



DEFENSE INFORMATION SYSTEMS AGENCY

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

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

15 Aug 08

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of the Polycom Inc. Multimedia Gateway Controller (MGC) 100 and MGC 50 with Software Release 9.0.1FED

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, Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification.

2. The Polycom Inc. MGC 100 with Software Release 9.0.1FED is hereinafter referred to as the system under test (SUT). The SUT met all the critical interface and functional interoperability requirements of the Unified Capabilities Requirements for a Multipoint Control Unit (MCU) as set forth in appendix 8, and is certified for joint use within the Defense Switched Network (DSN). The MGC 50 employs exactly the same software and video codec as the SUT. The difference between the MGC 50 and the SUT is in scalability. The SUT supports a maximum of 768 endpoints and the MGC 50 supports a maximum of 384. JITC analysis determined the MGC 50 to be functionally identical to the SUT for interoperability certification purposes. SUT offers an ITU-T H.323 interface; however, the sponsor did not request that JITC test this interface. The SUT ITU-T H.323 interface is not certified by JITC or authorized by the DSN Program Management Office for use within the DSN. The SUT meets the critical interoperability requirements set forth in reference (c) using test procedures derived from reference (d). 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 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 21 July through 7 August 2008. Review of the LoC was completed on 7 August 2008. The Certification Testing Summary (enclosure 2) documents the test results and describes the test configuration.

4. The Functional Requirements used to evaluate the interoperability of the SUT and the interoperability statuses are indicated in table 1.

Table 1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Requirements Required or Conditional	Status	UCR Reference
ITU-T H.323	No ¹	No ²	The VTC system/endpoints shall meet the requirements of FTR1080B-2002 (R)	Not Tested	A8.5
			ITU-T H.323 in accordance with FTR 1080B-2002 (C)	Not Tested	A8.5
			Layer 3 Differential Service Code Point tagging as specified in UCR paragraph A.3.2.9.2 (C)	Not Tested	A8.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Not Tested	A8.5
			Audio add-on interface, implemented independently of an IAS, shall be in accordance with UCR, Appendix 7 (CPE) (C)	Not Tested	A8.5
			Physical, electrical, and software characteristics of VTU system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations. (R)	Not Tested	A8.5
ISDN BRI	No ¹	No ³	The VTC system/endpoints shall meet the requirements of FTR 1080B-2002 (R)	Not Tested	A8.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Not Tested	A8.5
			Audio add-on interface, implemented independently of an IAS, shall be in accordance with UCR, Appendix 7 (CPE) (C)	Not Tested	A8.5
			Integrated BRI interface shall be in conformance with Terminal Adaptor requirements in UCR, Appendix 7 (CPE) (C)	Not Tested	A8.5
			Physical, electrical, and software characteristics of VTU system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations. (R)	Not Tested	A8.5
ISDN PRI T1 ISDN PRI E1	No ¹	Yes	The VTC system/endpoints shall meet the requirements of FTR 1080B-2002 (R)	Met	A8.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Met	A8.5
			Audio add-on interface, implemented independently of an IAS, shall be in accordance with UCR, Appendix 7 (CPE) (C)	Met	A8.5
			Integrated PRI interface shall be in conformance with IAS requirements in UCR, Appendix 6 (IAS) (C)	Met	A8.5
			Physical, electrical, and software characteristics of VTU system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations. (R)	Met	A8.5
Serial Interfaces ⁴ : EIA-366A EIA-449 EIA-530 ITU-T V.35 ⁵	No ¹	Yes	The VTC system/endpoints shall meet the requirements of FTR 1080B-2002 (R)	Met	A8.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Met	A8.5
			Audio add-on interface, implemented independently of an IAS, shall be in accordance with UCR, Appendix 7 (CPE) (C)	Met	A8.5
			Connections shall be in conformance with the requirements for serial interface(s) as described in FTR 1080B-2002 (C)	Met	A8.5
			Physical, electrical, and software characteristics of VTU system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations. (R)	Met	A8.5
	Yes	See note 6.	Security (R)	See note 6.	A8.7

Table 1. SUT Functional Requirements and Interoperability Status (continued)

LEGEND:	
A	- UCR Appendix
BRI	- Basic Rate Interface
C	- Conditional
CPE	- Customer Premise Equipment
DCE	- Data Circuit-terminating Equipment
DISA	- Defense Information Systems Agency
DSN	- Defense Switched Network
DTE	- Data Terminal Equipment
E1	- European Basic Multiplex Rate (2.048 Mbps)
EIA	- Electronic Industries Alliance
EIA-366A	- Standard for interface between DTE and automatic calling equipment for data communication
EIA-449	- Standard for 37-position and 9-position interface for DTE and DCE employing serial binary data interchange
EIA-530	- Standard for 25-position interface for DTE and DCE employing serial binary data interchange
FTR	- Federal Telecommunications Recommendation
H.320	- Standard for narrowband VTC
H.323	- Standard for multi-media communications on packet-based networks
IAS	- Integrated Access Switch
ISDN	- Integrated Services Digital Network
ITU-T	- International Telecommunication Union - Telecommunication Standardization Sector
JITC	- Joint Interoperability Test Command
kbps	- kilobits per second
kHz	- kiloHertz
Mbps	- Megabits per seconds
MCU	- Multipoint Control Unit
PMO	- Program Management Office
PRI	- Primary Rate Interface
R	- Required
SUT	- System Under Test
T1	- Digital Transmission Link Level 1 (1.544 Mbps)
TA	- Terminal Adapter
UCR	- Unified Capabilities Requirements
V.35	- Standard for data transmission at 48 kbps using 60-108 kHz group band circuits
V.36	- Modems for synchronous data transmission using 60-108 kHz group band circuits
V.37	- Synchronous data transmission at a data signaling rate higher than 72 kbps using 60-108 kHz group band circuits
VTC	- Video Teleconferencing
VTU	- Video Teleconferencing Unit

NOTES:

- The VTC system interface requirements can be met with an ISDN BRI, ISDN PRI, Serial, or ITU-T H.323 interface.
- The SUT offers an ITU-T H.323 interface; however, the sponsor did not request that JITC test this interface. The SUT ITU-T H.323 interface is not certified by JITC or authorized by the DSN PMO for use within the DSN. This is not a required interface for an MCU.
- The SUT does not support an ISDN BRI interface. This is not a required interface for an MCU. There is no risk associated with the SUT not supporting this interface.
- The SUT meets the critical interoperability requirements for serial interfaces; however, the serial interfaces must connect to an IAS or TA, which provides an inverse multiplex capability and a direct interface to the DSN. The SUT is certified with any IAS or TA on the DSN Approved Products List.
- The electrical physical interface tested was ITU-T V.35 in accordance with ITU-T V.36/V.37.
- Security is tested by DISA-led Information Assurance test teams and published in a separate report.

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 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. Steven Lesneski, DSN 879-5400, commercial (520) 538-5400, FAX DSN 879-4347, or e-mail to steven.lesneski@disa.mil. The JITC's mailing address is P.O. Box 12798, Fort Huachuca, AZ 85670-2798. The tracking number for the SUT is 0731803.

FOR THE COMMANDER:

2 Enclosures a/s



RICHARD A. MEADOR
Chief
Battlespace Communications Portfolio

JITC Memo, JTE, Special Interoperability Test Certification of the Polycom Inc. Multimedia Gateway Controller (MGC) 100 and MGC 50 Software Release 9.0.1FED

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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, "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

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. The Polycom Inc. Multimedia Gateway Controller (MGC) 100; hereinafter referred to as the System Under Test (SUT), and MGC 50 with Software Release 9.0.1FED (Federal).

2. PROPONENT. U.S. Army Materiel Command (AMC)

3. PROGRAM MANAGER. Mr. Hamid Ford, AMCIO-I-S, 9301 Chapek Rd, FT Belvoir, VA. 22060, Email: fordh@hqamc.army.mil

4. TESTER. Joint Interoperability Test Command (JITC), Fort Huachuca, Arizona.

5. SYSTEM UNDER TEST DESCRIPTION. The SUT is a Multipoint Control Unit (MCU) which supports scalable audio and video conferencing and gateway solutions. The 16-slot MGC-100 has redundant power supplies and supports a large number of ports, features and multiple network connections, dedicated, switched and packet. The Polycom MGC-100 offers the following features and capabilities:

Audio and video system capacities:

Audio: 860 Ports

Video:

- International Telecommunication Union – Telecommunication Standardization Sector (ITU-T) H.320 Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) Digital Transmission Link Level 1 (T1) at 384 kilobits per second (kbps), 122 ports
- ITU-T H.320 ISDN PRI European Basic Multiplex Rate (E1) at 384 kbps, 144 ports
- ITU-T H.323 Internet Protocol (IP) at 384 kbps, 384 ports (Not certified)

Transcoding:

- Audio Algorithms ITU-T G.711, ITU-T G.722, ITU-T G.722.1, ITU-T G.723, ITU-T G.728
- Siren™ 7, Siren™ 14
- Networks - IP (Not certified), ISDN, T1, E1, and serial Interfaces
- Network Speed - 56 kbps up to 2 Megabits per second
- Video Resolution - Quarter Common Intermediate Format and Common Intermediate Format
- Video Algorithms - ITU-T H.261, ITU-T H.263, ITU-T H.264+
- Frame Rate - 7.5 frames per second (fps), 30 fps, and 60 fields-per-second

MGC platform management tools:

- MGC Manager - Windows®-based application for configuration, scheduling and monitoring
- WebCommander™ - Web-based scheduling and management

- Personal Scheduler - Microsoft® Outlook® conference scheduling
- Interactive Voice Response/Dual Tone Multifrequency - Touch tone user interface to conference features
- Application Programming Interface Software Developers Kit
- Call Detail Recording Collector

Chassis dimensions:

- Height 40.8 centimeters (cm) (16 inches)
- Width 58.4 cm (23 inches)
- Depth 50.2 cm (19 inches)
- 16-Slot Chassis Power, redundant power supplies, 3 load sharing 110-240 volts Alternating Current, 50/60 Hertz, 48 volts Direct Current
- Network Equipment Building Standard Level 3 Compliance with special-order systems

The MGC 50 employs exactly the same software and video codec as the SUT. JITC analysis determined the MGC 50 to be functionally identical to the SUT for interoperability certification purposes. Table 2-1 depicts the comparison of the MGC 100 and MGC 50.

Table 2-1. MGC 100 and MGC 50 Product Comparison

Product	Software Release	Form Factor	T1/E1 /PRI interface	ITU-T V.35, EIA-449, and EIA-530 w/EIA-366A Interface	Max Video endpoints	Units for Max Voice endpoints																																								
MGC 50	9.0.1FED	16"x 15"x 19" (HWD) 8 slot chassis	Up to 8 per slot	Up to 8 per slot	384 @ 128 kbps, 192 @ 384 kbps	384																																								
MGC 100 (SUT)	9.0.1FED	16"x 23"x 19" (HWD) 16 slot chassis	Up to 8 per slot	Up to 8 per slot	768 @ 128 kbps, 384 @ 384 kbps	768																																								
<p>LEGEND:</p> <table border="0"> <tr> <td>DCE</td> <td>- Data Circuit-terminating Equipment</td> <td>kbps</td> <td>- kilobits per second</td> </tr> <tr> <td>DTE</td> <td>- Data Terminal Equipment</td> <td>kHz</td> <td>- kiloHertz</td> </tr> <tr> <td>E1</td> <td>- European Basic Multiplex Rate (2.048 Mbps)</td> <td>Mbps</td> <td>- Megabits per second</td> </tr> <tr> <td>EIA</td> <td>- Electronic Industries Alliance</td> <td>MGC</td> <td>- Multimedia Gateway Controller</td> </tr> <tr> <td>EIA-366A</td> <td>- Standard for interface between DTE and automatic calling equipment for data communication</td> <td>PRI</td> <td>- Primary Rate Interface</td> </tr> <tr> <td>EIA-449</td> <td>- Standard for 37-position and 9-position interface for DTE and DCE employing serial binary data interchange</td> <td>SUT</td> <td>- System Under Test</td> </tr> <tr> <td>EIA-530</td> <td>- Standard for 25-position interface for DTE and DCE employing serial binary data interchange</td> <td>T1</td> <td>- Digital Transmission Link Level 1 (1.544 Mbps)</td> </tr> <tr> <td>HWD</td> <td>- Height Width Depth</td> <td>V.35</td> <td>- Standard for data transmission at 48 kbps using 60-108 kHz group band circuits</td> </tr> <tr> <td>ITU-T</td> <td>- International Telecommunication Union – Telecommunication Standardization Sector</td> <td>V.36</td> <td>- Modems for synchronous data transmission using 60-108 kHz group band circuits</td> </tr> <tr> <td></td> <td></td> <td>V.37</td> <td>- Synchronous data transmission at a data signaling rate higher than 72 kbps using 60-108 kHz group band circuits</td> </tr> </table> <p>NOTE: The electrical physical interface tested was ITU-T V.35 in accordance with ITU-T V.36/V.37.</p>							DCE	- Data Circuit-terminating Equipment	kbps	- kilobits per second	DTE	- Data Terminal Equipment	kHz	- kiloHertz	E1	- European Basic Multiplex Rate (2.048 Mbps)	Mbps	- Megabits per second	EIA	- Electronic Industries Alliance	MGC	- Multimedia Gateway Controller	EIA-366A	- Standard for interface between DTE and automatic calling equipment for data communication	PRI	- Primary Rate Interface	EIA-449	- Standard for 37-position and 9-position interface for DTE and DCE employing serial binary data interchange	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)	HWD	- Height Width Depth	V.35	- Standard for data transmission at 48 kbps using 60-108 kHz group band circuits	ITU-T	- International Telecommunication Union – Telecommunication Standardization Sector	V.36	- Modems for synchronous data transmission using 60-108 kHz group band circuits			V.37	- Synchronous data transmission at a data signaling rate higher than 72 kbps using 60-108 kHz group band circuits
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6. OPERATIONAL ARCHITECTURE. The Unified Capabilities Requirements (UCR) Defense Switched Network (DSN) architecture in figure 2-1 depicts the relationship of the SUT to the DSN switches.

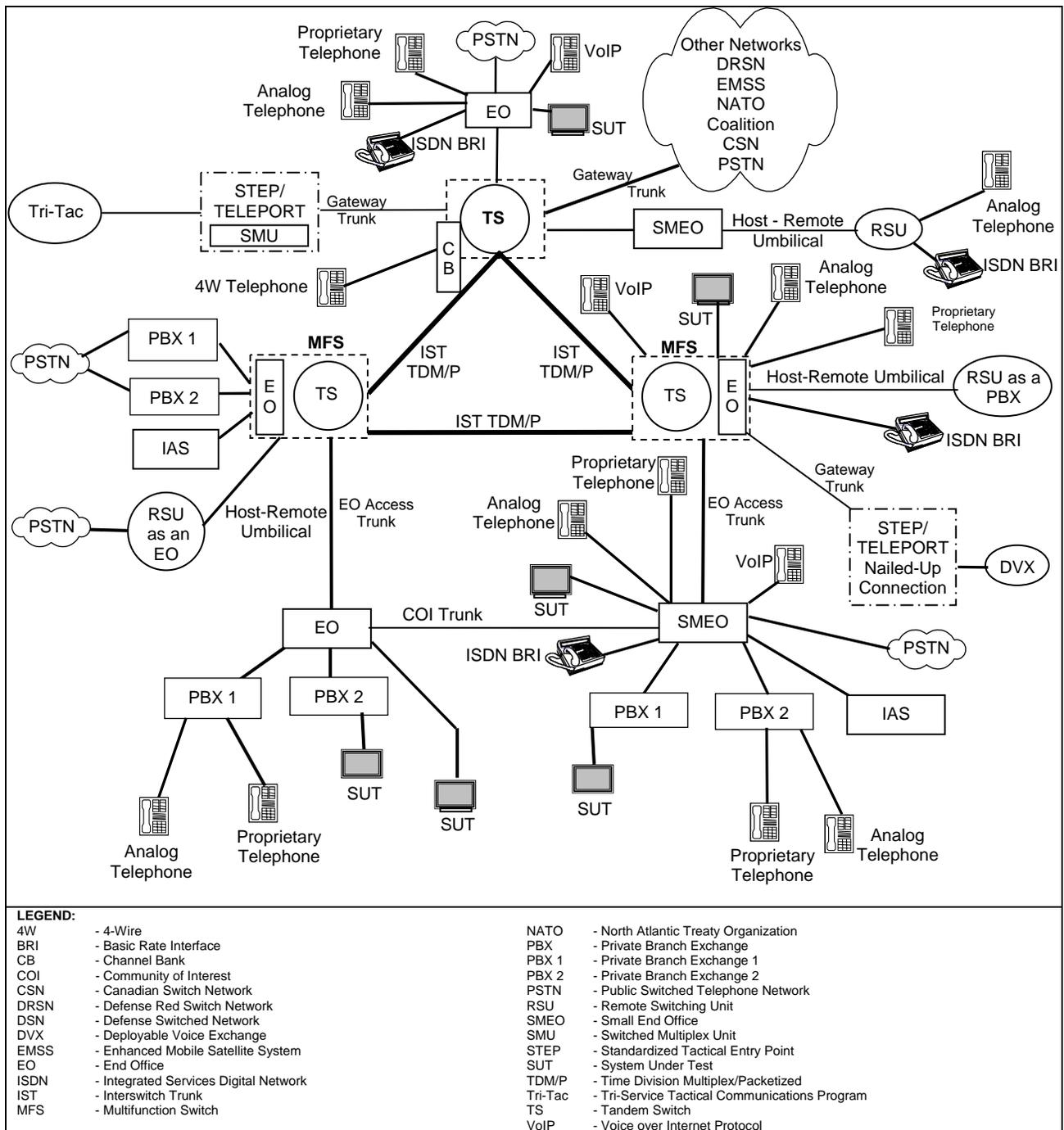


Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. Requirements specific to the SUT and interoperability results are listed in table 2-1. These requirements are derived from the UCR, appendix 8, Interface and Functional Requirements and verified through JITC testing and review of vendor's Letters of Compliance (LoC).

Table 2-1. SUT Functional Requirements and Interoperability Status

Interface	Critical	Certified	Requirements Required or Conditional	Status	UCR Reference
ITU-T H.323	No ¹	No ²	The VTC system/endpoints shall meet the requirements of FTR1080B-2002 (R)	Not Tested	A8.5
			ITU-T H.323 in accordance with FTR 1080B-2002 (C)	Not Tested	A8.5
			Layer 3 Differential Service Code Point tagging as specified in UCR paragraph A.3.2.9.2 (C)	Not Tested	A8.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Not Tested	A8.5
			Audio add-on interface, implemented independently of an IAS, shall be in accordance with UCR, Appendix 7 (CPE) (C)	Not Tested	A8.5
			Physical, electrical, and software characteristics of VTU system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations. (R)	Not Tested	A8.5
ISDN BRI	No ¹	No ³	The VTC system/endpoints shall meet the requirements of FTR 1080B-2002 (R)	Not Tested	A8.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Not Tested	A8.5
			Audio add-on interface, implemented independently of an IAS, shall be in accordance with UCR, Appendix 7 (CPE) (C)	Not Tested	A8.5
			Integrated BRI interface shall be in conformance with Terminal Adaptor requirements in UCR, Appendix 7 (CPE) (C)	Not Tested	A8.5
			Physical, electrical, and software characteristics of VTU system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations. (R)	Not Tested	A8.5
ISDN PRI T1 ISDN PRI E1	No ¹	Yes	The VTC system/endpoints shall meet the requirements of FTR 1080B-2002 (R)	Met	A8.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Met	A8.5
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			Integrated PRI interface shall be in conformance with IAS requirements in UCR, Appendix 6 (IAS) (C)	Met	A8.5
			Physical, electrical, and software characteristics of VTU system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations.(R)	Met	A8.5
Serial Interfaces ⁴ : EIA-366A EIA-449 EIA-530 ITU-T V.35 ⁵	No ¹	Yes	The VTC system/endpoints shall meet the requirements of FTR 1080B-2002 (R)	Met	A8.5
			A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference (R)	Met	A8.5
			Audio add-on interface, implemented independently of an IAS, shall be in accordance with UCR, Appendix 7 (CPE) (C)	Met	A8.5
			Connections shall be in conformance with the requirements for serial interface(s) as described in FTR 1080B-2002 (C)	Met	A8.5
			Physical, electrical, and software characteristics of VTU system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations.(R)	Met	A8.5
	Yes	See note 6.	Security (R)	See note 6.	A8.7

Table 2-1. SUT Functional Requirements and Interoperability Status (continued)

LEGEND:	
A	- UCR Appendix
BRI	- Basic Rate Interface
C	- Conditional
CPE	- Customer Premise Equipment
DCE	- Data Circuit-terminating Equipment
DISA	- Defense Information Systems Agency
DSN	- Defense Switched Network
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IAS	- Integrated Access Switch
ISDN	- Integrated Services Digital Network
ITU-T	- International Telecommunication Union - Telecommunication Standardization Sector
JITC	- Joint Interoperability Test Command
kbps	- kilobits per second
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VTC	- Video Teleconferencing
VTU	- Video Teleconferencing Unit
NOTES:	
1 The VTC system interface requirements can be met with an ISDN BRI, ISDN PRI, Serial, or ITU-T H.323 interface.	
2 The SUT offers an ITU-T H.323 interface; however, the sponsor did not request that JITC test this interface. The SUT ITU-T H.323 interface is not certified by JITC or authorized by the DSN PMO for use within the DSN. This is not a required interface for an MCU.	
3 The SUT does not support an ISDN BRI interface. This is not a required interface for an MCU. There is no risk associated with the SUT not supporting this interface.	
4 The SUT meets the critical interoperability requirements for serial interfaces; however, the serial interfaces must connect to an IAS or TA, which provides an inverse multiplex capability and a direct interface to the DSN. The SUT is certified with any IAS or TA on the DSN Approved Products List.	
5 The electrical physical interface tested was ITU-T V.35 in accordance with ITU-T V.36/V.37.	
6 Security is tested by DISA-led Information Assurance test teams and published in a separate report.	

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 the 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.

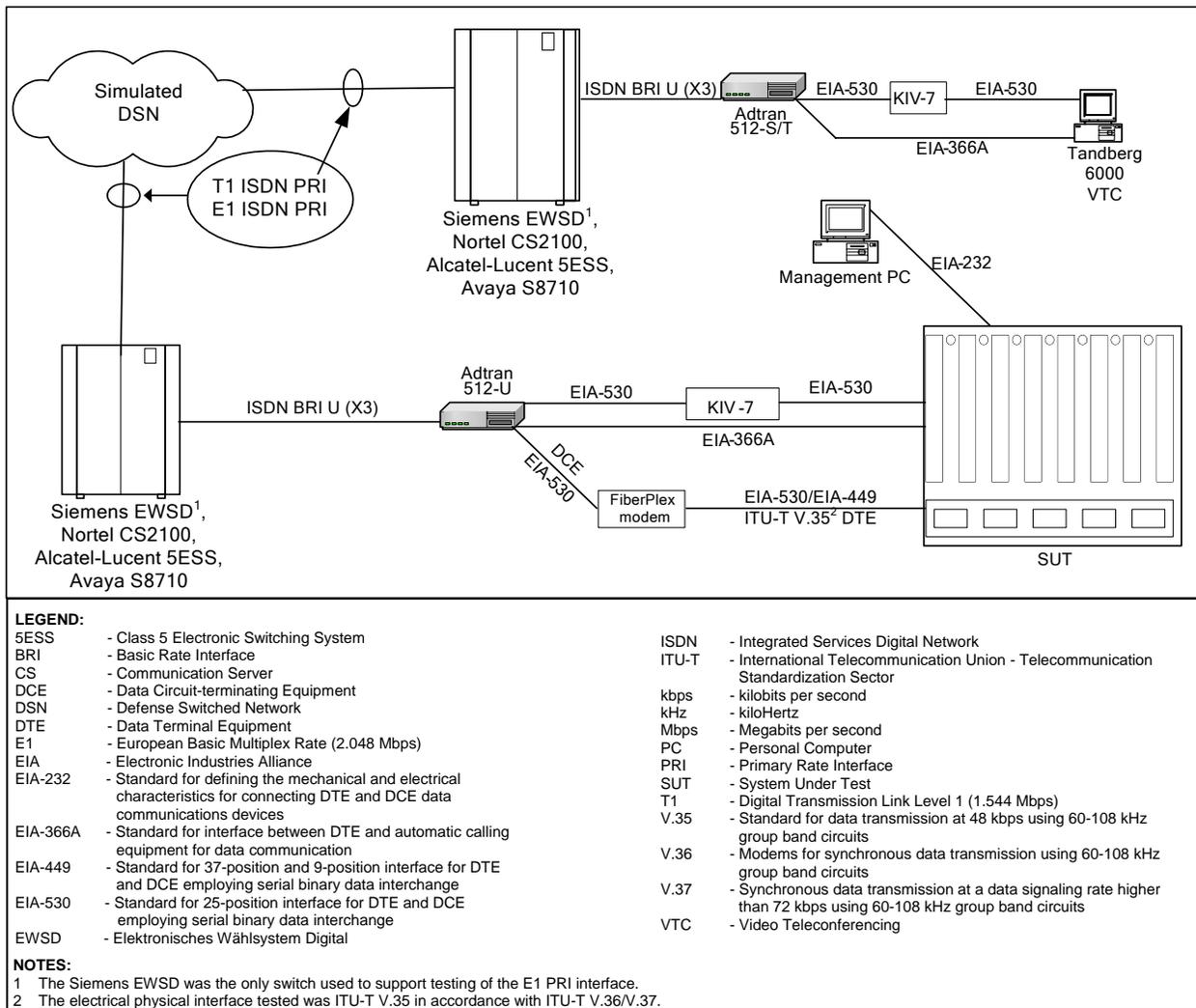


Figure 2-2. SUT Serial with Encryption Test Configuration

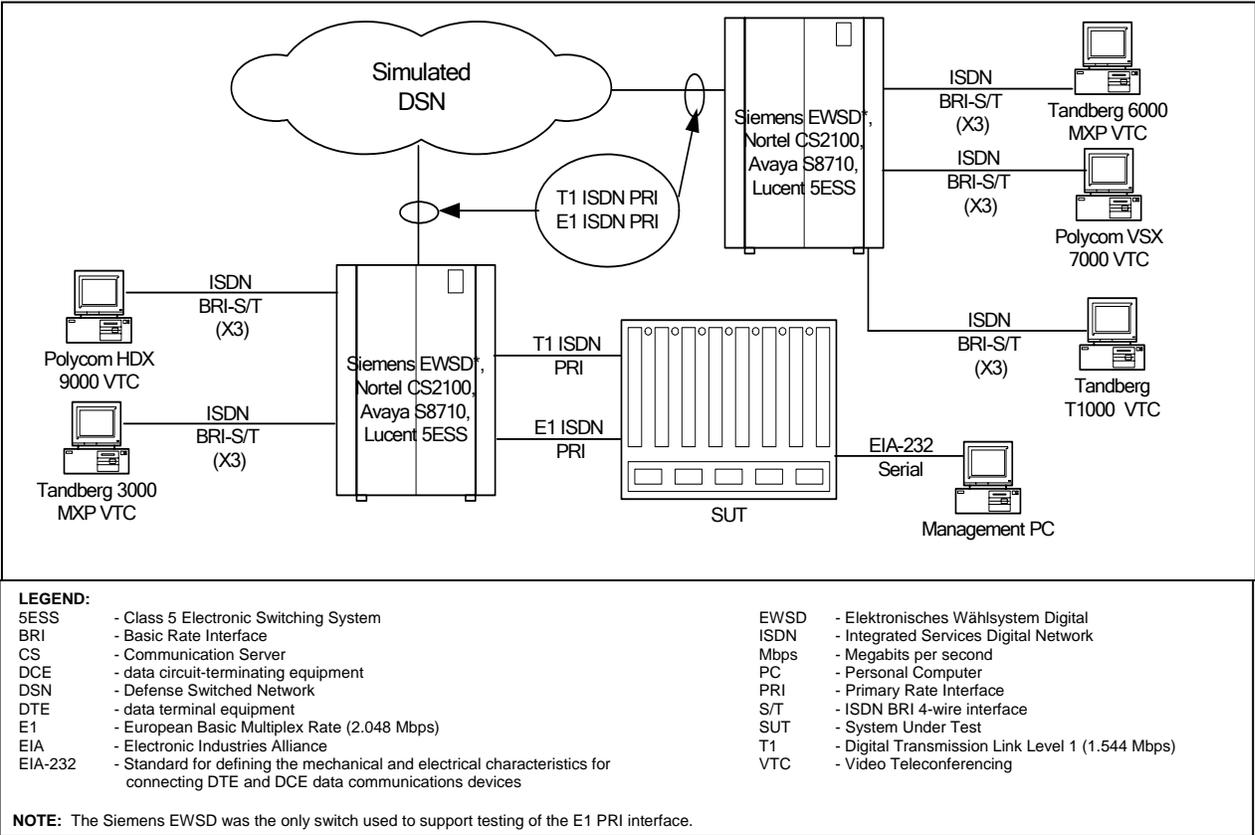


Figure 2-3. SUT ISDN PRI Test Configuration T1/E1 Interfaces

9. SYSTEM CONFIGURATIONS. Table 2-2 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 DSN switches noted in table 2-2. Table 2-2 lists the DSN 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 DSN Approved Products List (APL) that offer the same certified interfaces.

Table 2-2. Tested System Configurations

System Name	Software Release
Siemens EWSD	19d with Patch Set 46
Nortel CS2100	Succession Enterprise (SE)09.1
Avaya S8710	Communication Manager (CM) 4.0 (R014x.00.2.731.7: Super Patch 14419)
Alcatel-Lucent 5ESS	5E16.2, Broadcast Warning Message (BWM) 07-0003
Tandberg 6000	B9.1 NTSC
Adtran 512 IMUX	Firmware Version CS.0, Cksum10b2
Adtran 512 IMUX	Firmware Version F.00, Cksum2d44
Tandberg 1000	E5.3 NTSC
Tandberg 3000 MXP	F6.3 NTSC
Polycom VSX 7000S	Release 8.5
Polycom HDX 9000	2.0.0J
Polycom MGC 100 (SUT)	9.0.1FED
LEGEND: 5ESS - Class 5 Electronic Switching System CS - Communication Server EWSD - Elektronisches Wählsystem Digital IMUX - Inverse Multiplexer MGC - Multipoint Gateway Controller NTSC - National Television Standards Committee SUT - System Under Test	

10. TEST LIMITATIONS. None.

11. TEST RESULTS

a. Discussion. The SUT minimum critical interoperability interface and functional requirements were met through both interoperability certification testing conducted at the JITC GNTF and review of the vendor's LoC. Bonding mode 1 was tested to requirements defined in UCR, paragraph A8.5 and Federal Telecommunications Recommendation 1080B-2002. Bonding, often referred to as channel aggregation, takes place through inverse multiplexing. Inverse multiplexing takes a high-bandwidth signal and splits it for transport through the network over multiple lower-bandwidth channels. At the receiving end, the multiple, lower-bandwidth signals are recombined into the original high-bandwidth signal. A passed test result was based on 100 percent of the calls receiving a score of four or better on the subjective quality scale as defined in table 2-3.

Table 2-3. Video and Voice Subjective Quality Scale

Rating	Reference	Definition
1	<i>Unusable</i>	<u>Quality is unusable.</u> Voice and video may be heard and seen but is unrecognizable.
2	<i>Poor</i>	<u>Quality is unusable.</u> Words and phrases are not fully understandable or video cannot be properly identified.
3	<i>Fair</i>	<u>Quality is seriously affected by distortion.</u> Repeating words and phrases are required to convey speech or video is seriously impacted and barely recognizable.
4	Good	<u>Quality is usable. Audio or video is not impaired but some distortion is noticeable</u>
5	<i>Excellent</i>	<u>Quality is unaffected.</u> No discernable problems with either audio or video.
NOTE: Audio and video quality during a conference will receive a subjective rating on the Data Collection Form. A rating of lower than 4 on this reference scale is considered a failure.		

b. Test Conduct. Multiple two-way and three-way, 112 - 384-kbps bonding mode 1 Multipoint test calls at different durations (5-minute, 15-minute, 30-minute, 1-hour, 24-hours) were placed over the test network shown in figures 2-2 and 2-3 via all the combinations depicted in table 2-1. The Multipoint and Point-to-Point bonding mode 1 VTC test calls were placed at various precedence levels over the test configurations depicted in figures 2-2 and 2-3.

Seven- and ten-digit calls were placed to verify that the SUT met the capability to support both the North American Numbering Plan and the DSN World Wide Numbering and Dialing Plan (WWNDP) defined in UCR, paragraph A8.5. Multilevel precedence video calls were placed from the SUT and established within the DSN at the respective precedence level dialing the DSN WWNDP access code. The SUT was also tested with secure video sessions using a KIV-7 Communications Security (COMSEC) device as shown in figure 2-2. Table 2-4 provides the KIV-7 COMSEC device configuration settings.

Table 2-4. COMSEC Configuration

	KIV-7 HSB Serial Number	KIV-7 HSB SETUP Storage Location	Channel ID/Description	Date
		<input checked="" type="checkbox"/> STO 1 <input type="checkbox"/> STO2 <input type="checkbox"/> STO3	OC-256 KIV-7 HSB Setup	12-16-04
Setup ABCD	Setup Item	Options (Check the box to the left of the selected option. The highlighted box [x] indicates the setting during test)		
[-SETUP A]	[=CikSel]	<input type="checkbox"/> MASTER <input checked="" type="checkbox"/> SLAVE	<input type="checkbox"/> STA CLK <input type="checkbox"/> TT SEL1 <input type="checkbox"/> TT SEL2	
	[=SyncSel]	<input checked="" type="checkbox"/> RED <input type="checkbox"/> RED-as <input type="checkbox"/> NR <input type="checkbox"/> NR-as <input type="checkbox"/> OP2 <input type="checkbox"/> ACT1 <input type="checkbox"/> ACT2 <input type="checkbox"/> HF <input type="checkbox"/> HF-as <input type="checkbox"/> EXT <input type="checkbox"/> EXT-as		
	[=CommSel]	<input checked="" type="checkbox"/> FDX <input type="checkbox"/> FDX Ind <input type="checkbox"/> TX only <input type="checkbox"/> RX only	<input type="checkbox"/> SPLX 2W <input type="checkbox"/> SPLX 4W	
	[=DataMod]	<input type="checkbox"/> BB cond <input checked="" type="checkbox"/> BB <input type="checkbox"/> DP <input type="checkbox"/> DP cond		
	[=DataLen]	<input checked="" type="checkbox"/> Synch/S <input type="checkbox"/> Synch/A <input type="checkbox"/> 7 bits <input type="checkbox"/> 8 bits <input type="checkbox"/> 10 bits <input type="checkbox"/> 11 bits		
	[=TX Rate]	<input type="checkbox"/> 50 <input type="checkbox"/> 75 <input type="checkbox"/> 100 <input type="checkbox"/> 110 <input type="checkbox"/> 150 <input type="checkbox"/> 200 <input type="checkbox"/> 220 <input type="checkbox"/> 300 <input type="checkbox"/> 600 <input type="checkbox"/> 1.2k <input type="checkbox"/> 2.4k <input type="checkbox"/> 4.8k <input type="checkbox"/> 8.0k <input type="checkbox"/> 9.6k <input type="checkbox"/> 14.4k <input type="checkbox"/> 16k <input type="checkbox"/> 19.2k <input type="checkbox"/> 28.8k <input type="checkbox"/> 32k <input type="checkbox"/> 38.4k <input type="checkbox"/> 57.6k <input type="checkbox"/> 64k <input type="checkbox"/> 115.2k <input type="checkbox"/> 128k <input type="checkbox"/> 192k <input type="checkbox"/> 288k <input type="checkbox"/> EXT 32x <input checked="" type="checkbox"/> EXT DRC		
	[=RX Rate]	<input type="checkbox"/> 50 <input type="checkbox"/> 75 <input type="checkbox"/> 100 <input type="checkbox"/> 110 <input type="checkbox"/> 150 <input type="checkbox"/> 200 <input type="checkbox"/> 220 <input type="checkbox"/> 300 <input type="checkbox"/> 600 <input type="checkbox"/> 1.2k <input type="checkbox"/> 2.4k <input type="checkbox"/> 4.8k <input type="checkbox"/> 8.0k <input type="checkbox"/> 9.6k <input type="checkbox"/> 14.4k <input type="checkbox"/> 16k <input type="checkbox"/> 19.2k <input type="checkbox"/> 28.8k <input type="checkbox"/> 32k <input type="checkbox"/> 38.4k <input type="checkbox"/> 57.6k <input type="checkbox"/> 64k <input type="checkbox"/> 115.2k <input type="checkbox"/> 128k <input type="checkbox"/> 192k <input type="checkbox"/> 288k <input type="checkbox"/> EXT 32x <input checked="" type="checkbox"/> EXT DRC		
	[=TTY Mode]	<input checked="" type="checkbox"/> Auto <input type="checkbox"/> Manual <input type="checkbox"/> Unframd <input type="checkbox"/> SPLXint <input type="checkbox"/> SPLXext		
	[=I/Fctrl]	<input type="checkbox"/> OFF <input checked="" type="checkbox"/> PTRS <input type="checkbox"/> RS&CS <input checked="" type="checkbox"/> ICTCS <input type="checkbox"/> PTTR <input type="checkbox"/> CTRR <input type="checkbox"/> CTDM <input checked="" type="checkbox"/> Resync Level		
	[-SETUP B]	[=Invert]	<input type="checkbox"/> BLKdata <input type="checkbox"/> REDdata <input type="checkbox"/> SyncTX <input type="checkbox"/> SyncRX <input checked="" type="checkbox"/> NONE	Notes:
[=TXClock]		<input checked="" type="checkbox"/> contTXC <input type="checkbox"/> gateTXC		
[=RXClock]		<input checked="" type="checkbox"/> contRXC <input type="checkbox"/> gateRC		
[=SyncOOS]		<input type="checkbox"/> Enabled <input checked="" type="checkbox"/> Disabled		
[=IdleSel]		<input type="checkbox"/> Enabled <input checked="" type="checkbox"/> Disabled		
[=AutoPhs]		<input checked="" type="checkbox"/> OFF <input type="checkbox"/> ON 2s <input type="checkbox"/> ON 5s <input type="checkbox"/> ON 10s <input type="checkbox"/> ON 15s		
[=UpdateU]		<input checked="" type="checkbox"/> Enabled <input type="checkbox"/> Disabled <input type="checkbox"/> Clock Lock		
[-SETUP C]	[=RED I/F]	<input type="checkbox"/> RS-232 <input checked="" type="checkbox"/> EIA-530 <input type="checkbox"/> 422/423		
	[=BLK I/F]	<input type="checkbox"/> RS-232 <input checked="" type="checkbox"/> EIA-530 <input type="checkbox"/> 422/423		
	[=FIL I/F]	<input checked="" type="checkbox"/> 102/Std <input type="checkbox"/> 102/Tag <input type="checkbox"/> 101/Std <input type="checkbox"/> 101/Tag		
	[=FILAddr]	254 Record selected address 1 – 254. Default is 254		
	[=RCUAddr]	31 Record selected address 1 – 31. Default is 31		
	[=Display]	<input type="checkbox"/> High <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low		
	[=Speaker]	<input checked="" type="checkbox"/> Enabled <input type="checkbox"/> Disabled		
[-SETUP D]	[=Algorithms]	<input type="checkbox"/> Master <input checked="" type="checkbox"/> Slave Algorithm <input checked="" type="checkbox"/> ALG1		
[-SEL KEY]		<input checked="" type="checkbox"/> X01 <input type="checkbox"/> X02 <input type="checkbox"/> X03 <input type="checkbox"/> X04 <input type="checkbox"/> X05 <input type="checkbox"/> X06 <input type="checkbox"/> X07 <input type="checkbox"/> X08 <input type="checkbox"/> X09 <input type="checkbox"/> X10		

Table 2-4. COMSEC Configuration (continued)

LEGEND:	
ACT1	- Asynchronous cipher text to 288 kbps
ACT2	- Asynchronous cipher text to 288 kbps
as	- anti-spoof
Auto	- Automatic
Autophs	- Autophasing Select
BB	- Baseband
BB cond	- Baseband conditioned
BLK	- Invert Black
BLKdata	- Invert black data
ClkSel	- Clock Select
CommSel	- Communication Select
ContRXC	- Continuous receive clock
ContTXC	- Continuous transmit clock
CTCS	- Cipher text clear to send
CTDM	- Cyper Text Data Mode
CTRR	- Cipher text receiver ready
DataLen	- Data Length
DataMod	- Data Mode
DP	- Diphase
DP Cond	- Conditioned Diphase
EIA	- Electronic Industries Alliance
EIA-530	- Standard for 25-position interface for data terminal equipment and automatic calling equipment for data communications
EXT	- External
EXT DRC	- External Data Rate Clock
FDX	- Full duplex
FDX Ind	- Full duplex independent transmit and receive
FIL	- Fill
FILaddr	- Fill address select
gateRC	- Gated continuous receive clock
gateTXC	- Gated continuous transmit clock
HF	- High Frequency
HSB	- High Speed Bravo model
I/F	- Interface
I/Fctrl	- interface control
ID	- Identification
IdleSel	- Idle Select
kbps	- kilobits per second
NR	- Non-Redundant
OC	- Outpost Communicator
OP2	- Operational Mode 2
PTRS	- Plain text request-to-send
PTTR	- Plain text terminal ready
RCUaddr	- Remote control address select
RED	- Redundant (listed under setup A)
RED-as	- Redundant anti-spoof
REDdata	- RED (encrypted) (listed under Setup B)
RED I/F	- RED (encrypted) interface (listed under Setup C)
Resync	- Resynchronization
RS&CS	- Ready to Send & Clear to Send
RS-232	- Recommended standard 232
RX	- Receive
RXClock	- Receive Clock
RX Rate	- Receive rate
s	- Second
SPLX 2W	- Simplex 2-Wire
SPLX 4W	- Simplex 4-Wire
SPLXext	- Simplex external
SPLXint	- Simplex internal
STA CLK	- Station Clock
Std	- Standard
STO	- Store
Synch/A	- 64 characters, asynchronous 10-bit
Synch/S	- 512 bits, Synchronous
SyncOOS	- Synchronization Out of Sync detect signal
SyncRX	- Invert Synchronization receive control signal
SyncSel	- Synchronization Select
SyncTX	- Invert Synchronization Transmit control signal
TT SEL1	- Terminal Timing Selection 1
TT SEL2	- Terminal Timing Selection 2
TTY	- Teletype
TX	- Transmit
TX Clock	- Transmit Clock
TX Rate	- Transmit rate
Unframd	- Frame transmit, but no receive
UpdateU	- Update Unique variable
X01	- Cryptographic traffic key position
X02	- Cryptographic traffic key position
X03	- Cryptographic traffic key position
X04	- Cryptographic traffic key position
X05	- Cryptographic traffic key position
X06	- Cryptographic traffic key position
X07	- Cryptographic traffic key position
X08	- Cryptographic traffic key position
X09	- Cryptographic traffic key position
X10	- Cryptographic traffic key position

The UCR, paragraph A8.5 requirements state:

(1) The VTC system/endpoints shall meet the requirements of FTR 1080B-2002. The SUT met this requirement through testing and the vendor's LoC.

(2) The VTC features and functions used in conjunction with IP network services shall meet the requirements of ITU-T H.323 in accordance with FTR 1080B-2002. Additionally, ITU-T H.323 video end instruments must meet the tagging requirements as specified in UCR, appendix 3, section A3.2.9.2. The SUT is required to support the 6-bit Differential Service Code Point (DSCP) tagging assignment of 0-63 and it does. The SUT offers an ITU-T H.323 interface; however, the sponsor did not request that JITC test this interface. The SUT ITU-T H.323 interface is not certified by JITC or authorized by the DSN PMO for use within the DSN. This is not a required interface for an MCU.

(3) A loss of any conferee on a multipoint videoconference shall not terminate or degrade the DSN service supporting VTC connections of any of the other conferees on the videoconference. This was tested during each multipoint session established with the SUT by disconnecting single and multiple conferees. This was done by hanging up and simulating a failure by disconnecting the physical interface. 100 percent of the time during the test, the remaining conferees on the multipoint conference were not affected and remained in the conference.

(4) An audio add-on interface, implemented independently of an Integrated Access Switch (IAS), shall be in accordance with the UCR, appendix 7. The SUT met this requirement through testing and the vendor's LoC.

(5) A VTC system/endpoint that uses an integrated BRI interface to connect to the DSN shall be in conformance with the requirements associated with a Terminal Adaptor (TA) as described in the UCR, appendix 7. The SUT met this requirement through testing and the vendor's LoC.

(6) A VTC system/endpoint that uses an integrated PRI interface to connect to the DSN shall be in conformance with the requirements associated with an IAS as described in the UCR, appendix 6. The SUT met this requirement through testing and the vendor's LoC.

(7) A VTC system/endpoint that uses a serial interface(s) to another device, such as a cryptographic device, IAS, or TA, for eventual connection to the DSN, shall be in conformance with the requirements for that serial interface(s) as described in FTR 1080B-2002. The SUT met this requirement through testing and the vendor's LoC.

(8) The physical, electrical, and software characteristics of Video Teleconferencing Unit system(s)/ endpoint(s) that are used in the DSN network shall not degrade or impair the serving DSN switch and its associated network operations. This was tested by conducting other tests on the serving DSN switch to include bulk

call loading while point-to-point and multipoint video sessions were established. 100 percent of the time during the test, the SUT physical, electrical, and software characteristics did not impair the serving DSN switch and its associated operations.

c. Test Summary. The SUT met the critical interface and functional requirements for an MCU for the interfaces depicted in table 1, as set forth in Appendix 8 of reference (c), and is certified for joint use within the DSN. The SUT meets the critical interoperability requirements for serial interfaces; however, the serial interfaces must connect to an IAS or TA, which provides an inverse multiplex capability and a direct interface to the DSN. The SUT is certified with any IAS or TA on the DSN APL.

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>.