Panasonic

Digital Super Hybrid System

Installation Manual
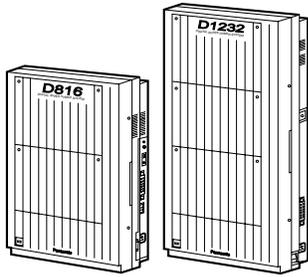
KX-TD816

Model KX-TD1232

Please read this manual before connecting the Digital Super Hybrid System.

Thank you for purchasing this Panasonic Model KX-TD816 / KX-TD1232, Digital Super Hybrid System.

System Components

System Components Table

	Model	Description
Service Unit	KX-TD816	Digital Super Hybrid System (Main Unit)
	KX-TD1232	Digital Super Hybrid System (Main Unit)
Telephone	KX-T7420	Digital proprietary telephone
	KX-T7425	Digital proprietary telephone
	KX-T7431	Digital proprietary telephone with 1-line display
	KX-T7433	Digital proprietary telephone with 3-line display
	KX-T7436	Digital proprietary telephone with 6-line display
	KX-T7320	Proprietary telephone
	KX-T7335	Proprietary telephone with backlit display
	KX-T7350	Proprietary telephone
	KX-T7220	Digital proprietary telephone
	KX-T7230	Digital proprietary telephone with 2-line display
	KX-T7235	Digital proprietary telephone with 6-line display
	KX-T7250	Digital proprietary telephone
	KX-T7130	Proprietary telephone with display
	KX-T7135	Proprietary telephone with backlit display
	KX-T7020	Proprietary telephone
	KX-T7030	Proprietary telephone with display
	KX-T7050	Proprietary telephone
	KX-T7055	Proprietary telephone
	KX-T7051	Single line telephone
	KX-T7052	Single line telephone

System Components

System Components Table

	Model	Description
Optional Equipment	KX-T7440	Digital DSS Console
	KX-T7441	Digital DSS Console
	KX-T7240	Digital DSS Console
	KX-T7040	DSS Console
	KX-TD112	PLL Card
	KX-TD160	Doorphone Card (2 doorphone / 2 door opener)
	KX-TD161	Doorphone Card (4 doorphone / 4 door opener)
	KX-TD170	8-Station Line Unit
	KX-TD171	8-Station Line Unit with SLT CID
	KX-TD180	4-CO Line Unit
	KX-TD185	4-DID Line Unit
	KX-TD187[*1]	T1 Unit
	KX-TD191[*1]	DISA Card
	KX-TD192[*1]	System Inter Connection Card (two cards with Connection Cable)
	KX-TD193	Caller ID Card
	KX-TD194	SLT Message Waiting Lamp Adaptor Unit
	KX-TD196[*1]	Remote Card
	KX-TD197[*1]	High Speed Remote Card
	KX-TD198[*2]	High Speed Remote Unit
	KX-TD284	4-ISDN S / T-point Line Unit (4-ISDN Line Unit)
	KX-TD382	2-ISDN U-point Line Unit (2-ISDN Line Unit)
	KX-TD384	4-ISDN U-point Line Unit (4-ISDN Line Unit)
	KX-TD386	6-ISDN U-point Line Unit (6-ISDN Line Unit)
	KX-TD290[*1]	Primary Rate Interface ISDN Expansion Unit
	KX-T30865	Doorphone
	KX-T30890	Headset (Earphone type)

[*1]   Can be installed in the KX-TD1232 only.

[*2]   Can be installed in the KX-TD816 only.

Important Safety Instructions

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

a) Read and understand all instructions.

b) Follow all warnings and instructions marked on the product.

c) Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

d) Do not use this product near water, for example, near a bathtub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.

e) Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.

f) Slots and openings in the cabinet and the back or bottom are provided for ventilation, to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on the bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.

g) This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your dealer or local power company.

h) This product is equipped with a three wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding type plug.

i) Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by people walking on it.

j) Do not overload wall outlets and extension cords as this can result in the risk of fire or electric shock.

k) Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.

l) To reduce the risk of electric shock, do not disassemble this product, but take it to a qualified serviceman when some service or repair work is required. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock when the appliance is subsequently used.

m) Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

1) When the power supply cord or plug is damaged or frayed.

2) If liquid has been spilled into the product.

3) If the product has been exposed to rain or water.

4) If the product does not operate normally by following the operating instructions. Adjust only those controls, that are covered by the operating instructions because improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.

5) If the product has been dropped or the cabinet has been damaged.

6) If the product exhibits a distinct change in performance.

n) Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.

o) Do not use the telephone to report a gas leak in the vicinity of the leak.

<u>SAVE THESE INSTRUCTIONS</u>

Attention

- Keep the unit away from heating appliances and electrical noise generating devices such as fluorescent lamps, motors and televisions. 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 by an authorized Panasonic Factory Service Center. 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 SUPPLY CORD IS USED AS THE MAIN DISCONNECT DEVICE, ENSURE THAT THE SOCKET-OUTLET IS LOCATED / INSTALLED NEAR THE EQUIPMENT AND IS EASILY ACCESSIBLE.

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

Accessory Order Information

- Replacement parts and accessories are available through your local authorized parts distributor.
- For ordering accessories, call toll free: 1-800-332-5368.

Part No.	Picture	Description	Comment
KX-J07W/B			213.36 cm (7 feet)
KX-J15W/B		Handset cord	457.2 cm (15 feet)
KX-J25W/B			762 cm (25 feet)
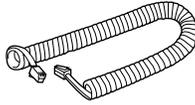
W:White   B:Black

When you ship the product
Carefully pack and send it prepaid, adequately insured and preferably in the original carton. Attach a postage-paid letter, detailing the symptom, to the outside of the carton. DO NOT send the product to the Executive or Regional Sales offices. They are NOT equipped to make repairs.

Product service
Panasonic Factory Servicenters for this product are listed in the servicenter directory. Consult your authorized Panasonic dealer for detailed instructions.

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 in the space provided and retain this book as a permanent record of your purchase to aid in identification in the event of theft.

MODEL NO.: _____

SERIAL NO.: _____

For your future reference

DATE OF PURCHASE   _____

NAME OF DEALER   _____

DEALER'S ADDRESS   _____

          _____

          _____

          _____

DEALER'S TEL NO.   _____

Introduction

This Installation Manual provides technical information for the Panasonic Digital Super Hybrid System, KX-TD816 / KX-TD1232. It is designed to serve as an overall technical reference for the system and includes a description of the system, its hardware and software, features and services and environmental requirements.

This manual contains the following sections:

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

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

Section 3, ISDN Installation
Contains the ISDN unit installation and wiring instructions.

Section 4, T1 Installation
Contains the T1 unit installation and wiring instructions.

Section 5, Troubleshooting
Provides information for system and telephone troubleshooting.

Section 6, Index
Provides the important words and phrases to help you access the required information easily.

Terms used in this Installation Manual

Programming Guide References
The related and required programming titles described in the *Programming Guide* are noted for your reference.
Programming Guide reference is also shown in the sentences as follows.
Example: *<SYS PRG [109]>*
Explanation: Refer to system program [109] in the Programming Guide.
This helps you know the related and required programming easily for the contents of the sentences.

Features Guide References
The related feature titles described in the *Features Guide* are noted for your reference.

About the other manuals

Along with this Installation Manual, the following manuals are available to help you know the available features, program and use the KX-TD816 / KX-TD1232 system.

Features Guide
Provides information about the system features.

Programming Guide
Provides system programming instructions.

User Manual
Provides operating instructions for the end users using proprietary telephones, single line telephones, consoles.

F.C.C REQUIREMENTS AND RELEVANT INFORMATION

1. **Notification to the Telephone Company**

   This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the bottom of this equipment is a label that contains, among other information, a product identifier in the format US: XXXXX##XXXXX. If requested, this number must be provided to the telephone company.

   Installation must be performed by a qualified professional installer. If required, provide the telephone company with the following technical information:
   - Telephone numbers to which the system will be connected
   - Make: Panasonic
   - Model: KX-TD816 / KX-TD1232
   - FCC Registration No.: found on the bottom of the unit
   - Ringer Equivalence No.: 0.4B
   - Facility Interface Code: 02LS2, 02RV2-T, 02IS5
   - Service Order Code: 9.0F, AS.2, 6.0P
   - Required Network Interface Jack: RJ11 / 14C, RJ49

2. **Ringer Equivalence Number (REN)**

   The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. The REN for this product is part of the product identifier that has the format US: XXXXX##XXXXX. The digits represented by ## are the REN without a decimal point (e.g., 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.

3. **Incidence of Harm to the Telephone Lines**

   If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

4. **Changes in Telephone Company Communications Facilities, Equipment, Operations and Procedures**

   The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

5. Trouble with This Equipment

If trouble is experienced with this equipment, for repair or warranty information, please see the attached warranty, which includes the Servicenter Directory. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

6. Connection to Party Line

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

Note

Allowing this equipment to be operated in such a manner as to not provide for proper answer supervision is a violation of Part 68 of the FCC's rules.

Proper answer supervision is when:

This equipment returns answer supervision to the public switched telephone network (PSTN) when DID calls are:
      —Answered by the called station
      —Answered by the attendant
      —Routed to a recorded announcement that can be administered by the customer
        premises equipment (CPE) user.
      —Routed to a dial prompt

This equipment returns answer supervision on all DID calls forwarded to the PSTN Permissible exceptions are:
      —A call is unanswered
      —A busy tone is received
      —A reorder tone is received

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this device.

When programming emergency numbers and / or making test calls to emergency numbers:
1. Remain on the line and briefly explain to the dispatcher the reason for the call before hanging up.
2. Perform such activities in the off-peak hours, such as early morning hours or late evenings.

WARNING

The software contained in the ARS and TRS features to allow user access to the network must be upgraded to recognize newly established network area codes and exchange codes as they are placed into service. Failure to upgrade the premises PBXs or peripheral equipment to recognize the new codes as they are established will restrict the customer and the customer's employees from gaining access to the network and to these codes. KEEP THE SOFTWARE UP-TO-DATE WITH THE LATEST DATA.

Table of Contents

Installation Manual

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

System Maximum Capacity

		KX-TD816	KX-TD1232	KX-TD1232x2
Extension	PT&SLT	16 (32)	32 (64)	64 (128)
	ISDN telephone[1]	4 BRI (8 ch)	6 BRI (12 ch)	12 BRI (24 ch)
	T1 Extension (OPX)[1]	0	24	24
Outside Line	Analog	8	12	24
	Basic Rate Interface (BRI)[1]	4 BRI (8 ch)	6 BRI (12 ch)	12 BRI (24 ch)
	Primary Rate Interface (PRI)[1]	0	1 PRI (23 ch)	1 PRI (23 ch)
	T1 Lines[1]	0	24	24

[1] Installing BRI unit, PRI unit and T1 unit together is impossible.

Module Expansion

Expansion modules are used to increase the system capacity.

EXtra Device Port (XDP)

Each extension jack in the system supports the connection of a digital proprietary telephone / DSS Console and a single line device. The two devices per jack have different extension numbers and are treated as two completely different extensions.

Paralleled Telephone Connection

Every jack in the system also 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.

Super Hybrid System

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

System Connection[*1]

With the addition of the optional System Inter Connection Card, two Digital Super Hybrid Systems can be connected together to expand the system to a maximum of 24 outside lines and 64 extensions. The two systems function as one, therefore, some functions such as paging and music-on-hold are duplicated.

ISDN Line Service

The system can manage a call received from the ISDN line by point-to-point or point-to-multi-point configuration. To use this service, an optional unit is required.

TIE Line Service

A TIE line is a privately leased communication line between two or more PBXs, which provides cost effective communications between company at different locations. To use this service, an optional unit is required.

T1 Line Service

A T1 line is at the bottom of the digital transmission hierarchy. The T1 line contains 24 voice channels. Voice is digitized by Pulse Code Modulation. To use this service, an optional unit is required.

Digital Proprietary Telephones (DPT)

The system supports four different models of digital proprietary telephones which cover the range from a monitor set to a large display handsfree version.

Programming System

The system can be programmed from a proprietary telephone or from a personal computer.

Voice Mail Integration

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

Automatic Route Selection (ARS)

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

[*1] Available for the KX-TD1232 only.

Caller ID

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

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

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

Remote Station Lock Control

      Allows an operator to lock an extension so that outgoing calls cannot be made.

Uniform Call Distribution (UCD)

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

1.2 Basic System Construction

1.2.1 Basic System Construction

The KX-TD816 Digital Super Hybrid System has a basic capacity of four outside lines and eight extensions, and the KX-TD1232 has eight outside lines and 16 extensions. They are capable of supporting Panasonic digital and analog proprietary telephones, DSS Consoles and single line devices such as single line telephones and fax machines.
To expand its capabilities, the system can be equipped with optional components or customer-supplied peripherals such as external speakers and external music sources (e.g., radios).

1.2.2 System Connection Diagram

KX-TD816

External Music Source

Amplifier   Speaker

Printer for SMDR or Personal Computer for System Programming

120 VAC, 60 Hz

AC Surge Protector

Avoid using the same AC outlet for office equipment and the KX-TD816. Use a dedicated AC outlet only.

(Lightning Protectors)
to outside lines 1 through 4 (initial)
to outside lines 5 through 8 (additional)

8 Outside Lines

Doorphone KX-T30865

Doorphone 1   Doorphone 2

Door Opener 1   Door Opener 2

Doorphone 3   Doorphone 4

Door Opener 3   Door Opener 4

16 Extensions (8 extensions – initial, 8 extensions – additional)

SLT Message
Waiting Lamp
Adaptor Unit
KX-TD194

(two pair)

(two pair)

KX-T7200 series digital
proprietary telephones

KX-T7400 series digital
proprietary telephones

(one pair)

(one pair)

(two pair)

KX-T7051 / KX-T7052
single line telephones

Single Line Telephone

KX-T7000 series analog
proprietary telephones

Digital DSS consoles
(KX-T7440 / KX-T7441
/ KX-T7240)

(one pair)

(one pair)

(two pair)

Cordless Phone

Data Terminal

(one pair)

KX-T7130 analog
proprietary telephone

(one pair)

KX-T7040 DSS console

Voice Processing System

Telephone Answering
Machine with Facsimile

: needs Optional Cards or Adaptor.

Note

• It is recommended that extension of jack 1 is a display proprietary telephone.
• Parallel connection of telephones is possible. Refer to the Parallel Telephone Connection in
  2.3.3   Telephone Connection.

KX-TD1232

Printer for SMDR or Personal Computer for System Programming

AC Surge Protector

120 VAC, 60 Hz

Avoid using the same AC outlet for office equipment and the KX-TD1232. Use a dedicated AC outlet only.

External Music Source 1

Amplifier   Speaker 1

External Music Source 2

Amplifier   Speaker 2

(Lightning Protectors)
to outside lines 1 through 8 (initial)
to outside lines 9 through 12 (additional)

12 Outside Lines

Doorphone KX-T30865

Doorphone 1   Doorphone 2

Doorphone 3   Doorphone 4

Door Opener 1   Door Opener 2

Door Opener 3   Door Opener 4

32 Extensions (16 extensions – initial, 16 extensions – additional)

SLT Message
Waiting Lamp
Adaptor Unit
KX-TD194

(two pair)

(two
pair)

KX-T7400 series digital
proprietary telephones

KX-T7200 series digital
proprietary telephones

(one
pair)

(one pair)

Single Line Telephone

KX-T7051 / KX-T7052
single line telephones

(two
pair)

(one pair)

KX-T7000 series analog
proprietary telephones

Digital DSS consoles
(KX-T7440 / KX-T7441
/ KX-T7240)

(one
pair)

(one pair)

Cordless Phone

Data Terminal

(three
pair)

(one pair)

KX-T7130 analog
proprietary telephone

(one
pair)

(one
pair)

KX-T7040 DSS console

Voice Processing System

Telephone Answering
Machine with Facsimile

: needs Optional Cards or Adaptor.

Note

• It is recommended that extension of jack 1 is a display proprietary telephone.
• Parallel connection of telephones is possible. Refer to the Parallel Telephone Connection in
  2.3.3   Telephone Connection.

1.3 Proprietary Telephones

1.3.1 Proprietary Telephones

The following Panasonic proprietary telephones are available with this system.

Proprietary Telephone	Description
KX-T7420	Digital, speakerphone, 12 Flexible CO
KX-T7425	Digital, speakerphone, 24 Flexible CO
KX-T7431	Digital, 1-line display, speakerphone, 12 Flexible CO
KX-T7433	Digital, 3-line display, speakerphone, 24 Flexible CO
KX-T7436	Digital, 6-line display, speakerphone, 24 Flexible CO
KX-T7320	Speakerphone, 12 Flexible CO
KX-T7335	1-line backlit display, speakerphone, 12 Flexible CO
KX-T7350	Monitor, 12 Flexible CO
KX-T7220	Digital, speakerphone, 24 Flexible CO
KX-T7230	Digital, 2-line display, speakerphone, 24 Flexible CO
KX-T7235	Digital, 6-line display, speakerphone, 12 Flexible CO
KX-T7250	Digital, monitor, 6 Flexible CO
KX-T7130	1-line display, speakerphone, 12 Flexible CO, 12 PF
KX-T7135	1-line backlit display, speakerphone, 12 Flexible CO, 12 PF
KX-T7020	Speakerphone, 12 Flexible CO, 4 PF
KX-T7030	1-line display, speakerphone, 12 Flexible CO, 4 PF
KX-T7050	Monitor, 12 Flexible CO, 4 PF
KX-T7055	Monitor, 3 Flexible CO, 3 PF

<u>Note</u>

Flexible CO : Flexible CO button (programmable)

PF : Programmable Feature button

1.4 Options

1.4.1 Options

Model No.	Model Name	Description	Max. Quantity on KX-TD816	Max. Quantity on KX-TD1232	
				Single System	System Connection
KX-TD170	8-Station Line Unit	Adds 8 extension lines.	1	2	4
KX-TD171	8-Station Line Unit with SLT CID	Adds 8 extension lines which contain single line telephones CID.	1	2	4
KX-TD180	4-CO Line Unit	Adds 4 outside lines.	1	1	2
KX-TD185	4-DID Line Unit	Adds 4 DID lines.	1	1	2
KX-TD187	T1 Unit	Adds 1 T1 line.	—	1	1
KX-TD382	2-ISDN Unit	Adds 2 ISDN U-point lines.	1	1	2
KX-TD384	4-ISDN Unit	Adds 4 ISDN U-point lines.	1	1	2
KX-TD386	6-ISDN Unit	Adds 6 ISDN U-point lines.	1	1	2
KX-TD284	4-ISDN Unit	Adds 4 ISDN S / T-point lines.	1	1	2
KX-TD290	Primary Rate Interface ISDN Expansion Unit	Adds 1 PRI ISDN line.	—	1	1
KX-TD191	DISA Card	Supports the Direct Inward System Access (DISA) feature and records outgoing messages.	—	1	2
KX-TD192	System Inter Connection Card	Connects two Digital Super Hybrid Systems.	—	—	2
KX-TD193	Caller ID Card	Supports the Caller ID Service of the central office.	2	3	6

Model No.	Model Name	Description	Max. Quantity on KX-TD816	Max. Quantity on KX-TD1232	
				Single System	System Connection
KX-TD194	SLT Message Waiting Lamp Adaptor Unit	Supports the Message Waiting feature for a single line telephone with a message waiting lamp. One unit supoorts 16 extensions.	1	2	4
KX-TD196	Remote Card	Supports the programming and maintenance of the system from a remote location.	—	1	2
KX-TD197	High Speed Remote Card	Supports the programming and maintenance of the system from a remote location.	—	1	2
KX-TD198	High Speed Remote Unit	Supports the programming and maintenance of the system from a remote location.	1	—	—
KX-TD112	PLL Card	Synchronizes the system clock with the clock of the ISDN network.	1	1	1 (Master Only)
KX-TD160	Doorphone Card	Supports 2 doorphones and 2 door openers.	1	1	2
KX-TD161	Doorphone Card	Supports 4 doorphones and 4 door openers.	1	1	2
KX-T7440 / KX-T7441 / KX-T7240 / KX-T7040 /	DSS Console	Provides easy and quick access to extensions and features. This must be used with a proprietary telephone.	4	4	8
KX-T30865	Doorphone	Used for a doorphone call.	2	2	4

1.4.2   Expansion Unit Combination

KX-TD816

	KX-TD17x	KX-TD180/ KX-TD185	KX-TD284	KX-TD38x
Basic (no unit connected)	○	○	○	○
+ KX-TD17x	×	○	○	○
+ KX-TD180 / KX-TD185		×	×	×
+ KX-TD284			×	×
+ KX-TD38x				×

KX-TD1232 Master System

	KX-TD17x	KX-TD180 / KX-TD185	KX-TD187	KX-TD284	KX-TD38x	KX-TD290
Basic (no unit connected)	○	○	○	○	○	○
+ KX-TD17x	○	○	○	○	○	○
+ KX-TD180 / KX-TD185		×	×	×	×	×
+ KX-TD187			×	×	×	×
+ KX-TD284				×	×	×
+ KX-TD38x					×	×
+ KX-TD290						×
+ KX-TD17x + KX-TD17x	×	○	○	○	○	○
+ KX-TD17x + KX-TD180 / KX-TD185		×	×	×	×	×
+ KX-TD17x + KX-TD187			×	×	×	×
+ KX-TD17x + KX-TD284				×	×	×
+ KX-TD17x + KX-TD38x					×	×
+ KX-TD17x + KX-TD290						×

KX-TD1232 Slave System (KX-TD187 or KX-TD290 is not connected to the master system)

	KX-TD17x	KX-TD180/ KX-TD185	KX-TD284	KX-TD38x
Basic (no unit connected)	○	○	○	○
+ KX-TD17x	○	○	○	○
+ KX-TD180 / KX-TD185		✕	✕	✕
+ KX-TD284			✕	✕
+ KX-TD38x				✕
+ KX-TD17x + KX-TD17x	✕	○	○	○
+ KX-TD17x + KX-TD180 / KX-TD185		✕	✕	✕
+ KX-TD17x + KX-TD284			✕	✕
+ KX-TD17x + KX-TD38x				✕

KX-TD1232 Slave System (KX-TD187 or KX-TD290 is connected to the master system)

<KX-TD187>

	KX-TD17x
Basic (no unit connected)	○
+ KX-TD17x	○
+ KX-TD17x + KX-TD17x	✕

<KX-TD290>

	KX-TD17x	KX-TD284[*]
Basic (no unit connected)	○	○
+ KX-TD17x	○	○
+ KX-TD284		✕
+ KX-TD17x + KX-TD17x	✕	○
+ KX-TD17x + KX-TD284		✕

Note

- ○: Combination possible; ✕: Combination not possible;
  Shaded part: These combinations appear elsewhere in the table.
  x: Any number (e.g., KX-TD17x can be KX-TD170 or KX-TD171)
- The KX-TD187 and KX-TD290 can only be connected to the master system.
- When the KX-TD187 or KX-TD290 is connected to the master system, Outside Line and Basic Rate Interface (BRI) in the slave system do not work.
- * When KX-TD290 is connected to the master system, KX-TD284 is only used for ISDN extension ports in the slave system. When KX-TD187 is connected to the master system, KX-TD284 is not available to be connected to the slave system.

1.5   Specifications

1.5.1   General Description

Control Method		CPU: 16-bit CPU	
Switching		Non Blocking PCM Time Switch	
Power Supplies	**Primary**	120 V AC, 60 Hz	
	Secondary	Station Supply Volt: 30 V Circuit Volt: ± 5 V, ± 15 V	
	Power Failure	• Memory backup duration: seven years with a factory-provided lithium battery • 4 outside lines max. for KX-TD816 and 6 outside lines max. for KX-TD1232 automatic transfer to extensions (Power Failure Transfer)	
Dialing	**Outward**	Dial Pulse (DP) 10 pps, 20 pps Tone (DTMF) Dialing	
	Internal	Dial Pulse (DP) 10 pps, 20 pps Tone (DTMF) Dialing	
Connectors	**Outside lines**	Modular Jack (RJ14C)	
	Extensions	KX-TD816: Modular Jack KX-TD1232: Amphenol Connector	
	Paging Output	Pin Jack (RCA JACK)	
	External Music Input	Two-conductor Jack (MINIJACK 3.5 mm diameter)	
Extension Connection Cable		Single line telephones	1 pair wire (T, R)
		KX-T7420, KX-T7425, KX-T7431, KX-T7433, KX-T7436, KX-T7220, KX-T7230, KX-T7235, KX-T7250	1 pair wire (D1, D2) or 2 pair wire (T, R, D1, D2)
		KX-T7130, KX-T7135 (with the KX-TD816), KX-T7320, KX-T7335, KX-T7350, KX-T7020, KX-T7030, KX-T7050, KX-T7055	2 pair wire (T, R, D1, D2)
		KX-T7130, KX-T7135 (with the KX-TD1232)	3 pair wire (T, R, D1, D2, P1, P2)
		KX-T7440, KX-T7441, KX-T7240, KX-T7040	1 pair wire (D1, D2)

Station Message Detail Recording (SMDR)	Interface	Serial Interface (RS-232C) (D-SUB, 25-pin)
	Output Equipment	Printer
	Detail Recording	Date, Time, Extension Number, Outside Line Number, Dialed Number, Ring Duration, Call Duration, Account Code, Caller ID, Timed Reminder

1.5.2   Characteristics

Station Loop Limit	Proprietary Telephone: 40 Ω Single Line Telephone: 600 Ω including set Doorphone: 20 Ω
Minimum Leakage Resistance	15 000 Ω
Maximum Number of Station Instruments per Line	**1** for 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	70 Vrms at 20 Hz depending on the Ringing Load
Central Office Loop Limit	1 600 Ω max.
Environmental Requirements	0 °C – 40 °C (32 °F – 104 °F), 10 % – 90 % relative humidity
Hooks witch Flash Timing Range	200 ms – 1000 ms

1.5.3   System Capacity

Lines, Station Equipment

Actual capacity will depend on the number or / and type of units connected to the system.

Item	Max. Quantity on KX-TD816	Max. Quantity on KX-TD1232	
		Single System	System Connection
Doorphones	4	4	8
Door Openers	4	4	8
External Pagers	1	2	4
External Music Sources	1	2	4

System Data

Item	Max. Quantity
Operators	2
System Speed Dialing	500
One-Touch Dialing	24 per extension (proprietary telephone)
Station Speed Dialing	10 per extension
Call Park areas	10
Absent Messages	9
Outside Line Groups	8
Toll Restriction Levels	8
Extension Groups	8
Class of Service levels	8
Message Waitings	128
Uniform Call Distribution Groups	8

Section 2

General Installation

2.1 Before Installation

2.1.1 Before Installation

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

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:

a) Never install telephone wiring during a lightning storm.

b) Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

c) Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

d) Use caution when installing or modifying telephone lines.

Installation Precautions

This system is designed for wall mounting only. Avoid installing in the following places. (Doing so may result in malfunction, noise, or discoloration.)

a) In direct sunlight and hot, cold, or humid places. (Temperature range: 0 °C – 40 °C / 32 °F – 104 °F)

b) Sulfuric gases produced in areas where there are thermal springs, etc., may damage the equipment or contacts.

c) Places in which shocks or vibrations are frequent or strong.

d) Dusty places, or places where water or oil may come into contact with the system.

e) Near high-frequency generating devices such as sewing machines or electric welders.

f) On or near computers, telexes, or other office equipment, as well as microwave ovens or air conditioners. (It is preferable not to install the system in the same room with the above equipment.)

g) Install at least 1.8 m (6 feet) away from radios and televisions. (Both the system and Panasonic proprietary telephones)

h) Do not obstruct area around the system (for reasons of maintenance and inspection — be especially careful to allow space for cooling above and at the sides of the system).

Wiring Precautions

Be sure to follow these instructions when wiring the unit:

a) To assure good quality telephone connection, it is recommended new and modifications to existing installation of customer premise wiring shall use solid twisted pair copper conductors with minimum 24 gauge that comply with the electrical specifications for Category 3 wiring as detailed in ANSI/EIA/TIA-570A Building Wiring Standards.

b) If cables are run on the floor, use protectors to prevent the wires from being stepped on. Avoid wiring under carpets.

c) Avoid using the same power supply outlet for computers, telexes, and other office equipment. Otherwise, the system operation may be interrupted by the induction noise from such equipment.

d) Please use one pair telephone wire for extension connection of (telephone) equipment such as single line telephones, data terminals, answering machines, computers, voice processing systems, etc., except Panasonic proprietary telephones (e.g., KX-T7436, KX-T7235).

e) The Power Switch of the system must be off during wiring. After all of the wiring is completed, turn the Power Switch on.

f) Mis-wiring may cause the system to operate improperly. Refer to 5.1.1   Installation and 5.1.2   Connection.

g) 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.

h) The system is equipped with a 3-wire grounding type plug. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.

i) Use twisted pair cable for outside line connection.

j) Outside lines should be installed with lightning protectors. For details, refer to 2.3.9   Installation of Lightning Protectors.

WARNING

Static sensitive devices are used. To protect printed circuit boards from static electricity, do not touch connectors indicated to the right. To discharge body static, touch ground or wear a grounding strap.

Warning: Static sensitive connectors
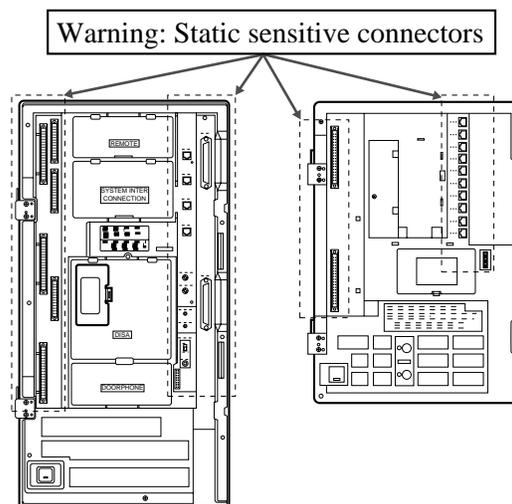
2.2 Installation of the Main Unit

2.2.1 Unpacking

Unpack the box and check the items below:

	KX-TD816	KX-TD1232
Main Unit	one	one
AC Cord	one	one
Template	one	one
Screws (Wall Mounting)	three	four
Pager Connectors	—	two
Music Source Connectors	—	two
Expansion Line Cord Holder	one	one

2.2.2   Location of Interfaces

Overview

KX-TD816

External Music Jack

Paging Jack

System Clear Switch

Reset Button

Serial Interface
(RS-232C) Connector

Ground Terminal

AC Inlet

Power Switch

Power Indicator

KX-TD1232

Ground Terminal

Serial Interface
(RS-232C) Connector

AC Inlet

Power Switch

Power Indicator

Inside View

KX-TD816

Extension Modular Jacks

Outside Line Modular Jacks

Fuse

Front Cover

KX-TD1232

Outside Line Modular Jacks

Extension Amphenol Connector

REMOTE

SYSTEM INTER CONNECTION

Paging Jack 2

Paging Jack 1

External Music Jack 2

External Music Jack 1

DISA

System Clear Switch

DOORPHONE

Reset Button

2.2.3   Wall Mounting

This set is designed for wall mounting only. The wall where the main unit is to be mounted must be able to support the weight of the main unit. If screws other than the ones supplied are used, use screws with the same diameter as the ones enclosed.

Mounting on Wooden Wall

1. Place the template (included) on the wall to mark the screw positions.
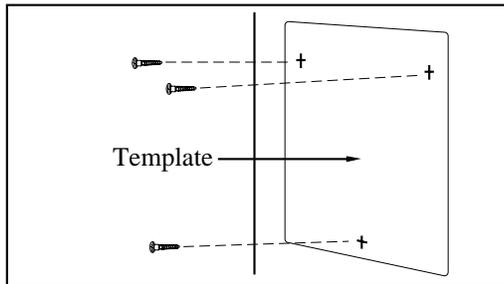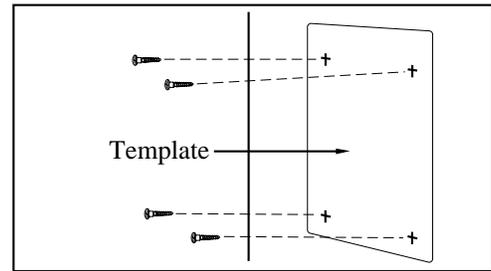
KX-TD816   KX-TD1232

2. Install the screws (included) into the wall.
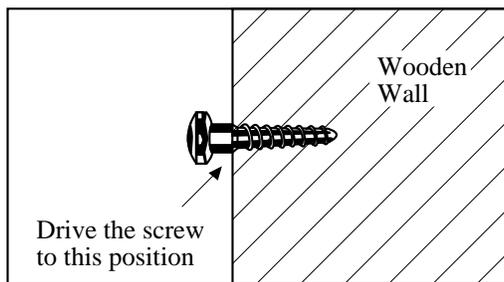
KX-TD816   KX-TD1232

3. Hook the main unit on the screw heads.
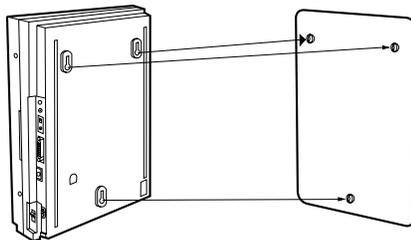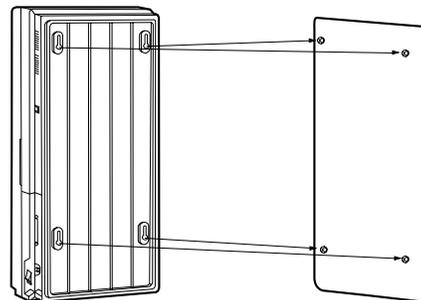
KX-TD816   KX-TD1232

Mounting on Concrete or Mortar Wall

1. Place the template (included) on the wall to mark the screw positions.
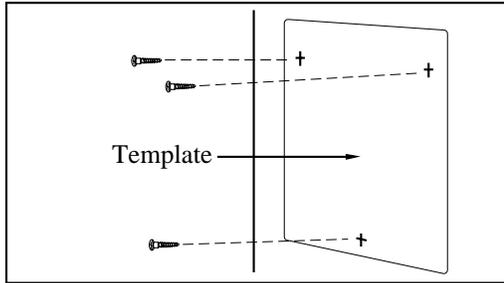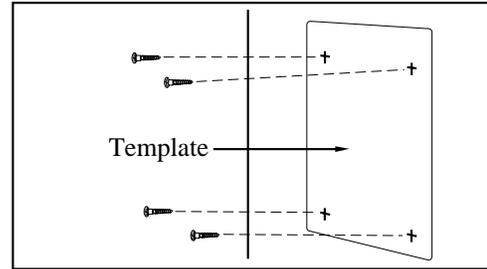
KX-TD816   KX-TD1232

2. Drill holes and drive the anchor plugs (user-supplied) with a hammer, flush to the wall.

To the wall surface   Concrete Wall
Anchor Plug
6.4 mm
(1/4 inch)
29 mm
(1 1/8 inch)
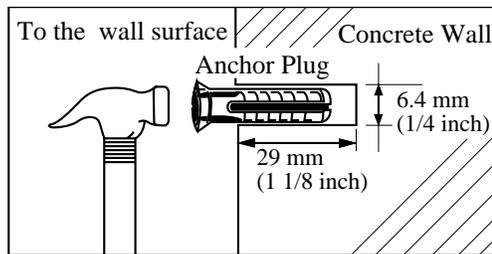
3. Install the screws (included) into the anchor plugs.

Drive the screw
to this position
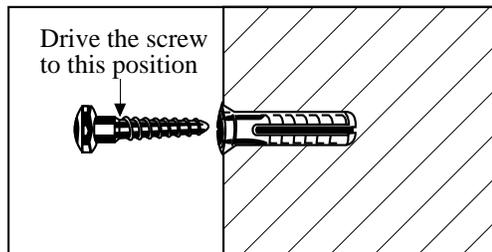
4. Hook the main unit on the screw heads.
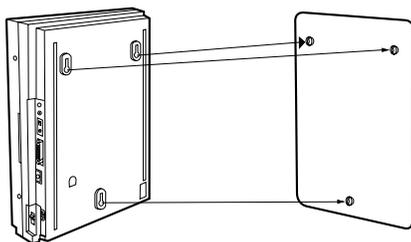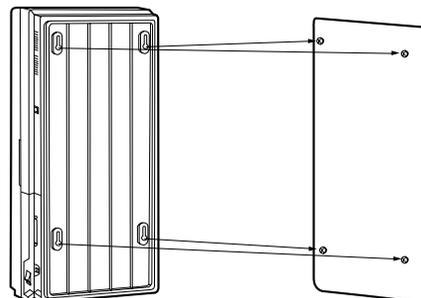
KX-TD816   KX-TD1232

2.2.4   Opening Front Cover

1. Loosen the two screws on the right side of the main unit.

2. Open the front cover in the direction of arrow Ⓐ.
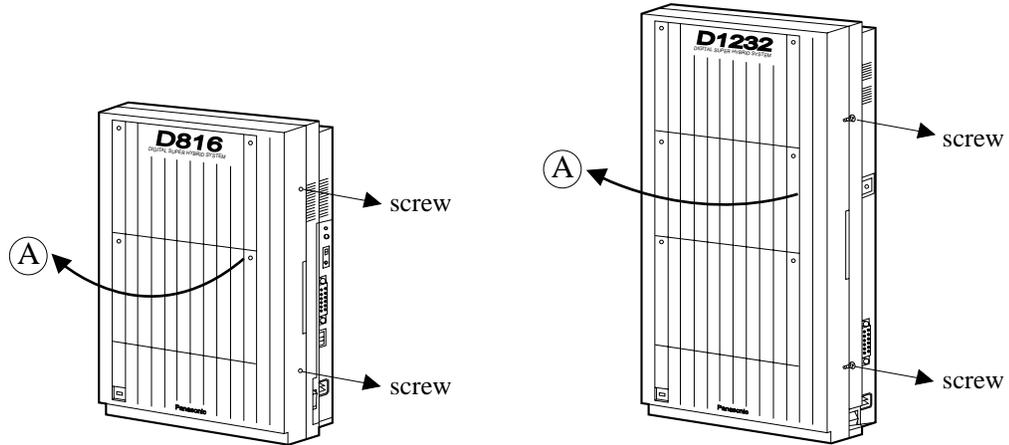
Note

The two screws are attached to the front cover with springs so that they will not be lost.

2.2.5　Frame Ground Connection

IMPORTANT

Connect the frame of the main unit to ground.

1. Loosen the screw.
2. Insert the grounding wire.
3. Tighten the screw.
4. Connect the grounding wire to ground.
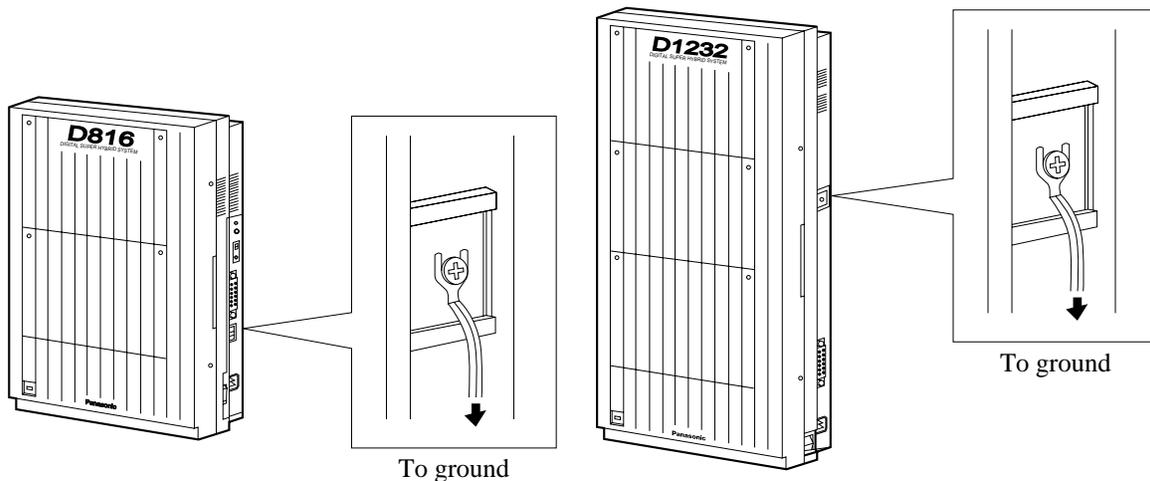
To ground

To ground

In most of the continental United States, the ground provided by the "Third wire ground" at the commercial power outlet will be satisfactory. However, in a small percentage of cases this ground may be installed incorrectly. Therefore, the following test procedure should be performed.

Test Procedure

1. Obtain a suitable voltmeter and set it for a possible reading of up to 250 V AC.
2. Connect the meter probes between the two main AC voltage points on the wall outlet. The reading obtained should be 108 V AC-132 V AC.
3. Move one of the meter probes to the 3rd prong terminal (GND).
   Either the same reading or a reading of 0 V should be obtained.
4. If a reading of 0 V at one terminal and a reading of 108 V AC-132 V AC at the other terminal is not obtained, the outlet is not properly grounded.
   This condition should be corrected by a qualified electrician (per article 250 of the National Electrical Code).
5. If a reading of 0 V at one terminal and a reading of 108 V AC-132 V AC at the other terminal is obtained, then set the meter to the "OHMS / RX1" scale, place one probe at the GND Terminal and the other probe at the terminal which gave a reading of 0 V.
   A reading of less than 1 ohm should be obtained.
   If the reading is not obtained the outlet is not adequately grounded, see a qualified electrician.

2.3   Connection

2.3.1   Outside Line Connection

Connection

1. Insert the modular plugs of the telephone line cords (4-conductor wiring) into the modular jacks on the system.

2. Connect the line cord to the terminal board or the Central Office jack.

KX-TD816

R: Ring   T: Tip

T2
R1
T1
R2

View of TEL Jack (Outside Line)

(T1, R1)   (T2, R2)

Outside Line 3, Outside Line 4

Outside Line 1, Outside Line 2

Use 4-conductor wiring cord

To Terminal Board or Modular
Jacks from the Central Office.

KX-TD1232

Use 4-conductor wiring cord

To Terminal Board or Modular
Jacks from the Central Office.
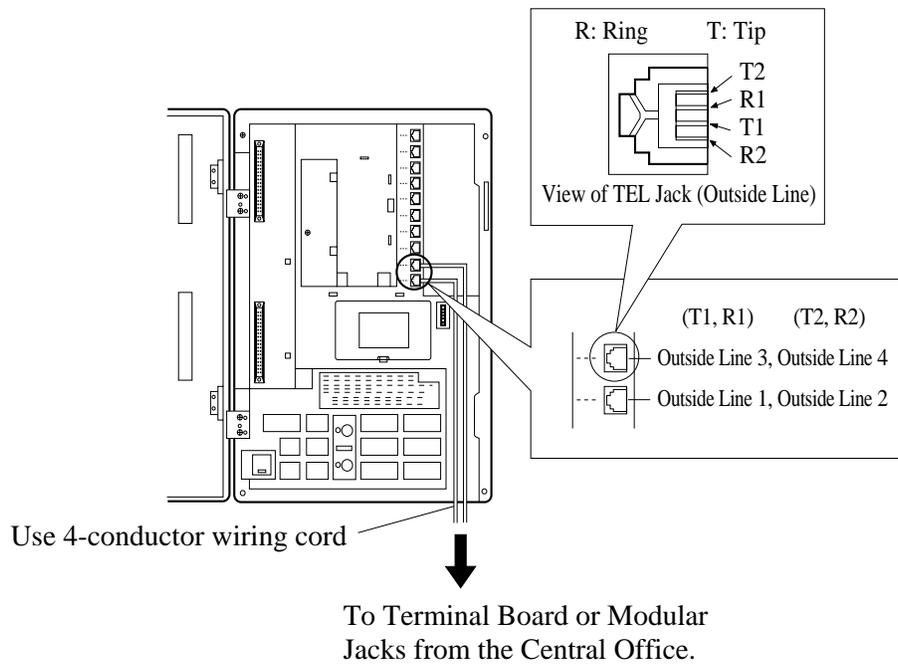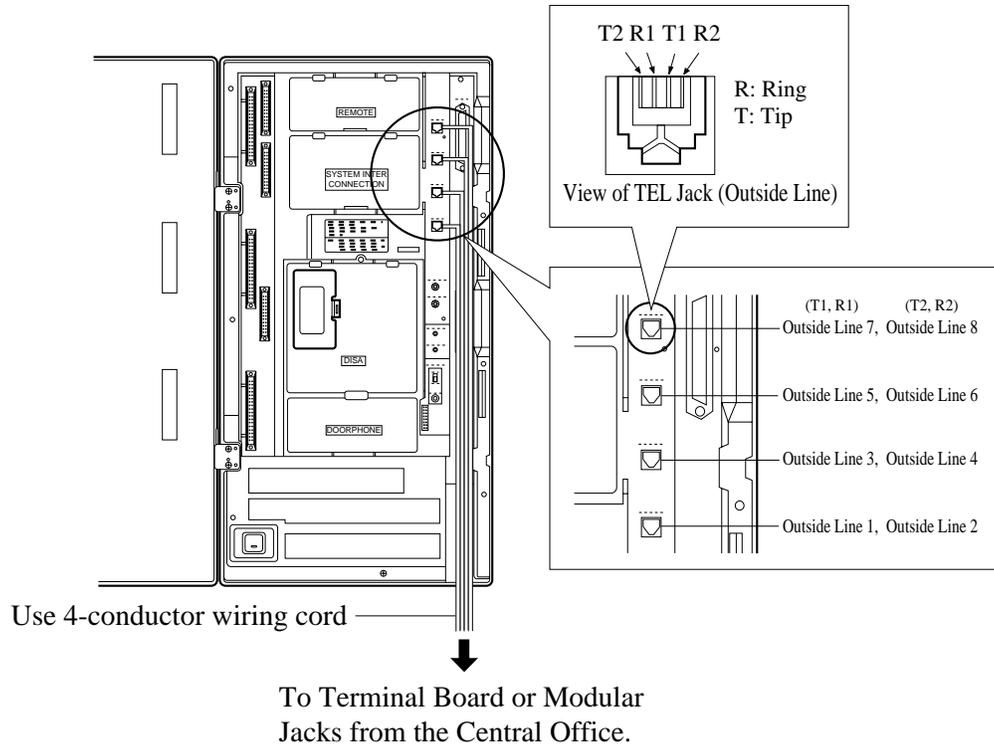
<u>**Notice**</u>

- Use twisted pair cable for installation.
- It is recommended to use RJ14C telephone jacks.
- Mis-connection may cause the system to operate improperly. See 5.1.1   Installation and
  5.1.2   Connection before Connection.

2.3.2   Extension Connection

KX-TD816

Extension jacks 1 through 8 are for all kinds of telephones.

Maximum Cabling Distance

The maximum length of the extension line cord (twisted cable) which connects the system and the extension is as follows:

	Diameter of the line	Max. length
Single Line Telephone	22 AWG 24 AWG 26 AWG	1798 m (5900 feet) 1128 m (3700 feet) 698 m (2290 feet)
Proprietary Telephone / DSS Console	22 AWG 24 AWG 26 AWG	360 m (1180 feet) 229 m (750 feet) 140 m (460 feet)

Telephone Wiring

2 or 4-conductor wiring is required for each extension as listed below. There are four pins for possible connection: "T", "R", "D1" and "D2".

T:Tip
R:Ring
D1:Low
D2:High

Telephone	Wiring
Single line telephones	1 pair wire (T, R)
Digital proprietary telephone (e.g., KX-T7436, KX-T7235)	1 pair wire (D1, D2) or 2 pair wire (D1, D2, T, R) for eXtra Device Port
Analog proprietary telephone (e.g., KX-T7030, KX-T7130)	2 pair wire (D1, D2, T, R)
DSS console (e.g., KX-T7440, KX-T7240)	1 pair wire (D1, D2)

Connection

To extensions (Jacks 1 – 8)
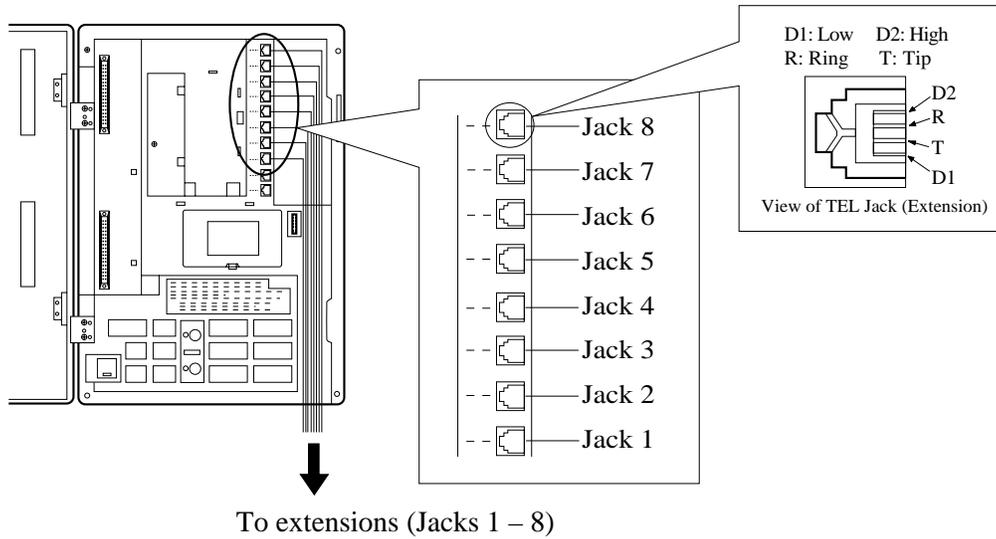
KX-TD1232

Extension jacks 1 through 16 are for all kinds of telephones.

Maximum Cabling Distance

The maximum length of the extension line cord (twisted cable) which connects the system and the extension is as follows:

	Diameter of the line	Max. length
Single Line Telephone	22 AWG 24 AWG 26 AWG	1798 m (5900 feet) 1128 m (3700 feet) 698 m (2290 feet)
Proprietary Telephone / DSS Console	22 AWG 24 AWG 26 AWG	360 m (1180 feet) 229 m (750 feet) 140 m (460 feet)

Telephone Wiring

2, 4 or 6-conductor wiring is required for each extension as listed below. There are six pins for possible connection: "T", "R", "D1", "D2", "P1" and "P2".

T:Tip
R:Ring
D1:Low
D2:High
P1:3 Pair Voice (OHCA)
P2:3 Pair Voice (OHCA)

Telephone	Wiring
Single line telephones Telephone wiring	1 pair wire (T, R)
Digital proprietary telephone (e.g., KX-T7436, KX-T7235)	1 pair wire (D1, D2) or 2 pair wire (D1, D2, T, R) for eXtra Device Port
Analog proprietary telephone except KX-T7130 (e.g., KX-T7020, KX-T7030)	2 pair wire (D1, D2, T, R)
KX-T7130 Analog proprietary telephone	3 pair wire (D1, D2, T, R, P1, P2)*
DSS console (e.g., KX-T7440, KX-T7240)	1 pair wire (D1, D2)

* 3-pair twisted cabling:
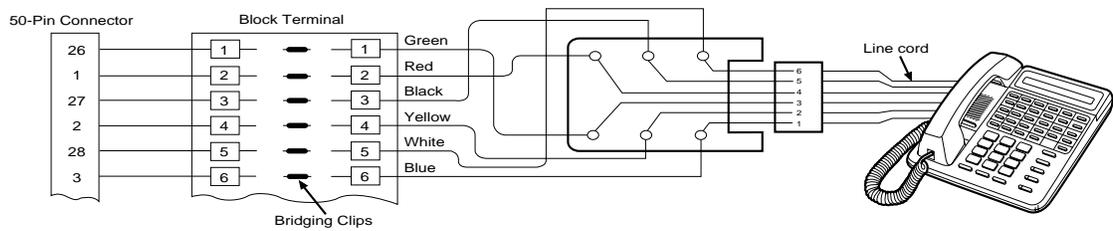
Connection

1. Insert the 50-pin connector to the Extension Jack as shown.

2. Connect the wire cords to the appropriate connector pins and the terminal equipment. Refer to the Telephone Wiring (Page 48) and Pin Number Chart (Page 51).
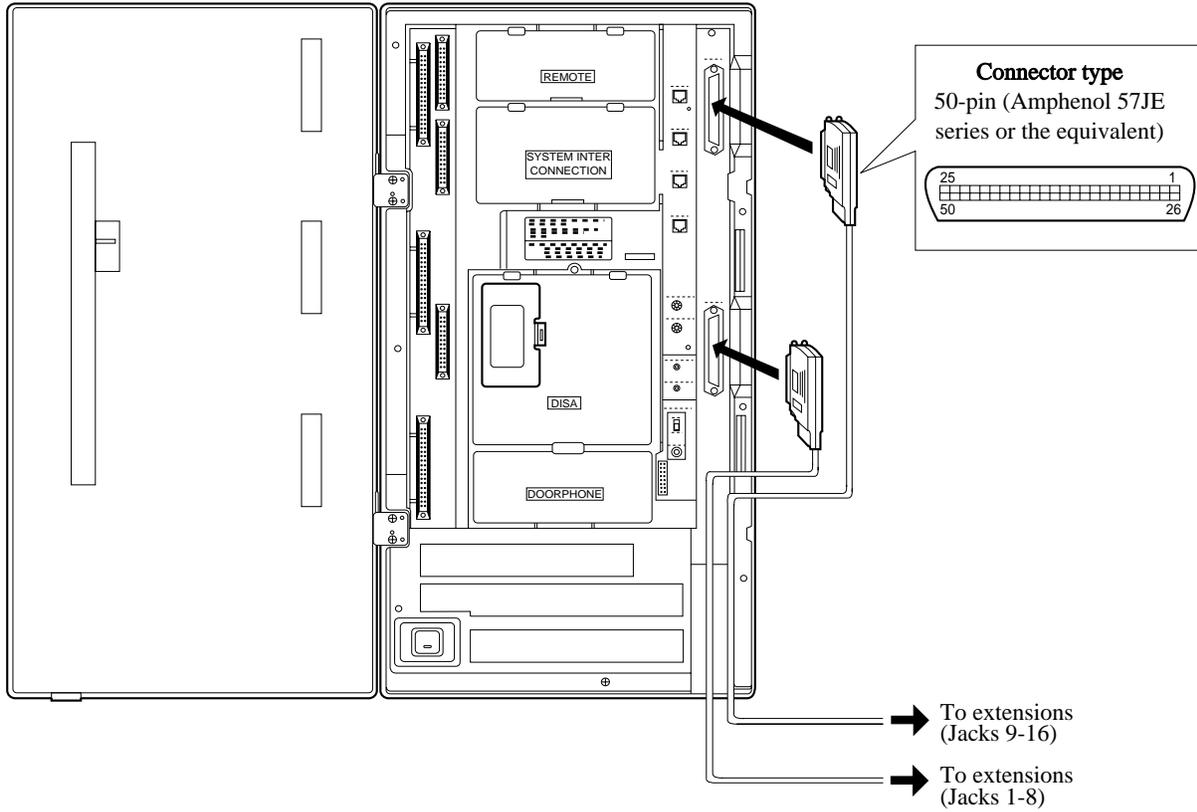
3. After inserting the connector, fasten the connector with the nylon tie.
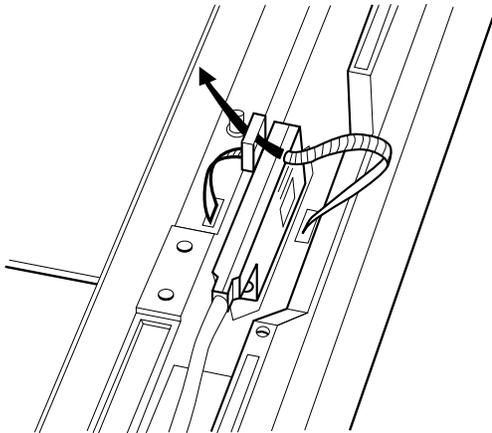
Pin Number Chart

Pin no.	Cable Color	EXTN. 1-8 / Doorphone		EXTN. 9-16		8EXTN.*		8EXTN.*	
26	WHT-BLU		T		T		T		T
1	BLU-WHT		R		R		R		R
27	WHT-ORN	Jack	D1	Jack	D1	Jack	D1	Jack	D1
2	ORN-WHT	No.1	D2	No.9	D2	No.17	D2	No.25	D2
28	WHT-GRN		P1		P1		P1		P1
3	GRN-WHT		P2		P2		P2		P2
29	WHT-BRN		T		T		T		T
4	BRN-WHT		R		R		R		R
30	WHT-SLT	Jack	D1	Jack	D1	Jack	D1	Jack	D1
5	SLT-WHT	No.2	D2	No.10	D2	No.18	D2	No.26	D2
31	RED-BLU		P1		P1		P1		P1
6	BLU-RED		P2		P2		P2		P2
32	RED-ORN		T		T		T		T
7	ORN-RED		R		R		R		R
33	RED-GRN	Jack	D1	Jack	D1	Jack	D1	Jack	D1
8	GRN-RED	No.3	D2	No.11	D2	No.19	D2	No.27	D2
34	RED-BRN		P1		P1		P1		P1
9	BRN-RED		P2		P2		P2		P2
35	RED-SLT		T		T		T		T
10	SLT-RED		R		R		R		R
36	BLK-BLU	Jack	D1	Jack	D1	Jack	D1	Jack	D1
11	BLU-BLK	No.4	D2	No.12	D2	No.20	D2	No.28	D2
37	BLK-ORN		P1		P1		P1		P1
12	ORN-BLK		P2		P2		P2		P2
38	BLK-GRN		T		T		T		T
13	GRN-BLK		R		R		R		R
39	BLK-BRN	Jack	D1	Jack	D1	Jack	D1	Jack	D1
14	BRN-BLK	No.5	D2	No.13	D2	No.21	D2	No.29	D2
40	BLK-SLT		P1		P1		P1		P1
15	SLT-BLK		P2		P2		P2		P2

Pin no.	Cable Color	EXTN. 1-8 / Doorphone		EXTN. 9-16		8EXTN.*		8EXTN.*	
41	YEL-BLU		T		T		T		T
16	BLU-YEL		R		R		R		R
42	YEL-ORN	Jack	D1	Jack	D1	Jack	D1	Jack	D1
17	ORN-YEL	No.6	D2	No.14	D2	No.22	D2	No.30	D2
43	YEL-GRN		P1		P1		P1		P1
18	GRN-YEL		P2		P2		P2		P2
44	YEL-BRN		T		T		T		T
19	BRN-YEL		R		R		R		R
45	YEL-SLT	Jack	D1	Jack	D1	Jack	D1	Jack	D1
20	SLT-YEL	No.7	D2	No.15	D2	No.23	D2	No.31	D2
46	VIO-BLU		P1		P1		P1		P1
21	BLU-VIO		P2		P2		P2		P2
47	VIO-ORN		T		T		T		T
22	ORN-VIO		R		R		R		R
48	VIO-GRN	Jack	D1	Jack	D1	Jack	D1	Jack	D1
23	GRN-VIO	No.8	D2	No.16	D2	No.24	D2	No.32	D2
49	VIO-BRN		P1		P1		P1		P1
24	BRN-VIO		P2		P2		P2		P2
50									
25									

Note

*"8EXTN" in the table indicates an extension expansion area for 8-Station Line Unit (KX-TD170) or 8-Station Line Unit with SLT CID (KX-TD171).
System Programming is required for card location identification.

- If a telephone or answering machine with an A-A1 relay is connected to the main unit, set the A-A1 relay switch of the telephone or answering machine to OFF position.
- Mis-connection may cause the system to operate improperly. See 5.1.1 Installation and 5.1.2 Connection.
- Up to four DSS Consoles (KX-T7440, KX-T7441, KX-T7240 or KX-T7040) can be installed per system. As the DSS Console itself cannot work alone, it always requires a proprietary telephone used in pair. Place the DSS Console and the paired telephone side by side on your desk.
- It is necessary to designate the jack numbers of paired DSS Consoles and proprietary telephones by system programming.
- After completing all the required inside cabling, including outside lines, extensions, external pagers, external music sources, doorphones and door openers fasten the cables with the nylon tie (included) as shown.
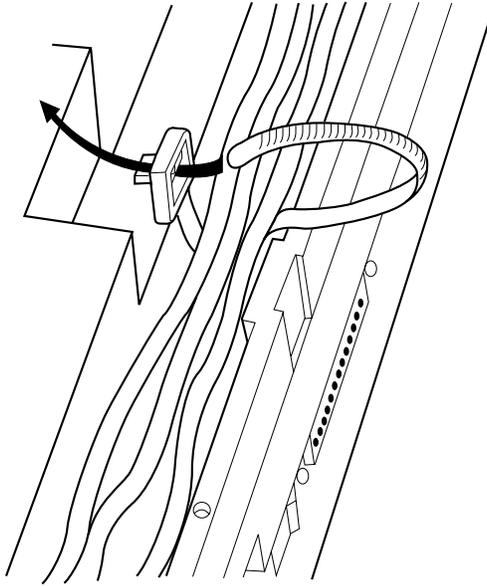
Programming Guide Reference

[007] DSS Console Port and Paired Telephone Assignment

[109] Expansion Unit Type

Features Guide Reference

DSS Console

Module Expansion

2.3.3   Telephone Connection

Proprietary Telephone / DSS Console Connection

Connect proprietary telephones and DSS Consoles as follows:

Analog Proprietary Telephone
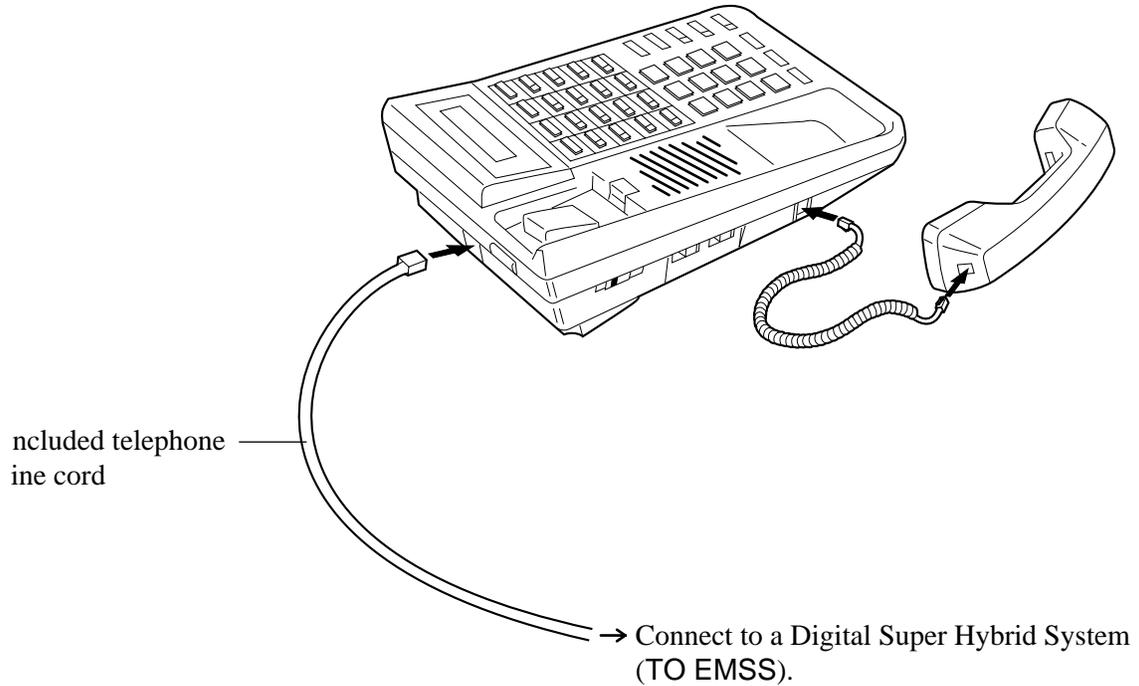
ncluded telephone
ine cord

→ Connect to a Digital Super Hybrid System
(TO EMSS).

KX-T7200 Series Digital Proprietary Telephone

Included telephone line cord

→ Connect to a single line telephone jack, Telephone Answering Machine, or FAX for XDP or parallel connections (TO TEL).

→ Connect to a Digital Super Hybrid System (TO EMSS).

KX-T7400 Series Digital Proprietary Telephone

Included telephone line cord

Connect to a Digital Super Hybrid System (TO MAIN UNIT).

Connect to a single line telephone jack, Telephone Answering Machine, or FAX for XDP or parallel connections (TO TEL).
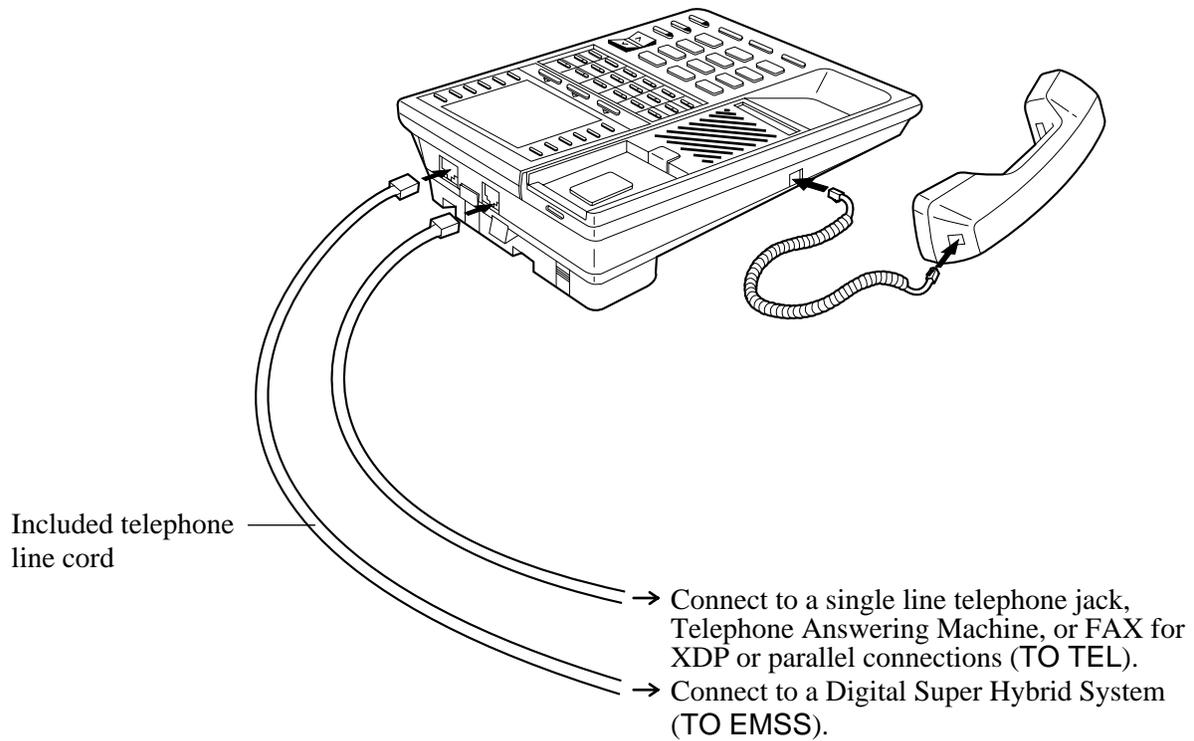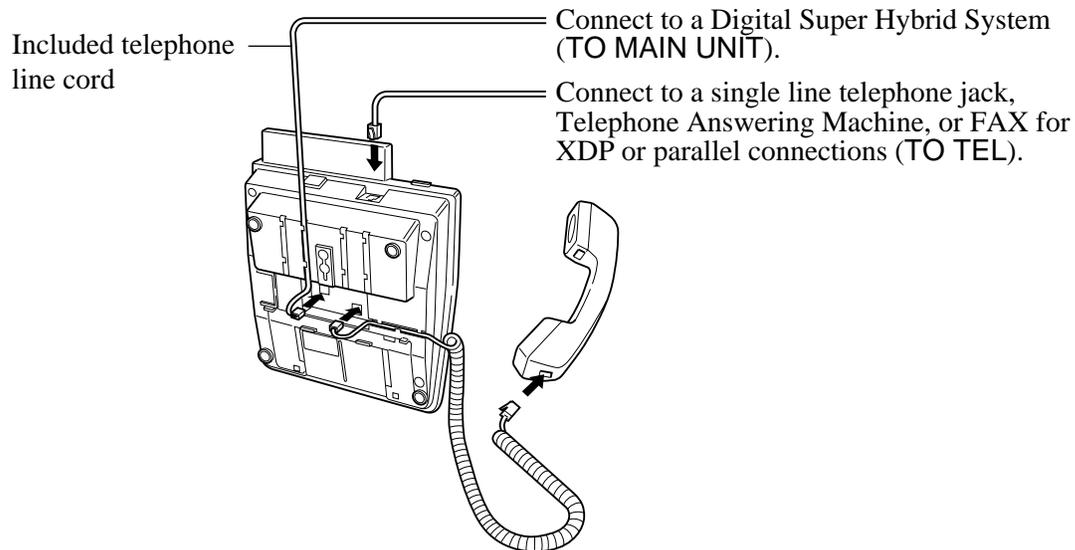
KX-T7400 DSS Console / KX-T7240 Digital DSS Console

Included telephone
line cord

→ Connect to a Digital Super
   Hybrid System (TO EMSS).
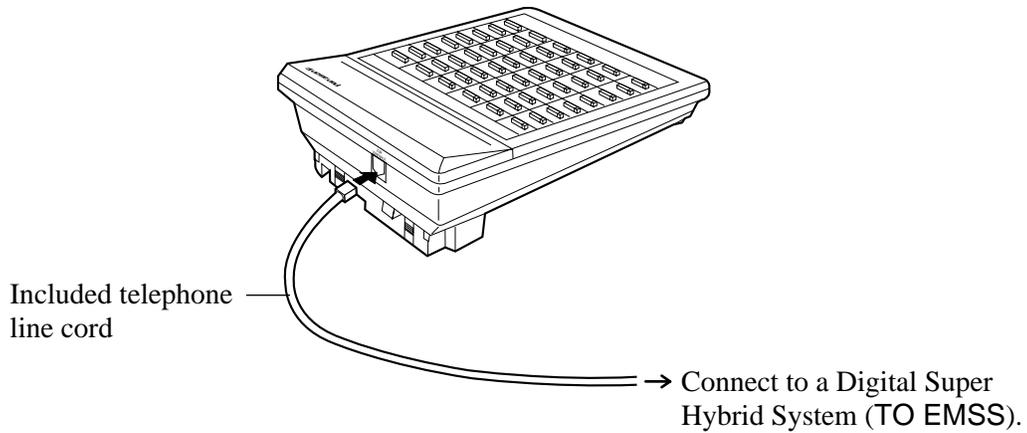
KX-T7440 / KX-T7441 Digital DSS Console

→ Connect to a Digital Super
   Hybrid System (TO MAIN UNIT).

Included telephone
line cord
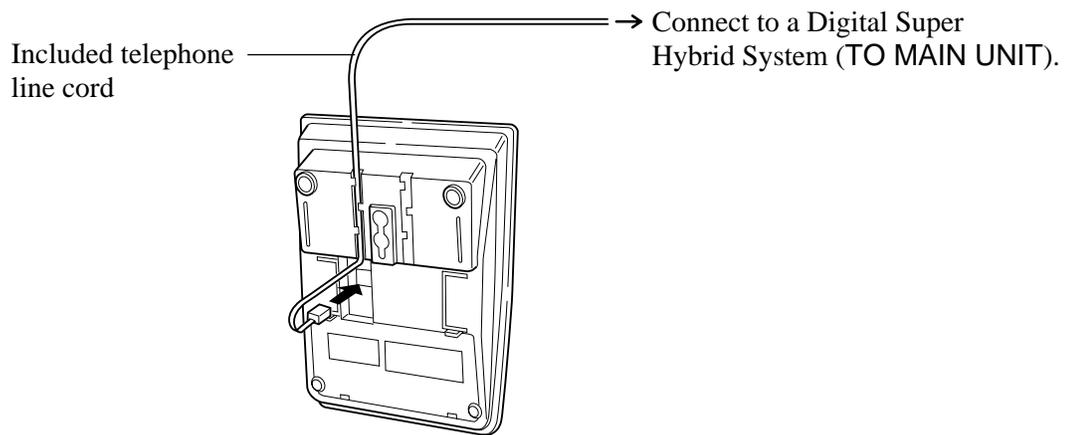
KX-T7440 and KX-T7441 can be connected to a KX-T7400 series digital proprietary
telephone.
Use the attached plates and screws as follows.

Plate

Screws
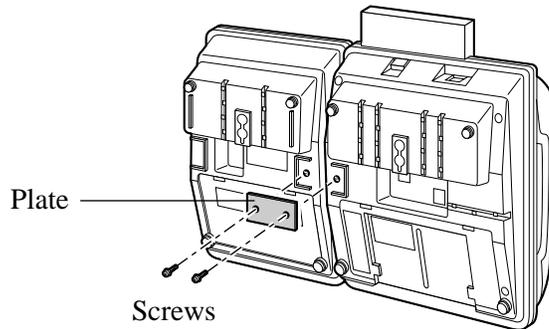
Paralleled Telephone Connection

Any single line telephone can be connected in parallel with a proprietary telephone as follows:

Method 1: Using a Modular T-Adaptor

Any single line telephone can be connected in parallel with a proprietary telephone as follows:

Modular T-Adaptor
(Panasonic KX-J66 or USOC RJA2X)

2-conductor wiring cord
Connect pins "T" and "R".

4-conductor wiring cord
For DPT: Connect pins "D1" and "D2"
only. ("T" and "R" are not necessary.)
For APT: Connect pins "T2", "R", "D1"
and "D2".

Digital or Analog
Proprietary Telephone

Single Line Telephone
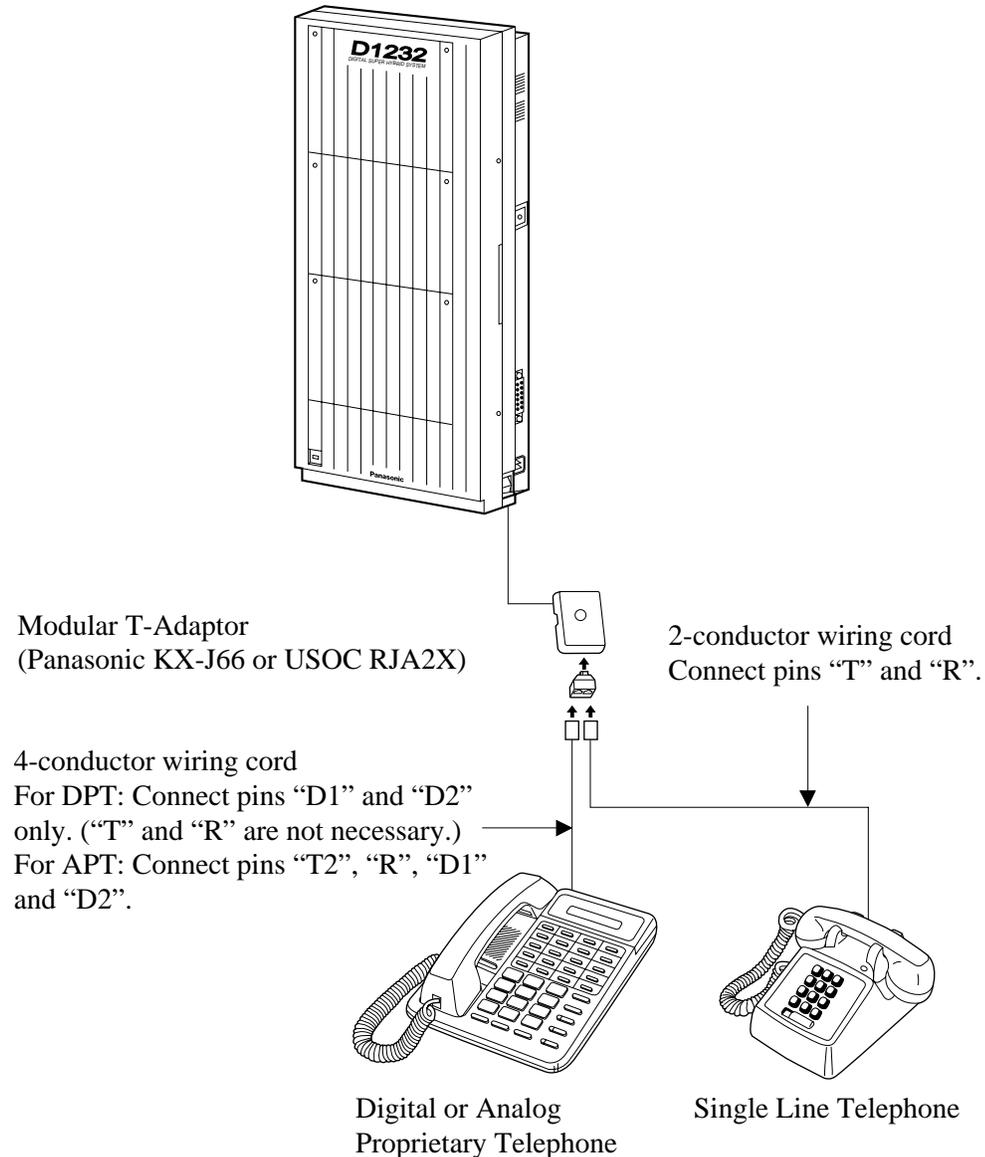
<u>**Note**</u>
- The KX-TD1232 is illustrated as the main unit.
- The 6-conductor wiring cord (and the Modular T Adaptor KX-J36) is required if the proprietary telephone KX-T7130 is to be used for parallel connection for KX-TD1232.

Method 2: For Digital Proprietary Telephones only

4-conductor wiring cord
Connect pins "T", "R", "D1" and "D2".

2-conductor wiring cord
Connect pins "T" and "R".

<Back of the KX-T7400 Series DPTs>

To single line
telephone

To system

Single Line Telephone

Digital Proprietary
Telephone

<Back of the KX-T7200 Series DPTs>

To system

To single line
telephone
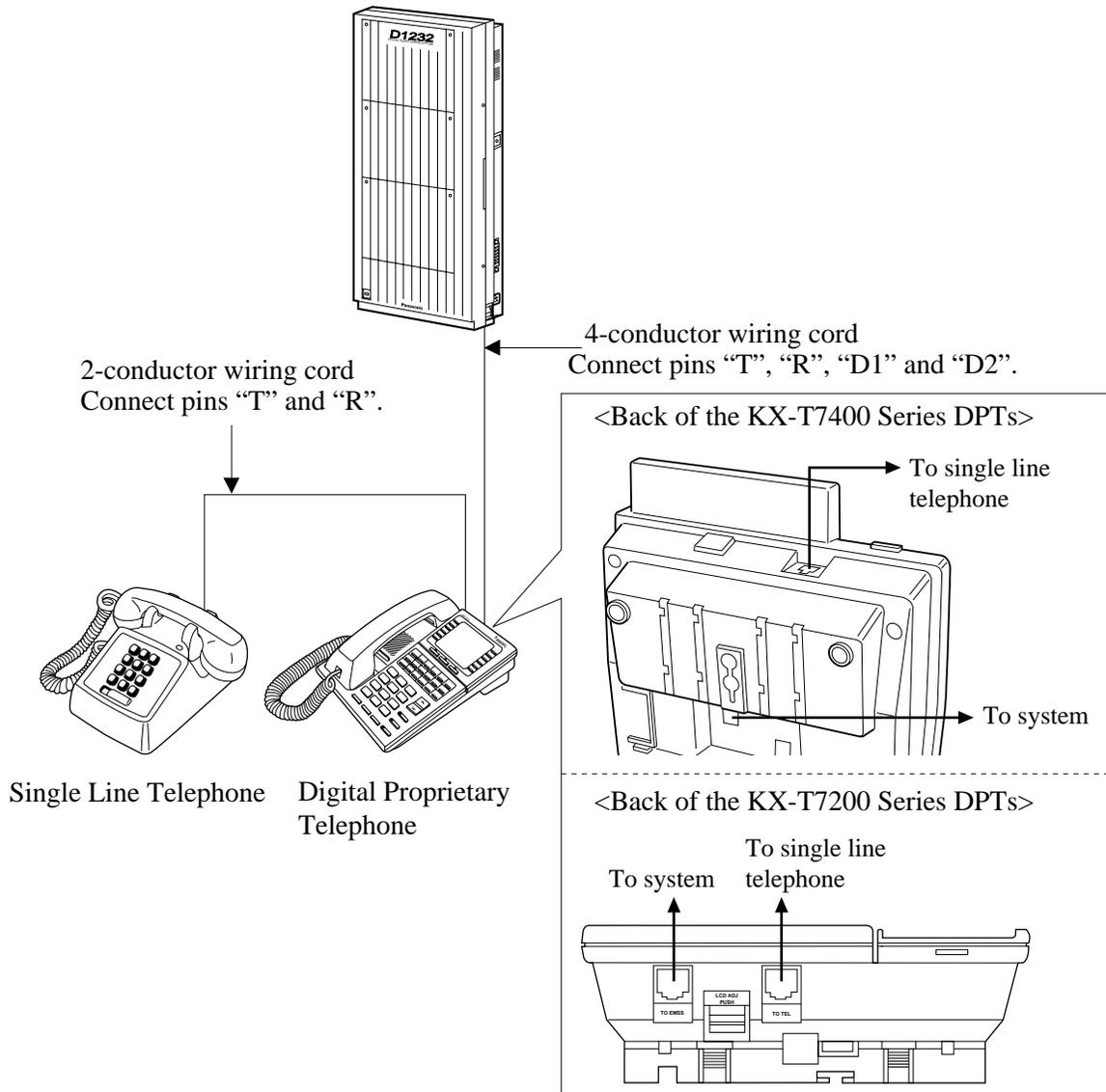
Note

- The KX-TD1232 is illustrated as the main unit.
- Not only a single line telephone but a single line device such as an answering machine, a facsimile or a modem (personal computer) etc., can be connected in parallel with a proprietary telephone.
- If a single line telephone with a Caller ID feature is connected in parallel, the Caller ID feature will not function.

Features Guide Reference

Paralleled Telephone

2.3.4   EXtra Device Port (XDP) Connection

A digital proprietary telephone and a single line telephone can be connected to the same extension jack yet have different extension numbers (eXtra Device Port feature). System Programming is required for this jack.

Method 1

4-conductor wiring cord
Connect pins "D1" and "D2" only. ("T" and "R" are not necessary.)

2-conductor wiring cord
Connect pins "T" and "R".

Digital Proprietary
Telephone

Single Line Telephone
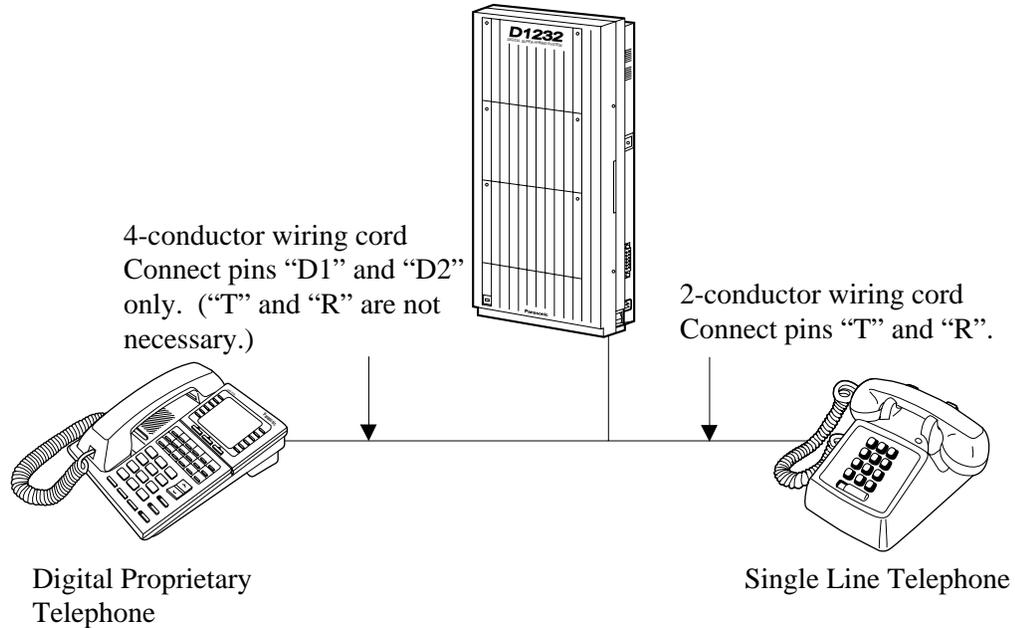
Note

The KX-TD1232 is illustrated as the main unit.

Method 2

Section 2.3.4 "Telephone Connection, Paralleled Telephone Connection, Method 2: for Digital Proprietary Telephone only" is also available for XDP connection.

Programming Guide Reference

[600] EXtra Device Port

Features Guide Reference

EXtra Device Port (XDP)

2.3.5   Polarity Sensitive Telephone Connection

If your telephone is polarity sensitive, follow the procedure below:

1. Complete all the required extension wiring.

2. Confirm that dialing can be done from all the extensions using a touch-tone telephone. If dialing fails, the polarity between the extension and the system must be reversed.

3. Reverse as shown.

Extension

Central Office Line

Reverse here
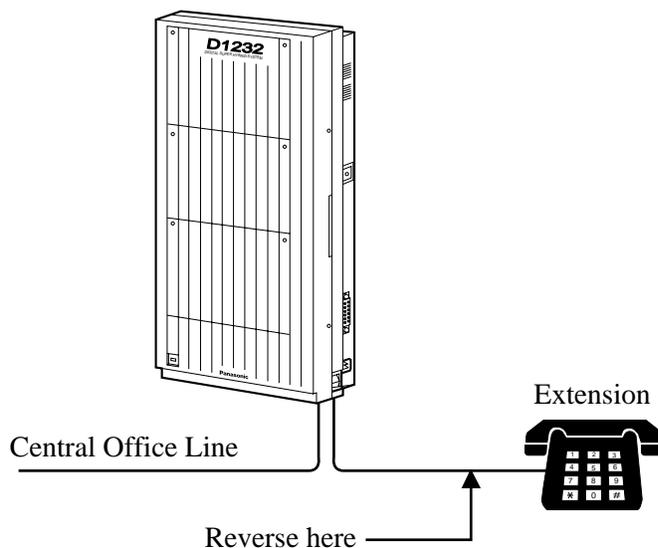
4. Set the Power Switch to "OFF" position.

5. Connect all outside lines.

6. Confirm that dialing can be done on the following extensions using a tone telephone.
   KX-TD816
   Extension (T, R) of jack 1: Outside line 1
   Extension (T, R) of jack 2: Outside line 2
   Extension (T, R) of jack 9 and 10(Extension Expansion Unit): Outside line 5 and 6
   KX-TD1232
   Extension (T, R) of jack 1: Outside line 1
   Extension (T, R) of jack 2: Outside line 2
   Extension (T, R) of jack 9: Outside line 3
   Extension (T, R) of jack 10: Outside line 4
   Extensions (T, R) of jacks 17 and 18 (Extension Expansion Unit 1): Outside line 9 and 10
   (**Note:** Extensions of jacks 9 and 10 for KX-TD816, and 17 and 18 for KX-TD1232 depend on the Power Failure Transfer connection. For details, refer to 2.5.1   Auxiliary Connection for Power Failure Transfer.)
   If dialing fails, the polarity between the system and the outside line must be reversed.

7. Reverse as shown.

Central Office Line

Extension

Reverse here
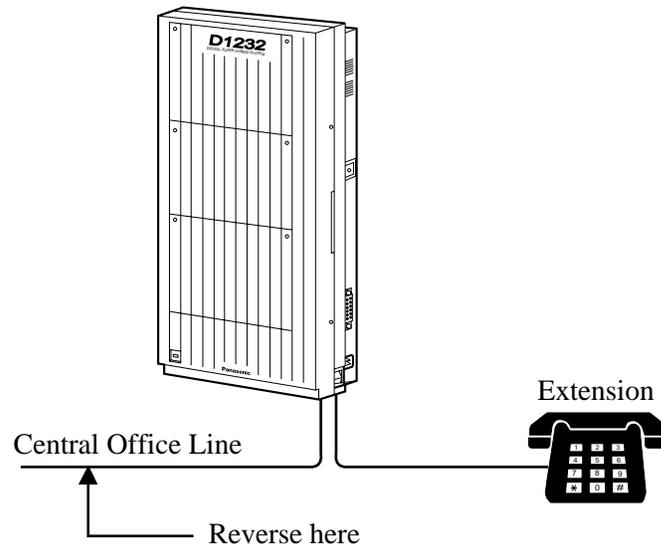
8. Every time an extension telephone is replaced, repeat the above procedure.

<u>**Note**</u>

The KX-TD1232 is illustrated as the main unit.

2.3.6   External Pager (Paging Equipment) Connection

KX-TD816

One external pager (user-supplied) can be connected to the KX-TD816 as illustrated below.
Use an RCA connector and shielded cable.

- Output impedance: 600 Ω
  Maximum length of the cable
  AWG 18 — 22: Under 10 m (33 feet)
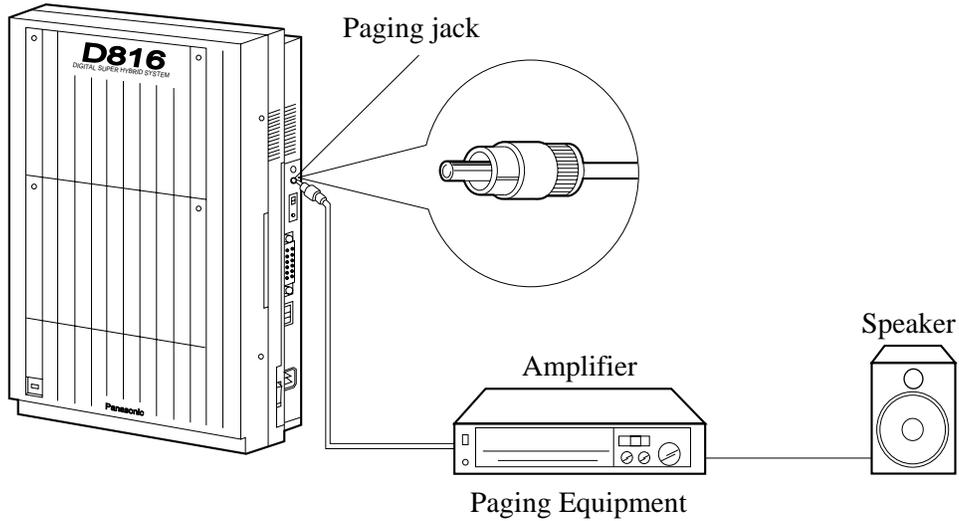
KX-TD1232

Up to two external pagers (user-supplied) can be connected to the KX-TD1232 per system as illustrated below.

Use an RCA connector and shielded cable.

- Output impedance: 600 Ω
  Maximum length of the cable
  AWG 18 — 22: Under 10 m (33 feet)
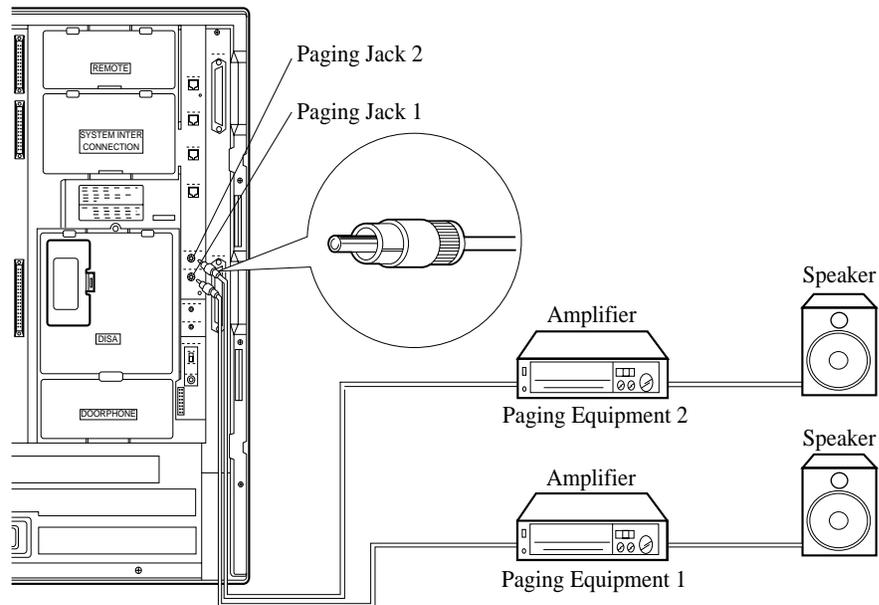
Note

- System Connection* permits a maximum of four external pagers.
  It is programmable which external pager will send background music and whether all the pagers will generate a confirmation tone.
- To adjust the sound level of the pagers, use the volume control on the amplifiers.

Programming Guide Reference

[804] External Pager BGM

[805] External Pager Confirmation Tone

Features Guide Reference

Background Music (BGM)

Paging — All

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

* Available for the KX-TD1232 only.

2.3.7   External Music Source Connection

KX-TD816

One music source such as a radio (user-supplied) can be connected to the KX-TD816 as illustrated below.

Insert the plug to the earphone / headphone jack on the external music source. Use a two-conductor plug {3.5 mm (9/64 inch) in diameter}.

- Input impedance: 600 Ω
  Maximum length of the cable
  AWG 18 — 22: Under 10 m (33 feet)

External Music Jack

External Music Source
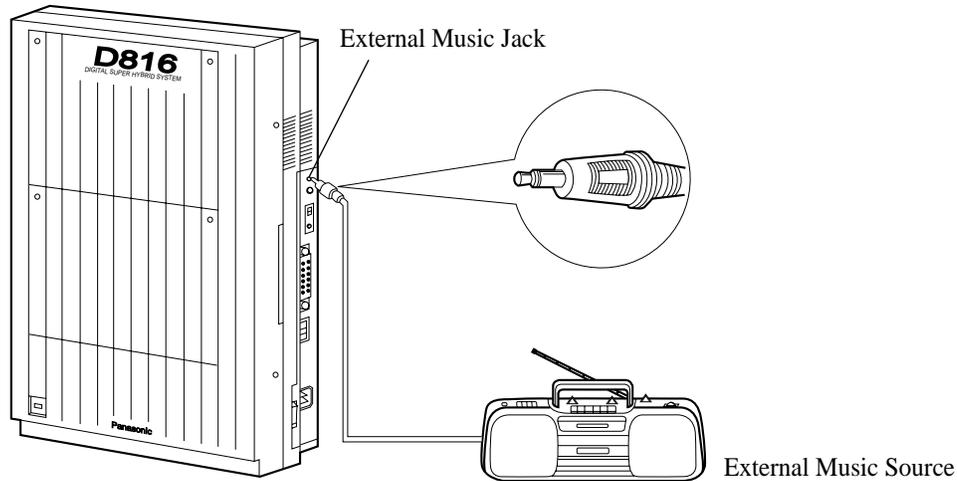
KX-TD1232

Up to two music sources such as a radio (user-supplied) can be connected to the KX-TD1232 per system as illustrated below.

Insert the plug to the earphone / headphone jack on the external music source.
Use a two-conductor plug {3.5 mm (9/64 inch) in diameter}.

- Input impedance: 600 Ω
  Maximum length of the cable
  AWG 18 — 22: Under 10 m (33 feet)
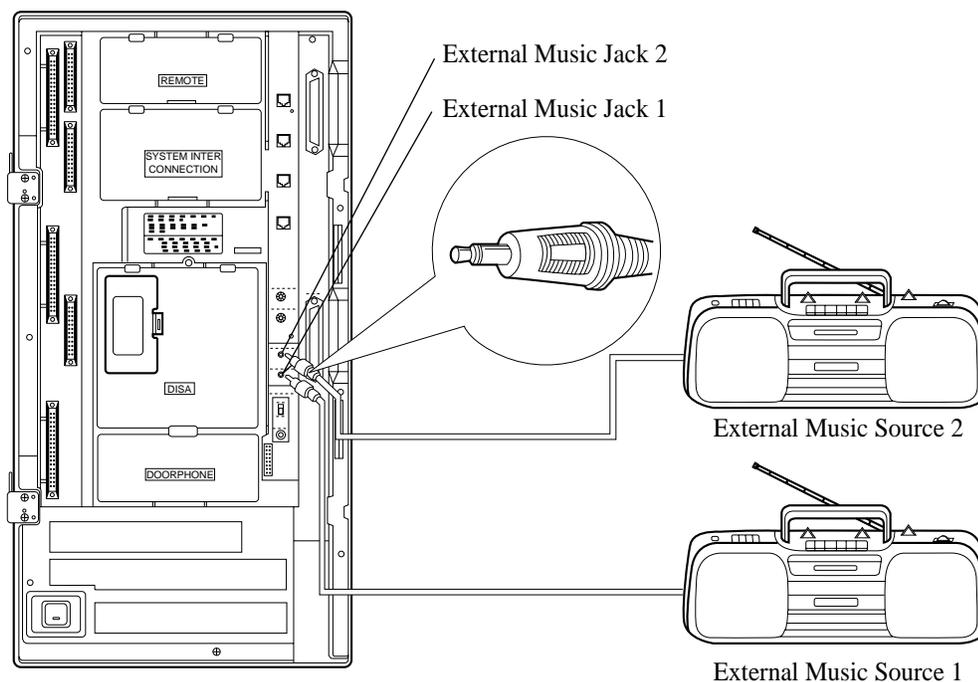
Note

- System Programming of music sources used for Music on Hold and Background Music is required.
- To adjust the sound level of the Music on Hold, use the volume control on the external music source.

Programming Guide Reference

[803] Music Source Use
[990] System Additional Information

Features Guide Reference

Background Music (BGM)
Background Music (BGM) — External
Music on Hold

2.3.8 Printer and PC Connection

A user-supplied printer or personal computer (PC) can be connected to the system. These are used to print out or refer to the Station Message Detail Recording (SMDR) call records and system programming data.
Connect the printer cable or the PC cable to the Serial Interface (RS-232C) connector. The cable must be shielded and the maximum length is 2 m (6.5 feet).

Serial Interface
(RS-232C) (25-pin)
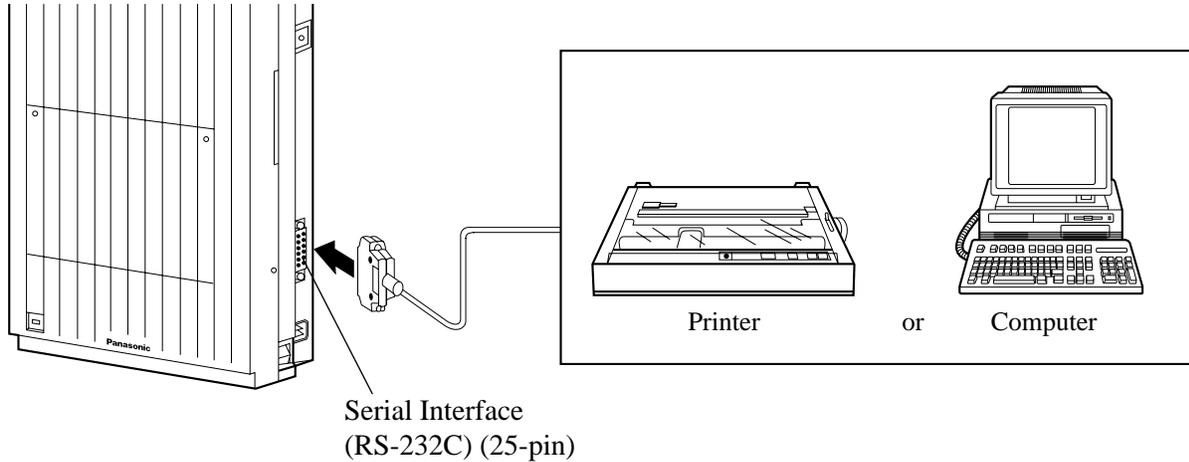
Note

The KX-TD1232 is illustrated as the main unit.

Arrange cables so that the printer will be connected to the system as shown in the chart on the following page.
When using special accessories such as cable, the user should use those specified in this installation manual to comply with the limits for a class A digital device pursuant to the FCC Rules.

The pin configuration of Serial Interface (RS-232C) Connector is as follows:

Pin No.	Signal Name		Circuit Type	
			EIA	CCITT
1	FG	Frame Ground	AA	101
2	SD (TXD)	Transmitted Data	BA	103
3	RD (RXD)	Received Data	BB	104
4	RS (RTS)	Request To Send	CA	105
5	CS (CTS)	Clear To Send	CB	106
6	DR (DSR)	Data Set Ready	CC	107
7	SG	Signal Ground	AB	102
8	CD (DCD)	Data Carrier Detect	CF	109
20	ER (DTR)	Data Terminal Ready	CD	108.2

Connection Chart for Printer / IBM® [1] Personal Computer

If you connect a printer or a PC with a 25-pin cable, follow the chart below.

System				**25-pin Cable Printer/PC**	
Circuit Type (EIA)	Signal Name	Pin No.	Pin No.	Signal Name	Circuit Type (EIA)
AA	FG	1	1	FG	AA
BA	SD (TXD)	2	3	RD (RXD)	BB
BB	RD (RXD)	3	2	SD (TXD)	BA
CB	CS (CTS)	5			
CC	CR (DSR)	6	20	ER (DTR)	CD
AB	SG	7	7	SG	AB
CD	ER (DTR)	20	5	CS (CTS)	CB
			6	CR (DSR)	CC
			8	CD (DCD)	CF

---

[1] IBM is a registered trademark of International Business Machines Corporation in the United States.

If you connect a printer or an IBM-PC with a 9-pin cable, follow the chart below.

System				9-pin Cable Printer/IBM-PC		
Circuit Type (EIA)	Signal Name	Pin No.		Pin No.	Signal Name	Circuit Type (EIA)
AA	FG	1				
BA	SD (TXD)	2		2	RD (RXD)	BB
BB	RD (RXD)	3		3	SD (TXD)	BA
CA	RS (RTS)	4		4	ER (DTR)	CD
CB	CS (CTS)	5		5	SG	AB
CC	DR (DSR)	6		6	DR (DSR)	CC
CB	SG	7		7	RS (RTS)	CA
CC	ER (DTR)	20		8	CS (CTS)	CB
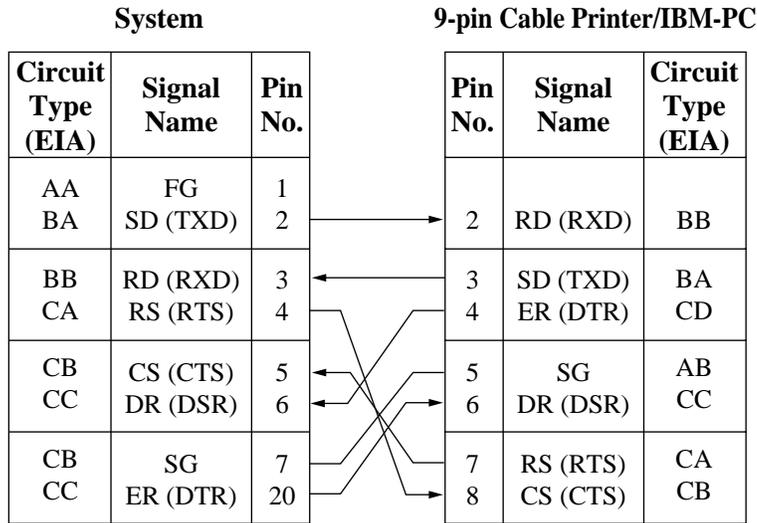
Note

Please read your printer manual and connect the first EIA pin (FG) of this unit to the printer cable.

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: SD (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: RD (RXD): (input)
Conveys signals from the printer.

Request to Send: RS (RTS): (output)
This lead is held ON whenever DR (DSR) is ON.

Clear To Send: CS (CTS): (input)
An ON condition of circuit CS (CTS) indicates that the printer is ready to receive data from the unit. The unit does not attempt to transfer data or receive data when circuit CS (CTS) is OFF.

Data Set Ready: DR (DSR): (input)
An ON condition of circuit DR (DSR) indicates the printer is ready. Circuit DR (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: ER (DTR): (output)
This signal line is turned ON by the unit to indicate that it is ON LINE. Circuit ER (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: CD (DCD): (input)
The ON condition is an indication to data terminal (DTE) that the carrier signal is being received.

Programming Guide Reference

[800] SMDR Incoming / Outgoing Call Log Printout

[801] SMDR Format

[802] System Data Printout

[806-807] Serial Interface (RS-232C) Parameters

Features Guide Reference

Hotel Application — Room Status

Station Message Detail Recording (SMDR)

System Programming and Diagnosis with Personal Computer

2.3.9   Installation of Lightning Protectors

Overview

A lightning protector is a device to be installed on an outside 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 V.

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

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

Installation
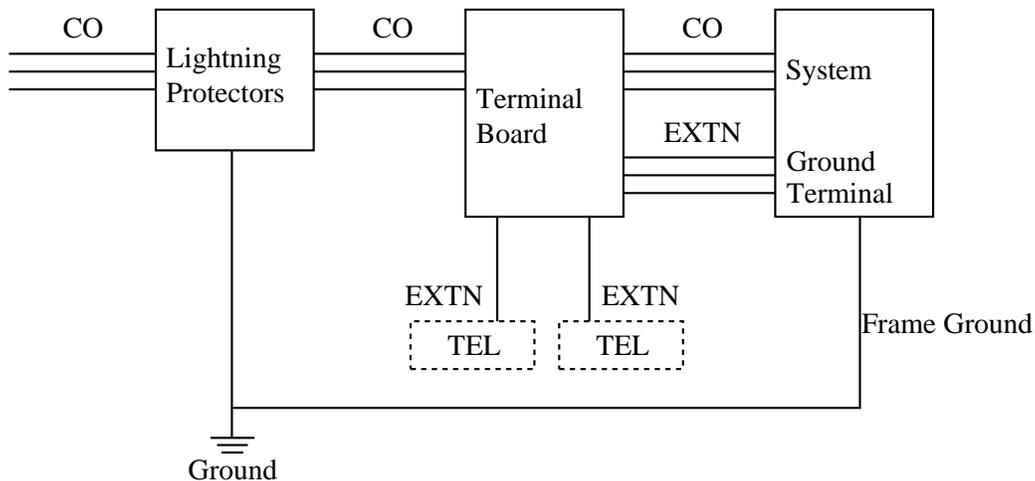
CO: Central Office (Outside line)
EXTN: Extension line
TEL: Telephone

Outside Installation Diagram

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.
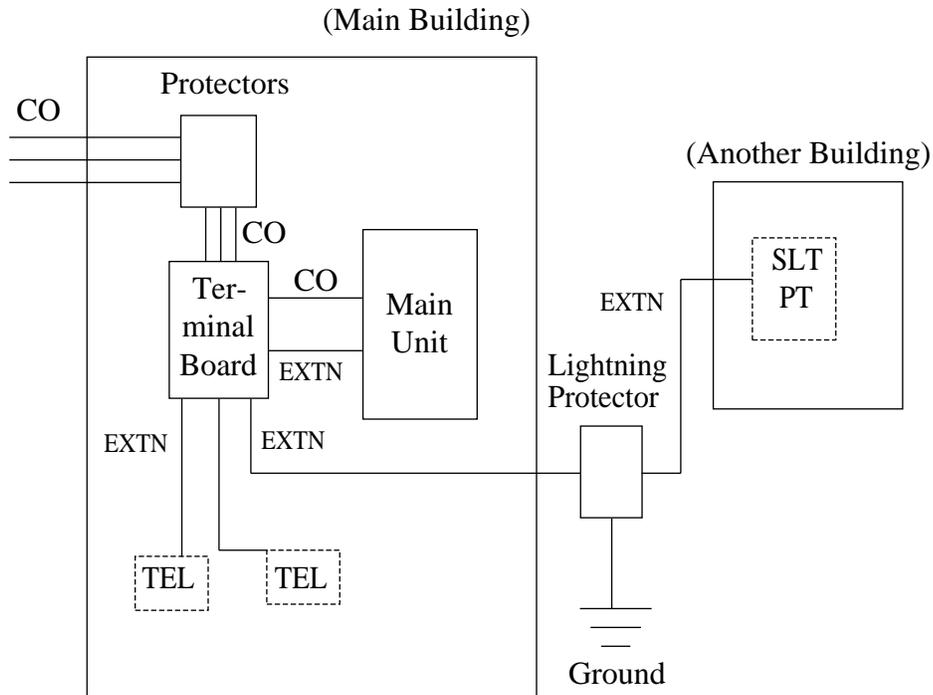
Note

- The lightning protector for an extension is different from that for outside line.

Earth Rod Installation Diagram
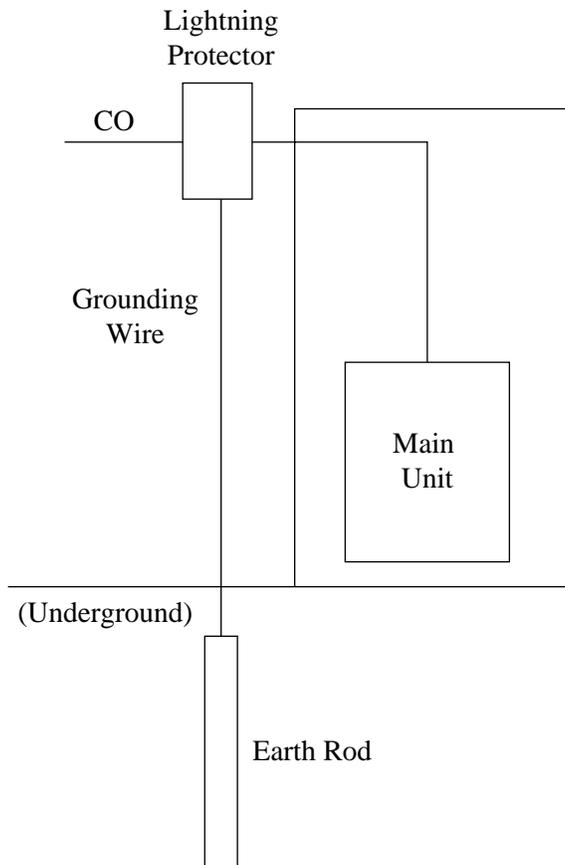
1. Installation location of the earth rod: Near the protector
2. Check obstructions: None
3. Composition of the earth rod: Metal
4. Depth of the earth rod: More than 50 cm (20 inches)
5. Size of the grounding wire: Thickness is more than 16 AWG
6. Length of the grounding wire: As short as possible.

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

2.4   Installation of Optional Cards and Unit

2.4.1   Location of Optional Cards and Units

The location of the optional cards and units is shown below.

Precaution

To protect the printed circuit boards (P-boards) from static electricity, do not touch parts on the P-boards in the main unit and on the optional cards.

Expansion Units

KX-TD816

The following expansion units can be installed to any of the two expansion areas.
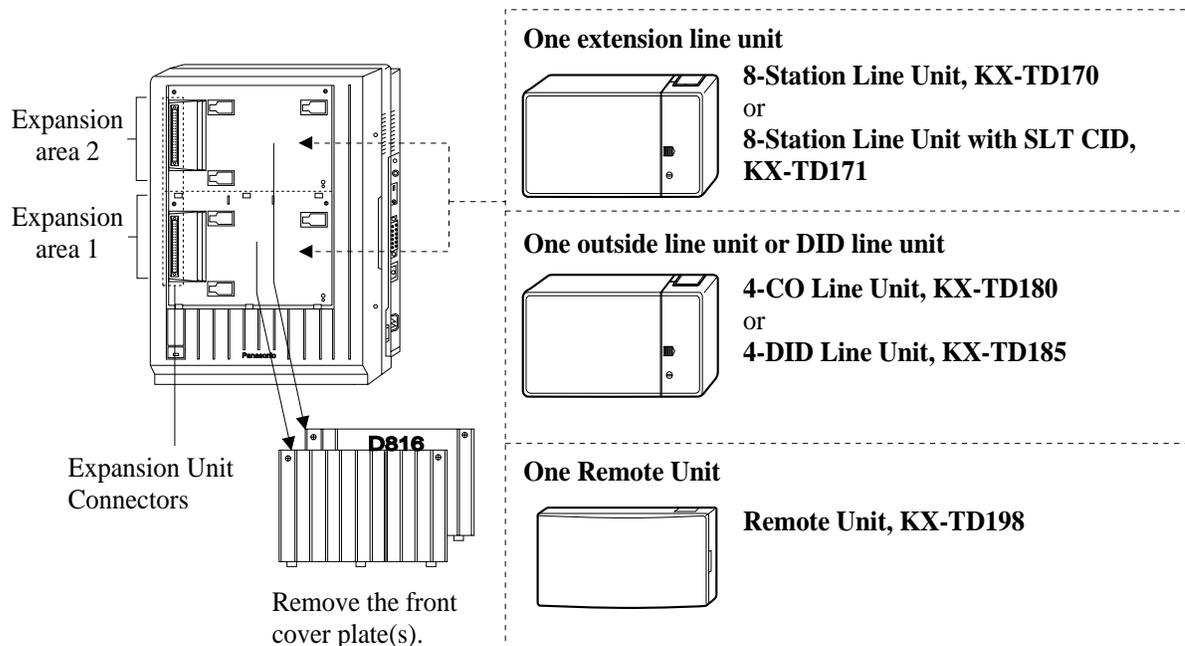
One extension line unit

8-Station Line Unit, KX-TD170
or
8-Station Line Unit with SLT CID, KX-TD171

One outside line unit or DID line unit

4-CO Line Unit, KX-TD180
or
4-DID Line Unit, KX-TD185

One Remote Unit

Remote Unit, KX-TD198

Expansion area 2

Expansion area 1

Expansion Unit Connectors

Remove the front cover plate(s).

Note

System Programming is required for expansion unit location. Refer to [109] Expansion Unit Type.
Default:
Area 1 = 4-CO Line Unit,
Area 2 = 8-Station Line Unit.

KX-TD1232

The following expansion units can be installed to any of the three expansion areas.
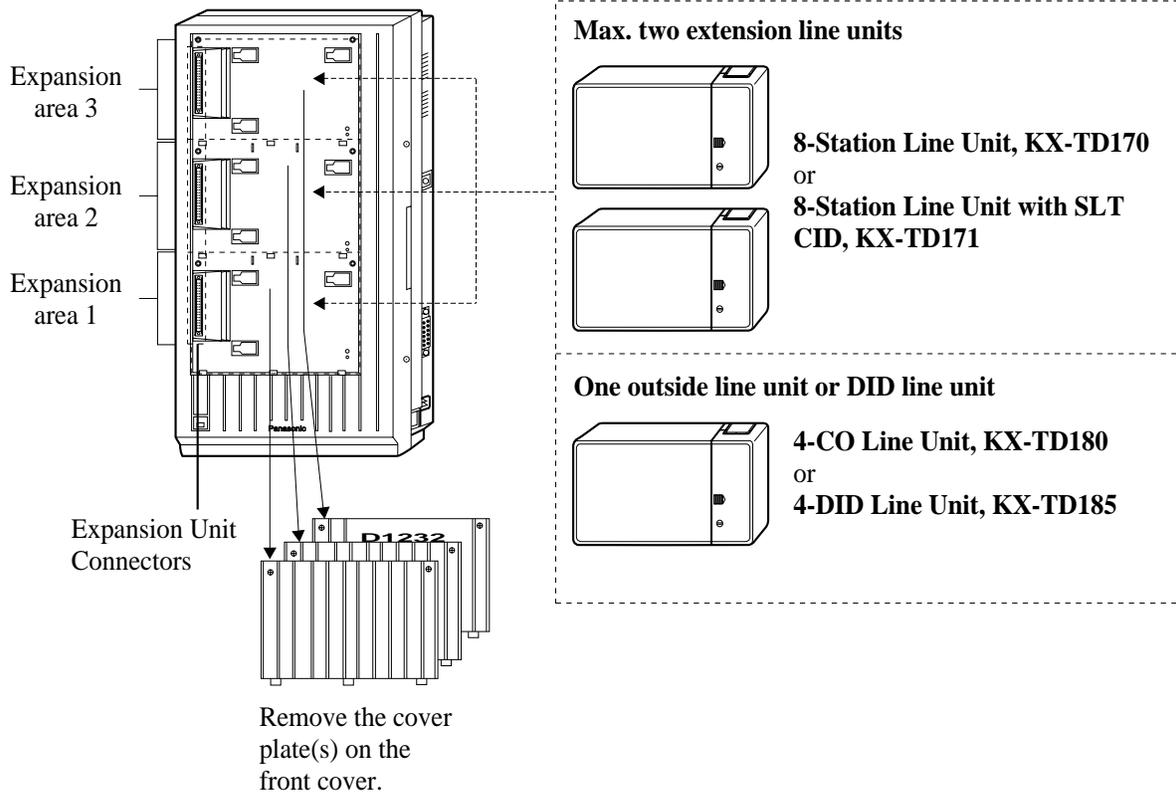
Max. two extension line units

8-Station Line Unit, KX-TD170
or
8-Station Line Unit with SLT CID, KX-TD171

One outside line unit or DID line unit

4-CO Line Unit, KX-TD180
or
4-DID Line Unit, KX-TD185

Expansion area 3

Expansion area 2

Expansion area 1

Expansion Unit Connectors

Remove the cover plate(s) on the front cover.

Note

System Programming is required for expansion unit location. Refer to [109] Expansion Unit Type.

Default:
Area 1 = 4-CO Line Unit,
Area 2 and 3 = 8-Station Line Unit.

Doorphone Card for KX-TD816

Doorphone
Card
Connector

Install **Doorphone Card,
KX-TD160/KX-TD161**.
KX-TD160 connects two doorphones and
two door openers.
KX-TD161 connects four doorphones and
four door openers.

Front Cover
is open.
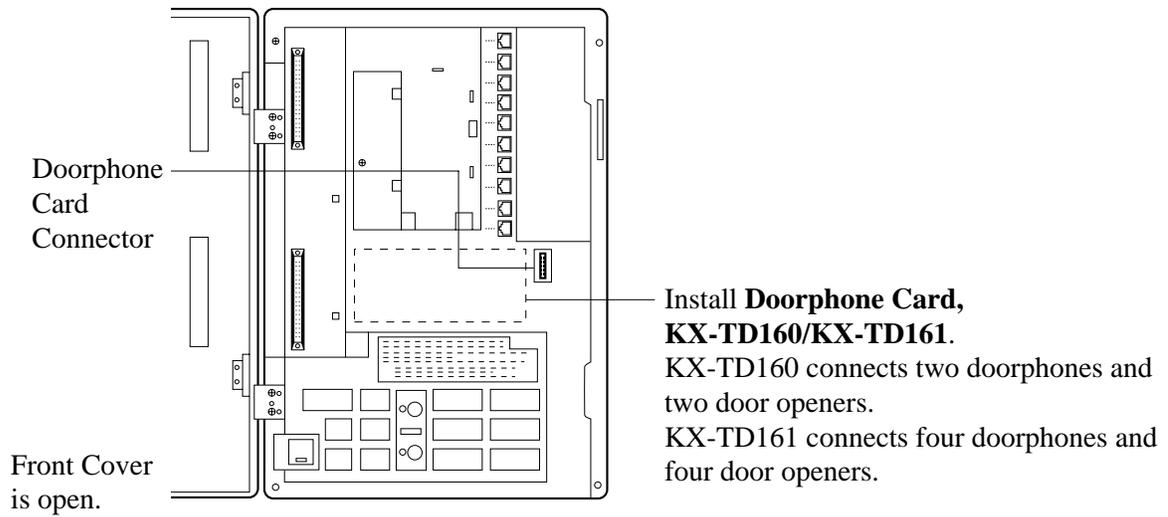
Remote Card, System Inter Connection Card, DISA Card, Doorphone Card for KX-TD1232

Remote Card
Connector

REMOTE

Install **Remote Card, KX-TD196**, or
High Speed Remote Card, KX-TD197.
This card provides data communications
between the system and a remote location.

System Inter
Connection
Card
Connector

SYSTEM INTER
CONNECTION

Install **System Inter Connection Card**,
KX-TD192.
This card connects two systems.

DISA Card
Connector

DISA

Install **DISA Card**, **KX-TD191**.
This card permits access to the system from
outside tone telephones.

Doorphone
Card
Connector

DOORPHONE

Install **Doorphone Card**,
KX-TD160/KX-TD161.
KX-TD160 connects two doorphones and
two door openers.
KX-TD161 connects four doorphones and
four door openers.

Front Cover is
open.

Caller ID Cards, PLL Card

Up to two **Caller ID Cards** (KX-TD193) for KX-TD816, and up to three Caller ID Cards for KX-TD1232 can be installed to the initially provided Outside Line Card and 4-CO Line Unit. This card supports Caller ID services offered by the central office. The initially provided Outside Line Card is located behind the inside cover.

PLL (Phase Locked Loops) Card (KX-TD112) synchronizes the system clock with the clock of the ISDN network. This card must be installed to the CPU Board before the ISDN Line Unit is installed.

KX-TD816
Initial Outside Line Card
Install one **Caller ID Card, KX-TD193.**

KX-TD1232
Initial Outside Line Card
Install up to two **Caller ID Cards, KX-TD193.**

CPU Board
Install **PLL Card, KX-TD112.**

Inside cover

CPU Board
Install **PLL Card, KX-TD112.**

Inside cover

4-CO Line Unit, KX-TD180
(inside the cabinet)
Install one **Caller ID Card, KX-TD193.**
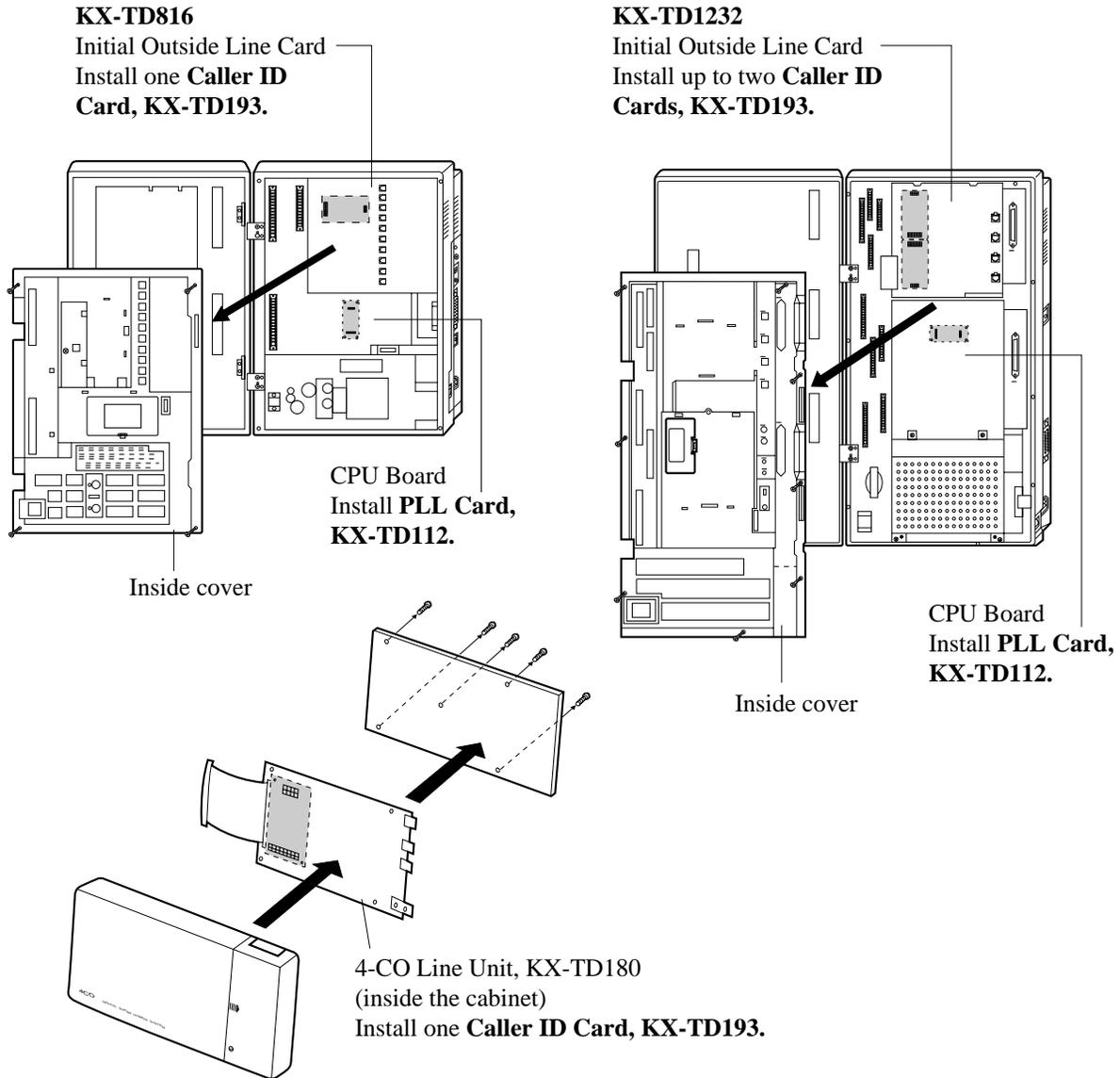
SLT Message Waiting Lamp Adaptor Unit

One SLT Message Waiting Lamp Adaptor Unit (KX-TD194) for KX-TD816, and up to two SLT Message Waiting Lamp Adaptor Units for KX-TD1232 can be installed. This card supports the Message Waiting feature for a single line telephone with a message waiting lamp. One adaptor supports 16 extensions.

Connection Example

KX-TD194

KX-TD194   KX-TD194   KX-TD194

To AC outlet

From a KX-TD1232
or KX-TD816

To stations

Notice   DC connection cables

<If each unit is connected to an AC outlet,
these cables are not nessesary.>

16 Extensions
(16-T / R, 1-D1/D2)

KX-TD816   KX-TD1232   System Connection   KX-TD1232

To AC outlet   To AC outlet
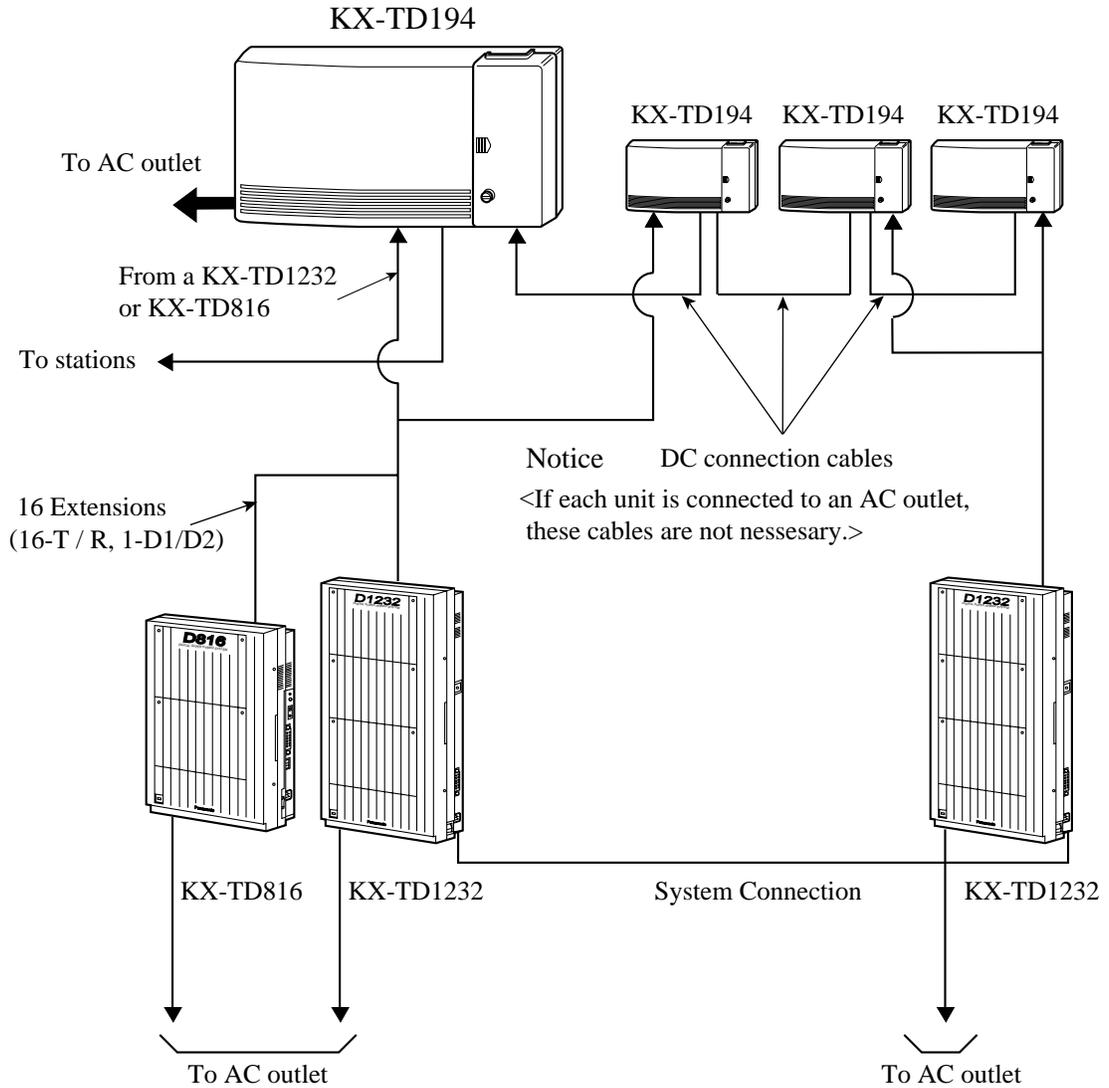
<u>Note</u>

Do not connect more than four units with DC connection cables.

2.4.2   4-CO Line Unit Connection

To add four outside lines (outside lines 5 through 8 for KX-TD816, and outside lines 9 through 12 for KX-TD1232), use the optional 4-CO Line Unit (KX-TD180). This unit can be installed to any of the expansion unit areas provided on the front of the main unit. For outside line expansion unit installation, see 2.4.6   Installing Expansion Unit.

Note
- System Programming is required for card location identification.
- If you intend to attach a Caller ID Card to the 4-CO Line Unit, attach the Caller ID Card before outside line connection. See 2.4.8   Caller ID Card Installation.

Programming Guide Reference

[109] Expansion Unit Type

Features Guide Reference

Module Expansion

2.4.3   8-Station Line Unit Connection

To add eight extensions (jack numbers 9 through 16 for KX-TD816, and jack numbers 17 through 24 or 25 through 32 for KX-TD1232), use the optional 8-Station Line Unit (KX-TD170). To add 16 extensions for KX-TD1232 (jack numbers 17 through 32), use two 8-Station Line Units.
This unit can be installed to any of the expansion unit areas provided on the front of the main unit.
For extension expansion unit installation, see 2.4.6   Installing Expansion Unit.

Note

System Programming is required for card location identification.

Programming Guide Reference

[109] Expansion Unit Type

Features Guide Reference

Module Expansion

2.4.4   8-Station Line Unit with SLT CID Connection

The optional 8-Station Line Unit with SLT CID (KX-TD171) adds eight extensions (jack numbers 9 through 16 for the KX-TD816, and jack numbers 17 through 24 or 25 through 32 for the KX-TD1232) in which either one of two ports enables the Caller ID feature for display single line telephone users.

To add 16 extensions, including 2 extensions with SLT Caller ID feature, for the KX-TD1232 (jack numbers 17 through 32), use two Extension Cards with SLT CID.

This unit can be installed to any of the expansion unit areas provided on the front of the main unit.

For installation, see 2.4.6   Installing Expansion Unit.

Note

System Programming is required for card location identification.

Programming Guide Reference

[109] Expansion Unit Type

Features Guide Reference

Module Expansion

2.4.5   4-DID Line Unit Connection

To add four DID lines, use the optional 4-DID Line Unit (KX-TD185). This unit can be installed in any of the expansion areas provided on the front of the main unit. For installation, see 2.4.6   Installing Expansion Unit.

Note

System Programming is required for card location identification.

Programming Guide Reference

[109] Expansion Unit Type

Features Guide Reference

Module Expansion

2.4.6 Installing Expansion Unit

The following procedures can be used to install the optional expansion units.
The following steps 1 through 5 and 7 through 10 are the same for all expansion units. Step 6 is different for each unit.
The KX-TD1232 is illustrated as the main unit.

1. Loosen the two screws on the cover plate. Insert fingers into the slits to remove the cover plate.
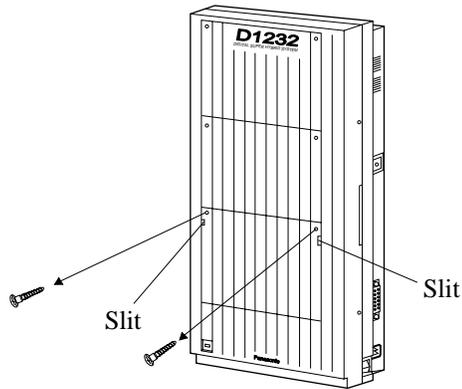
Note

Any of the cover plates can be removed, as needed.

2. Connect the cabinet cord to the connector in the main unit firmly.
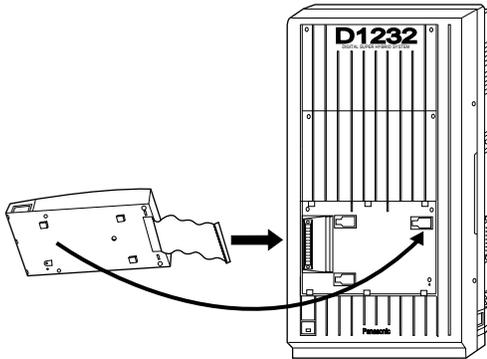
3. Hook the cabinet on the main unit and slide the cabinet to the left until it is secured.
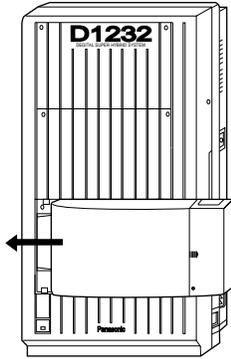
4. Loosen the outside screw and slide the cover to the right.
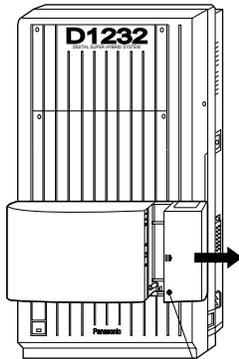
Outside screw

**5.** Secure the inside screw (included) to fix the cabinet to the main unit.
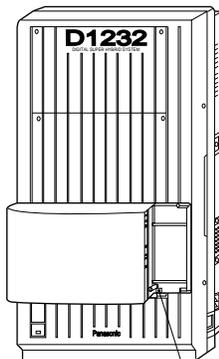
Inside screw

<u>**Note**</u>

Be sure to fix the inside screw to the main unit, or the unit may not work properly.

6. (If a option is to be installed)

If a KX-TD180 / KX-TD185 is to be installed; (for KX-TD1232)

Insert the modular plugs of the telephone line cords (4-conductor wiring) into the modular jacks on the unit.
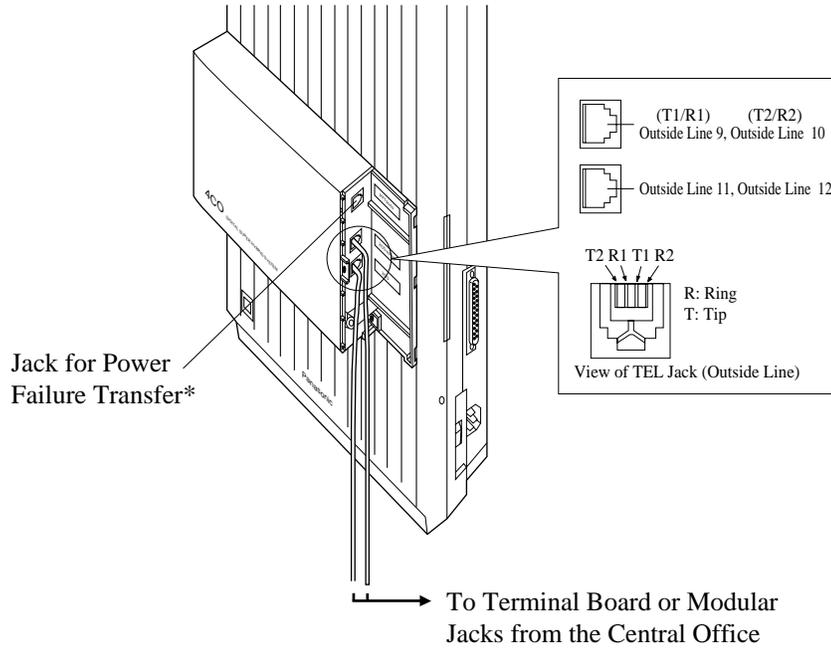
Note

- * For details, refer to 2.5.1   Auxiliary Connection for Power Failure Transfer.
- DID lines of the KX-TD185 are polarity sensitive.

If a KX-TD170 / KX-TD171 is to be installed; (for KX-TD1232)

Insert the connector into the jack.

Jack for Power
Failure Transfer*

Connector type
50-pin (Amphenol 57JE
series or the equivalent)

To extensions
(TD816 : Jacks 9 – 16,
 TD1232: Jacks 17 – 24 or 25 – 32)
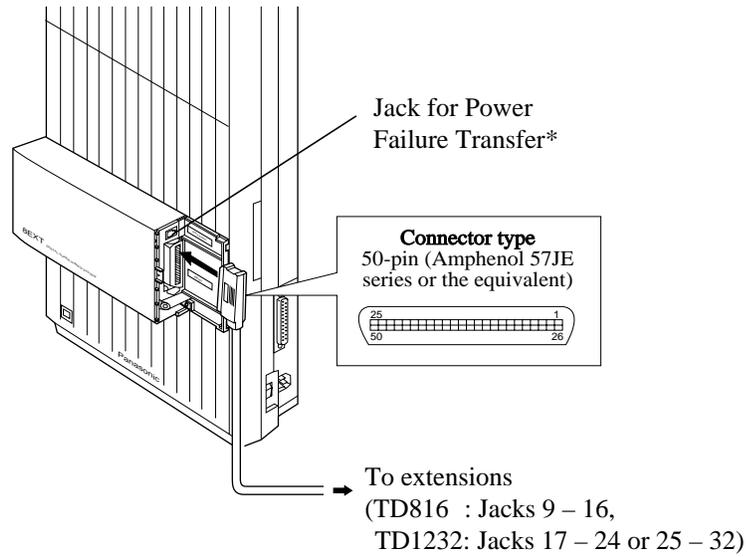
Note

- • * For details, refer to 2.5.1   Auxiliary Connection for Power Failure Transfer.
- • For cable pin numbers to be connected, see "Pin Number Chart" in 2.3.2   Extension Connection.
- • For fixing the connector, see "Amphenol 57JE Type (screw-attach-type 50-pin connector) Connection for KX-TD170 / KX-TD171" in 2.4.6   Installing Expansion Unit.

7. Tie all of the cords into a bundle. If other cords are exposed in the upper cabinets, tie them also.

8. Close the cabinet cover and secure the outside screw.

9. Cover the cords with the cord holder (included).

Cord holder
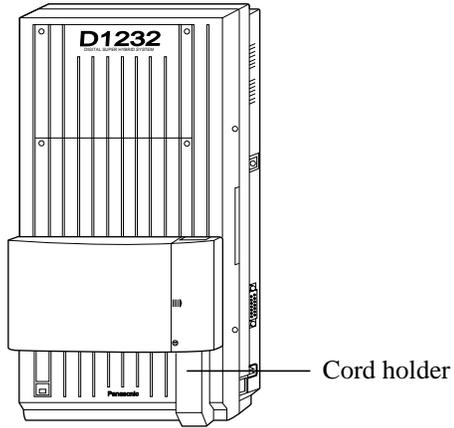
10. Fix the cords to the wall as shown so that the front cover can be opened.
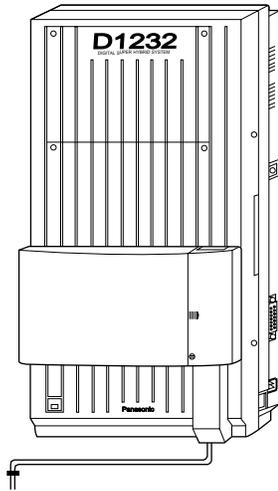
<u>Note</u>

- If you attach the Caller ID Card (KX-TD193) to the 4-CO Line Unit (KX-TD180), attach it before installing the 4-CO Line Unit to the main unit. For installation, Refer to 2.4.8   Caller ID Card Installation.

- If two expansion units are installed, cut the cabinet cover(s) on the lower cabinet(s) to allow the cords from upper cabinet to go down through the cabinet cover(s). To protect the cords, smooth the cut edges.

Cut here
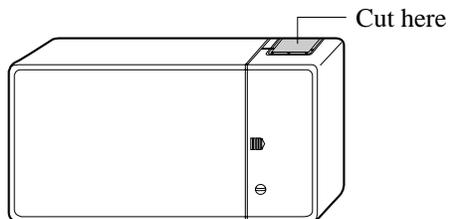
Amphenol 57JE Type (screw-attach-type 50-pin connector) Connection for KX-TD170 / KX-TD171

To fix the Amphenol 57JE type (screw-attach type 50-pin connector) to the 8-Station Line Unit or the 8-Station Line Unit with SLT CID, follow the procedure below.

1. The 50-pin connector (Jack) on the Expansion Unit has two hook-pins. Remove the upper hook-pin, and take out the screw.
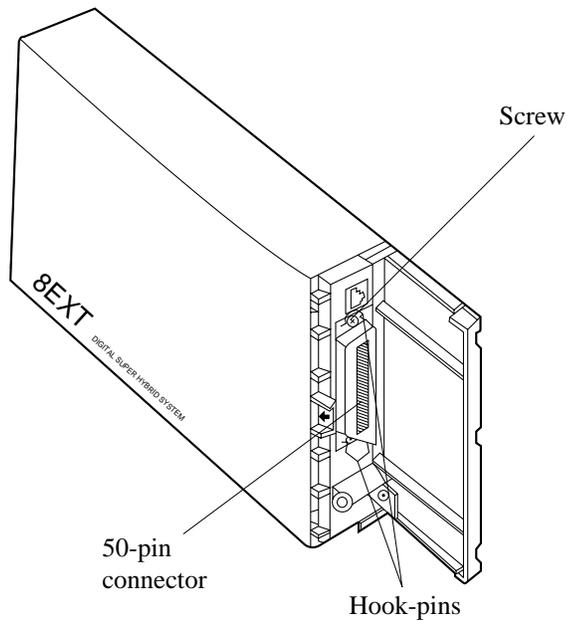
Note

When installing a connector like the type shown below, unscrew the lower hook-pin also. Then drive both accessory screws.
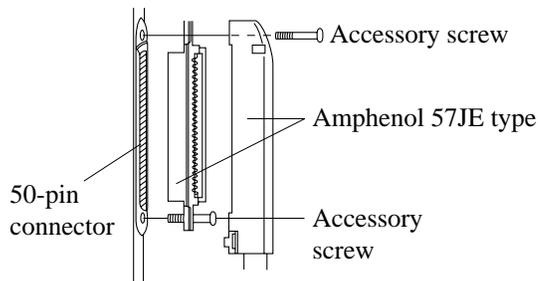
2. To attach the Amphenol 57JE type (Plug) to the connector, drive the accessory screw into the upper part.
Fasten the accessory wire tie around the lower hook-pin and the Amphenol 57JE type, as shown.
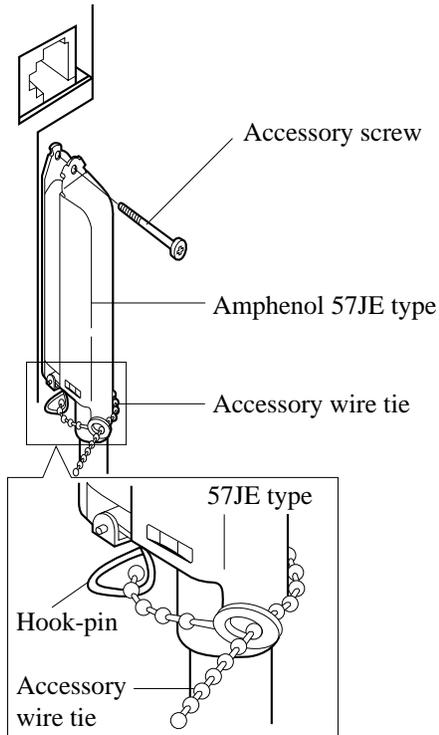
2.4.7 DISA Card and Remote Card / Unit Installation

The DISA Card (KX-TD191), Remote Card (KX-TD196), High Speed Remote Card (KX-TD197) and Remote Unit (KX-TD198) can be installed as follows.

Main Unit	For DISA feature	For remote access
KX-TD816		KX-TD198
KX-TD1232	KX-TD191	KX-TD196, KX-TD197

Note

If you use the KX-TD170 with the KX-TD198, you must use the KX-TD170 which has suffix 'C' or later.
The former KX-TD170 dose not work properly with KX-TD198.
This is available for the KX-TD816 only.
Please see the back of the unit and check suffix.

How to distinguish suffix

Serial No. LABEL

⤬ ⤬ ⤬ ⤬ C ⤬ ⤬ ⤬ ⤬ ⤬

Suffix   UNIT No.
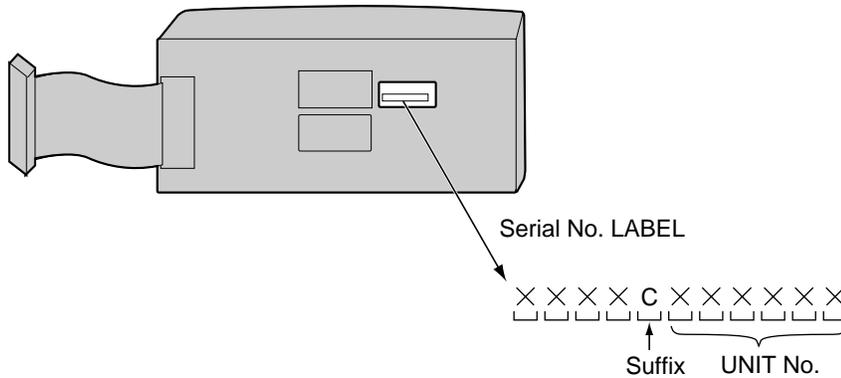
KX-TD816

Installing the Remote Unit (KX-TD198)

1. Loose the two screws on the cover plate. Insert your fingers into the slits to remove the cover plate.

Slit   Slit
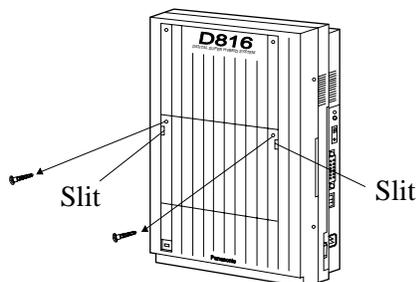
Note

There are two cover plates. Any of them can be removed, as needed.

2. Connect the cabinet cord to the connector in the main unit firmly.
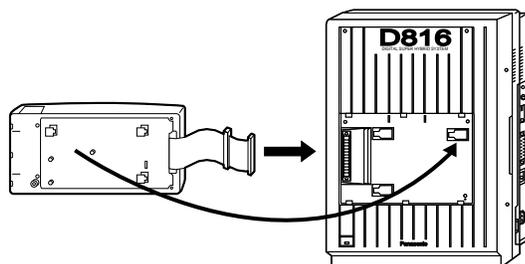
3. Hook the cabinet onto the main unit and slide the cabinet to the left until it is secured.
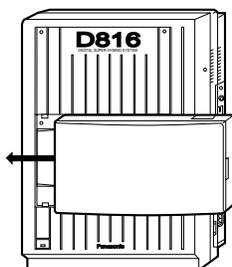
Attaching another line expansion unit to the Remote Unit (KX-TD198) and install them to the system.

1. Remove the front cover of the Remote Unit. Set the MODE switch to 2 only.

MODE
1 • • 2
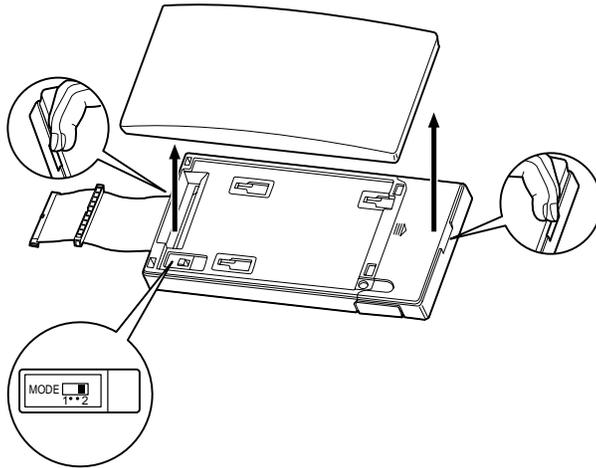
2. Attach the expansion unit to the Remote Unit as shown below. Be sure to connect the cabinet cords by inserting the expansion unit cabinet cord through the slot in the Remote Unit.

Expansion unit cabinet cord

Remote unit
cabinet cord
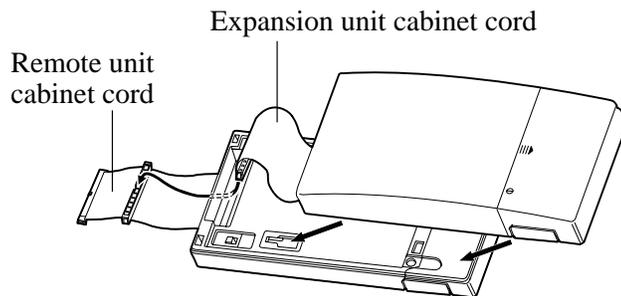
3. Remove the cover plate and connect the cabinet cord to the connector in the main unit firmly.

D816
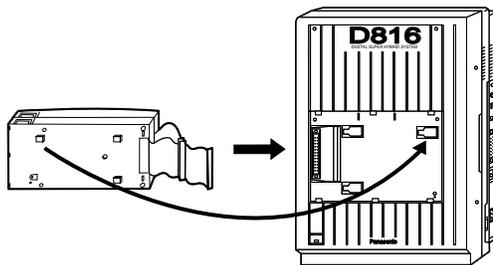
4. Hook the cabinets onto the main unit and slide the cabinets to the left until they are secured.
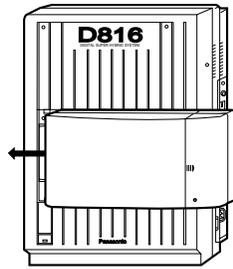
5. Loosen the outside screw of the expansion unit and slide the cover to the right.
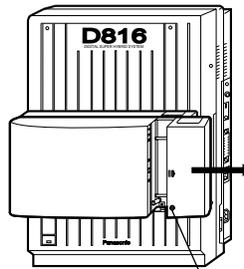
Outside screw

6. Secure the inside screw (inside with the Remote Unit) to fix the cabinet to the main unit.
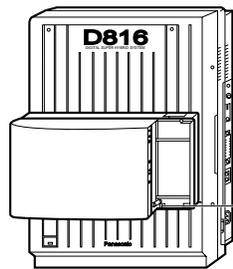
Inside screw

7. Tie all of the cords into a bundle. If other cords are exposed from the upper cabinets, tie them also.

8. Close the cabinet cover and secure the outside screw.

9. Cover the cords with the cord holder. If two cabinets are connected together and attached to the main unit, use the cord holder included with the Remote Unit.

10. Fix the cords to the wall as shown here, so that the front cover can be opened.
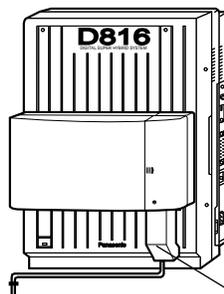
Cord holder

KX-TD1232

Installing the DISA Card (KX-TD191)

1. Insert the upper side of the DISA Card into the two hooks on the main unit.
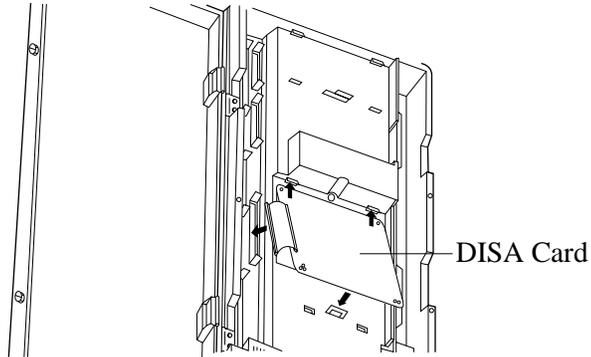
DISA Card

2. Press down the two corners of the lower side of the DISA Card.

3. Connect the cord to the DISA Card Connector.

Features Guide Reference

Direct Inward System Access (DISA)

Installing the Remote Card (KX-TD196) or High Speed Remote Card (KX-TD197)

1. Insert the upper side of the Remote Card into the two hooks on the main unit.
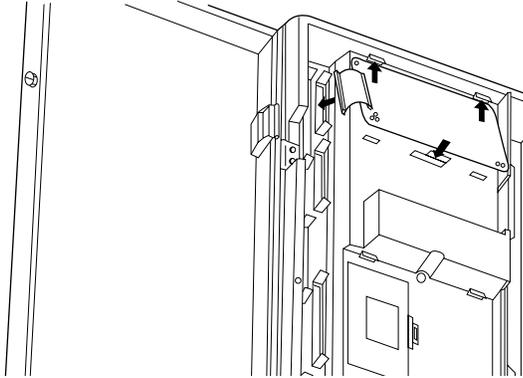
2. Press down the two corners of the lower side of the Remote Card.

3. Connect the cord to the Remote Card Connector.

Programming Guide Reference

[107] System Password

[813] Floating Number Assignment

[814] Modem Standard

[817] KX-TD197 / KX-TD198 Baud Rate Set

Features Guide Reference

System Programming and Diagnosis with Personal Computer

2.4.8 Caller ID Card Installation

A maximum of two Caller ID Cards (KX-TD193) can be installed to the KX-TD816, and a maximum of three Caller ID Cards can be installed to the KX-TD1232. The Caller ID Cards can be installed to the initially provided Outside Line Card and / or to an optional 4-CO Line Unit (KX-TD180), as required.
The Outside Line Card of KX-TD816 can accept one Caller ID Card, and the Outside Line Card of KX-TD1232 can accept two Caller ID Cards. 4-CO Line Unit can accept one Caller ID Card.

Installing to the Initial Outside Line Card for KX-TD816

1. Loosen the four screws to open the inside cover of the main unit.

Note

If any cards, units, or cords are installed to the main unit, remove them beforehand.

2. Insert the Caller ID Card to the connectors on the Outside Line Card.
One card can be installed to the initial Outside Line Card.
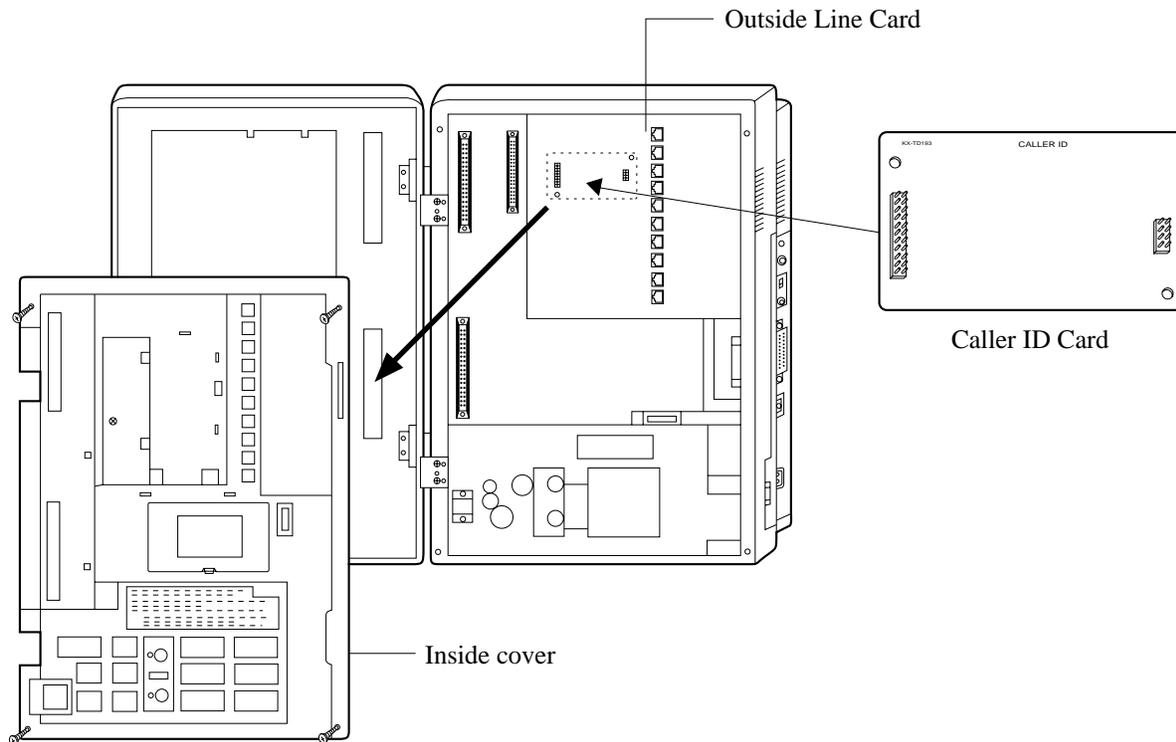
Outside Line Card

Caller ID Card

Inside cover

3. Put the inside cover back on the main unit and secure the screws.

Installing to the Initial Outside Line Card for KX-TD1232

1. Loosen the eight screws to open the inside cover of the main unit.

Note

If any cards, units, or cords are installed to the main unit, remove them beforehand.

2. Insert the Caller ID Card(s) to the connectors on the Outside Line Card.
Up to two cards can be installed to the initial Outside Line Card.

Outside Line Card

Caller ID Card
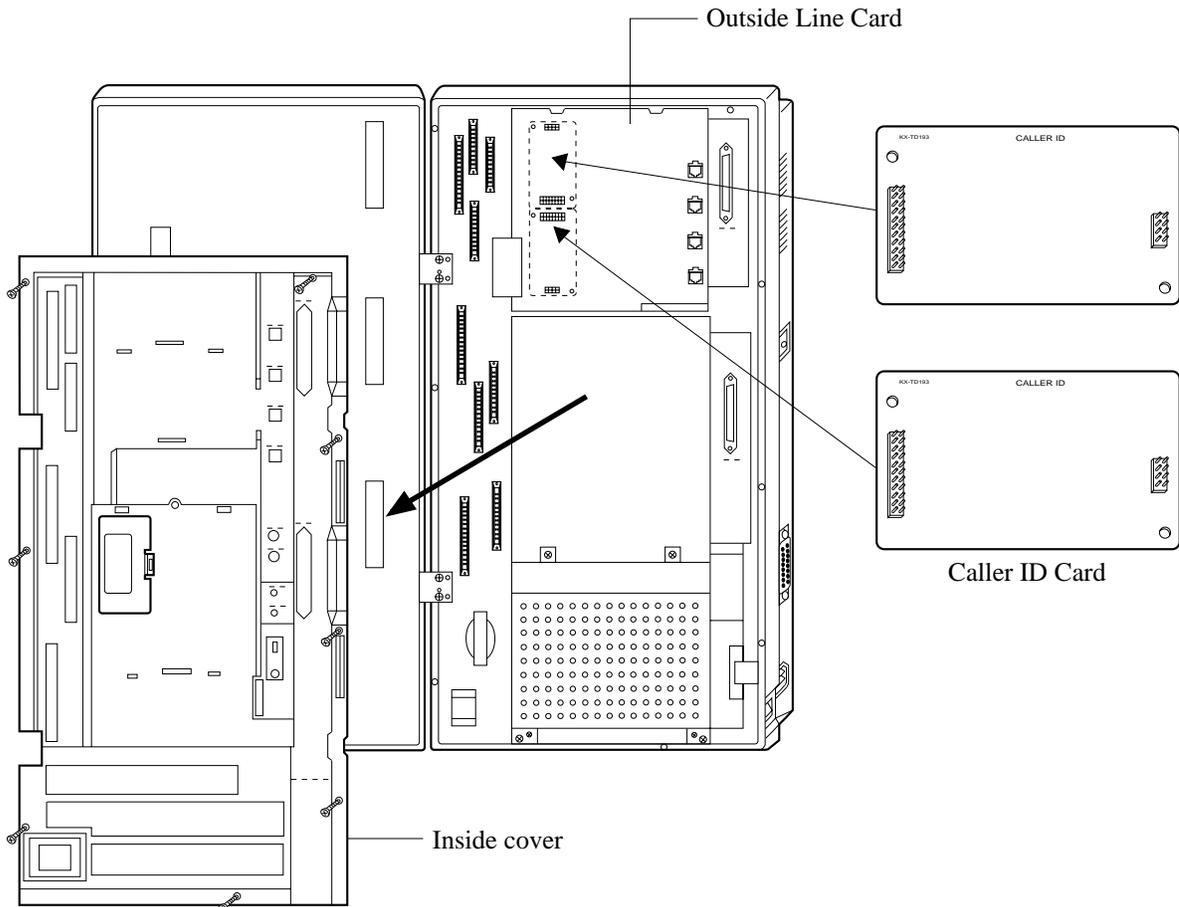
Inside cover

3. Put the inside cover back on the main unit and secure the screws.

Installing to the Optional 4-CO Line Unit

The following procedure must be done before installing the 4-CO Line Unit (KX-TD180) to the main unit.

1. Loosen the five screws located at the rear of the 4-CO Line Unit.

2. Remove the back plate and take out the P-board.

3. Attach the Caller ID Card to the P-board, fitting the connectors.

4. Put the P-board back into the cabinet and fix the rear plate with the five screws.
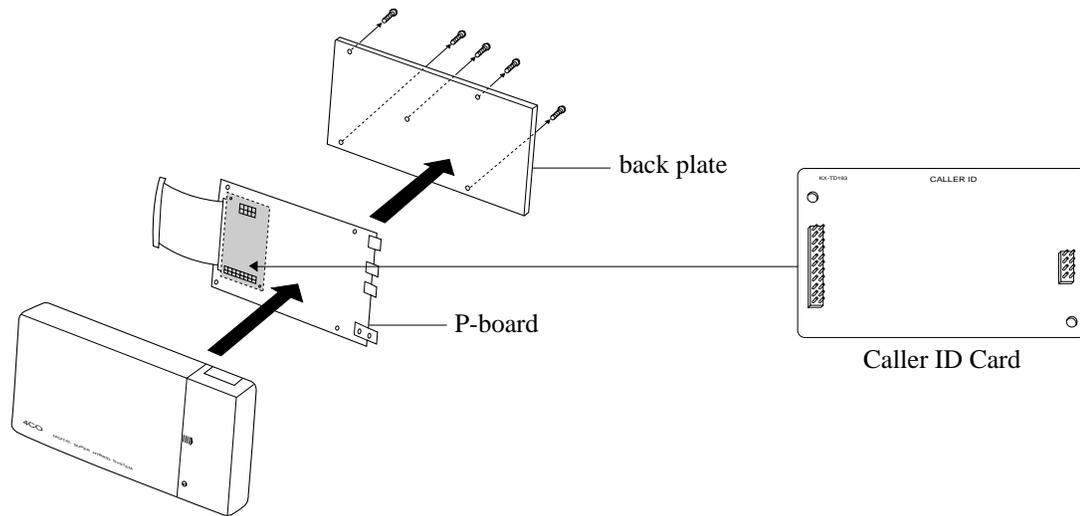
Caller ID Card

Note

For installing the 4-CO Line Unit to the main unit, refer to 2.4.6   Installing Expansion Unit.

Programming Guide Reference

[110] Caller ID Code Set

[111] Caller ID Name Set

[125] Area Code Assignment

[126] Caller ID Modification for Local Call

[127] Caller ID Modification for Long Distance Call

[406] Caller ID Assignment

Features Guide Reference

Caller ID

2.4.9 Doorphone and Door Opener Connection

To connect up to two doorphones (KX-T30865) and up to two door openers (user-supplied), a Doorphone Card (KX-TD160) is required.
To connect up to four doorphones (KX-T30865) and up to four door openers (user-supplied), a Doorphone Card (KX-TD161) is required.

Installing the Doorphone

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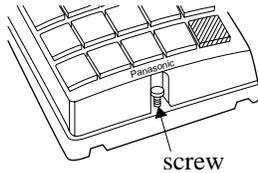
screw

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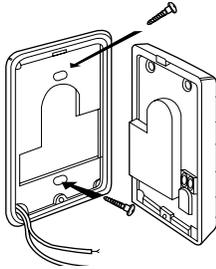
Note

Two kinds of screws are included. Please choose the appropriate one depending on your wall type:

Type 1: When the doorphone plate has been fixed to the wall.

Type 2: When you wish to install the doorphone directly to the wall.
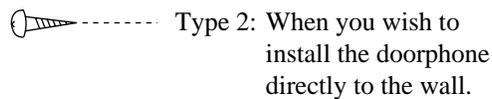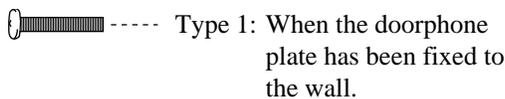
3. Connect the wires to the screws located in the front cover.

To the terminal box (See "Wiring of the Doorphone".)
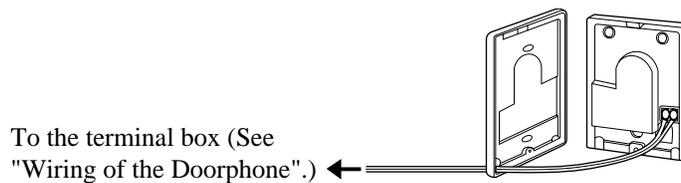
4. Secure both halves together and re-install the screw.

Doorphone Card Installation (for KX-TD160)

1. Connect a 4-conductor modular connector to the Doorphone Card Cabinet, and pass the cord through the groove in the cabinet.
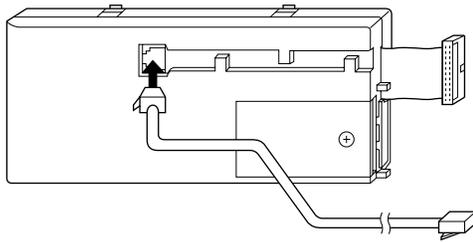
2. Attach the Doorphone Card Cabinet to the main unit and press down.

3. Connect the cord to the Doorphone Card Connector.

KX-TD1232   **KX-TD816**

To Terminal Box
Installation
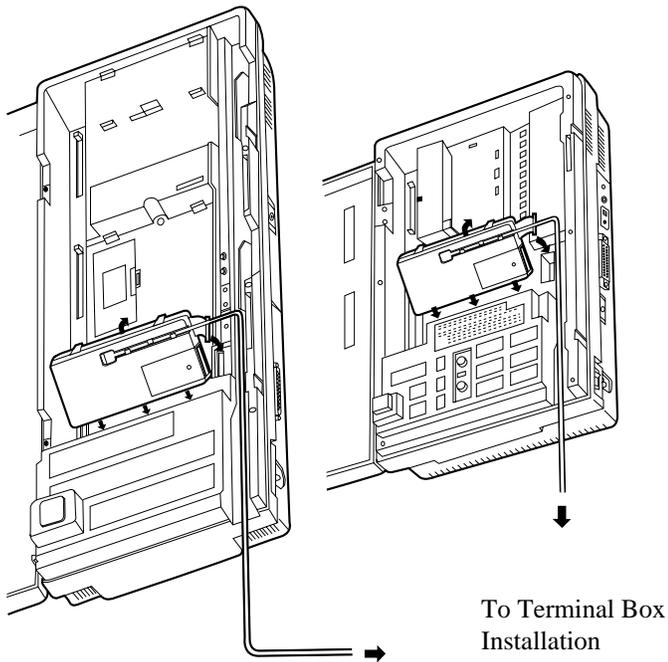
Doorphone Card Installation (for KX-TD161)

1. Connect two 4-conductor modular connectors to the Doorphone Card Cabinet, and pass the cords through the grooves in the cabinet.
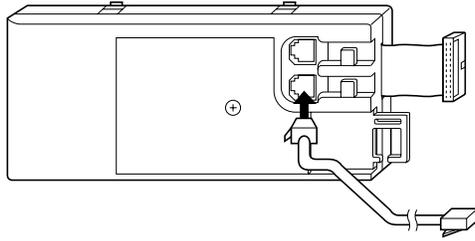
2. Attach the Doorphone Card Cabinet to the main unit and press down.

3. Connect the cords to the Doorphone Card Connector.

KX-TD1232   **KX-TD816**

To Terminal Box
Installation
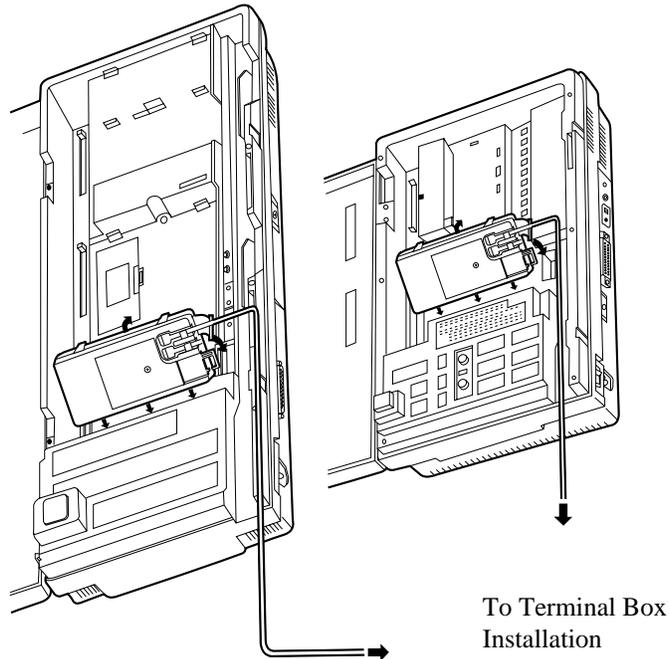
Wiring of the Doorphone (for KX-TD160)

1. Connect the Doorphone 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.

3. Connect the wires of doorphone 2 to the yellow and black screws of the terminal box.

KX-TD816

4-conductor wiring is required.

Terminal Box

Doorphone 1 (KX-T30865)

Doorphone 2 (KX-T30865)

Yellow

Red

Black

Green

KX-TD1232

4-conductor wiring is required.

Terminal Box

Doorphone 1 (KX-T30865)

Doorphone 2 (KX-T30865)

Yellow

Red

Black
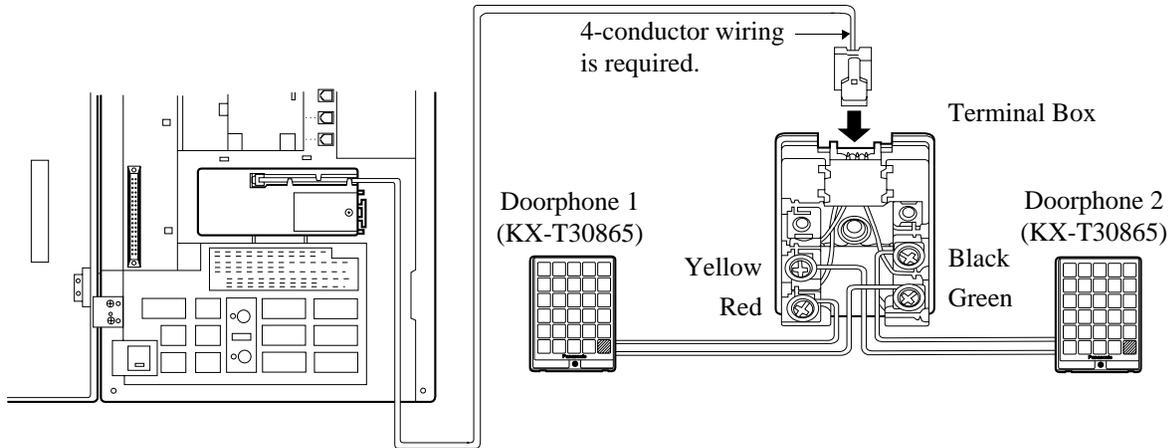
Green

Wiring of the Doorphone (for KX-TD161)

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

KX-TD816

KX-TD1232

View of Doorphone Connector Jack

Doorphone 4

Doorphone 3

Doorphone 2

Doorphone 1

4-conductor wiring is required.

Terminal Box

Doorphone 3 (KX-T30865)

Yellow

Red

Black

Green

Doorphone 4 (KX-T30865)

4-conductor wiring is required.

Terminal Box

Doorphone 1 (KX-T30865)

Yellow

Red

Black

Green

Doorphone 2 (KX-T30865)
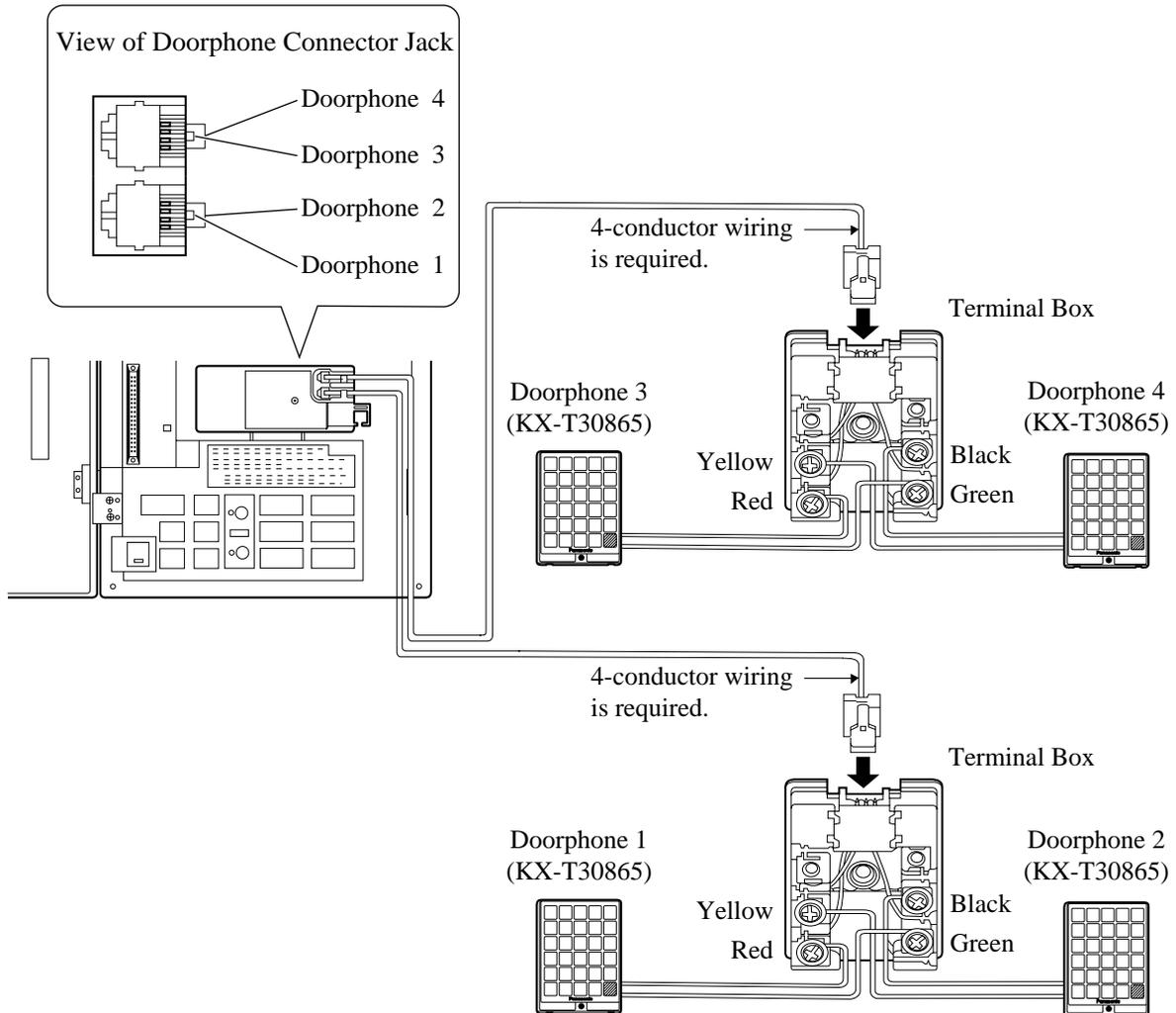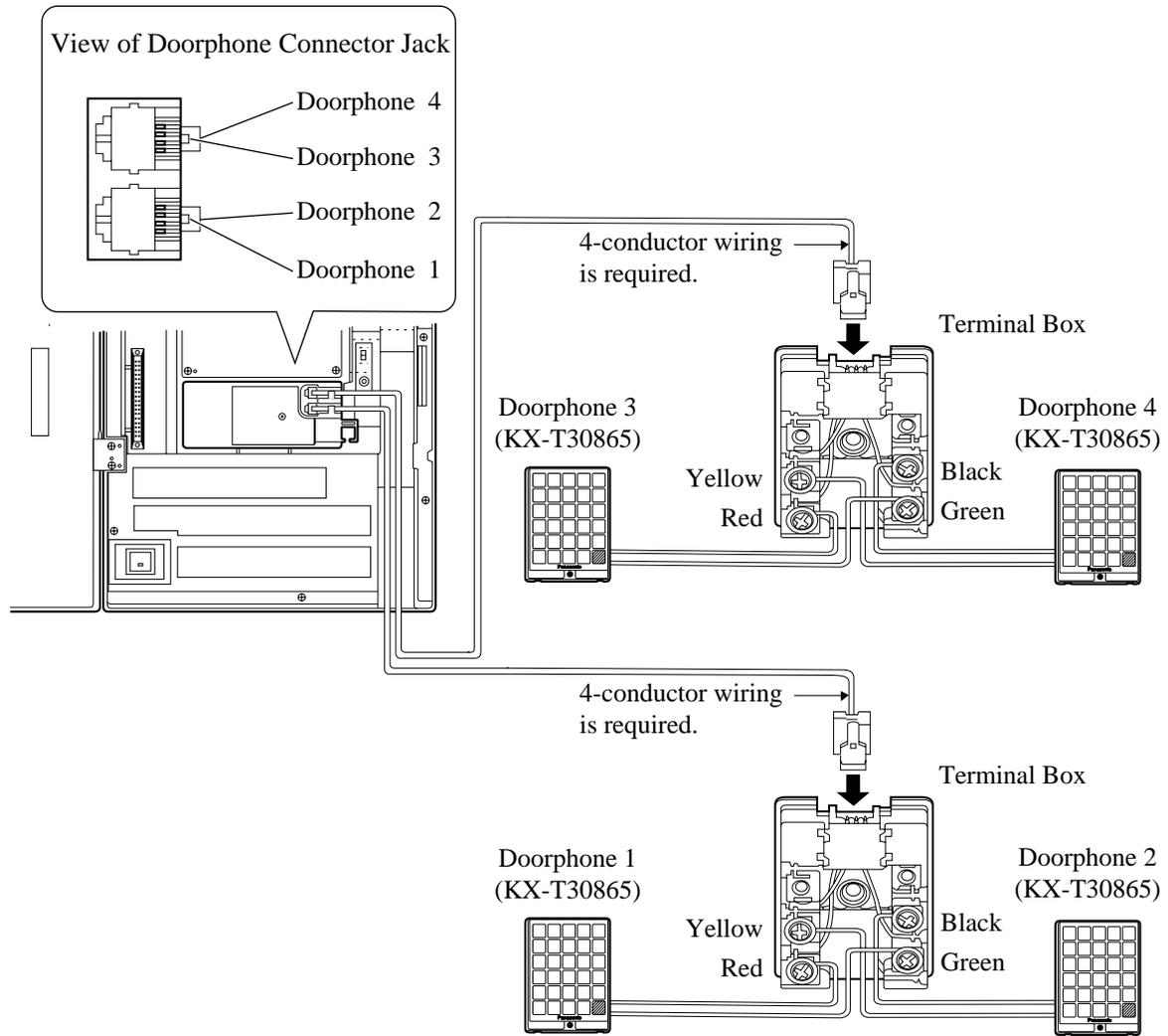
Connecting Door Openers (for KX-TD160)

   1. Loosen the screw to remove the cover.

   2. Loosen the screws on the terminal strip.

3. Insert the wires coming from the door openers into holes and tighten the screws.
Pass all the wires through the Holder.

Holder

To door
opener 2

To door
opener 1

Note

- The KX-TD1232 is illustrated as the main unit.
- Set the door opener paired with the doorphone.
- For wiring, UL 1015, AWG 22 twisted wire or the equivalent is recommended.
- The wire should be between 1.2 and 2.4 mm (3/64 and 3/32 inch) in diameter including the coating.

D=1.2-2.4 mm (3/64-3/32 inch)

Installation Manual
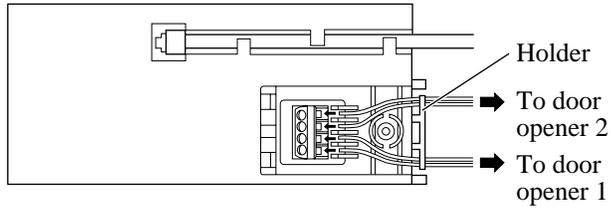
Connecting Door Openers (for KX-TD161)

    1. Loosen the screw to remove the cover.
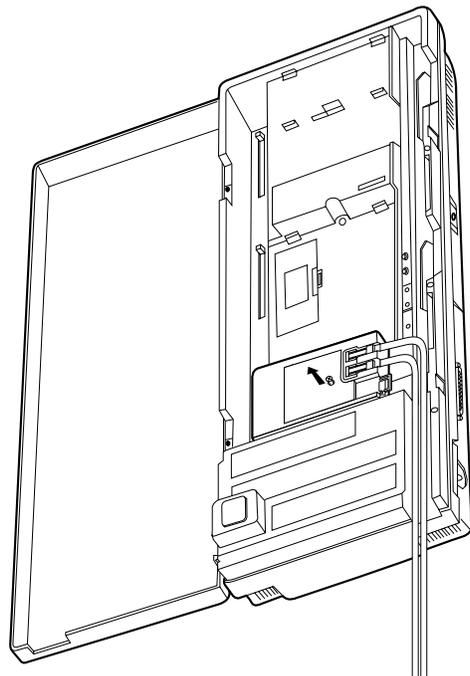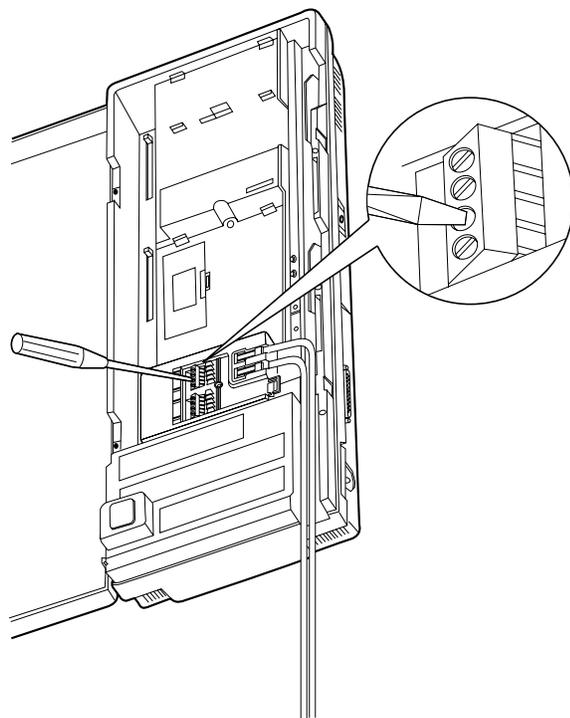
    2. Loosen the screws on the terminal strip.

3. Insert the wires coming from the door openers into holes and tighten the screws.
Pass all the wires through the Holder.

Note

- The KX-TD1232 is illustrated as the main unit.
- Set the door opener paired with the doorphone.
- For wiring, UL 1015, AWG 22 twisted wire or the equivalent is recommended.
- The wire should be between 1.2 and 2.4 mm (3/64 and 3/32 inch) in diameter including the coating.

D=1.2-2.4 mm (3/64-3/32 inch)
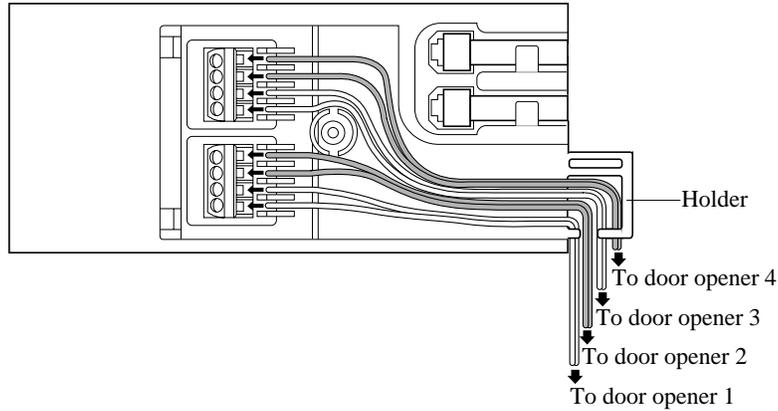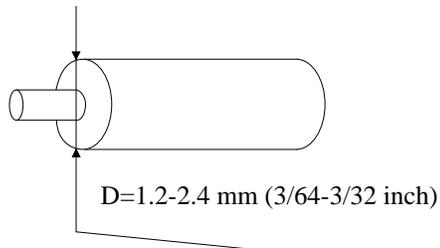
Maximum cabling distance of the doorphone and the door opener line

The maximum length of the doorphone and door opener line that connects to the main unit is shown below:

26 AWG: Under 70 m (230 feet)
24 AWG: Under 113 m (370 feet)
22 AWG: Under 180 m (590 feet)

Doorphone
KX-T30865

22 AWG: Under 180 m (590 feet)
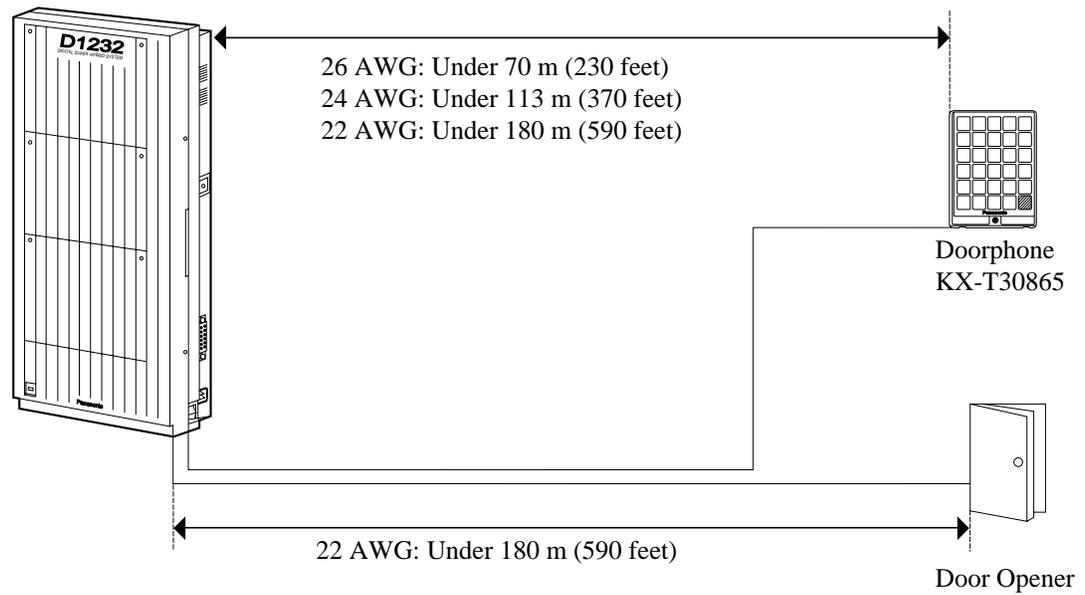
Door Opener

Note

The KX-TD1232 is illustrated as the main unit.

Programming Guide Reference

[607-608] Doorphone Ringing Assignment —— Day / Night

Features Guide Reference

Door Opener
Doorphone Call

2.4.10   SLT Message Waiting Lamp Adaptor Unit Connection

Name and Locations

Side View

Connector (TO SYSTEM)

Connector (TO EXTN)

AC inlet

Power light

Binders

Ground terminal

DC input / output
connector
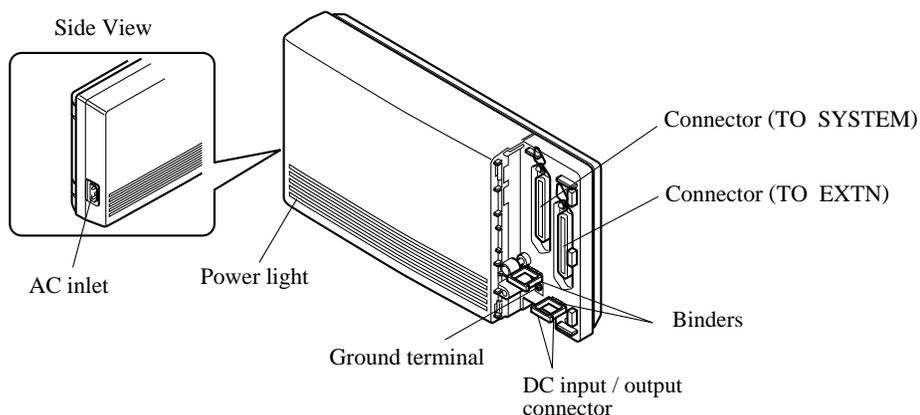
Specifications

1. General Description

Capacity	Corresponding extensions	16
Control Method	CPU: One-chip microcomputer Interface: 1-APT Interface	
Power Supplies	Primary Power Secondary	120 V AC, 60 Hz Station Supply Voltage: + 85 V Circuit Voltage: + 5 V, + 15 V
Connectors	Stations DC Input / Output Interface	50-pin Amphenol Connector 4-pin Connector

2. Characteristics

DC Power Supply to Stations	85 V, 1.2 mA (max)
Primary Power	120 V AC, 60 Hz, 0.8 A (max) [1]
Environmental Requirements	0 °C – 40 °C / 32 °F – 104 °F, 10 % – 90 % rel. hum.

[1]   This is the maximum current when three TD194s are connected by DC input / output interfaces (only the main TD194 is connected to an AC outlet).

<u>WARNING</u>

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

Wall Mounting

This unit can be mounted to a wall. Refer to 2.2.3   Wall Mounting

Template

or

Template
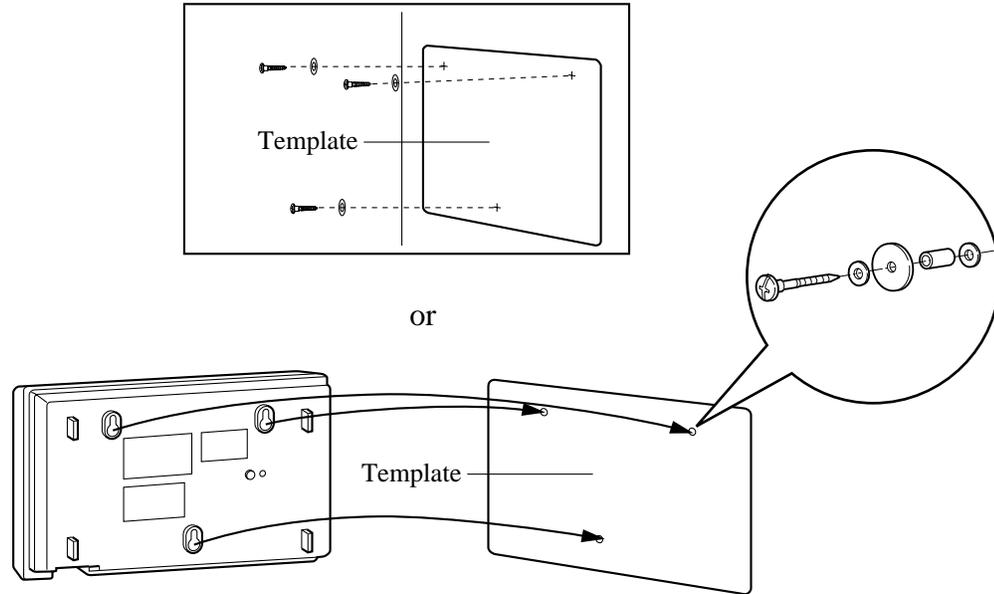
Opening the front cover

1. Loosen the screw.

2. Slide the cover while pressing the mark.

<u>Note</u>

The screw cannot be removed from the unit.
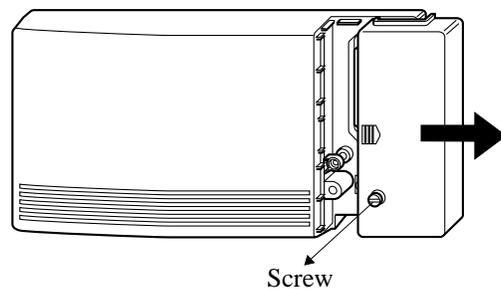
Screw

Frame Ground Connection

IMPORTANT

Connect the system frame to the ground.

1. Loosen the screw.

2. Insert the grounding wire.

3. Tighten the screw.

4. Connect the grounding wire to the ground.

Screw

To ground

In most of the continental United States, the ground provided by the "Third wire ground" at the commercial power outlet will be satisfactory. However, in a small percentage of cases this ground may be installed incorrectly. Therefore, the following test procedure should be performed.

Test Procedure

1. Obtain a suitable voltmeter and set it for a possible reading of up to 250 VAC.

2. Connect the meter probes between the two main AC voltage points on the wall outlet. The reading should be 108 – 132 VAC.

3. Move one of the meter probes to the 3rd prong terminal (GND).
Either the same reading or a reading of 0 V should be obtained.

4. If a reading of 0 V at one terminal and a reading of 108 – 132 VAC at the other terminal is not obtained, the outlet is not properly grounded. This should be corrected by a qualified electrician (per article 250 of the National Electrical Code).

5. If a reading of 0 V at one terminal and a reading of 108 – 132 VAC at the other terminal is obtained, then set the meter to the "OHMS / RX1" scale, place one probe at the GND Terminal and the other probe at the terminal which gave a reading of 0 V. A reading of less than 1 ohm should be obtained. If the reading is not obtained, the outlet is not adequately grounded. See a qualified electrician.

Inserting the Connector

1. Insert the two 50-pin connectors to the jacks as shown below.
The connector "TO SYSTEM" should be connected to the cable which is connected to the KX-TD816 / KX-TD1232.
Also, the connector "TO EXTN" should be connected to the cable which is connected to the extensions.

Connector (TO SYSTEM)

Connector (TO EXTN)

Connector type
50-pin (Amphenol 57JE series or the equivalent)

To System (TD816 / TD1232) To Extensions
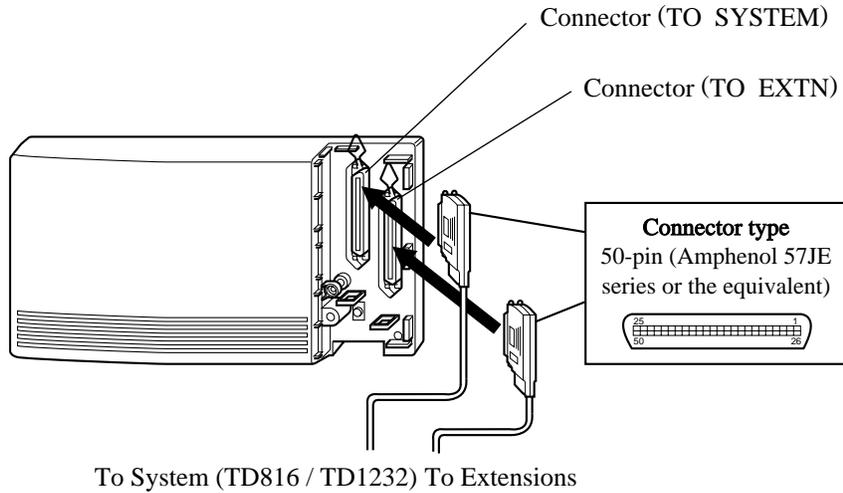
2. Insert the cables through the binders.

Binders
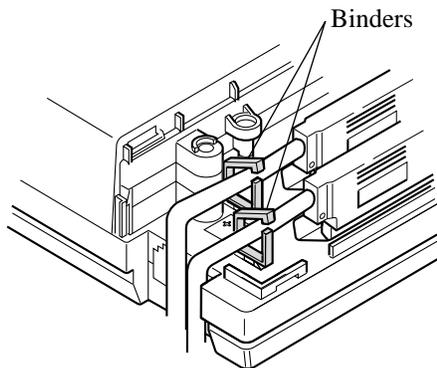
3. If two units are connected with the DC IN / OUT, insert the 4-pin connectors to the jacks as shown on the next page.

To another
KX-TD194
(See "SLT Message Waiting Lamp Adaptor Unit Connection",
 "Location of Optional Cards and Units" in this section
  for a connection example.)

Side View

DC IN / OUT
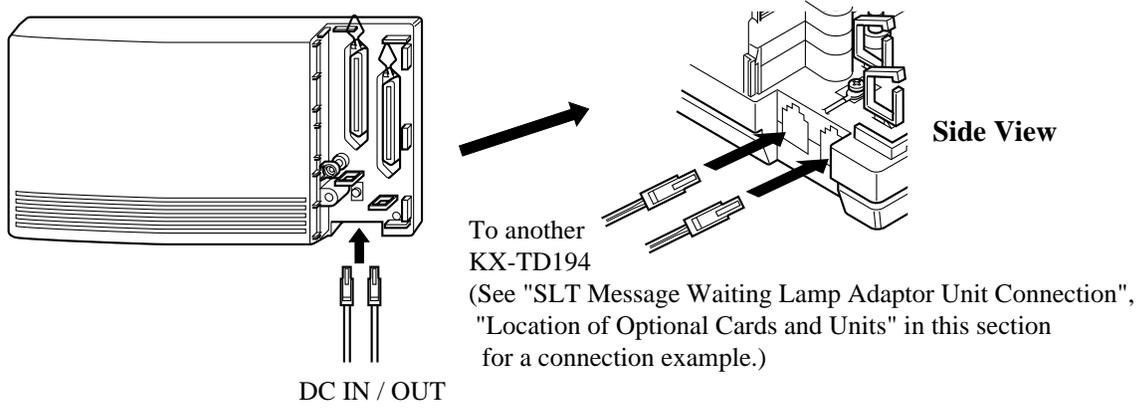
Cable Pins to Be Connected

CONN. PIN	To System Connector (CN1)		To Extension Connector (CN2)	
26 1	APT DATA	D1 D2	EXTN. 1	T R
27 2	EXTN. 1	T R	EXTN. 2	T R
28 3	EXTN. 2	T R	EXTN. 3	T R
29 4	EXTN. 3	T R	EXTN. 4	T R
30 5	EXTN. 4	T R	EXTN. 5	T R
31 6	EXTN. 5	T R	EXTN. 6	T R
32 7	EXTN. 6	T R	EXTN. 7	T R
33 8	EXTN. 7	T R	EXTN. 8	T R
34 9	EXTN. 8	T R	EXTN. 9	T R
35 10	EXTN. 9	T R	EXTN. 10	T R
36 11	EXTN. 10	T R	EXTN. 11	T R
37 12	EXTN. 11	T R	EXTN. 12	T R
38 13	EXTN. 12	T R	EXTN. 13	T R
39 14	EXTN. 13	T R	EXTN. 14	T R
40 15	EXTN. 14	T R	EXTN. 15	T R
41 16	EXTN. 15	T R	EXTN. 16	T R
42 17	EXTN. 16	T R		

Closing the Front Cover

1. Fasten the binders.
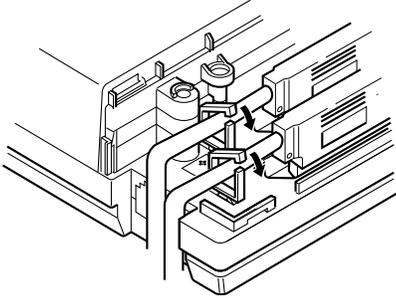
2. Replace the cover and tighten the screw.
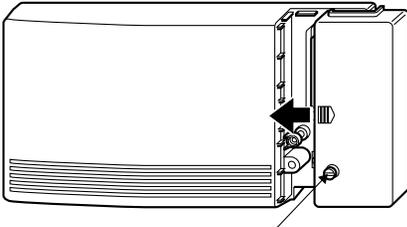
3. Tie together all of the connected cords and attach them to the wall so that the cords cannot be pulled out of the system.
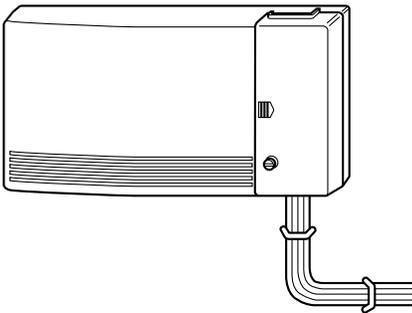
Starting the unit

Plug the AC cord into the system AC inlet and an AC outlet.
Avoid sharing the AC outlet of this system with other office equipment. Use a dedicated AC outlet only.

AC Surge Protecter

134 cm (52 3/4 inches)
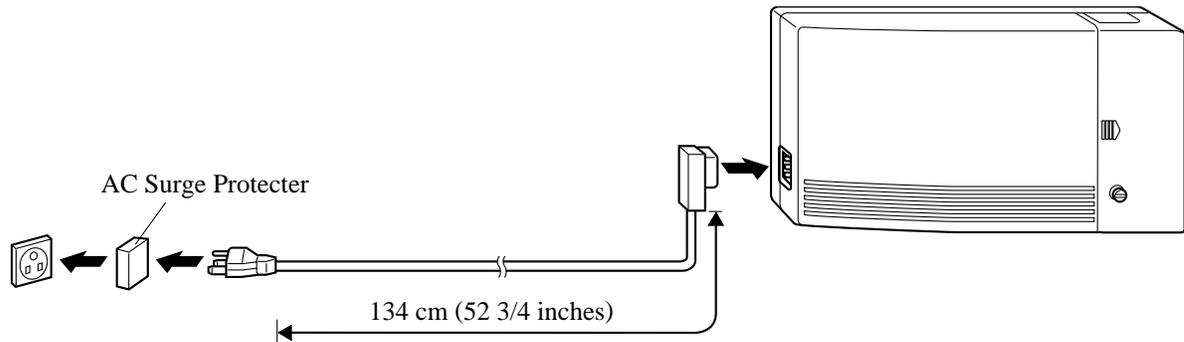
<u>CAUTION</u>

The power supply cord is used as the main disconnect device. Ensure that the socket-outlet is located / installed near the equipment and is easily accessible.

2.4.11   System Connection[*1]

To connect two main units, use the optional System Inter Connection Cards (two) and the Connection Cable (included in the cards).

1. Insert the upper side of the System Inter Connection Card into two hooks on the main unit (Master System).

System Inter Connection Card
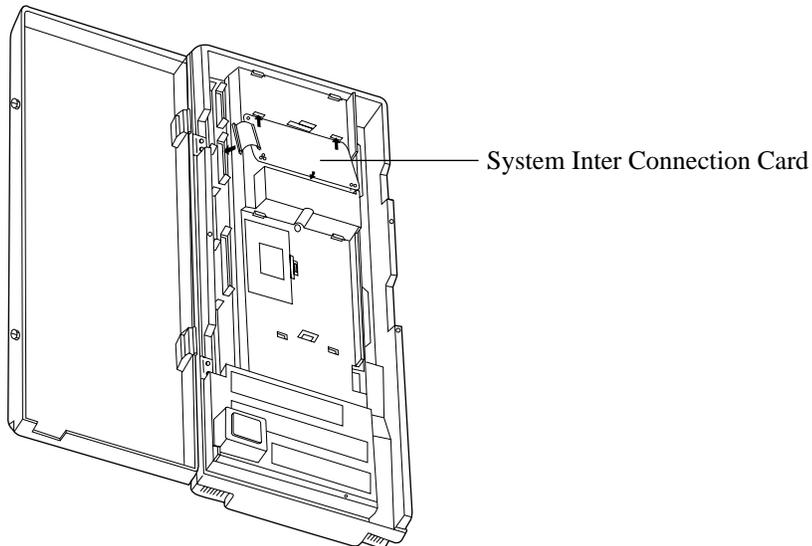
2. Press down the two corners of the lower side of the System Inter Connection Card.

3. Connect the cord to the System Inter Connection Card connector.
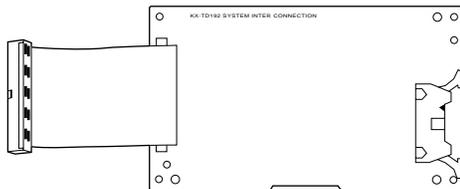
System Inter Connection Card

4. Open the latch on the card.

5. Repeat steps 1 through 4 for the Slave System, using the other card.

6. Insert one Connection Cable end into the Master System and insert the other end into the Slave System.

[*1]   Available for the KX-TD1232 only.

7. Close the latches on both systems.
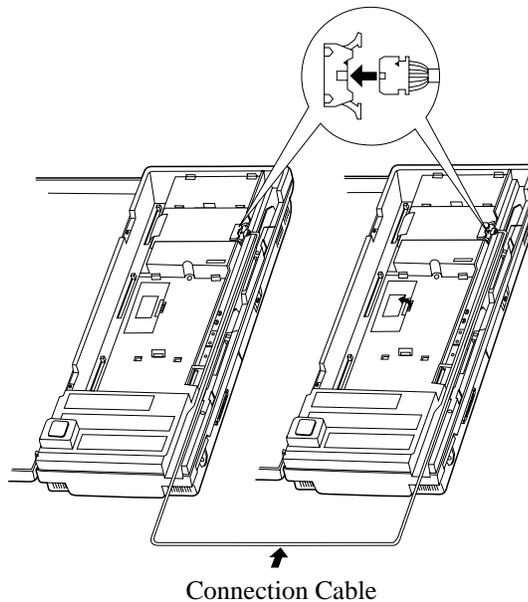
Connection Cable

8. Open the ROM Cover in the Slave System and set the Master / Slave Switch on the CPU Card to "Slave" position.
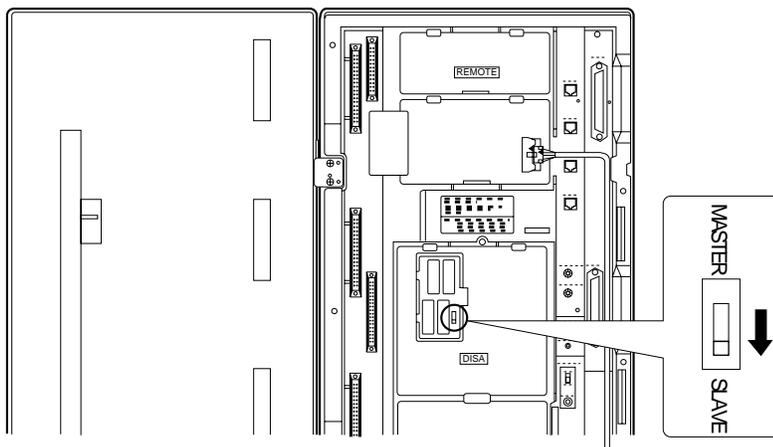
9. Turn the power on.

Note

- System Connection is completed about three minutes after the power is turned on. To confirm System Connection completion, try to call a Slave System extension from a Master System extension.
- To turn the power on for the first time, refer to Section 2.6 "Starting the System for the First Time".
- The master and slave must have the same version software. Otherwise, System Connection will not work properly.
- When you install an ISDN Line Unit, you should install it to the Master System first and then the Slave System. If only installed to the Slave System, noise may occur.

Programming Guide Reference

No programming required.

Features Guide Reference

System Connection

2.5   Auxiliary Connection for Power Failure Transfer

2.5.1   Auxiliary Connection for Power Failure Transfer

Power Failure Transfer connects specific single line telephones to selected outside lines in the event of system power failure, as follows:

KX-TD816

Outside Line 1 — Extension (T, R) Jack 1 /
Outside Line 2 — Extension (T, R) Jack 2 /
Outside Line 5 — Extension (T, R) Jack 9 /
Outside Line 6 — Extension (T, R) Jack 10
Connections of outside lines 1, 2 and the respective extensions require no auxiliary connection.
Outside lines 5 and 6 require auxiliary connection to implement this feature.

KX-TD1232

Outside Line 1 — Extension (T, R) Jack 1 /
Outside Line 2 — Extension (T, R) Jack 2 /
Outside Line 3 — Extension (T, R) Jack 9 /
Outside Line 4 — Extension (T, R) Jack 10 /
Outside Line 9 — Extension (T, R) Jack 17 /
Outside Line 10 — Extension (T, R) Jack 18
Connections of outside lines 1 through 4 and the respective extensions require no auxiliary connection. Outside lines 9 and 10 require auxiliary connection to implement this feature.

Insert the modular plugs of connection cords (4-conductor wiring) to the modular jacks of 4-CO Line Unit and 8-Station Line Unit 1.
(In the case of KX-TD816, one 8-Station Line Unit is available.)

T2 R1 T1 R2

R: Ring
T: Tip

View of TEL Jack (Outside Line)
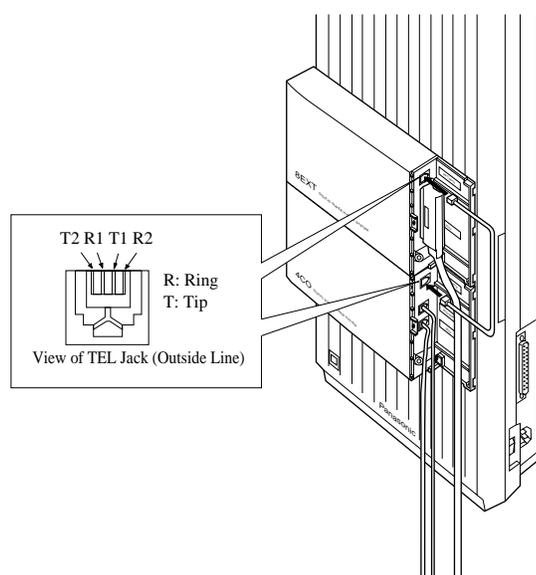
<u>Note</u>

- In the event of a power failure, system memory is protected by a factory-provided lithium battery. There is no memory loss except the memories of Camp-on, Saved Number Redial, Last Number Redial, Call Park and Message Waiting.
- The system changes the current connection to this connection automatically when the power supply stops.
- The KX-TD1232 is illustrated as the main unit, and the KX-TD170 and KX-TD180 are illustrated as the expansion units.

Features Guide Reference

Power Failure Transfer

2.6 Closing the Front Cover

2.6.1 Closing the Front Cover

1. Fasten all the cables and cords with the cord fastener.
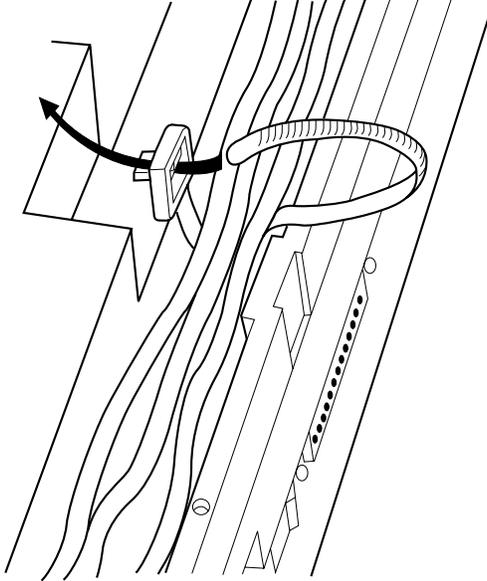
2. Replace the cover and tighten the screw.

<u>Note</u>

Be sure to tighten two screws, or the unit may not work properly.
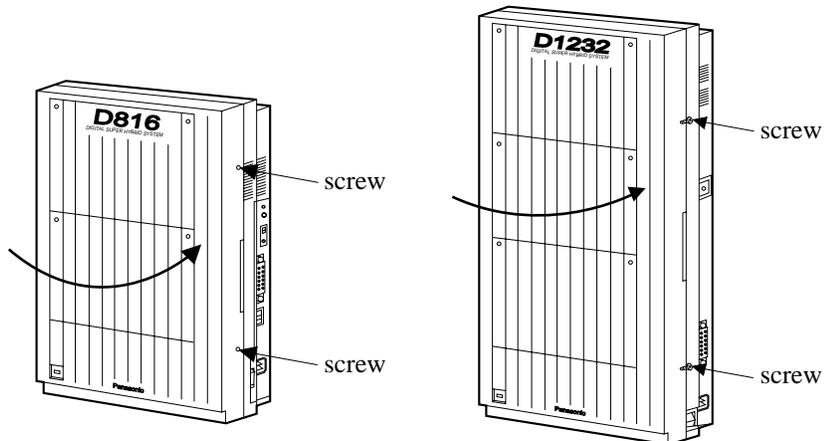
3. Tie together all of the connected cords and attach them to the wall so that the cords cannot be pulled out of the main unit.
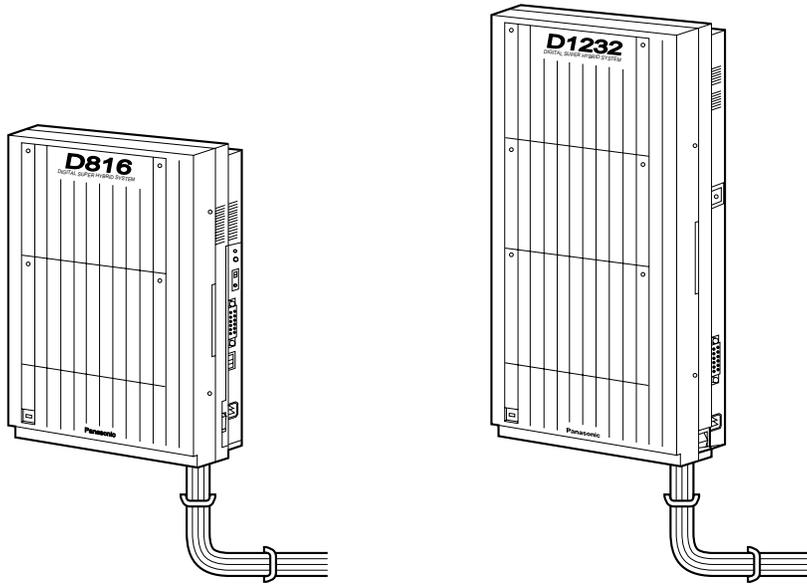
2.7 Starting the System for the First Time

2.7.1 Starting the System for the First Time

1. Set the Power Switch to the "OFF" position.
2. Set the System Clear Switch to the "CLEAR" position.
3. Plug the AC power cord into the system and an AC outlet.
4. Turn the Power Switch on.
5. Press the Reset Button with a pointed tool.
   (The power indicator will flash.)
6. Slide the System Clear Switch to the "NORMAL" position while the power indicator is flashing (within approximately 10 seconds).

The system will be initialized with default values. The system will also check the outside lines, extensions, and optional cards and units.

KX-TD816

KX-TD1232

System Clear Switch

SYSTEM
CLEAR

CLEAR

NORMAL

RESET

Reset Button

Power Indicator

Power Switch

To AC Outlet
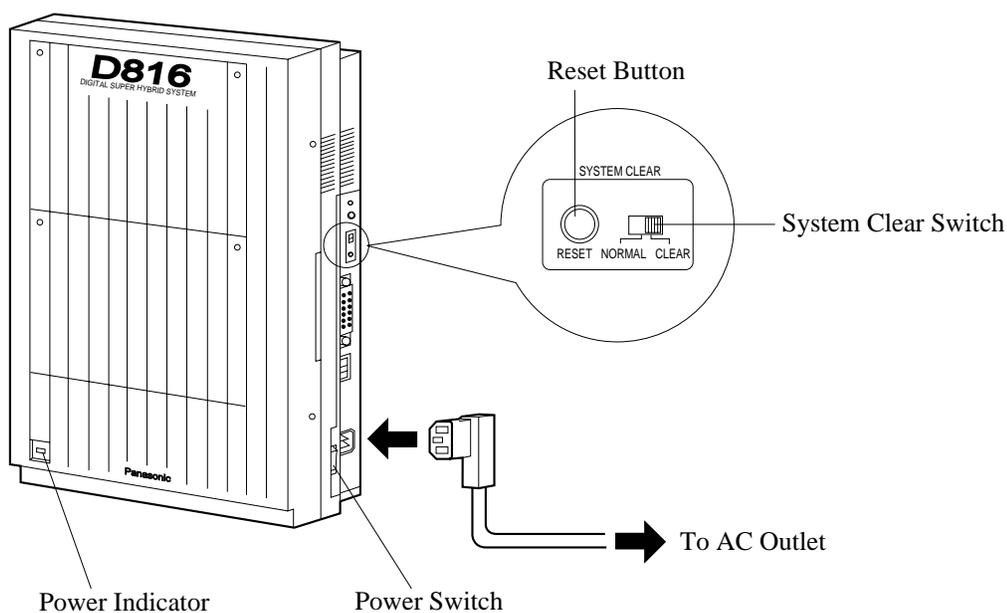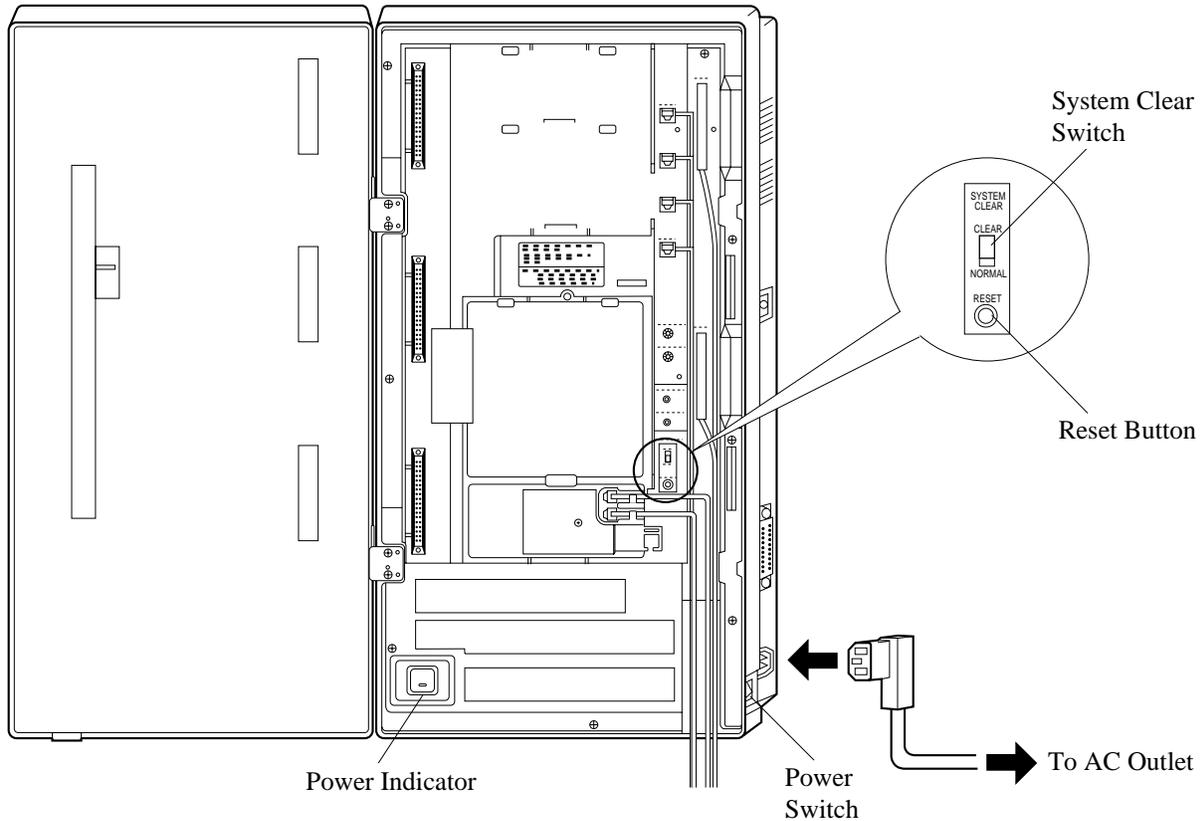
Notice
- After pressing the Reset Button, slide the System Clear Switch to the "NORMAL" position at step 6 while the power indicator is flashing (within approximately 10 seconds). Otherwise, the system will not start up with the default values.

CAUTION

The power socket wall outlet should be located near this equipment and be easily accessible.

Once you start up the system and you turn the power off, do not perform the above procedure to start the system again. Otherwise, your programmed data will be cleared. To start the system, just turn the Power Switch on.

The power outlet should be located near this equipment and easily accessible.

2.8 System Restart

2.8.1 System Restart

After starting the system, if the system does not operate properly, restart the system.
Before restarting the system, try the system feature again to confirm whether there definitely is a problem or not.
System Restart causes the following:

a) Camp-on is cleared.

b) Calls on Hold are terminated.

c) Calls on Exclusive Hold are terminated.

d) Calls in progress are terminated.

e) Call Park is cleared.

Other data is not cleared by System Restart.

1. Make sure that the System Clear Switch is set to the "NORMAL" position.

2. Press the Reset Button with a pointed tool.

Notice

After pressing the Reset Button, if you notice that the System Clear Switch is set to the "CLEAR" position, never slide the System Clear Switch to the "NORMAL" position within 20 seconds. Otherwise, all the system programming data are reset to default values (Refer to 2.9.1   System Data Clear). Wait at least 30 seconds, then slide to the "NORMAL" position. Then the system will work as before.

If the system still does not operate properly, please see 5.1.4   Using the Reset Button.

2.9   System Data Clear

2.9.1   System Data Clear

After storing or changing the system programming data, it is possible to clear your programming data stored in the system, if required. The system will restart with the default setting.

1. Slide the System Clear Switch to the "CLEAR" position.

2. Press the Reset Button with a pointed tool.

3. Return the System Clear Switch to the "NORMAL" position while the power indicator is flashing (within approximately 10 seconds).

Notice

After pressing the Reset Button, return the System Clear Switch to the "NORMAL" position in step 3 while the power indicator is flashing (within approximately 10 seconds). Otherwise, the system will not clear.

Section 3

ISDN Installation

3.1 ISDN Network Outline

3.1.1 Overview

To use the ISDN Line Service, the following unit can be installed to the KX-TD816 and KX-TD1232.

2-ISDN U-point Line Unit (KX-TD382)
4-ISDN U-point Line Unit (KX-TD384)
6-ISDN U-point Line Unit (KX-TD386)
4-ISDN S / T-point Line Unit (KX-TD284)
Primary Rate Interface ISDN Expansion Unit (KX-TD290) [KX-TD1232 Master only]

These units add ISDN U-point or S / T-point lines.
These units can be installed in any of the expansion areas provided on the front of the main unit.
The KX-TD290 adds one Primary Rate Interface (PRI) ISDN line. One PRI ISDN line adds 23 outside lines (outside lines 25 through 47) to the system. This unit can only be installed to the KX-TD1232 Master system.
When the KX-TD290 is installed to the system, the maximum number of available outside lines is limited to 31. In the case of System Connection, the basic and extended outside line in the Slave system cannot be used.

Notice

- System Programming is required for card location identification. It is not possible to connect this unit only to the slave system.
- The PLL (Phase Locked Loops) Card (KX-TD112) must be installed to the system before the ISDN Line Unit is installed. This card is used to synchronize the system clock with the clock of the ISDN network.
- In the System Connection of the KX-TD1232, the PLL Card can be installed to the only master system.
- If you use the KX-TD170 with the KX-TD290, you must use the KX-TD170 which has suffix 'C' or later.
  The former KX-TD170 does not work properly with KX-TD290.
  Please see the back of the unit and check suffix.

How to distinguish suffix

Serial No. LABEL

$\times \times \times \times$ C $\times \times \times \times \times$

Suffix   UNIT No.
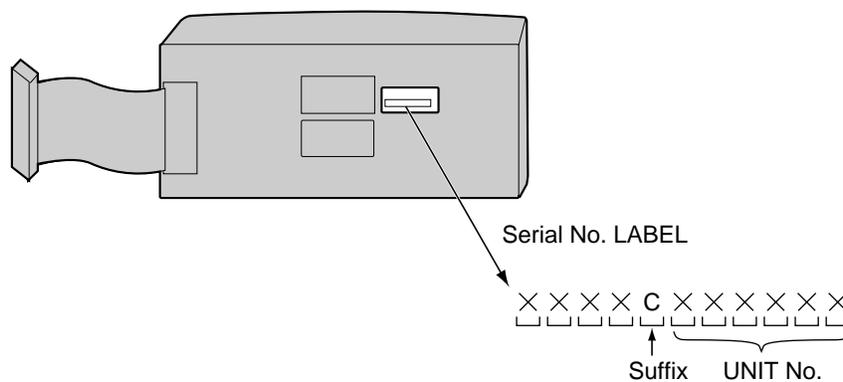
The compatibility between KX-TD290 and KX-TD170

	Master System	Slave System
With KX-TD290	Suffix 'C' or later	Don't care. [1]
Without KX-TD290	Don't care.	Don't care. [1]

[1] KX-TD290 can not be installed in slave system.

- System Programming is required for card location identification.

Programming Guide References

[109] Expansion Unit Type

Features Guide References

Module Expansion

3.2   ISDN Line Connection

3.2.1   Location of the Units

KX-TD816

One ISDN Line Unit (KX-TD382, KX-TD384, KX-TD386 or KX-TD284) can be installed to any expansion area.
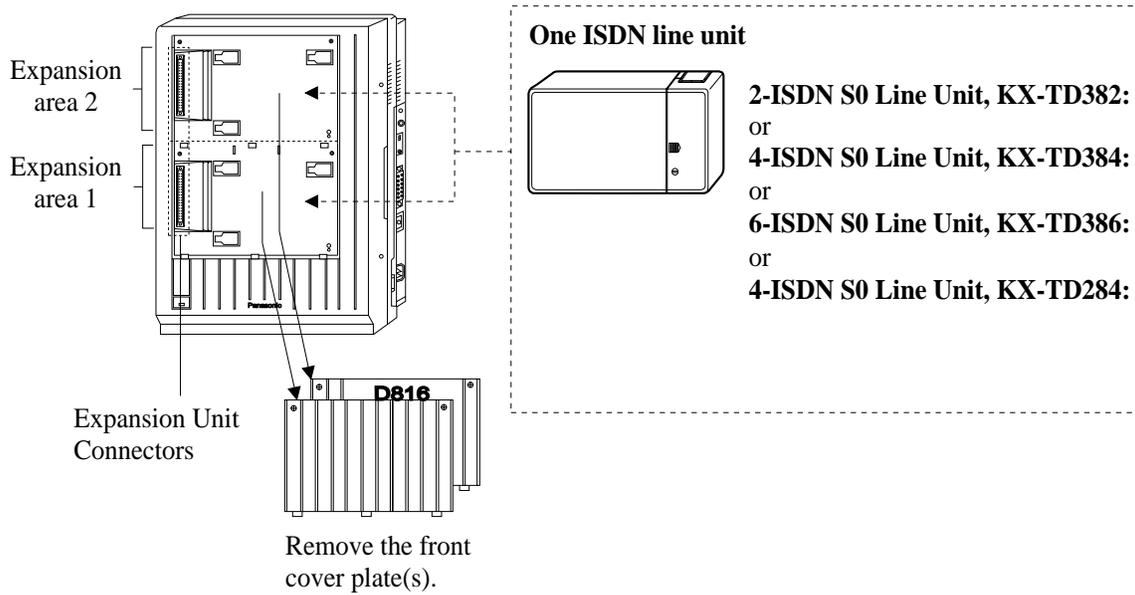
One ISDN line unit

2-ISDN S0 Line Unit, KX-TD382:
or
4-ISDN S0 Line Unit, KX-TD384:
or
6-ISDN S0 Line Unit, KX-TD386:
or
4-ISDN S0 Line Unit, KX-TD284:

Expansion area 2

Expansion area 1

Expansion Unit Connectors

D816

Remove the front cover plate(s).

Note

• System Programming is required for expansion unit location.
   <SYS PRG [109]>
   Default : Area 1 = 4-CO Line Unit
              Area 2 = 8-Station Line Unit
• Either one KX-TD382, one KX-TD384, one KX-TD386 or one KX-TD284 can be installed in a system.
• For unit combinations, refer to 1.4.2   Expansion Unit Combination.

KX-TD1232

One ISDN Line Unit (KX-TD382, KX-TD384, KX-TD386 or KX-TD284) or one PRI ISDN Line Unit (KX-TD290) can be installed to any expansion area.
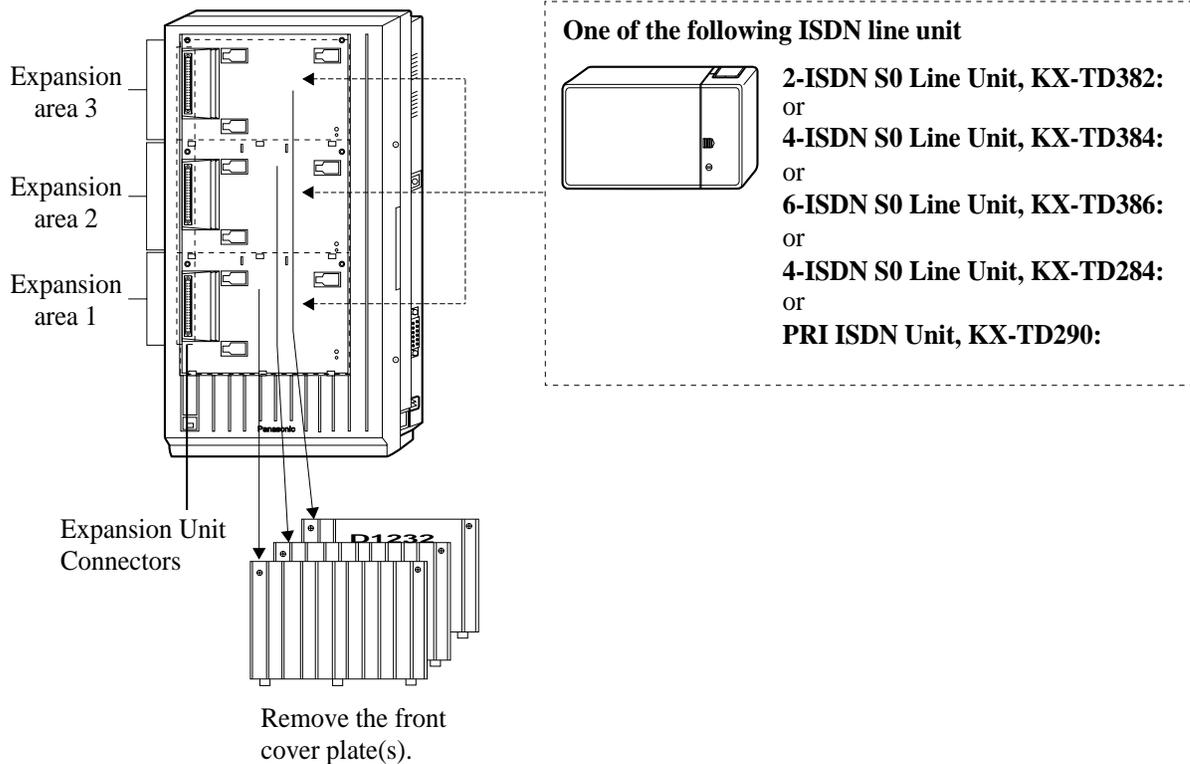
One of the following ISDN line unit

2-ISDN S0 Line Unit, KX-TD382:
or
4-ISDN S0 Line Unit, KX-TD384:
or
6-ISDN S0 Line Unit, KX-TD386:
or
4-ISDN S0 Line Unit, KX-TD284:
or
PRI ISDN Unit, KX-TD290:

Expansion area 3

Expansion area 2

Expansion area 1

Expansion Unit Connectors

Remove the front cover plate(s).

Note

- System Programming is required for expansion unit location.
  <SYS PRG [109]>
  Default : Area 1 = 4-CO Line Unit
  Area 2 and 3 = 8-Station Line Unit
- For unit combinations, refer to 1.4.2 Expansion Unit Combination.

3.2.2   Installation the Unit

Step 6 is different for each unit.
The KX-TD1232 is illustrated as the main unit.

Attention
To install an ISDN Line Unit, install the PLL (Phase Locked Loops) Card (KX-TD112) first.

1. Power off the system, and unplug the AC cord.

2. Loosen the screws to open the front cover and the inside cover of the main unit.

> **Note**
>
> If any card, unit, or cords are installed to the main unit, remove them beforehand.

3. Insert the PLL Card to the connectors on the CPU Board.

> **Note**
>
> Make sure the card connectors are attached securely to the board, or the system may not operate properly.

CPU Board

PLL Card
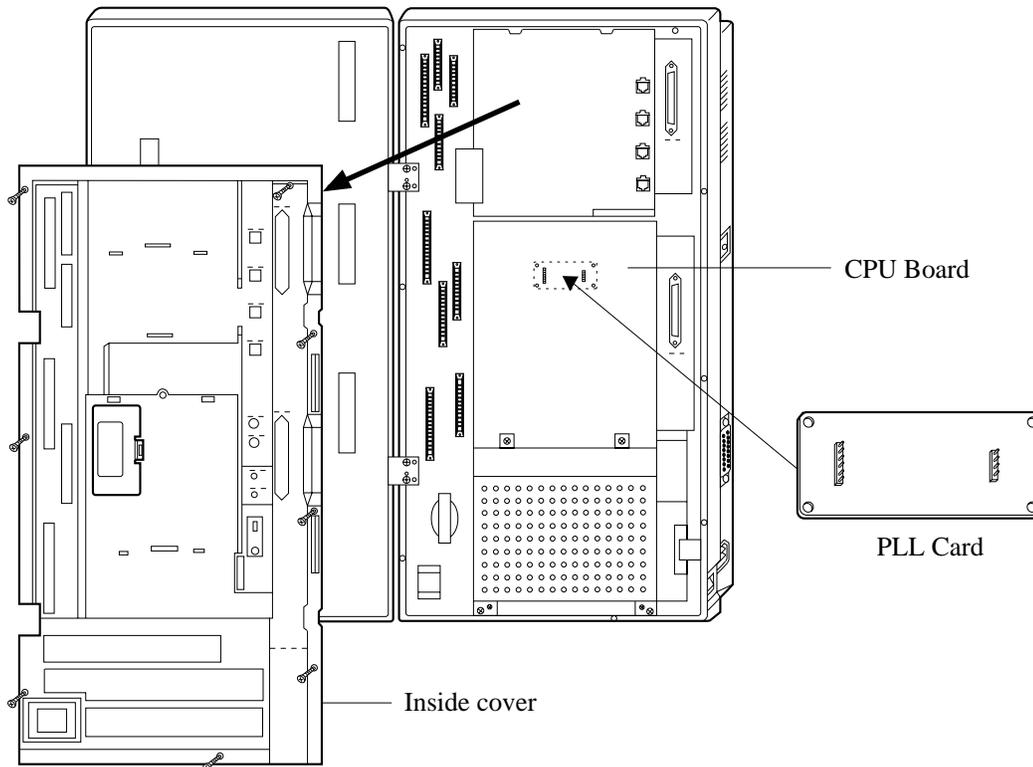
Inside cover

4. Place the inside cover back on the main unit and secure the screws, and then close the front cover and secure the screws.

5. Follow the steps on the next page.

1. Loosen two screws on the cover plate. Insert fingers into the slits to remove the cover plate.

Slit

Slit

Note

Any of the cover plates can be removed, as needed.

2. Connect the cabinet cord to the connector in the main unit firmly.

3. Hook the cabinet to the main unit and slide the cabinet to the left until it is secured.
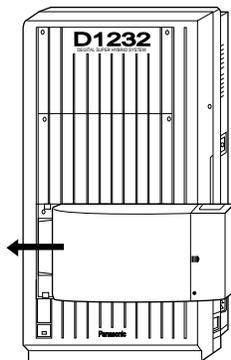
4. Loosen the outside screw and slide the cover to the right.
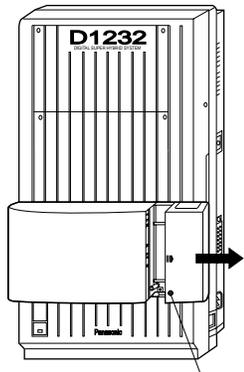
Outside screw

5. Secure the inside screw (included) to fix the cabinet to the main unit.

Inside screw

Note
Be sure to fix the inside screw to the main unit, or the unit may not work properly.

6. Insert the 8-pin modular plug into a jack on the unit.

If a KX-TD382, KX-TD384 or KX-TD386 is to be installed:

KX-TD382

Jack 2 (ISDN port 6)
Jack 1 (ISDN port 5)

4:
5: U-point

View of TEL Jack (CO)

To Terminal Board or
Modular Jacks from
the Central Office

KX-TD384

Jack 4 (ISDN port 6)
Jack 3 (ISDN port 5)
Jack 2 (ISDN port 4)
Jack 1 (ISDN port 3)

4:
5: U-point

View of TEL Jack (CO)

To Terminal Board or
Modular Jacks from
the Central Office

KX-TD386

Jack 6 (ISDN port 6)
Jack 5 (ISDN port 5)
Jack 4 (ISDN port 4)
Jack 3 (ISDN port 3)
Jack 2 (ISDN port 2)
Jack 1 (ISDN port 1)

4:
5: U-point

View of TEL Jack (CO)

To Terminal Board or Modular
Jacks from the Central Office

If a KX-TD284 is to be installed:

a) Prepare the required plugs. (RJ45: plugs are not included in KX-TD284.)

Wiring for external ISDN S0 line

Pin No.
3 ←RA
4 ←TA
5 ←TB
6 ←RB
← From Network
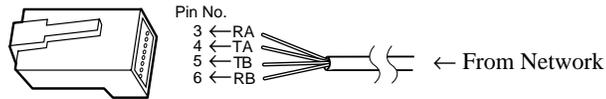
* Pin 1, 2, 7 and 8 are not connected.

Wiring for internal ISDN S0 line

Pin No.
3 ←RA
4 ←TA
5 ←TB
6 ←RB
← From Terminal
Equipment
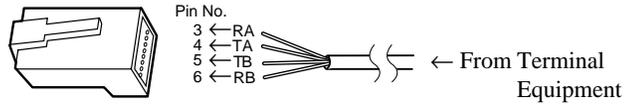
* Pin 1, 2, 7 and 8 are not connected.

b) Insert the plug into a jack on the unit.
Connect a grounding wire to the ground terminal on the KX-TD284.

— Jack 4 (ISDN port 6)
— Jack 3 (ISDN port 5)
— Jack 2 (ISDN port 4)
— Jack 1 (ISDN port 3)

3: TA
4: RA
5: RB
6: TB

View of TEL Jack

To Terminal Board or
Modular Jacks from NT-1
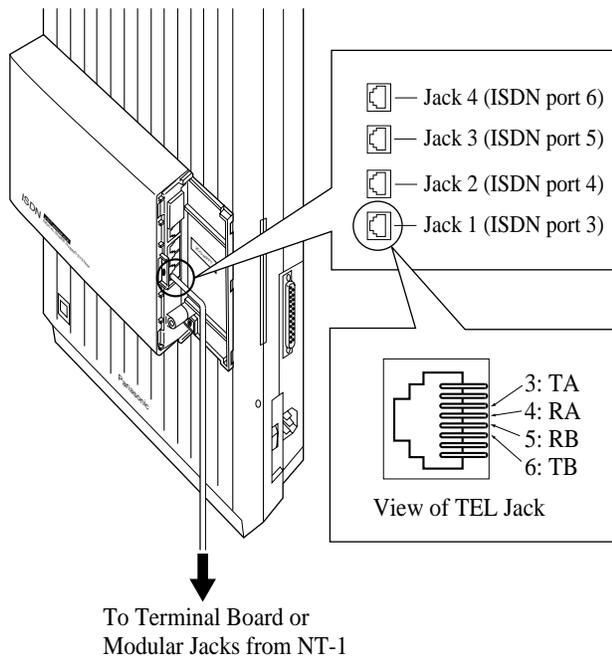
If a KX-TD290 is to be installed (KX-TD1232 only):

Insert the plug into a jack on the unit.
Connect a grounding wire to the ground terminal on the KX-TD290.

Jack

1:RA
2:RB (Receive)
4:TB
5:TA (Transmit)

View of TEL Jack (Outside Line)
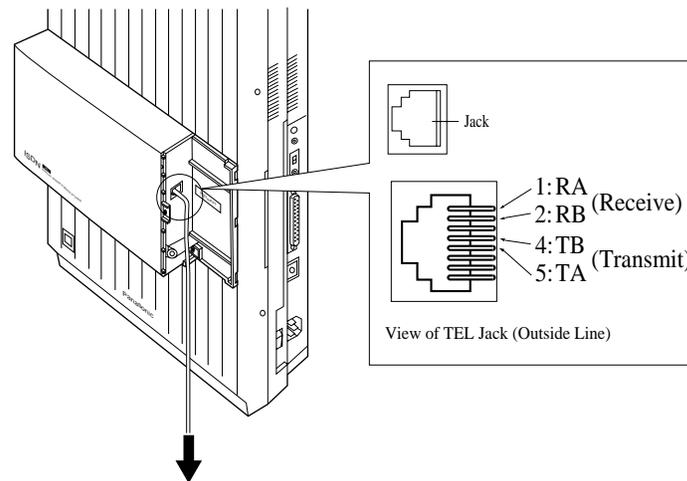
To Terminal Board or Modular
Jacks from the Central Office

7. Tie all of the cords into a bundle. If other cords are exposed in the upper cabinets, tie them also.

8. Close the cabinet cover and secure the outside screw.

9. Cover the cords with the cord holder (included).

Cord holder

10. Fix the cords to the wall as shown so that the front cover can be opened.

<u>**Note**</u>

If two or three expansion units are installed, cut the cabinet covers on the lower cabinets to allow the cords from the upper cabinet to go down through the cabinet covers. To protect the cords, smooth the cut edges.

Cut here
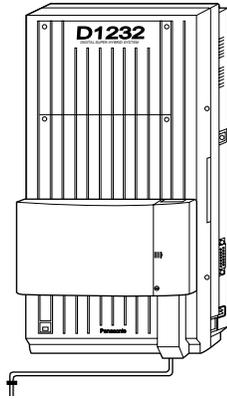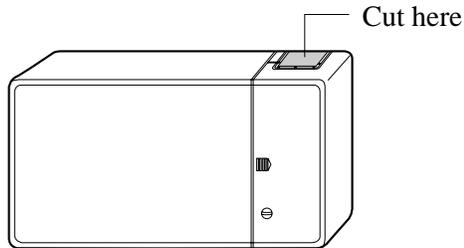
Programming Guide References

[109] Expansion Unit Type

Section 4

T1 Installation

4.1 T1 Line Outline

4.1.1 Overview

To use the T1 Line, the following unit is required.

T1 Line Unit (KX-TD187)
The unit adds 24 channels (outside line number 25 through 48 for KX-TD1232). If this unit is installed, other optional cards which extend outside lines cannot. This unit can be installed to any of the expansion unit areas provided on the front of the main unit.

Note
- KX-TD187 must be installed behind an FCC registered and UL or CSA-NRTL listed CSU.
- If you use the KX-TD170 with the KX-TD187, you must use the KX-TD170 which has suffix 'C' or later.
  The former KX-TD170 does not work properly with KX-TD187.
  Please see the back of the unit and check suffix.

How to distinguish suffix

Serial No. LABEL

× × × × C × × × × × ×

Suffix   UNIT No.
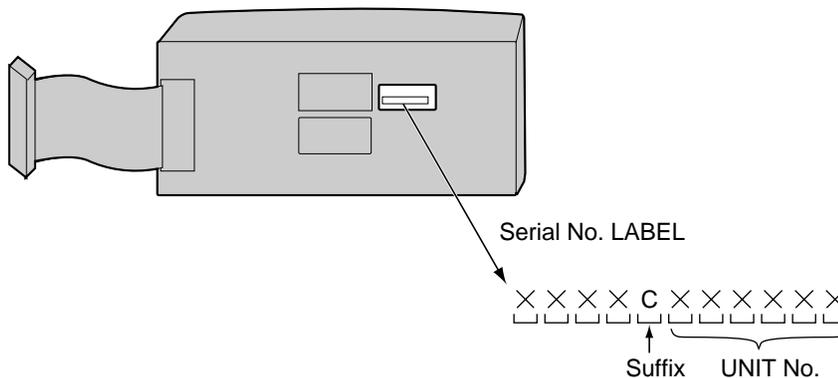
The compatibility between KX-TD187 and KX-TD170

	Master System	Slave System
With KX-TD187	Suffix 'C' or later	Don't care. [*1]
Without KX-TD187	Don't care.	Don't care. [*1]

[*1] KX-TD187 can not be installed in slave system.

- System Programming is required for card location identification.

Installation Manual

- The T1 Unit (KX-TD187) can be installed to the only master system of the KX-TD1232.
- In the case of system connection, the basic or extended outside lines in the slave system cannot be used.
- The capacity of outside lines is the follows.

KX-TD1232 only	8
KX-TD187+KX-TD1232	32
KX-TD187+KX-TD1232×2 (System connection)	32

Programming Guide References

[109] Expansion Unit Type

Features Guide References

Module Expansion

4.2 T1 Line Installation

4.2.1 Location of the Unit

KX-TD1232

One T1 Line Unit (KX-TD187) can be installed to any expansion area on the master system of KX-TD1232.
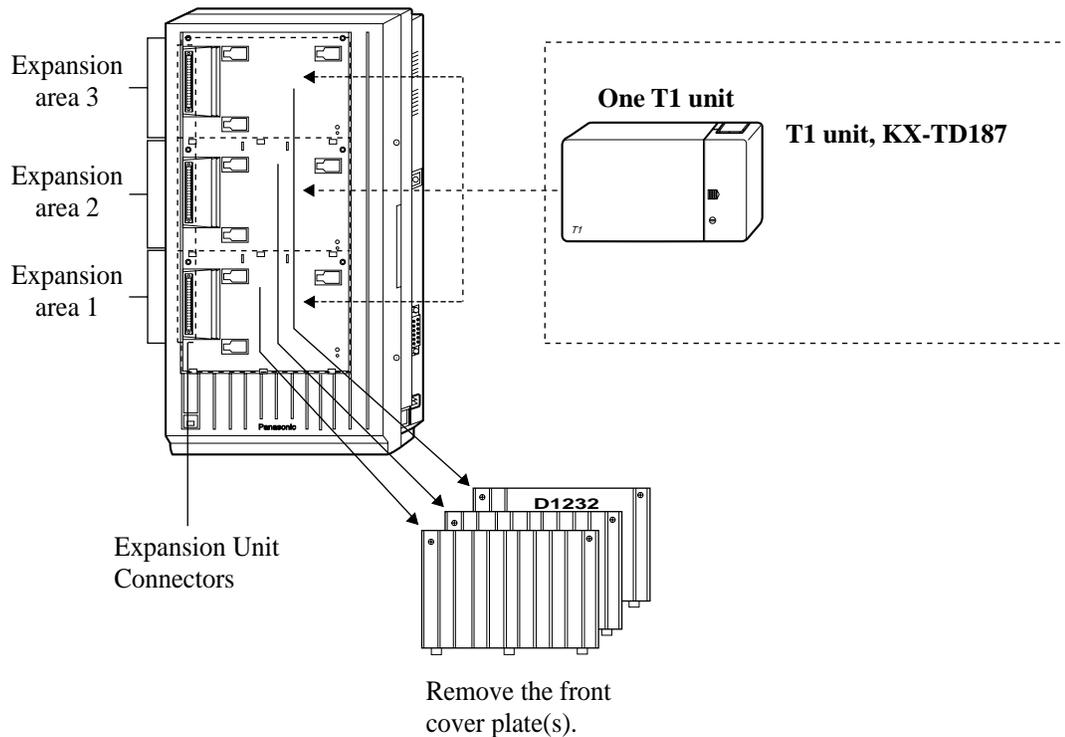
Expansion area 3

Expansion area 2

Expansion area 1

Expansion Unit Connectors

One T1 unit

T1 unit, KX-TD187

D1232

Remove the front cover plate(s).

Note

- System Programming is required for expansion unit location.
  <SYS PRG [109]>
  Default : Area 1 = 4-CO Line Unit
  　　　　　 Area 2 and 3 = 8-Station Line Unit
- As Section 1.4.2　Expansion Unit Combination.

4.2.2 Installing the Unit

Installing one unit to the system allows 24 channels to be connect to outside lines (outside line number 25 through 48) for the master system of KX-TD1232.

1. Loosen two screws on the cover plate. Insert fingers into the slits to remove the cover plate.

Slit

Slit

Note

Any of the cover plates can be removed, as needed.

2. Connect the cabinet cord to the connector in the main unit firmly.

3. Hook the cabinet to the main unit and slide the cabinet to the left until it is secured.

4. Loosen the outside screw and slide the cover to the right.

Outside screw

5. Secure the inside screw (included) to fix the cabinet to the main unit.

Inside screw

<u>Note</u>

Be sure to fix the inside screw to the main unit, or the unit may not work properly.

6. Insert the 8-pin modular plug into a jack on the unit.

Jack

1: R1
2: T1 (Receive)
4: R
5: T (Transmit)

View of TEL Jack (Outside Line)

CSU   CSU (Channel Service Unit)

7. Tie all of the cords into a bundle. If other cords are exposed in the upper cabinets, tie them also.

8. Close the cabinet cover and secure the outside screw.

9. Cover the cords with the cord holder (included).

D1232

— Cord holder

10. Fix the cords to the wall as shown so that the front cover can be opened.

<u>**Note**</u>

If two or three expansion units are installed, cut the cabinet covers on the lower cabinets to allow the cords from the upper cabinet to go down through the cabinet covers. To protect the cords, smooth the cut edges.

Cut here

Programming References

[109] Expansion Unit Type

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.
Incorrect 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 Dialing or One-Touch Dialing does not function.	Bad programming.	Enter the outside line access number (9, 81 through 88) into programming.

5.1.2 Connection

Connection between the system and a proprietary telephone:

Can you dial an extension? — No / Yes
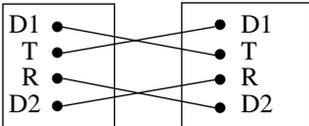
CAUSE	SOLUTION
The T / R is connected to the D1 / D2. D1 — D1 T — T R — R D2 — D2 KX-TD816 / KX-TD1232 extension	Use the correct cord (inner 2 wires are for T / R and the outer 2 wires are for D1 / D2).
*The P1 / P2 is connected to the D1 / D2. P1 — P1 D1 — D1 T — T R — R D2 — D2 P2 — P2 KX-TD1232 extension	Use the correct cord (2 second wires from the outside are for D1 / D2 and the 2 outer wires are for P1 / P2).
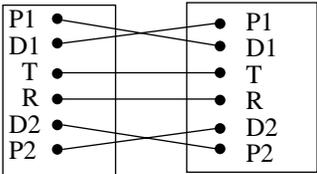
Connection between the system and a single line telephone:

CAUSE	SOLUTION
The T / R is connected to the D1 / D2. D1 T — T R — R D2 KX-TD816 / KX-TD1232 extension	Use the correct cord (inner 2 wires are for T / R). • If a telephone equipped with an A-A1 relay is connected to the system, set the A-A1 relay switch of the telephone to "OFF".

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

CAUSE	SOLUTION
The "T" is connected to the "R". D1 T — T R — R D2 KX-TD816 / KX-TD1232 extension	Reverse the connections of the T / R.
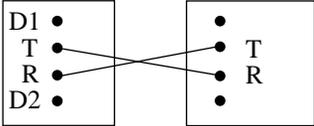
(Continued on the following.)

*: Available for the KX-TD1232 only.

Connection between the central office and the system:

Connection between the central office and the system:

(Continued from the previous.)

↓

Can you dial out on an outside line? →No→
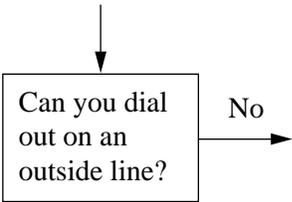
CAUSE	SOLUTION
Outside lines are connected to the T2 / T1. Outside line KX-TD816 / KX-TD1232 • T2 • R1 • T1 • R2 Outside lines are connected to the T2 / R1. Outside line KX-TD816 / KX-TD1232 • T2 • R1 • T1 • R2	Reconnect the outside lines to the T1 / R1 or T2 / R2 of the telephone jack using 2-conductor wiring.
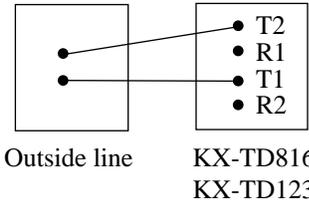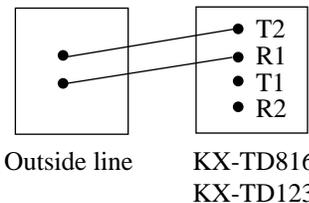
5.1.3 Operation

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 digital proprietary telephone, 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 connected to jack numbers 1, 2, 9, 10 for KX-TD816, and 1, 2, 9, 10, 17, 18 for KX-TD1232 do not operate.	• A digital or analog proprietary telephone (DPT / APT) is connected to the jack. • The dialing 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.
During system connection operation for KX-TD1232, originating an intercom / outside call from one system to the other system is not possible.	Interface between the systems is disconnected.	Connect the interface between the systems and press the Reset Button on both systems.
Originating an outside call, Call Transfer, or Conference cannot be performed.	The corresponding CO button does not exist on the proprietary telephone.	Program the CO button. See Section [005] Flexible CO Button Assignment.

5.1.4   Using the Reset Button

If the system does not operate properly, use the Reset Button.
(If Master and Slave Systems are in operation by System Connection for KX-TD1232, reset both systems.)
Before using the Reset Button, try the system feature again to confirm whether there definitely is a problem or not.

1. When the System Clear Switch is set to "NORMAL", pressing the Reset Button causes the following:

   a) Camp-on is cleared.

   b) Calls on Hold are terminated.

   c) Calls on Exclusive Hold are terminated.

   d) Calls in progress are terminated.

   e) Call Park is cleared.

   All other data stored in memory is not cleared.

2. When the System Clear Switch is set to the "CLEAR" position, you must press the Reset Button with caution. All data stored in memory will be cleared by the following operation: pressing the Reset Button and setting the System Clear Switch to the "NORMAL" position while the Power Indicator is flashing.

Operation

1. If the system does not operate properly,

   a) Make sure that the System Clear Switch is set to the "NORMAL" position.

   b) Press the Reset Button with a pointed tool.

2. If the system still does not operate properly,

   a) Set the System Clear Switch to the "CLEAR" position.

   b) Press the Reset Button with a pointed tool.

   c) Return the System Clear Switch to the "NORMAL" position while the Power Indicator is flashing (approximately within 10 seconds).

3. If the system still does not work, switch the power off and on again after five minutes.

4. If the system still does not work,

   a) Switch the power off.

   b) Set the System Clear Switch to the "CLEAR" position.

   c) Switch the power on.

   d) Press the Reset Button with a pointed tool.

   e) Set the System Clear Switch to the "NORMAL" position while the Power Indicator is flashing (approximately within 10 seconds).

5. If the system still does not work, switch the power off. Then consult an authorized service person.

When the power supply stops, certain extensions are automatically connected straight to specific analog outside lines:

KX-TD816

Extension (T, R) of jack number 1: Outside line 1

Extension (T, R) of jack number 2: Outside line 2

Extension (T, R) of jack number 9: Outside line 5

Extension (T, R) of jack number 10: Outside line 6

KX-TD1232

Extension (T, R) of jack number 1: Outside line 1

Extension (T, R) of jack number 2: Outside line 2

Extension (T, R) of jack number 9: Outside line 3

Extension (T, R) of jack number 10: Outside line 4

Extension (T, R) of jack number 17: Outside line 9

Extension (T, R) of jack number 18: Outside line 10

Connect single line telephones to the above extension jacks.

Section 6

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