



DEFENSE INFORMATION SYSTEMS AGENCY

JOINT INTEROPERABILITY TEST COMMAND

P.O. BOX 12798

FORT HUACHUCA, ARIZONA 85670-2798

IN REPLY
REFER TO:

Battlespace Communications Portfolio (JTE)

23 April 2008

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of the Polycom HDX 9000 Series with Software Release 2.0.0J

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 HDX 9000 Series with Software Release 2.0.0J 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, appendix 8, and is certified for joint use on the Defense Switched Network (DSN) as a Video Teleconferencing (VTC) system. The Polycom HDX 9004 was the only VTC system tested; however, other VTC systems in the HDX 9000 series, which includes the HDX 9001 and HDX 9002, employ the same software and video codec as the SUT. JITC analysis determined these other systems in the series to be functionally identical to the SUT for interoperability certification purposes. The SUT offers an International Telecommunication Union - Telecommunication Standardization Sector (ITU-T) H.323 interface; however, the ITU-T H.323 interface was not requested for testing by the sponsor and is therefore not certified or authorized for use with the DSN. The SUT meets the critical interoperability requirements for serial interfaces; however, the serial interfaces must connect to an Integrated Access Switch (IAS) or Terminal Adapter (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 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 25 February through 7 March 2008. Review of the LoC was completed on 19 March 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 shall not degrade or impair switch and associated network operations (R)	Not Tested	A8.5
ISDN BRI	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 BRI interface shall be in conformance with Terminal Adaptor requirements in UCR, Appendix 7 (CPE) (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
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 ³ : EIA-366A EIA-449 EIA-530 ITU-T V.35 ⁴	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 5.	Security (R)	See note 5.	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
DISA	- Defense Information Systems Agency
DSN	- Defense Switched Network
E1	- European Basic Multiplex Rate (2.048 Mbps)
EIA	- Electronic Industries Alliance
EIA-366A	- Standard for interface between data terminal equipment and automatic calling equipment for data communication
EIA-449	- Standard for 37-position and 9-position interface for data terminal equipment and data circuit-terminating equipment employing serial binary data interchange
EIA-530	- Standard for 25-position interface for data terminal equipment and data circuit-terminating equipment 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
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:

- 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, therefore it is not certified by JITC or authorized for use within the DSN by the PMO.
- 3 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.
- 4 The electrical physical interface tested was ITU-T V.35 in accordance with ITU-T V.36/V.37.
- 5 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 tracking number for the SUT is 0706001.

FOR THE COMMANDER:

2 Enclosures a/s



RICHARD A. MEADOR
Chief
Battlespace Communications Portfolio

JITC Memo, JTE, Special Interoperability Test Certification of the Polycom HDX 9000 Series with Software Release 2.0.0J

Distribution:

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U.S. Joint Forces Command, J68, Net-Centric Integration, Communications, and Capabilities Division, 1562 Mitscher Ave., Norfolk, VA 23551-2488

Defense Information Systems Agency (DISA), ATTN: GS23 (Mr. McLaughlin), Room 5W23, 5275 Leesburg Pike (RTE 7), Falls Church, VA 22041

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 HDX 9000 Series with Software Release 2.0.0J, hereinafter referred to as the System Under Test (SUT).

2. PROPONENT. Department of Defense (DoD), Headquarters, Department of the Army (HQDA).

3. PROGRAM MANAGER. Mr. Eric Cole, 2530 Crystal Drive 9th Floor, Arlington, VA 22202, Email: eric.cole@hqda.army.mil.

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

5. SYSTEM UNDER TEST DESCRIPTION. The SUT is a high-performance video system. This Video Teleconferencing (VTC) system sets on top of a monitor and is designed for medium and large-sized videoconferencing sessions. The SUT offers 1280 x 720 (720p) resolution with over nine times the video quality of Common Intermediate Format video. The SUT has five High Definition (HD) video inputs and four high-grade video outputs. The SUT supports the following features:

- Supports Integrated Services Digital Network (ISDN) Basic Rate Interface and Primary Rate Interface, Digital Transmission Link Level 1 (T1), or European Basic Multiplex Rate (E1) International Telecommunication Union-Telecommunication Standardization Sector (ITU-T) H.320
- Network Interfaces: ISDN Quad BRI, ISDN PRI T1 or E1, 10/100/1000 auto NIC
- Serial support: ITU-T V.35, Electronic Industries Alliance (EIA)-530, and EIA-449 with EIA-366 dialing
- Supported Standards: ITU-T H.320 up to 2 Megabits per second (Mbps)
- Supports ITU-T H.323 up to 4 Mbps pt-to-pt, Session Initiation Protocol (SIP) up to 4 Mbps (not tested and not certified)
- Audio standards: ITU-T G.711, ITU-T G.722, ITU-T G.722.1, ITU-T G.728, MPEG4 AAC-LD
- Video standards: ITU-T H.261, ITU-T H.263, ITU-T H.263++, ITU-T H.264, ITU-T H.239, ITU-T H.241
- Multi-Control Point compatibility ITU-T H.243, ITU-T H.231, ITU-T H.221, ITU-T H.224/H.281
- Inverse Multiplexing ITU-T H.244
- Up to three monitors, wireless remote control, camera, microphone
- Microphones provide a 360 degree range, mute button, and up to two microphones in a daisy-chain configuration
- Echo Cancellation, Adaptive Post Filtering, Automatic Gain Control, Automatic Noise Suppression
- Video formats supported: National Television Standards Committee, Phase Alternate Line, Video Graphics Array, Super Video Graphics Array, Extended Graphics Array

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.

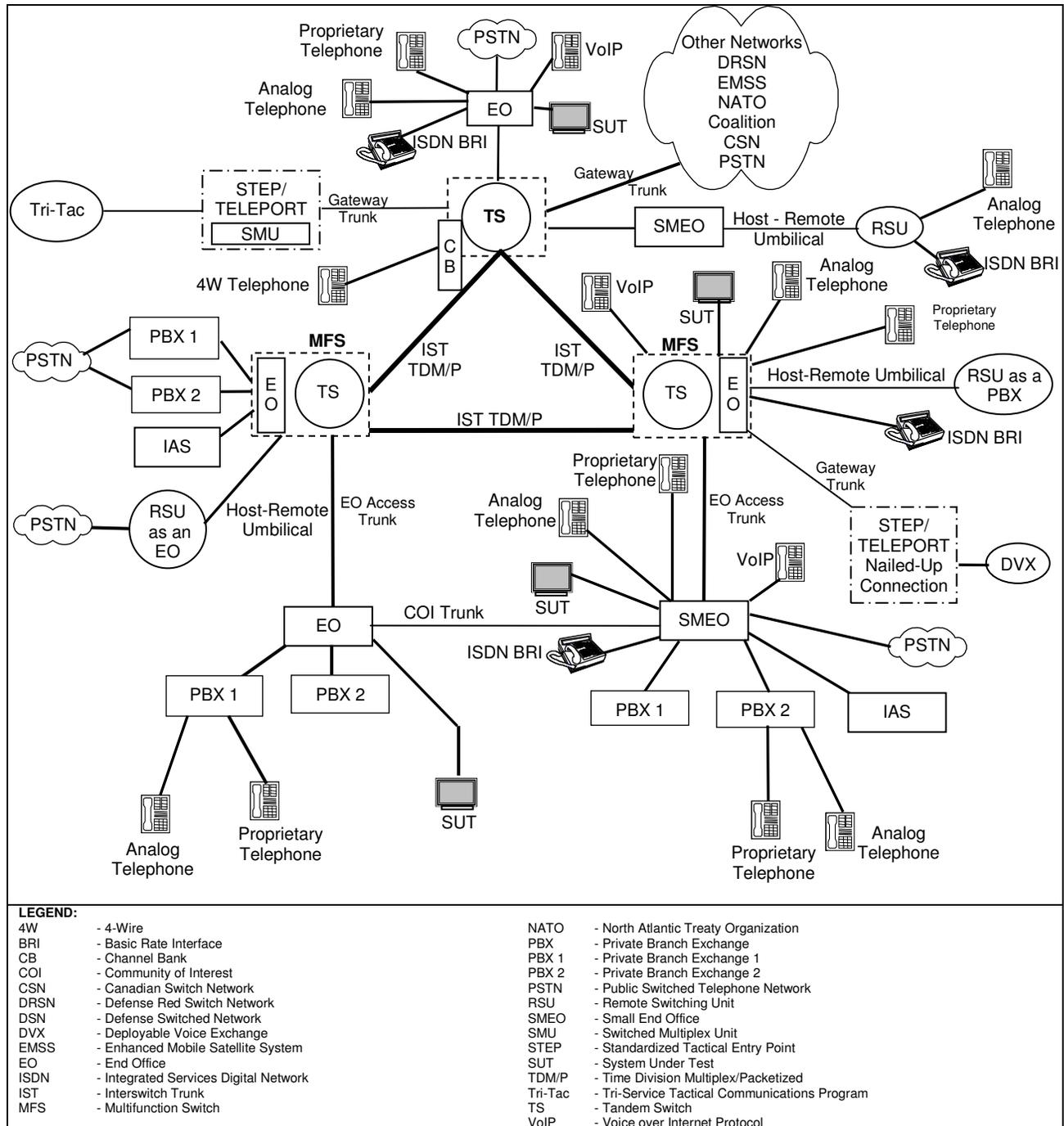


Figure 2-1. DSN Architecture

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	Yes 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
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			Integrated BRI interface shall be in conformance with Terminal Adaptor requirements in UCR, Appendix 7 (CPE) (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
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			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 ³ : EIA-366A EIA-449 EIA-530 ITU-T V.35 ⁴	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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			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 5.	Security (R)	See note 5.	A8.7

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

LEGEND:	
A	- UCR Appendix
BRI	- Basic Rate Interface
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JITC	- Joint Interoperability Test Command
kbps	- kilobits per second
kHz	- kiloHertz
Mbps	- Megabits per seconds
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:

- 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, therefore it is not certified by JITC or authorized for use within the DSN by the PMO.
- 3 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.
- 4 The electrical physical interface tested was ITU-T V.35 in accordance with ITU-T V.36/V.37.
- 5 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 through 2-4.

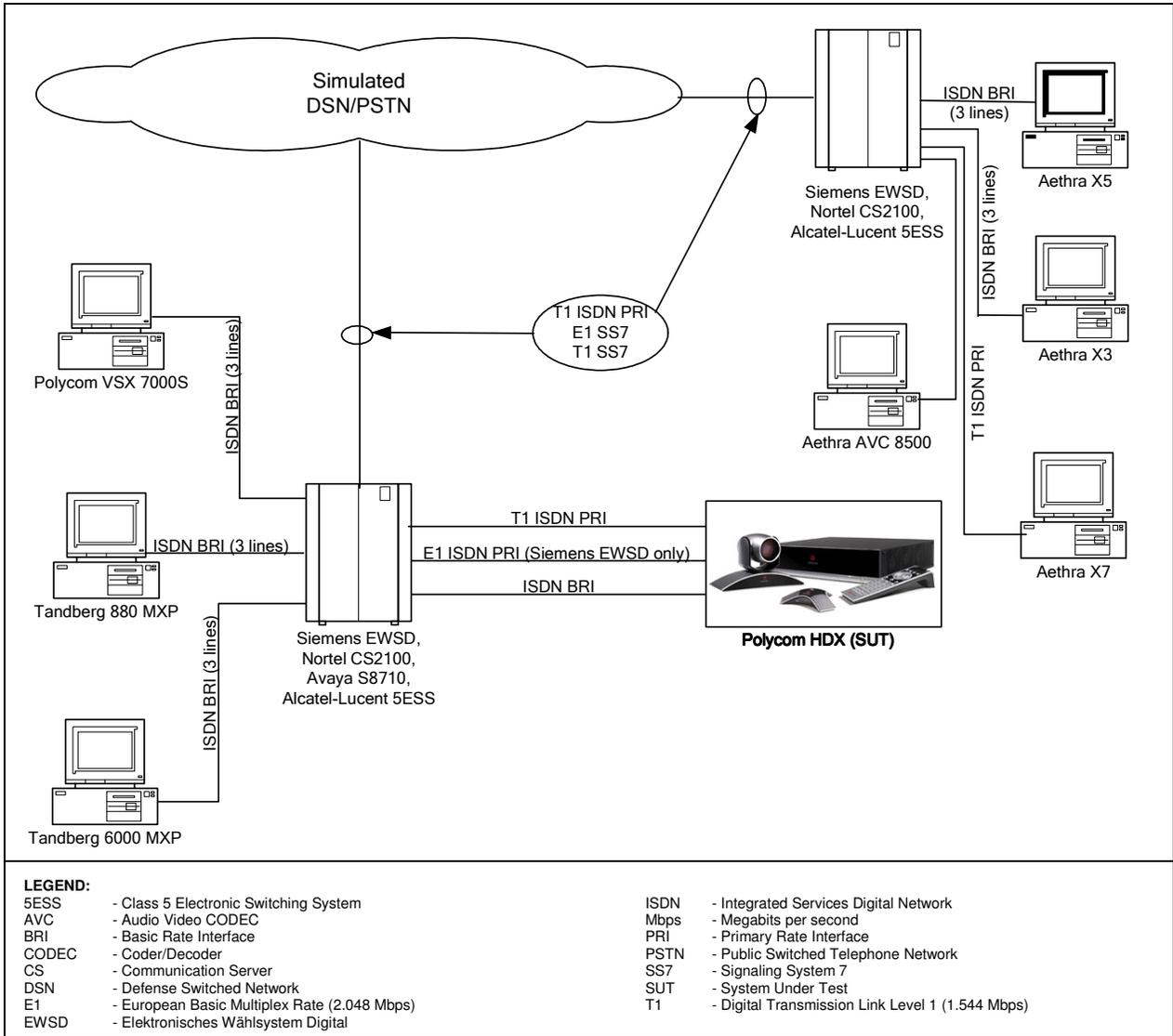


Figure 2-2. SUT ISDN PRI and BRI Test Configuration

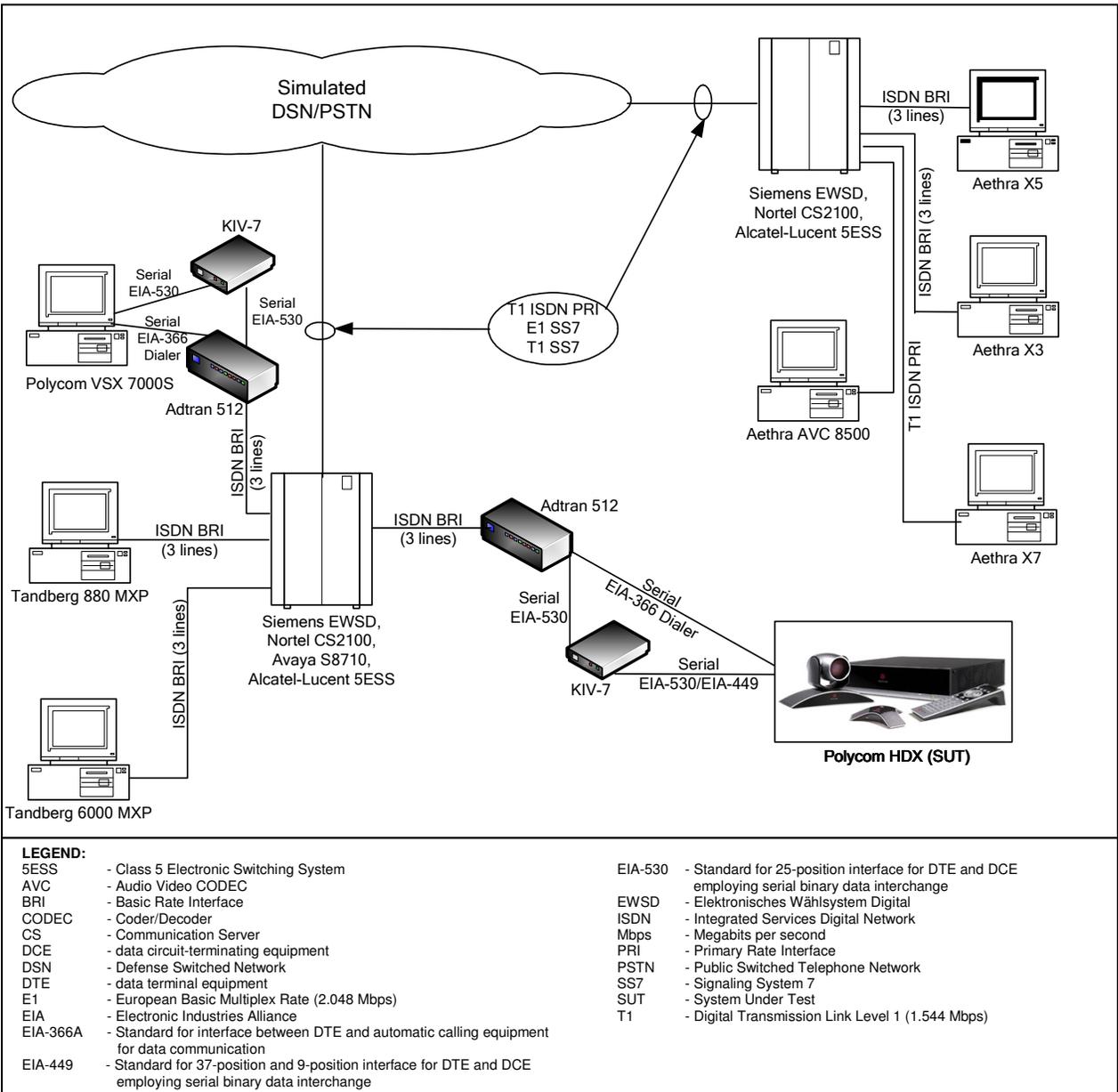


Figure 2-3. SUT Serial with Encryption Test Configuration

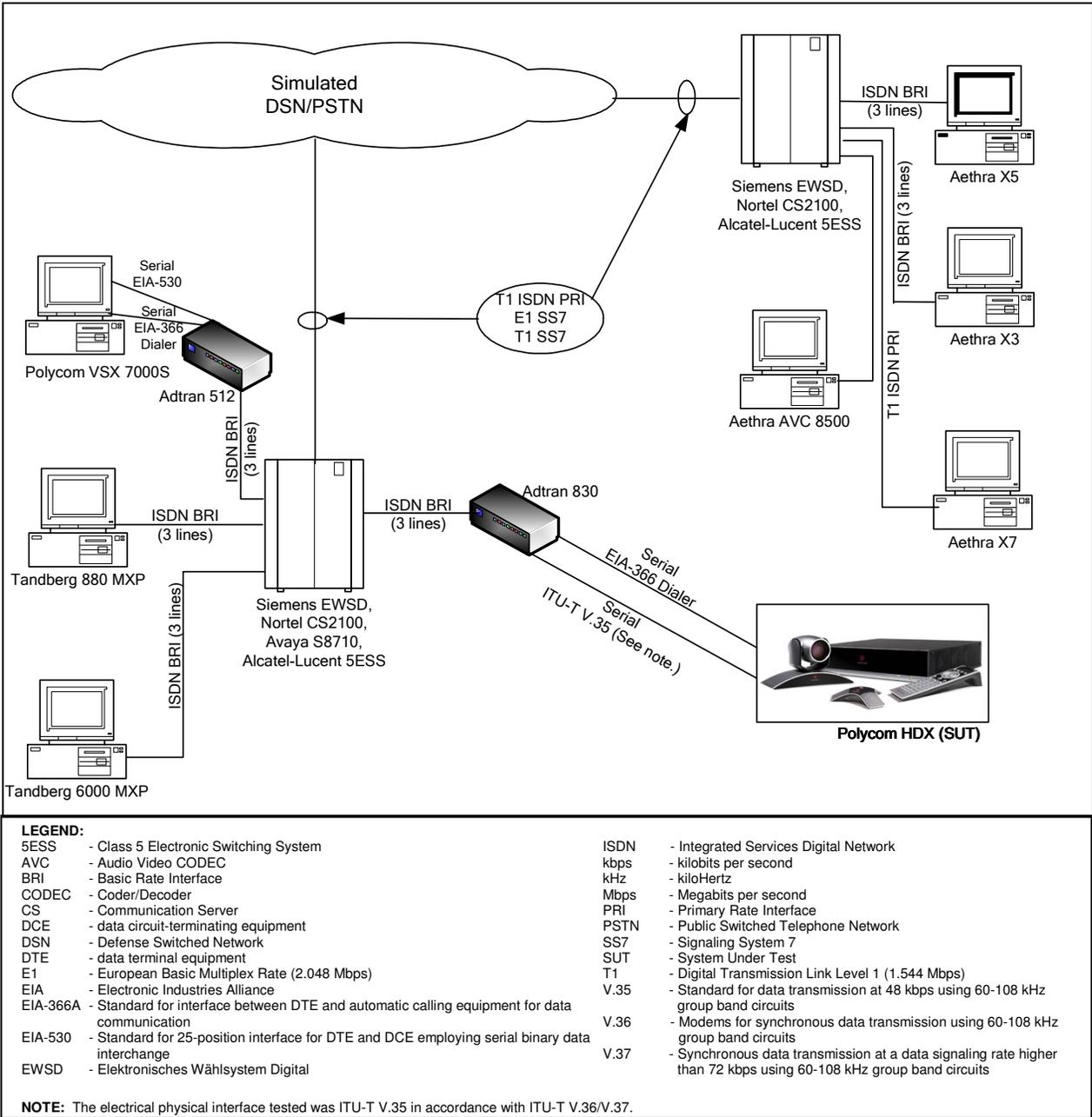


Figure 2-4. SUT ITU-T V.35 Serial Test Configuration

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 6000	B9.1 NTSC
Tandberg 6000 MXP	F2.3 NTSC
Tandberg 880 MXP	F2.1 NTSC
Polycom VSX 7000S	Release 8.5
Aethra AVC 8500	11.4.14
Aethra X3	11.4.14
Aethra X5	11.4.14
Aethra X7	11.4.14
Polycom HDX 9004 (SUT)	2.0.0J
LEGEND:	
5ESS - Class 5 Electronic Switching System	EWSD - Elektronisches Wählsystem Digital
AVC - Audio Video CODEC	IMUX - Inverse Multiplexer
CODEC - coder/decoder	NTSC - National Television Standards Committee
CS - Communication Server	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 112 - 384-kbps bonding mode 1 Multipoint and Point-to-Point test calls at different durations (15-minute, 30-minute, 1-hour, 24-hours, and 48-hours) were placed over the test network shown in figure 2-2 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 through 2-4.

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 2-3. 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]	[=ClkSel]	<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		
[=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	- Cypher 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, therefore it is not certified by JITC or authorized for use within the DSN by the Program Management Office.

(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. Lessons Learned. During testing, it was noted that when the SUT PRI module is installed in the codec chassis, the user can enable a checkbox option for “calling endpoint uses the original ISDN number”. This checkbox function allows in-bound calls to connect to the codec’s first ISDN PRI channel number, negating the requirement to dial additional numbers or digits. This function is left enabled when the user changes to either the ITU-T V.35 or Quad BRI module and is neither viewable nor available to change if not using a PRI module. This will now cause calling endpoints to be given the same 1st channel again, which will be already busy for subsequent bonding channels, and the call will fail. Out-bound calls are not affected and completed at NX56 or NX64 kbps data rates. Users will need to ensure they de-select the checkbox option when switching out PRI modules to prevent failed calls. This issue and the corrective steps will be put into the user documentation by the vendor.

d. Test Summary. The SUT met the critical interface and functional requirements for a VTC system for the interfaces depicted in table 2-1, as set forth in Appendix 8 of reference (c), and is certified for joint use within the DSN. The SUT also met the requirements for the ITU-T H.323 interface standard; however, Assured Service is not yet defined for the ITU-T H.323 interface. Since ITU-T H.323 interfaces do not provide Assured Services during a crisis or contingency, users’ access to the DSN will be on a best effort basis. Therefore, Command and Control (C2) VTC users and Special C2 VTC users are not authorized to be served by an ITU-T H.323 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.

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>.