



DEFENSE INFORMATION SYSTEMS AGENCY
JOINT INTEROPERABILITY TEST COMMAND
FORT HUACHUCA, ARIZONA 85613-7020

IN REPLY
REFER TO:

Networks, Transmission and
Integration Division (JTE)

1 May 2001

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Joint Interoperability Test Certification of the
Nortel Passport 6480, Software Version 7.0.3

References: (a) DOD Directive 4630.5, "Compatibility,
Interoperability, and Integration of Command,
Control, Communications, and Intelligence
(C3I) Systems," 12 Nov 1992

(b) CJCSI 6212.01B, "Interoperability and
Supportability of National Security Systems,
and Information Technology Systems," 8 May
2000

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 Enclosure 1.
2. The Nortel Passport 6480 met all the interoperability requirements for deployment in the Defense Switched Network (DSN) and is certified for joint use. Testing of the Passport was carried out in accordance with the references provided at Enclosure 1. This certification expires upon system changes that affect interoperability, but no later than three years from the date of this memorandum.
3. These findings are based on interoperability testing conducted during the following periods: DSN voice services testing, 16-27 October 2000, Advanced DSN Integrated Management Support System (ADIMSS) testing, 8-12 January 2001, and Integrated Digital Network Exchange (IDNX) testing, 20-25 January 2001. Testing of the DSN voice services and testing of ADIMSS was conducted at JITC, Fort Huachuca, Arizona. IDNX interoperability testing with the Passport was carried out in

the operational environment (Ramstein to Incirlik) prior to cutting over live traffic. The Certification Testing Summary (Enclosure 2) documents the test results and describes the tested network configurations. Users should verify interoperability if deploying the Passport 6480 in an environment that varies from that described.

4. The certification is based upon evaluation of the switch interfaces and Exchange Requirements (ERs) derived from DSN voice services requirements and the Defense Information System Network (DISN) Asynchronous Transfer Mode (ATM) Specification. The ERs used to evaluate the interoperability of the devices are listed in Table 1. The interoperability status of the Passport with Software Version 7.0.3 is indicated in Table 2.

Table 1. Nortel Passport 6480 Exchange Requirements

	PASSPORT 6480	MARCONI ASX- 1000/1200 TNX-1100	PROMINA 800/400 (IDNX)	Voice DSN Switch (MSL-100) (KNS-4100)	ADIMSS
PASSPORT 6480	Voice Services Voice Compression Silence Detection Dynamic Bandwidth ATM Trunking	VTOA CES PVC UNI 3.1 DSN Signaling MLPP	PVC	T1/E1 CAS DSN Alarms MLPP Modem Secure Voice Timing VTC 56 Kbps	SNMP OMS-P HPOV

LEGEND:

ADIMSS	Advanced DSN Integrated Management Support System
ATM	Asynchronous Transfer Mode
CAS	Channel Associated Signaling
CES	Circuit Emulation Services
DSN	Defense Switched Network
HPOV	Hewlett-Packard OpenView
IDNX	Integrated Digital Network Exchange
IP	Internet Protocol
Kbps	Kilobits Per Seconds
MLPP	Multi-level Precedence and Preemption
OMS-P	Open Management System for Passport
PVC	Permanent Virtual Circuit
SNMP	Simple Network Management Protocol
UNI	User Network Interface
VTC	Video Teleconference
VTOA	Voice Telephony Over ATM

Table 2. Interoperability Status of the Passport 6480

Interface Requirement	Version	Critical	Status	Remarks
Passport 6480	7.0.3	Yes	Certified	All requirements met
Marconi ASX-1000/1200	FT 6.0.1 (Build 1.48622)	Yes	Certified	All requirements met
TNX-1100	FT 6.2.0 (Build 1.46770)	Yes	Certified	
Promina 800	2.03.03	Yes	Certified	All requirements met
Promina 400 (Replaces the IDNXs)	2.01.01	Yes	Certified	
Nortel MSL-100	MSL-12	Yes	Certified	All requirements met
Siemens KNS-4100	APS4V.2.3	Yes	Certified	All requirements met
ADIMSS	4.0 (Note 1)	Yes	Certified	Most requirements met

LEGEND:

ADIMSS Advanced DSN Integrated Management Support System
ATM Asynchronous Transfer Mode
FT ForeThought
HPOV Hewlett-Packard OpenView
IDNX Integrated Digital Network Exchange
OMS-P Open Management System for Passport
PVC Permanent Virtual Circuit
SNMP Simple Network Management Protocol
UNI User Network Interface
VTOA Voice Telephony over ATM

Note 1: The ADIMSS was on a workstation running Sun Solaris 2.6, OMS-P 4.1, and HPOV 6.1. ADIMSS gathered alarm data and read alarms by polling traffic between Passports. Alarm levels and types were captured using SNMP version 2 and correctly displayed on the ADIMSS management station. Captured alarm entries were successfully committed into the ADIMSS database. Alarm clear messages were generated from the Passport, but the alarms did not clear from the list of defined active alarms. These alarms could be cleared by the ADIMSS so the problem poses no operational impact.

5. JITC disseminates certification testing information to the DOD community via the Joint Interoperability Tool (JIT), which resides on the SIPRNET at <http://199.208.204.125/> or at

JITC, Memo, Networks Transmission and Integration Division (JTE), Joint Interoperability Test Certification of the Nortel Passport 6480, Software Version 7.0.3

<http://198.17.54.202/> (mirror site), and on the NIPRNET at <http://jit.fhu.disa.mil/>. A copy of this certification memorandum and enclosures will be available on the JIT. Instructions for obtaining access to JIT information are contained on the above homepages.

6. The JITC point of contact is Captain Gordon Bradley, DSN 821-8575 or commercial (520) 533-8575. The e-mail address is bradleyg@fhu.disa.mil.

FOR THE COMMANDER:



2 Enclosures:
1 Additional References
2 Certification Testing
Summary

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ADDITIONAL REFERENCES

- (c) DISA, Circular 370-175-13, "Defense Switched Network System Interface Criteria," December 1994
- (d) Defense Information Systems Agency (DISA), Joint Interoperability and Engineering Organization (JIEO) Technical Report 8249, "Defense Information System Network (DISN) Circuit Switched Subsystem, Defense Switched Network (DSN) Generic Switching Center Requirements (GSCR)," March 1997
- (e) Nortel Networks, Submission to Defense Information Systems Agency, "Passport MVP-E and Data Certification Test Plan, Voice Network Support with Data Integration," September 2000
- (f) American National Standards Institute, ANSI T1-403.02-1999, May 1999
- (g) DOD, "DISN ATM Specification," Version 1.2c, April 1998
- (h) DISA, "DSN Certification Test Procedures for the ADIMSS 4.0," Nortel Passport-ADIMSS Only, January 2001

CERTIFICATION TESTING SUMMARY

1. **SYSTEM TITLE.** Nortel Passport 6480, Software Version 7.0.3.
2. **PROPONENT.** Defense Information Systems Agency (DISA).
3. **PROGRAM MANAGER.** Howard Osman, NS53, 11140 Isaac Newton Square, Reston, Virginia, 22090-5087, DSN 653-8075, e-mail: osmanh@ncr.disa.mil.
4. **TESTERS.** Nortel Networks, Tysons Corner, VA, Technica Corporation, Vienna Virginia. Observed by members of the DISA/JEEGA/Circuit Switched Services Branch, Reston, VA, and Joint Interoperability Test Command, Fort Huachuca, Arizona.
5. **SYSTEM UNDER TEST DESCRIPTION.** The Passport with Software Version 7.0.3 will be deployed by DISA in the Defense Switched Network (DSN). The Passport's voice services, voice compression and voice trunking capabilities were tested for interoperability at the JITC's Network Engineering and Integration Lab (NEIL). The Passport 6480 was evaluated across physical interfaces Optical Carrier (OC-3), Digital Signal Level 3 (DS3), E1 and T1 providing point-to-point and nailed-up Permanent Virtual Circuit (PVC) through a Marconi (previously FORE Systems) Asynchronous Transfer Mode (ATM) network. Additional physical interfaces consist of V.35 interface for the Advanced Defense Switched Network Integrated Management Support System (ADIMSS). To simulate the DSN, Nortel MSL-100 and Siemens KNS-4100 switches were configured and connected to the Passports to pass voice traffic. To test the Promina 800 and 400 (replaces the Integrated Digital Network Exchange (IDNX)) interface, testing was carried out in Europe on the Ramstein-Incirlık link. Testing in Europe was performed by DISA personnel, supported by Technica Corporation, using the JITC approved test plan for the Passport and the results forwarded to JITC for validation.
6. **OPERATIONAL ARCHITECTURE.** The Passport was tested in a configuration similar to the DSN operational environment. The Passport 6480 fielding implementation within the DSN consists of Passports in the Pacific and European theaters. The two Passports deployed in DISA-PAC between Hawaii and Korea were previously certified by JITC with Software Version 4.8. The European Theater will be a six-site configuration with Passports located in Germany, United Kingdom, Italy, Spain and Turkey. The European implementation will employ Software Version 7.0.3 and the Passports in DISA-PAC will be upgraded to the newly certified version. The Passport's European operational environment is depicted in Figure 1.

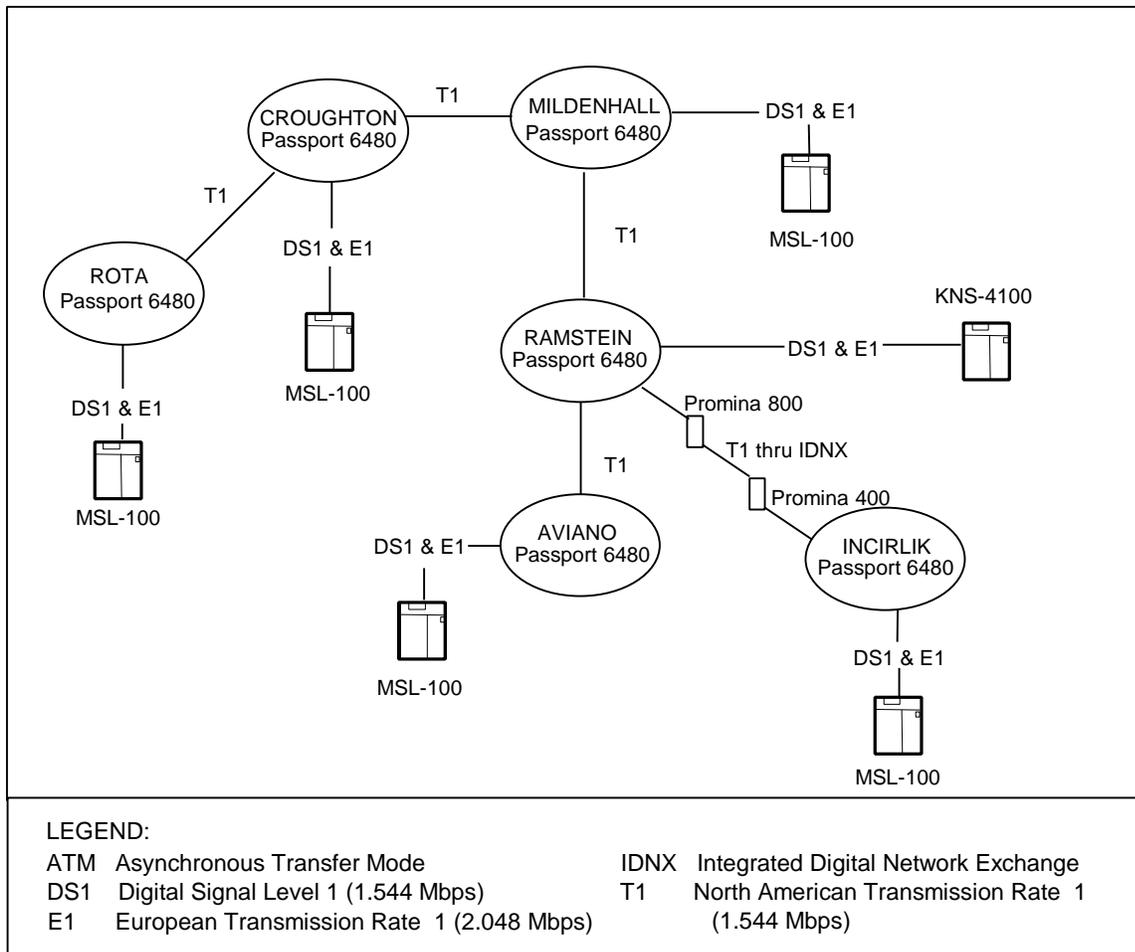


Figure 1. Passport European Operational Environment

7. REQUIRED SYSTEM INTERFACES. Table 1 details the required interfaces and Exchange Requirements (ERs) identified for interoperability certification of the Passport 6480. Interfaces and ERs were derived from the operational architecture, DSN requirements documentation and Department of Defense (DOD) DISN ATM Specification. Interoperability certification of the interfaces is based on meeting criteria derived from the ERs. ERs and the criteria used are contained in Table 3.

Table 1. Required Interfaces

Interface Requirement	Exchange Requirement	Exchange Method	Critical	References
Nortel Passport 6480				
Nortel Passport 6480	Voice Services Voice Compression Silence Detection Dynamic Bandwidth ATM Trunking	ATM AAL1 OC-3	Yes	JIEO Technical Report 8249 "GSCR", DOD DISN ATM Specification
Marconi ASX-1000/1200 TNX-1100	VTOA CES PVC UNI 3.1 DSN Signaling MLPP	ATM AAL1 OC-3	Yes	JIEO Report 8247 DISN Architecture, JIEO Technical Report 8249 "GSCR", DOD DISN ATM Specification
Promina 800/400	PVC	V.35	Yes	JIEO Report 8247 DISN Architecture, JIEO Technical Report 8249 "GSCR"
DSN Switch Nortel Switch, MSL-100 Siemens Switch, KNS-4100	T1 CAS E1 CAS DSN Alarms MLPP Modem Secure Voice Timing VTC 56 Kbps	DS1/E1	Yes	JIEO Report 8247 DISN Architecture, JIEO Technical Report 8249 "GSCR"
ADIMSS	SNMP Version 2 OMS-P HPOV	V.35	Yes	JIEO Report 8247 DISN Architecture

LEGEND:

ADIMSS	Advanced Defense Switched Network Integrated Management Support System
AAL	ATM Adaptation Layer
ATM	Asynchronous Transfer Mode
CAS	Channel Associated Signaling
DISN	Defense Information System Network
DOD	Department of Defense
GSCR	Generic Switching Center Requirements
JIEO	Joint Interoperability and Engineering Organization
MLPP	Multi-Level Precedence and Preemption
OC-3	Optical Carrier 3 (155 Mbps)
OMS-P	Open Management System for Passport
SNMP	Simple Network Management Protocol
UNI	User Network Interface
VTC	Video Teleconference
VTOA	Voice Telephony over ATM

8. TEST NETWORK DESCRIPTION. The test network is depicted in Figure 2. In order to emulate an operational environment several Ethernet 10 or 100 Megabits Per Second (Mbps) interfaces were tested between the Nortel equipment, dependent upon test interfaces requirement. Optical Carrier 3 (OC-3) Multi-mode Fiber (MMF) was used to interface the emulated DISN ATM Network. The ATM Network consisted of the Passport 6480, Marconi (FORE Systems) ASX-1000/1200 and TNX-1100 ATM switches. The voice network consisted of the MSL-100 and KNS-4100. The data network consisted of ADIMSS, CISCO 7500 and 2600 routers. Edge devices were installed with subscribers configured for voice and video traffic loads placed through each ATM switch while the integrity of the network was maintained.

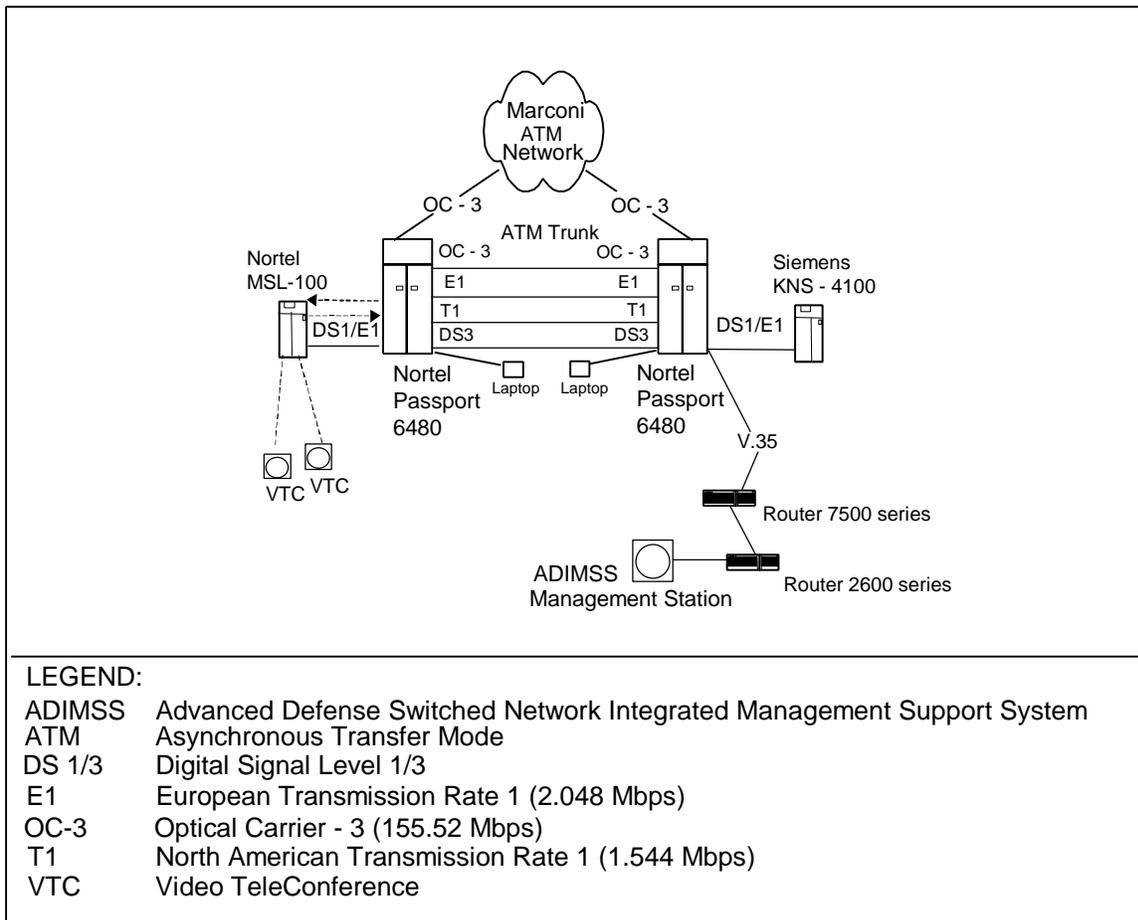


Figure 2. Test Network Configuration

9. SYSTEM CONFIGURATIONS. Table 2 lists the hardware and software configurations associated with the systems used during the test.

Table 2. Tested System Configurations

System Name	Hardware	Software
Nortel Passport 6480	CP 1 DS1 MVP-E FP DS1 Voice FP E1 MVP-E FP E1 Voice FP DS1 FP E1 FP DS1 AAL1 FP E1 AAL1 FP DS1A FP E1A FP DS3A FP OC3M FP V.35 FP Standby CP	Version 7.0.3
Marconi ATM Switch ASX-1000/1200	SCP-I960 Processor	ForeThought Version 6.0.1E and FCS-Patch (1.48662)
Marconi (FORE Systems) ATM Switch TNX-1100	SCP-P5-266 Processor	ForeThought Version 6.2.0 and FCS-Patch (1.46770)
Promina 800 Promina 400	PRC Card	2.03.03 2.01.01
Nortel MSL-100 Switch	RISC Processor	MSL-12
Siemens Switch KNS-4100		APS4V.2.3
ADIMSS	Sun Ultra 60	OMS-P 4.1 HPOV 6.1 Sun Solaris 2.6 ADIMSS 4.0

Legend:

- AAL1 ATM Adaptation Layer 1
- ATM Asynchronous Transfer Mode
- CP Control Processor
- DS1 Digital Signal Level 1 (1.544 Mbps)
- DS3 Digital Signal Level 3 (44.736 Mbps)
- E1 European Transmission Rate 1 (2.048 Mbps)
- FP Function Processor
- MSL Meridian Software Load
- MVP-E Multi-function Voice Processor-Enhanced Echo Cancellation Processor
- OC Optical Carrier
- SCP Switch Control Processor

Note: ASX, TNX, FCS and FORE are affiliated with Marconi equipment lines and are not acronyms per se. PRC is affiliated with the Promina line and is not a known acronym.

10. TESTING LIMITATIONS. The Passport was tested in an operationally realistic environment. However, JITC was not able to replicate the continuous volume of traffic that may be encountered in the networks where the Passport may be deployed. This testing limitation should not have an impact on the overall results of the test.

11. ASSESSMENT RESULTS. The Passport 6480 successfully passed all the requirements. Table 3 shows the interoperability results and status for the Passport's interfaces and ERs.

Table 3. Passport 6480 Interoperability Results and Status

Interface	Version	ER/Criteria	Critical	Test Result	Operational Impact	Interface Status
Nortel Passport 6480 (with MVP-E cards)	7.0.3	Voice Services (Note 1)	Yes	Passed	None	Certified
		Voice Compression	Yes	Passed	None	
		Silence Detection	Yes	Passed	None	
		Dynamic Bandwidth	Yes	Passed	None	
		ATM Trunking (Note 2)	Yes	Passed	None	
Marconi ASX-1000/1200 TNX-1100	FT 6.0.1 (Build 1.48662)	VTOA must be capable of processing voice traffic of multiple rates IAW DOD DISN ATM Specification	Yes	Passed	None	Certified
	FT 6.2.0 (Build 1.46770)	CES must be capable of passing Structured and Unstructured services IAW Para. 5.5, DOD DISN ATM Specification	Yes	Passed CES at multiple sizes and rates	None	
		PVC must transfer permanent virtual circuit using virtual channels and virtual paths for point-to-point CBR connections, VBR, and UBR service IAW DOD DISN ATM Specification	Yes	Passed	None	
		UNI 3.1 must be capable of carrying ATM signaling IAW DOD DISN ATM Specification	Yes	Passed	None	

Table 3. Passport 6480 Interoperability Results and Status (Continued)

Interface	Version	ER/Criteria	Critical	Test Result	Operational Impact	Interface Status
Marconi ASX-1000/1200 TNX-1100	FT 6.0.1 (Build 1.48662)	DSN Signaling MVP-E cards must provide interconnecting service that are interoperable with DSN circuit switches interfaces and are in compliance with DISA DSN Interface Criteria (DISAC 370-175-13), and DSN GSCR	Yes	Passed	None	Certified
	FT 6.2.0 (Build 1.46770)	MLPP must be capable of sending a measured supervisory signal toward both the calling and the called user lines. The supervisory pulses must be recognized at each DSN switch, causing disconnect of the intermediate trunk circuit and the user line circuit at each end	Yes	Passed	None	Certified
Promina 800/400		PVC (Note 3)	Yes	Passed	None	Certified
Voice DSN Switch (MSL-100) (KNS-4100)		T1 CAS	Yes	Passed	None	
		E1 CAS	Yes	Passed	None	
		Alarms capable of propagating alarms across point-to-point and ATM cloud IAW DOD DISN ATM Specification	Yes	Passed	None	
		MLPP must process voice calls IAW the GSCR	Yes	Passed	None	
		Modem	Yes	Passed	None	
		Secure Voice	Yes	Passed	None	
	VTC 56 Kbps	Yes	Passed	None		

Table 3. Passport 6480 Interoperability Results and Status (Continued)

Interface	Version	ER/Criteria	Critical	Test Result	Operational Impact	Interface Status
ADIMSS (Note 4)		SNMP Version 2	Yes	Passed	None	Certified
		HPOV	Yes	Passed	None	
		OMS-P	Yes	Passed	None	

LEGEND:

ANSI	American National Standards Institute	MLPP	Multi-Level Precedence and Preemption
ATM	Asynchronous Transfer Mode	MVP-E	Multipurpose Voice Platform Enhanced Echo Cancellation Function Processor
CAS	Channel Associated Signaling	OMS-P	Open Management System for Passport Paragraph
CES	Circuit Emulation Services	PARA	Paragraph
CBR	Constant Bit Rate	PVC	Permanent Virtual Circuit
DISA	Defense Information Systems Agency	SNMP	Simple Network Management Protocol
DISAC	Defense Information Systems Agency Circular	T1	North American Transmission Rate 1 (1.544 Mbps)
DISN	Defense Information Systems Network	UBR	Unspecified Bit Rate
DOD	Department of Defense	UNI	User Network Interface
DSN	Defense Switched Network	VTC	Video Teleconference
E1	European Transmission Rate 1 (2.048 Mbps)	VTOA	Voice Telephony Over ATM
GSCR	Generic Switching Center Requirements		
HPOV	Hewlett-Packard OpenView		
IAW	In Accordance With		

NOTES:

- Secure and non-secure voice calls were configured and successfully connected across ATM Permanent Virtual Circuits (PVCs) between the Passport 6480 and across the ATM backbone switches.
- The network successfully supported interface rates at DS3, T1, E1, and OC-3.
- The use of the Passport 6480 between the Promina nodes ensured that DSN alarm information was correctly processed.
- ADIMSS gathered alarm data and read alarms by polling traffic between Passports. Alarm levels and types were captured and correctly displayed on the ADIMSS management station. Captured alarm entries were successfully committed into ADIMSS database. Alarm clear messages were generated from the Passport, but the alarms did not clear from the list of defined active alarms. These alarms could be cleared by the ADIMSS so the problem poses no operational impact.