Stored Program Control (SPC) Switch Port Applications

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1. General

1.1 Purpose

This practice provides the technical and administrative guidelines to standardize the following for all Stored Program Control (SPC) switching technologies in GTE:

- Minimum port requirements.
- Applications.
- I/O messages.
- Testing parameters.
- Password requirements.

1.2 Filing Instructions and Supersedures

File this practice in numerical order in your GTE Telephone Operations practices set.

This practice supersedes and cancels:

- All policies, procedures, general instructions, letters, and memoranda which address this subject.
- Any document which provides information contrary to the information contained in this practice.

1.3 Responsibility

This practice was published by the GTE Telephone Operations Enterprise Services Department. For more information about this practice, contact the GTE Telephone Operations Headquarters Network Support Systems Department.

1.4 Disclaimer

This practice was prepared solely for the use of GTE Telephone Operations. It must be used only by its employees, customers, and end-users when installing, operating, maintaining, and repairing GTE Telephone Operations' equipment, facilities, and services. Any other use of this practice is forbidden. The information contained in this practice may not be applicable in all circumstances and is subject to change without notice. By using this practice the user agrees that GTE Telephone Operations will have no liability (to the extent permitted by applicable law) for any consequential, incidental, special, or punitive damages that may result.

2. Overview

2.1 Introduction

To maintain its leadership role in the telecommunications industry GTE has migrated to server/server applications with our existing Stored Program Control (SPC) technology. This evolution of systems and SPC technology resulted in significant differences in the planning, engineering, and operation of the digital switches. National standard support systems were developed using Process Reengineering. These systems require sufficient ports to access the SPC switch and expect a standard message input and output syntax. Customer operations require that support systems meet the minimum performance standards necessary to accomplish a one touch approach to repair and provisioning requests.

2.2 Scope

This practice applies to:

- Region Network Reliability.
- Data Base Management.
- Headquarters Network Reliability Support.
- Network Operations Center (NOC).
- Central Office (CO) Personnel.
- Planning.
- Engineering.
- Headquarters National Support Systems Group.

2.3 Definitions

The following chart provides definitions for the acronyms and terms used in this practice.

Acronym or Term	Definition
ADC	Automatic Data Collection
ADCC	ADC Collection
ACDC	Administrative Control and Display Complex
1AESS	Western Electric 1AESS Switch
ALIT	Automatic Line Insulation Test
AMP	Alarm Message Processor
baud	Teleprocessing term representing bits per second.
BBS	Bulletin Board Server
BMC	Billing Media Converter
bps	Bits per second -A measure of the speed of data communications.
BST	Billdats Special Transfer

(continued)

2.3 Definitions, continued

Acronym or Term	Definition
CIOPT	Craft Interface Options
CLI	Calling Line Identification
CMAC	Customer Moves And Changes
CO	Central Off ice
CRC	Cyclic Redundancy Check
CRT	Cathode Ray Terminal
DACS	Digital Access Cross-Connect System
Diag	Diagnosis
DCO	Digital Central Office
DMS	Digital Multiplexing System
EDLC	EDT Data Link Controller
EIA	Electronic Industries Association
EXE	Executable File
FEP	Front End Processor
FIU	Facilities Interface Unit
GTENAS	GTE Network Authenticity System
HSO	Host Serving Office
ICIC	Intelligent Communications Interface Controller
ID	Identification
IMID	Input Message Identifier
I/O	Input/Output
IPAL	Input Al lowed
ISDN	Integrated Services Digital Network
LAPD	Link Access Procedures on the D-Channel

(continued)

2.3 Definitions, continued

Acronym or Term	Definition
LCDT	Local Control & Display Terminal
LIT	Line Insulation Test
mA	Milliamperes.
MARK	Mechanized Assignment Record Keeping System
NDR	Network Disaster Recovery
NTMOS	GTE Network Traffic Management System
NOC	Network Operations Center
NOC - OLS	Network Operations Center/On-Line Support
NOP	Network Operations Protocol
NTM	Network Traffic Management
NTI	Northern Telecom, Inc.
NTP	NTI Practices
OLS	On-Line Support
OM	Operational Measurement
OMID	Output Message Identif ier
PCM	Pulse Code Modulation
PL	Private Line
POTS	Plain Old Telephone Service
PTC	Peripheral Test Console
PW	Password
RCDT	Remote Control & Display Terminal
RFD	Rapid Feature Deployment
RLU	Remote Line Unit
RSU	Rapid Switching Unit

(continued)

2.3 Definitions, continued

Acronym or Term	Definition
SAM	Switched Access Module
SDL	Synchronous Datalink
SLU	Serial Line Unit
SPC	Stored Program Controlled Central Off ice
SS0	Special Services Operations
SW0	Switching Position - 0
SW3	Switching Position - 3
TAMS	Telenet Access Management System
TCAF Server	Server for iine performance testing.
TCU	Time Switch/Peripheral Control Unit
TDCS	Traffic Data Collection System
TEST Server	Server for auto testing SPC hardware.
TOP	Telephone Operator Position
TRACE	Identifies where line events originate.
TRAP	Identifies events on a particular line.
TSM	Total Surveillance Module
TSW	Time Switch
TT00	Teletype Address 00
TTY	Teletypewriter
Vidar	A digital switch.
YEAGER Server	Server for Trap/Trace messages.

2.4 References

The following chart provides sources of supplementary information relating to this practice. The documents could be required for performing certain tasks.

See...	For Information About...
AT&T TOP 231-361-010*	Plug and pin location.
NTP 207-3401-311**	Cable Voice Frequency Loading Systems
NTP 297-1001-594**	Threshold values.
Siemens Stromberg Carlson Publication Number 00-030 Part 2†	SLU card and SLU panel.

* Available from AT&T

** Available from Northern Telecom, Inc.

† Available from Siemens Stromberg Carlson, Inc.

3. Stored Program Control Switch Technologies

3.1 SPC Digital Switch Technologies

This practice describes the following SPC digital switch technologies:

- GTD5.
- 5ESS.
- DMS100, DMS100/200, DMS200, DMS250.
- DMS10.
- DCO.
- No.2 EAX.
- 1AESS.
- Vidar (American Digital Switching).

There are over 1450 digital CO base units in GTE with several thousand remote switching locations plus pair gain devices. Each similar technology must accept messages and respond to support systems in an identical manner. To accomplish this goal:

- Each technology must be equipped with a minimum hardware configuration according to complex line size.
- All ports must function electrically and be administratively identical according to the application assigned to the port.
- All database parameters relating to testing must use a set standard for each technology.

NOTE: This ensures that all support systems evaluate and generate reports without weighted factors for geographical areas.

3.2 Network Integration

The following support networks have been integrated with the SPC switches,

- TSM - Monitors switch messages and alarms.
- NDR - Controls GTD5, DMS100/200, and 5ESS processors.
- SAM - Transport system interfacing SPC and systems.
- TDCS - Traffic data collection system.
- NTM - Netminder switch management system.
- GTENAS - Secure dial-in access system.
- 4TEL -Local loop testing system.
- CMAC - Customer moves and changes system.
- UNFORCE - Data collection unit for DMS200.
- ISD2000 - Local maintenance data collection device.
- Printers - I/O local printers.
- Monitors - I/O local monitoring devices.

The following servers interconnect with the SPC switches via SAM:

- The TEST server:
  - Performs various diags of hardware and customer lines automatically.
  - Application creates specific switch messages.

  NOTE: To ensure that the TEST server generates repairable trouble tickets, all SPC switch parameters relating to these output messages are identically set in all sites.
- The TCAF server handles all line performance data. including the T1 span error detection messages.
- The YEAGER server compiles trap and trace data for the Security Department.

All other marks are the property of their respective owners

3.3 Complex Line Size

Line size is the most common factor within all SPC switches other than TOPS (operator traffic) locations. To achieve maximum efficiency for ail locations, typical, medium, and large SPC line size categories are designed for each Base Unit Complex. In addition to the line size determining switch port configurations, specific technologies might have the following restrictions:

- Maximum number of ports.
- Speed.
- Parity.
- Other generic design parameters.

Refer to each technology for restrictions in later sections of this practice. The Base Unit Complex has the following SPC line categories:

- Typical size office has 1 - 15,000 lines assigned in the Base Unit Complex.
- Medium size office has 15,001 - 40,000 lines assigned to the Base Unit Complex.
- Large size office has 40,001 + (plus) lines assigned to the Base Unit Complex.

NOTE: The SAM ports required by technology are based on normal traffic loads. The port requirements are the minimum that can be equipped in each CO. Special circumstances might require an increase in ports over those specified in the matrix. Traffic studies substantiates the additions required,

3.3 Complex Line Size, continued

The following chart describes SAM port requirements.

Switch Type	Typical < 15,000	Medium > 15,000	Large > 40,000
GTD5 Complex	4	6	8
5ESS Complex	5 4RCV 1 TLWS	6 5RCV 2TLWS	8 6RCV 2TLWS
DMS100/200 Complex	4	6	8
DMS200 Complex	2	2	2
DMS10 Base Unit	3	3	3
DMS10 HSO Complex	4	4	4
DMSlO SSO Only	3	3	3
DCO Complex	4	5	6
DCO RNS Only	4	5	6
No. 2 EAX Base	3	3	3
1 AESS Complex	2	2	2
Vidar Complex	2	2	2
ITTI 210 Complex	3	3	3
EWSD Complex	3	4	5

NOTE: Each new SPC unit (that meets the criteria listed in Section 3.4) must provide the ports before placing the site in-service. It is the responsibility of the Planning and Engineering Department to ensure that the correct amount of ports are installed.

4. Stored Program Control Port Applications

4.1 Hardware

Each SPC switching technology has specific hardware that interfaces with printers, monitors, billing collection units, and communication devices. This practice does not seek to enforce physical port assignments by card/file/slot. It merely provides a configuration that ensures effectiveness throughout as required by the application. Existing conflicts must be resolved based on this practice.

4.2 Physical/ Electrical Restrictions

The physical and electrical restrictions relate to the following:

- Physical restrictions:
  - Limited to the maximum number of I/O cards in a frame.
  - Limited to the maximum number of ports on a card.
  - Maximum number of ports is based on the design of the technology.
  - Restricted usage applications.
- Electrical restrictions:
  - The baud rate is not equal to the byte throughput.
  - Maximum high speed ports per card.
  - Fixed parity.

4.3 Software Naming Conventions By Port

Each SPC switching technology has generic naming conventions. This has restricted the use of a universal numeric for the various server systems attached to each site. Therefore, each SPC by switch type, must follow a specific naming system by application. The standard naming conventions, by hardware application, are listed in Section 8 of the applicable SPC section. The software naming conventions are:

- SAM port assignment for all technologies.
- Port assignments for all applications by technologies.

4.3 Software Naming Conventions By Port, continued

4.3.1 SAM Port Assignment for All Technologies

The following chart describes SAM port assignments for all technologies.

SWITCH TYPE	SAM #1	SAM #2	SAM #3	SAM #4	SAM #5	SAM #6	SAM #7	SAM #8
GTD5 COMPLEX	TERM 21	TERM 22	TERM 23	TERM 24	TERM 25	TERM 26	TERM 27	TERM 28
5ESS COMPLEX	TTY p (15	TTY q (16)	TTY w (22)	TTY n (13)	TTY o (14)	TTY s (18)	TTY u (20)	TTY j (09)
DMS100/200 COMPLEX	SAM1	SAM2	SAM3	SAM4	SAM5	SAM6	SAM7	SAM8
DMS200 COMPLEX	SAM1	SAM2	N/A	N/A	N/A	N/A	N/A	N/A
DMS10 BASE UNIT	TTY 4	TTY 5	TTY 6	N/A	N/A	N/A	N/A	N/A
DMS10 HSO COMPLEX	TTY 4	TTY 5	TTY 6	TTY 8	N/A	N/A	N/A	N/A
DMS10 SSO ONLY	TTY 4	TTY 5	TTY 6	N/A	N/A	N/A	N/A	N/A
DCO COMPLEX	CH 3	CH 5	CH 6	CH 7	CH 8	N/A	N/A	N/A
DCO RNS ONLY	CH 3	CH 5	CH 6	CH 7	CH 8	N/A	N/A	N/A
No.2 EAX BASE	RTFT	RSOT	RTAT	N/A	N/A	N/A	N/A	N/A
1AESS COMPLEX	N/A	SC2	RCS	N/A	N/A	N/A	N/A	N/A
VIDAR COMPLEX	3	4	N/A	N/A	N/A	N/A	N/A	N/A
ITT1210 COMPLEX	6	7	8	N/A	N/A	N/A	N/A	N/A
ESWD COMPLEX	LINK4 CH. 8	LINK6 CH. 1	LINK6 CH. 2	LINK6 CH. 5	LINK6 CH. 6	N/A	N/A	N/A

4.3 Software Naming Conventions By Port, continued

4.3.2 Port Assignments for All Applications By Technologies

The following chart describes port assignments for all applications by technologies.

SWITCH TYPE	TSM	NDR	TDCS	NTM	NAS #1	NAS #2	ISD2X	CMAC
GTD5 COMPLEX	TERM 5	TERM 7	N/A	TERM 11	TERM 9	TERM 10	TERM 4	N/A
5ESS COMPLEX	TTY r (17)	MTTYQ	TTY h (07)	SDL 3 EADAS	TTY v (21)	TTY k (10)	ROP 0 / 1	SDLq RMAS
DMS100/200 COMPLEX	TSM	NDR	TDCS	NTM	GTE NAS1	GTE NAS2	ISD 2000	CMAC
DMS200 COMPLEX	TSM	NDR	TDCS	NTM	GTE NAS1	GTE NAS2	ISD 2000	N/A
DMS10 BASE UNIT	TTY 7	N/A	N/A	N/A	LOCAL TTY 2	FX TTY 3	IF EQ TTY 7	N/A
DMS10 HSO COMPLEX	TTY 7	N/A	N/A	N/A	LOCAL TTY 2	FX TTY 3	IF EQ TTY 7	N/A
DMS10 SSO ONLY	TTY 7	N/A	N/A	N/A TTY	LOCAL 2 TTY	FX 3	IF EQ TTY 7	N/A
DCO COMPLEX	TT 00 SW1	N/A	WA	N/A	TT 00 SW2	CH 2	TT 00 SW0	WA
DCO RNS ONLY	TT 00 SW1	N/A	N/A	WA	TT 00 SW2	CH 2	TT 00 SW0	N/A
No.2 EAX BASE	RMT	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1AESS COMPLEX	SC1	MTTYa	TR1	N/A	NA	NA	NA	N/A
VIDAR COMPLEX	1	WA	N/A	N/A	2	N/A	N/A	N/A
ITT1210 COMPLEX	1	N/A	N/A	N/A	4	N/A	5	NIA
ESWD COMPLEX	LINK4 CH. 3N	/	N/A	A N/A	LINK4 CH. 9	LINK4 CH. 7	LINK4 CH. 10	N/A

4.4 Base Unit Application

The following chart describes base unit application

Base Unit	Definition
Typical Base Unit Complex	1 - 15,000 lines have ports assigned based on the technology and host/remote configurations (refer to Section 8).
Medium Base Unit Complex	15,000 - 40,001 lines have ports assigned based on technology and host/remote configurations (refer to Section 8).
Large Base Unit Complex	40,001 + (plus) lines have ports assigned based on technology and host/remote configurations (refer to Section 8).

4.5 Port Alarms

When a port providing critical business support data or functions is removed from service, either through maintenance or system intervention, the port standards are set to generate a major alarm to the TSM port if the technology is capable of this feature.

5. Input/Output Message Standard

5.1 Mandatory Message Routing

To provide all GTE employees with the optimum data required to perform their job functions, the message classes within each switch technology must be set to I/O to/from specific ports. To accomplish this, each technology has a defined message classing system that addresses the hardware status and responds to queries. Certain messages must appear at either a dedicated port or echoed to multiple ports. These assignments are mandatory by port, to ensure the integrity of the application (support systems) reporting and escalation processes. The assignments also ensure the integrity of comparative analysis between similar technologies. This practice enforces a standard I/O message assignment by port type, technology and configuration.

5.2 Input Restriction By Port Application

The input to a port is restricted if its application is hardware or user specific, i.e., a dedicated traffic port or line testing unit. In other applications, the ports are unrestricted, allowing the server to control the input messages to the SPC site. The server application verifies user ID, password, and permissions before allowing input messages to any SPC site. Each specific port application, by technology, is addressed in Section 8.

5.3 output Restriction By Port Application

Output message restriction, by port, is required for the following reasons:

- Reduce SPC processor overload.
- Eliminate port congestion.
- Conserve resources (paper products).
- Reduce transport network congestion (X.25 packet).
- Direct only appropriate messages to support systems.

NOTE: The restrictions enforce a standard output message assignment by port type, technology, and configuration (refer to Section 8).

5.4 Echo Message Standardization

Echo messages are assigned as part of the standard. Use extreme care with this feature to ensure none of the conditions listed in Section 5.3 occur. With these restrictions, this practice enforces a standard echo message assignment by (refer to Section 8):

- Port type.
- Technology.
- Configuration.

5.5 Local Options

Local variations for redirect or echo to additional terminals is permitted only with the approval of the Region Network Reliability Group. They must ensure that redirect or echo do not conflict with the I/O guidelines for that technology. No IMID/OMID changes are allowed. If a class of messages are echoed, the entire class of these messages must be echoed.

5.6 Network Operations Center – On Line Support Bulletin Board Server

The NOC - OLS BBS contains the appropriate files to keep every SPC switch technology at the current I/O message standard. This includes EXE type **files,** were applicable, that can be downloaded into a PC. Documentation to install and configure the specific SPC software release accompanies the EXE file. Because each technology has unique application features, the BBS has specific sections for each technology. For information regarding NOC - OLS BBS access by technology, file types, and structure (see Section 8).

6. Error Message Thresholds

6.1 Local Customer Lines

Customer lines, including regular, coin, ISDN, Centranet, and Switched 56 generate specific output messages. These messages are generated by either generic specifications or database parameters that trigger when an algorithm threshold is met. Support systems developed by GTE require that all similar technologies reach these thresholds based on systems standards. The NOC - OLS Group has set these standards in conjunction with the Support System Operations Group. Refer to Section 8 to obtain specific information concerning:

- Each technology.
- What parameters are set to a standard.
- Where the information resides on the NOC - OLS BBS.

6.2 Recovery/ Diagnostic Hardware Threshold

Each technology generates a high level message to assist with hardware recovery. Some of the technologies permit engineering or database groups to set the parameters. All hardware recovery action parameters must be set to operate at support systems standards. Refer to Section 8 to obtain specific information concerning:

- Each technology.
- What parameters are set to a standard.
- Where the information resides on the NOC - OLS BBS.

6.3 Digital Span Line Threshold

The T1 span lines that terminate on the SPC digital interfaced frames generate various alarms. In some technologies, this threshold is set as an engineering value or similar parameter. Support systems tracking these error messages require all similar technologies output the identical information based on standard parameters. Refer to Section 8 to obtain specific information concerning:

- Each technology.
- What parameters are set to a standard.
- Where the information resides on the NOC - OLS BBS.

6.4 Call Processing Thresholds

Log messages can be generated by certain call processing events. These thresholds are established and maintained on the NOC - OLS BBS.

7. Password Security

7.1 Server Application

Server applications require no password assignment, other than what is required for access to various segments of a switch. Access to switch is provided via X.25. The Packet Network is set to block access from all nonauthorized ports on the network. This allows the server applications to either access the switch on a full period basis or simulated basis without concern for illegal access to that port. Several technologies require passwords as part of the permission tables. The owner of the server application is responsible for the passwords that must be used or changed.

7.2 Nonprotected Ports

All ports that are accessed by dial-in modems, but not permanently assigned as described in Section 6.1, must be assigned to the GTENAS secure modem system. Because the GTENAS uses an ID, password, and permissions level access, no password administration is required unless the passwords are part of the permissions tables.

7.3 Local Ports

The local ports on all switch technologies that can be protected with the logon process must have the password security feature active. Employees must logoff when not in the general area of the terminal they previously logged on.

7.4 Password Aging Multiuser

Several technologies have a password aging system that automatically prohibits remote access if the passwords have been active in the system too long. When the port is assigned access by multiuser groups, and is not protected by the TAMS or GTENAS, then follow the existing password administrative guidelines.

7.5 Password Aging – Dedicated Servers

Ports connected to dedicated servers are not set to password age. if the system has mandatory password aging, set the table to the maximum number of days allowed by the software.

8.1 GTD5 Port Applications

GTD5 port applications include:

- Hardware.
- Physical restriction.
- Electrical restriction.
- Terminal naming.
- Typical base unit.
- Medium baseunit.
- Large base unit.

8.1.1 Hardware

The ICIC card FB/l6031 is the **I/O** interface for the GTD5. There are two channels per card and the transfer rates are programmable from 110 to 9600 baud. It provides for Full Duplex Asynchronous Transmission via a:

- 12 volt 20 mA current loop.

  AND

- RS/232C interface per channel.

8.1.2 Physical Restrictions

The GTD5 switch can be databased with a maximum of 61 terminals. Terminal assignment restrictions include the following:

- TERM1 is always assigned as the Local ACDC terminal (LCDT) and is the only terminal with 19,200 baud capabilities.
- TERM2 is always assigned as the Remote ACDC (RCDT) terminal.
- TERM3 is generically assigned to IOUD0.0.0.
- TERM4 is assigned to IOUD1 .0.0.
- TERM5 is assigned to IOUD0.0.1.
- TERM6 is assigned IOUD10.1 .
- TERM64 is reserved as the ADC collection (ADCC) terminal and cannot be deleted.

NOTE: All other terminals can be assigned to any available ICIC card location.

8.1.3 Electrical Restrictions

Two high-speed devices (devices that operate at 2400 baud or higher are considered high-speed) must not be assigned to the same ICIC board when one of the ports is being used to input data. If two high-speed devices are assigned to the same board and either device inputs a message, data loss can occur.

8.1.4 Terminal Naming

The terminal names available for LOCAL and REMOTE terminals are found in the Users Guide, Pan 13, under the MAKE TERM command.

8.1 GTD5 Port Applications, continued

8.1.5 Typical Base Unit

The Typical Base Unit (1 - 15,000 lines) terminals are assigned per the following number of terminals, associated AUXI name, and terminal numbers needed for each function.

The following chart describes Typical Base Units and terminals.

Number of Terms	Typical Base Unit	AUXI Name	Terminal Number
1	LOCAL ACDC		1
1	NDR PORT		2
1	LOCAL TTY	LPMC	3
1	LOCAL TTY	LMTOO	4
1	TSM PORT	RMCS	5
1	PTC TTY	LPTCOO	6
1	RCDT I/O PORT	RMTOO	7
1	Spare Port		8
2	LOCAL DIAL-UPS	RMTxx	9-10
1	NETMOS PORT	RNSMOO	11
9	Spare PORTs		12 - 20
4	SAM PORTs	RSPxx	21 - 40
?	4TEL TTY	RLTTXX	41-50
?	LOCAL TTY	(extras)	51 -- 60
2	RFD PORTs	RMT03-04	61 - 62
1	Spare PORT		63

8.1 GTD5 Port Applications, continued

8.1.6 Medium Base Unit

The Medium Base Unit (15,001 - 40,000 lines) has terminals assigned per the following number of terminals, associated AUXI name, and terminal numbers needed for each function.

The following chart describes Medium Base Units and terminals.

Number of Terms	Typical Base Unit	AUXI Name	Terminal Number
1	LOCAL ACDC		1
1	NDR PORT		2
1	LOCAL TTY	LPMC	3
1	LOCAL TTY	LMTOO	4
1	TSM PORT	RMCS	5
1	PTC TTY	LPTCOO	6
1	RCDT I/O PORT	RMTOO	7
1	SPARE PORT		8
2	LOCAL DIAL-UPS	RMTxx	9 - 10
1	NETMOS PORT	RNSMOO	11
9	SPARE PORTs		12-20
6	SAM PORTs	RSPxx	21 - 40
?	4TEL TTY	RLTTXX	41-50
?	LOCAL T-W	(extras)	51-60
2	RFD PORTs	RMT03-04	61-62
1	SPARE PORT		63

8.1 GTD5 Port Applications, continued

8.1.7 Large Base Unit

The Large Base Unit (40,000 plus lines) has terminals assigned per the following number of terminals, associated AUXI name, and terminal numbers needed for each function.

The following chart describes Large Base Units and terminals.

Number of Terms	Typical Base Unit	AUXI Name	Terminal Number
	LOCAL ACDC		1
1	NDR PORT		2
1	LOCAL TTY	LPMC	3
1	LOCAL TTY	LMT00	4
1	TSM PORT	RMCS	5
1	PTC TTY	LPTC00	6
1	RCDT I/O PORT	RMT00	7
1	SPARE PORT		8
2	LOCAL DIAL-UPS	RMTxx	9 - 10
1	NETMOS PORT	RNSM00	11
9	SPARE PORTs		12-20
8	SAM PORTs	RSPxx	21 - 40
?	4TEL TTY	RLTTXX	41 -50
?	LOCAL T-t-Y	(extras)	51 - 60
2	RFD PORTs	RMT03-04	61 - 62
1	SPARE PORT		63

8.2 Input/Output (I/O) Message Standards

Terminal inputs, outputs, and echo assignments follow the standard IOSTD.EXE file located on the NOC - OLS BBS. This is an executable file which unarchives itself. It contains instructions necessary to implement the standard for any GTD5 switch. I/O message standards have the following restrictions

- Input - Message class 0 is allowed input from any terminal that is cutover and cannot be denied.
- Output - There are no output restrictions.
- Echo - Assignments are assigned for TERM 3 through TERM 63.

8.3 Test Parameters

Test parameters include:

- Line threshold.
- Span threshold.
- Password security.

8.3.1 Line Threshold

Line thresholds are user defined by the SET LTT THRE command. The LTT DEF and LTT CHOI commands determine what tests are run on lines for DIAGS and ROUTINES. The standard for these fields is *(ltt.exe)* is on the NOC - OLS BBS. The fields definitions are in the Users Guide, Part 6.

8.3.2 Span Threshold

The SET NERT command is used to establish network error threshofds for FIUs, TCUs, RSUs, RLUs, and EDLC cards. Threshold errors include the following:

- FLUs errors thresholds are available for:
  - Clock synchronization errors per hour.
  - Parity errors per hour in the channel-select memory of an FIU.
  - Peripheral processor bus access errors to an FIU.
  - Bipolar violations per line per second.
  - CRC errors per path per second.
- Network error thresholds for TCUs, RSUs, and RLUs include:
  - PCM and nonPCM error thresholds.
  - The number of controller errors per hour tolerated on each TSW.
  - Clock-skip errors per hour in an RSU or RLU.
- The threshold for slip errors tolerated per hour on a T1 span can also be set with the SET NERT command.

NOTES: Error thresholds for the EDLC cards Includes the following error thresholds:

- **Maskable Interrupt.**
- **Nonmaskable interrupt.**
- **Processing error.**

A minor alarm performance error threshold percentage per D-channel is provided for LAPD. This:

- **Establishes the standard that is implemented for all GTD5 switches.**
- **Provides equal presentation of alarms to the NOC MONITOR & CONTROL for evaluation and escalation of alarms.**

The standard for NERT values is the DEFAULT value found under SET NERT in the Users Guide, Part 13.

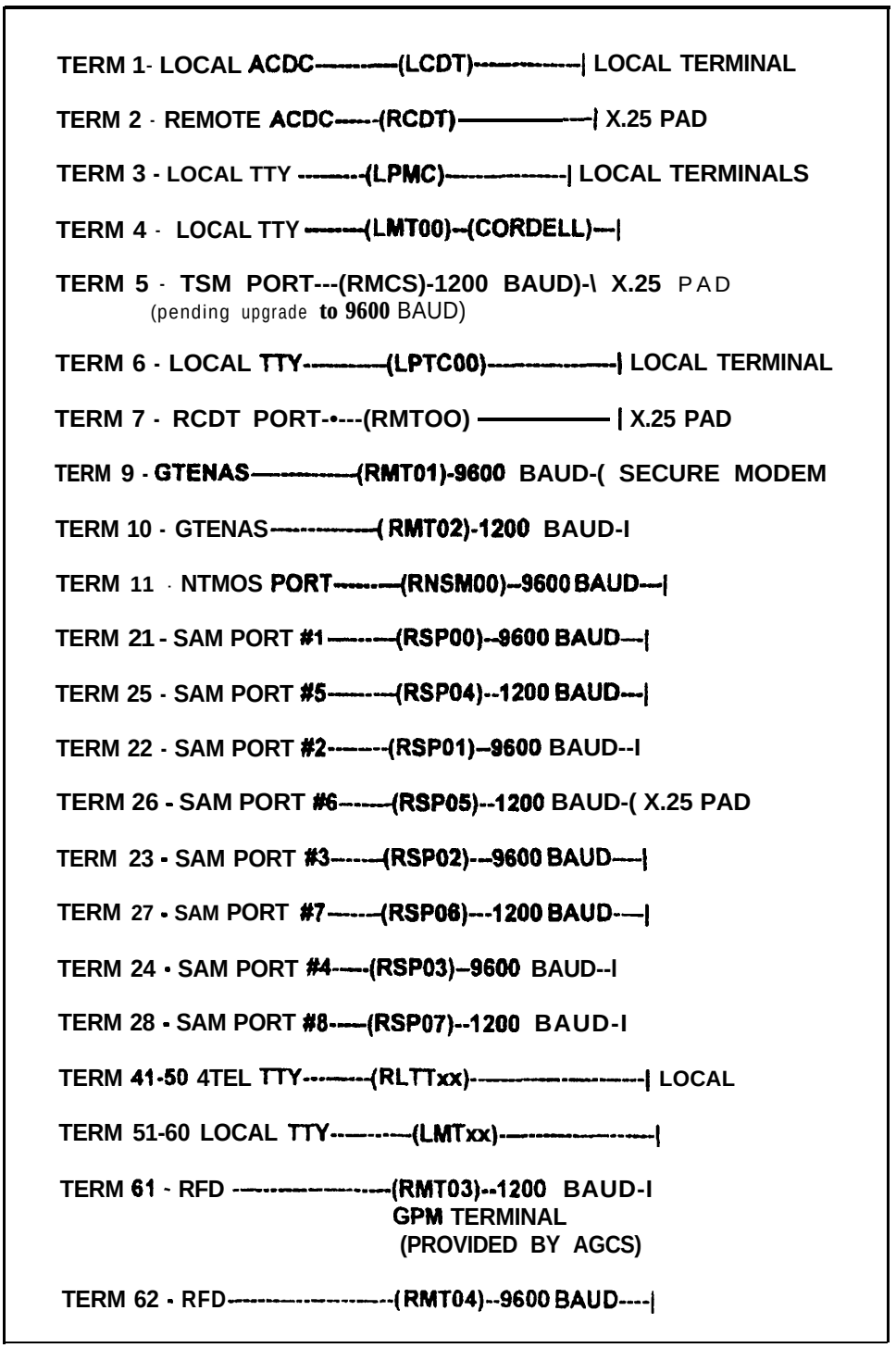
8.3 Test Parameters, continued

8.3.3 Password Security

GTD5 provides password security, however, this feature must not be used due to the available system access security provided by GTENAS, SAM, NDR, TSM, etc.

8.4 Switch Diagrams

The following illustration describes terminal assignment switch diagrams.



8.5 5ESS Port Applications

The following 5ESS Port applications include:

- Port connections.
- Port configuration.

8.5.1 Port Connections

me 5ESS port connectivity is as follows:

- X.25 DIRECT CONNECT TTY's include:
  - ttyh (7) (4800) - TRAFFIC PORT (TDCS/UDC).
  - ttyr (17) (4800) - NOC TSM LOGGING CHANNEL.
  - mtty (O&I) (9600) - NOC MCC to NDR CONNECTION via the following spitter/line boosters:
    - Splitter Port #I to PAD (ACP50).
    - Splitter Port #2 to MCRT.
    - Splitter Port #3 (vacant).
- Private Line (PL) TTY's - ttyU(46) - 4TEL Learn Port.
- SAM TTY's include:
  - ttyp (15) (4800) - SAM1 RCV (Trap and Trace).
  - ttyq (16) (4800) - SAM2 RCV - (APPRC AND APPTEXT.
  - ttyw (22) (4800) - SAM3 RCV - (APPRC AND APPTEXT).
  - ttyn (13) (4800) - SAM4 TLWS (CFTSHL).
  - ttyo (14) (4800) - SAM5 TLWS (CFTSHL).
  - ttys (18) (4800) - SAM6 RCV - (as required).
  - ttyu (19) (4800) - SAM7 RCV - (as required)
  - ttyt (20) (4800) - SAM8 RCV - (as required).
  - ttyv (21) (4800) - SAM9 RCV - (as required).
  - ttyk (10) (4800) - GTENAS TLWS.
- Local TTY's include:
  - ROP O/I (4800) Cordell ISD2000 (port #8).
  - tty1 (11) (4800) - Local Office TLWS #1.
  - ttym (12) (4800) - Local Office TLWS #2/RCV (local option).
  - ttyR (43) (4800) - Cordell ISD2000 (port #2).
  - BST (1200) - Local Billdats (BST) console.

8.5 5ESS Port Applications, continued

8.5.2 Port Configuration

The switch configuration for the SAM ports is as follows:

- Device form logical devname =*tty(x)* -Where x is the lower case alpha character associated with the SAM terminal.
  - Field #7 *maxq* = 300.
  - Field #8 *blksize* = **3100.**
  - Field #9 *linelen* = **132.**
  - Field #49 ***protocol*** = sccs_prot.
- Getty form *gettyrec* = *getty(x)* -Where x is the lower case alpha character associated with the SAM terminal.
  - Field #2 ***gettyname*** = *shlgetty.*
  - Field #3 ***getty dir*** = */cft/shl.*
  - Field #4 ***shlname*** = */cft/bin/pdshl.app.*
  - Field #6 ***ptompt*** = *y.*
- Ciopt form option name = *ttyop(x)* -Where x is the number of the SAM terminal – Field #2 *ttopt* name = *PDS48*(4800 baud).
- Ttopt form *option_name* = *PDS48* – *field* # 60 *wdth* = 732 (This is a change from the default of 80).
- SAM TLWS terminals are configured as follows:
  - Device form logical *devname* = *tty(x)* – where x is the lower case alpha character associated with the SAM terminal.
    - Field #7 *maxq = 300.*
    - Field #8 *blksize = 3100.*
    - Field #49 *protocol* = sccs_prot.
  - Getty form *gettyrec* = *getty(x)* – where x is the lower case alpha character associated with the SAM terminal.
    - Field #2 *gettyname = shlgetty*.
    - Field #3 *getty dir = /cft/shl*.
    - Field #4 *shlname = /cft/bin/pdshl. app.*
    - Field #6 *prompt* = y.
  - Ciopt form option name = *ttyop(x)* – where x is the number of the SAM terminal – Field #2 *ttopt* name = PDS48C (4800 Color).

8.6 I/O Message Standards

Output message class assignments are posted on the NOC - OLS BBS. Specific information pertaining to system and file access can be obtained by calling NOC 5ESS OLS.

8.7 5ESS Test Parameters

The 5ESS test parameters include the following:

- Customer line testing-The 5ESS has generic values for testing customer line faults. These are not database changeable by GTE.
- Digital span line threshold-The 5ESS digital span line thresholds are set using the default values assigned in performance monitoring. Refer to Recent Change/Verify, View 22.15. These groups are:
  - DF2DEF - Performance Monitoring Group for DLTU.
  - PMDEF - Performance Monitoring Group for DSL's.
  - FACDEF - Performance Monitoring Group for IDCU facilities.

8.8 Password Port Security

No ID or password security can be used within the 5ESS. Placing passwords on ports accessed by server systems causes the logon process to fail. All password functions are performed per Section 7. All direct dial-in ports assigned to modems must be provisioned in accordance with Section 7.2.

8.9 Switch Diagram

Detailed diagram infofmation – SDL not shown. SDLs are hard-coded in the 5ESS and assigned according to the application and not the SDL number. The typical SDLs are shown the GTED-384 illustration. Obtain the illustration from the Switching Engineering Group serving the Region. (The GTED-384 is not a site specific drawing, therefore it is not automatically distributed to all sites.)

8.10 DMS1 00, DMS1 00/200, and DMS200 Port Applications

The following chart describes DMS100, DMS100/200, and DMS200 port applications.

Port Applications	Description
Hardware	• I/O ports are provisioned with the 1X67 type card. • Ports are set to: BAUD 1200, PARITY NONE, DATA BITS 8, STOP BITS 1, although the SAM ports are configured to 2400 baud. • For special applications, when a higher baud rate is required, as in the case of the TRAFFIC PORT (TDCS), the port can be set for 4800. In this application only one port is assigned to the 1X67 card. • Other special applications, such as Network Switch Management (EDAS_NTM), require the 1X89 Multiprotocol Converter.
Physical Restriction	The DMS100/200 Supernode supports a maximum of 20 10Cs. Each IOC supports 9 controller cards. The controlling cards include: • Disk drive unit - 1X55. • Magnetic tape drive - 1X68. • Terminal controller - 1X67. • Multiprotocol converter - 1X89.

(continued)

8.10 DMS100, DMS100/200, and DMS200 Port Applications, continued

Port Applications	Description
Electrical	Terminal Controller - 1X67AB and 1X67CB cards support 1200 baud per port or one port at 4800 baud. NT will not guarantee data integrity-of any port over 1200 baud.
Software naming	The DMS software data fill supports any alphanumeric characters up to 8.
Typical Base Unit	The minimum port requirements for a Host Complex of 1 - 15,090 lines includes the following for a DMSlOO or DMS100/200: • Four SAM ports. **NOTE: SAM1 is used to output CLI/TRAP and TRACE logs plus other line and switch fault messages. No inbound switch access is permitted on this port.** • One NDR port (NDR). • One TSM port (TSM). • One Office Maintenance Port (MAP). • One Office Log Printer (MAPPRT). • One **NTMOS** Port, if required by NSM, install a 1X89 card. • One NOP port that requires 1X89 card. • One Local Dial-up (GTENAS1). • One FX Dial-up (GTENAS2). • One TRAFFIC port (TDCS). • One BMC port that is connected to the network.
Medium Base Unit	The minimum port requirements for a Host Complex of 15,001 - 40,000 lines for a DMSlOO or DMS100/200 includes: • All the ports listed for a typical base unit. AND • Two additional SAM ports.
Large Base Unit	The Large port requirements for a Host Complex of 40,001 ± lines includes the following for a DMSlOO or DMS100/200: • All the ports listed for a typical base unit. AND • Four additional SAM ports.
TOPS Base Unit	The DMS200 port requirements for a nonline complex includes all the ports listed for a typical base unit minus two SAM ports (total of 2 SAM ports).

8.11 I/O Message Standards

The following chart describes I/O message standards.

Standards	Description
Mandatory Message Restriction	All CLI and selected maintenance logs are directed to SAM1 port and all CLI and maintenance logs to the TSM port as a minimum requirement. All OM reports are directed to ports designated as traffic ports. No OM type report is directed to TSM or SAM1 except the SPMS and AMREPORT, which can be assigned to a maintenance log class. Maintenance log classes are assigned accordingly: • Classes 22 - 31 are assigned to the OM reports. • Class 20 is used for CLI LINE logs. • Class 21 is used for CLI TRK logs. • Classes 1 - 19 are assigned to maintenance type logs. • Class 0 is unassigned.
Input Restriction By Port Application	There are no input restrictions on the DMS100/200. However, the SAM#1 and TSM ports are output only.
Output Restriction By Port Application	The SAM1 and TSM ports are set to output selected maintenance log classes: • CLI logs - Classes 20 and 21. • Maintenance logs - Classes 1 - 19. All ports designated as traffic TDCS receive only OM reports and OM logs - Classes 22 - 31.
Echo Message Restriction	All output messages are defined to a specific port. Changes from the standard are not permitted.
Local Options Restriction	All t/O message classes are defined and may not be changed or reassigned by local maintenance or support work groups.
NOC - OLS BBS	No files reside on the NOC - OLS BBS that define the I/O message classes or port assignments.

8.12 Test Parameters

The following chart describes test parameters.

Test Parameters	Description
Local Customer Lines	me threshold values for POTS lines are the standard that must be followed (refer to NTP 297-1001-594). Table ALTSCHED or the ALT Map level LIT allow for customer assignable options. All test related parameters are set to the default values recommended by NTl as defined in the following chart. Tip to Ring / Tip to Ground / Ring to Ground Parameter Min Max Min Max Mins Max Volts DC -10 +10 -60 i-60 -60 +60 Volts AC 0 10 0 120 0 120 RES(kohm) 800 INF 800 INF 800 INF CAP (uf) 0 4 0 4 0 4
NOC – OLS BBS	No files reside on the NOC - OLS BBS that define the customer line testing parameters that must be set to a specific value.
Recovery/Diagnostic Hardware Threshold	DMS100/200 supports: There are no parameters for the user to set for these tests. • In-service testing. • Out of service tests. • Rex testing.
NOC - OLS BBS	No files reside on the NOC - OLS BBS that define the standard recovery/diag hardware parameters that must be set to a specific value.
Digital Span Line Threshold	DMS span line thresholds are database-definable in Table CARRMTC. Set the parameters to NTl recommended default values.
NOC - OLS BBS	No files reside on the NOC - OLS BBS that define the standard digital span line threshold parameters that must be set to a specific value.

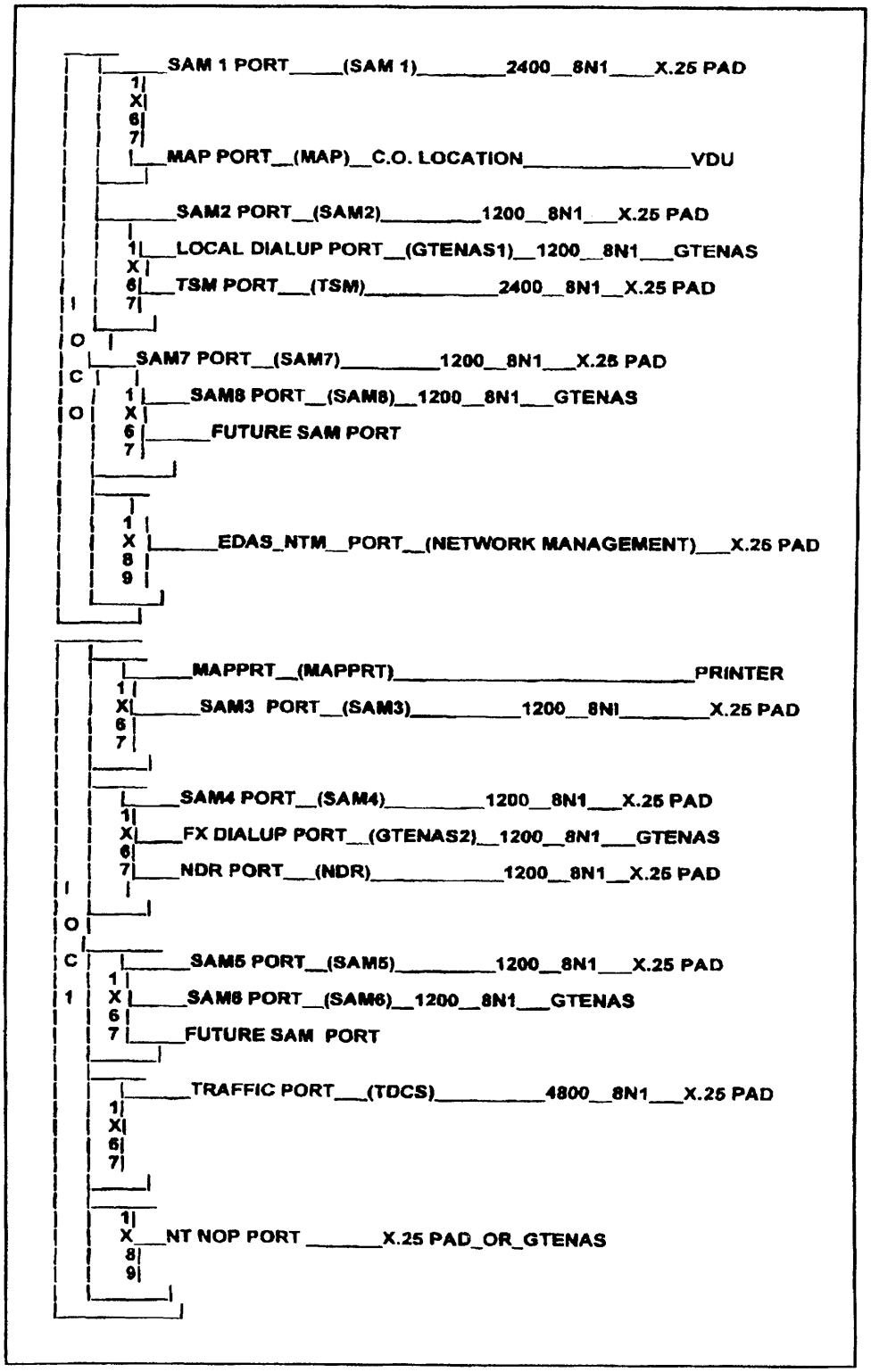
8.13 Password Security

The following chart describes password security parameters.

Security Parameters	Description
Server Application	All DMS Base units rely on the servers (SAM, TSM, TDCS, etc.) for password security. Therefore, parameters must be set in accordance with the DMS 100/200/100-200 switch diagram.
Enhanced Password Feature	In the DMS100, password security is controlled by the parameter **ENHANCED_PASSWORD_CONTROL** in table OFCOPT This table can only be changed at the time of a new software load. When this parameter is set to "YES", the following parameters are created in table OFCENG: • *EXPIRED-PASSWORD-GRACE* – Specifies the number of logons for which a password can be used if the password is older than the value of parameter *PASSWORD_LIFE TIME.* This parameter must be set to 32767. • *PASSWORD_L/FETIME* – Determines the duration, in number of days, that a password can be used. This parameter must be set to 32767. • *MIN_PASSWORD_LENGTH* – Specifies the minimum number of characters that are allowed for the logon password. This parameter must be set to the default of 6.
Nonprotected Ports	The only port that will not interface with a server is the NOP port. This port is used by NTI and NOC - OLS. It uses X.25 protocol with a GDC V.Fast 28.8K modem, that provides access at 19,200 bits per second to download patches.
Password Aging Multiuser	This feature is applied as the server standards.

8.13 Password Security, continued

Refer to the following DMS 100/200/100-200 switch diagram.



8.14 DMS10 Port Applications

The following chart describes DMSlO port applications.

Port Applications	Description
Hardware	• I/O ports are provisioned with the NT3T09, NT3T80AA, or NT3T80BA Serial Data interface Pack. Ports are normally set to: BAUD 2400, PARITY NONE DATA BITS 8, STOP BITS 1. Tests indicate the baud rate must not exceed 2400 baud to ensure that data loss does not occur. • NT3T09 Serial Data Interface Pack -This card supports up to 4800 baud with one port per card. • NT3T80AA Serial Data Interface Pack -This card supports up to 9800 baud with two ports per card. • NT3T80BA Serial Data Interface Pack -This card supports up to 19,200 baud with two ports per card.
Physical Restriction	The DMSlO supports a maximum of 32 I/O ports. The TTY 0 and TTY 1 ports are designated on-site maintenance terminals and interfaced to the switch with NT3T71 packs. The remaining ports are assigned as TTY 2 through TTY 31.
Minimum Port Requirements	The minimum DMSlO port requirements for a Typical Base/Host Complex with 1- 15,000 lines are: • Three SAM ports for a DMSlO standalone base unit (nonHS0). • Four SAM ports for a DMSlO base unit HSO/SSO configuration. **NOTE: SAM#1 outputsCLI/TRAP and TRACE plus other line and switch fault messages.** • Two office maintenance terminals. • One TSM port. • One Local Dial-up. • One FX Dial-up.

8.15 I/O Message Standards - Maintenance Messages

The following restrictions effect maintenance messages:

- CLI, TRAP and TRACE, all CLI/TRAP and TRACE plus other line and switch fault and maintenance messages are directed to the SAM#1 and TSM port.
- Input restrictions - IPAL options determine the expected input to a specific port.

8.16 Threshold Test Parameters

Test parameters effecting the following thresholds:

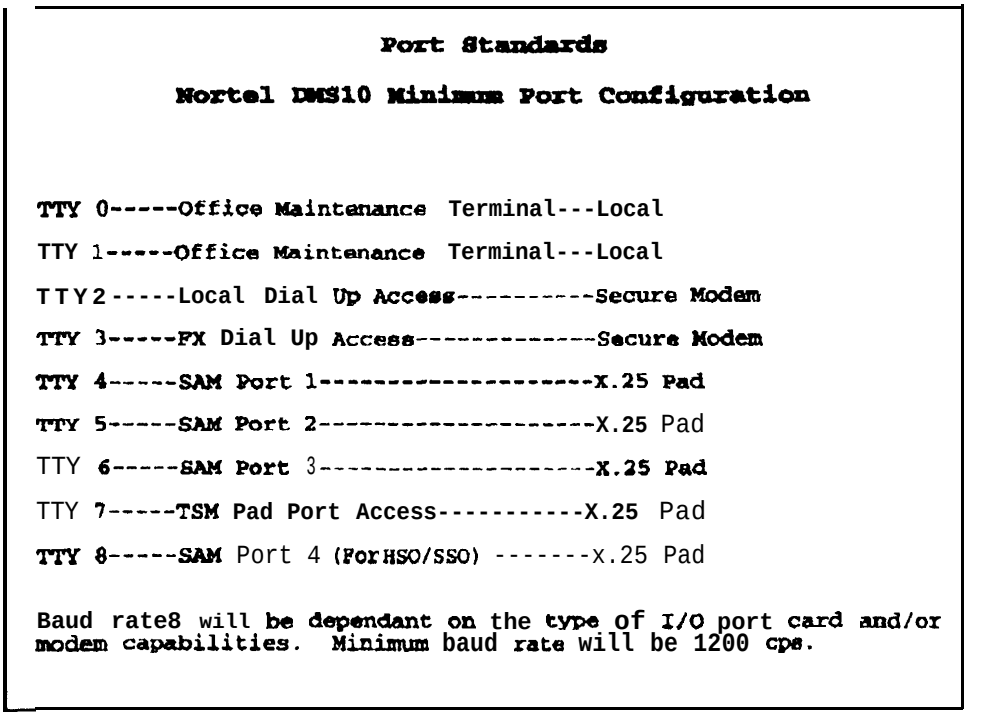
- Local line threshold values for POTS are the standard that must be followed (refer to NTP 297-3401-311).
- Span line thresholds-The bipolar violation, slip, and frame loss out-of-service limits are defined in NTP 207-3401-311. These thresholds are user definable, but NTI standards must be used.

8.17 Server Access Security

All DMS Base and HSO/SSO sites rely on the following servers for password security:

- SAM.
- TSM.
- TDCS.

Refer to the following terminal assignment switch diagram.



Port Standards

Nortel DMS10 Minimum Port Configuration

TTY 0-----Office Maintenance Terminal---Local

TTY 1-----Office Maintenance Terminal---Local

TTY 2-----Local Dial Up Access----------Secure Modem

TTY 3-----FX Dial Up Access-------------Secure Modem

TTY 4-----SAM Port 1--------------------X.25 Pad

TTY 5-----SAM Port 2--------------------X.25 Pad

TTY 6-----SAM Port 3--------------------X.25 Pad

TTY 7-----TSM Pad Port Access-----------X.25 Pad

TTY 8-----SAM Port 4 (For HSO/SSO) -------x.25 Pad

Baud rate8 will be dependant on the type of I/O port card and/or modem capabilities. Minimum baud rate will be 1200 cps.

Stromberg Carlson DCO Port Applications

The following chart describes Stromberg Carlson DCO port applications.

Port Applications	Description
Hardware	The I/O cards associated with the DCO have specific guidelines (both physical and electrical) that must be followed.
Physical Restriction	• The DCO is capable of handling 32 ports/channels (0 - 31) by using the 814721-676 SLU card. • A fully equipped DCO requires two SLU boards and a second SLU panel. The SLU board has 16 ports/channels and are identified as SLU A and SLU B. • Physical ports reside on the 814721-066 or 814721-216 SLU daughter board. Each daughter board supports two ports. The daughter board: - Has no restrictions on what baud or other characteristics each port can support. - 814721-066 SLU is a 25-pin RS232 configuration. - 814721-216 SLU is a 9-pin RS232 configuration. - Serial data interface cables used on these ports cannot exceed EIA data standards. • The DCO's first four ports are labeled TT00/SW0 - TT00/SW3 are common and under thumbwheel control located on the 814721-676 SLU board. • OLS must be notified that a software change to the MP Startup File must be made if ports are added to the DCO. • The 814721-676 SLU card resides in the maintenance processor.

(continued)

8.18 Stromberg Carlson DCO Port Applications, continued

Port Applications	Description
Electrical Restriction	• The advertised baud rate settings is not the true throughput for the DCO. The actual bit rate that the DCO processes is about 2000 bps. Therefore, the baud rate must not be set for over 2400 bps. • The minimum baud card setting is 300 bps and the maximum baud rate is 9600 bps. • Ports named TT00/SW0 - TT00/SW3: - Are common to each other. - Cannot be assigned with different baud rates or parity/character length/stop bits. - Are set for 1200 baud/even parity/7 bits character length/l stop bit. - Have no restrictions for combining ports or for ports named channel. . DAUGHTER BOARD 814722-XXX supports two separate channels that are independent of each other. • Overlays $SLUUTL and $SECTTY are used for software administration of ports. • Refer to the Siemens Stromberg Carlson Publication Number 00-030 Part 2 for additional information about the SLU card and Panel.
Naming Conventions	Ports in the DCO are only named for their hardware location. Example: TT00/SW0 - TT00/SW3 (SW indicates the thumbwheel position) CHANNEL 1 - CHANNEL 31. No provisioning has been made to allow name assignments for routing purposes.
Typical Base Unit	The typical application of 1- 15,000 lines has: • Four SAM ports assigned along with the system console/TT00. • Channel 1 for a local maintenance terminal. • One secured dial-up terminal for vendor access on TT00/SW2.

(continued)

All other marks are the property of their respective owners.

8.18 Stromberg Carlson DCO Port Applications, continued

Port Applications	Description
Typical Base Unit, continued	The secured dial-up can be used if the need arises by: • Local forces. • Network Reliability. . OLS. If the site has a BMC, a modem must be connected for maintenance or an FEP (Cordell C-6000 or Cordell ISD2000). Ail modems must be configured for access via the GTENAS for security purposes. The following table describes Typical Base Unit port assignments. Seven 814722-XXX cards are required to support the following configuration.

Port	Assignment
TT00/SW0	Connected to the system console.
TT00/SW1	Connected to TSM.
TT00/SW2	Connected to a secure modem/GTENAS (dial-in)
TT00/SW3	SAM port number 1
BMUX	Do not use.
Channel 1	Connected to a local maintenance terminal.
Channel 2	Spare/2nd modem if required/GTENAS access (dial-in).
Channel 3	Spare.
Channel 4	Vacant spare.
Channel 5	SAM port number 2.
Channel 6	SAM port number 3.
Channel 7	SAM port number 4.
Channel 8	Future SAM port number 5.
Channel 9	Future SAM port number 6.

(continued)

8.18 Stromberg Carlson DCO Port Applications, continued

Port Applications	Description
Medium Base Unit	The medium application of 15,000 - 40,000 lines has five SAM ports assigned along with the same number of ports used for the typical base unit application.
Large Base Unit	The large application of 40,001 and greater has six SAM ports assigned along with the same number of ports used for the typical base unit application.

8.19 I/O Standards

I/O messages must meet the standards described in the following chart.

Standards	Description
Mandatory Message Restriction	• Mandatory message assignments have all AMP system messages routed to all the System Console/TT00 switch positions. This is the default from the manufacturer. • The only exception for any other termination points (other than the system console) are sites where, due to the volume of malicious call traps, there is a local requirement to store the call traps in an ISD2000 device on-site (i.e., college, nuclear power plant, or a similar exception).
Input Restriction	The TT00/SW3 SAM # 1port is restricted to one way only outbound messages. SAM restricts traffic by blocking incoming messages to this port.
Output Restriction	Output restriction means no routing of system console messages to any port except for the local maintenance port. The command string *$RRTUTL* is: • Used for testing/troubleshooting purposes. • Terminated after troubleshooting is completed.
Echo Message Restriction	Same as output restriction.
Local Options Restriction	Same as output restriction.
NOC - OLS BBS	The NOC - OLS BBS lists files that enable Network Reliability/on site personnel to download PROCOMM PLUS script files that perform the changes automatically to the associated overlays/files in the DCO. Contact the DCO NOC - OLS Support group for access arrangements and file download instructions in the SAMs file.

8.20 Test Parameters

The following chart describes test parameters.

lest Parameters	Description
Local Customer Lines	Threshold values are found on the NOC - OLS BBS under Siemens Stromberg DCO.
Recovery/Diagnostic Hardware	Threshold values: • Are located in CFSITE. • Are established by the OLS/Vendor. • Can result in a total system outage if set incorrectly. • Can only be changed by OLS. **NOTE: The values and locations are not publlshed.**
Digital Span Line	Threshold values for faults and alarms is found on the NOC - OLS BBS under Siemens Stromberg DCO.

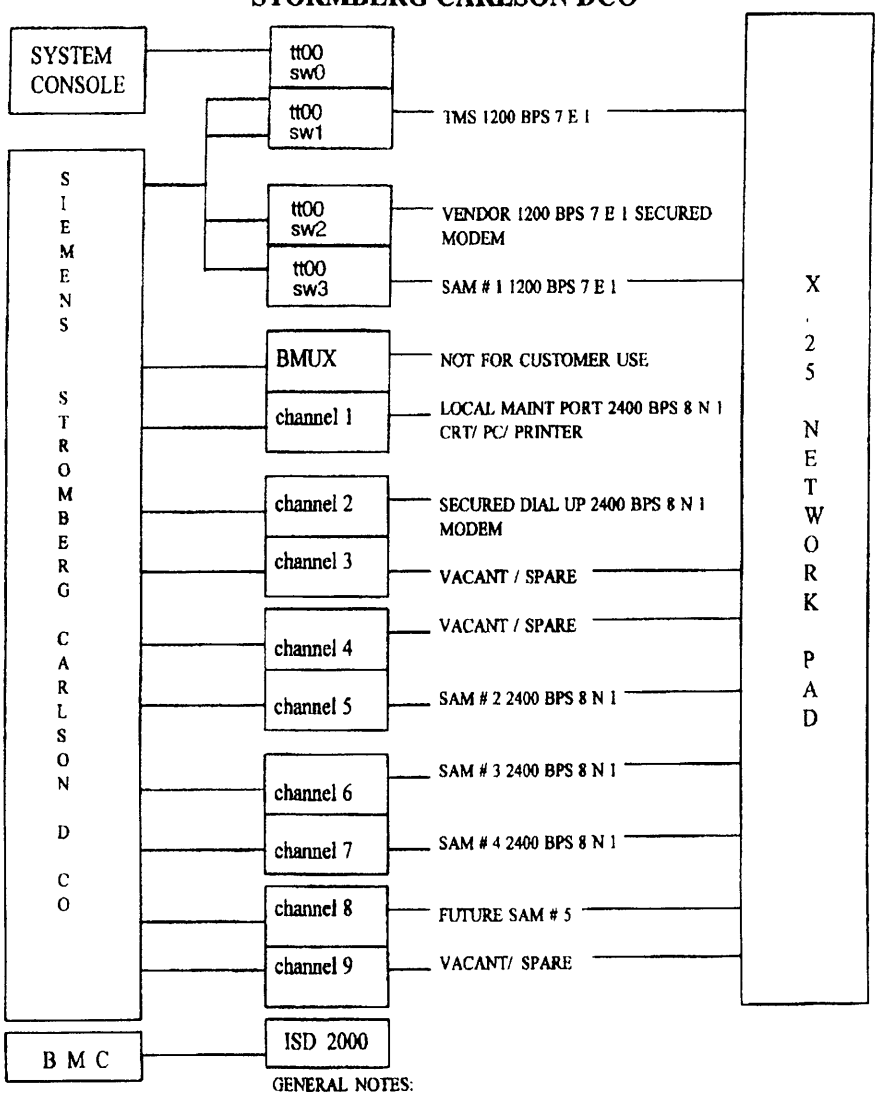
8.21 Password Security

The following chart describes password security parameters.

Security Parameters	Description
Server Application	Server applications have a standard username/password that is: • Used at all DCO sites. • Located in a script file on the NOC - OLS BBS. • Transparent to the user accessing the server due to the server performing the logon and logout of the DCO ports. • 1- 8 alphabetic characters.
Nonprotected Ports	• Nonprotected ports (those not connected to the servers) must be accessed by a secure modem through GTENAS if they are not a local terminal. • Local terminals must always be logged off after each session is completed.
Password Aging Multiuser	Is available in Release 19.0. OLS does not recommend its use because Security is already managed by TAMS and GTENAS.

8.22 No. 2 EAX Port Applications

Refer to the following switch diagram.



GENERAL NOTES:

1. All ports are interfaced via the SLU panel (above drawing) and SLU board/ s in the DCO. SLU (Serial Line Unit)
2. SLU Board part number 814721-676 or greater.
3. A full equipped DCO can support two SLU Boards 814721-676. Each SLU can support a maximum of 16 ports. Port interface to the SLU is via SLU "Daughter" boards. There are two (2) Types.
4. Daughter Board/ S part numbers are as follows: 25 PIN RS232 requires an 814722-066, 9 PIN RS232 requires an 814722-216
5. The first Four (4) Ports Designated "tt00/swx?" are regulated via a thumbwheel located on the 814721-676 SLU board. The thumbwheel must remain in the position four (4) for these ports to operate correctly. If the thumbwheel is left in any position other than 4 only one port will have 2 way communication. All others will only receive switch output messages. Also, these (4) ports are required to be strapped and declared identical to each other.
6. The ISD 2000 or Cordell should have system console / TMS routed through it, along with BMC.

8.22 No. 2 EAX Port Applications, continued

The following chart describes No. 2 EAX port applications (see Section 8.24 for No. 2 EAX switch diagram).

Port Applications	Description
Hardware	• Use *ADD/CHANGE TERMx.x TTS TCR120* CR7 terminal features when adding a terminal in recent change (refer to the Recent Change Manual, Part 10.2). Terminal x has a SOFT COPY (S) 1200 BAUD (TCR120) and *TERMINAL* TYPE (CRT). • The No.2 EAX system only supports 1STOP BIT, 7 DATA BITS, and EVEN PARITY. • me AGCS EC-12295 is a DTE configured cable that connects to an EIA front tab FB-15984. • The DCE application in the following chart: - Maintains the No.2 EAX terminal in-service. - Allows the terminal to pass diagnostics without the use of a 104 adaptor. (see Section 8. 24). **NOTE: No changes are made to the front tab end of the EC-12295 cable.**

Front Tab Connector Terminal	6 Pair Cable (9 leads used)	New EIA Connector Pin
SA	white/blue	2-See note 1.
SH	red/blue	3 -See note 2.
SE	white/slate	See note 3, solder and tape.
SQ	green/white	See note 4.
RA	blue/white	
RD	brown/white	
RE	slate/white	See note 5.
RH	blue/red	
RQ	white/green	
Wires	white/brown	Wires
Not used	orange/white	Not used
Not used	white/orange	Not used

(continued)

8.22 No. 2 EAX Port Applications, continued

Port Applications	Description
Hardware, continued	**NOTES:** **1. Wire terminated on pin 3 of the original female connector.** 2. **The red/blue wire Is terminated on pin 2 of the original female connector.** 3. **The white/slate wire** is **terminated on pin** 4 **of the original female connector.** 4. **The green/white wire is termlnated on pin 5 of the original female connector.** 5. **All five wires are terminated on pin** 7 **of the original female connector.**
Hardware Physical Restriction	The No.2 EAX: • Is timited to 16 terminals. • Has two ports per card (FB 15984). • Does not support 8 DATA BIT, NO PARITY OPERATION.Terminal controller -- 1 X67.
Electrical Restriction	The No.2 EAX electronic restrictions are: • 1200 baud. • Fixed EVEN, ONE STOP BIT, 7 DATA BITS.

(continued)

8.22 No. 2 EAX Port Applications, continued

Port Applications	Description
Software Naming Convention	The following chart describes the No. 2 EAX port software naming conventions.

Port	Naming Convention
CMT1	Common maintenance terminal one.
CMT2	Common maintenance terminal two.
RMT	Remote maintenance terminal.
RAT	Remote alarm terminal.
RTFT	Remote traffic facilities terminal.
RTAT	Remote traffic analysis terminal.
RNST	Remote network and switch management terminal.
RSOT	Remote service office terminal.
RLTT	Remote line test terminal.
SOT	Service off ice terminal.
TTT0	Trunk test terminal zero.
TTT1	Trunk test terminal one.
TTT2	Trunk test terminal two.
TTT3	Trunk test terminal three.
TST	Trunk supervisory.

(continued)

8.22 No. 2 EAX Port Applications, continued

Port Applications	Description
Mandatory Message Restriction	The following chart describes how No. 2 EAX requires/allows message distribution.

Port	Naming Convention
CMT1	Common Maintenance Terminal one in CO.
CMT2	Common Maintenance Terminal two in CO.
TTT0	Trunk Test Terminal one in the CO.
SOT	Service Order Terminal is a remote terminal.
RMT	Remote Maintenance Terminal is a remote terminal.
RSOT	Remote Service Order Terminal is a remote terminal.
RNST	Remote Network and Switch Management Terminal is a remote terminal.
RTFT	Remote Traffic Facility Terminal is a remote terminal.

Base Unit

The No. 2 EAX configuration is the same for all base units. The typical base unit has terminals assigned according to the number of terminals needed for each function, associated AUX1 name, and terminal numbers.

Quantity	Name	Function
1	RMT	TSM/NOC port.
3	SAM	The following SAM ports do not have I/O restrictions: • SAM 1 - RTFT. . SAM 2 - RSOT. . SAM 3 - RTAT.

8.23 Input Output Message Standard

I/O message standards restrictions include:

- input restrictions by port application.
- Output message restrictions.
- Echo message restriction.
- Local restrictions.

NOTE: All the information concerning the No. 2 EAX I/O and terminal standardization is on the NOC - OLS BBS.

8.23.1 Input Restriction By Port Application

The following chart describes input messages restrictions. The options are mandatory to allow server access to all sites.

Terminal Function	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CMT1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CMT2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
RMT	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
RNST	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
RSOT	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
RTFT	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
SOT	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
TTTO	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

8.23.2 Output Message Restriction

Output message are described in the following chart. The following options are mandatory and provide the servers with the correct alarm (TRAP TRACE, etc.) from all sites.

output Message Class	OM Term RTG Type	Terminal Function		
		Primary	Alternate	Remote
ANNC	5	CMT2	CMT1	RMT
CDIA	6	CMT1	CMT2	RMT
CRCV	6	CMT1	CMT2	RMT
DMTM	6	RMT	RNST	CMT2
IDSP	5	CMT1	CMT2	RMT
LDIA	5	CMT1	CMT2	RMT
LPRM	1	CMT1	CMT2	
MLG	5	CMT1	CMT2	RMT

(continued)

8.23 I/O Message Standard, continued

8.23.2 Output Message Restriction, continued

output Message Class	OM Term RTG Type	Terminal Function Primary	Alternate	Remote
NSMI	1	RTFT	CMT2	
NSMM	1	RTFT	CMT2	
NSMO	1	RTFT	CMT2	
NSMT	1	RTFT	CMT2	
PDIA	6	CMT1	CMT2	RMT
PRCV	5	CMT1	CMT2	RMT
RC	5	RSOT	CMT2	CMT2
RESP	1	CMT1	CMT2	
SMAC	5	CMT2	CMT1	RMT
SMAH	5	CMT2	CMT1	RMT
SMAL	5	CMT2	CMT1	RMT
SMAO	5	CMT2	CMT1	RMT
SMAP	5	CMT1	CMT2	RMT
SMAR	1	CMT1	CMT2	
SMAS	5	CMT2	CMT1	RMT
SMAT	5	CMT2	CMT1	RMT
SMSU	5	CMT2	CMT1	RMT
STCN	5	CMT2	CMT1	RMT
SYSA	5	CMT1	CMT2	RMT
TDAF	1	RTFT	CMT2	Null Terminal
TDAT	1	RTFT	CMT2	Null Terminal
TDFT	1	RTFT	CMT2	Null Terminal
TDIA	5	CMT1	CMT2	RMT

8.23 I/O Message Standard, continued

8.23.3 Echo Message Restriction

This feature is not available. Refer to Sections 8.23.1 and 8.23.2. when setting all terminal message classes.

8.23.4 Local Restrictions

Local message reroutes or changes are not allowed to prevent processor overload and correct message routing to ail terminals.

8.23.5 Network Operations Center - On Line Support Bulletin Board Server

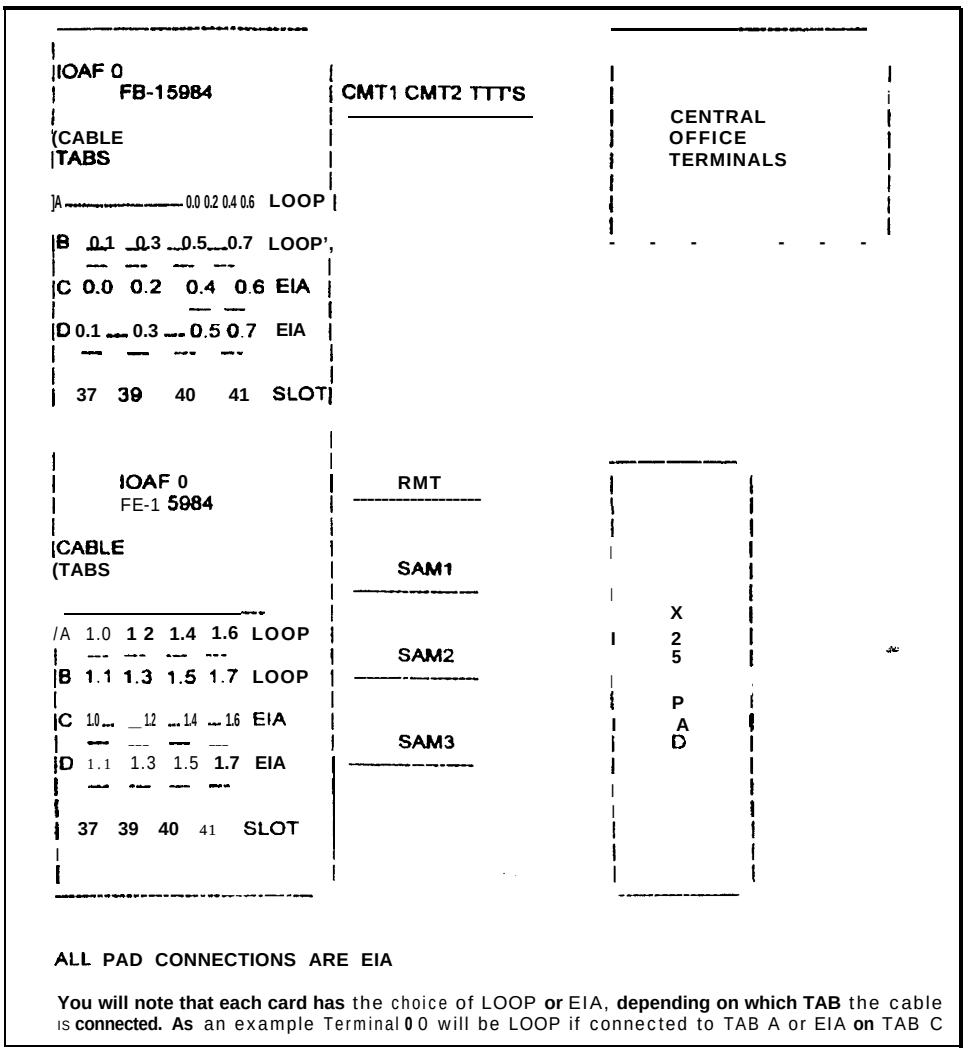
All information concerning the No. 2 EAX I/O and terminal standardization is on the NOC - OLS BBS.

8.24 No. 2 EAX Application

The following features are not applicable to the No. 2 EAX.

- Customer line testing is not applicable to the No. 2 EAX. However, ALIT is established generically and the parameters are not changeable.
- Password security is not applicable to the No. 2 EAX.

The following illustration describes the the No. 2 EAX office switch configuration.



8.25 1AESS Port Applications

The following chart describes 1AESS port applications.

Port Applications	Description
Hardware	With the majority of the I/O options generically defined the 1AESS switch possesses limited port diversity. The BAUD rate: • Is restricted by an I/O unit. • Must remain at 1200 baud for all ports unless otherwise noted.
Typical Base Unit	The following table describes the ports on the 1AESS unit.

NO.	Port	Baud	Assignment
1	TR1/TR2	1200	Traffic port (TDCS/UDC).
2	SCI	1200	NOC TSM logging channel.
3	MTTYa(0& 1)	9600	NOC MCC to NDR connection (via a 3 port splitter/line booster or a 3B20D attached processor).
4	Local TTYs:		
	LOC	1200	
	REM	1200	Local supplementary maintenance TTY.
	BST	1200	Local BST console.

(continued)

8.25 IAESS Port Applications, continued

Port Applications	Description
Typical Base Unit, continued	1AESS unit, continued.

No.	Port	Baud	Assignment
5	SAM TTYs:		
	XXX SAM1		Not equipped.
	SC2 SAM2	1200	Supplementary maintenance port.
	RCS SAM3	1200	Recent change access MARK/MSI, CARE, HELP, DBA, etc.

SAM 1 - Due to generic constraints with output **message routing**, SAM 1 **will** not be **configured** at this **time**.

SAM 2 - MAINTENANCE TTY's will be **configured as follows**:

SPEED: 1200, HALF-DUPLEX
DS: **202T/108** - PCK
PORT 0: **PLDS(OPER)**
PORT 1: PLDS(OPER)
PORT 2: **(UNAV)**
DCE XID: NO
ACU: NO
CARRIER: **CONT**
DIALUP: N O
CHANNEL USERS (0):

c. SAM 3 - RCN **TTY's** will be configured as follows:

SPEED: 1200, HALF-DUPLEX
DS: **202T/108** - TPCK
PORT 0: **PLDS(OPER)**
PORT 1: **DDD(OPER)**
PORT 2: **(UNAV)**
DCE XID: NO
ACU: NO
CARRIER: CONT
DIALUP: N O
CHANNEL USERS (0):

NOTE: Port 0 is the only port used. If port 1 and 2 are operational, they must be equipped with a bypass plug.

(continued)

8.25 1AESS Port Applications, continued

Port Applications	Description
Medium Base Unit	The minimum port requirements for a host complex of 15,001 - 40,000 lines is the same as the typical office configuration.
Large Base Unit	The minimum port requirements for a host complex of 40,001 ± lines is the same as the typical office configuration.

8.26 1AESS I/O Message Standards

The following standards are not applicable to the 1 AESS.

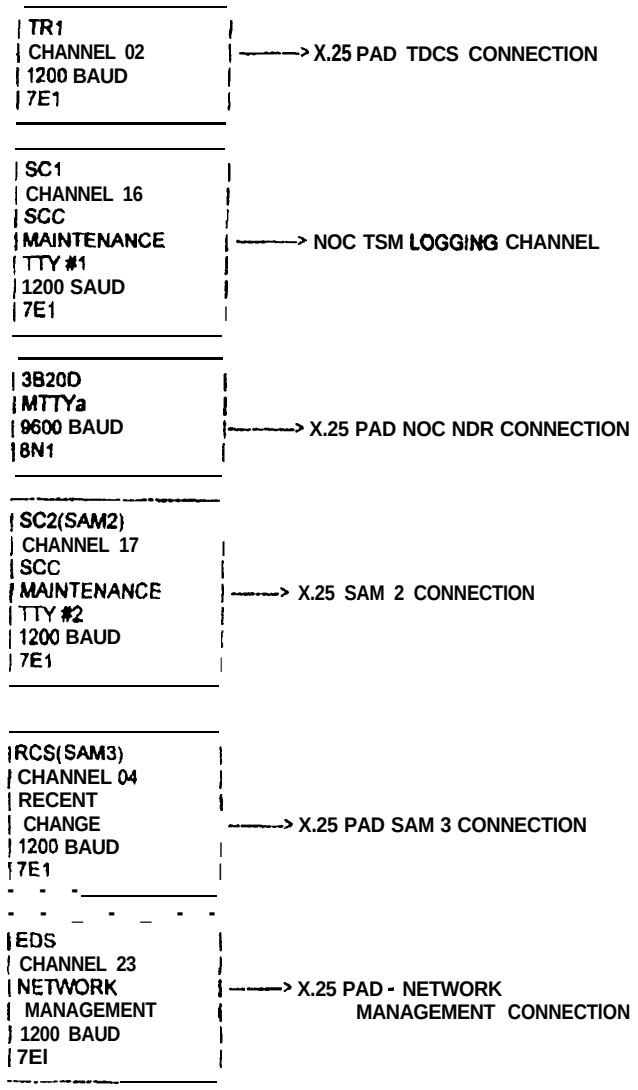
- Message restriction application -The 1AESS i/O message classes are:
  - Defined in the generic tables and cannot be changed.
  - Channel specific.
- Customer line testing -The 1 AESS is not equipped with any database parameters to test customer iines hardware.
- Password security-The 1AESS switch is not equipped with any logon or password functions to provide security. All security applications are preformed by the attached servers (i.e., SAM, TSM, etc.).

8.27 1AESS Switch Diagram

The following illustration describes a typical **1AESS** switch configuration.

NOTE: The actual port card assignments vary by site and are connected per site Parameter Data Assembler, set card CHNXXX.

The actual port card assignments will vary by site and will be connected per site Parameter Data Assembler, set card CHNXXX.



8.27 1AESS Switch Diagram, continued

A typical 1AESS switch configuration includes the following:

- Cable connectors-The switch side cable is equipped with a standard Berg connector plugged into port 0 of the designated card slot. The X.25 pad end of the cable is equipped with a standard RS232 connector.
- Cable configurations-The plug and pin location for for port "0" varies according to office equipage. Refer to AT&T TOP 231-361-010 for plug and pin location.

The following chart describes plug and pin location.

Frame Type	Use DLP #
J5A006A	DLP - 532
J5A006C	DLP - 576
J5A006D	DLP - 594

8.28 Vidat Port Applications

The following chart describes Vidar port applications.

Port Applications	Description
Hardware	• Multiport access provides four remote terminals in addition to the two local terminals. • The physical and logical characteristics of the terminals are defined in the office database per terminal, normally, BAUD 1200, PARITY NONE, DATA BITS 8, STOP BITS 1, although the SAM ports must be configured at 4800 baud.
Base Unit Layout	• Multiport 1 is designated for TSM. • Multiport 2 is designated dial-up, except in the Northwest Region where it is assigned to ROTL. • Multiport 3 is designated SAM 1. • Multiport 4 is designated SAM 2.

8.29 I/O Message Standards

The following chart describes I/O message standards.

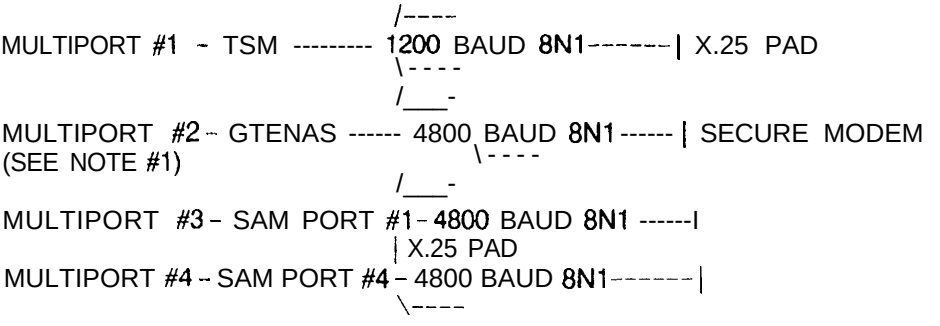
Standards	Description
Mandatory Message Restriction	• Multiport 1 and 2 output all switch messages except the traffic report. • Multiport 3 outputs all switch messages including traps and traces and traffic reports. • Multiport 4 has no output messages.
Input Restriction	Multiport access allows concurrent entry of commands from any available local and remote terminal. Commands belonging to the same concurrent restriction class may not be handled concurrently on more than one terminal. Example: Line administration cannot be entered on more than one terminal at a time.
Echo Message Restriction	All output messages are defined to a port and changes from standards are not permitted.
NOC - OLS BBS	No files reside on the NOC - OLS BBS that define the I/O messages or port assignments.

8.30 Test Parameters

All Vidar base units rely on the following servers for password security:

- SAM.
- TSM.
- GTENAS.

The following illustration describes Vidar base units servers switches.



NOTE #1 - MULTIPORT #2, in GTE Northwest Region is assigned to trunk testing or GTENAS.

9. Planning Department

9.1 Network Planning

Network Planning uses the port quantities detailed in this practice as a guideline for port additions. Although some switches do not meet the minimum quantities in this practice, the plan is to add ports to meet the minimum when digital lines are added.

Digital lines were established as a driver for additional SAM I/O ports starting in 1996. This driver adds funding to the capital budget for each state. It is proportional to the digital lines added within the state. Because this budget is not specific to a switch, a pool of funds based on the number of digital lines added to a state are available for adding SAM I/O ports. The Regional planner decides which switches receive the port additions. These additions are purchased and installed using the same processes used for other switch equipment.

If additional ports are required because of a new work group using SAM, the funding is provided by that group. Any additions to the internal network required to support the port additions are funded from the internal network budget.

10. Engineering Support

10.1 Network Engineering

Network Engineering provides via "switch models" the quantity of switch I/O ports and cables identified in this practice for new start switches. In regard to the embedded base, Network Engineering provides additional switch I/O port(s) on the basis of the following:

- me monitoring process informs network engineers (with funding) that more ports are required due to usage.
- me end-user requiring more I/O ports in a switch:

  Has authorization from Network Reliability Staff and NOC for application and deviation from standards.

  Must obtain the required funding.

NOTE: **Network Engineers assist the end-user in identifying equipment required to add a port.**