



**DEFENSE INFORMATION SYSTEMS AGENCY**  
JOINT INTEROPERABILITY TEST COMMAND  
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FORT HUACHUCA, ARIZONA 85613-7051

IN REPLY  
REFER TO: Networks and Transport Division (JTE)

5 August 2004

MEMORANDUM FOR DISTRIBUTION

**SUBJECT:** Special Interoperability Test Certification of Avaya S8700 with Software Release Communication Manager (CM) 2.01 (R012x.00.1.221.1) with Software Patches 6960 and 6745 (Includes Voice over Internet Protocol)

**References:** (a) DOD Directive 4630.5, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," 5 May 2004  
(b) CJCSI 6212.01C, "Interoperability and Supportability of Information Technology and National Security Systems," 20 November 2003

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. Additional references are provided in the enclosure.

2. The Avaya S8700 with Software Release CM 2.01 (R012x.00.1.221.1), including Voice over Internet Protocol (VoIP) with software patches 6960 and 6745, hereinafter referred to as the system under test (SUT), meets all of its critical interoperability requirements and is certified as interoperable for joint use within the Defense Switched Network (DSN). The SUT was tested and met the critical interoperability requirements for the following DSN switch types: Small End Office, Private Branch Exchange (PBX) 1, and PBX 2. The SUT also offers a Remote Switching Unit capability, however this capability was not tested and is not covered by this certification. This certification expires upon changes that could affect interoperability, but no later than three years from the date of this memorandum.

3. This certification is based on interoperability testing conducted by the Global Information Grid Network Test Facility, JITC, Fort Huachuca, AZ, documented in reference (c), and regression testing of software patches 6960 and 6745 conducted from 29 June through 8 July 2004. The Certification Test Summary shown in reference (c) documents the test results and describes the tested network and system configurations. System interoperability should be verified before deployment in an operational environment that varies significantly from the test environment.

4. The interoperability summary of the SUT is indicated in table 1. Network Management (NM) capabilities of the SUT platform were tested in accordance with the DISA NS53 requirements as set forth in references (d) and (e). These references require that a switch provide NM capabilities via either Ethernet, serial (EIA-232), or serial (X.25 or BX.25 variant). The SUT meets the NM

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requirements through the use of Ethernet connections. This interoperability test status is based on evaluation of:

a. The following network interfaces as specified in reference (f): DSN, Defense Red Switch Network Gateway, Tactical Network Gateway, North Atlantic Treaty Organization Gateway, and Public Switched Telecommunications Network Gateway.

b. The interface and signaling requirements for trunk/line interfaces, and interoperability Exchange Requirements (ERs) and Functional Requirements (FRs) derived from references (g) and (h).

c. The overall system interoperability performance derived from test procedures listed in reference (i). The interoperability status and criticality are listed in table 2, and the ERs and FRs for each network interface are listed in table 3.

d. Review of Letters of Compliance submitted by Avaya.

**Table 1. S8700 Interoperability Summary**

Network	Critical	Status	Remarks
DSN	Yes	Certified	- Certified for VoIP with C2 VG LAN. (See note) - Certified as SMEO, PBX 1, and PBX 2. - RSU not certified. - E1 CAS and CDC certified (DISN-E only). - The identified test discrepancies shown in enclosure (2) of reference (c) that remained open have an overall minor operational impact.
DRSN Gateway	Yes	Certified	- All critical requirements met.
Tactical Gateway	No	Certified	- All critical requirements met.
NATO Gateway	No	Not Tested	
PSTN Gateway	Yes	Certified	- All critical requirements met.
<b>Legend:</b>			
C2	- Command and Control	Mbps	- Megabits per second
CAS	- Channel Associated Signaling	NATO	- North Atlantic Treaty Organization
CDC	- Common Data Channel	PBX	- Private Branch Exchange
DISN-E	- Defense Information System Network Europe	PSTN	- Public Switched Telephone Network
DRSN	- Defense Red Switch Network	RSU	- Remote Switching Unit
DSN	- Defense Switched Network	SMEO	- Small End Office
E1	- European Basic Multiplex Rate (2.048 Mbps)	VG	- Voice Grade
LAN	- Local Area Network	VoIP	- Voice over Internet Protocol
Note: Refer to reference (c), table 2, for the C2 VG LAN certified components.			

**Table 2. Interoperability Status**

	<b>Trunk Interfaces</b>			
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Status</b>	<b>Remarks</b>
<b>Defense Switched Network</b>	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	Yes	Certified	Met all critical ERs and FRs.
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	Yes	Certified	Met all critical ERs and FRs.
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP	Yes	Certified	Met all critical ERs and FRs.
	PCM-30 E1 CAS HDB3 MFR1	No	Certified	Met all ERs and FRs.
	PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all critical ERs and FRs.
	Analog E&M Signaling Type I	No	Certified	Met all ERs and FRs.
	<b>Line Interfaces</b>			
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Status</b>	<b>Remarks</b>
	TPC ISDN BRI ST and U Interface Q.931	Yes	Certified	Met all critical ERs and FRs. Full compliance of DSN Announcements <sup>1</sup> not met. Operational impact is minor.
	TPC 2-Wire analog (GR-506-CORE) <sup>2</sup>	Yes	Certified	Met all critical ERs and FRs. Full compliance of DSN Announcements <sup>1</sup> not met. Operational impact is minor.
	TPC 2-Wire Digital (Proprietary)	No	Certified	Met all ERs and FRs except for full compliance of DSN Announcements. <sup>1</sup> Operational impact is minor.
	Voice over Internet Protocol IEEE 802.3, H.323	No	Certified	
	<b>Network Management Interfaces</b>			
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Status</b>	<b>Remarks</b>
CAT 5 TPC IEEE 802.3 10BaseT Ethernet, TCP/IP	No <sup>3</sup>	Certified	Met all ERs and FRs.	
TPC EIA-232 Asynchronous @ 9.6 kbps	No <sup>3</sup>	Certified	Met all ERs and FRs.	
TPC X.25 or BX.25 Synchronous	No <sup>3</sup>	Not Tested		
<b>Defense Red Switch Network Gateway</b>	<b>Line Interfaces</b>			
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Status</b>	<b>Remarks</b>
	TPC 2-Wire Analog (GR-506-CORE) <sup>2</sup>	Yes	Certified	Met all critical ERs and FRs.
<b>Tactical Network Gateway</b>	<b>Trunk Interfaces</b>			
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Status</b>	<b>Remarks</b>
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	No	Certified	Met all ERs and FRs.
	PCM-30 E1 HDB3 CAS MFR1	No	Certified	Met all ERs and FRs.
	Analog E&M Signaling Type I	No	Certified	Met all ERs and FRs.
<b>NATO Gateway</b>	<b>Trunk Interfaces</b>			
	<b>Interface &amp; Signaling</b>	<b>Critical</b>	<b>Status</b>	<b>Remarks</b>
		No	Not Tested	

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**Table 2. Interoperability Status (continued)**

Public Switched Telephone Network Gateway	Trunk Interfaces			
	Interface & Signaling	Critical	Status	Remarks
	Same Interfaces and Signaling as DSN	Yes	Certified	See note 4.
<b>Legend:</b>				
802.3	- IEEE Ethernet protocol	HDB3	- High Density Bi-Polar Three	
10BaseT	- 10 Mbps (Baseband Operation, Twisted Pair) Ethernet	IEEE	- Institute of Electrical and Electronics Engineers, Inc.	
AMI	- Alternate Mark Inversion	ISDN	- Integrated Services Digital Network	
B8ZS	- Bipolar Eight Zero Substitution	ITU	- International Telecommunication Union	
BRI	- Basic Rate Interface	kbps	- kilobits per second	
CAS	- Channel Associated Signaling	Mbps	- Megabits per second	
CAT	- Category	MFR1	- Multi-Frequency R1	
DP	- Dial Pulse	NATO	- North Atlantic Treaty Organization	
DSN	- Defense Switched Network	NM	- Network Management	
DTMF	- Dual Tone Multi-Frequency	PCM-24	- Pulse Code Modulation 24 Channels	
E1	- European Basic Multiplex Rate (2.048 Mbps)	PCM-30	- Pulse Code Modulation 30 Channels	
E&M	- Ear and Mouth	PRI	- Primary Rate Interface	
EIA	- Electronic Industries Alliance	Q.931	- ITU Signaling Standard for ISDN	
ERs	- Exchange Requirements	SF	- Superframe	
ESF	- Extended Superframe	ST	- ISDN BRI Four-Wire Interface	
FRs	- Functional Requirements	SUT	- System Under Test	
GR	- Generic Requirement (Telcordia)	T1	- Digital Transmission Link level 1 (1.544 Mbps)	
GSCR	- Generic Switching Center Requirements	TCP/IP	- Transmission Control Protocol/Internet Protocol	
GSTP	- Generic Switch Test Plan	TPC	- Twisted Pair Copper	
H.323	- Standard for multi-media communications on packet-based networks	U	- ISDN BRI Two-Wire Interface	
<b>Notes:</b>				
1 Met all DSN Announcement requirements except for Isolation Code Announcement. The SUT provides this announcement only for precedence calls above ROUTINE. ROUTINE precedence calls receive a fast busy signal.				
2 The GR-506-CORE reference was added to clarify the reference requirements for 2-Wire Analog.				
3 References (d) and (e) require that a switch provide NM capabilities via either Ethernet, serial (EIA-232), or serial (X.25 or BX.25 variant). The SUT meets the NM requirements through the use of either serial (EIA-232) or Ethernet connection.				
4 The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.				

**Table 3. Exchange and Functional Requirements**

	<b>Trunk Interfaces</b>	
	<b>Interface &amp; Signaling</b>	<b>Exchange &amp; Functional Requirements</b>
<b>Defense Switched Network</b>	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	<ul style="list-style-type: none"> <li>- MLPP</li> <li>- Hotline services</li> <li>- System Interface                             <ul style="list-style-type: none"> <li>• Non-secure voice and data</li> <li>• Secure voice and data (STU-III and STE)</li> <li>• NX56 and NX64 synchronous data</li> <li>• Non-secure and Secure FAX</li> <li>• VTC</li> <li>• Alarms</li> </ul> </li> <li>- Integrated Services Digital Network (<i>ISDN PRI only</i>)</li> <li>- Attendant services<sup>1</sup></li> <li>- System Administration, Measurements, and Service Standards</li> <li>- Y2K (Rollover, Valid, and Invalid Dates)</li> <li>- Screening, Zone Restriction, and DSN Access Restriction</li> <li>- Automated Message Accounting</li> <li>- Network Integration</li> <li>- Common Data Channel (<i>TI and E1 CAS only</i>)</li> <li>- ANSI T1.619a (<i>TI ISDN PRI</i>)</li> </ul>
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP	
	PCM-30 E1 CAS HDB3 MFR1	
	PCM-24 T1 B8ZS/ESF ISDN PRI	
	Analog E&M Signaling Type I	
	<b>Line Interfaces</b>	
	<b>Interface &amp; Signaling</b>	<b>Exchange &amp; Functional Requirements</b>
	TPC ISDN BRI ST and U Interface Q.931	<ul style="list-style-type: none"> <li>- MLPP</li> <li>- Hotline services</li> <li>- ANSI T1.619a</li> <li>- ISDN supplemental services</li> <li>- Call treatments</li> <li>- DSN announcements</li> <li>- Attendant services<sup>1</sup></li> <li>- EKTS</li> <li>- VTC</li> <li>- NX56 and NX64 synchronous data</li> <li>- Non-secure voice and data</li> <li>- Secure voice and data (STE)</li> </ul>
TPC 2-Wire Analog (GR-506-CORE) <sup>2</sup>	<ul style="list-style-type: none"> <li>- MLPP</li> <li>- Hotline services</li> <li>- DSN announcements</li> <li>- Traffic measurements</li> <li>- Attendant services<sup>1</sup></li> <li>- Call treatments</li> <li>- Non-secure voice and data</li> <li>- Non-secure and Secure FAX</li> <li>- Secure voice and data (STU-III and STE)</li> </ul>	
TPC 2-Wire Digital and Analog (Proprietary)	<ul style="list-style-type: none"> <li>- MLPP</li> <li>- Hotline services</li> <li>- DSN announcements</li> <li>- Traffic measurements</li> <li>- Attendant services<sup>1</sup></li> <li>- Call treatments</li> <li>- Non-secure voice</li> </ul>	
Voice over Internet Protocol IEEE 802.3 H.323	<ul style="list-style-type: none"> <li>- MLPP</li> <li>- Hotline services</li> <li>- DSN Announcements</li> <li>- Traffic Measurements</li> <li>- Attendant services</li> <li>- Call Treatments</li> <li>- Non-secure Voice</li> <li>- C2 Voice Grade Local Area Network<sup>3</sup></li> </ul>	

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**Table 3. Exchange and Functional Requirements (continued)**

Defense Switched Network (continued)	Network Management Interfaces	
	Interface & Signaling	Exchange & Functional Requirements
	CAT 5 TPC IEEE 802.3 10BaseT Ethernet, TCP/IP	- Automated Message Accounting - Traffic Measurements
	TPC EIA-232 Asynchronous @ 9.6 kbps	- Alarms ( <i>TCP/IP interface only</i> ) - Man Machine Language
Defense Red Switch Network Gateway	Line Interfaces	
	Interface & Signaling	Exchange & Functional Requirements
	TPC 2-Wire Analog (GR-506-CORE) <sup>2</sup>	- MLPP - Secure Voice (STU-III & STE)
Tactical Network Gateway	Trunk Interfaces	
	Interface & Signaling	Exchange & Functional Requirements
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	- MLPP - Non-secure Voice
	PCM-30 E1 HDB3 CAS MFR1 Analog E&M Signaling Type I	
NATO Gateway	Trunk Interfaces	
	Interface & Signaling	Exchange & Functional Requirements
	Not tested	See note 4.
PSTN Gateway	Trunk Interfaces	
	Interface & Signaling	Exchange & Functional Requirements
	Same Interfaces and Signaling as DSN	See note 5.
<b>Legend:</b> 802.3 - IEEE Ethernet protocol 10BaseT - 10 Mbps (Baseband Operation, Twisted Pair) Ethernet AMI - Alternate Mark Inversion ANSI - American National Standards Institute B8ZS - Bipolar Eight Zero Substitution BRI - Basic Rate Interface C2 - Command and Control CAS - Channel Associated Signaling CAT - Category DP - Dial Pulse DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency E1 - European Basic Multiplex Rate (2.048 Mbps) E&M - Ear and Mouth EIA - Electronic Industries Alliance EKTS - Electronic Key Telephone System ESF - Extended Superframe FAX - Facsimile GR - Generic Requirement GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan H.323 - Standard for multi-media communications on packet-based networks HDB3 - High Density Bi-Polar Three IEEE - Institute of Electrical and Electronics Engineers, Inc. ISDN - Integrated Services Digital Network ITU - International Telecommunication Union kbps - kilobits per second LAN - Local Area Network Mbps - Megabits per second MFR1 - Multi-Frequency R1 MLPP - Multi-Level Precedence and Preemption NATO - North Atlantic Treaty Organization NX56 - Data format restricted to multiples of 56 kbps NX64 - Data format restricted to multiples of 64 kbps PCM-24 - Pulse Code Modulation 24 Channels PCM-30 - Pulse Code Modulation 30 Channels PRI - Primary Rate Interface PSTN - Public Switched Telephone Network Q.931 - ITU signaling standard for ISDN SF - Superframe SS7 - Signaling System 7 ST - ISDN BRI Four-Wire Interface STE - Secure Terminal Equipment STU-III - Secure Telephone Unit-III SUT - System Under Test T1 - Digital Transmission Link level 1 (1.544 Mbps) T1.619a - SS7 and ISDN Signaling Std. For T1 TCP/IP - Transmission Control Protocol/Internet Protocol TPC - Twisted Pair Copper U - ISDN BRI Two-Wire Interface VG - Voice Grade VTC - Video Conferencing Y2K - Year 2000		
<b>Notes:</b> 1 SUT meets all the GSCR exchange requirements for attendant services with the following console: Lucent Attendant Console Model 302C. 2 The GR-506-CORE reference was added to clarify the reference requirements for 2-Wire Analog. 3 Refer to reference (c), table 2 for the C2 VG LAN certified components. 4 NATO interface requirements are in accordance with the GSCR paragraph 10.8. Not all switches are required to perform this function. 5 The certification of interoperability with commercial networks was verified based on the review of the vendor's letter of compliance to requirements identified as the "Letter" and "Verify" items listed in appendix E of the GSTP and specified in tables 2-1 through 2-15 of the GSCR.		

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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 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 Capt. Michel Roy, DSN 821-8575, commercial (520) 533-8575, FAX DSN 879-4347, or e-mail to roym@fhu.disa.mil.

FOR THE COMMANDER:

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National Security Agency, ATTN: DT, Suite 6496, 9800 Savage Road, Fort Meade, MD 20755-6496

Commander, Defense Information Systems Agency (DISA), ATTN: GS23 (Mr. Osman), Room 5w23, 5275 Leesburg Pike (RTE 7), Falls Church, VA 22041

## ADDITIONAL REFERENCES

- (c) Joint Interoperability Test Command (JITC) Memorandum, Networks, Transmission and Integration Division (JTE), "Joint Interoperability Test Certification of the Avaya S8700 with Software Release CM 2.01 (R012x.00.1.221.1)," 23 June 2004
- (d) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Switch Network Management Interface," 26 July 2001
- (e) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Network Management Requirements for End Offices," 2 August 2001
- (f) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services," 23 September 2001
- (g) Defense Information Systems Agency (DISA), Joint Interoperability and Engineering Organization (JIEO), Technical Report 8249, "Defense Information Systems Network (DISN) Circuit Switched Subsystem, Defense Switched Network (DSN) Generic Switching Center Requirements (GSCR)," March 1997
- (h) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Global Network Requirements for Tandem (Standalone), Multifunction, End Office, and Small End Office Switches," 30 January 2003
- (i) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP)," 17 June 1999