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NEAX® 2000 IVS²
INTEGRATED VOICE SERVER

Open Application Interface (OAI)
System Manual

JULY, 2000

NEC America, Inc.

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NEAX2000 IVS^2
OAI System Manual

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INTRODUCTION

PURPOSE

This manual explains the system description, installation procedure, programming procedure and troubleshooting information for providing the Open Application Interface (OAI) to the NEAX2000 IVS^2.

OUTLINE OF THIS MANUAL

This manual contains the following chapters and appendix:

CHAPTER 1 GENERAL INFORMATION
This chapter explains the system outline and specifications of the OAI system.

CHAPTER 2 INSTALLATION
This chapter explains the hardware installation procedure to provide an OAI interface to the PBX.

CHAPTER 3 SYSTEM DATA PROGRAMMING
This chapter explains the programming procedure to provide the OAI feature to the PBX.

CHAPTER 4 TROUBLESHOOTING
This chapter explains troubleshooting information after installing the OAI system.

CHAPTER 5 CIRCUIT CARD INFORMATION
This chapter explains the mounting location, the meaning of lamp indications, and the method of switch settings of each circuit card for OAI.

APPENDIX This appendix contains the definition of V.24 signal leads.

REFERENCE MANUALS

Refer to the following manuals during installation:

Installation Procedure Manual:	Describes the installation procedure of the PBX system.
Command Manual:	Describes Customer Administration Terminal (CAT) operation, command function and setting data required for programming the system, and Resident System Program.
Office Data Programming Manual:	Contains the Customer Specification Sheet and Office Data Programming Sheet.

CHAPTER 1

GENERAL INFORMATION

This chapter explains the OAI system outline and specifications.

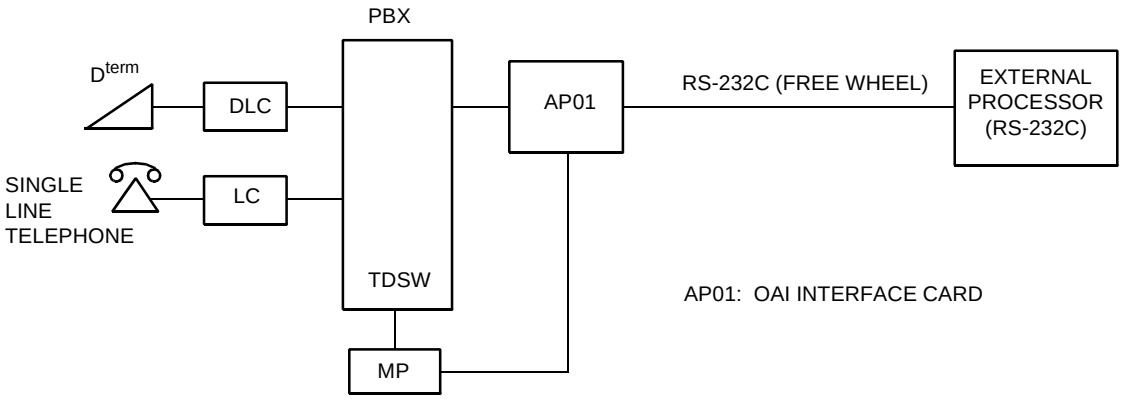
SYSTEM OUTLINE

The PBX is equipped with an interface to provide user applications through an external processor. The interface supports RS-232C (Free Wheel) protocol and TCP/IP protocol.

OAI with RS-232C

For adding the interface with RS-232C, the AP01 card (OAI Interface Card) is required. Figure 1-1 shows the system outline of OAI with RS-232C.

Figure 1-1 System Outline of OAI with RS-232C

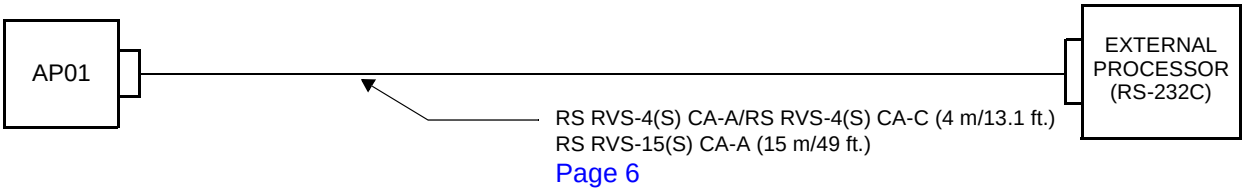


External Processor Connection

The PBX can be directly connected to an external processor with a cable. The maximum length of the cable is 15 m (49 ft.). The PBX also can be connected to a MODEM for extending the distance between the PBX and the external processor. The maximum length of the cable from PBX to modem is 4 m (13 ft.). Figure 1-2 shows the external processor connection for RS-232C interface.

Figure 1-2 External Processor Connection for RS-232C Interface

(1) External Processor Direct Connection



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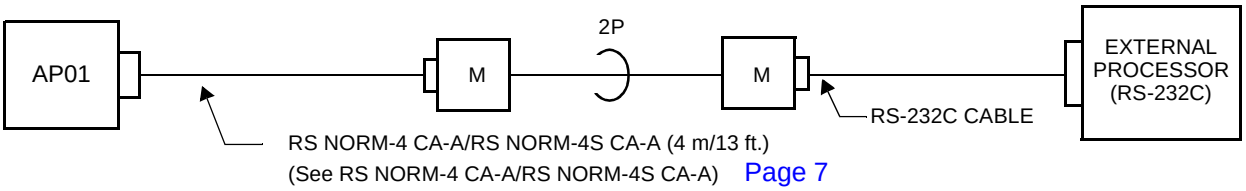
(2) External Processor Connection via MODEM



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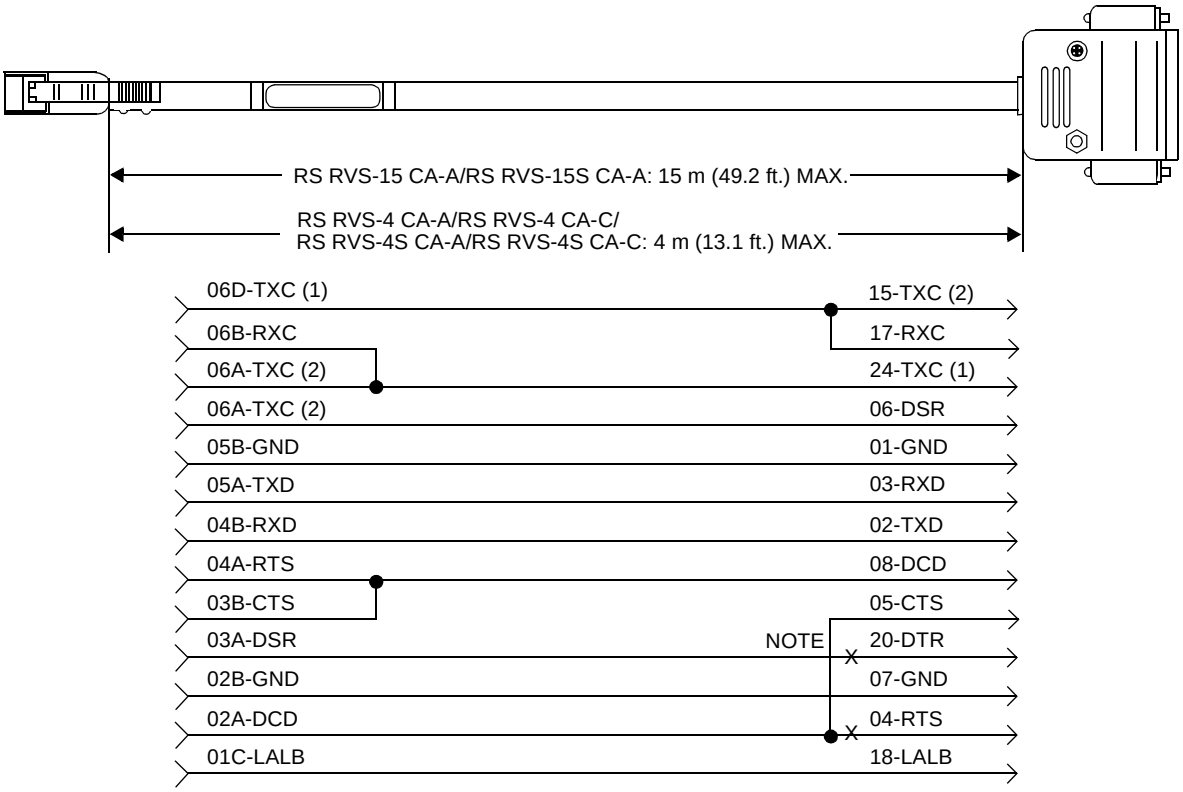
AP01: OAI INTERFACE CARD
M : MODEM

RS RVS-15 CA-A/RS RVS-15S CA-A
RS RVS-4 CA-A/RS RVS-4 CA-C
RS RVS-4S CA-A/RS RVS-4S CA-C

NOTE: If the external processor does not send DTR or RTS signal, cut the signal lead marked by X in the D-Sub connector (external processor side) as shown in the wiring diagram below.

See APPENDIX DEFINITION OF V.24 SIGNAL LEADS. Page 79



	D	C	B	A
06	TXC (1)	X	RXC	TXC (2)
05	X	DTR	GND	TXD
04	(RT)	X	RXD	RTS
03	X	(ST)	CTS	DSR
02	----	X	GND	DCD
01	X	LALB	X	G

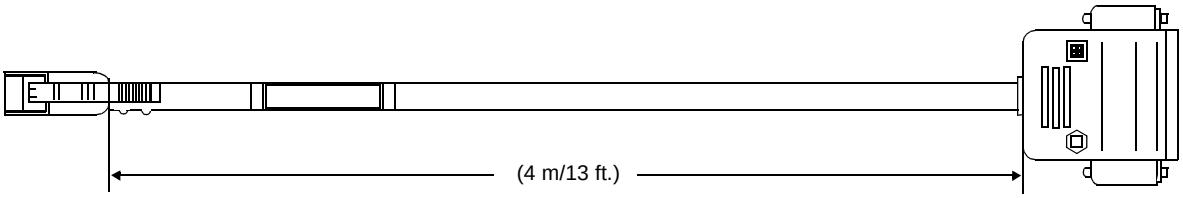
G: GROUND

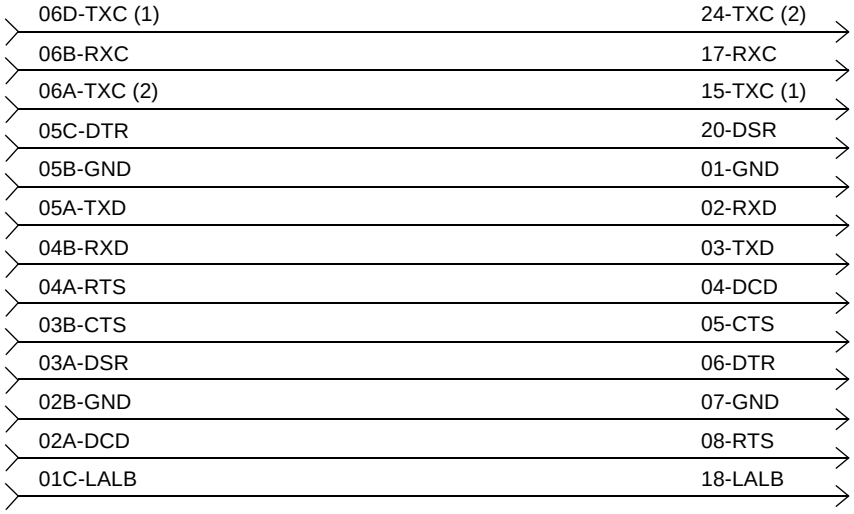
13	----
12	----
11	----
10	----
09	----
08	DCD
07	GND
06	DSR
05	CTS
04	RTS
03	RXD
02	TXD
01	GND

25	----
24	TXC (1)
23	----
22	----
21	----
20	DTR
19	----
18	LALB
17	RXC
16	----
15	TXC (2)
14	----

See APPENDIX DEFINITION OF V.24 SIGNAL LEADS. Page 79

RS NORM-4 CA-A/RS NORM-4S CA-A





	D	C	B	A
06	TXC (1)	×	RXC	TXC (2)
05	×	DTR	GND	TXD
04	(RT)	×	RXD	RTS
03	×	(ST)	CTS	DSR
02	----	×	GND	DCD
01	×	LALB	×	G

G: GROUND

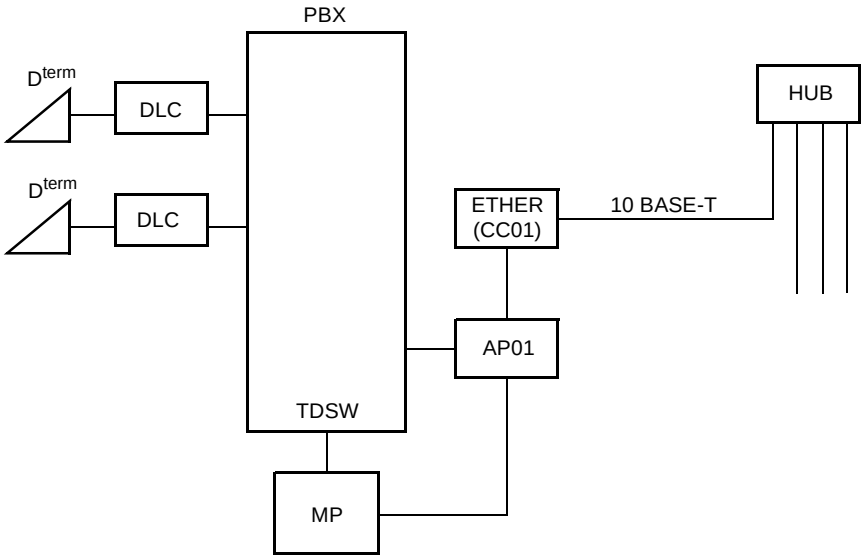
13	----	25	----
12	----	24	TXC (1)
11	----	23	----
10	----	22	----
09	----	21	----
08	DCD	20	DTR
07	GND	19	----
06	DSR	18	LALB
05	CTS	17	RXC
04	RTS	16	----
03	RXD	15	TXC (2)
02	TXD	14	----
01	GND		

OAI with TCP/IP-Ethernet

The PBX is equipped with an interface to transmit/receive the control signals between the PBX and the Ethernet. The interface supports TCP/IP protocol. For adding the interface with TCP/IP, the ETHER card (CC01) (Ethernet Gateway Controller) is required in addition to the AP01 card.

Figure 1-3 shows the system outline of OAI with TCP/IP-Ethernet.

Figure 1-3 System Outline of OAI with TCP/IP-Ethernet



AP01: OAI INTERFACE CARD
ETHER: ETHERNET CONTROLLER (CC01)

SYSTEM SPECIFICATIONS

RS-232C Interface Specification

Table 1-1 RS-232C Interface Specification

DESCRIPTION	SPECIFICATION	REMARKS
Transmission Speed	150, 300, 600, 1200, 2400, 4800 or 9600 bps	
Synchronization	Asynchronous	
Transmission Mode	Full Duplex	
Parity	No Parity	
Stop Bit	1-Stop Bit	
Kind of Code	JIS (8-bit)	
Transmission Procedure	Free Wheel	

MODEM Specification

Table 1-2 MODEM Specification

DESCRIPTION	SPECIFICATION	REMARKS
Synchronization	Asynchronous	
Data Speed	150, 300, 600, 1200, 2400, 4800 or 9600 bps	
Transmission Mode	Full Duplex	
Line	4 wire	
Connecting Type	Ring (Dial up)/Leased	
Interface Condition	ITU-T V.24	

CHAPTER 2

INSTALLATION

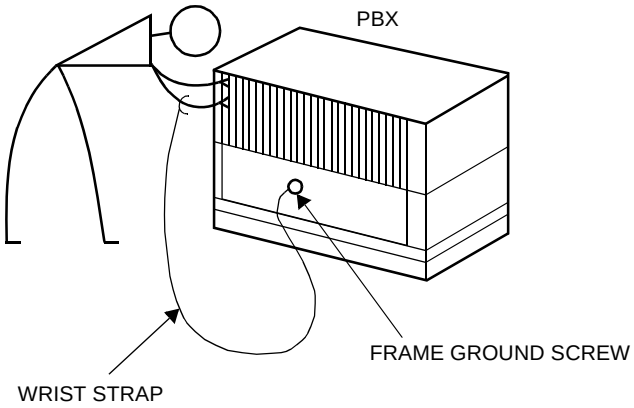
This chapter explains the hardware installation procedure to provide OAI interface to the PBX.

PRECAUTIONS

Static Electricity Guard
You must wear a grounded wrist strap to protect circuit cards from static electricity.

Figure 2-1 Static Electricity Guard (1 of 2)

- WHEN PLUGGING/UNPLUGGING A CIRCUIT CARD



- WHEN HOLDING A CIRCUIT CARD

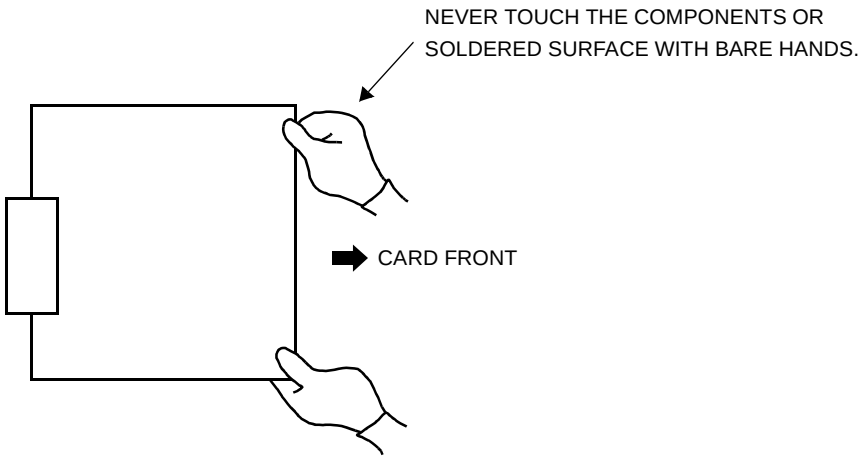
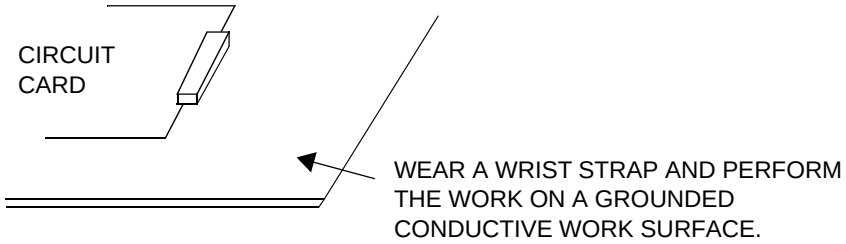
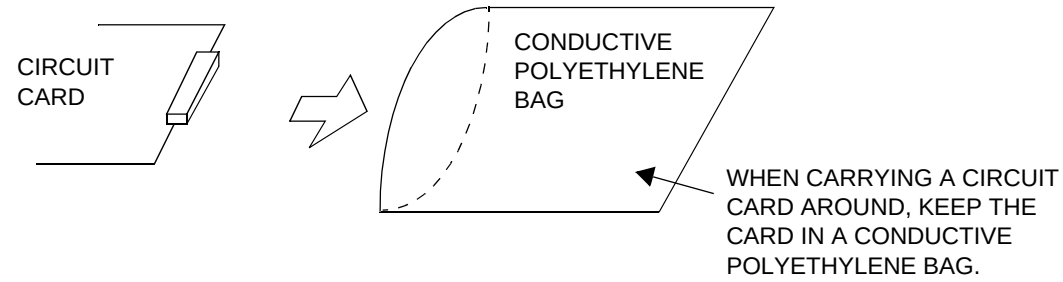


Figure 2-1 Static Electricity Guard (2 of 2)

- WHEN MAKING A SWITCH SETTING ON A CIRCUIT CARD



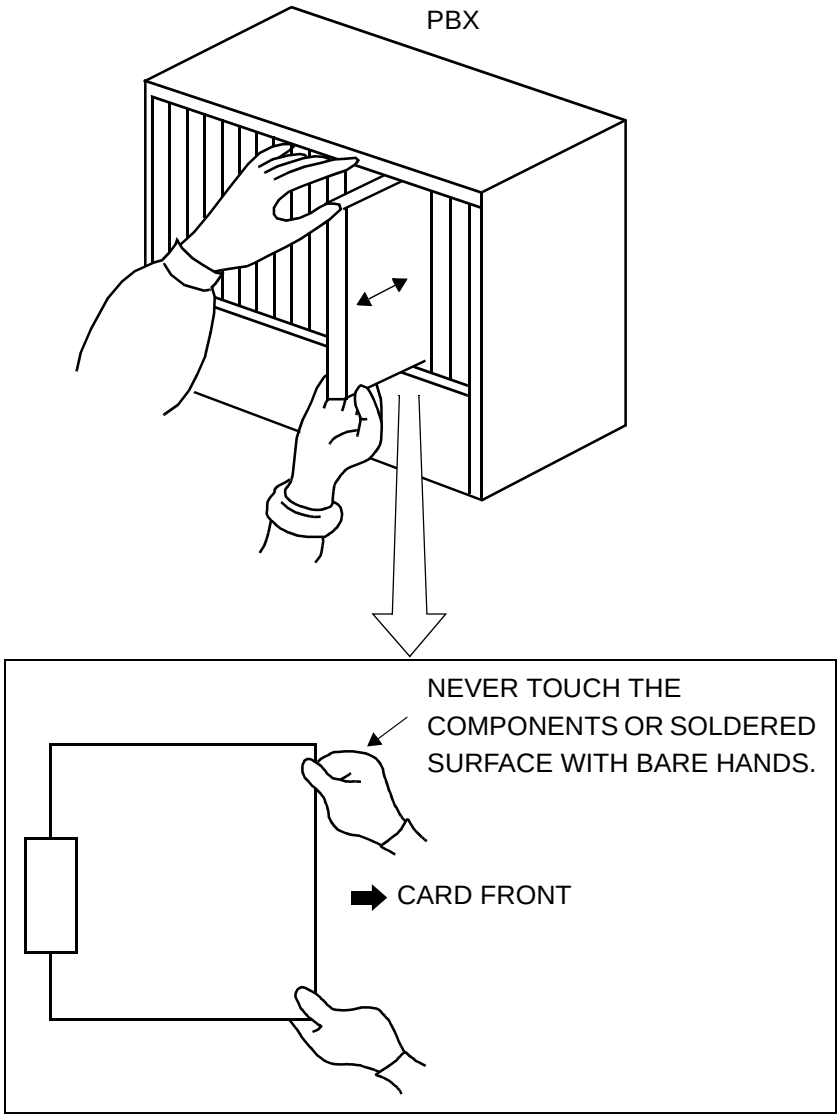
- WHEN CARRYING A CIRCUIT CARD



The mark shown below is attached to the sheet for work in which circuit cards are handled. When engaging in such work, the installer must be careful not to cause damage by static electricity.

Caution

You must hold the edge of a circuit card when plugging or unplugging the circuit card. If you touch another area, you may be exposed to hazardous voltages.



REQUIRED EQUIPMENT

Table 2-1 and Table 2-2 show the required equipment when the OAI is provided through an external processor with RS-232C interface, or through the Ethernet with TCP/IP.

Required Equipment for OAI with RS-232C Interface

Table 2-1 Required Equipment for OAI with RS-232C Interface

EQUIPMENT	DESCRIPTION	QTY	REMARKS
• PN-AP01	OAI Interface Card	1	
• RS NORM-4 CA-A /RS NORM-4S CA-A	Connecting Cable between PN-AP01 and MODEM (Required if 15 m/49 ft. or more)	1	Cable length: 4 m/13 ft.
• RS RVS-4 CA-A /RS RVS-4S CA-A /RS RVS-4 CA-C /RS RVS-4S CA-C	Connecting Cable between PN-AP01 and External Processor	1	Cable length: 4 m/13 ft.
or			
• RS RVS-15 CA-A /RS RVS-15S CA-A		1	Cable length: 15 m/49 ft.
• RS-232C Cable	Connecting Cable between External Processor and MODEM	1	Required if 15 m/49 ft. or more is needed (Should be provided by customer)
• External Processor with RS-232C Interface		1	(Should be provided by customer)
• MODEM	Refer to MODEM Specification. Page 9	2	Required if 15 m/49 ft. or more is needed (Should be provided by customer)

Required Equipment for OAI with TCP/IP-Ethernet

Table 2-2 Required Equipment for OAI with TCP/IP-Ethernet

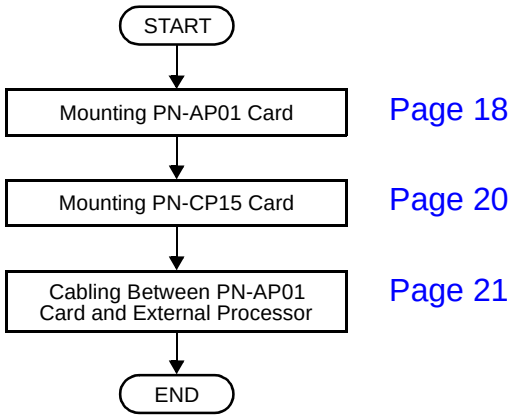
EQUIPMENT	DESCRIPTION	QTY	REMARKS
• PN-AP01	OAI Interface Card	1	
• PN-CC01	Ethernet Control Card	1	
• 48-TW-0.3 CONN CA	BUS Cable between PN-AP01 and PN-CC01	1	Cable length: 0.3 m/1 ft. **NOTE**
• 10 BASE-T twisted pair cable (TIA/EIA category 3 or larger)	10 BASE-T Cable between PN-CC01 and Ethernet	1	Cable length: Max. 100 m/328 ft. (Should be provided by customer)

INSTALLATION PROCEDURE

Installation Procedure for OAI with RS-232C

Install the OAI system with RS-232C interface according to the following procedure.

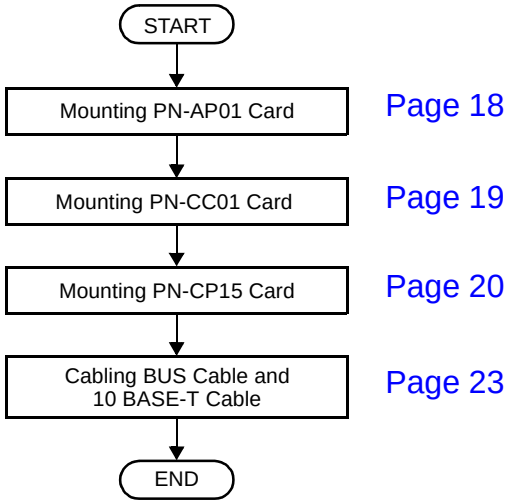
Figure 2-2 Installation Procedure for OAI with RS-232C Interface



Installation Procedure for OAI with TCP/IP-Ethernet

Install the OAI system with TCP/IP-Ethernet according to the following procedure.

Figure 2-3 Installation Procedure for OAI with TCP/IP-Ethernet



Mounting PN-AP01 Card

(1) Confirm the correct switch settings. See CHAPTER 5. Page 65
Before mounting the card, set the MB switch to UP position.

(2) Mount the PN-AP01 card in one of the following AP slots.

PIM 0 : AP00-AP10 slot
PIM 1-7: AP00-AP11 slot

After mounting the card, set the MB switch to DOWN position.

Mounting PN-CC01 Card

(1) Confirm the correct switch settings. See CHAPTER 5. Page 65

(2) Mount the PN-CC01 card in one of the following AP slots.

PIM 0 : AP00-AP10 slot
PIM 1-7: AP00-AP11 slot

Mounting PN-CP15 Card

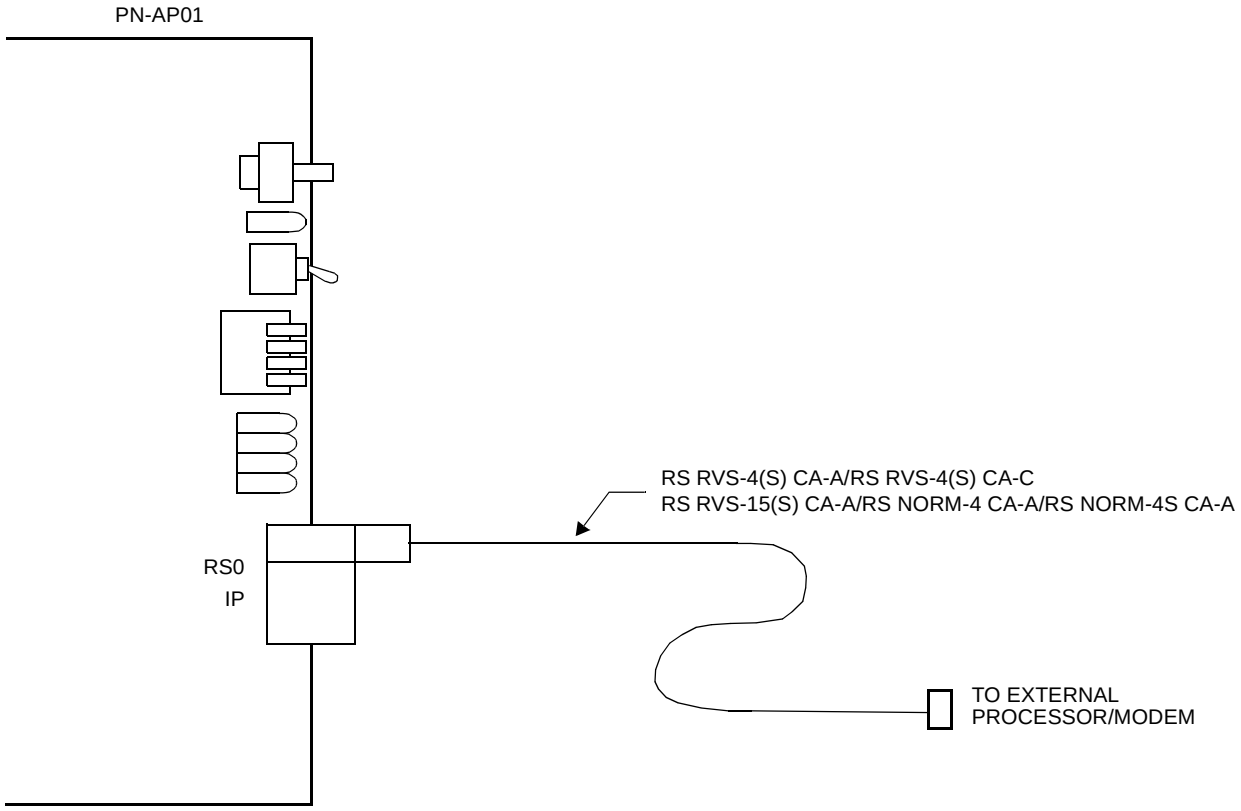
(1) Confirm the correct switch settings. See CHAPTER 5. Page 65
Before mounting the card, set the MB switch to UP position.

(2) Mount one PN-CP15 card in the each FP slot of PIM0, PIM2, PIM4 and PIM6, according to the system configuration.
After mounting the card, set the MB switch to DOWN position.

Cabling between PN-AP01 Card and External Processor

(1) Connect the RS RVS cable or RS NORM cable onto the “RS0” connector on the PN-AP01 card, as shown in Figure 2-4.

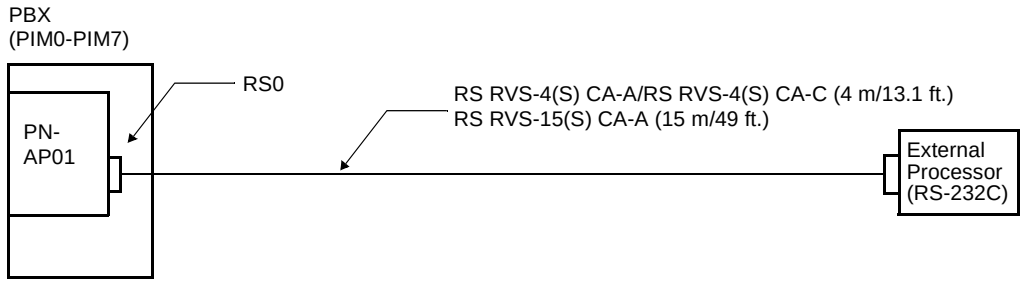
Figure 2-4 Cable Running of RS RVS Cable/RS NORM Cable



(2) Connect the RS RVS cable or RS NORM cable, as shown in Figure 2-5 and Figure 2-6.

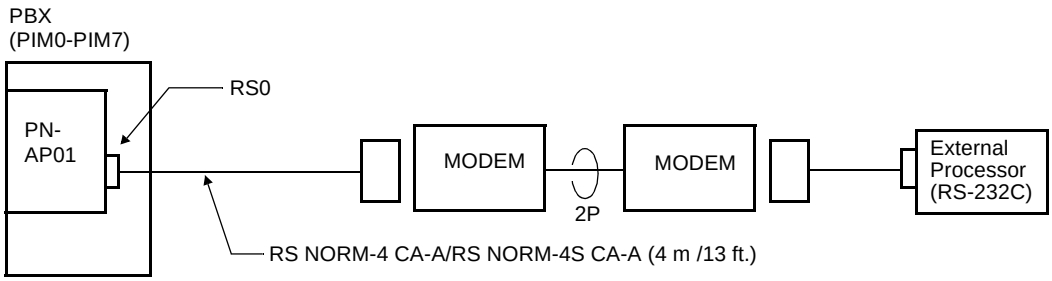
When connecting an External Processor directly:
Connect the External Processor to the PN-AP01 using an RS RVS-4(S) CA-A/RS RVS-4(S) CA-C/RS RVS-15(S) CA-A cable, as shown in Figure 2-5.

Figure 2-5 Direct Connection



When connecting an External Processor using MODEMs:
Connect the External Processor through the MODEMs, as shown in Figure 2-6. In this case, the RS NORM-4 CA-A/RS NORM-4S CA-A should be used for DCE-DCE connection.
When the cable length between the External Processor and PBX is more than 15 m/49 ft., MODEMs are required.

Figure 2-6 MODEM Connection

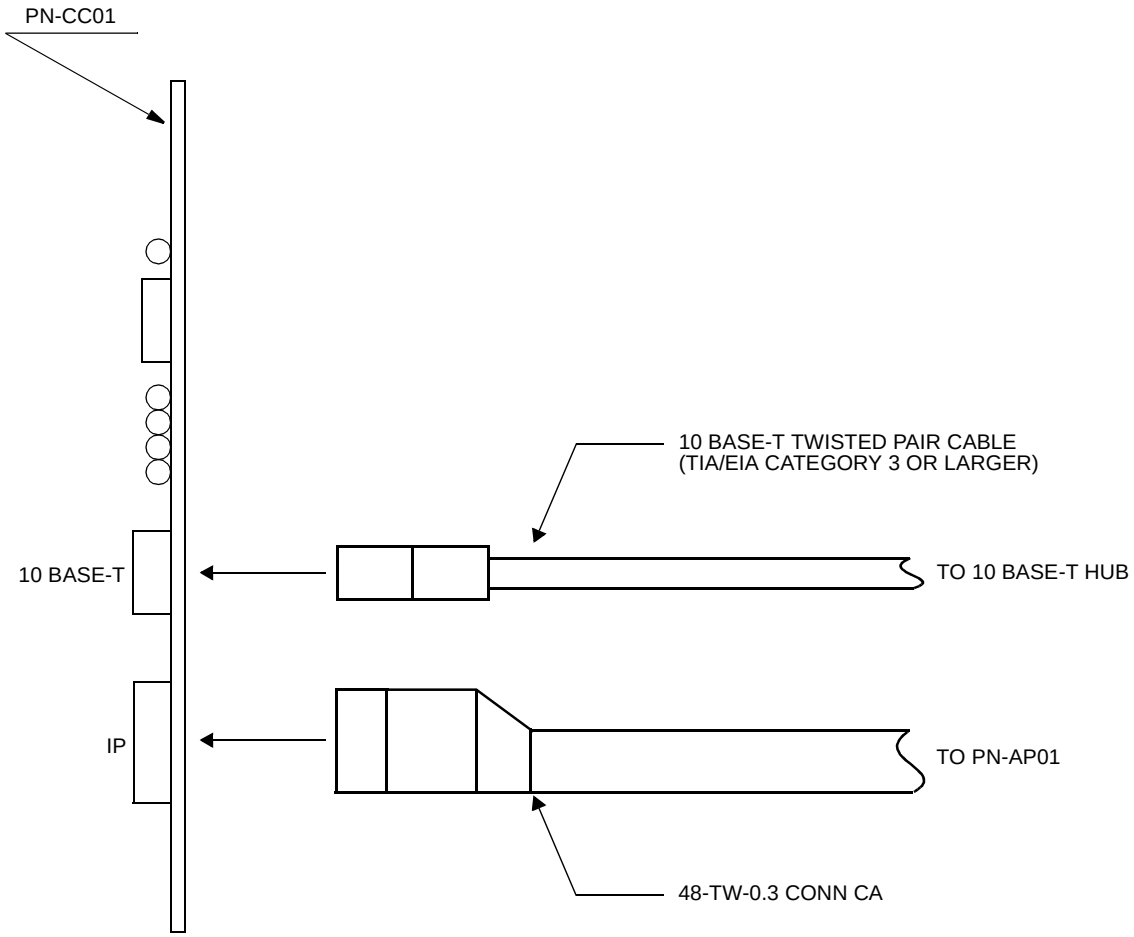


Cabling BUS Cable and 10 BASE-T Cable

(1) Connect the 48-TW-0.3 CONN CA (BUS cable) onto the “IP” connector on the PN-CC01 card, as shown in Figure 2-7.

(2) Connect the 10 BASE-T twisted pair cable (TIA/EIA Category 3 or larger) onto the “10 BASE-T” connector on the PN-CC01 card, as shown in Figure 2-7.

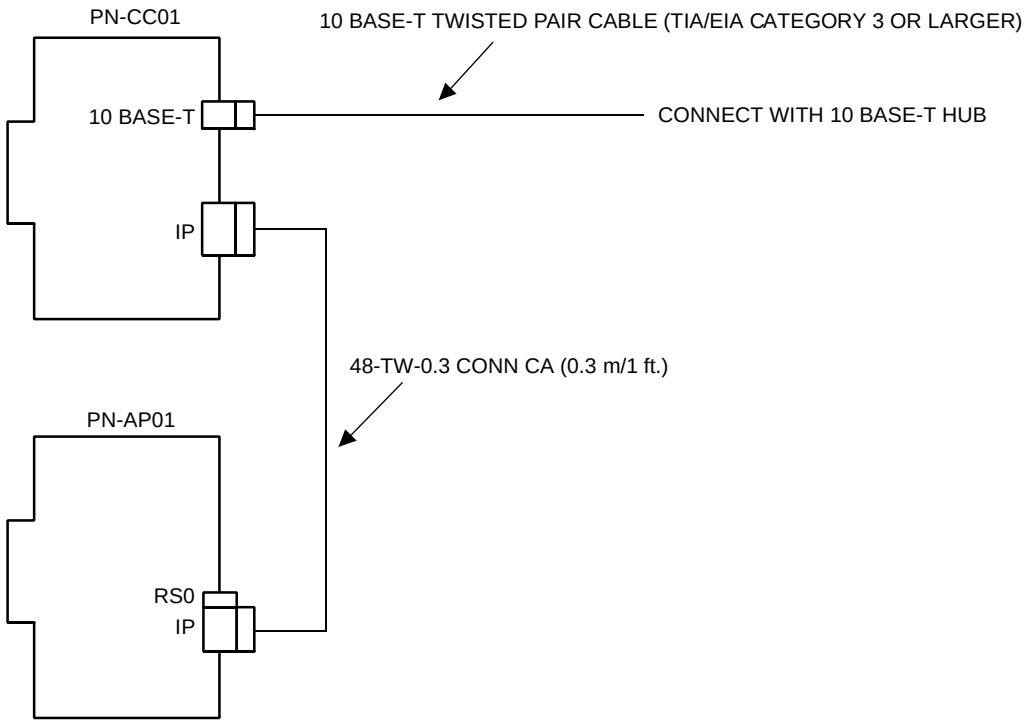
Figure 2-7 Cable Connections on PN-CC01 Card



(3) Connect the 48-TW-0.3 CONN CA onto the “IP” connector on the PN-AP01 card, as shown in Figure 2-8.

(4) Connect the 10 BASE-T twisted pair cable (TIA/EIA category 3 or larger) onto the 10 BASE-T HUB on the Ethernet.

Figure 2-8 Cabling 48-TW-0.3 CONN CA and 10 BASE-T Twisted Pair Cable



CHAPTER 3

SYSTEM DATA PROGRAMMING

This chapter explains the programming procedure to provide the OAI feature to the PBX.

HOW TO READ THIS CHAPTER

AP Initialization

When first programming the OAI system data, initialize the PN-AP01 card using the procedure described in AP01 Initialization.

Preparation before Programming

Before programming, confirm that the system is under the following conditions.

- The system is under On-Line mode. (“RUN” lamp is flashing on the MP card.)
- MB (Make Busy) switch of AP01 card is set to “DOWN” (In Service) position.
- All the system data pertaining to the stations, trunks and service features are already programmed.

NOTE: The tenant service assignment for the stations in the PBX must match the tenant service assignment for those same stations in the User Application Processor (UAP). If these assignments do not match, the OAI features will not work.

According to the programming procedures described in this chapter, assign the system data related to the OAI. For details of each command, refer to the Command Manual.
In the programming procedure, the meaning of (1), (2) and the markings are as follows.

(1) : 1st Data

(2) : 2nd Data

◀ : Initial Data
With the system data clear command (CM00, CM01), the data with this marking is automatically assigned for each command.

(INITIAL) : System Initialization
After entering the data, a system reset (press SW1 on the MP card) is required.

(AP01 INITIAL) : AP Initialization
After entering the data, an AP reset (UP and DOWN of MB switch on the AP01 card) is required.

LIST OF COMMANDS RELATED TO OAI

Table 3-1 shows the commands related to the OAI with each facility (MSF, TMF etc.).

Table 3-1 List of Commands Related to OAI

ITEM	RELATED COMMAND			
	COMMAND No.	1ST DATA	2ND DATA	MEANING
AP01 Initial-ization Data	CM05 Y=0	04-15	07	AP Number of PN-AP01
	CMD6 Y=0	0000	CCC	PN-AP01 Memory All Clear
OAI Com-muni-cation Data (TCP/IP)	CMD7 Y=9	00-03	0-255	IP Address of TCP/IP-Ethernet
OAI Com-muni-cation Data (RS-232C)	CMA6 YY=04	3	0-6	AP Port Data
	CMA6 YY=05	3	1	
	CMA6 YY=06	3	7	
	CMA6 YY=07	3	1	
	CMA6 YY=08	3	1	
	CMA6 YY=09	3	06	
	CMA6 YY=10	3	0/1	
	CMA6 YY=11	3	0/1	
	CMA6 YY=12	3	0/1	
	CMA6 YY=20	3	2	
	CMA6 YY=21	3	0	
	CMA6 YY=24	3	1	

Table 3-1 List of Commands Related to OAI (Continued)

ITEM	RELATED COMMAND			
	COMMAND No.	1ST DATA	2ND DATA	MEANING
MSF	CM10	000-763	EB000-EB127	Digital Announcement Trunk Card No.
	CM12 YY=02	Station No.	00-15	Service Restriction Class
	CM15 YY=59	00-15	1	
	CM20 Y=0-3	Access Code	A084	MSF Access Code
	CM20 Y=0-3	Access Code	A100-A102	Digital Announcement Trunk Access Code
	CM41 Y=0	56	00-99	Message Replay Timer/Tone Sending Timer
	CM49 YY=00	000-127	10	Announcement Service for OAI
	CM90 YY=00	My Line No. + [,] + Key No.	F1032-F1047	OAI Function Key
	CMD7 Y=0	F1032-F1047	128-191	MSF Operation Code
	CMD7 Y=0	F1032-F1047	DCX (X=1-3)	Digit Number of Digit Code
	CMD7 Y=1	Access Code	128-191	MSF Operation Code
	CMD7 Y=2	000-127	1000-1127	Digital Announcement Trunk Card No.
	CMD7 Y=3	00	000-127	RR Timer
	CMD7 Y=4	00	00-32	Maximum number of terminals to be in MSF simultaneously
	CMD7 Y=6	Digit Code	128-191	Operation Code for MSF
	CMD7 Y=7	F1032-F1047	00/01	Chime from D^{term} when Receiving RR Signal
TMF	CM90 YY=00	My Line No. + [,] + Key No.	F1032-F1047	OAI Function Key

Table 3-1 List of Commands Related to OAI (Continued)

ITEM	RELATED COMMAND			
	COMMAND No.	1ST DATA	2ND DATA	MEANING
TMF	CMD7 Y=0	F1032-F1047	192-255	TMF Operation Code
	CMD7 Y=0	F1032-F1047	DCX (X=1-3)	Digit Number of Digit Code
	CMD7 Y=3	00	000-127	RR Timer
	CMD7 Y=4	01	00-32	Maximum number of terminals to be in TMF simultaneously
	CMD7 Y=6	Digit Code	192-255	Operation Code for TMF
	CMD7 Y=7	F1032-F1047	00/01	Chime from D^{term} when Receiving RR Signal
	CMD7 Y=8	00-03	00/01	Chime from D^{term}, Display Guidance when setting up TMF
SCF	CM08	465	0/1	Facility Error detail information from PBX to computer
	CM10	000-763	EB002-EB127	Digital Announcement Trunk Card No.
	CM11	000-255	Virtual-Line number	Virtual Line number (Assign only one per system)
	CM17 Y=0	Station No.	Another Station No.	UCD Group
	CM17 Y=1	Station No.	2/3	Member station/Pilot station
	CM17 Y=2	Station No.	00-15	UCD Group No.
	CM17 Y=A	Station No.	0/1	Method of Sending Multi-Connection Announcement
	CM41 Y=0	56	01-99	Message Replay Timer/Tone Sending Timer
	CM41 Y=0	65	01-99	Ringing Time
	CM41 Y=0	67	01-32	OAI Announcement Connection Timer

Table 3-1 List of Commands Related to OAI (Continued)

ITEM	RELATED COMMAND			
	COMMAND No.	1ST DATA	2ND DATA	MEANING
SCF	CM42	10	01-06	Account Code Max. digit (SCF FID=1, 3, 4, 7)
	CM49 YY=00	000-127	10/1602-1663	Announcement Service for OAI/ Message Group No. for Multi-Connection Announcement Service for OAI
	CMD7 Y=2	000-127	1000-1127	Digital Announcement Trunk Card No.
FLF	CM08	216	1	AP (PN-AP01)
	CM08	217	1	AP (PN-AP01)
	CM15 YY=31	00-15	0/1	Authorization Code/Forced Account Code
	CM20 Y=0-3	Access Code	A157	First Digit of Authorization Code
	CM42	11	01-10	Max. Number of Digit for Authorization Code
	CMD7 Y=5	00	X-XXXX	Office Number
	CMD7 Y=A	00	0/1	Recognition of AP database
	CMD7 Y=A	01	0/1	Omission of AP database
KTF	CM90 YY=00	My Line No. + [,] + Key No.	F1032-F1047	OAI Function Key
ACF	CM08	217	0/1	Processor for Checking ID Cords
	CM08	362	0/1	SST after Dialing the Access Code for ID Code Class Change
	CM20 Y=0-3	Access Code	A086/A087	Access Code for ID Code Class Change
	CM42	11-13	01-10	Number of digits for Authorization Code/Forced Account Code/DISA

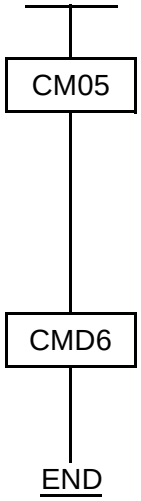
Table 3-1 List of Commands Related to OAI (Continued)

ITEM	RELATED COMMAND			
	COMMAND No.	1ST DATA	2ND DATA	MEANING
ACF	CMD5 Y=3	ID code	ABBCCDDEE	Temporary Class Data
	CMD7 Y=3	00	000-127	RR Timer
	CMD7 Y=5	00	XXXX	Office Number
	CMD7 Y=B	00	0-3	Number of Digits for ID Codes when AP Stops
TCF	None			
NTF	None			
ADF	None			
SSF (MW)	CM08	140	0/1	Message Wait Indication (MW)
	CM08	235	0	Message Waiting/Message Reminder reset
	CM08	376	0/1	VMS via CCIS
	CM08	443	0	VMS with MCI
	CM08	444	0/1	Message Waiting lamp control
	CM13 YY=03	Station No.	0	Message Waiting/Message Reminder

Table 3-1 List of Commands Related to OAI (Continued)

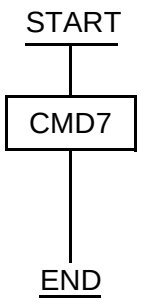
ITEM	RELATED COMMAND			
	COMMAND No.	1ST DATA	2ND DATA	MEANING
SMF	CM08	429	0/1	D^{term} subline
	CM08	460	0/1	SMFN STS (Status)
	CM08	461	0/1	SMFN when answering a held call
	CM08	462	0/1	ANI/Caller ID/CPN to OAI Terminal
	CM08	464	0/1	TSAPI/SCF facility
	CMD7 Y=A	02	0/1	SMFN/SSFN Delay Timer
MRF	None			
Health check	None			

AP01 INITIALIZATION



DESCRIPTION	DATA
Assign an AP number to the AP01 card. (INITIAL) **NOTE:** The AP number must match the SENSE switch settings on the AP01 card.	• Y=0 (1) AP Number (04-15) (2) 07: AP01 card
Load the initial data into the AP01 card.	• Y=0 (1) 0000 (2) CCC

OAI COMMUNICATION DATA ASSIGNMENT (TCP/IP)



DESCRIPTION	DATA
Assign the IP Address of TCP/IP-Ethernet. **NOTE 1**, **NOTE 2** (AP01 INITIAL)	• Y=9 (1) 00-03: Division No. of IP Address (2) 0-255: Address Data (1-3 digits)

NOTE 1: The IP Address must be assigned to the 1st data 00-03 as follows.

IP Address: AAA.BBB.CCC.DDD [AAA-DDD: 2nd Data (2)]

1st Data (1)	00: AAA 01: BBB 02: CCC 03: DDD

NOTE 2: When setting the 2nd Data as shown in Table 3-2 IP Address Assignment Patterns (PN-CC01 Card) (See Page 35), note that the setting data is different from the data actually assigned.

IP Address: AAA.BBB.CCC.DDD

Table 3-2 IP Address Assignment Patterns (PN-CC01 Card)

PATTERN	INPUT DATA (2ND DATA)				ASSIGNED DATA
	AAA	BBB	CCC	DDD	
When no data or all 0 is input	No data	No data	No data	No data	4C.A4.XX.XX (HEX) 4C.A4: Fixed XX.XX: According to the switch setting of SW1 (D15-D8) and SW2 (D7-D0) (The IP Address is the same as lower 32 bits of MAC Address.)
	0	0	0	0	
When the data only for Address AAA is input	0≤AAA ≤127	0	0	0	A.A4.XX.XX (HEX) A.A4: Fixed XX.XX: According to the switch setting of SW1 (D15-D8) and SW2 (D7-D0) (The lower 24 bits of IP Address is the same as the lower 24 bits of MAC Address.)
When the data only for Address AAA and BBB is input	128≤AAA ≤191	0≤BBB ≤255	0		A.B.XX.XX (HEX) A.B: Fixed XX.XX: According to the switch setting of SW1 (D15-D8) and SW2 (D7-D0) (The lower 16 bits of IP Address is the same as the lower 16 bits of MAC Address.)

OAI COMMUNICATION DATA ASSIGNMENT (RS-232C)

START

CMA6

A

DESCRIPTION

Assign the attribute data for RS-232C port of the PN-AP01.

AP01 INITIAL

DATA

- YY=04 Data Transmission Speed of RS-232C port

(1) 3
(2) 0: 150 bps
1: 300 bps
2: 600 bps
3: 1200 bps
4: 2400 bps
5: 4800 bps
6: 9600 bps

- YY=05 Parity Check

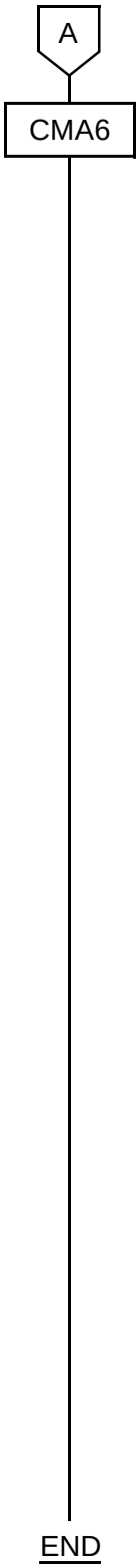
(1) 3
(2) 1◀ : Ineffective

- YY=06 Synchronous/Asynchronous

(1) 3
(2) 7◀ : Asynchronous

- YY=07 Duplex/Half-duplex

(1) 3
(2) 1◀ : Duplex



DESCRIPTION

AP01 INITIAL

DATA

- YY=08 Stop Bit

(1) 3
(2) 1◀ : 1-Stop Bit

- YY=09 Type of Code

(1) 3
(2) 06: JIS (8-bit)

- YY=10 Flow Control by DCD Signal

(1) 3
(2) 0◀ : Ineffective
1 : Effective

- YY=11 RTS Signal Control

(1) 3
(2) 0 : Ineffective (RTS Signal ON)
1◀ : Effective

NOTE: When connecting an external processor with RS-232C interface via MODEM, assign 0 (RTS Signal ON) as the 2nd data.

- YY=12 Designation of Signal for Detecting Line Disconnection

(1) 3
(2) 0 : DCD (with MODEM)
1◀ : DSR (without MODEM)

- YY=20 Designation of Facility

(1) 3
(2) 2: OAI

- YY=21 Priority

(1) 3
(2) 0: 1st Priority

- YY=24 Kind of Procedure

(1) 3
(2) 1: Free Wheel

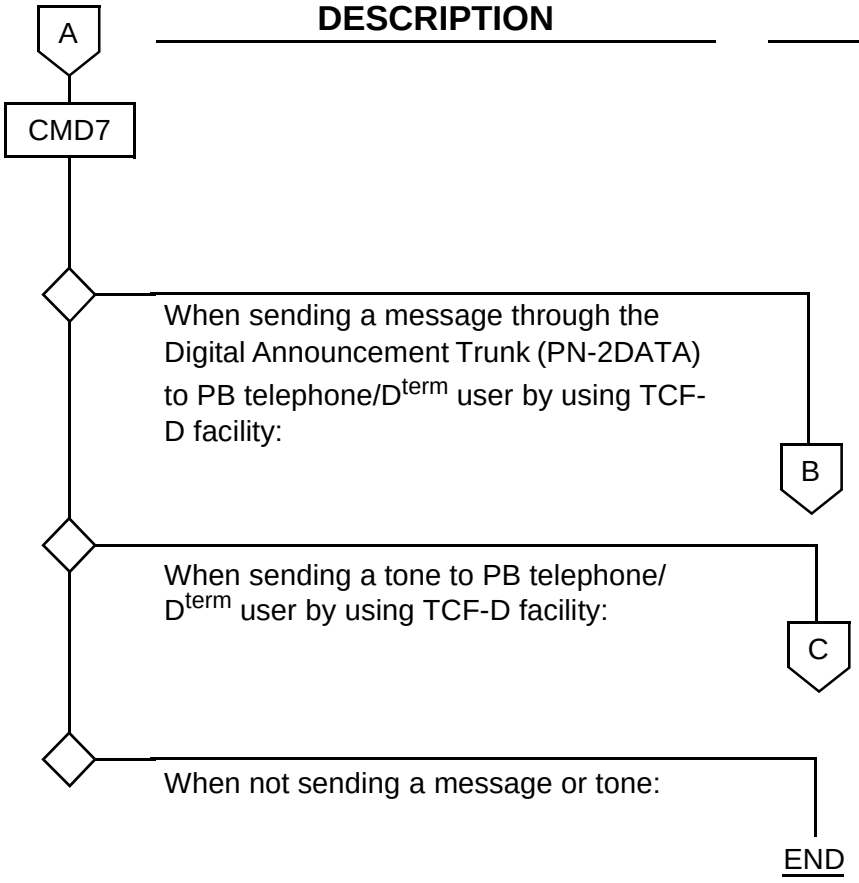
DATA ASSIGNMENT FOR MSF

To start up MSF from D^{term} by using an OAI function key:

START	DESCRIPTION	DATA
CM90	Assign the OAI function key for starting up MSF to a D^{term}.	• YY=00 (1) My Line No. + [,] + Key No. (2) F1032-F1047: OAI Function Key No. 0-15
CMD7	When pressing the OAI function key to start up MSF, assign the operation code to the OAI function key assigned by CM90.	• Y=0 (1) F1032-F1047: OAI Function Key No. 0-15 (2) 128-191: Operation Code for MSF
	When dialing a digit code (1-3 digits) after pressing OAI function key to start up MSF, assign the digit number of digit code, then assign the operation code to the digit code.	• Y=0 (1) F1032-F1047: OAI Function Key No. 0-15 (2) DCX (X=1-3) : Digit Number of Digit Code
		• Y=6 (1) X-XXX: Digit Code (X=0-9, #) (2) 128-191: Operation Code for MSF
	Assign the waiting timer for receiving an answer signal (RR signal) after starting up MSF, if required.	• Y=3 (1) 00 (2) 000-127: 8-508 sec. (4-sec. increments) If no data is set, the default setting is 8 sec.
	Specify a chime from D^{term} when receiving RR signal of MSF.	• Y=7 (1) F1032-F1047: OAI Function Key No. 0-15 (2) 00◀ : Not sent 01 : To send
END		

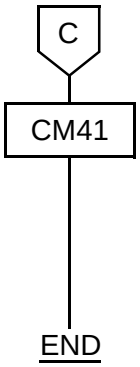
To start up MSF from PB Telephone/D^{term} by using an access code:

START	DESCRIPTION	DATA
CM12	Assign the Service Restriction Class for starting up MSF to the required stations. **NOTE:** After starting up the MSF from a PB telephone or D^{term}, the PB receiver is busy during MSF mode. Therefore, you must make sure that a call origination is not available if all PB receivers are used. To prevent the "all busy," we recommend using the OAI function key on D^{term}, as the PB receiver is not used for the D^{term}.	• YY=02 (1) X-XXXX: Station No. (2) XX ZZ ZZ: 00-15◀ : Service Restriction Class B
CM15		• YY=59 (1) 00-15: Service Restriction Class B assigned by CM12 Y=02 (2) 1◀ : Allow
CM20	Assign the access code for starting up MSF.	• Y=0-3 Number Plan Group 0-3 (1) X-XXXX: Access Code for MSF (2) A084
CMD7	Assign the operation code to the access code assigned by CM20>A084. **NOTE 1:** The operation code means a number to designate each OAI application. **NOTE 2:** The maximum number of operation code is 16.	• Y=1 (1) X-XXXX: Access Code assigned by CM20>A084 (2) 128-191: Operation Code for MSF
	Assign the waiting timer for receiving an answer signal after starting up MSF, if required.	• Y=3 (1) 00 (2) 000-127: 8-508 sec. (4-sec. increments) If no data is set, the default setting is 000 (8-sec.).
	Assign the number of the terminal (PB telephone) to be in the terminal mode simultaneously.	• Y=4 (1) 00 (2) 00◀ -32: Number of Terminal
A		


DESCRIPTION
DATA
A
CMD7
When sending a message through the Digital Announcement Trunk (PN-2DATA) to PB telephone/D^term user by using TCF-D facility:
B
When sending a tone to PB telephone/ D^term user by using TCF-D facility:
C
When not sending a message or tone:
END

B

	DESCRIPTION	DATA
CM10	Assign a Digital Announcement Trunk card number to the required LEN. **NOTE 1:** The Digital Announcement Trunk card number must be assigned to the first LEN (Level 0), the third LEN (Level 2), the fifth LEN (Level 4) and the seven LEN (Level 6) of each LT slot. **NOTE 2:** EB000 and EB001 are dedicated to built-in Digital Announcement Trunk of the MP card.	(1) LEN: 000-763 (2) EB002-EB127: Digital Announcement Trunk Card No. For PIM0/1: EB002-EB031 For PIM2/3: EB032-EB063 For PIM4/5: EB064-EB095 For PIM6/7: EB096-EB127 **NOTE 2**
CM49	Assign the function of the Digital Announcement Trunk card.	• YY=00 (1) 000-001: Built-in DAT on MP card 002-127: Digital Announcement Trunk Card No. assigned by CM10 (EB002-EB127) (2) 10: Announcement Service in the OAI Terminal mode
CM20	To record, replay or delete a message, assign the respective Digital Announcement Trunk access code.	• Y=0-3 Numbering Plan Group 0-3 (1) X-XXXX: Access Code (2) A100: Record A101: Replay A102: Delete
CM41	Specify the message replay timer in the OAI terminal mode, if required.	• Y=0 (1) 56 (2) 01-99: 0-396 sec. (4 sec. increments) If no data is set, the default setting is 20-24 sec.
CMD7	Assign the Digital Announcement Trunk card number.	• Y=2 (1) 000-127: Message No. (2) 1 XXX XXX: 000-127: Digital Announcement Trunk Card No. assigned by CM10
END		



DESCRIPTION

Specify the tone sending timer in the OAI terminal mode, if required.

DATA

- Y=0

(1) 56

(2) 01-99: 0-396 sec. (4 sec. increments)

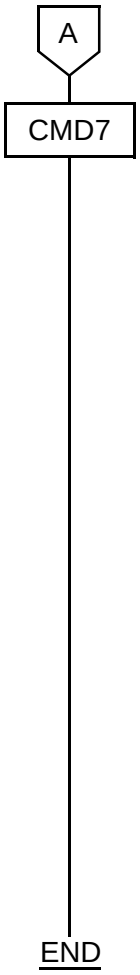
If no data is set, the default setting is 20-24 sec.

DATA ASSIGNMENT FOR TMF

START

	DESCRIPTION	DATA
CM90	Assign the OAI function key for starting up TMF to a D^{term}.	• YY=00 (1) My Line No. + [,] + Key No. (2) F1032-F1047: OAI Function Key No. 0-15
CMD7	When you start up the TMF by pressing the OAI function key, assign the operation code to the OAI function key assigned by CM90.	• Y=0 (1) F1032-F1047: OAI Function Key No. 0-15 (2) 192-255: Operation Code for TMF
	When you start up the TMF by dialing a digit code (1-3 digits) after pressing the OAI function key, assign the digit number of the digit code, then assign the operation code to the digit code.	• Y=0 (1) F1032-F1047: OAI Function Key No. 0-15 (2) DCX (X=1-3): Digit Number of Digit Code
		• Y=6 (1) X-XXX: Digit Code (X=0-9, #) (2) 192-255: Operation Code for TMF
	Assign the waiting timer for receiving an answer signal after starting up the TMF, if required.	• Y=3 (1) 00 (2) 000-127: 8-508 sec. in 4-sec. increments If no data is set, the default setting is 8 seconds.
	Assign the maximum number of terminals to be in TMF simultaneously.	• Y=4 (1) 01 (2) 00◀ : 32 terminals 01-32 : Number of Terminal

A



DESCRIPTION	DATA
Specify a chime from D^{term} when receiving RR signal of TMF.	• Y=7 (1) F1032-F1047: OAI Function Key No. 0-15 (2) 00◀ : Not sent 01 : To send
Specify a chime from D^{term} when setting up TMF.	• Y=8 (1) 00: Chime before sending terminal messages (when pressing the OAI Function key) 02: Chime after sending terminal messages (2) 00 : No ring 01◀ : Ring
Specify the display of guidance on D^{term} when setting up TMF.	• Y=8 (1) 01: Display of guidance before sending terminal messages (When pressing the OAI Function key) 03: Display of guidance after sending terminal messages (2) 00◀ : To display 01 : Not displayed

DATA ASSIGNMENT FOR SCF

To provide Call Origination with Ringing (FID=3):

START	DESCRIPTION	DATA
CM41	Assign the Ringing Tone Sending time for SCF of OAI.	• Y=0 (1) 65: OAI RGT Sending Time (2) 01-99: 4-396 sec. (4 sec. increments) If no data is set, the default setting is 12-16 sec.
END		

To originate a call with Account Code (FID=1, 3, 4, 7):

START	DESCRIPTION	DATA
CM42	Specify the maximum number of digits for Account Code.	(1) 10 (2) 01-16 : 1 digit-16 digits 10◀ : 10 digits
END		

If the Digital Announcement Trunk or Tone is provided, do the following programming:

START	DESCRIPTION	DATA
CM10	Assign a Digital Announcement Trunk card number to the required LEN. **NOTE 1:** The Digital Announcement Trunk card number must be assigned to the first LEN (Level 0), the third LEN (Level 2), the fifth LEN (Level 4) and the seven LEN (Level 6) of each LT slot. **NOTE 2:** EB000 and EB001 are dedicated to built-in Digital Announcement Trunk of the MP card.	(1) LEN: 000-763 (2) EB002-EB127: Digital Announcement Trunk Card No. For PIM0/1: EB002-EB031 For PIM2/3: EB032-EB063 For PIM4/5: EB064-EB095 For PIM6/7: EB096-EB127 **NOTE 2**
CM41	Assign the Message Replay timer/Tone Sending timer in the OAI terminal mode.	• Y=0 (1) 56: Message Replay Timer/Tone Sending Timer (2) 01-99: 4-396 sec. (4 sec. increments) If no data is set, the default setting is 20-24 sec.
CM49	Assign the function of the Digital Announcement Trunk card.	• YY=00 (1) 000-001: Built-in DAT on MP card 002-127: Digital Announcement Trunk Card No. assigned by CM10 (EB002-EB127) (2) 10: Announcement Service in the OAI Terminal mode.
CMD7	Assign the Digital Announcement Trunk card number.	• Y=2 (1) 000-127: Message No. (2) 1 XXX XXX: 000-127: Digital Announcement Trunk Card No.
END		

To provide Queue Connection (FID=4):

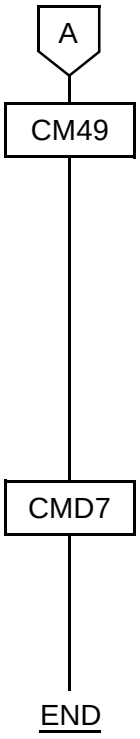
START	DESCRIPTION	DATA
CM17	Assign the UCD group.	• Y=0 (1) X-XXXX: Station No. (2) X-XXXX: Another station No. to be linked
	Assign the Pilot station and Member station to queuing for SCF of OAI.	• Y=1 Distinction of Member station from Pilot station (1) X-XXXX: Station No. (2) 2: Off Hook suppressed 3: Pilot station (Monitor No.) * Unable to place or receive a call.
	Assign the UCD group number.	• Y=2 (1) X-XXXX: UCD Station No. (2) 00-15: UCD Group 00-15
END		

To provide the system with a monitor number:

START	DESCRIPTION	DATA
CM11	Assign a virtual station number to be used as the monitored number. (Assign only one per system.)	(1) 000-255: Virtual LEN (2) X-XXXX: Virtual-Line number
CM17	Assign the Pilot station and Member station to queuing for SCF or OAI.	• Y=1 Distinction of Member station from Pilot station (1) X-XXXX: Station No. (2) 2: Member station 3: Pilot station (Monitor No.) * Unable to place or receive a call.
	Assign the UCD group number.	• Y=2 (1) X-XXXX: UCD station No. (2) 00-15: UCD Group 00-15
END		

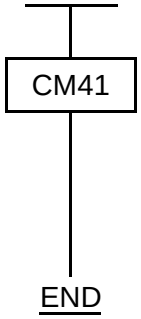
To provide Announcement Call (FID=5):

START	DESCRIPTION	DATA
CM10	Assign a Digital Announcement Trunk card number to the required LEN. **NOTE 1:** The Digital Announcement Trunk card number must be assigned to the first LEN (Level 0), the third LEN (Level 2), the fifth LEN (Level 4) and the seven LEN (Level 6) of each LT slot. **NOTE 2:** EB000 and EB001 are dedicated to built-in Digital Announcement Trunk of the MP card.	(1) LEN: 000-763 (2) EB002-EB127: Digital Announcement Trunk Card No. For PIM0/1: EB002-EB031 For PIM2/3: EB032-EB063 For PIM4/5: EB064-EB095 For PIM6/7: EB096-EB127 **NOTE 2**
CM17	Assign the Pilot station and Member station to queuing for SCF of OAI. When sending an announcement from the beginning on the Multi-Connection Announcement Service, set this data to “3”.	• Y=1 Distinction of Member station from Pilot station (1) X-XXXX: Station No. (2) 2: Originate Suppress 3: Pilot station (Monitor No.) * Unable to place nor receive a call. **NOTE:** 2 is for Member station 3 is for Pilot station
	Assign the method to send Multi-Connection Announcement. When sending an announcement from the beginning on the Multi-Connection Announcement, set this data to “1”.	• Y=A (1) X-XXXX: Pilot station No. (2) 0 : To be sent periodically 1◀ : To be sent only once
CM41	When sending an announcement from the beginning on the Multi-Connection Announcement, assign the latency time of sending the announcement after receiving SCF FID=5.	• Y=0 (1) 67: OAI Announcement Connection Timer (2) 01-32: 4-128 sec. (4 sec. increments) If no data is set, the default setting is 8-12 sec.
A		



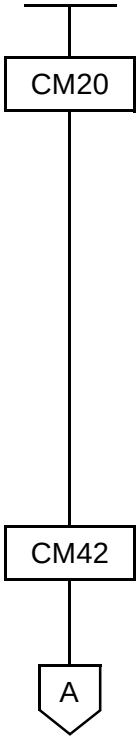
DESCRIPTION	DATA
Assign the function of the Digital Announcement Trunk card.	• YY=00 (1) 000-001: Built-in DAT on MP card 002-127: Digital Announcement Trunk Card No. assigned by CM10 (EB002-EB127) (2) 10: Announcement Service for OAI 16 XX XX: Message Group No. (02-63) for Multi-Connection Announcement Service for OAI.
Assign the Digital Announcement Trunk card number.	• Y=2 (1) 000-127: Message No. (2) 1 XXX XXX: 000-127: Digital Announcement Trunk Card No.

To provide Conversation Monitoring (FID=6) and Call Conferencing (FID=8):



DESCRIPTION	DATA
Assign the Ringing Tone Sending time for SCF of OAI.	• Y=0 (1) 65: OAI RGT Sending Time (2) 01-99: 4-396 sec. (4 sec. increments) If no data is set, the default setting is 12-16 sec.

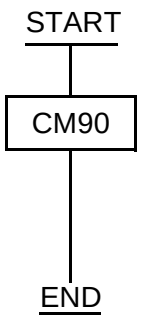
DATA ASSIGNMENT FOR FLF



DESCRIPTION	DATA
Assign the access code to recognize Authorization Code for FLF. **NOTE:** The access code should be assigned to the first one, two or three digits of Authorization Code. For example: 1 2 3 4 5 6 (Authorization Code) Max. No. of digits assigned by CM42>11 Access Code assigned by CM20>A157	• Y=0-3 (1) X-XXXX: Access Code (2) A157
Assign the maximum number of digits for Authorization Code.	(1) 11 (2) 01-10◀ : Max. Number of Digits

	DESCRIPTION	DATA
A		
CMD7	Assign the recognition of AP database by RR message.	• Y=A (1) 00 (2) 0◀ : To provide 1 : Not provided
	Assign the omission of AP database for information added to RR message.	• Y=A (1) 01 (2) 0◀ : Not omitted 1 : To omit
	Assign the office number.	• Y=5 (1) 00 (2) Office No. (Max. 4 digits)
CM08	Assign the processor for Authorization Code/Forced Account Code.	(1) 216 (2) 1◀ : AP (PN-AP01)
	Assign the processor for a Remote Access to System (DISA).	(1) 217 (2) 1◀ : AP (PN-AP01)
CM15	Allow the Authorization Code/Forced Account Code in required Service Restriction Class.	• YY=31 (1) 00-15: Service Restriction Class A assigned by CM12 YY=02. (2) 0 : Restrict 1◀ : Allow
END		

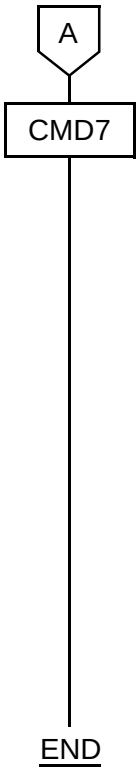
DATA ASSIGNMENT FOR KTF



DESCRIPTION	DATA
Assign the OAI function key for starting up FLF to a D^{term}.	• YY=00 (1) My Line No. + [,] + Key No. (2) F1032-F1047: OAI Function Key No. 0-15

DATA ASSIGNMENT FOR ACF

START	DESCRIPTION	DATA
CM08	Specify the processor to check the ID Codes.	(1) 217 (2) 1◀ : AP (PN-AP01)
	Specify whether SST is sent after dialing the access code for ID Code Class Change or not.	(1) 362 (2) 0 : No Tone 1◀ : Service Set Tone (SST)
CM42	Assign the number of digits for each ID code of Authorization Code/Forced Account Code/Remote Access to System (DISA).	(1) 11: Authorization Code 12: Forced Account Code 13: Remote Access to System (DISA) (2) 01-10: Number of digits
CM20	Assign the Access code for ID Code Class Change.	• Y=0-3 Numbering Plan Group 0-3 (1) X-XXXX: Access Code (2) A086: Authorization Code A087: Forced Account Code
CMD5	Assign the Temporary Class data to the ID codes. **NOTE:** This data is to use PBX internal class change data when ACF is in operation and the AP stopped. The number of digits is set through CMD7 Y=B.	• Y=3 (1) ID code (2) A BB CC DD EE A: Type of Temporary Service Class 0: Unrestricted 1: Fully-Restricted 2: Temporary Service Class 9: Delete of the ID Code BB: 01-08: Trunk Restriction Class CC: 00-15: Service Feature Class-A DD: 00-15: Service Feature Class-B EE: 00-15: Service Feature Class-C
A		



DESCRIPTION	DATA
Assign the return result waiting timer for the PBX sent facility.	• Y=3 (1) 00 (2) 000-127: 8-508 sec. (4-sec. increments) If no data is set, the default setting is 8 sec.
Assign the office number.	• Y=5 (1) 00 (2) Office No. (Max. 4 digits)
Assign the Number of ID code digits when AP stops during ACF operation.	• Y=B (1) 00 (2) 0◀ : No ACF operation 1 : 1 digit 2 : 2 digits 3 : 3 digits

DATA ASSIGNMENT FOR SSF

START

	DESCRIPTION	DATA
CM08	Assign the Message Wait Indication (VM) for My Line only or My Line and sub-line on D^{term}.	(1) 140 (2) 0 : MW for My Line and sub-lines 1◀ : MW for My Line only
	Whether Message Waiting/Message Reminder is reset (turning the MW Lamp off) by answering at the called station when the calling station calls again after setting this feature.	(1) 235 (2) 0: Available
	When a forwarded call is terminated to the VMS via CCIS, Whether Message Waiting from the VMS is provided for the called station.	(1) 376 (2) 0 : To provide 1◀ : Not provided
	Assign the Type of Voice Mail System.	(1) 443 (2) 0: VMS with MCI
	Message Waiting lamp control from VMS with MCI to all stations.	(1) 444 (2) 0: Available
	NOTE: MW lamp control is only available to the stations in the opposite PBX connected with CCIS via MCI. Station dialing MW access codes are not allowed over CCIS.	
CM13	Assign the Message Waiting/Message Reminder.	• YY=03 (1) X-XXXX: Station No. (2) 0: To provide (For the station with MW lamp)

END

DATA ASSIGNMENT FOR SMF

START	DESCRIPTION	DATA
CM08	Assign the automatic setting of SMFR for D^{term} Sub line.	(1) 429 (2) 0 : Available 1◀ : Not available
	Specify OAI SMFN STS (status) for Call Transfer from a station.	(1) 460 (2) 0 : SMFN STS=7 1◀ : SMFN STS=0
	Specify whether OAI SMFN is sent when answering a held call.	(1) 461 (2) 0 : Sent 1◀ : Not sent
	Specify whether ANI/Caller ID/CPN is sent to OAI terminal.	(1) 462 (2) 0 : Available 1◀ : Not available
	Assign the OAI-TSAPI/SCF facility.	(1) 464 (2) 0 : Same as IMX system (recommended setting) 1◀ : SMFN Off-Hook indication sent
CMD7	Assign the SMFN/SSFN delay timer	• Y=A (1) 02 (2) 0 : Immediate start 1◀ : 512 msec. delay
END		

CHAPTER 4

TROUBLESHOOTING

This chapter explains the troubleshooting information after installing the OAI system.

TROUBLESHOOTING FOR OAI WITH RS-232C

This section explains the troubleshooting information for the OAI system with RS-232C. Table 4-1 shows the cause of trouble and the remedial action.

Table 4-1 Troubleshooting Information for OAI with RS-232C

TROUBLE	CAUSE	ACTION
The PN-AP01 does not set up.	• The AP data (07) of PN-AP01 has not been assigned by CM05.	• Assign the AP data (07) by CM05, then initialize the PN-AP01 (press SW1 of MP card).
	• The AP data (07) of PN-AP01 has been assigned to two slot numbers.	• Delete one data of the two, then initialize the PN-AP01 (press SW1 of MP card).
	• The unused data have been assigned by CMA6.	• Confirm the programming procedure of Chapter 3, then assign the correct data.
The system cannot communicate with an external processor at all.	• The cables between the system and an external processor have not been connected properly.	• Connect the cables properly.
	• The attribute data for RS-232C port of PN-AP01 have not been assigned by CMA6.	• When providing OAI with RS-232C, assign the attribute data in accordance with the external processor attribution.
	• The attribute data assigned by CMA6 have not coincided with the external processor attribution.	• When providing the OAI with RS-232C, assign the attribute data in accordance with the external terminal attribution.
	• The PN-AP01 has not been initialized after the programming of CMA6.	• Initialize the PN-AP01 (Move the MB switch on the PN-AP01 up and down).
	• The switches of MODEM have not been set properly.	• Set the switches properly.

Table 4-1 Troubleshooting Information for OAI with RS-232C (Continued)

TROUBLE	CAUSE	ACTION
The system cannot communicate with an external processor at all.	• In an external processor (RS-232C) connection via MODEM, the RTS signal control of RS-232 port has been effective (CMA6 YY=11, 2nd Data=1).	• Assign 0 (RTS Signal ON) as the 2nd data of CMA6 YY=11.
The OAI function key of D^{term} does not operate.	• The OAI function key has not been assigned by CM90.	• Assign the OAI function key to D^{term}.
	• The operation code for MSF/TMF has not been assigned by CMD7 Y=0.	• Assign the operation code.
	• The operation code for MSF/TMF has not been accepted by the external processor.	• Check the application program of the external processor, then assign correct operation code.

TROUBLESHOOTING FOR OAI WITH TCP/IP-ETHERNET

This section explains the troubleshooting information for the OAI system with TCP/IP-Ethernet. Table 4-2 shows the cause of trouble and the remedial action. When a trouble occurs, do the remedial action.

Troubleshooting Information for ETHER Card

Table 4-2 Troubleshooting Information for ETHER Card

TROUBLE	CAUSE	ACTION
The system cannot communicate with an external processor at all.	• The cables between the system and an external processor have not been connected properly.	• Connect the cable properly.
	• The IP Address overlaps with another.	• Confirm the data set by CMD7 Y=9, and assign the correct data.
	• The MAC Address overlaps with another.	• Confirm the switch setting on the PN-CC01 card, and set correctly.

The lamp indications on the PN-CC01 card on normal condition are as follows:

LAMP NAME	COLOR	FUNCTION
RUN	Green	Flashes at 60 IPM while this card is operating normally.
LINK	Green	Lights when link is established. **NOTE**
XMT	Green	Lights when transmitting data.
RCV	Green	Lights when receiving data.
RVP	Green	Lights when receiving data with own IP Address.
ERR	_	Not used

NOTE: Confirm connection of a cable if a lamp disappears.

Troubleshooting Information for PN-AP01 Card

Table 4-3 Troubleshooting Information for PN-AP01 Card

TROUBLE	CAUSE	ACTION
The PN-AP01 does not set up.	• The AP data (07) of PN-AP01 has not been assigned by CM05.	• Assign the AP data (07) by CM05, then initialize the PN-AP01 (press SW1 of MP card).
	• The AP data (07) of PN-AP01 has been assigned to two slot numbers.	• Delete one data of the two, then initialize the PN-AP01 (press SW1 of MP card).
	• The unused data have been assigned by CMA6.	• Confirm the programming procedure of CHAPTER 3, then assign the correct data.

Replacement Procedure for PN-AP01/PN-CC01 Card

When replacing the PN-AP01 card or the PN-CC01 card with power on, do the following procedure.

(1) Procedure for PN-AP01 Card

(a) When unplugging:

- Set the MB switch on the PN-AP01 card to the UP position.
- Remove the BUS cable (48-TW-0.3 CONN CA).
- Unplug the PN-AP01 card from the card slot.

(b) When plugging in:

- Set the MB switch on the PN-AP01 card to the UP position.
- Plug in the PN-AP01 card to the card slot.
- Connect the BUS cable with the PN-AP01 card.
- Set the MB switch on the PN-AP01 card to the DOWN position.

(2) Procedure for PN-CC01 Card

(a) When unplugging:

- Remove the transceiver cable/10 BASE-T cable.
- Remove the BUS cable.
- Set the MB switch on the PN-CC01 to the UP position.
- Unplug the PN-CC01 card from the card slot.

(b) When plugging in:

- Set the MB switch on the PN-CC01 to the UP position.
- Plug in the PN-CC01 card to the card slot.
- Connect the BUS cable with the PN-CC01 card.
- Connect the 10 BASE-T cable with the PN-CC01 card.
- Set the MB switch on the PN-CC01 to the DOWN position.

CHAPTER 5

CIRCUIT CARD INFORMATION

This chapter explains the mounting location, the meaning of lamp indications, and the method of switch settings of each circuit card for the OAI system.

HOW TO READ THIS CHAPTER

This chapter explains each circuit card used in this system about the following items. Explanations are given in alphabetical order of the circuit card names within each circuit card category (Control, Application Processor, and Line/Trunk).

(1) Locations of Lamps, Switches, and Connectors
The locations of lamps, switches, and connectors of each circuit card are shown by a face layout.

(2) Lamp Indications
The name, color, and functions of each indicator lamp equipped on each circuit card are described in a table.

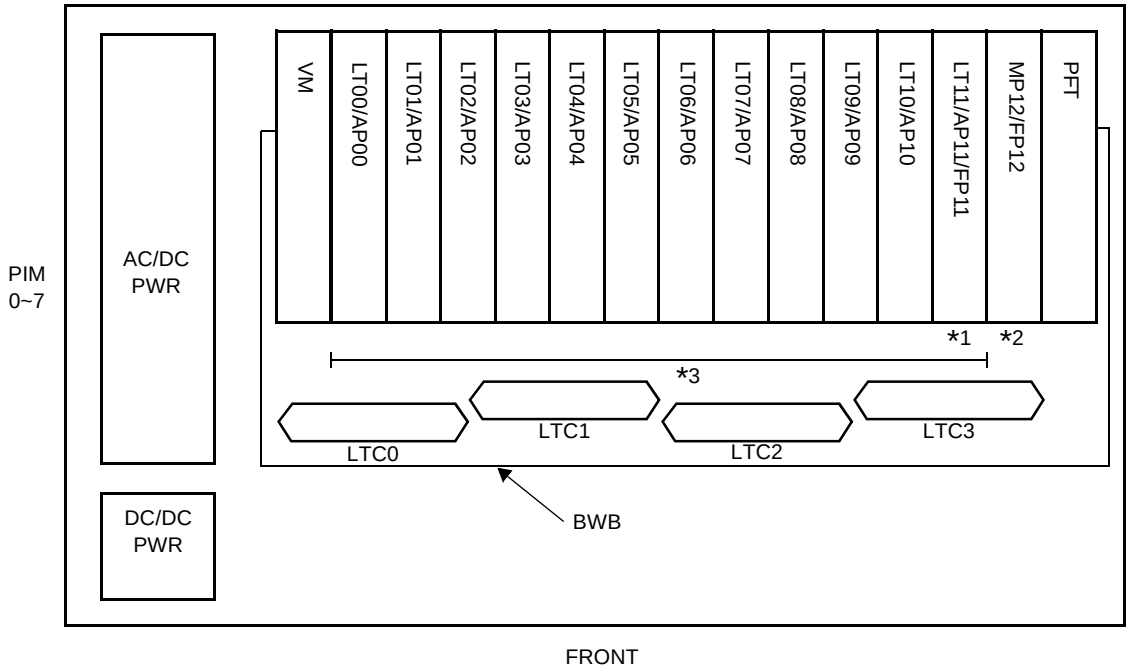
(3) Switch Settings
The name, settings, and functions of each switch equipped on each circuit card are described in a table.

Each switch setting table has a “CHECK” column. Make necessary entries in the CHECK column during and/or after the system installation and maintenance, and use each table as a reference for subsequent system maintenance and operations.

MOUNTING LOCATION OF CIRCUIT CARD

This section explains the conditions for mounting circuit cards for the OAI. Figure 5-1 shows circuit card mounting slots allocated in the PIM.

Figure 5-1 Mounting Location of Circuit Card



***1** PN-CP15 (FP) is to be mounted in FP11 slot on PIM0.
***2** PN-CP15 (FP) card is to be mounted in FP12 slot on PIM2/PIM4/PIM6.
***3** PN-AP01 (AP01) card and PN-CC01 (ETHER) card are to be mounted in AP00-AP10 slots on PIM0, and on the AP00-AP11 slots on PIM1-7.

LIST OF REQUIRED CIRCUIT CARD

Table 5-1 shows the required circuit cards to be explained in this section.

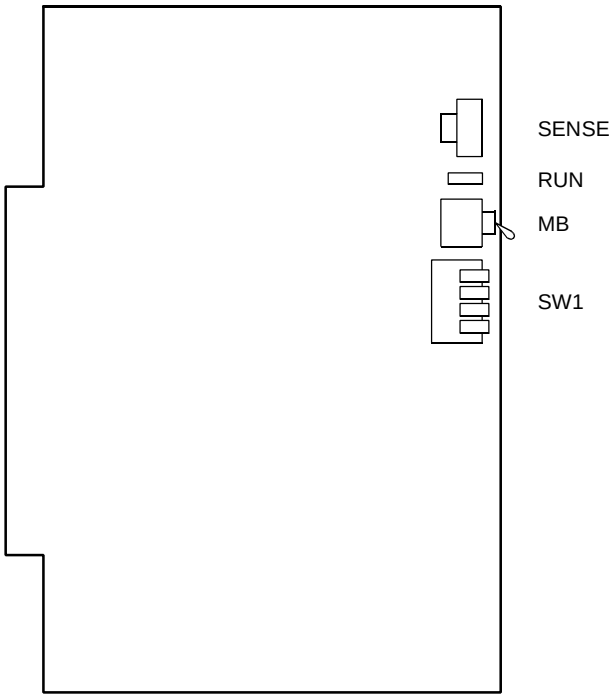
Table 5-1 List of Required Card

NAME (FUNCTIONAL NAME)	LAMP X:PROVIDED –:NOT PROVIDED	SWITCH X:PROVIDED –:NOT PROVIDED	EXTRACTION/ INSERTION WITH POWER ON X:ALLOWED Δ:ALLOWED AFTER MB* –:NOT ALLOWED	REFERENCE PAGE
PN-CP15 (FP)	X	X	Δ	Page 69
PN-AP01 (AP01)	X	X	Δ	Page 71
PN-CC01 (ETHER)	X	X	X	Page 74

*MB = Make Busy

PN-CP15 (FP)

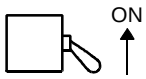
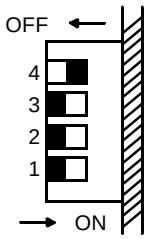
Locations of Lamps, Switches, and Connectors



Lamp Indications

LAMP NAME	COLOR	FUNCTION
RUN	Green	Flashes at 120 IPM while the circuit card is operating normally.

Switch Settings

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
SENSE (Rotary SW)  **NOTE 1**	0-3	For setting FP No.		
		0	For mounting this card in PIM0	
		1	For mounting this card in PIM2	
		2	For mounting this card in PIM4	
		3	For mounting this card in PIM6	
	4-F		Not used	
MB (Toggle SW)  **NOTE 2**		UP	For make-busy	
		(DOWN)	For normal operation	
SW1 (Piano Key SW) 	1 - 3	(OFF)	Not used	
	4	(ON)	For normal operation	
		OFF	Not used	

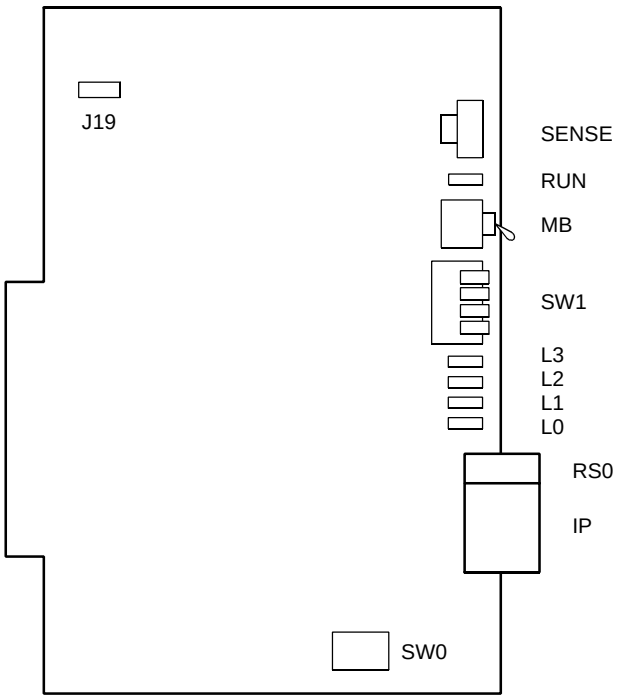
The figure in the SWITCH NAME column and the position in ( ) in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and ( ), the setting of the switch varies with the system concerned.

NOTE 1: Set the groove on the switch to the desired position.

NOTE 2: When the power is on, flip the MB switch to ON (UP position) before plugging/ unplugging the circuit card.

PN-AP01 (AP01)

Locations of Lamps, Switches and Connectors

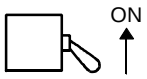


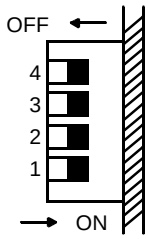
Lamp Indications

LAMP NAME		COLOR	FUNCTION
RUN		Green	Flashes at 120 IPM while this card is operating normally.
L0-L3	L3	Green	Indication of CTS signal status on RS-232C port.
	L2		Indication of DCD signal status on RS-232C port.
	L1		Indication of TXD signal status on RS-232C port.
	L0		Indication of RXD signal status on RS-232C port.

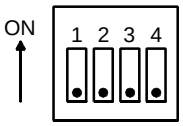
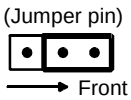
Switch Settings

<table>
<tr><th>SWITCH NAME</th><th>SWITCH NUMBER</th><th>SETTING POSITION</th><th>FUNCTION</th><th>CHECK</th></tr>
<tr><td rowspan="2">SENSE
(Rotary SW)
 

NOTE 1</td><td>4-F</td><td colspan="3">Set the switch to match the AP Number (04-15) to be set by CM05.
<table><tr><td>AP No.</td><td>04</td><td>05</td><td>06</td><td>07</td><td>08</td><td>09</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr><tr><td>SW No.</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr></table></td><td></td></tr>
<tr><td>0-3</td><td colspan="3">Not used</td><td></td></tr>
<tr><td rowspan="2">MB (Toggle SW)
 

NOTE 2</td><td rowspan="2"></td><td>UP</td><td>For make-busy</td><td></td></tr>
<tr><td>DOWN</td><td>For normal operation</td><td></td></tr>
<tr><td rowspan="8">SW1
(Piano Key SW)
 
</td><td rowspan="2">1</td><td>ON</td><td>For normal operation</td><td></td></tr>
<tr><td>OFF</td><td>Not used</td><td></td></tr>
<tr><td rowspan="2">2</td><td>ON</td><td>For normal operation</td><td></td></tr>
<tr><td>OFF</td><td>Not used</td><td></td></tr>
<tr><td rowspan="2">3</td><td>ON</td><td>For normal operation</td><td></td></tr>
<tr><td>OFF</td><td>Not used</td><td></td></tr>
<tr><td rowspan="2">4</td><td>ON</td><td>For normal operation</td><td></td></tr>
<tr><td>OFF</td><td>Not used</td><td></td></tr>
</table>

(Continued)

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
SW0 (Dip SW)  	1	ON	Receives RT clock	
		(OFF)	Uses internal clock	
	2	ON	Receives ST2 clock	
		(OFF)	Uses internal clock	
	3	ON	Sends ST1 clock	
		(OFF)	Not send ST1 clock	
	4	(OFF)	Not used	
J19  		(RIGHT)	For normal operation (Memory backup ON)	
		LEFT	Not used (Memory backup OFF)	

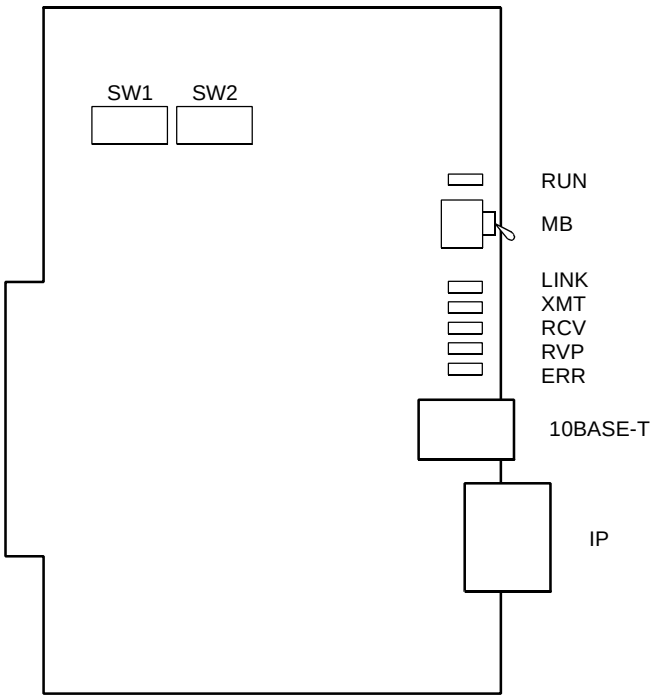
The figure in the SWITCH NAME column and the position in ( ) in the SETTING POSITION column indicate the standard setting of the switch. When the switch is not set as shown by the figure and ( ), the setting of the switch varies with the system concerned.

NOTE 1: Set the groove on the switch to the desired position.

NOTE 2: When the power is on, flip the MB switch to ON (UP position) before plugging/ unplugging the circuit card.

PN-CC01 (ETHER)

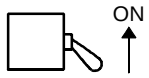
Location of Lamps, Switches and Connectors



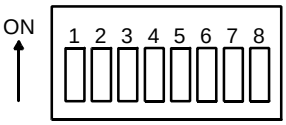
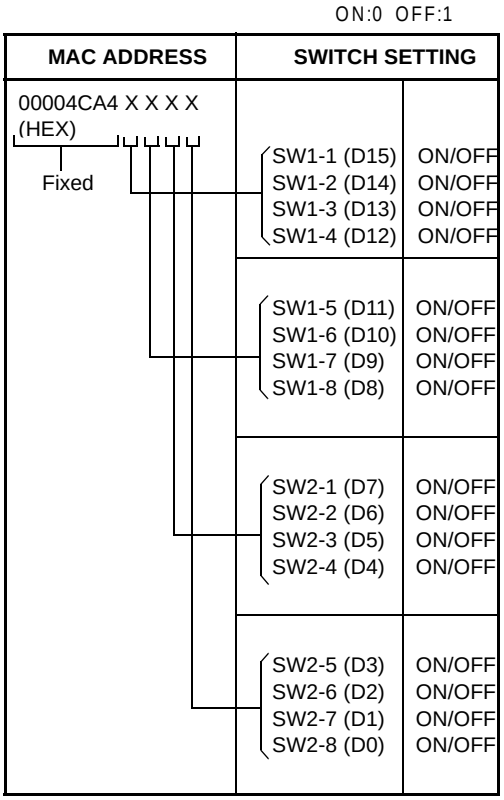
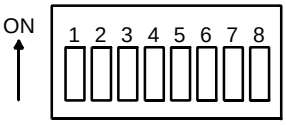
Lamp Indications

LAMP NAME	COLOR	FUNCTION
RUN	Green	Flashes at 60 IPM while this card is operating normally.
LINK	Green	Remains lit when link is established.
XMT	Green	Remains lit when it is transmitting the data.
RCV	Green	Remains lit when it is receiving the data.
RVP	Green	Remains lit only when it is receiving the data with its own IP address.
ERR	–	Not used

Switch Settings

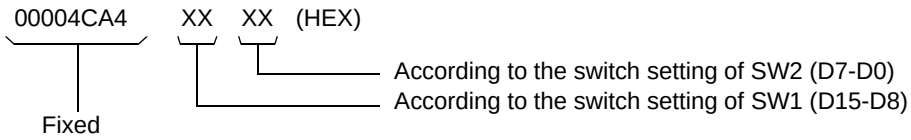
SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
MB (Toggle SW)  **NOTE 1**		UP	For make-busy	
		DOWN	For normal operation	

(Continued)

SWITCH NAME	SWITCH NUMBER	SETTING POSITION	FUNCTION	CHECK
SW1 (DIP SW)  **NOTE 2**	1 (D15)	ON	 	
	2 (D14)	ON		
	3 (D13)	ON		
	4 (D12)	OFF		
	5 (D11)	ON		
		OFF		
	6 (D10)	ON		
		OFF		
	7 (D9)	ON		
		OFF		
	8 (D8)	ON		
		OFF		
SW2 (DIP SW)  **NOTE 2**	1 (D7)	ON		
		OFF		
	2 (D6)	ON		
		OFF		
	3 (D5)	ON		
		OFF		
	4 (D4)	ON		
		OFF		
	5 (D3)	ON		
		OFF		
	6 (D2)	ON		
		OFF		
	7 (D1)	ON		
		OFF		
	8 (D0)	ON		
		OFF		

NOTE 1: When the power is on, flip the MB switch to ON (UP position) before plugging/ unplugging the Circuit card.

NOTE 2: Each equipment must have a unique MAC address to distinguish between systems. Therefore, when more than one PBX is installed in the same network, assign the lower 4 digits of the following MAC address by SW1 and SW2 to prevent duplicate addresses.



APPENDIX

DEFINITION OF V.24 SIGNAL LEADS

This appendix contains the definition of V.24 signal leads.

PIN No.	SIGNAL-NAME				DIRECTION OF SIGNAL	MEANING
	RS-232C	JIS C 6361	CCITT V.24	ANOTHER		
1	AA	(FG)	101	GND		Frame Ground
2	BA	SD	103	TXD	DTE →	Send Data
3	BB	RD	104	RXD	← DCE	Receive Data
4	CA	RS	105	RTS	DTE →	Request to Send
5	CB	CS	106	CTS	← DCE	Clear to Send
6	CC	DR	107	DSR	← DCE	Data Set Ready
7	AB	SG	102	GND		Signal Ground
8	CF	CD	109	DCD	← DCE	Data Channel Receive Carrier Detect
9						Not used
10						Not used
11		PB				Peripheral Busy
12	SCF	BCD	122		← DCE	Backward Channel Receive Carrier Detect
13	SCB	BCS	121		← DCE	Backward Channel Send (OK)
14	SBA	BSD	118		DTE →	Backward Channel Send Data
15	DB	ST2	114	TXC (2)	← DCE	Send Signal Element Timing
16	SBB	BRD	119		← DCE	Backward Channel Receive Data
17	DD	RT	115	RXC	← DCE	Receive Signal Element Timing
18						Not used
19	SCA	BRS	120		DTE →	Backward Channel Send Detect
20	CD	ER	108/2	DTR	DTE →	Data Terminal Ready
21	CG	SQD	110		← DCE	Data Signal Quality Detect
22	CE	CI	125	RI	← DCE	Call Indication
23	CI, CH	SRS	112, 111		←→	Data Signal Speed Choice
24	DA	ST1	113	TXC (1)	DTE →	Send Signal Element Timing
25						Not used