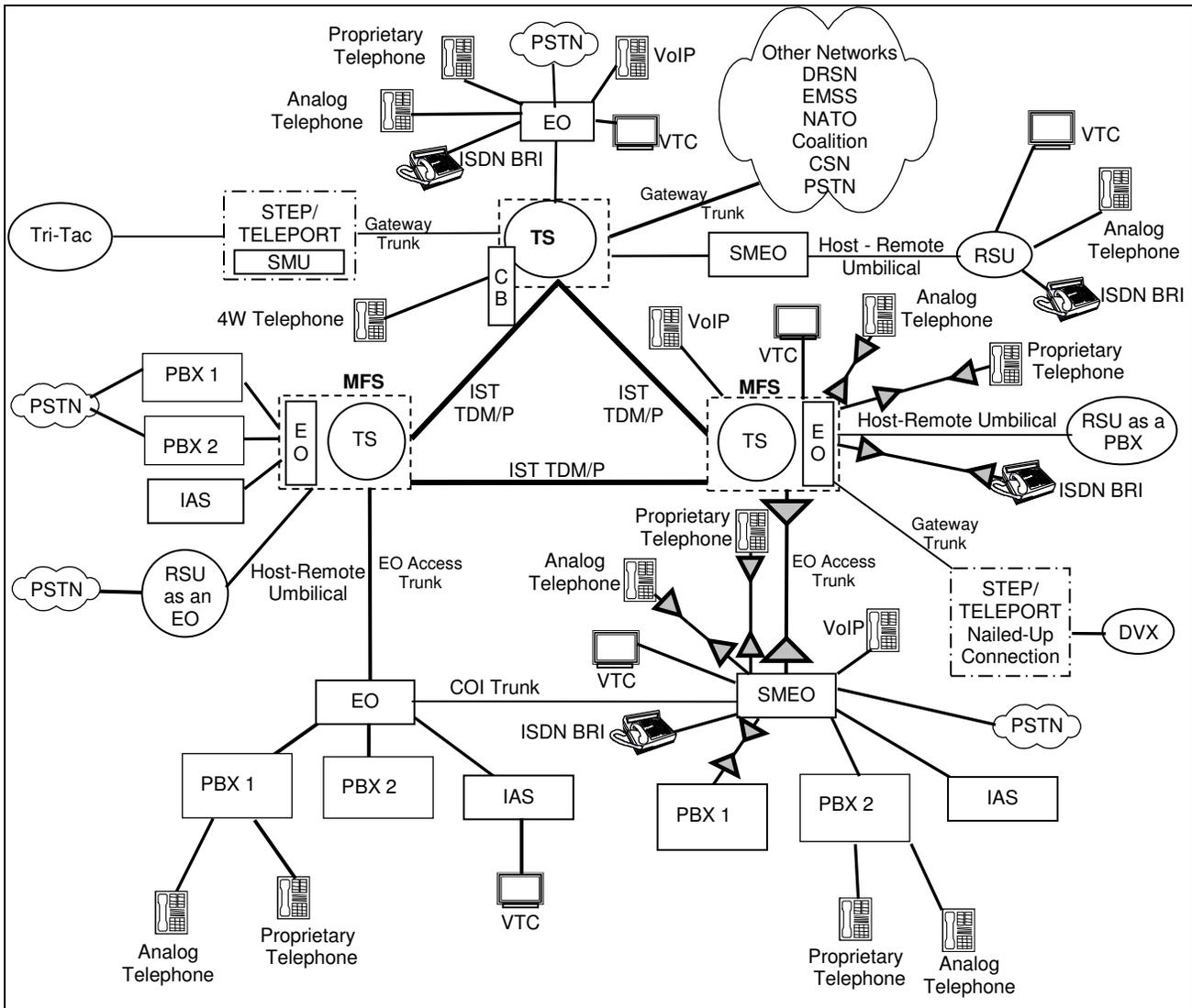
- (c) Defense Information Systems Agency, "Department of Defense Networks, Unified Capabilities Requirements," 21 December 2007
- (d) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 2," 2 October 2006

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CERTIFICATION TESTING SUMMARY

- 1. SYSTEM TITLE.** ADTRAN Total Access (TA) 1500 with Software Release 3.4; hereinafter referred to as the System Under Test (SUT).
- 2. PROPONENT.** Defense Information Systems Agency (DISA).
- 3. PROGRAM MANAGER.** Mr. John Wilson, DISA, 7 Skyline Place, 5275 Leesburg Pike, Falls Church, Virginia, 22041, email: john.wilson@disa.mil.
- 4. TESTER.** Joint Interoperability Test Command (JITC), Fort Huachuca, Arizona.
- 5. SYSTEM UNDER TEST DESCRIPTION.** The SUT can be used in the Defense Switched Network (DSN) as a Strategic Network Element (S-NE). The SUT platform is a narrowband, multiservice access platform with the versatility for numerous applications. The SUT platform supports Multiple Digital Transmission Link Level 1 (T1) voice and data access interfaces. The SUT is a modular 23 inch rack mounted chassis with five common twenty-four user access slots. Each interface contains the necessary circuitry to convert voice data signals from the customer's loop to Pulse Code Modulation (PCM) digital data and to convert PCM digital data from the carrier to voice data. The SUT is capable of providing high density Plain Old Telephone (POTS) deployment supporting up to 96 2-wire interfaces. The SUT terminates up to four T1s for the Subscriber Line Carrier (SLC)-96 interface.
- 6. OPERATIONAL ARCHITECTURE.** The Unified Capabilities Requirements (UCR) DSN architecture in Figure 2-1 depicts the relationship of the SUT to the DSN 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
DSN	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	▲	SUT

Figure 2-1. DSN 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

DSN Access Interfaces			
Interface	Critical	Status	Remarks
2-Wire Analog (GR-506-CORE)	No ¹	Certified	Met all CRs and FRs
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Features and Capabilities	Critical	Status	Remarks
Synchronization	Yes	Certified	Met all CRs and FRs.
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Security	Yes	See note 3.	See note 3.
NOTES:			
1 The UCR does not stipulate a minimum Access interface requirement for a Strategic Network Element.			
2 The UCR does not stipulate a minimum Transport interface requirement a Strategic Network Element.			
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LEGEND:			
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EIA-232	Standard for defining the mechanical and electrical characteristics for connecting Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) data communications devices	T1	Digital Transmission Link Level 1 (1.544 Mbps)
ESF	Extended Superframe	U	ISDN BRI 2-wire interface
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GR	Generic Requirement	V.35	Standard for data transmission at 48 kbps using 60-108 kHz group band circuits
GR-506-CORE	LSSGR: Signaling for Analog Interfaces		

Table 2-2. SUT Capability and Feature Interoperability Requirements

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E&M Type I, Type II, Type III, and Type V	No ¹	<ul style="list-style-type: none"> • E&M Signaling in accordance with UCR, section 7.4 • MLPP (R) • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) • Modem (R) • Facsimile (R) • Call Control Signals (R) 	<ul style="list-style-type: none"> • UCR App. A9.5.1.2.1 • UCR App. A9.1 • UCR App. A9.5.1.1
Line Side Loop Start T1 CAS (B8ZS/ESF, AMI/SF)	No ¹	<ul style="list-style-type: none"> • DS1 Supervisory Channel Associated Signaling (R) • DS1 Alarm and Restoral Requirements (R) • MLPP (R) • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) • Modem (R) • Facsimile (R) • Call Control Signals (R) • Carrier Group Alarms (R) 	<ul style="list-style-type: none"> • UCR App. A9.5.1.2.4 • UCR App. A9.5.1.2.4 • UCR App. A9.1 • UCR App. A9.5.1.1
SLC-96 Loop Start T1 CAS (B8ZS/ESF, AMI/SF)	No ¹	<ul style="list-style-type: none"> • DS1 Supervisory Channel Associated Signaling (R) • DS1 Alarm and Restoral Requirements (R) • MLPP (R) • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) • Modem (R) • Facsimile (R) • Call Control Signals (R) • Carrier Group Alarms (R) 	<ul style="list-style-type: none"> • UCR App. A9.5.1.2.4 • UCR App. A9.5.1.2.4 • UCR App. A9.1 • UCR App. A9.5.1.1
ITU-T V.35 Serial Interface	No ¹	<ul style="list-style-type: none"> • In accordance with ITU-T V.35 (C) 	<ul style="list-style-type: none"> • UCR App. A9.5.1.2.2
EIA-232 Serial Interface	No ¹	<ul style="list-style-type: none"> • In accordance with TIA-232F (C) 	<ul style="list-style-type: none"> • UCR App. 9.5.1.2.2

Table 2-2. SUT Capability and Feature Interoperability Requirements (continued)

DSN Transport Interface																																			
Interface	Critical	Requirements Required or Conditional	References																																
T1 (B8ZS/ESF) Proprietary Signaling	No ²	<ul style="list-style-type: none"> • DS1 Supervisory Channel Associated Signaling (R) • DS1 Clear Channel Capability (R) • DS1 Alarm and Restoral Requirements (R) • MLPP (R) • MOS (R) • BERT (R) • Secure Transmission (Voice and Data) (R) • Modem (R) • Facsimile (R) • Call Control Signals (R) • Carrier Group Alarms (R) • Call Congestion (R) • Voice Compression (C) 	<ul style="list-style-type: none"> • UCR App. A9.5.1.2.4 • UCR App. A9.5.1.2.4 • UCR App. A9.5.1.2.4 • UCR App. A9.1 • UCR App. A9.5.1.1 • UCR App. A9.5.1.1.1 • UCR App. A9.5.1.1.2 • UCR App. A9.5.1.1.4 																																
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 para. A9.5.1.2.7 																																
Network Management	Yes	<ul style="list-style-type: none"> • Management Option (R) <ul style="list-style-type: none"> - 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 para. A9.5.2.1 • UCR para. A9.5.2.2 • UCR para. A9.5.2.3 • UCR para. A9.5.3 																																
Security	Yes	<ul style="list-style-type: none"> • DIACAP (R) 	<ul style="list-style-type: none"> • UCR para. A9.6 																																
<p>NOTES:</p> <p>1 The UCR does not stipulate a minimum Access interface requirement for a Strategic Network Element.</p> <p>2 The UCR does not stipulate a minimum Transport interface requirement for a Strategic Network Element.</p> <p>LEGEND:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">A Appendix</td> <td style="width: 33%;">GR-506-CORE LSSGR: Signaling for Analog Interfaces</td> </tr> <tr> <td>ADIMSS Advanced DSN Integrated Management Support System</td> <td>ISDN Integrated Services Digital Network</td> </tr> <tr> <td>AMI Alternate Mark Inversion</td> <td>ITU-T International Telecommunication Union - Telecommunication Standardization Sector</td> </tr> <tr> <td>App. Appendix</td> <td>kbps kilobits per second</td> </tr> <tr> <td>B8ZS Bipolar Eight Zero Substitution</td> <td>kHz kiloHertz</td> </tr> <tr> <td>BERT Bit Error Rate Test</td> <td>LSSGR Local Access and Transport Area (LATA) Switching Systems Generic Requirements</td> </tr> <tr> <td>BRI Basic Rate Interface</td> <td>Mbps Megabits per second</td> </tr> <tr> <td>C Conditional</td> <td>MLPP Multi-Level Precedence and Preemption</td> </tr> <tr> <td>DIACAP Department of Defense Information Assurance Certification and Accreditation Process</td> <td>MOS Mean Opinion Score</td> </tr> <tr> <td>DS1 Digital Signal Level 1</td> <td>R Required</td> </tr> <tr> <td>DSN Defense Switched Network</td> <td>SF Super Frame</td> </tr> <tr> <td>E&M Ear and Mouth</td> <td>SLC Subscriber Line Carrier</td> </tr> <tr> <td>EIA Electronic Industries Alliance</td> <td>SUT System Under Test</td> </tr> <tr> <td>EIA-232 Standard for defining the mechanical and electrical characteristics for connecting Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) data communications devices</td> <td>T1 Digital Transmission Link Level 1 (1.544 Mbps) ISDN BRI 2-wire interface</td> </tr> <tr> <td>ESF Extended Superframe</td> <td>U Unified Capabilities Requirements</td> </tr> <tr> <td>GR Generic Requirement</td> <td>V.35 Standard for data transmission at 48 kbps using 60-108 kHz group band circuits</td> </tr> </table>				A Appendix	GR-506-CORE LSSGR: Signaling for Analog Interfaces	ADIMSS Advanced DSN Integrated Management Support System	ISDN Integrated Services Digital Network	AMI Alternate Mark Inversion	ITU-T International Telecommunication Union - Telecommunication Standardization Sector	App. Appendix	kbps kilobits per second	B8ZS Bipolar Eight Zero Substitution	kHz kiloHertz	BERT Bit Error Rate Test	LSSGR Local Access and Transport Area (LATA) Switching Systems Generic Requirements	BRI Basic Rate Interface	Mbps Megabits per second	C Conditional	MLPP Multi-Level Precedence and Preemption	DIACAP Department of Defense Information Assurance Certification and Accreditation Process	MOS Mean Opinion Score	DS1 Digital Signal Level 1	R Required	DSN Defense Switched Network	SF Super Frame	E&M Ear and Mouth	SLC Subscriber Line Carrier	EIA Electronic Industries Alliance	SUT System Under Test	EIA-232 Standard for defining the mechanical and electrical characteristics for connecting Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) data communications devices	T1 Digital Transmission Link Level 1 (1.544 Mbps) ISDN BRI 2-wire interface	ESF Extended Superframe	U Unified Capabilities Requirements	GR Generic Requirement	V.35 Standard for data transmission at 48 kbps using 60-108 kHz group band circuits
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ADIMSS Advanced DSN Integrated Management Support System	ISDN Integrated Services Digital Network																																		
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DS1 Digital Signal Level 1	R Required																																		
DSN Defense Switched Network	SF Super Frame																																		
E&M Ear and Mouth	SLC Subscriber Line Carrier																																		
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ESF Extended Superframe	U Unified Capabilities Requirements																																		
GR Generic Requirement	V.35 Standard for data transmission at 48 kbps using 60-108 kHz group band circuits																																		

8. TEST NETWORK DESCRIPTION. The SUT was tested at JITC's Global Information Grid Network Test Facility (GNTF) in a manner and configuration similar to

that of its DSN operational environment. Testing the system's required functions and features was conducted using the test configurations depicted in Figures 2-2 and 2-3.

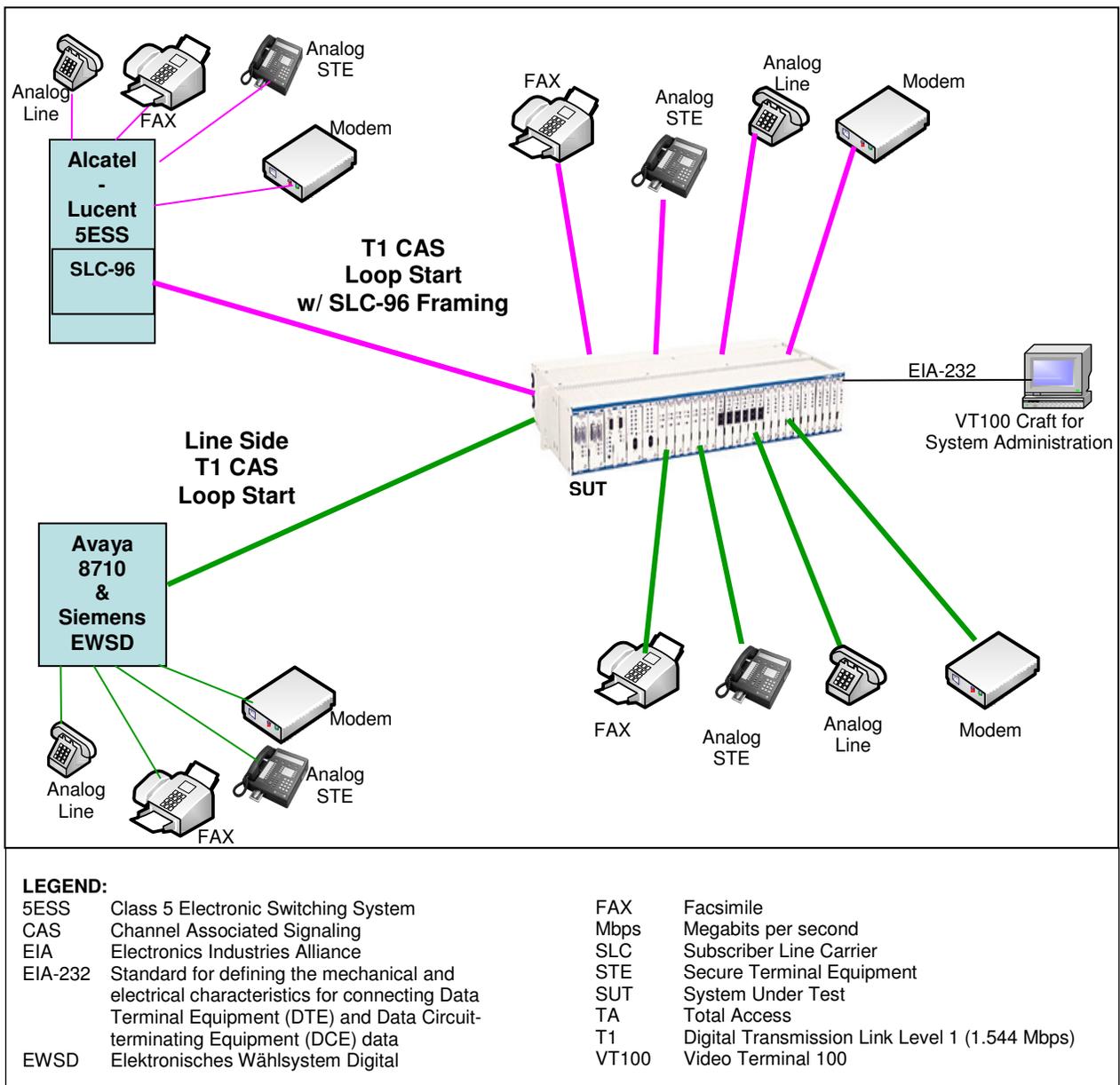
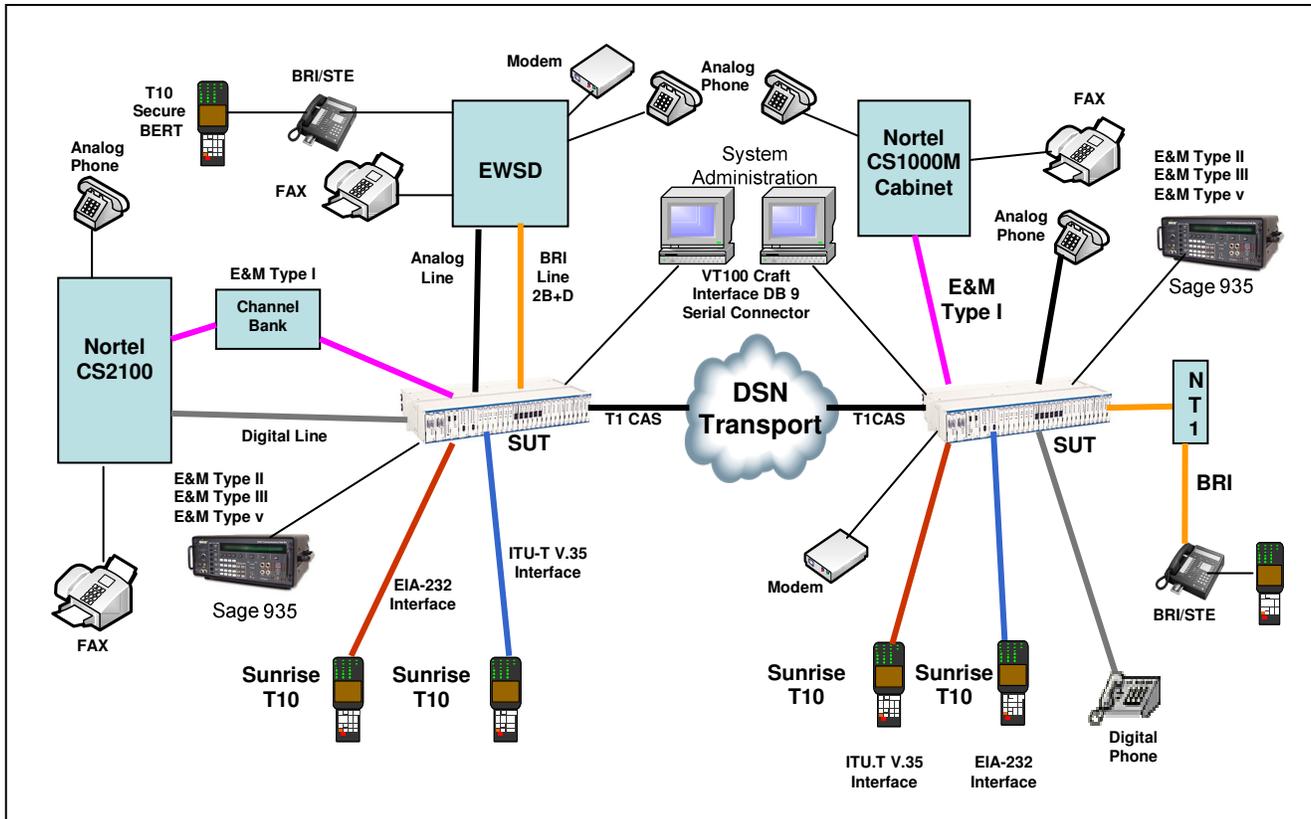


Figure 2-2. Test Configuration Using a Single TA1500



LEGEND:

BRI	Basic Rate Interface	kbps	kilobits per second
CAS	Channel Associated Signaling	kHz	kiloHertz
CS	Communication Server	Mbps	Megabits per second
DSN	Defense Switched Network	NT1	Network Termination Unit 1
E&M	Ear and Mouth	STE	Secure Terminal Equipment
EIA	Electronics Industries Alliance	SUT	System Under Test
EIA-232	Standard for defining the mechanical and electrical characteristics for connecting Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) data	T1	Digital Transmission Link Level 1 (1.544 Mbps)
EWSD	Elektronisches Wählsystem Digital	TA	Total Access
FAX	Facsimile	V.35	Standard for data transmission at 48 kbps using 60-108 kHz group band circuits
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector		

Figure 2-3. Test Configuration Using Two TA1500s

9. SYSTEM CONFIGURATIONS. Table 2-3 provides the system configurations used in the test. The SUT was tested in an operationally realistic environment to determine interoperability with a complement of DSN switches noted in Table 2-3. The DSN switches listed in Table 2-3 only depict the tested configuration. Table 2-3 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 (UC) Approved Products List (APL) that offer the same certified SUT interfaces.

Table 2-3. Tested System Configurations

System Name		Hardware/Software Release	
Nortel CS1000M Cabinet		4.5W	
Nortel CS2100		Succession Enterprise (SE)09	
Siemens EWSD		19d with Patch Set 46	
Alcatel-Lucent 5ESS		5E16.2 Broadcast Warning Message (BWM) 07-0003	
Avaya S8710		Communication Manager (CM) 4.0 (R014x.00.2.731.7: Super Patch 14419)	
Nortel Optical Multiservice Edge (OME) 6500		Software Release 5.12	
SUT	ADTRAN TA1500 with Software Release 3.4	TA1500 Commons	Firmware
		Chassis Type: 1500	
		SCU (1180008L23)	V14
		Quad LIU (118010922)	T18Q
		TA1500 Access Modules	Firmware
		FXS/DPO (1180403L1)	T18Q
		Quad RS232 (1180435L1)	Product rev – E Software rev – B03
		RT EBS (1180430L1)	fw-01.07, Fpga-05.05
		E&M/TO (1180402L1)	T18Q
		Quad R-Pots (1180408L1)	T18Q
		Quad C-Pots (1180407L1)	T18Q
		Dual Nx56/64 (1180025L1)	F.0.0
		U-BR1TE (1180020L1)	R01
		COT EBS (1180430L1)	Fw-01.07, fpga-05.05
System Administrator Laptop	Microsoft Windows XP 2002, Service Pack 2		
End Instruments			
Device Name	Boot Code	Software Release	
L3 Secure Terminal Equipment (STE)	0018	2.2, 2.4, 2.5, and 2.6	
OMNI Secure Terminal	02.03	04.18	
Sectera Secure Wireline Terminal (SWT)	B00600010000	B00600100000	
iLex 760 Security Fax	Not Applicable	Proprietary	
LEGEND:			
5ESS	Class 5 Electronic Switching System	Nx	Network Exchange
BRI	Basic Rate Interface	Rev	revision
C-POTS	Central Office-Plain Old Telephone Service	R-POTS	Remote-Plain Old Telephone Service
CS	Communication Server	RT	Remote Terminal
DPO	Dial Pulse Only	SCU	System Control Unit
EBS	Electronic Business Service	SUT	System Under Test
E&M	Ear and Mouth	TA	Total Access
EWSD	Elektronisches Wählsystem Digital	TO	Transmit Only
FXS	Foreign Exchange Service	U-BR1TE	ISDN BRI 2-wire Interface-Basic Rate 1 Terminal End Point
ISDN	Integrated Services Digital Network		
LIU	Line Interface Unit		

10. TEST LIMITATIONS. None.

11. TEST RESULTS

a. Discussion

(1) DSN Access Interfaces. The SUT met all critical CRs and FRs for the following access interfaces: 2-Wire Analog, 2-Wire Basic Rate Interface (BRI), Digital Proprietary, E&M (Type I, Type II, Type III, and Type V), Line Side Loop Start T1 Channel Associated Signaling (CAS) (Bipolar Eight Zero Substitution [B8ZS]/Extended Superframe [ESF], Alternate Mark Inversion [AMI]/Superframe [SF]), SLC-96 Loop Start T1 CAS (B8ZS/ESF, AMI/SF), Electronic Industries Alliance (EIA)-232 serial interface, and International Telecommunication Union - Telecommunication Standardization

Sector (ITU-T) V.35 serial interface. The SUT interface access characteristics were tested according to UCR, appendix 9. All of the SUT access interface characteristics were verified through vendor Letter of Compliance (LoC) and testing.

(a) Interface Characteristics. The T1 interface characteristics were verified and measured using the pulse mask measurement on the Sunset T10 test set. The SUT met all T1 interface characteristics as required by the UCR, appendix 9.

(b) Supervisory Channel Associated Signaling. Trunk seizure, answer supervision, preemption signals, and all other trunk supervisory information sent and received on a per channel basis were passed transparently through the SUT as required in the UCR, appendix 9.

(c) Alarm and Restoral Requirements. The UCR, appendix 9, paragraph A9.5.1.1.1, states the Network Element (NE) shall be able to propagate Carrier Group Alarms (CGAs) in accordance with UCR, section 7, upon physical loss of the Time Division Multiplexing (TDM) interface. The SUT is capable of transparently passing the alarm and restoral features of the DSN switch's digital interface unit, which meets the requirement.

(d) Mean Opinion Score (MOS). The UCR, appendix 9, paragraph A9.5.1.1, states that a Network Element shall have a MOS of 4.0 or better for 95 percent of all calls placed. The Sage 935 test set was used to generate simulated voice traffic across the T1 as depicted in figures 2-2 and 2-3. There were 100 calls placed over the T1 interfaces. The SUT met this requirement with 99 percent of all calls placed via the SUT having an MOS of 4.0 or better for an average of 4.3.

(e) Bit Error Rate Test (BERT). The UCR, appendix 9, paragraph A9.5.1.1, requires that the SUT, when inserted in to the test network, will not exceed an end-to-end bit error rate of less than one error in 1×10^9 (averaged over a nine hour period). BERTs were conducted across all T1 and line interfaces using SunsSet T10 and BRI test sets. The SUT met this requirement with a recorded bit error ratio of one error in 1×10^{10} .

(f) Secure Transmission (Voice and Data). The UCR, appendix 9, paragraph A9.5.1.1, states that the introduction of NEs shall not degrade secure transmission for secure end devices. There were 60 secure calls placed between Secure Terminal Equipment (STEs) and Secure Wireline Terminals (SWTs) through the SUT with a 100 percent success rate. The SUT did not degrade secure end device transmissions, which meets the requirement.

(g) Modem. The UCR, appendix 9, paragraph A9.5.1.1, states that NEs shall support a minimum modem transmission speed of 9.6 kilobits per second (kbps) across the NE. There were 20 modem calls placed through the SUT using laptop computer. All modem calls had a transmission rate of 32.5 kbps, which meets the requirement.

(h) Facsimile. The UCR, appendix 9, paragraph A9.5.1.1, states that NEs shall support a minimum facsimile transmission speed of 9.6 kbps across the NE. There were 20 facsimile calls placed through the SUT using iLex 760 Security Fax and all calls had a transmission rate of 9.6 kbps or better, which meets the requirements.

(i) Call Control Signals. The UCR, appendix 9, paragraph A9.5.1.1, states the NE shall transport all call control signals transparently on the end-to-end basis. The SUT transparently transported all Multi-Level Precedence and Preemption (MLPP) call control signals, which meets the requirement.

(j) Military Unique Features. The SUT supports the full complement of Military Unique Features as required in the UCR, section 3. The following types of MLPP calls were placed over all the SUT access interfaces between the switching systems listed in Tables 2-2 and 2-3. All calls were completed successfully and met the MLPP interactions as required by the UCR, section 3.

1. Circuit for Reuse; Answered Call
2. Circuit for Reuse; Unanswered Call
3. Circuit not for Reuse; Answered Call
4. Circuit not for Reuse; Unanswered Call
5. Resources not Available (Intra- and inter-switch)
6. Circuit for Reuse; Answered Call (simultaneous preemption of line and trunk)
7. Circuit for Reuse; Unanswered Call (simultaneous preemption of line and trunk)

(2) DSN Transport Interfaces. The SUT only supports T1 (B8ZS/ESF Proprietary Signaling). The T1 interface provides 1.544 Mbps of transport bandwidth.

(a) Alarm and Restoral Requirements. The UCR appendix 9, paragraph A9.5.1.1.1, states that the NE shall be able to propagate CGAs in accordance with UCR, section 7, upon physical loss of the TDM interface. Voice switching systems shall receive the proper CGAs from the NE upon loss of the transport link between NEs. The SUT is capable of transparently passing the alarm and restoral features of the DSN switch's digital interface unit, which meets the requirement.

(b) Mean Opinion Score (MOS). The Sage 935 communications test sets were used for conducting MOS tests. The UCR appendix 9, paragraph A9.5.1.1, states that the introduction of S-NEs shall not cause the end-to-end average MOS to fall below 4.0 as measured over any 5-minute time interval. There were 100 calls placed through the SUT test network all having an MOS of 4.0 or greater with an average of 4.3, which meets the requirement.

(c) Bit Error Rate Tests (BERTs). The UCR, appendix 9, paragraph A9.5.1.1, states that the introduction of an S-NE shall not cause the end-to-end digital

bit error rate to exceed the requirement of less than 1 error in 1×10^9 (averaged over a nine-hour period). The SUT met this requirement with a recorded bit error ratio of one error in 1×10^{10} .

(d) Secure Transmission (Voice and Data). The UCR appendix 9, paragraph A9.5.1.1, states that the introduction of NEs shall not degrade secure transmission for secure end devices as defined by Appendix 10. There were 60 secure calls placed over the test configurations shown in Figures 2-2 and 2-3 between STEs and SWTs with a 100 percent success rate without degrading transmissions between end devices, which meet the requirement. These tests included secure voice, data, fax, and crypto rekey.

(e) Modem. UCR appendix 9, paragraph A9.5.1.1, states that the NE(s) shall support a minimum modem speed of 9.6 kbps across the associated NE. A total of 60 modem test calls were using lap top computers and secure data modems through the S-NE configuration and all modem calls had a transmission rate of 9.6 kbps or better, which meets the requirements.

(f) Facsimile. UCR appendix 9, paragraph A9.5.1.1, and appendix 2, paragraph A2.4.1, state that NEs shall support a minimum facsimile transmission speed of 9.6 kbps across the associated NEs. A total of 60 facsimile calls were placed over the access and transport interfaces through the SUT with a measure transmission speed of 9.6 kbps or better, which meets the requirement.

(g) Call Control Signals. UCR appendix 9, paragraph A9.5.1.1, states that the NE shall transport all call control signals transparently on an end-to-end basis. The SUT transparently transported all MLPP call control signals, which meets the requirement.

(h) Military Unique Features. The SUT supports the full complement of Military Unique Features as required in the UCR, section 3. The following types of MLPP calls were placed over the SUT transport interface between the switching systems listed in Table 2-3. All calls were completed successfully and met the MLPP interactions as required by the UCR, section 3.

1. Circuit for Reuse; Answered Call
2. Circuit for Reuse; Unanswered Call
3. Circuit not for Reuse; Answered Call
4. Circuit not for Reuse; Unanswered Call
5. Resources not Available (Intra- and inter-switch)
6. Circuit for Reuse; Answered Call (simultaneous preemption of line and trunk)
7. Circuit for Reuse; Unanswered Call (simultaneous preemption of line and trunk)

(3) Synchronization. UCR appendix 9, paragraph A9.5.1.2.7, states that the NE shall be able to derive timing signal from an internal source, an incoming digital signal, or an external source in accordance with UCR Section 11.1. The SUT can derive timing from any of the three following methods: Local Clock (used to derive the timing from the local Quad LIU), Loop A Clock (used to derive the timing from the T1 bit stream) or External Clock input (used to derive the timing from an external source). During this test, the timing for SUT was derived from a dedicated T1 source, which meets the minimum requirement.

(4) Device Management

(a) Management Option. UCR appendix 9, paragraph A9.5.2.1, states that the NE devices are to 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. NE devices in the DSN may be monitored and managed by the Advanced DSN Integrated Management Support System (ADIMSS) as described in the UCR, section 9. The SUT meets this requirement with an external console which is locally connected to the VT100 Craft Interface DB9 connector located on the front of the System Control Unit card. The System Administration was conducted with a modular PC using the Windows XP 2002 operating system. The System Administration functions include configuring and monitoring of the SUT.

(b) Fault Management. UCR appendix 9, paragraph A9.5.2.2, states that the 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 does not have any diagnostic capabilities; however, trunk status and alarms can be monitored via the alarm log, or performance monitoring menu options. This is a conditional requirement for a S-NE, there is no operational impact.

(c) Loop Back Capability. UCR appendix 9, paragraph A9.5.2.3, states that the NEs shall provide loop back capability on each of the trunk side interfaces in accordance with ITU-T Recommendation V.54. The SUT does not provide ITU-T V.54 loop back capability. Since this is a conditional requirement for a S-NE, there is no operational impact.

(5) Operational Configuration Restoral. UCR appendix 9, paragraph A9.5.3, states that the 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 then power was restored. The SUT returned to the last customer configured state prior to the power failure, which meets the requirement.

(6) Security. Security is tested as part of the Information Assurance testing and is covered under a separate report.

b. Summary. The SUT is certified for joint use within the DSN as a DSN S-NE in accordance with the requirements set forth in reference (c). When connected to the interfaces certified in this letter, the SUT and its associated applications were transparent to the switching systems interfaced causing no degradation of service or negative impact.

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 DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <http://jitc.fhu.disa.mil/tssi>.