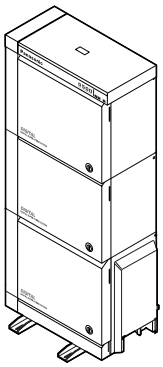
Panasonic



Digital Super Hybrid System

Installation Manual

Model No. KX-TD500

Please read this manual before connecting the Digital Super Hybrid System.
Thank you for purchasing the Panasonic Model KX-TD500, Digital Super Hybrid System.

System Components

System Components Table

	Model	Description
Shelf	KX-TD500	Basic Shelf
	KX-TD520	Expansion Shelf
Extension Cards	KX-T96170	HLC (Hybrid Line Circuit) Card
	KX-T96172	PLC (Proprietary Line Circuit) Card
	KX-T96174	SLC (Single Line Telephone Circuit) Card
	KX-T96175	SLC-M (Single Line Telephone Circuit with Message Waiting) Card
	KX-T96185	OPX (Off Premise Extension) Card
	KX-TD50170	DHLC (Digital Hybrid Line Circuit) Card
	KX-TD50172	DLC (Digital Proprietary Line Circuit) Card
	KX-TD50175	ESLC (Enlarged-Single Line Telephone Circuit with Message Waiting) Card
Trunk Cards	KX-T96180	LCOT (Loop Start Central Office Trunk) Card
	KX-T96181	GCOT (Ground Start Central Office Trunk) Card
	KX-T96182	DID (Direct Inward Dialling Trunk) Card
	KX-T96182CE	DID-MFC (Direct Inward Dialling Trunk with MFC) Card
	KX-T96182D	DID-2W (Both-way Direct Inward Dialling Trunk) Card
	KX-T96183	RCOT (Loop Start Central Office Trunk Card with Polarity Reversal Detection) Card
	KX-T96184	E&M Card
	KX-T96187	T1 Digital Trunk Card
	KX-T96188	E1 Digital Trunk Card
	KX-T96189	PCOT (Loop Start Central Office Trunk Card with Pay-Tone Detection) Card
	KX-TD50180	ELCOT (Enhanced Loop Start Central Office Trunk) Card
	KX-TD50288	BRI (ISDN Basic Rate Access Interface) Card
	KX-TD50290	PRI30 (ISDN Primary Rate Access Interface) Card
Resource Cards	KX-T96191	DISA (Direct Inward System Access Trunk) Card
	KX-T96193	AGC (Automatic Gain Control Trunk) Card
	KX-T96196	RMT (Remote Circuit) Card
	KX-TD50197	ERMT (Enhanced Remote Circuit) Card

System Components Table

	Model	Description
Other Cards	KX-T96136	OHCA (Off Hook Call Announcement) Card
	KX-T96161	DPH (Doorphone Circuit) Card
	KX-TD193	Caller ID Card
	KX-TD50104	TSW-CONF (TSW Conference Expansion) Card
	KX-TD50105	DOHCA (OHCA for Digital Telephone) Card
	KX-TD50189	Pay Tone Card

Notice

There are some optional service cards and features which are not available for certain countries. Consult your authorized Panasonic dealer for detailled instructions.

Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

CE

73/23/EEC
89/336/EEC
92/31/EEC
93/68/EEC

System Components Table

	Model	Description
Analogue Proprietary Telephones (APTs)	KX-T7020	APT with SP-PHONE (12-CO)
	KX-T7030	APT with SP-PHONE, 1-Line Display (12-CO)
	KX-T7033	APT with SP-PHONE (12-CO)
	KX-T7050	APT with MONITOR (12-CO)
	KX-T7055	APT with MONITOR (3-CO)
	KX-T7130	APT with SP-PHONE, 1-Line Display (12-CO)
	KX-T7320	APT with SP-PHONE (12-CO)
	KX-T7330	APT with SP-PHONE, 1-Line Display (12-CO)
	KX-T7350	APT with MONITOR (12-CO)
Digital Proprietary Telephones (DPTs)	KX-T7220	DPT with SP-PHONE (24-CO)
	KX-T7230	DPT with SP-PHONE, 2-Line Display (24-CO)
	KX-T7235	DPT with SP-PHONE, 6-Line Display (12-CO)
	KX-T7250	DPT with MONITOR (6-CO)
	KX-T7420	DPT with SP-PHONE (12-CO)
	KX-T7425	DPT with SP-PHONE (24-CO)
	KX-T7431	DPT with SP-PHONE, 1-Line Display (12-CO)
	KX-T7433	DPT with SP-PHONE, 3-Line Display (24-CO)
	KX-T7436	DPT with SP-PHONE, 6-Line Display (24-CO)
	KX-T7450	DPT with MONITOR (12-CO)
	KX-T7451	DPT with MONITOR (4-CO)
Single Line Telephones (SLTs)	KX-T7051	SLT with FLASH button and Message Waiting Lamp
	KX-T7052	SLT with FLASH button and Message Waiting Lamp
	KX-T7310	SLT with FLASH button and Message Waiting Lamp
	KX-T7315	SLT with FLASH button and Message Waiting Lamp
Proprietary Equipment	KX-T7040	DSS Console (32-DSS, 16-PF)
	KX-T7240	DSS Console (32-DSS, 16-PF)
	KX-T7340	DSS Console (32-DSS, 16-PF)
	KX-T7440	DSS Console (66-DSS)
	KX-T7441	DSS Console with ANSWER and RELEASE buttons (48-DSS)
	KX-T96186	Off Premise Extension (OPX) Power Unit
	KX-T30865	Doorphone
	KX-T7090	Headset
	KX-A46	Battery Adaptor
	KX-A46D	Battery Adaptor with Battery Charger

Note

CO : CO line access button

DSS: Direct Station Selection button

PF : Programmable Feature button

Precaution

- Keep the unit away from heating appliances and electrical noise generating devices such as fluorescent lamps, motors and television. These noise sources can interfere with the performance of the Digital Super Hybrid System.
- This unit should be kept free of dust, moisture, high temperature (more than 40°C / 104°F) and vibration, and should not be exposed to direct sunlight.
- Never attempt to insert wires, pins, etc. into the vents or other holes of this unit.
- If there is any trouble, disconnect the unit from the telephone line. Plug the telephone directly into the telephone line. If the telephone operates properly, do not reconnect the unit to the line until the trouble has been repaired. If the telephone does not operate properly, chances are that the trouble is in the telephone system, and not in the unit.
- Do not use benzine, thinner, or the like, or any abrasive powder to clean the cabinet. Wipe it with a soft cloth.

WARNING

THIS UNIT MAY ONLY BE INSTALLED AND SERVICED BY QUALIFIED SERVICE PERSONNEL.

WHEN A FAILURE OCCURS WHICH RESULTS IN THE INTERNAL PARTS BECOMING ACCESSIBLE, DISCONNECT THE POWER SUPPLY CORD IMMEDIATELY AND RETURN THIS UNIT TO YOUR DEALER.

DISCONNECT THE TELECOM CONNECTION BEFORE DISCONNECTING THE POWER CONNECTION PRIOR TO RELOCATING THE EQUIPMENT, AND RECONNECT THE POWER FIRST.

THIS UNIT IS EQUIPPED WITH AN EARTHING CONTACT PLUG. FOR SAFETY REASONS THIS PLUG MUST ONLY BE CONNECTED TO AN EARTHING CONTACT SOCKET WHICH HAS BEEN INSTALLED ACCORDING TO REGULATIONS.

THE POWER SOCKET WALL OUTLET SHOULD BE LOCATED NEAR THIS EQUIPMENT AND BE EASILY ACCESSIBLE.

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

The serial number of this product may be found on the label affixed to the bottom of the unit. You should note the model number and the serial number of this unit inthe space providedand retain this book as a permanent record of your purchase to aid in identificationin the event of theft.

MODEL NO.: _____

SERIAL NO.: _____

Introduction

This Installation Manual is designed to serve as an overall technical reference for the Panasonic Digital Super Hybrid System, KX-TD500. It provides instructions for installing the hardware, and programming the system using the Maintenance Console software for a PC.

The Structure of This Manual

This manual contains the following sections:

Section 1 System Outline
Provides general information on the system including system capacity and specifications.

Section 2 Installation
Contains the basic system installation and wiring instructions, as well as how to install the optional cards and units including environmental requirements.

Section 3 Maintenance Console Guide
Explains the structure of the Maintenance Console software and the basic information you need.

Section 4 Utility
Describes the information necessary for testing, monitoring and maintaining the KX-TD500 System using the Maintenance Console software for a PC.

Section 5 Troubleshooting
Provides information for system and telephone troubleshooting.

About the Other Manuals

Along with this Installation Manual, the following manuals are available:

Features Guide
Describes every basic, optional and programmable features of the KX-TD500 System in alphabetical order.

User Manual
Designed for users of Digital Super Hybrid System, KX-TD500.
The focus is Digital Proprietary Telephones (DPTs), Digital DSS Consoles, Single Line Telephones (SLTs) and their features.

Programming Guide
Describes step-by-step instruction for performing system programming using the Maintenance Console software for a PC.

Table of Contents

3 Maintenance Console Guide

4 Utility

5 Troubleshooting

Section 1

System Outline

This section provides general information on the system, including system capacity and specifications.

1.1 System Highlights

1.1.1 System Highlights

Automatic Route Selection (ARS)

Automatically selects the pre-programmed least expensive route for outgoing toll calls.

Caller ID

Allows the extension user to see the name or telephone number of a caller on the telephone display before answering the call.

Digital Proprietary Telephones (DPTs)

The system supports a wide variety of digital proprietary telephones which cover the range from a monitor set to a large display hands-free version.

EXtra Device Port (XDP)

Each extension port on the DHLC card supports the connection of a digital proprietary telephone and a single line device.The devices have different extension numbers and are treated as two completely different extensions.

Parallelled Telephone Connection

Each extension port on the HLC or DHLC card supports the parallel connection of a proprietary telephone and a single line device. They share the same extension number and are considered by the system to be one extension.

Remote Station Lock Control

Allows the Manager and the Operators to lock an extension so that outgoing calls cannot be made.

Super Hybrid System

This system supports the connection of digital and analogue proprietary telephones, DSS Consoles and single line devices such as single line telephones, facsimiles, and data terminals.

Trunk (CO Line) Answer From Any Station (TAFAS)

Ringing occurs over the external paging system; call can be answered from any station.

Uniform Call Distribution (UCD)

Allows incoming calls to be distributed uniformly to a specific group of extensions called UCD Group.

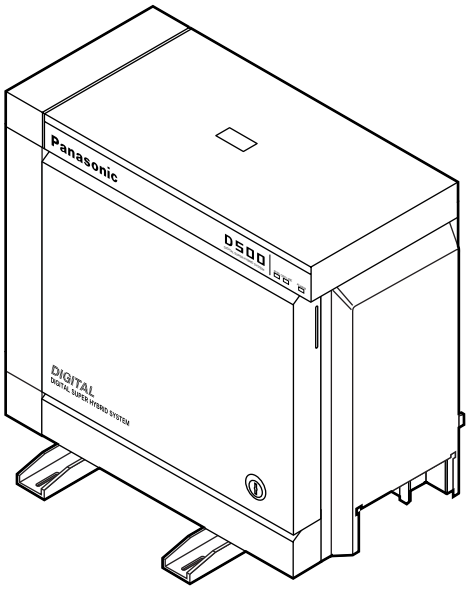
VPS Integration

The system supports Voice Processing Systems with in-band DTMF signalling as well as DPT integration.The Panasonic Voice Processing System provides automated attendant, voice mail, interview and custom services.

1.2 System Construction

1.2.1 Basic System

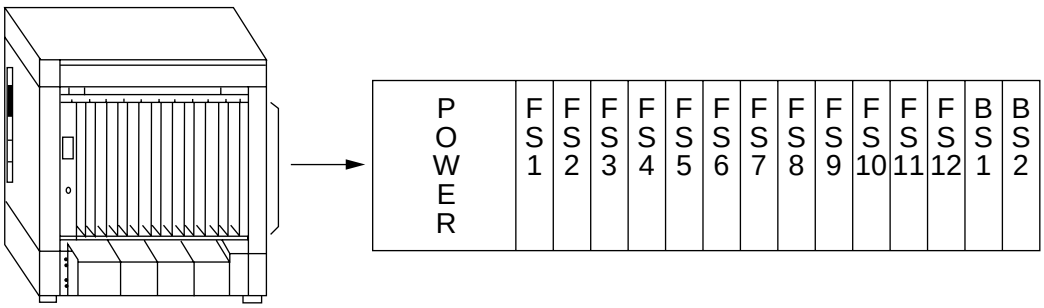
Basic System consists of one Shelf called Basic Shelf and it can be equipped with up to 192 lines (including Extensions and CO lines).



Basic Shelf

A Basic Shelf is always required. It contains its own power supply and 14 mounting spaces called "Slots." The TSW card is installed in the Basic Slot 2 at the factory. The remaining 12 slots provide mounting space for various cards that can be used. Any optional service card can be mounted in any one of these 12 slots. So these slots are called "Free Slot."

Construction of Basic Shelf



1.2.2 System Expansion

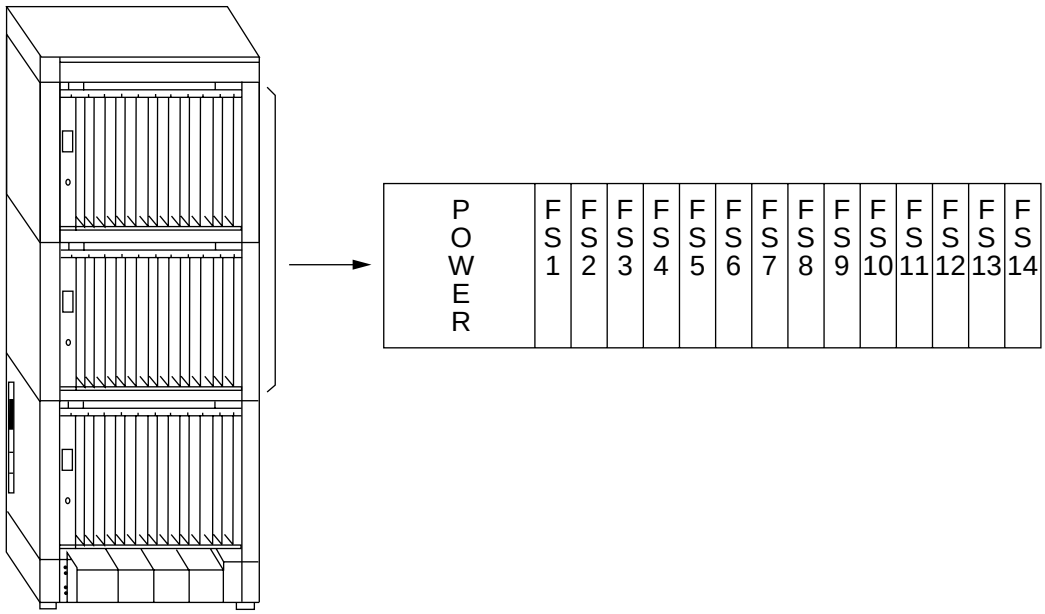
Building Block System

The KX-TD500 system can consist of one, two, or three shelves (Basic and Expansion 1,2). Each shelf contains its own power supply.

Expansion Shelf

An optional Expansion Shelf consists of its own power supply and 14 Free Slots for mounting any optional cards. It can be equipped with up to 222 lines (including Extensions and CO lines).

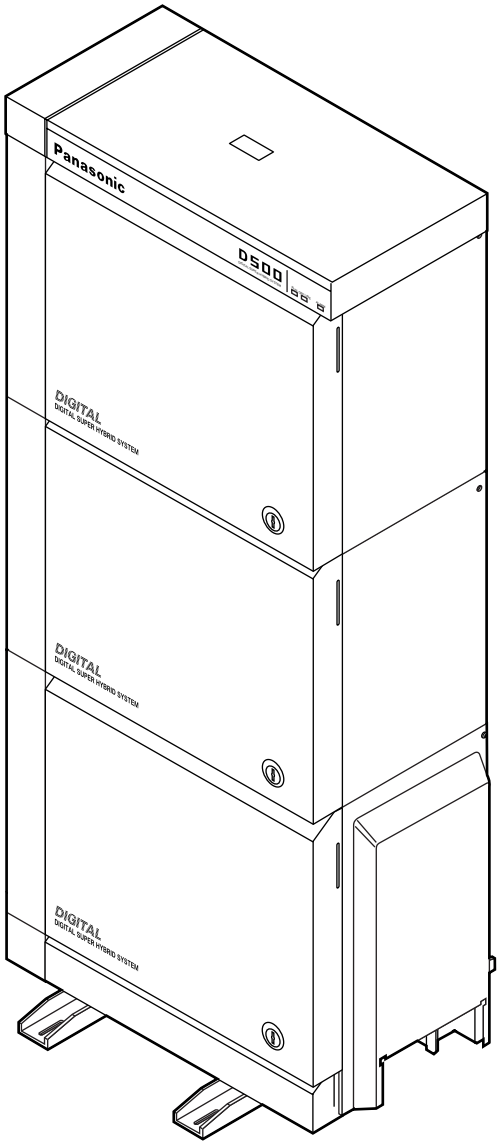
Construction of Expansion Shelf (1 and 2)



System Expansion

The KX-TD500 system's capacity can be expanded by installing up to two Expansion Shelves on the Basic Shelf.
Fully expanded system (Basic Shelf + Expansion Shelf 1 + Expansion Shelf 2) is called "3-Shelf System."

3 - Shelf System



1.2.3 System Capacity

The KX-TD500 system can be equipped with up to 512 ports, if expanded to a 3-Shelf System. A Max.192 of CO lines and 448 extensions are available and the total of them should be less than 512 ports.

Note

You cannot assign any cards which exceed the system capacity.
When the system starts up with excess cards by the automatic configuration mode, they will be ignored.
Please refer to "2.10.2 CPU Rotary-Switch Features" in this manual for further information.

Port Limits of Extension/CO Lines

Maximum number of Extensions (PT/SLT) and CO lines allowable per system/shelf is as shown below.

	Item	Maximum Port Number		
		/ System	/ Basic Shelf	/ Expansion Shelf
1	PT Extension + SLT Extension + CO Line	512	192	222
2	PT Extension + SLT Extension	448	192	192
3	PT Extension	384	128	128
4	CO Line	192	138	154

Port Limits of Other Terminals

Maximum number of other terminals allowable per system is as shown below.

	Item	Maximum Port Number
		/ System
1	Doorphone	8
2	DSS Console	64

Note

A DSS Console is counted as a PT extension.

Port/Resource Number per Card

Maximum number of Ports/Resources per Extension/CO card is as as follows:

Model Number	Card Name	Number of Port			
		CO Line	Extension		Others
			SLT	PT	
KX-T96161	DPH	-	-	-	4
KX-T96170	HLC	-	-	8	-
KX-T96172	PLC	-	-	8	-
KX-T96174	SLC	-	8	-	-
KX-T96175	SLC-M	-	8	-	-
KX-T96180	LCOT	8	-	-	-
KX-T96181	GCOT	8	-	-	-
KX-T96182	DID	4	-	-	-
KX-T96182CE	DID-MFC	4	-	-	-
KX-T96182D	DID-2W	4	-	-	-
KX-T96183	RCOT	8	-	-	-
KX-T96184	E&M	4*1	-	-	-
KX-T96185	OPX	-	4	-	-
KX-T96187	T1	24	(24)*2		
KX-T96188	E1	32*3	-	-	-
KX-T96189	PCOT	4	-	-	-
KX-TD50170	DHLC	-	8	8	-
KX-TD50172	DLC	-	-	16	-
KX-TD50175	ESLC	-	16	-	-
KX-TD50180	ELCOT	8	-	-	-
KX-TD50288	BRI	16*4	-	-	-
KX-TD50290	PRI30	30*5	-	-	-

*1 E&M Line
*2 Counted as an SLT resource, when channel type is set to "OPX."
*3 An E1 card is used as a 30-port trunk. However, it consumes 32 trunk resources.
*4 8 BRI Ports
*5 1 PRI Port

Card Limits

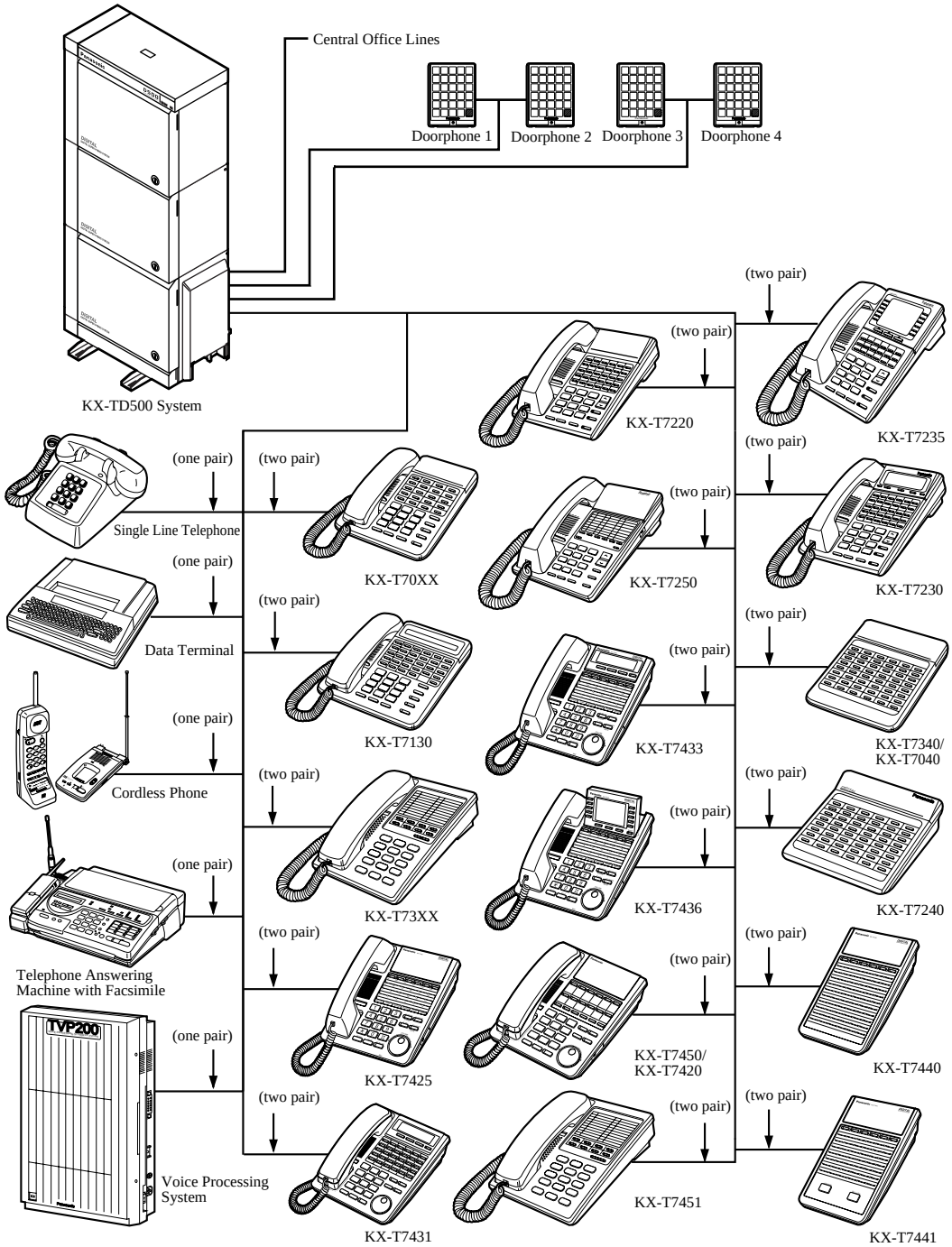
Maximum number of special cards allowable per system/shelf is as shown below.

	Item	Maximum Card Number		
		/ System	**/ Basic Shelf**	**/ Expansion Shelf**
1	DISA Card	8	-	-
2	AGC Card	8	-	-
3	ERMT Card	1	-	-
4	T1 Card	8	3	3
5	E1 Card	6	3	3
6	DPH Card	2	-	-
7	PRI30 Card	6	3	3

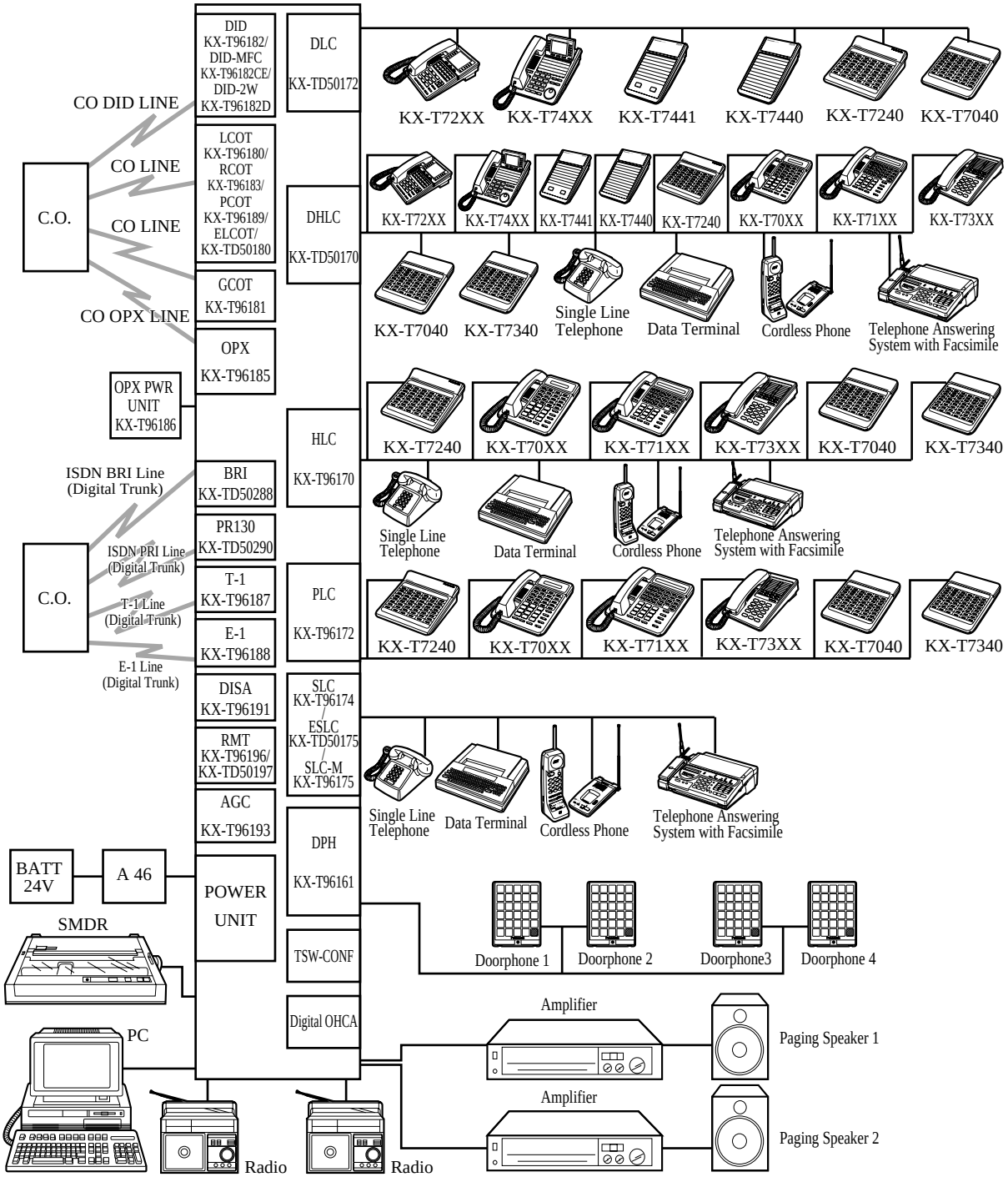
- A T1 and an E1 Card should be installed in Free Slot 01, 05, or 09.
- A PRI30 Card should be installed in Free Slot 01, 03, 05, 07, 09, 11 or 13.

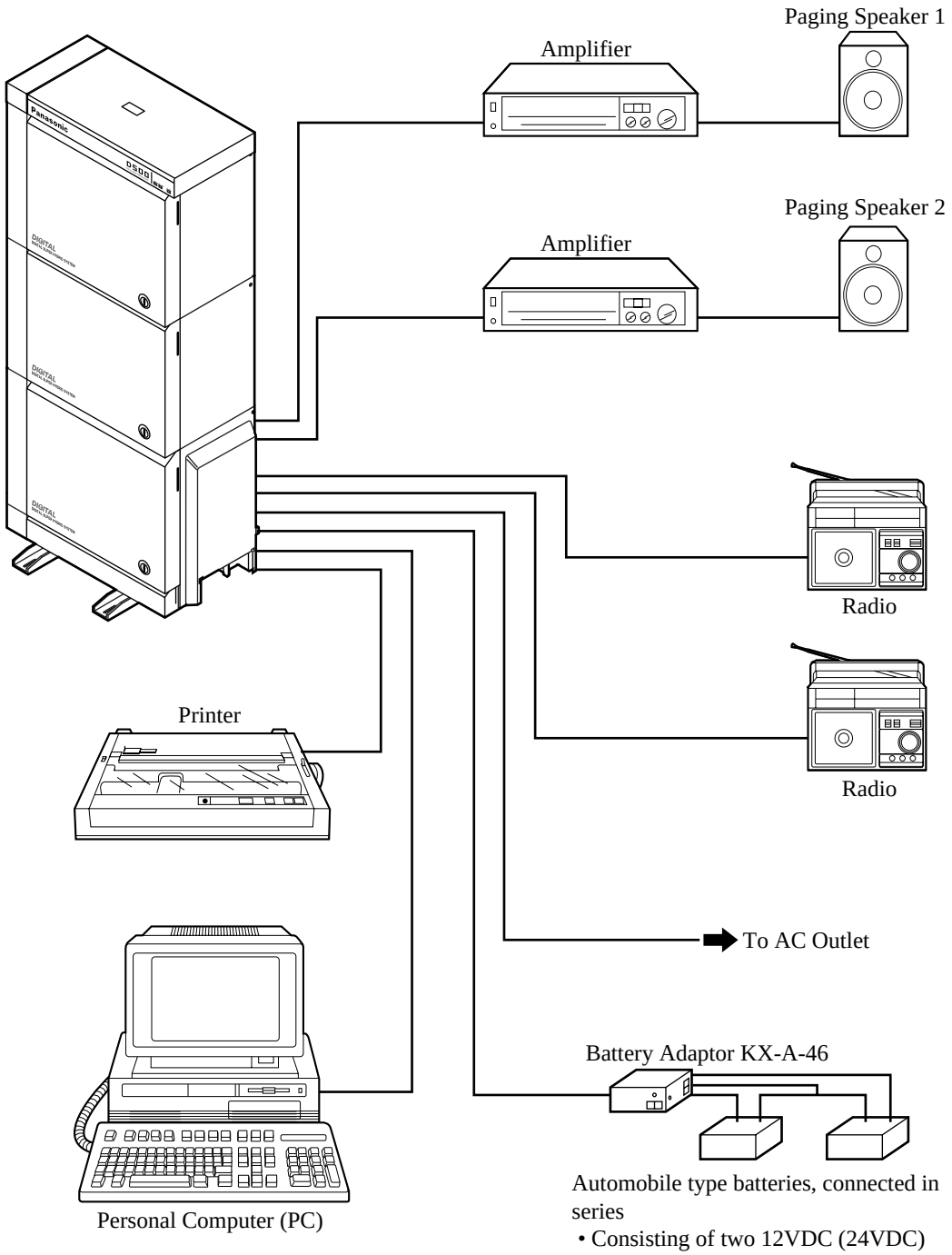
1.3 System Connection Diagram

1.3.1 System Connection Diagram



· Parallel connections of extension is available. Please refer to "Paralleled Telephone"in 1.3 System Features of the Features Guide for further information.


DID
KX-T96182/
DID-MFC
KX-T96182CE/
DID-2W
KX-T96182D
LCOT
KX-T96180/
RCOT
KX-T96183/
PCOT
KX-T96189/
ELCOT/
KX-TD50180
GCOT
KX-T96181
OPX
KX-T96185
BRI
KX-TD50288
PR130
KX-TD50290
T-1
KX-T96187
E-1
KX-T96188
DISA
KX-T96191
RMT
KX-T96196/
KX-TD50197
AGC
KX-T96193
POWER
UNIT
DLC
KX-TD50172
DHLC
KX-TD50170
HLC
KX-T96170
PLC
KX-T96172
SLC
KX-T96174
ESLC
KX-TD50175
SLC-M
KX-T96175
DPH
KX-T96161
TSW-CONF
Digital OHCA
CO DID LINE
CO LINE
CO LINE
CO OPX LINE
C.O.
OPX PWR
UNIT
KX-T96186
ISDN BRI Line
(Digital Trunk)
ISDN PRI Line
(Digital Trunk)
T-1 Line
(Digital Trunk)
E-1 Line
(Digital Trunk)
C.O.
BATT
24V
A 46
SMDR
PC
Radio
Radio
KX-T72XX
KX-T74XX
KX-T7441
KX-T7440
KX-T7240
KX-T7040
KX-T72XX
KX-T74XX
KX-T7441
KX-T7440
KX-T7240
KX-T70XX
KX-T71XX
KX-T73XX
KX-T7040
KX-T7340
Single Line
Telephone
Data Terminal
Cordless Phone
Telephone Answering
System with Facsimile
KX-T7240
KX-T70XX
KX-T71XX
KX-T73XX
KX-T7040
KX-T7340
Single Line
Telephone
Data Terminal
Cordless Phone
Telephone Answering
System with Facsimile
KX-T7240
KX-T70XX
KX-T71XX
KX-T73XX
KX-T7040
KX-T7340
Single Line
Telephone
Data Terminal
Cordless Phone
Telephone Answering
System with Facsimile
Doorphone 1
Doorphone 2
Doorphone3
Doorphone 4
Amplifier
Paging Speaker 1
Amplifier
Paging Speaker 2


Paging Speaker 1
Amplifier
Paging Speaker 2
Amplifier
Radio
Radio
Printer
To AC Outlet
Battery Adaptor KX-A-46
Automobile type batteries, connected in series
• Consisting of two 12VDC (24VDC)
Personal Computer (PC)

1.4 Service Cards Description

1.4.1 Extension Cards

Hybrid Line Circuit (HLC) Card (KX-T96170);

This card interfaces APTs/SLTs/DSS consoles and the TDM (Time Division Method) bus. It provides 8 APTs/SLTs/DSS consoles to the system per HLC card.

Proprietary Line Circuit (PLC) Card (KX-T96172);

This card interfaces 8 Analogue Proprietary Telephones (APTs), DSS consoles and the TDM bus. It provides 8 APTs, DSS consoles to the system per PLC card.

Single Line Telephone Line Circuit (SLC) Card (KX-T96174);

This card interfaces 8 Single Line Telephone (SLT) and the TDM bus. It provides 8 SLTs to the system per SLC card.

SLC card with Message Waiting (SLC-M) (KX-T96175);

This card is the same as the standard SLC card and except that it has the capability to turn on/off the message waiting lamp of an SLT.

Off Premise Extension Trunk (OPX) Card (KX-T96185);

This card interfaces 4 off premise extensions through off premise extension power unit.

Digital Hybrid Line Circuit (DHLC) Card (KX-TD50170);

This card interfaces DPTs/APTs/SLTs/DSS consoles and the TDM bus. It provides 8 telephones and DSS consoles to the system per DHLC card.

Digital Proprietary Line Circuit (DLC) Card (KX-TD50172);

This card interfaces 16 Digital Proprietary Telephones (DPTs), DSS consoles and the TDM bus. It provides 16 DPTs/DSS consoles to the system per DLC card.

SLC Card with Message Waiting —16 ports (ESLC) (KX-TD50175);

This card interfaces 16 Single Line Telephones (SLTs) and the TDM bus. It provides 16 SLTs to the system per ESLC card. It has the capability to turn on/off the message waiting lamp of an SLT.

1.4.2 CO Trunk Cards

Loop Start Central Office Trunk (LCOT) Card (KX-T96180);

This card interfaces 8 central office loop start trunks and the TDM bus. It provides 8 CO lines to the system per LCOT card. With loop start, a line is seised by bridging through a resistance the tip and ring (both wires) of the telephone line.

Ground Start Central Office Trunk (GCOT) Card (KX-T96181);

This card interfaces 8 central office trunks and the TDM bus. It provides 8 CO lines to the system per GCOT card.
This card uses a way of signalling on subscriber trunks in which one side of the two wire trunk (typically the "Ring" conductor of the Tip and Ring) is momentarily grounded to get a dial tone.

Direct Inward Dialling Trunk (DID) Card (KX-T96182);

This card interfaces 4 central office trunks arranged for Direct Inward Dialling (DID) and the TDM bus.

Direct Inward Dialling Trunk with MFC(DID-MFC) Card (KX-T96182CE);

This card is a version of the DID card with the capability to accept MFC signalling.

Both-way Direct Inward Dialling Trunk (DID-2W) Card (KX-T96182D);

This card is a version of the DID card with the capability to accept both dial pulse and touch-tone signalling. This card can be used for both receiving incoming CO calls and making outside calls.

LCOT card with Polarity Reversal Detection (RCOT) Card (KX-T96183);

This card is a version of the LCOT card with the capability to detect a reversal of CO line polarity. This is useful for determining the start and completion of calls.

E&M Card (KX-T96184);

This card interfaces E&M lines. (4 circuits/card)

EM type : Type 5
Transmission : 2 wire/4wire (Programmable)
Signalling : Pulse/DTMF

T1 Digital Trunk Card (KX-T96187);

This card interfaces 1 T1 line and the TDM bus. It is available to connect a T1 line to the system per T1 card. A T1 line has a capacity of 24 voice conversations.

E1 Digital Trunk Card (KX-T96188);

This card interfaces 1 E1 line and the TDM bus. It is available to connect an E1 line to the system per E1 card. An E1 line has a capacity of 30 voice conversations.

LCOT Card with Pay-Tone Detection (PCOT) (KX-T96189);

This card is a version of the LCOT card with the capability to detect a pay-tone of CO line. This is useful to charge management with a pay-tone which is sent from CO line.

Enhanced Loop Start Central Office Trunk (ELCOT) Card (KX-TD50180);

This card interfaces 8 central office loop start trunks and the TDM bus. It provides 8 CO lines to the system per ELCOT card. With loop start, a line is seized by bridging through a resistance the tip and ring (both wires) of the telephone line. This card supports Caller ID service or Pay Tone service.

ISDN Basic Rate Access Interface (BRI) Card (KX-TD50288);

This card interfaces ISDN Basic Access line (2B+D). It is available to connect 8 BRI-ISDN lines to the system per BRI-ISDN card. A BRI-ISDN line has capacity of 2 voice conversations.

ISDN Primary Rate Access Interface (PRI30) Card (KX-TD50290);

This card interfaces ISDN Primary Access line. (1 circuit/card)
A PRI-ISDN line has capacity of 30 voice conversations.

1.4.3 Resource Cards

Direct Inward System Access (DISA) Card (KX-T96191);

This card interfaces 4 central office trunks arranged for Direct Inward System Access (DISA) and the TDM bus.

Automatic Gain Control (AGC) Card (KX-T96193);

This card is used to maintain volume of CO-to-CO communication. An electronic circuit which compares the level of an incoming signal with a previously defined standard and automatically amplifies or attenuates that signal so it arrives at its destination at the correct level.

Remote Circuit (RMT) Card (KX-T96196);

This card is necessary for accessing the system from a remote location. This card supports baud rate at 1,200 bps.

Enhanced Remote Circuit (ERMT) Card (KX-TD50197);

This card is necessary for accessing the system from a remote location. This card supports the V.34 modem standard of ITU-T recommendation. This card supports data transmission rate at 33,600 bps.

1.4.4 Other Cards

Off Hook Call Announcement (OHCA) Card (KX-T96136);

This card is for Off Hook Call Announcement feature and is installed on the HLC or PLC card.

Doorphone Circuit (DPH) Card (KX-T96161);

This card interfaces 4 doorphones and the TDM bus. Up to 4 doorphones per DPH card can be connected to the system.

Caller ID Card (KX-TD193);

This card supports the Caller ID service provided by Central Office, and is installed on the ELCOT card.
Caller ID allows the extension user to see the name or phone number of an external caller on the display before answering the call.

Time Switch Conference Expansion Card (TSW Conference) Card (KX-TD50104);

This card provides 64 additional conference trunks, and is installed on the TSW card.

Off Hook Call Announcement for Digital Telephone (DOHCA) Card (KX-TD50105);

This card is for Off Hook Call Announcement features on DPT, and is installed on the TSW card. This card is required to utilize "DPT Integration" feature.

Pay Tone Card (KX-TD50189);

This card supports the Pay Tone Service provided by Central Office, and is installed on the ELCOT Card.

1.5 Proprietary Telephones

1.5.1 Proprietary Telephones

The following Panasonic proprietary telephones are available with this system.

Model	Type	Hands-free mode	Display	CO	PF/F	Soft
KX-T7020	APT	SP-PHONE	—	12	4 (PF)	—
KX-T7030	APT	SP-PHONE	1-Line	12	4 (PF)	—
KX-T7033	APT	SP-PHONE	—	12	4 (PF)	—
KX-T7050	APT	MONITOR	—	12	4 (PF)	—
KX-T7055	APT	MONITOR	—	3	4 (PF)	—
KX-T7130	APT	SP-PHONE	1-Line	12	12 (PF)	—
KX-T7320	APT	SP-PHONE	—	12	4 (PF)	—
KX-T7330	APT	SP-PHONE	1-Line	12	4 (PF)	—
KX-T7350	APT	MONITOR	—	12	4 (PF)	—
KX-T7220	DPT	SP-PHONE	—	24	—	—
KX-T7230	DPT	SP-PHONE	2-Line	24	—	3
KX-T7235	DPT	SP-PHONE	6-Line	12	10 (F)	3
KX-T7250	DPT	MONITOR	—	6	—	—
KX-T7420	DPT	SP-PHONE	—	12	—	—
KX-T7425	DPT	SP-PHONE	—	24	—	—
KX-T7431	DPT	SP-PHONE	1-Line	12	—	—
KX-T7433	DPT	SP-PHONE	3-Line	24	—	3
KX-T7436	DPT	SP-PHONE	6-Line	24	10 (F)	3
KX-T7450	DPT	MONITOR	—	12	—	—
KX-T7451	DPT	MONITOR	—	4	—	—

Note

APT: Analogue Proprietary Telephone

DPT: Digital Proprietary Telephone

SP-PHONE: Used for a hands-free speakerphone operation.

MONITOR: Used for a hands-free dialling operation.

CO: CO line access button

PF: Programmable Feature button

F: Function button

Used to perform the corresponding displayed function or operation.

Soft: Soft button

Used to perform the function or operation that appears on the bottom line of the display.

1.6 Specifications

1.6.1 General Description

System Capacity

CO lines

192 max.

Stations

448 max.

Control Method

CPU

32-bit CPU with 16-bit Data Bus

Switching

Non Blocking PCM Time Switch

Power Supplies

Primary

220-240 VAC, 50/60 Hz

Secondary

Station Supply Volt: 30V

Circuit Volt: ±5V, ±15V

Power Failure

- Memory backup duration: seven years with a factory-provided lithium battery
- Power Failure Transfer function is provided.
- System operation for about four hours using recommended batteries (consisting of two12 VDC 40 Ah Automobile type batteries)

Dialling

Outward/Internal

Dial Pulse (DP) 10 pps, 20 pps

Tone (DTMF) Dialling

Mode Conversion

DP-DTMF, DTMF-DP

Connector

LCO lines
Amphenol Connector

ISDN lines
Modular Jack (RJ45)

Stations
Amphenol Connector

Paging Output
Pin Jack (RCA JACK)

External Music Input
Two-conductors Jack
(MINIJACK 3.5 mm 9/64 inch diameter)

Extension Connection Cable

Telephones	Cable
Single line telephones	1 pair wire (T, R)
KX-T7420, KX-T7425, KX-T7431, KX-T7433, KX-T7436, KX-T7450, KX-T7451, KX-T7220, KX-T7230, KX-T7235, KX-T7250	1 pair wire (D1, D2) or 2 pair wire (T, R, D1, D2)
KX-T7020, KX-T7030, KX-T7033, KX-T7050, KX-T7055, KX-T7320, KX-T7330, KX-T7350	2 pair wire (T, R, D1, D2)
KX-T7040, KX-T7440, KX-T7441, KX-T7240	1 pair wire (D1, D2) or 2 pair wire (T, R, D1, D2)
KX-T7130	3 pair wire (T, R, D1, D2, P1, P2)

SMDR (Station Message Detail Recording)

Interface
RS-232C

Output Equipment
Printer/Personal Computer

Detail Recording
Date, Time, Extension Number, CO Line Number, Dialled Number, Call Duration, Account Code, Caller ID, Timed Reminder

1.6.2 Characteristics

Station Loop Limit

Analogue, Digital Proprietary Telephone
40 ohms

Single Line Telephone
600 ohms including set

Doorphone
20 ohms

Minimum Leakage Resistance

15,000 ohms

Maximum Number of Station Instruments per Line

1 for Analogue, Digital Proprietary Telephone, or single line telephone
2 by Parallel or eXtra Device Port Connection of a proprietary telephone and a single line telephone

Ring Voltage

75 Vrms at 25 Hz depending on the Ringing Load

Primary Power

220-240 VAC, 50/60 Hz, 10 A max.

Central Office Loop Limit

1,600 ohms max.

Environmental Requirements

Temperature range : 0 – 40 °C / 32 – 104 °F
Rel. Humidity :10 – 90%

Hookswitch Flash Timing Range

204 – 1,000 milliseconds

Power Unit Functions

1. Power supply (+5.9 VDC, ±15 VDC, GND) for a shelf.
2. External battery interface. (±12V)
   Battery power (±12V) is input from KX-A46 (Battery Backup Adaptor) with a 4-wire cable.
3. Power failure detection.
   A circuit in power unit detects power failures of +5.9VDC, ±15VDC, AC Voltage, and 3 power alarm signals are sent to CPU card as DC alarm, AC alarm and Heat alarm.
4. Generation of bell signal. (25Hz, 75Vrms)

CPU Card Functions

1. Call process and basic shelf main protocol. (Microprocessor 80386EX).
   Time switch (TSW) control, detection of system clock alarm, basic shelf power down and expansion shelf power down alarm, watchdog timer overflow.
2. System switch interface.
   There are Operation Switch (MODE) (10 modes, 0 to 9) and System Switch (SYSTEM) (10 modes, 0 to 9) on the CPU rotary switch.
3. Terminal interface.
   CPU card has two RS-232C terminal interfaces.

CPU Card Operation

1. Operation Switch (MODE) and System Switch (SYSTEM) are set by turning with screwdriver.
2. Reset switch is non-lock push switch.
3. LED for battery alarm lights when voltage of Lithium-battery becomes too low (less than 2.5V).
4. LED for watchdog lights when the software is running away.

TSW Card Functions

1. Time switch.
   Capability of switching voice is 768ch $\times$ 768ch.
2. Generation of call progress tones.
   Call progress tones are dial tone, busy tone, reorder tone and ringback tone.
3. Conference circuit.
   TSW card has 3 party $\times$ 8 conference's circuits.
4. Paging interface.
   TSW card has 2 pre-amplifier circuits for paging. In order to adjust volume, each amplifier circuit is equipped with a knob.
5. Music-in interface.
   TSW card has 2 interface circuits for music on hold or BGM.

TSW Card Operation

1. A knob for adjusting volume of external paging is turned with a screwdriver from front of TSW card.
2. The LED indicator on the TSW card lights when system resets or TSW local reset occurs.

HLC Card (KX-T96170) Functions

Hybrid Line Circuit card is for APT, DSS console and SLT. (8 extensions/card)

1. Standard SLT interface. SLT interface is quite the same as that of SLC card.
2. APT and DSS console interface. APT and DSS console interface is quite the same as that of PLC card.

   Note
   DSS Consoles KX-T7440 and KX-T7441 can be connected to this card.
   In this case, however, ANSWER and RELEASE buttons on the KX-T7441 do not function.
3. Interface for OHCA feature with APT (KX-T7130).
   This is quite the same as that of PLC.
4. Power failure transfer by each port. (when using SLT)
   Power failure transfer is quite the same as that of SLC card.
5. Diagnostic transfer by each port. Diagnostic transfer is quite the same as that of SLC card.

HLC Card (KX-T96170) Operation

LED indicator on the HLC card lights when the system reset or HLC local reset occurs.

PLC Card (KX-T96172) Functions

Proprietary Line Circuit card (8 APT extensions / card)

1. APT and DSS console interface. (8 circuits / card)
   Maximum loop resistance : 40 ohms
   Power supply 1 : +30V (supplied through speech path, and with current limitation circuit).
   Power supply 2 : +15V (supplied through data line).

   Note
   Digital DSS Consoles KX-T7440 and KX-T7441 can be connected to this card.
   In this case, however, ANSWER and RELEASE buttons on the KX-T7441 do not function.
2. Interface for OHCA feature with APT (KX-T7130).
   When an APT with OHCA feature is connected to a port, an OHCA piggyback card (KX-T96136) should be mounted on its interface circuit.

PLC Card (KX-T96172) Operation

The LED indicator on the PLC card lights when the system resets or PLC local reset occurs.

SLC Card (KX-T96174) Functions

Single Line Telephone Circuit card

1. Standard SLT interface.
   Maximum loop resistance : 600 ohms. (including SLT)
   Power supply : +30V (with current limitation circuit.)
   2 DTMF receivers, dial pulse detector.
2. Power Failure Transfer (PFT) by each port.
   When a power failure occurs, SLT Tip / Ring are led by a PFT relay, but SLT PFT modular and ELCOT/LCOT / GCOT modular should be connected to each other in advance.
3. Diagnostic transfer (DT) by each port.
   Diagnostic relay is placed in Tip / Ring of each port. During diagnostic test, only one diagnostic relay in the SLT of a system is activated.

SLC Card (KX-T96174) Operation

The LED indicator on the SLC card lights when system reset or SLC local resets occurs.

SLC-M Card (KX-T96175) Functions

Single Line Telephone Circuit card

1. Same as SLC card.
2. Same as SLC card.
3. Same as SLC card.
4. SLT with Message Waiting Lamp interface
   Power supply to Message Waiting
   Lamp: +80VDC (when 1mA)

SLC-M Card (KX-T96175) Operation

Same as SLC card

OPX Card (KX-T96185) Functions

Off Premise Extension (4 OPX Lines / card)
OPX Power Unit is necessary.

OPX Power Unit should be connected with OPX card, and Single Line Telephones for OPX should be connected with OPX card.

DHLC (Digital Hybrid Line Circuit) Card (KX-TD50170) [*1] Functions

1. Standard SLT interface.
   Power supply : +30V(with current limitation circuit).
   2 DTMF receivers, dial pulse detector.
2. Interface for APT/DPT and DSS console.
   The interface for the APT/DPT and DSS console is similar to the DLC card.

[*1] For a DPT/APT, DSS console and SLT. (8 extensions or 16 extensions with XDP/card. Please refer to "2.4.13 Extra Device Port (XDP) Connection" in this manual for XDP.)

3. Interface for OHCA feature with APT (KX-T7130).
   The OHCA feature with APT (KX-T7130) is available without any optional cards.
4. Interface for DPT (KX-T7235, KX-T7436) with OHCA feature.
   The interface for DPT (KX-T7235, KX-T7436) with OHCA feature is similar to the DLC card.
5. Interface for power failure transfer by each port (when using SLT).
   When a power failure occurs, SLT Tip / Ring are led by a PFT relay, but SLT PFT modular and ELCOT modular should be connected to each other in advance.
6. Interface for diagnostic transfer by each port.
   Diagnostic relay is placed in Tip / Ring of each port. During diagnostic test, only one diagnostic relay in the SLT of a system is activated.

DHLC (Digital Hybrid Line Circuit) Card (KX-TD50170) Operation

1. The LED indicator on the DHLC card lights when the system resets or DHLC local reset occurs.

DLC (Digital Proprietary Line Circuit) Card (KX-TD50172) Functions

1. DPT and DSS console interface (16 circuits/card).
   Maximum loop resistance : 40 ohms
   Power supply : +15V (supplied through the data line)
2. DPT (KX-T7235, KX-T7436) interface with OHCA feature.
   When a DPT with OHCA feature is connected to a port, a DOHCA card should be mounted on the TSW card.

DLC (Digital Proprietary Line Circuit) Card (KX-TD50172) Operation

1. The LED indicator on the DLC card lights when the system resets or DLC local reset occurs.

ESLC (Enlarged Single Line Telephone Circuit with Message Waiting) Card (16 extensions/card) (KX-TD50175) Functions

1. Standard SLT interface.
   Power supply: +30V (with current limitation circuit)
   4 DTMF receivers, and dial pulse detectors.
2. Interface for power failure transfer by ports 1 to 8.
   When a power failure occurs, SLT Tip/Ring are led by a PFT relay, but SLT PFT modular and ELCOT modular should be connected to each other in advance.
3. Interface for diagnostic transfer (DT) by each port.
   Diagnostic relay is placed in Tip/Ring of each port. During diagnostic test, only one diagnostic relay in the SLT of a system is activated.

ESLC (Enlarged Single Line Telephone Circuit with Message Waiting) Card (16 extensions/card) (KX-TD50175) Operation

1. The LED indicator on the ESLC card lights when the system resets or ESLC local reset occurs.

LCOT Card (KX-T96180) Functions

Loop Start Central Office Trunk card (8 CO Lines/ card)

1. Loop start CO interface.
   CPC detection, 1 DTMF generator.
   With loop start, you seize a line by bridging through a resistance the tip and ring (both wires) of your telephone line.
2. Power failure transfer (PFT) by each port
   Tip/Ring of CO are connected to a CO interface circuit, and directly to LCOT PFT modular. When power failure occurs, CO Tip/ring leads are directly connected to SLT Tip/Ring leads, but LCOT PFT modular and SLT PFT modular should be connected to each other in advance.
3. Diagnostic transfer (DT) by each port.
   A diagnostic relay is placed in Tip/Ring of each port.
   During diagnostic test, only one diagnostic relay in an LCOT of a system is activated.

LCOT Card (KX-T96180) Operation

The LED indicator on the LCOT card lights when the system resets or LCOT local reset occurs.

GCOT Card (KX-T96181) Functions

Ground Start Central Office Trunk card (8 CO Lines/card)

1. Ground start CO interface.
   CPC detection, 1 DTMF generator.
   A way of signalling on subscriber trunks in which one side of the two wire trunk (typically the "Ring" conductor of the Tip and Ring) is momentarily grounded to get dial tone.
2. Power failure transfer (PFT) by each port.
   Tip/Ring of CO are connected to a CO interface circuit, and directly to GCOT PFT modular. When power failure occurs, CO Tip/Ring leads are directly connected to SLT Tip/Ring leads, but GCOT PFT modular and SLT PFT modular should be connected each other with connection cords in advance.
3. Diagnostic transfer (DT) by each port.
   A diagnostic relay is placed in Tip/Ring of each port.During diagnostic test, only one diagnostic relay in a GCOT of a system is activated.

GCOT Card (KX-T96181) Operation

The LED indicator on the GCOT card lights when the system resets or GCOT local reset occurs.

DID Card (KX-T96182) Functions

Direct Inward Dialling card

Wink start/immediate start DID interface.
(4 circuits/card)
45V used in circuits is originated from DC-DC converter on DID card.
The DID card will receive pulse signals only.

DID Card (KX-T96182) Operation

The LED indicator on the DID card lights when the system resets or DID local reset occurs.

DID-MFC Card (KX-T96182CE) Functions

Direct Inward Dialling Trunk with MFC card

Wink start/immediate start DID interface.
(4 circuits/card)

a) Incoming

- 48V used in circuit is originated from DC-DC converter in DID-MFC card.
- Signalling-MFC-R2

b) Outgoing

- Seize a line by bridging through a registance between tip and ring.
- Signalling-MFC-R2

DID-MFC Card (KX-T96182CE) Operation

The LED indicator on the DID-MFC card lights when the system resets or DID-MFC local reset occurs.

DID-2W Card (KX-T96182D) Functions

Both-way Direct Inward Dialling Trunk card

Wink start/immediate start DID interface.
(4 circuits/card)

a) Incoming

- 45V used in circuit is originated from DC-DC converter in DID-2W card.
- Signalling-Pulse/DTMF

b) Outgoing

- Seize a line by bridging through a registance between tip and ring.
- Signalling-Pulse/DTMF

DID-2W Card (KX-T96182D) Operation

The LED indicator on the DID-2W card lights when the system resets or DID-2W local reset occurs.

RCOT Card (KX-T96183) Functions

Loop Start Central Office Trunk with Polarity Reversal Detection card (8 CO Lines/card)

1. Loop start CO interface.
CPC detection, 1 DTMF driver.
With loop start, you seize a line by bridging through a resistance the tip and ring (both wires) of your telephone line.
Polarity reversal detection.

2. Power failure transfer (PFT) by each port.
Tip/Ring of CO are connected to a CO interface circuit, and directly to RCOT PFT modular. When power failure occurs, CO Tip/ring leads are directly connected to SLT Tip/Ring leads, but RCOT PFT modular and SLT PFT modular should be connected each other with connection cord in advance.

3. Diagnostic transfer (DT) by each port.
A diagnostic relay is placed in Tip/Ring of each port. During diagnostic test, only one diagnostic relay in an RCOT of a system is activated.

RCOT Card (KX-T96183) Operation

The LED indicator on the RCOT card lights when the system reset or RCOT local reset occurs.

E&M Card (KX-T96184) Functions

1. E&M (Tie) Line Types.
Type 5 only.

2. Transmission.
2-wire or 4-wire voice path (Programmable)
(Note) Maximum cablling distance of E&M line cord (twisted cable):22 AWG : Under 9.6 km

3. Transmission levels.
2-wire voice path …… -3 dB (transmit / receive)
4-wire voice path …… -3dB normal (transmit / receive)
Programmable (-6dB, -3dB, 0dB, +3dB)

4. Signalling.
DTMF or Pulse

5. E lead.
Battery: -48 VDC, -20mA to ground (max.)
Sensitivity: 5 mA or 2000 Ω to ground (max.) (min.)

6. M lead.
Permitted current : 30mA (max.)
Permitted voltage: ±100V (max.)

T1 Digital Trunk Card (KX-T96187) Functions

T1 interface. (1 circuit / card)
T1 is a digital transmission link with a capacity of 1.544 Mbps.
T1 can carry 24 voice conversations.

Frame Format	:	D4 / ESF
Line Coding	:	AMI / B8ZS
Channel Type	:	LCO / GCO / DID / OPX / TIE
Signalling	:	Pulse / DTMF

(DTMF : 24 receivers and 6 generators)

T1 Digital Trunk Card (KX-T96187) Operation

The LED indicator on T1 card lights when the system resets, or T1 card local reset or T1 line fault occurs.

E1 Digital Trunk Card (KX-T96188) Functions

1. E1 interface (1 circuit/card).
   E1 is a digital transmission link with a capacity of 2.048Mbps.
   E1 can carry 30 voice conversations
   Frame Format : PCM30/PCM30-CRC
   Line Coding : AMI/HDB3
   Channel Type : DR2/E&M-C/E&M-P
   Signalling : Pulse / DTMF / MFC-R2

E1 Digital Trunk Card (KX-T96188) Operation

1. The LED indicator on E1 card lights when the system resets, or E1 card local reset or E1 line fault occurs.

PCOT (Loop Start Central Office Trunk with Pay Tone Detection) Card (4 CO Lines/card)(KX-T96189) Functions

1. Loop start CO interface.
   CPC detection, 1 DTMF driver.
   With loop start, you seize a line by bridging through a resistance the tip and ring (both wires) of your telephone line.
   Pay tone detection (12kHz/16kHz)
2. Power failure transfer (PFT) by each port.
   Tip/Ring of CO are connected to a CO interface circuit, and directly to PCOT PFT modular. When power failure occurs, CO Tip/ring leads are directly connected to SLT Tip/Ring leads, but PCOT PFT modular and SLT PFT modular should be connected each other with connection cord in advance.
3. Diagnostic transfer (DT) by each port.
   A diagnostic relay is placed in Tip/Ring of each port.
   During diagnostic test, only one diagnostic relay in an PCOT of a system is activated.

PCOT (Loop Start Central Office Trunk with Pay Tone Detection) Card (4 CO Lines/card)(KX-T96189) Operation

1. The LED indicator on the PCOT card lights when the system reset or PCOT local reset occurs.

ELCOT (Enhanced Loop Start Central Office Trunk) Card (8 CO Lines/ card) (KX-TD50180) Functions

1. Loop start CO interface.
1 DTMF generator. Line Reversal detection.
With loop start, you seize a line by bridging through a resistance the tip and ring (both wires) of your telephone-line.

2. Caller ID/ Pay Tone Capability.
Two Caller ID Cards (KX-TD193) can be mounted on ELCOT card.
Or Two Pay Tone Cards (KX-TD50189) can be mounted on ELCOT card.

3. Power failure transfer (PFT) by each port.
Tip/Ring of CO are connected to a CO interface circuit, and directly to ELCOT PFT mudular. When power failure occurs, CO Tip/ring leads are directly connected to SLT Tip/ Ring leads, but ELCOT PFT mudular and SLT PFT modular should be connected to each other in advance.

4. Diagnostic transfer (DT) by each port.
A diagnostic relay is placed in Tip/Ring of each port.
All diagnostic relays are set to the diagnostic position except on the call.

ELCOT (Enhanced Loop Start Central Office Trunk) Card (8 CO Lines/ card) (KX-TD50180) Operation

1. The LED indicator on the ELCOT card lights when the system resets or ELCOT local reset occurs.

BRI Card (KX-TD50288) Functions

ISDN Basic Rate Access Interface. (8 circuits/card)

a) 8 ISDN Basic Interface (2B+D)

b) S0/EXT flexibility for each line

c) Power Feeding of EXT mode
One card total : 18 W max.
One Line : 4.5 W max.
The maximum power consumption available for each line is 4.5 W, however, the whole power consumption available for the card (8 lines in total) is limited to less than 18 W. (e.g. If 2 lines consume 4.5 W each, the rest of 6 lines can consume 1.5 W each.)

d) Line cording : AMI

e) Impedance : 100 ohms

BRI Card (KX-TD50288) Operation

1. The LED indicator on the BRI card lights when the system reset, BRI card local reset or BRI card fault occurs.
2. The DC Alarm LED indicator on the BRI Card lights if Power feeding of EXT mode exceeds the limit described in c) in BRI Card (KX-TD50288) Functions .

[LED Indication Table for BRI Card (KX-TD50288)]

LED No. (Item)	Colour	Status	Contents
D50 (DC ALM)	Red	ON	DC Alarm
		OFF	Normal
D20	Red	ON	Card Fault
		OFF	Normal

• When the 1st bit of the DIP Switch (SW2) is set to "ON"

LED No. (Item)	Colour	Status	Contents
D21~D27	Green	-	Not used
D28	Green	FLASH	Clock Master at External Clock Mode
		ON	Detection of Signal
		OFF	No Detection of Signal

• When the 1st bit of the DIP Switch (SW2) is set to "OFF"

LED No. (Item)	Colour	Status	Contents
D21	Green	ON	LINE1 Data Link established
		FLASH	LINE1 Layer1 Synchronisation established (Detection of Signal)
		OFF	LINE1 No Detection of Signal
D22	Green	ON	LINE2 Data Link established
		FLASH	LINE2 Layer1 Synchronisation established (Detection of Signal)
		OFF	LINE2 No Detection of Signal
D23	Green	ON	LINE3 Data Link established
		FLASH	LINE3 Layer1 Synchronisation established (Detection of Signal)
		OFF	LINE3 No Detection of Signal

• When the 1st bit of the DIP Switch (SW2) is set to "OFF"

LED No. (Item)	Colour	Status	Contents
D24	Green	ON	LINE4 Data Link established
		FLASH	LINE4 Layer1 Synchronisation established (Detection of Signal)
		OFF	LINE4 No Detection of Signal
D25	Green	ON	LINE5 Data Link established
		FLASH	LINE5 Layer1 Synchronisation established (Detection of Signal)
		OFF	LINE5 No Detection of Signal
D26	Green	ON	LINE6 Data Link established
		FLASH	LINE6 Layer1 Synchronisation established (Detection of Signal)
		OFF	LINE6 No Detection of Signal
D27	Green	ON	LINE7 Data Link established
		FLASH	LINE7 Layer1 Synchronisation established (Detection of Signal)
		OFF	LINE7 No Detection of Signal
D28	Green	ON	LINE8 Data Link established
		FLASH	LINE8 Layer1 Synchronisation established (Detection of Signal)
		OFF	LINE8 No Detection of Signal

PRI30 Card (KX-TD50290) Functions

ISDN Primary Rate Access Interface-2.048MHz. (1 circuit/card)

a) PRI30 carry 30 voice conversations

b) Frame Format : CRC-Multiframe

c) Line Cording : HDB3

d) Impedance : 120 ohms

PRI30 Card (KX-TD50290) Operation

LED indicator on the PRI30 card lights when the system reset, PRI30 card local reset or PRI30 card fault occurs.

[LED Indication Table for PRI Card (KX-TD50290)]

LED No. (Item)	Colour	Status	Contents
D19 (FALT)	Red	ON	Card Fault
		OFF	Normal
D20 (SYNC ERROR)	Red	ON	Clock Synchronisation Error or Loss of Signal (Red Alarm)
		OFF	Normal
D21(RA1)	Red	ON	Receive Remote Alarm Indication signal (Yellow Alarm)
		OFF	Normal
D22 (AIS)	Red	ON	Send Alarm Indication signal (Blue Alarm)
		OFF	Normal
D23 (SYNC)	Green	FLASH	Clock Master at External Clock Mode
		ON	Layer1 Synchronisation established (Detection of Signal)
		OFF	No Detection of Signal
D24 (DATA LINK)	Green	ON	Data Link established
		OFF	No Data Link established
D25~D27	Red	-	Not used or Reserved for future use.

DISA (Direct Inward System Access) Card (KX-T96191) Functions

1. 4 OGM trunks.
   OGM duration: 30 seconds,
   OGM Capacitor Backup: 5 days.
   The number of OGM: 1,
   Recording Algorithm: ADPCM.
2. 4 CO-to-CO speech paths without amplifier.
   A CO-to-CO speech path consists of up-path and down-path.
   Up-path is from call-originate CO to call-answer CO, and 1 DTMF receiver and one speech end detector is connected to it.
   Down-path is from call-answer CO to call-originate CO and one speech end detector is connected to it.
3. Speech end detector.
   Speech end detector detects call progress tones.

DISA (Direct Inward System Access) Card (KX-T96191) Operation

1. The LED indicator on the DISA card lights when the system resets or DISA local reset occurs.

AGC Card (KX-T96193) Functions

Automatic Gain Control card

1. 4 CO-to-CO speech paths with AGC amplifier and Echo-Suppressor.
A CO-to-CO speech path consists of up-path and down-path, up-path is from call-originate CO to call-answer CO, and AGC amplifier is inserted and speech end detector is connected.
The Maximum amplification of AGC is 10 dB.
The Echo-Suppressor is inserted in a CO-to-CO speech path.

2. 4 DTMF receivers.
DTMF transceiver is used as DTMF repeater.
So, AGC card microprocessor controls DTMF repeater.

3. 8 Speech End Detectors.
Speech end detector of AGC is quite the same as that of the DISA card.

AGC Card (KX-T96193) Operation

The LED indicator on the AGC card lights when the system resets or AGC local reset occurs.

RMT Card (KX-T96196) Functions

Remote Circuit card

Modem (300/1200 bps) for remote administration.

RMT Card (KX-T96196) Operation

The LED indicator on the RMT card lights when the system resets or RMT local reset occurs.

ERMT (Enhanced Remote Circuit) Card (KX-TD50197) Functions

1. Modem (V.34 MODEM) for remote administration.

ERMT (Enhanced Remote Circuit) Card (KX-TD50197) Operation

1. The LED indicator on the ERMT card lights when the system resets or ERMT local reset occurs.

OHCA Card (KX-T96136) Functions

OHCA (Off Hook Call Announcement) card

This card is mounted on HLC card (KX-T96170) or PLC card (KX-T96172)

This card includes 2 OHCA circuits.
Allows an extension user to intrude through the speaker into another extension that is in conversation using the handset.
This feature is available only for the following APT: KX-T7130.

DPH (Doorphone) Card (KX-T96161) Functions

1. Doorphone interface (4 circuits / card).
   4 doorphones can be connected using a modular connector.
2. Door opener interface (4 circuits / card).
   DPH card has 4 relays for door opener (220VAC, 1A). The relay opens for doorlock, closes for door release. It also opens in the case of power failure.

DPH (Doorphone) Card (KX-T96161) Operation

1. Terminal plate on the DPH card has 8 terminals, 2 leads from door opener are directly connected to two of 8 terminals.

Caller ID Card (KX-TD193) Functions

1. This card is mounted on ELCOT card for receiving Caller ID information sent from the Central Office.
   Four CO Lines are available for Caller ID with one Caller ID card.

TSW-CONF (TSW Conference Expansion) Card (KX-TD50104) Functions

1. This card is mounted on TSW card for conference trunk expansion.
   3 party x 64 conference circuits.

DOHCA (TSW OHCA for DPT) Card (KX-TD50105) Functions

1. This card is mounted on TSW card for OHCA feature for DPT. OHCA feature is available for the following DPTs: KX-T7235, KX-T7436
   This card is required to utilize "DPT Integration" feature.

Pay Tone Card (KX-TD50189) Functions

This card is mounted on ELCOT Card for receiving Pay Tone information sent from the Central Office.

Section 2

Installation

This section describes the procedures required to install the KX-TD500 System. Detailed instructions for planning the installation site, installing the shelves and optional cards, and cabling of peripheral equipment are provided. Further information on system expansion and peripheral equipment installation is included.

2.1 Before Installation

2.1.1 Precautions

Please read the following notes concerning installation and connection before installing the system.

Safety Installation Instructions

When installing telephone wiring, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:

1. Never install telephone wiring during a lightning storm.
2. Never install telephone ports in wet locations unless the port is specifically designed for wet locations.
3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4. Use caution when installing or modifying telephone lines.

Installation Precautions

Avoid installing in the following places. (Doing so may result in malfunction, noise, or discoloration.)

1. In direct sunlight and hot, cold, or humid places. (Temperature range: 0°C – 40°C / 32°F – 104°F)
2. Sulfuric gases produced in areas where there are thermal springs, etc. may damage the equipment or contacts.
3. Places in which shocks or vibrations are frequent or strong.
4. Dusty places, or places where water or oil may come into contact with the unit.
5. Near high-frequency generating devices such as sewing machines or electric welders.
6. On or near computers, telexes, or other office equipment, as well as microwave ovens or air conditioners. (It is preferable not to install in the same room with the above equipment.)
7. Install at least 1.8 m (6 feet) from radios and televisions. (both the main unit and proprietary telephones)
8. Do not obstruct area around the main unit (for reasons of maintenance and inspection — be especially careful to allow space for coolling above and at the sides of the main unit).

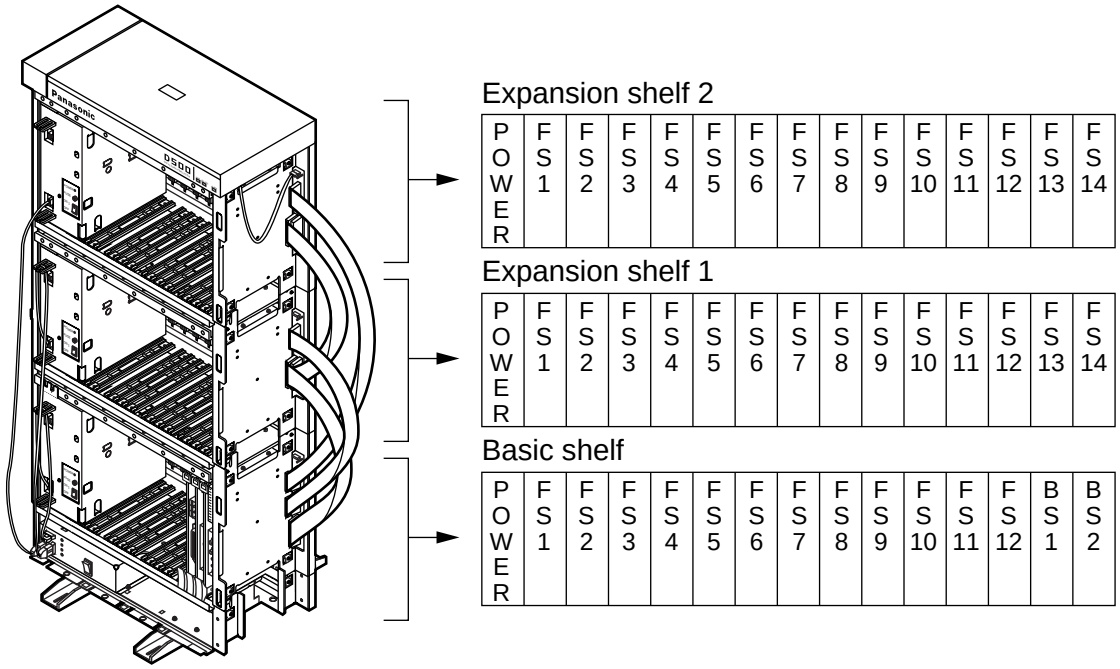
Wiring Precautions

Be sure to follow these instructions when wiring the unit.

1. Do not wire the telephone cable in parallel with an AC power source, computer, telex, etc. If the cables are run near those wires, shield the cables with metal tubing or use shielded cables and ground the shields.

2. If cables are run on the floor, use protectors to prevent the wires from being stepped on. Avoid wiring under carpets.
3. Avoid using the same power supply outlet for computers, telexes, and other office equipment. Otherwise, KX-TD500's system operation may be interrupted by the induction noise from such equipment.
4. Please use one pair telephone wire for extension connection of (telephone) equipment such as standard telephones, data terminals, answering machines, computers, voice processing systems, etc., except proprietary telephones (KX-T7220, KX-T7230, KX-T7235, KX-T7250 etc.).
5. The Power Switch of the system must be off during wiring. After all the wirings are completed, turn the Power Switch on.
6. Mis-wiring may cause the system to operate improperly.
7. If an extension does not operate properly, disconnect the telephone from the extension line and then connect again, or turn off the Power Switch of the system and then on again.
8. Use twisted pair cable for CO line connection.
9. CO lines should be installed with lightning protectors. For details, please refer to 2.11.1 Lightning Protectors.

2.1.2 Slot Construction



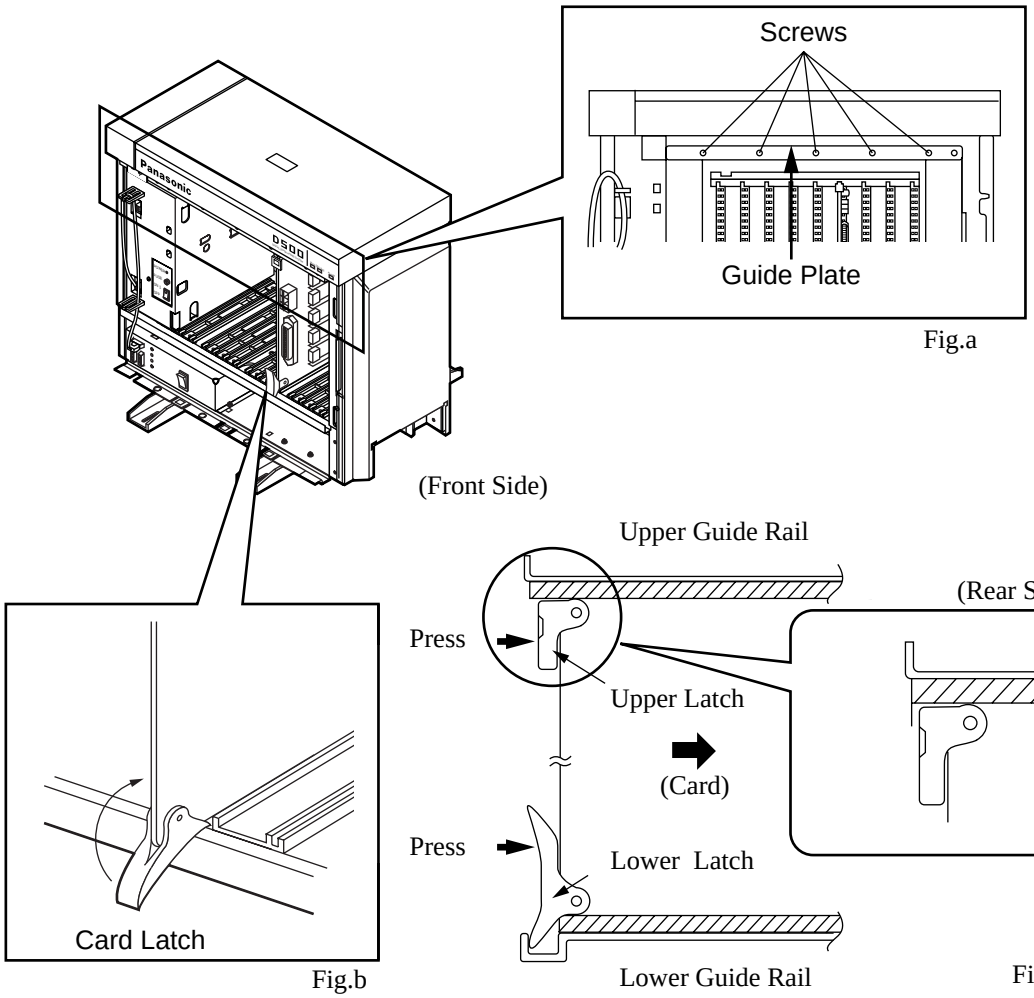
Basic shelf

No.	Name	Number
1	POWER - for Power Unit	1
2	BS1 (Basic Slot 1) - for CPU card	1
3	BS2 (Basic Slot 2) - for TSW card	1
4	FS1 to 12 (Free Slot 1 to 12) - for optional service card	12

Expansion shelf 1/Expansion shelf 2

Name	Number
POWER - for Power Unit	1
FS1 to FS14 (Free Slot) - for optional service card	14

2.1.3 Guide Plate



1. Before installing the service cards, remove the Guide Plate (See Fig.a) from the upper front side of the basic shelf (and expansion shelf 1 and 2, if provided) by loosening the five screws.
2. Install a service card (with facing the components side to the right) along with the upper and lower guide rails. Press the upper and lower latch firmly until the upper latch is located inside of the shelf. (See Fig.b and Fig.c)
   Please do not touch the components side of the service card.
3. After installing the service cards, attach the Guide Plate to the upper front side of the basic shelf (and expansion shelf 1 and 2, if provided) with five screws.
   If service cards are not installed properly, the Guide Plate will not be fixed.

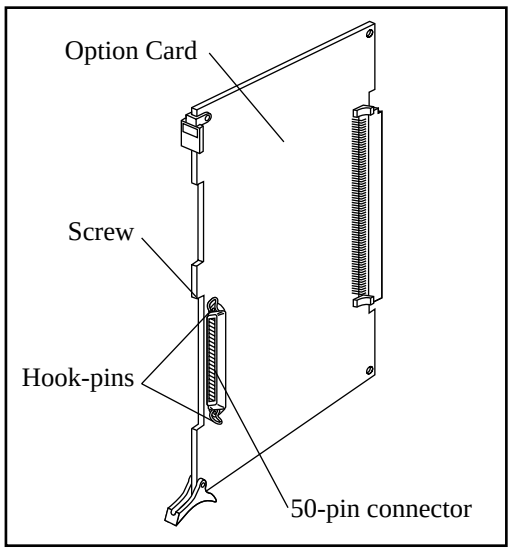
To remove an optional service card from the shelf :

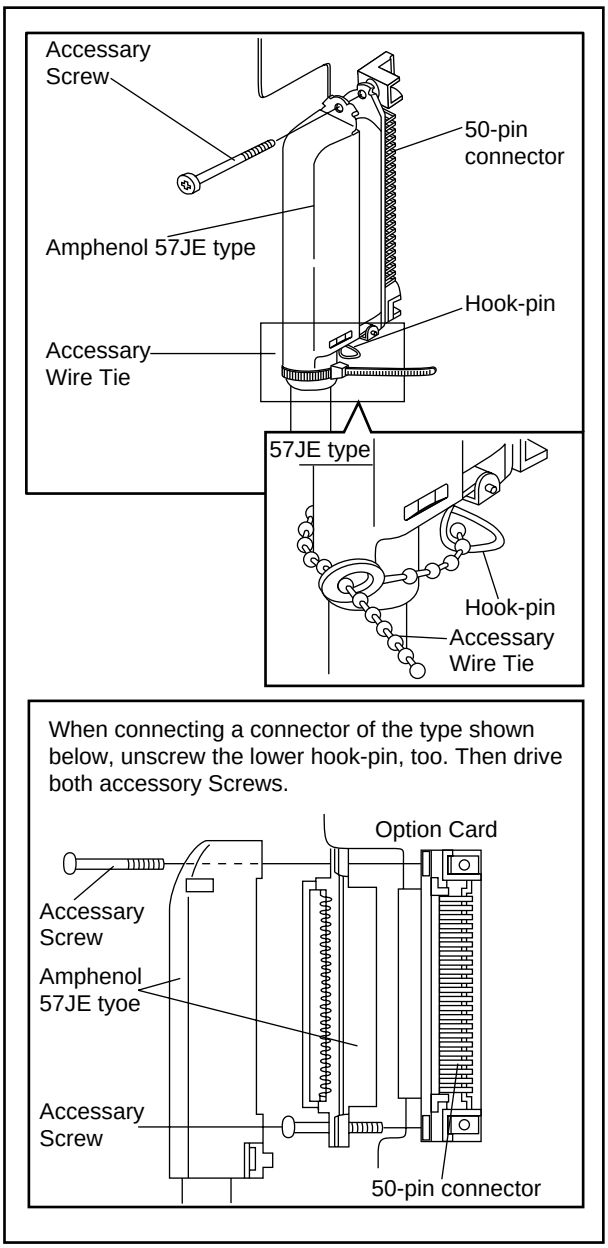
1. Hold the upper part of the card with one hand.
2. Pull the card toward you while pushing the lower latch upward with the other hand.
3. Remove the card from the shelf when it is pulled out of the slot.

2.1.4 Amphenol 57JE type Connector

To connect Amphenol 57JE type (screw-attach-type 50-pin connector) to the Option Card, follow the procedure below.

1. The 50-pin connector (jack) on the Option Card has two hook-pins.
   Remove the upper hook-pin, taking out the screw.
2. To attach the Amphenol 57JE type (plug) to the connector, drive the accessory Screw at the upper part, and fasten the accessory Wire Tie around the lower hook-pin and the Amphenol 57JE type, as shown.





2.2 Installation of Shelf

2.2.1 Installation of Shelf

This subsection describes the installation of the shelf, with information on expanding the capacity of an existing system.

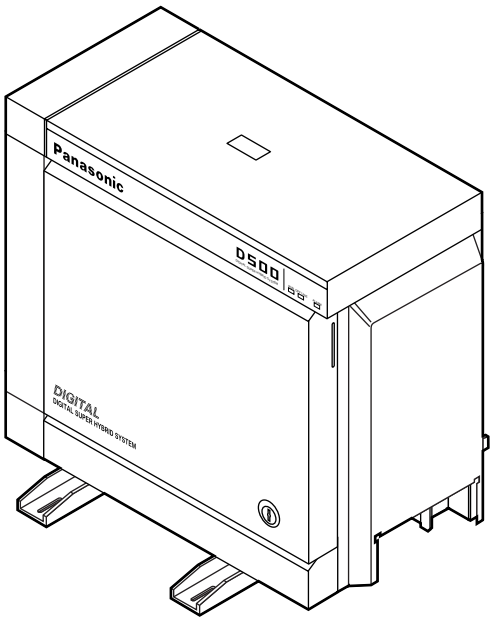
Building Block System provides the enlargement of system's ability by installing the optional Expansion Shelf.
Up to two Expansion Shelves can be installed to the system.
Each expansion shelf can be equipped with up to 222 lines (including Extensions and CO lines).

The system can consist of one, two or three shelves (Basic, Expansion 1 and Expansion 2). Each shelf contains its own power supply.

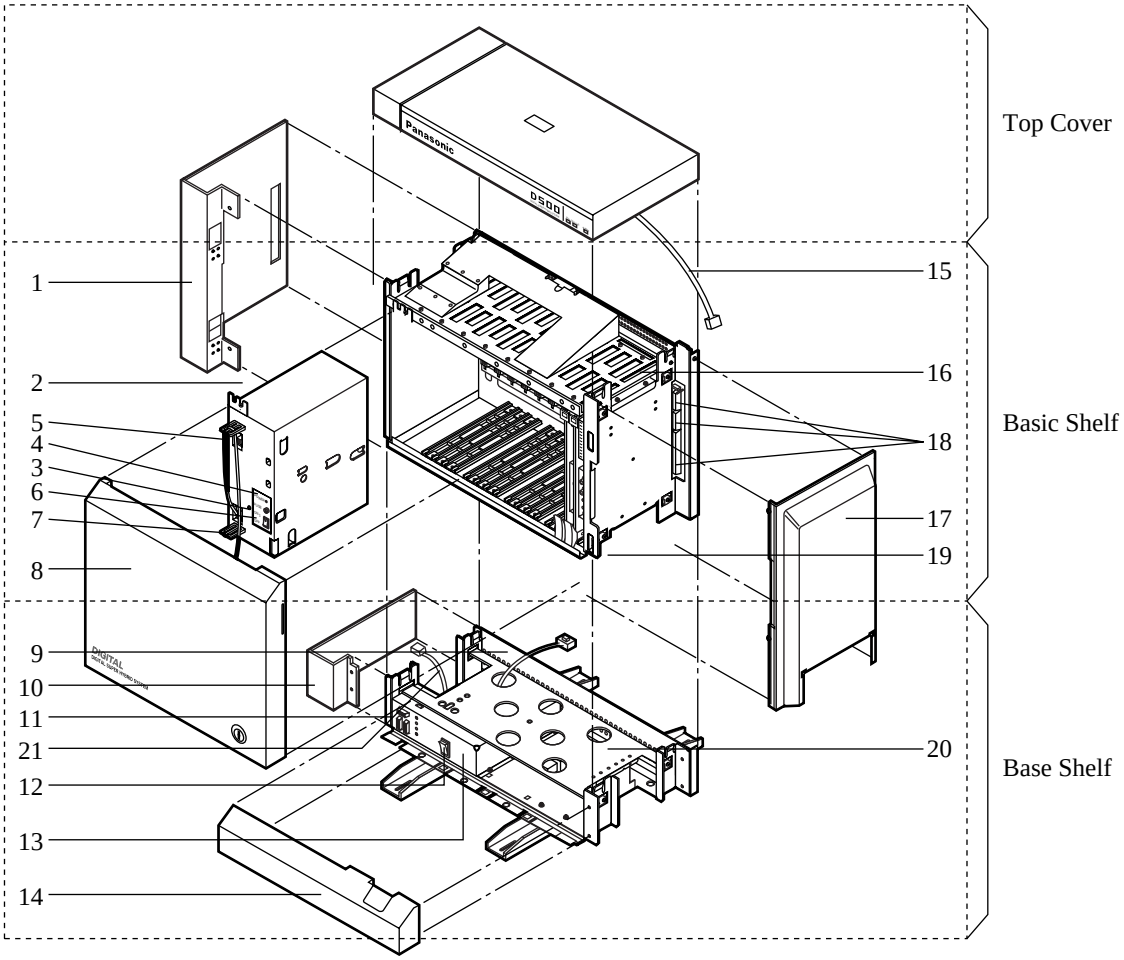
2.2.2 Basic Shelf

Basic Shelf is always required and it can be equipped with up to 192 lines (including Extensions and CO lines).
The basic shelf includes top cover and base shelf.

The following figure shows a basic system composed of a basic shelf only.



Basic Shelf Assembly

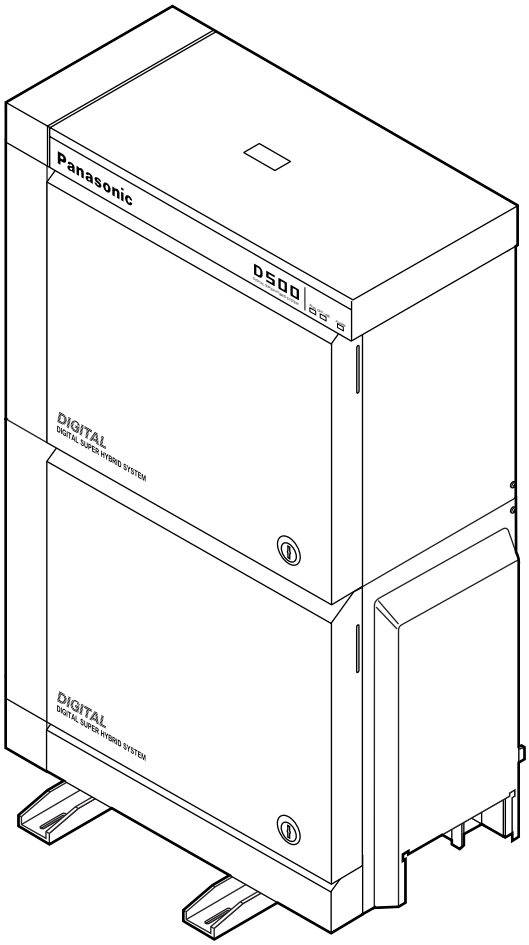


1. Side Panel (Left)
2. Power Unit
3. Fuse
4. Power Indicator
5. Backup Battery Connector (Connects the Battery Adaptor Cable)
6. Power Switch (Turns ON and OFF the Power of Basic Shelf)
7. Power Supply Cable
8. Front Panel
9. Transform Cord
10. Base Side Panel (Left)
11. Power Supply Cable Connector
12. Main Power Switch (Turns ON and OFF the Power of Whole Unit)
13. Ground Wire Connector (GND)
14. Base Front Panel
15. LED Cable

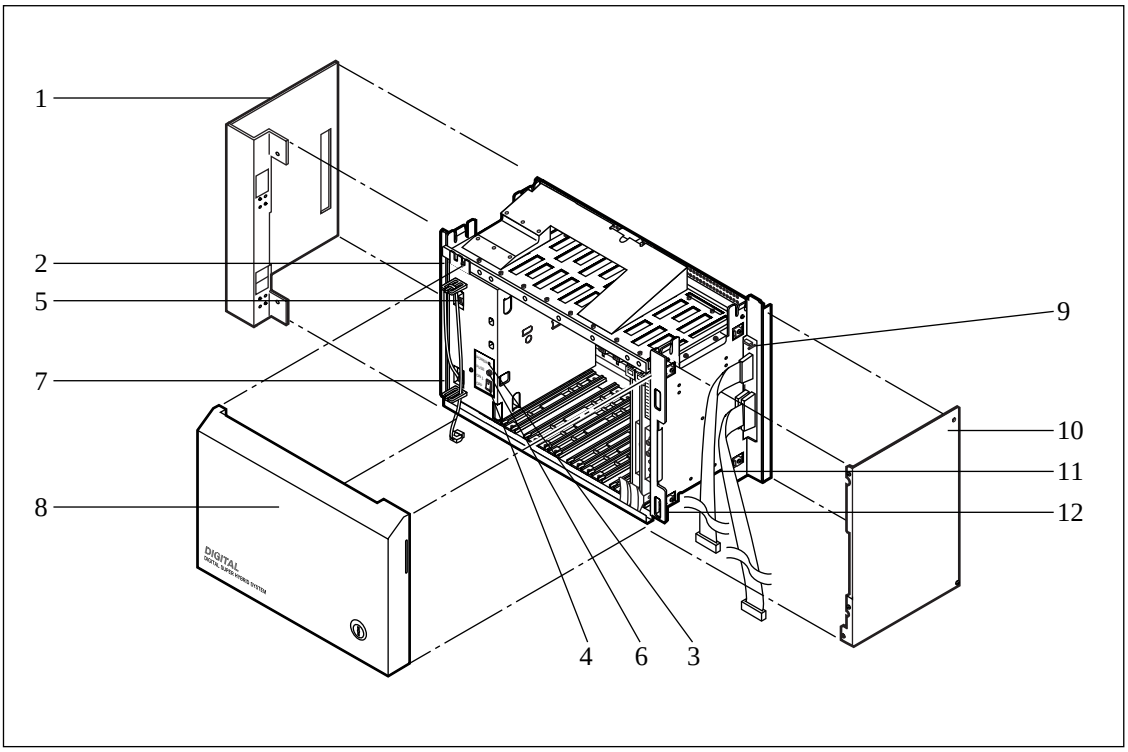
16. LED Cable Connector (Connects the LED Cable)
17. Side Panel (Right)
18. Flat Cable Connector (Connects the Flat Cable from Expansion Shelf)
19. Cable Opening
20. Base Board
21. Fan Cable

2.2.3 Expansion to 2-Shelf System

The KX-TD500 System can be expanded to 2-Shelf System by installing the Expansion Shelf 1 on the Basic Shelf.
The 2-Shelf system can be equipped with up to 414 lines (including extensions and CO lines).
The following figure shows a 2-Shelf System composed of a basic shelf and an expansion shelf.



Expansion Shelf Assembly



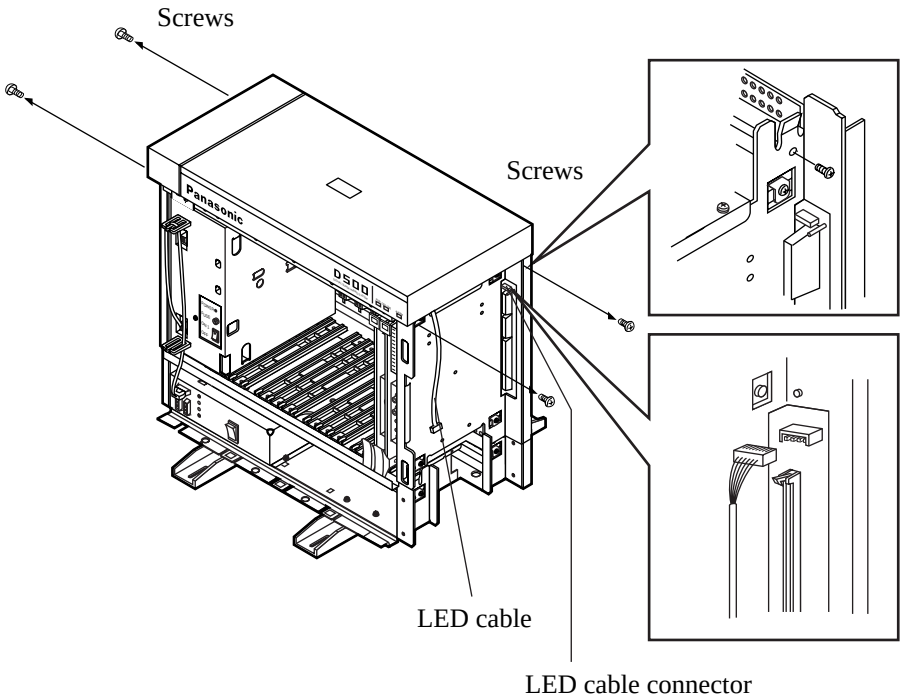
1. Side Panel (Left)
2. Power Unit
3. Power Indicator
4. Power Switch (Turns ON and OFF the Power of Expansion Shelf)
5. Backup Battery Connector (Connects the Battery Adaptor Cable)
6. Fuse
7. Power Supply Cable
8. Front Panel
9. LED Cable Connector (Connects the LED Cable)
10. Side Panel (Right)
11. Flat Cable
12. Cable Opening

Note

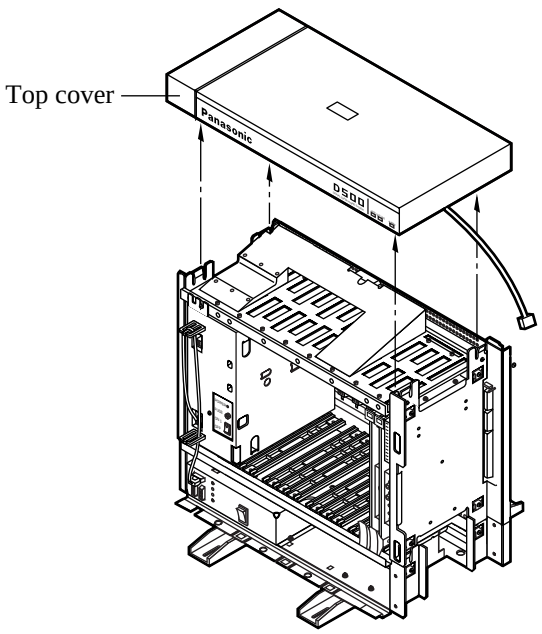
The construction of Expansion Shelf 1 and Expansion Shelf 2 is identical to each other.

Removing the Panels <Basic Shelf>

1. Disconnect the LED cable (on the top cover) from the LED cable connector (on the basic shelf).

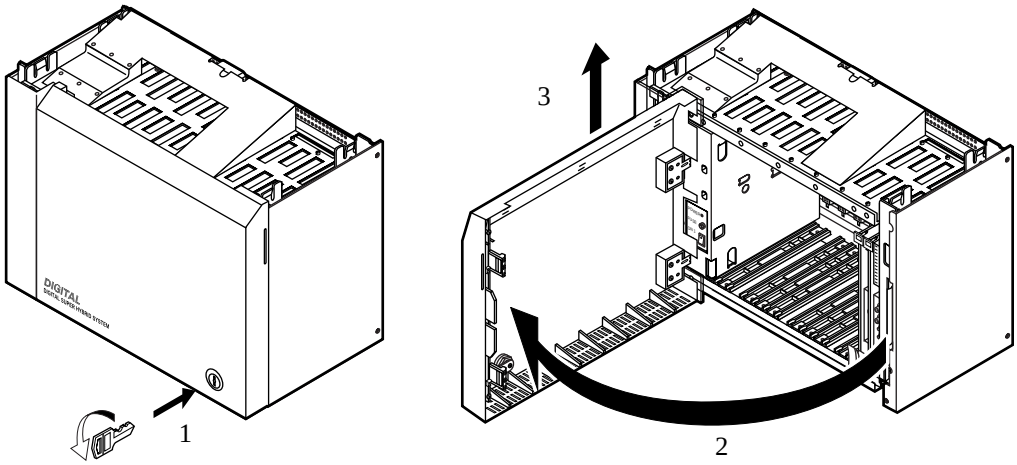


2. Remove the top cover by loosening the four screws.

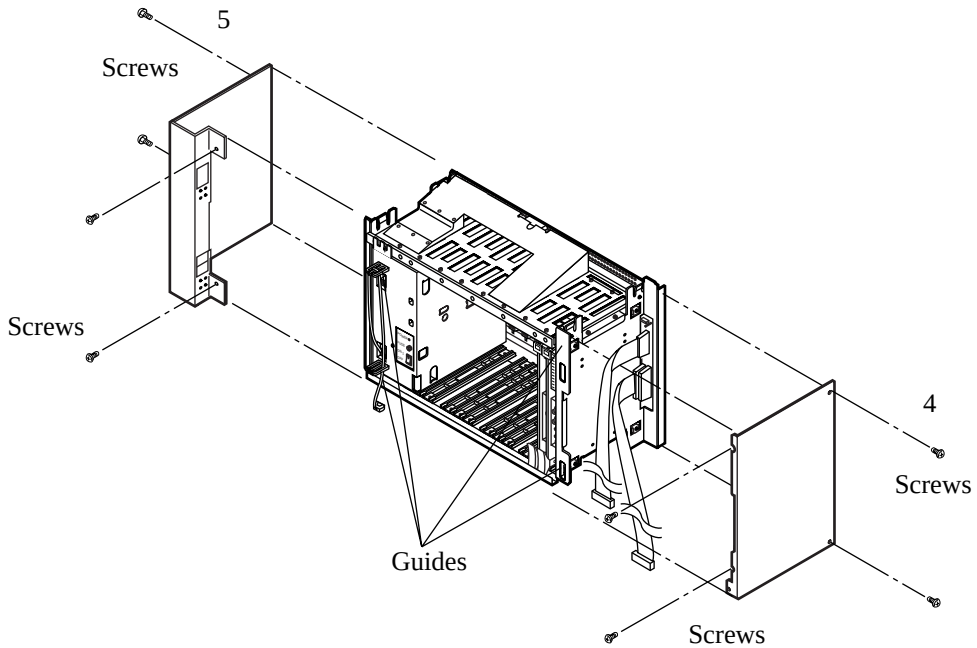


Removing the Panels <Expansion Shelf>

1. Rotate the key on the front panel counterclockwise to unlock.
2. Open the front panel toward you at right angles to the expansion shelf.
3. Remove the front panel by lifting it straight up.

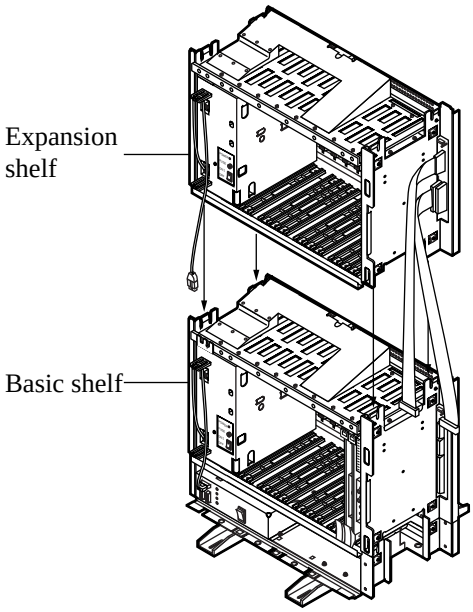


4. Remove the right side panel by loosening the four screws.
5. Remove the left side panel by loosening the four screws.

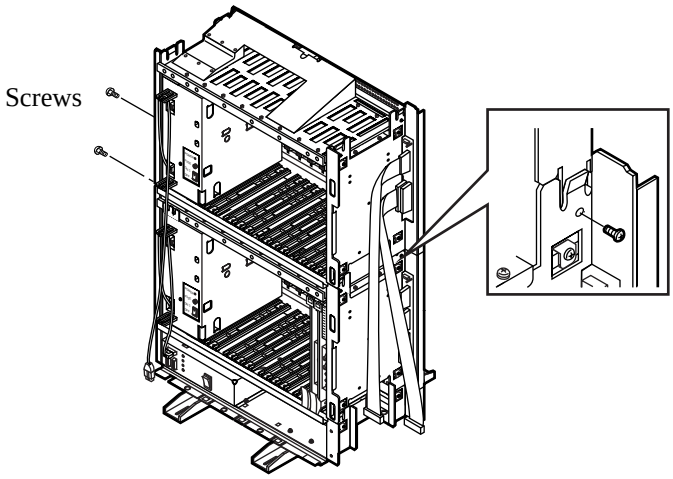


Stacking on the Basic Shelf

1. To connect the expansion shelf with basic shelf, place the holes of the expansion shelf exactly on the holes of the basic shelf.



2. When the holes are placed properly, fix them with the three screws immediately to prevent the expansion shelf from falling down.

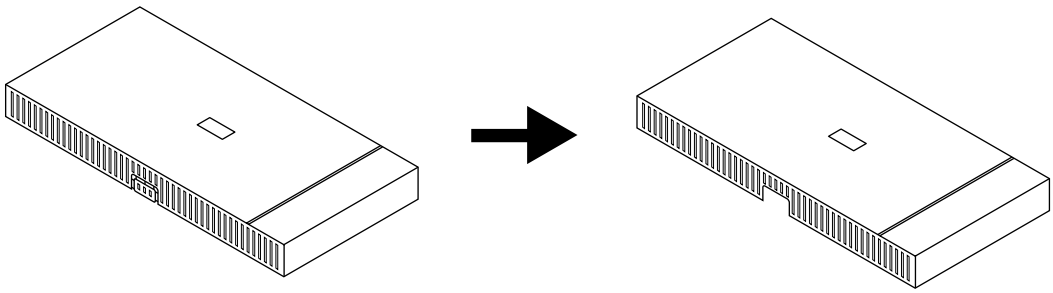


Note

If the system is to be expanded to 3-Shelf System, proceed to 2.2.4 Expansion to 3-Shelf System.

Removing a Part of the Top Cover

1. Remove the part which is located on the back side of the top cover.

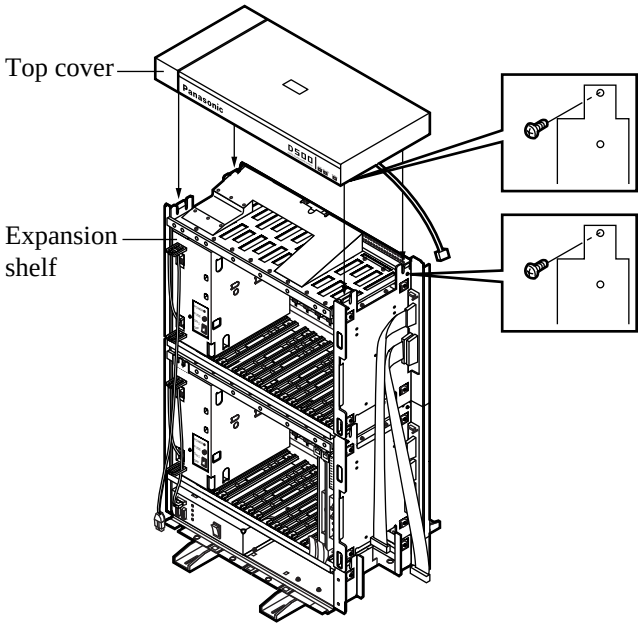


Note

This part should be removed before stacking the expansion shelf 2 and expansion shelf 3 on the basic shelf. Required for ventilation of the coolling fan in the expansion shelf.

Installation of Top Cover

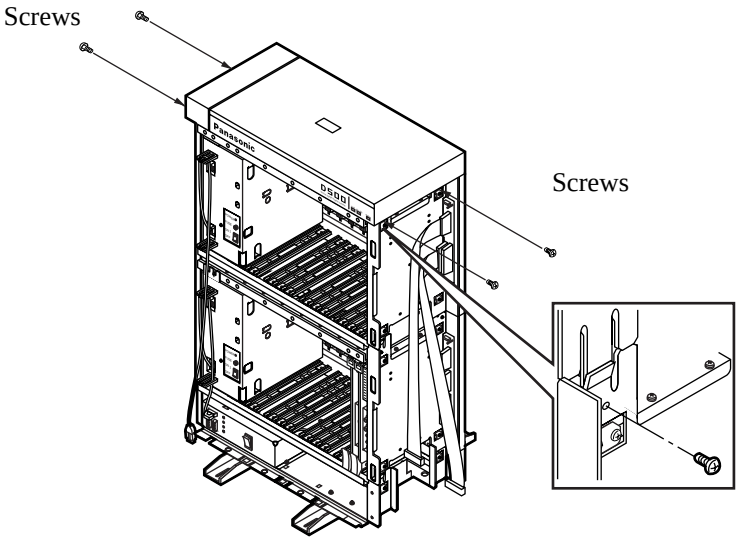
1. To connect the top cover, place the holes of the top cover exactly on the holes of the expansion shelf.



Note

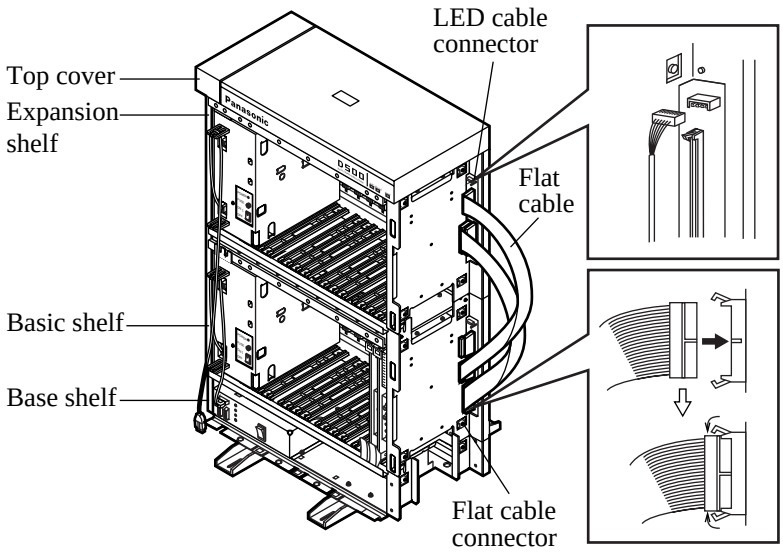
Before installing the top cover, remove a screw as shown in the illustration above. Otherwise the top cover cannot be installed properly. This screw is necessary for installing an expansion shelf.

2. When the holes are placed properly, fix them with the four screws immediately to prevent the top cover from falling down.



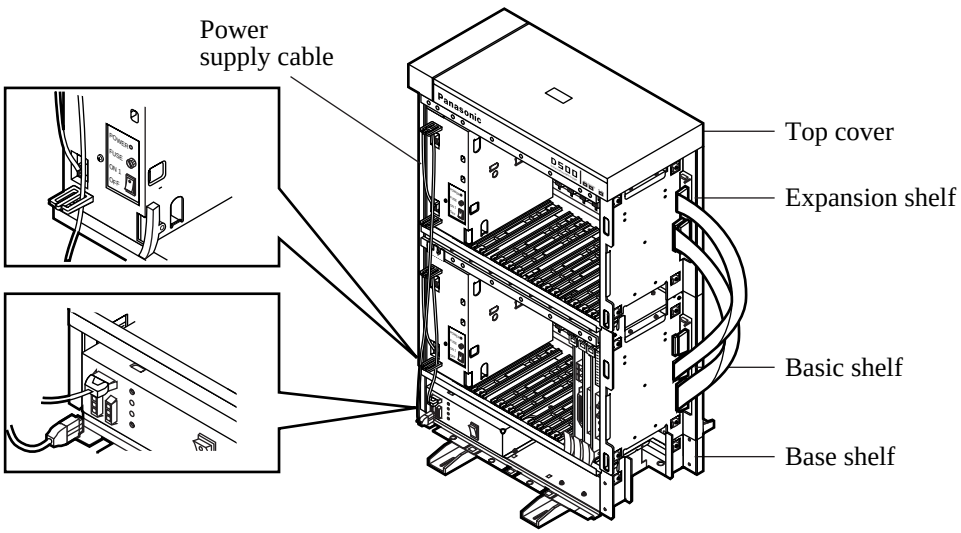
Cable Connections <LED Cable/Flat Cable>

1. Plug the LED cable (on the top cover) into the LED cable connector (on the expansion shelf).
2. Plug the flat cable (on the expansion shelf) into the flat cable connector (on the basic shelf).



Cable Connections <Power Supply Cable>

1. Plug the power supply cable into the power supply cable connector ("AC OUT 2").



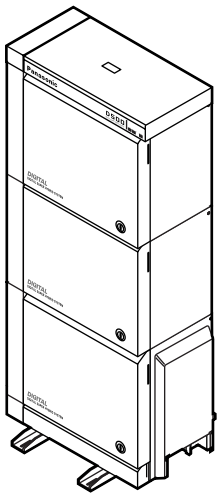
2.2.4 Expansion to 3-Shelf System

The KX-TD500 System can be expanded to 3-Shelf System by installing the Expansion Shelf 2 on the 2-Shelf System.
Up to 512 lines (including Extensions and CO lines) can be equipped with 3-Shelf System.

Note

Before stacking the Expansion Shelf 2 on the 2-Shelf System, remove the front panel and side panels from Expansion Shelf 2 following the procedures described in 2.2.3 Expansion to 2-Shelf System. If a part of the top cover is not removed, it is necessary to remove the part of the top cover just like the 2-Shelf System. Please refer to "Removing a Part of the Top Cover" in 2.2.3 Expansion to 2-Shelf System.

The figure below shows a 3-Shelf System composed of a basic shelf and two expansion shelves.

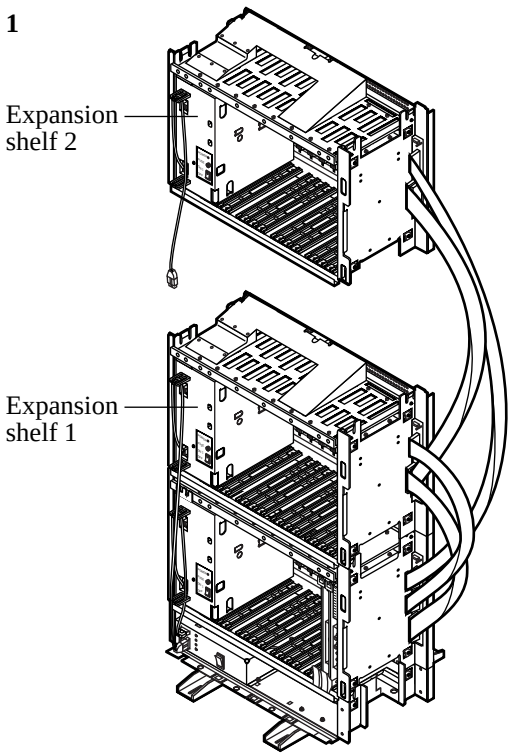


Stacking on the 2-Shelf System

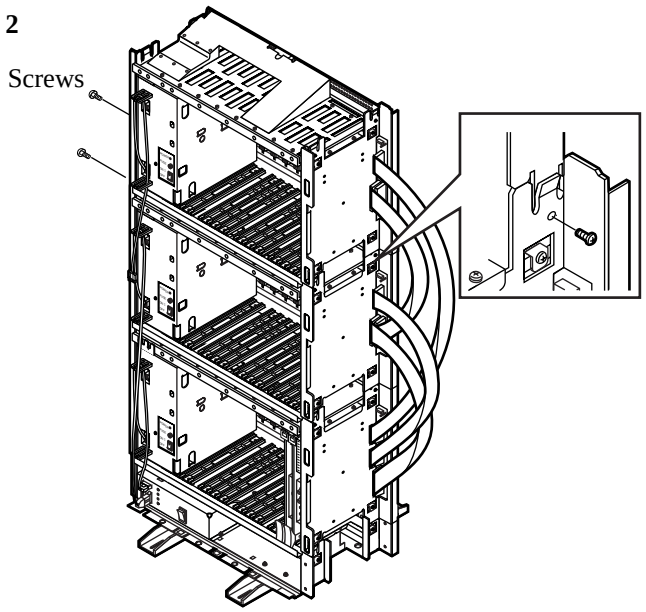
1. To connect the expansion shelf 2 with 2-Shelf System, place the holes of the expansion shelf 2 exactly on the holes of the expansion shelf 1.

Note

Remove the plastic cover on the back cover of the Expansion Shelf 2. Please refer to "Removing Parts on the Top Cover and Back Cover" in 2.2.4 Expansion to 3-Shelf System.



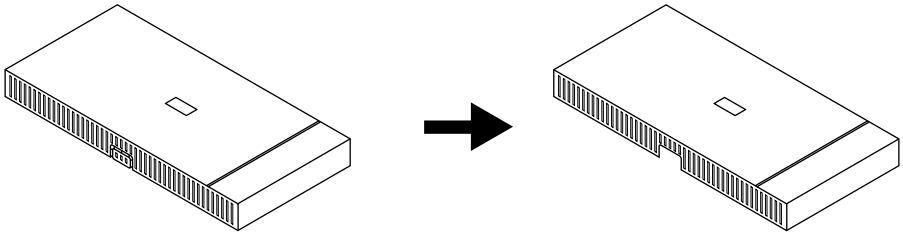
2. When the holes are placed properly, fix them with the three screws immediately to prevent the expansion shelf 2 from falling down.



Removing Parts on the Top Cover and Back Cover

1. Remove the part which is located on the back side of the top cover.

- This operation is required for ventilation of the coolling fan in the expansion shelf.

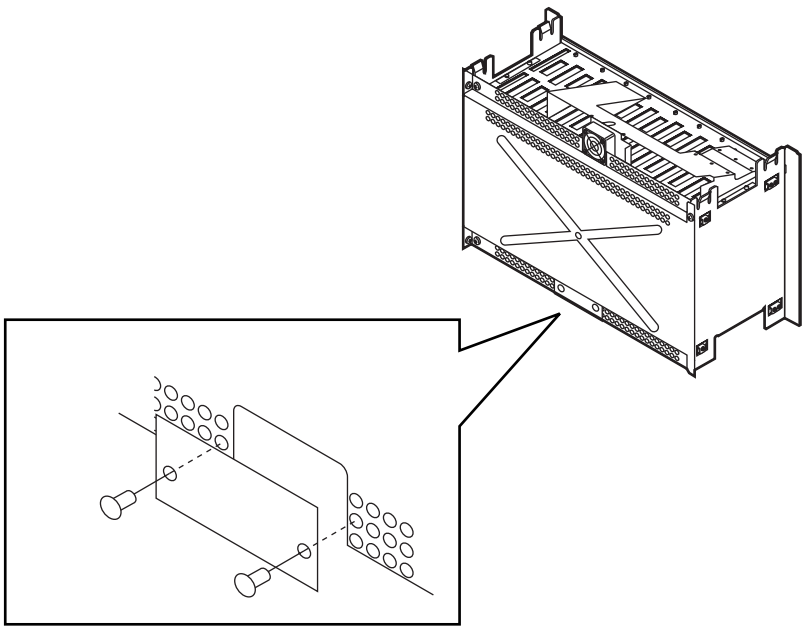


2. Remove the plastic cover on the back cover of the Expansion Shelf 2.

- This operation is required for ventilation of the coolling fan in the expansion shelf.

Note

Do not remove the plastic cover of the Expansion Shelf 1.

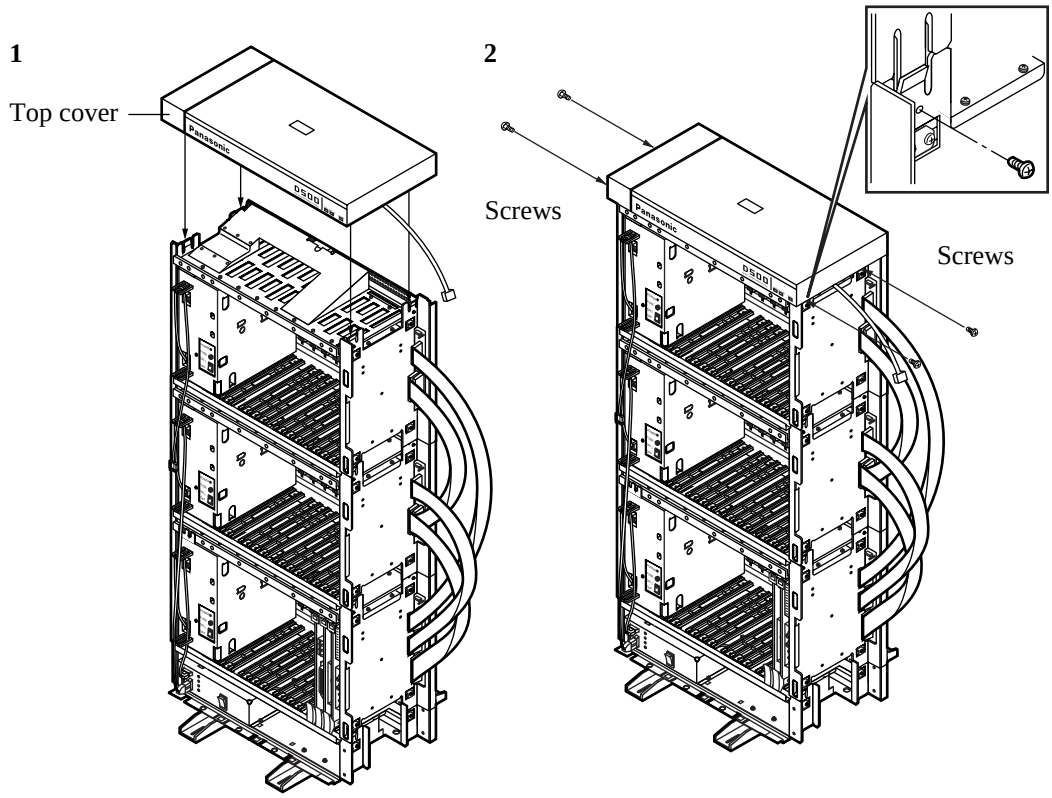


Note

Remove these parts before stacking the Expansion Shelf 1 and 2.

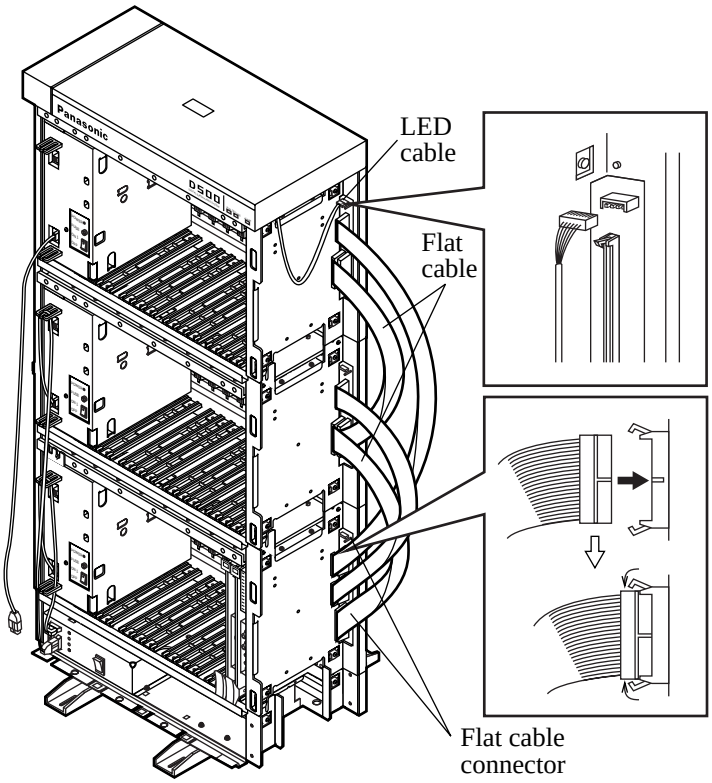
Installation of Top Cover

1. To connect the top cover, place the holes of the top cover exactly on the holes of the expansion shelf 2.
2. When the holes are placed properly, fix them with the four screws immediately to prevent the top cover from falling down.



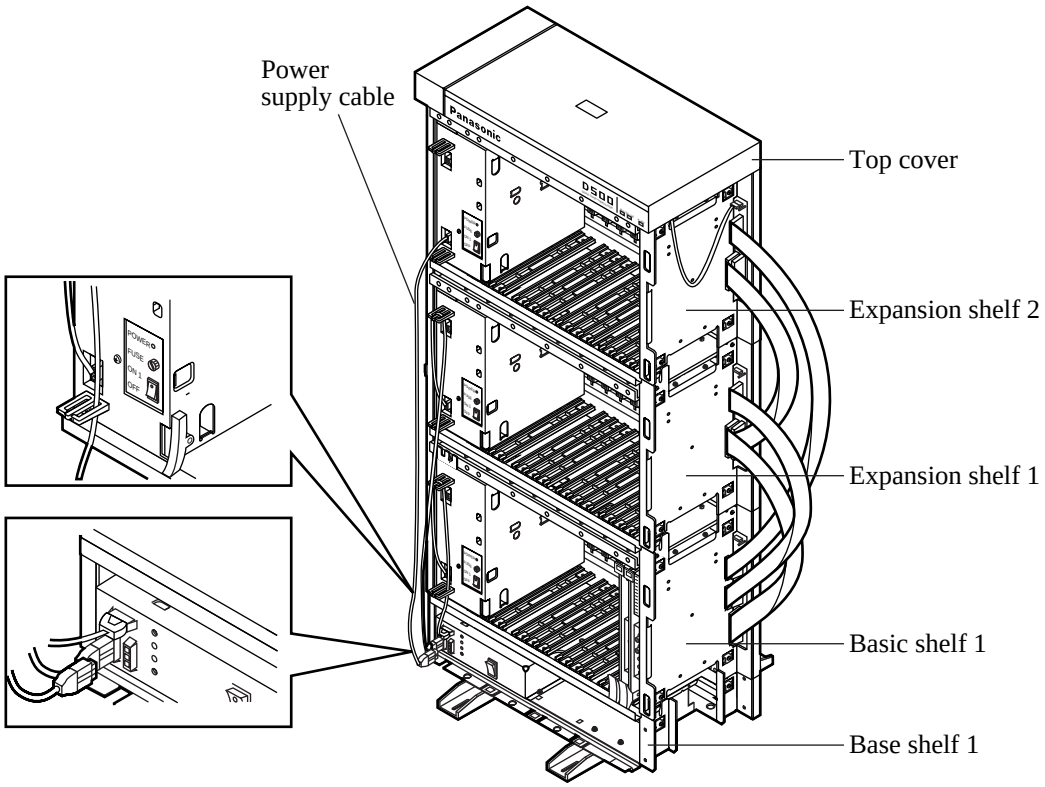
Cable Connections <LED Cable/Flat Cable>

1. Plug the LED cable (on the top cover) into the LED cable connector (on the expansion shelf 2).
2. Plug the flat cable (on the expansion shelf 2) into the flat cable connector (on the basic shelf).



Cable Connections < Power Supply Cable>

1. Plug the power supply cable (on the Expansion Shelf 2) into the power supply cable connector ("AC OUT 3").

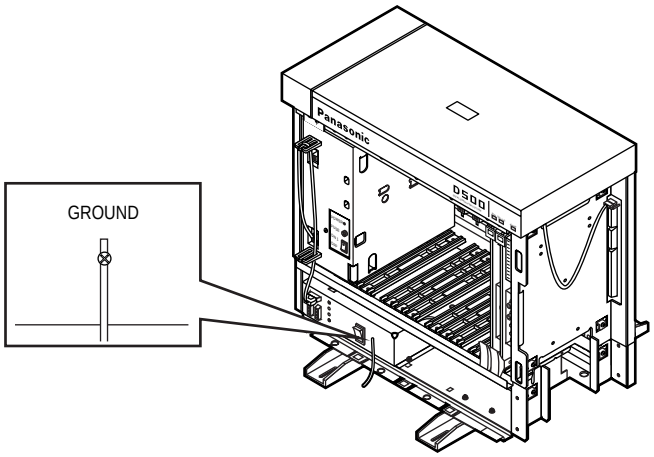


2.2.5 Ground Wiring

IMPORTANT

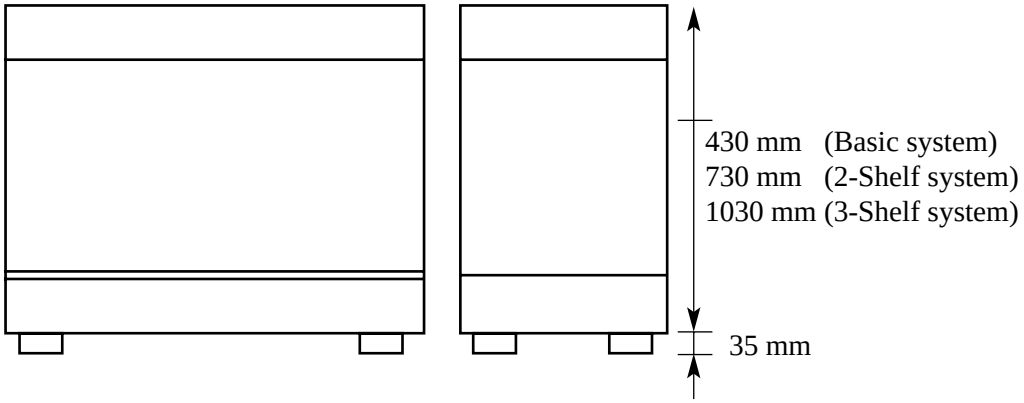
Make sure to connect the frame of the KX-TD500 system to the earth ground properly to protect the unit.

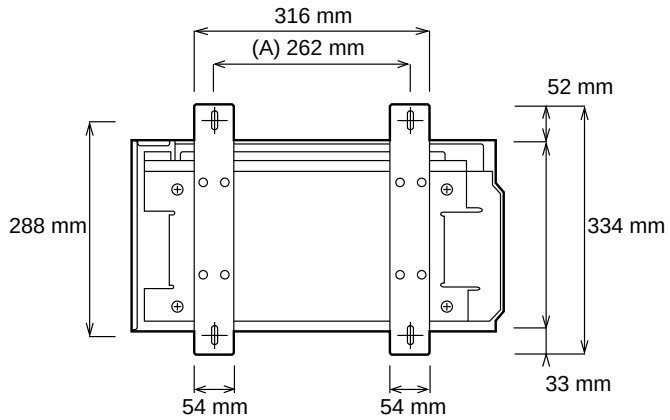
1. Connect the ground wire to the ground wire connector (GND).



2.2.6 Fixing on the Floor

Setting Out and Drilling



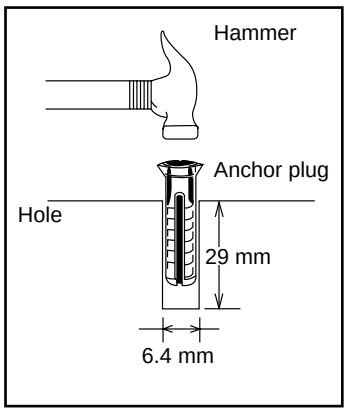


Shelf	Weight
Basic Shelf*1	20.4 kg
Expansion Shelf*2	12.6 kg

*1 With CPU and T-SW cards
*2 Without cards

Location of the anchor plug (A):

1. Drill the hole for the anchor plug on the floor in accordance with the measurements.



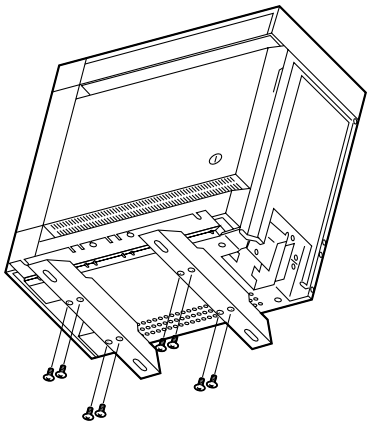
2. Drive the anchor plug into the hole.

Note

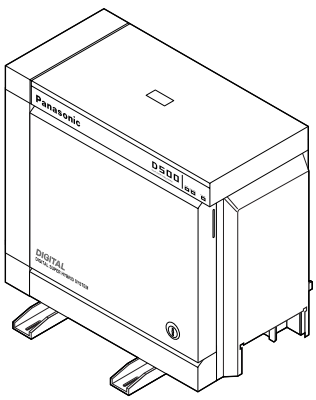
When fixing the KX-TD500 System to the floor, anchor plugs should always be used to prevent the system from falling over.

Fixing on the Floor

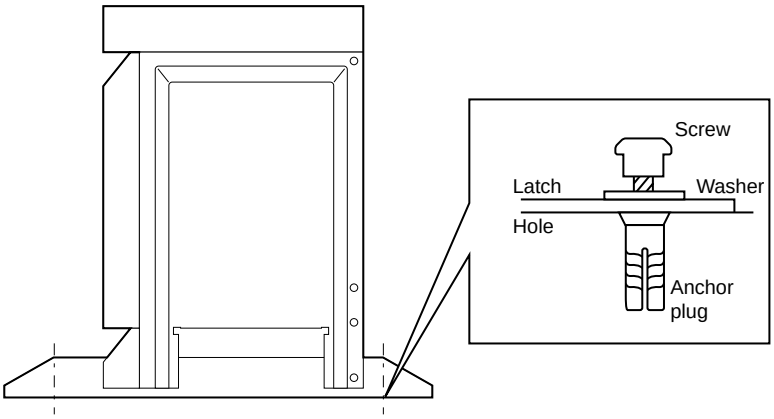
1. Attach the two floor-fixing brackets to the basic shelf as shown in the figure. Fasten each bracket with four screws.



2. Position the shelf on the floor.
Check the alignment and the level of the shelf.



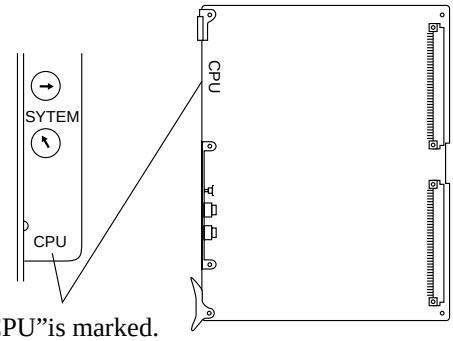
3. Fix the shelf securely to the floor using screws and flat washers.



2.3 Factory-Installed Card/Unit

2.3.1 CPU Card

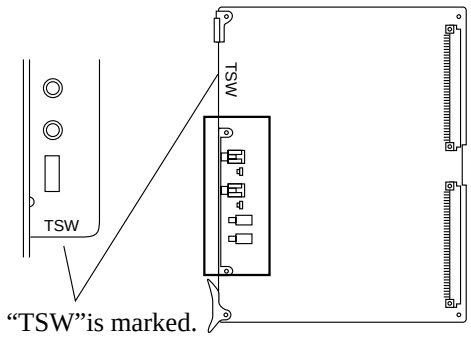
This card is already inserted at the factory in the "CPU" in the Basic Shelf.



“CPU”is marked.

2.3.2 TSW Card

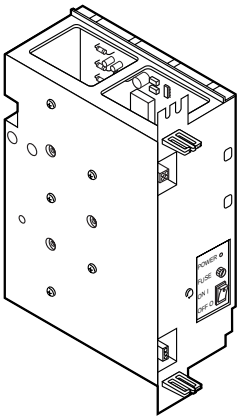
This card is already inserted at the factory in the "TSW" in the Basic shelf.



“TSW”is marked.

2.3.3 Power Unit

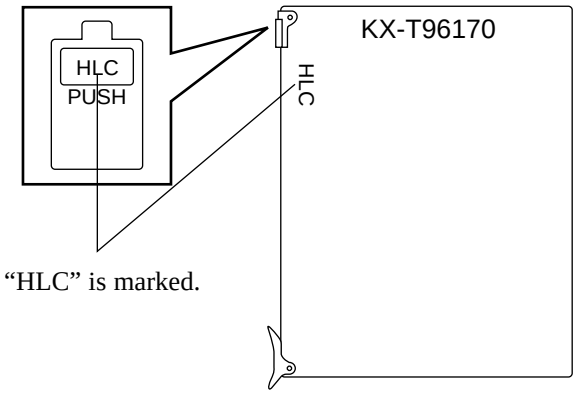
Power unit is already inserted at the factory in the "POWER" in the Basic shelf and the Expansion shelf 1, 2.



2.4 Extension Cards

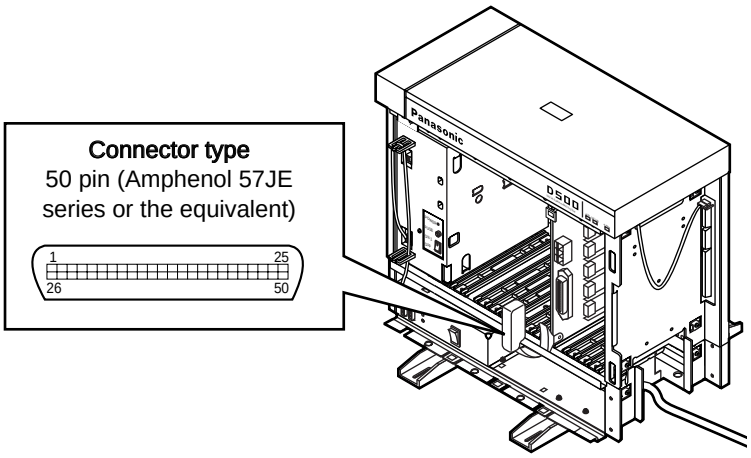
2.4.1 HLC Card (KX-T96170)

Insert this card into a free slot.



Connection of the extension line cord

Insert the 50-pin connector (plug) of the extension line cord into the 50-pin connector (jack) on the HLC card. See 2.1.4 Amphenol 57JE type Connector.



Connection of cable pins

See 2.4.11 Cable Pin Numbers for Extension Lines.

Maximum cabling distance of the extension line cord (twisted cable)

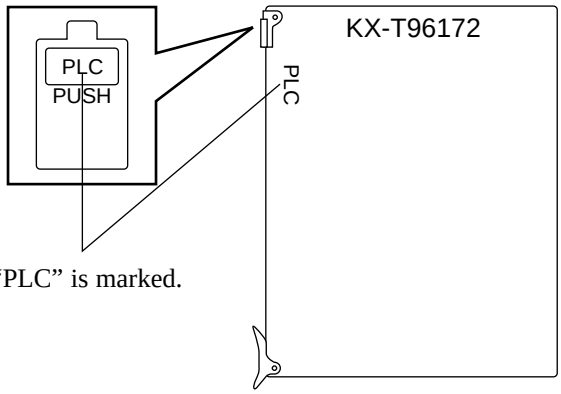
See 2.4.9 Maximum cabling distance of the extension line cord (twisted cable).

Auxiliary connection

See 2.9.1 Auxiliary Connection for Power Failure Transfer.

2.4.2 PLC Card (KX-T96172)

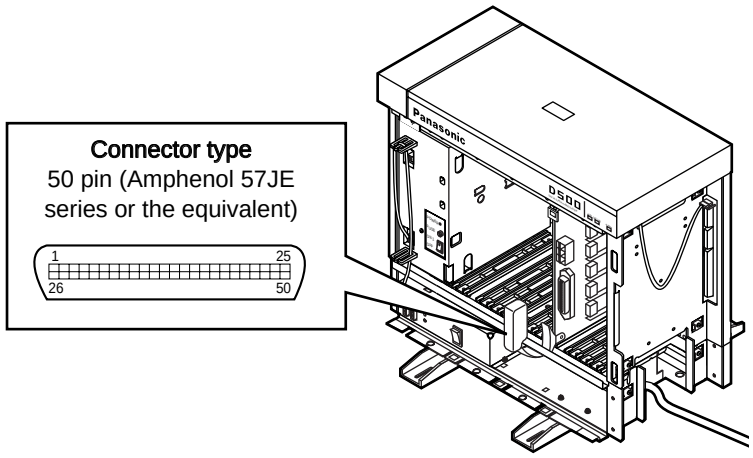
Insert this card into a free slot.



"PLC" is marked.

Connection of the extension line cord

Insert the 50-pin connector (plug) of the extension line cord into the 50-pin connector (jack) on the PLC card. See 2.1.4 Amphenol 57JE type Connector.



Connection of cable pins

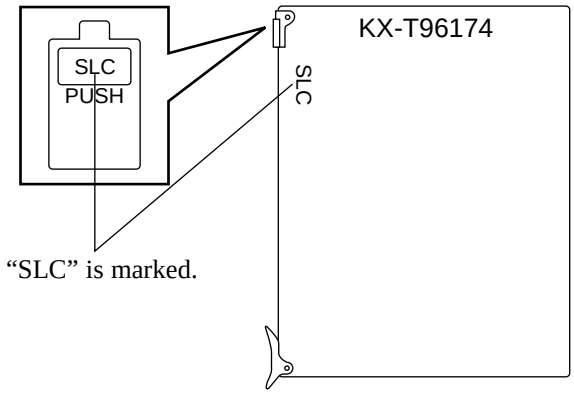
See 2.4.11 Cable Pin Numbers for Extension Lines.

Maximum cabling distance of the extension line cord (twisted cable)

See 2.4.9 Maximum cabling distance of the extension line cord (twisted cable).

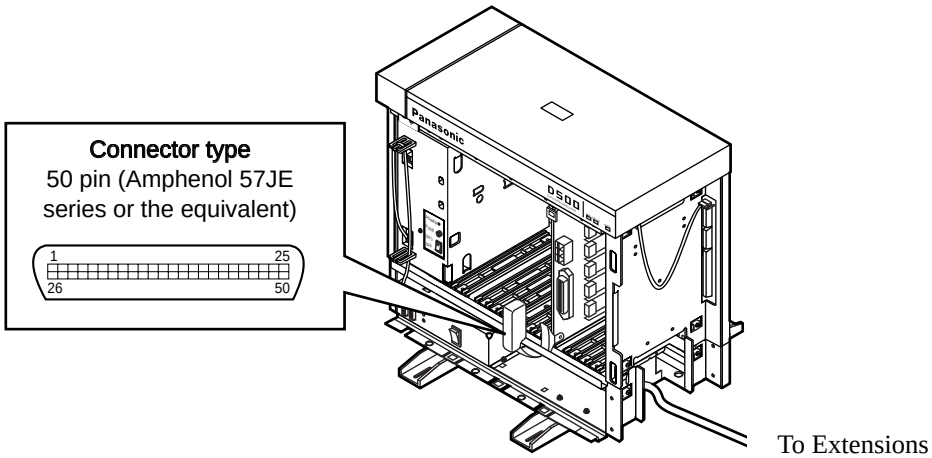
2.4.3 SLC Card (KX-T96174)

Insert this card into a free slot.



Connection of the extension line cord

Insert the 50-pin connector (plug) of the extension line cord into the 50-pin connector (jack) on the SLC card. See 2.1.4 Amphenol 57JE type Connector.



Connection of cable pins

See 2.4.11 Cable Pin Numbers for Extension Lines.

Maximum cabling distance of the extension line cord (twisted cable)

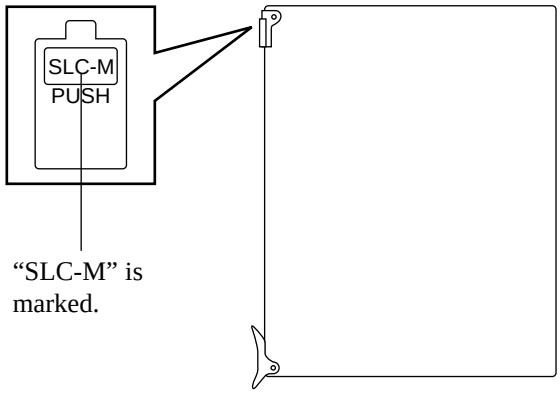
See 2.4.9 Maximum cabling distance of the extension line cord (twisted cable).

Auxiliary connection

See 2.9.1 Auxiliary Connection for Power Failure Transfer.

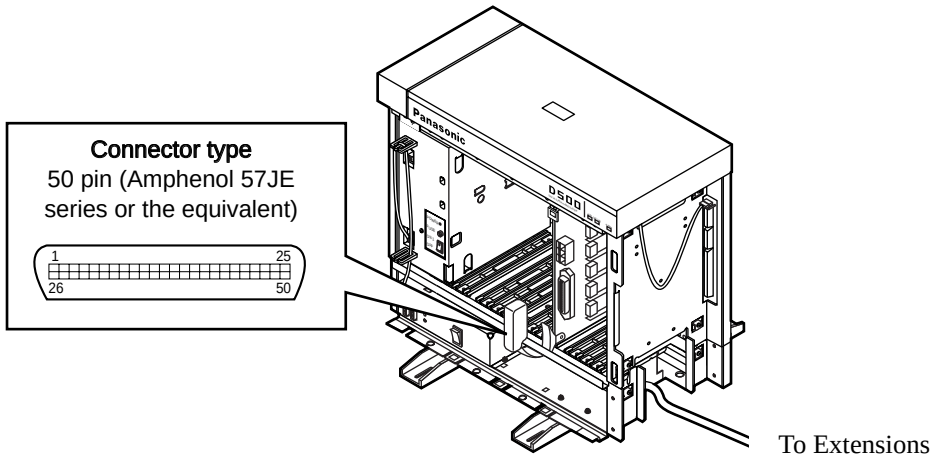
2.4.4 SLC-M Card (KX-T96175)

Insert this card into a free slot.



Connection of the extension line cord

Insert the 50-pin connector (plug) of the extension line cord into the 50-pin connector (jack) on the SLC-M card. See 2.1.4 Amphenol 57JE type Connector.



Connection of cable pins

See 2.4.11 Cable Pin Numbers for Extension Lines.

Maximum cabling distance of the extension line cord (twisted cable)

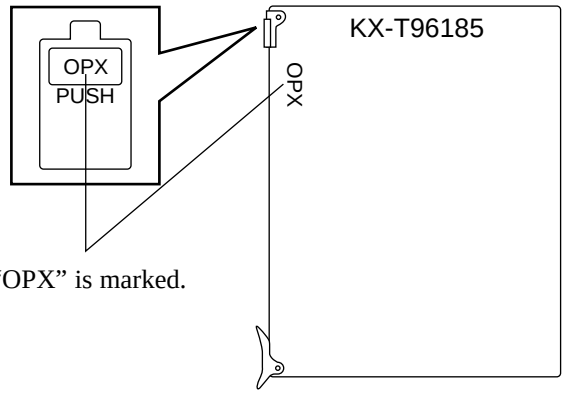
See 2.4.9 Maximum cabling distance of the extension line cord (twisted cable).

Auxiliary connection

See 2.9.1 Auxiliary Connection for Power Failure Transfer.

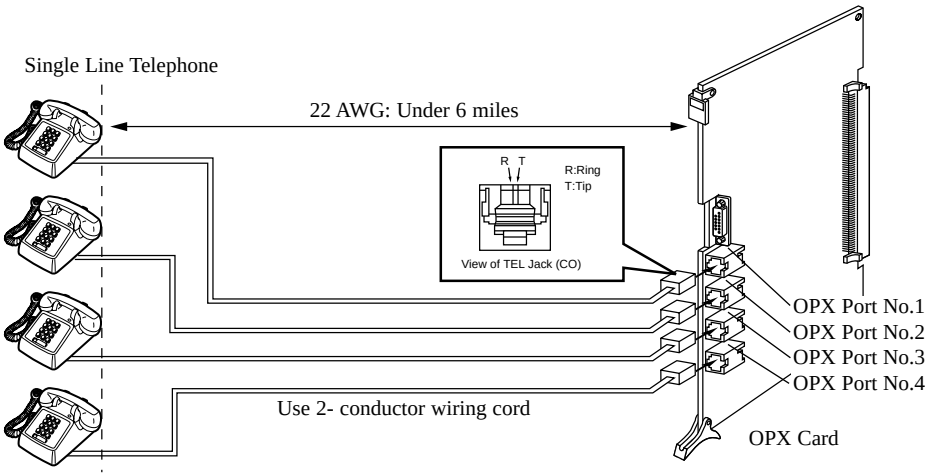
2.4.5 OPX Card (KX-T96185)

Insert this card into a free slot.



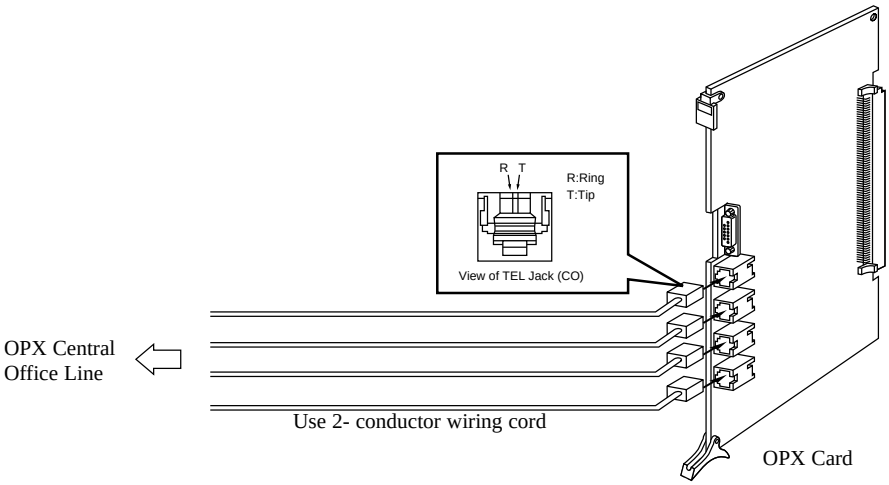
"OPX" is marked.

Connection to private lines



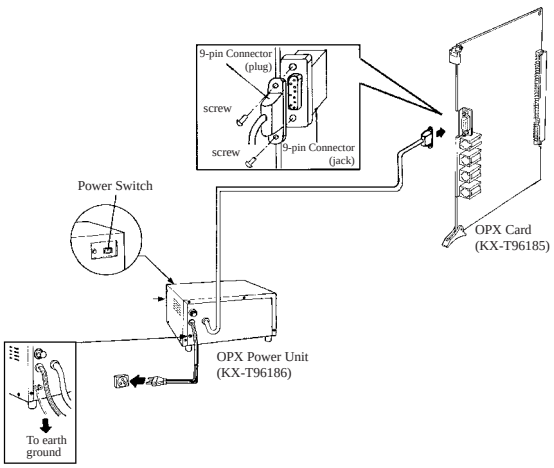
Insert the modular plug of the Single Line Telephone Line cord (2-conductor wiring) into the modular jack on the OPX card.

Connection to public lines



Insert the modular plug of the Single Line Telephone Line cord (2-conductor wiring) into the modular jack on the OPX card.

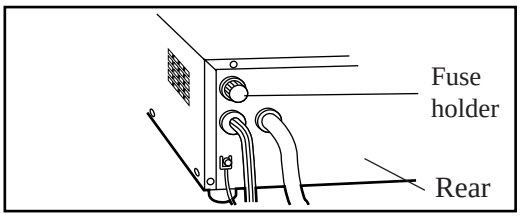
Connection to the OPX Power Unit (KX-T96186)



1. Insert the 9-pin connector (plug) of the OPX Power Unit into the 9-pin connector (jack) on the OPX card.
2. Connect the frame of the OPX Power Unit to earth ground properly to protect the unit.
3. Plug in the AC Power cord from the OPX Power Unit.
4. Turn on the Power Switch on the OPX Power Unit.
   - The Power indicator will be lit.

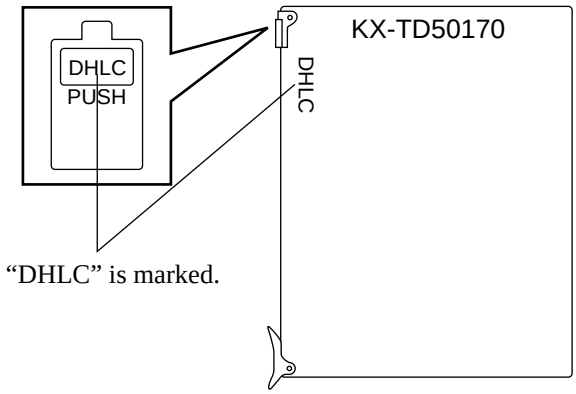
Primary Power Fuse

If the Power Indicator light goes out, replace the Primary Power Fuse after solving the problem.



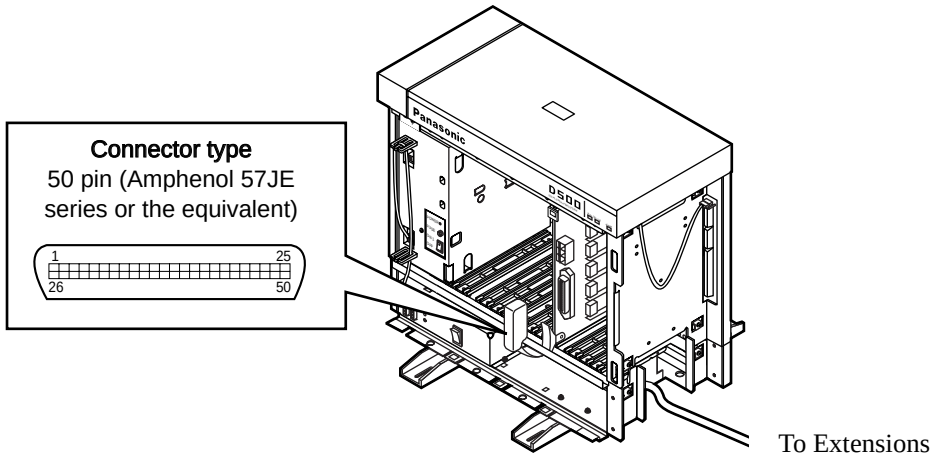
2.4.6 DHLC Card (KX-TD50170)

Insert this card into a free slot.



Connection of the extension line cord

Insert the 50-pin connector (plug) of the extension line cord into the 50-pin connector (jack) on the DHLC card. See 2.1.4 Amphenol 57JE type Connector.



Connection of cable pins

See 2.4.11 Cable Pin Numbers for Extension Lines.

Maximum cabling distance of the extension line cord (twisted cable)

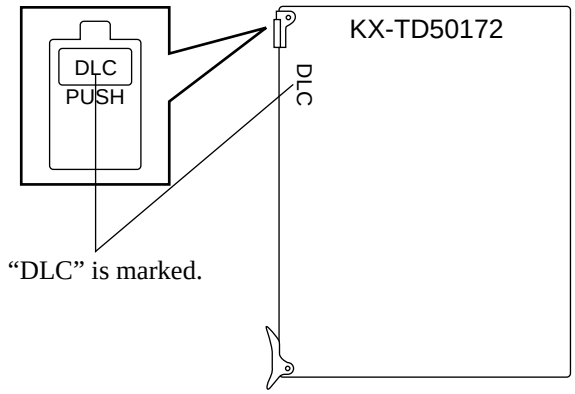
See 2.4.9 Maximum cabling distance of the extension line cord (twisted cable).

Auxiliary connection

See 2.9.1 Auxiliary Connection for Power Failure Transfer.

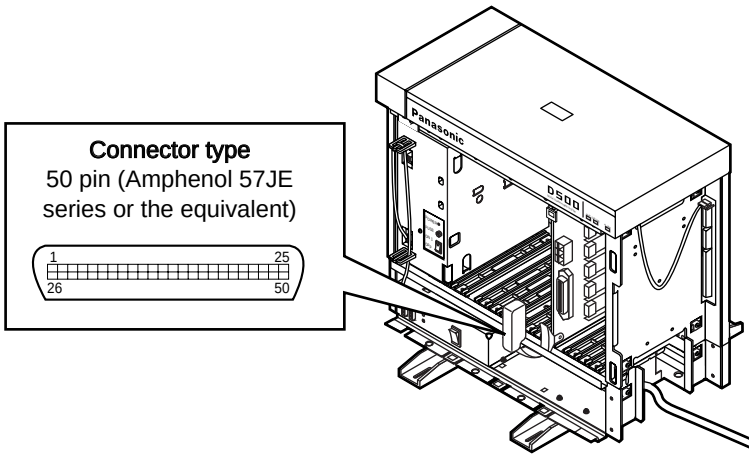
2.4.7 DLC Card (KX-TD50172)

Insert this card into a free slot.



Connection of the extension line cord

Insert the 50-pin connector (plug) of the extension line cord into the 50-pin connector (jack) on the DLC card. See 2.1.4 Amphenol 57JE type Connector.



Connection of cable pins

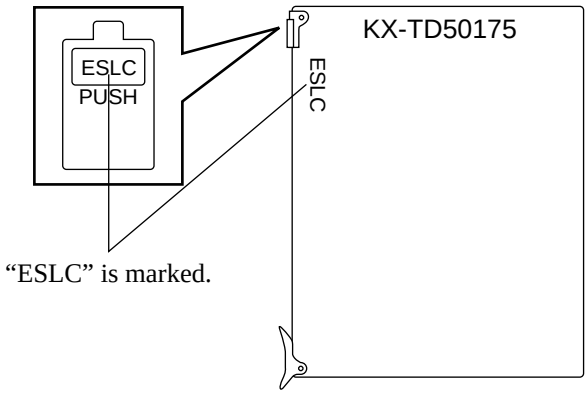
See 2.4.11 Cable Pin Numbers for Extension Lines.

Maximum cabling distance of the extension line cord (twisted cable)

See 2.4.9 Maximum cabling distance of the extension line cord (twisted cable).

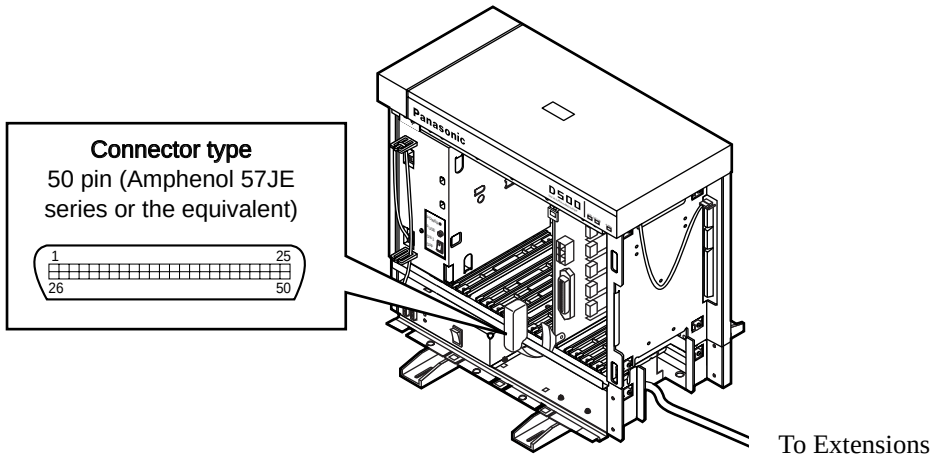
2.4.8 ESLC Card (KX-TD50175)

Insert this card into a free slot.



Connection of the extension line cord

Insert the 50-pin connector (plug) of the extension line cord into the 50-pin connector (jack) on the ESLC card. See 2.1.4 Amphenol 57JE type Connector.



Connection of cable pins

See 2.4.11 Cable Pin Numbers for Extension Lines.

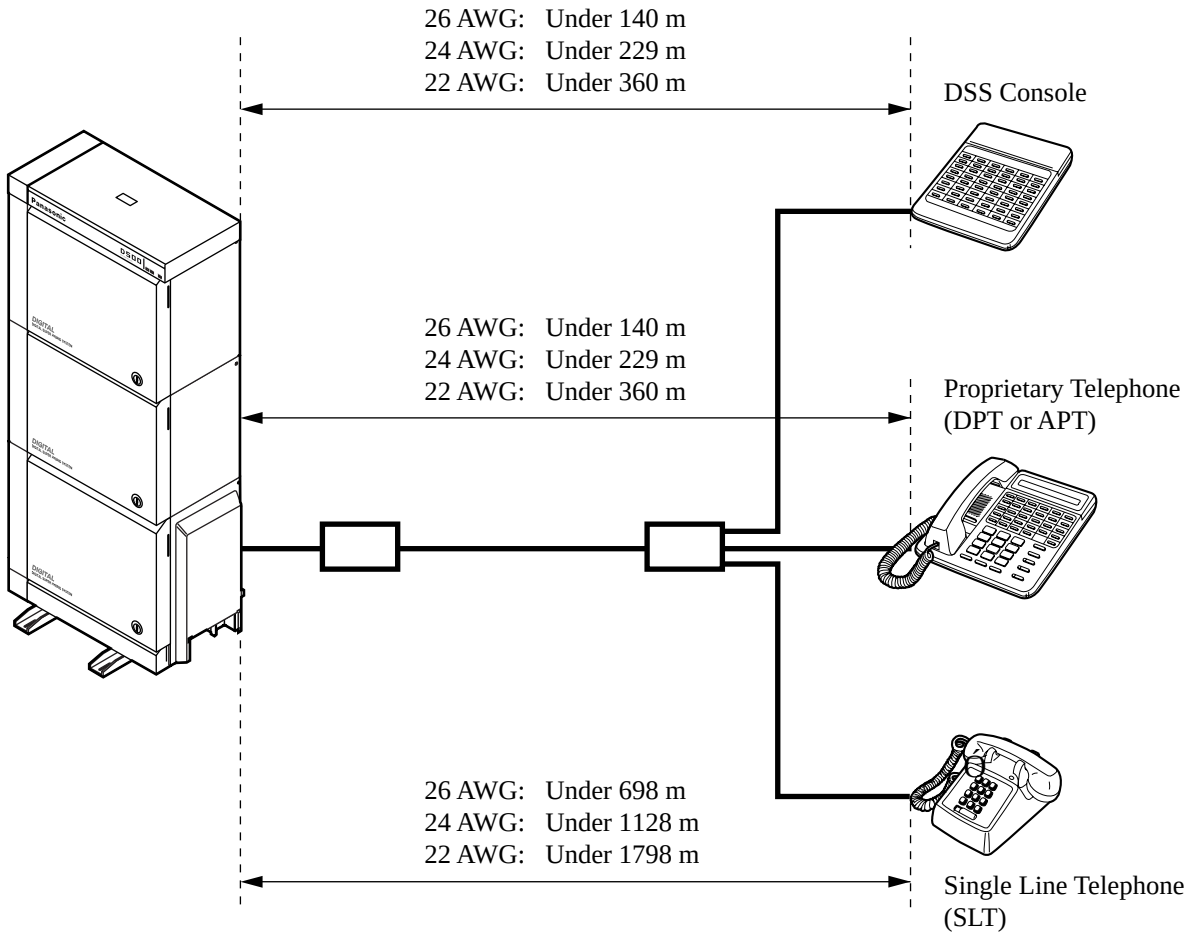
Maximum cabling distance of the extension line cord (twisted cable)

See 2.4.9 Maximum cabling distance of the extension line cord (twisted cable).

Auxiliary connection

See 2.9.1 Auxiliary Connection for Power Failure Transfer.

2.4.9 Maximum cabling distance of the extension line cord (twisted cable)



↓ Card / Terminal →	DSS Console	Proprietary Telephone		SLT
		DPT	APT	
HLC (KX-T96170)	✔		✔	✔
PLC (KX-T96172)	✔		✔	
SLC (KX-T96174)				✔
SLC-M (KX-T96175)				✔
DHLC (KX-TD50170)	✔	✔	✔	✔
DLC (KX-TD50172)	✔	✔		
ESLC (KX-TD50175)				✔

" ✔" indicates that the extension card is available for the terminal.

2.4.10 Extension Connection of KX-A204 (Cable)/KX-A205 (Clip Terminal)

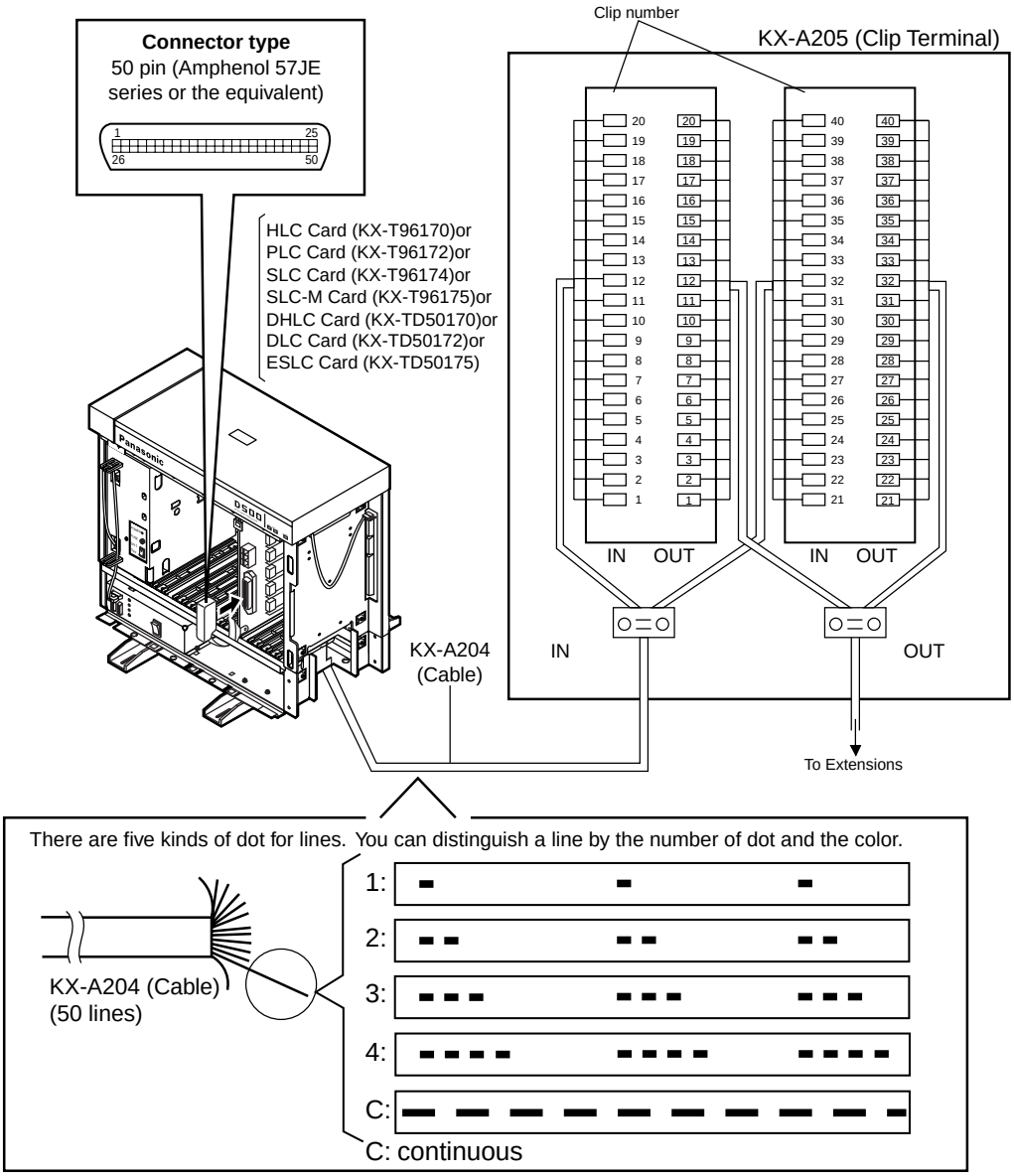
This KX-A204 (cable) enables you to connect 8 extensions to the KX-TD500 System. When you want to connect 8 extensions to the connector (KX-A205), two of KX-A205 are required.

Please connect KX-A204 (Cable) to KX-A205 (Clip Terminal) as follows. See 2.4.11 Cable Pin Numbers for Extension Lines.

The KX-A204/205 consists of the following:

KX-A204 : Cable.....1

KX-A205 : Clip Terminal.....1



2.4.11 Cable Pin Numbers for Extension Lines

1) HLC/PLC/DHLC/SLC/SLC-M Card

Between Clip Terminal and the system (HLC/PLC/DHLC/SLC/SLC-M)

Conn. Pin	Cable Color	Clip No.	Number of Dot	Extension Line	
26	ORN-RED	1	1		T
1	ORN-BLK	2	1		R
27	YEL-RED	3	1	No.1	D1
2	YEL-BLK	4	1		D2
28	GRN-RED	5	1		P1
3	GRN-BLK	6	1		P2
29	GRY-RED	7	1		T
4	GRY-BLK	8	1		R
30	WHT-RED	9	1	No.2	D1
5	WHT-BLK	10	1		D2
31	ORN-RED	11	2		P1
6	ORN-BLK	12	2		P2
32	YEL-RED	13	2		T
7	YEL-BLK	14	2		R
33	GRN-RED	15	2	No.3	D1
8	GRN-BLK	16	2		D2
34	GRY-RED	17	2		P1
9	GRY-BLK	18	2		P2
35	WHT-RED	19	2		T
10	WHT-BLK	20	2		R
36	ORN-RED	21	3	No.4	D1
11	ORN-BLK	22	3		D2
37	YEL-RED	23	3		P1
12	YEL-BLK	24	3		P2
38	GRN-RED	25	3		T
13	GRN-BLK	26	3		R
39	GRY-RED	27	3	No.5	D1
14	GRY-BLK	28	3		D2
40	WHT-RED	29	3		P1
15	WHT-BLK	30	3		P2

Between Clip Terminal and the system (HLC/PLC/DHLC/SLC/SLC-M)

Conn. Pin	Cable Color	Clip No.	Number of Dot	Extension Line	
41	ORN-RED	31	4		T
16	ORN-BLK	32	4		R
42	YEL-RED	33	4	No.6	D1
17	YEL-BLK	34	4		D2
43	GRN-RED	35	4		P1
18	GRN-BLK	36	4		P2
44	GRY-RED	37	4		T
19	GRY-BLK	38	4		R
45	WHT-RED	39	4	No.7	D1
20	WHT-BLK	40	4		D2
46	ORN-RED	41	C		P1
21	ORN-BLK	42	C		P2
47	YEL-RED	43	C		T
22	YEL-BLK	44	C		R
48	GRN-RED	45	C	No.8	D1
23	GRN-BLK	46	C		D2
49	GRY-RED	47	C		P1
24	GRY-BLK	48	C		P2
50	WHT-RED	49	C	Not used	
25	WHT-BLK	50	C		

C: continuous

Between Clip Terminal and extensions (HLC/PLC/DHLC/SLC/SLC-M)

Conn. Pin	Cable Color	Clip No.	Extension Line	
26	WHT-BLU	1		T
1	BLU-WHT	2		R
27	WHT-ORN	3	No.1	D1
2	ORN-WHT	4		D2
28	WHT-GRN	5		P1
3	GRN-WHT	6		P2
29	WHT-BRN	7		T
4	BRN-WHT	8		R
30	WHT-SLT	9	No.2	D1
5	SLT-WHT	10		D2
31	RED-BLU	11		P1
6	BLU-RED	12		P2

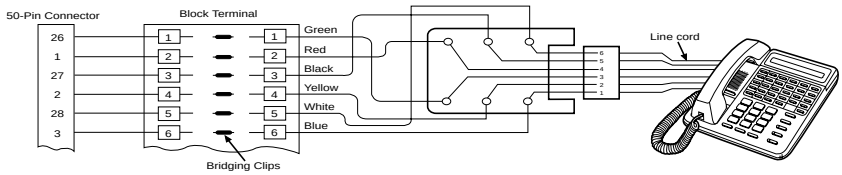
Between Clip Terminal and extensions (HLC/PLC/DHLC/SLC/SLC-M)

Conn. Pin	Cable Color	Clip No.	Extension Line	
32	RED-ORN	13		T
7	ORN-RED	14		R
33	RED-GRN	15	No.3	D1
8	GRN-RED	16		D2
34	RED-BRN	17		P1
9	BRN-RED	18		P2
35	RED-SLT	19		T
10	SLT-RED	20		R
36	BLK-BLU	21	No.4	D1
11	BLU-BLK	22		D2
37	BLK-ORN	23		P1
12	ORN-BLK	24		P2
38	BLK-GRN	25		T
13	GRN-BLK	26		R
39	BLK-BRN	27	No.5	D1
14	BRN-BLK	28		D2
40	BLK-SLT	29		P1
15	SLT-BLK	30		P2
41	YEL-BLU	31		T
16	BLU-YEL	32		R
42	YEL-ORN	33	No.6	D1
17	ORN-YEL	34		D2
43	YEL-GRN	35		P1
18	GRN-YEL	36		P2
44	YEL-BRN	37		T
19	BRN-YEL	38		R
45	YEL-SLT	39	No.7	D1
20	SLT-YEL	40		D2
46	VIO-BLU	41		P1
21	BLU-VIO	42		P2
47	VIO-ORN	43		T
22	ORN-VIO	44		R
48	VIO-GRN	45	No.8	D1
23	GRN-VIO	46		D2
49	VIO-BRN	47		P1
24	BRN-VIO	48		P2

Between Clip Terminal and extensions (HLC/PLC/DHLC/SLC/SLC-M)

Conn. Pin	Cable Color	Clip No.	Extension Line
50 25	VIO-SLT SLT-VIO	49 50	Not used

- Station wiring (3-pair twisted cabling)



2) ESLC Card

Between Clip Terminal and the system (ESLC)

Conn. Pin	Cable Color	Clip No.	Number of Dot	Extension Line	
26 1	ORN-RED ORN-BLK	1 2	1 1	No.1	T R
27 2	YEL-RED YEL-BLK	3 4	1 1	No.2	T R
28 3	GRN-RED GRN-BLK	5 6	1 1	No.3	T R
29 4	GRY-RED GRY-BLK	7 8	1 1	No.4	T R
30 5	WHT-RED WHT-BLK	9 10	1 1	No.5	T R
31 6	ORN-RED ORN-BLK	11 12	2 2	No.6	T R
32 7	YEL-RED YEL-BLK	13 14	2 2	No.7	T R
33 8	GRN-RED GRN-BLK	15 16	2 2	No.8	T R
34 9	GRY-RED GRY-BLK	17 18	2 2	No.9	T R
35 10	WHT-RED WHT-BLK	19 20	2 2	No.10	T R

Between Clip Terminal and the system (ESLC)

Conn. Pin	Cable Color	Clip No.	Number of Dot	Extension Line	
36	ORN-RED	21	3	No.11	T
11	ORN-BLK	22	3		R
37	YEL-RED	23	3	No.12	T
12	YEL-BLK	24	3		R
38	GRN-RED	25	3	No.13	T
13	GRN-BLK	26	3		R
39	GRY-RED	27	3	No.14	T
14	GRY-BLK	28	3		R
40	WHT-RED	29	3	No.15	T
15	WHT-BLK	30	3		R
41	ORN-RED	31	4	No.16	T
16	ORN-BLK	32	4		R
42	YEL-RED	33	4		
17	YEL-BLK	34	4		
43	GRN-RED	35	4		
18	GRN-BLK	36	4		
44	GRY-RED	37	4		
19	GRY-BLK	38	4		
45	WHT-RED	39	4		
20	WHT-BLK	40	4		
46	ORN-RED	41	C		
21	ORN-BLK	42	C		
47	YEL-RED	43	C		
22	YEL-BLK	44	C		
48	GRN-RED	45	C		
23	GRN-BLK	46	C		
49	GRY-RED	47	C		
24	GRY-BLK	48	C		
50	WHT-RED	49	C		
25	WHT-BLK	50	C		

C: continuous

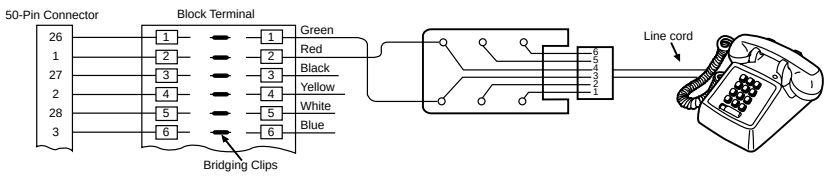
Between Clip Terminal and extensions (ESLC)

Conn. Pin	Cable Color	Clip No.	Extension Line	
26 1	WHT-BLU BLU-WHT	1 2	No.1	T R
27 2	WHT-ORN ORN-WHT	3 4	No.2	T R
28 3	WHT-GRN GRN-WHT	5 6	No.3	T R
29 4	WHT-BRN BRN-WHT	7 8	No.4	T R
30 5	WHT-SLT SLT-WHT	9 10	No.5	T R
31 6	RED-BLU BLU-RED	11 12	No.6	T R
32 7	RED-ORN ORN-RED	13 14	No.7	T R
33 8	RED-GRN GRN-RED	15 16	No.8	T R
34 9	RED-BRN BRN-RED	17 18	No.9	T R
35 10	RED-SLT SLT-RED	19 20	No.10	T R
36 11	BLK-BLU BLU-BLK	21 22	No.11	T R
37 12	BLK-ORN ORN-BLK	23 24	No.12	T R
38 13	BLK-GRN GRN-BLK	25 26	No.13	T R
39 14	BLK-BRN BRN-BLK	27 28	No.14	T R
40 15	BLK-SLT SLT-BLK	29 30	No.15	T R
41 16	YEL-BLU BLU-YEL	31 32	No.16	T R
42 17	YEL-ORN ORN-YEL	33 34		

Between Clip Terminal and extensions (ESLC)

Conn. Pin	Cable Color	Clip No.	Extension Line	
43	YEL-GRN	35		
18	GRN-YEL	36		
44	YEL-BRN	37		
19	BRN-YEL	38		
45	YEL-SLT	39		
20	SLT-YEL	40		
46	VIO-BLU	41		
21	BLU-VIO	42		
47	VIO-ORN	43		
22	ORN-VIO	44		
48	VIO-GRN	45		
23	GRN-VIO	46		
49	VIO-BRN	47		
24	BRN-VIO	48		
50	VIO-SLT	49		
25	SLT-VIO	50		

- Station wiring (1-pair twisted cabling)



3) DLC Card

Between Clip Terminal and the system (DLC)

Conn. Pin	Cable Color	Clip No.	Number of Dot	Extension Line	
26	ORN-RED	1	1	No.1	D1
1	ORN-BLK	2	1		D2
27	YEL-RED	3	1	No.2	D1
2	YEL-BLK	4	1		D2
28	GRN-RED	5	1	No.3	D1
3	GRN-BLK	6	1		D2
29	GRY-RED	7	1	No.4	D1
4	GRY-BLK	8	1		D2
30	WHT-RED	9	1	No.5	D1
5	WHT-BLK	10	1		D2
31	ORN-RED	11	2	No.6	D1
6	ORN-BLK	12	2		D2
32	YEL-RED	13	2	No.7	D1
7	YEL-BLK	14	2		D2
33	GRN-RED	15	2	No.8	D1
8	GRN-BLK	16	2		D2
34	GRY-RED	17	2	No.9	D1
9	GRY-BLK	18	2		D2
35	WHT-RED	19	2	No.10	D1
10	WHT-BLK	20	2		D2
36	ORN-RED	21	3	No.11	D1
11	ORN-BLK	22	3		D2
37	YEL-RED	23	3	No.12	D1
12	YEL-BLK	24	3		D2
38	GRN-RED	25	3	No.13	D1
13	GRN-BLK	26	3		D2
39	GRY-RED	27	3	No.14	D1
14	GRY-BLK	28	3		D2
40	WHT-RED	29	3	No.15	D1
15	WHT-BLK	30	3		D2
41	ORN-RED	31	4	No.16	D1
16	ORN-BLK	32	4		D2

Between Clip Terminal and the system (DLC)

Conn. Pin	Cable Color	Clip No.	Number of Dot	Extension Line	
42	YEL-RED	33	4		
17	YEL-BLK	34	4		
43	GRN-RED	35	4		
18	GRN-BLK	36	4		
44	GRY-RED	37	4		
19	GRY-BLK	38	4		
45	WHT-RED	39	4		
20	WHT-BLK	40	4		
46	ORN-RED	41	C		
21	ORN-BLK	42	C		
47	YEL-RED	43	C		
22	YEL-BLK	44	C		
48	GRN-RED	45	C		
23	GRN-BLK	46	C		
49	GRY-RED	47	C		
24	GRY-BLK	48	C		
50	WHT-RED	49	C		
25	WHT-BLK	50	C		

C: continuous

Between Clip Terminal and extensions (DLC)

Conn. Pin	Cable Color	Clip No.	Extension Line	
26	WHT-BLU	1	No.1	D1
1	BLU-WHT	2		D2
27	WHT-ORN	3	No.2	D1
2	ORN-WHT	4		D2
28	WHT-GRN	5	No.3	D1
3	GRN-WHT	6		D2
29	WHT-BRN	7	No.4	D1
4	BRN-WHT	8		D2
30	WHT-SLT	9	No.5	D1
5	SLT-WHT	10		D2
31	RED-BLU	11	No.6	D1
6	BLU-RED	12		D2

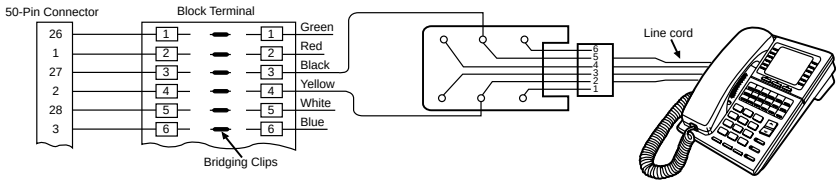
Between Clip Terminal and extensions (DLC)

Conn. Pin	Cable Color	Clip No.	Extension Line	
32 7	RED-ORN ORN-RED	13 14	No.7	D1 D2
33 8	RED-GRN GRN-RED	15 16	No.8	D1 D2
34 9	RED-BRN BRN-RED	17 18	No.9	D1 D2
35 10	RED-SLT SLT-RED	19 20	No.10	D1 D2
36 11	BLK-BLU BLU-BLK	21 22	No.11	D1 D2
37 12	BLK-ORN ORN-BLK	23 24	No.12	D1 D2
38 13	BLK-GRN GRN-BLK	25 26	No.13	D1 D2
39 14	BLK-BRN BRN-BLK	27 28	No.14	D1 D2
40 15	BLK-SLT SLT-BLK	29 30	No.15	D1 D2
41 16	YEL-BLU BLU-YEL	31 32	No.16	D1 D2
42 17 43 18 44 19 45 20 46 21 47 22 48 23	YEL-ORN ORN-YEL YEL-GRN GRN-YEL YEL-BRN BRN-YEL YEL-SLT SLT-YEL VIO-BLU BLU-VIO VIO-ORN ORN-VIO VIO-GRN GRN-VIO	33 34 35 36 37 38 39 40 41 42 43 44 45 46		

Between Clip Terminal and extensions (DLC)

Conn. Pin	Cable Color	Clip No.	Extension Line	
49	VIO-BRN	47		
24	BRN-VIO	48		
50	VIO-SLT	49		
25	SLT-VIO	50		

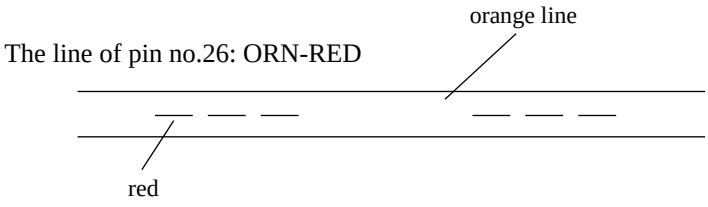
- Station wiring (1-pair twisted cablling)

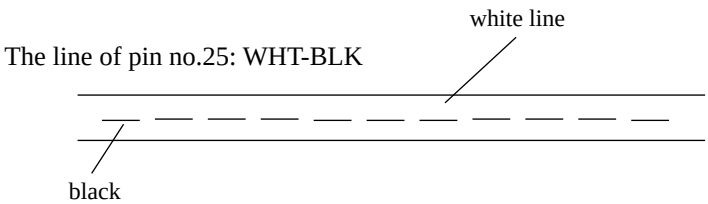


The meanings of the pin names

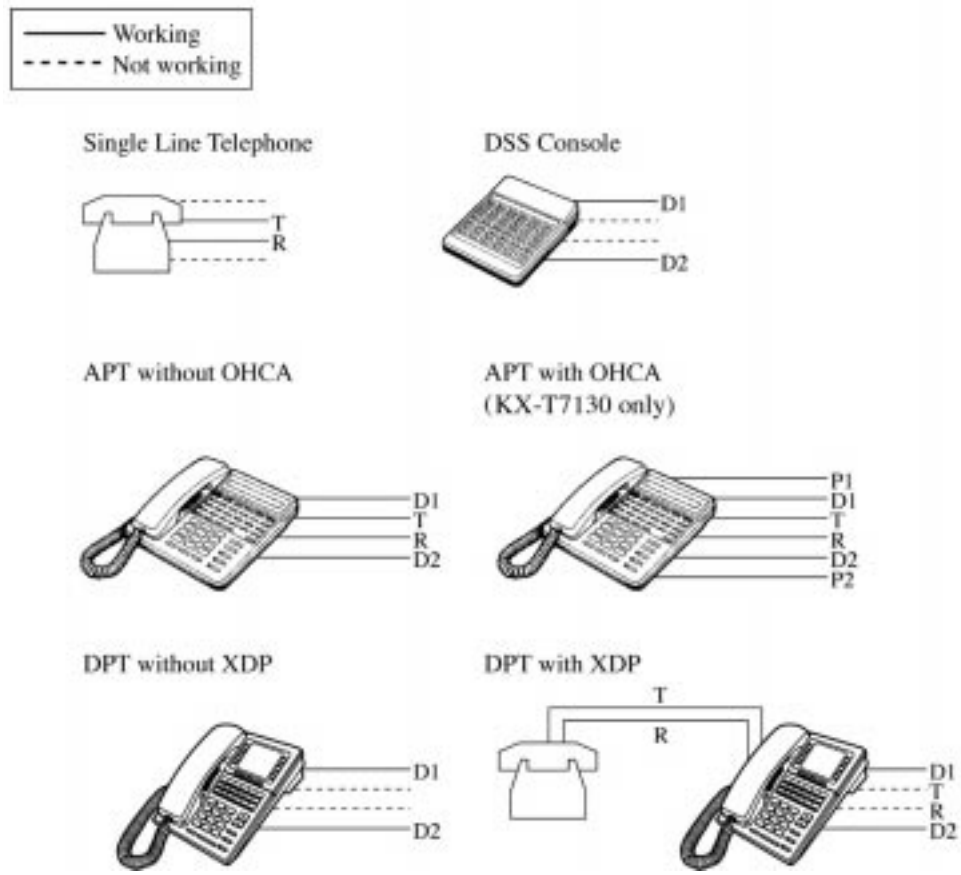
T: Tip
D1: Data 1
P1: 3 Pair Voice
R: Ring
D2: Data 2
P2: 3 Pair Voice

Cable color examples





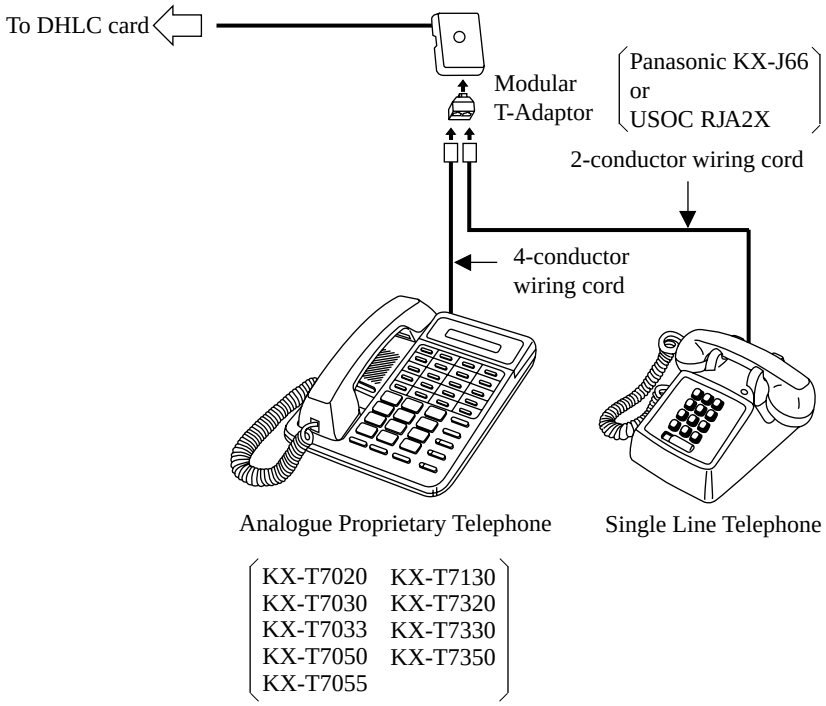
Working pins for the various telephones or DSS consoles



2.4.12 Parallel Connection of the Extensions

Parallel Connection - APT

Any Single Line Telephone can be connected parallel with Analogue Proprietary Telephone as follows:

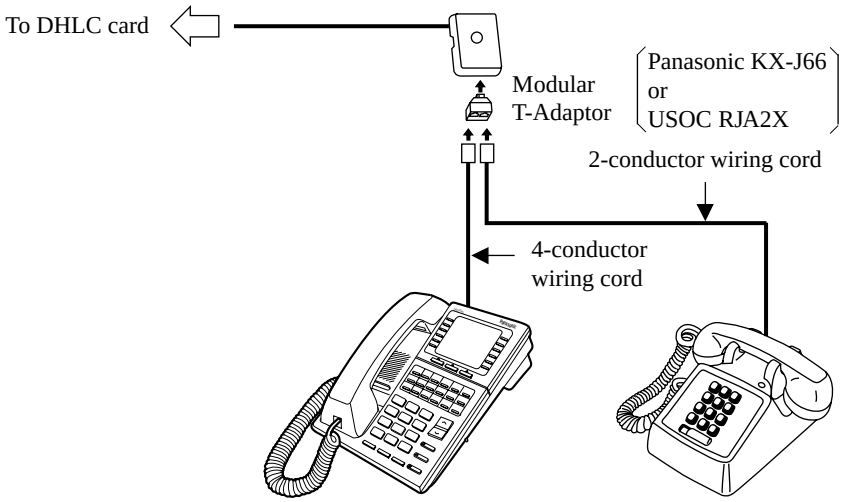


Notes

- The 6-conductor wiring cord and the Modular T-Adaptor KX-J36 are required when KX-T7130 is used for parallel connection.
- Not only a Single Line Telephone but an answering machine, a facsimile or a modem (personal computer) can be connected parallel with certain PTs.
  Please refer to "Parallelled Telephone" in 1.3 System Features of the Features Guide for further information.

Parallel Connection - DPT

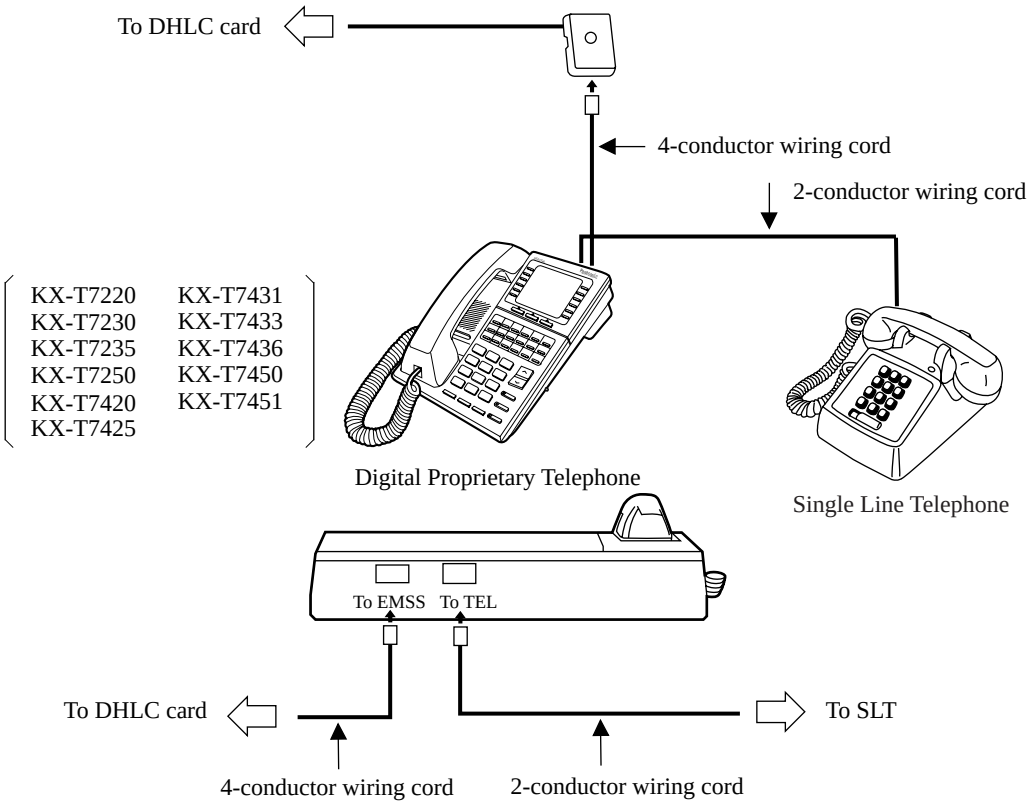
Any Single Line Telephone can be connected parallel with Digital Proprietary Telephone as follows:



KX-T7220	KX-T7431
KX-T7230	KX-T7433
KX-T7235	KX-T7436
KX-T7250	KX-T7450
KX-T7420	KX-T7451
KX-T7425	

2.4.13 Extra Device Port (XDP) Connection

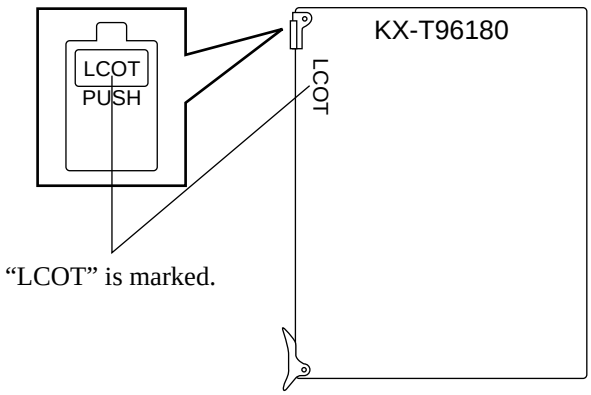
Any Single Line Telephone can be connected parallel with Digital Proprietary Telephone as follows:



2.5 Trunk Cards

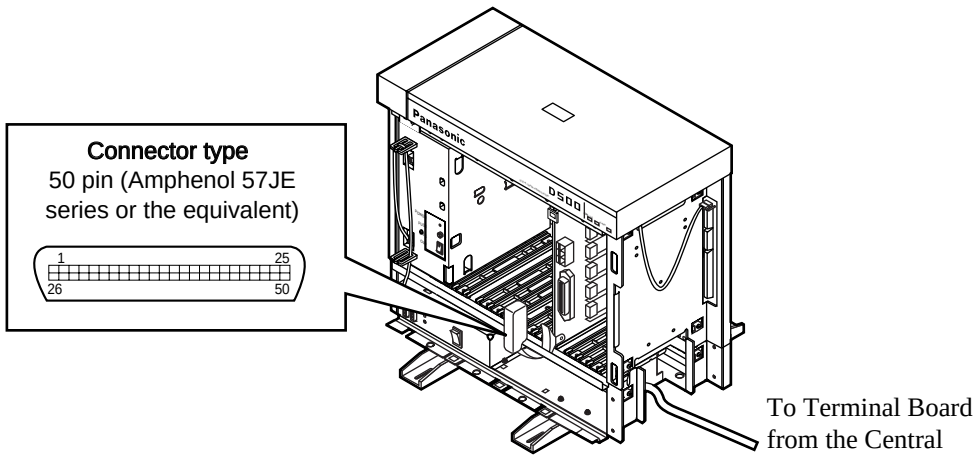
2.5.1 LCOT Card (KX-T96180)

Insert this card into a free slot.



Connection of the Central Office Line cord (twisted cable)

Insert the 50-pin connector (plug) of the Central Office Line cord (twisted cable) into the 50-pin connector (jack) on the LCOT card. See 2.1.4 Amphenol 57JE type Connector.



Connection of cable pins

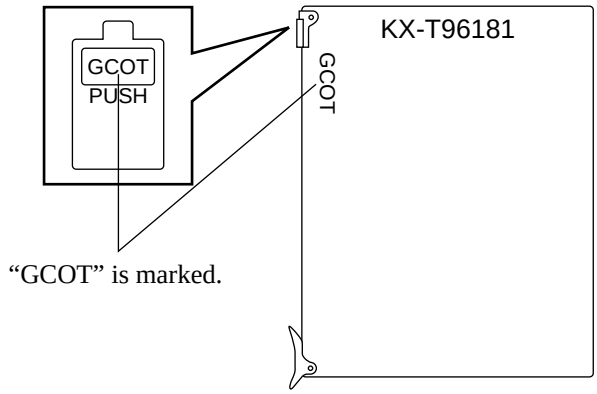
See Section 2.5.15 Cable Pin Numbers for CO Lines.

Auxiliary connection

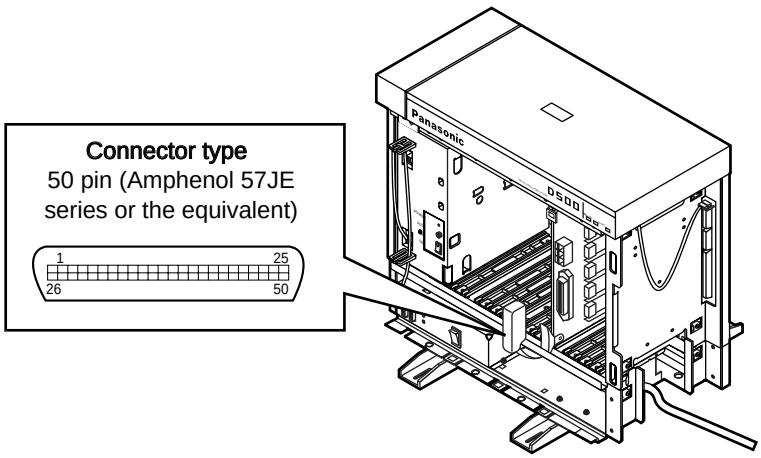
See 2.9.1 Auxiliary Connection for Power Failure Transfer.

2.5.2 GCOT Card (KX-T96181)

Insert this card into a free slot.



Connection of the Central Office Line cord (twisted cable)



Insert the 50-pin connector (plug) of the Central Office Line cord (twisted cable) into the 50-pin connector (jack) on the GCOT card. See Section 2.1.4 Amphenol 57JE type Connector.

Connection of cable pins

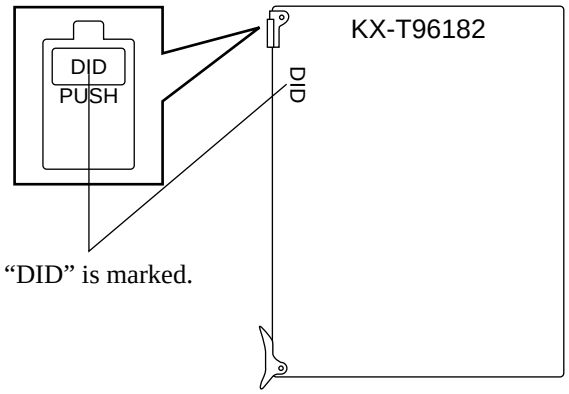
See Section 2.5.15 Cable Pin Numbers for CO Lines.

Auxiliary connection

See 2.9.1 Auxiliary Connection for Power Failure Transfer.

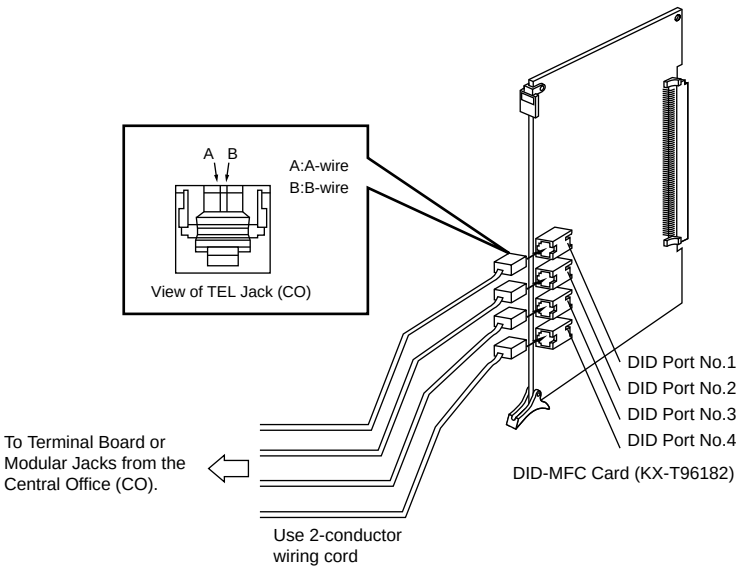
2.5.3 DID Card (KX-T96182)

Insert this card into a free slot.



Connection of the Central Office Line

Insert the modular plug of the telephone line cord (2-conductor wiring) into the modular jack on the DID card.

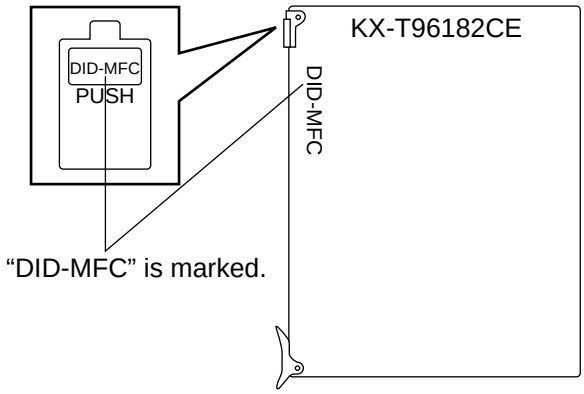


[Notes]

- The DID port No.4 is equipped with "H" and "L" leads as well as "A-wire" and "B- wire". However, please be sure to use 2-conductor wiring cord for connection.
- Make sure to connect the frame of the KX-TD500 System to the earth ground properly to protect the unit.

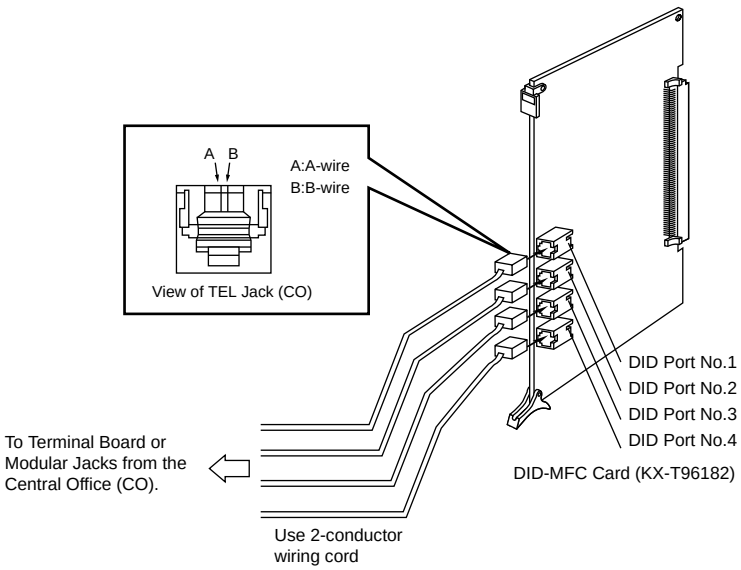
2.5.4 DID-MFC Card (KX-T96182CE)

Insert this card into a free slot.



Connection of the Central Office Line

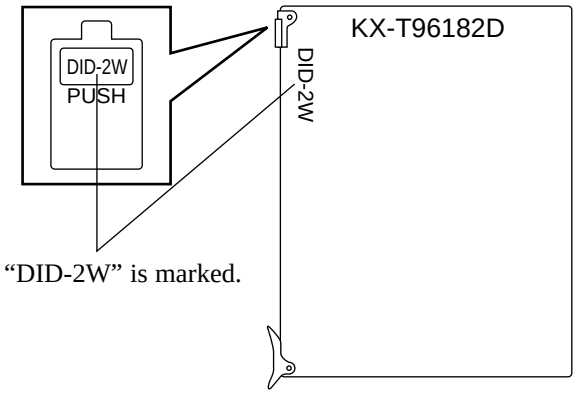
Insert the modular plug of the telephone line cord (2-conductor wiring) into the modular jack on the DID card.



- The DID port No.4 is equipped with "H" and "L" leads as well as "A-wire" and "B- wire." However, please be sure to use 2-conductor wiring cord for connection.
- Make sure to connect the frame of the KX-TD500 System to the earth ground properly to protect the unit.

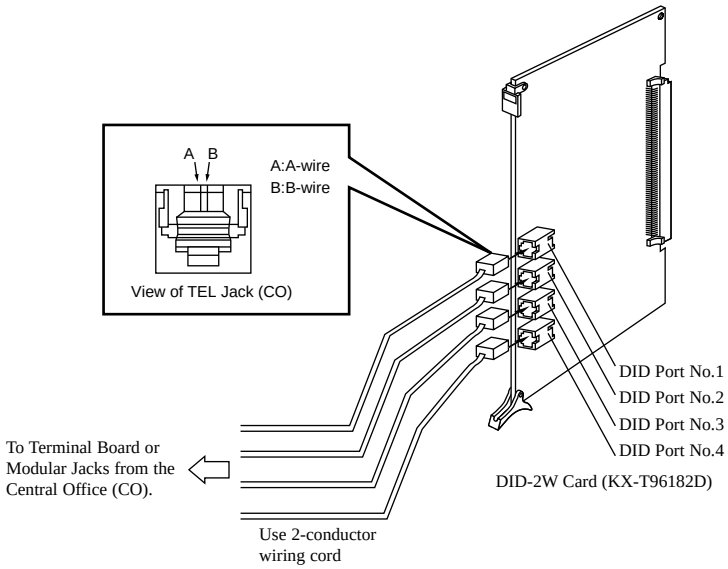
2.5.5 DID-2W Card (KX-T96182D)

Insert this card into a free slot.



Connection of the Central Office Line

Insert the modular plug of the telephone line cord (2-conductor wiring) into the modular jack on the DID card.

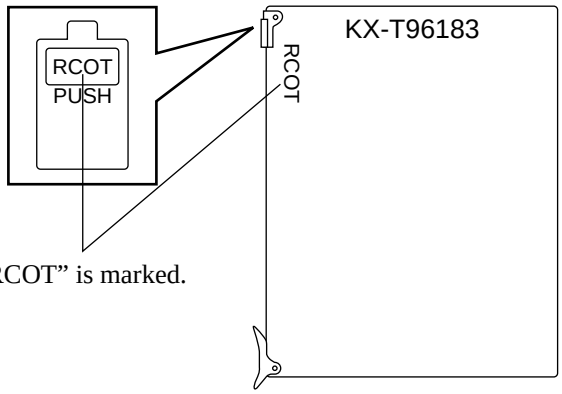


[Notes]

- The DID port No.4 is equipped with "H" and "L" leads as well as "A-wire" and "B- wire". However, please be sure to use 2-conductor wiring cord for connection.
- Make sure to connect the frame of the KX-TD500 System to the earth ground properly to protect the unit.
- Make sure to match the polarity of DID lines and DID ports —A-wire: "-" (negative), B-wire: "+" (positive).

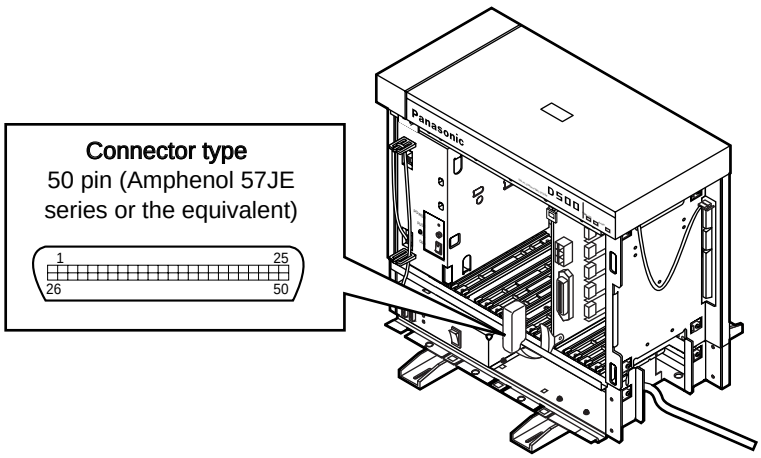
2.5.6 RCOT Card (KX-T96183)

Insert this card into a free slot.



"RCOT" is marked.

Connection of the Central Office Line cord (twisted cable)



To Terminal Board from the Central Office (CO)

Insert the 50-pin connector (plug) of the Central Office Line cord (twisted cable) into the 50-pin connector (jack) on the RCOT card. See Section 2.1.4 Amphenol 57JE type Connector.

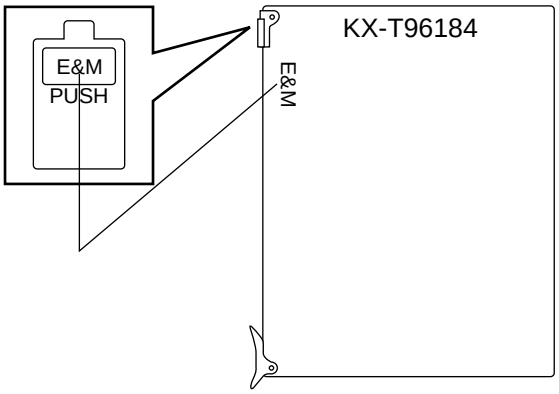
Connection of cable pins

See 2.5.15 Cable Pin Numbers for CO Lines.

Auxiliary connection

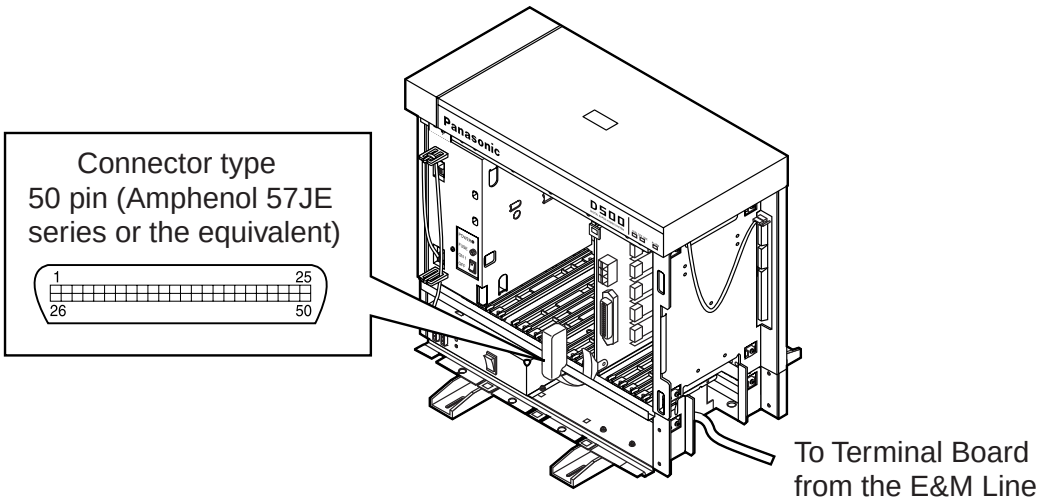
See 2.9.1 Auxiliary Connection for Power Failure Transfer.

2.5.7 E&M Card (KX-T96184)



- Insert this card into a free slot.

1. Connection of the E&M Line cord (twisted cable)



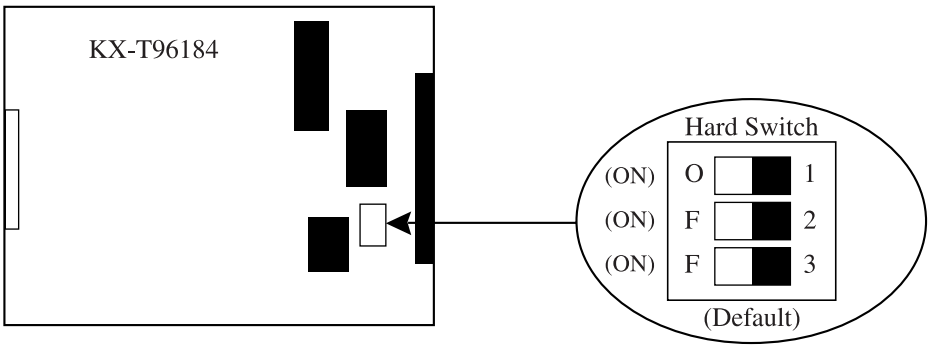
- Connect the ground wire to the ground wire connector (GND).
- Insert the 50-pin connector (plug) of the E&M Line cord (twisted cable) into the 50-pin con-nector (jack) on the E&M card. See Section 2.1.4 Amphenol 57JE type Connector.

2. Connection of cable pins

See Section 2.5.17 Cable Pin Numbers for E&M Lines.

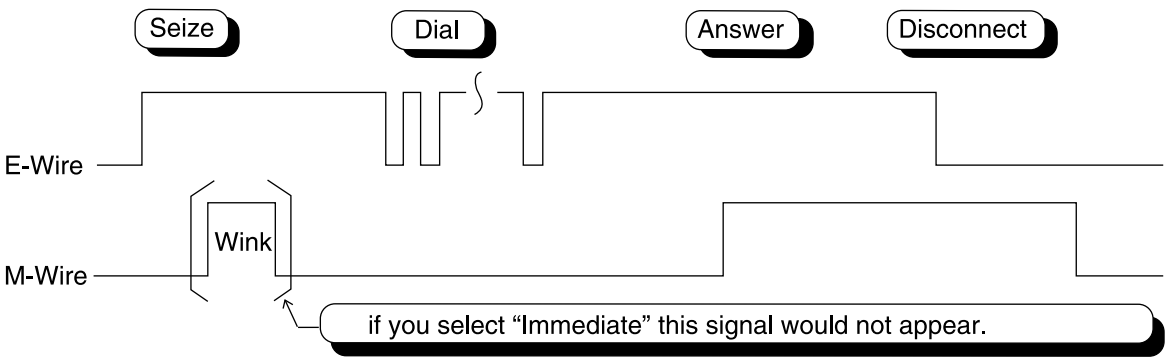
Hardware Setting

You can choose one of the following E&M sequences using the hard switch on the KX-T96184.

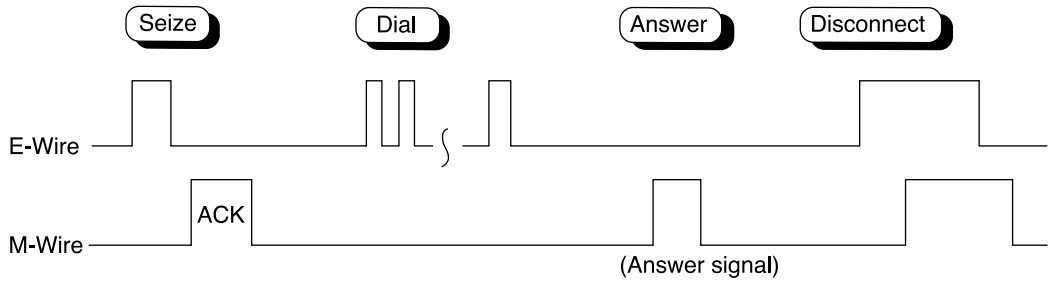


Hard switch	1 2 3 (ON/ON/ON)	(1) Continuous E&M (Wink/Immediate)
	1 2 3 (OFF/ON/ON)	
	1 2 3 (ON/OFF/ON)	(2) Pulsed E&M with Answer signal (Wink)
	1 2 3 (OFF/OFF/ON)	(3) Pulsed E&M without Answer signal (Wink)
	1 2 3 (ON/ON/OFF)	Reserved
	1 2 3 (OFF/OFF/OFF)	

1. Continuous E&M

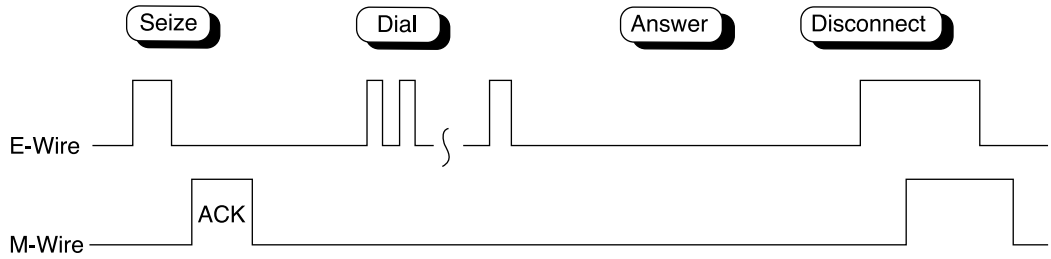


2. Pulsed E&M with Answer signal



- If you select this sequence, you must select "Wink" as a start type.

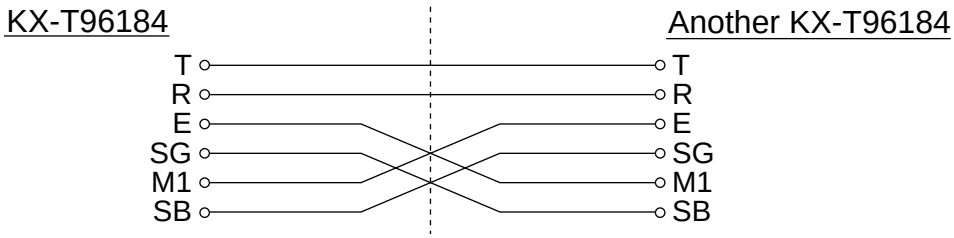
3. Pulsed E&M without Answer signal



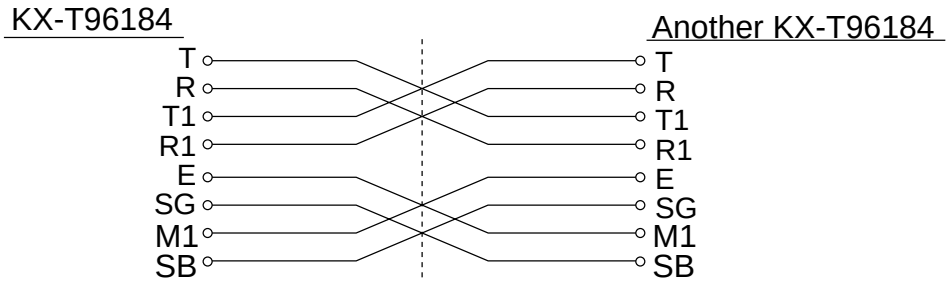
- If you select this sequence, you must select "Wink" as a start type.

Connection to another KX-TD500 system (KX-T96184)

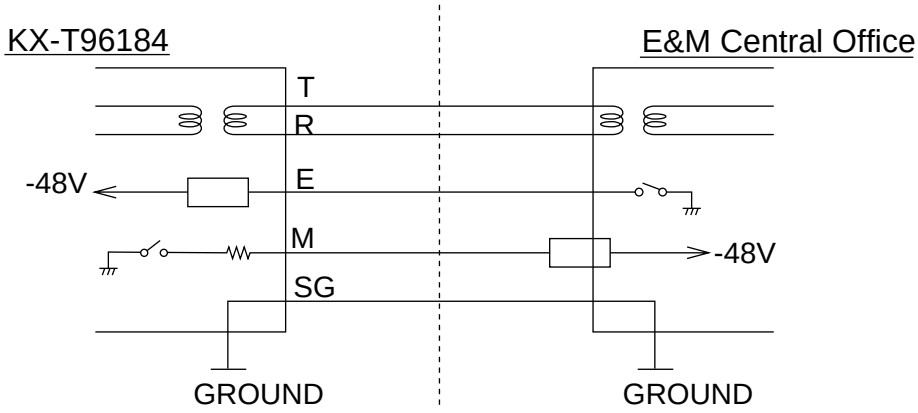
1. 2-wire voice path

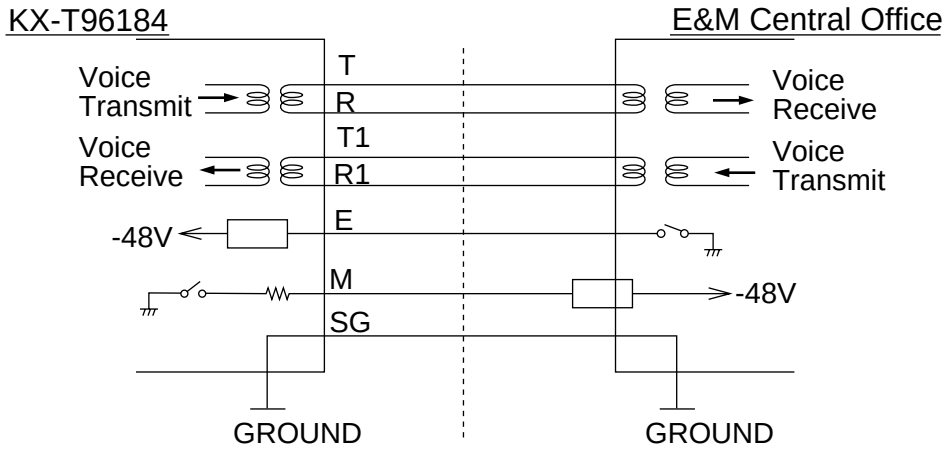


2. 4-wire voice path



Connection to E&M Central Office



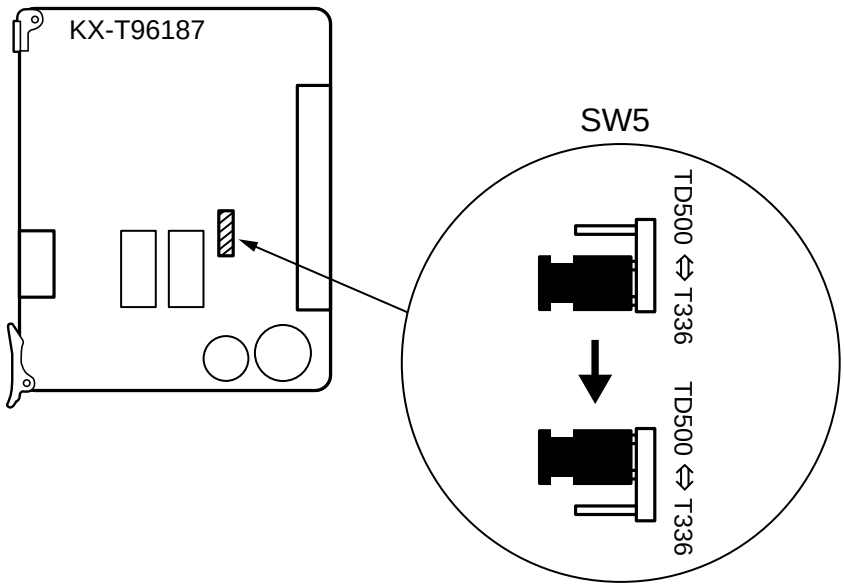


2.5.8 T1 Digital Trunk Card (KX-T96187)

Short Jumper Setting

Before installing the T1 digital trunk card into the KX-TD500 system, you should change the position of the short jumper (SW5) to the "TD500" side. Otherwise, the T1 digital trunk card will not work with the KX-TD500 system.

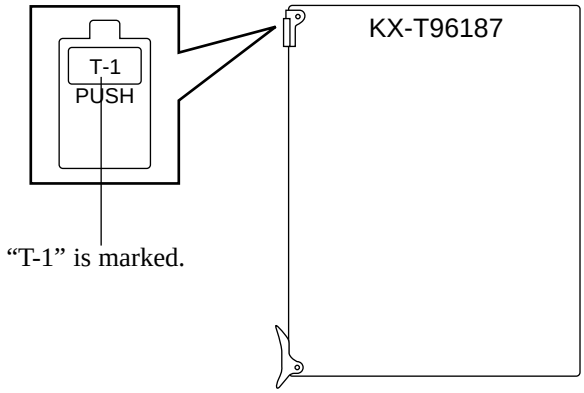
Jumper Position	Explanation
T336	Mode for KX-T336
TD500	Mode for KX-TD500



Insert this card into a free slot 1, 5 or 9. Otherwise, this card will not function.

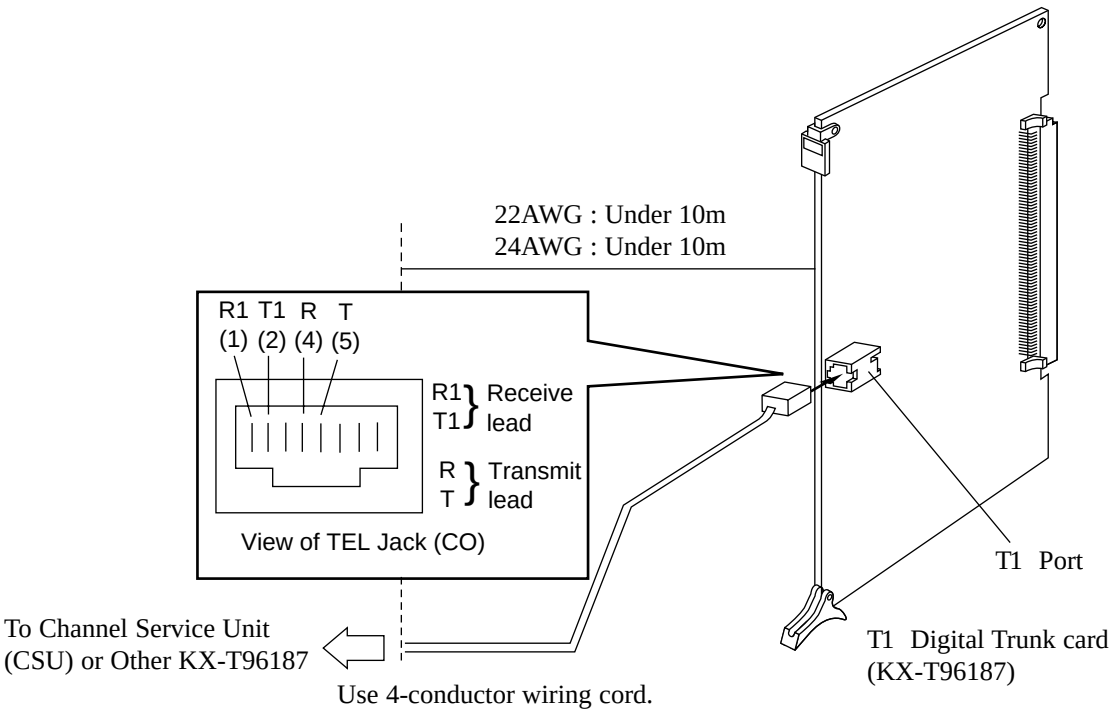
One T1 Digital Trunk card occupies two slots. If you assign a T1 Digital Trunk card to FS01, FS02 is not available for other cards.

A maximum of eight KX-T96187 cards can be installed in the system.



Connecting the Central Office Line

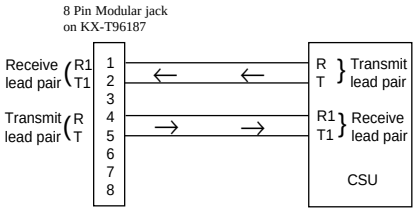
Insert the RJ-48C plug of the telephone line cord (4-conductor wiring) into the RJ-48C ack (T1 port on the KX-T96187).



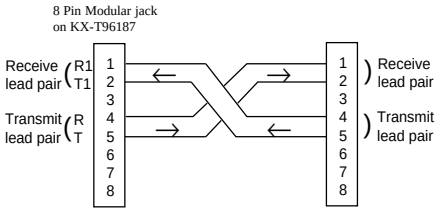
The installer must provide a CSU to connect the T1 line to the KX-T96187.

Cable Pin Numbers to be connected

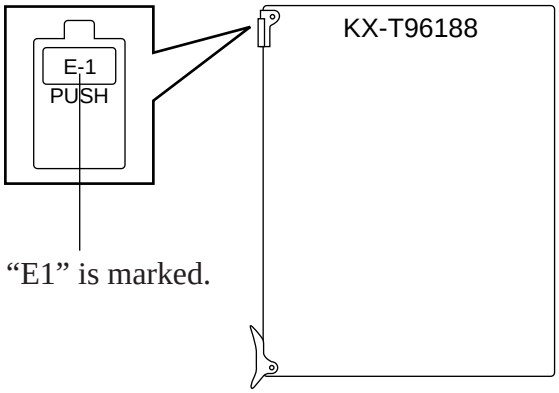
KX-T96187 ↔ CSU



KX-T96187 ↔ KX-T96187



2.5.9 E1 Digital Trunk Card (KX-T96188)



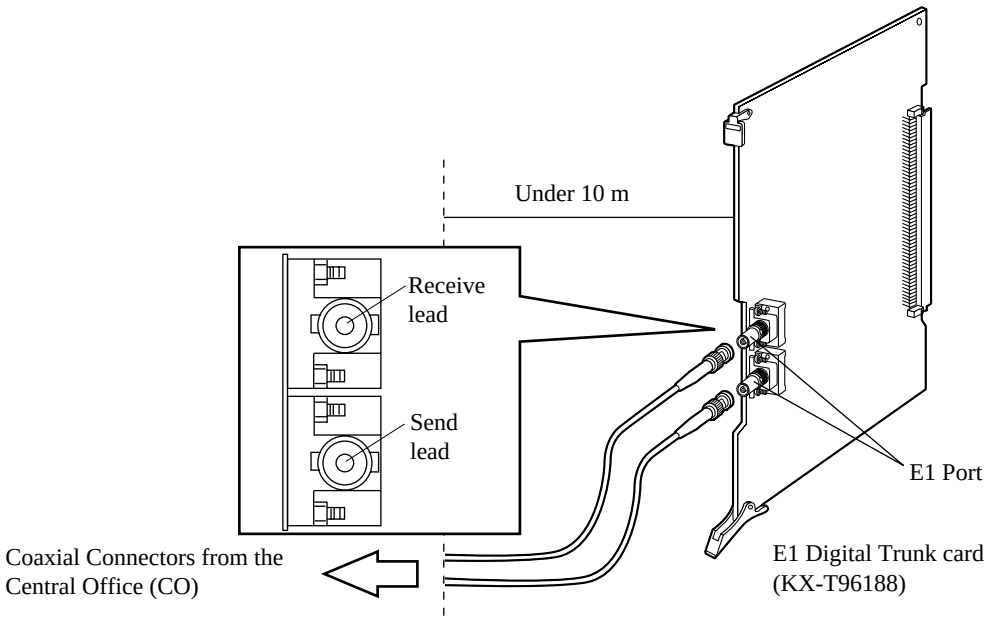
- Insert this card into a free slot 01, 05 or 09.
- A maximum of six KX-T96188 cards can be installed in the system.

CAUTION

E1 ports are SELV ports and should only be connected to SELV services.

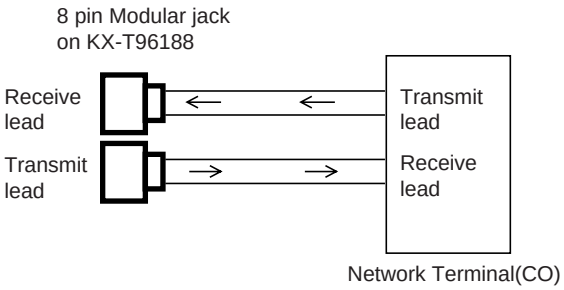
Connecting coaxial cables to E1 card

Insert the coaxial plug of the telephone line cords (2 coaxial cables) into the coaxial jack (E1 port on the KX-T96188).



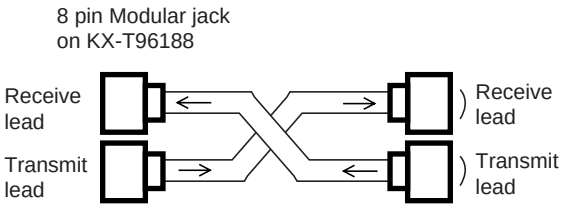
Connecting central office line and E1 card

KX-T96188 ↔ Network Terminal (CO)



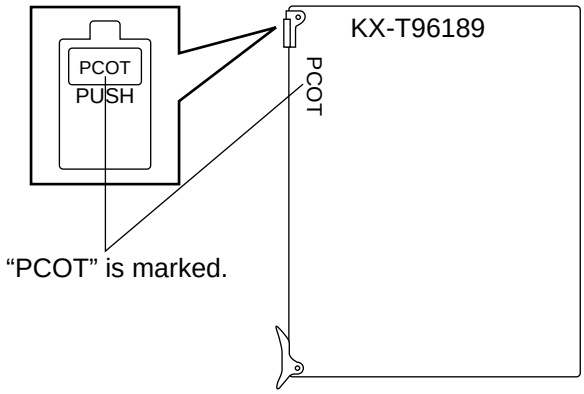
Connecting E1 card and E1 card

KX-T96188 ↔ KX-T96188

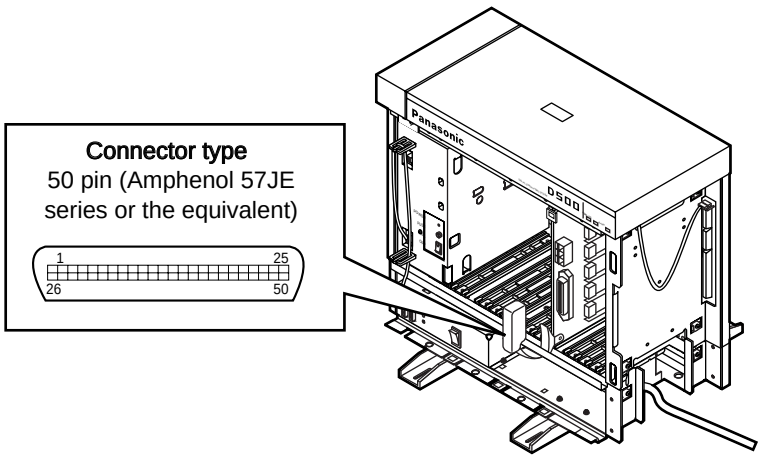


2.5.10 PCOT Card (KX-T96189)

Insert this card into a free slot.



Connection of the Central Office Line cord (twisted cable)



Insert the 50-pin connector (plug) of the Central Office Line cord (twisted cable) into the 50-pin connector (jack) on the PCOT card. See Section 2.1.4 Amphenol 57JE type Connector.

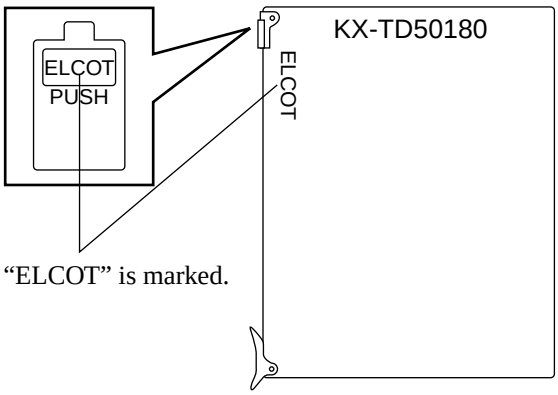
Connection of cable pins

See 2.5.15 Cable Pin Numbers for CO Lines.

Auxiliary connection

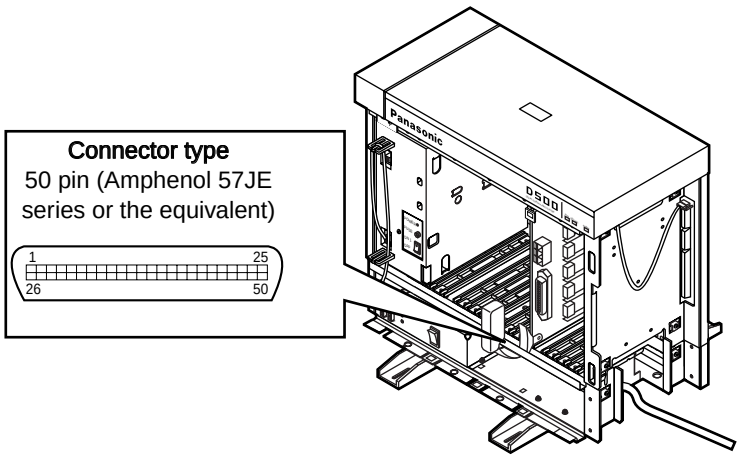
See 2.9.1 Auxiliary Connection for Power Failure Transfer.

2.5.11 ELCOT Card (KX-TD50180)



- Insert this card into a free slot.

Connection of the Central Office Line cord (twisted cable)



Insert the 50-pin connector (plug) of the Central Office Line cord (twisted cable) into the 50-pin connector (jack) on the ELCOT card. See Section 2.1.4 Amphenol 57JE type Connector.

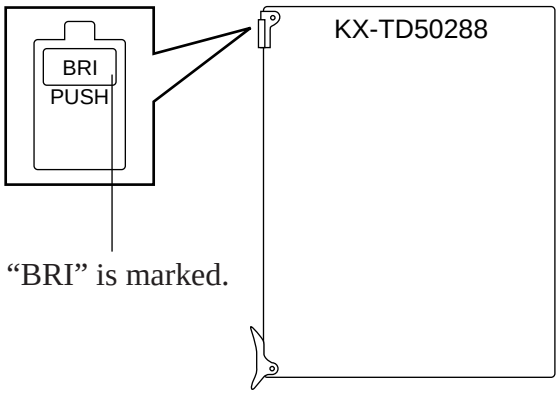
Connection of cable pins

See 2.5.15 Cable Pin Numbers for CO Lines.

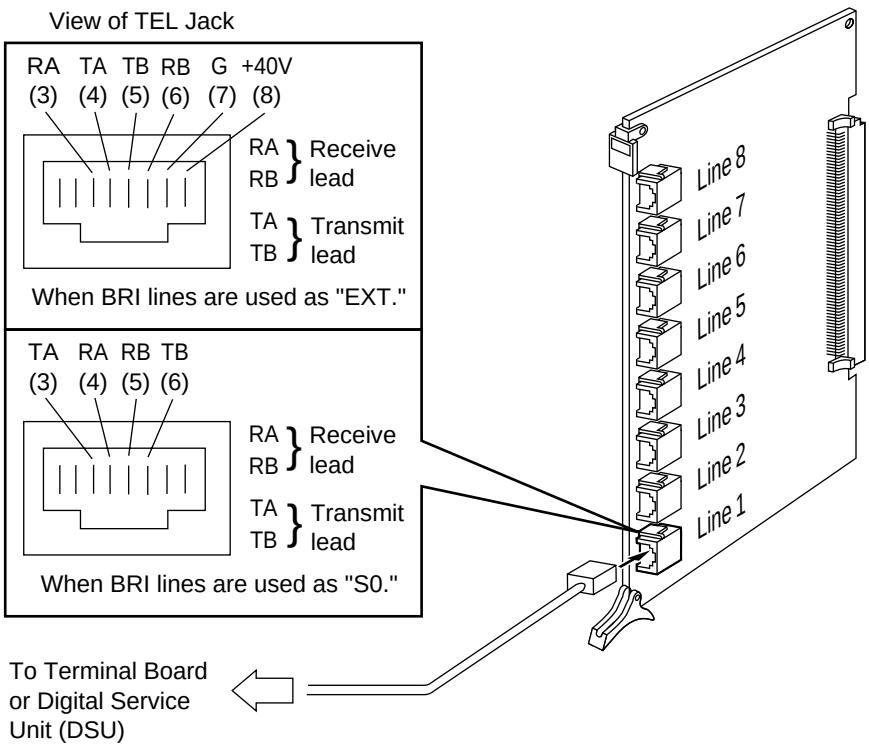
Auxiliary connection

See 2.9.1 Auxiliary Connection for Power Failure Transfer.

2.5.12 BRI Card (KX-TD50288)

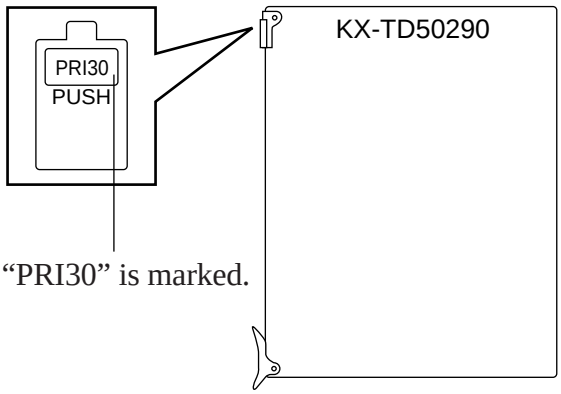


- Insert this card into a free slot.

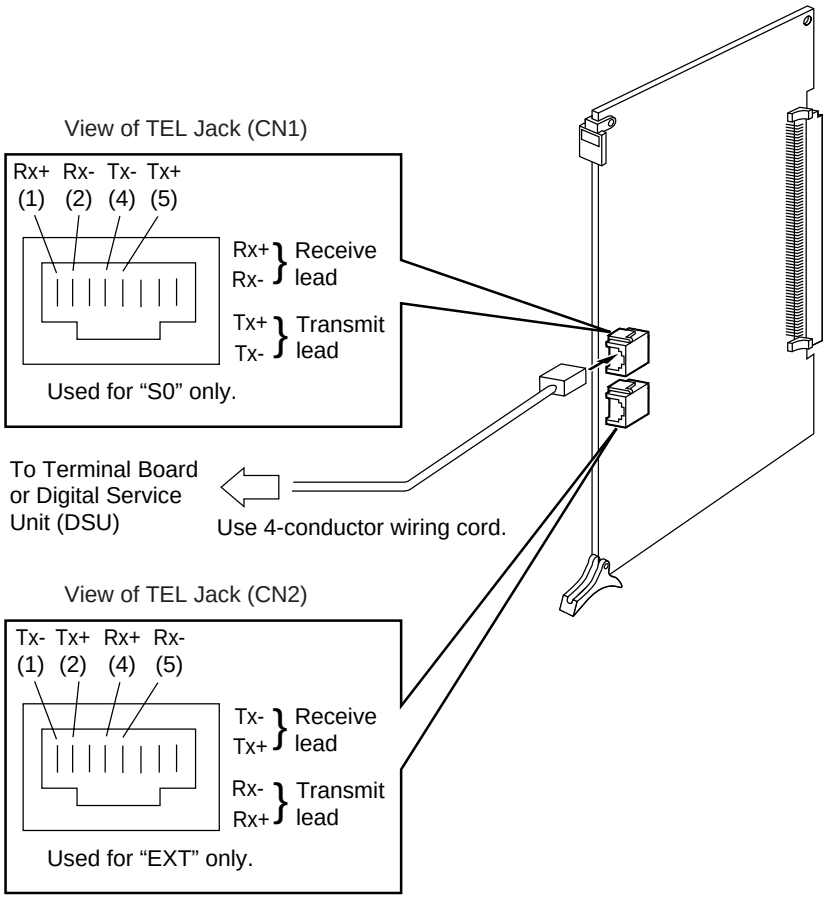


- Insert the 8 pin modular (RJ-45) plug into a jack on the BRI card.

2.5.13 PRI30 Card (KX-TD50290)



- Insert this card into a free slot 01, 03, 05, 07, 09, 11 or 13. Otherwise, this card does not function.
- A maximum of six KX-TD50290 cards can be installed in the system.



- Insert the 8 pin mudular (RJ-45) plug into a jack on the PRI30 card.

2.5.14 Central Office Line Connection of KX-A204 (Cable) /KX-A205 (Clip Terminal)

Central Office Line Connection of KX-A204 (Cable)/KX-A205 (Clip Terminal) for LCOT, GCOT, RCOT and ELCOT cards

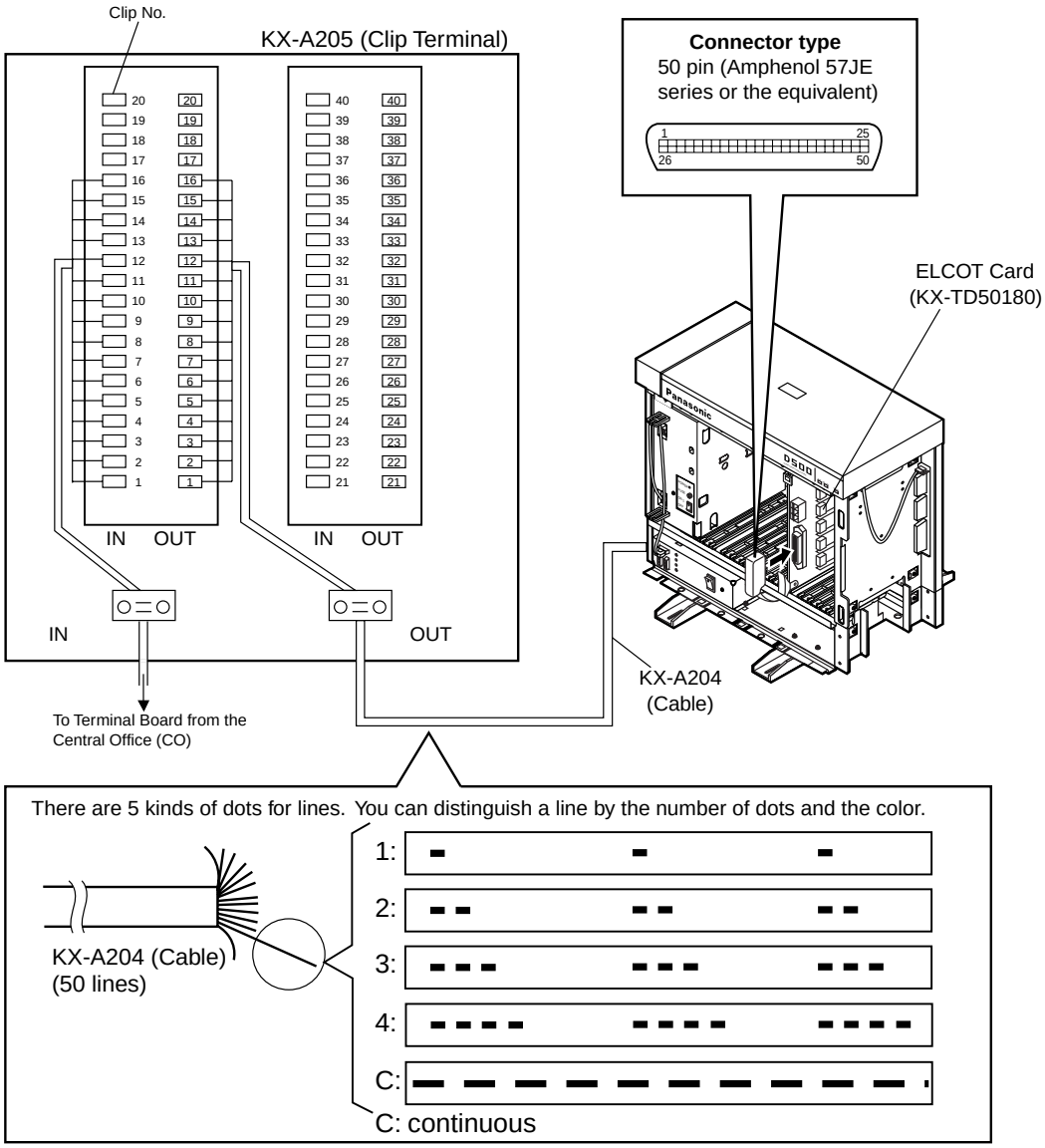
This KX-A204 (cable) enables you to connect 8 Central Office lines to the KX-TD500 System.

Please connect KX-A204 (Cable) to KX-A205 (Clip Terminal) as follows. See Section 2.5.15 Cable Pin Numbers for CO Lines.

The KX-A204/205 consists of the following:

KX-A204 : Cable.....one

KX-A205 : Clip Terminal.....one



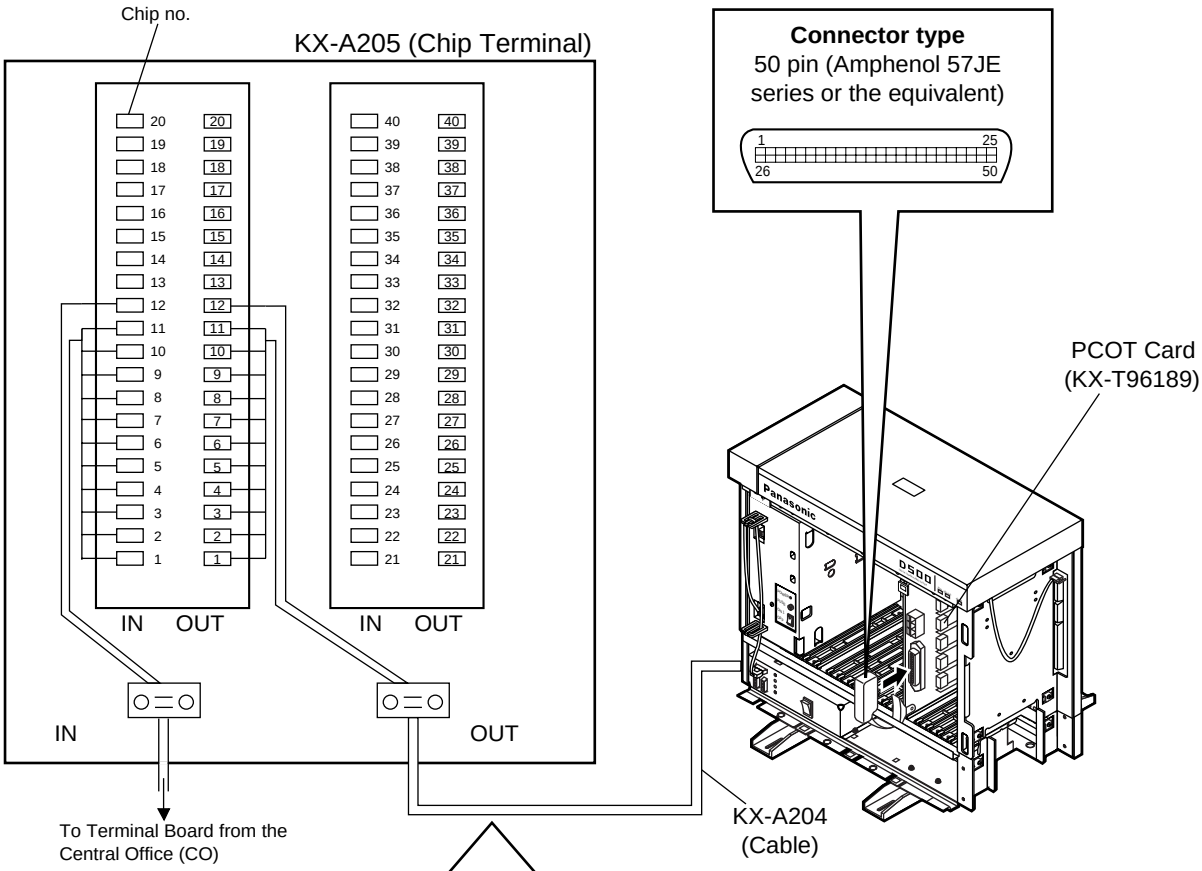
Central Office Line Connection of KX-A204 (Cable)/KX-A205 (Clip Terminal) for PCOT card

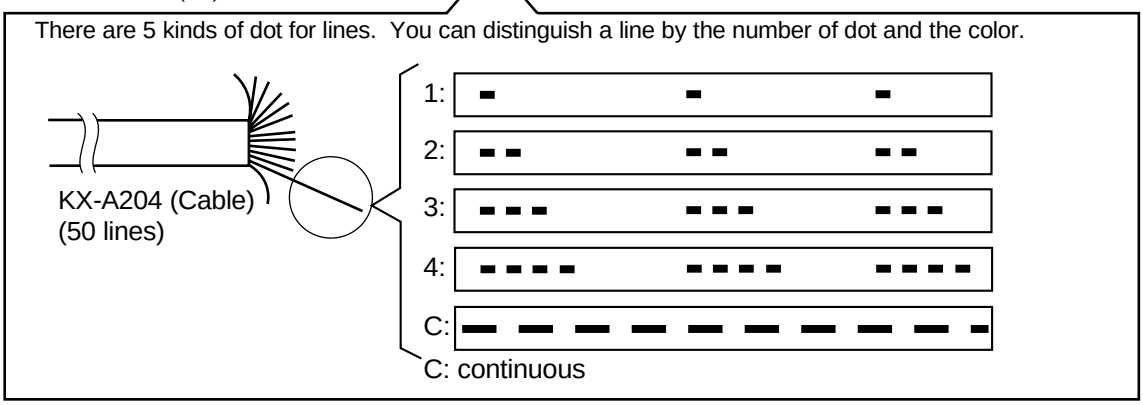
This KX-A204 (cable) enables you to connect 8 Central office lines to the KX-TD500 System.

The KX-A204/205 consists of the following:

KX-A204 : Cable..... one
KX-A205 : Clip Terminal ..... one

Please connect KX-A204 (Cable) to KX-A205 (Clip Terminal) as follows. Refer to the connection chart on page 135.





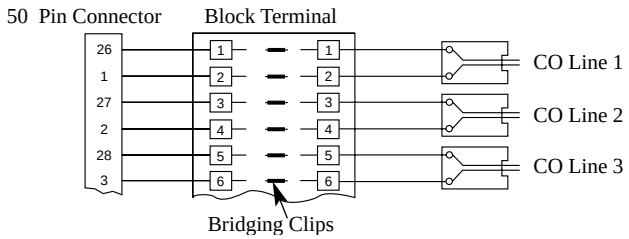
2.5.15 Cable Pin Numbers for CO Lines

Cable Pin Numbers to be connected (Central Office Line) for LCOT/GCOT/RCOT/ELCOT card

Conn. Pin	Cable Color	Clip No.	CO Line	
26 1	WHT-BLU BLU-WHT	1 2	No.1	T R
27 2	WHT-ORN ORN-WHT	3 4	No.2	T R
28 3	WHT-GRN GRN-WHT	5 6	No.3	T R
29 4	WHT-BRN BRN-WHT	7 8	No.4	T R
30 5	WHT-SLT SLT-WHT	9 10	No.5	T R
31 6	RED-BLU BLU-RED	11 12	No.6	T R
32 7	RED-ORN ORN-RED	13 14	No.7	T R
33 8	RED-GRN GRN-RED	15 16	No.8	T R
34 9	RED-BRN BRN-RED	17 18		
35 10	RED-SLT SLT-RED	19 20		
36 11	BLK-BLU BLU-BLK	21 22		
37 12	BLK-ORN ORN-BLK	23 24		
38 13	BLK-GRN GRN-BLK	25 26		
39 14	BLK-BRN BRN-BLK	27 28		
40 15	BLK-SLT SLT-BLK	29 30		

Conn. Pin	Cable Color	Clip No.	CO Line
41	YEL-BLU	31	
16	BLU-YEL	32	
42	YEL-ORN	33	
17	ORN-YEL	34	
43	YEL-GRN	35	
18	GRN-YEL	36	
44	YEL-BRN	37	
19	BRN-YEL	38	
45	YEL-SLT	39	
20	SLT-YEL	40	
46	VIO-BLU	41	
21	BLU-VIO	42	
47	VIO-ORN	43	
22	ORN-VIO	44	
48	VIO-GRN	45	
23	GRN-VIO	46	
49	VIO-BRN	47	
24	BRN-VIO	48	
50	VIO-SLT	49	
25	SLT-VIO	50	

- Central Office Line Wiring



Cable Pin Numbers to connected (Central Office Line) for PCOT card

Connection Chart (PCOT)

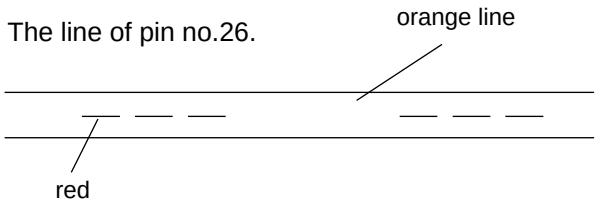
Conn. Pin	Cable Color	Clip No.	Number of Dot	CO Line
26	ORN-RED	1	1	No.1
1	ORN-BLK	2	1	
27	YEL-RED	3	1	No.2
2	YEL-BLK	4	1	
28	GRN-RED	5	1	No.3
3	GRN-BLK	6	1	
29	GRY-RED	7	1	No.4
4	GRY-BLK	8	1	
30	WHT-RED	9	1	
5	WHT-BLK	10	1	
31	ORN-RED	11	2	
6	ORN-BLK	12	2	
32	YEL-RED	13	2	
7	YEL-BLK	14	2	
33	GRN-RED	15	2	
8	GRN-BLK	16	2	
34	GRY-RED	17	2	
9	GRY-BLK	18	2	
35	WHT-RED	19	2	
10	WHT-BLK	20	2	
36	ORN-RED	21	3	
11	ORN-BLK	22	3	
37	YEL-RED	23	3	
12	YEL-BLK	24	3	
38	GRN-RED	25	3	
13	GRN-BLK	26	3	
39	GRY-RED	27	3	
14	GRY-BLK	28	3	
40	WHT-RED	29	3	
15	WHT-BLK	30	3	
41	ORN-RED	31	4	
16	ORN-BLK	32	4	

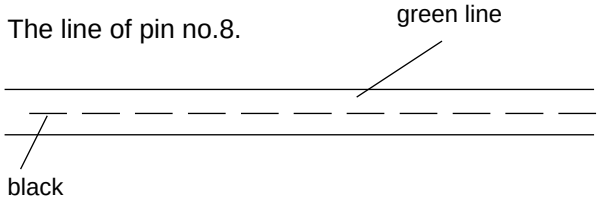
Connection Chart (PCOT)

Conn. Pin	Cable Color	Clip No.	Number of Dot	CO Line
42	YEL-RED	33	4	
17	YEL-BLK	34	4	
43	GRN-RED	35	4	
18	GRN-BLK	36	4	
44	GRY-RED	37	4	
19	GRY-BLK	38	4	
45	WHT-RED	39	4	
20	WHT-BLK	40	4	
46	ORN-RED	41	C	
21	ORN-BLK	42	C	
47	YEL-RED	43	C	
22	YEL-BLK	44	C	
48	GRN-RED	45	C	
23	GRN-BLK	46	C	
49	GRY-RED	47	C	
24	GRY-BLK	48	C	
50	WHT-RED	49	C	
25	WHT-BLK	50	C	

C: continuous

EXAMPLE:





Cable Pin Numbers to be connected

Between Clip Terminal and the system

Conn. Pin	Cable Color	Clip No.	Number of Dot	CO Line
26 1	ORN-RED ORN-BLK	1 2	1 1	No.1
27 2	YEL-RED YEL-BLK	3 4	1 1	No.2
28 3	GRN-RED GRN-BLK	5 6	1 1	No.3
29 4	GRY-RED GRY-BLK	7 8	1 1	No.4
30 5	WHT-RED WHT-BLK	9 10	1 1	No.5
31 6	ORN-RED ORN-BLK	11 12	2 2	No.6
32 7	YEL-RED YEL-BLK	13 14	2 2	No.7
33 8	GRN-RED GRN-BLK	15 16	2 2	No.8
34 9	GRY-RED GRY-BLK	17 18	2 2	
35 10	WHT-RED WHT-BLK	19 20	2 2	
36 11	ORN-RED ORN-BLK	21 22	3 3	
37 12	YEL-RED YEL-BLK	23 24	3 3	
38 13	GRN-RED GRN-BLK	25 26	3 3	
39 14	GRY-RED GRY-BLK	27 28	3 3	
40 15	WHT-RED WHT-BLK	29 30	3 3	
41 16	ORN-RED ORN-BLK	31 32	4 4	

Between Clip Terminal and the system

Conn. Pin	Cable Color	Clip No.	Number of Dot	CO Line
42	YEL-RED	33	4	
17	YEL-BLK	34	4	
43	GRN-RED	35	4	
18	GRN-BLK	36	4	
44	GRY-RED	37	4	
19	GRY-BLK	38	4	
45	WHT-RED	39	4	
20	WHT-BLK	40	4	
46	ORN-RED	41	C	
21	ORN-BLK	42	C	
47	YEL-RED	43	C	
22	YEL-BLK	44	C	
48	GRN-RED	45	C	
23	GRN-BLK	46	C	
49	GRY-RED	47	C	
24	GRY-BLK	48	C	
50	WHT-RED	49	C	
25	WHT-BLK	50	C	

Between Clip Terminal and CO Lines

Conn. Pin	Cable Color	Clip No.	CO Line	
26	WHT-BLU	1	No.1	T
1	BLU-WHT	2		R
27	WHT-ORN	3	No.2	T
2	ORN-WHT	4		R
28	WHT-GRN	5	No.3	T
3	GRN-WHT	6		R
29	WHT-BRN	7	No.4	T
4	BRN-WHT	8		R
30	WHT-SLT	9	No.5	T
5	SLT-WHT	10		R
31	RED-BLU	11	No.6	T
6	BLU-RED	12		R

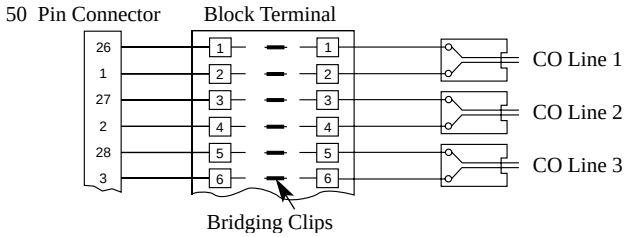
Between Clip Terminal and CO Lines

Conn. Pin	Cable Color	Clip No.	CO Line	
32	RED-ORN	13	No.7	T
7	ORN-RED	14		R
33	RED-GRN	15	No.8	T
8	GRN-RED	16		R
34	RED-BRN	17		
9	BRN-RED	18		
35	RED-SLT	19		
10	SLT-RED	20		
36	BLK-BLU	21		
11	BLU-BLK	22		
37	BLK-ORN	23		
12	ORN-BLK	24		
38	BLK-GRN	25		
13	GRN-BLK	26		
39	BLK-BRN	27		
14	BRN-BLK	28		
40	BLK-SLT	29		
15	SLT-BLK	30		
41	YEL-BLU	31		
16	BLU-YEL	32		
42	YEL-ORN	33		
17	ORN-YEL	34		
43	YEL-GRN	35		
18	GRN-YEL	36		
44	YEL-BRN	37		
19	BRN-YEL	38		
45	YEL-SLT	39		
20	SLT-YEL	40		
46	VIO-BLU	41		
21	BLU-VIO	42		
47	VIO-ORN	43		
22	ORN-VIO	44		
48	VIO-GRN	45		
23	GRN-VIO	46		

Between Clip Terminal and CO Lines

Conn. Pin	Cable Color	Clip No.	CO Line
49	VIO-BRN	47	
24	BRN-VIO	48	
50	VIO-SLT	49	
25	SLT-VIO	50	

- Central Office Line Wiring

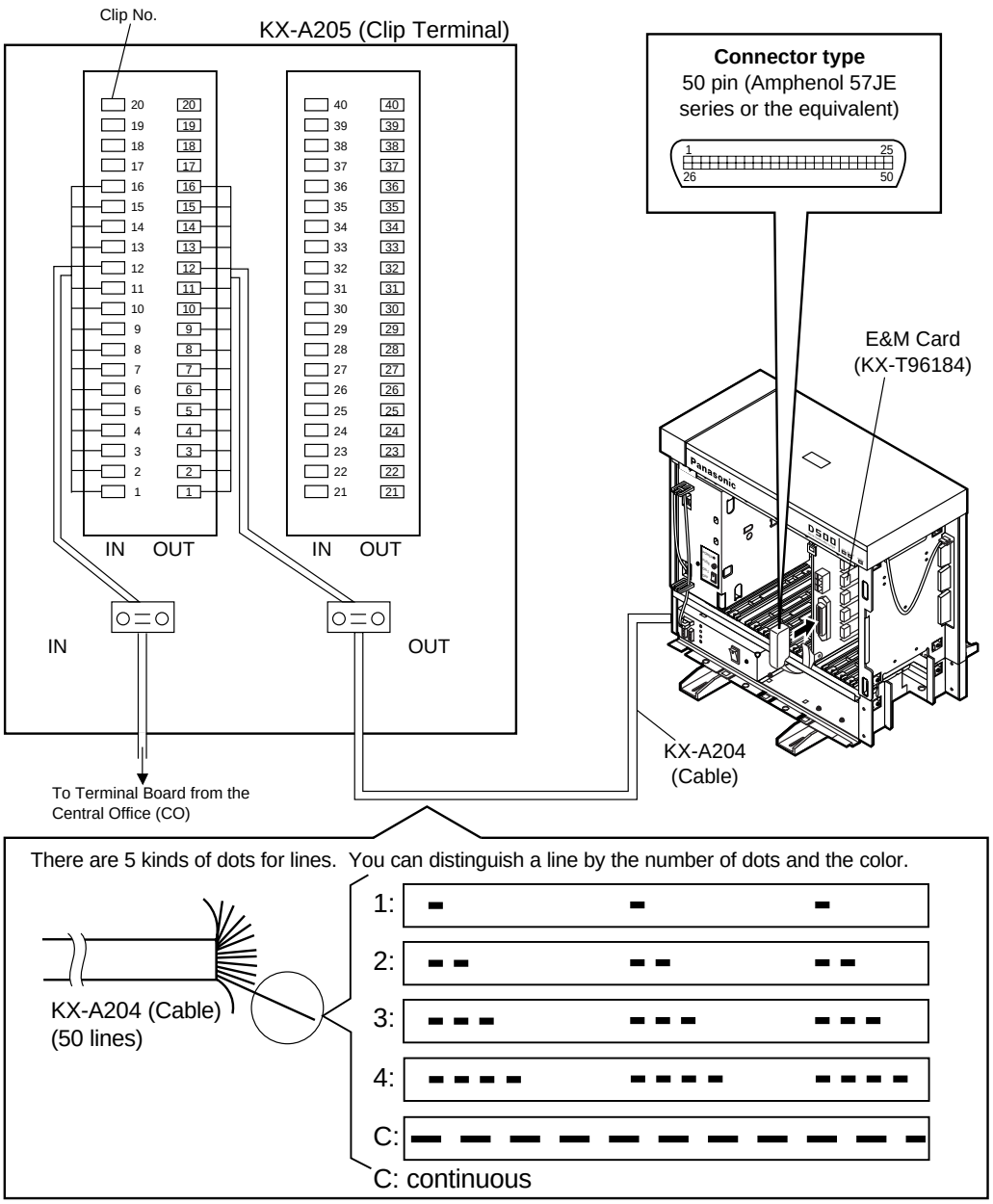


2.5.16 E&M Line Connection of KX-A204 (Cable) /KX-A205 (Clip Terminal)

KX-A204 (cable) enables you to connect four E&M lines to the KX-TD500 System. Please connect KX-A204 (Cable) to KX-A205 (Clip Terminal) as follows. Refer to the connection chart on Page 141.

The KX-A204/205 consists of the following:

KX-A204 : Cable ..... one
KX-A205 : Clip Terminal ..... one



2.5.17 Cable Pin Numbers for E&M Lines

Cable Pin Numbers to be connected (E&M Line)

Cable Pin Numbers to be connected (E&M Line)

Connect Pin	Cable Color	Clip No.	Number of Dot	E&M Line	
1	ORN-RED	1	1	No.1	T 2-wire or 4-wire-send
26	ORN-BLK	2	1		R
2	YEL-RED	3	1		T1 4-wire-receive
27	YEL-BLK	4	1		R1
3	GRN-RED	5	1		E Lead
28	GRN-BLK	6	1		SG Lead
4	WHY-RED	7	1		SB Lead
29	WHY-BLK	8	1		M1 Lead
5	ORN-RED	9	1		No connect
30	ORN-BLK	10	1		M Lead only for Type5
6	YEL-RED	11	2	No.2	T 2-wire or 4-wire-send
31	YEL-BLK	12	2		R
7	GRY-RED	13	2		T1 4-wire-receive
32	GRY-BLK	14	2		R1
8	WHY-RED	15	2		E Lead
33	WHY-BLK	16	2		SG Lead
9	ORN-RED	17	2		SB Lead
34	ORN-BLK	18	2		M1 Lead
10	YEL-RED	19	2		No connect
35	YEL-BLK	20	2		M Lead only for Type5
11	GRY-RED	21	3	No.3	T 2-wire or 4-wire-send
36	GRY-BLK	22	3		R
12	WHY-RED	23	3		T1 4-wire-receive
37	WHY-BLK	24	3		R1
13	ORN-RED	25	3		E Lead
38	ORN-BLK	26	3		SG Lead
14	YEL-RED	27	3		SB Lead
39	YEL-BLK	28	3		M1 Lead
15	GRY-RED	29	3		No connect
40	GRY-BLK	30	3		M Lead only for Type5

Cable Pin Numbers to be connected (E&M Line)

Connect Pin	Cable Color	Clip No.	Number of Dot	E&M Line	
16	WHY-RED	31	4	No.4	T 2-wire or 4-wire-send
41	WHY-BLK	32	4		R
17	ORN-RED	33	4		T1 4-wire-receive
42	ORN-BLK	34	4		R1
18	YEL-RED	35	4		E Lead
43	YEL-BLK	36	4		SG Lead
19	GRY-RED	37	4		SB Lead
44	GRY-BLK	38	4		M1 Lead
20	WHY-RED	39	4		No connect
45	WHY-BLK	40	4		M Lead only for Type5

Cable Pin Numbers to be connected

Between Clip Terminal and the system (E&M Line)

Connect Pin	Cable Color	Clip No.	Number of Dot	E&M Line
26	ORN-RED	1	1	No.1
1	ORN-BLK	2	1	
27	YEL-RED	3	1	
2	YEL-BLK	4	1	
28	GRN-RED	5	1	
3	GRN-BLK	6	1	
29	GRY-RED	7	1	
4	GRY-BLK	8	1	
30	WHT-RED	9	1	
5	WHT-BLK	10	1	
31	ORN-RED	11	2	No.2
6	ORN-BLK	12	2	
32	YEL-RED	13	2	
7	YEL-BLK	14	2	
33	GRN-RED	15	2	
8	GRN-BLK	16	2	
34	GRY-RED	17	2	
9	GRY-BLK	18	2	
35	WHT-RED	19	2	
10	WHT-BLK	20	2	

Between Clip Terminal and the system (E&M Line)

Connect Pin	Cable Color	Clip No.	Number of Dot	E&M Line
36	ORN-RED	21	3	No.3
11	ORN-BLK	22	3	
37	YEL-RED	23	3	
12	YEL-BLK	24	3	
38	GRN-RED	25	3	
13	GRN-BLK	26	3	
39	GRY-RED	27	3	
14	GRY-BLK	28	3	
40	WHT-RED	29	3	
15	WHT-BLK	30	3	
41	ORN-RED	31	4	No.4
16	ORN-BLK	32	4	
42	YEL-RED	33	4	
17	YEL-BLK	34	4	
43	GRN-RED	35	4	
18	GRN-BLK	36	4	
44	GRY-RED	37	4	
19	GRY-BLK	38	4	
45	WHT-RED	39	4	
20	WHT-BLK	40	4	
46	ORN-RED	41	5	No.5
21	ORN-BLK	42	5	
47	YEL-RED	43	5	
22	YEL-BLK	44	5	
48	GRN-RED	45	5	
23	GRN-BLK	46	5	
49	GRY-RED	47	5	
24	GRY-BLK	48	5	
50	WHT-RED	49	5	
25	WHT-BLK	50	5	

Between Clip Terminal and E&M Lines

Connect Pin	Cable Color	Clip No.	Number of Dot	E&M Line	
26	WHT-BLU	1	1	No.1	T
1	BLU-WHT	2	1		R
27	WHT-ORN	3	1		T1
2	ORN-WHT	4	1		R1
28	WHT-GRN	5	1		E Lead
3	GRN-WHT	6	1		SG Lead
29	WHT-BRN	7	1		SB Lead
4	BRN-WHT	8	1		M1 Lead
30	WHT-SLT	9	1		No connect
5	SLT-WHT	10	1		M Lead
31	RED-BLU	11	2	No.2	T
6	BLU-RED	12	2		R
32	RED-ORN	13	2		T1
7	ORN-RED	14	2		R1
33	RED-GRN	15	2		E Lead
8	GRN-RED	16	2		SG Lead
34	RED-BRN	17	2		SB Lead
9	BRN-RED	18	2		M1 Lead
35	RED-SLT	19	2		No connect
10	SLT-RED	20	2		M Lead
36	BLK-BLU	21	3	No.3	T
11	BLU-BLK	22	3		R
37	BLK-ORN	23	3		T1
12	ORN-BLK	24	3		R1
38	BLK-GRN	25	3		E Lead
13	GRN-BLK	26	3		SG Lead
39	BLK-BRN	27	3		SB Lead
14	BRN-BLK	28	3		M1 Lead
40	BLK-SLT	29	3		No connect
15	SLT-BLK	30	3		M Lead
41	YEL-BLU	31	4	No.4	T
16	BLU-YEL	32	4		R
42	YEL-ORN	33	4		T1
17	ORN-YEL	34	4		R1
43	YEL-GRN	35	4		E Lead
18	GRN-YEL	36	4		SG Lead
44	YEL-BRN	37	4		SB Lead
19	BRN-YEL	38	4		M1 Lead
45	YEL-SLT	39	4		No connect
20	SLT-YEL	40	4		M Lead

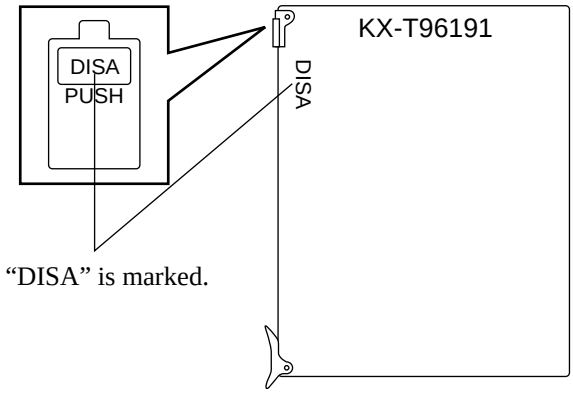
Between Clip Terminal and E&M Lines

Connect Pin	Cable Color	Clip No.	Number of Dot	E&M Line	
46	VIO-BLU	41	5		
21	BLU-VIO	42	5		
47	VIO-ORN	43	5		
22	ORN-VIO	44	5		
48	VIO-GRN	45	5		
23	GRN-VIO	46	5		
49	VIO-BRN	47	5		
24	BRN-VIO	48	5		
50	VIO-SLT	49	5		
25	SLT-VIO	50	5		

2.6 Resource Cards

2.6.1 DISA Card (KX-T96191)

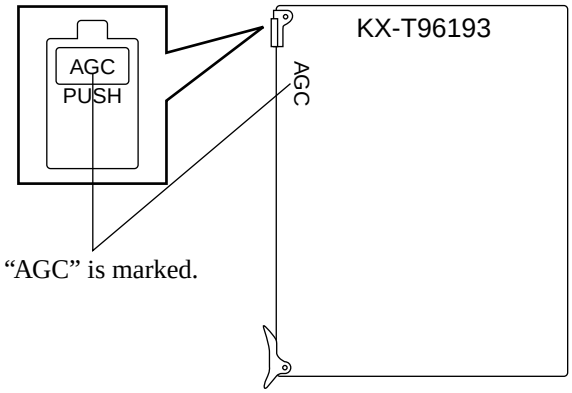
Insert this card into a free slot.



“DISA” is marked.

2.6.2 AGC Card (KX-T96193)

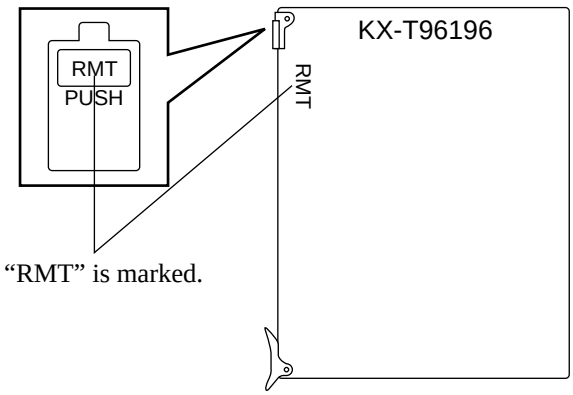
Insert this card into a free slot.



"AGC" is marked.

2.6.3 RMT Card (KX-T96196)

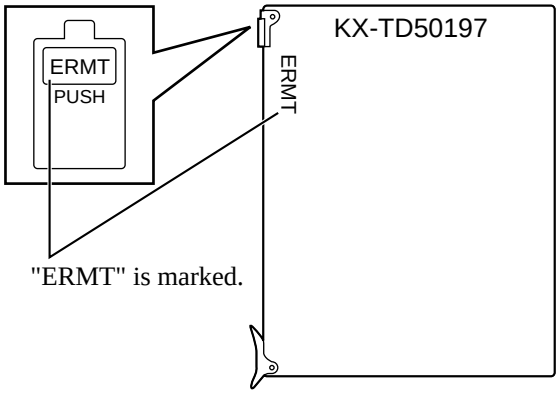
Insert this card into a free slot.



"RMT" is marked.

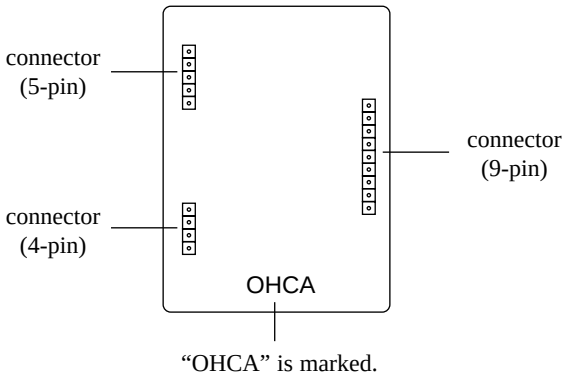
2.6.4 ERMT Card (KX-TD50197)

Insert this card into a free slot.



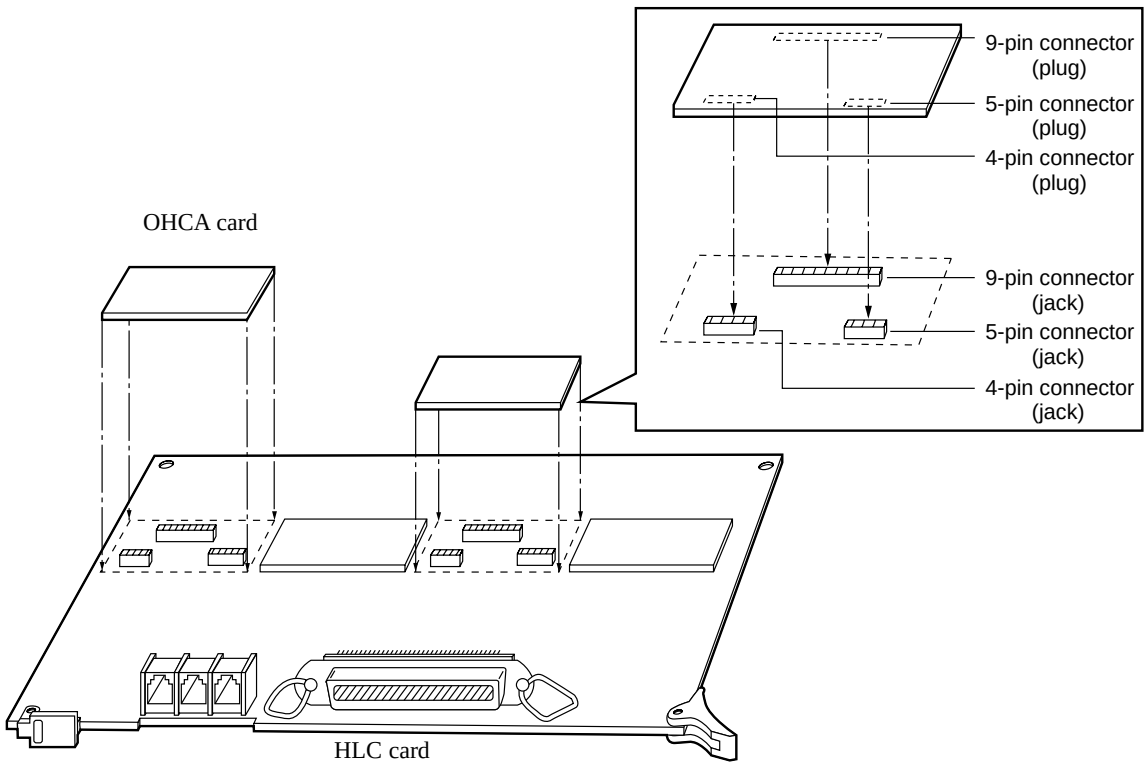
2.7 Other Cards

2.7.1 OHCA Card (KX-T96136)



- This card is installed on the HLC card or PLC card.

Connection to the HLC card (KX-T96170)



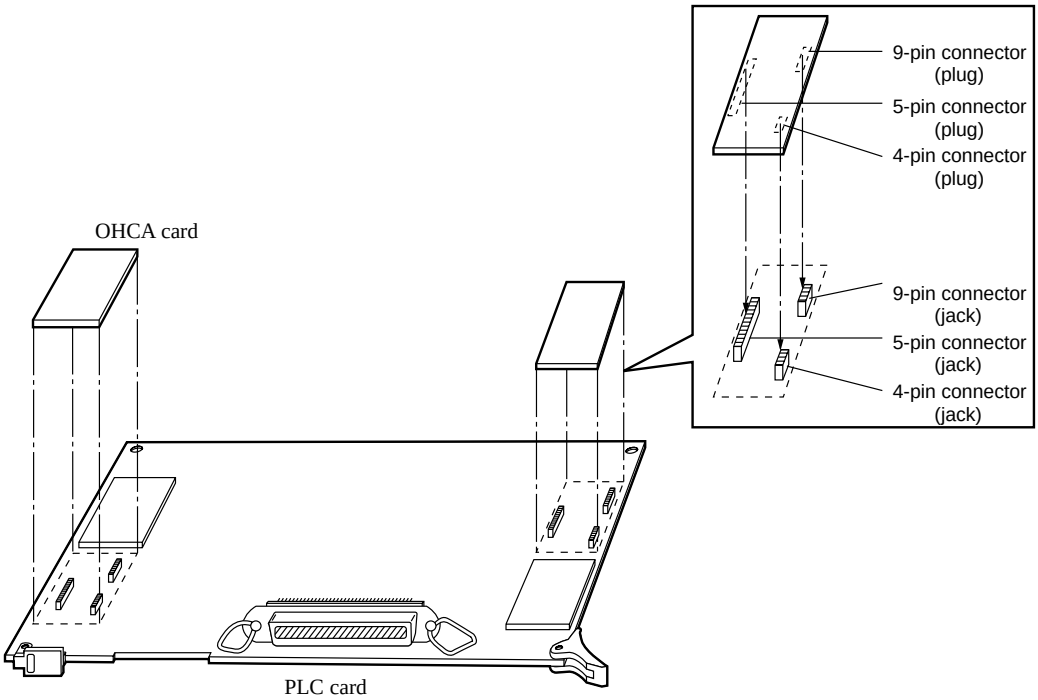
1. Insert the connector (plug) on the OHCA card into the connector (jack) on the PLC card.

2. Install the HLC card into a free slot. See 2.4.1 HLC Card (KX-T96170).

[Notes]

- Two extensions are available for the OHCA function with one OHCA card. See Page 152.
- The OHCA function for APT is only provided with the following APT: KX-T7130.

Connection to the PLC card (KX-T96172)



1. Make sure that the extensions which use OHCA function have OHCA cards.

2. Insert the connector (plug) on the OHCA card into the connector (jack) on the PLC card.

3. Install the PLC card to a free slot. See 2.4.2 PLC Card (KX-T96172).

[Notes]

- Two extensions are available for the OHCA function with one OHCA card. See Page 152.
- The OHCA function for APT is only provided with the following APT: KX-T7130.

Wiring Table

Conn. Pin	Cable Color	Clip No.	Extension		OHCA Extension
26	WHT-BLU	1		T	NO1
1	BLU-WHT	2		R	
27	WHT-ORN	3	No.1	D1	
2	ORN-WHT	4		D2	
28	WHT-GRN	5		P1	
3	GRN-WHT	6		P2	
29	WHT-BRN	7		T	
4	BRN-WHT	8		R	
30	WHT-SLT	9	No.2	D1	
5	SLT-WHT	10		D2	
31	RED-BLU	11		P1	
6	BLU-RED	12		P2	
32	RED-ORN	13		T	NO2
7	ORN-RED	14		R	
33	RED-GRN	15	No.3	D1	
8	GRN-RED	16		D2	
34	RED-BRN	17		P1	
9	BRN-RED	18		P2	
35	RED-SLT	19		T	
10	SLT-RED	20		R	
36	BLK-BLU	21	No.4	D1	
11	BLU-BLK	22		D2	
37	BLK-ORN	23		P1	
12	ORN-BLK	24		P2	
38	BLK-GRN	25		T	NO3
13	GRN-BLK	26		R	
39	BLK-BRN	27	No.5	D1	
14	BRN-BLK	28		D2	
40	BLK-SLT	29		P1	
15	SLT-BLK	30		P2	
41	YEL-BLU	31		T	
16	BLU-YEL	32		R	
42	YEL-ORN	33	No.6	D1	
17	ORN-YEL	34		D2	
43	YEL-GRN	35		P1	
18	GRN-YEL	36		P2	

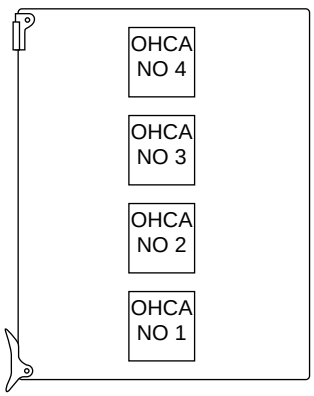
Conn. Pin	Cable Color	Clip No.	Extension		OHCA Extension
44	YEL-BRN	37	No.7	T	NO4
19	BRN-YEL	38		R	
45	YEL-SLT	39		D1	
20	SLT-YEL	40		D2	
46	VIO-BLU	41		P1	
21	BLU-VIO	42		P2	
47	VIO-ORN	43	No.8	T	
22	ORN-VIO	44		R	
48	VIO-GRN	45		D1	
23	GRN-VIO	46		D2	
49	VIO-BRN	47		P1	
24	BRN-VIO	48		P2	
50	VIO-SLT	49			
25	SLT-VIO	50			

Connection of the Analogue Proprietary Telephone: KX-T7130.

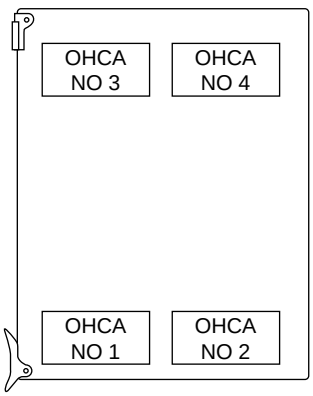
T: Tip	D1: Data 1	P1: 3 Pair Voice
R: Ring	D2: Data 2	P2: 3 Pair Voice

OHCA NO.

(HLC card)

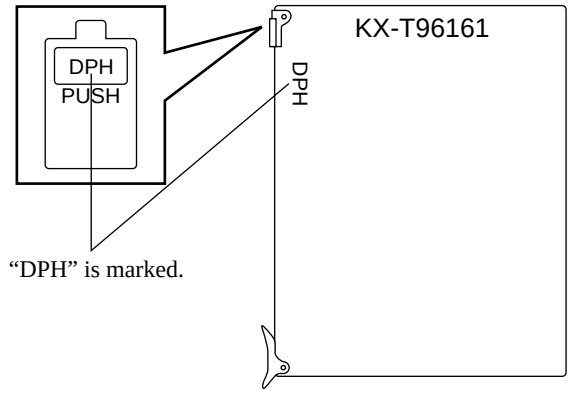


(PLC card)

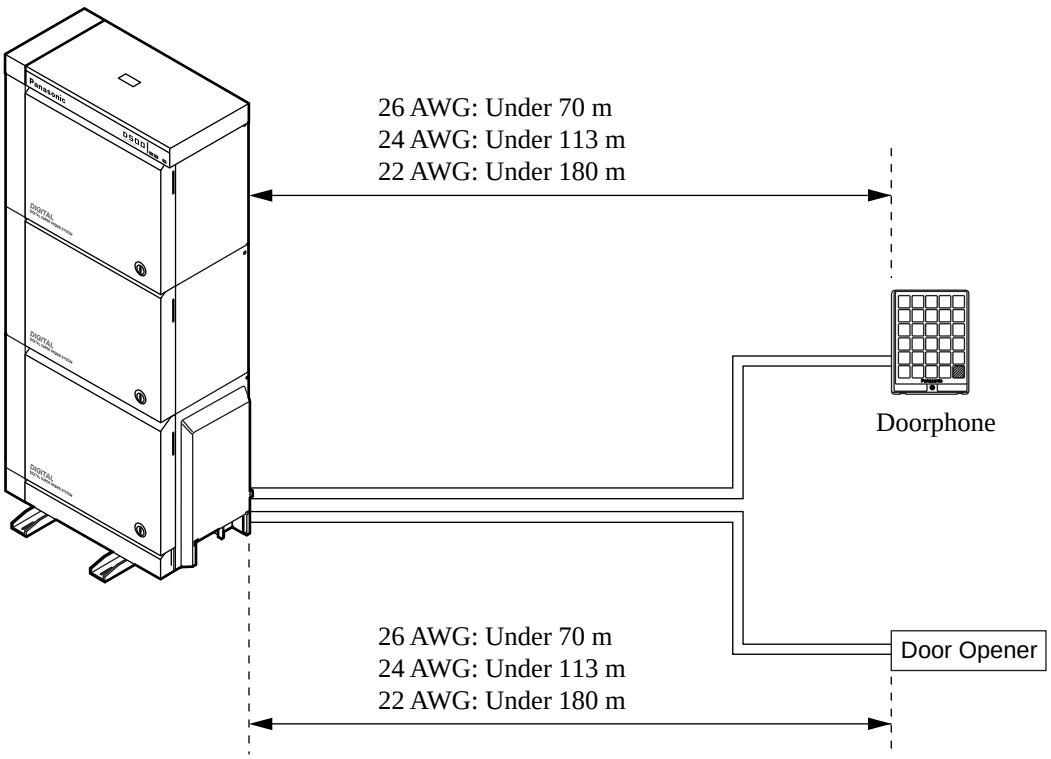


2.7.2 DPH Card (KX-T96161)

Insert this card into a free slot.



Maximum cabling distance of the Doorphone and the Door Opener line.



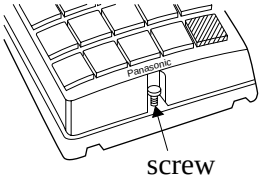
CAUTION

The door opener cabling is considered a hazardous circuit and is required to be installed as a separate component to the door phone cabling.

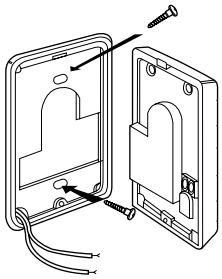
Installation of the Doorphone (KX-T30865)

1. Loosen the screw to separate the doorphone into two halves.

2. Install the base cover to the wall with two screws.



screw

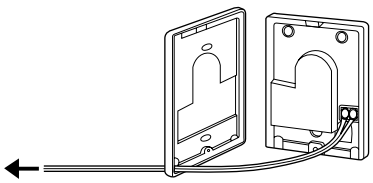


- Two kinds of screws are included. Please choose one according to your wall type. See the following.

.....When the doorphone plate has been fixed to the wall.

.....When you wish to install the doorphone directly to the wall.

3. Connect the wires from the terminal box to the screws located in the front cover.

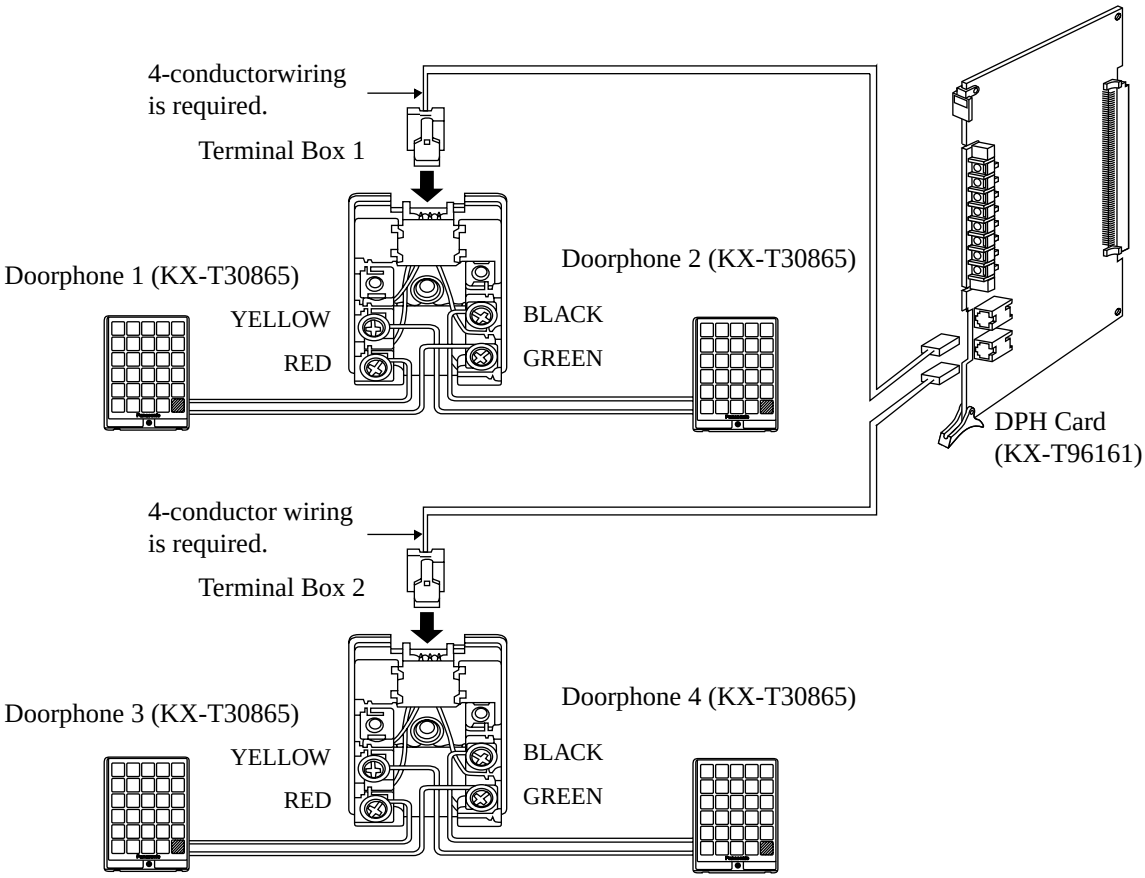


To the terminal box
(See the next page.)

4. Secure both halves together and re-install the screw.

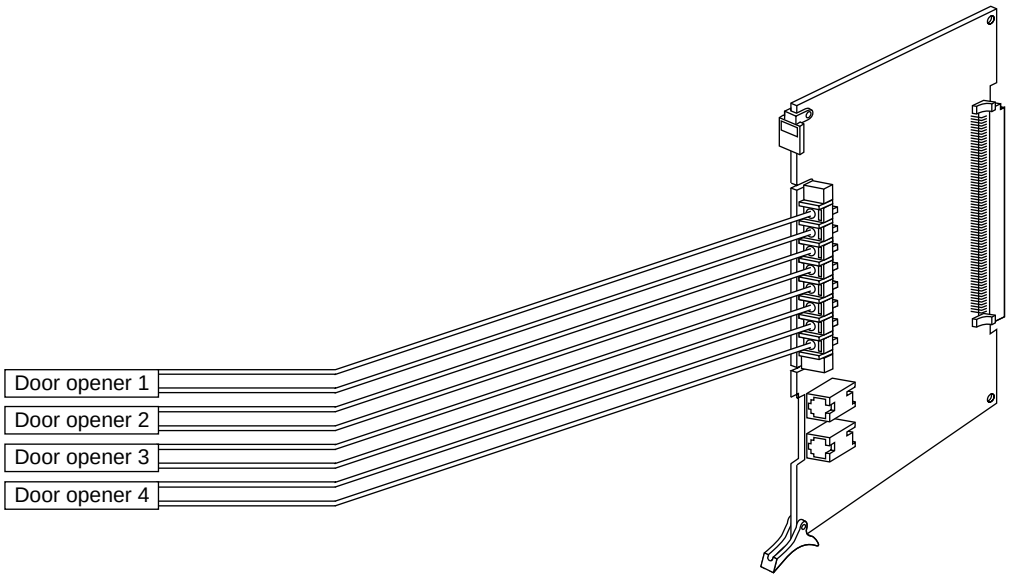
Wiring of the Doorphone

1. Connect the DPH Card to the terminal box using a 4-conductor modular connector.
2. Connect the wires of doorphone 1 to the red and green screws of the terminal box 1.
3. Connect the wires of doorphone 2 to the yellow and black screws of the terminal box 1.
4. Connect the wires of doorphone 3 to the red and green screws of the terminal box 2.
5. Connect the wires of doorphone 4 to the yellow and black screws of the terminal box 2.

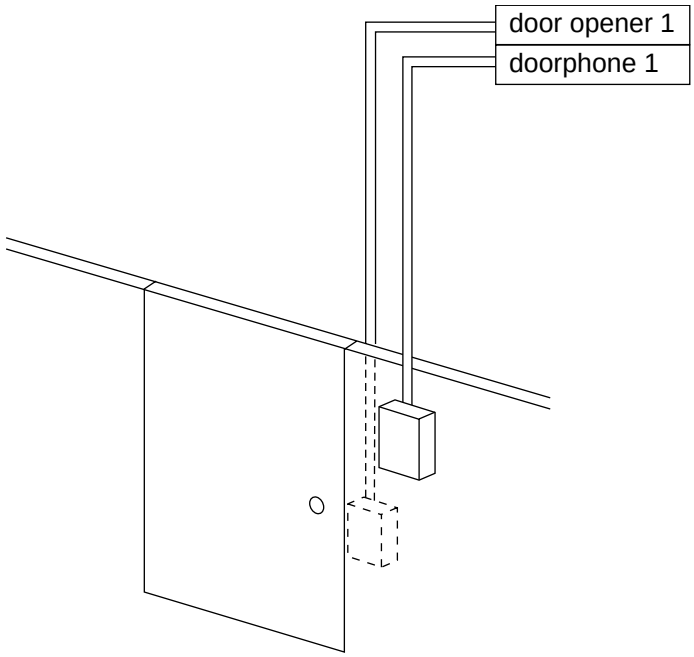


Connection to Door Openers (User-supplied)

Set the door opener paired with the doorphone.



DPH Card (KX-T96161)



doorphone 1	Paired
door opener 1	
doorphone 2	Paired
door opener 2	
doorphone 3	Paired
door opener 3	
doorphone 4	Paired
door opener 4	

Note

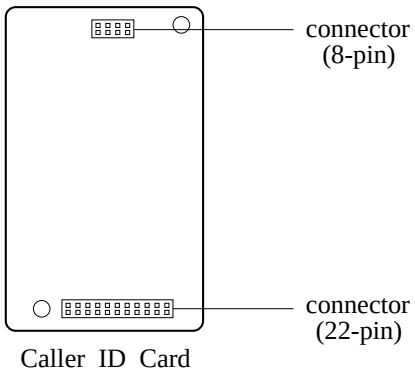
- The following extensions are available to unlock the door opener:

  (1) The extensions specified as the destination of the doorphone calls by System Programming.

  (2) Any extenision engaged in a doorphone call.

2.7.3 Caller ID Card (KX-TD193)

This card is installed on the ELCOT card.



Connection to the ELCOT card (KX-TD50180)

Before connecting the Caller ID card (KX-TD193) to the ELCOT card (KX-TD50180), please replace the spacers on the KX-TD193 with the short type spacers included in the package.

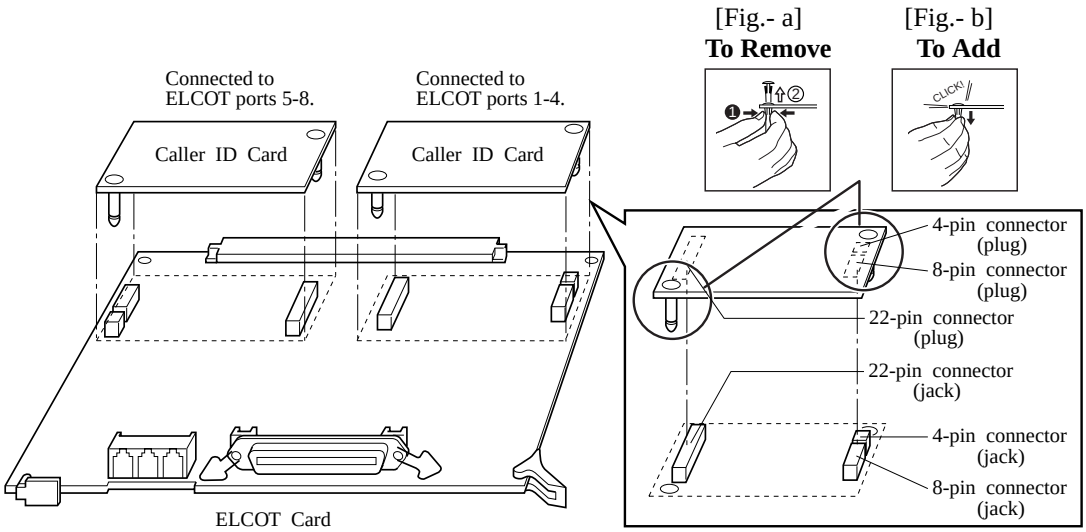
Removing the spacers[Fig.-a]

Push up a spacer (See step 2 .) while holding it with fingers (See step 1 .) as shown in the figure below.

Adding the short type spacers[Fig.-b]

Pull the spacer until "CLICK" sounds as shown in the figure below.

1. Insert the connector (plug) on the Caller ID card into the connector (jack) on the ELCOT card.
2. Install the ELCOT card into a free slot. See 2.5.11 ELCOT Card (KX-TD50180).

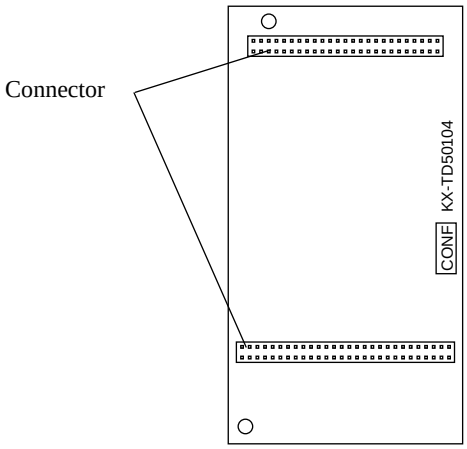


Note

- Four CO lines are available for the Caller ID function with one Caller ID card.

2.7.4 TSW Conference Expansion Card (KX-TD50104)

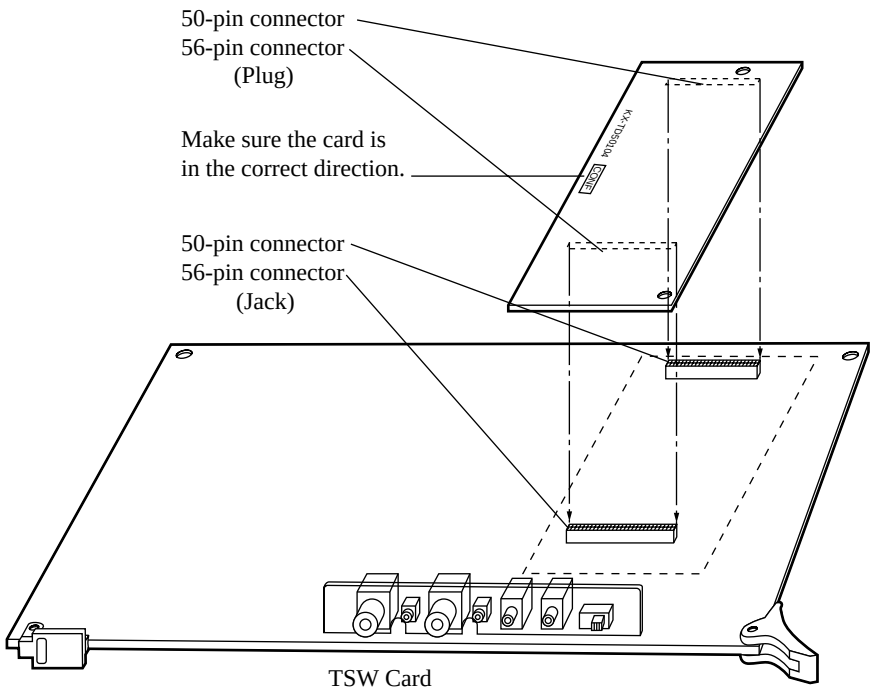
This card is installed on the TSW card.



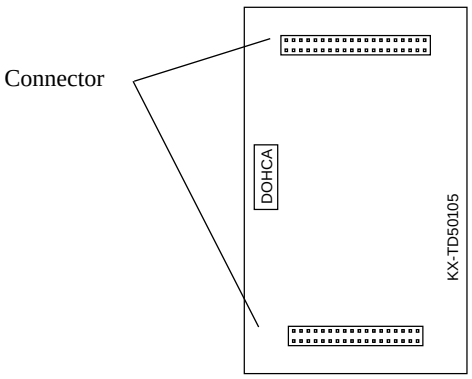
Connection to the TSW card

1. Insert the 50/56-pin connector (plug) on the TSW CONF card into the 50/56-pin connector (jack) on the TSW card.
2. Install the TSW card into the Basic Slot 2 (BS2). See 2.3.2 TSW Card.

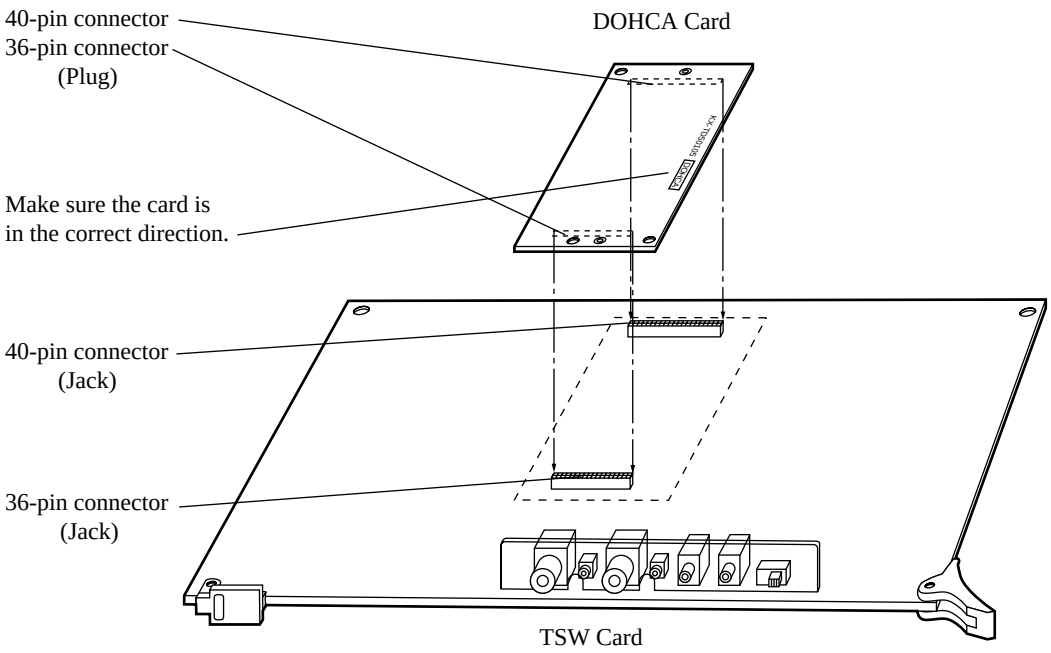
TSWConference Expansion Card



2.7.5 DOHCA Card (KX-TD50105)



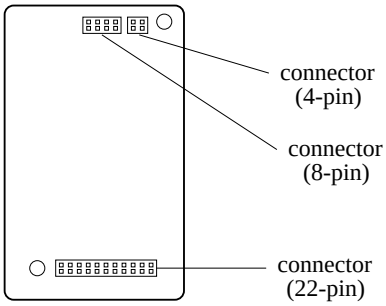
Connection to the TSW card



Note

- The OHCA function with DPT needs this card.
- The OHCA function with DPT is only provided with a certain type of DPTs, such as KX-T7235 and KX-T7436.
- This card is required to implement "DPT Integration" feature (See 1.3 System Features of the Features Guide).

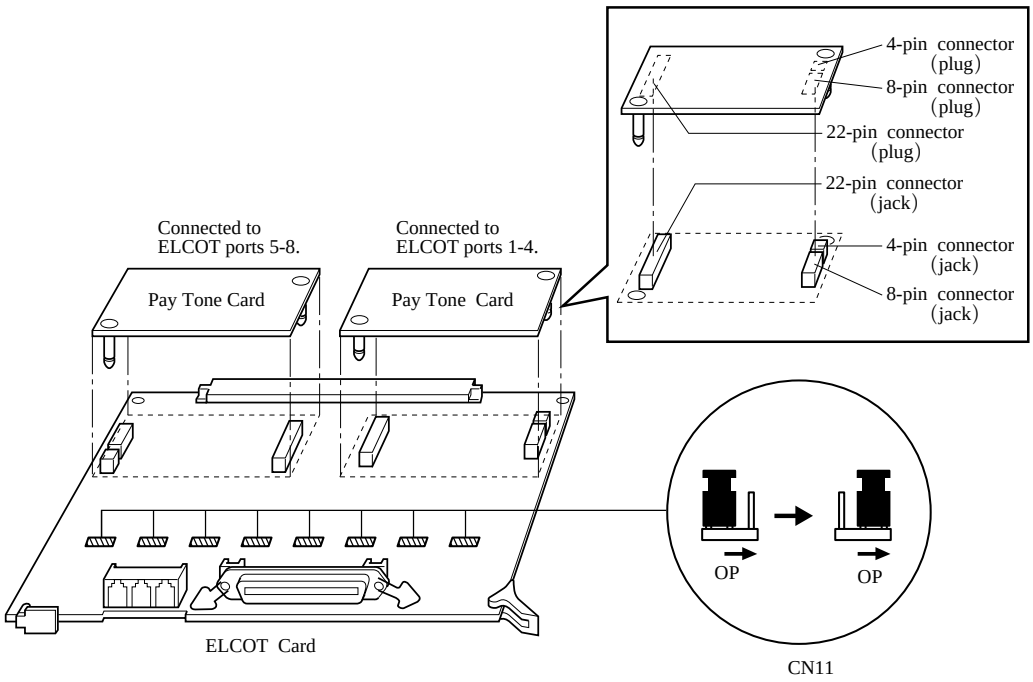
2.7.6 Pay Tone Card (KX-TD50189)



Pay Tone Card

- This card is installed on the ELCOT card.

Connection to the ELCOT card (KX-TD50180)



1. Insert the connector (plug) on the Pay Tone card into the connector (jack) on the ELCOT card.
2. Move the pin jack on the CN11s toward OP direction.
3. Install the ELCOT card into a free slot. See Section 2.5.11 ELCOT Card (KX-TD50180).

Note

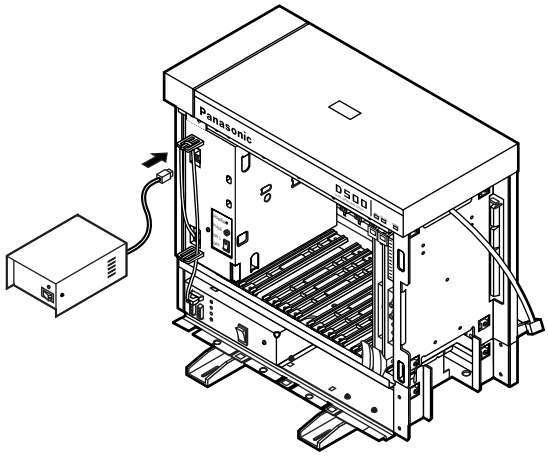
- Four CO lines are available for the Pay Tone function with one Pay Tone card.

2.8 Peripheral Equipment

2.8.1 Battery Adaptor (KX-A46)

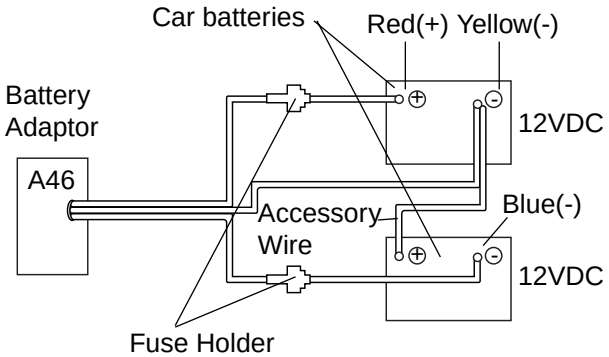
Connection to KX-TD500

1. Connection of KX-A46



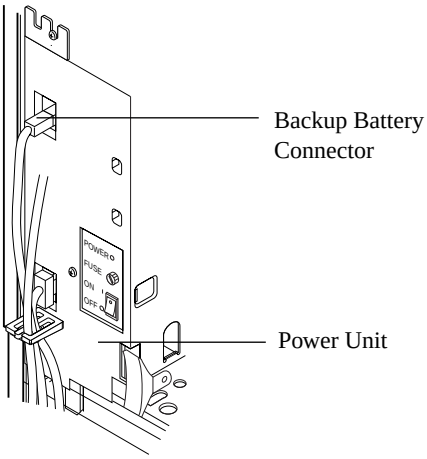
2. Connect the batteries to the KX-A46.

Connect the Battery Adaptor with two automobile-type batteries (12V DC × 2) using Battery Adaptor Line Cable as shown.
Make sure of the polarities of batteries and wires.
Make sure you do not short the batteries and wires.
To connect the two batteries, use an accessory wire.

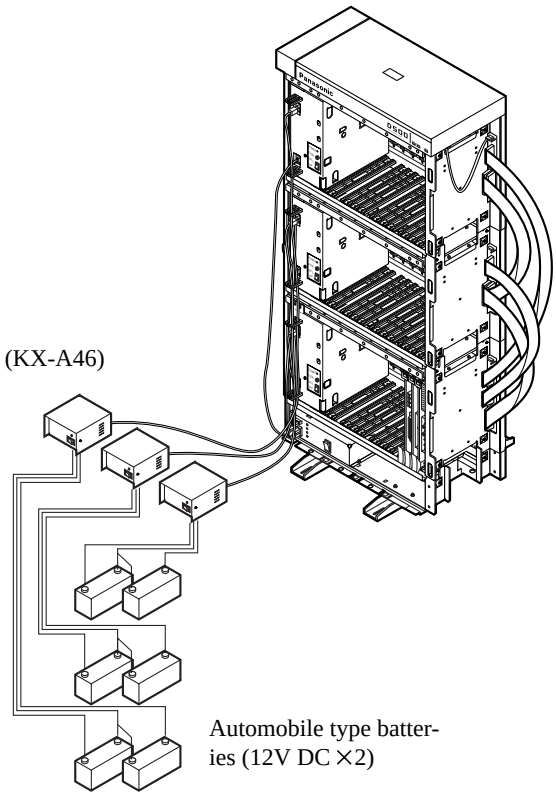


3. Connecting to KX-TD500.

Plug the Battery Adaptor cord to Backup Battery connector on the Basic Shelf.



4. When one or two Expansion Shelves are installed, connect another Battery Adaptor (KX-A46) with automobile type batteries (12V DC × 2) following the same procedures from 1 to 3.

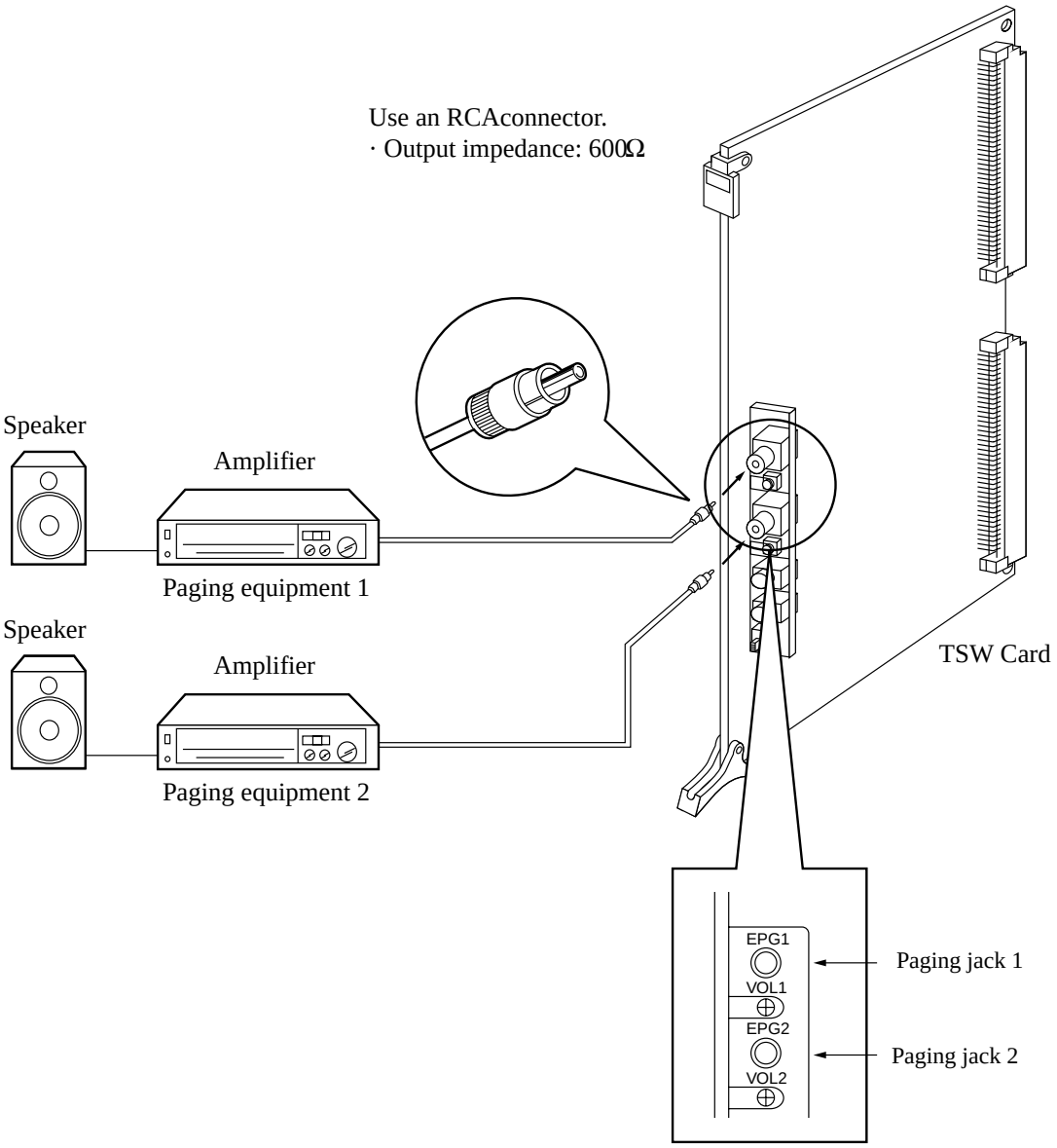


Notes

- Up to three pairs of automobile-type batteries can be connected to the KX-TD500 System.
- If power failure occurs, each pair of batteries supplies the power to each shelf (Basic, Expansion 1, 2) connected respectively via Battery Adaptor (KX-A46).

2.8.2 External Pager (Paging Equipment)

Up to two paging equipment (customer-supplied) can be connected to the system as illustrated below.

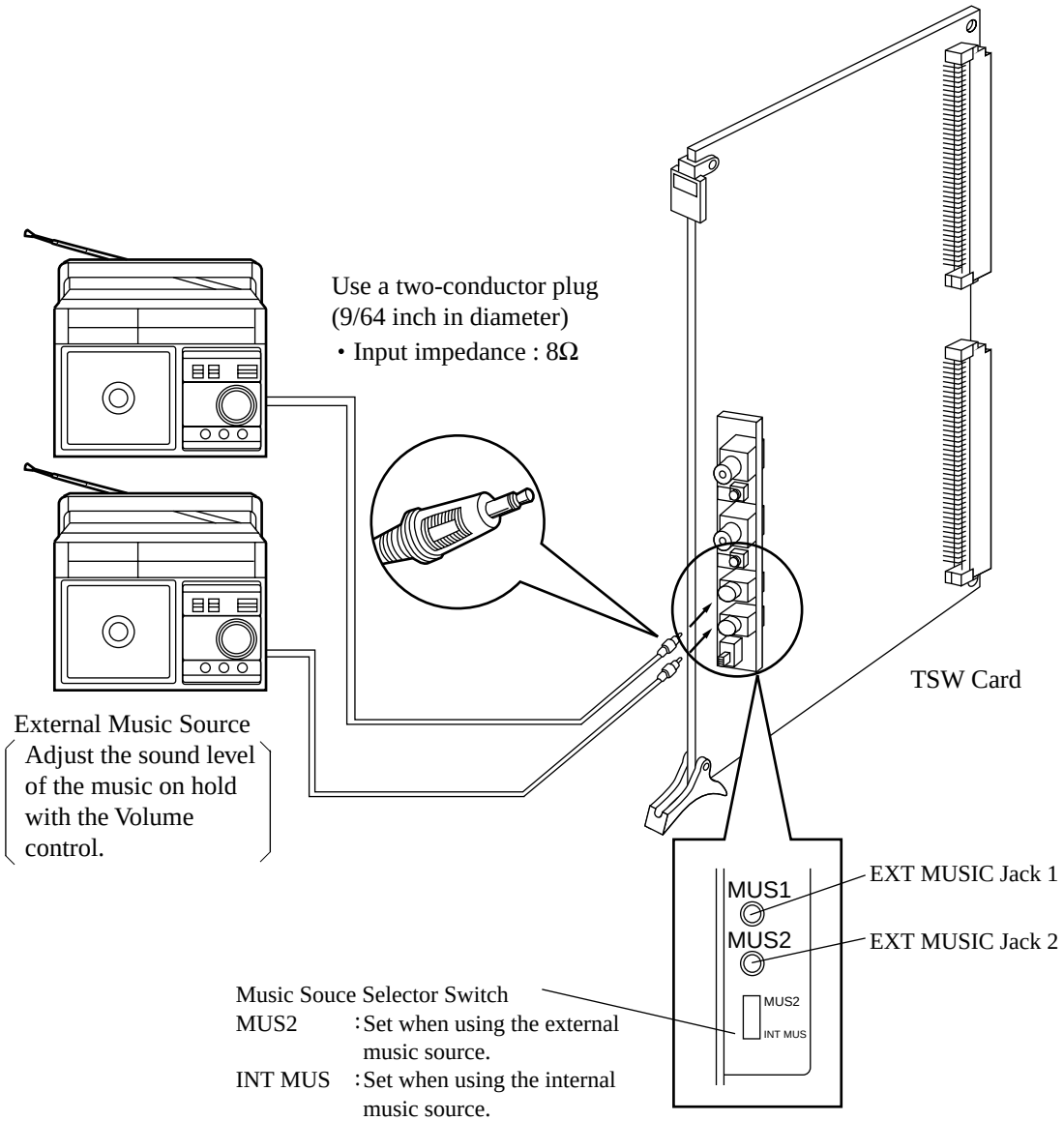


CAUTION

External Paging Jacks are SELV ports and should only be connected to approved SELV devices or via a Line Isolation Unit with Telecommunications Compliance Label.

2.8.3 Music Source (External / Internal)

The KX-TD500 System provides Music on Hold and Background Music.
External Music Source (e.g. radio) can be used by connecting it to the KX-TD500 System. Up to two external music sources (customer-supplied) can be connected to the system as illustrated below.

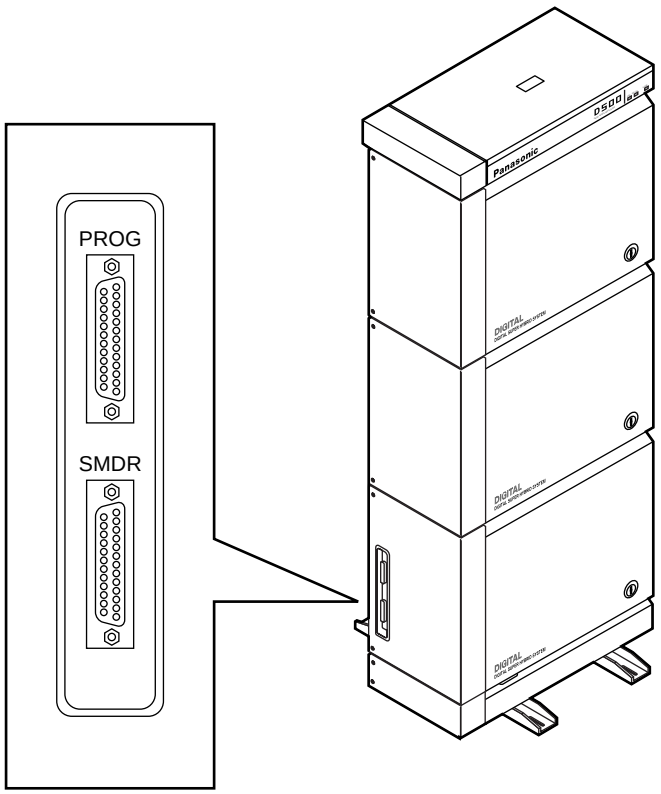


CAUTION

- *Wiring should be done carefully to prevent this plug from being stressed in tension. Otherwise, no sound may sometimes be heard through the external music source.*
- *External Music Jacks are SELV ports and should only be connected to approved SELV devices or via a Line lsolation Unit with Telecommunications Compliance Label.*

2.8.4 Personal Computer/Priner

The KX-TD500 System is equipped with two RS-232C interfaces.
These interfaces provide communication between the system and customer supplied devices such as personal computers and line printers.
RS-232C Port 1 (PROG) is used for system programming, diagnostics and external system database storage (Save/Load) functions, and Port 2 (SMDR) for Station Message Detailled Recording (SMDR) only.



Pin Configulation (PROG/SMDR) – 1/2

Pin No.	Signal Name		Circuit Type (EIA)
1	FG	Frame Ground	AA
2	SD (TXD)	Transmitted Data	BA
3	RD (RXD)	Received Data	BB
4	RTS (No Connection)	Request To Send	CA
5	CTS (No Connection)	Clear To Send	CB
6	DR (DSR)	Data Set Ready	CC

Pin Configulation (PROG/SMDR) – 2/2

Pin No.	Signal Name		Circuit Type (EIA)
7	SG	Signal Ground	AB
8	DCD	Data Carrier Detect	CF
20	ER (DTR)	Data Terminal Ready	CD

Serial Interface (RS-232C) signals

Frame Ground (FG);
Connects to the unit frame and the earth ground conductor of the AC power cord.

Transmitted Data (TXD);.....(output)
Conveys signals from the unit to the printer. A "Mark" condition is held unless data or BREAK signals are being transmitted.

Received Data (RXD);.....(input)
Conveys signals from the printer.

Request To Send (RTS);.....(output)
This signal is not used.

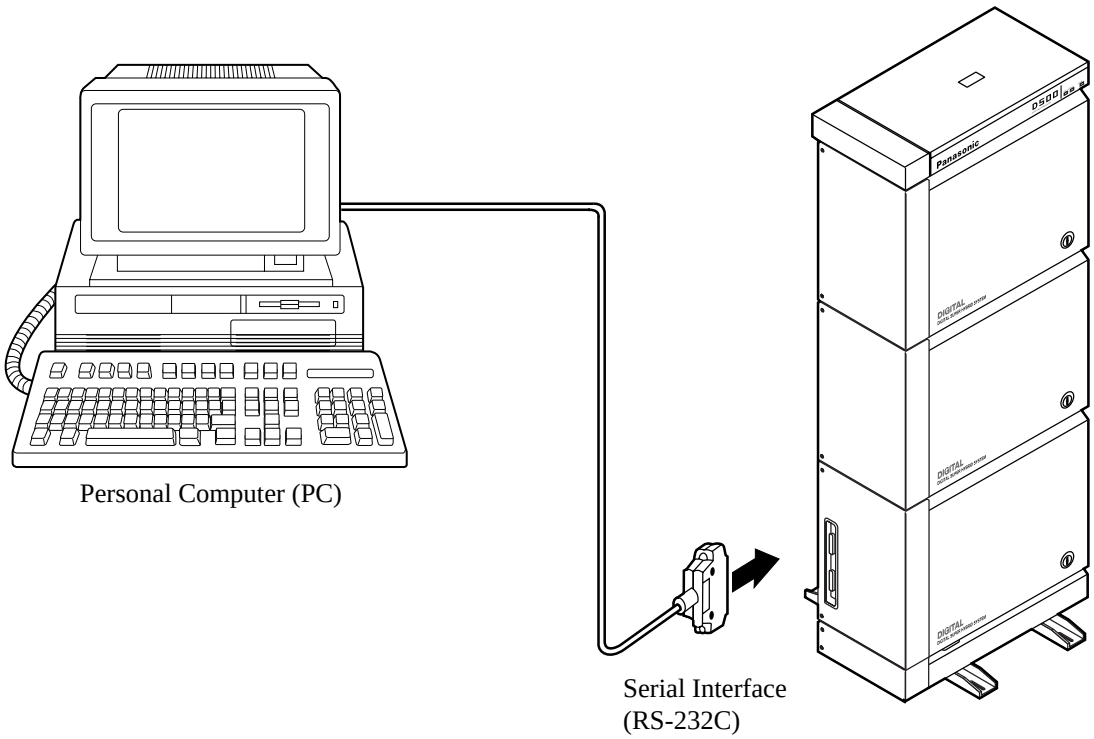
Clear To Send (CTS);.....(input)
This signal is not used.

Data Set Ready (DSR);.....(input)
The ON condition of circuit DSR indicates the printer is ready. Circuit DSR ON does not indicate that communication has been established with the printer.

Signal Ground (SG);
Connects to the DC ground of the unit for all interface signal.

Data Terminal Ready (DTR).....(output)
This signal line is turned ON by the unit to indicate that it is ON LINE. Circuit DTR ON does not indicate that communication has been established with the printer. It is switched OFF when the unit is OFF LINE.

Data Carrier Detect (DCD).....(input)
The ON condition is an indication to data terminal (DTE) that the carrier signal is being received.



- Connect the RS-232C connector of the Personal Computer to the "PROG."
- Cables must be shielded and the maximum length of the cable is 2 m.

Connection Chart 1 (9 pin Connector)

RS-232C port (PROG) on the Basic Shelf

Circuit Type (EIA)	Signal Name	Pin No.
AA	FG	1
BA	SD (TXD)	2
BB	RD (RXD)	3
CA	RTS	4
CB	CTS	5
CC	DR (DSR)	6
AB	SG	7
CF	DCD	8
CD	ER (DTR)	20

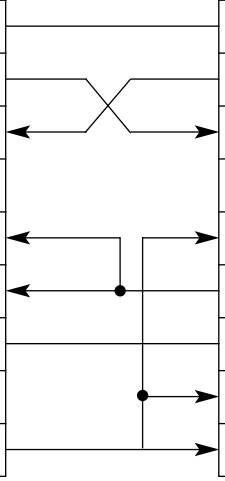
RS-232C port on the PC (9 pin)

Pin No.	Signal Name	Circuit Type (EIA)
9	RI	CE
2	RXD	BB
3	TXD	BA
7	RTS	CA
8	CTS	CB
4	DTR	CD
5	SG	AB
6	DSR	CC
1	DCD	CF

Connection Chart 2 (25 pin Connector)

RS-232C port (PROG/SMDR) on the Basic Shelf

Circuit Type (EIA)	Signal Name	Pin No.
AA	FG	1
BA	SD (TXD)	2
BB	RD (RXD)	3
CA	RTS (No Connection)	4
CB	CTS	5
CC	DR (DSR)	6
AB	SG	7
CF	DCD	8
CD	ER (DTR)	20



RS-232C port on the PC/Printer (25 pin)

Pin No.	Signal Name	Circuit Type (EIA)
1	FG	AA
2	TXD	BA
3	RXD	BB
4	RTS	CA
5	CTS	CB
20	DTR	CD
7	SG	AB
6	DSR	CC
8	DCD	CF

2.9 Auxiliary Connection for Power Failure Transfer

2.9.1 Auxiliary Connection for Power Failure Transfer

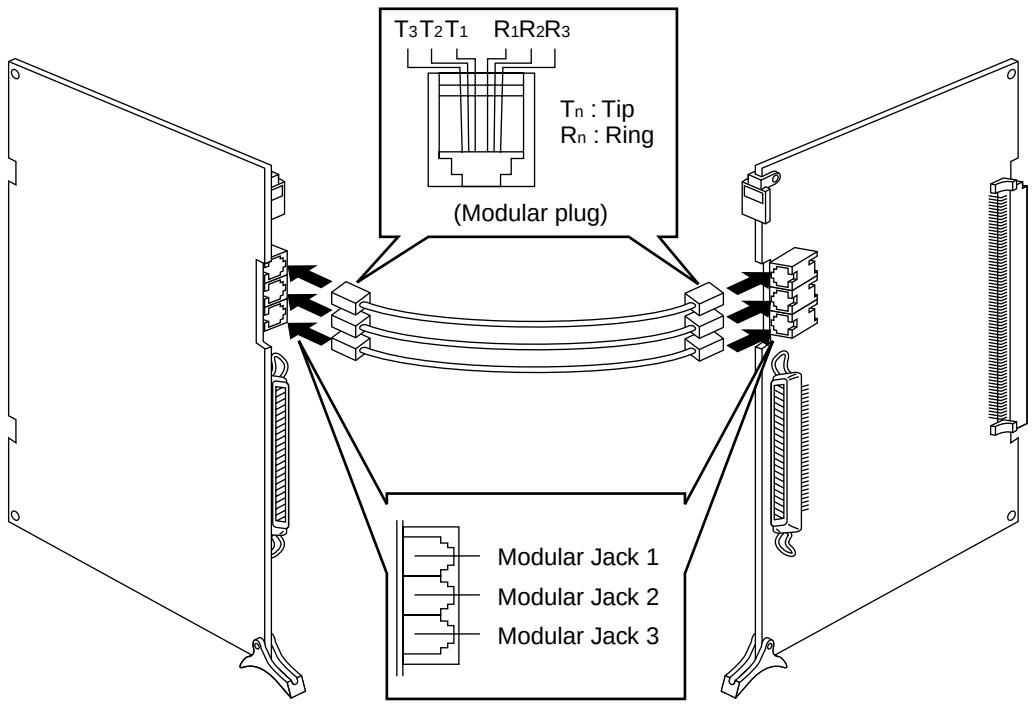
Power Failure Transfer connects a specific Single Line and Proprietary telephones to selected trunks in the event of system power failure.
Please refer to "Power Failure Transfer " in 1.4 Fault Recovery / Diagnostics of the Features Guide for further information.
The Auxiliary Connection (see the illustration below) is required to implement this feature.

Note

- The KX-TD500 System switches the current connection to the Auxiliary Connection automatically when the power supply dies.
- While DC power is provided by the backup batteries when the AC power fails, the KX-TD500 System does not switch the current connection to the Auxiliary Connection.

Connection

Insert the modular plugs of connection cords (6-conductor wiring) to the modular jacks of Central Office Line cards (LCOT, GCOT, RCOT, PCOT, ELCOT) and Extension cards (SLC, HLC, DHLC, ESLC, MSLC).



Central Office Line card
(LCOT, GCOT, RCOT, PCOT, ELCOT)

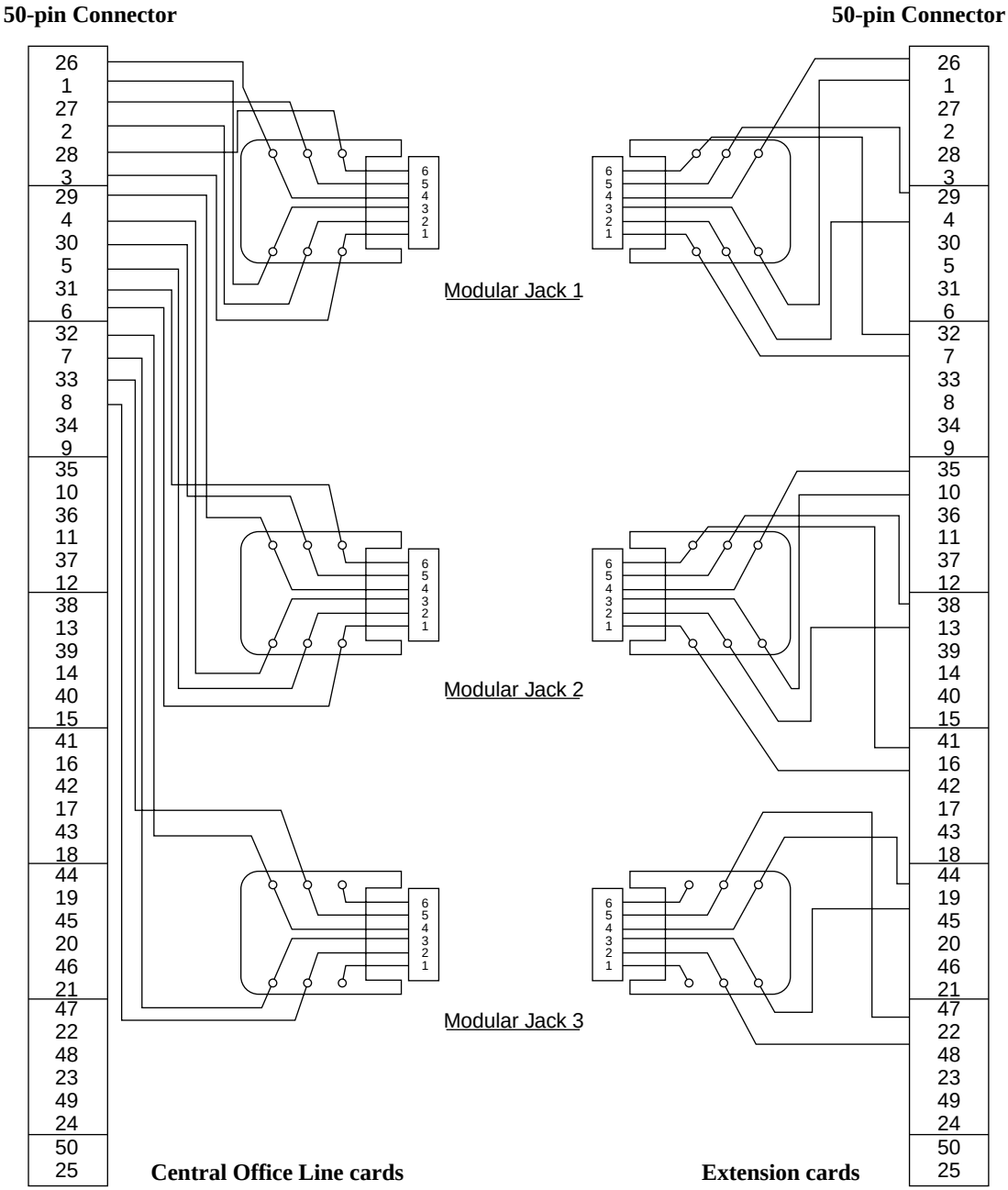
Extension card
(SLC, HLC, DHLC, ESLC, MSLC)

Insert the modular plugs of connection cords (6-conductor wiring) to the modular jacks of Central Office Line cards (LCOT, GCOT, RCOT, PCOT, ELCOT) and Extension cards (SLC, HLC, DHLC, ESLC, MSLC).

Note

- PLC and DLC cards (Extension card) are not available for Power Failure Transfer.

Connection of Central Office Line and Extensions



2.10 Starting Up the KX-TD500 System

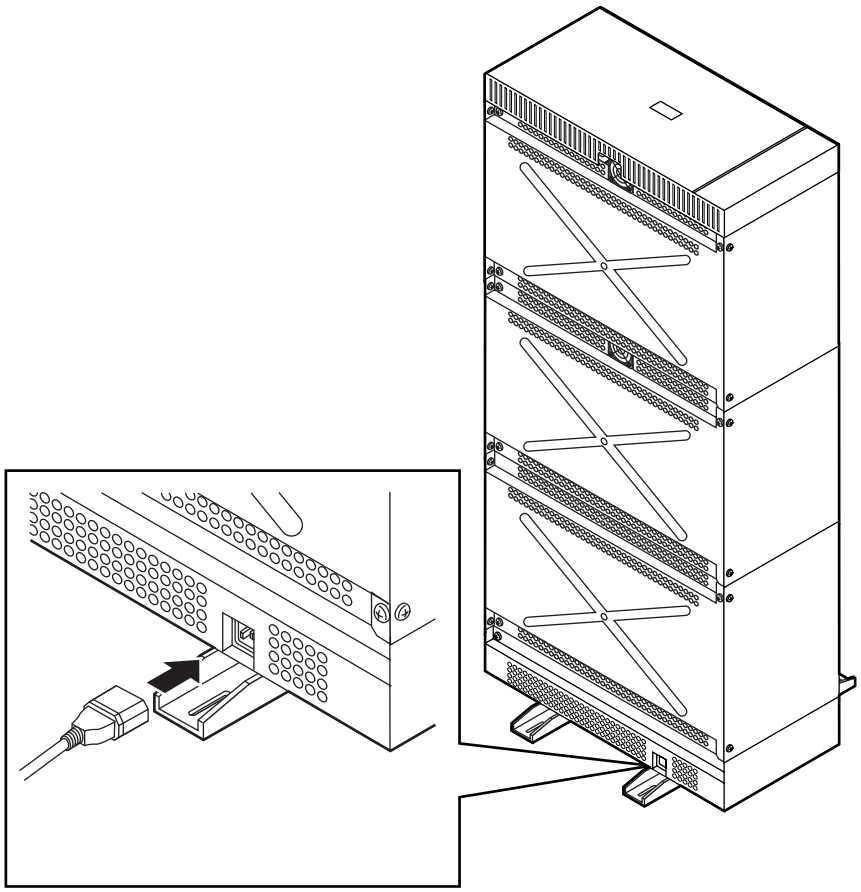
2.10.1 System Power-Up Procedure

Complete and check all installation procedures before connecting the AC power supply cable (packaged separately).

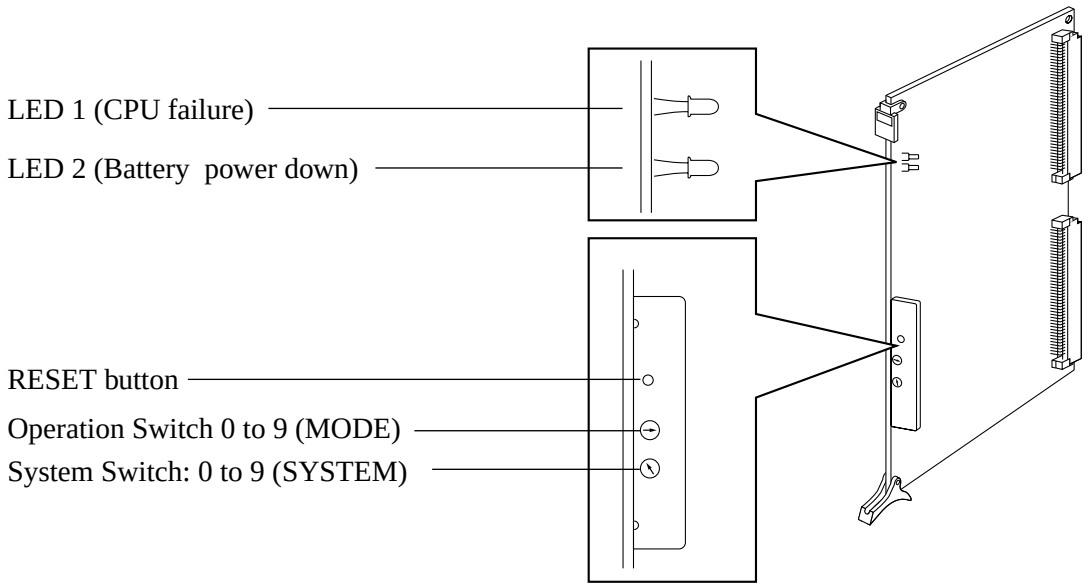
1. First insert the AC power supply cable into the AC power supply cable connector on the back of the basic shelf as shown below.
2. Then insert the other end of the AC power supply cable into the AC outlet.
3. Turn on the Main Power Switch on the basic shelf.
4. Turn on the power switch on the power unit of each expansion shelf.
   - The power indicator on the power unit will light.
5. Turn on the power switch on the power unit of basic shelf.

Note

Each shelf may be powered down individually, without powering down the entire system.



2.10.2 CPU Rotary-Switch Features



Operation Switch (MODE) – 1/2

Switch Position	Explanation	Operation Mode
0	Starts up the system with current system programming data	On-line*1
1	Reserved for future use (Functions same as "0")	
2		
3		
4	Holds the current system programming data	Off-line*2
5	Assigns default values automatically	
6	Special Operation (Forced connection mode) (Functions same as "0")	On-line*1
7	Special Operation (Examination on the finished product)	
8		

Operation Switch (MODE) – 2/2

Switch Position	Explanation	Operation Mode
9	Reserved for future use (Functions same as "0")	On-line*1

*1 Call Processing mode

*2 It is available to perform system programming but call processing and functional tests are not available in this mode.

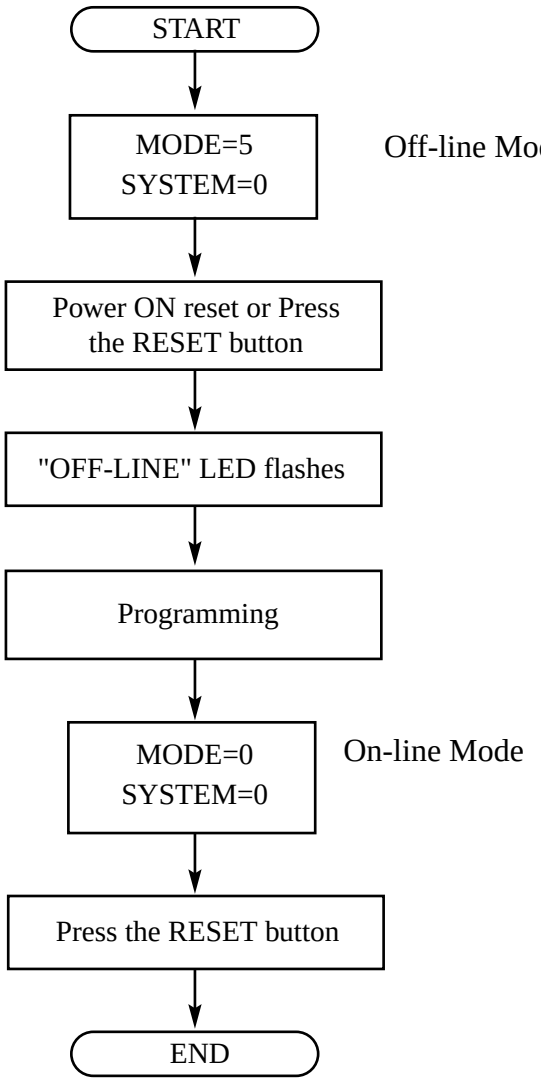
System Switch (SYSTEM)

All reserved.

Operation Sequence for System Starting Up

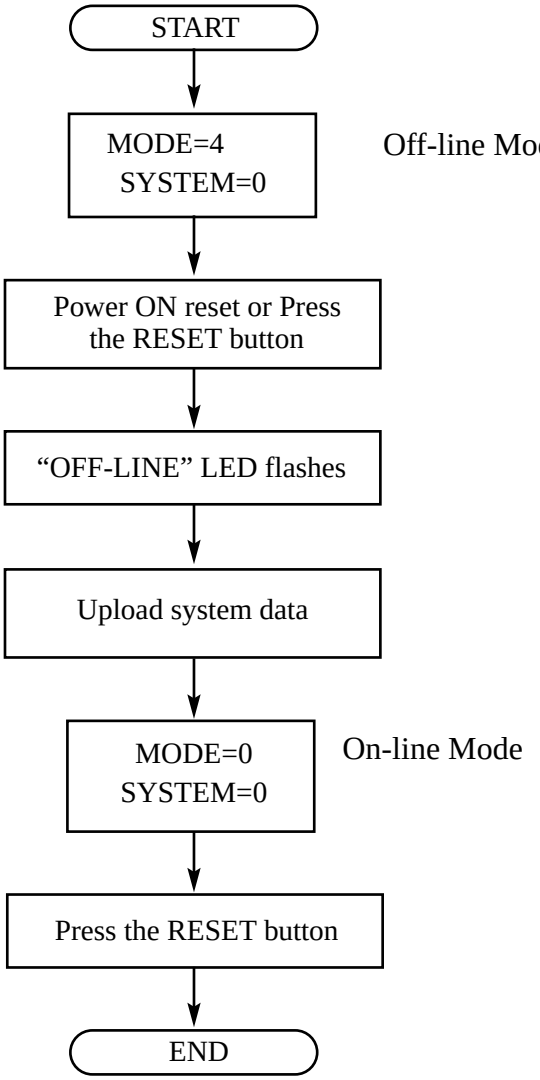
Starting up the system with default values

After installing the optional cards required, execute the following procedures.



Starting up the system with system data programmed by Maintenance PC, or using the saved data.

After installing the optional cards required, execute the following procedures.

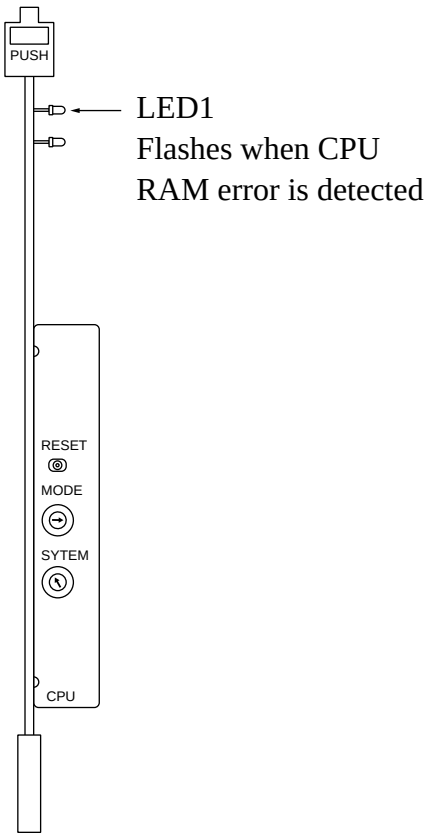


Note

- System programming from Maintenance PC can be done in on-line mode.
- When "OFF-LINE" LED flashes, system start-up is completed. After this, system programming from the Maintenance PC can be done.

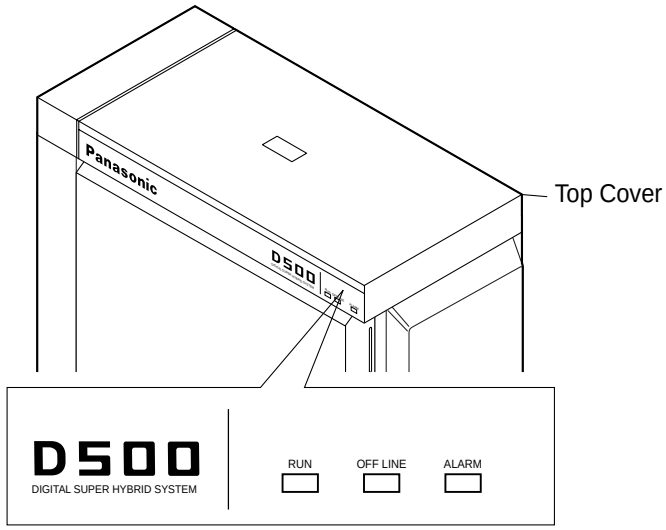
2.10.3 CPU RAM Test

The KX-TD500 executes a testing of CPU RAM reading and writing when powered on. If no errors are detected, the system continues booting to the On-line or Off-line procedure. When an error is detected in CPU RAM, the LED1 of CPU card flashes. You need to fix the CPU card in this case.



2.10.4 System Status and LED Indicators

There are three LEDs located on the Top Cover. These LEDs indicate the system operation status.



1. **"RUN" LED (Green)**
   Indicates whether the system is running or not.
   Turns green when the system is running normally.
2. **"OFF LINE" LED (Yellow)**
   Indicates whether the system is running in off-line mode, or in on-line call processing mode.
   Turns yellow in system on-line or off-line start-up mode.
   Flashes yellow when off-line mode is established.
3. **"ALARM" LED (Red)**
   Indicates whether the system trouble is existing or not.
   Turns red when the system detects a problem.
   Please refer to "5.2.2 Troubleshooting via the LED Indicators" for further information.

Depending on the system start-up mode, "RUN" and "OFF LINE" indicators behave as follows:

Start-up Mode	LED Status	
	RUN	**OFF LINE**
In off-line start-up mode	ON	ON
Off-line mode is established	ON	Flashing
In on-line start-up mode	ON	ON
On-line mode is established	ON	OFF

2.11 Lightning Protectors

2.11.1 Lightning Protectors

Overview

A lightning protector is a device to be installed on a CO line to prevent a dangerous surge from entering the building and damaging equipment.

A dangerous surge can occur if a telephone line comes in contact with a power line. Trouble due to lightning surges has been showing a steady increase with the development of electronic equipment.

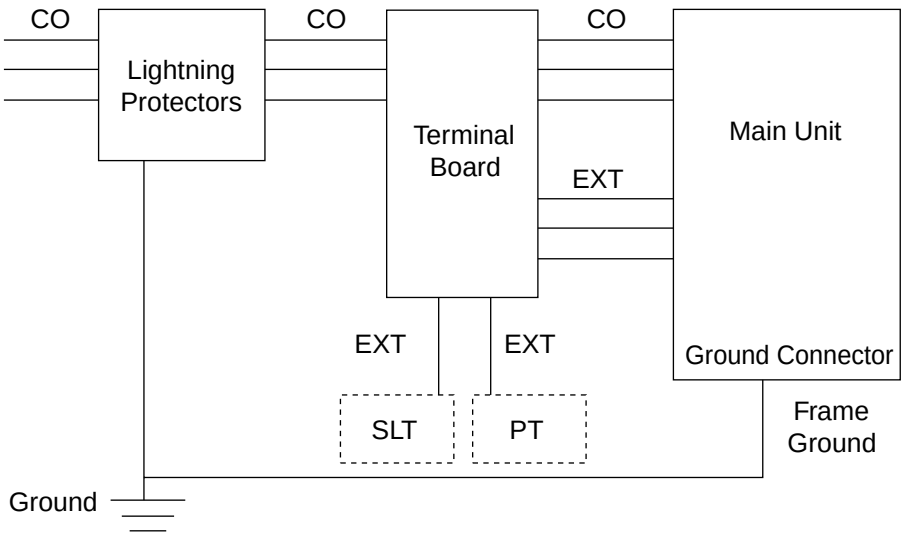
In many countries, there are regulations requiring the installation of a lightning protector. A lightning strike to a telephone cable which is 10 m (33 feet) above ground can be as high as 200,000 volts.

This system should be installed with lightning protectors. In addition, grounding (connection to earth ground) is very important for the protection of the system.

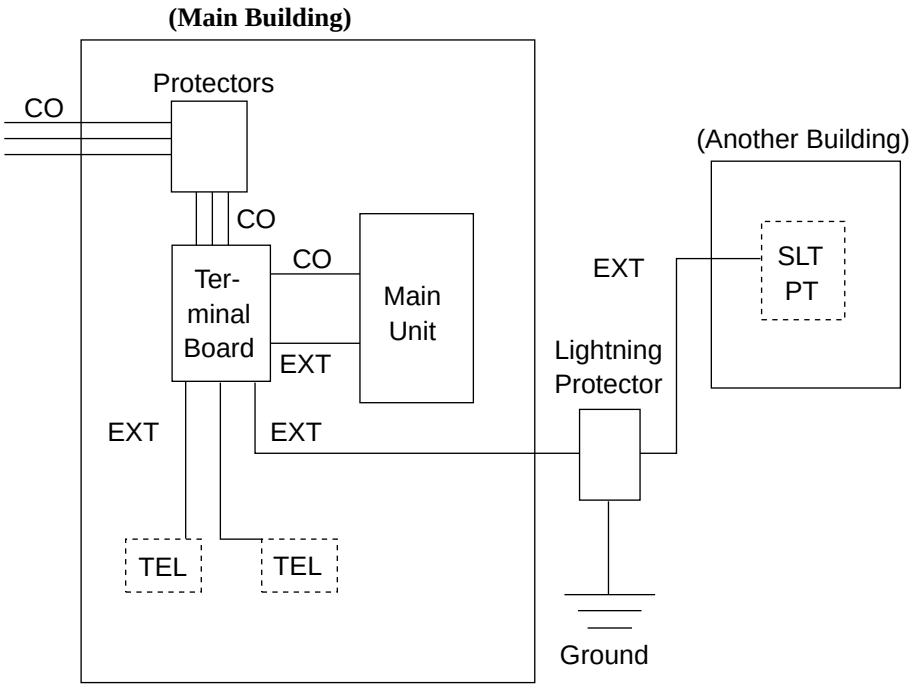
Recommended lightning protectors

- KX-A207
- TELESPIKE BLOK MODEL TSB (TRIPPE MFG. CO.)
- SPIKE BLOK MODEL SK6-0 (TRIPPE MFG. CO.)
- Super MAX™ (PANAMAX)
- MP1 (ITW LINK)

Installation



Outside Installation



If you install an extension outside of the main building, the following precautions are recommended:

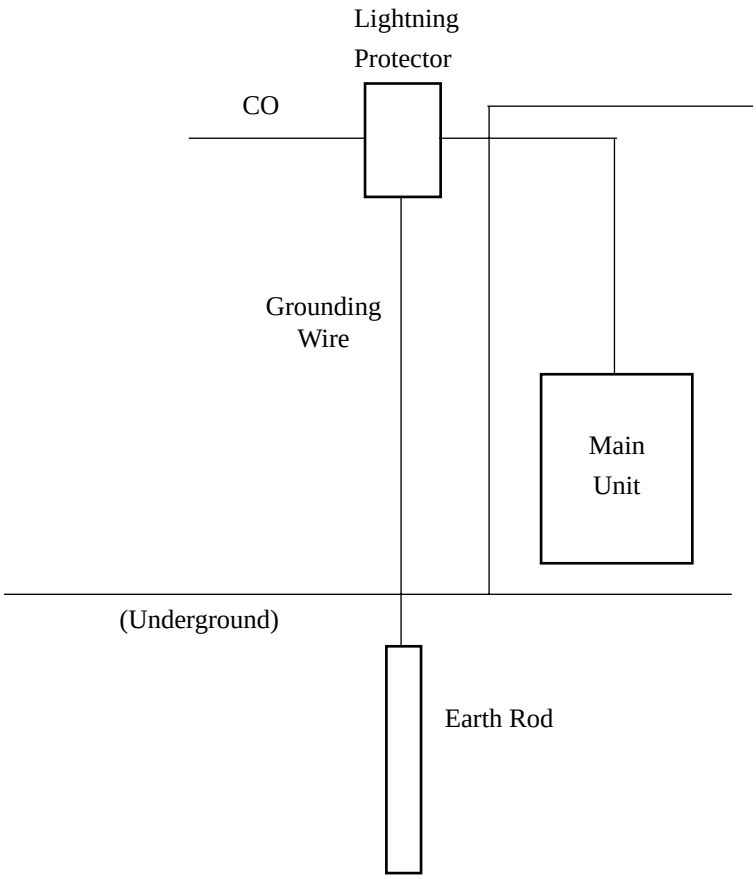
a) Install the extension wire underground.

b) Use a conduit to protect the wire.

Note

- The lightning protector for an extension is different from that for CO lines.

Installation of an Earth Rod



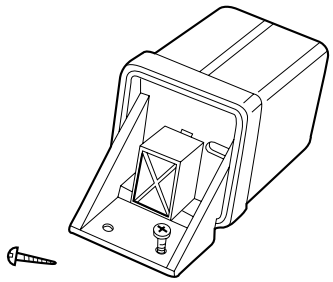
1. Installation location of the earth rod.....Near the protector
2. Check obstructions.....None
3. Composition of the earth rod.....Metal
4. Depth of the earth rod.....More than 50 cm (20 inches)
5. Size of the grounding wire.....Thickness is more than 16 AWG

Note

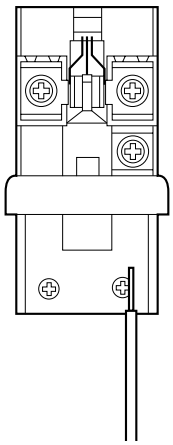
- The above figures are recommendations only.
- The length of earth rod and the required depth depend on the composition of the soil.

Installation of the KX-A207

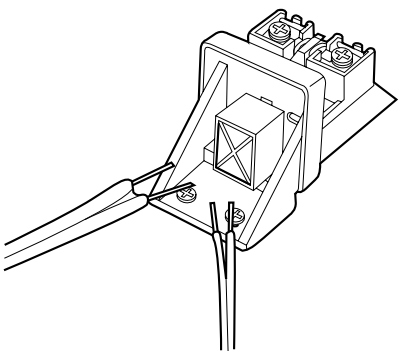
1. Secure the protector to a building with the enclosed mounting screws.



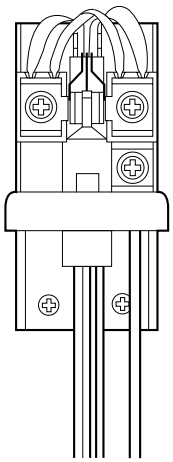
2. Remove about 1 cm (13/32 inch) of insulation from the end of the earth wire. Insert the earth wire through the bottom of the protector base and secure it to the earth terminal.



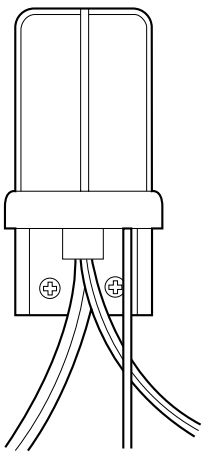
3. Remove about 1.5 cm (19/32 inch) of insulation from the ends of the external and internal cables, then pass the cables through the rubber packing.



4. Fold the external and internal cables, and connect them to the terminal screws using washers.



5. Secure the external and internal cables and the earth wire to the building. Then, install the arrester and mount the cover on the protector.



Section 3

Maintenance Console Guide

Explains the structure of the Maintenance Console PC software and the basic information you need.

3.1 Installing PC Programming Software

3.1.1 System Requirements

Software
OS: Microsoft Windows 3.1, 95

Hardware (minimum requirements)
CPU: Intel 80486DX 25 MHz or better microprocessor
RAM: at least 8 megabytes (MB) of free RAM
HDD: at least 5 megabytes (MB) of hard disk space plus about 500 kilobytes (KB) additional disk space for user files

Note

Please select "Small Fonts" by using the Display Properties – Settings "Font size" programming of the Windows system. Otherwise, the characters used in the display may not be displayed correctly.

3.1.2 Starting Setup

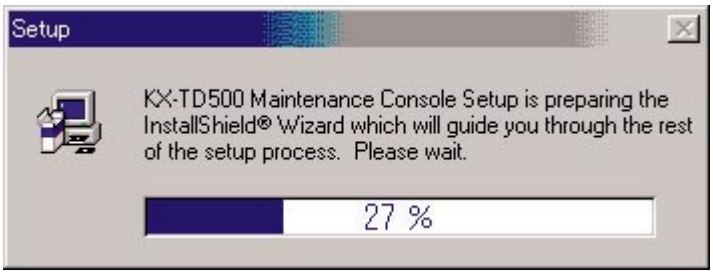
To begin installation:

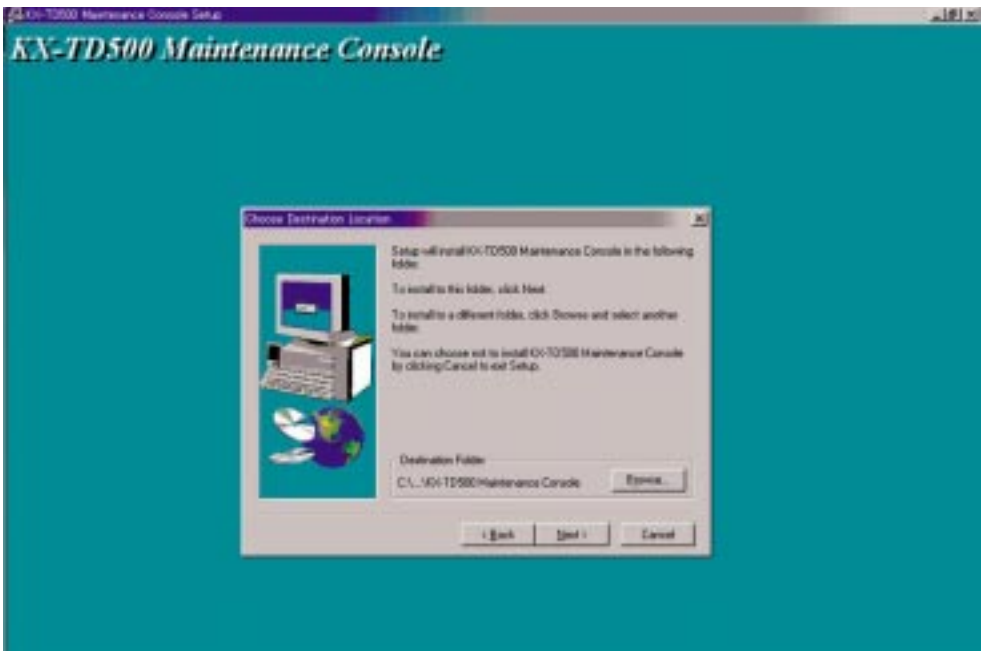
1. Insert Setup Disk 1 into the appropriate drive.
2. Follow the instructions for your Windows platform:

   [In Windows 3.1 or later]
   Choose the Run command from the File menu in Programme Manager.

   [In Windows 95]
   Choose the Run command from the Start Menu.
3. Type "**A:\setup.exe**"and click OK.

   Or click Browse to find and open "**A:\setup.exe**."
   - You will see the window shown below and then the Maintenance Console Installer screen appears.

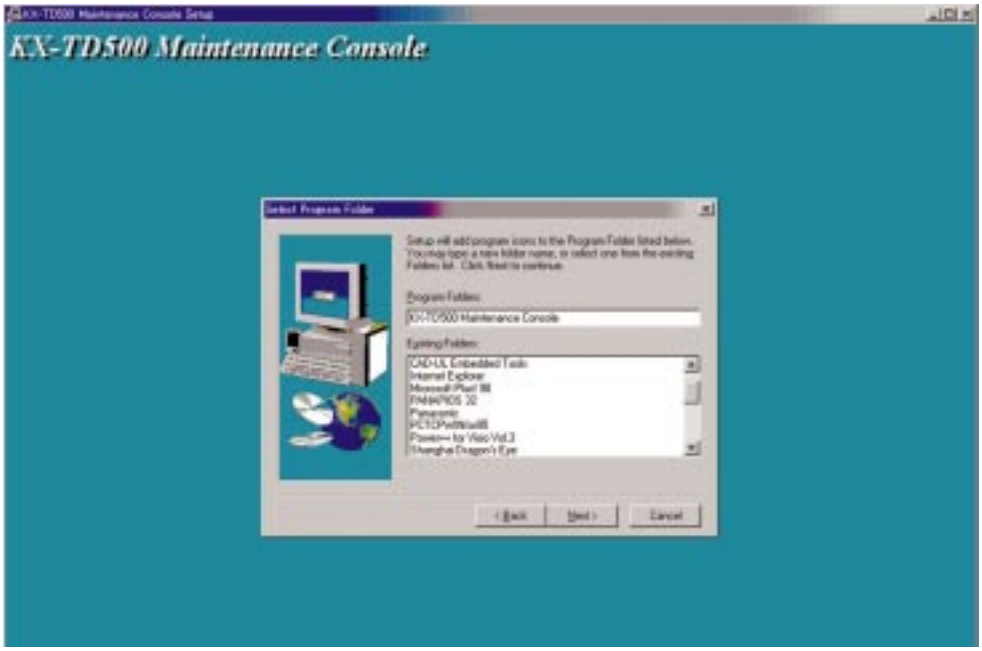




4. Press Next if you accept **"C:\Programmefiles\Panasonic\KX-TD500 Maintenance Console"** (initial value) as your Maintenance Console software directory.

   Or, enter a different directory name (if necessary) and press Next.

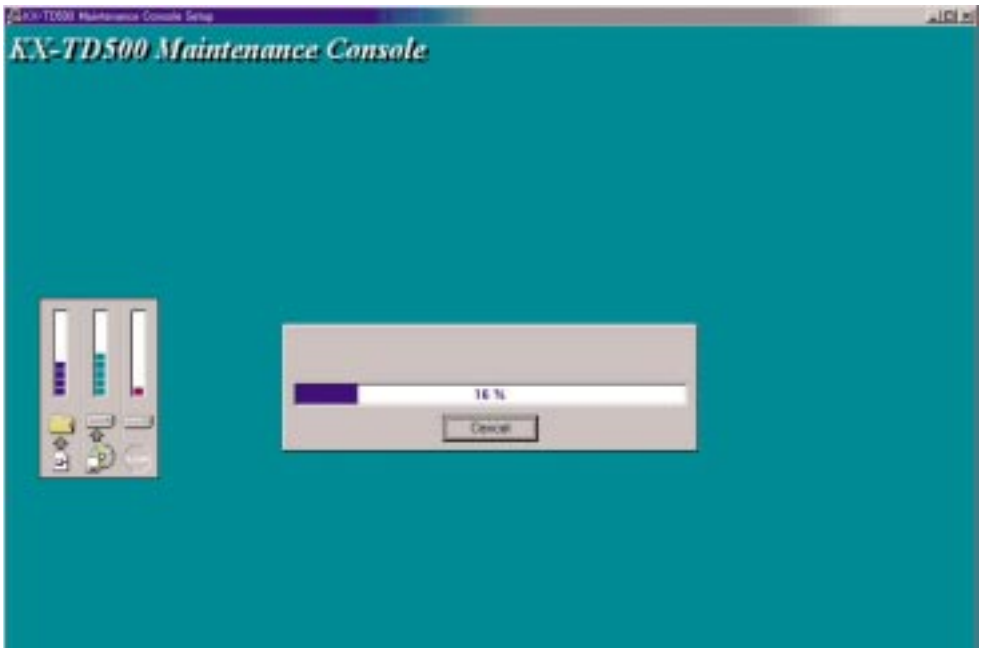
   - You will see the window shown below.



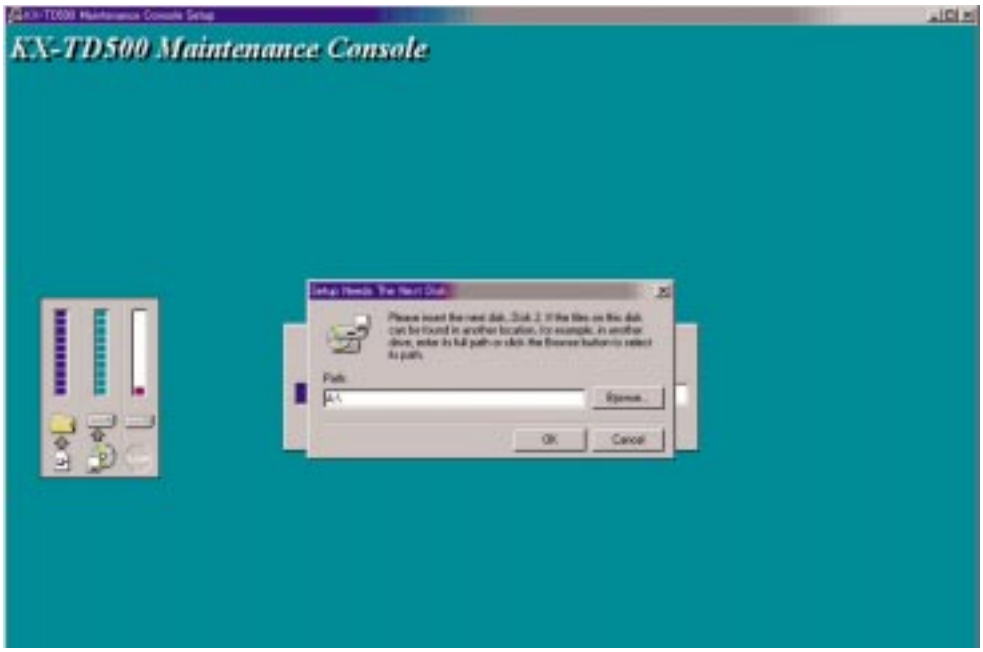
5. Press Next if you accept **"KX-TD500 Maintenance Console"** (initial value) as your Maintenance Console programme folder.

   Or, enter a different folder name (if necessary) and press Next.

   - You will see the window shown below.



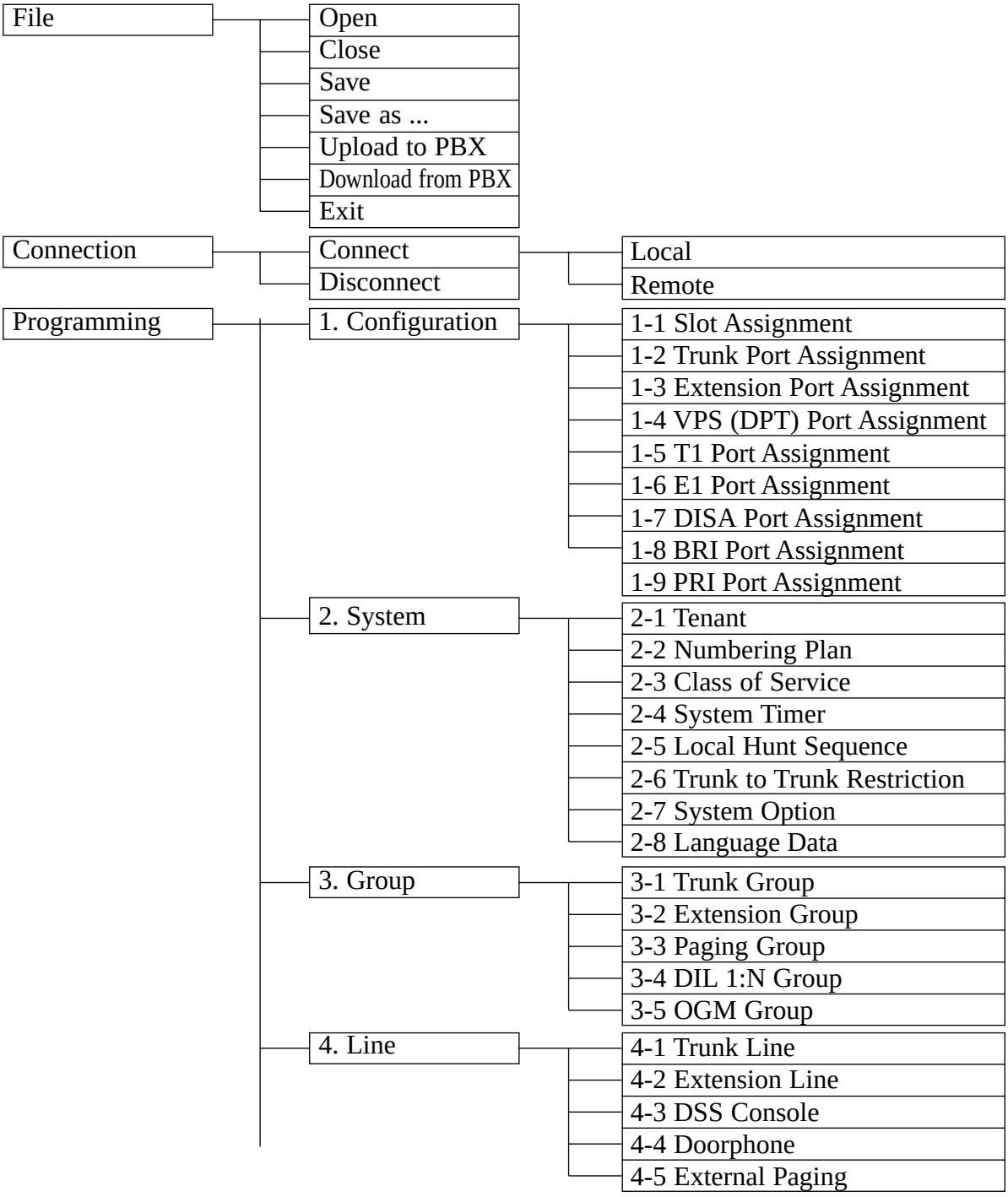
- Then "Setup Needs The Next Disk" screen appears.

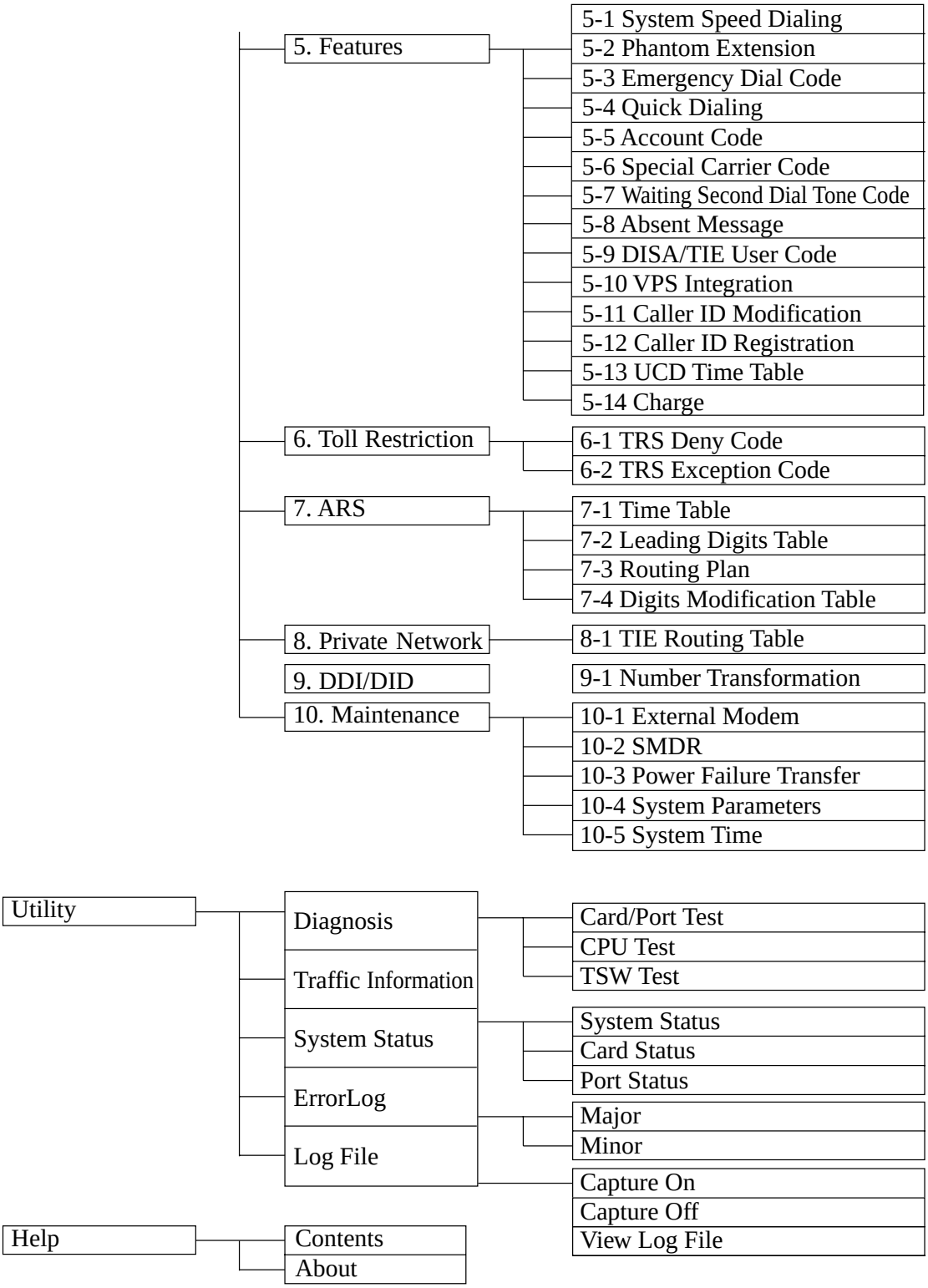


6. Insert Setup Disk 2 into the appropriate drive and press OK.

3.2 Structure of the Maintenance Console

3.2.1 Structure of the Maintenance Console




5. Features
5-1 System Speed Dialing
5-2 Phantom Extension
5-3 Emergency Dial Code
5-4 Quick Dialing
5-5 Account Code
5-6 Special Carrier Code
5-7 Waiting Second Dial Tone Code
5-8 Absent Message
5-9 DISA/TIE User Code
5-10 VPS Integration
5-11 Caller ID Modification
5-12 Caller ID Registration
5-13 UCD Time Table
5-14 Charge
6. Toll Restriction
6-1 TRS Deny Code
6-2 TRS Exception Code
7. ARS
7-1 Time Table
7-2 Leading Digits Table
7-3 Routing Plan
7-4 Digits Modification Table
8. Private Network
8-1 TIE Routing Table
9. DDI/DID
9-1 Number Transformation
10. Maintenance
10-1 External Modem
10-2 SMDR
10-3 Power Failure Transfer
10-4 System Parameters
10-5 System Time
Utility
Diagnosis
Traffic Information
System Status
ErrorLog
Log File
Card/Port Test
CPU Test
TSW Test
System Status
Card Status
Port Status
Major
Minor
Capture On
Capture Off
View Log File
Help
Contents
About

3.3 Basic Operation

3.3.1 Main Menu Screen

The Main Menu contains commands you can carry out on what you've selected. When you double-click the " TD500" icon using the left mouse button, the Main Menu screen is displayed.

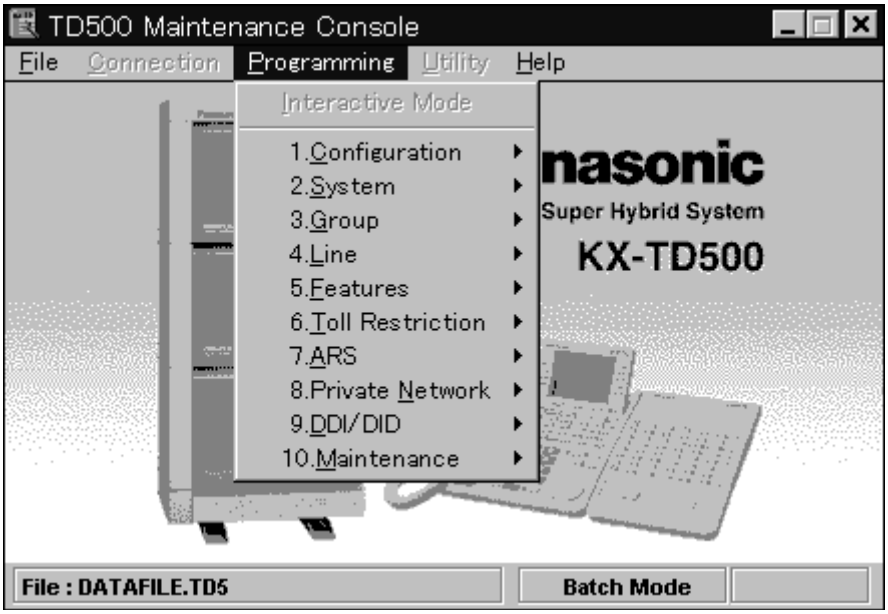
Along the top of the main menu screen, you can find the titles of five menus in the menu bar.

Selecting what you want to work with

Point to the desired menu title and click.

- The corresponding drop-down menu appears on the screen. If you click a command in the drop-down menu, a dialogue box appears.

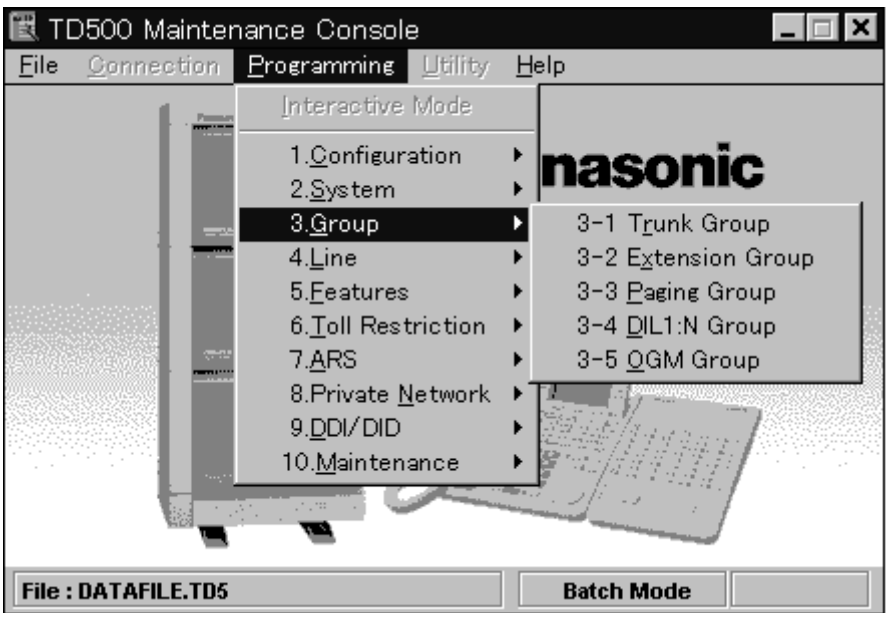
(Example)



Submenu

If you notice the small triangle at the right of the command, there is a Submenu containing more choices.

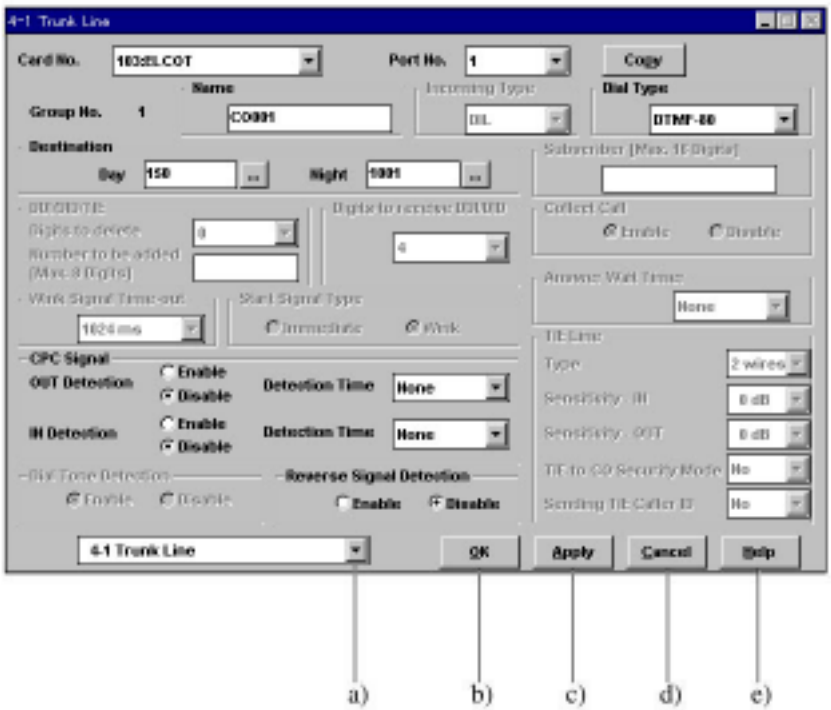
(Example)



3.3.2 Setup Dialogue

Setup dialogue buttons are arranged in the lower side of each programming screen. These buttons are used for saving or cancelling the data change you have made.

(Example)



a) Click here to display the drop-down list box containing all titles of programming screen. You can select a desired setup screen directly.

b) Click here to close the current setup screen after saving the data change.

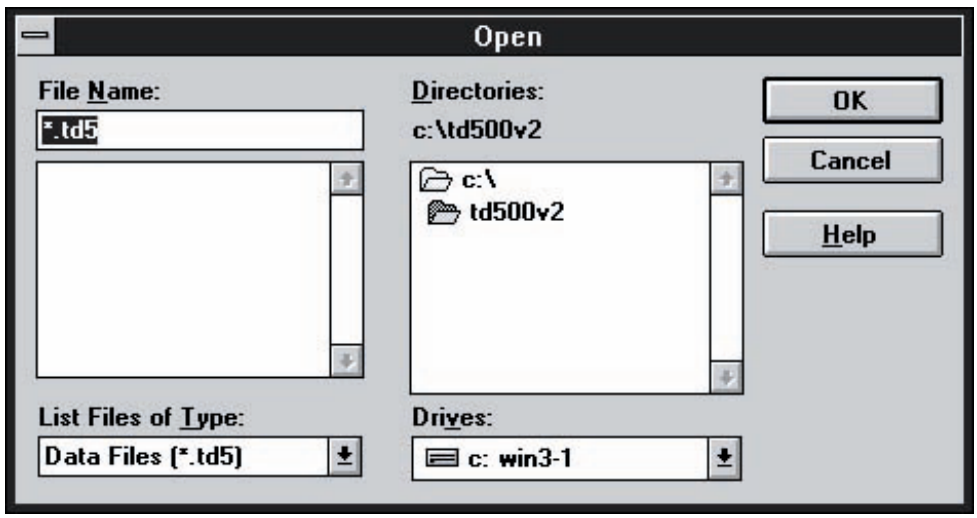
c) Click here to save the data change without closing the current setup screen.

d) Click here to close the current setup screen without saving the data change.

e) Click here to get instructions for using the application.

3.3.3 Files

Opening and saving files can be done using **"common dialogue boxes"** of Windows system.
(Example)
Open dialogue box - In Windows 3.1 or later



Note

- If you are saving a file for the first time, you see the "Save As" dialogue box.

3.4 System Administration

3.4.1 System Administration

You can execute System Administration either at On-site (Local Administration) or from a Remote Location (Remote Administration).

System Administration can be categorized as follows:

- **System Programming** (See Programming Guide.)
- **Maintenance** (See Section 4 Utility.)
- **Backup** (See 3.6.1 Backup.)

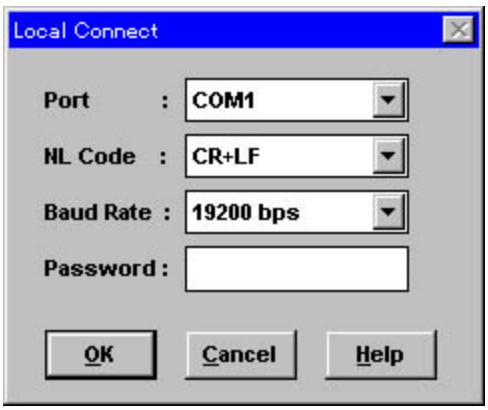
	With System Data	Without System Data
When connected with PBX	• Interactive Programming • Batch Programming • Receiving data from PBX • Sending data to PBX • Utility • Opening/Saving a file	• Interactive Programming • Receiving data from PBX • Utility • Opening/Saving a file
When not connected with PBX	• Batch Programming • Opening/Saving a file	• Opening a file

3.4.2 On-site Administration (Local Connection)

You can execute On-site System Administration by connecting your Maintenance Console PC to the KX-TD500 System directly using an RS-232C Cable.

Operation

1. Point to "Connection" in the Main Menu and click.
   - The "Connection" drop-down menu is displayed.
2. Point to "Connect" and click "Local" in the drop-down menu.
   - "Local Connect" screen is displayed.



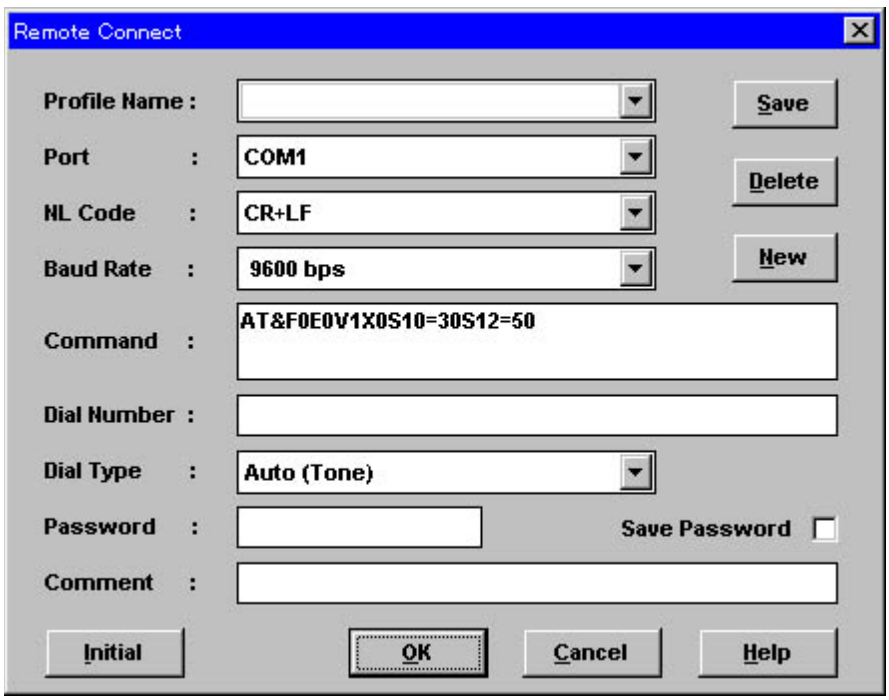
3. Enter the appropriate communication parameters and the System Programming password.
4. Click OK.
   - Communication between the KX-TD500 and a PC begins.
   - After a data link is established, choose a desired command from the Main Menu.

3.4.3 Remote Administration (Remote Connection)

You can execute the System Administration from a remote location using a modem via public telephone line.

Operation

1. Point to "Connection" in the Main Menu and click.
   - The "Connection" drop-down menu is displayed.
2. Point to "Connect" and click "Remote" in the drop-down menu.
   - "Remote Connect" screen is displayed.



3. Enter the appropriate communication parameters and the System Programming password.
4. Click OK .
   - Communication between the KX-TD500 and a PC begins.
5. Point to "Programming" in the Main Menu and click.
   - The "Programming" drop-down menu is displayed.
6. Click "Interactive" in the drop-down menu.
   - Communication between the KX-TD500 and a PC begins.

Remote Access Procedure

Starting up the System Administration from a remote location can be done in one of the following ways:

a) DISA (Direct Inward System Access)
Dial "Remote FDN" after accessing the KX-TD500 system using DISA feature.

b) DID (Direct Inward Dialling)
Programme DID feature so that the incoming telephone number is converted to "Remote FDN."

c) DIL 1:1
Assign "Remote FDN" as the destination of a CO line whose "Incoming Type" is set to "DIL."

d) Call Transfer to Remote Administration Resource
The call from a remote location can be made on any trunk into the system, and be answered by an extension user. The call is then placed on hold and the Remote FDN of the system dialled is received. The extension user transfers the call after receiving the modem answer tone. The caller at a remote location will then hear the modem answer tone and can proceed with sign-on.

Notes

- Be sure to install the software (attached to the modem) to your PC before executing the remote administration using a modem.
  Otherwise, remote access cannot be executed successfully.
- When 'Manual' is selected in "Dial Type" menu, please dial the desired telephone number using an SLT connected with the modem in parallel.
- To execute the Remote Administration, an ERMT card (KX-TD50197) should be installed in the system or an External Modem should be connected to the RS-232C Port 1.

3.5 Operational Mode

3.5.1 Operational Mode

System Programming can be done either in Interactive or Batch mode.
Interactive programming can be done either at On-site or by Remote.

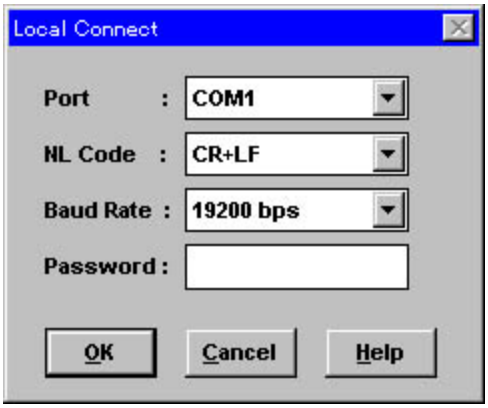
Interactive programming mode
Two-way communications between the KX-TD500 and a PC are taking place in real time. This provides the PC user with direct, immediate responses from the KX-TD500 system.

Batch Processing mode (Non-interactive)
In batch processing, all the data to be input is collected together before being processed together as a batch data.
Batch programming can be done by PC alone. No connection with the KX-TD500 System is required. The KX-TD500 System receives a batch transmission (upload) and has no need to respond to it.

3.5.2 Interactive Programming - On-site

Operation

1. Point to "Connection" in the Main Menu and click.
   - The "Connection" drop-down menu is displayed.
2. Click "Local" in the drop-down menu.
   - "Local Connect" screen is displayed.

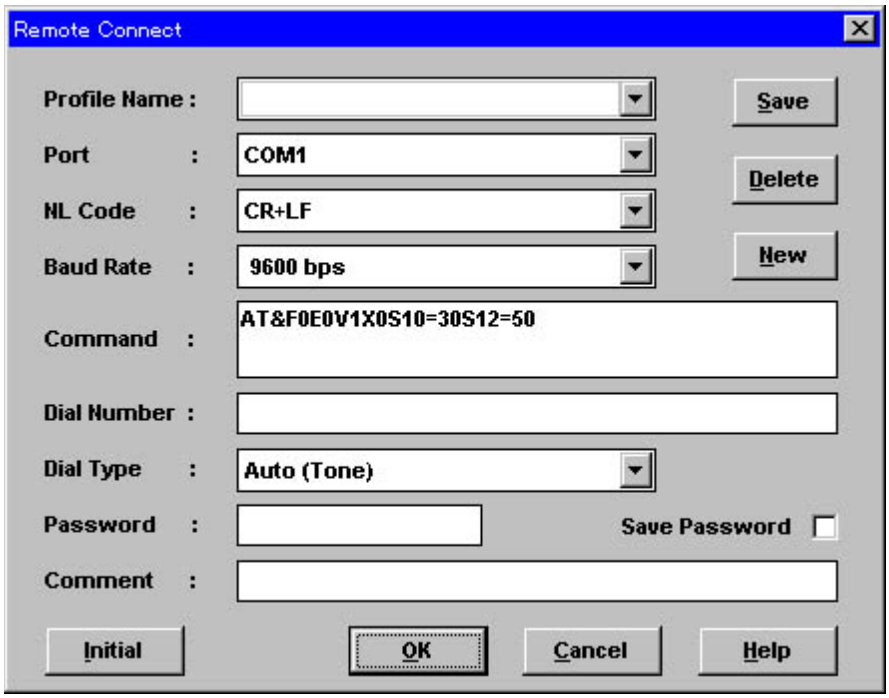


3. Enter the appropriate communication parameters and the System Programming password.
4. Click OK .
   - Communication between the KX-TD500 and a PC begins.
5. Point to "Programming" in the Main Menu and click.
   - The "Programming" drop-down menu is displayed.
6. Click "Interactive" in the drop-down menu.
   - Communication between the KX-TD500 and a PC begins.

3.5.3 Interactive Programming - Remote

Operation

1. Point to "Connection" in the Main Menu and click.
   - The "Connection" drop-down menu is displayed.
2. Click "Remote" in the drop-down menu.
   - "Remote Connect" screen is displayed.

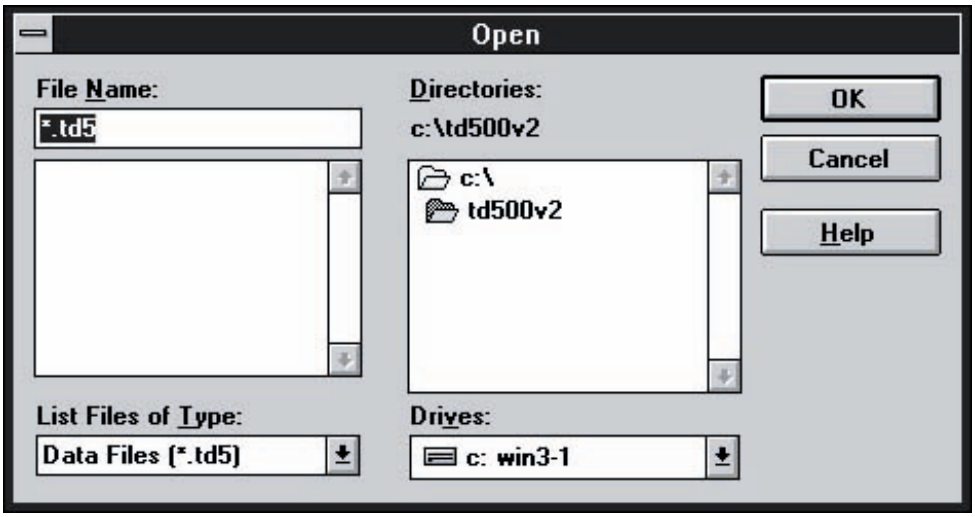


3. Enter the appropriate communication parameters and the System Programming password.
4. Click OK .
   - Communication between the KX-TD500 and a PC begins.
5. Point to "Programming" in the Main Menu and click.
   - The "Programming" drop-down menu is displayed.
6. Click "Interactive" in the drop-down menu.
   - Communication between the KX-TD500 and a PC begins.

3.5.4 Batch Programming

Operation

1. Point to "File" in the Main Menu and click.
   - The "File" drop-down menu is displayed.
2. Click "Open" in the drop-down menu.
   - "Open" dialogue box is displayed.



3. Choose the desired file and click OK .
   - "Main Menu" screen is displayed again.

3.6 Backup

3.6.1 Backup

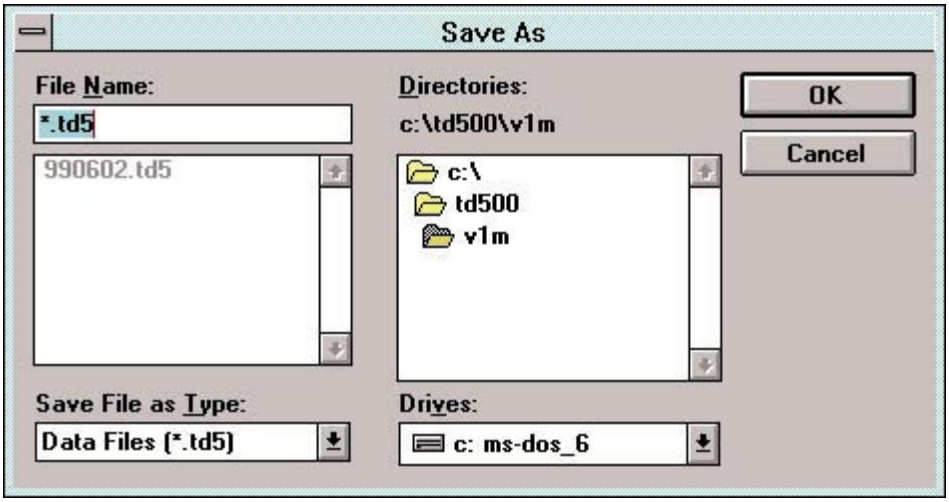
Backup is a procedure where a copy of the system programming data is stored on an external storage medium, such as a floppy disk.
If it becomes necessary to re-initialize the system programming data, it will be faster to reload from disk than by manual re-input.
This subsection describes a backup procedure of system programming data at on-site using a PC (Windows machine) via RS-232C cable.

Backup can be categorized as follows:
Download (from TD500 to PC)
Downloading system programming data from the KX-TD500 System to the PC at on-site can be done during on-line mode as well as off-line mode.
In case of Remote Access, download can be done during on-line mode only.
Upload (from PC to TD500)
Uploading the system programming data from the PC to the KX-TD500 System can be done during **off-line mode only**.

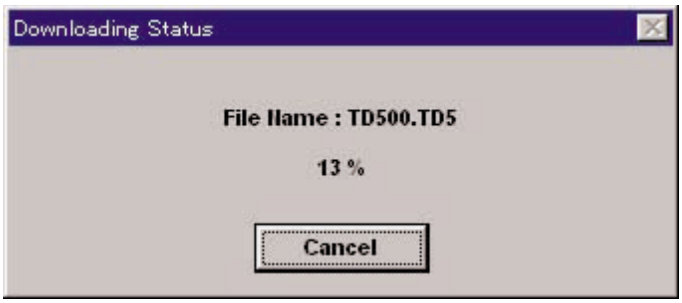
3.6.2 Download (from PBX to PC)

Operation

1. Point to "File" in the Main Menu and click.
   - The "File" drop-down menu is displayed.
2. Click "Download load to PBX" in the drop-down menu.
   - "Save As" dialogue box is displayed.



3. Enter the desired file name and click OK.
   - Downloading the system programming data from PBX to PC begins.

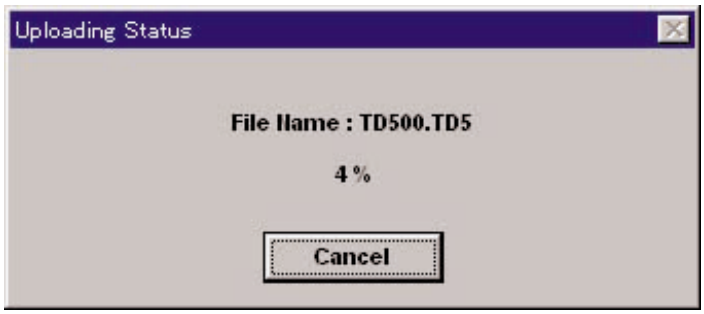


   - "Main Menu" screen is displayed again.

3.6.3 Upload (from PC to PBX)

Operation

1. Set the system to the off-line mode.
   - See Section 2.10 "Starting Up the KX-TD500 System" for details.
2. Point to "File" in the Main Menu and click.
   - The "File" drop-down menu is displayed.
3. Click "Upload to PBX" in the drop-down menu.
   - Uploading the system programming data from PC to PBX begins.



   - When the uploading is finished, "Upload End" dialogue box will be displayed.
4. Click OK.
   - The message "W2001: Would you like to upload a language data?" is displayed.
5. Click OK or Cancel.
   - If you click OK, "2-8 Language Data" screen will be displayed and the upload of the language data will begin automatically.
   - If you click Cancel, "Upload" screen will be closed.

Note

- Uploading the system programming data from the PC to the KX-TD500 System can be done during **off-line mode only** (See 3.6.1 Backup.)

Section 4

Utility

This section provides the information necessary for testing, monitoring and maintaining the system using a Windows machine in interactive mode.

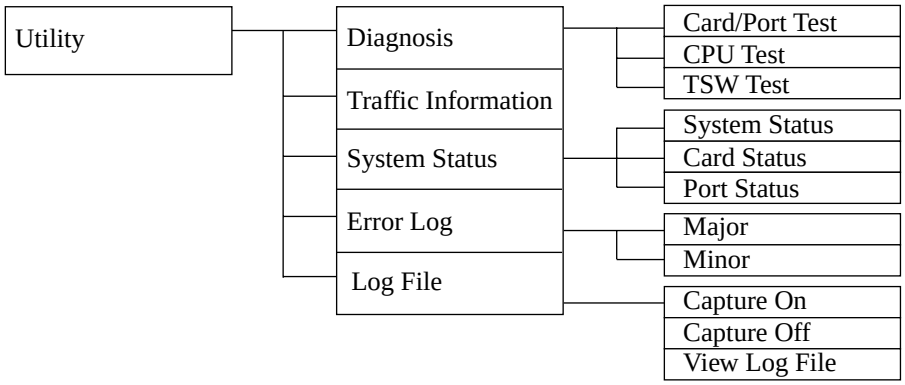
4.1 Introduction

4.1.1 Introduction

Utility software is designed to diagnose and fix problems, and to output Traffic Measurement and Error Log information.

This section describes the information necessary for testing, monitoring and maintaining the system using Windows machine in interactive format.
The modular self-testing capabilities of the system allow most maintenance to be reduced to simple procedures. Only one administration device can be performing system administration at the same time.

4.1.2 Structure of Utility Programme



Utility drop-down menu screen

4.2 Diagnosis

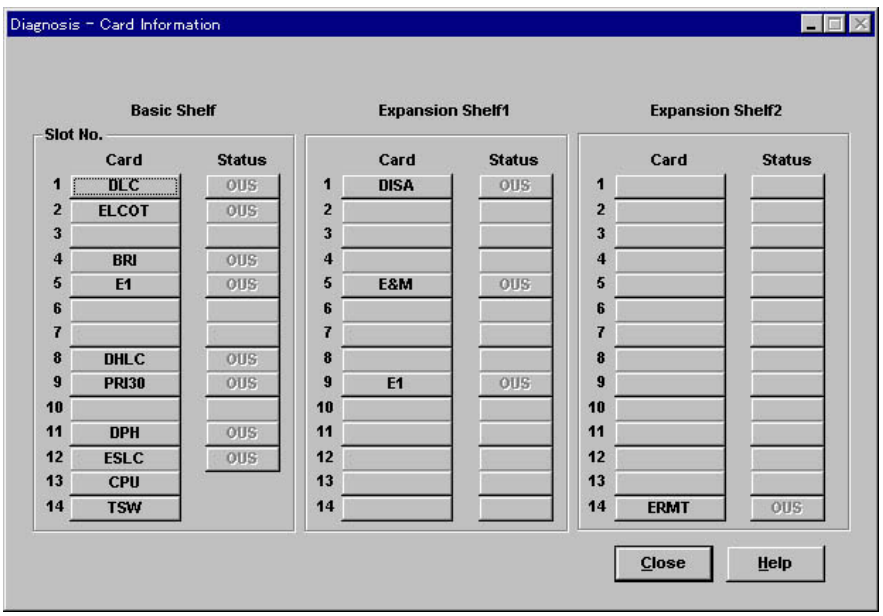
4.2.1 Diagnosis

System Diagnosis programme is used to test the system hardwares and pinpoint the problems caused by hardware defects.

System Diagnosis programme is classified into the following three types:

- 4.2.2 Card/Port Test (On-line/Off-line diagnosis)
- 4.2.3 CPU Test (Off-line diagnosis)
- 4.2.4 TSW Test (Off-line diagnosis)

Diagnosis - Card Information screen (an example of Off-line diagnosis)



4.2.2 Card/Port Test (On-line/Off-line diagnosis)

Functions to be verified

This test verifies the status of each card for the following items:

Classification	Target Card	Test Item
Card Test	SLC / HLC / PLC / SLC-M / DLC / DHLC / ESLC / LCOT / PCOT / RCOT / GCOT / DID / DID-MFC / DID-2W / T1 / ELCOT / E&M / AGC	LINK TYPE ROM RAM
	OPX	LINK TYPE ROM RAM POWER SUPPLY
	DISA	LINK TYPE DISA-ROM DISA-RAM OGM-ROM OGM-RAM OGM REC / PLAY
	DPH	TYPE
	RMT / ERMT	LINK TYPE ROM RAM MODEM
	E1	LINK TYPE ROM RAM DSP-LINK

Classification	Target Card	Test Item
Card Test	PRI30	LINK TYPE ROM RAM FRAME IC
	BRI	LINK TYPE ROM RAM FRAME IC POWER (DC)
Port Test	PLC / HLC	OHCA Detection
	DLC / DHLC	Speech Path HDLC
	DISA	Speech Path DTMF Receiver Tone Detector
	AGC	Speech Path DTMF Receiver Tone Detector Repeater
DTMF G / R Test	T1 / DID-MFC	DTMF-G / R
	E1	DTMF-G / R DSP Card
	BRI / PRI30	DTMF-G
Loop Back Test	E1 / T1	Control Channel Speech Channel
Caller ID Loop Back Test	ELCOT	Caller ID Loop Back

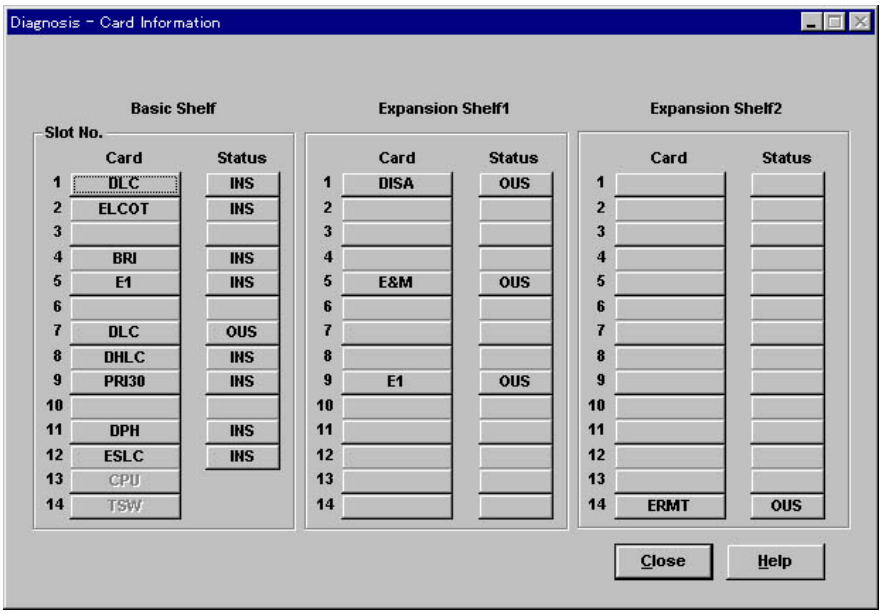
Classification	Target Card	Test Item
CO-Extension Path Test	LCOT / PCOT / RCOT / GCOT / ELCOT (Paired Extension: SLC / HLC / SLC-M / ESLC / DHLC / OPX)	Loop Current Bell Hook Dial Pulse Path (CO → EXT) Path (EXT → CO) PBR 1 (EXT) PBR 2 (EXT) PBR 3 (EXT) PBR 4 (EXT) PBG (CO)
PT Path Test	PLC / HLC / DLC / DHLC	Path (Voice) Path (OHCA)

Before executing the Card/Port Test

- This test is required in the following cases:
  - **a)** When new devices are installed.
  - **b)** When the device combination is changed.
  - **c)** When the system detects an alarm or an error message in the error log.
  - **d)** When the device status becomes "Fault."
  - **e)** When a number of extension phones don't function properly.
- This test is available in on-line/off-line mode.
  Please refer to "2.10 Starting Up the KX-TD500 System" in this manual for details about on-line and off-line.
- The target card should be set to "OUS (Out-of-Service)" status beforehand.

[Card/Port Test] - Operation (General)

1. Point to "Utility" in the Main Menu and click.
   - The "Utility" drop-down menu is displayed.
2. Click "Diagnosis" in the drop-down menu.
   - "Diagnosis - Card Information" (an example of on-line diagnosis) screen is displayed.



3. Click INS Status button of the target card.
(Example: When a DLC card is installed in the Slot No.1 of the Basic Shelf)

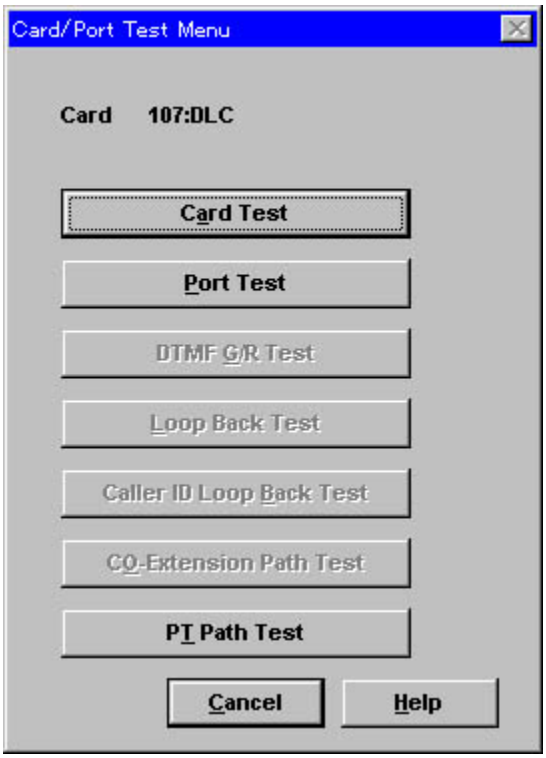
- The message "Change the status of card (101:DLC)?" is displayed.

4. Click OK.

- Confirm that the Status button of the target card is changed to "OUS (Out-of-Service)."

5. Click the Card button of the target card.

- "Card / Port Test Menu" screen is displayed.
  This menu shows the test items for each card that you selected in the "Card Information" screen. The card number and the type of the target card are displayed on the top of this screen.
- If the card you selected is in INS (In-Service) status, the message "Status Error (The card status is not "OUS")" is displayed.



Notes

- From "Card / Port Test Menu" screen, you can select one of the following seven tests.
  - Card Test
  - Port Test
  - DTMF G/R Test
  - Loop Back Test
  - Caller ID Loop Back Test
  - CO-Extension Path Test
  - PT Path Test
- Test items which apply to the card vary depending on the card type.
  Dim-displayed test items are not available for the selected card type.

[Card/Port Test] Card Test – Operation

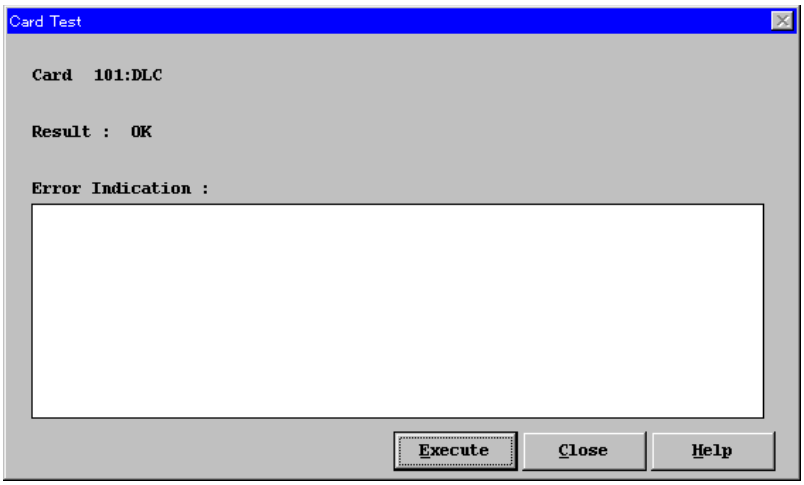
(Continued from step 5 of [Card/Port Test] – Operation (General).)

a) Point to Card Test in the Card/Port Test Menu screen and click.

- "Card Test" screen is displayed.

b) Click Execute.

- After executing the test, the test result is displayed.
  Example: When a DLC card is installed in the Slot No. 101.



Notes

- After executing (or cancelling) the Card Test, go back to "Diagnosis - Card Information" screen by pressing Close button and change the card status from "OUS (Out-of-Service)" to "INS (In-Service)."
- Executing the DISA card test erases the pre-recorded OGM and a beep tone will be recorded automatically instead of the OGM.
- When executing the T1/E1 card test, set the DIP Switch on the T1/E1 card to "TEST" position.

[Card/Port Test] Card Test - Description

Item	Display/Input Value	Description
Card	Card No. : Type	The card number and the type of the target card to be diagnosed. (The card specified in "Card Information" screen is displayed automatically.)
Result	OK NG	The results of diagnosis.
Error Indication	See "Error Indication Table."	The details of an error. Displayed only when Result is NG (no good).

[Card/Port Test] Card Test - Error Indication Table

Error Message	Description	Card Applied
Card link error	Data link between the selected card and the PBX is abnormal.	
Card type error	Card assignment does not match the card type installed to the free slot.	
ROM error	Card ROM is not functioning properly.	

[Card/Port Test] Card Test - Error Indication Table

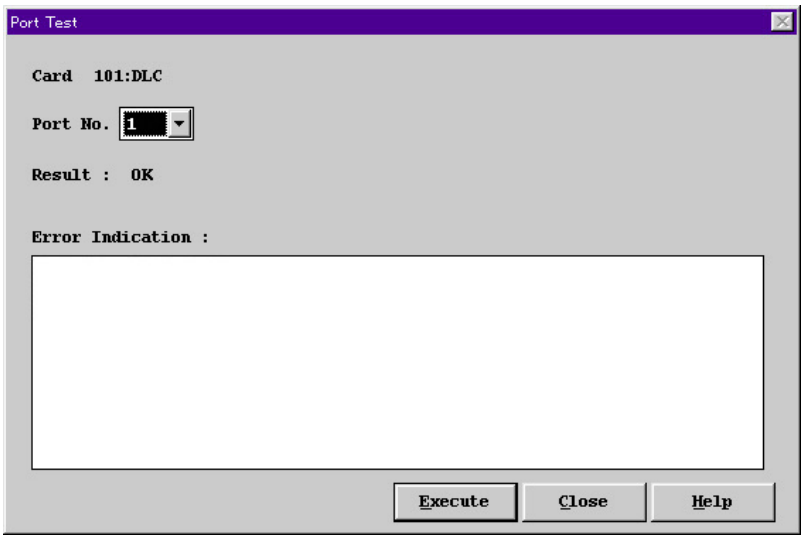
Error Message	Description	Card Applied
RAM error	Card RAM is not functioning properly.	
MODEM failure	MODEM is not functioning properly.	RMT/ ERMT
OPX power failure	OPX External Power Unit is not functioning properly.	OPX
Bell power failure	OPX Bell Power is not functioning properly.	OPX
OGM ROM error	OGM controlling ROM on the DISA card is not functioning properly.	DISA
OGM RAM error	OGM controlling RAM on the DISA card is not functioning properly.	DISA
OGM Rec / Play failure	OGM Recording and Playing back are not functioning properly.	DISA
DSP link error	Data link between the DSP card and the PBX is abnormal.	E1
Frame IC error	ISDN Frame IC is not functioning properly.	PRI30, BRI
ISDN power failure	ISDN power is not functioning properly.	BRI

[Card/Port Test] Port Test – Operation
(Continued from step 5 of [Card/Port Test] – Operation (General).)

a) Point to Port Test in the Card/Port Test Menu screen and click.
- "Port Test" screen is displayed.

b) Specify the port number, or select "All."
- If you select "All," all ports on the selected card will be tested at a time.

c) Click Execute.
- After executing the test, the test result is displayed.
  Example: When a DLC card is installed in the Slot No. 101



Note

- An APT/DPT should be connected to the specified card when executing the DLC or DHLC port test.

[Card/Port Test] Port Test - Description

Item	Display/Input Value	Description
Card	Card No. : Type	The card number and the type of the target card to be diagnosed. (The card specified in "Card Information" screen is displayed automatically.)
Port No.	1-4/8/16/all	The port number of the target card to be diagnosed.
Result	OK NG	The results of diagnosis.
Error Indication	See "Error Indication Table."	The details of an error. Displayed only when Result is NG (no good).

[Card/Port Test] Port Test - Error Indication Table

Error Message	Description	Card Applied
Tone detection circuit 1 failure	Tone detection of circuit 1 is not functioning properly.	DISA, AGC
Tone detection circuit 2 failure	Tone detection of circuit 2 is not functioning properly.	DISA, AGC

[Card/Port Test] Port Test - Error Indication Table

Error Message	Description	Card Applied
HDLC failure	HDLC (high level data link control procedures) controller is not functioning properly.	DLC, DHLC
OHCA card not installed	OHCA (Off Hock Call Announcement) Card is not installed.	PLC, HLC
PB receiver failure	PB receiver is not functioning properly.	DISA, AGC
Speech path failure	Speech path is abnormal.	DLC, DHLC, DISA, AGC
Repeater failure	Repeater is not functioning properly.	AGC

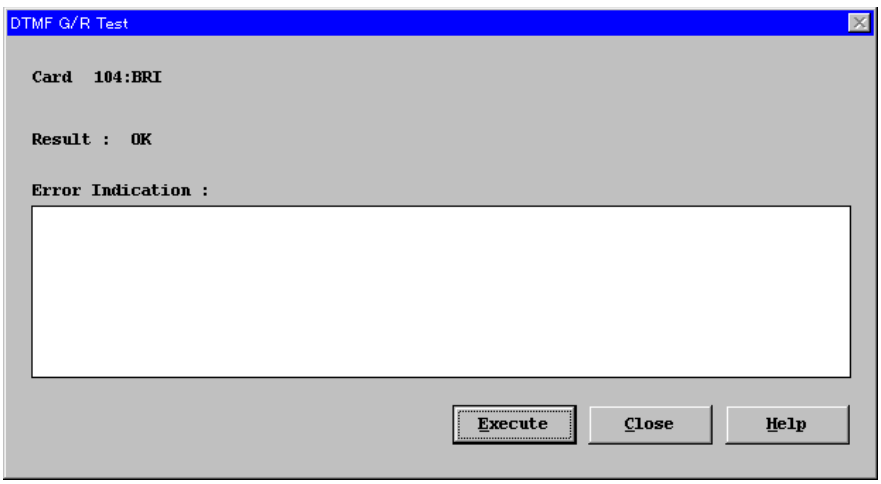
[Card/Port Test] DTMF G/R Test – Operation
(Continued from step 5 of [Card/Port Test] – Operation (General).)

a) Point to DTMF G/R Test in the Card/Port Test Menu screen and click.

- "DTMF G/R Test" screen is displayed.

b) Click Execute.

- After executing the test, the test result is displayed.
  Example: When a BRI card is installed in the Slot No. 104.



Note

- When executing the T1/E1 card test, set the DIP Switch on the T1/E1 card to "TEST" position.

[Card/Port Test] DTMF G/R Test - Description

Item	Display/Input Value	Description
Card	Card No. : Type	The card number and the type of the target card to be diagnosed. (The card specified in "Card Information" screen is displayed automatically.)
Result	OK NG	The results of diagnosis.
Error Indication	See "Error Indication Table."	The details of an error. Displayed only when Result is NG (no good).

[Card/Port Test] DTMF G/R Test - Error Indication Table

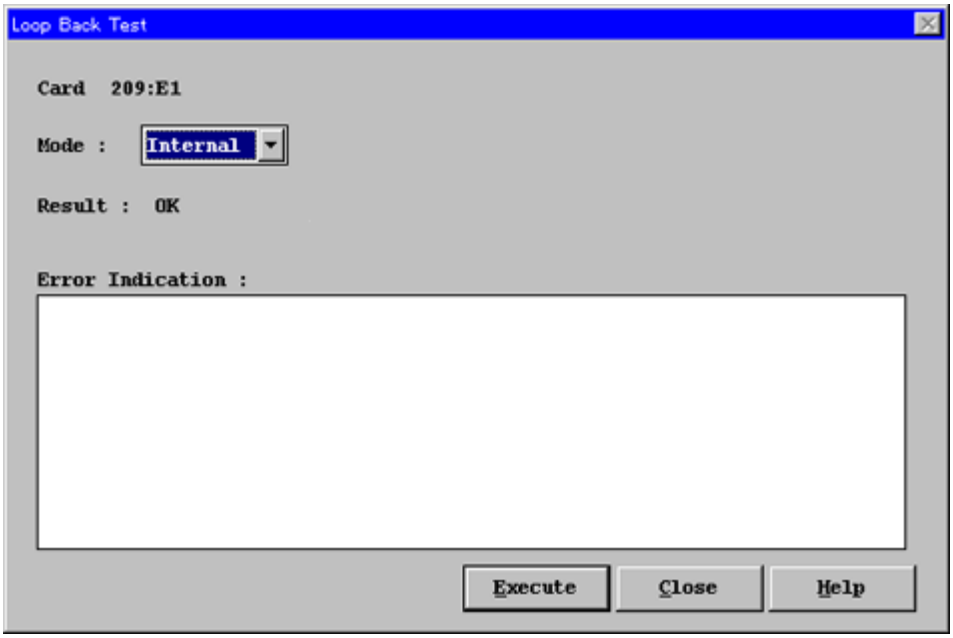
Error Message	Description	Card Applied
PB Generator XX failure	PB Generator is not functioning properly. XX:PB Generator No.	E1, BRI, PRI30, T1, DID-MFC
PB Receiver XX failure	PB Receiver is not functioning properly. XX:PB Receiver No.	E1, T1, DID-MFC
DSP1 failure	DSP1 on the E1 Card is not functioning properly.	E1
DSP2 failure	DSP2 on the E1 Card is not functioning properly.	E1

[Card/Port Test] Loop Back Test – Operation
(Continued from step 5 of [Card/Port Test] – Operation (General).)

a) Point to Loop Back Test in the Card/Port Test Menu screen and click.
- "Loop Back Test" screen is displayed.

b) Specify "External" or "Internal."

c) Click Execute.
- Loop Back Test is executed between the Generator 1 and the Receiver 1.
- After executing the test, the test result is displayed.
  Example: When an E1 card is installed in the Slot No. 209.



[Card/Port Test] Loop Back Test - Description

Item	Display/Input Value	Description
Card	Card No. : Type	The card number and the type of the target card to be diagnosed. (The card specified in "Card Information" screen is displayed automatically.)
Mode	Internal External	Used to specify "Internal Loop Back" or "External Loop Back."
Result	OK NG	The results of diagnosis.
Error Indication	See "Error Indication Table."	The details of an error. Displayed only when Result is NG (no good).

[Card/Port Test] Loop Back Test - Error Indication Table

Error Message	Description	Card Applied
Speech path failure	Speech path is abnormal.	E1, T1
Control signal path failure	Control signal path is abnormal.	E1, T1

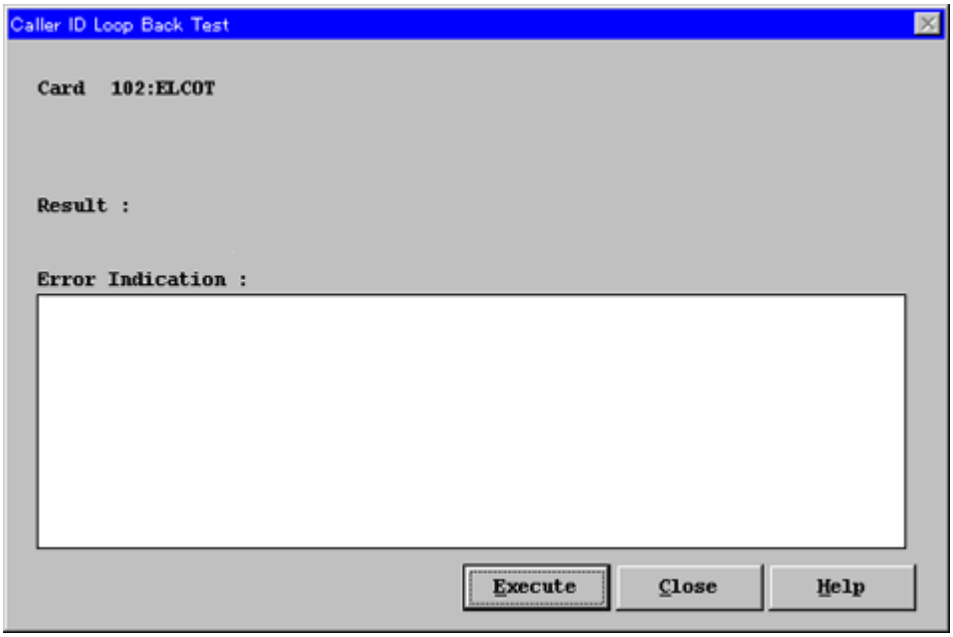
[Card/Port Test] Caller ID Loop Back Test – Operation
(Continued from step 5 of [Card/Port Test] – Operation (General).)

a) Point to Caller ID Loop Back Test in the Card/Port Test Menu screen and click.

- "Caller ID Loop Back Test" screen is displayed.

b) Click Execute.

- After executing the test, the test result is displayed.
  Example: When an ELCOT card is installed in the Slot No. 102.



[Card/Port Test] Caller ID Loop Back Test - Description

Item	Display/Input Value	Description
Card	Card No. : Type	The card number and the type of the target card to be diagnosed. (The card specified in "Card Information" screen is displayed automatically.)
Result	OK NG	The results of diagnosis.
Error Indication	See "Error Indication Table."	The details of an error. Displayed only when Result is NG (no good).

[Card/Port Test] Caller ID Loop Back Test - Error Indication Table

Error Message	Description	Card Applied
Caller ID card detection error	Caller ID card is not installed.	ELCOT

[Card/Port Test] CO-Extention Path Test – Operation
(Continued from step 5 of [Card/Port Test] – Operation (General).)

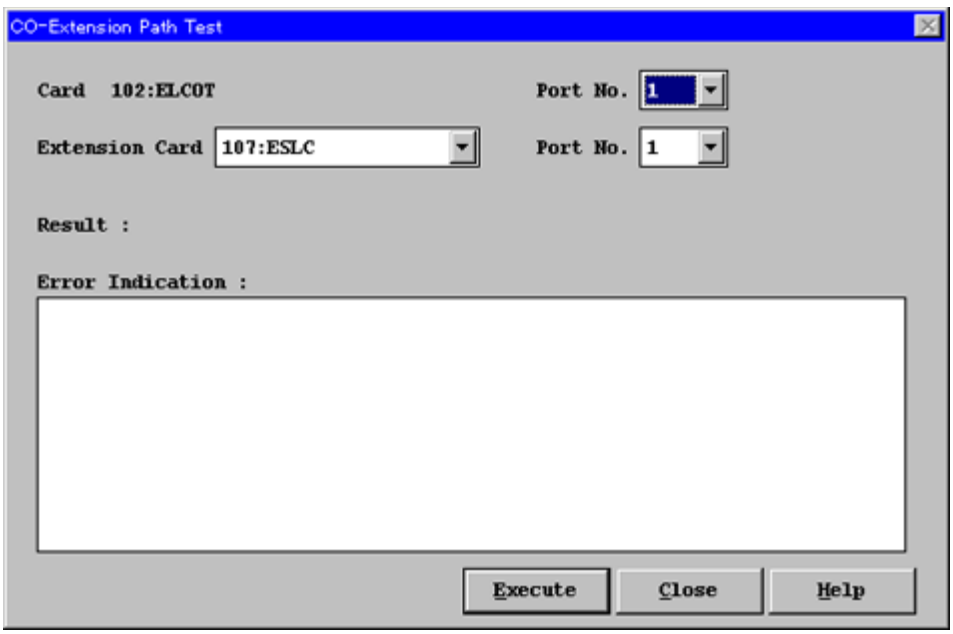
This test is executed by selecting a trunk card in "Card Information" screen.
A trunk port and an extension port are tested in pairs.

a) Point to CO-Extension Path Test in the Card/Port Test Menu screen and click.
- "CO-Extension Path Test" screen is displayed.

b) Specify a port number of the CO card to be tested.

c) Specify an Extension Card and its port number to be tested.

d) Click Execute.
- After executing the test, the test result is displayed.
  Example:
  When an ELCOT card is installed in the Slot No. 102 and an ESLC card is installed in the Slot No.107.



[Card/Port Test] CO-Extension Path Test - Description

Item	Display/Input Value	Description
CO Card	Card No. : Type	The card number and the type of the target card to be diagnosed. (The card specified in "Card Information" screen is displayed automatically.)
Port No.	1-8/ all	Used to specify the port number of the trunk card to be diagnosed.
Extension Card	Card No. : Type	Used to specify the paired extension card (in OUS(Out-of-Service)) status to be diagnosed. Options: SLC/HLC/SLC-M/ESLC/DHLC/ OPX
Port No.	1-4/8/16/all	Used to specify the port number of the extension card to be diagnosed.
Result	OK NG	The results of diagnosis.
Error Indication	See "Error Indication Table."	The details of an error. Displayed only when Result is NG (no good). TXXXXX&EXXXXX:"Error Message" (TXXXXX: Physical port no. of CO, EXXXXX: Physical port no. of Extension)

[Card/Port Test] CO-Extension Path Test - Error Indication Table

Error Message	Description
Loop current failure	Loop current was not detected.
Bell detection failure	Bell signal was not detected.
PB Generator failure	PB Generator is not functioning properly.
Hook signal detection failure	Hooking signal was not detected.
Dial pulse failure	Dial Pulse signal was not detected.
Speech path failure (CO→Extension)	Speech path (CO→Extension) is abnormal.
Speech path failure (Extension→CO)	Speech path (Extension→CO) is abnormal.
PB receiver 1 failure	PB Receiver 1 is not functioning properly.
PB receiver 2 failure	PB Receiver 2 is not functioning properly.
PB receiver 3 failure	PB Receiver 3 is not functioning properly.

[Card/Port Test] CO-Extension Path Test - Error Indication Table

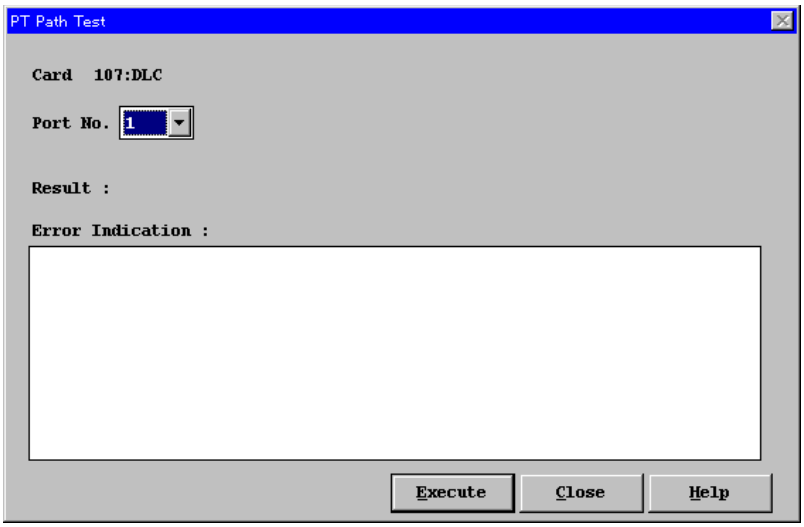
Error Message	Description
PB receiver 4 failure	PB Receiver 4 is not functioning properly.

[Card/Port Test] PT Path Test – Operation
(Continued from step 5 of [Card/Port Test] – Operation (General).)

a) Point to PT Path Test in the Card/Port Test Menu screen and click.
- "PT Path Test" screen is displayed.

b) Specify the port number to be tested, or select "All."
- If you select "All," all ports on the selected card will be tested at a time.

c) Click Execute.
- After executing the test, the test result is displayed.
  Example: When a DLC card is installed in the Slot No. 107.



[Card/Port Test] PT Path Test - Description

Item	Display/Input Value	Description
Card	Card No. : Type	The card number and the type of the target card to be diagnosed. (The card specified in "Card Information" screen is displayed automatically.)
Port No.	1-8/16/all	Used to specify the port number of the extension card to be diagnosed.
Result	OK NG	The results of diagnosis.

[Card/Port Test] PT Path Test - Description

Item	Display/Input Value	Description
Error Indication	See "Error Indication Table."	The details of an error. Displayed only when Result is NG (no good).

[Card/Port Test] PT Path Test - Error Indication Table

Error Message	Description	Card Applied
PT Link failure	Communication link between the target card and PT is abnormal.	PLC, HLC, DLC, DHLC
PT Normal Path failure	PT Normal Path is not functioning properly.	PLC, HLC, DLC, DHLC
PT OHCA Path failure	PT OHCA Path is not functioning properly.	PLC, HLC, DLC, DHLC
Not Available	The PT connected to the specified port is not applicable to this test. APTs other than KX-T7130 are not applicable to this test.	PLC, HLC, DHLC

Notes

- This test applies to all DPTs and a certain type of APT(KX-T7130 only). If other type of PTs are used for the test, the message "Not Available" will be displayed.
- When executing this test with KX-T7130, use a 6-conductor wiring cord (3-paired wire) for testing the OHCA path.
- When executing this test, a PT in "INS (In-Service)" status should be connected to the specified card. Otherwise the test is not available.
- A message "PT Link failure" will also be displayed, if the test target is an SLT card.
- If both messages "PT Normal Path failure" and "PT OHCA Path failure" are displayed simultaneously, there will be a possibility of PT PB Generator failure.

4.2.3 CPU Test (Off-line diagnosis)

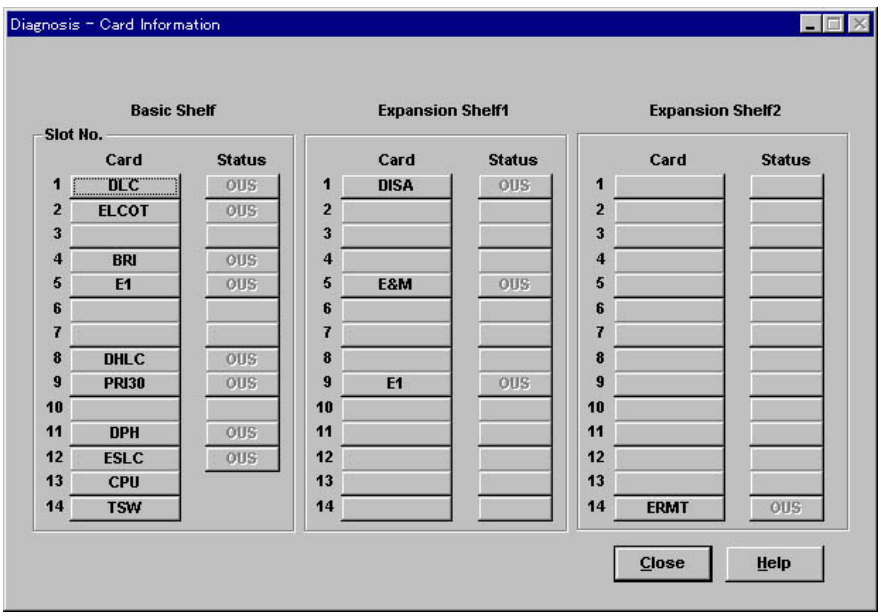
"CPU Test Menu" screen is displayed by clicking the CPU button on "Card Information" screen. The Calendar IC of the CPU card is diagnosed on this screen. This diagnosis is available for the system in off-line mode.

Functions to be verified

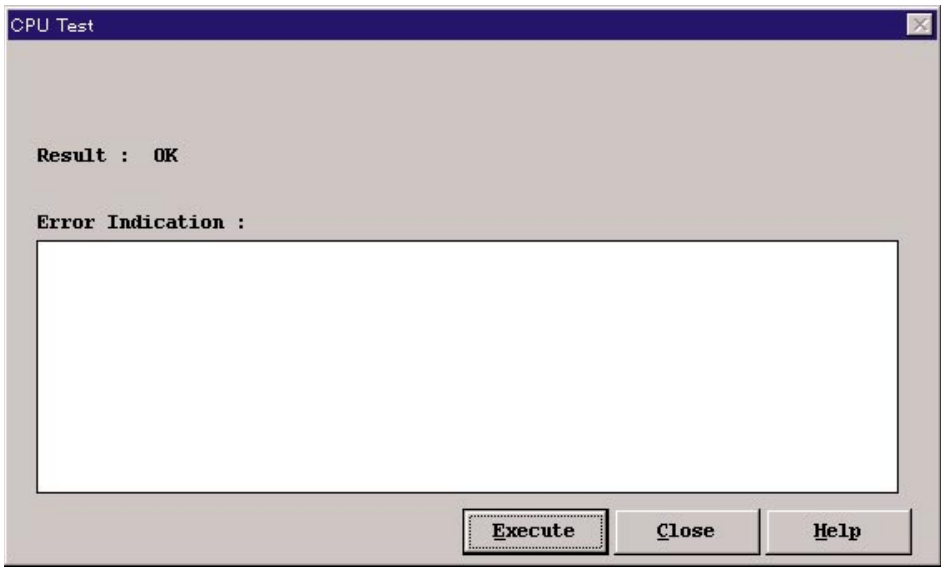
Classification	Target Card	Test Item
CPU Test	CPU	Calendar IC

[CPU Test] – Operation

1. Set the system to the off-line mode.
   - See 2.10 Starting Up the KX-TD500 System for details.
2. Point to "Utility" in the Main Menu and click.
   - The "Utility" drop-down menu is displayed.
3. Click "Diagnosis."
   - "Card Information" screen is displayed.



4. Click CPU.
   - "CPU Test" screen is displayed.
5. Click Execute.
   - After executing the test, the CPU Test Result is displayed.



[CPU Test] - Description

Item	Display/Input Value	CPU Test - Description
Result	OK NG	The results of diagnosis.
CPU Test - Error Indication	See "Error Indication Table."	The details of an error. Displayed only when Result is NG (no good).

[CPU Test] - Error Indication Table

Error Message	Description
Calendar IC failure	Calendar IC is not functioning properly.

4.2.4 TSW Test (Off-line diagnosis)

TSW Test is classified into the following three types:

- TSW Test
- Extension-CONF Card Test
- Digital OHCA Card Test

TSW Test should be done in off-line mode.

Functions to be verified

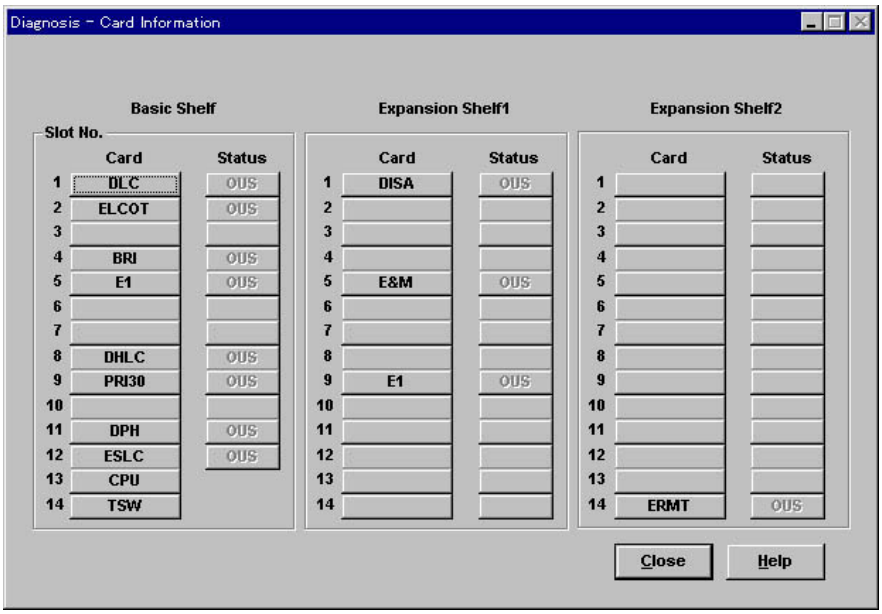
Classification	Card Name	Test Item
TSW Test	TSW	Tone Detection TSW DPAD CONF
	Expansion-CONF	Card Detection CONF. Trunk
	Digital OHCA	Card Detection OHCA TSW

[TSW Test] - Operation (General)

1. Set the system to the off-line mode.
- See 2.10 Starting Up the KX-TD500 System for details.

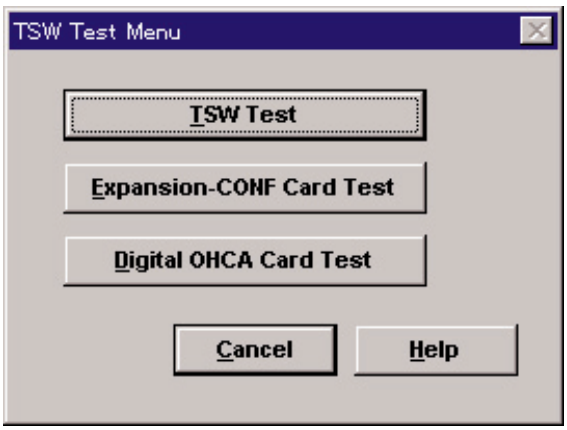
2. Point to "Utility" in the Main Menu and click.
- The "Utility" drop-down menu is displayed.

3. Click "Diagnosis."
- "Card Information" screen is displayed.



4. Click TSW .

- "TSW Test Menu" screen is displayed.



Note

- From "TSW Test Menu" screen, you can select one of the following three tests.
  - TSW Test
  - Expansion-CONF Card Test
  - Digital OHCA Card Test

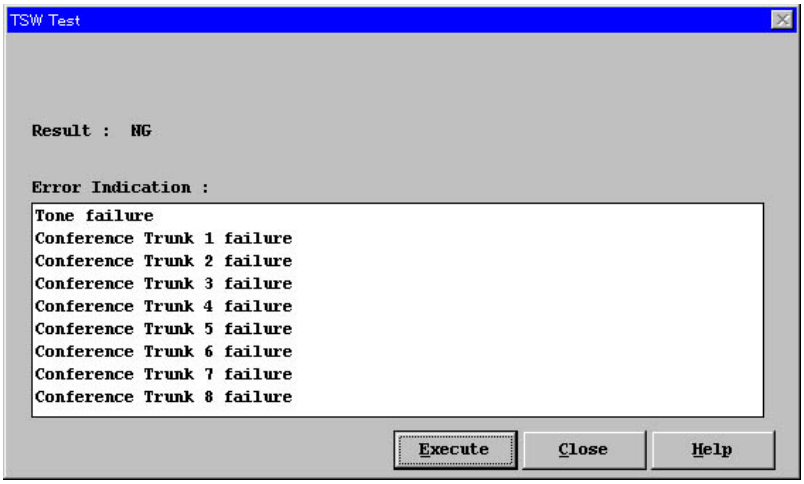
[TSW Test] TSW Test – Operation
(Continued from step 4 of [TSW Test] – Operation (General).)

a) Point to TSW Test in the TSW Test Menu screen and click.

- "TSW Test" screen is displayed.

b) Click Execute.

- After executing the test, the TSW Test Result is displayed.



[TSW Test] TSW Test - Description

Item	Display/Input Value	Description
Result	OK NG	The results of diagnosis.
Error Indication	See "Error Indication Table."	The details of an error. Displayed only when Result is NG (no good).

[TSW Test] TSW Test - Error Indication Table

Error Message	Description
Tone failure	PB tone detector is not functioning properly.
TSW1 failure	TSW1 is abnormal.
TSW2 failure	TSW2 is abnormal.
TSW3 failure	TSW3 is abnormal.
TSW4 failure	TSW4 is abnormal.
TSW5 failure	TSW5 is abnormal.
TSW6 failure	TSW6 is abnormal.

[TSW Test] TSW Test - Error Indication Table

Error Message	Description
TSW7 failure	TSW7 is abnormal.
TSW8 failure	TSW8 is abnormal.
TSW9 failure	TSW9 is abnormal.
DPAD1 failure	DPAD1 is abnormal.
DPAD2 failure	DPAD2 is abnormal.
DPAD3 failure	DPAD3 is abnormal.
DPAD4 failure	DPAD4 is abnormal.
Conference Trunk 1 failure	Conference Trunk 1 is not functioning properly.
Conference Trunk 2 failure	Conference Trunk 2 is not functioning properly.
Conference Trunk 3 failure	Conference Trunk 3 is not functioning properly.
Conference Trunk 4 failure	Conference Trunk 4 is not functioning properly.
Conference Trunk 5 failure	Conference Trunk 5 is not functioning properly.
Conference Trunk 6 failure	Conference Trunk 6 is not functioning properly.
Conference Trunk 7 failure	Conference Trunk 7 is not functioning properly.
Conference Trunk 8 failure	Conference Trunk 8 is not functioning properly.

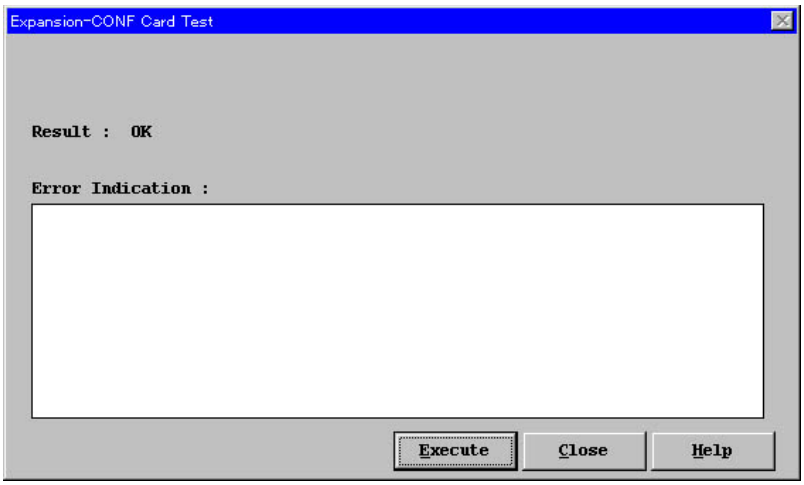
[TSW Test] Expansion-CONF Card Test – Operation
(Continued from step 4 of [TSW Test] – Operation (General).)

a) Point to Expansion-CONF Card Test in the TSW Test Menu screen and click.

- "Expansion-CONF Card Test" screen is displayed.
- This test is available only when "Expansion Conference Card" is installed in the system. Otherwise "Not Installed" will be displayed.

b) Click Execute.

- After executing the test, the Test Result is displayed.



[TSW Test] Expansion-CONF Card Test - Description

Item	Display/Input Value	Description
Result	OK NG	The results of diagnosis.
Error Indication	See "Error Indication Table."	The details of an error. Displayed only when Result is NG (no good).

[TSW Test] Expansion-CONF Card Test - Error Indication Table

Error Message	Description
Not Installed	Expansion Conference Card is not installed.
Conference Trunk 1 failure	Expansion Conference Trunk 1 is defective.
Conference Trunk 2 failure	Expansion Conference Trunk 2 is defective.

[TSW Test] Expansion-CONF Card Test - Error Indication Table

Error Message	Description
Conference Trunk 3 failure	Expansion Conference Trunk 3 is defective.
Conference Trunk 4 failure	Expansion Conference Trunk 4 is defective.
Conference Trunk 5 failure	Expansion Conference Trunk 5 is defective.
Conference Trunk 6 failure	Expansion Conference Trunk 6 is defective.
: :	: :
Conference Trunk 64 failure	Expansion Conference Trunk 64 is defective.

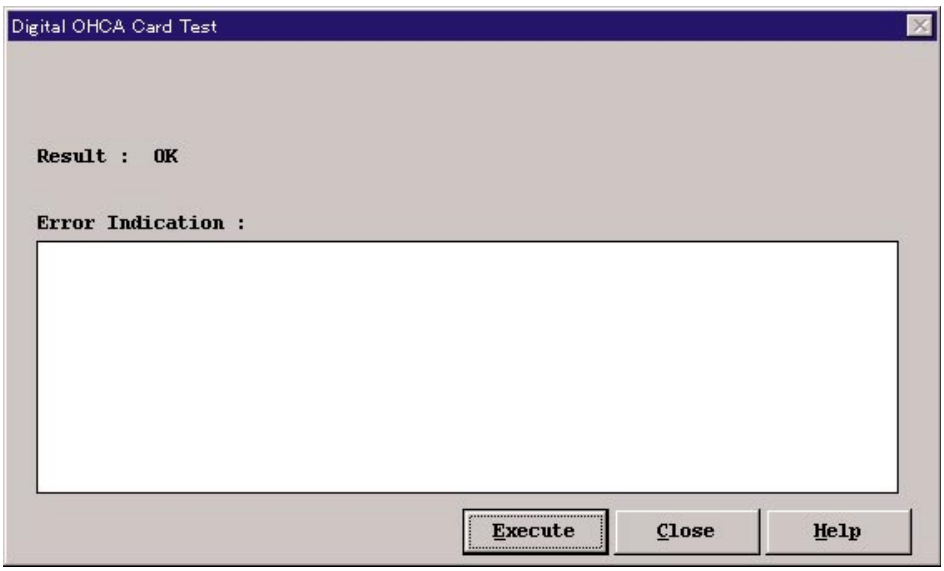
[TSW Test] Digital OHCA Card Test – Operation
(Continued from step 4 of [TSW Test] – Operation (General).)

a) Point to Digital OHCA Card Test in the TSW Test Menu screen and click.

- "Digital OHCA Card Test" screen is displayed.

b) Click Execute.

- After executing the test, the Test Result is displayed.



[TSW Test] Digital OHCA Card Test - Description

Item	Display/Input Value	Description
Result	OK NG	The results of diagnosis.
Error Indication	See "Error Indication Table."	The details of an error. Displayed only when Result is NG (no good).

[TSW Test] Digital OHCA Card Test - Error Indication Table

Error Message	Description
Not Installed	Digital OHCA Card is not installed.
OHCA 1 failure	Digital OHCA Card TSW 1 is defective.
OHCA 2 failure	Digital OHCA Card TSW 2 is defective.
OHCA 3 failure	Digital OHCA Card TSW 3 is defective.
OHCA 4 failure	Digital OHCA Card TSW 4 is defective.

4.3 Traffic Information

4.3.1 Traffic Information

You can display the traffic information on your Maintenance Console PC by downloading the traffic data measured at KX-TD500 System.

Traffic Menu consists of the following six submenus.

- 4.3.2 Station
- 4.3.3 Trunk Group
- 4.3.4 Operator
- 4.3.5 UCD (Uniform Call Distribution)
- 4.3.6 OGM
- 4.3.7 AGC

If you select "Traffic Information" in the "Utility" drop-down menu, "Traffic Measurement" screen is displayed. The current status of traffic measurement is displayed on the top of this screen. There are "Start," "Stop" and "View" buttons, which control measurement, depending on under the condition of traffic measurement. The details of each item are as follows.

Traffic Measurement Status

- **Now Idling** The system is not in the measurement mode at present.
- **Now measuring** The system is in the measurement mode now.

Start traffic measurement

- **"Start" button** The traffic measurement begins.

  This button is available only when the Traffic Measurement is idle.

Interrupt Traffic Measurement

- **"Stop" button** The traffic measurement stops.

  This button is available only when the system is measuring the traffic.

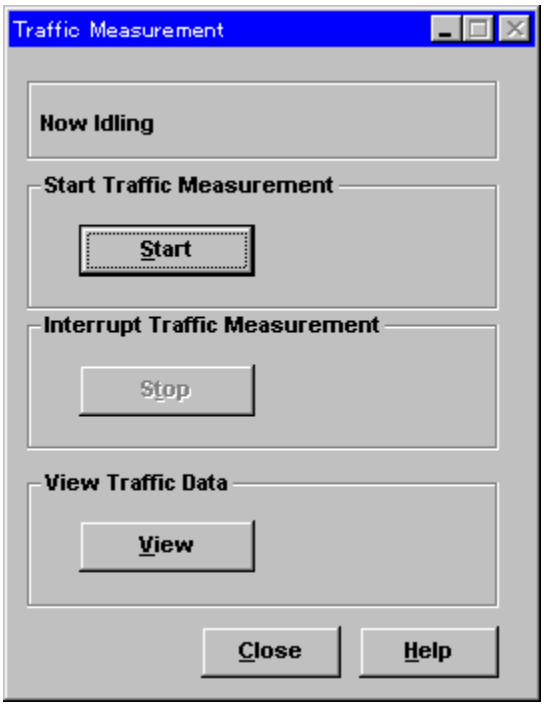
View Traffic Data

- **"View" button** "Traffic Information" screen is displayed.

Operation

1. Point to "Utility" in the Main Menu and click.
   - The "Utility"drop-down menu is displayed.
2. Click "Traffic Information."

- "Traffic Measurement" screen is displayed.



3. Click Start.

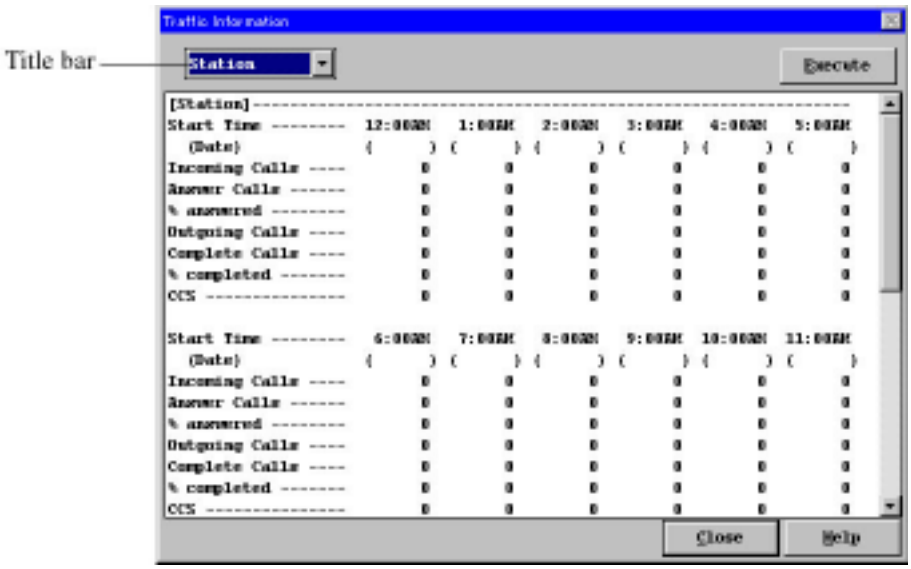
- The Traffic Measurement begins.

4. Click Stop.

- The Traffic Measurement stops.

5. Click View.

- "Traffic Information" screen is displayed.



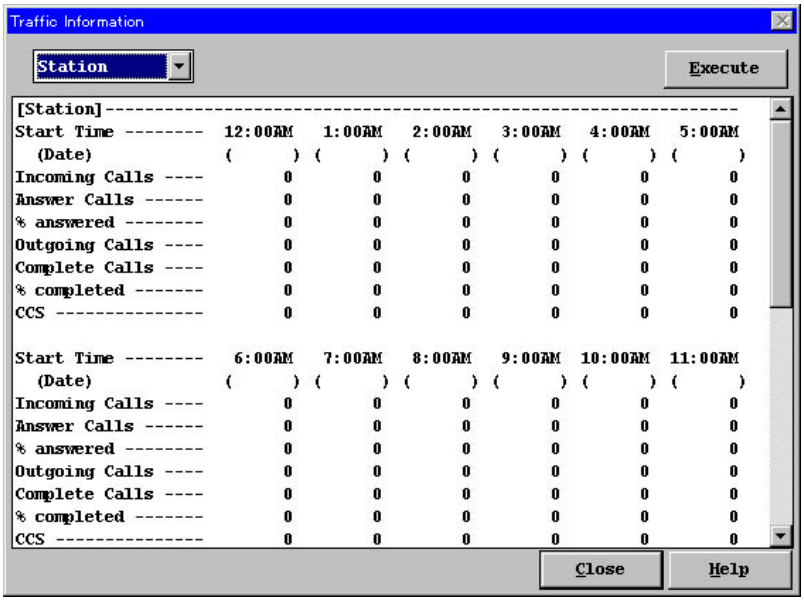
6. Click the small triangle on the title bar and choose one of the five submenus.

7. Click Execute.

- Traffic information of the specified submenu is displayed.
  See 4.3.2 Station, 4.3.3 Trunk Group, 4.3.4 Operator, 4.3.5 UCD (Uniform Call Distribution), 4.3.6 OGM and 4.3.7 AGC for information about each submenu.

4.3.2 Station

Displays information on call activities of all extensions in the system.

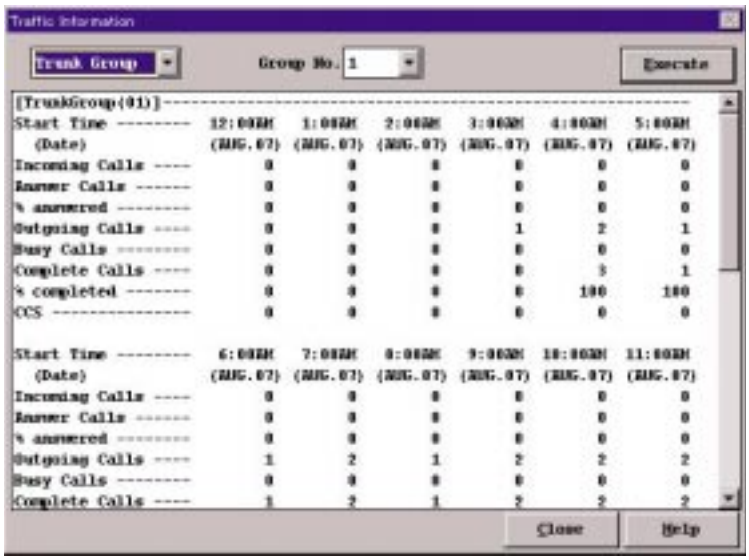


Description

Item	Description
Start Time	The Start Time of Traffic Measurement.
(Date)	The date of Traffic Measurement.
Incoming Calls	The number of calls (both extension and CO) coming in on the extensions.
Answer Calls	The number of calls (both extension and CO) answered by the extensions.
% answered	The ratio of "Answered Calls" to "Incoming Calls."
Outgoing Calls	The number of calls (both extension and CO) made by the extensions.
Complete Calls	The number of completed outgoing calls (both extension and CO).
% completed	The ratio of "Completed Calls" to "Outgoing Calls."
CCS	One hundred call seconds, or one hundred seconds of telephone conversation. One hour telephone traffic is equal to 36 CCS.

4.3.3 Trunk Group

Displays information on call activities of trunk lines on a trunk group basis/all trunk groups.

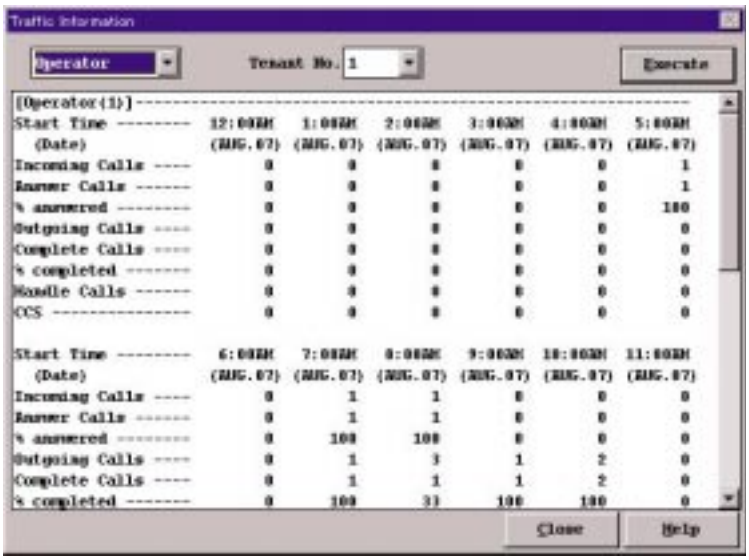


Description

Item	Description
Group No.	1-48 : Specifies a desired trunk group. All : Specifies all trunk groups at once.
Start Time	The Start Time of Traffic Measurement.
(Date)	The date of Traffic Measurement.
Incoming Calls	The number of calls (both extension and CO) coming in on the extensions.
Answer Calls	The number of calls (both extension and CO) answered by the extensions.
% answered	The ratio of "Answered Calls"" to "Incoming Calls."
Outgoing Calls	The number of calls (both extension and CO) made by the extensions.
Busy Calls	The number of outgoing calls encountered busy situation.
Complete Calls	The number of completed outgoing calls (both extension and CO).
% completed	The ratio of "Completed Calls" to "Outgoing Calls."
CCS	One hundred call seconds, or one hundred seconds of telephone conversation. One hour telephone traffic is equal to 36 CCS.

4.3.4 Operator

Displays information on call activities of operators on a tenant basis/all tenants.

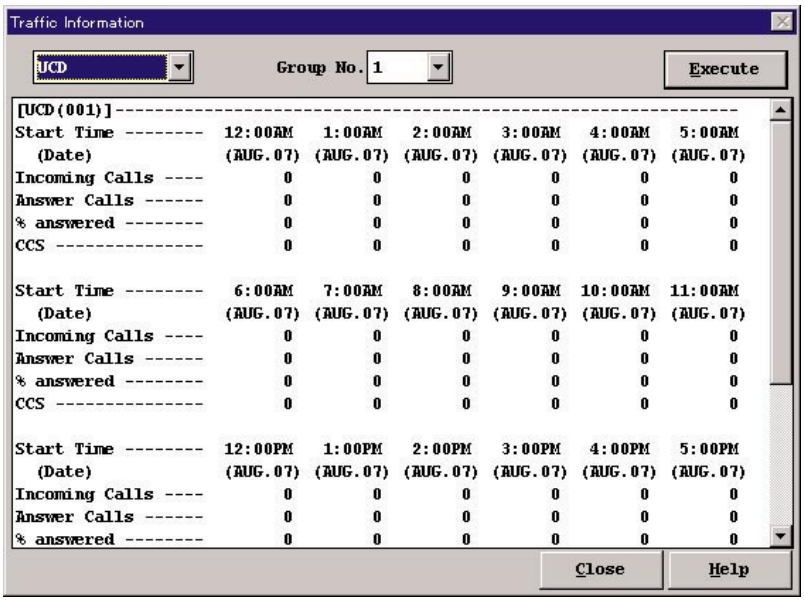


Description

Item	Description
Tenant No.	1-8: Specifies a desired tenant. All: Specifies all tenants at once.
Start Time	The Start Time of Traffic Measurement.
(Date)	The date of Traffic Measurement.
Incoming Calls	The number of calls (both extension and CO) coming in on the extensions.
Answer Calls	The number of calls (both extension and CO) answered by the extensions.
% answered	The ratio of "Answered Calls" to "Incoming Calls."
Outgoing Calls	The number of calls (both extension and CO) made by the extensions.
Complete Calls	The number of completed outgoing calls (both extension and CO).
% completed	The ratio of "Completed Calls" to "Outgoing Calls."
Handle Calls	The number of calls transferred by the Operators.
CCS	One hundred call seconds, or one hundred seconds of telephone conversation. One hour telephone traffic is equal to 36 CCS.

4.3.5 UCD (Uniform Call Distribution)

Displays information on call activities of extensions in a UCD group on each UCD group basis/ all UCD groups.

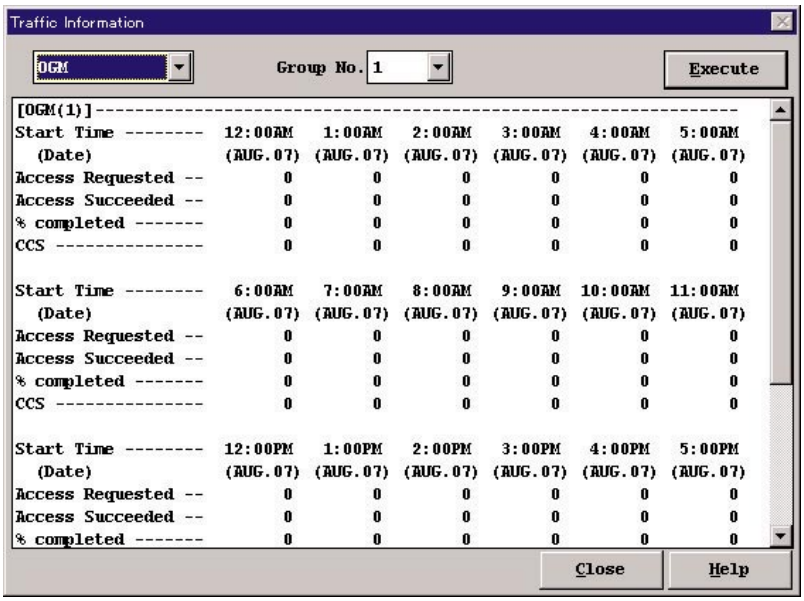


Description

Item	Description
Group No.	1-128: Specifies a desired UCD group. All: Specifies all UCD groups at once.
Start Time	The Start Time of Traffic Measurement.
(Date)	The date of Traffic Measurement.
Incoming Calls	The number of calls (both extension and CO) coming in on the extensions.
Answer Calls	The number of calls (both extension and CO) answered by the extensions.
% answered	The ratio of "Answered Calls" to "Incoming Calls."
CCS	One hundred call seconds, or one hundred seconds of telephone conversation. One hour telephone traffic is equal to 36 CCS.

4.3.6 OGM

Displays information on operating conditions of OGM resources in the system on an OGM group basis/all OGM groups.

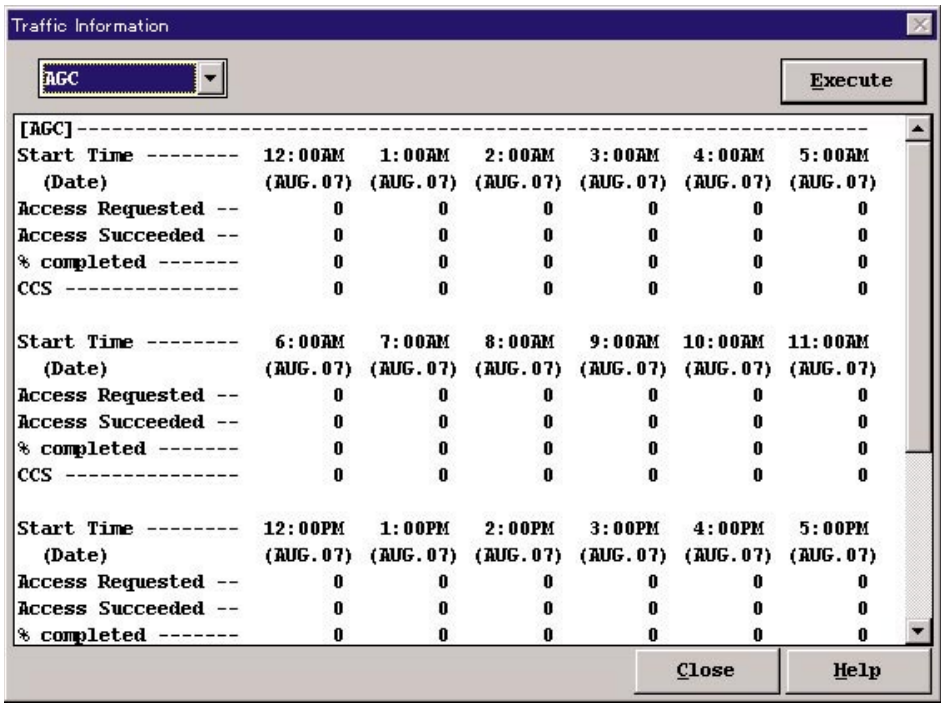


Description

Item	Description
Group No.	1-8: Specifies a desired OGM group. All: Specifies all OGM groups at once.
Start Time	The Start Time of Traffic Measurement.
(Date)	The date of Traffic Measurement.
Access Requested	The requested times of the OGM resource (DISA, Wakeup, UCD-OGM) access.
Access Succeeded	The succeeded times of the OGM resource (DISA, Wakeup, UCD-OGM) access.
% completed	The ratio of "Access Succeeded" to "Access Requested."
CCS	One hundred call seconds, or one hundred seconds of telephone conversation. One hour telephone traffic is equal to 36 CCS.

4.3.7 AGC

Displays information on operating conditions of AGC resource in the system.



Description

Item	Description
Start Time	The Start Time of Traffic Measurement.
(Date)	The date of Traffic Measurement.
Access Requested	The requested times of the AGC resource access.
Access Succeeded	The succeeded times of the AGC resource access.
% completed	The ratio of "Access Succeeded" to "Access Requested."
CCS	One hundred call seconds, or one hundred seconds of telephone conversation. One hour telephone traffic is equal to 36 CCS.

4.4 System Status

4.4.1 System Status

System Status menu consists of the following three status indication screens.

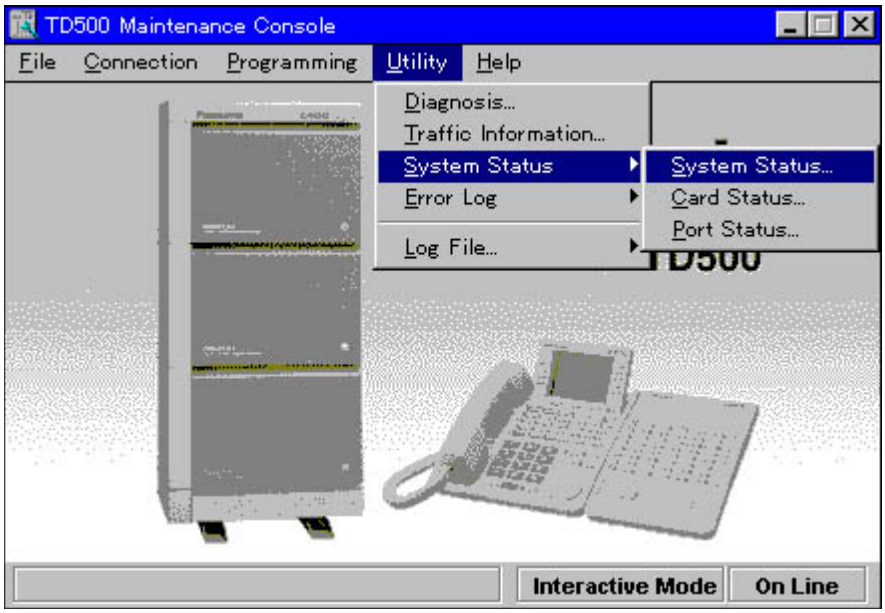
- 4.4.2 System Status Screen
- 4.4.3 Card Status Screen
- 4.4.4 Port Status Screen

4.4.2 System Status Screen

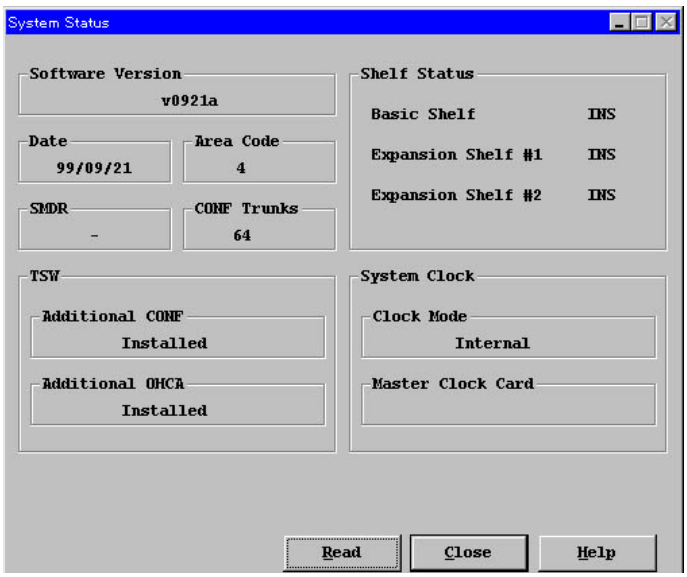
Displays the current system status.

Operation

1. Point to "Utility" in the Main Menu and click.
   - The "Utility" drop-down menu is displayed.
2. Point to "System Status" in the Utility drop-down menu.
   - The "System Status" drop-down menu is displayed.



3. Click "System Status."
   - "System Status" screen is displayed.



Description

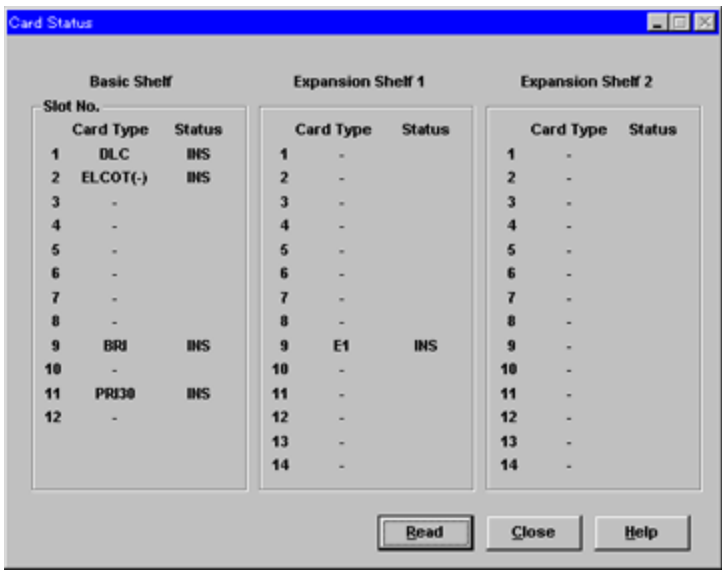
Item	Description
Software Version	Version of the PBX software
Date	Date of the PBX software released
Area Code	Destination Code
SMDR	Current status of SMDR Device
CONF Trunks	Available conference trunk number
Additional CONF	Current status of optional Conference Trunk card of TSW card.
Additional OHCA	Current status of optional OHCA card of TSW card.
Basic Shelf	Current status of the Basic Shelf
Expansion Shelf # 1	Current status of the Expansion Shelf # 1
Expansion Shelf # 2	Current status of the Expansion Shelf # 2
Clock Mode	Displayed only when a T1/E1 digital trunk, BRI or PRI30 card is installed in the system. External --- The system synchronizes with the External Clock. Internal ---- The system synchronizes with the Internal Clock.
Master Clock Card	Displayed only when a T1/E1 digital trunk, BRI or PRI30 card is installed in the system. "XXX" (physical number of the master card) is displayed when the external clock mode is utilized. Nothing is displayed when the internal clock mode is utilized.

4.4.3 Card Status Screen

Displays the current status of each service card.

Operation

1. Point to "Utility" in the Main Menu and click.
   - The "Utility" drop-down menu is displayed.
2. Point to "System Status" in the Utility drop-down menu.
   - The "System Status" drop-down menu is displayed.
3. Click "Card status."
   - "Card Status" screen is displayed.



Description

ELCOT Card Status

Depending on the installation status of the Caller ID or Pay Tone card (piggyback card for ELCOT card), there are the following four types of ELCOT Card Status indication as follows:

Description

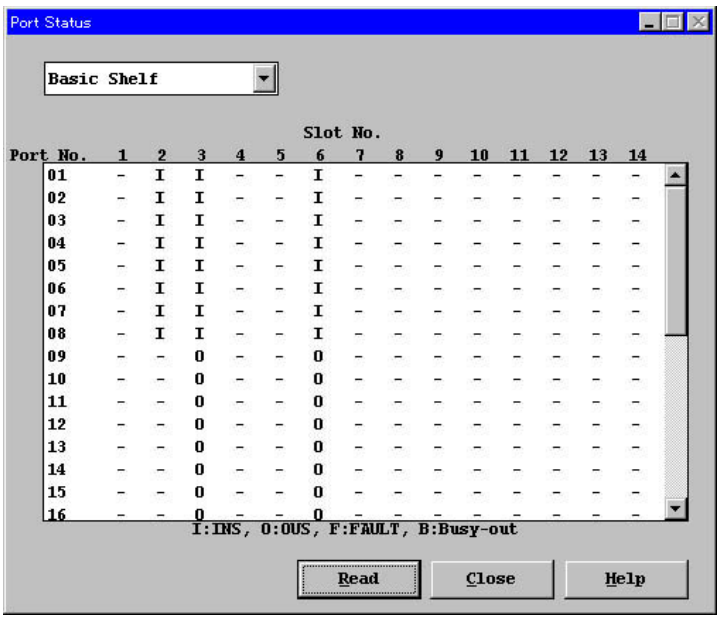
Indication	Description
ELCOT (U)	Upper (port# 5-8) Caller ID or Pay Tone card is installed on the ELCOT card.
ELCOT (L)	Lower (port# 1-4) Caller ID or Pay Tone card is installed on the ELCOT card.
ELCOT (B)	Both upper and lower Caller ID or Pay Tone card is installed on the ELCOT card.
ELCOT (-)	No Caller ID or Pay Tone card is installed on the ELCOT card.

4.4.4 Port Status Screen

Displays the current status of each service card.

Operation

1. Point to "Utility" in the Main Menu and click.
   - The "Utility" drop-down menu is displayed.
2. Point to "System Status" in the Utility drop-down menu.
   - The "System Status" drop-down menu is displayed.
3. Click "Port Status."
   - "Port Status" screen is displayed.



Discription

Port Status
Specifies the operating status of the port.

Indication	Description
I: INS	The port is In-Service.
O: OUS	The port is Out-of-Service.
F: FAULT	The port is defective.
B: Busy-out	The trunk port is busied out.

Note

- The status of the port is displayed up to the maximum port numbers of each card.

4.5 Error Log

4.5.1 Error Log

The system automatically generates an error record when it detects hardware or software error. Depending on the severity, the record is stored in one of the following two tables in the Error Log:

Error Log - Major
Up to 40 major error records are stored in this table.

Error Log - Minor
Up to 40 minor error records are stored in this table.

The error tables are organized by time of occurrence. The newest error appears on the bottom of the screen. If more than 40 errors have occurred in that time, error records already stored in the error log will be overwritten, starting with the first.

4.5.2 Error Log Screen

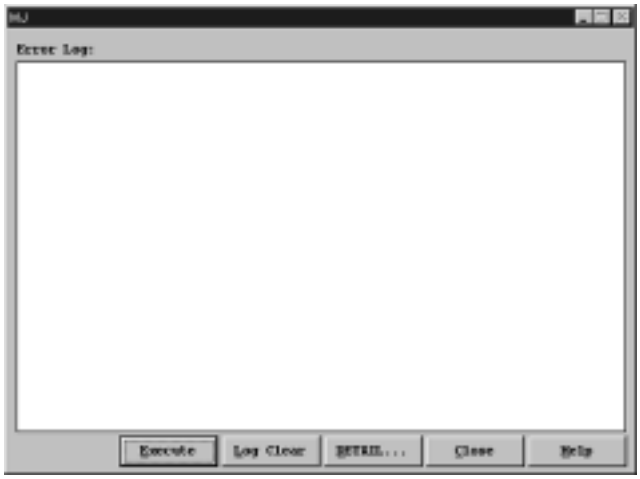
Displays the Error Log records screen.

Operation

1. Point to "Utility" in the Main Menu and click.
   - The "Utility" drop-down menu is displayed.
2. Click "Error Log."
   - The "Error Log" drop-down menu is displayed.

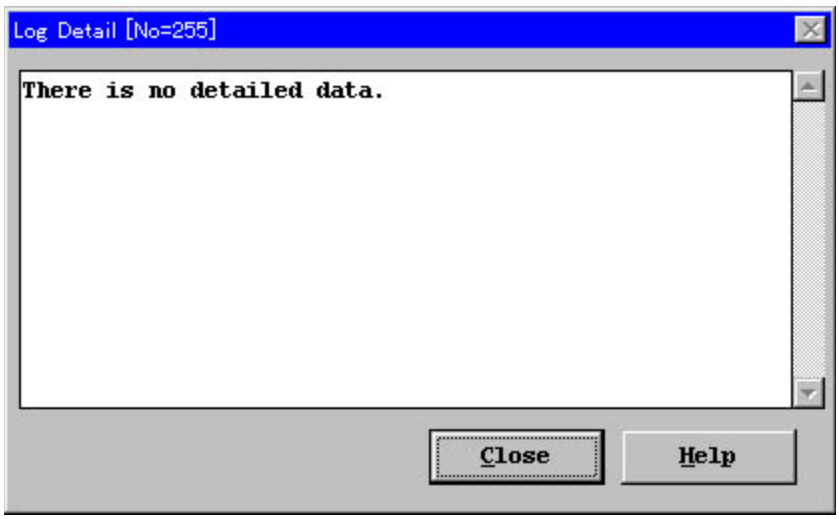
3. Click "Major."

- "Error Log - MJ(Major)" screen is displayed.



4. Click DETAIL.

- "Log Detail" screen is displayed.



Note

- The message "There is no detailed data" is displayed if there is no Detailled Log information.
- The following Error Messages have the detailled Log information.
  — #1000 Hard WDT overflow
  — #1001 Illegal interrupt
  — #1002 Soft WDT overflow

4.5.3 Error Message Tables

Error Log (Major)

Error Code	Error Message	Cause
#1000	Hard WDT overflow	Overflow of the watchdog timer occurs for the following reasons. **a)** External circumstances, such as induction noise **b)** Hardware is defective.
#1001	Illegal interrupt	The CPR software is terminated by executing illegal instruction.
#1002	Soft WDT overflow	The CPR software is terminated by executing infinite loop.
#1100	TSW clock down	The TSW clock malfunction occurs because of TSW card connection error or TSW card clock link failure.
#1101	Basic shelf DC power down	The Basic shelf DC power malfunction occurs for the following reasons. **a)** AC power cord is unplugged. **b)** Power Failure **c)** Power Switch of the Basic Shelf is turned off. **d)** Malfunction of Power Supply Unit of the Basic Shelf, or the trouble with the Power Supply System (Backboard, CPU card) of the Shelf
#1102	Expansion shelf 1 DC power down	The Expansion shelf DC power malfunction occurs for the following reasons. **a)** Power switch of the Expansion Shelf 1 is turned off. **b)** Malfunction of Power Supply Unit of the Expansion Shelf, or the trouble with the Power Supply System (Backboard, CPU card) of the Shelf
#1103	Expansion shelf 2 DC power down	The Expansion shelf DC power malfunction occurs for the following reasons. **a)** Power switch of the Expansion Shelf 2 is turned off. **b)** Malfunction of Power Supply Unit of the Expansion Shelf 2, or the trouble with the Power Supply System (Backboard, CPU card) of the Shelf

Error Code	Error Message	Cause
#1104	Basic shelf heat alarm	The heat of the power supply of Basic shelf exceeds the limit.
#1105	Expansion shelf 1 heat alarm	The heat of the power supply of Expansion shelf 1 exceeds the limit.
#1106	Expansion shelf 2 heat alarm	The heat of the power supply of Expansion shelf 2 exceeds the limit.
#1107	Basic shelf fan alarm	The fan of Basic shelf gets out of order.
#1108	Expansion shelf 1 fan alarm	The fan of Expansion shelf 1 gets out of order.
#1109	Expansion shelf 2 fan alarm	The fan of Expansion shelf 2 gets out of order.
#1110	Calendar IC R/W stop	The calendar IC of CPU card is defective.
#1111	Calendar IC stop	The calendar IC of CPU card is defective.
#1112	CPU RAM battery alarm	The CPU RAM battery alarm occurs because of defective lithium battery on the CPU card or defective CPU card.

Error Log (Minor)

Error Code	Error Message	Cause
#1200	Basic shelf AC power down	The Basic shelf AC power malfunction occurs for the following reasons. **a)** AC power cord is unplugged. **b)** Power Failure **c)** Malfunction of Power Supply Unit of the Basic Shelf or the trouble with the Power Supply System (Backboard, CPU card) of the Shelf
#1201	Expansion shelf 1 AC power down	The Expansion shelf AC power malfunction occurs for the following reasons. **a)** Power Failure **b)** Malfunction of Power Supply Unit of the Expansion Shelf 1, or the trouble with the Power Supply System (Backboard, CPU card) of the Shelf
#1202	Expansion shelf 2 AC power down	The Expansion shelf AC power malfunction occurs for the following reasons. **a)** Power Failure **b)** Malfunction of Power Supply Unit of the Expansion Shelf 2, or the trouble with the Power Supply System (Backboard, CPU card) of the Shelf

Error Code	Error Message	Cause
#1203	SMDR disconnect	SMDR disconnects for the following reasons. **a)** RS-232C cable is not connected. **b)** RS-232C cable is defective. **c)** Printer is turned off. (including out of paper)
#1300	Echo back error	No answer from the card when the PBX executed Echo Back test.
#1301	LPR ROM failure	LPR ROM checksum error occurred.
#1302	LPR RAM failure	LPR RAM failure occurred.
#1303	Card disconnect	Card disconnects because of card connection error or defective CPU card.
#1304	LPR modem failure	LPR modem failure occurred.
#1306	LPR memory checksum error	LPR memory checksum error occurs because of defective LPR RAM.
#1307	LPR runaway	LPR runaway occurs when the LPR software executed illegal instruction.
#1308	Card start up error (Reset Notice)	The PBX couldn't reset the card properly.
#1309	Card start up error (Sync Ans)	The PBX synchronized with the card in vain.
#1310	Card start up error (Card Kind)	The PBX received illegal card type from the card.
#1311	Card start up error (Download)	The PBX received data downloading error from the card.
#1312	Card start up error (System Start)	The PBX received starting up error from the card.
#1313	DISA OGM CPU runaway	Runaway of the OGM (CPU) of the DISA card occurred.
#1314	DISA OGM lost	DISA OGM lost occurs for the following reasons. **a)** Power failure or power-off for long duration (6-7days) **b)** Defective backup battery for DISA card **c)** OGM was not recorded after the installation.
#1316	OPX power down	OPX power down occurs because of power-off of external OPX Power Unit, or defective OPX card.
#1317	OPX bell power down	OPX bell power down occurs because of power-off of external OPX Power Unit, or defective OPX card.

Error Code	Error Message	Cause
#1318	Digital trunk out of sync	T1, E1, BRI or PRI30 card (physical number XXX) lost the synchronization with the clock time sent from the Central Office.
#1319	Digital trunk RAI signal reception	T1, E1 card (physical number XXX) received RAI (Remote Alarm Indication) signal sent from the Central Office.
#1320	Digital trunk AIS signal reception	T1, E1 card (physical number XXX) received AIS (Alarm Indication Signal) signal sent from the Central Office.
#1323	Digital trunk frame failure	On booting-up of T1, E1 card (physical number XXX), it failed to synchronize with the clock time sent from the Central Office.

4.6 Log File

4.6.1 Log File

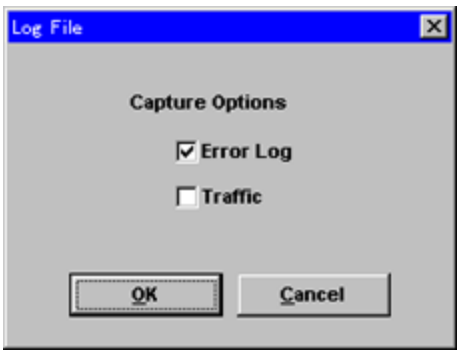
Used to make a Log File (text format) automatically.

Operation

1. Point to "Utility" in the Main Menu and click.
   - The "Utility" drop-down menu is displayed.
2. Click "Log File."
   - "Log File" menu is displayed.

3. Click "Capture On."

   "Log File" screen is displayed.



- You can select the Log File type "Error Log" or "Traffic."
- The system will save "Error Log" or "Traffic" data depending on your selection.

4. Click "Capture off."
    - The system creates a Log File.

Section 5

Troubleshooting

This section provides information for system and telephone troubleshooting.

5.1 Troubleshooting

5.1.1 Installation

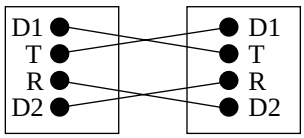
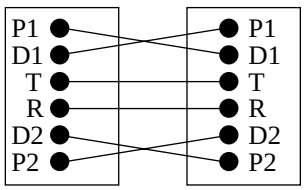
PROBLEM	PROBABLE CAUSE	POSSIBLE SOLUTION
Extension does not operate.	Bad printed circuit board (Extension Card).	Exchange printed circuit board for another printed circuit board.
	Bad connection between the system and extension.	Take the extension and plug it into the same extension port using a short telephone cord. If the telephone does not work, the connection between the system and the extension must be repaired.
	A telephone with an A-A1 relay is connected.	Use a 2 wire cord. Set the A-A1 relay switch of the telephone to the "OUT" or "OFF" position.
	Bad extension.	Take the extension and plug it into another extension port that is working. If the telephone does not work, replace the phone.
Improper reset operation.		Press the Reset Button.
Noise in external paging.	Induced noise on the wire between the system and the amplifier.	Use a shielded cable as the connection wire between the system and amplifier. A short shielded cable is recommended.
Volume distortion from external music source.	Excessive input level from external music source.	Decrease the output level of the external music source by using the volume control on the music source.
Speed Dialling or One-Touch Dialling does not function.	Bad programming.	Enter the CO line access number (9, 801 through 848) into programming.

5.1.2 Connection

Can you dial an extension?

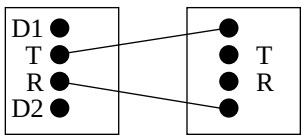
No

Connection between the KX-TD500 and a proprietary telephone:

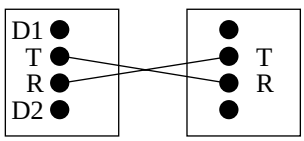
CAUSE	SOLUTION
The T/R is connected to the D1/D2.  	Use the correct cord (inner 2 wires are for T/R and the outer 2 wires are for D1/D2).
The P1/P2 is connected to the D1/D2.  	Use the correct cord (2 second wires from the outside are for D1/D2 and the 2 outer wires are for P1/P2).

Yes

Connection between the KX-TD500 and a single line telephone:

CAUSE	SOLUTION
The T/R is connected to the D1/D2.  	Use the correct cord (inner 2 wires are for T/R). • If a telephone equipped with an A-A1 relay is connected to the KX-TD500, set the A-A1 relay switch of the telephone to "OFF."

Connection between the KX-TD500 and a single line telephone that is polarity-sensitive:

CAUSE	SOLUTION
The "T" is connected to the "R."  	Reverse the connections of the T/R.

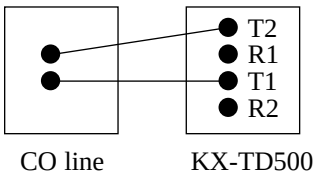
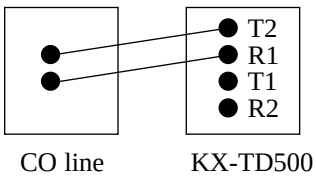
(Continued on the following page.)

(Continued from the previous page.)

Can you dial out on a CO line?

No

Connection between the central office and the KX-TD500:

CAUSE	SOLUTION
CO lines are connected to the T2/T1.  CO lines are connected to the T2/R1.  	Reconnect the CO lines to the T1/R1 or T2/R2 of the telephone jack using 2-conductor wiring.

5.1.3 Operation

PROBLEM	PROBABLE CAUSE	POSSIBLE SOLUTION
• When using the speakerphone mode with a proprietary telephone KX-T7130 or KX-T7030, nothing is audible.	• The HANDSET / HEADSET selector of the KX-T7130 or KX-T7030 is set to the "HEADSET" position.	• When the headset is not used, set the HANDSET / HEADSET selector to the "HANDSET" position.
• When using the speakerphone/monitor mode with a DPT, nothing is audible.	• The "HEADSET" mode is selected by Station Programming, "Handset/ Headset Selection."	• When the headset is not used, select the "HANDSET" mode by Station Programming.
The unit does not ring.	The Ringer Volume Selector is set to "OFF."	Set to "HIGH" or "LOW."
During a power failure, extensions assigned for power failure operation do not operate.	• A DPT or APT is connected to the extension port. • The dialling mode (tone or pulse) is improper.	• Disconnect the DPT or APT and connect a single line telephone. • Set the Tone / Pulse switch to the other position.
Originating an outside call, Call Transfer, or Conference cannot be performed.	The corresponding CO button does not exist on the proprietary telephone.	Programme the CO button. See "Flexible CO key Assignment" in Section 4.3 Extension Line of the Programming Guide.

5.2 Troubleshooting Guide

5.2.1 Troubleshooting Guide

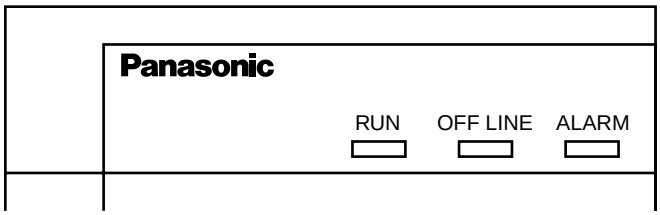
This subsection uses system troubleshooting flow charts to guide the service personnel in efficient and systematic testing and fault location.
The system troubleshooting flow charts provide service personnel with a step-by-step sequence to use for system evaluation. Isolated steps in a flow chart should never be used out of context, since any step assumes that proper results were obtained on all previous tests.

5.2.2 Troubleshooting via the LED Indicators

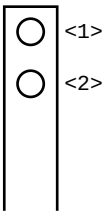
When the system detects a problem, the alarm LED indicator located on the top shelf will turn red. If the detected trouble is generated by a card, the alarm LED indicator on the card will light up. (Refer to the figure and the table below)

When the trouble is cleared, the alarm LED indicator located on the top shelf goes off automatically.

LED Indicators on the Top Shelf

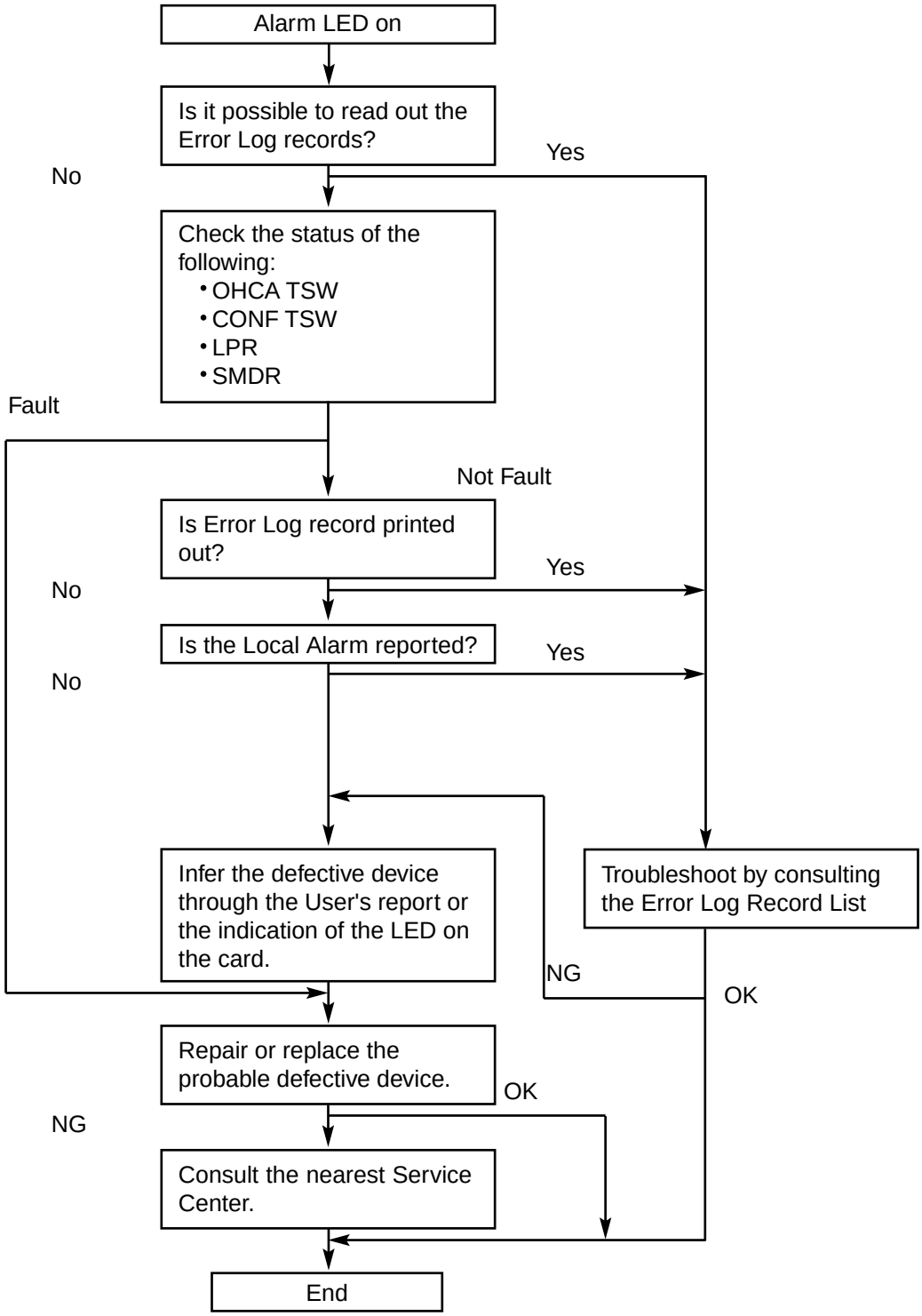


LED indicators on the CPU card



Location of LED indicators on card

Alarm LED on the Top Shelf	LED on the Card	Possible contents	Error Code
ON	ON (CPU<1>)	Calendar	1110/1111
	ON (CPU<2>)	Backup Battery	1112
	ON (LPR)	Link	1300/1306/1307/1308/ 1309/1311/1312
		Card Type	1310
		ROM	1301
		RAM	1302
		MODEM	1304
	None	Clock	1100
		DC Power Supply	1101/1102/1103
		AC Power Supply	1200/1201/1202
		Heat	1104/1105/1106
		Fan	1107/1108/1109
		SMDR Communication	1203
		Card not installed	1303


Alarm LED on
Is it possible to read out the Error Log records?
Yes
No
Check the status of the following:
• OHCA TSW
• CONF TSW
• LPR
• SMDR
Fault
Not Fault
Is Error Log record printed out?
Yes
No
Is the Local Alarm reported?
Yes
No
Infer the defective device through the User's report or the indication of the LED on the card.
Troubleshoot by consulting the Error Log Record List
NG
OK
Repair or replace the probable defective device.
OK
NG
Consult the nearest Service Center.
End

5.2.3 Troubleshooting via Error Log Records

Error code	Sub code	Severity	AUTOMATIC FAULT REPORT (SMDR) MESSAGE (MAX 39 characters)	LOCAL ALARM MESSAGE	COMMENTS
				PT (Max.16 digits)	
1000	mm	MJ	-	-	Hard WDT overflow
1001	mm	MJ	-	-	Illegal interrupt
1002	mm	MJ	-	-	Soft WDT overflow
1100		MJ	TSW clock down	ERR TSW DWN	
1101		MJ	-	-	Basic shelf DC power down
1102		MJ	Expansion shelf 1 DC power down	ERR DC DOWN	
1103		MJ	Expansion shelf 2 DC power down	ERR DC DOWN	
1104		MJ	Basic shelf heat alarm	B/S OVER HEAT!	
1105		MJ	Expansion shelf 1 heat alarm	E/S1 OVER HEAT!	
1106		MJ	Expansion shelf 2 heat alarm	E/S2 OVER HEAT!	
1107		MJ	Basic shelf fan alarm	B/S FAN FLT!	
1108		MJ	Expansion shelf 1 fan alarm	E/S1 FAN FLT!	
1109		MJ	Expansion shelf 2 fan alarm	E/S2 FAN FLT!	
1110		MJ	Calendar IC R/W stop	ERR CLCK IC	
1111		MJ	Calendar IC stop	ERR CLCK IC	
1112		MJ	CPU RAM battery alarm	ERR BAT ALM	
1200		MN	Basic shelf AC power down	ERR AC DOWN	
1201		MN	Expansion shelf 1 AC power down	ERR AC DOWN	
1202		MN	Expansion shelf 2 AC power down	ERR AC DOWN	
1203		MN	-	ERR SMDR	SMDR Not Connect
1300	xyy	MN	Echo back error	-	

Error code	Sub code	Severity	AUTOMATIC FAULT REPORT (SMDR) MESSAGE (MAX 39 characters)	LOCAL ALARM MESSAGE PT (Max.16 digits)	COMMENTS
1301	xyy	MN	LPR ROM failure	ERR xyy LPR ROM	
1302	xyy	MN	LPR RAM failure	ERR xyy LPR RAM	
1303	xyy	MN	Card disconnect	ERR xyy DISCNCT	
1304	xyyz	MN	LPR modern failure	ERR xyyz MODEM	z=Error type
1305			Reserved	-	
1306	xyy	MN	LPR memory checksum error	-	
1307	xyy	MN	LPR runaway	-	
1308	xyy	MN	Card start up error	ERR xyy CRD ERR	Reset Notice error
1309	xyy	MN	Card start up error	ERR xyy CRD ERR	Sync Ans error
1310	xyy	MN	Card start up error	ERR xyy CRD ERR	Card type error
1311	xyy	MN	Card start up error	ERR xyy CRD ERR	Download error
1312	xyy	MN	Card start up error	ERR xyy CRD ERR	System Start error
1313	xyy	MN	DISA OGM CPU runaway	-	
1314	xyy	MN	DISA OGM lost	ERR xyy OGM LOS	
1315			Reserved		
1316	xyy	MN	OPX power down	ERR xyy OPX POW	
1317	xyy	MN	OPX bell power down	ERR xyy OPX POW	
1318	xyy	MN	Digital trunk out of sync	ERR xyy DTR SYC	
1319	xyy	MN	Digital trunk RAI signal reception	ERR xyy DTR RAI	
1320	xyy	MN	Digital trunk AIS signal reception	ERR xyy DTR AIS	
1321			Reserved		
1322			Reserved		
1323	xyy	MN	Digital trunk frame failure	ERR xyy DTR FRM	
1324			Reserved		
1325			Reserved		
1326			Reserved		
1327			Reserved		

Error code	Sub code	Severity	AUTOMATIC FAULT REPORT (SMDR) MESSAGE (MAX 39 characters)	LOCAL ALARM MESSAGE PT (Max.16 digits)	COMMENTS
1328			Reserved		
1329			Reserved		
1330			Reserved	-	

[Legend]

mm : error information location number (00-02)

x : shelf number (1-3)

yy : slot number (01-14)

(1) System Reset caused by CPU Runaway (Re-start Procedure)

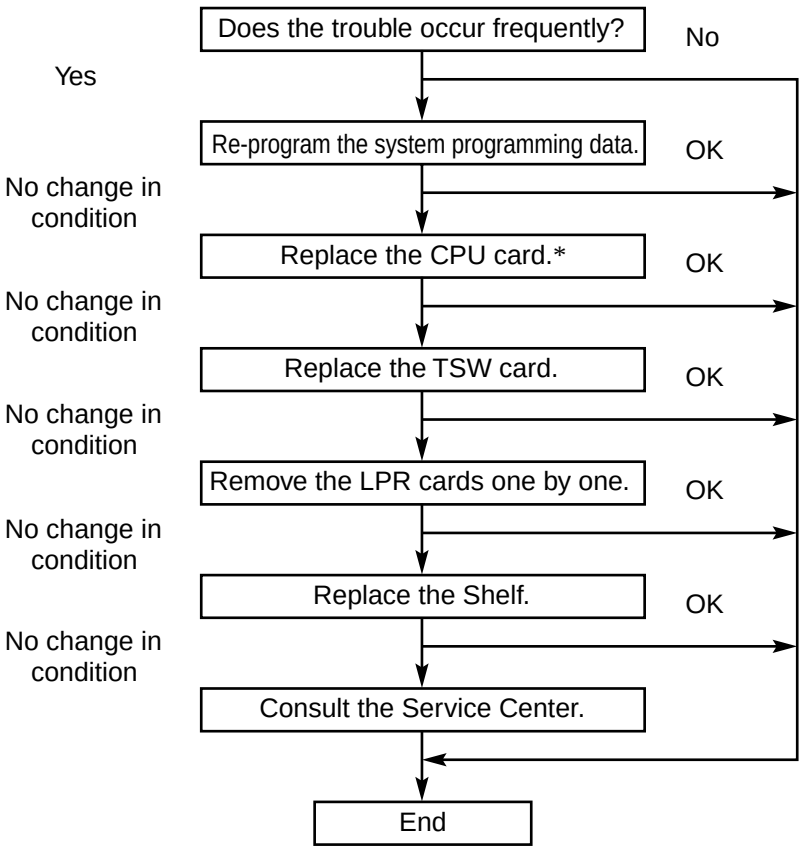
Error Code

1000 : Hard WDT overflow
1001 : Illegal interrupt
1002 : Soft WDT overflow

Possible cause of the malfunction

1. External circumstance, such as induction noise
2. Hardware is defective.
3. The CPR software is terminated by executing illegal instruction.
4. The CPR software is terminated by executing infinite loop.

Countermeasures



Note

*It is recommended to have a current copy of the programme on disk to facilitate accurate and rapid recovery.

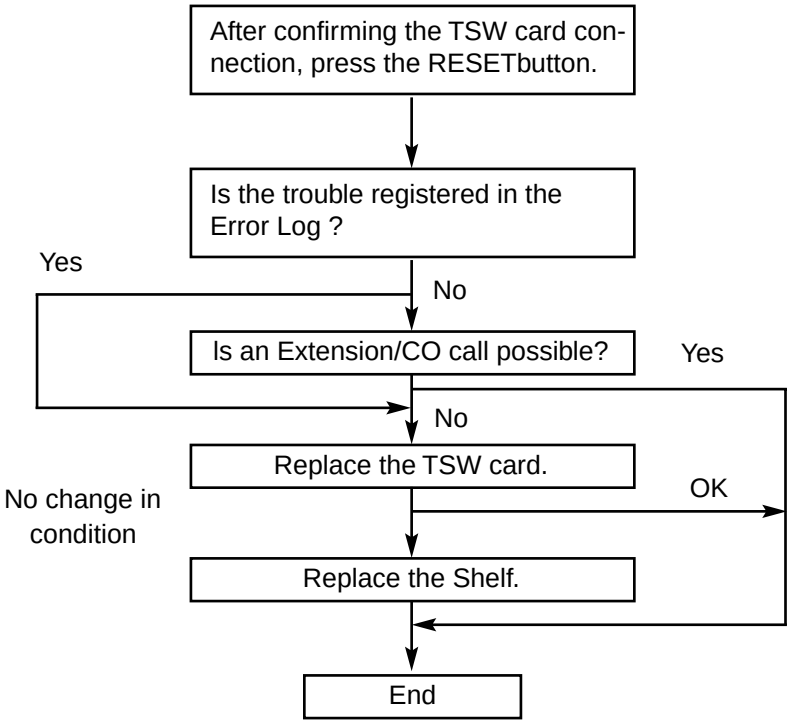
(2) TSW clock down

Error Code 1100 : TSW clock down

Possible cause of the malfunction

1. TSW card connection error
2. TSW card clock link failure

Countermeasures



Note If the TSW clock malfunction occurs:

1. Calling becomes impossible.
2. Power Failure Transfer will be activated.

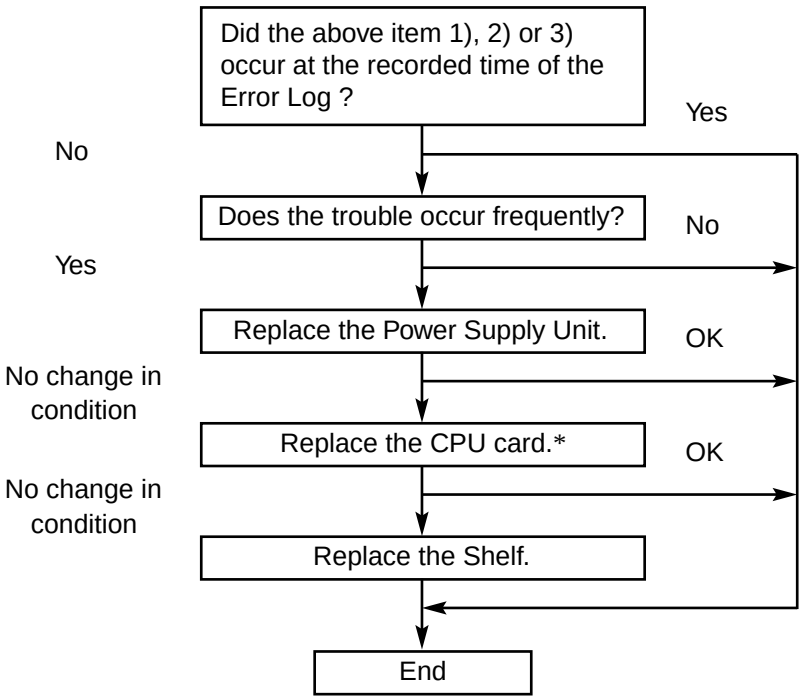
(3) Basic shelf DC power down

Error Code 1101 : Basic shelf DC power down

Possible cause of the malfunction

1. AC power cord is unplugged.
2. Power Failure
3. Power Switch is turned off.
4. Malfunction in the Power Supply Unit of the Basic Shelf, or the trouble with the Power Supply System (Backboard, CPU card) of the Shelf

Countermeasures



Note *It is recommended to have a current copy of the programme on disk to facilitate accurate and rapid recovery.

(4) Expansion shelf DC power down

Error Code

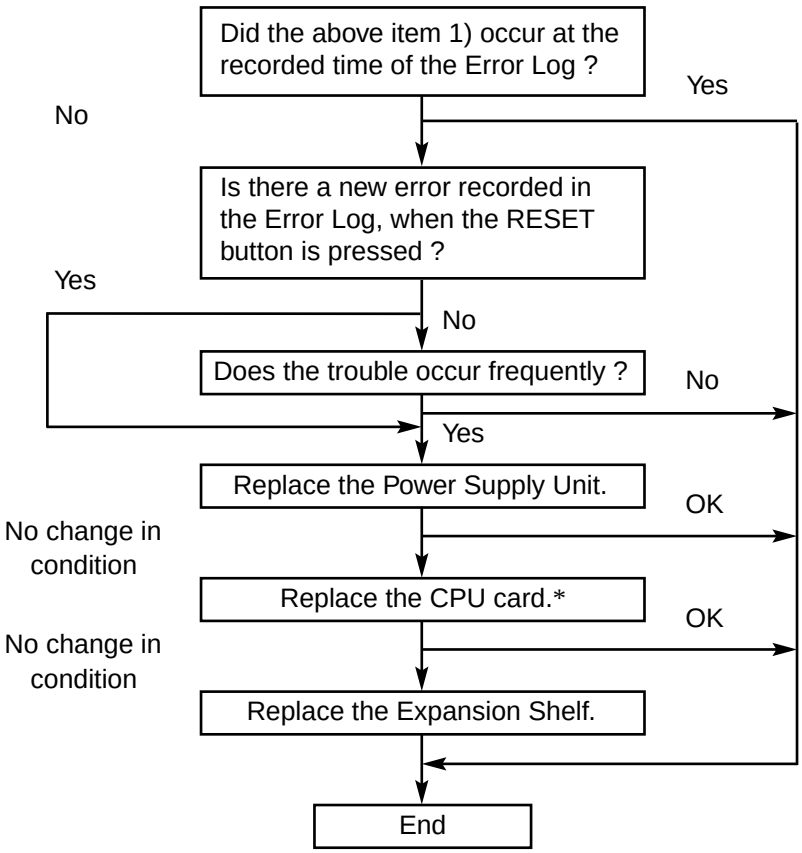
1102 : Expansion Shelf 1 DC power down

1103 : Expansion Shelf 2 DC power down

Possible cause of the malfunction

1. Power switch of the Expansion Shelf n (n=1 or 2) is turned off.
2. Malfunction of Power Supply Unit of the Expansion Shelf, or trouble with the Power Supply System(Backboard, CPU card) of the shelf

Countermeasures



Note

*It is recommended to have a current copy of the programme on disk to facilitate accurate and rapid recovery.

(5) Heat alarm

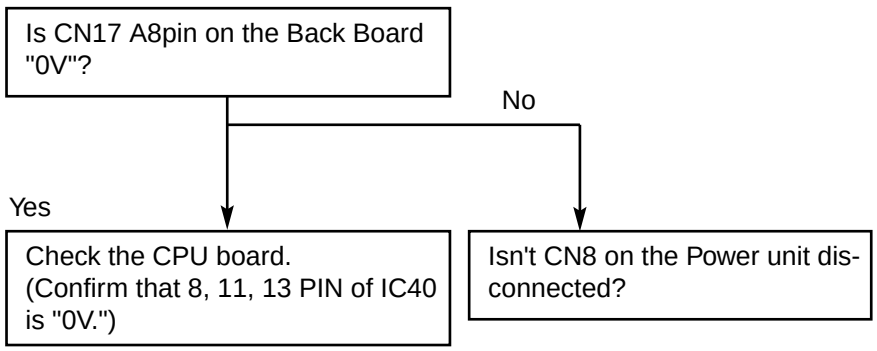
Error Code

1104 : Basic shelf heat alarm
1105 : Expansion shelf 1 heat alarm
1106 : Expansion shelf 2 heat alarm

Possible cause of the malfunction

1. The heat of the power supply of Basic shelf, Expansion shelf 1 or Expansion shelf 2 exceeds the limit.

Countermeasures



Note

None

(6) Fan alarm

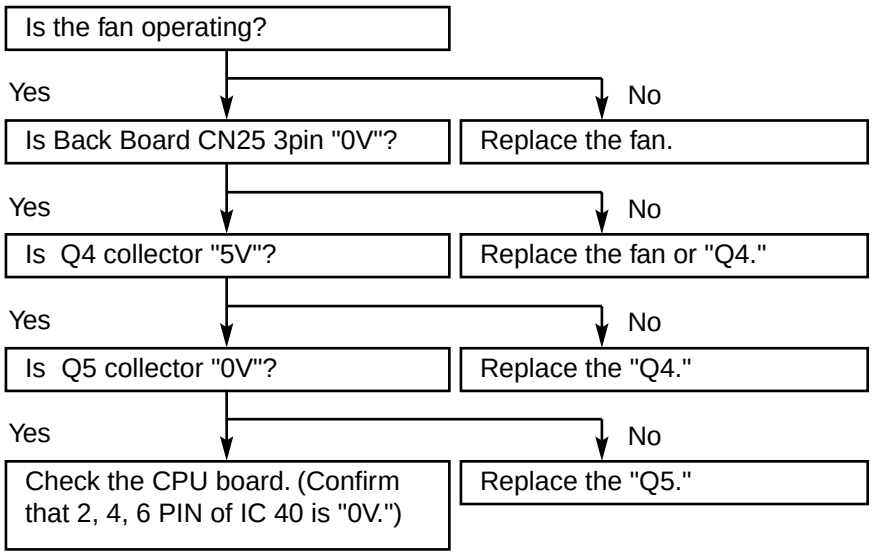
Error Code

1107 : Basic shelf fan alarm
1108 : Expansion shelf 1 fan alarm
1109 : Expansion shelf 2 fan alarm

Possible cause of the malfunction

1. The fan of Basic shelf, Expansion shelf 1 or Expansion shelf 2 is out of order.

Countermeasures



Note

None

(7) Calendar IC Stop

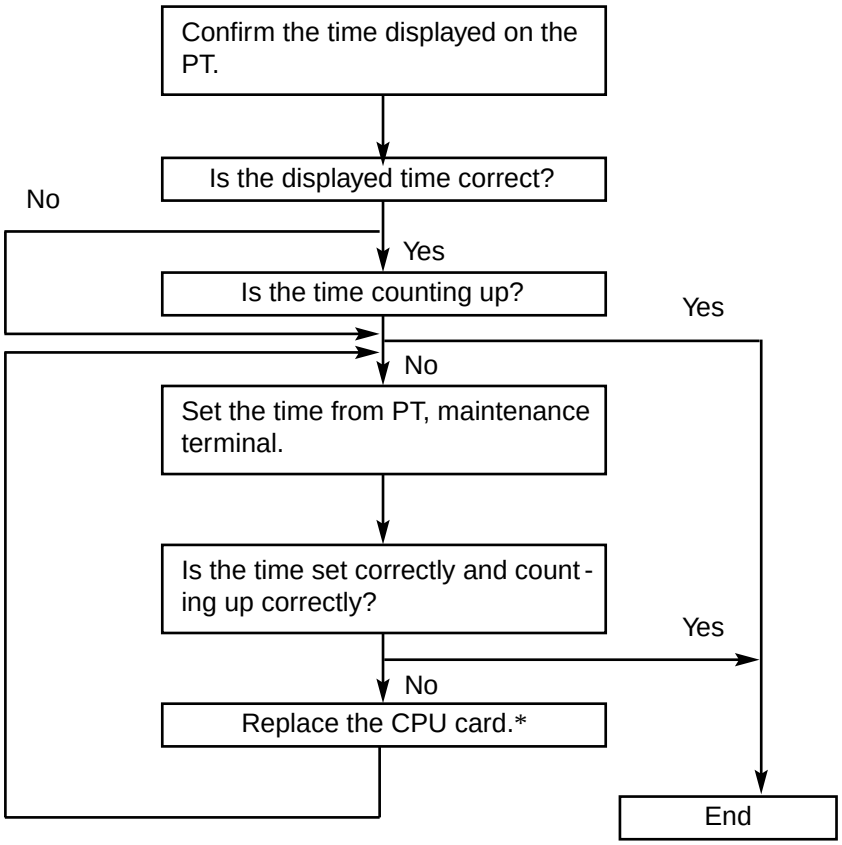
Error Code

1110 : Calendar IC R/W stop
1111 : Calendar IC stop

Possible cause of the malfunction

1. Count up of the calendar IC is stopped.
2. Calendar IC of the CPU card failure

Countermeasures



Note

*It is recommended to have a current copy of the programme on disk to facilitate accurate and rapid recovery.

(8) CPU RAM backup battery down

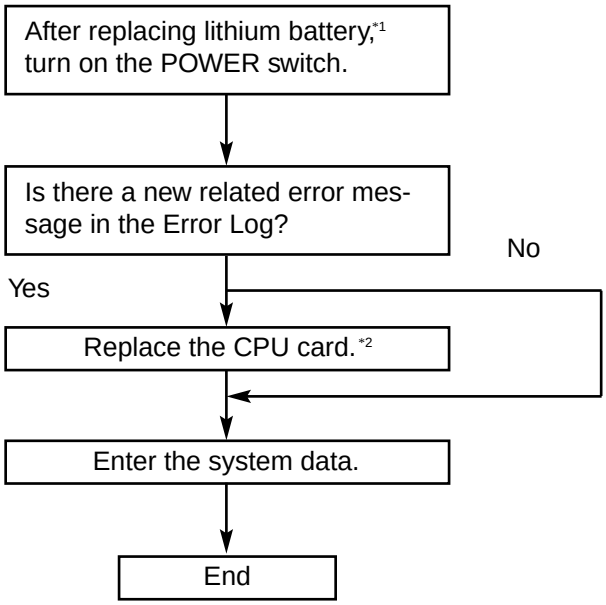
Error Code 1112 : CPU RAM battery alarm

Possible cause of the malfunction

1. Defective rechargeable lithium battery on the CPU card

2. Defective CPU card

Countermeasures



Note

*1. Consult the nearest service center.

*2. It is recommended to have a current copy of the programme on disk to facilitate accurate and rapid recovery.

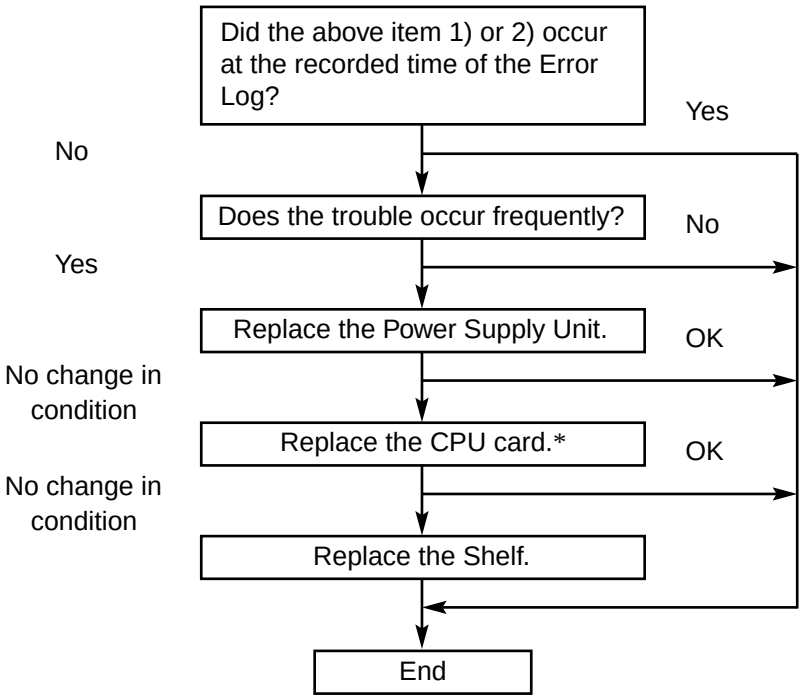
(9) Basic shelf AC power down

Error Code 1200 : Basic shelf AC power down

Possible cause of the malfunction

1. AC power cord is unplugged.
2. Power Failure
3. Malfunction of the Power Supply Unit of the Basic Shelf or Power Supply System (Backboard, CPU card) failure of the Shelf

Countermeasures



Note *It is desirable to store the system programming data on a floppy disk to facilitate accurate and rapid recovery, considering the limited running time (about 3 years) of the backup battery in case the Power Failure continues for a long time.

(10) Expansion shelf AC power down

Error Code

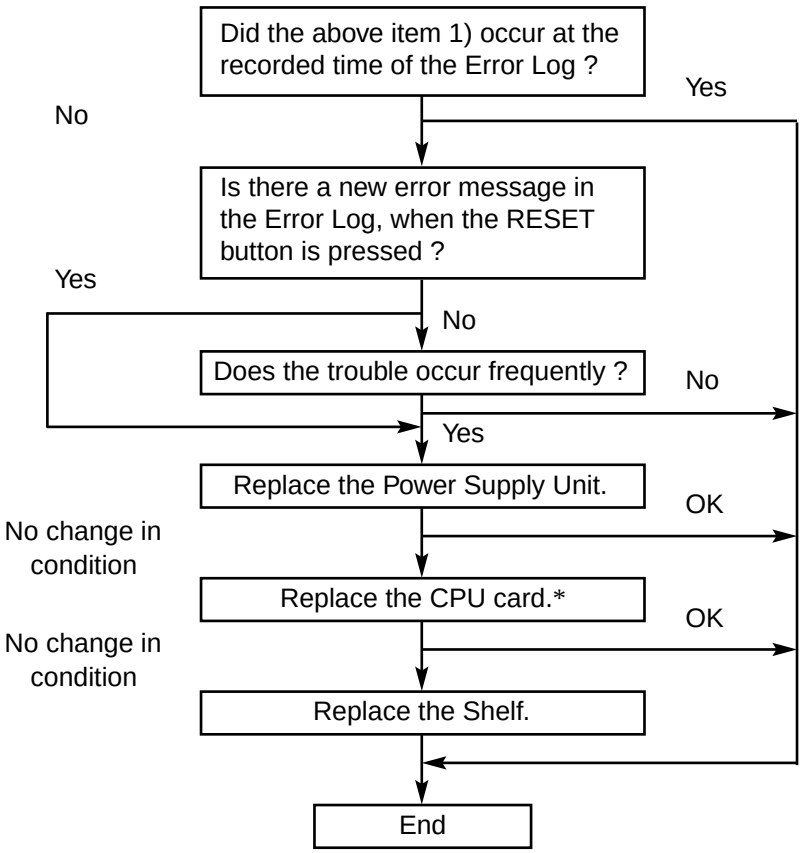
1201 : Expansion shelf 1 AC power down

1202 : Expansion shelf 2 AC power down

Possible cause of the malfunction

1. Power failure
2. Power Supply Unit malfunction of the Expansion Shelf n(n=1 or 2), or trouble with the Power Supply System(Backboard, CPU card) of the shelf

Countermeasures



Note

*It is recommended to have a current copy of the programme on disk to facilitate accurate and rapid recovery.

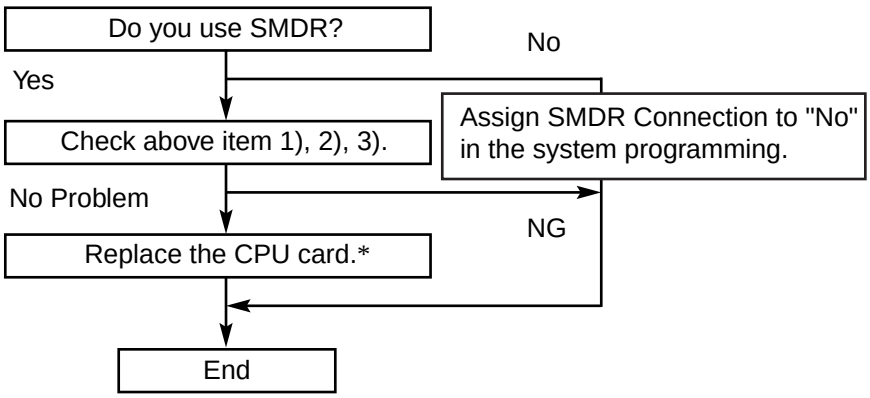
(11) Device not connect for SMDR

Error Code 1203 : SMDR disconnect

Possible cause of the malfunction

1. RS-232C cable is not connected.
2. RS-232C cable is defective.
3. Printer is turned off. (including out of paper)

Countermeasures



Note *It is recommended to have a current copy of the programme on disk to facilitate accurate and rapid recovery.

(12) Echo back error

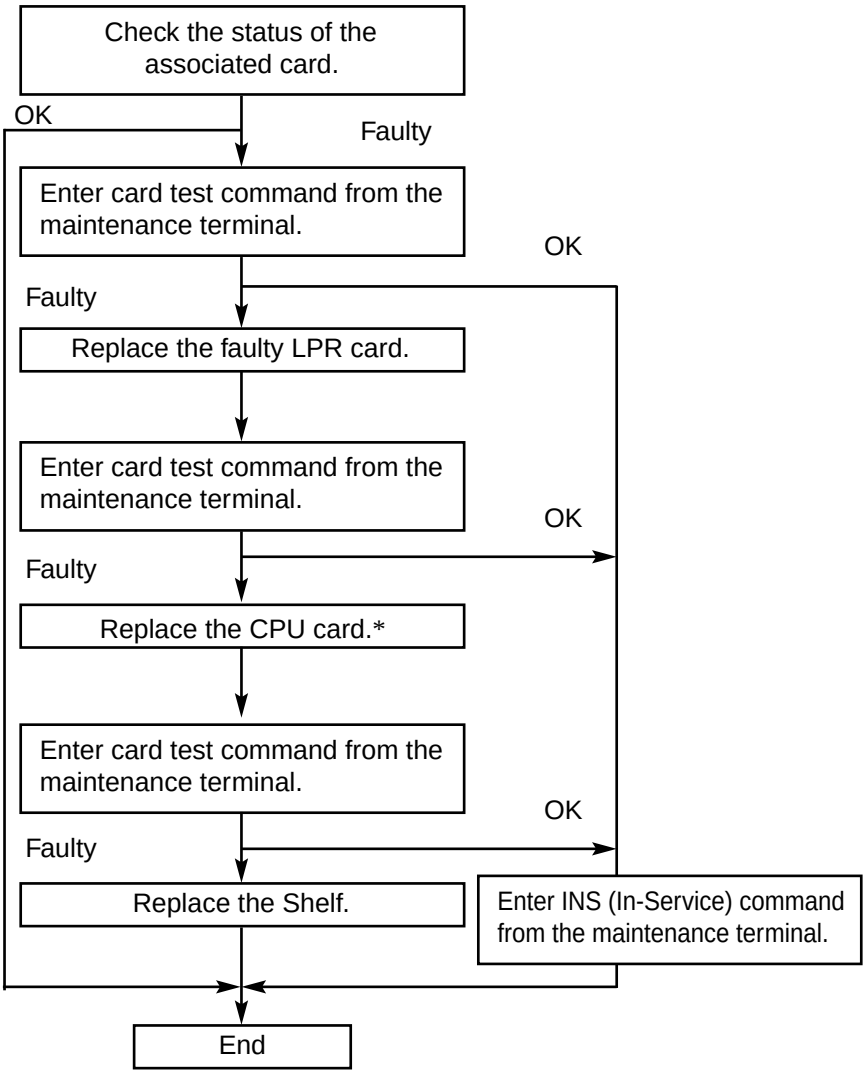
Error Code

1300 xyy : Echo back error
x = 1 to 3 : Shelf number
yy = 01 to 14 : Slot number

Possible cause of the malfunction

1. Defective FIFO (First In First Out) trouble with a card
2. Input/Output trouble (CPU card, Shelf)

Countermeasures



Note

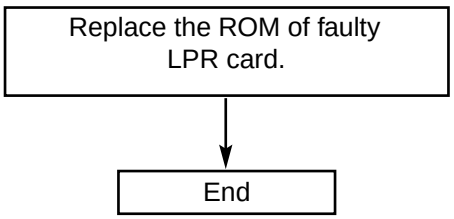
*It is recommended to have a current copy of the programme on disk to facilitate accurate and rapid recovery.

(13) LPR ROM checksum error

Error Code 1301 xyy : LPR ROM checksum error
x = 1 to 3 : Shelf number
yy = 01 to 14 : Slot number

Possible cause of the malfunction
1. LPR ROM checksum error

Countermeasures



Note None

(14) LPR RAM failure

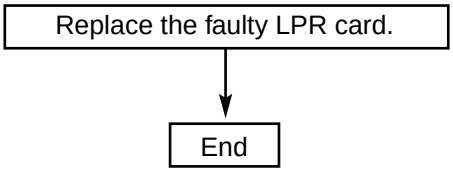
Error Code

1302 xyy : LPR RAM failure
x = 1 to 3 : Shelf number
yy = 01 to 14 : Slot number

Possible cause of the malfunction

1. LPR RAM failure

Countermeasures



Note

None

(15) Card disconnect

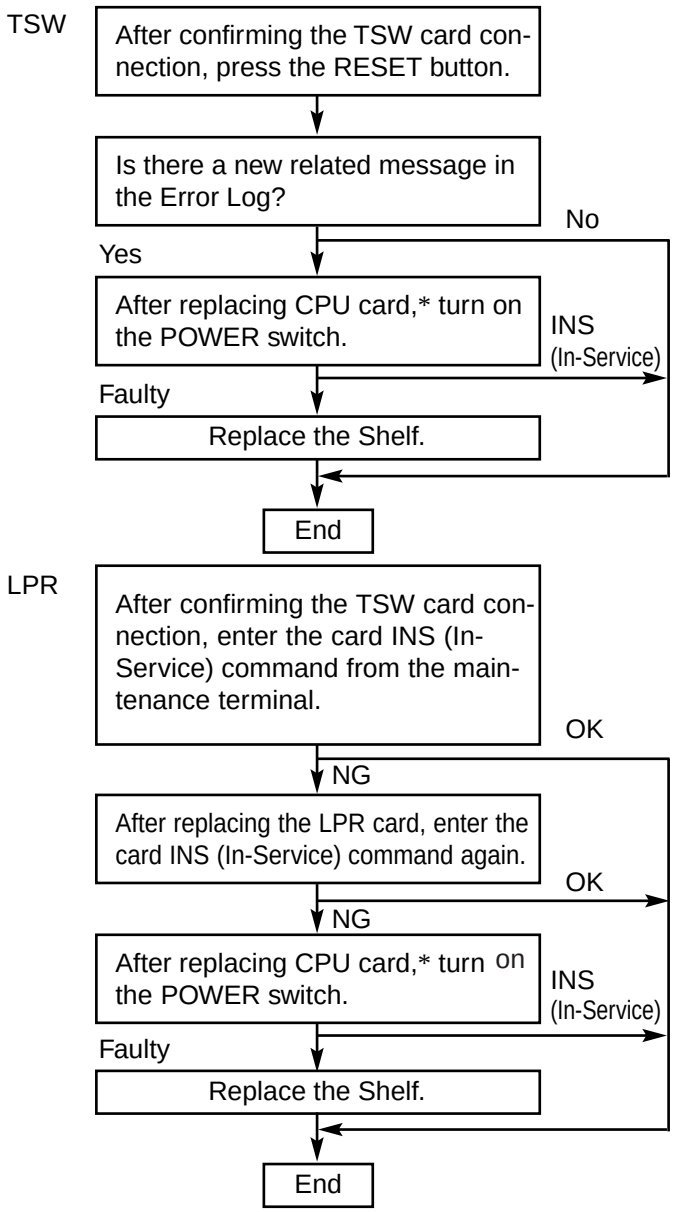
Error Code

1303 xyy : Card disconnect
x = 1 to 3 : Shelf number
yy = 01 to 14 : Slot number

Possible cause of the malfunction

1. Card connection error
2. Defective CPU card

Countermeasures



Note

* It is recommended to have a current copy of the programme on disk to facilitate accurate and rapid recovery.

(16) Modem failure (RMT/ERMT card)

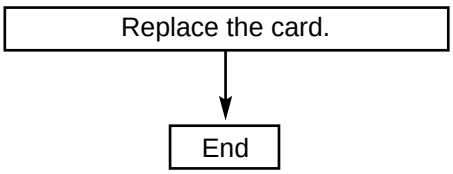
Error Code

1304 xyyz : Modem failure
x= 1 to 3 : Shelf number
yy= 01 to 14 : Slot number
z= Error type

Possible cause of the malfunction

1. Modem failure

Countermeasures



Note

[Error Type]

(1) RMT card

1. Analogue	300 bps	NG
2. Analogue	1200 bps	NG
3. Digital	300 bps	NG
4. Digital	1200 bps	NG

(2) ERMT card

1. Analogue	33.6 kbps	NG
2. Analogue	1200 bps	NG
3. Digital	33.6 kbps	NG
4. Digital	1200 bps	NG

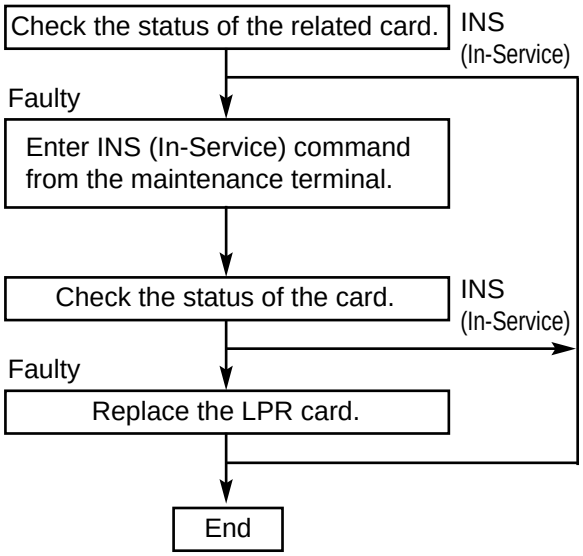
(17) LPR memory checksum error

Error Code 1306 xyy : LPR memory checksum error
x = 1 to 3 : Shelf number
yy = 01 to 14 : Slot number

Possible cause of the malfunction

1. Defective LPR RAM

Countermeasures



Note None

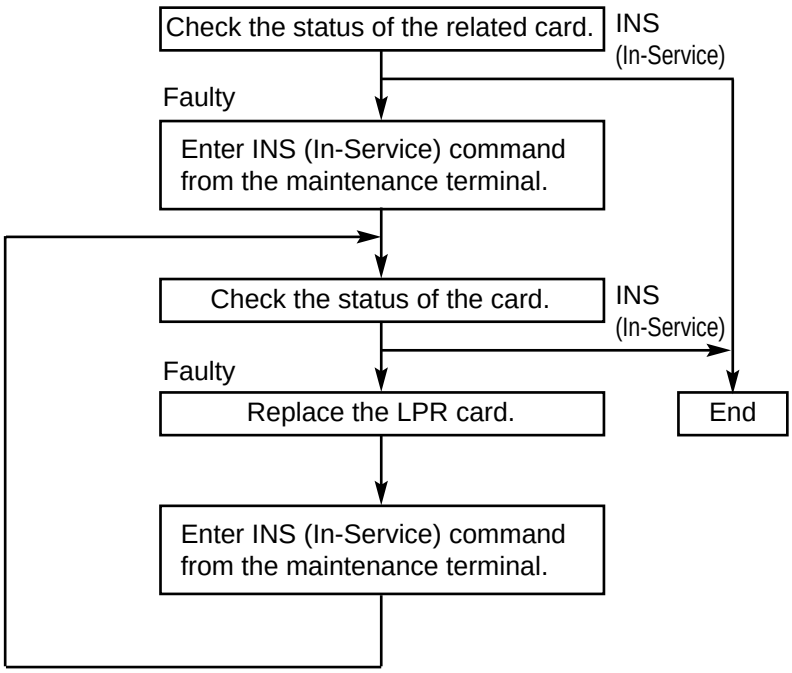
(18) LPR runaway

Error Code 1307 xyy : LPR runaway
x = 1 to 3 : Shelf number
yy = 01 to 14 : Slot number

Possible cause of the malfunction

1. LPR is reset.

Countermeasures



Note None

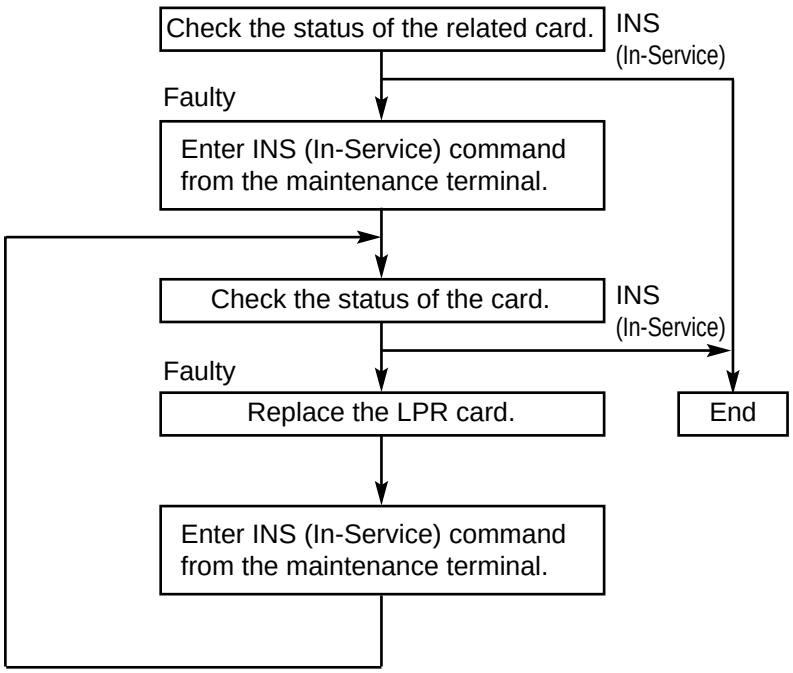
(19) Card start up error

Error Code

1308 : Card start up error (Reset Notice)
1309 : Card start up error (Sync Ans)
1310 : Card start up error (Card kind)
1311 : Card start up error (Download)
1312 : Card start up error (System Start)

Possible cause of the malfunction

1. The PBX received starting up error from the card.



Note

None

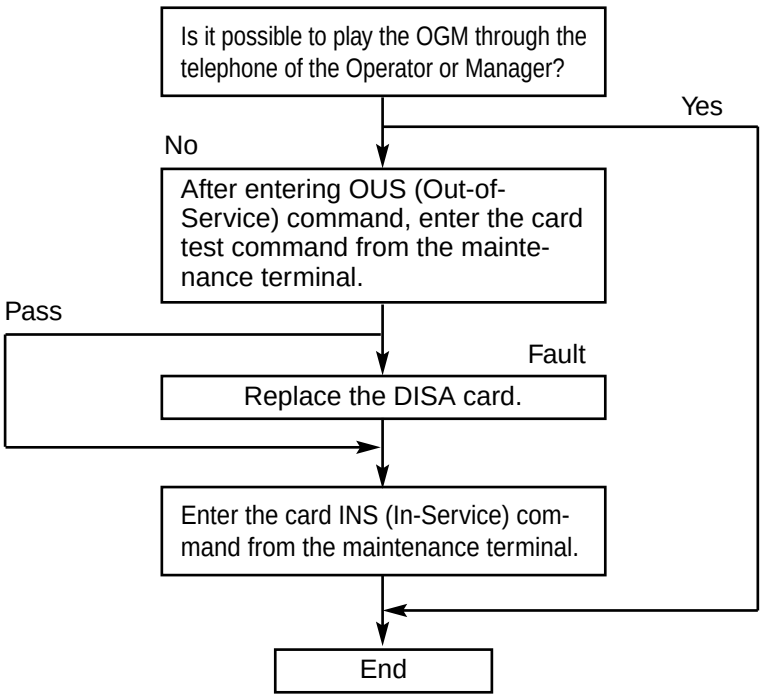
(20) DISA OGM CPU runaway

Error Code 1313 xyy : DISA OGM CPU runaway
x = 1 to 3 : Shelf number
yy = 01 to 14 : Slot number

Possible cause of the malfunction

1. Runaway of the OGM (CPU) of the DISA card

Countermeasures



Note None

(21) DISA OGM Lost

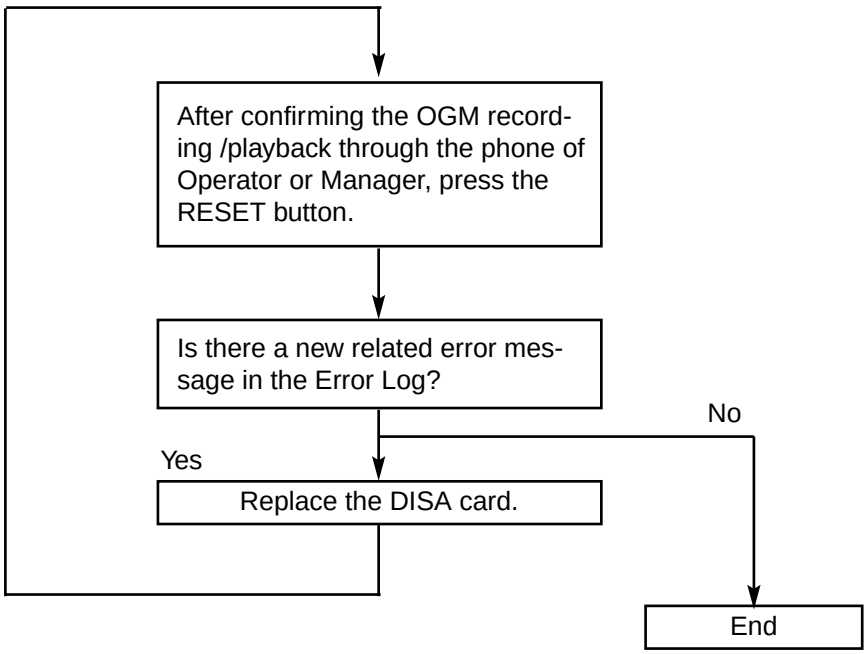
Error Code

1314 xyy : DISA OGM Lost
x = 1 to 3 : Shelf number
yy = 01 to 14 : Slot number

Possible cause of the malfunction

1. Power failure or power-off for long duration (6 to 7 days)
2. Defective backup battery for DISA card
3. OGM was not recorded after the installation.

Countermeasures



Note

None

(22) OPX power down

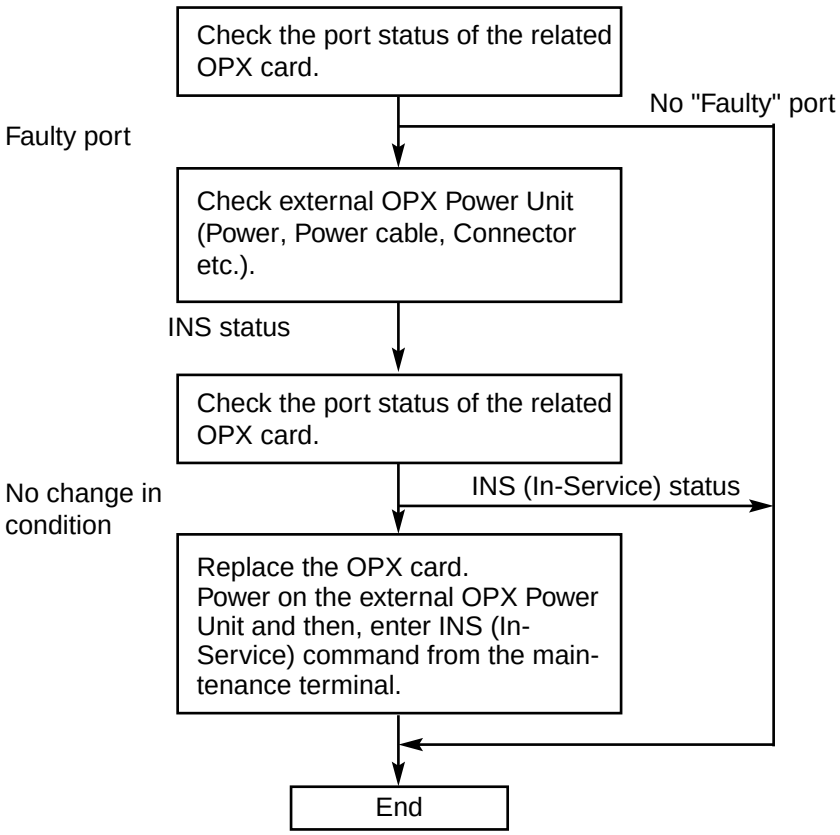
Error Code

1316 xyy : OPX power down
1317 xyy : OPX bell power down
x = 1 to 3 : Shelf number
yy = 01 to 14 : Slot number

Possible cause of the malfunction

1. Power-off of external OPX Unit or bell
2. Defective OPX card

Countermeasures



Note

None

(23) Digital trunk failure (out of synchornization)

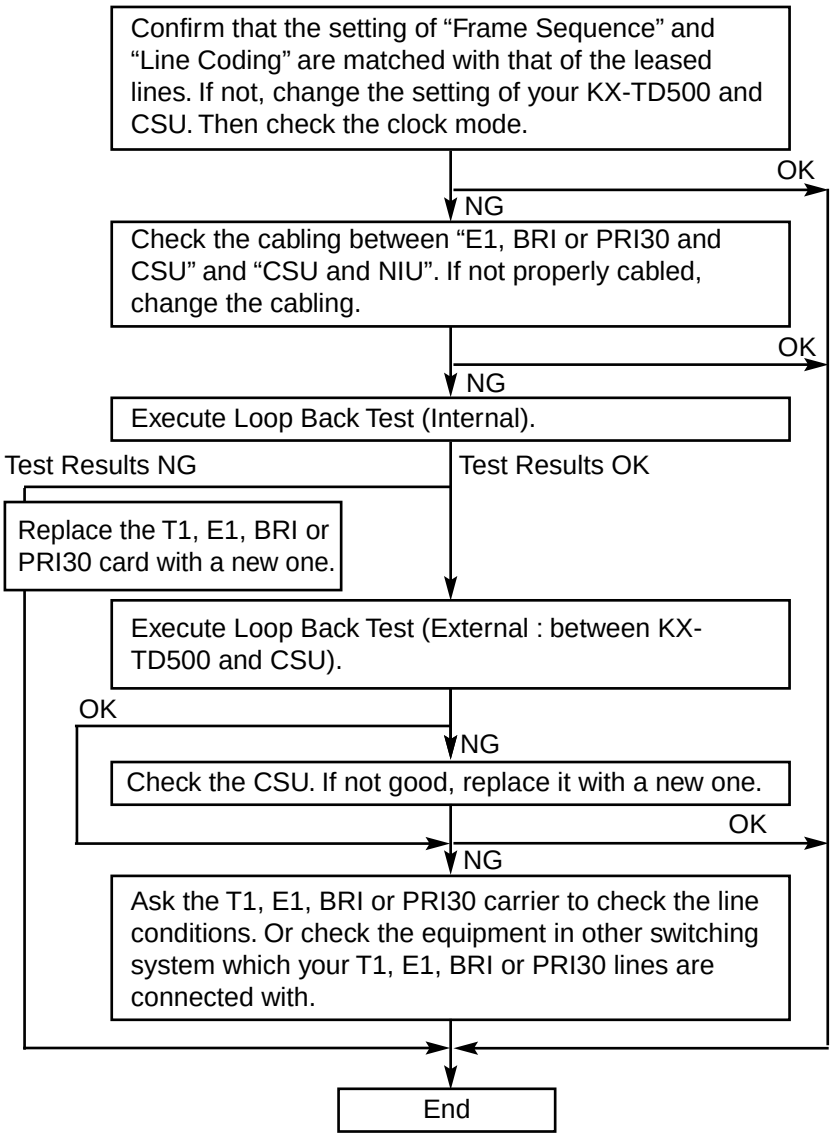
Error Code

1318 xyy : Digital trunk out of sync
x = 1 to 3 : Shelf number
yy = 01 to 14 : Slot number

Possible cause of the malfunction

T1, E1, BRI or PRI30 card (physical number xyy) lost the synchronization with the clock time sent from the Central Office.

Countermeasures



Note

Another T1, E1, BRI or PRI30 card with next priority will work as a master card, if more than two T1, E1, BRI or PRI30 cards were registered to the system by PC programming (TSW card configuration) beforehand. Otherwise, the system will synchronize with the system internal clock.

(24) Digital trunk failure (RAI signal reception)

Error Code	1319 xyy : Digital trunk RAI signal reception x = 1 to 3 : Shelf number yy = 01 to 14 : Slot number
Possible cause of the malfunction	T1, E1, BRI or PRI30 card (physical number xyy) received the RAl (Remote Alarm Indication) signal sent from the Central Office.
Countermeasures	Ask the T1, E1, BRI or PRI30 carrier to check the line conditions. Or check the equipment in other switching system which your T1, E1, BRI or PRI30 lines are connected with.
Note	None

(25) Digital trunk failure (AIS signal reception)

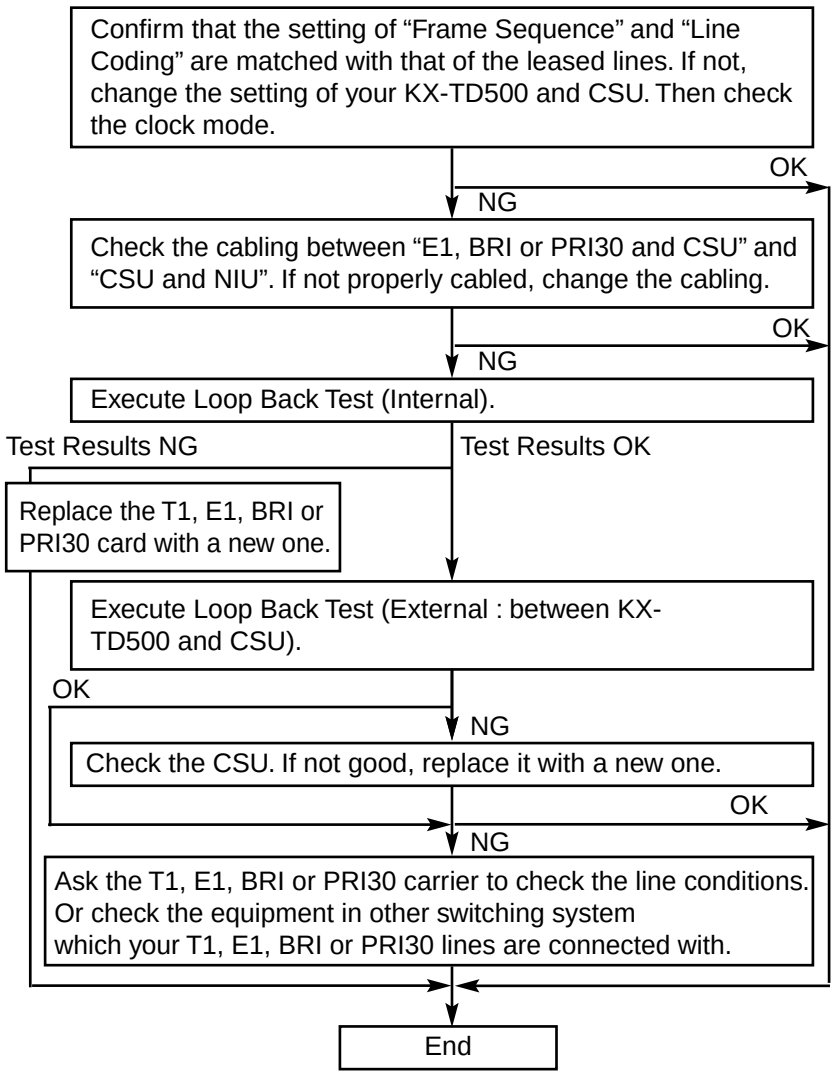
Error Code

1320 xyy : Digital trunk AIS signal reception
x = 1 to 3 : Shelf number
yy = 01 to 14 : Slot number

Possible cause of the malfunction

T1, E1, BRI or PRI30 card (physical number xyy) received the AIS (Alarm Indication Signal) signal from the Central Office.

Countermeasures



Note

Another T1, E1, BRI or PRI30 card with next priority will work as a master card, if more than two T1, E1, BRI or PRI30 cards were registered to the system by PC programming (TSW card configuration) beforehand. Otherwise, the system will synchronize with the system internal clock.

(26) Digital trunk failure (frame trouble)

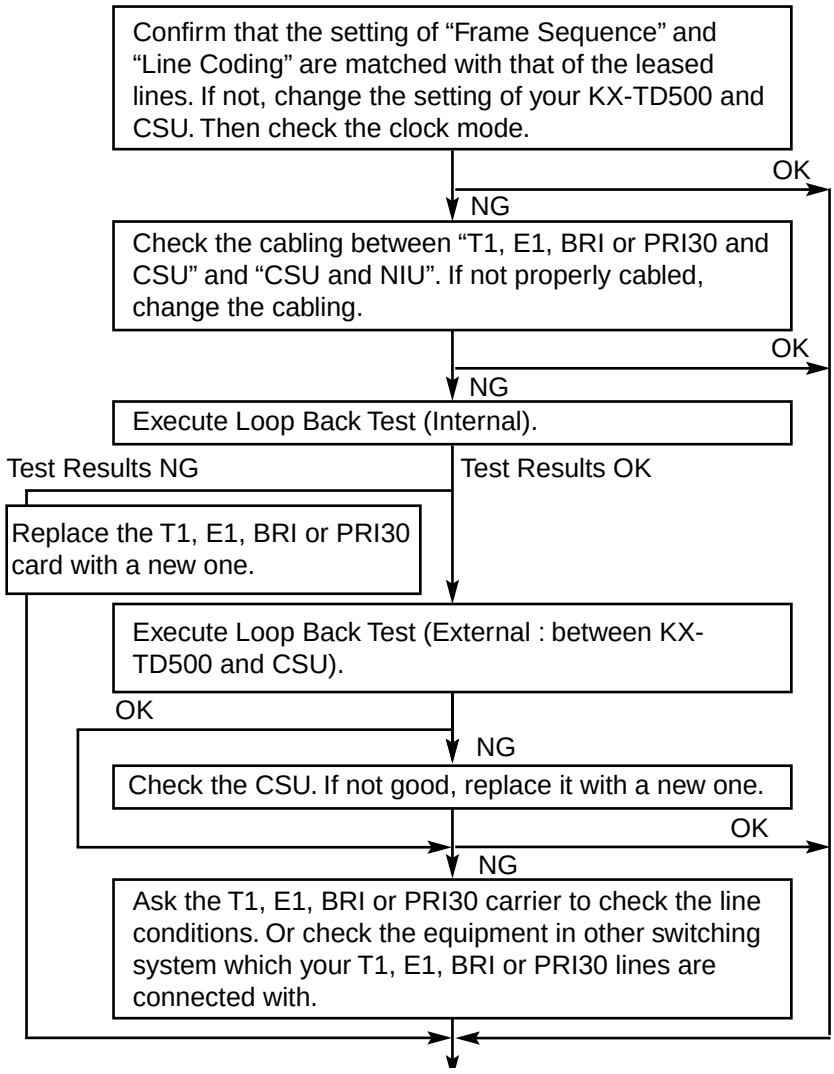
Error Code

1323 xyy: Digital trunk frame failure
x = 1 to 3 : Shelf number
yy = 01 to 14 : Slot number

Possible cause of the malfunction

On booting-up of T1, E1, BRI or PRI30 card (physical number xyy), it failed to synchronize with the clock time sent from the Central Office.

Countermeasures



Note

Another T1, E1, BRI or PRI30 card with next priority will work as a master card, if more than two T1, E1, BRI or PRI30 cards were registered to the system by PC programming (TSW card configuration) beforehand. Otherwise, the system will synchronize with the system internal clock.

This PBX fulfills the requirements of following European regulations:

CE

73/23/EEC	Low Voltage Directive
89/336/EEC	Electromagnetic compatibility (Basic EMC Publication)
92/31/EEC	Electromagnetic compatibility (Supplement)
93/68/EEC	CE mark

For above mentioned standards the unit is signed with the CE-mark.

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