

# Panasonic®



## Advanced Hybrid System Installation Manual

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Model No. **KX-TA824**



Thank you for purchasing a Panasonic Advanced Hybrid System.  
Please read this manual carefully before using this product and save this manual for future use.

# System Components

System Components Table

	Model	Description
<b>Main Unit</b>	KX-TA824	Advanced Hybrid System: 3 to 8 Outside (CO) Lines, 8 to 24 Extensions
<b>Optional Service Cards</b>	KX-TA82461	4-Port Doorphone Card
	KX-TA82470	8-Port Hybrid Extension Card
	KX-TA82481	2-Port Analog CO Line and 8-Port Hybrid Extension Card
	KX-TA82483	3-Port Analog CO Line and 8-Port Hybrid Extension Card
	KX-TA82491	Message Expansion Card for DISA OGMs
	KX-TA82492	2-Channel Voice Message Card
	KX-TA82493	3-Port Caller ID Card
<b>Proprietary Equipment</b>	KX-T30865	Doorphone

Expandability of Outside (CO) Lines and Extensions

	KX-TA82483 Outside (CO) Line: 3 Extension: 8	KX-TA82481 Outside (CO) Line: 2 Extension: 8	KX-TA82470 Outside (CO) Line: 0 Extension: 8	Expanded System
<b>KX-TA824 Outside (CO) Line: 3 Extension: 8</b>	–	–	0	<b>3</b>
	–	–	8	<b>16</b>
	–	2	–	<b>5</b>
	–	8	–	<b>16</b>
	3	–	–	<b>6</b>
	8	–	–	<b>16</b>
	3	–	0	<b>6</b>
	8	–	8	<b>24</b>
	3	2	–	<b>8</b>
	8	8	–	<b>24</b>

## Abbreviations in this manual

- Proprietary Telephone: PT
- Single Line Telephone: SLT
- Direct Station Selection: DSS

## Compatible Proprietary Telephones

- KX-T7700, KX-T7300, and KX-T7000 series PTs
- KX-T7740, KX-T7340, and KX-T7040 DSS Consoles

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- Wireless PTs such as KX-T7885 and KX-TD7895

For the equipment that can be connected to the PBX, refer to "1.2.2 System Connection Diagram".

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# 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:

1. Read and understand all instructions.
2. Follow all warnings and instructions marked on the product.
3. Unplug the product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Clean with a damp cloth.
4. 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.
5. Do not place the product on an unstable surface, as a fall may cause serious internal damage.
6. Slots and openings in the front, back and bottom of the cabinet 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 a bed, sofa, rug, or other similar surface while in use. The product should never be placed near or over a radiator or other heat source. This product should not be placed in a sealed environment unless proper ventilation is provided.
7. The product should only be connected to the type of electrical power supply specified on the product label. If you are not sure of the type of power supply to your home, consult your dealer or local power company.
8. For safety purposes this unit is equipped with a grounded plug. If you do not have a grounded outlet, please have one installed. Do not bypass this safety feature by tampering with the plug.
9. Do not allow anything to rest on the power cord. Do not locate this product where the power cord may be stepped on or tripped on.
10. To reduce the risk of fire or electric shock, do not overload wall outlets and extension cords.
11. Do not insert objects of any kind into this product through its slots and openings, 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 or in the product.
12. To reduce the risk of electric shock, do not disassemble this product. Only qualified personnel should service this product. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock.
13. Unplug this product from the wall outlet and have it serviced by qualified service personnel in the following cases:
  - a) When the power supply cord or plug is damaged or frayed.
  - b) If liquid has been spilled into the product.
  - c) If the product has been exposed to rain or water.
  - d) If the product does not operate according to the operating instructions. Adjust only the controls that are explained in the operating instructions. Improper adjustment of other controls may result in damage and may require service by a qualified technician to restore the product to normal operation.
  - e) If the product has been dropped or the cabinet has been damaged.
  - f) If product performance deteriorates.
14. Avoid using wired telephones during an electrical storm. There is a remote risk of electric shock from lightning.
15. Do not use a telephone in the vicinity of a gas leak to report the leak.

**SAVE THESE INSTRUCTIONS**

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# Precautions

- Keep the unit away from heating appliances and devices that generate electrical noise such as fluorescent lamps, motors and televisions. These noise sources can interfere with the performance of the PBX.
- 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.
- If you are having problems making calls to outside destinations, follow this procedure to test the outside (CO) lines:
  1. Disconnect the PBX from all outside (CO) lines.
  2. Connect known working single line telephones (SLTs) to those outside (CO) lines.
  3. Make a call to an external destination using those SLTs.If a call cannot be carried out correctly, there may be a problem with the outside (CO) line that the SLT is connected to. Contact your telephone company.  
If all SLTs operate properly, there may be a problem with your PBX. Do not reconnect the PBX to the outside (CO) lines until it has been serviced by an authorized Panasonic Factory Servicenter.
- Wipe the unit with a soft cloth. Do not clean the unit with abrasive powders or with chemical agents such as benzene or thinner.

## **WARNING**

- **THIS UNIT MAY ONLY BE INSTALLED AND SERVICED BY QUALIFIED SERVICE PERSONNEL.**
- **IF DAMAGE TO THE UNIT EXPOSES ANY INTERNAL PARTS, DISCONNECT THE POWER SUPPLY CORD IMMEDIATELY AND RETURN THE UNIT TO YOUR DEALER.**
- **UNPLUG THIS UNIT FROM THE AC OUTLET IF IT EMITS SMOKE, AN ABNORMAL SMELL OR MAKES UNUSUAL NOISE. THESE CONDITIONS CAN CAUSE FIRE OR ELECTRIC SHOCK. CONFIRM THAT SMOKE HAS STOPPED AND CONTACT AN AUTHORIZED PANASONIC FACTORY SERVICENTER.**
- **WHEN RELOCATING THE EQUIPMENT, FIRST DISCONNECT THE TELECOM CONNECTION BEFORE DISCONNECTING THE POWER CONNECTION. WHEN THE UNIT IS INSTALLED IN THE NEW LOCATION, RECONNECT THE POWER FIRST, AND THEN RECONNECT THE TELECOM CONNECTION.**
- **TO PREVENT POSSIBLE FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.**
- **THE POWER SUPPLY CORD IS USED AS THE MAIN DISCONNECT DEVICE. ENSURE THAT THE AC OUTLET IS LOCATED NEAR THE EQUIPMENT AND IS EASILY ACCESSIBLE.**

### **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.

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**Product Service**

Panasonic Factory Servicers for this product are listed in the servicer directory. Consult your certified Panasonic dealer for detailed instructions.

**For Future Reference**

Please print, record, and retain the following information for future reference.

**Note**

The serial number of this product can be found on the label affixed to the unit. You should record the model number and the serial number of this unit as a permanent record of your purchase to aid in identification in the event of theft.

MODEL NO.	_____
SERIAL NO.	_____
DATE OF PURCHASE	_____
NAME OF DEALER	_____
DEALER'S ADDRESS	_____ _____ _____ _____
DEALER'S TEL. NO.	_____

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# Introduction

## About the Installation Manual

This Installation Manual is designed to serve as an overall technical reference for Panasonic Advanced Hybrid System, KX-TA824. It explains how to install the hardware and program this PBX using KX-TA Maintenance Console.

The Installation Manual is divided into the following sections:

### Section 1 System Outline

Provides general information on the PBX, including the system capacity and specifications.

### Section 2 Installation

Provides detailed instructions for installing the PBX, optional service cards, and peripheral equipment.

### Section 3 Guide for KX-TA Maintenance Console

Explains how to install and use KX-TA Maintenance Console, a PC-based programming utility.

### Section 4 Troubleshooting

Provides information on troubleshooting and restarting the PBX.

## About the Other Manuals

The following manuals are also available:

### Feature Manual

The Feature Manual explains what the PBX can do, as well as how to obtain the most of its many features and facilities.

### Programming Manual

The Programming Manual explains how to program the PBX using Panasonic proprietary telephones (PTs) or the KX-TA Maintenance Console.

### Operating Manual

The Operating Manual describes how users can access commonly used PBX features and functions with their PTs, single line telephones (SLTs), and Direct Station Selection (DSS) Consoles.

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# **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 side of this equipment is a label that contains, among other information, a product identifier in the format US: ACJMF04BKX-TA824. 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-TA824
- Certification No.: found on the side of the unit
- Ringer Equivalence No.: 0.4B
- Facility Interface Code: 02LS2
- Service Order Code: 9.0F
- Required Network Interface Jack: RJ11

## **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: ACJMF04BKX-TA824. The digits represented by 04 are the REN without a decimal point (e.g., 04 is a REN of 0.4). 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.



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## 7. Combined Use with Alarm Equipment

If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this equipment does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

### **Note**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### **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 TRS feature 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.**

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# Table of Contents

<b>1</b>	<b>System Outline</b>	<b>13</b>
1.1	<b>System Highlights</b>	<b>14</b>
1.1.1	System Highlights	14
1.2	<b>Basic System Construction</b>	<b>15</b>
1.2.1	Main Unit	15
1.2.2	System Connection Diagram	16
1.3	<b>Specifications</b>	<b>17</b>
1.3.1	General Description	17
1.3.2	Characteristics	18
1.3.3	System Capacity	19
<b>2</b>	<b>Installation</b>	<b>21</b>
2.1	<b>Before Installing</b>	<b>22</b>
2.1.1	Before Installing	22
2.2	<b>Installing the Advanced Hybrid System</b>	<b>24</b>
2.2.1	Unpacking	24
2.2.2	Names and Locations	25
2.2.3	Opening/Closing Covers	26
2.2.4	Securing Cords	28
2.2.5	Connecting Frame Ground	30
2.2.6	Wall Mounting	31
2.2.7	Installing Surge Protector	34
2.3	<b>Installing Optional Service Cards</b>	<b>37</b>
2.3.1	Location of Optional Service Cards	37
2.3.2	3-Port Analog CO Line and 8-Port Hybrid Extension Card (KX-TA82483)	38
2.3.3	2-Port Analog CO Line and 8-Port Hybrid Extension Card (KX-TA82481)	40
2.3.4	8-Port Hybrid Extension Card (KX-TA82470)	43
2.3.5	3-Port Caller ID Card (KX-TA82493)	45
2.3.6	4-Port Doorphone Card (KX-TA82461)	47
2.3.7	Message Expansion Card for DISA OGMs (KX-TA82491)	48
2.3.8	2-Channel Voice Message Card (KX-TA82492)	50
2.4	<b>Connecting Outside (CO) Lines</b>	<b>52</b>
2.4.1	Connecting Outside (CO) Lines	52
2.5	<b>Connecting Extensions</b>	<b>53</b>
2.5.1	Connecting Extensions	53
2.5.2	Connecting Extensions in Parallel	55
2.6	<b>Connecting Doorphones and Door Openers</b>	<b>56</b>
2.6.1	Connecting Doorphones and Door Openers	56
2.7	<b>Connecting Doorbell or Door Chime</b>	<b>60</b>
2.7.1	Connecting Doorbell or Door Chime	60
2.8	<b>Connecting Peripherals</b>	<b>61</b>
2.8.1	Connecting Peripherals	61
2.9	<b>Power Failure Connections</b>	<b>66</b>
2.9.1	Power Failure Connections	66
2.10	<b>Starting the Advanced Hybrid System</b>	<b>67</b>
2.10.1	Starting the Advanced Hybrid System	67
<b>3</b>	<b>Guide for KX-TA Maintenance Console</b>	<b>69</b>

---

<b>3.1</b>	<b>Installing KX-TA Maintenance Console .....</b>	<b>70</b>
3.1.1	Installing KX-TA Maintenance Console on a PC.....	70
<b>3.2</b>	<b>Connection .....</b>	<b>72</b>
3.2.1	Connection.....	72
3.2.2	Starting KX-TA Maintenance Console for the first time.....	75
3.2.3	Accessing PBX via Internal Modem.....	76
<b>4</b>	<b>Troubleshooting.....</b>	<b>79</b>
<b>4.1</b>	<b>Troubleshooting.....</b>	<b>80</b>
4.1.1	Installation.....	80
4.1.2	Connection.....	81
4.1.3	Operation .....	82
4.1.4	System Restart .....	83
4.1.5	System Reset with System Data Clear .....	84
<b>Index</b> .....		<b>85</b>



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# **Section 1**

## **System Outline**

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

# 1.1 System Highlights

## 1.1.1 System Highlights

### **Built-in Voice Message (BV) (Optional voice message card required)**

Built-in Voice Message (BV) allows a caller to leave a voice message in a user's personal message area or the PBX's common message area.

### **Caller ID Display on SLT**

The PBX can receive Caller ID information (telephone numbers and callers' names) from calls received on outside (CO) lines. This information can be shown on the displays of SLTs that support Caller ID as well as proprietary telephones (PTs) when receiving calls.

### **3-level Automated Attendant (AA)**

3-level Automated Attendant (AA) service allows a caller to dial a single-digit number (Direct Inward System Access [DISA] AA number) following the guidance of 3-level DISA outgoing messages (OGMs), and be connected to the desired party automatically.

### **PC Programming**

System programming settings can be accessed using a PC and the Panasonic KX-TA Maintenance Console software as well as by using a PT.

The PBX software can be upgraded via the Serial Interface (RS-232C port) or USB port, using the KX-TA Maintenance Console software.

### **Quick Setup**

Basic PBX parameters such as Automatic Configuration for Outside (CO) Line Type, Country Setting can be programmed the first time the PBX is accessed with a PC using the KX-TA Maintenance Console software.

### **Call Waiting Caller ID**

Call Waiting Caller ID allows the user to see the name or telephone number of a second caller during a conversation.

### **Local Carrier-based Voice Mail Service**

Local carrier-based voice mail service allows the user to receive remote voice mail service from the telephone company to record caller messages when calls cannot be answered.

### **Wireless Proprietary Telephones (PTs)**

Wireless PTs such as the KX-T7885 and the KX-TD7895 give a user the freedom to move around and still have the powerful features of Panasonic PTs. Some examples of the advantages of wireless PTs over wireless SLTs are:

- a) Caller ID
- b) Seizure of outside (CO) lines by a one-touch operation
- c) Carrier-based voice mail service

Refer to the Operating Instructions of the wireless PT for additional information.

### **Advanced Hybrid System**

This PBX supports the connection of PTs, wireless PTs, Direct Station Selection (DSS) Consoles, and single line devices such as SLTs, fax machines, wireless SLTs, and data terminals.

## 1.2 Basic System Construction

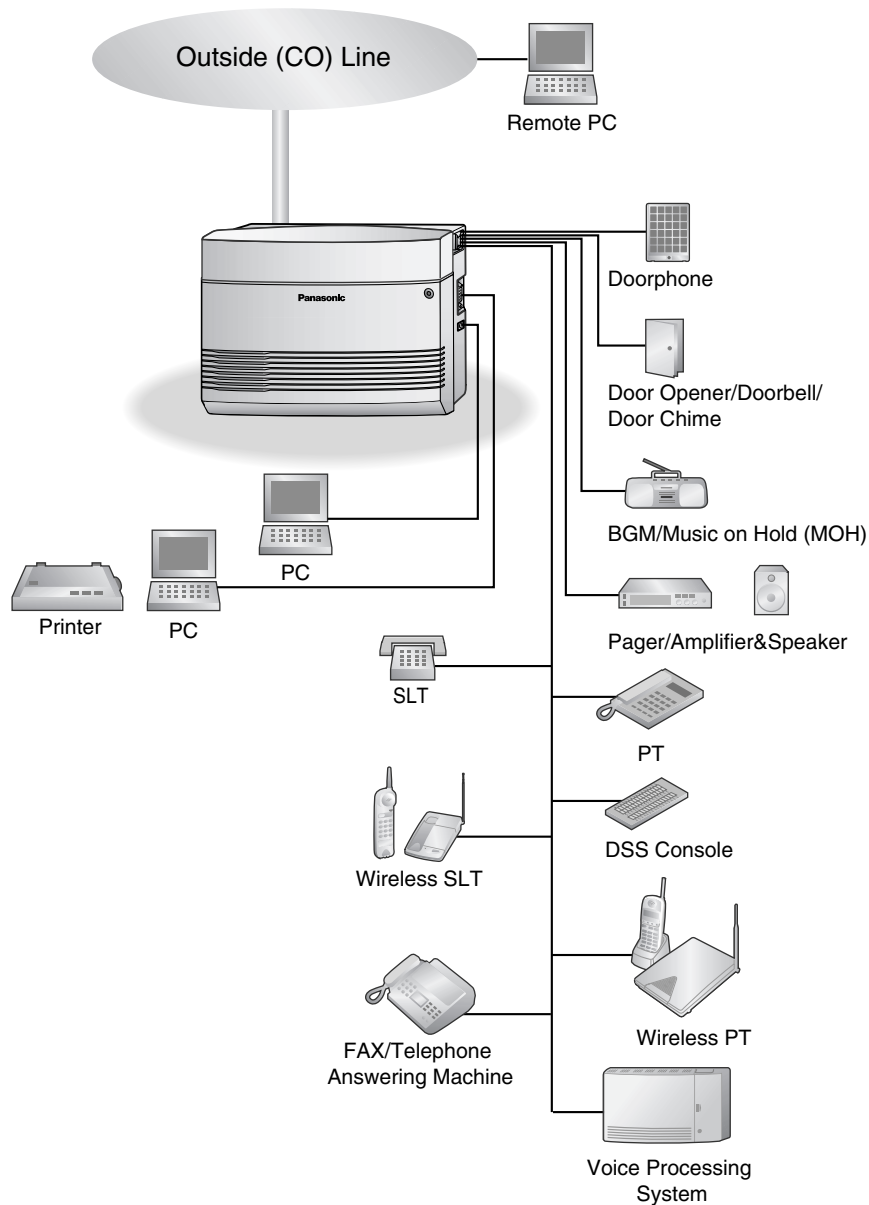
### 1.2.1 Main Unit

The KX-TA824 has a basic capacity of 3 outside (CO) lines and 8 extensions. It is capable of supporting Panasonic proprietary telephones (PTs), and single line devices such as single line telephones (SLTs), fax machines and data terminals.

One Caller ID card is installed by default to support the Caller ID feature for 3 outside (CO) lines. To expand its capabilities, the PBX can be equipped with optional components or user-supplied peripherals, such as door openers, external speakers, and an external audio source such as a radio or CD player.



## 1.2.2 System Connection Diagram



- Connect a display-equipped proprietary telephone (PT) to extension jack 01, as this extension is automatically designated as the manager extension.
- PTs and single line telephones (SLTs) can be connected in parallel. (→2.5.2 Connecting Extensions in Parallel)



## 1.3 Specifications

### 1.3.1 General Description

<b>Control Bus</b>		Original bus (16-bit, 24 MHz)	
<b>Switching</b>		Space Division CMOS Crosspoint Switch	
<b>Power Input</b>		100 V AC to 240 V AC, 1.5A to 0.75A, 50 Hz/60 Hz	
<b>Maximum Power Failure Tolerance</b>		300 ms	
<b>Memory Backup Duration</b>		7 years	
<b>Dialing</b>	<b>Outside (CO) Line</b>	Pulse (10 pps, 20 pps) or Tone (DTMF)	
	<b>Extension</b>	Pulse (10 pps, 20 pps) or Tone (DTMF)	
<b>Intercom Path</b>		4	
<b>Mode Conversion</b>		Pulse-DTMF	
<b>Ring Frequency</b>		20 Hz/25 Hz (selectable)	
<b>Operating Environment</b>	<b>Temperature</b>	0 °C to 40 °C (32 °F to 104 °F)	
	<b>Humidity</b>	10 % to 90 % (non-condensing)	
<b>Conference Call Outside (CO) Line</b>		2	
<b>Music on Hold (MOH)</b>		1 port Selectable MOH: Internal/External/Tone	
<b>Paging</b>	<b>Internal</b>	1	
	<b>External</b>	1 port	
<b>Serial Interface Port</b>	<b>RS-232C</b>	1	
	<b>USB 1.1</b>	1	
<b>Extension Connection Cable</b>		SLT	1-pair wire (T, R)
		PT	2-pair wire (T, R, H, L)
		DSS Console	1-pair wire (H, L)
<b>Dimensions</b>		368 mm (W) × 284 mm (H) × 102 mm (D) (14-1/2 in × 11-3/16 in × 4 in)	
<b>Weight (when fully expanded)</b>		Approx. 3.5 kg (7.7 lb)	

## 1.3.2 Characteristics

<b>Terminal Equipment Loop Limit</b>	PT	40 $\Omega$
	SLT	600 $\Omega$ including set
	Doorphone	20 $\Omega$
<b>Minimum Leakage Resistance</b>	15 000 $\Omega$ minimum	
<b>Maximum Number of Extension Instruments per Line</b>	1 PT or SLT in standard connection 1 PT and 1 SLT in parallel connection	
<b>Ring Voltage</b>	75 Vrms at 20 Hz/25 Hz depending on the ringing load	
<b>Outside (CO) Line Loop Limit</b>	1600 $\Omega$ maximum	
<b>Hookswitch Flash/Recall Timing Range</b>	24 ms–2032 ms	
<b>Door Opener Current Limit</b>	30 V DC/125 V AC, 3 A maximum	
<b>Paging Terminal Impedance</b>	600 $\Omega$	
<b>MOH Terminal Impedance</b>	10 000 $\Omega$	

## 1.3.3 System Capacity

### System Capacity

		TA824
<b>Basic System</b>	Outside (CO) lines	3
	Extensions	8
<b>Fully Expanded System</b>	Outside (CO) lines	8
	Extensions	24

### Maximum Cards and Terminal Equipment

Item	TA824
PT	24
SLT	24
3-Port Analog CO Line and 8-Port Hybrid Extension Card	1
2-Port Analog CO Line and 8-Port Hybrid Extension Card	1
8-Port Hybrid Extension Card	1
Message Expansion Card for DISA OGMs	1
4-Port Doorphone Card	1
3-Port Caller ID Card	3
2-Channel Voice Message Card	1
Doorphone	4
Door Opener	4
Pager	1
Music on Hold (MOH)	1
DSS Console	2

### System Data

Item	Max. Quantity
Operator	1
System Speed Dialing	100
One-touch Dialing	24 per extension (PT)
Personal Speed Dialing	10 per extension
Call Park Area	10
Absent Message	6
Toll Restriction (TRS) COS	5

### 1.3 Specifications

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Item	Max. Quantity
Extension Group	8
Message Waiting	8 per extension
Message for Built-in Voice Message	125 messages (total 60 minutes)

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## **Section 2**

# **Installation**

*This section describes how to install the PBX. Detailed instructions for installing the main unit and optional service cards, and cabling of peripheral equipment are provided. Information on system expansion and peripheral equipment installation is included.*

## 2.1 Before Installing

### 2.1.1 Before Installing

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

Be sure to comply with all applicable laws, regulations, and guidelines.

#### Safety Installation Instructions

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

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

#### Installation Precautions

This PBX is designed for wall mounting only, and should be installed in a location where it is accessible for inspections and maintenance.

To prevent malfunction, noise, or discoloration, avoid installing the PBX in the following locations:

1. In direct sunlight and hot, cold, or humid places.  
Temperature range: 0 °C to 40 °C (32 °F to 104 °F)
2. Areas where sulfuric gases may be present, such as near thermal springs.
3. Areas where shocks or vibrations are frequent or strong.
4. High-dust areas, or places the PBX may come into contact with water or oil.
5. Near devices that generate high frequencies, such as sewing machines or electric welders.
6. On or near computers, telexes, or other office equipment, as well as microwave ovens or air conditioners. (It is preferable not to install the PBX in the same room as the above equipment.)
7. Within 1.8 m (6 ft) of radios and televisions. (Both the PBX and Panasonic proprietary telephones should be at least 1.8 m (6 ft) away from such devices.)
8. Locations where other objects will obstruct the area around the PBX. Be especially careful to leave at least 20 cm (8 in) of space above and 10 cm (4 in) to the sides of the PBX for ventilation.

#### Wiring Precautions

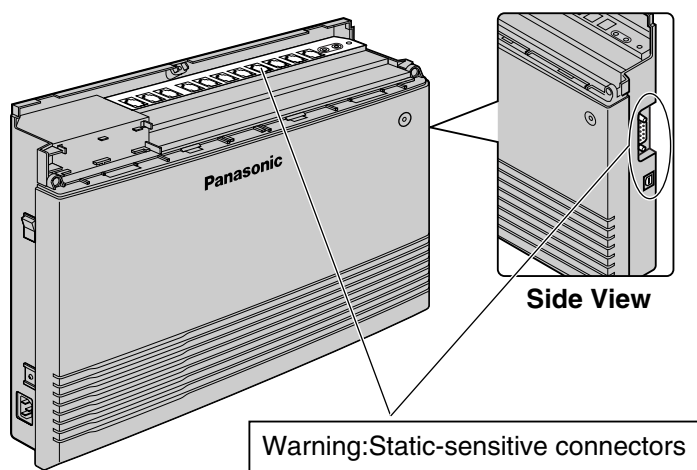
Be sure to follow these instructions when wiring the unit:

1. Do not run unshielded telephone cables near AC power cables, computer cables, AC power sources, etc. When running cables near other noise-generating devices or cables, use shielded telephone cables or shield the telephone cables with metal tubing.
2. If cables are run on the floor, use protectors to prevent the cables from being stepped on. Avoid running cables under carpets.
3. Avoid using the same AC outlet for computers, telexes, and other office equipment, as noise generated by such equipment may hamper system performance or interrupt the system.

4. Use 2-pair telephone cables when connecting Panasonic proprietary telephones (PTs). Use 1-pair telephone cables when connecting single line telephones (SLTs), data terminals, answering machines, computers, voice processing systems, etc.
5. Unplug the PBX from its power source when wiring, and plug the PBX back in only after all wiring is completed.
6. Mis-wiring may cause the PBX to operate improperly. Refer to Section 2, "Installation" when wiring the PBX.
7. If an extension does not operate properly, disconnect the telephone from the extension line and connect it again, or turn off the PBX using the power switch then turn it on again.
8. For safety purposes this unit is equipped with a grounded plug. If you do not have a grounded outlet, please have one installed. Do not bypass this safety feature by tampering with the plug.
9. Use twisted pair cable for outside (CO) line connection.
10. Outside (CO) lines should be installed with surge protectors. For details, refer to "2.4.1 Connecting Outside (CO) Lines", "2.2.7 Installing Surge Protector".
11. 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.

### **WARNING**

**Static-sensitive devices are used in this PBX. To protect printed circuit boards from static electricity, do not touch the connectors indicated below. To discharge static electricity from your body, touch ground or wear a grounding strap.**



## 2.2 Installing the Advanced Hybrid System

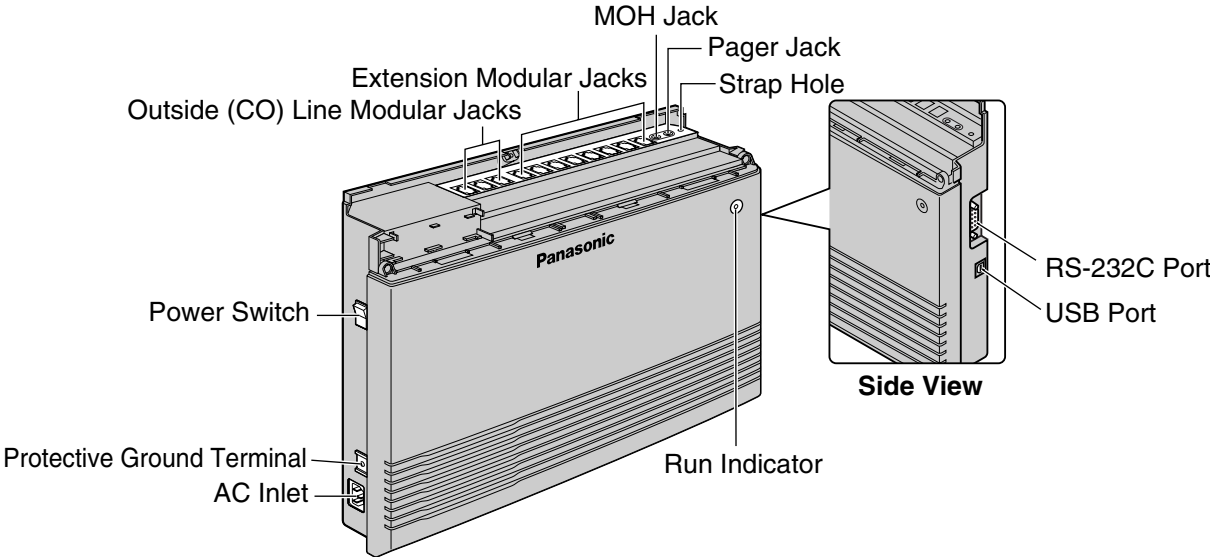
### 2.2.1 Unpacking

The following items are included upon shipment.

Main Unit	1
AC Cord	1
CD-ROM, Manuals	1 set
Screw (Wall Mounting)	3
Washer (Wall Mounting)	3
Pager Connector	1
Audio Source Connector	1
Strap	1
Rivet	1



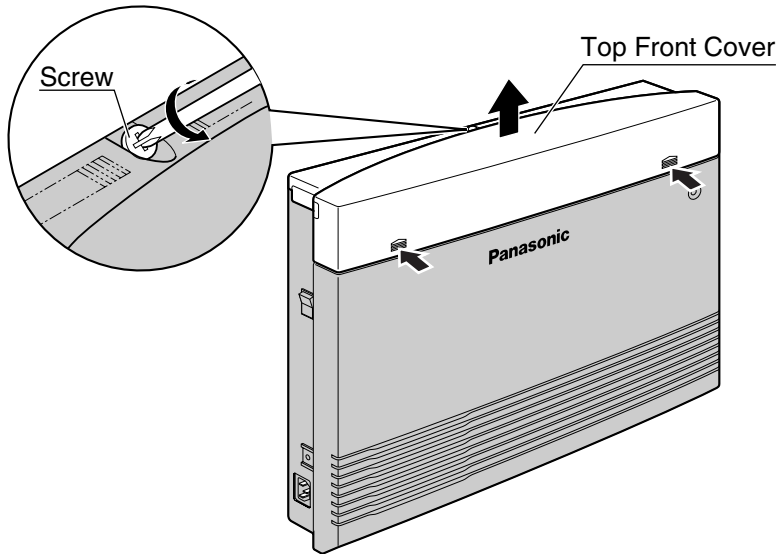
### 2.2.2 Names and Locations



## 2.2.3 Opening/Closing Covers

### Opening Covers

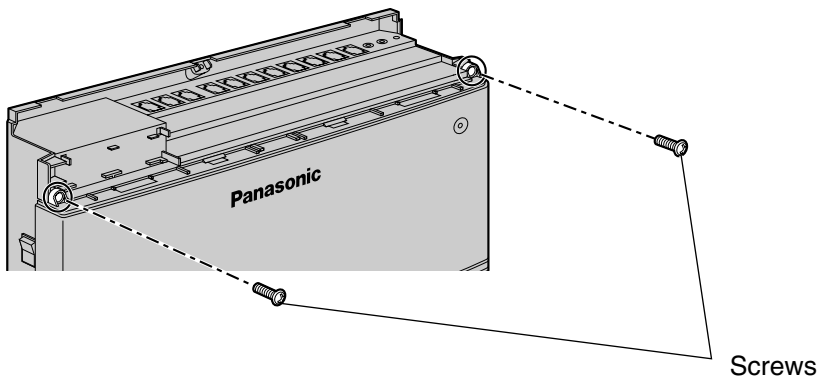
1. Loosen the top cover screw.
2. Remove the top front cover.



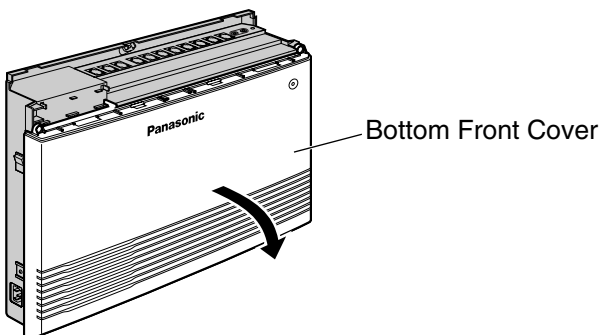
#### **Note**

The screw cannot be removed from the cover.

3. Remove the 2 bottom-cover screws.

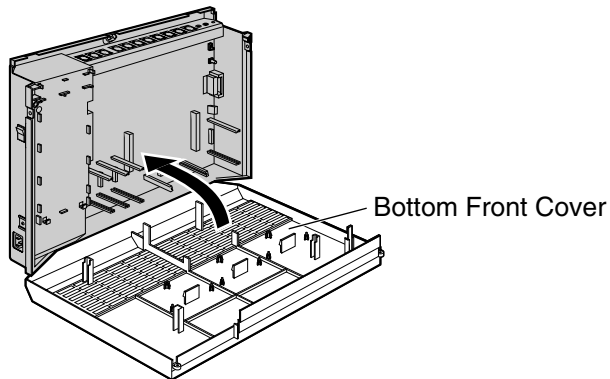


4. Open the bottom front cover.

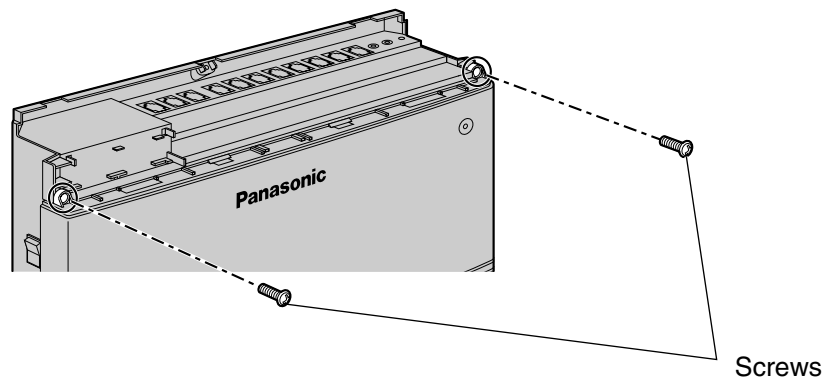


## Closing Covers

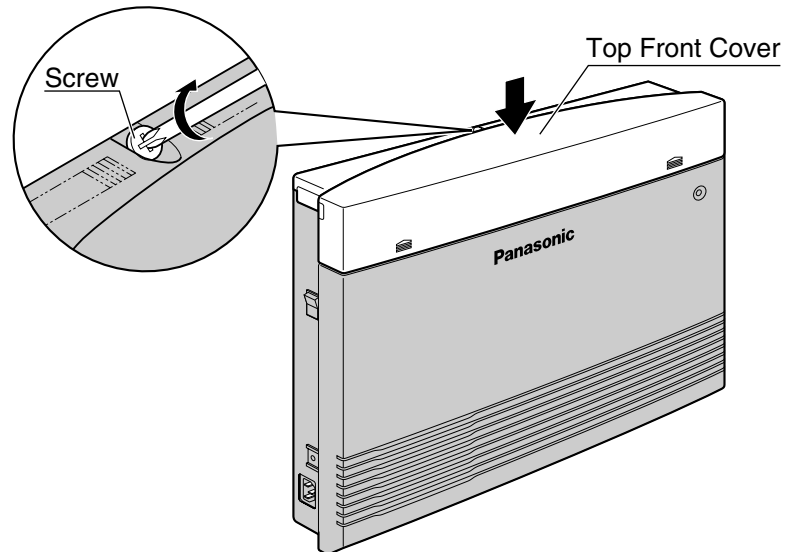
1. Replace the bottom front cover.



2. Attach the 2 bottom-cover screws.



3. Replace the top front cover and tighten the screw.

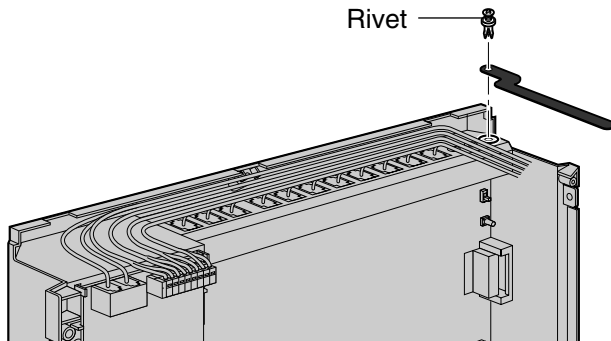


### **Note**

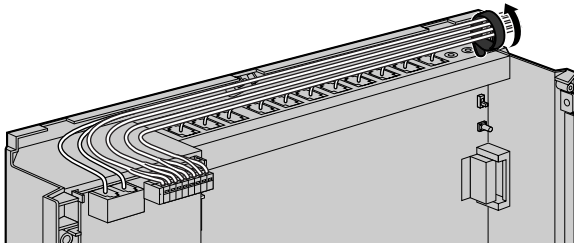
For safety reasons, keep the front covers closed while the PBX is in operation.

## 2.2.4 Securing Cords

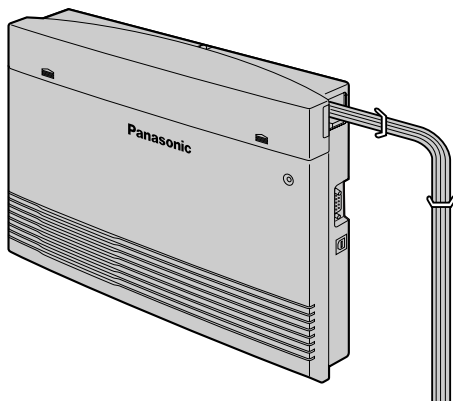
1. Insert the rivet into the hole in the strap.
2. Insert the rivet and strap into the hole on the PBX.



3. Wrap the strap around all of the cords.

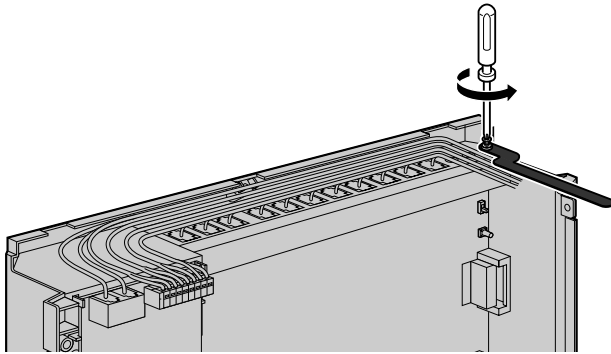


4. Close the covers. (→2.2.3 Opening/Closing Covers)
5. Tie together all of the connected cords and secure them to the wall so that they cannot be pulled out of the PBX.



**Note**

To remove the rivet, use a screwdriver as shown below.

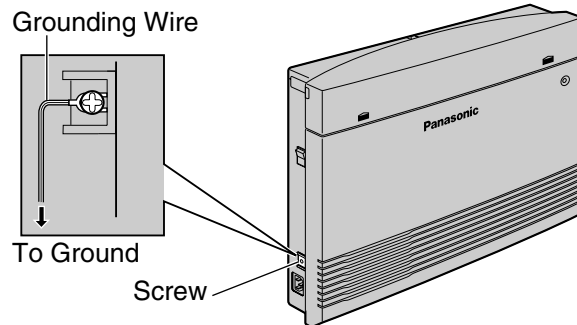


## 2.2.5 Connecting Frame Ground

### **IMPORTANT**

**Connect the frame of the PBX to ground.**

1. Loosen the screw.
2. Insert a grounding wire (user-supplied)\*.
3. Tighten the screw.
4. Connect the grounding wire to ground.



\* Use a grounding wire that has a conductor with a cross-sectional area of at least 0.75 mm<sup>2</sup> or 18 AWG. Green-and-yellow insulation is required.

- Be sure to comply with all applicable laws, regulations, and guidelines.
- Proper grounding is very important to protect the PBX from external noise and to reduce the risk of electrocution in the event of a lightning strike.
- The AC cable's grounding pin may not be enough to protect the PBX from external noise and lightning strikes. A permanent connection must be made between ground and the ground terminal of the main unit.

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 2 main AC voltage points on the wall outlet. The reading obtained should be 108 V AC to 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 volt should be obtained.
4. If a reading of 0 volt at one terminal and a reading of 108 V AC to 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 volt at one terminal and a reading of 108 V AC to 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 volt. A reading of less than 1 ohm should be obtained. If the reading is not obtained, the outlet is not adequately grounded. See qualified electrician.

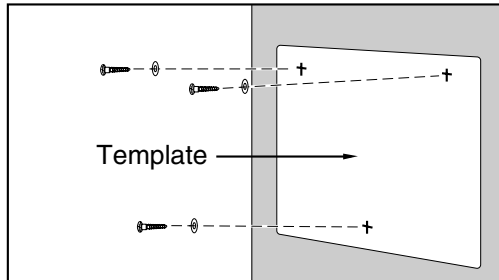
## 2.2.6 Wall Mounting

The PBX is designed for wall mounting only. The wall where the PBX is to be mounted must be able to support the weight of the PBX. When wall mounting the main unit, use either the included screws, or screws of the same size.

### Mounting on a Wooden Wall

The included screws may be used when mounting the main unit on a wooden wall.

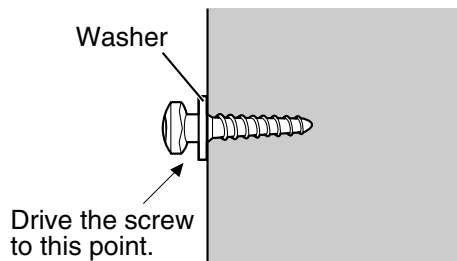
1. Place the template (found on the last page of this manual) on the wall to mark the 3 screw positions.



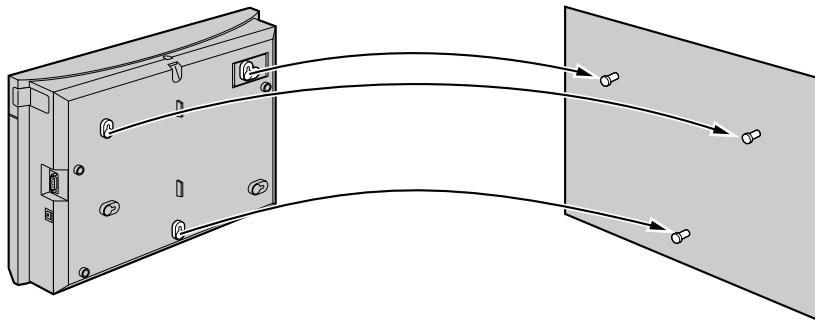
#### Note

When you print out the template, the distance on the paper output may deviate slightly from the indicated measurement. In this case, use the indicated measurement.

2. Fit the washers on the screws, and drive the screws into the wall.



3. Affix the PBX to the screw heads.



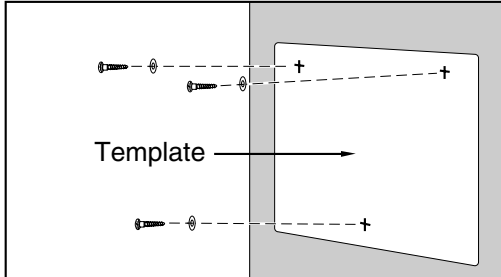
#### Notes

- Do not block the openings of the cabinet. Leave at least 20 cm (8 in) of space above and 10 cm (4 in) to the sides of the PBX for ventilation.
- Make sure that the wall behind the cabinet is flat and free of obstacles, so that the openings on the back of the cabinet will not be blocked.
- Be careful not to drop the cabinet.

## Mounting on a Concrete or Mortar Wall

The included screws may be used when mounting the main unit on a concrete or mortar wall. User-supplied anchor plugs are also necessary.

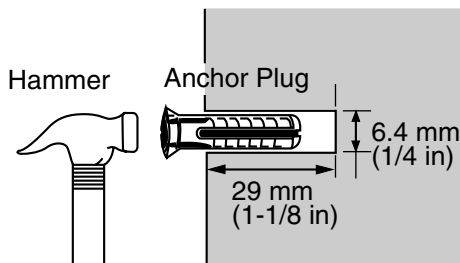
1. Place the template (found on the last page of this manual) on the wall to mark the 3 screw positions.



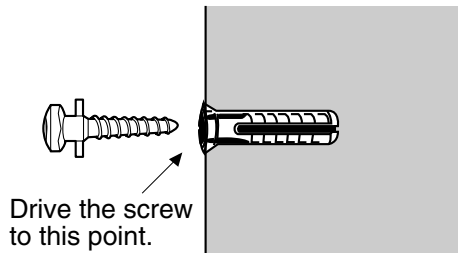
### Note

When you print out the template, the distance on the paper output may deviate slightly from the indicated measurement. In this case, use the indicated measurement.

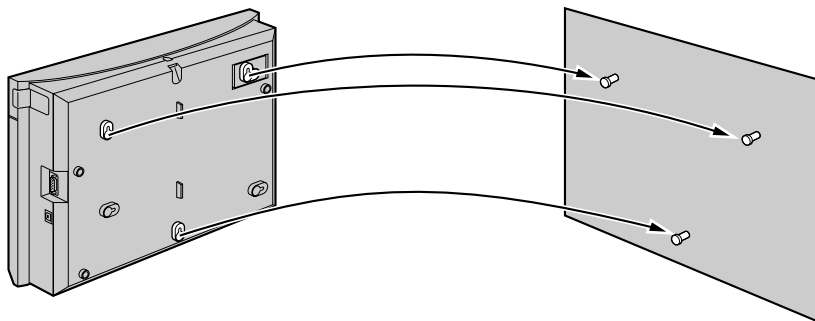
2. Drill holes in the wall as marked and fit the anchor plugs (not included) into the holes.



3. Fit the washers on the screws, and drive the screws into the anchor plugs.



4. Affix the PBX to the screw heads.





### **Notes**

- Do not block the openings of the cabinet. Leave at least 20 cm (8 in) of space above and 10 cm (4 in) to the sides of the PBX for ventilation.
- Make sure that the wall behind the cabinet is flat and free of obstacles, so that the openings on the back of the cabinet will not be blocked.
- Be careful not to drop the cabinet.

## 2.2.7 Installing Surge Protector

### Overview

A massive electrical surge can be caused if lightning strikes a telephone cable 10 m (33 ft) above ground, or if a telephone line comes into contact with a power line. A surge protector is a device that is connected to an outside (CO) line to prevent potentially dangerous electrical surges from entering the building via the outside (CO) lines and damaging the PBX and connected equipment.

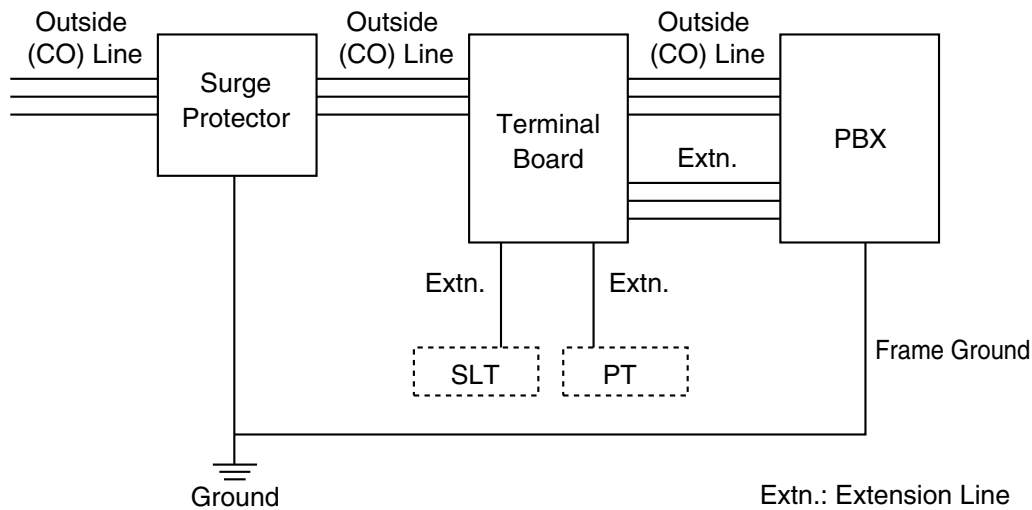
To protect the PBX from electrical surges, we strongly recommend connecting the PBX to a surge protector that meets the following specifications:

- Surge arrestor type: 3-electrode arrestor
- DC spark-over voltage: 230 V
- Maximum peak current: at least 10 kA

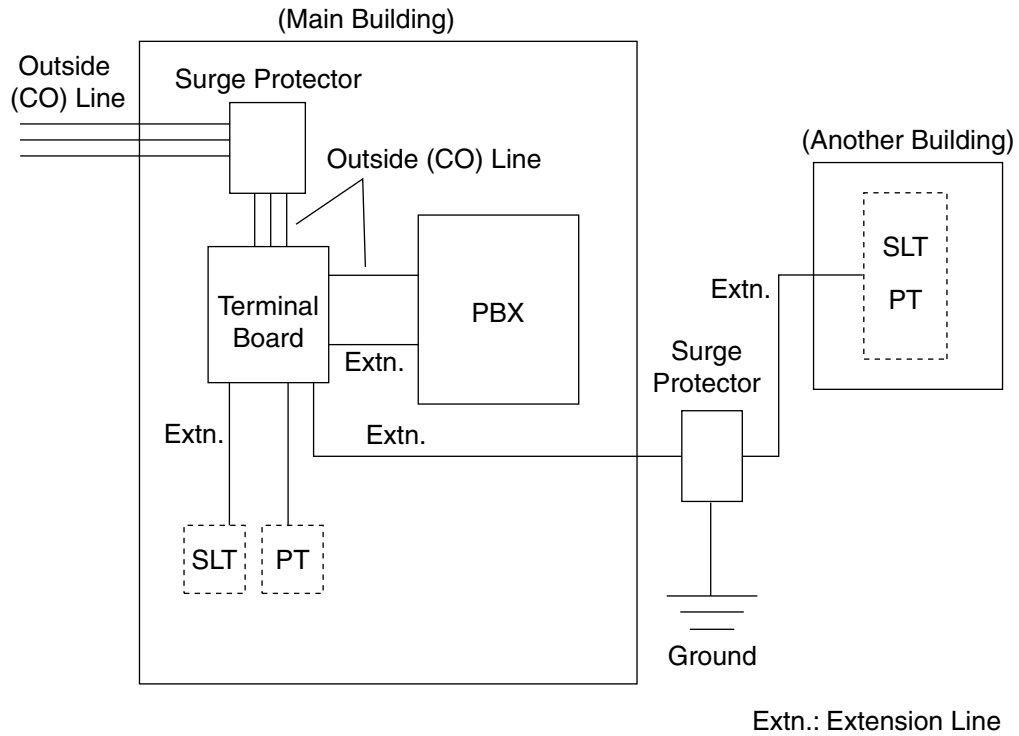
Additionally, proper grounding is very important for the protection of the PBX. (→2.2.5 Connecting Frame Ground)

Many countries/areas have regulations requiring surge protection. Be sure to comply with all applicable laws, regulations, and guidelines.

### Installation



## Outside Installation



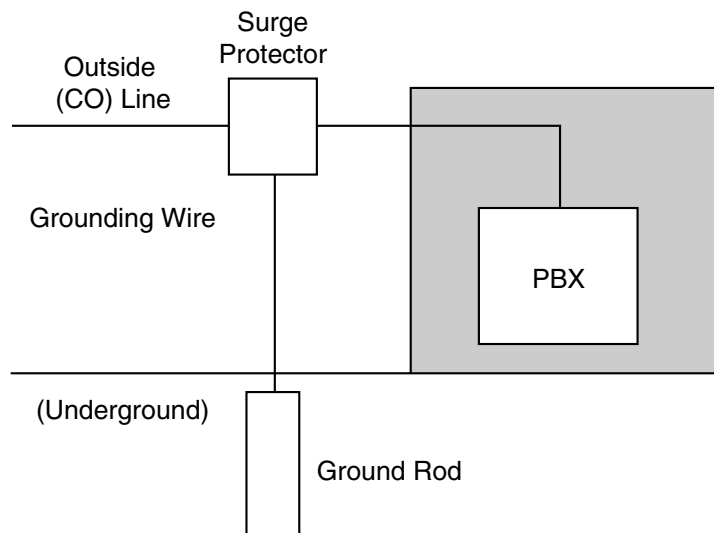
If you install an extension outside of the building, the following precautions are recommended:

- a. Install the extension wire underground.
- b. Use a conduit to protect the wire.

### **Note**

The surge protector for an extension is different from that for an outside (CO) line.

## Installation of a Ground Rod



1. Connect the ground rod to the surge protector using a grounding wire with a cross-sectional area of at least 16 AWG.

## 2.2 Installing the Advanced Hybrid System

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2. Bury the ground rod near the protector. The grounding wire should be as short as possible.
3. The grounding wire should run straight to the ground rod. Do not run the wire around other objects.
4. Bury the ground rod at least 50 cm (20 in) underground.

### **Notes**

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

## 2.3 Installing Optional Service Cards

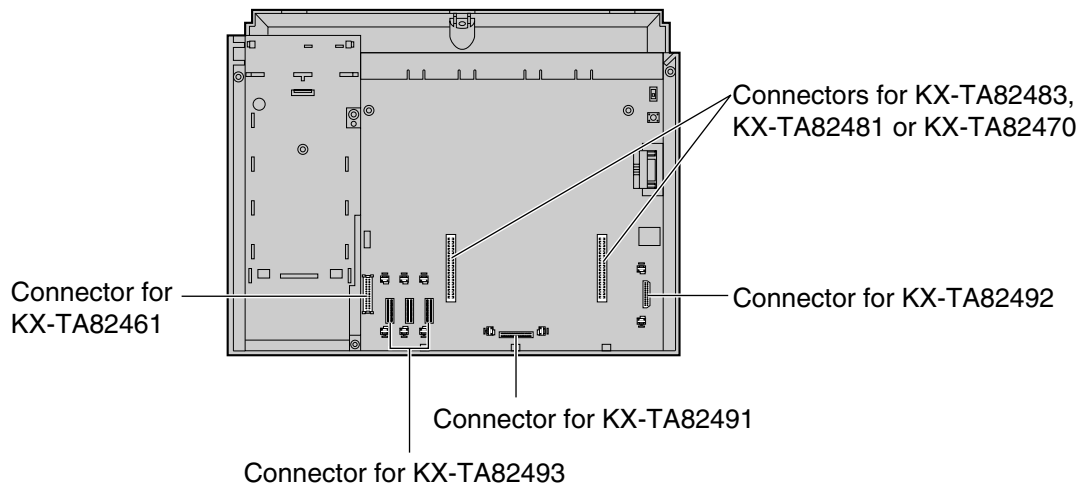
### 2.3.1 Location of Optional Service Cards

Optional service cards are installed by opening the front covers of the main unit and affixing the cards to the appropriate connectors. Each card should be installed in the appropriate location as shown below.

See "System Components Table" for the description of each optional service card.

#### **CAUTION**

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 service cards. If you must touch the P-boards, wear a grounding strap.



#### **Note**

Before installing optional service cards, turn off the PBX and unplug the AC cord.

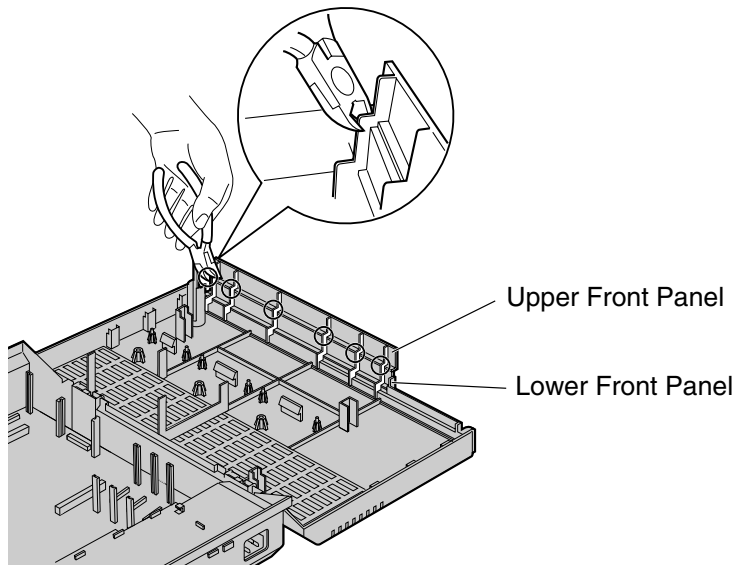
## 2.3.2 3-Port Analog CO Line and 8-Port Hybrid Extension Card (KX-TA82483)

### Function

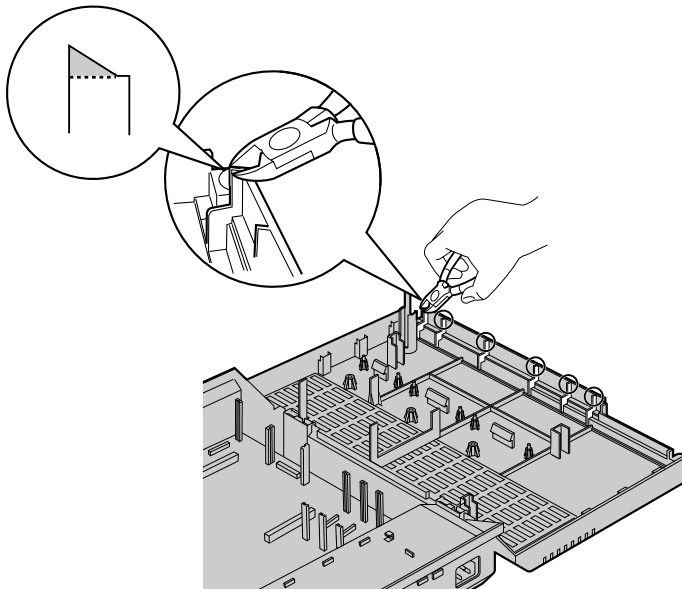
Adds 3 outside (CO) lines and 8 hybrid extensions on the KX-TA824 basic system.

### Installing KX-TA82483 to KX-TA824

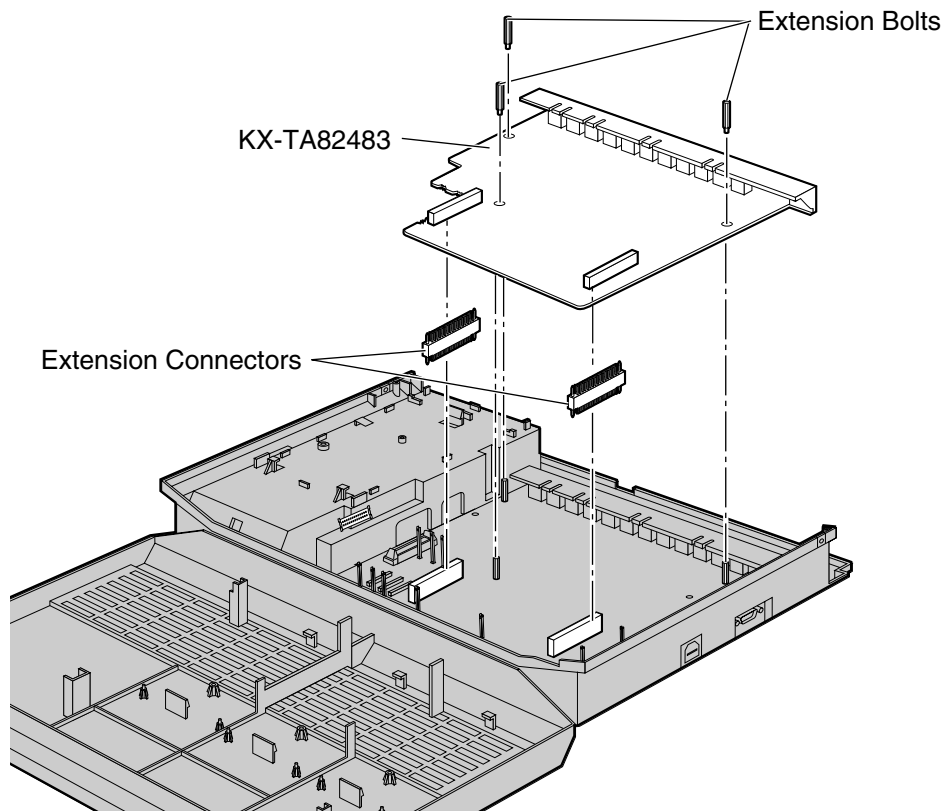
1. Loosen the screws and open the top and bottom front covers. (→2.2.3 Opening/Closing Covers)
2. Using cutting pliers, cut the 6 parts marked with circles, and remove the upper front panel as shown below.



3. Cut off any excess plastic in order to make the surface smooth.



- Attach the 2 extension connectors to the main unit, install the card as shown below, and secure the 3 extension bolts.



- Insert the modular plugs of the telephone line cords (2-conductor wiring) into the card's modular CO ports. (→2.4.1 Connecting Outside (CO) Lines)
- Connect the line cords to the terminal board or the modular jacks from the telephone company.
- Insert the modular plugs of the telephone line cords (2- or 4-conductor wiring) into the card's modular extension jacks. (→2.5.1 Connecting Extensions)
- Wrap the strap around all of the cords. (→2.2.4 Securing Cords)
- Close the covers and secure the screws. (→2.2.3 Opening/Closing Covers)

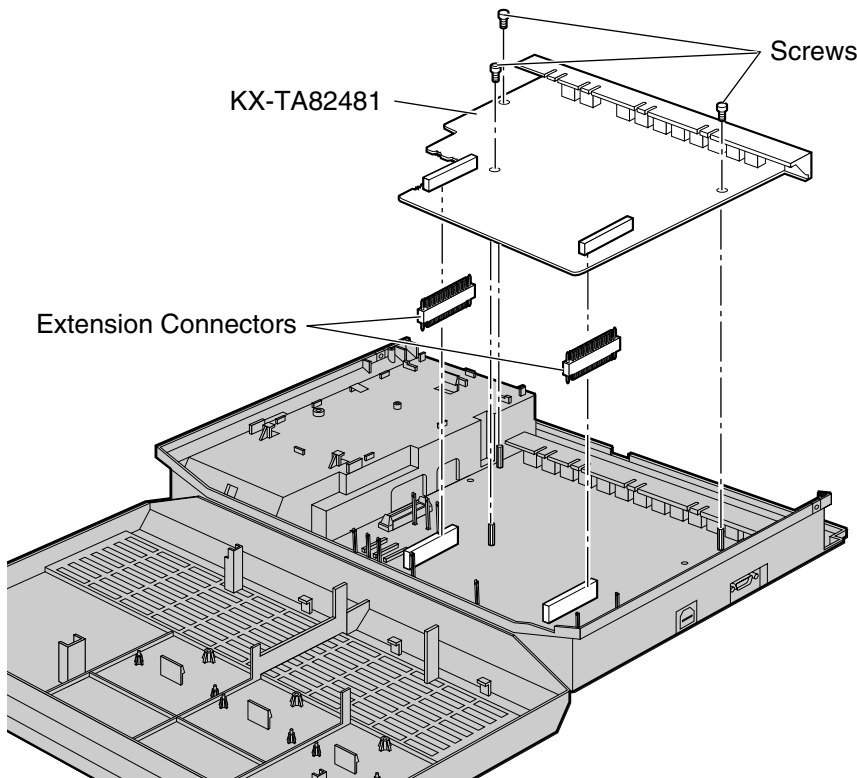
## 2.3.3 2-Port Analog CO Line and 8-Port Hybrid Extension Card (KX-TA82481)

### Function

Adds 2 outside (CO) lines and 8 hybrid extensions on the basic system of KX-TA824.

### Installing KX-TA82481 to KX-TA824

1. Loosen the screws and open the top and bottom front covers. (→2.2.3 Opening/Closing Covers)
2. Remove the upper front panel. Refer to the previous section for the cutting procedure. (→2.3.2 3-Port Analog CO Line and 8-Port Hybrid Extension Card (KX-TA82483))
3. Attach the 2 extension connectors to the main unit, install the card as shown below, and secure the 3 screws.



4. Insert the modular plugs of the telephone line cords (2-conductor wiring) into the card's modular CO ports. (→2.4.1 Connecting Outside (CO) Lines)
5. Connect the line cords to the terminal board or the modular jacks from the telephone company.
6. Insert the modular plugs of the telephone line cords (2- or 4-conductor wiring) into the card's modular extension jacks. (→2.5.1 Connecting Extensions)
7. Wrap the strap around all of the cords. (→2.2.4 Securing Cords)
8. Close the covers and secure the screws. (→2.2.3 Opening/Closing Covers)

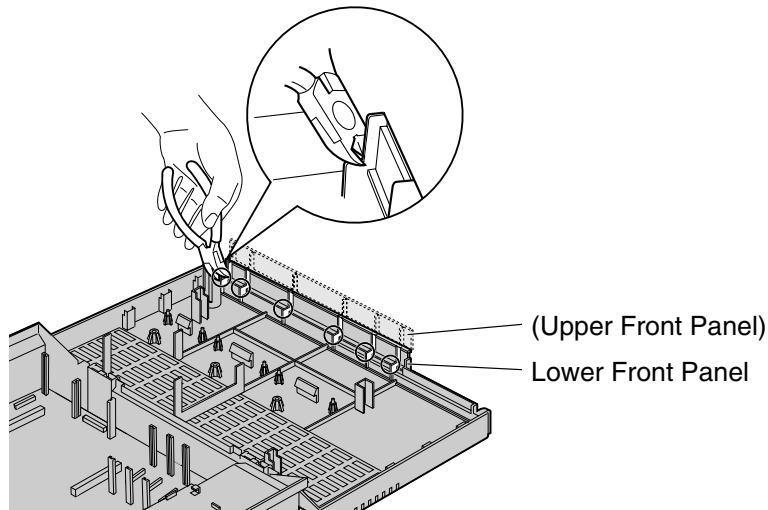


## Installing KX-TA82481 on 3-Port Analog CO Line and 8-Port Hybrid Extension Card (KX-TA82483) installed to KX-TA824

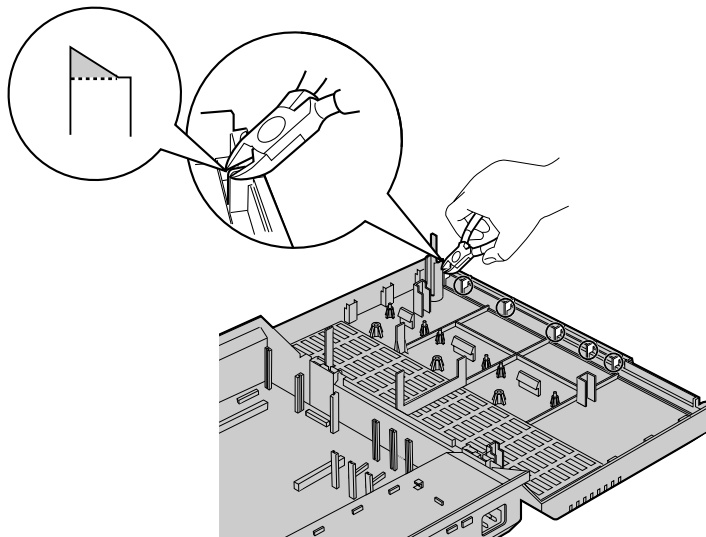
### Note

Install the KX-TA82481 on top of the KX-TA82483.

1. Loosen the screws and open the top and bottom front covers. (→2.2.3 Opening/Closing Covers)
2. Using cutting pliers, cut the 6 parts marked with circles, and remove the lower front panel or both upper and lower front panels as shown below.

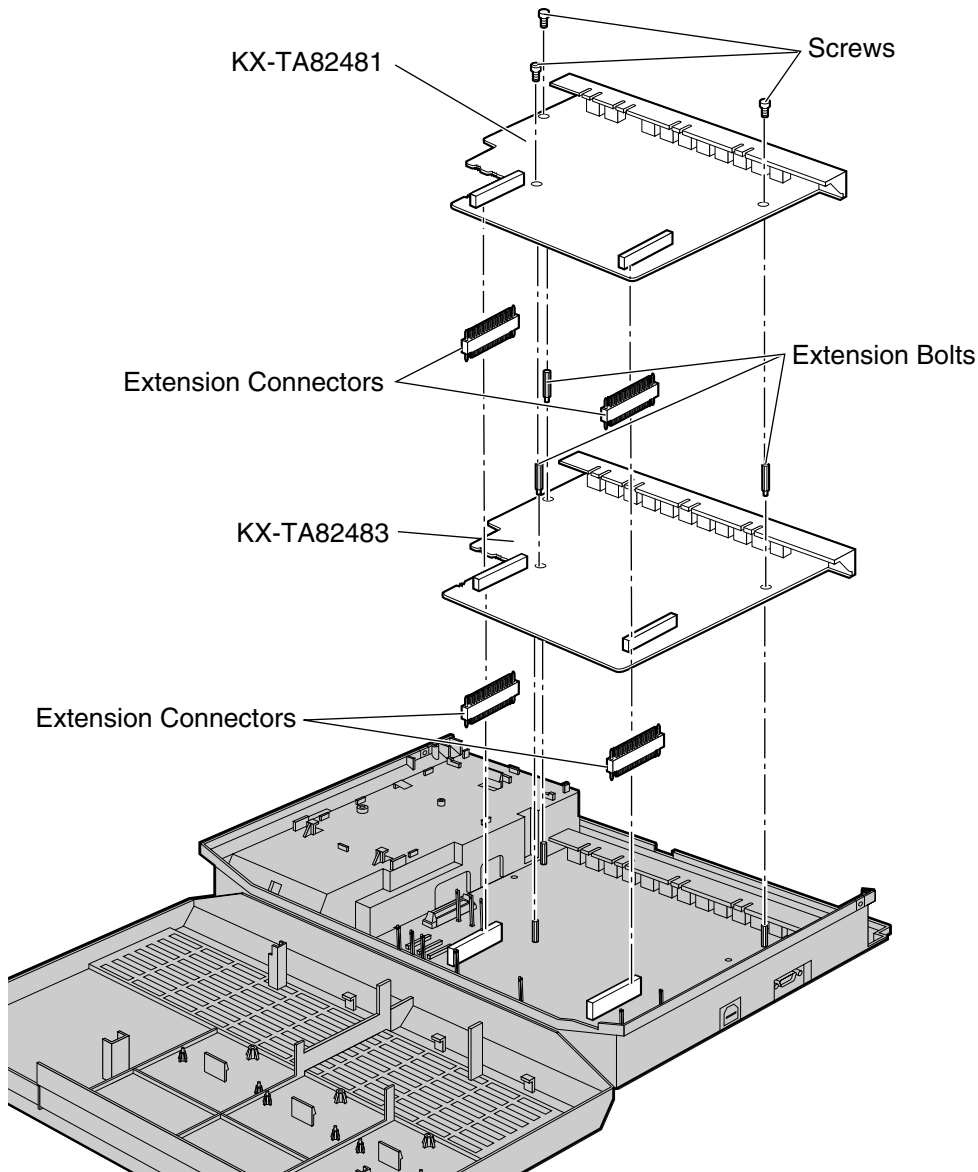


3. Cut off any excess plastic in order to make the surface smooth.



## 2.3 Installing Optional Service Cards

4. Attach the extension connectors and extension bolts, install the cards as shown below, and secure the 3 screws.



5. Insert the modular plugs of the telephone line cords (2-conductor wiring) into the card's modular CO ports. (→2.4.1 Connecting Outside (CO) Lines)
6. Connect the line cords to the terminal board or the modular jacks from the telephone company.
7. Insert the modular plugs of the telephone line cords (2- or 4-conductor wiring) into the card's modular extension jacks. (→2.5.1 Connecting Extensions)
8. Wrap the strap around all of the cords. (→2.2.4 Securing Cords)
9. Close the covers and secure the screws. (→2.2.3 Opening/Closing Covers)

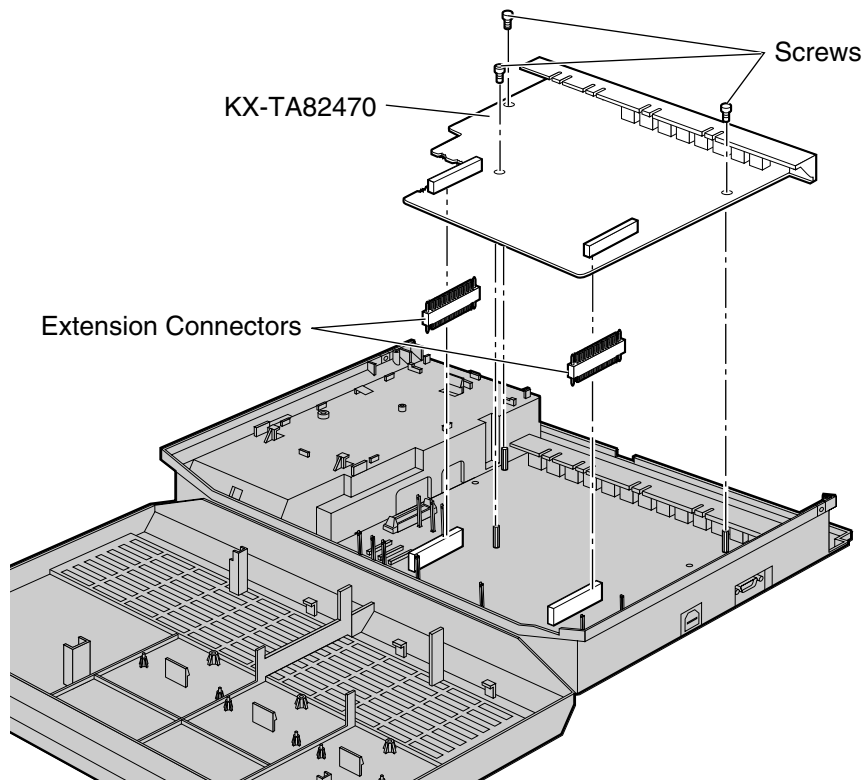
## 2.3.4 8-Port Hybrid Extension Card (KX-TA82470)

### Function

Adds 8 hybrid extensions on the basic system of KX-TA824.

### Installing KX-TA82470 to KX-TA824

1. Loosen the screws and open the top and bottom front covers. (→2.2.3 Opening/Closing Covers)
2. Remove the upper front panel. Refer to the previous section for the cutting procedure. (→2.3.2 3-Port Analog CO Line and 8-Port Hybrid Extension Card (KX-TA82483))
3. Attach the 2 extension connectors to the main unit, install the card as shown below, and secure the 3 screws.



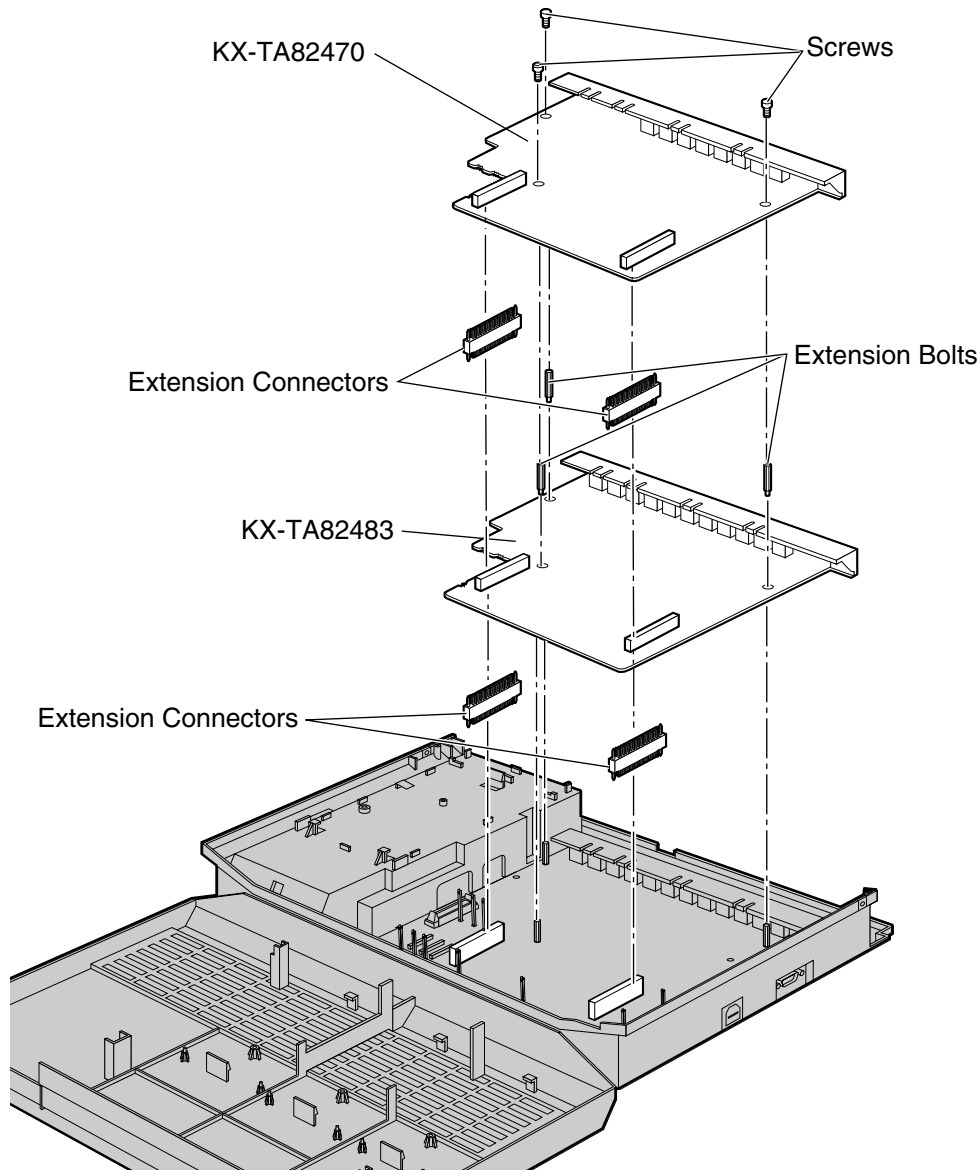
4. Insert the modular plugs of the telephone line cords (2-conductor wiring) into the card's modular CO ports. (→2.4.1 Connecting Outside (CO) Lines)
5. Connect the line cords to the terminal board or the modular jacks from the telephone company.
6. Insert the modular plugs of the telephone line cords (2- or 4-conductor wiring) into the card's modular extension jacks. (→2.5.1 Connecting Extensions)
7. Wrap the strap around all of the cords. (→2.2.4 Securing Cords)
8. Close the covers and secure the screws. (→2.2.3 Opening/Closing Covers)

## Installing KX-TA82470 on 3-Port Analog CO Line and 8-Port Hybrid Extension Card (KX-TA82483) installed to KX-TA824

### Note

Install the KX-TA82470 on top of the KX-TA82483.

1. Loosen the screws and open the top and bottom front covers. (→2.2.3 Opening/Closing Covers)
2. Remove the lower front panel or both upper and lower front panels. For the cutting procedure, refer to "Installing KX-TA82481 on 3-Port Analog CO Line and 8-Port Hybrid Extension Card (KX-TA82483) installed to KX-TA824". (→2.3.3 2-Port Analog CO Line and 8-Port Hybrid Extension Card (KX-TA82481))
3. Attach the extension connectors, install the cards as shown below, and secure the 3 screws.



4. Insert the modular plugs of the telephone line cords (2- or 4-conductor wiring) into the card's modular extension jacks. (→2.5.1 Connecting Extensions)
5. Wrap the strap around all of the cords. (→2.2.4 Securing Cords)
6. Close the covers and secure the screws. (→2.2.3 Opening/Closing Covers)

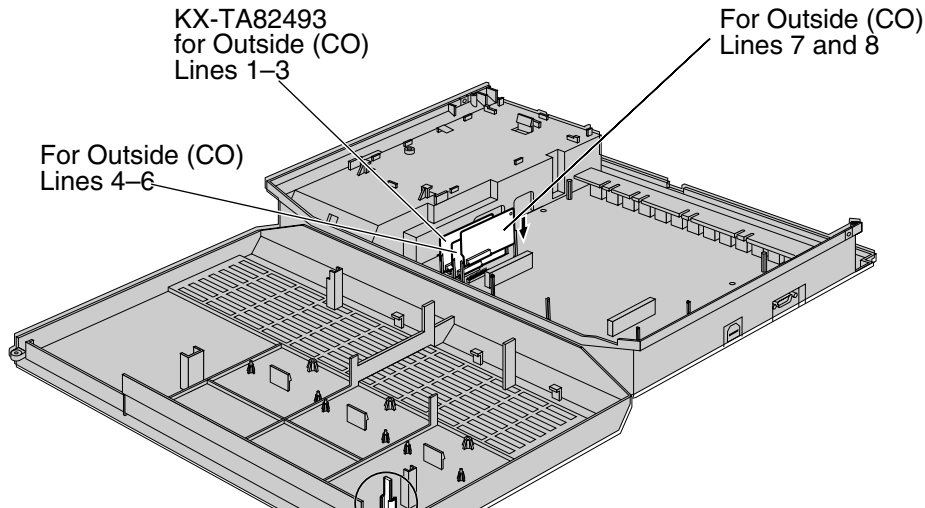
## 2.3.5 3-Port Caller ID Card (KX-TA82493)

### Function

Adds Caller ID support for 3 outside (CO) lines. 1 card is installed by default for outside (CO) lines 1–3. The first optional card can be installed for outside (CO) lines 4–6 and the second optional card can be installed for outside (CO) lines 7 and 8.

FSK and DTMF Caller ID types are supported. For information on the type of Caller ID used in your area, contact your telephone company.

1. Loosen the screws and open the top and bottom front covers. (→2.2.3 Opening/Closing Covers)
2. Slide the card between the guiderails until it clicks, and attach the connector to it.



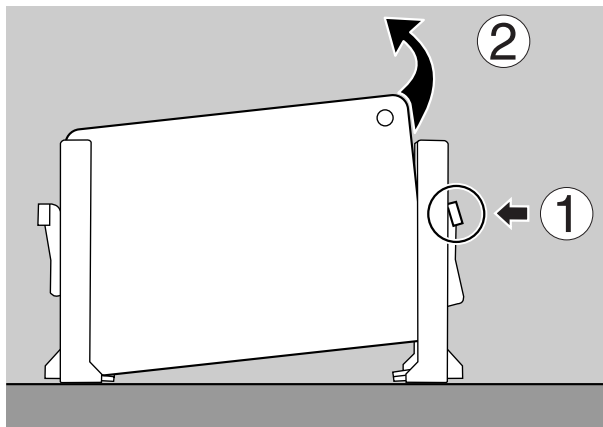
### Note

Use extra care to make sure you do not damage the part of the case marked with a circle.

3. Close the covers and secure the screws. (→2.2.3 Opening/Closing Covers)

### Note

To uninstall the card, follow the instructions illustrated below.



1. Push the catch on the side of one guiderail in the direction of the arrow to release it.
2. Lift the edge of the card while holding the catch open. (Do not touch the circuit board of the card during the operation.)

### Feature Manual References

1.1.30 Caller ID

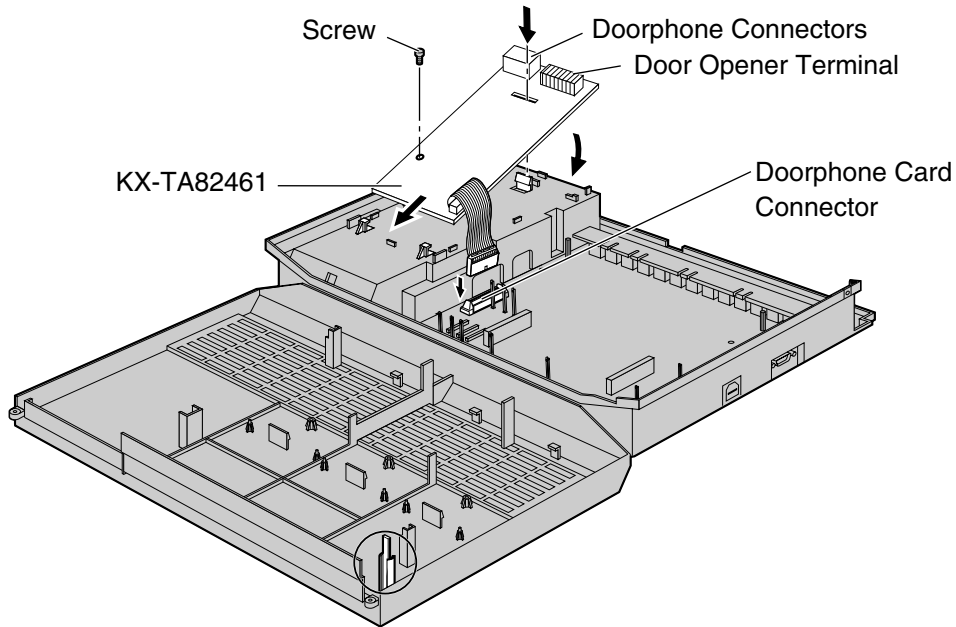
1.1.78 Local Carrier-based Voice Mail Service

## 2.3.6 4-Port Doorphone Card (KX-TA82461)

### Function

Supports the connection of 4 doorphones and 4 door openers.

1. Loosen the screws and open the top and bottom front covers. (→2.2.3 Opening/Closing Covers)
2. Attach the 4-Port Doorphone Card to the main unit, connect the cord to the Doorphone Card Connector and secure the screw.



### Note

Use extra care to make sure you do not damage the part of the case marked with a circle.

3. Close the covers and secure the screws. (→2.2.3 Opening/Closing Covers)

### Feature Manual References

1.1.46 Door Open

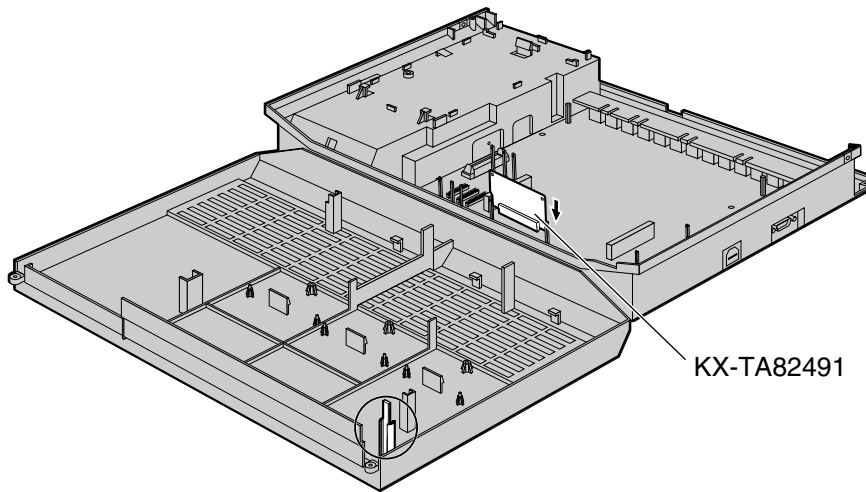
1.1.48 Doorphone Call

## 2.3.7 Message Expansion Card for DISA OGMs (KX-TA82491)

### Function

When an optional message expansion card for DISA OGMs is added, up to 2 messages can be played simultaneously for callers and the total recording time of the PBX is increased from 3 to 6 minutes.

1. Loosen the screws and open the top and bottom front covers. (→2.2.3 Opening/Closing Covers)
2. Slide the card between the guiderails until it clicks, and attach the connector to it.



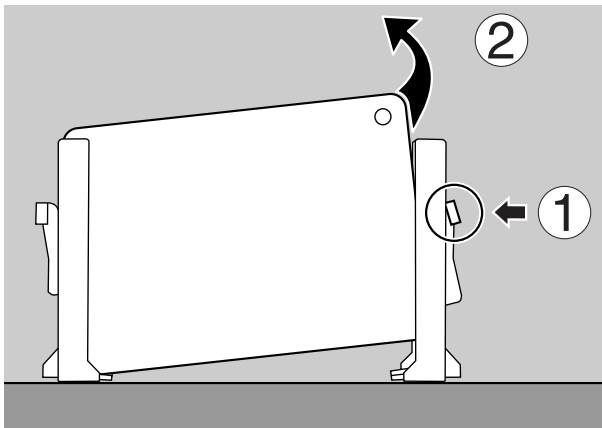
### Note

Use extra care to make sure you do not damage the part of the case marked with a circle.

3. Close the covers and secure the screws. (→2.2.3 Opening/Closing Covers)

### Note

To uninstall the card, follow the instructions illustrated below.



1. Push the catch on the side of one guardrail in the direction of the arrow to release it.
2. Lift the edge of the card while holding the catch open. (Do not touch the circuit board of the card during the operation.)

### Programming Manual References

[599] Clear All OGMs of DISA



8.5 DISA OGM Clear

**Feature Manual References**

1.1.41 Direct Inward System Access (DISA)

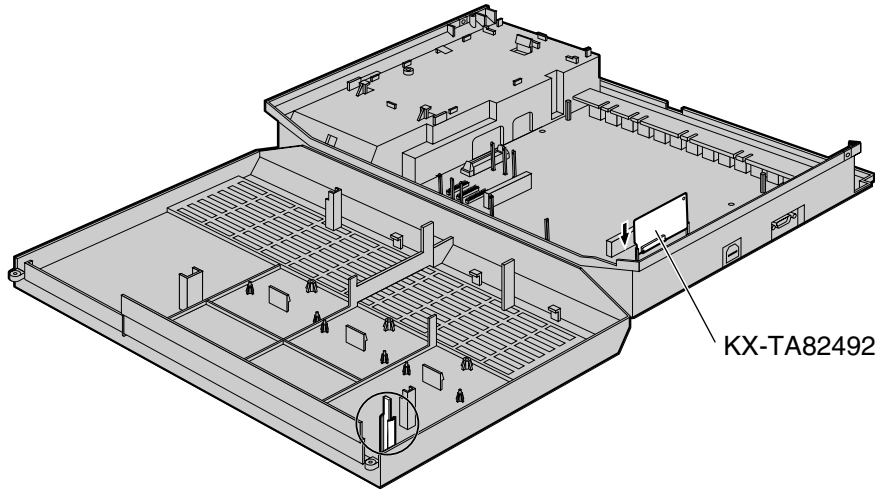
1.1.88 Outgoing Message (OGM) for DISA

## 2.3.8 2-Channel Voice Message Card (KX-TA82492)

### Function

Provides 60 minutes of recording time (2 channels) for messages using the Built-in Voice Message Feature.

1. Loosen the screws and open the top and bottom front covers. (→2.2.3 Opening/Closing Covers)
2. Slide the card between the guiderails until it clicks, and attach the connector to it.



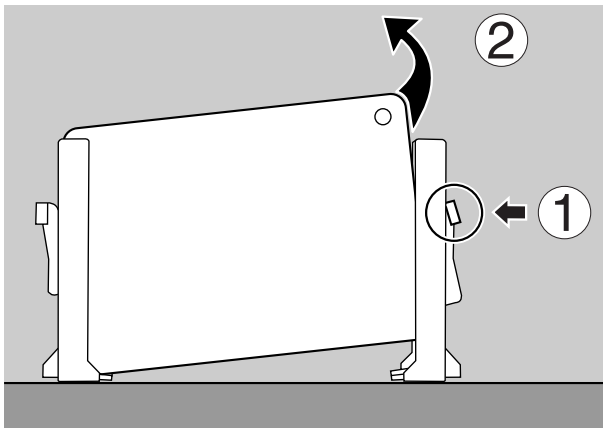
### Note

Use extra care to make sure you do not damage the part of the case marked with a circle.

3. Close the covers and secure the screws. (→2.2.3 Opening/Closing Covers)

### Note

To uninstall the card, follow the instructions illustrated below.



1. Push the catch on the side of one guardrail in the direction of the arrow to release it.
2. Lift the edge of the card while holding the catch open. (Do not touch the circuit board of the card during the operation.)

**Programming Manual References**

- [808] BV Card Initialization
- 8.6 BV Card Initialization

**Feature Manual References**

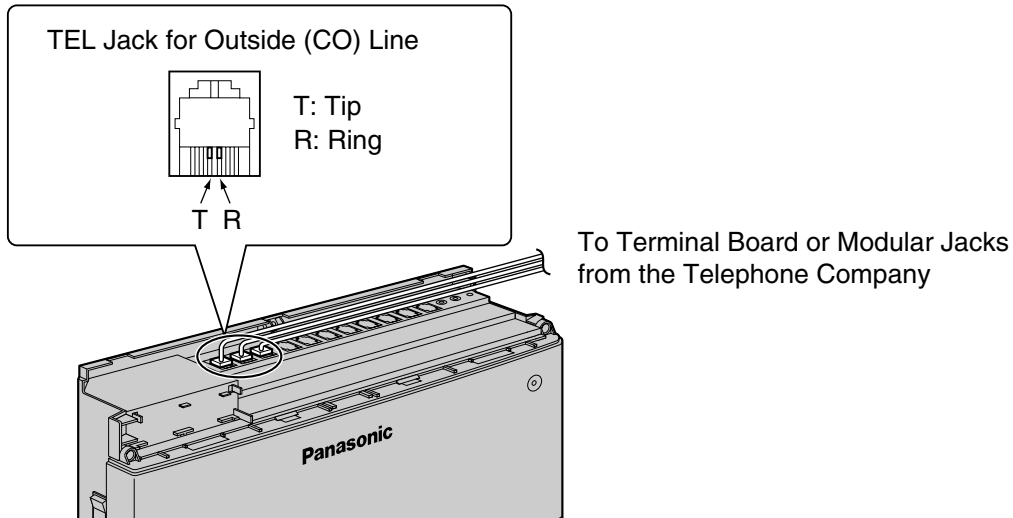
- 1.1.8 Built-in Voice Message (BV)

## 2.4 Connecting Outside (CO) Lines

### 2.4.1 Connecting Outside (CO) Lines

#### Connection

1. Insert the modular plugs of the telephone line cords (2-conductor wiring) into the outside (CO) line jacks.
2. Connect the line cords to the terminal board or the modular jacks from the telephone company.



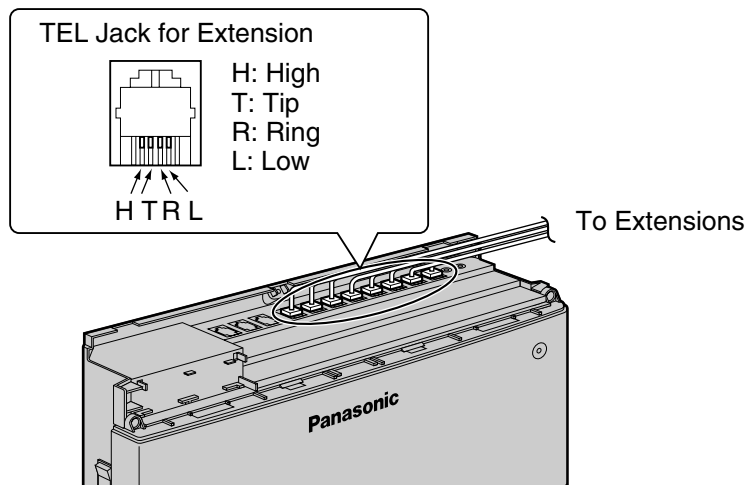
## 2.5 Connecting Extensions

### 2.5.1 Connecting Extensions

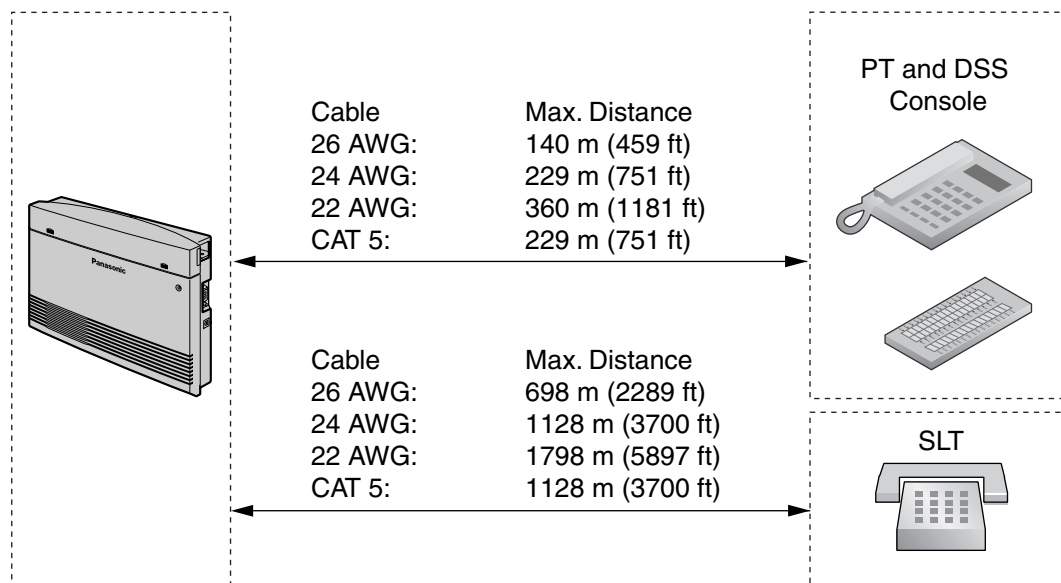
Extension jacks can be used for proprietary telephones (PTs), Direct Station Selection (DSS) Consoles, single line telephones (SLTs), and Voice Processing Systems.

#### Connection

Insert the modular plugs of the telephone line cords (2- or 4-conductor wiring) into the modular jacks on the PBX.



#### Maximum Cabling Distance of Extension Wiring (Twisted Cable)



2- or 4-conductor wiring is required for each extension as listed below. There are 4 pins that can be used for connection: "T" (Tip), "R" (Ring), "H" (High) and "L" (Low).

## 2.5 Connecting Extensions

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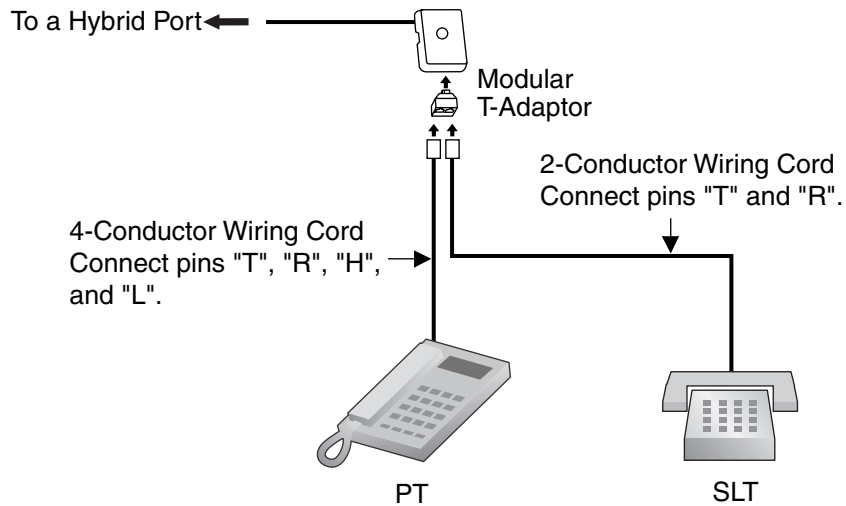
Telephone	Wiring
SLT	1-pair wire (T, R)
PT (such as KX-T7736)	2-pair wire (T, R, H, L)
DSS Console	1-pair wire (H, L)

**Note**

If a telephone or answering machine with an A-A1 relay is connected to the PBX, set the A-A1 relay switch on the telephone or answering machine to the "OFF" position.

## 2.5.2 Connecting Extensions in Parallel

Any single line telephone (SLT) can be connected in parallel with a proprietary telephone (PT) as follows:



### **Note**

An answering machine, fax machine or modem can be connected in parallel with a PT in the same way as an SLT can.

### **Feature Manual References**

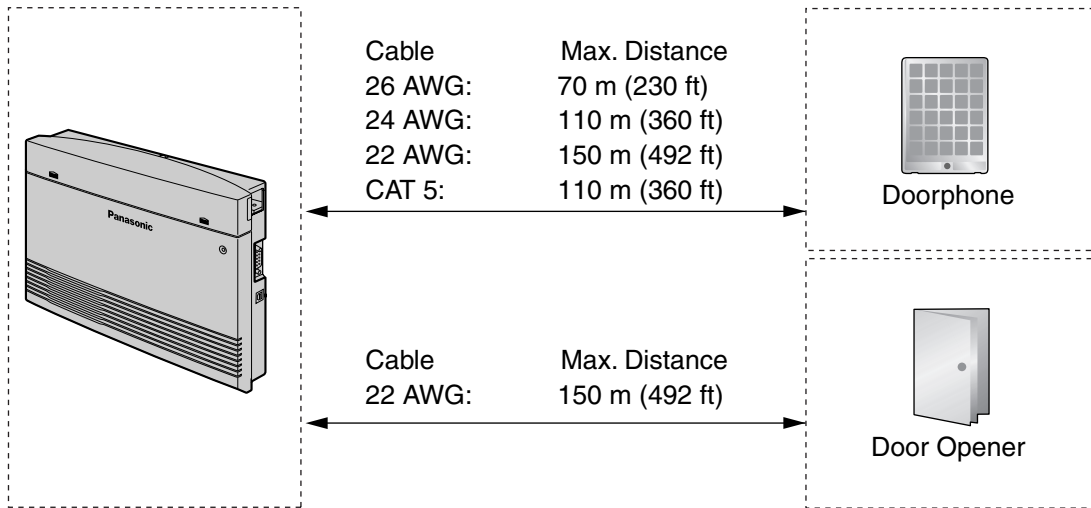
1.1.97 Paralleled Telephone

## 2.6 Connecting Doorphones and Door Openers

### 2.6.1 Connecting Doorphones and Door Openers

Up to 4 doorphones (KX-T30865) and 4 door openers (user-supplied) can be installed.

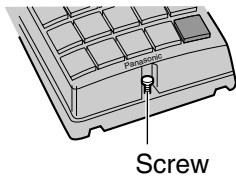
#### Maximum Cabling Distance



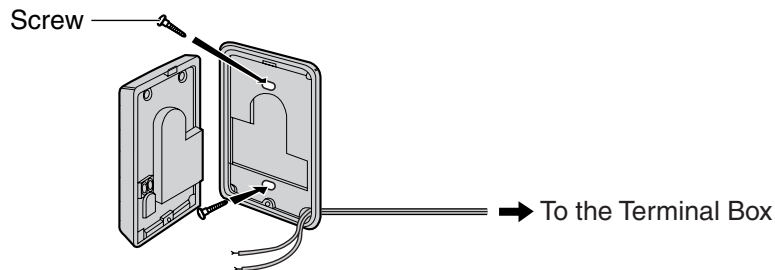
Door opener current limit: 30 V DC/125 V AC, 3 A maximum

#### Installing the Doorphone (KX-T30865)

1. Loosen and remove the screw at the bottom of the case to separate the doorphone into 2 halves.




2. Pass the wires through the hole in the base cover, and attach the base cover to a wall using 2 screws.






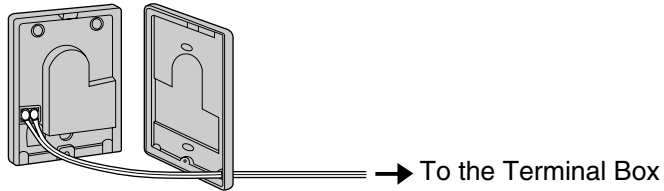
**Note**

Two kinds of screws are included with the KX-T30865. Please choose the appropriate screws for your wall type.

 : when a doorphone plate has been fixed to the wall

 : when you wish to install the doorphone directly to the wall

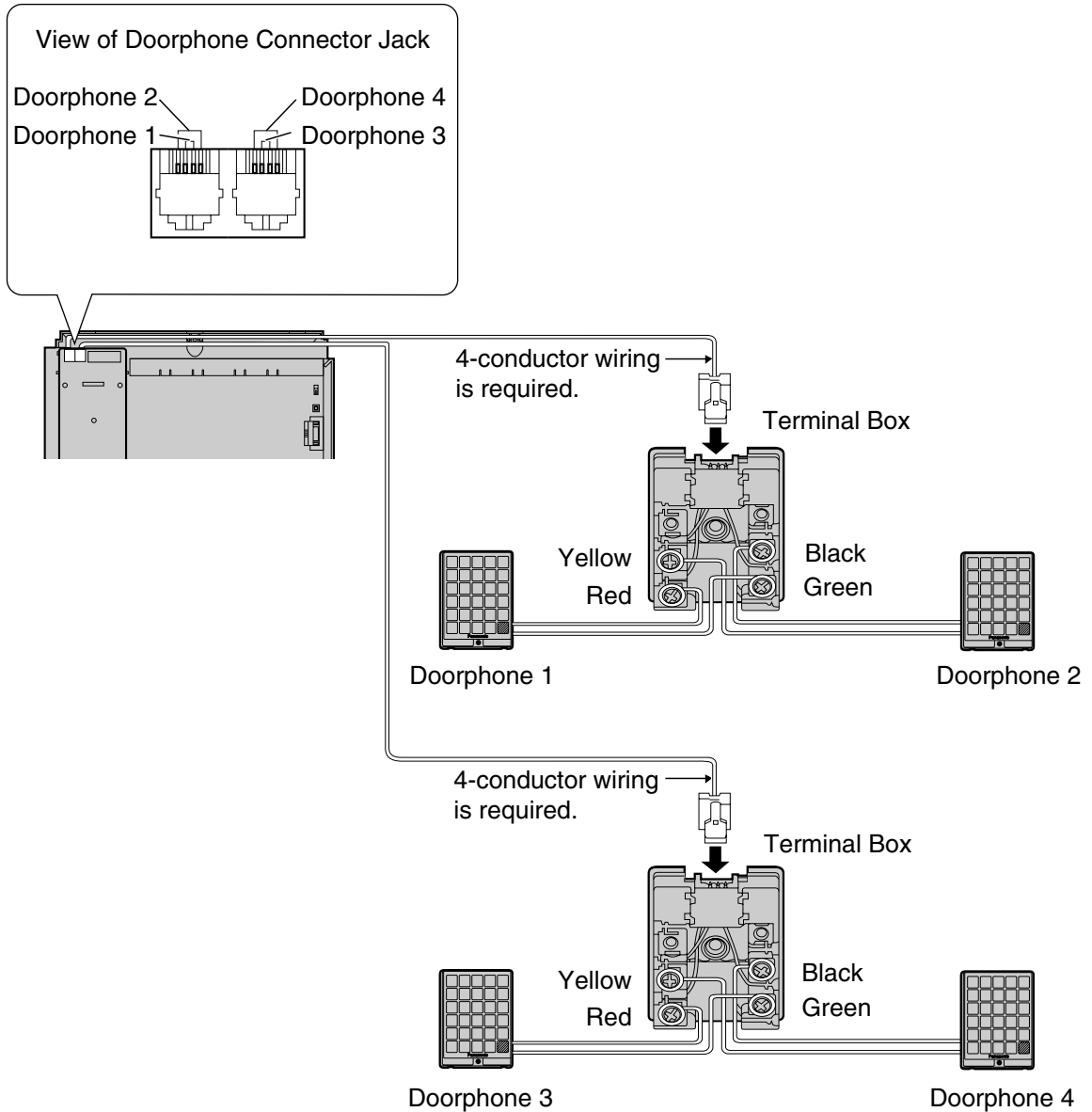
**3.** Connect the wires to the screws located in the front cover.



**4.** Re-attach the 2 halves and re-insert and tighten the screw.

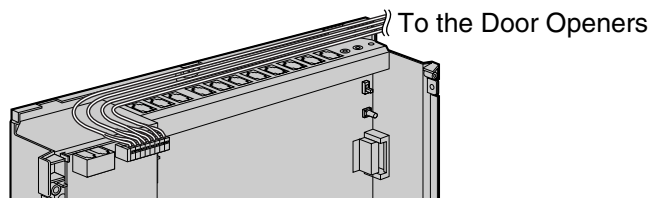
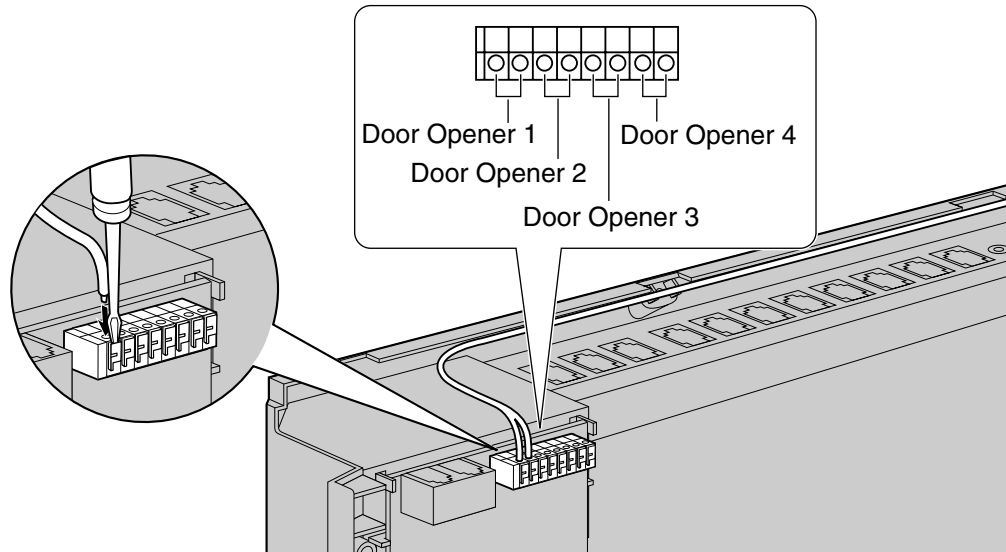
## Connecting Doorphones (KX-T30865)

1. Connect the Doorphone Card to the terminal boxes using 4-conductor wiring and modular connectors.
2. Connect the wires of doorphones 1 and 3 to the red and green screws on the appropriate terminal box.
3. Connect the wires of doorphones 2 and 4 to the yellow and black screws on the appropriate terminal box.



## Connecting Door Openers

1. Use a flathead screwdriver to press and hold open the button below the terminal, and insert the wire coming from the door opener into the terminal.



2. Wrap the strap around all of the cords. (→2.2.4 Securing Cords)

### **Note**

- We recommend using a UL1015, 26 AWG to 22 AWG wire or an equivalent for wiring.

### **Feature Manual References**

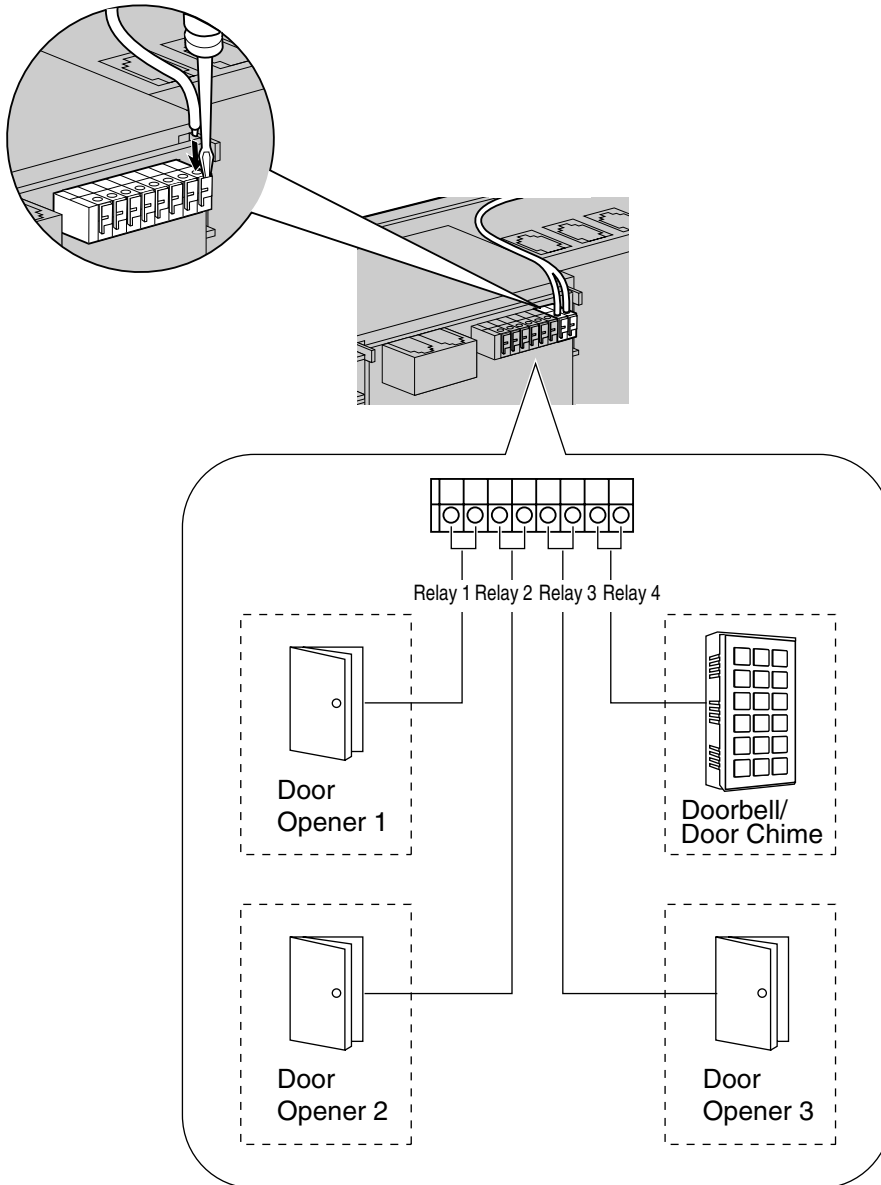
- 1.1.46 Door Open
- 1.1.48 Doorphone Call

## 2.7 Connecting Doorbell or Door Chime

### 2.7.1 Connecting Doorbell or Door Chime

Use a flathead screwdriver to press and hold open the button below the terminal, and insert the wire coming from the doorbell or door chime into the terminal. You can use a standard doorbell or door chime. For more details, please consult your dealer.

Refer to "2.6 Connecting Doorphones and Door Openers" for connecting doorphones (KX-T30865) and door openers.

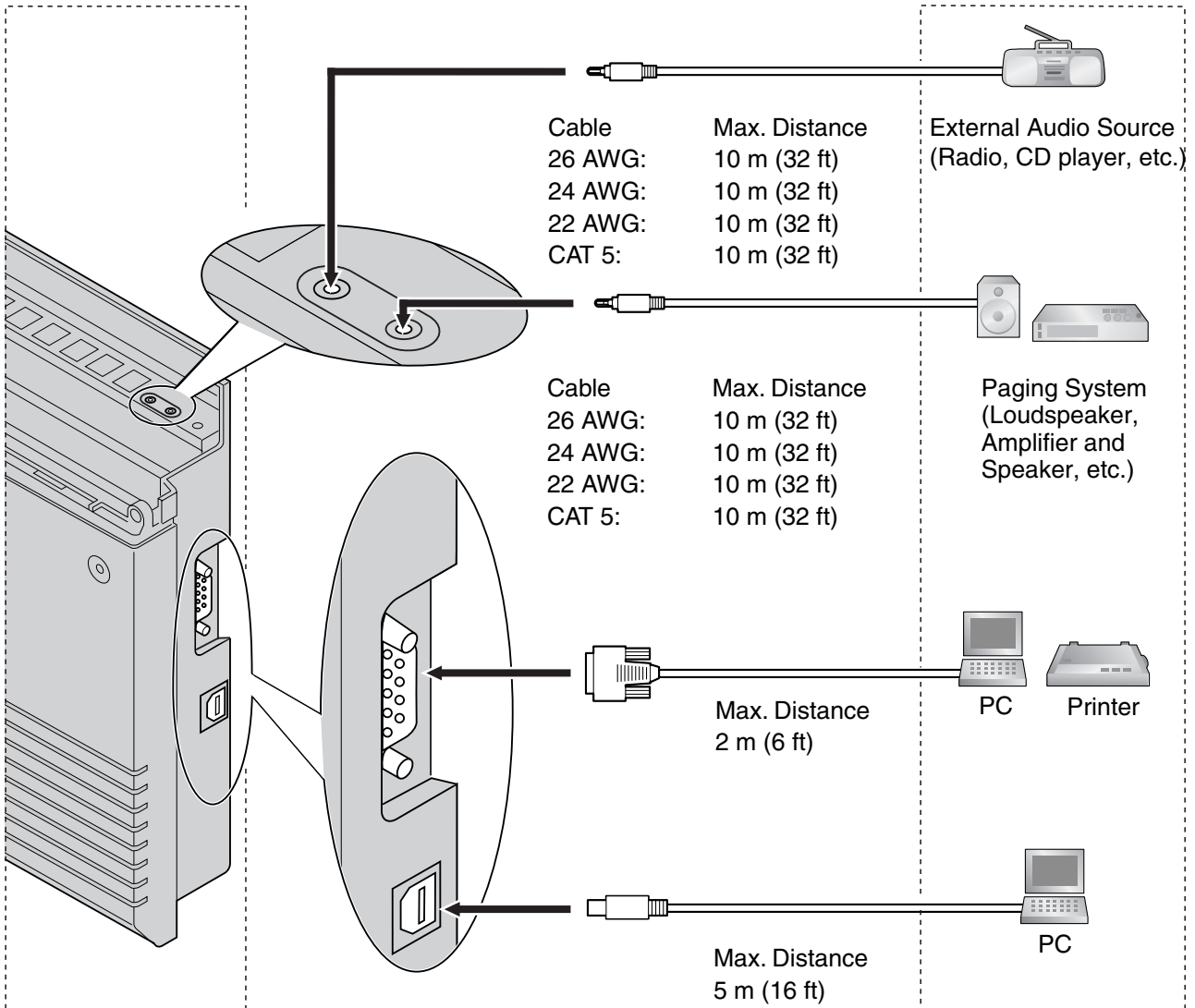


#### Feature Manual References

- 1.1.47 Doorbell/Door Chime
- 1.1.48 Doorphone Call

## 2.8 Connecting Peripherals

### 2.8.1 Connecting Peripherals



**Note**

Be sure to comply with the above maximum distance between the PBX and each peripheral.

### BGM/MOH

1 audio source (user-supplied), such as a radio or CD player, can be connected to the PBX and used as the source of Background Music (BGM) and Music on Hold (MOH).

Connect a cable from the audio output (earphone jack, headphone jack, etc.) of the audio source to

## 2.8 Connecting Peripherals

---

the MOH Jack of the PBX.

Use an EIAJ RC-6701 A plug (2-conductor, 3.5 mm [1/8 in] in diameter).

- Input impedance: 8  $\Omega$

### **CAUTION**

- Do not force audio cables into the jacks. Doing so may damage the connections and cause the audio to cut in and out.
- The MOH port is an SELV port and should only be connected to an approved SELV device.

### **Notes**

- Use the supplied audio source connector in the event that the user-supplied audio cable connector is too long and does not fit when the top front cover of the PBX is closed. Remove the connector from the user-supplied audio cable, expose the bare cable, and attach the supplied audio source connector.
- When the PBX and external audio source are not connected to the same ground, a humming noise may be heard in the BGM and MOH.
- The audio source used for BGM and MOH is determined by system programming.
- To adjust the sound level of the MOH, use the volume control on the external audio source.

### **Feature Manual References**

1.1.7 Background Music (BGM)

1.1.85 Music on Hold

## **Pager**

Only 1 paging device (user-supplied) can be connected to the PBX.

Use an EIAJ RC-6701 A plug (2-conductor, 3.5 mm [1/8 in] in diameter).

- Output impedance: 600  $\Omega$

### **CAUTION**

The External Paging Jack is an SELV port and should only be connected to an approved SELV device.

### **Notes**

- Use the supplied pager connector in the event that the user-supplied pager cable connector is too long and does not fit when the top front cover of the PBX is closed. Remove the connector from the user-supplied pager cable, expose the bare cable, and attach the supplied pager connector.
- To adjust the sound level of the pager, use the volume control on the loudspeaker or amplifier.

### **Feature Manual References**

1.1.92 Paging—SUMMARY

## PC/Printer (via RS-232C)

A PC can be connected via the RS-232C interface and used to log and display call records, and program the PBX. A printer can also be connected, to print call records.

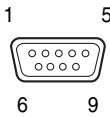
Connect the PC or printer via an RS-232C cable (user-supplied).

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 B digital device pursuant to the FCC Rules.

### Note

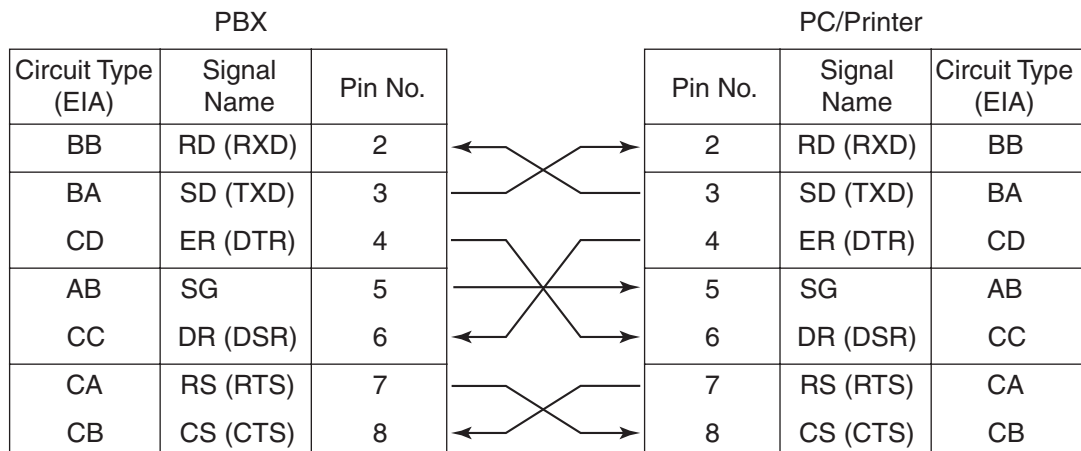
Use an RS-232C cross cable when connecting the PBX with a PC.

### Pin Assignments

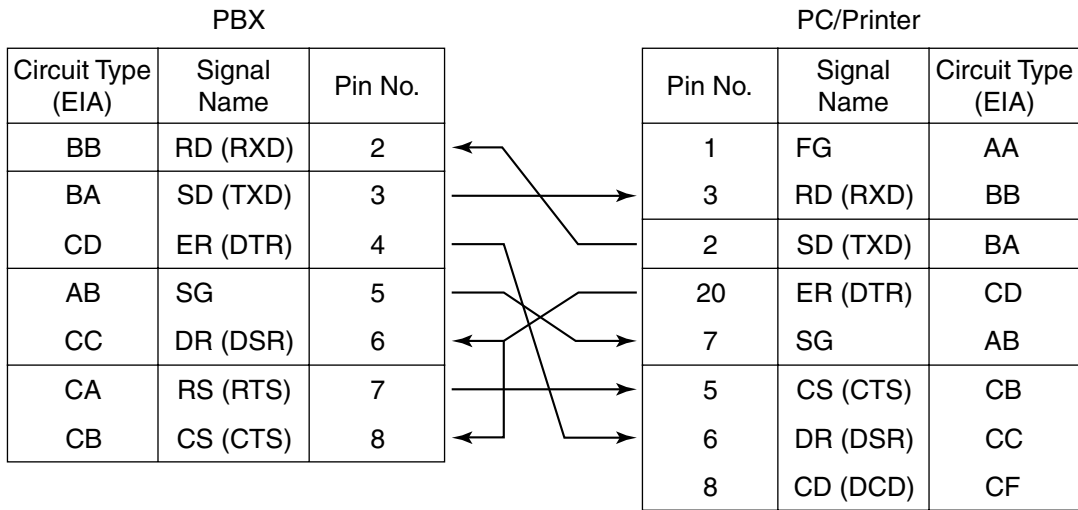
	No.	Signal Name	Function	Circuit Type	
				EIA	CCITT
	2	RD (RXD)	Receive Data	BB	104
	3	SD (TXD)	Transmit Data	BA	103
	4	ER (DTR)	Data Terminal Ready	CD	108.2
	5	SG	Signal Ground	AB	102
	6	DR (DSR)	Data Set Ready	CC	107
	7	RS (RTS)	Request To Send	CA	105
	8	CS (CTS)	Clear To Send	CB	106

### Connection Charts

For connecting a PC/printer with a 9-pin RS-232C connector



**For connecting a PC/printer with a 25-pin RS-232C connector**



**RS-232C Signals**

- **Receive Data (RXD):...**(input)  
Carries signals from the printer or the PC to the PBX.
- **Transmit Data (TXD):...**(output)  
Carries signals from the PBX to the printer or the PC. Stays in "Mark" status unless data or BREAK signals are being transmitted.
- **Data Terminal Ready (DTR):...**(output)  
This signal line is turned ON by the PBX to indicate that it is ON LINE. Circuit ER (DTR) ON does not indicate that communication has been established with the printer or the PC. It is switched OFF when the PBX is OFF LINE.
- **Signal Ground (SG)**  
Connects to the DC ground of the PBX for all interface signals.
- **Data Set Ready (DSR):...**(input)  
An ON condition of circuit DR (DSR) indicates that the printer or the PC is ready. Circuit DR (DSR) ON does not indicate that communication has been established with the printer or the PC.
- **Request To Send (RTS):...**(output)  
This is held ON whenever DR (DSR) is ON.
- **Clear To Send (CTS):...**(input)  
An ON condition of circuit CS (CTS) indicates that the printer or the PC is ready to receive data from the PBX. The PBX does not attempt to transfer data or receive data when circuit CS (CTS) is OFF.
- **Frame Ground (FG)**  
Connects to the unit frame and the ground conductor of the AC cord.
- **Data Carrier Detect (DCD):...**(input)  
An ON condition of circuit CD (DCD) indicates the data terminal (DTE) that the carrier signal is being received by.

**Feature Manual References**


1.1.112 Station Message Detail Recording (SMDR)



## PC (via USB 1.1 interface)

A PC running the KX-TA Maintenance Console software can be connected via the USB interface and used to program the system and upload/download data to the PBX.

### Pin Assignments

	No.	Signal Name
	1	VBUS
	2	USB D-
	3	USB D+
	4	GND

### Programming Manual References

8.1 Firmware Upgrade

### Feature Manual References

1.1.58 Firmware Upgrade

## 2.9 Power Failure Connections

### 2.9.1 Power Failure Connections

When the power supply to the PBX fails, power failure transfer will switch from the current connection to the Power Failure Connections.

Power Failure Connections connect a specific extension and an outside (CO) line in the event of power failure as follows:

Outside (CO) line 1—extension (T, R) jack 01

Outside (CO) line 4—extension (T, R) jack 09

Outside (CO) line 7—extension (T, R) jack 17

#### **Notes**

- In the event of a power failure, system memory is protected by a factory-provided lithium battery. No system data will be lost, except for the Camp-on, Saved Number Redial, Last Number Redial and Call Park data.
- The current connection automatically switches to the Power Failure Connection when the power supply stops.
- Proprietary telephones (PTs) cannot be used during a power failure. Therefore, we recommend connecting single line telephones (SLTs) in parallel with PTs to extension jacks 01, 09, and 17.

#### **Feature Manual References**

1.1.102 Power Failure Transfer

#### **CAUTION**

DANGER OF EXPLOSION EXISTS IF THE BATTERY IS INCORRECTLY REPLACED. REPLACE THE BATTERY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE BATTERY MANUFACTURER. DISPOSE OF USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

## 2.10 Starting the Advanced Hybrid System

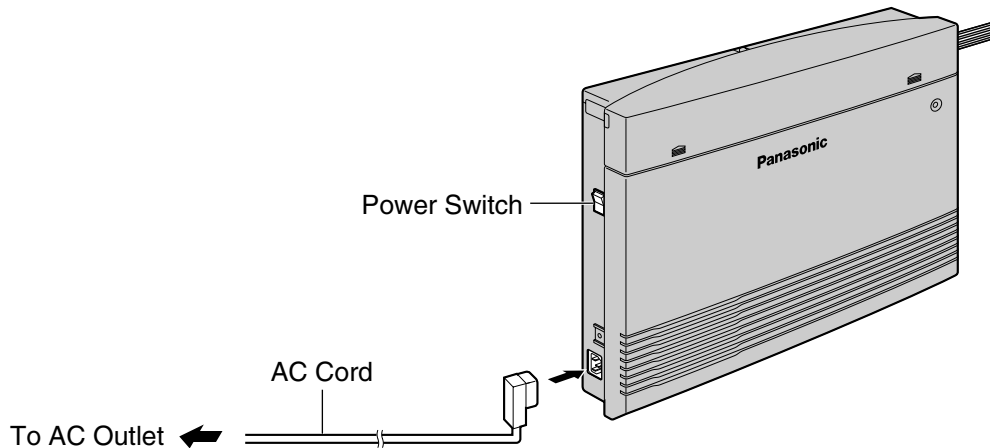
### 2.10.1 Starting the Advanced Hybrid System

This section explains the procedure for starting the PBX for the first time, with default values, or when you wish to re-initialize the PBX.

1. Make sure that all outside (CO) lines you use are connected to the PBX.
2. Set the Power Switch to the "OFF" position.
3. Connect the AC cord to the PBX, then plug the AC cord into an AC outlet.
4. Set the Power Switch to the "ON" position.

#### Note

For safety reasons, do not stretch, bend, or pinch the AC cord.



5. Perform the following operation with a proprietary telephone (PT) connected to JACK 01.
  - a. Press the PROGRAM button.
  - b. Press \* #.
  - c. Enter 1234.
  - d. Enter 999.
  - e. Press the NEXT (SP-PHONE) button.
  - f. Press the SELECT (AUTO ANS/MUTE) button until "All Para" is displayed.
  - g. Press the STORE (AUTO DIAL/STORE) button.
  - h. Press the END (HOLD) button.
  - i. Press the PROGRAM button.
    - The PBX will be initialized with the default values. The type of outside (CO) lines is automatically detected.
    - If the PBX does not function properly, refer to "4.1.5 System Reset with System Data Clear".
6. Program the PBX using either one of the following methods:
  - a. PC programming. Refer to "Section 3, Guide for KX-TA Maintenance Console".
  - b. PT programming. Refer to "2 PT Programming" of the Programming Manual.

### **CAUTION**

- The PBX is powered as long as the AC cord is plugged into an AC outlet, even if the Power Switch is set to the "OFF" position.
- The power supply cord is used as the main disconnect device. Ensure that the AC outlet is located/installed near the equipment and is easily accessible.

### **Notes**

- If the outside (CO) lines you use are not connected to the PBX, outside (CO) line type can not be automatically detected.
- Use only the AC cord included with the PBX.
- If the PBX will not be used for an extended period of time, set the Power Switch to the "OFF" position and disconnect the AC cord from the AC outlet to conserve power.

### **Programming Manual References**

[999] System Data Clear

8.4 System Data Clear

### **Feature Manual References**

1.1.103 PT Programming

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## **Section 3**

# ***Guide for KX-TA Maintenance Console***

*This section explains how to connect a PC to the PBX and get started using KX-TA Maintenance Console.*

## 3.1 Installing KX-TA Maintenance Console

### 3.1.1 Installing KX-TA Maintenance Console on a PC

#### System Requirements

##### Operating System

- Microsoft® Windows® 98 SE, Windows Me, Windows 2000, or Windows XP

##### Hardware

- CPU: 300 MHz Intel® Celeron® or faster
- RAM: At least 128 megabytes (MB) of available RAM
- Hard disk space: At least 100 MB of space for the installation, and approximately 2 MB of additional space for user files.

#### Setting the Password and Password Security

To maintain system security, a password is required to perform system programming. When KX-TA Maintenance Console is started for the first time, the Quick Setup utility will ask you to set the system password. To avoid unauthorized access and possible fraudulent dialing, do not disclose the password.

##### Warning to the Installer regarding the system password

1. Please inform the customer of the importance of the password and the possible dangers if it becomes known to others.
2. To avoid unauthorized access and possible fraudulent dialing, maintain the secrecy of the password.
3. We strongly recommend that you change the default password value to something else for reasons of system security. It is best to use a password of 7 digits.
4. Please change the password periodically.
5. If a system password is forgotten, it can be found by loading a backup of the system data into a PC, and checking the password using the KX-TA Maintenance Console software. If you do not have a backup of the system data, you must reset the PBX to its factory defaults and reprogram it. Therefore, we strongly recommend maintaining a backup of the system data.

For more information on how to back up the system data, refer to the on-line help that appears by selecting the Help menu during PC programming. However, as system passwords can be extracted from backup copies of the system data file, do not allow unauthorized access to these files.

##### **Note**

This PBX has only one system password. It can be changed by either PT programming or PC programming. For this reason, the password can consist of numerals only.

## Installing KX-TA Maintenance Console

### **Notes**

- Before installing or uninstalling the software, be sure to close any open applications.
- To install or uninstall the software on a PC running Windows 2000 Professional or Windows XP Professional, you must be logged in as a user in the "Administrators" group.

1. Insert the included CD-ROM into the CD-ROM drive of your PC.

The main screen will appear automatically.

2. Click **Maintenance Console**.



3. Double-click the setup file to run the installer. (Its icon is shown here, on the left.)

4. Follow the on-screen instructions provided by the installation wizard.

### **Programming Manual References**

3.2 PC Programming

### **Feature Manual References**

1.1.99 PC Programming

## 3.2 Connection

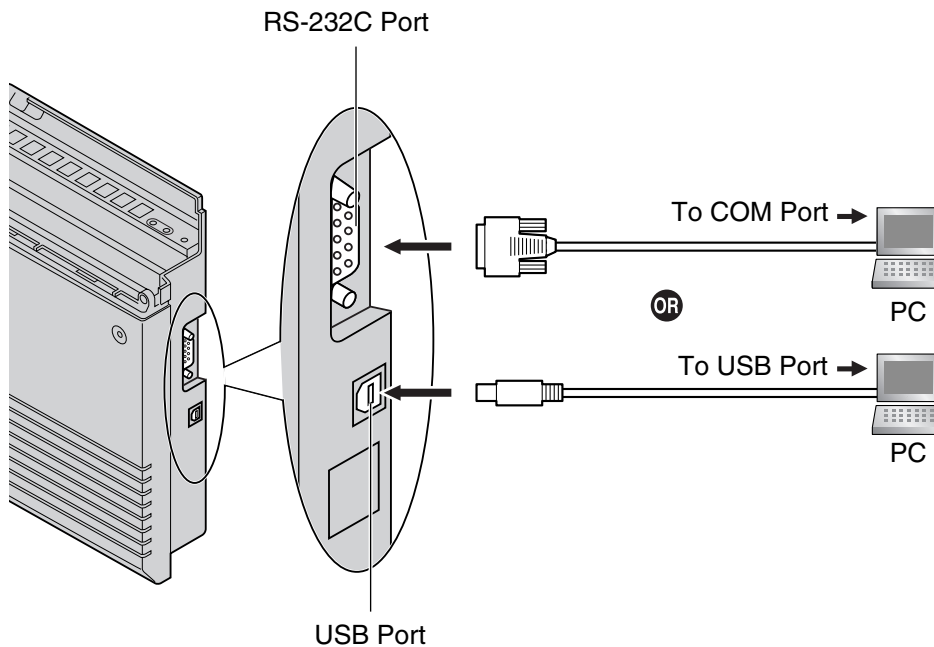
### 3.2.1 Connection

PBX features and settings can be customized using a PC and the KX-TA Maintenance Console software.

Programming can be performed both on-site, using a PC connected directly to the PBX, and off-site, by accessing the PBX via modem.

#### Serial Interface Connection

A PC can be connected to the RS-232C port of the PBX, or to the USB port for faster access.



#### Notes

- For pin assignments and maximum cabling distance, refer to "2.8 Connecting Peripherals".
- When connecting the KX-TA Maintenance Console to the PBX using an RS-232C cable, assign the following values to the Serial Interface (RS-232C) port of the PBX through system programming, "[800] SMDR RS-232C Parameter":
  - Baud Rate: 9600 bps
  - Word Length: 8 bits
  - Parity Bit: None
  - Stop Bit: 1 bit

#### Installing the USB Driver

#### CAUTION

Installing the USB driver may prevent the USB driver for KX-TDA series or PC Console/Phone Software from functioning correctly. In this case, update the USB drivers as necessary from the following folders on the included CD-ROM:



KX-TDA Series: CD-ROM Drive:\TDA\_USB Driver\TDA\_USB Driver  
PC Console/Phone Software: CD-ROM Drive:\TDA\_USB Driver\T7601\_USB Driver

**Note**

Before installing or uninstalling the driver, be sure to close any open applications.

**Windows 98SE**

1. Connect the PC to the PBX with a USB cable.  
The **Add New Hardware Wizard** will appear.
2. Click **Next**.
3. Select **Search for the best driver for your device. [Recommended]**, then click **Next**.
4. Select **Specify a location**, then click **Browse**.
5. Specify the folder containing the USB driver, **CD-ROM Drive:\USB driver\Win98**, then click **OK**.
6. Click **Next**.
7. Click **Next**.
8. Click **Finish**.

**Note**

If a dialog box appears asking you to restart your PC, restart the PC.

**Windows Me**

1. Connect the PC to the PBX with a USB cable.  
The **Add New Hardware Wizard** will appear.
2. Select **Specify the location of the driver [Advanced]**, then click **Next**.
3. Select **Search for the best driver for your device. [Recommended]**.
4. Select **Specify a location**, then click **Browse**.
5. Specify the folder containing the USB driver, **CD-ROM Drive:\USB driver\WinMe**, then click **OK**.
6. Click **Next**.
7. Click **Next**.
8. Click **Finish**.

**Note**

If a dialog box appears asking you to restart your PC, restart the PC.

**Windows 2000**

1. Connect the PC to the PBX with a USB cable.  
The **Found New Hardware Wizard** will appear.
2. Click **Next**.
3. Select **Search for a suitable driver for my device. [Recommended]**, then click **Next**.
4. Select **Specify a location**, then click **Next**.
5. Click **Browse**, and specify the folder containing the USB driver, **CD-ROM Drive:\USB driver\Win2000**, then click **Open**.
6. Click **OK**.
7. Click **Next**.
8. Click **Finish**.

### Windows XP

1. Connect the PC to the PBX with a USB cable.  
The **Found New Hardware Wizard** will appear.
2. Select **Install from a list or specific location [Advanced]**, then click **Next**.
3. Select **Search for the best driver in these locations**.
4. Select **Include this location in the search:**, then click **Browse**.
5. Specify the folder containing the USB driver, **CD-ROM Drive:\USB driver\WinXP**, then click **OK**.
6. Click **Next**.
7. Click **Continue Anyway**.
8. Click **Finish**.

### Programming Manual References

- 4.1 Software Modes
- 6.1 Connect

### Feature Manual References

- 1.1.99 PC Programming

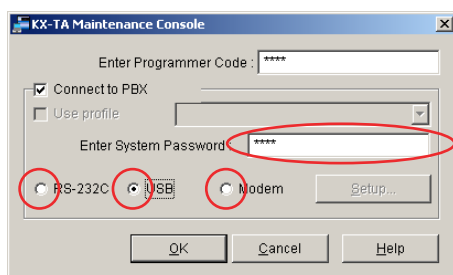
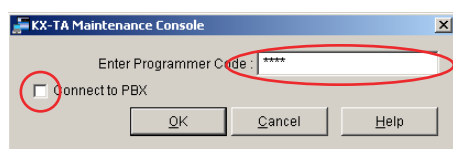
## 3.2.2 Starting KX-TA Maintenance Console for the first time

When you start the KX-TA Maintenance Console with the Installer Level Programmer Code and connect to the PBX for the first time after initialization (with factory default setting), Quick Setup will launch automatically. During Quick Setup, you will setup:

- The date and time. The PBX uses the date and time set to the PC.
- The System Password.
- The operator extension number.
- Automatic Configuration for CO Line Type (DTMF/Pulse).
- The feature numbers for Operator Call and Automatic Line Access.
- Extension numbers and names.
- The Numbering Plan type.
- Ringing assignment for each outside (CO) line (either all extensions, or a specific extension).

### Note

The screenshots shown here are for reference only, and may differ from the screens displayed on your PC.



1. Start the KX-TA Maintenance Console software from the start menu. (**Start** → **Programs** → **KX-TA Maintenance Console**)
2. Type the Installer Level Programmer Code that was set during the KX-TA Maintenance Console installation.
3.
  - a. Click the check box to connect to the PBX. Options will appear as shown here, on the left.
  - b. Type the System Password. (default: **1234**)
  - c. Select the method of connection.
  - d. Click **OK** to log in.
4. Quick Setup starts. Follow the on-screen instructions and assign the items as prompted.

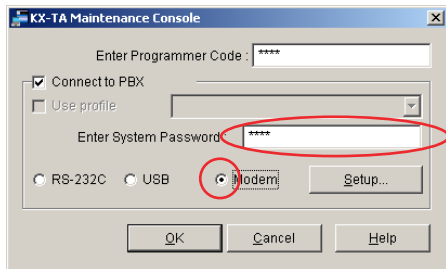
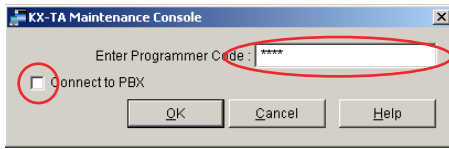
### Note

Software features, design, and system requirements are subject to change.

## Programming Manual References

- 4.1 Software Modes
- 6.1 Connect
- 8.2 Quick Setup

### 3.2.3 Accessing PBX via Internal Modem



1. Start the KX-TA Maintenance Console software from the start menu on your PC. (**Start** → **Programs** → **KX-TA Maintenance Console**)
2. Type the Installer Level Programmer Code that was set during the KX-TA Maintenance Console installation.
3. Click the check box to connect to the PBX. Options will appear as shown here, on the left.
4. Type the System Password. (default: 1234)
5. Select **Modem**, and click **Setup**.

#### When the mode of the PBX outside (CO) line that will be accessed is 'MODEM':

1. For Dial Number, enter the telephone number assigned to the internal modem of the PBX.
2. Select **Auto (Tone)** or **Auto (Pulse)** for Dial Type.
3. Click **OK**.
4. Click **OK**. The PC will connect to the PBX.

#### When the mode of the PBX outside (CO) line that will be accessed is 'DISA':

1. For Dial Number, enter the telephone number assigned to the internal modem of the PBX, several pause symbols (',') and the Remote Maintenance feature number (for example: 01234567,,,,,729).
2. Select **Auto (Tone)** for Dial Type.
3. Click **OK**.
4. Click **OK**. The PC will connect to the PBX.

#### Notes

- The number of pause symbols to be inserted differs depending on the PC modem used.
- Auto (Pulse) Dial Type cannot be used.

#### When the mode of the PBX outside (CO) line that will be accessed is 'Normal':

1. For Dial Number, enter the pause symbol (',').
2. Select **Manual** for Dial Type.
3. Click **Initialize**.
4. Click **OK**.
5. Click **OK**.
6. Dial the telephone number assigned to the outside (CO) line from a telephone connected in parallel with the PC.

7. Ask the respondent to transfer the call to the internal modem of the PBX. ('Transfer' + '729 [Remote Maintenance feature number]')
8. Click **OK** and wait for 2 or 3 seconds, and then go on-hook before you hear a tone from the modem. The PC will connect to the PBX.

#### **Notes**

- The AT command 'Use V.22bis' may be required to configure the modem to communicate with the PBX, depending on the modem (for example: "AT + MS = V22B").
- The AT commands 'Use V.42' and 'Use V.42bis' may be required to configure the modem to communicate with the PBX, depending on the modem.
- The AT command to dial without waiting for a dial tone may be required to configure the modem to communicate with the PBX, depending on the modem.
- The AT command to set the Result Code format to text beginning with 'CONNECT' when a connection is established may be required to configure the modem to communicate with the PBX, depending on the modem.
- If the Baud Rate (bps) is set too high or too low the modem may not be able to communicate with the PBX, depending on the modem or PC. In this case, adjust the Baud Rate (bps) and reconnect to the PBX.

#### **Programming Manual References**

- 4.1 Software Modes
- 6.1 Connect



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# **Section 4**

## **Troubleshooting**

*This section provides information on troubleshooting and resetting the PBX.*

# 4.1 Troubleshooting

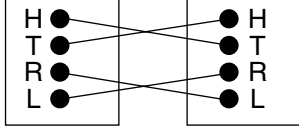
## 4.1.1 Installation

PROBLEM	PROBABLE CAUSE	SOLUTION
<ul style="list-style-type: none"> <li>Extension telephone does not function.</li> </ul>	<ul style="list-style-type: none"> <li>Faulty connection between the PBX and telephone.</li> <li>Faulty telephone.</li> <li>A telephone with an A-A1 relay is connected.</li> <li>Faulty extension card.</li> </ul>	<ul style="list-style-type: none"> <li>Plug the telephone into the same extension port using a short telephone cord. If the telephone functions, then the connection between the PBX and the telephone must be repaired.</li> <li>Plug the telephone into a known functioning extension port. If the telephone does not function, replace the telephone.</li> <li>Use a 2-wire cord. Set the A-A1 relay switch of the telephone to the "OUT" or "OFF" position.</li> <li>Exchange the card for a known functioning one.</li> </ul>
<ul style="list-style-type: none"> <li>Proprietary telephones (PTs) connected to extension jacks do not operate, but single line telephones (SLTs) do.</li> </ul>	<ul style="list-style-type: none"> <li>The H and L pins of extension jacks may have shorted.</li> </ul>	<ul style="list-style-type: none"> <li>Turn the Power Switch to the "OFF" position. Fix the shorted part, then turn the Power Switch to the "ON" position.</li> </ul>
<ul style="list-style-type: none"> <li>Noise heard through external pager (loudspeaker).</li> </ul>	<ul style="list-style-type: none"> <li>If using an amplifier, noise may be being introduced through the cable connecting the PBX and the amplifier or loudspeaker.</li> </ul>	<ul style="list-style-type: none"> <li>Use a shielded cable to connect the PBX and the amplifier or loudspeaker. A shorter cable will introduce less noise.</li> </ul>
<ul style="list-style-type: none"> <li>Audio (Music on Hold, Background Music) is distorted.</li> </ul>	<ul style="list-style-type: none"> <li>Audio level from the output of the audio source is too high.</li> </ul>	<ul style="list-style-type: none"> <li>Decrease the output level of the external audio source by using the volume control on the audio source.</li> </ul>
<ul style="list-style-type: none"> <li>Speed Dialing or One-touch Dialing does not function.</li> </ul>	<ul style="list-style-type: none"> <li>Incorrect programming.</li> </ul>	<ul style="list-style-type: none"> <li>Store the outside (CO) line access number (for example, 9, 81 through 88) at the beginning of the telephone number.</li> </ul>
<ul style="list-style-type: none"> <li>Improper operation other than the above.</li> </ul>		<ul style="list-style-type: none"> <li>Turn the Power Switch to the "OFF" position, and then back to the "ON" position.</li> </ul>

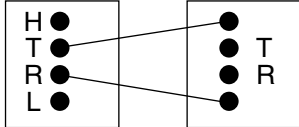


## 4.1.2 Connection

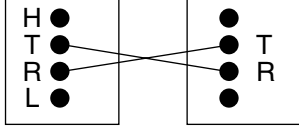
Telephone cord connecting the PBX and a proprietary telephone (PT):

Can you dial an extension?	No	<b>CAUSE</b>	<b>SOLUTION</b>
		<p>The T/R pins are connected to the H/L pins.</p>  <p style="text-align: center;">PBX                  Extension</p>	<p>Use the correct cord (the inner 2 wires are for T/R and the outer 2 wires are for H/L).</p>

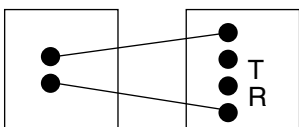
Telephone cord connecting the PBX and a single line telephone (SLT):

Can you dial an extension?	No	<b>CAUSE</b>	<b>SOLUTION</b>
		<p>The T/R pins are connected to the H/L pins.</p>  <p style="text-align: center;">PBX                  Extension</p>	<p>Use the correct cord (the inner 2 wires are for T/R).</p>

Telephone cord connecting the PBX and an SLT that is polarity-sensitive:

Can you dial an extension?	No	<b>CAUSE</b>	<b>SOLUTION</b>
		<p>The T and R pins are crossed over.</p>  <p style="text-align: center;">PBX                  Extension</p>	<p>Reverse the connections of the T/R pins.</p>

Telephone cord connecting an outside (CO) line and the PBX:

Can you dial out using an outside (CO) line?	No	<b>CAUSE</b>	<b>SOLUTION</b>
		<p>The outside (CO) line(s) is connected to the H/L pins.</p>  <p style="text-align: center;">Outside (CO) Line          PBX</p>	<p>Reconnect the outside (CO) line(s) to the T/R pins of the telephone jack using 2-conductor wiring.</p>

## 4.1.3 Operation

PROBLEM	PROBABLE CAUSE	SOLUTION
<ul style="list-style-type: none"> <li>When using the speakerphone on an analog proprietary telephone, no sound is heard.</li> </ul>	<ul style="list-style-type: none"> <li>The HANDSET/ HEADSET selector is set to the "HEADSET" position.</li> </ul>	<ul style="list-style-type: none"> <li>When the headset is not used, set the HANDSET/HEADSET selector to the "HANDSET" position.</li> </ul>
<ul style="list-style-type: none"> <li>The proprietary telephone (PT) does not ring.</li> </ul>	<ul style="list-style-type: none"> <li>The ringer volume is set to off.</li> </ul>	<ul style="list-style-type: none"> <li>Set to "HIGH" or "LOW".</li> </ul>
<ul style="list-style-type: none"> <li>During a power failure, PTs connected to jack numbers 01, 09, or 17 do not operate.</li> </ul>		<ul style="list-style-type: none"> <li>Only single line telephones (SLTs) can be used during a power failure. Disconnect the PT and connect an SLT.</li> </ul>
<ul style="list-style-type: none"> <li>Outside (CO) line calls cannot be made with a PT.</li> </ul>	<ul style="list-style-type: none"> <li>A flexible button on the PT has not been programmed to select an outside (CO) line.</li> </ul>	<ul style="list-style-type: none"> <li>Program the CO buttons. Refer to "1.1.61 Flexible Buttons" in the Feature Manual.</li> </ul>
<ul style="list-style-type: none"> <li>An SLT set to "tone" dialing mode cannot make calls.</li> </ul>	<ul style="list-style-type: none"> <li>There may be something wrong with the DTMF receiver.</li> </ul>	<ol style="list-style-type: none"> <li>Select "Enable" for DTMF receiver 1 and "Disable" for DTMF receiver 2 through system programming, "[107] DTMF Receiver Check".</li> <li>Try to make a call using a tone-type SLT connected to one of extension jacks 01–08.</li> <li>If you cannot make the call, the problem may have been caused by DTMF receiver 1. If the call can be made, go to step 4.</li> <li>Try DTMF receiver 2. Select "Disable" for DTMF receiver 1 and "Enable" for DTMF receiver 2 through system programming, "[107] DTMF Receiver Check", and make another call. If you cannot make the call, the problem may have been caused by DTMF receiver 2. If the call can be made, go to step 5.</li> <li>Check the other 4 DTMF receivers the same way through "[107] DTMF Receiver Check" in system programming.</li> </ol>

## 4.1.4 System Restart

If the PBX does not operate correctly, confirm that the operation/feature is being used correctly and refer to the Troubleshooting section if necessary. If the PBX still does not operate correctly, restart the PBX.

When the PBX is restarted:

- Calls on Hold are terminated.
- Calls on Exclusive Hold are terminated.
- Calls in progress are terminated.
- Automatic Callback Busy (Camp-on) is cleared.
- Call Park is cleared.
- Last Number Redial is cleared.
- Saved Number Redial is cleared.

No other data is cleared by System Restart.

1. To restart the PBX, turn the Power Switch to the "OFF" position, then turn the Power Switch back to the "ON" position.

**Note**

If the PBX still does not operate correctly, please see "4.1.5 System Reset with System Data Clear".

## 4.1.5 System Reset with System Data Clear

When the PBX does not operate correctly after restarting, you can clear the programming data stored in the PBX. The PBX will restart with the default settings.

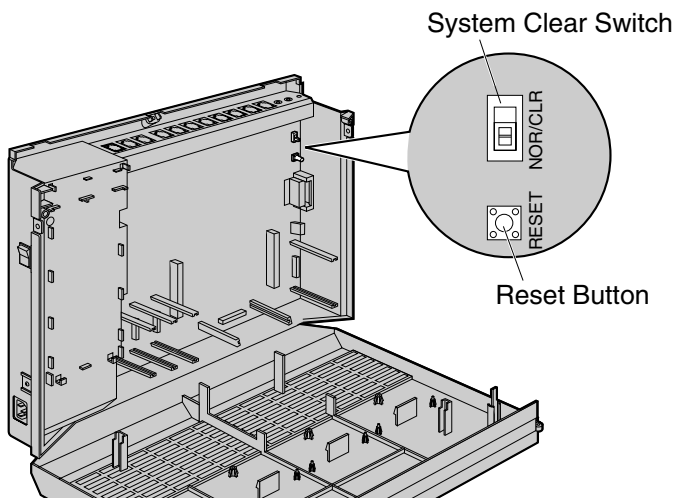
1. Make sure that all outside (CO) lines you use are connected to the PBX.
2. Slide the System Clear Switch to the "CLR" position.
3. Press the Reset Button, and then return the System Clear Switch to the "NOR" position before the power indicator stops flashing. (The power indicator will flash for about 5 seconds.)

### **CAUTION**

Before touching the System Clear Switch and Reset Button, put on a grounding strap.

### **Notes**

- After pressing the Reset Button, make sure to return the System Clear Switch to the "NOR" position before the power indicator stops flashing, otherwise the system data will not be cleared.
- The recorded OGMs for DISA and Built-in Voice Message are not cleared by the System Data Clear.



### **Programming Manual References**

- [999] System Data Clear
- 8.3 System Reset
- 8.4 System Data Clear

---

# ***Index***

## Numerics

- 2-Channel Voice Message Card (KX-TA82492) 50
- 2-Port Analog CO Line and 8-Port Hybrid Extension Card (KX-TA82481) 40
- 3-Port Analog CO Line and 8-Port Hybrid Extension Card (KX-TA82483) 38
- 3-Port Caller ID Card (KX-TA82493) 45
- 4-Port Doorphone Card (KX-TA82461) 47
- 8-Port Hybrid Extension Card (KX-TA82470) 43

## A

- About the Installation Manual 7
- About the Other Manuals 7
- Accessing PBX via Internal Modem 76

## B

- Basic System Construction 15
- Before Installing 22

## C

- Characteristics 18
- Connecting Doorbell or Door Chime 60
- Connecting Doorphones and Door Openers 56
- Connecting Extensions 53
- Connecting Extensions in Parallel 55
- Connecting Frame Ground 30
- Connecting Outside (CO) Lines 52
- Connecting Peripherals 61
- Connection 72, 81

## E

- Expandability of Outside (CO) Lines and Extensions 2

## G

- General Description 17
- Guide for KX-TA Maintenance Console 69

## I

- Installation 21, 80
- Installation Precautions 22
- Installing KX-TA Maintenance Console 71
- Installing KX-TA Maintenance Console on a PC 70
- Installing Optional Service Cards 37
- Installing Surge Protector 34
- Installing the Advanced Hybrid System 24
- Installing the USB Driver 72

## L

- Location of Optional Service Cards 37

## M

- Main Unit 15
- Maximum Cabling Distance of Extension Wiring (Twisted Cable) 53
- Maximum Cards and Terminal Equipment 19
- Message Expansion Card for DISA OGMs (KX-TA82491) 48
- Mounting on a Concrete or Mortar Wall 32

- Mounting on a Wooden Wall 31

## N

- Names and Locations 25

## O

- Opening/Closing Covers 26
- Operation 82

## P

- Power Failure Connections 66

## S

- Safety Installation Instructions 22
- Securing Cords 28
- Serial Interface Connection 72
- Setting the Password and Password Security 70
- Specifications 17
- Starting KX-TA Maintenance Console for the first time 75
- Starting the Advanced Hybrid System 67
- System Capacity 19
- System Components Table 2
- System Connection Diagram 16
- System Data 19
- System Highlights 14
- System Outline 13
- System Requirements 70
- System Reset with System Data Clear 84
- System Restart 83

## T

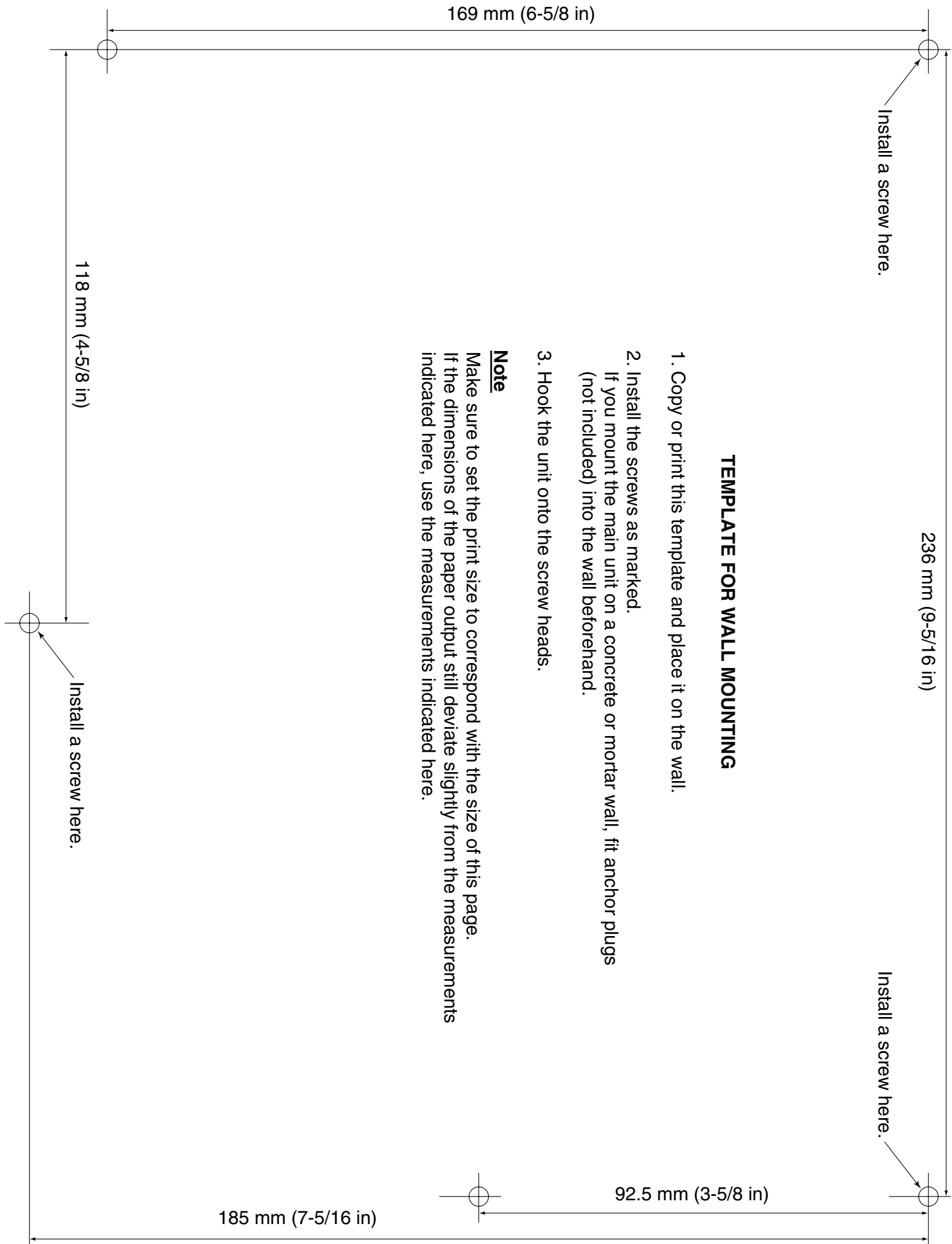
- Troubleshooting 79

## U

- Unpacking 24

## W

- Wall Mounting 31
- Wiring Precautions 22



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