



DEFENSE INFORMATION SYSTEMS AGENCY

JOINT INTEROPERABILITY TEST COMMAND

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FORT HUACHUCA, ARIZONA 85670-2798

IN REPLY
REFER TO:

Networks and Transport Division (JTE)

October 4, 2006

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Special Interoperability Test Certification of the Secure Systems Group (SSG) Optically Isolated Secure/Non-Secure Switch Dial Isolator (DI) 101, 102, and 103 with Firmware Version C

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

1. References (a) and (b) establish the Defense Information Systems Agency, Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification. Additional references are provided in enclosure 1.
2. The SSG Optically Isolated Secure/Non-Secure Switch DI 101, 102, and 103 with firmware version C is hereinafter referred to as the System Under Test (SUT). The SUT meets all of the critical interoperability requirements and is certified for joint use in the Defense Switched Network (DSN). The SUT is configured and can be purchased in a single (DI 101), double (DI 102) or triple (DI 103) package. The SUT was tested primarily to determine that it appeared transparent when connected between the Video Teleconferencing (VTC) equipment and the inverse multiplexer and had no adverse effect on 384 kilobits per second Bonding mode 1 VTC calls. JITC tested the SUT as set forth in appendix 8 of reference (c) using test procedures derived from reference (d). 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 conducted by JITC at the Global Information Grid Network Test Facility, Fort Huachuca, Arizona, from 15 May through 5 June 2006. Final review of test data compliance completed on 29 June 2006. The Certification Testing Summary (enclosure 2) documents the test results and describes the test configuration. Users should verify interoperability before deploying the SUT in an environment that varies significantly from that described.
4. The certification of the SUT is based upon evaluation of the platforms using the Capability Requirements (CRs) derived from reference (c). The CRs used to evaluate the interoperability of the application are listed in table 1.

JITC Memo, JTE, Special Interoperability Test Certification of the Secure Systems Group (SSG) Optically Isolated Secure/Non-Secure Switch Dial Isolator (DI) 101, 102, and 103 with Firmware Revision C

Table 1. SUT Interface Interoperability Status

Interface	Critical	Certified	Requirements Required or Conditional	Status	Reference
SERIAL INTERFACES EIA-366A	Yes	Yes	Connections shall be in conformance with the requirements for serial interface(s) as described in FTR 1080B-2002 (R)	Met	A8.5
	Yes	See note.	Security (R)	See note.	A8.7
LEGEND: A - GSCR Appendix DISA - Defense Information Systems Agency EIA - Electronic Industries Alliance EIA-366A - Standard for interface between data terminal equipment and automatic calling equipment for data communication FTR - Federal Telecommunications Recommendation GSCR - Generic Switching Center Requirements R - Required SUT - System Under Test					
NOTE: Security is tested by DISA-led Information Assurance test teams and published in a separate report.					

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 <https://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. John Hooper, DSN 879-5041, commercial (520) 538-5041, FAX DSN 879-4347, or e-mail to John.Hooper@disa.mil. The tracking number for the SUT is 0605402.

FOR THE COMMANDER:

2 Enclosures a/s


 RICHARD A. MEADOR
 Chief
 Networks and Transport Division

JITC Memo, JTE, Special Interoperability Test Certification of the Secure Systems Group (SSG) Optically Isolated Secure/Non-Secure Switch Dial Isolator (DI) 101, 102, and 103 with Firmware Revision C

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

ADDITIONAL REFERENCES

- (c) Defense Information Systems Agency, "Department of Defense Voice Networks Generic Switching Center Requirements (GSCR), Incorporated Change 1," 1 March 2005
- (d) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP), Change 1, Revision 1," 1 June 2005

CERTIFICATION TESTING SUMMARY

1. SYSTEM TITLE. The Secure Systems Group (SSG) Optically Isolated Secure/Non-Secure Switch Dial Isolator (DI) 101, 102, and 103 with firmware revision C is hereinafter referred to as the System Under Test (SUT).

2. PROPONENT. Defense Information Systems Agency (DISA).

3. PROGRAM MANAGER. Mr. Howard Osman, GS23, Room 5W23, 5275 Leesburg Pike, Falls Church, VA 22041, e-mail: Howard.Osman@disa.mil.

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

5. SYSTEM UNDER TEST DESCRIPTION. The Secure Systems Group Dial Isolator is manufactured to optically couple Electronic Industries Alliance (EIA)-366 dialing communications from the coder/decoder to the inverse multiplexer. The unit is equipped with redundant power supplies to assure maximum reliability. Each unit is packaged in a 1U, 19-inch rack mountable chassis. These units can be configured into single, double, or triple Dial Isolator packages, 101, 102, and 103 respectively.

6. OPERATIONAL ARCHITECTURE. The Generic Switching Center Requirements (GSCR) Defense Switched Network (DSN) architecture in figure 2-1 depicts the relationship of the SUT to the DSN switches.

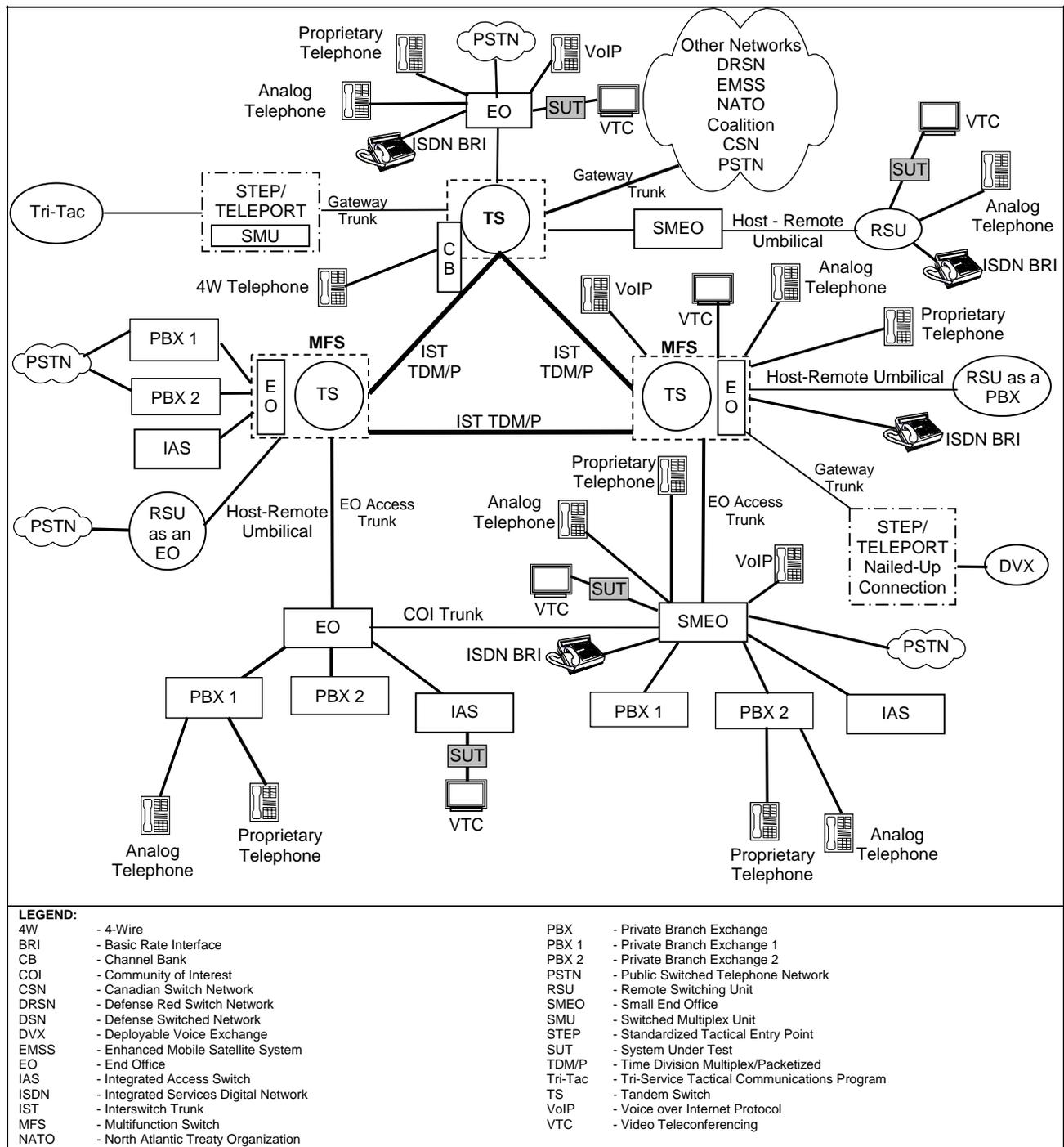


Figure 2-1. DSN Architecture

7. REQUIRED SYSTEM INTERFACES. The Capability Requirements (CRs) used to evaluate the interoperability of the application are listed in table 2-1. Interoperability certification of the interface is based on meeting criteria from the CRs.

Table 2-1. SUT Interface Interoperability Status

Interface	Critical	Certified	Requirements Required or Conditional	Status	Reference
SERIAL INTERFACES EIA-366A	Yes	Yes	Connections shall be in conformance with the requirements for serial interface(s) as described in FTR 1080B-2002 (R)	Met	A8.5
	Yes	See note.	Security (R)	See note.	A8.7

LEGEND:
A - GSCR Appendix
DISA - Defense Information Systems Agency
EIA - Electronic Industries Alliance
EIA-366A - Standard for interface between data terminal equipment and automatic calling equipment for data communication
FTR - Federal Telecommunications Recommendation
GSCR - Generic Switching Center Requirements
R - Required
SUT - System Under Test

NOTE: 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 figure 2-2.

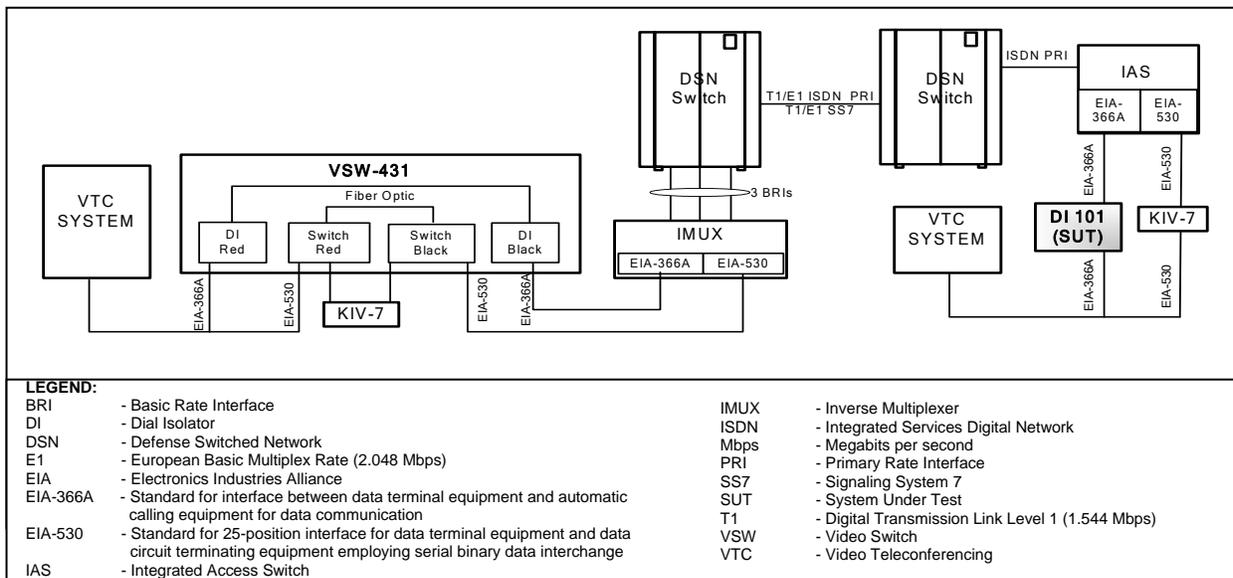


Figure 2-2. SUT Test Configuration

9. SYSTEM CONFIGURATIONS. Table 2-2 provides the system configurations used in the test. Table 2-3 provides the Communications Security (COMSEC) configuration of the KIV-7.

Table 2-2. Test System Configurations

System Name	Software/Firmware Release
Secure Systems Group DI 101 (SUT)	Firmware Revision C
Secure Systems Group Secure/Non-Secure VSW 431	Firmware Revision C
ADTRAN 512 IMUX	Firmware Version CS.0, Cksum10b2
ADTRAN 830 IAS	A.03, Boot ROM version A.01
KIV-7	N/A
Siemens EWSD	19d with Patch Set 46
Nortel Networks MSL-100	SE08
Avaya S8700	CM 3.0 (R013x.00.340.3)
Nortel Networks CS1000 (Option 61C)	Succession 4.5W
REDCOM HDX	1.0A R1P3, Build 23 August 2005
Aethra AVC 8500	10.2.9B
Aethra AVC 8400	6.0.30
Tandberg 6000	E.4.1 NTSC
LEGEND:	
AVC - Audio Video CODEC	IMUX - Inverse Multiplexer
CM - Communications Manager	MSL - Meridian Switching Load
CODEC - coder/decoder	N/A - Not Applicable
CS - Communications Server	NTSC - National Television System(s) Committee
DI - Dial Isolator	ROM - Read Only Memory
EWSD - Elektronisches Wählsystem Digital	SE - Succession Enterprise
HDX - High Density Exchange	SUT - System Under Test
IAS - Integrated Access Switch	

Table 2-3. 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 type="checkbox"/> RED <input type="checkbox"/> RED-as <input checked="" type="checkbox"/> NR <input type="checkbox"/> NR-as <input checked="" type="checkbox"/> OP2 <input checked="" type="checkbox"/> ACT1 <input type="checkbox"/> ACT2 <input type="checkbox"/> HF <input type="checkbox"/> HF-as <input checked="" 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 type="checkbox"/> CTCS <input type="checkbox"/> PTTR <input type="checkbox"/> CTRR <input type="checkbox"/> CTDM <input 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 checked="" type="checkbox"/> Enabled <input 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 checked="" 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 <input checked="" type="checkbox"/> Algorithm 1		
[-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 2-3. COMSEC Configuration (continued)

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

10. TEST LIMITATIONS. None.

11. TEST RESULTS

a. Discussion. The SUT minimum critical interoperability interface and functional requirements were met through interoperability certification testing conducted at the JITC GNTF. Bonding mode 1 was tested to requirements defined in GSCR, 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. The SUT isolates the dialing stream from the data stream by using an EIA-366 interface DI module along with an EIA-530 interface to pass the data stream.

b. Test Results. Testing included call strings utilizing KIV-7 encryption devices and call strings without encryption devices. The SUT handled each type of call attempt flawlessly and transparently. Five 384-kilobits per second Bonding mode 1 test calls at different durations (15-minute, 30-minute, 1-hour, and 24-hours) were placed over the test networks shown in figure 2-2. A passed test result was based on 100% of the calls receiving a score of four or better on the subjective quality scale as defined in table 2-4.

Table 2-4. 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	Quality is usable. Audio or video is not impaired but some distortion is noticeable
5	<i>Excellent</i>	<u>Quality is unaffected.</u> No discernable problems with either audio or video.
<small>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.</small>		

c. Summary. The SUT is certified for joint use in the DSN in accordance with the requirements set forth in reference (c). When connected to the interfaces certified in this letter, the SUT was transparent to the switching systems or lines interfaced, causing no degradation of service or negative impact, and met all the critical interoperability requirements.

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 <https://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>.