DIGITAL CENTRAL OFFICE - PACKET NETWORK INTERFACE (DCO-PNI) OPERATION

CONTENTS PAGE

1. GENERAL

1.01 This section describes how to use the DCO-PNI (Digital Central Office-Packet Network Interface) as a terminal concentrator for DACS (Digital Access Cross-Connect System) and Granger operations. It also describes No. 2SCCS (No. 2 Switching Control Center System) interface operations. Examples are shown for command entry and response sequences. These sequences assume the user is familiar with the DACS and GMAP (Granger Maintenance, Alarm and Programming) commands. A complete description of the DACS commands is given in the Input/Output Message Manual, MC-90017-09. Granger commands are modeled on the DACS command set and they may be found in AT&T Practices 365-181-918AC and 365-181-921AC, Issue 1, November 1986.

1.02 This section is being reissued to include operation information concerning the GMAP Processor and No. 2 SCCS interface. This practice is also being reissued to create separate Operation and Maintenance practices.

2. DACS OPERATION PROCEDURES

A. Terminals

2.01 Terminals connected to the DCO-PNI are used in a manner similar to a terminal connected directly to a DACS frame. The inputs are the same for each NTE (Network Terminal Equipment), but the input format is slightly different. Any terminal may access any DACS frame connected to that DCO-PNI. For this reason, the frame number must be specified in the command.

Note: Terminals must be set to enter capital letters only.

B. Command Entry for DACS Frames

2.02 Because the DCO-PNI may access several DACS frames, commands must specify the number of the frame to be accessed. The frames may be accessed two ways:

(1) Single Entry Mode

(2) Latched Entry Mode.

Note: Do not use the Latched Entry Mode from the No. 2 SCCS terminal because you cannot unlatch.

2.03 ***Single Entry Mode*** — In this mode, the frame number must be specified each time a command is entered. This mode sends the command to the DACS frame specified and is then ready for the next frame and command.

Note 1: Single-digit frame numbers must have a leading zero entered.

Note 2: Underline indicates system generated responses.

Example: D04>UTL: FRM 04, SEQ 29 :QRY,WHO! PF

M 13:49:07 04,29 4 UTL QRY WHO CLMBOHIIKZZD04 COMPL

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COMMAND	EXPLANATION
D04>	This is the frame number and first part of the DACS command.
UTL:	This is a DACS command entered by the user. As soon as the colon ":" is typed, the terminal displays the frame and sequence number. The sequence number identifies the local terminal originating the command. This shortens the terminal input process and insures that the message returned is properly mapped back to the terminal.
FRM 04, SEQ 29:	This is the frame and sequence number. The numbers display on the terminal when the colon ":" is entered after the UTL command. The frame number is the DACS frame number. The sequence number identifies the terminal originating the command.
QRY,WHO!	This is the second part of the DACS command entered from the terminal. The exclamation point "!" is displayed when the carriage return key is pressed to send the command.
-	*Note:* The "!" key may be substituted for a carriage return if desired.
PF	This response is from the DACS frame indicating the command was received.

2.04 *Latched Entry Mode* — This mode is normally used when several commands are being sent to the same DACS frame. To access this mode, enter a D and the frame number. Do not use this format from the No. 2 SCCS terminal because you cannot unlatch.

Note: Single-digit frame numbers must have a leading zero entered.

Example: D04(CR)

D04>UTL:FRM 04, SEQ 27:QRY,WHO! PF

M 13:49:07 04,27 4 UTL QRY WHO CLMBOHIIKZZD04 COMPL

COMMAND	EXPLANATION
D04	The operator entered a D and the frame number, followed by a carriage return, to access the desired frame.
-	D04 is the prompt received in the latched mode. This example is for frame 04.
-	*Note:* To exit the latched mode, press the ESC key twice.
-	The remaining format is the same as described in the Single Entry format. Subsequent carriage returns cause the prompt "DXX" to be displayed (XX is the latched frame number). Additional commands may be entered to the latched frame. To unlatch the terminal from the frame, press the ESC key.
-	*Note:* If the prompt "DXX" is displayed, entering ESC once unlatches the terminal. If a command has been partially entered when you decide to unlatch the terminal, enter two escapes. The first escape cancels the command, and the second escape unlatches the terminal.

C. Input Response

2.05 Each time a command is sent to a DACS frame, the frame responds with "PF", "RL", "?T" or "?E". This indicates the frame acknowledged the message. The PF response is usually made in a fraction of a second except for SRDC (Sub-Rate Digital Cross-Connect) system using SEDIT. There is no response for an SRDC frame. However, when the frame is executing other commands (i.e., "BM TRANSFER"), the response may be delayed. If the PF response is not returned in 30 seconds, the following message is displayed:

DACS FRAME HAS NOT RESPONDED WITHIN 30 SECONDS

2.06 This message is generated by the DCO-PNI and may or may not indicate a problem. If the DACS frame was performing other lengthy tasks, it will complete the command entered when the other tasks are completed. In this case, the response from the DACS frame will be returned even though the timeout message was received.

D. Reset Response

2.07 The DCO-PNI generates a query command to each DACS frame connected to it when power is applied and when the cage reset button is pressed. Pressing the reset button on an individual board causes a query command to be sent to all DACS frames connected to that board. By doing this, the DCO-PNI identifies which DACS frame is connected to each port on each board. This means the DCO-PNI does not require DACS frames to be assigned to a specific port. The query response is displayed on the All Messages Printer with a sequence number of 49.

Note: The DACS group adaptors and DCO-PNI daughter boards must be properly matched.

E. Sequence Numbers

2.08 The sequence number for DACS input commands is assigned by the DCO-PNI. As a function of the DACS control programs, the DACS frame assigns sequence numbers for autonomous responses. The sequence number identifies the source of the message. The DCO-PNI uses the sequence numbers to direct responses to the terminal originating the command. The sequence number assignments are as follows:

COMMAND	EXPLANATION
1-25	Operations support
26-37	Local terminals
38-48	DOM
49	DCO-PNI reset query
50-99	DACS autonomous messages.

F. DACS Frame Response

2.09 Responses from the DACS frames through the DCO-PNI are in the same format as when directly connected to a DACS frame. Autonomous messages will be indicated by a header added by the DCO-PNI:

********** AUTONOMOUS MESSAGE FOLLOWS **********

G. Printers

2.10 The DCO-PNI has an All Messages Printer and an Autonomous Messages Printer that prints DACS and GMAP messages. These messages do not appear on the terminal. The information printed for DACS is as follows:

All Messages Printer —Displays all responses from the DACS frames. Autonomous messages have a header added by the DCO-PNI to distinguish them.

Autonomous Messages Printer —Displays the autonomously generated messages from all DACS frames (sequence numbers greater than or equal to 50).

Printer Examples

2.11 The following are some typical printer outputs:

(a) Typical output after on-board reset:

M 11:18:44 03,49 5 UTL QRY WHO KSCYM009KZZD03

M 11:18:45 04,49 5 UTL QRY WHO KSCYM009KZZD04

This example shows two DACS frames connected to the board.

(b) The following is a typical output after a terminal query who command:

M 11:21:34 01,29 5 UTL QRY WHO KSCYM009KZZD01

Note: The sequence number, 29, identifies the terminal which originated the command.

(c) Typical autonomous message output:

********** AUTONOMOUS MESSAGE FOLLOWS **********

I 11:08:36 03,79 BM TRANSFER IN PROGRESS

H. Error Messages

2.12 Error messages may be received from the DACS frames or the DCO-PNI. See the DACS I/O (input/output) manual for a description of DACS error messages. Examples of DCO-PNI generated error messages are as follows:

(a) **INVALID DACS COMMAND SYNTAX** —This message indicates an invalid DACS command was entered, i.e., the command did not conform to the proper DACS format.

(b) **DACS FRAME NOT IN MAP** —This message indicates the frame number requested is not accessible by the DCO-PNI. This could be a frame that does not exist or one that is temporarily disconnected because maintenance is being performed.

3. GMAP OPERATION PROCEDURES

A. Terminals

3.01 Terminals connected to the DCO-PNI are used in a manner similar to a terminal connected directly to a GMAP processor. The input commands are the same for each Granger digroup, but the initial input format to the master GMAP processor is slightly different. Any terminal may access any Granger GMAP connected to that DCO-PNI. For this reason, the GMAP port number must be specified in the command.

Note: Terminals must be set to enter capital letters only.

B. Command Entry for GMAP Processors

3.02 Because the DCO-PNI may access several GMAP systems, commands must specify the GMAP system to be accessed. Commands can be entered through the DACS-OSS and/or control terminal access. Up to 14 commands can be stored in the buffer before an error message is received. The DACS-OSS will only send the PR, DS, FA, and FD commands to the GMAP processor. All commands can be input from the DCO-PNI control terminal. GMAP processors have only one command entry format: COMMAND FIELD: ADDRESS FIELD: PARAMETER FIELD; (Return). However, the processors can be accessed using two entry modes:

(1) Single Entry Mode

(2) Latched Entry Mode.

GMAP command entry output displays can be found in Sections 365-181-918AC and 365-181-921AC. Certain commands cannot be initated via the DCO-PNI access (reference Note 1 and Note 2).

Note 1: If there is more than one page of information, the complete command must be re-entered with a page number to get additional information. This has to be done since the "control P" and "control N" functions will not work through the DCO-PNI.

Note 2: The PNI will not pass commands in the stepping mode format.

3.03 *Single Entry Mode* — In this mode, the GMAP system number must be specified each time a command is entered. This mode sends the command to the GMAP system specified and is then ready for the next system command.

Note 1: Single-digit frame numbers must have a leading zero entered.

Note 2: Underline indicates system generated responses.

Example: G03>DS: 4,1,1: CA; (Return) PROCESSING IN PROGRESS (M9)

COMMAND	EXPLANATION
G03>	This is the GMAP system number specified.
DS:	This is the GMAP command entered by the user. The colon ":" is used as a field separator.
4,1,1:	This is the address field. The bay, shelf, and digroup is entered and separated by a comma.
CA;	This is the parameter field. The semicolon terminates the command

COMMAND	EXPLANATION
Return	This indicates that the command to the PNI is finished and is sent to the GMAP processor. Once return is pressed, the PROCESS IN PROGRESS (M9) message is received. The display will follow.

Once the display is finished. You will get the EXECUTION COMPLETE (M23) and the command you entered. The command given in the example causes the following display on the terminal.

```
G03>DS:4,1,1:CA;PROCESSING IN PROGRESS (M9)
GRANGER ASSOCIATES TM7400-M4 GMAP V1.20  G1:1AT SNANTXCA02T / WHPLNY0203T
OFFICE: WHPLNY02KZZ   06-17-87   10:54:17    G2:6AT   SLKCUTMA02T / WHPLNY0203T
BAY:  030354.05 -04,1,1                          LTA:8001      WHPLNY02 / WHPLNY0203T
     SYSTEM OPTIONS:  01(TMG)=1(SLV)   05(FMG)=1(D3/D4)   06(L CD)=1(BPLR)
        07(BPVR)=4(10-6)     08(PRE/IN SVC)=2(IN SVC)    09(NO/SIG/EC)=2(SIG)
G1: 02 (T PIL)=1 (NO ALM/PIL)              G2: 02 (T PIL) =1 (NO ALM/PIL)
    03 (DEL)  =4 (2.5 SEC)                     03 (DEL)  =4 (2.5 SEC)
    04 (R PIL)=1 ( NO DET)                     04 (R PIL) =1 ( NO DET)
```

CH	GAIN	VNL	SIG	EC	RS	NM	TD	CH	GAIN	VNL	SIG	EC	RS	NM	TD
01	0.4	0.0	CC	OF	SF	MF	DF	13	0.0	0.0	EM	OF	SF	MF	DF
02	0.2	0.0	CC	OF	SF	MF	DF	14	0.0	0.0	EM	OF	SF	MF	DF
03	0.1	0.0	CC	OF	SF	MF	DF	15	0.0	0.0	EM	OF	SF	MF	DF
04	-0.2	0.0	CC	OF	SF	MF	DF	16	0.0	0.0	EM	OF	SF	MF	DF
05	-0.1	0.0	CC	OF	SF	MF	DF	17	0.0	0.0	EM	OF	SF	MF	DF
06	-0.1	0.0	CC	OF	SF	MF	DF	18	0.0	0.0	EM	OF	SF	MF	DF
07	-0.3	0.0	CC	OF	SF	MF	DF	19	0.0	0.0	EM	OF	SF	MF	DF
08	-0.2	0.0	CC	OF	SF	MF	DF	20	0.0	0.0	EM	OF	SF	MF	DF
09	-0.3	0.0	CC	OF	SF	MF	DF	21	0.0	0.0	EM	OF	SF	MF	DF
10	-0.4	0.0	CC	OF	SF	MF	DF	22	0.0	0.0	EM	OF	SF	MF	DF
11	-0.7	0.0	CC	OF	SF	MF	DF	23	0.0	0.0	EM	OF	SF	MF	DF
12	-0.9	0.0	CC	OF	SF	MF	DF	24	0.0	0.0	EM	OF	SF	MF	DF

```
EXECUTION COMPLETE (M23)
DS:4,1,1:CA;
```

3.04 *Latched Entry Mode* — This mode is normally used when several commands are being sent to the GMAP system. To access this mode, enter a G and the system number. (This mode should not be used from the No. 2 SCCS access terminal because it will not unlatch from the remote location.)

COMMAND	EXPLANATION
G03	The operator entered a G and the GMAP system number, followed by a carriage return, to access the desired GMAP system.
-	G03 is the prompt received in the Latched Entry Mode. This example is for system 03.
-	*Note:* To exit the Latched Entry Mode, press the ESC key twice.
-	The remaining format is the same as described in the Single Entry Mode. Subsequent carriage returns cause the prompt "GXX" to be displayed (XX is the latched frame number). Additional commands may be entered to the latched system. To unlatch the terminal from the system, press the ESC key.
-	*Note:* If the prompt "GXX" is displayed, entering ESC once unlatches the terminal. If a command has been partially entered when you decide to unlatch the terminal, enter two escapes. The first escape cancels the command, and the second escape unlatches the terminal.

C. Printers

3.05 The DCO-PNI has an All Messages Printer and an Autonomous Messages Printer that prints DACS and GMAP messages. These messages do not appear on the terminal. The information printed for GMAP is as follows:

All Messages Printer — Displays all responses from the GMAP processors. Unnumbered messages do not print on the All Messages Printer. Responses from the GMAP processor through the DCO-PNI are in the same format as when directly connected to a GMAP processor. Autonomous messages will be indicated by a header added by the DCO-PNI:

********** AUTONOMOUS MESSAGE FOLLOWS **********

Autonomous Messages Printer— Displays the autonomously generated messages from all GMAP processors. Autonomous messages are indicated by the GMAP processor to the PNI and sent to the Autonomous and All Messages Printers. The GMAP processor will identify each alarm message with a unique message number. Each time a command is sent to a GMAP processor, the printer responds with the date, time, PNI, and command entered. This indicates the processor acknowledged the message.

D. Error Messages

3.06 Error messages may be received from the GMAP processor or from the DCO-PNI. See Sections 365-181-918AC and 365-181-921AC for a description of GMAP error messages. Examples of DCO-PNI generated error messages are as follows:

(a) **GMAP MASTER NOT CONNECTED** — This message indicates the GMAP system requested is not accessible by the DCO-PNI. This could be a GMAP system that does not exist or one that is temporarily disconnected because maintenance is being performed.

(b) **SYNTAX ERROR** — This message indicates the input format is incorrect.

4. No. 2 SCCS OPERATION PROCEDURES

A. Terminals

4.01 Terminals connected to the DCO-PNI are used in a manner similar to a terminal connected directly to a DACS frame. The inputs are the same for each NTE (Network Terminal Equipment), but the input format is slightly different. Any terminal may access any DACS frame connected to that DCO-PNI. For this reason, the frame number must be specified in the command.

Note: Terminals must be set to enter capital letters only.

B. Command Entry for No. 2 SCCS

4.02 Because the DCO-PNI may access several DACS frames, commands must specify the number of the frame to be accessed. The frames may be accessed two ways:

(1) Single Entry Mode

(2) Latched Entry Mode.

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Note 1: It is strongly recommended that the Latched Entry Mode not be used from the No. 2 SCCS terminal because it cannot be subsequently unlatched from that terminal. The frame would have to be unlatched from the central office. However, if an office is logged by a No. 2B SCCS, the Latch Entry Mode does not cause a problem.

Note 2: D or S commands can be used from the No. 2 SCCS Terminal. However, it is recommended that only S commands be used to prevent responses from the DCO - PNI. Also, S commands coincide with the No. 2 SCCS Schedules file message format.

4.03 *Single Entry Mode* — In this mode, the frame number must be specified each time a command is entered. This mode sends the command to the DACS frame specified and is then ready for the next frame and command.

Note 1: Single-digit frame numbers must have a leading zero entered.

Note 2: Underline indicates system generated responses.

Example: S04>UTL::QRY,WHO! PF

M 13:49:07 04,29 4 UTL QRY WHO CLMBOHIIKZZD04 COMPL

COMMAND	EXPLANATION
S04>	This is the frame number and first part of the DACS command.
UTL::	This is a DACS command entered by the user. The second colon prevents an automatic response from the PNI.
QRY,WHO!	This is the second part of the DACS command entered from the terminal. The exclamation point "!" is displayed when the carriage return key is pressed to send the command to the PNI.
-	*Note:* The "!" key may be substituted for a carriage return if desired.
PF	This response is from the DACS frame indicating the command was received.

4.04 *Latched Entry Mode* — This mode is normally used when several commands are being sent to the same DACS frame. To access this mode, enter an S and the frame number. However, do not use this mode unless an office is logged by a No. 2B SCCS.

Note: Single-digit frame numbers must have a leading zero entered.

Example: S04(CR)

S04>UTL:FRM 04, SEQ 27:QRY,WHO! PF

M 13:49:07 04,27 4 UTL QRY WHO CLMBOHIIKZZD04 COMPL

COMMAND	EXPLANATION
S04	The operator entered an S and the frame number, followed by a carriage return, to access the desired frame.
-	S04 is the prompt received in the latched mode. This example is for frame 04.
-	*Note:* To exit the latched mode, press the ESC key twice.
-	The remaining format is the same as described in the Single Entry format. Subsequent carriage returns cause the prompt "SXX" to be displayed (XX is the latched frame number). Additional commands may be entered to the latched frame. To unlatch the terminal from the frame, press the ESC key.
-	*Note:* If the prompt "SXX" is displayed, entering ESC once unlatches the terminal. If a command has been partially entered when you decide to unlatch the terminal, enter two escapes. The first escape cancels the command, and the second escape unlatches the terminal.

C. Input Response

4.05 Each time a command is sent to a DACS frame, the frame responds with "PF", "RL", "?T" or "?E". This indicates the frame acknowledged the message. The PF response is usually made in a fraction of a second except for SRDC (Sub-Rate Digital Cross-Connect) system using SEDIT. There is no response for an SRDC frame. However, when the frame is executing other commands (i.e., "BM TRANSFER"), the response may be delayed. If the PF response is not returned in 30 seconds, the following message is displayed:

DACS FRAME HAS NOT RESPONDED WITHIN 30 SECONDS

4.06 This message is generated by the DCO-PNI and may or may not indicate a problem. If the DACS frame was performing other lengthy tasks, it will complete the command entered when the other tasks are completed. In this case, the response from the DACS frame will be returned even though the timeout message was received.

D. Reset Response

4.07 The DCO-PNI generates a query command to each DACS frame connected to it when power is applied and when the cage reset button is pressed. Pressing the reset button on an individual board causes a query command to be sent to all DACS frames connected to that board. By doing this, the DCO-PNI identifies which DACS frame is connected to each port on each board. This means the DCO-PNI does not require DACS frames to be assigned to a specific port. The query response is displayed on the All Messages Printer with a sequence number of 49.

Note: The DACS group adaptors and DCO-PNI daughter boards must be properly matched.

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E. Sequence Numbers

4.08 The sequence number for DACS input commands is assigned by the DCO-PNI. As a function of the DACS control programs, the DACS frame assigns sequence numbers for autonomous responses. The sequence number identifies the source of the message. The DCO-PNI uses the sequence numbers to direct responses to the terminal originating the command. The sequence number assignments are as follows:

1-25	Operations support
26-37	Local terminals
38-48	DOM
49	DCO-PNI reset query
50-99	DACS autonomous messages.

F. DACS Frame Response

4.09 Responses from the DACS frames through the DCO-PNI are in the same format as when directly connected to a DACS frame. Autonomous messages will be indicated by a header added by the DCO-PNI:

********** AUTONOMOUS MESSAGE FOLLOWS **********

G. Printers

4.10 The DCO-PNI has an All Messages Printer and an Autonomous Messages Printer that prints DACS and GMAP messages. These messages do not appear on the terminal. The information printed for DACS is as follows:

All Messages Printer —Displays all responses from the DACS frames. Autonomous messages have a header added by the DCO-PNI to distinguish them.

Autonomous Messages Printer —Displays the autonomously generated messages from all DACS frames (sequence numbers greater than or equal to 50).

Printer Examples

4.11 The following are some typical printer outputs:

(a) Typical output after on-board reset:

M 11:18:44 03,49 5 UTL QRY WHO KSCYM009KZZD03

M 11:18:45 04,49 5 UTL QRY WHO KSCYM009KZZD04

This example shows two DACS frames connected to the board.

(b) The following is a typical output after a terminal query who command:

M 11:21:34 01,29 5 UTL QRY WHO KSCYM009KZZD01

Note: The sequence number, 29, identifies the terminal which originated the command.

(c) Typical autonomous message output:

********** AUTONOMOUS MESSAGE FOLLOWS **********

I 11:08:36 03,79 BM TRANSFER IN PROGRESS

H. Error Messages

4.12 Error messages may be received from the DACS frames or the DCO-PNI. See the DACS I/O (input/output) manual for a description of DACS error messages. Examples of DCO-PNI generated error messages are as follows:

(a) **INVALID DACS COMMAND SYNTAX** —This message indicates an invalid DACS command was entered, i.e., the command did not conform to the proper DACS format.

(b) **DACS FRAME NOT IN MAP** —This message indicates the frame number requested is not accessible by the DCO-PNI. This could be a frame that does not exist or one that is temporarily disconnected because maintenance is being performed.

I. Logging

4.13 The Logger receives messages from the DCO-PNI ROP (Read-Only-Printer) output and stores them on the No. 2 SCCS disk in a circular **logging** file. To activate the Logger for a particular DCO-PNI office, the ROP channel must be turned on by the **restore:[chl;]<office name>!** command issued from the No. 2 SCCS administrative terminal. An office is removed from logging by the **remove:[chl;]<office name>!** command.

J. Remote Work Center Application

4.14 The No. 2 SCCS terminal may serve as a RWS (Remote Work Station) for the DACS frames served by a No. 2 SCCS machine. When the No. 2 SCCS command **monitor:<channel name>!**, where <channel name> is the name of the Terminal Interface channel between the DCO-PNI and No. 2 SCCS, is executed, the No. 2 SCCS terminal becomes a RWS to the DCO-PNI and connected DACS frames. The operator receives messages from the digital office and has the capability to transmit messages to DCO-PNI and DACS frames.

4.15 Messages from the No. 2 SCCS to the individual DACS frames mapped into the DCO-PNI must be preceded with the **S<frame number>** prefix. The monitor session is terminated by the "break" key entry.

5. ACRONYMS

5.01 The following acronyms, located throughout this document, have been consolidated for easy reference:

ACRONYM	DEFINITION
DACS	Digital Access Cross-Connect System
DCO-PNI	Digital Central Office—Packet Network Interface
GMAP	Granger Maintenance, Alarm and Programming
I/O	Input/Output
NO. 2 SCCS	No. 2 Switching Control Center System
NTE	Network Terminal Equipment
PC-MUX	Protocol Converting Multiplexer
ROP	Read Only Printer
RWS	Remote Work Station
SRDC	Sub-rate Digital Cross-Connect

6. REFERENCES

6.01 The following sections should be referenced for specific information:

SECTION	TITLE
365-181-918AC	Terminal Operation Granger TM7400-M4
365-181-921AC	Terminal Operation Granger TM7400-M2/M3
365-680-300	PC-MUX System Description
MC-90017-09	DACS Input/Output Message Manual
365-680-301AC	DCO-PNI Description
365-680-302AC	DCO-PNI Installation and Acceptance
365-680-304AC	DCO-PNI Maintenance
365-680-365AC	-
C-PL-87-03-208	RWC Support for the Digital Central Office, March 13, 1987

SECTION	TITLE
SM-20763	PC-MUX Application Schematic
NJ08576-01	-
NJ08576A1	Specification for a Protocol Converting Multiplex Cabinet (PC-MUX) Arranged for Digital Control Office-Packet Network Interface (DCO-PNI) Application
NT08576-30	Operating Support Systems PC-MUX for DCO-PNI Unit Wiring
NT08576-31	Operating Support Systems PC-MUX for DCO-PNI Interconnect Circuit
ED3B062-10	Method of Installing Computer Cabinets
NS08576-01	Application Schematic

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