NEC

Xen Topaz

System Hardware Manual

NEC Business Solutions Ltd.
Document No.:8846
Release 1.1
September, 2004

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Disclaimer

NEC shall not be liable for any direct, indirect, consequential or incidental damages about the use of this equipment, manual or any related materials.

The information in this technical manual is advisory in nature and is subject to change. NEC may make improvements and changes in the products described in this manual without notice.

Changes will be periodically made to the information in the new editions. Efforts have been made to ensure that the contents of this manual are correct. Should you find any error, NEC welcomes your comments to improve our communications. Please contact NEC on 1800 036 136.

Contents of this manual are subject to change without prior notice at the discretion of NEC Business Solutions Ltd.

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Regulatory Information

CHAPTER 1

SECTION 1
ELECTROMAGNETIC INTERFERENCE (EMI)

WARNING

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

SECTION 2
INCIDENCE OF HARM

If the System is malfunctioning, it may also be causing harm to the telephone network. The Telephone system should be disconnected until the source of the problem can be determined and until repair has been made. If this is not done, the Network Provider may temporarily disconnect the service.

SECTION 3
HEARING AID COMPATIBILITY

The NEC Multiline Terminals that are provided for this system are hearing aid compatible. The manufacturer of Single Line Telephones for use with the system must provide notice of hearing aid compatibility to comply with ACA Technical Standards.

SECTION 4
SERVICE REQUIREMENTS

WARNING

This equipment must only be installed and maintained by service personnel.

In the event of equipment malfunction, all repairs must be performed by an authorised dealer of NEC Business Solutions Ltd or by NEC Business Solutions Ltd. It is the responsibility of users requiring service to report the need for service to one of NEC Business Solutions Ltd authorised agents or to NEC Business Solutions Ltd.

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SECTION 5
COMPLIANCE INFORMATION

This equipment has been tested to comply with all relevant ACA Technical Standards.

The Xen Topaz KSU must be permanently connected to protective earth, via the earth terminal inside the KSU.

SECTION 6
CONNECTION REQUIREMENTS FOR EARTHING THE TOPAZ KSU

Because this Topaz KSU has been ACA approved as an Earthed-SELV Customer Switching System for connection to a telecommunications network, the KSU Earth terminal (on the 308M System Mainboard) **MUST** be permanently connected to Earth by connecting a minimum of 2.5mm2 green/yellow conductor cable.

This cable **MUST** be connected between a Multiple Earth Neutral (MEN) Bonding Bar at the nearest convenient mains Switch Board to the KSU. This cable must serve no other purpose than installing the KSU.

CAUTION: If this cable is not installed or requires disconnection, then the telecommunication network connection(s), namely CO and/or ISDN, must be disconnected first from the KSU.

Liability for this installation rests solely with the licensed installer/dealer. It is recommended that the installer provide their label and it is to be placed in the Main Switch Board, certifying that the installation complies with the safety earthing installation manual instructions for the Topaz KSU Section 3.1.

(**Technical References**: AS/NZS 60950:2000, ACIF S009:2001. See Protective Earthing Conductor requirements.)

SECTION 7
VOICE ANNOUNCEMENT/ MONITORING

CAUTION

The use of monitoring, recording or listening devices to eavesdrop, monitor, retrieve or record telephone conversations or other sound activities, whether or not contemporaneous with its transmission may be illegal in certain circumstances under federal or state laws. Legal advise should be sought prior to implementing any practice that monitors or records any telephone conversation. *The telecommunications (Interception) Act* 1979 (Cth), *The telecommunications Act* 1997, *The Privacy Act* 1988 and State and Territory Listening Devices Legislation are all relevant. Some federal and state laws require some form of notification to all parties to the telephone conversation, such as using a beep tone or other notification methods, or require the consent of all parties to the telephone conversation, prior to monitoring or recording a telephone conversation. Some of these laws incorporate strict penalties. Section 6 of the Industry Guidelines recommend pre-recorded messages or verbal notification to alert callers

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that the calls may be monitored:

For example: “Your call may be listened to and recorded for quality and coaching purposes. Please tell the consultant if you don’t want this to happen.”

Section 6 of the Industry Guidelines also make recommendations in relation to notifications in writing.

SECTION 8
MUSIC ON HOLD

IMPORTANT NOTE

In accordance with Australian Copyright Law, a license may be required from The Australian Performing Right Association Limited (APRA), or other similar organisation, when radio or TV broadcasts are transmitted through the Music On Hold feature of this telecommunication system. NEC Business Solutions Ltd hereby disclaims any liability arising out of the failure to obtain such a license.

SECTION 9
BATTERY DISPOSAL AND SAFETY

This system includes the batteries listed below. When disposing of these batteries, KSUs and/or cards, you must comply with applicable Federal and State regulations regarding proper disposal procedures.

IMPORTANT SAFEGUARDS FOR BATTERY DISPOSAL

The incineration, landfilling or mixing of nickel-cadmium or sealed lead batteries with the municipal solid waste stream is PROHIBITED BY LAW in most areas. Contact your local solid waste management officials for other information regarding the environmentally sound collection, recycling and disposal of the battery.

Nickel-Cadmium or sealed lead batteries must be returned to a Federal or State approved nickel-cadmium or sealed lead battery recycler. This may be where the batteries were originally sold or a local seller of automotive batteries. Contact your local waste management officials for other information regarding the environmentally sound collection, recycling and disposal of the battery contained in this product.

Table 1-1: Battery Types and Quantities

Unit Name	Type of Battery	Quantity
IP2AT-924M KSU	Lithium	1
DX2E-32i/NXE Battery Box	Lead Acid (User supplied)	2/4

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CAUTION

Danger of explosion if batteries are incorrectly installed. Replace only with the same or equivalant type of battery as indicated throughout this manual.

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About This Manual

CHAPTER 2

SECTION 1
SYMBOLS IN THIS MANUAL

The meaning of each Symbol used in this manual is illustrated below.

Symbol	Description
	This symbol informs you about additional notes.
	This symbol alerts you to important information.
	This symbol recommends you to refer the related parts.

CAUTION

The system does NOT support the Power-On Maintenance.
DO NOT POWER ON until all installations have been completed.

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The Components

CHAPTER 3

SECTION 1

LIST OF COMPONENTS

Item	Description	QTY	Note
IP2AT-924M KSU	Main KSU	1	Initially equipped : -CPU with Main Software -Power Supply (110V/240V) -External Backup Battery Charger -SLT Ringer -3 Trunks + 8 Hybrid Ext. I/F - 1 MOH/BGM Music Input - 1 External Paging Input -1 Power Failure Transfer Circuit -2 mounting spaces for 308E/008E -1 slot for 2PGDU -1 slot for EXIFU -1 connector for DSPDB
IP2WW-OPBOX	Additional Box for Optional I/F Cards	1	Joint to 924M KSU. 2 slots for Optional I/F Cards.
IP2AT-308E-A1	3 Trunks + 8 Hybrid Extensions I/F	2	Installed into 924M KSU. 1 Power Failure Transfer Circuit is provided.
IP2WW-EXIFU-A1	Expansion Connectors, SMDR I/F, LAN Port, CF Slot	1	Installed into 924M KSU.
IP2WW-EXIFU-B1	SMDR I/F		
IP2WW-2PGDU-A1	2 Doorphone I/F, 2 Door Unlock Relay, 2 Audio Input/Output I/F (ExMOH / BGM / 2 External Paging)	1	Installed into 924M KSU.
IP1E-DSPDB-A1	16ch VRS, additional DSP I/F	1	Installed into 924M KSU.
IP1E-CF-B1	Compact Flash Card (8ch Voice Mail)	1	Installed onto DSPDB-A1.
IP1WW-2BRIU-S1	2 BRI (Euro-ISDN) I/F	2	Installed into OPBOX.
IP1WW-4BRIU-S1	4 BRI (Euro-ISDN) I/F		Installed into OPBOX.
IP2AT-6TD TEL (BK)	6 Keys, Standard type Key Telephone	24	
IP2AT-6TXD TEL (BK)	6 Keys, Display type Key Telephone		
IP2AT-12TD TEL (BK)	12 Keys, Standard type Key Telephone		
IP2AT-12TXD TEL (BK)	12 Keys, Display type Key Telephone		
IP2AT-64BD DSS (BK)	64 Keys DSS Console	3	Connected to the Extension Port.

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Item	Description	QTY	Note
IP2AT-24BDL DLS (BK)	24 Keys DLS Console	24	Connected to the Display type Key Telephone
DP-D-1D DOORPHONE	Doorphone Box	2	Connected to 2PGDU
DX2E-32i/NX7E Battery Box	External Backup Battery Box	1	Connected to the Power Supply of the 924M KSU.
DX.E ABB. CARD SET	Stand type ABB Card Set (20pcs)	As needed.	

SECTION 2
KSUs

2.1 924M KSU

This is the main cabinet. The following features are supplied.

- CPU
- Main Software
- Power Supply (110V / 240V)
- External Backup Battery Charger Circuit
- SLT Ringer
- 3 Analogue Trunk Ports
- 8 Hybrid Extension Ports
- 1 Power Failure Transfer Circuit
- 1 MOH/BGM Music Input
- 1 External Paging Output
- 2 mounting spaces for 308E/008E card
- 1 slot for 2PGDU card
- 1 slot for EXIFU-A1/B1 card

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- 1 connector for DSPDB card
- 1 connector for OPBOX

The on-board DSPDB provides :

- 16 Tone Receivers (DTMF/Busy Tone/Caller-ID)/Caller-ID Senders
- 64 Tone Senders (DTMF/Service Tone)
- 32ch Conference Resources (8ch x 4)

SECTION 3
SYSTEM OPTIONS

3.1 OPBOX

This is the Option Box for optional interface cards. An OPBOX can be attached to the right hand side of each KSU. One OPBOX provides up to 2 universal slots.

3.2 32i/NX7E Battery Box

This is the external backup battery box to supply DC power to the system when the AC power has failed. It is connected to the Power Supply for each KSU. The battery itself must be prepared by your local supplier.

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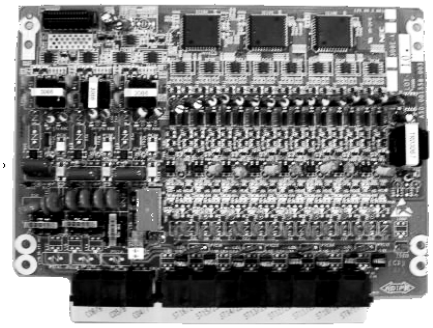
3.3 ABB CARD SET

This is a Stand-Type Abbreviated Dialling Card set, and fixed to the rear of each Key Telephone. This set contains 20 pieces.

SECTION 4
SYSTEM EXPANSION INTERFACE CARDS

4.1 308E-A1

This is the expansion interface card, and is installed into 924M/924ME KSU. Up to 3 analogue trunk and 8 hybrid extension ports are mounted per a card. Also, 1 Power Failure transfer circuit is equipped on this card (1st Trunk Port -> 8th Extension Port). Up to 2 308E/008E cards can be installed per a KSU.



4.2 008E-A1

This is also an expansion interface card and is installed into 924M KSU. Up to 8 hybrid extension ports are mounted per a card. Up to 2 308E/008E cards can be installed per a KSU.

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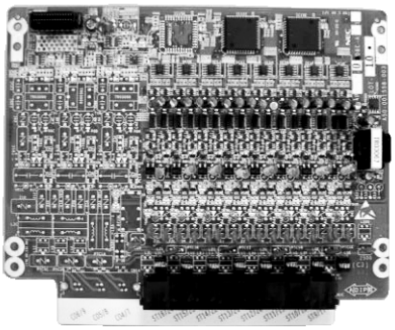

SECTION 5
OPTIONAL INTERFACE CARDS (INSTALLED INTO THE KSU)

5.1 EXIFU-A1

This expansion interface card is installed into the "EXIFU" slot of the 924M KSU to provide the following functions. Either the EXIFU-A1 or EXIFU-B1 can be installed in 924M KSU.

- 1 Ethernet Port (10/100M)
  Used for SMDR Reports, Alarm Reports, PC Programming (PCPro and WebPro), and Main Software Upgrade.
- 1 Serial Port (D-Sub 9 Pin)
  Used for SMDR Reports, Alarm Reports, PC Programming (PCPro), and Modem Connection.
- 1 CF Slot
  For storing System Data Backup and Restore, and Main Software Upgrade.
- 2 System Expansion Connectors (RJ45)
  Not Used.

5.2 EXIFU-B1

This expansion interface card is installed into the "EXIFU" slot of the 924M KSU to provide the following functions. Either the EXIFU-A1 or EXIFU-B1 can be installed in 924M KSU.

- 1 Serial Port (D-Sub 9 Pin)
  Used for SMDR Reports, Alarm Reports, PC Programming (PCPro), and Modem Connection.

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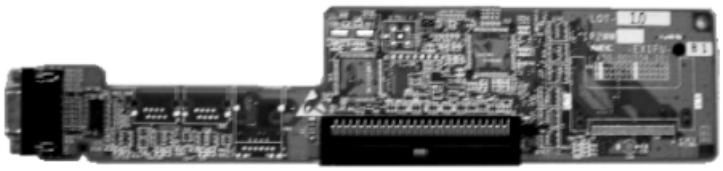


5.3 2PGDU-A1

This is the Doorphone/Paging/Audio interface card, and is installed into the "PGDU" slot in 924M KSU. This card provides :

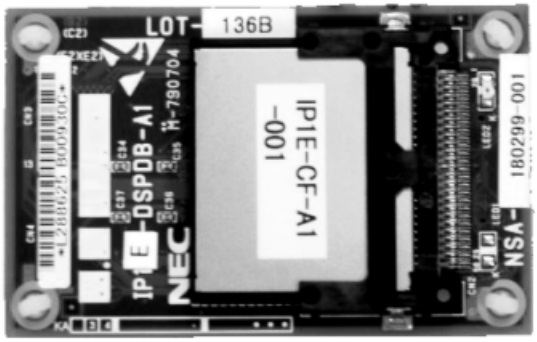
- 2 Doorphone circuits
- 2 Relay contacts for Door Unlock/Audio Control
- 2 Audio Jacks

The NEC doorphone DP-D-1D unit is supported.

This card provides 2 audio jacks in order to connect External Paging Speaker, External Music On Hold and BGM audio sources, of which two items may be selected simultaneously (assigned by software setting).

5.4 DSPDB-A1

This is the additional DSP resource with VRS (Voice Response System) card, and is installed into the 924M KSU. This card provides up to 16 Tone Receivers (DTMF/Busy Tone/Caller-ID) / Caller-ID Senders, and 16ch VRS functions which is provided by the CF (Compact Flash) located on DSPDB.



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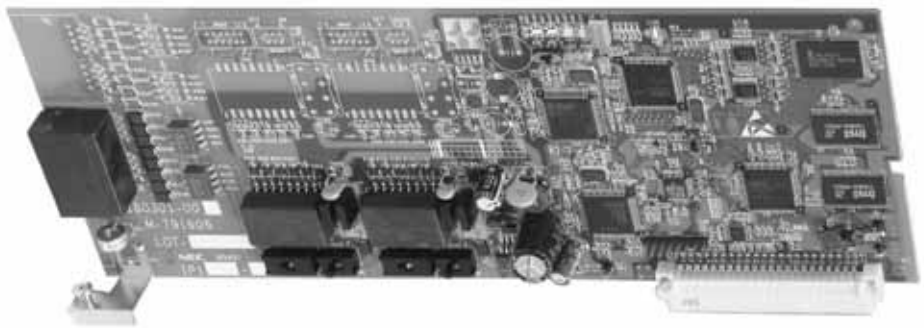
5.5 CF-B1

This is the CF (Compact Flash) card, and is installed to the DSPDB-A1 (replaced from current CF to CF-B1) This card provides 16ch VRS with 8ch Voice Mail function.

SECTION 6
OPTIONAL INTERFACE CARDS (INSTALLED INTO OPBOX)

6.1 2/4BRIU-S1

This is the Euro-ISDN BRI (Basic Rate Interface) card, and is installed into the OPBOX. Up to 2 (2BRIU) or 4 (4BRIU) 2ch circuits (2B+D) configured as T-Bus or S-Bus are provided. Up to 2 cards may be installed.



- 2 or 4 BRI Connections per card (RJ45)
- T or S Configuration
- Power Feeding for S-Bus Devices
- 100 Ω Line Terminations

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SECTION 7
KEY TELEPHONES

7.1 12TXD TEL

This hybrid Multiline Terminal has 12 Line Keys (with 2-colour LEDs), 10 Programmable Function Keys (with 1-colour LEDs), built-in handsfree, a large LED to indicate incoming calls and messages, and a 2-line 16-character Liquid Crystal Display (LCD). It also incorporates height adjustment, built-in wall mount facility and supports one DLS Console. It is available in black.

A maximum of 24 12TXD terminals can be installed in the Xen Topaz system. The combined total of all terminals that can be installed is 24.

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7.2 12TD TEL

This hybrid Multiline Terminal has 12 Line Keys (with 2-colour LEDs), 10 Programmable Function Keys (no LED indication), intercom talkback function, and a large LED to indicate incoming calls and messages. It also incorporates height adjustment, built-in wall mount facility. It is available in black.

A maximum of 24 12TD terminals can be installed in the Xen Topaz system. The combined total of all terminals that can be installed is 24.

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7.3 6TXD TEL

This hybrid Multiline Terminal has 6 Line Keys (with 2-colour LEDs), 10 Programmable Function Keys (with 1-colour LEDs), built-in handsfree, a large LED to indicate incoming calls and messages, and a 2-line 16-character Liquid Crystal Display (LCD). It also incorporates height adjustment, built-in wall mount facility and supports one DLS Console. It is available in black.

A maximum of 24 6TXD terminals can be installed in the Xen Topaz system. The combined total of all terminals that can be installed is 24.

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7.4 6TD TEL

This hybrid Multiline Terminal has 6 Line Keys (with 2-colour LEDs), 10 Programmable Function Keys (no LED indication), intercom talkback function, and a large LED to indicate incoming calls and messages. It also incorporates height adjustment, built-in wall mount facility. It is available in black.

A maximum of 24 6TD terminals can be installed in the Xen Topaz system. The combined total of all terminals that can be installed is 24.

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SECTION 8
OPTIONAL TERMINALS

The DLS Console installs onto a Display Multiline Terminal and provides 24 Programmable Function Keys (with 2-colour LEDs). These 24 keys can be programmed as Direct Station Selection (DSS) with Busy Lamp Field (BLF), function keys, one-touch keys, or Line Keys.

A maximum of 24 DLS consoles can be installed in the Xen Topaz system, one per display Multiline Terminal.

8.1 64BD DSS Console

The Attendant Console connects to a hybrid extension port and provides 64 Programmable Function Keys (with 1-colour LEDs) and 14 dedicated function keys. The 64 programmable keys can be assigned as Direct Station Selection (DSS) with Busy Lamp Field (BLF), function keys, or one-touch keys.

A maximum of 3 DSS consoles can be installed in the Xen Topaz system and a terminal can have up to 3 DSS consoles assigned.

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8.2 DP-D-1D DOORPHONE

The NEC DP-D-1D unit is the doorphone which connects to the 2PGDU card of the Topaz system. This unit includes a handsfree microphone and speaker and a call button, and is suitable for installing in a sheltered outdoor location.

A maximum of 2 doorphone units can be installed in the Xen Topaz system. Each doorphone can be associated with a door lock release mechanism.

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Installing the Main KSU

CHAPTER 4

SECTION 1
BEFORE INSTALLING THE KSUS

1.1 General Precautions

- To avoid shock or damage, do not plug in or turn the system power on before completing the installation process.
- Avoid working with the KSU during electrical storms.
- Use only commercial AC power to prevent shock or fire.
- Use the power cord supplied for the KSU.
- Do not bundle AC Power cords together, the cords may over heat.
- Make sure the KSU has proper Earth ground connected to the earth terminal.

1.2 Unpacking

Unpack the KSU and check it against the following list. Inspect for physical damage.

Items	List of Contnets	QTY
924M KSU	924M KSU	1
	AC Power Cord	1
	Screws (M4.1x25)	4
	Template for Wall Mounting	1

1.3 Preparations

- Make sure the necessary tools (Screw Driver Set, Pliers Set, etc) are propertied.
- Make sure you have a building plan showing common equipment, extensions, the telecom demarcation, and earth ground location. The installation site must meet the following Site / Environmental Requirements.

1.4 Site Requirements

- The system should be **wall-mounted only**. Ensure that enough space is available to allow the installation of KSUs and/or OPBOX.
- A dedicated 110/240VAC circuit located within 2 meters of the KSU is required. A separate dedicated AC outlet is necessary for each KSU.

1.5 Environmental Requirements

Meeting established environmental standards maximizes the life of the system. Be sure that the site is not :

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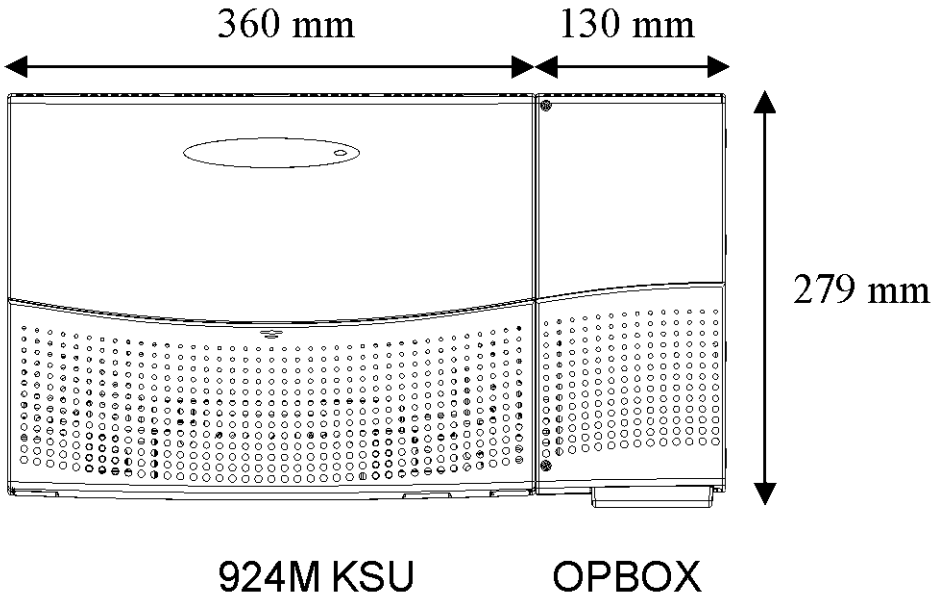
- In direct sunlight or in hot, cold or humid places.
- In dusty areas or in areas where sulphuric gases are produced.
- In places where shocks or vibrations are frequent or strong.
- In places where water or other fluids comes in contact with the equipment.
- In areas near high-frequency machines or electric welders.
- Near computers, telexes, microwaves, air conditioners, etc.
- Near radio antennas (including shortwave)

SECTION 2
INSTALLING THE KSUS

2.1 KSU/OPBOX Size

The dimensions of the main KSU (924M) and OPBOX, are shown below.



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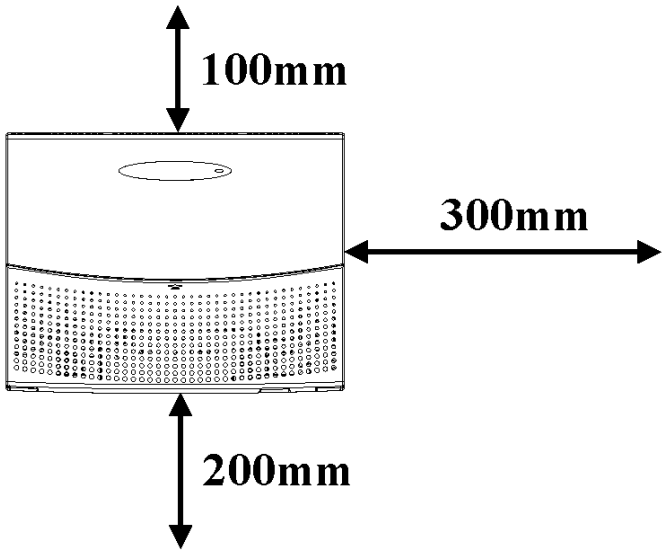
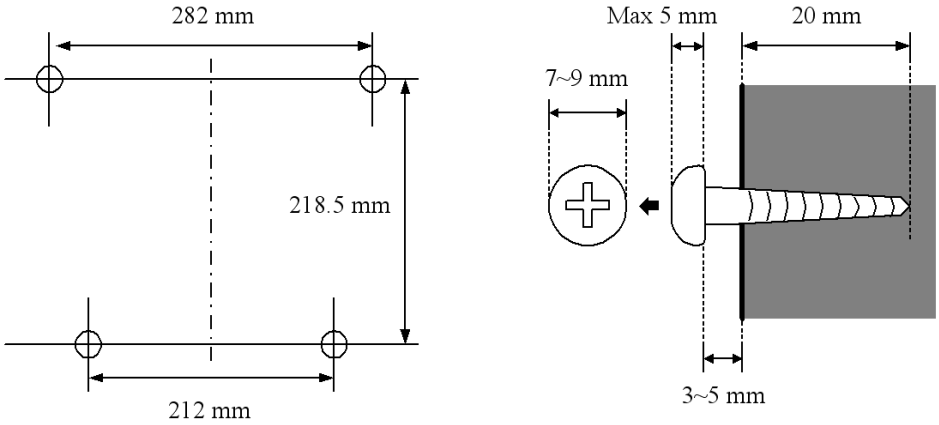
2.2 Secure the KSU to the Wall

The main KSU (924M) must be mounted onto the wall. Before installing, refer to the appropriate spacing as illustrated below.



2.3 Wall-wounting the Main KSU

1. Place the attached template on the wall to mark the four screw positions.
2. Install four screws into the wall. The screw heads must remain out about 3~5 mm.



- Wall-Mounting Screws (M4.1x25:4 pcs) are included with each KSU.
- The screw diameter is 4~4.5mm.

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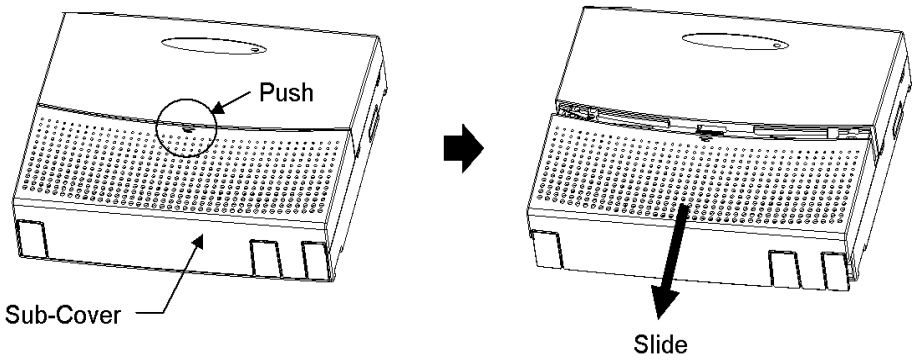
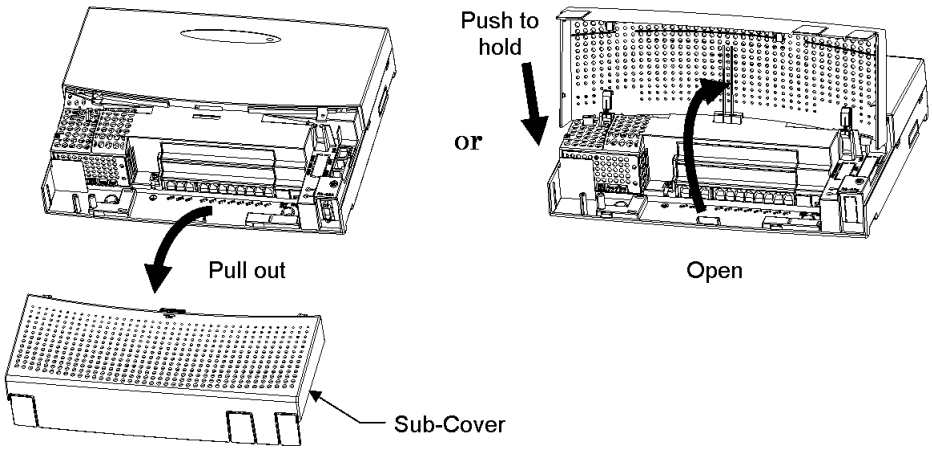
3. Push the center of Sub-Cover and slide the Sub-Cover down and outward.



4. Pull out or open & hold the Sub-Cover.



5. Hook the KSU on the screw heads, and fasten screws.

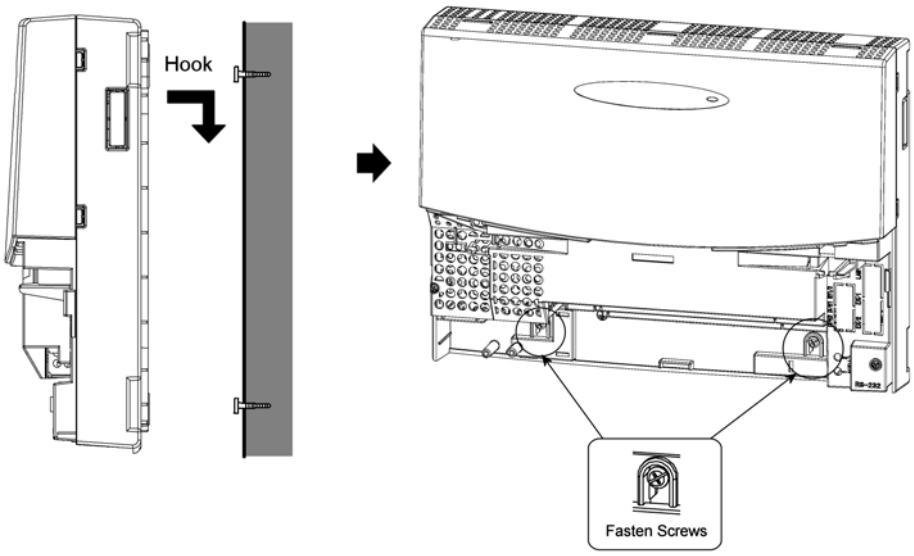


Figure 4-1:

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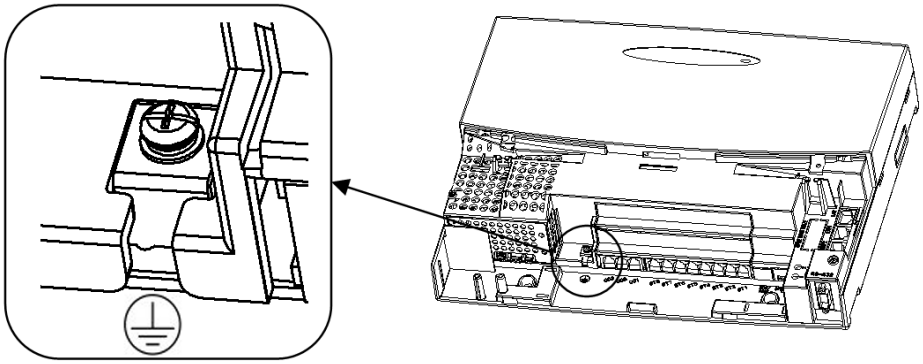
SECTION 3
GROUNDING & ACD CABLING

3.1 Grounding the KSU

The Earth terminal is located near the Power Supply on each KSU, indicated by the symbol ⏚. The Sub-Cover must be opened in order to access to it.

1. Connect the Earth terminal to the verified Earth Ground point using 16AWG (2.5mm^2) wire.



• The grounding cable is supplier-provided (not attached to the system).

CONNECTION REQUIREMENTS FOR EARTHING THE TOPAZ KSU

Because this Topaz KSU has been ACA approved as an Earthed-SELV Customer Switching System for connection to a telecommunications network, the KSU Earth terminal ⏚ (on the 308M System Mainboard) **MUST** be permanently connected to Earth by connecting a minimum of 2.5mm2 green/yellow conductor cable.

This cable **MUST** be connected between a Multiple Earth Neutral (MEN) Bonding Bar at the nearest convenient mains Switch Board to the KSU. This cable must serve no other purpose than installing the KSU.

CAUTION: If this cable is not installed or requires disconnection, then the telecommunication network connection(s), namely CO and/or ISDN, must be disconnected first from the KSU.

Liability for this installation rests solely with the licensed installer/dealer. It is recommended that the installer provide their label and it is to be placed in the Main Switch Board, certifying that the installation complies with the safety earthing installation manual instructions for the Topaz KSU Section 3.1.

(**Technical References**: AS/NZS 60950:2000, ACIF S009:2001. See Protective Earthing Conductor requirements.)

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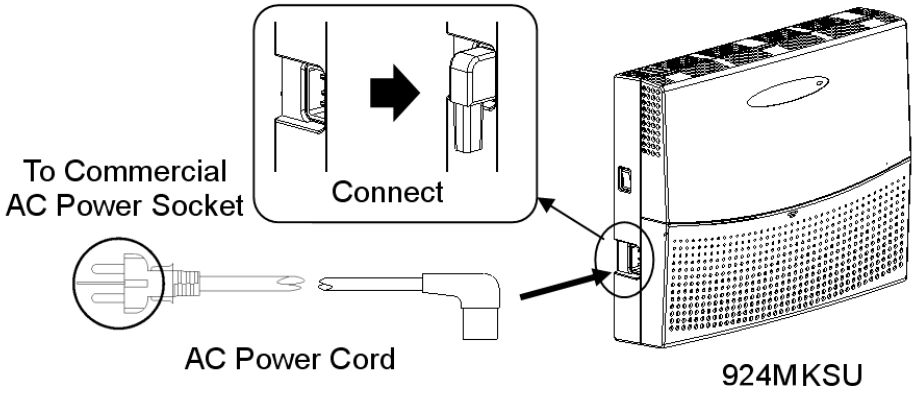
3.2 AC Power Cord

The Power Switch and AC Power Inlet are located at the left hand side of the KSU. The AC power cord is attached to the KSU, and is connected to the AC Inlet and the commercial AC power socket.

Before connecting the AC power cord, make sure :

- the Power Switch at the left hand side of the KSU is turned OFF.
- the Power Switch at the commercial AC Power socket is turned OFF.
- the AC Plug fits the commercial AC power socket. The plug adapter is necessary if it does not fit.



- The KSU must have its own Commercial AC Power Socket.
- DO NOT POWER ON until all installations have been completed.
- The power switch of the 924M KSU switches the DC power of the PSU, it does not isolate mains power from the PSU. Always switch off the mains power from the mains outlet prior to servicing the unit.

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Trunk/Extension Cabling and Installing the Expansion PCBs

CHAPTER 5

SECTION 1
TRUNK EXTENSION CABLING

1.1 General

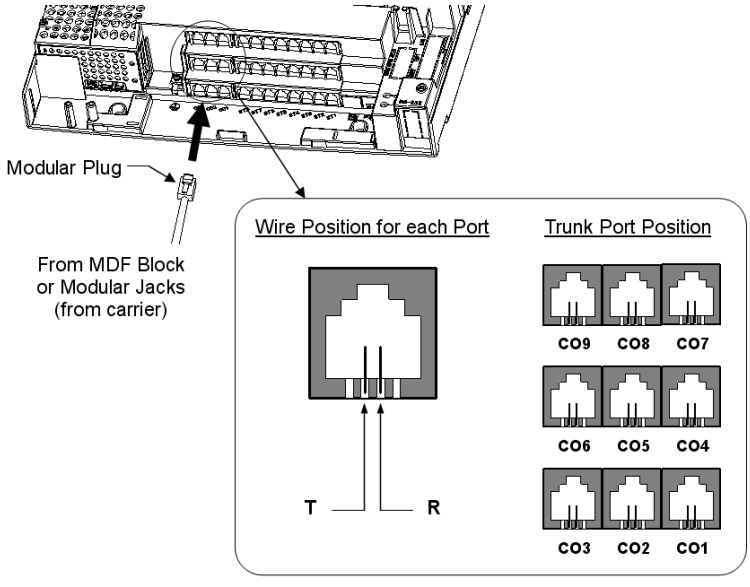
The system provides "RJ11" Modular Jacks for Analog Trunk and extension connection.

1.2 Precautions for Cabling

- Do not wire the cable with an AC cable, computer, etc.
- Do not run the cable near the high frequency generating device.
- Use cable protectors in case the cables are run on the floor.
- Aerial distribution wiring is not allowed.
- Trunks must be installed with lighting protectors.

1.3 Trunk Cabling

1. Open the Sub-Cover.
2. Insert the modular plugs of the trunk line cords (2-wire) into the Analog Trunk Modular Jacks on the system.



The Lighting Protectors **MUST BE INSTALLED** on each Trunk.

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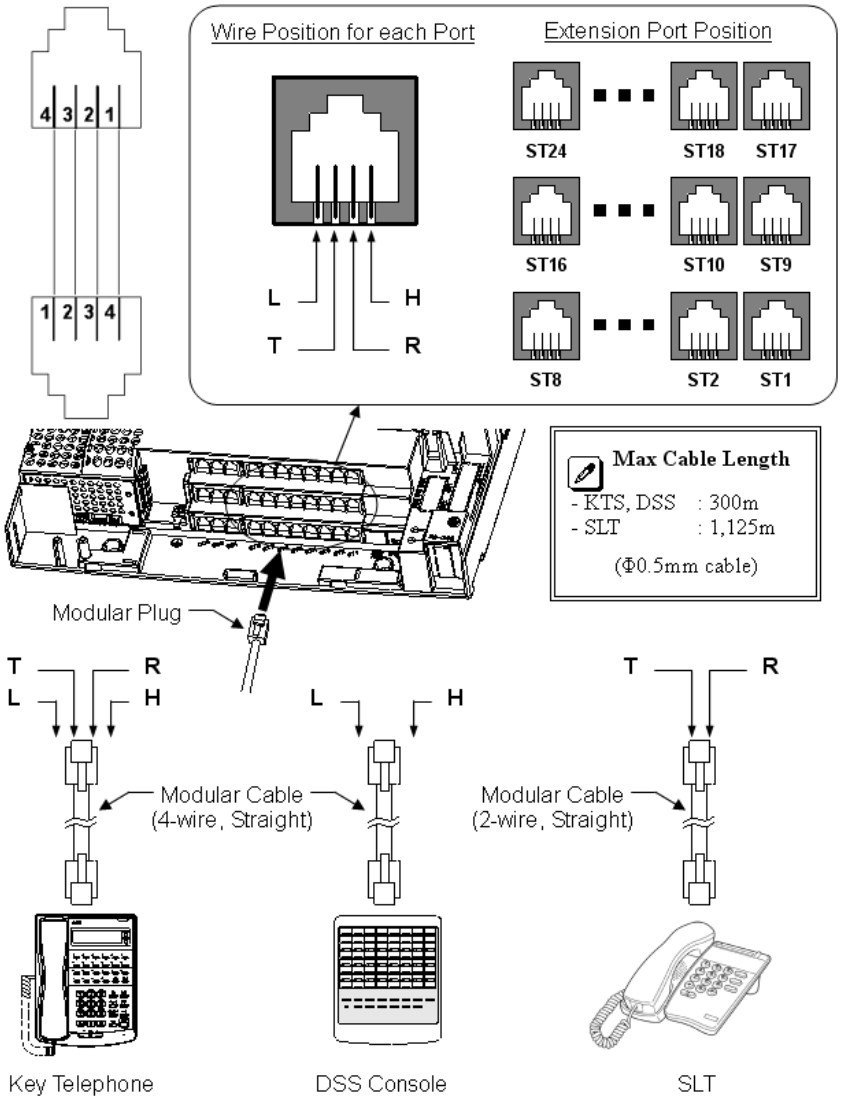
1.4 Extension Cabling

1. Open the Sub-Cover.
2. Insert the modular plugs of the extension line cords (2-wire / 4-wire) into the Extension Modular Jacks on the system.



IMPORTANT

1. Both the inner pair (voice) and outer pair (data) of the hybrid multiline terminal cabling are polarity conscious.
2. When installing an analogue device onto a hybrid extension port, use only a 2-wire connection to the centre pair of pins. Do not connect all 4 wires from the hybrid port to the analogue device. Some analogue devices such as facsimile machines and modems, use a "Mode 3" pin configuration (i.e., pin 2 connected to pin 3 and pin 4 is connected to pin 5). Connecting all four wires to such devices could result in a non-functioning port or damage to the analogue device.

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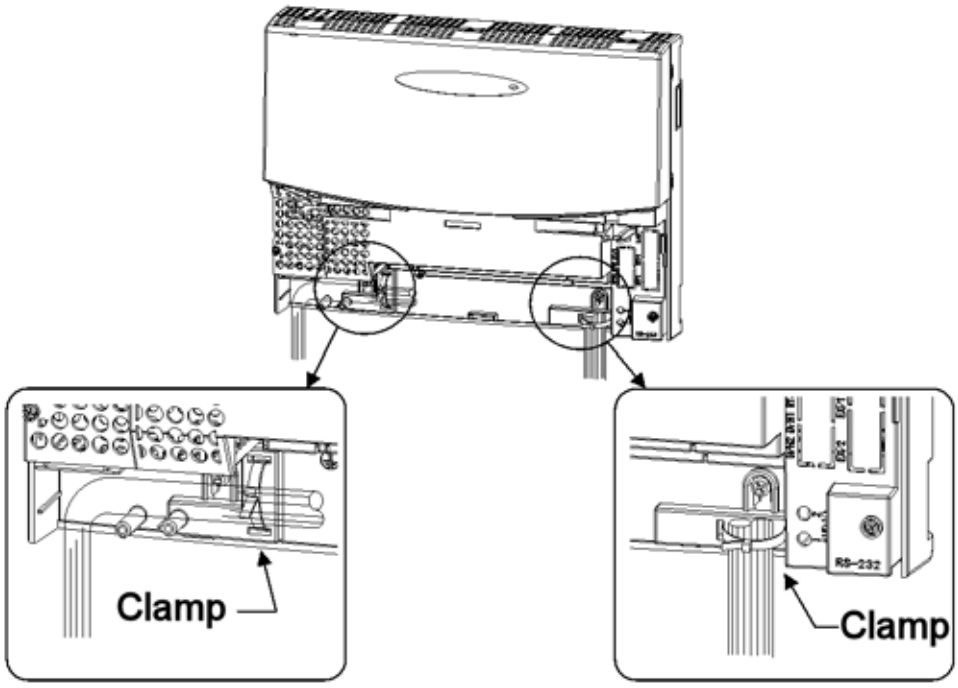
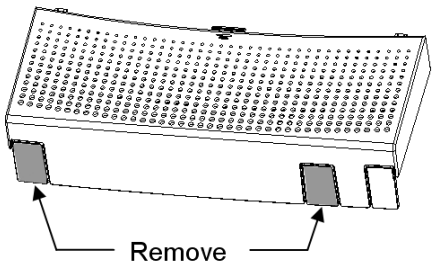
1.5 Cable Routing and Clamping

1. There are two exits (Right and Left) for cables. Clamp and route cables to outside.



2. Use a blunt object to remove the plastic filler piece(s) at the Sub-Cover for Cables.



3. Replace the Sub-Cover.

SECTION 2
INSTALLING THE EXPANSION PCBS

2.1 General

In order to expand the system capacity, up to two 308E/008E Expansion PCBs can be installed in the KSU.

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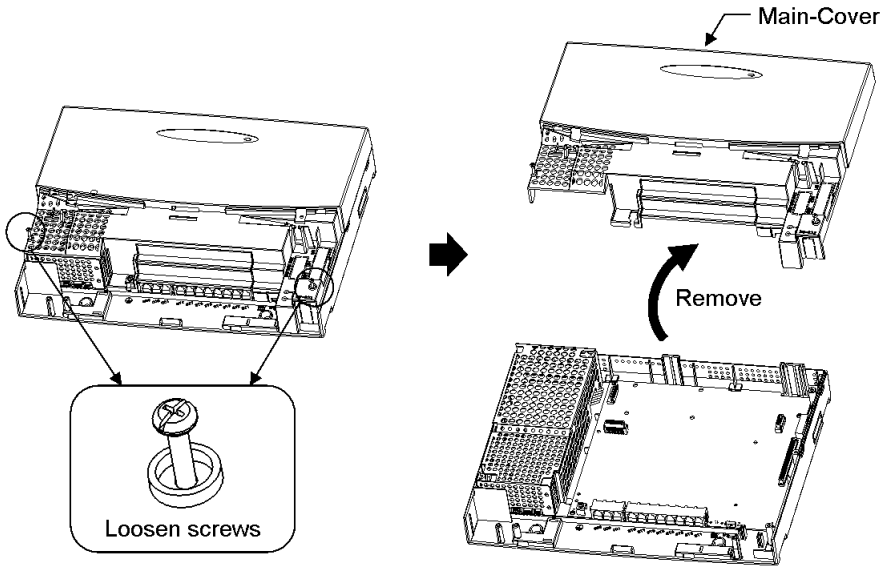
2.2 Unpacking

Unpack the 308E/008E and check it against the following list. Inspect for physical damage.

Items	List of Contents	QTY
308E-A1	308E-A1 PCB	1
	Nylon Spacers	2
	Metal Spacers	2
	Screws	2
008E-A1	008E-A1 PCB	1
	Nylon Spacers	2
	Metal Spacers	2
	Screws	2

2.3 Installing the 308E/008E PCB

1. Open and pull out the Sub-Cover.
2. Loosen two screws and remove the Main-Cover.



3. Insert two Nylon-Spacers into the specified holes, and fasten two Metal-Spacers into the specified holes. (Both Nylon and Metal

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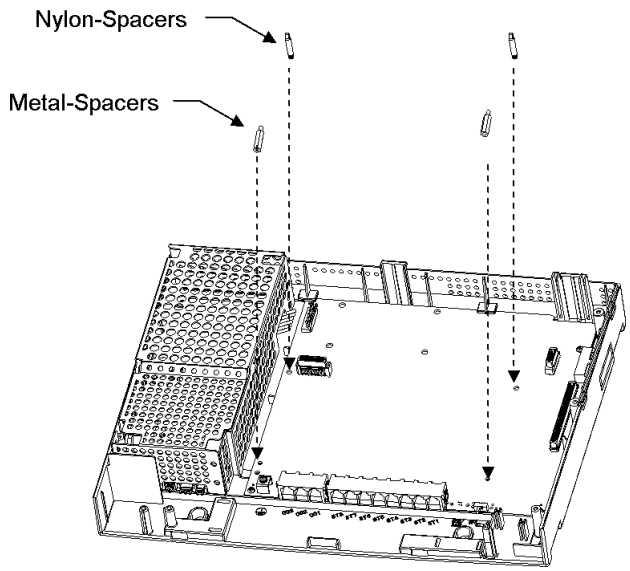
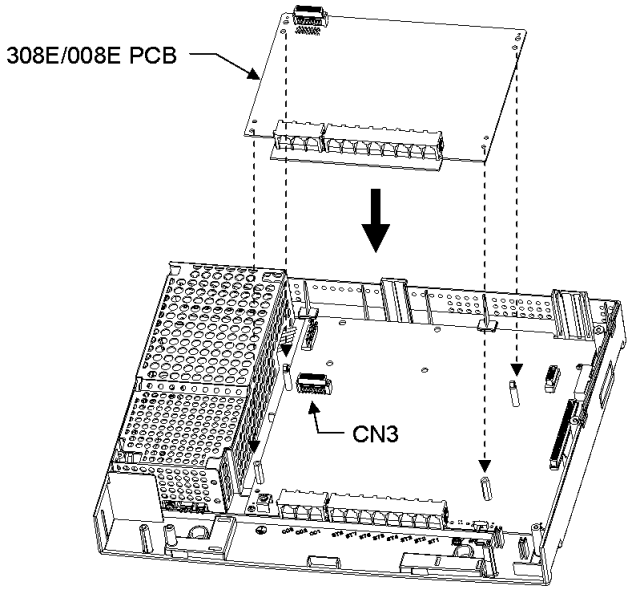
Spacers are provided with 308E/008E)



4. Mount the 308E/008E PCB to the "CN3" Connector.



5. In case a second PCB is installed, repeat Step-3 and 4. (Refer to

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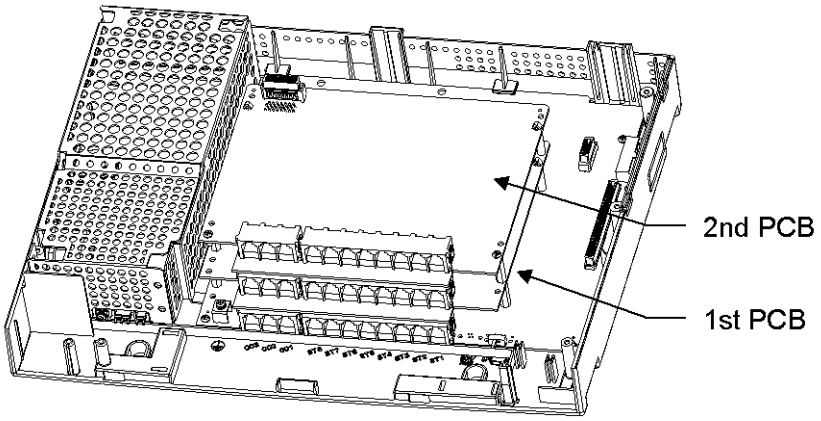
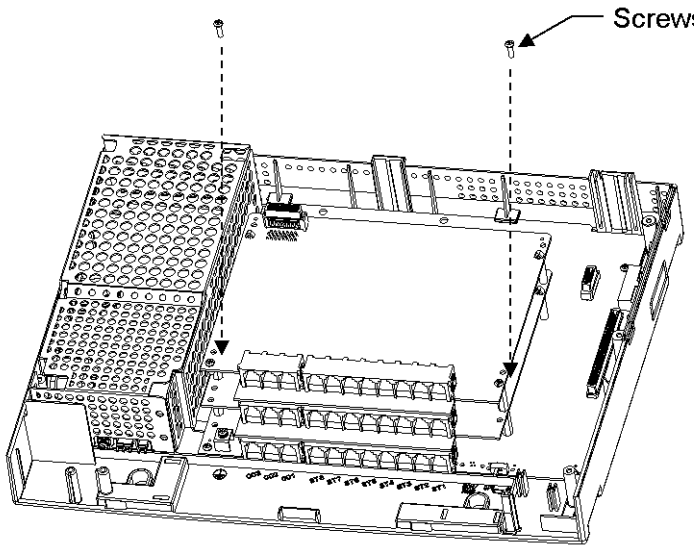
the previous page)



6. Fasten two screws to fix the expansion PCB at the top of 308E/ 008E PCB.



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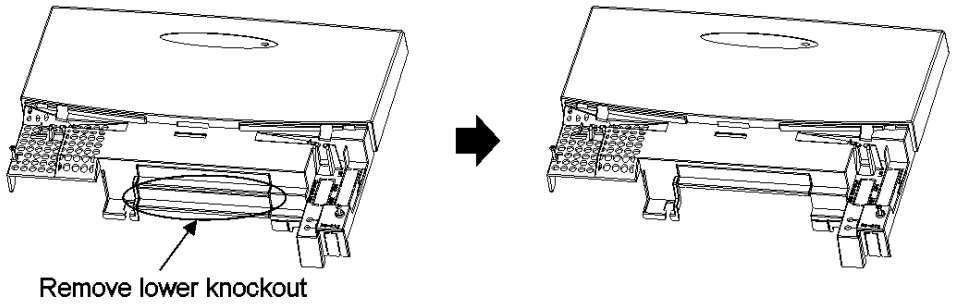
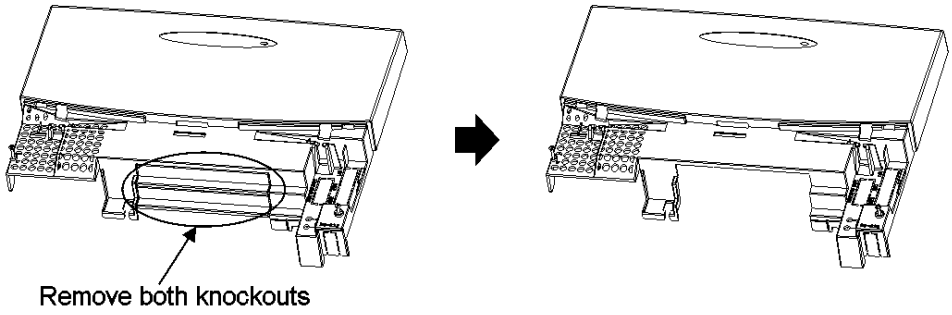
2.4 Use a blunt object to remove the plastic filler piece for 308E/008E connectors.

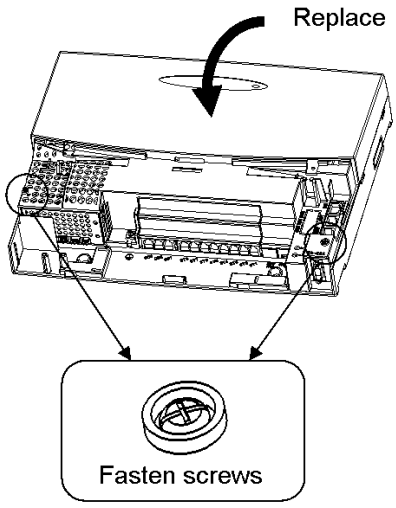
In case of 1st PCB Only



In case of 1st and 2nd PCBs



7. Replace the Main-Cover and fasten two screws.



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SECTION 3
POWER FAILURE TRANSFER

3.1 General

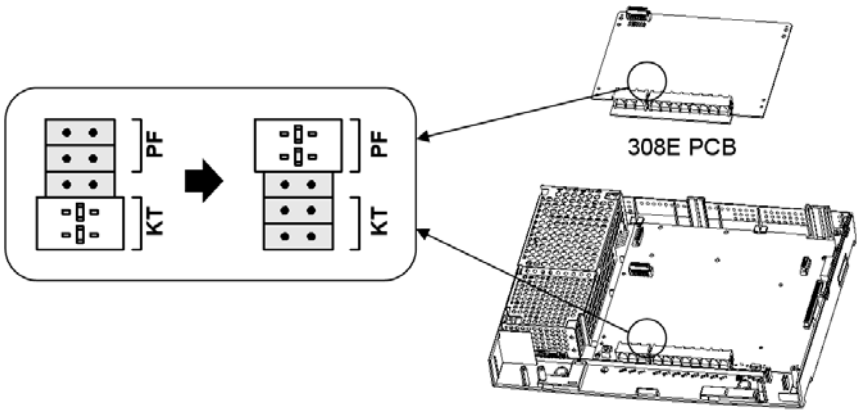
In the event of AC Power failure, the specified trunks are directly connected to the specified extension ports as below.

Trunk Port		Extension Port
No.1	→	No.8
No.4	→	No.16
No.7	→	No.24

The connected extensions must be SLT (Single Line Telephone).

3.2 Power Failure Setting

1. SLT is connected to the Extension Port No. 8 / 16 / 24 .
2. Change the switch position of "CN500" from "KT" to "PF" as below. *(Default : KT)*



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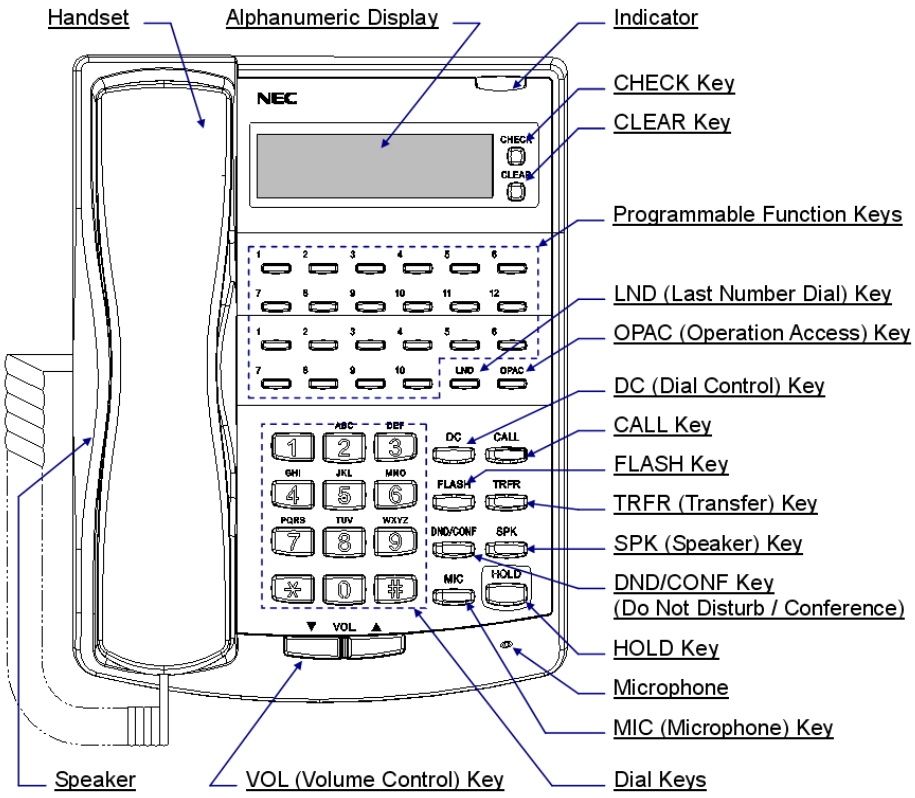
Key Telephone & Console Installations

CHAPTER 6

SECTION 1
KEY TELEPHONES

1.1 Locations of Controls



Functions	12TXD	12TD	6TXD	6TD
Programmable Keys (Line Keys)	12	12	6	6
Additional Programmable Keys	10	10 (No BLF)	10	10 (No BLF)
Display	Yes	No	Yes	No
CHECK/CLEAR Keys	Yes	No	Yes	No
Handsfree	Yes	No (Intercom Talkback)	Yes	No (Intercom Talkback)
Accept DLS Console	Yes	No	Yes	No
Wall Mount Kit	Yes (Built In)	Yes (Built In)	Yes (Built In)	Yes (Built In)

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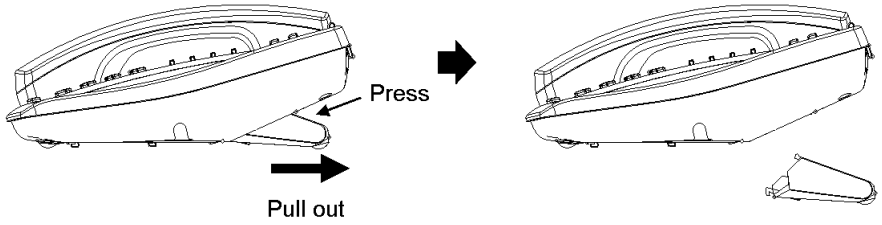
- The BLF (Busy Lamp Field) on Additional Programmable Keys are not available on the standard type Key Telephones (12TD / 6TD).

1.2 Key Telephone Legs Adjustment

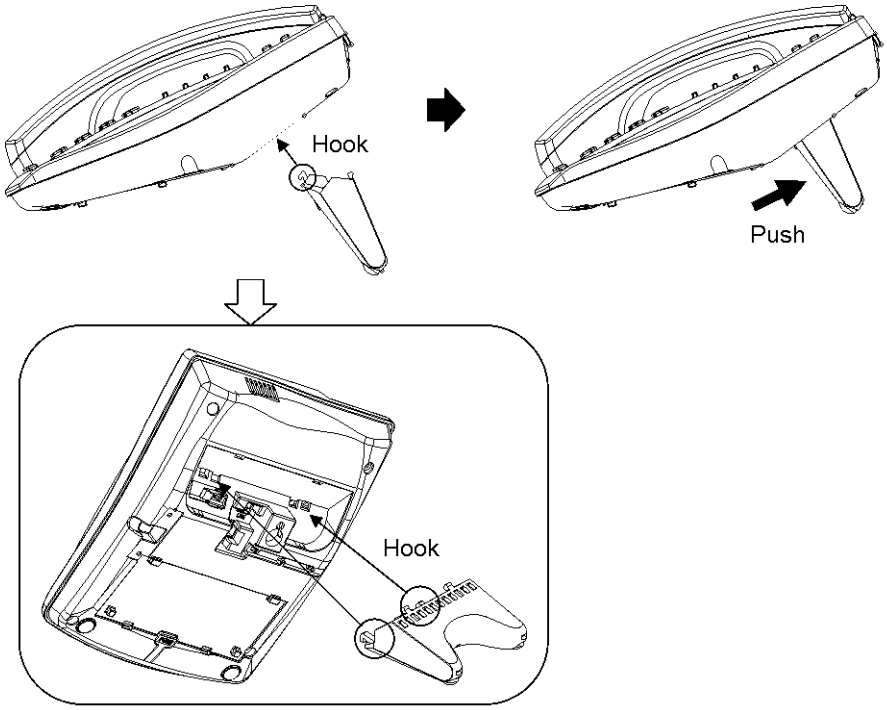
The Key Telephone provides the leg for angling the phone to best suit each user. The leg can be set for two different heights (Low / High). For the factory setting, the leg is set for "Low" position.

- When the DLS or DSS Console is connected to the Key Telephone, the height should be set to "Low" position.

1. Remove the leg from the phone.



2. Insert the leg.



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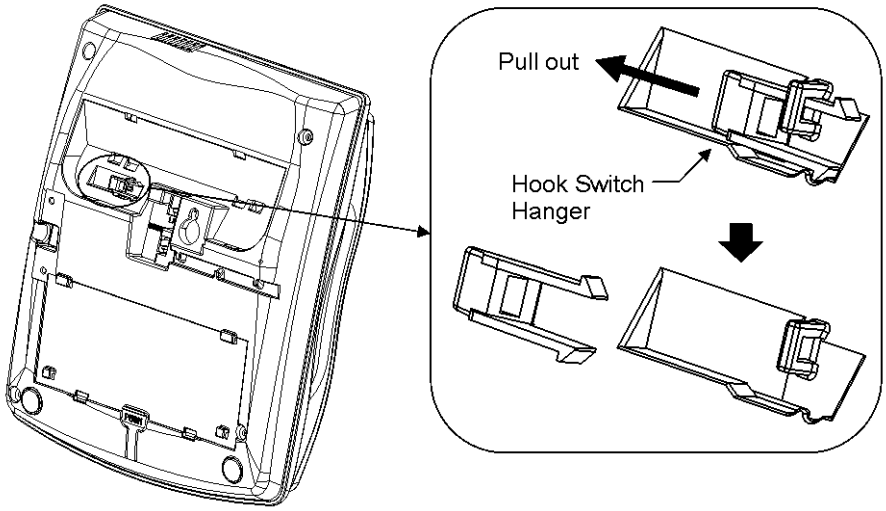
1.3 Key Telephone Wall Mounting

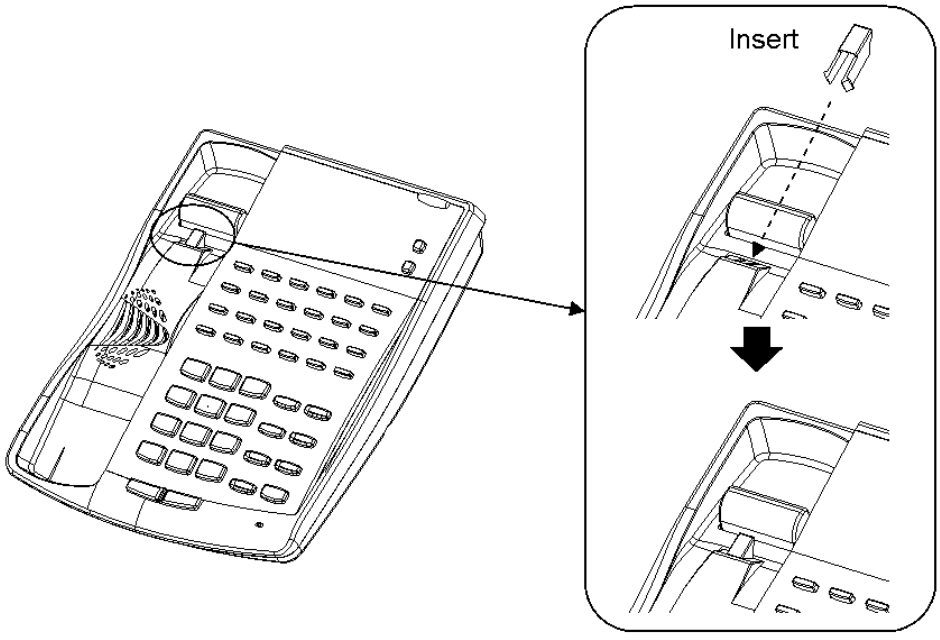
The Key Telephone's leg is able to use as Wall Mounting bracket. This allows the phone to be mounted to a wall at a convenient location. The Key Telephone also contains the hook-switch hanger, clipped at the back of phone.

- The Key Telephone with DLS/DSS Console can not be mounted to a wall.
- Up to two screws are necessary. These are not attached to the phone.

1. Remove the leg from the phone, as illustrated above.
2. Remove the hook-switch hanger located at the back of phone.



3. Insert the hook-switch hanger in the slot below the hook-switch.



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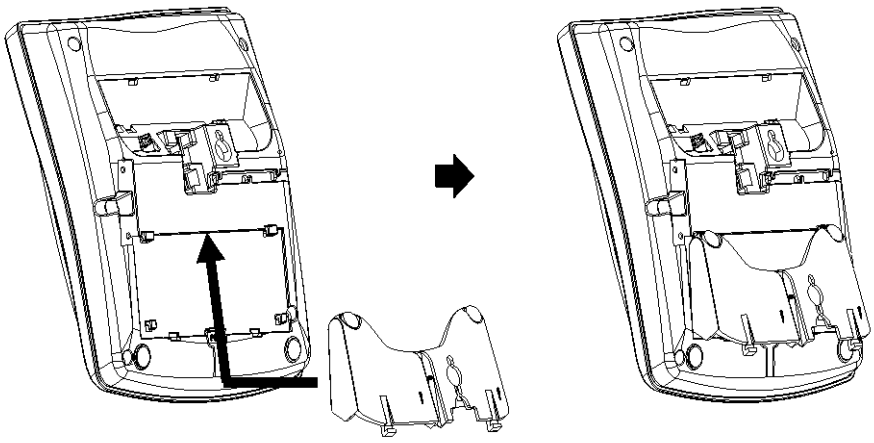
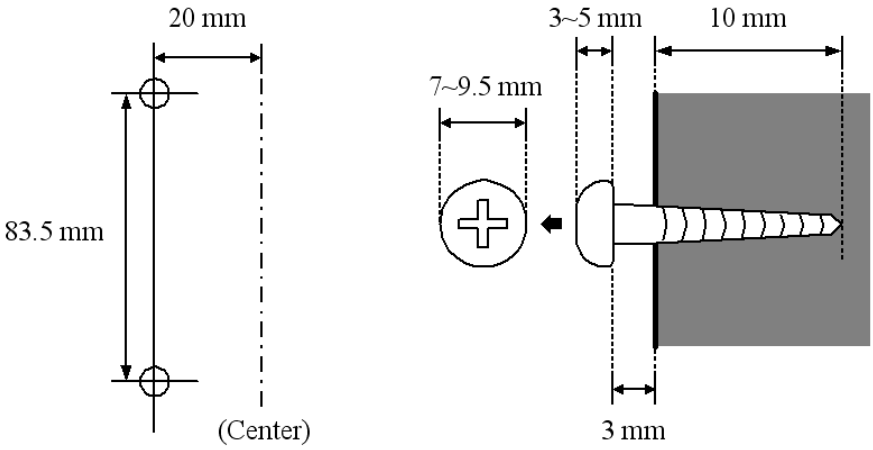
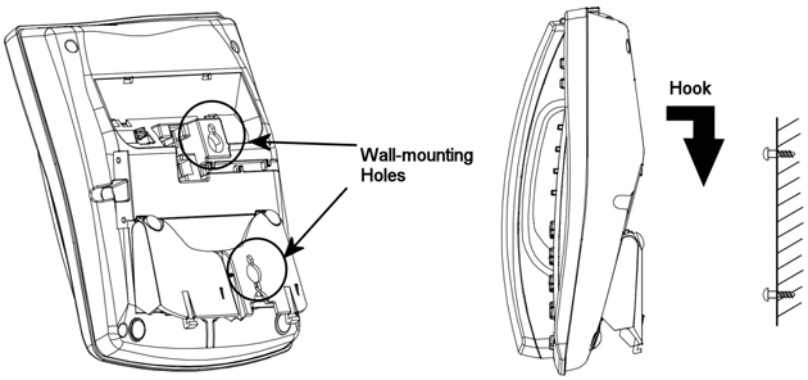
4. Fix the leg at the back of phone.



5. Install 2 screws into a wall. The screw heads must be remained about 3 mm.



6. Hook the phone to a wall.



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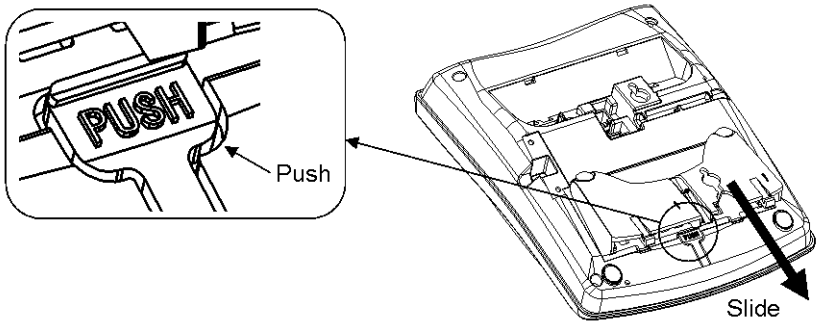
- The leg can be removed as below. (Push & Slide)



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SECTION 2
DLS CONSOLE

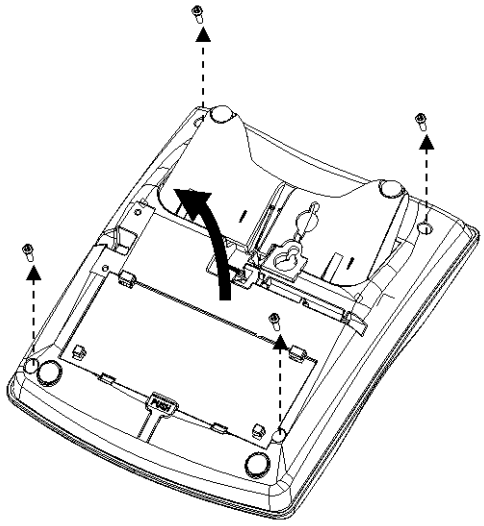
2.1 General

24BDL DLS Console should be installed on the right-hand side of the **Display Type Key Telephone** in order to use the fixing plate supplied with the console.

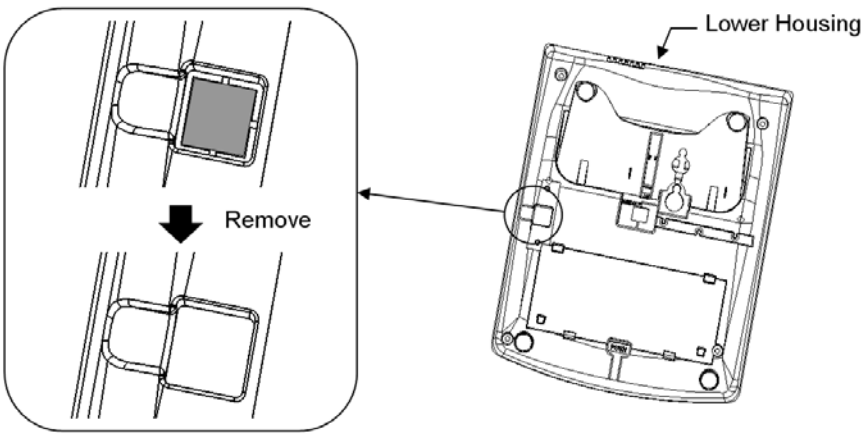
- When the DLS Console is connected to the Key Telephone, the height should be set to "Low" position.
- The Key Telephone with DLS Console can not be mounted to a wall.
- DLS Console can not be connected to the Standard Type Key Telephone.

2.2 Installing the DLS Console

1. Turn the phone upside down and remove four screws from each corner. Lift the lower housing off.



2. On the lower housing, use a blunt object to remove the plastic filler piece that covers the hole for DLS connector.



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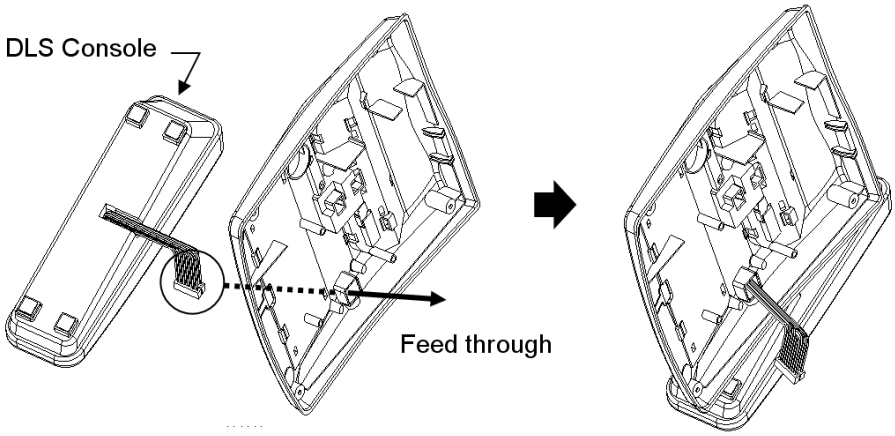
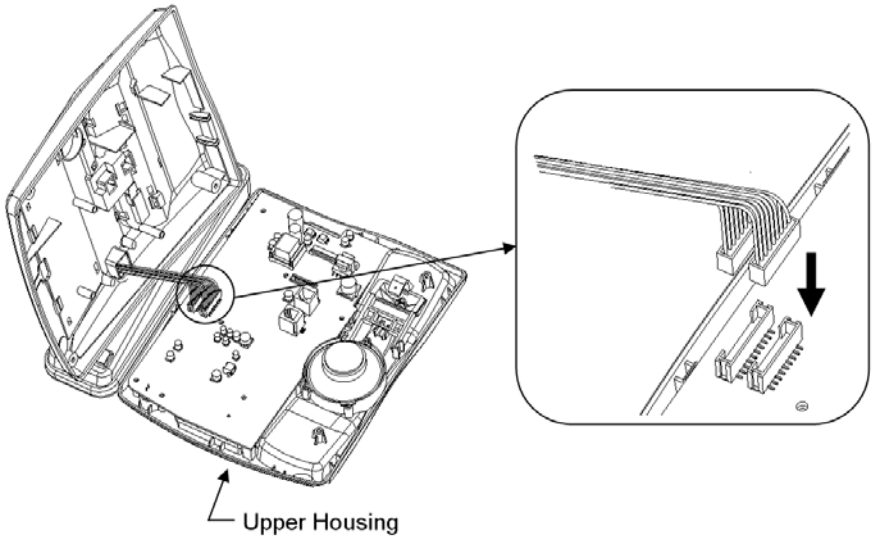
3. Feed DLS cable into the hole.



4. Insert the DLS Connectors on the DLS Cable into "DLCN1" and "DLCN2" on the PCB in the upper housing.



5. Replace the lower housing and tighten the screws to hold the

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housing in place.

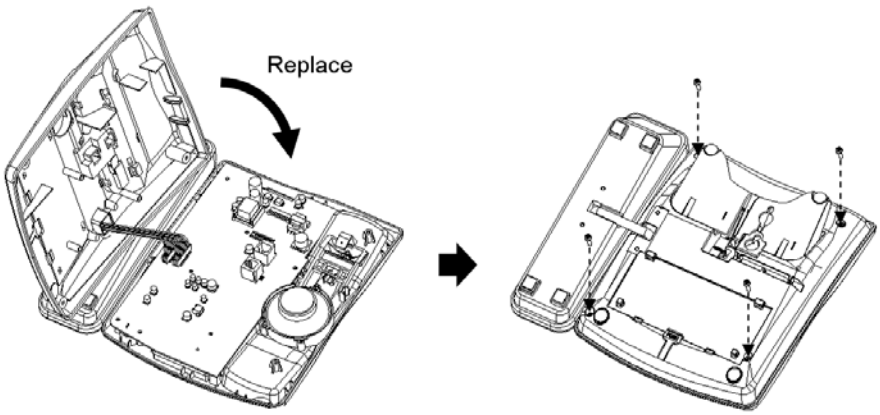
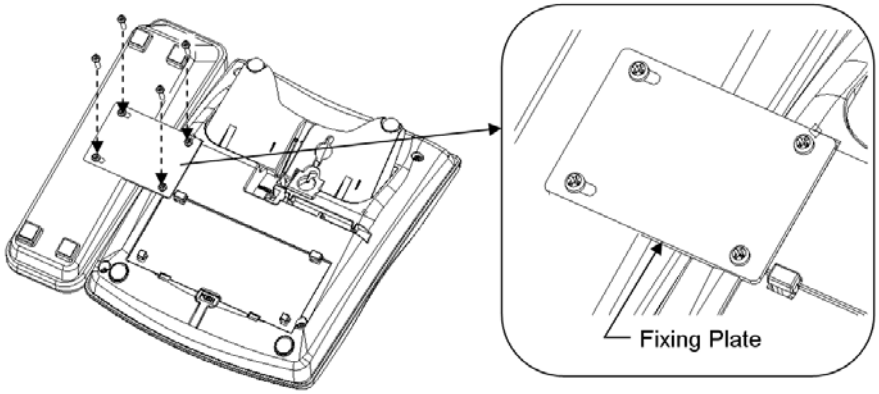


Figure 6-2:

6. Install the fixing plate provided with the DLS Console to the bottom of the console and phone to join the two sets together.



SECTION 3
DSS CONSOLE

The 64BD DSS Console can be connected to the eighth extension port of each 308M, 308E or 008E unit, i.e. ports 8, 16 or 24 only. Single-pair (2 wire) cabling is required to the outer pair (pins 1 and 4). Three consoles can be connected in total when two port expansion cards (308E/008E) are installed. The associated extension for each DSS Console is assigned in system programming..

For the details of cabling, refer to the Section 3. (Page 3-3)
For the details of setting, refer to the Features Manual. (separate issue)

- When a DSS Console is used, the associated Key Telephone should be desk mounted in the low position.

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Installing the Optional Equipment

CHAPTER 7

SECTION 1
SMDR (STATION MESSAGE DETAIL RECORDING)

1.1 General

SMDR (Station Message Detail Recording) provides a record of the system's outside calls. Typically, the record outputs to a customer-provided SMDR Device such as Printer or PC via Serial Port at the EXIFU PCB.

There are 2 types of EXIFU PCB, and either EXIFU-A1 or B1 is installed to the specified slot in the 924M KSU.

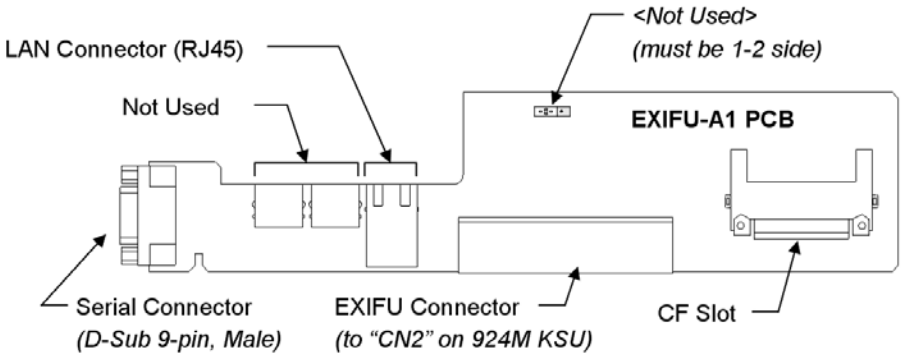
1.2 Unpacking (EXIFU)

Unpack the EXIFU-A1/B1 and check it against the following list. Inspect for physical damage.

Items	List of Contents	QTY
EXIFU-A1	EXIFU-A1 PCB	1
	Ferrite Core (for Ethernet Cable)	1
EXIFU-B1	EXIFU-B1 PCB	1

1.3 Switches and Connector Locations

EXIFU-A1



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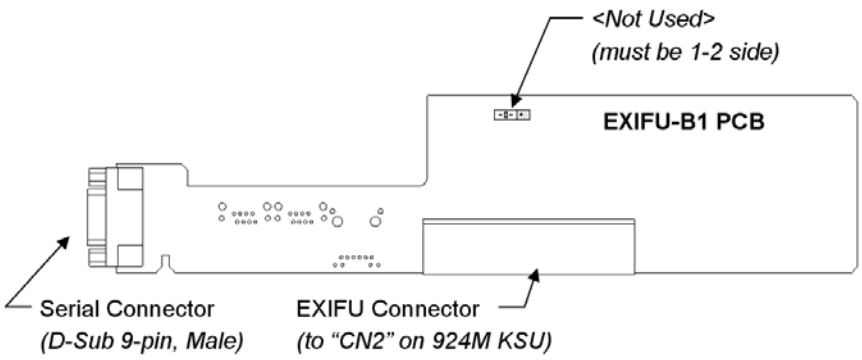
Connectors	Connectable Devices
Serial Connector (D-Sub 9-pin Male)	- Serial Printer (for SMDR/Alarms) - PC (for SMDR/PC Programming) - Modem (for Remote Programming)
LAN Connector (RJ45)	- PC (for SMDR / PC Programming/Main Software Upgrading) - Switching HUB (for LAN)
CF Slot	- CF (Compact Flash) Card (for Data Saving / Main Software Upgrading)
EXP1, EXP2	Not Used

EXIFU-B1



Connectors	Connectable Devices
Serial Connector (D-Sub 9-pin Male)	- Serial Printer (for SMDR/Alarms) - PC (for SMDR/PC Programming) - Modem (for Remote Programming)

• *For the details of Data Saving, refer to the Section 7. (Page 7-5)*
• *For the details of Main Software Upgrading, refer to the Section 8. (Page 8-4)*

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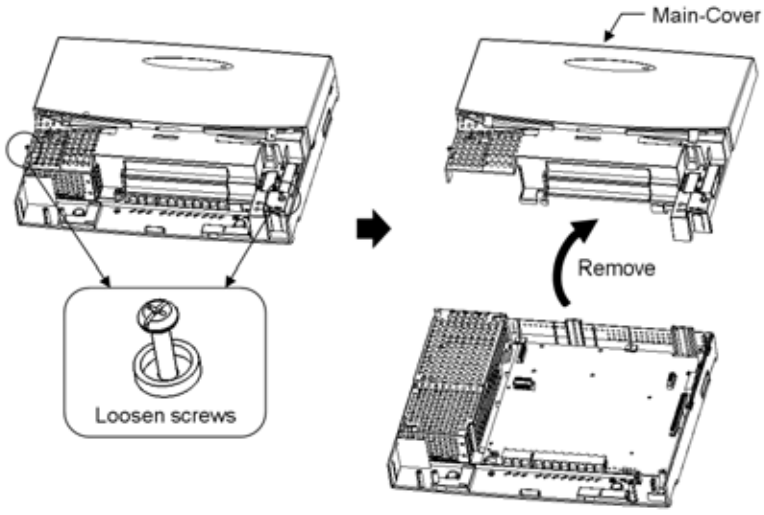
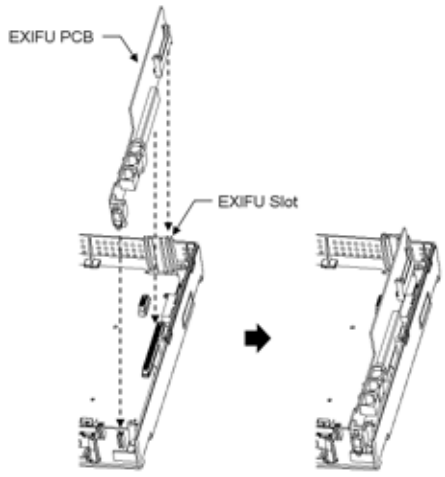
1.4 Installing the EXIFU PCB

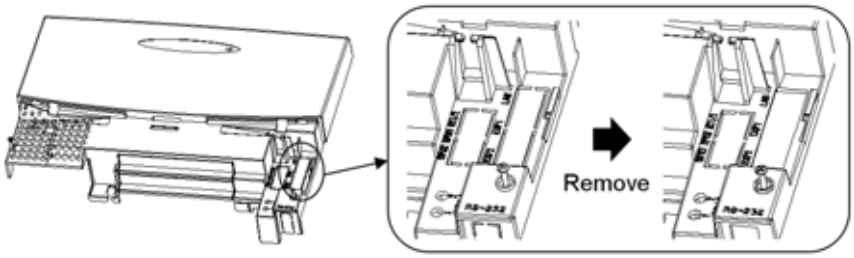
1. Open and pull out the Sub-Cover.
2. Loosen two screws and remove the Main-Cover.



3. Insert the EXIFU PCB to the EXIFU Slot.



4. When installing the EXIFU-A1, use a blunt object to remove the plastic filler piece for EXP and Ethernet Connectors.



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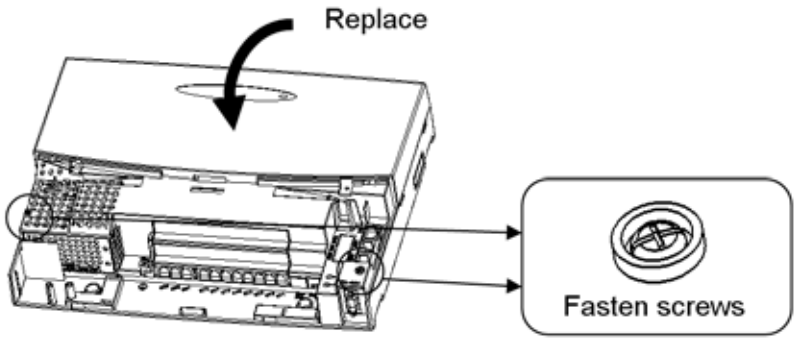
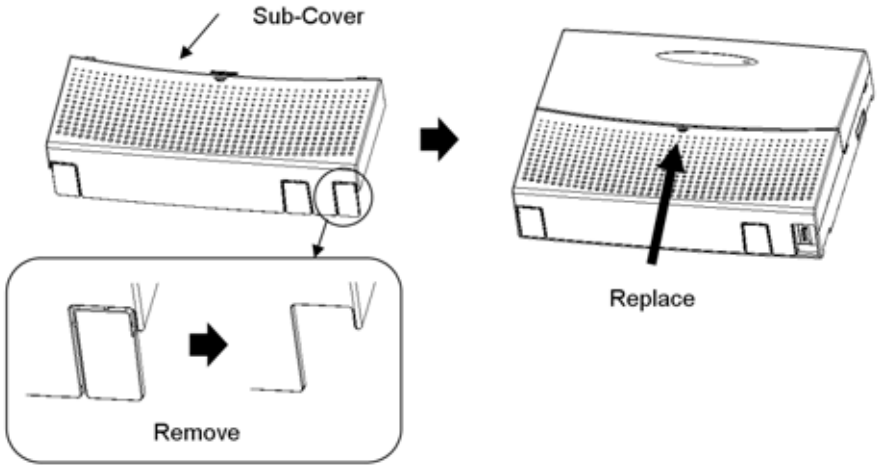
5. Replace the Main-Cover and fasten two screws.

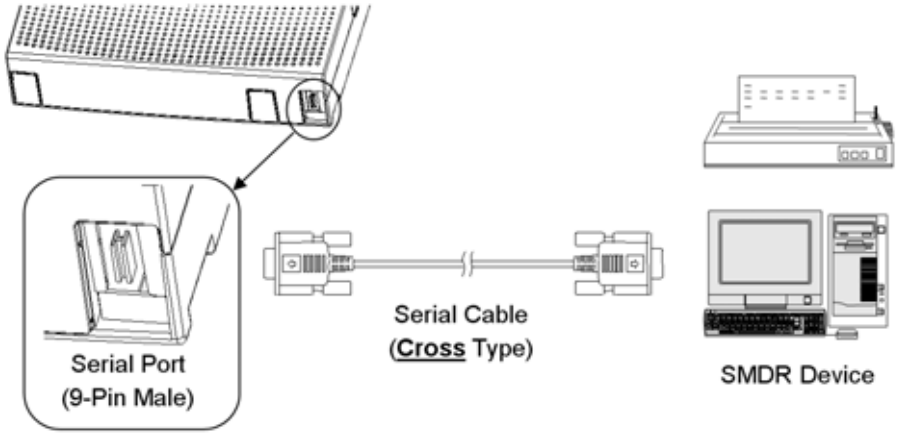


6. Use a blunt object to remove the plastic filler piece for the Serial Connector.
7. Replace the Sub-Cover.



1.5 Connecting the SMDR Device (Serial Port)

1. Plug the Serial Cable between the system and SMDR Device.



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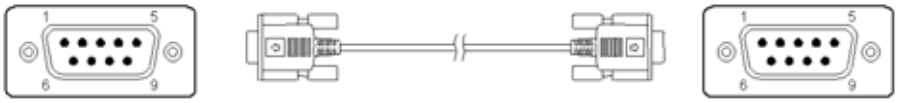
• *The Serial Cable must be shielded, and the maximum cable length is 15m.*

1.6 Serial Cable Specification

The connection for the cable that links between the system and SMDR Device is as below.

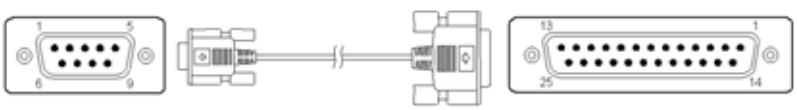
9 Pin to 9 Pin Cable

System		SMDR Device	
Signal	**Pin No.**	**Pin No.**	**Signal Name**
RXD	2	2	RXD
TXD	3	3	TXD
DTR	4	4	RTS
SG	5	5	CTS
DSR	6	6	DSR
RTS	7	7	SG
CTS	8	20	DTR



9 Pin to 25 Pin Cable

System		SMDR Device	
Signal	**Pin No.**	**Pin No.**	**Signal Name**
RXD	2	2	TXD
TXD	3	3	RXD
DTR	4	4	RTS
SG	5	5	CTS
DSR	6	6	DSR
RTS	7	7	SG
CTS	8	20	DTR



1.7 Connecting a Modem

Connect a modem to the Topaz KSU via the EXFIU-A1/B1 card using a RS-232C serial cable. Connection to the EXIFU card requires a DB9 Female, while connection to the modem will depend on the requirements of the modem itself. Refer to section 1.6 for cable configuration details.

Configure the modem as follows:

1. Set Auto Answer On.
2. Port Speed - assign the required port speed for Topaz in system programming (PRG 10-21-02) and set the modem port speed to the same rate.

These settings can be performed manually or automatically. Manual settings will be made using HyperTerminal, however the settings will also be applied automatically whenever the system is reset (hot or cold) or PRG 10-21-02 is changed, as long as the modem is connected to the EXIFU-A1/B1 card and powered on at the time.

Ensure that jumper CN10 on the EXIFU-A1/B1 card is set to position 1-2 (default setting).

The following facilities are supported via a modem connection:

1. PC Programming (PCPro),
2. SMDR data,
3. Debug data.

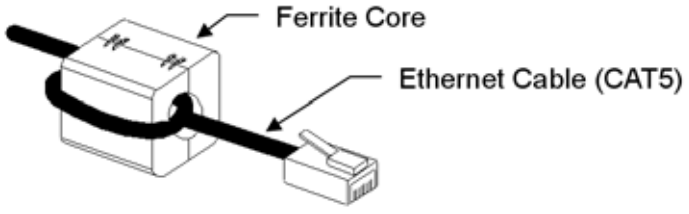
1.8 Connecting the PC/LAN

EXIFU-A1 has 10/100M Ethernet Port, and shall be connected to the In-house LAN environment or PC directly. (SMDR Output and/or PC Programming).

<Before the cabling>

The Ethernet Cable must pass 1 time (1 round) through the Ferrite Core as below. (Ferrite Core is supplied with EXIFU-A1)

.



<Case 1 : PC Direct Connection>

1. Plug the **Cross Type** Ethernet Cable (CAT5) between the system

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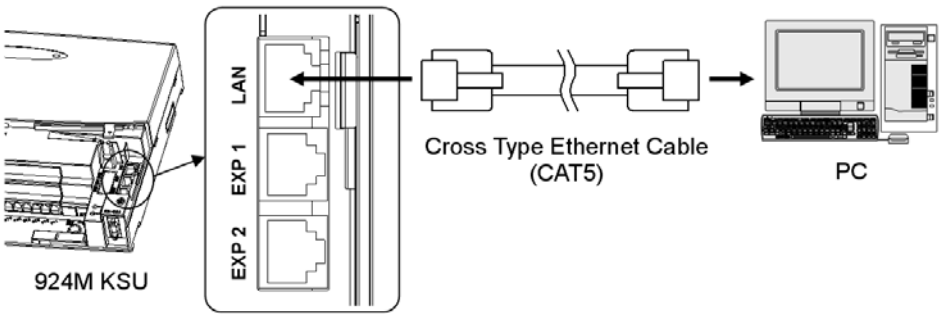
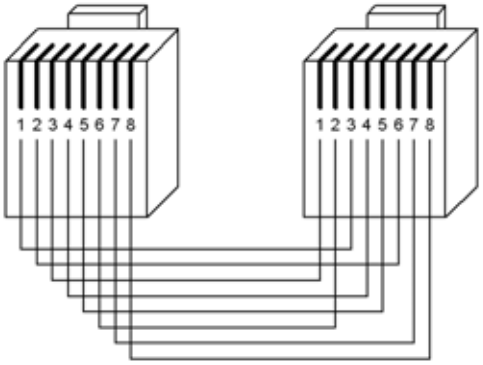
and PC.

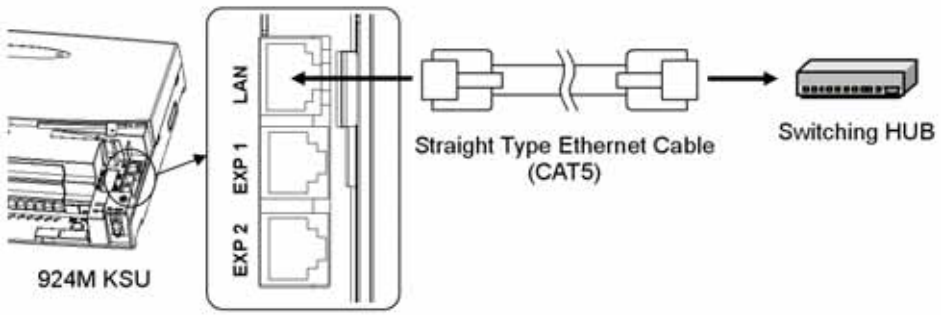


Cross Type Ethernet Cable



<Case 2 : In-house LAN Connection>

1. Plug the Straight Type Ethernet Cable (CAT5) between the system and In-house LAN.



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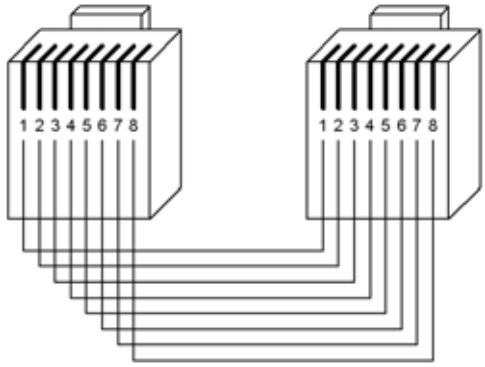
Straight Type Enternet Cable



SECTION 2
DOORPHONE/ EXTERNAL PAGING/ EXTERNAL MOH/BGM

2.1 General

2PGDU PCB provides:

- Doorphone Connection
- External Paging Speaker Connection
- External MOH (Music On Hold) source Connection
- BGM (Background Music) source Connection

and is installed into the specified slot in the 924M KSU.

2.2 Unpacking (2PGDU)

Unpack the 2PGDU-A1 and check it against the following list. Inspect for physical damage.

Items	List of Contents	QTY
2PGDU-A1	2PGDU-A1 PCB	1

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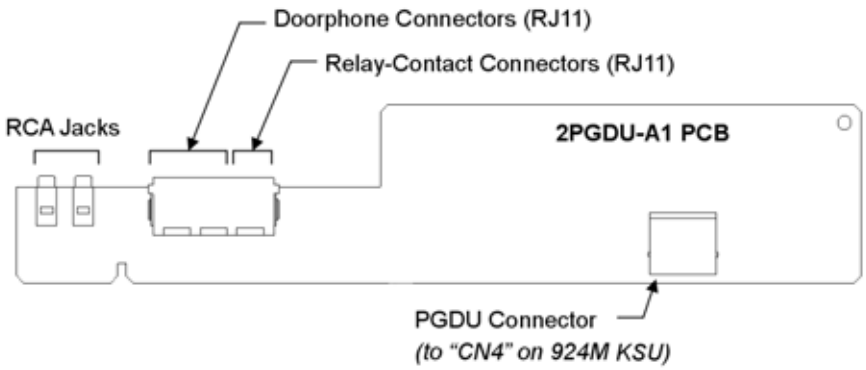
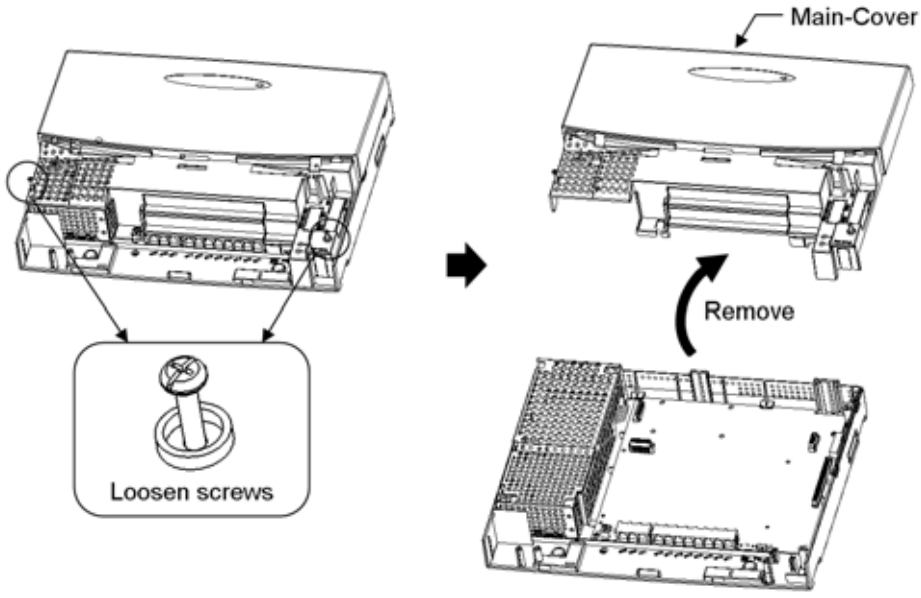
2.3 Switches and Connector Locations



Connectors	Connectable Devices
RCA Jacks (Audio 1, 2)	• Music Sources (for External MOH, BGM) • Paging Systems (for External Paging)
Doorphone Connectors (DPH1, DPH2)	• Doorphone Units
Relay-Contact Connectors (RY 1/2)	• Door Unlock Devices • Music Source Control • Paging System Control

2.4 Installing the 2PGDU PCB

1. Open and pull out the Sub-Cover.
2. Loosen two screws and remove the Main-Cover.



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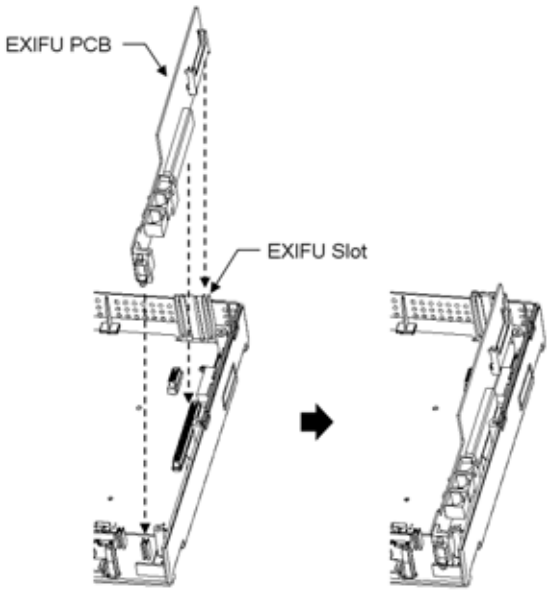
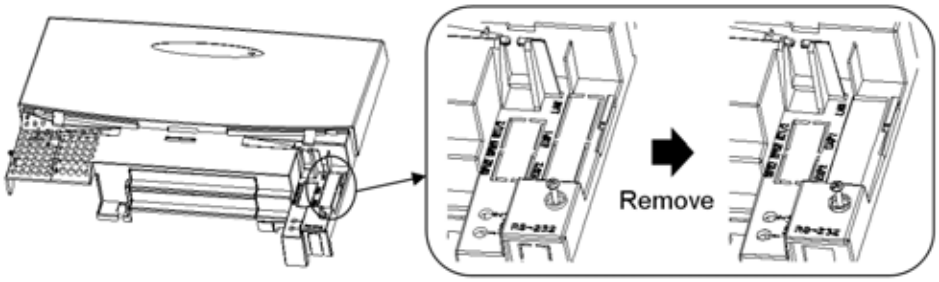
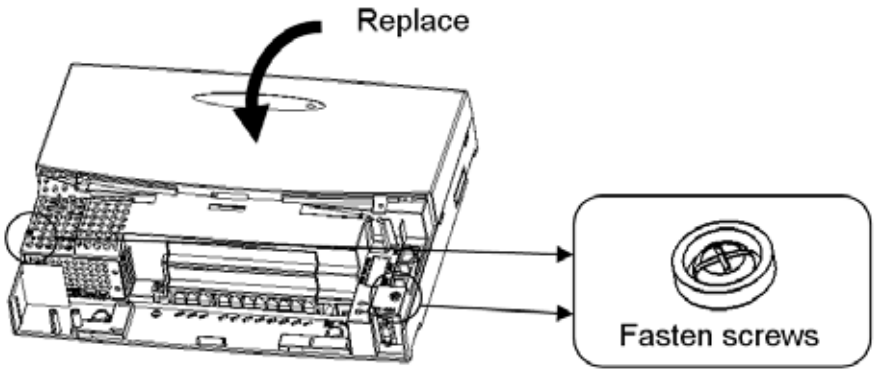
3. Insert the 2PGDU PCB to the PGDU Slot.



4. Use a blunt object to remove the plastic filler piece for Doorphone Connectors.



5. Replace the Main-Cover and fasten two screws.



2.5 Installing the Doorphone Boxes

Up to 2 NEC DP-D-1D Doorphone units can be connected to the 2PGDU PCB.

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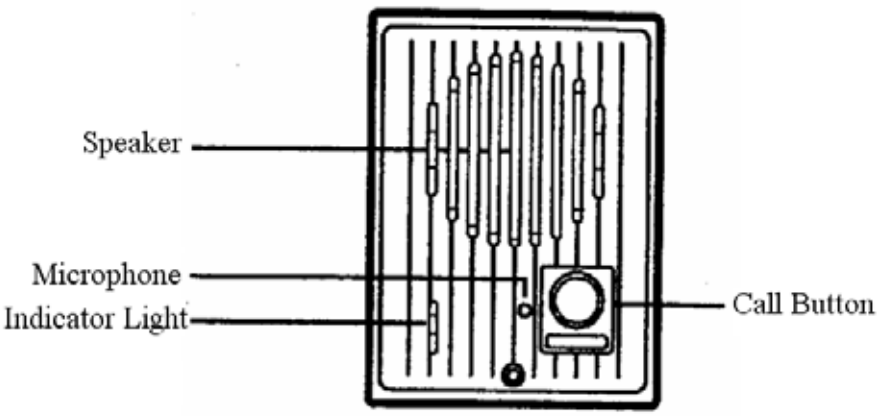
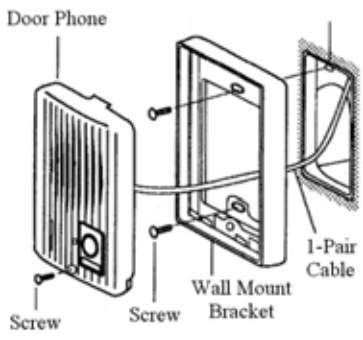
3rd Party Doorphone units can NOT be connected to the 2PGDU PCB.

DP-D-1D DOORPHONE UNIT

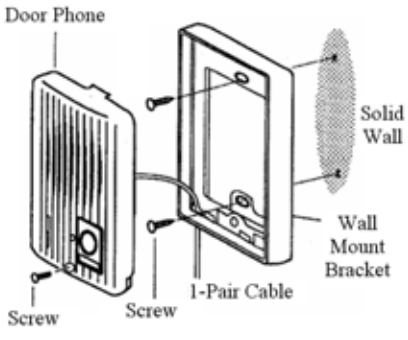


1. Remove the screw on the front of the Doorphone Unit.
2. Remove the wallmount bracket from the back of the Doorphone, then fix it to the wall using either the screws provided or other suitable fasterners.

.



Fixing to a Hollow Wall



Fixing to a Solid Wall

3. Run the single pair cable either through the back of the wall mount bracket into the wall, or through the bottom of the wall mount bracket (via the access hole provided), and connect to the DPH1 or DPH2 connector (centre pair) on the 2PGDU card.

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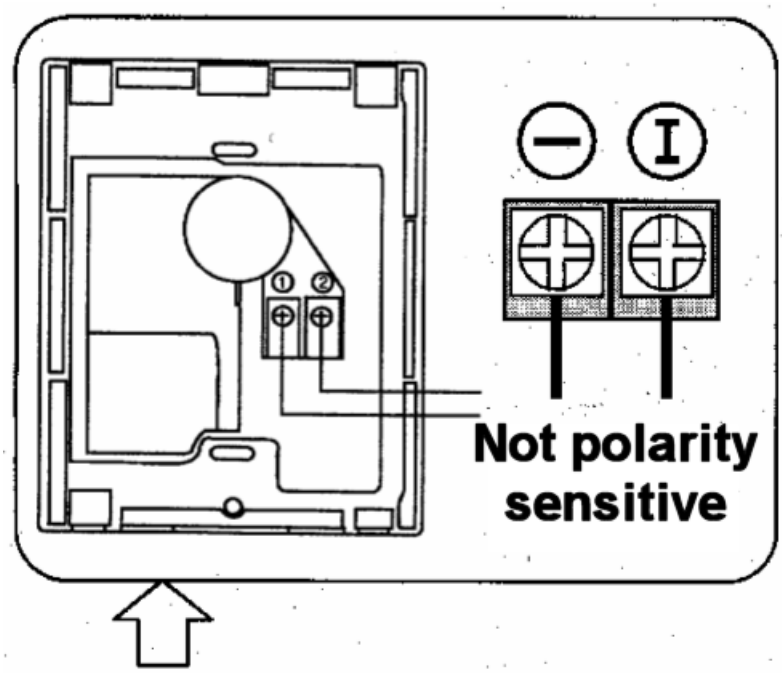
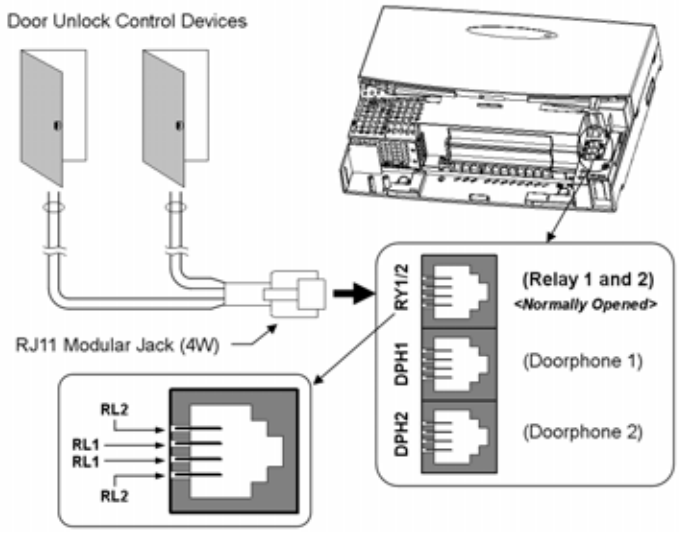


4. Remount the doorphone unit onto its wall mount bracket and reaffix the front screw.

2.6 Installing the Door Unlock Devices

Up to 2 Door Unlock Control devices can be connected to the 2PGDU PCB.



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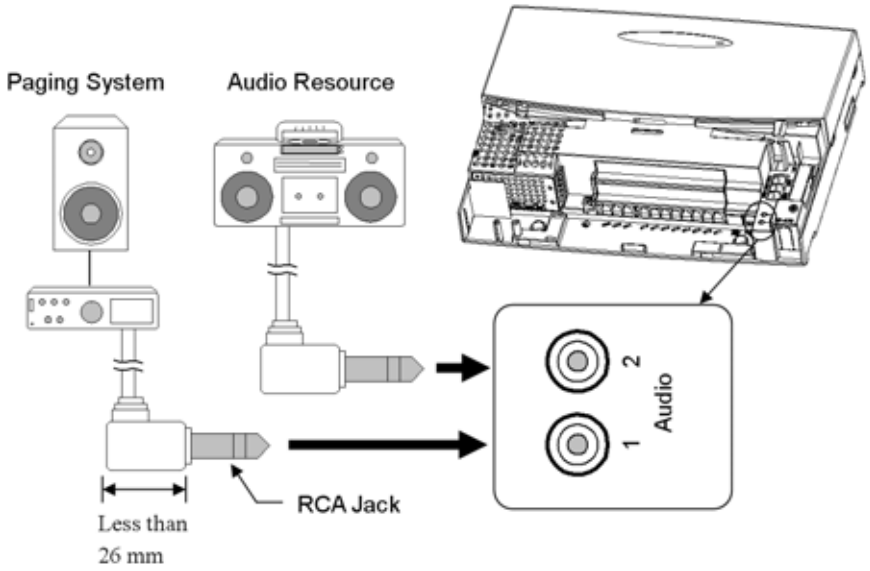
2.7 Installing the External Paging Speaker/ExMOH/BGM Sources



- The Relay Contacts at 2PGDU PCB can be used for the Paging System / Audio Resource controls, if necessary. (Refer to the previous page for more details.)

EXTERNAL PAGING OUTPUT SPECIFICATIONS	
Output Impedance	600Ω @ 1kHz
Output Level	Nominal 250mV (-10dBm)
Maximum Output	400mV RMS

BGM/ExMOH Source Input	
Output Impedance	600Ω @ 1kHz
Output Level	Nominal 250mV (-10dBm)
Maximum Output	1V RMS

SECTION 3
VRS (VOICE RESPONSE SYSTEM)

3.1 General

The DSPDB-A1 PCB provides additional DSP resources with 16ch VRS (Voice Response System). It is installed in the main KSU (924M).

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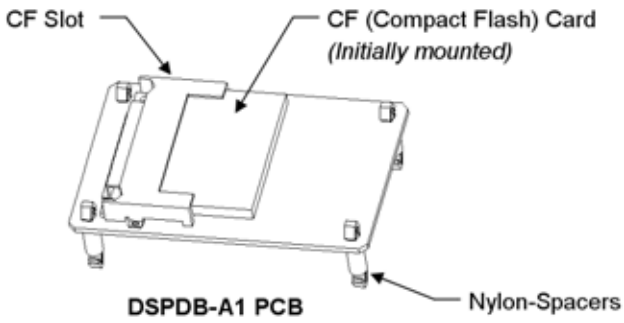
3.2 Unpacking (DSPDB-A1)

Unpack the DSPDB-A1 and check it against the following list. Inspect for physical damage.

Items	List of Contents	QTY
DSPDB-A1	DSPDB-A1 PCB	1
	Nylon Spacers	4
	CF (Compact Flash) Card	1 (mounted)

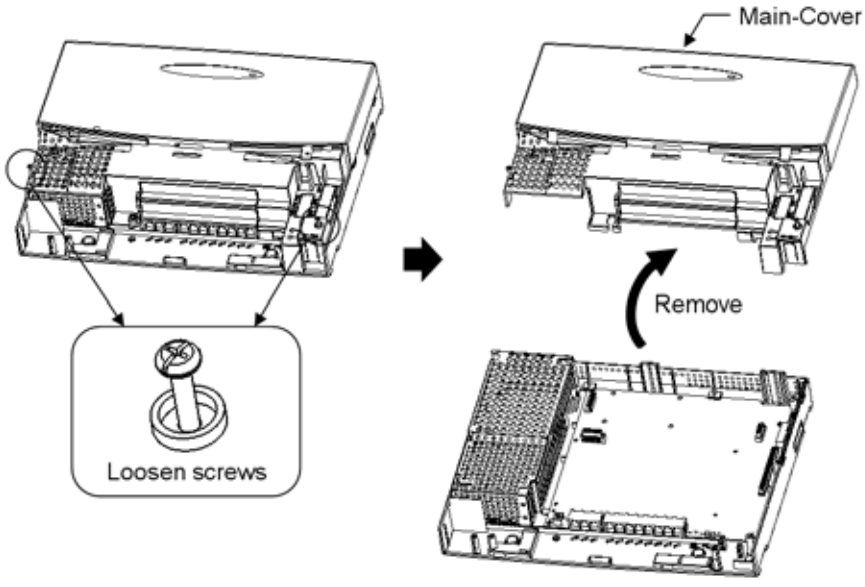
3.3 Switches and Connector Locations



- Make sure the Nylon-Spacers are inserted in each corner of the DSPDB-A1 PCB.
- The spacers must be attached from the back of the DSPDB-A1 PCB so when installed, the CF slot is facing up.

3.4 Installing the DSPDB-A1 PCB

1. Open and pull out the Sub-Cover.
2. Loosen two screws and remove the Main-Cover.



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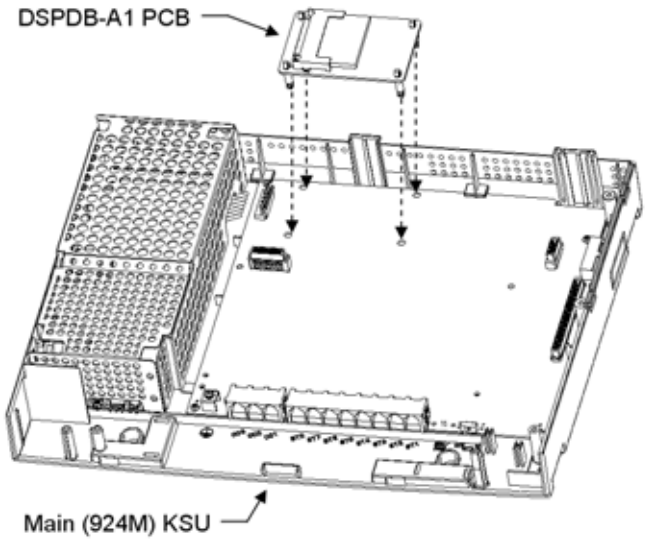
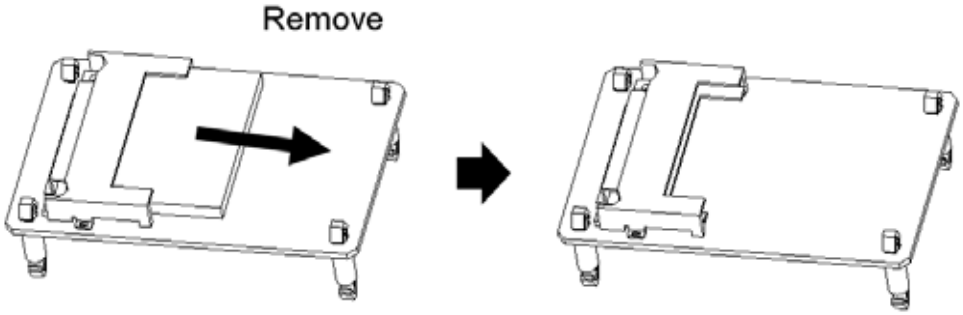
3. Mount the DSPDB-A1 PCB to the "CN6" Connector at the Main (924M) KSU.



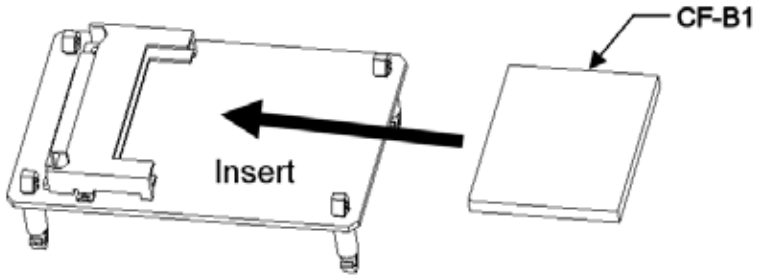
- For easy installation, DSPDB-A1 PCB is recommended to install before 308E/008E installations.

3.5 Installing the CF-B1

1. Remove the CF Card from the DSPDB-A1 PCB.



2. Insert the CF-B1 into the CF slot of DSPDB-A1 PCB. This new package is now referred to as DSPDB-A2 PCB.



3. Install the DSPDB-A2 PCB to the 924M KSU. (Refer to the previous

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page.)

• **The CF-B1 is protected by copy-guard function.**

SECTION 4
EXTERNAL BACKUP BATTERY

4.1 General

The external backup battery box with batteries provides the power to the system when AC power fails. It is connected to the Power Supply of the main KSU (924M).

• The Batteries themselves must be prepared by your local supplier.

4.2 Unpacking (Battery Box)

Unpack the 32i/NX7E Battery Box and check it against the following list. Inspect for physical damage.

Items	List of Contents	QTY
32i/NX7E Battery Box	Battery Box	1
	Cable with Connector (Blue & Red)	1
	Cable (Orange)	1
	Screws	2

4.3 Battery Specifications

Items	Data	
Capacity	12V, 2.6Ah or equivalent (Voltage must be 12V)	
Recommended Battery	Yuasa NP2.6-12 (134x67x64 mm / 1.12kg) <Yuasa Corporation>	
Number of Batteries (per box)	2 pieces	4 pieces
Backup Duration (estimated)	30 Minutes	1 Hour

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4.4 Installing the Backup Battery

1. Make sure the system power is OFF.
2. Install Batteries into the Box.
3. Using battery terminal screws, connect the cables to the battery terminals. Use "Red" cable to connect the positive terminal of one battery to the negative terminal of the other battery.
4. Connect the Backup Battery Box Cable to the connector at the Power Supply on the KSU.

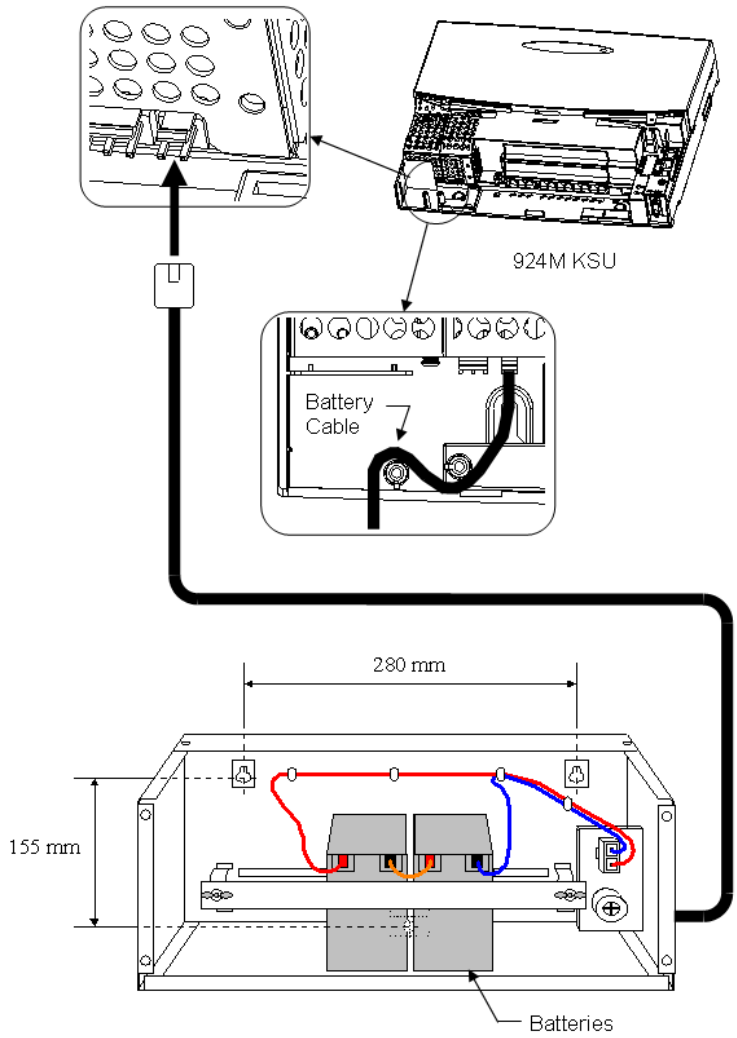

Figure 7-3:

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Installing the Optional Facilities

CHAPTER 8

SECTION 1
INSTALLING THE OPTIONAL BOX

1.1 General

In order to install the optional facilities such as ISDN BRI, the following PCBs are necessary and are installed to the universal slot in the optional BOX called OPBOX. The OPBOX provides up to 2 universal slots and is jointed at the right hand side of each KSU.

PCB Name	Description
IP1WW-2BRIU-S1	2 BRI (ETSI-ISDN) I/F
IP1WW-4BRIU-S1	4 BRI (ETSI-ISDN) I/F

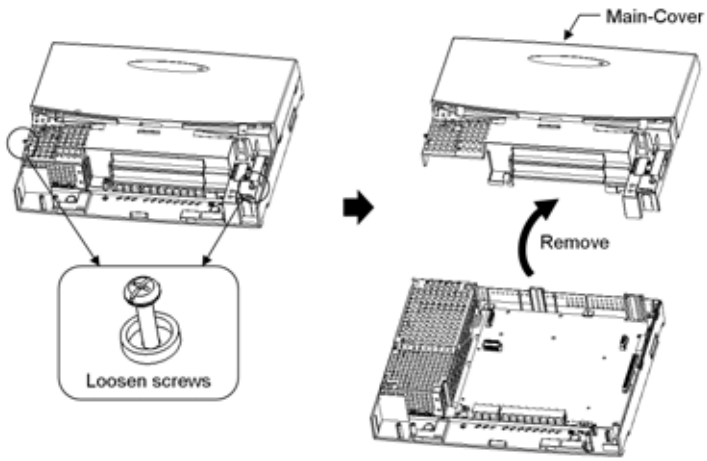
1.2 Unpacking

Unpack the OPBOX and check it against the following list. Inspect for physical damage.

Items	List of Contents	QTY
OPBOX	OPBOX	1
	Short Screw	1
	Screws (with circular washer)	2
	Screws	4

1.3 Installing the OPBOX

1. Open and pull out the Sub-Cover.
2. Loosen two screws and remove the Main-Cover.



3. Use a blunt object to remove the plastic filler piece that covers the

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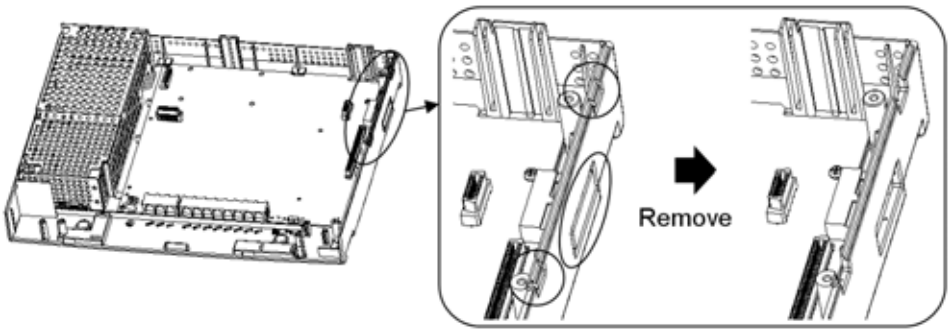
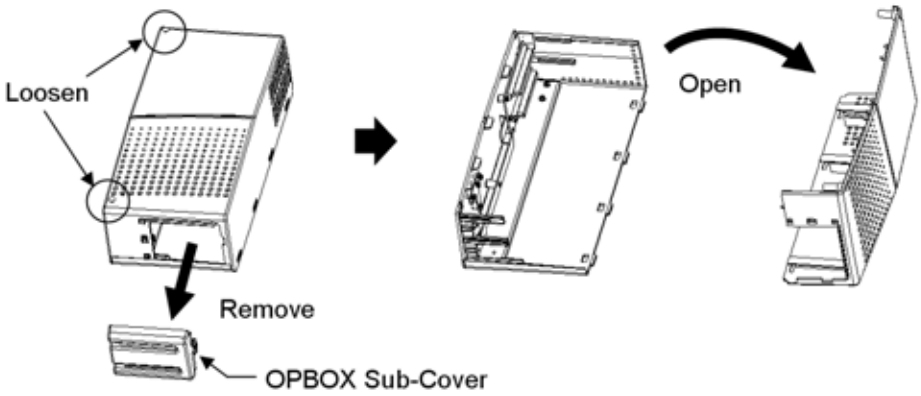
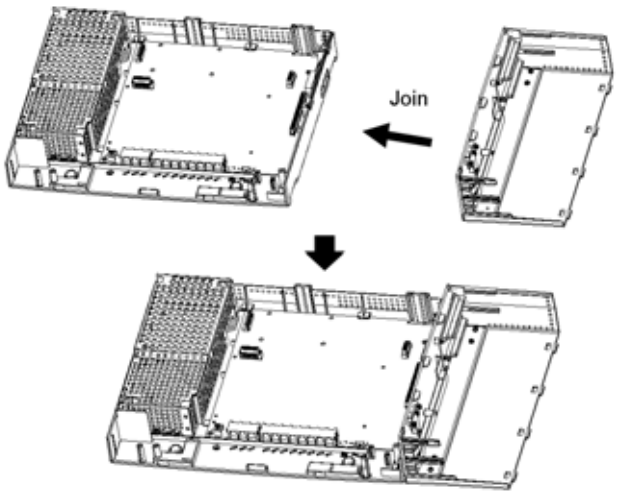
hole.



4. Remove the OPBOX Sub-Cover, loosen two screws on OPBOX, and open the cover.



5. Join the OPBOX lower housing to the right hand side of KSU lower housing.



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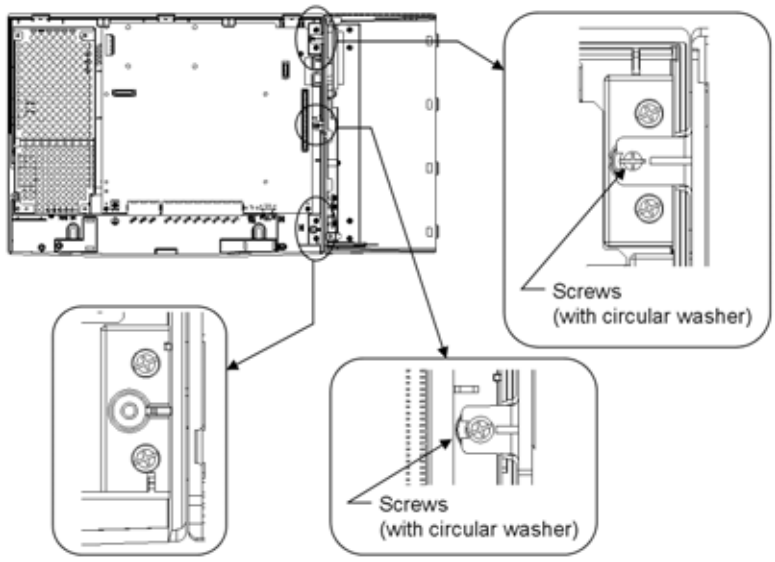
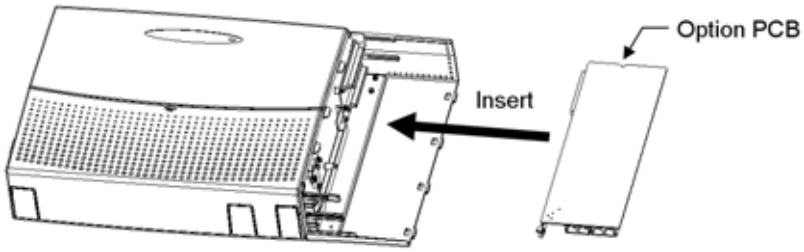
6. Fasten six screws to fix the OPBOX to KSU.



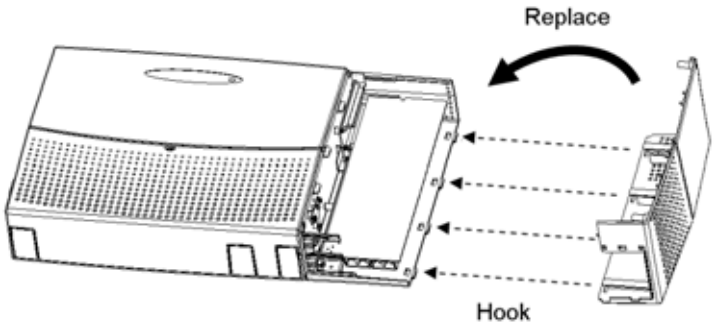
- The screws are attached to the OPBOX.

1.4 Installing the Optional PCBs to the OPBOX

1. Insert the Option PCBs into the universal slot at OPBOX. Fasten the PCB using the captive screw/bracket marked TB1.



2. Replace the OPBOX Cover.



3. After connecting the cables, replace the OPBOX Sub-Cover. (Hook

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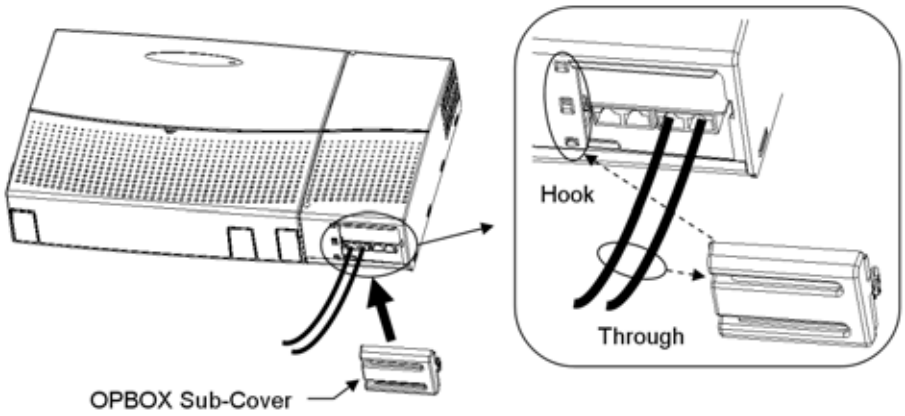
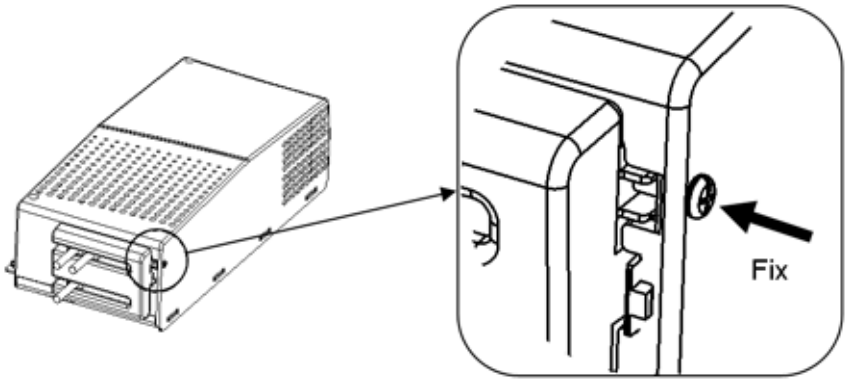
and Push)



4. Fix the OPBOX Sub-Cover by short screw.



SECTION 2
ISDN BRI (BASIC RATE INTERFACE)

2.1 General

The ISDN BRI (Basic Rate Interface) can be accommodated to the system. The specified PCB called "BRIU-S1" is necessary, and shall be installed to the OPBOX.

2.2 Unpacking

Unpack the 2/4BRIU-S1 and check it against the following list. Inspect for physical damage.

Items	List of Contents	QTY
2BRIU-S1	2BRIU-S1 PCB (2 circuit type)	1
4BRIU-S1	4BRIU-S1 PCB (4 circuit type)	1

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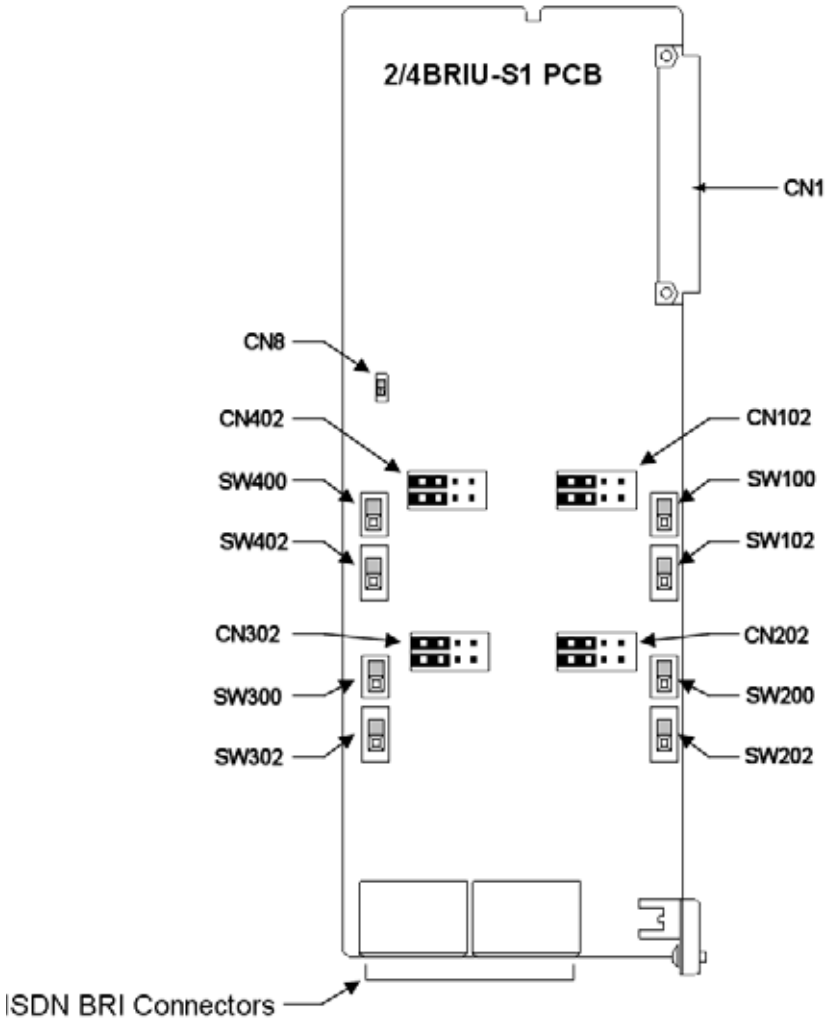
2.3 Switches and Connector Locations



Swtich Name	Switch Position	Result	Comments
CN8	**NORMAL**	PCB Active	Normal operating mode
	LOOP	Not Used	Do not use this setting
SW102 SW202	T	T-Bus Connection	The polarity of the Tx and Rx are defined in the T-Bus table
SW302 SW402	S	S-Bus Connection	The polarity of the Tx and Rx are defined in the S-Bus table

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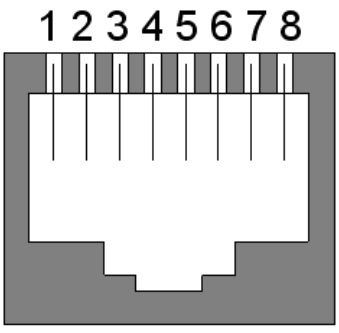
Swtich Name	Switch Position	Result	Comments
SW100 SW200 SW300 SW400	ON	Termination resistor is ON	This switch should be set to ON: 1. When T-Bus with Point-to-Point is selected. 2. When T-Bus with Point-to-Multipoint is selected and if the Topaz system is not connected to the last port of the Bus connection, this switch should be OFF. 3. When S-Bus is selected.
	OFF	Termination resistor is OFF	When T-Bus with Point-to-Multipoint is selected and if the Topaz system is not connected to the last port of the Bus connection, this switch should be OFF.
CN102 CN202 CN302 CN402	ON	With S-Bus selected, the Feeding Power is supplied to the terminal.	If S-Bus is selected, this switch should be ON if the connected device requires line power.
	OFF	With T-Bus selected, the Feeding Power is not required.	If T-Bus is selected, this switch should be OFF.

ISDN BRI CONNECTOR (RJ45) T-BUS CONNECTIONS



Pin No.	Connections
1	–
2	–
3	TA
4	RA
5	RB
6	TB
7	–
8	–

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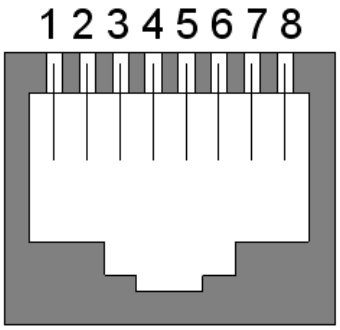
ISDN BRI CONNECTOR (RJ45) S-BUS CONNECTIONS		
	**Pin No.**	**Connections**
	1	–
	2	–
	3	RA
	4	TA
	5	TB
	6	RB
	7	–
	8	–

2.4 LED Indicators

LED	Function	LED Status	Operation Status
LD5 (LIVE)	Indicates the status of the PCB	Green On	Initializing
		Green Flashing (slow flash)	Initialization problem occuring during self-check.
		Green Flashing (100ms On/Off)	Operating normally
		Green Off	Downloading firmware
LD1 - LD4	Indicates the status of the lines	Red On	Line in use
		Red Off	Line idle

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System Start Up

CHAPTER 9

SECTION 1
SYSTEM START UP

1.1 Before Starting Up the System

Before starting up the system, make sure:

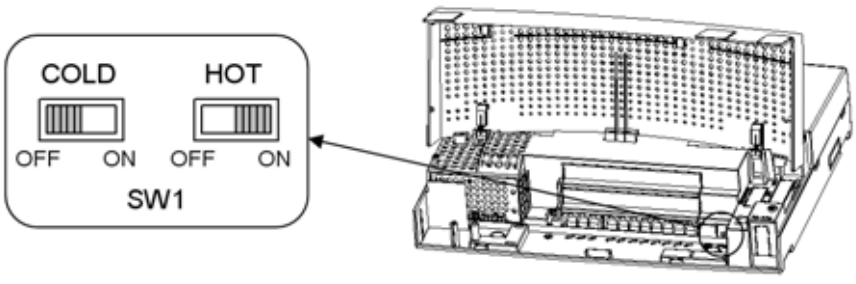
- The KSU is installed correctly.
- All extensions are cabled correctly.
- All Earth connections and PSTN Trunks are cabled correctly.
- All PCBs are configured, equipped, and strapped correctly.
- AC Power cord is cabled correctly.
- At least one Display type Key Telephone is connected to the system (for Programming).

1.2 Powering Up the System

There are 2 types of start up method as below.

Name	SW1 Position	Description	Purpose
COLD Start (Battery OFF)	OFF	The factory setting data is loaded.	• First time start up • System Initialization
HOT Start (Battery ON)	ON	The customer setting data is loaded.	• System Reboot

1. Open the Sub-Cover at the main KSU, and check the position of switch SW1.



924M Main KSU

• For the first time start up, the SW1 (Battery) must be set to "OFF" (COLD Start) side.
• For the system reboot, the SW1 (Battery) must be set to "ON" (HOT Start) side.

2. The AC Power Switch is ON. The switch is located at the left hand side of each KSU.

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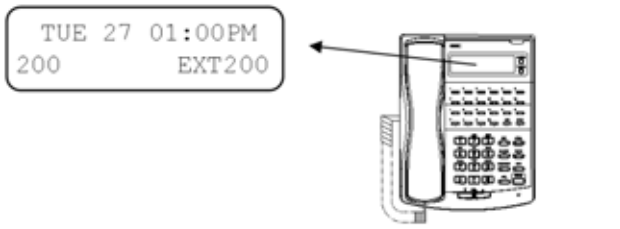
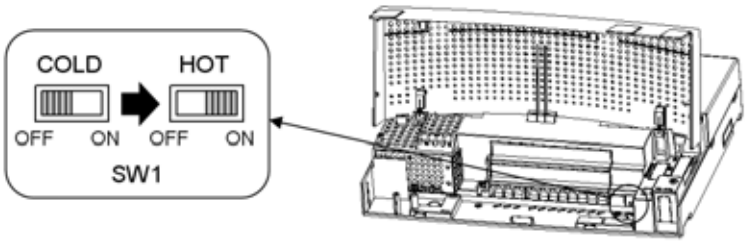
3. Wait about 2 minutes. The connected Key Telephone's display will show the Time & Date and Extension Number when the boot sequence completes.



Display Type Key Telephone

4. In case of a "COLD Start", change the SW1 position from "OFF" to "ON" side.



924M Main KSU

- The default setting of extension number and name is as below.

Physical Port No.	Extension Number	Extension Name
1	200	EXT 200
2	201	EXT 201
:	:	:

The system will automatically assign the extension number and name to each hardware port, even if the extension is not connected.

For the details of numbering, refer to the Programming Manual (separate publication).

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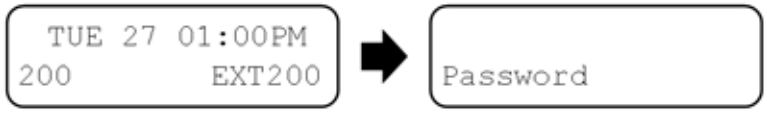
SECTION 2
PROGRAMMING MODE

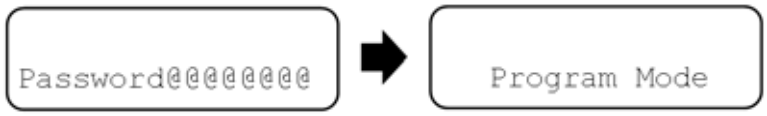
2.1 Enter the Programming Mode

The installer/system administrator can enter to the system programming mode from the Display Type Key Telephone. (Up to 2 users can enter to the mode at the same time.)

1. Press SPK (Do not lift the handset)
2. Dial 6 3 2 1 .



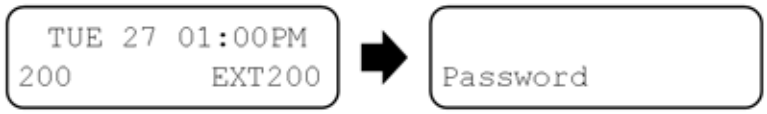
3. Dial the system password, and then press **HOLD**



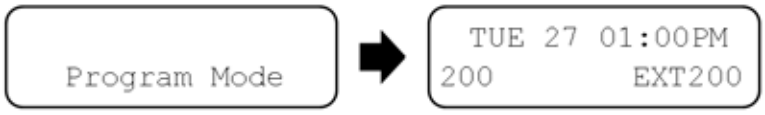
GO *For programming details, refer to the Programming Manual (separate publication).*

2.2 Exit Programming Mode

1. Press **DC** several times to return to the "PRG No. Entering Screen".



2. Press SPK to exit.



The system will automatically save the customer data to memory which is backed up by a lithium battery.

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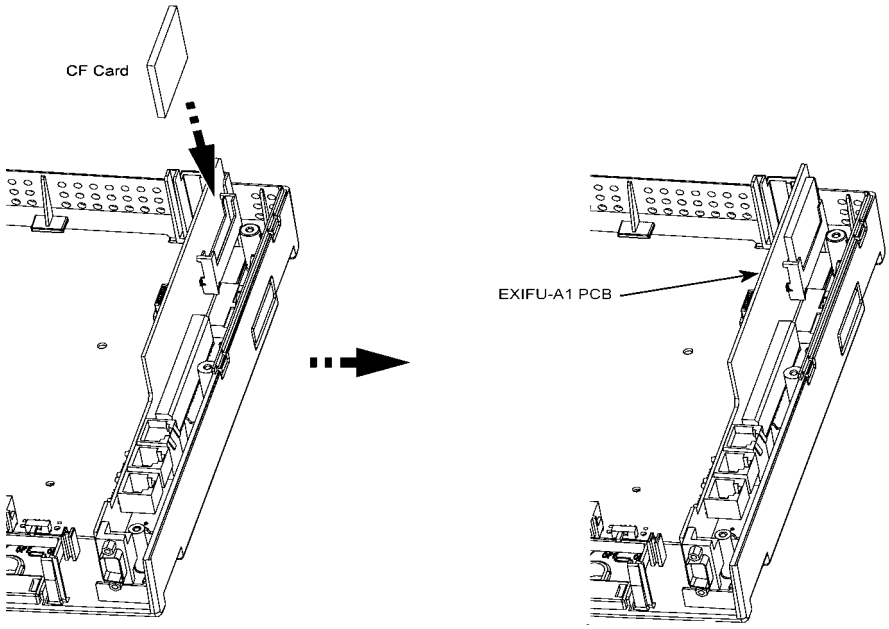
2.3 Save (Backup) the Customer Data

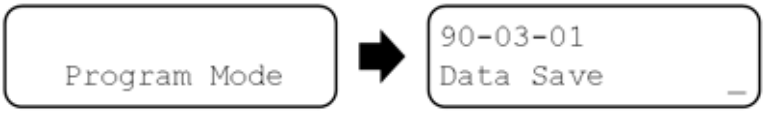
When the installer/system administrator exit from the programming mode, the system shall automatically save the customer data to the on-board memory which is backed up by lithium battery. On the other hands, this customer data can be saved to the CF Card for the backup purpose. If the it is necessary, **EXIFU-A1 PCB** must be installed to the system.

GO *For the details of EXIFU-A1 installation, refer to the Section 5. (Page 5-4)*

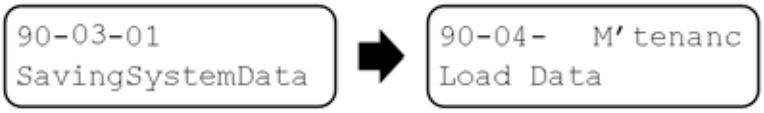
1. Insert the blank CF card (8MB or upwards) to the CF Slot on EXIFU-A1.



2. Enter Program Mode (PRG90-03-01).



3. Dial [1] and press **HOLD**.
4. When the data backup to the CF Card is complete, the display will change to the next PRG.



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5. Remove the CF Card and exit Programming Mode.

- **The saved data on the CF Card cannot be edited from your PC**

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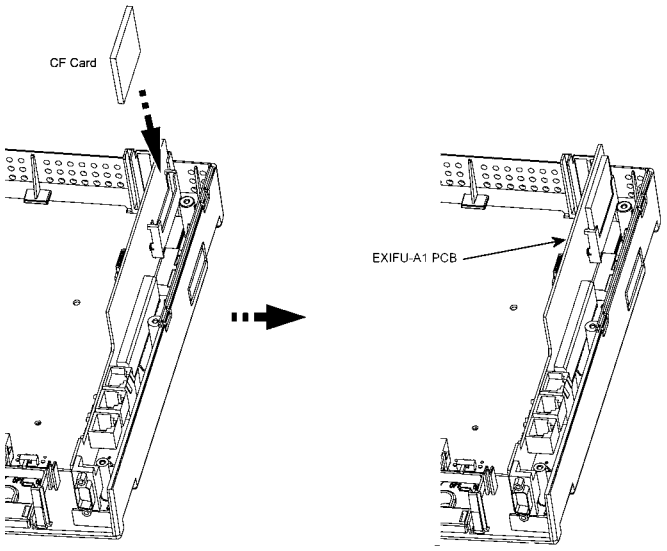
2.4 Load the Customer Data

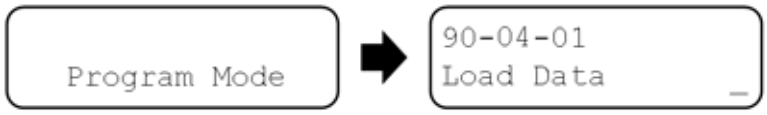
The backed up customer data can be loaded to the system by CF Card. If the it is necessary, EXIFU-A1 PCB must be installed to the system.

For the details of EXIFU-A1 installation, refer to the Section 5. (Page 5-4)

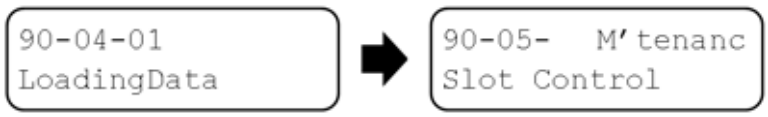
1. Insert the Customer Data CF card to the CF Slot on EXIFU-A1



2. Enter Program Mode (PRG90-04).



3. Dial [1] and press HOLD.
4. When the data backup to the CF Card is complete, the display will change to the next PRG.



5. Remove the CF Card and exit Programming Mode.

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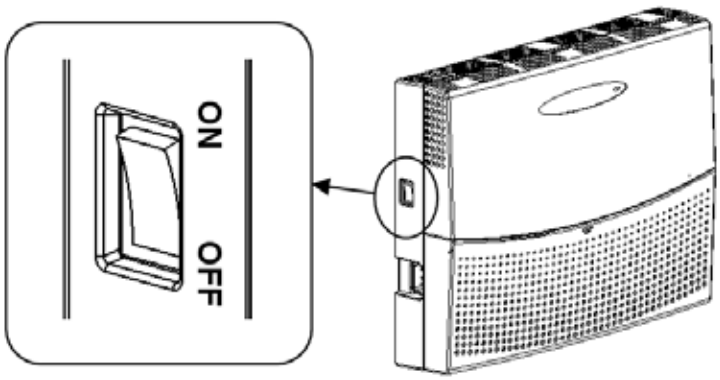
SECTION 3
SYSTEM SHUTDOWN

3.1 Powering OFF the System

1. The AC Power Switch which is located at the left hand side of each KSU is OFF.



924M KSU

- **The KSU must have its own Commercial AC Power Socket.**
- **DO NOT POWER ON until all installations have been completed.**
- **The power switch of the 924M KSU switches the DC power of the PSU, it does not isolate mains power from the PSU. Always switch off the mains power from the mains outlet prior to servicing the unit.**

3.2 Resetting the System

The System is reset by switching the KSU power switch OFF then ON again.

- **Before resetting the system, make sure the SW1 switch is set to "HOT".**

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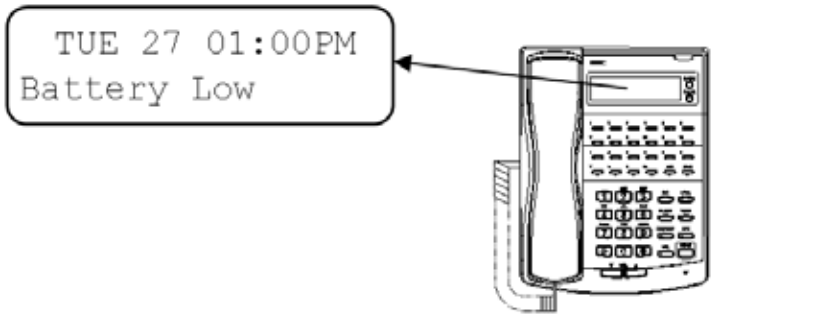
SECTION 1
LITHIUM BATTERY REPLACEMENT

1.1 General

The Lithium Battery (SONY CR2450 or equivalent) is initially installed on the 308M PCB in 924M KSU. It provides the battery-backup of the RAM memory for approximately 36 months. When the battery life becomes almost over, the system will inform the "Warning Message" to the assigned Display Key Telephone as below.



Display Type Key Telephone

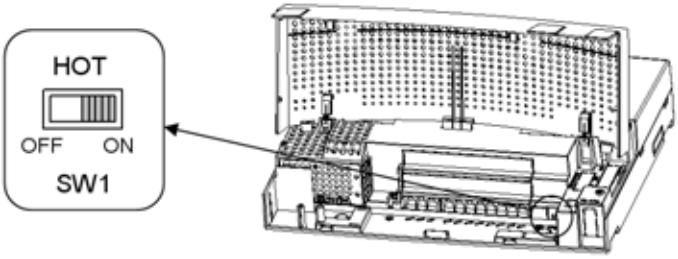
1.2 Lithium Battery Specification

Before replacing the Lithium Battery, prepare the new Lithium Battery. (**"SONY CR2450" or equivalent**)

- **Risk of explosion if the battery is replaced by an incorrect type.**
- **Dispose of used batteries as instructed by the manufacturer of the battery.**

1.3 Replacing the Lithium Battery

1. Open the Sub-Cover at the main KSU and make sure the SW1 is set to "ON" (HOT Start)..



924M Main KSU

2. Power OFF the system, and remove the AC plug from the outlet..

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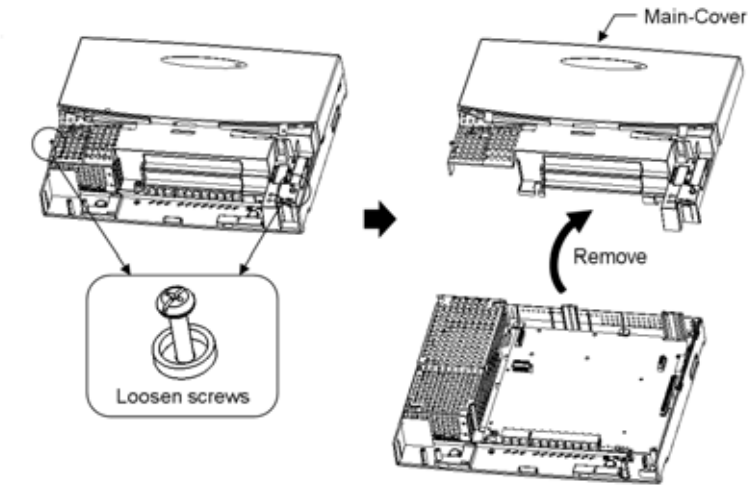
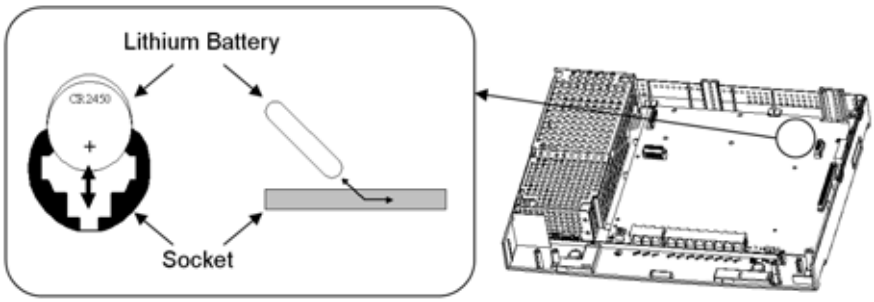
3. Loosen two screws and remove the Main-Cover..



4. Find the Lithium Battery, located at the top right-hand corner of the PCB in 924M KSU
5. Remove the old Lithium Battery and insert the new one into the socket..



• The polarity "+" symbol must be on top.

6. Replace the Main-Cover and Sub-Cover.

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SECTION 2
MAIN SOFTWARE UPGRADING

2.1 General

The system main software is initially stored in the Flash Memory located on the PCB of 924M KSU. It can be upgraded by the new software on the CF (Compact Flash) card.

2.2 Before Upgrading the Main Software

Before upgrading the Main Software, the following preparations are necessary.

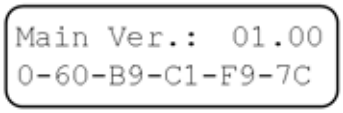
2.3 Main Software Version Confirmation

- Prepare the CF Card (8MB, or upwards), and store the new main software on the CF Card by PC. (New Main Software is supplied by NEC Business Solutions.)
- Prepare the EXIFU-A1 PCB (if the system does not have it).

The main software version is able to confirm by the following operation at the Display Type Key Telephone.

1. On-Hook Condition.

2. Press OPAC OPAC and dial 3



- The display will automatically return to "Time & Date" after 3 seconds.

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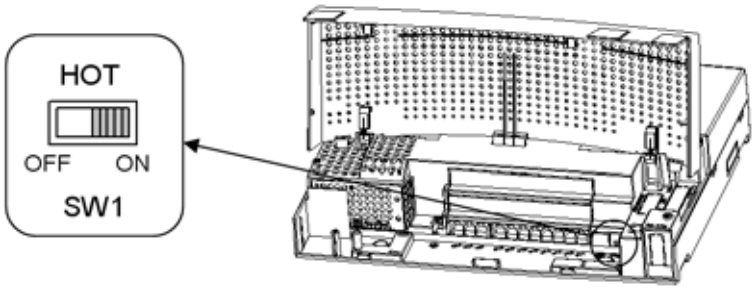
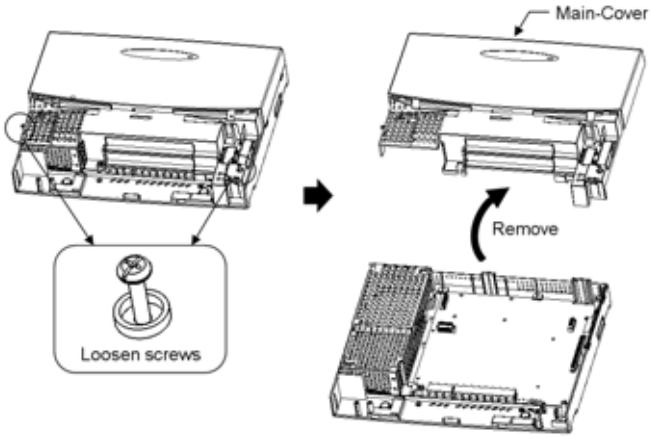
2.4 Upgrading the Main Software

1. During the system power ON, open the Sub-Cover and make sure the SW1 is set to "HOT"

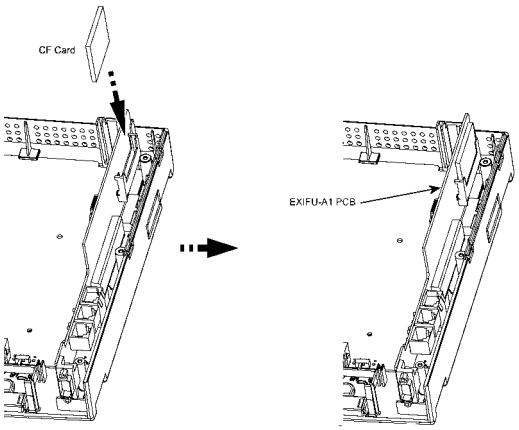


924M Main KSU

2. Power OFF the system.
3. Loosen two screws and remove the Main-Cover.



4. Insert CF card into the CF Slot on EXIFU-A1. (The EXIFU-A1 should be temporarily installed if the system does not have it.)



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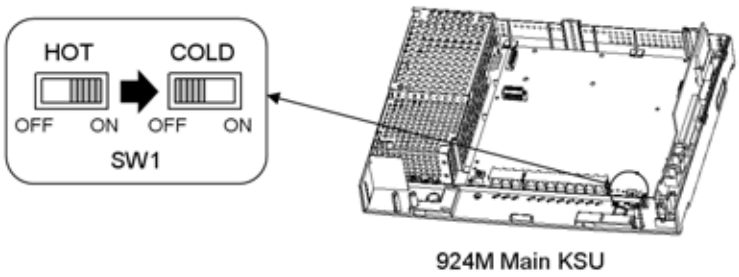
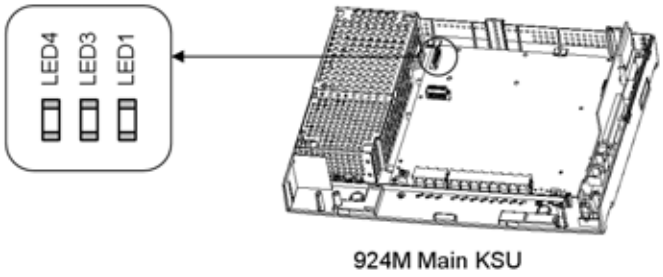
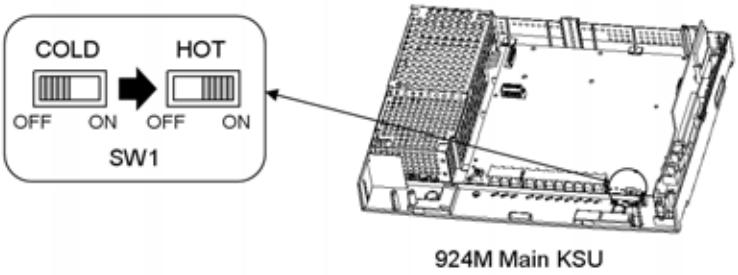
5. SW1 is set to "OFF" (COLD Start).



6. Power ON the system. LED1 turns on and LED4 starts fast blinking (approx 2~3 min). When the loading process is complete, the LED4 will stop blinking.



7. Set SW1 to "ON" (HOT Start).



8. Power OFF the system.

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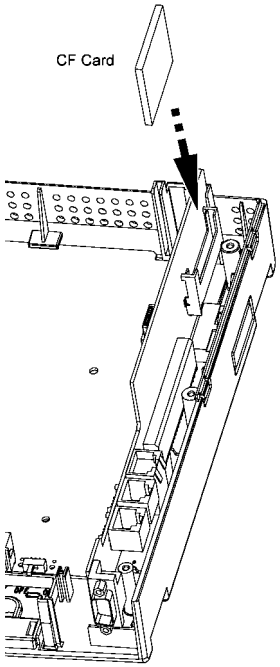
9. Remove the CF Card from the CF Slot on the EXIFU-A1. (Remove the EXIFU-A1 if it is temporarily installed.



10. Replace the Main-Cover and Sub-Cover.
11. Power ON the system.
12. Confirm the software version using the "OPAC" and "Dial 3" operation.

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Specifications

CHAPTER 11

SECTION 1
SYSTEM CAPACITY

1.1 System Capacity

Item	Main KSU
Analog Trunk	9
Key Telephone	(24)
Single Line Telephone	(24)
DSS Console	(3)
	24 Total
Virtual Extension	50
ETSU ISDN (BRI)	8 (16CH)
DLS Console	24
Doorphone	2
External Paging Output	(2) 2PGDU
External MOH Input	(2)
BGM Input	(2)
	2 Total + 1 308M
	1 Total
	1 3 1 1
Power Failure Transfer	3

- The system provides Trunk/Extension Ports for the following items independently. (These are not related for the number of Analog Trunk and Hybrid Extension.)
- Virtual Extension
- ETSI-ISDN (BRI) T-Bus / S-Bus

General Precautions
• Never attempt to insert wires, pins, etc. into the vents or other holes of the equipment. • Do not use benzene, thinner, or the like, or any abrasive powder to clean the equipment. Wipe it with a soft dry cloth.

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Environmental Requirements
Meeting established environmental standards maximizes the life of the system. Be sure that the site is not : • In direct sunlight or in hot, cold or humid places. • In dusty areas or in areas where sulfuric gases are produced. • In places where shocks or vibrations are frequent or strong. • In places where water or other fluids comes in contact with the equipment. • In areas near high-frequency machines or electric welders. • Near computers, telexes, microwaves, air conditioners, etc. • Near radio antennas (including shortwave)

Environmental Specifications	
KSU, PCBs and Key Telephones	Temperature:0 ~ +40 degrees (32 ~ 104 degrees F) Humidity: 10 ~ 90% (non-condensing)
Doorphone	Temperature: -20 ~ +60 degree (-4 ~ 140 degrees F) Humidity: 10 ~ 90% (non-condensing)

Site Requirements
The KSU must be wall-mounted only. Ensure that enough space is available to allow the installation of KSU and/or OPBOX.

AC Power Requirements
A dedicated 110/240VAC circuit located within 2 metres of the KSU is required. A separate dedicated AC outlet is necessary for each KSU.

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Electrical Specifications				
Input Voltage	85VAC ~ 264VAC			
Frequency	50 / 60Hz			
Power Requirement	1.8A @ 100VAC (180VA) 0.9A @ 240VAC (216VA)			
Power Consumption	120W			
Phase and Wire	Single, 2-Wire			
Grounding Requirement	No.14 AWG copper wire			
Output Voltage Type	+3.42VDC	+5VDC	-28VDC	-27VDC (Backup BATT)
Load Fluctuation	±5%	±5%	±5%	±5%
Output Current	0.5A~3.0A	0.0A~2.0A	0.0A~2.0A	0.0A~2.0A
Ripple/Noise	100mVp-p	100mVp-p	200mVp-p	200mVp-p
Over Voltage Protection	3.7V~6.5A	5.6V~13.0V	-32.3V~ -38.2V	-32.3V~ -38.2V
Over Current Protection	5.5A~6.5A	1.8A~2.1A	4.7A~5.6A	0.22A

Mechanical Specifications				
Equipment	**Width (mm)**	**Depth (mm)**	**Height (mm)**	**Weight (Kg)**
924 KSU	360	90	275	2.8 Fully Equipped
OPBOX	130	86	279	1.1 Fully Equipped
Backup Battery Box	384	99	182	5.2 Fully Equipped
Display Type TEL	178	178	84 (Low) 115 (High)	0.829 (12TXD) 0.822 (6TXD)
Standard Type TEL	178	178	84 (Low) 115 (High)	0.819(12TD) 0.812(6TD)
DSS Console	315.5	177	59	0.196
DLS Console	212	60	59	0.196
Doorphone DP-D-1D	98.4	25.4	130.1	0.2

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Doorphone Specifications	
Output Impedance	600Ω
Output Level	Nominal 250mV (-10dBm)
Maximum Output	400mV RMS
Configuration	Normally open

BGM / ExMOH Source Input Specifications	
Input Impedance	600 Ω @ 1kHz
Input Level	Nominal 250mV (-10dBm)
Maximum Output	1V RMS

External Paging Output Specifications	
Output Impedance	600Ω @ 1kHz
Output Level	Nominal 250mV (-10dBm)
Maximum Output	400mV RMS

EXIFU-A1 LAN Port Specifications	
Standard	IEEE802.3 10 Base-T and 100Base-TX Compliant
Access	CSMA/CD
I/F (Layer 1)	Speed: 10Mbps/100Mbps Auto Negotiation
	Cable: CAT5 or better, Straight/Cross Auto Crossover

Cabling Requirements

- Do not run extension cable in parallel with the AC source, telex or computer etc. If the cables are near cable runs to those devices, use shielded cable with grounded shields or install the cable in conduit.
- When cables must be run on the floor, use cable protectors.
- Cable runs for Key Telephones, DSS Consoles, Single Line Telephones, and Doorphone Boxes must be a dedicated, isolated cable pair.
- Aerial distribution cabling is not allowed.
- Trunk Lines must be installed with lighting protectors.
- Do not use 4-wire cabling for DSS Console and SLT connections. Use only 2-wire (centre Pair).

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Cable Requirements		
Device	**Cable Type**	**Cable Run Length (m)**
Key Telephone	4-wire, 24AWG (F0.5mm)	300
DSS Console	2-wire, 24AWG (F0.5mm)	300
Single Line Telephone Analog Terminals (25mA)	2-wire, 24AWG (F0.5mm)	1125
Doorphone	2-wire, 24AWG (F0.5mm)	150
EXIFU LAN Port to External Device (e.g. PC)	Ethernet Cross Cable	100
EXIFU LAN Port to Switching Hub	Ethernet Straight Cable	100
ISDN Terminals (from 2/4BRIU)	4-wire, 24AWG (F0.5mm)	100 (P-MP Short-passive) 300 (P-MP Long-passive) 500 (P-P)

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