NEC

Intelligent Hybrid System

Aspila TOPAZ

Hardware Manual

Issue : 1.0
Date : July, 2004

Table of Contents

Section 1 : The Components
Section 2 : Installing the Main and Expansion KSUs
Section 3 : Trunk/Extension Cabling and Installing the Expansion PCBs
Section 4 : Key Telephone Installations
Section 5 : Installing the Optional Equipment
Section 6 : Installing the Optional Facilities
Section 7 : System Start Up
Section 8 : Maintenance
Section 9 : Specifications

Symbol in this Manual

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

Symbol	Description
	This symbol informs you the additional notes.
	This symbol alerts you the 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.

Nothing contained in this manual shall be deemed to be, and this manual does not constitute, a warranty of, or representation with respect to, any of the equipment covered. This manual is subject to change without notice and NEC Infrontia Asia Pacific Sdn Bhd has no obligation to provide any updates or corrections to this manual. Further, NEC Infrontia Asia Pacific Sdn Bhd also reserves the right, without prior notice, to make changes in equipment design or components as it deems appropriate. No representation is made that this manual is complete or accurate in all respects and NEC Infrontia Asia Pacific Sdn Bhd shall not be liable for any errors or omissions. In no event shall NEC Infrontia Asia Pacific Sdn Bhd be liable for any incidental or consequential damages in connection with the use of this manual. This document contains proprietary information that is protected by copyright. All rights are reserved. No part of this document may be photocopied or reproduced without prior written consent of NEC Infrontia Asia Pacific Sdn Bhd.

© 2004 by NEC Infrontia Asia Pacific Sdn. Bhd.
All Rights Reserved.

Revision History

Issue No.	Date	Reason of Change
0.5	June, 2004	Limited Release (for Field Trial purpose)
1.0	July, 2004	1st Release

- For Your Notes -

Section 1 : The Components

Table of Contents

List of Components..... 1-2

1. KSUs 1-4

924M KSU
924ME KSU

2. System Options 1-5

OPBOX
32i/NX7E Battery Box
ABB Card Set

3. System Expansion Interface Cards 1-6

308E-A1
008E-A1

4. Optional Interface Cards (installed into KSU) 1-7

EXIFU-A1
EXIFU-B1
2PGDU-A1
DSPDB-A1
CF-B1

5. Optional Interface Cards (installed into OPBOX) 1-8

2/4BRIU-S1

6. Key Telephones 1-9

12TXD TEL
12TD TEL
6TXD TEL
6TD TEL

7. Optional Terminals 1-10

24BDL DLS Console
64BD DSS Console
DX4NA DOORPHONE

List of Components

Item	Description	Max QTY			Note
		924	1848	2772	
IP2AP-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 Power Failure Transfer Circuit - 2 mounting spaces for 308E/008E - 1 slot for 2PGDU - 1 slot for EXIFU - 1 connector for DSPDB - 1 connector for OPBOX
IP2AP-924ME KSU	Expansion KSU	---	1	2	Initially equipped : - Power Supply (110V/240V) - External Backup Battery Charger - SLT Ringer - 3 Trunks + 8 Hybrid Ext. I/F - 1 Power Failure Transfer Circuit - 2 mounting spaces for 308E/008E - 1 slot for 2PGDU - 1 connector for 924M KSU - 1 connector for OPBOX
IP2WW-OPBOX	Additional Box for Optional I/F Cards	1	2	3	Joint to 924M/924ME KSU. 2 slots for Optional I/F Cards.
IP2AP-308E-A1	3 Trunks + 8 Hybrid Extensions I/F	2	4	6	Installed into 924M/924ME KSU. 1 Power Failure Transfer Circuit is provided. (308E)
IP2AP-008E-A1	8 Hybrid Extensions I/F				
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	2	3	Installed into 924M/924ME 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	4	6	Installed into OPBOX..
IP1WW-4BRIU-S1	4 BRI (Euro-ISDN) I/F				Installed into OPBOX.

Item	Description	Max QTY			Note
		924	1848	2772	
IP2AP-6TD TEL (WH)	6 Keys, Standard type Key Telephone	24	48	72	
IP2AP-6TXD TEL (WH)	6 Keys, Display type Key Telephone				
IP2AP-12TD TEL (WH)	12 Keys, Standard type Key Telephone				
IP2AP-12TXD TEL (WH)	12 Keys, Display type Key Telephone				
IP2AP-64BD DSS (WH)	64 Keys DSS Console	3	6	9	Connected to the Extension Port.
IP2AP-24BDL DLS (WH)	24 Keys DLS Console	24	48	72	Connected to the Display type Key Telephone
DXNA DOORPHONE	Doorphone Box	2	4	6	Connected to 2PGDU
DX2E-32i/NX7E Battery Box	External Backup Battery Box	1	2	3	Connected to the Power Supply In each KSU.
DX.E ABB. CARD SET	Stand type ABB Card Set (20pcs)	As needed			

1. KSUs

◆ 924M KSU

This is the main cabinet. The following facilities are initially equipped.

- CPU
- Main Software
- Power Supply (110V / 240V)
- External Backup Battery Charger Circuit
- SLT Ringer
- 3 Analog Trunk Ports
- 8 Hybrid Extension Ports
- 1 Power Failure Transfer Circuit
- 2 mounting spaces for 308E/008E card
- 1 slot for 2PGDU card
- 1 slot for EXIFU-A1/B1 card
- 1 connector for DSPDB card
- 1 connector for OPBOX

And, the on-board DSP provides :
- 16 Telephony Resources
  (DTMF / Dial Tone / Busy Tone / Caller-ID Receivers, Caller-ID Senders <FSK>)
- 64 Tone Sender Resources (DTMF / Service Tone / Caller-ID Senders <DTMF>)
- 32ch Conference Resources (8ch x 4)

◆ 924ME KSU

This is the expansion cabinet to expand the system capacity. Up to two 924ME KSUs can be connected to the 924M Main KSU. The KSU shape and structure is exactly same as 924M KSU, however the capability is different. The following facilities are initially equipped.

- Power Supply (110V / 240V)
- External Backup Battery Charger Circuit
- SLT Ringer
- 3 Analog Trunk Ports
- 8 Hybrid Extension Ports
- 1 Power Failure Transfer Circuit
- 2 mounting spaces for 308E/008E card
- 1 slot for 2PGDU card
- 1 connector for 924M KSU
- 1 connector for OPBOX

And, the on-board DSP provides :
- 32 Telephony Resources
  (DTMF / Dial Tone / Busy Tone / Caller-ID receivers, Caller-ID Senders <FSK>)

924ME KSU does **NOT** have CPU and Main Software, therefore it shall not activate by stand-alone.

2. System Options

◆ OPBOX

This is the additional box for optional interface cards. An OPBOX can be jointed at the right hand side of each KSU. One OPBOX provides up to 2 universal slots.

◆ 32i/NX7E Battery Box

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

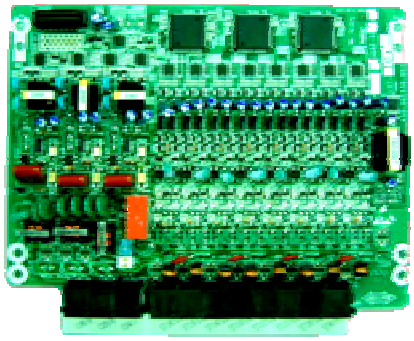
◆ ABB CARD SET

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

3. System Expansion Interface Cards

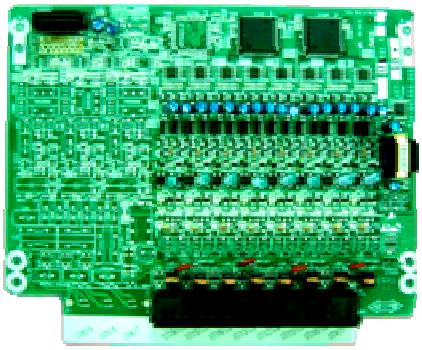
◆ 308E-A1

This is the expansion interface card, and is installed into 924M/924ME KSU. Up to 3 analog 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-A1 cards can be installed per a KSU.



◆ 008E-A1

This is also the expansion interface card as same as 308E-A1, and is installed into 924M/924ME KSU. Up to 8 hybrid extension ports are mounted per a card. Up to 2 308E/008E-A1 cards can be installed per a KSU.



4. Optional Interface Cards (installed into KSU)

◆ EXIFU-A1

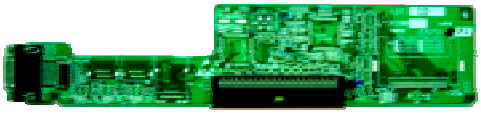
This is the expansion interface card with following various functions, and is installed into the "EXIFU" slot in 924M KSU. Either EXIFU-A1 or B1 can be installed in 924M KSU.

- 2 Expansion Connectors (for 924ME KSU)
- 1 Ethernet Port (10/100M)
- 1 Serial Port (D-Sub 9 Pin)
- 1 CF Slot

The Ethernet Port is for SMDR Output and/or PC Programming. The Serial Port is for SMDR Output. And the CF Slot is for main software upgrading purpose.

◆ EXIFU-B1

This is the Serial interface card and is installed into the "EXIFU" slot in 924M KSU. Only 1 Serial Port (D-Sub 9 Pin) is located. Either EXIFU-A1 or B1 can be installed in 924M KSU.



◆ 2PGDU-A1

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

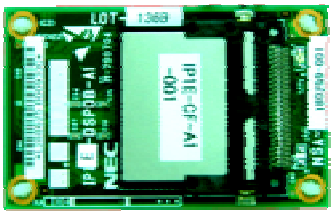
- 2 Doorphone circuits
- 2 Relay contacts for Door Unlock/Audio Control
- 2 Audio Jacks

There is a hardware switch to choose either "DXNA DOORPHONE" or "BL-S-D6". (BL-S-D6 is the Doorphone Box for AK/dX-Z Series)

This card provides 2 audio jacks in order to connect External Paging Speaker, External Music On Hold and BGM audio sources, however up to 2 items must be selected from them. (Assigned by software setting)

◆ DSPDB-A1

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



◆ 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 VRS with 8ch Voice Mail function.

5. Optional Interface Cards (installed into OPBOX)

◆ 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.

6. Key Telephones

◆ 12TXD TEL

This is the 12 Programmable Keys, 10 additional Programmable Keys, Display type Key Telephone with Handsfree function. The display is 2 lines x 16 digits. Phone-Angle adjustment leg is initially attached, and it can be used for Wall-Mounting.

◆ 12TD TEL

This is the 12 Programmable Keys, 10 additional Programmable Keys (without BLF), Standard type Key Telephone with Intercom Talkback function. Phone-Angle adjustment leg is initially attached, and it can be used for Wall-Mounting.

◆ 6TXD TEL

This is the 6 Programmable Keys, 10 additional Programmable Keys, Display type Key Telephone with Handsfree function. The display is 2 lines x 16 digits. Phone-Angle adjustment leg is initially attached, and it can be used for Wall-Mounting.

◆ 6TD TEL

This is the 6 Programmable Keys, 10 additional Programmable Keys (without BLF), Standard type Key Telephone with Intercom Talkback function. Phone-Angle adjustment leg is initially attached, and it can be used for Wall-Mounting.

7. Optional Terminals

◆ 24BDL DLS Console

This is the 24 Programmable Keys console to increase the number of Programmable Keys of Key Telephone. This console is directly connected to the Display Type Key Telephone.

◆ 64BD DSS Console

This is the 64 Programmable Keys console, and is connected to one of extension port. The main purpose of this console is DSS (Direct Station Selection) for Operator, however, unused keys can be assigned as other function keys such as Feature Access Key, One-Touch Key, and so on.

◆ DXNA DOORPHONE

This is the Doorphone Box, and is connected to the 2PGDU.

Section 2 : Installing the Main and Expansion KSUs

Table of Contents

1. Before Installing the KSUs 2-2
1-1 : General Precautions
1-2 : Unpacking
1-3 : Preparations
1-4 : Site Requirements
1-5 : Environmental Requirements

2. Installing the KSUs 2-4
2-1 : KSUs /OPBOX size
2-2 : Secure the KSUs to the Wall
2-3 : Wall-Mounting the KSUs

3. Installing the Expansion KSUs 2-8
3-1 : General
3-2 : Unpacking (EXIFU-A1)
3-3 : Switch & Connectors Location
3-4 : Installing the EXIFU-A1 PCB
3-5 : KSUs Inter-connection

4. Grounding & AC Cabling 2-12
4-1 : Grounding the KSUs
4-2 : AC Power Cord

Section 2
Installing the Main & Expansion KSUs

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.

1-2 : Unpacking

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

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

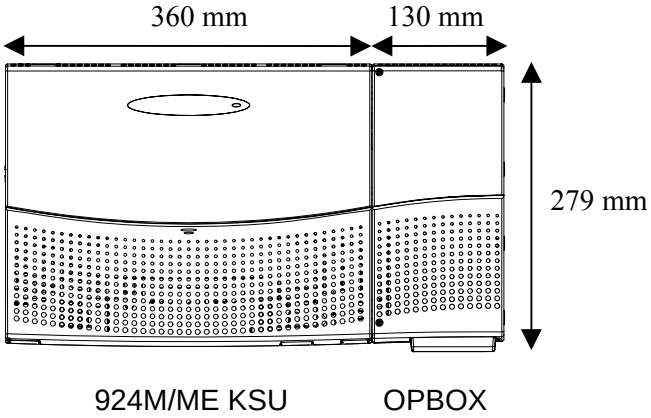
Meeting established environmental standards maximizes the life of the system. Be sure that the site is not :

- 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)

2. Installing the KSUs

2-1 : KSUs /OPBOX size

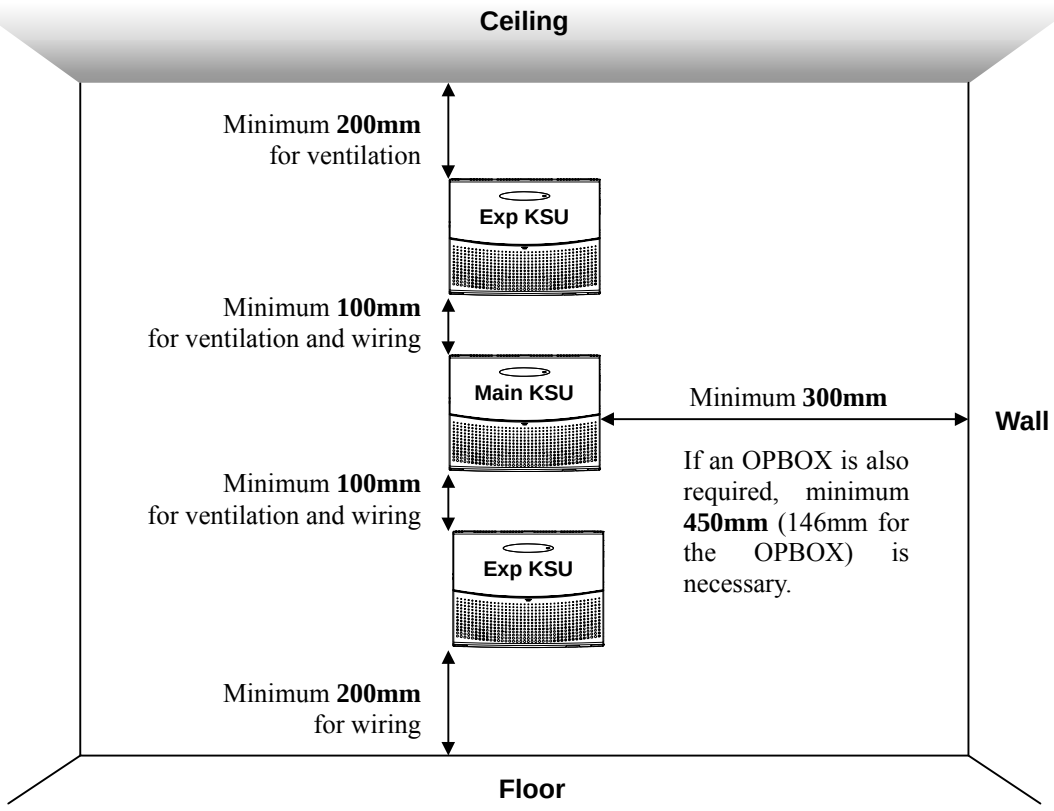
The dimension of main KSU (924M), expansion KSU (924ME) and OPBOX is as below.



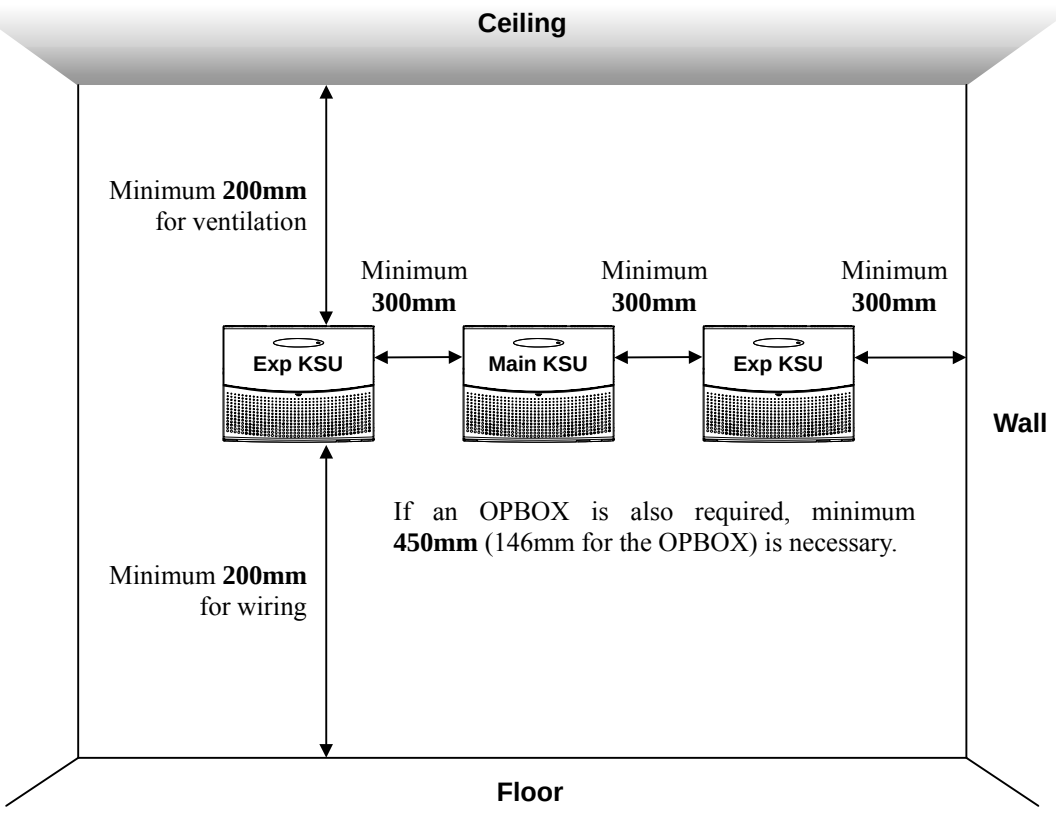
2-2 : Secure the KSUs to the Wall

The main KSU (924M) and expansion KSUs (924ME) must be mounted onto the wall. Before installing, secure the appropriate spacing as below.

<In case KSUs arrange lengthways>

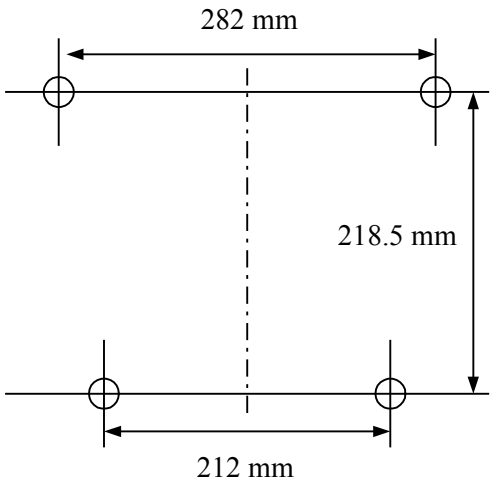


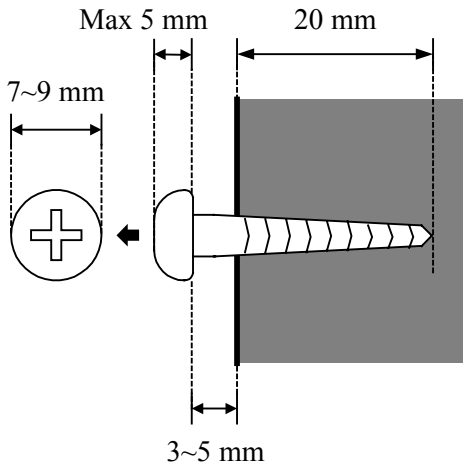
<In case KSUs arrange sideways>



2-3 : Wall-Mounting the KSUs

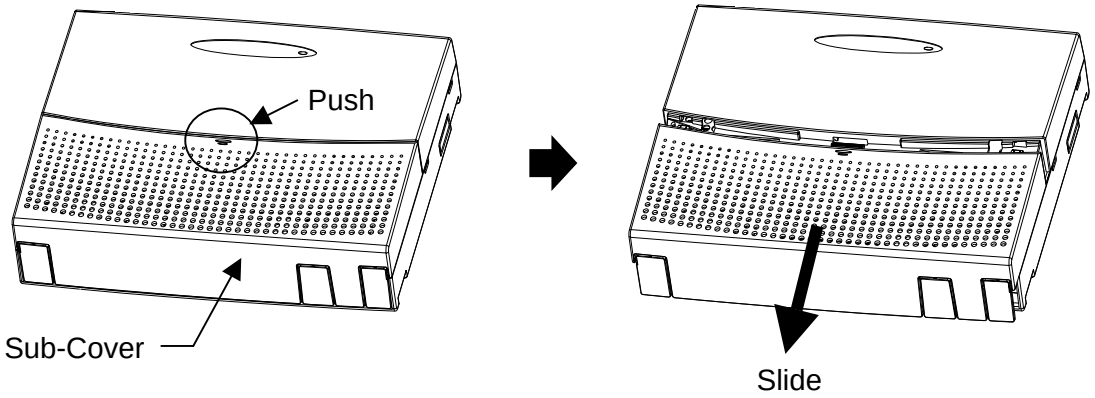
1. Place the attached template on the wall to mark the four screw positions.
2. Install four screws into the wall. The screw heads must be remained about 3~5 mm.



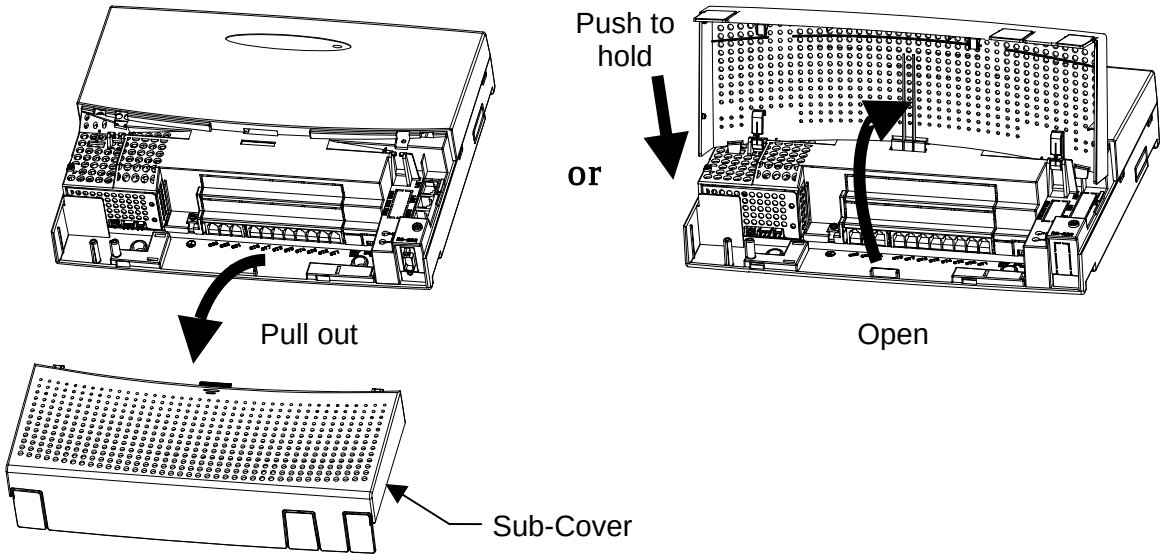


- Wall-Mounting Screws (M4.1x25 : 4 pcs) are attached to the KSU.
- The screw diameter is 4~4.5mm.

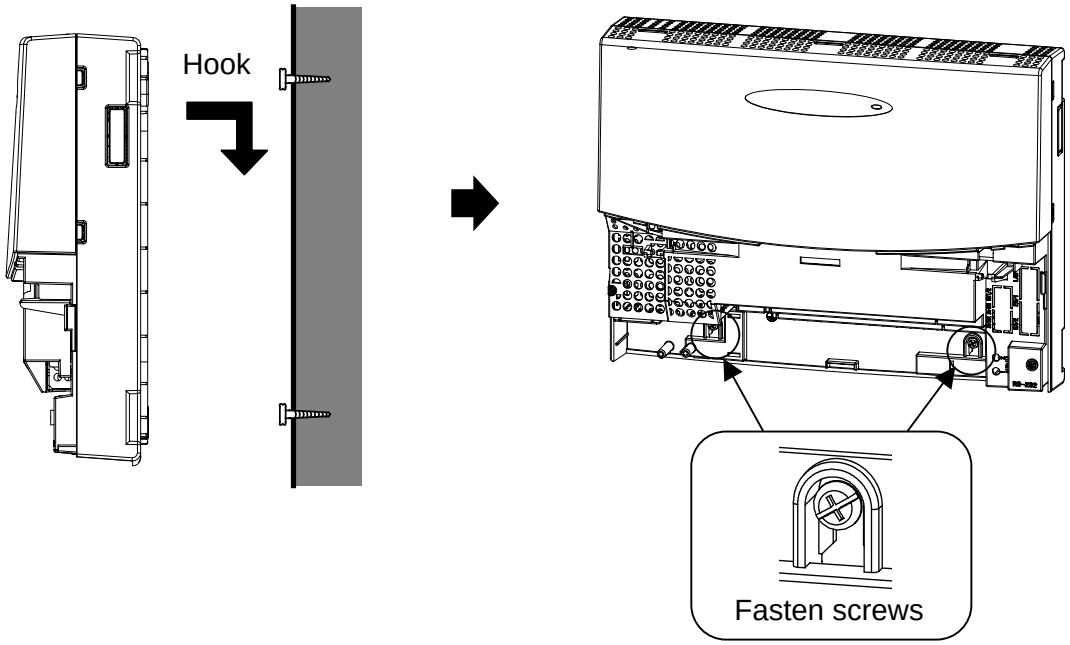
3. Push the center of Sub-Cover and slide the Sub-Cover.



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



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



3. Installing the Expansion KSUs

3-1 : General

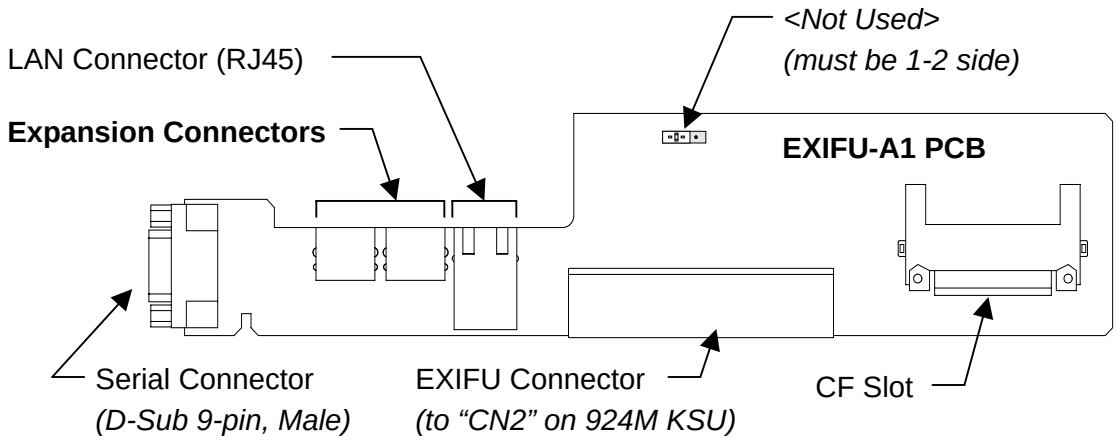
The expansion KSU(s) is/are connected to the main KSU individually. The EXIFU-A1 card must be installed to the **main KSU (924M)**.

3-2 : Unpacking (EXIFU-A1)

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

Items	List of Contents	QTY
EXIFU-A1	EXIFU-A1 PCB	1

3-3 : Switch & Connectors Location

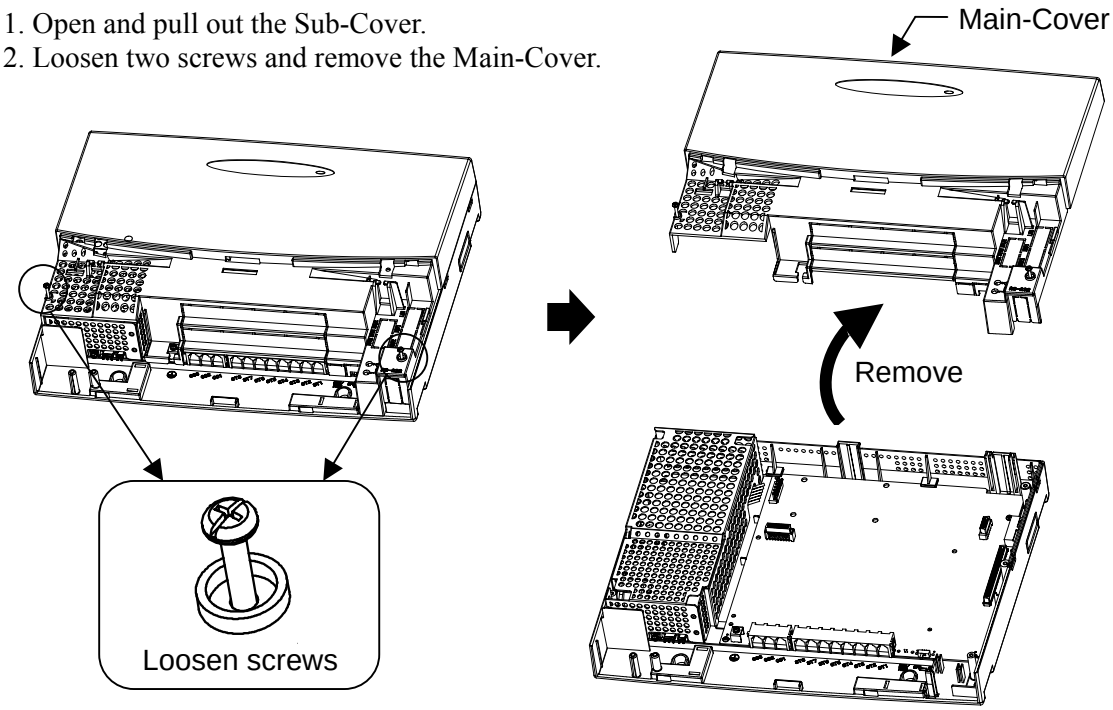


Connectors	Connectable Devices
Expansion Connectors (EXP1, EXP2)	- 924ME KSUs (Expansion KSUs)

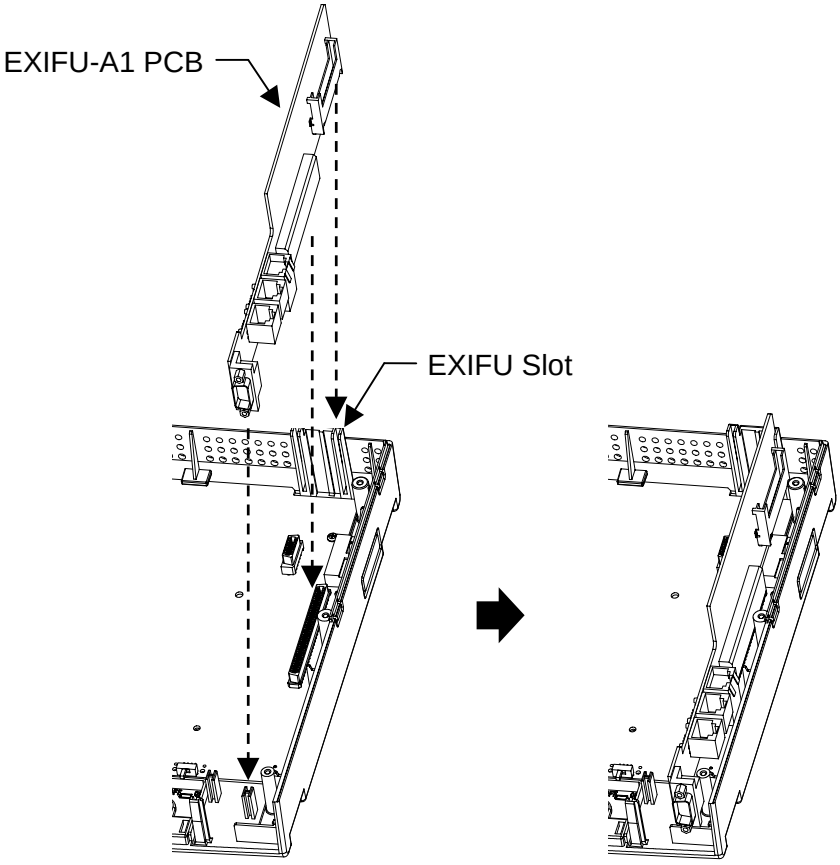
GO *For the details of other Switch & Connectors, refer to the Section 5. (Page 5-2)*

3-4 : Installing the EXIFU-A1 PCB

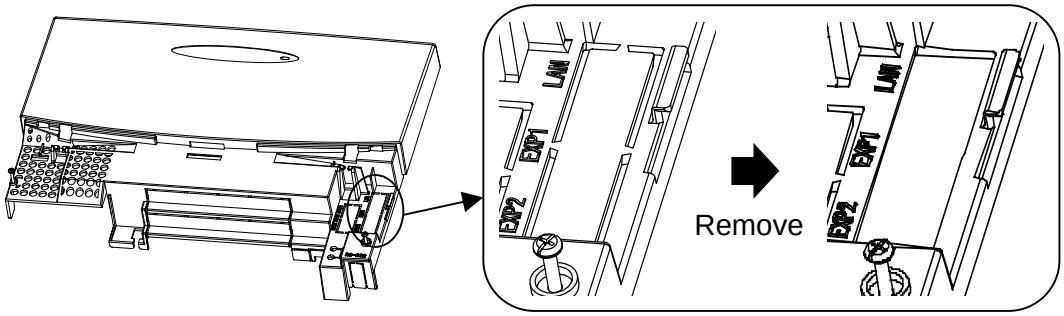
1. Open and pull out the Sub-Cover.
2. Loosen two screws and remove the Main-Cover.



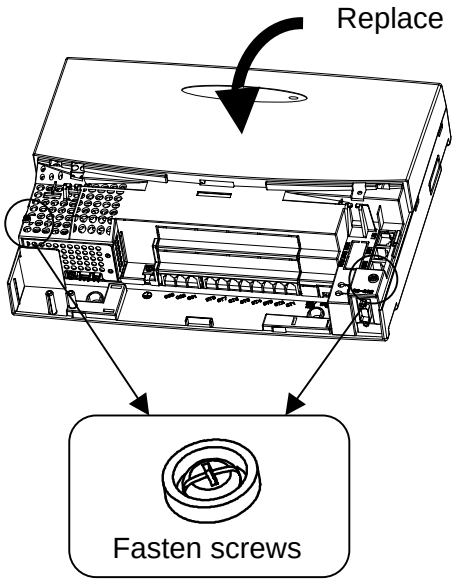
3. Insert the EXIFU-A1 PCB to the EXIFU Slot.



4. Use a blunt object to remove the plastic filter piece for EXP and Ethernet Connectors.

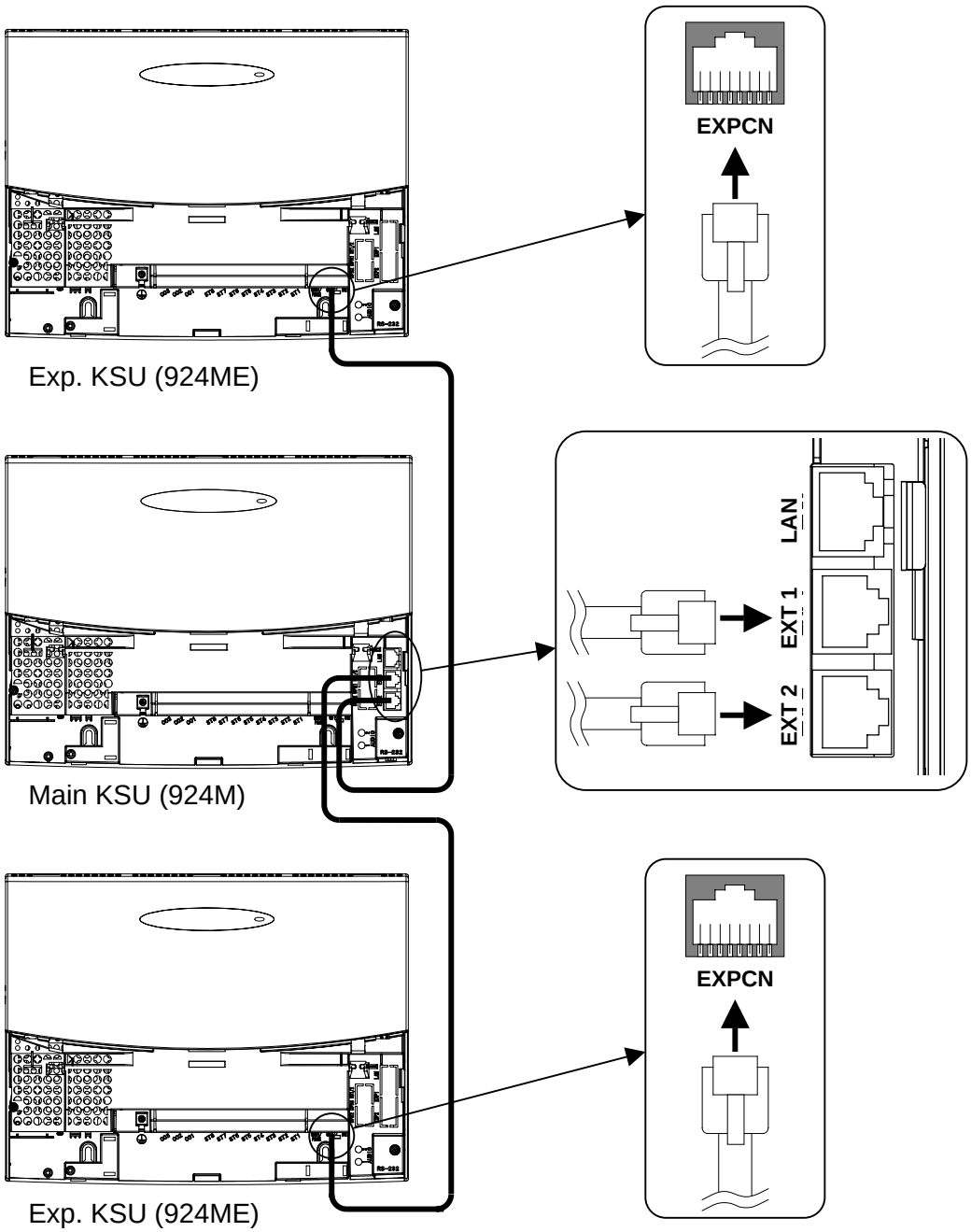


5. Replace the Main-Cover and fasten two screws.



3-5 : KSUs Inter-connection

1. Connect between main KSU and expansion KSU(s) by the cables which are attached to the expansion KSU.



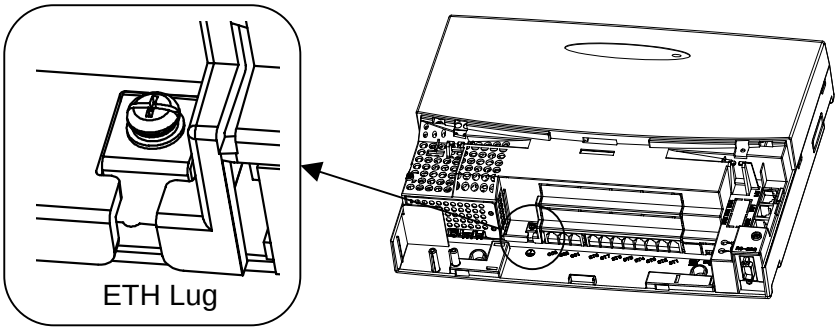
Use attached cables for the above inter-connection.

4. Grounding & AC Cabling

4-1 : Grounding the KSUs

The "ETH" lug is located near the Power Supply on each KSU. The Sub-Cover must be opened in order to access to it.

1. In each KSU, connect "ETH" (Earth Ground) lug to the verified Earth Ground point using 14AWG (Φ2.0mm) wire.



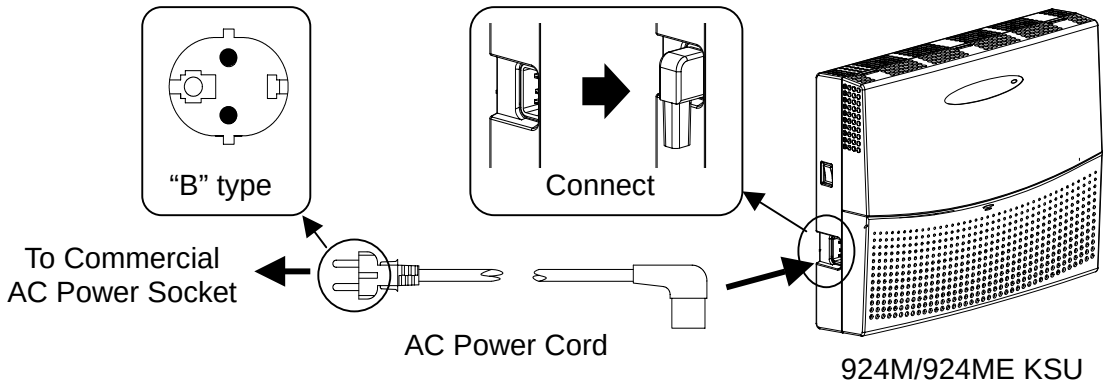
The grounding cable is supplier-provided. (not attached to the system)

4-2 : AC Power Cord

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



- Each KSU must have an own Commercial AC Power Socket.
- DO NOT POWER ON until all installations have been completed.

Section 3 : Trunk/Extension Cabling and Installing the Expansion PCBs

Table of Contents

1. Trunk / Extension Cabling 3-2
1-1 : General
1-2 : Precautions for Cabling
1-3 : Trunk Cabling
1-4 : Extension Cabling
1-5 : Cable Routing and Cramping

2. Installing the Expansion PCBs..... 3-5
2-1 : General
2-2 : Unpacking
2-3 : Installing the 308E/008E PCB

3. Power Failure Transfer..... 3-9
3-1 : General
3-2 : Power Failure Setting

Section 3
Cabling & Installing the Expansion PCBs

1. Trunk / Extension Cabling

1-1 : General

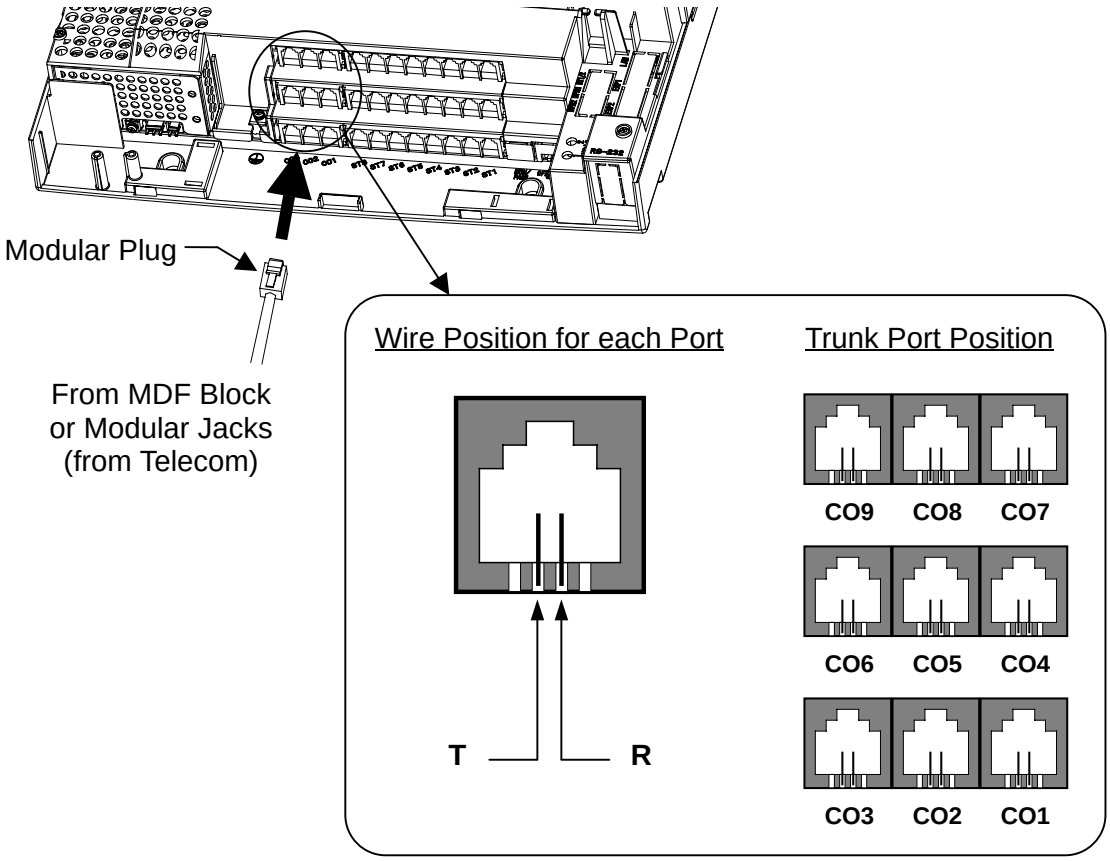
The system provides “RJ11” Modular Jacks for Analog Trunk and extension connection.

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

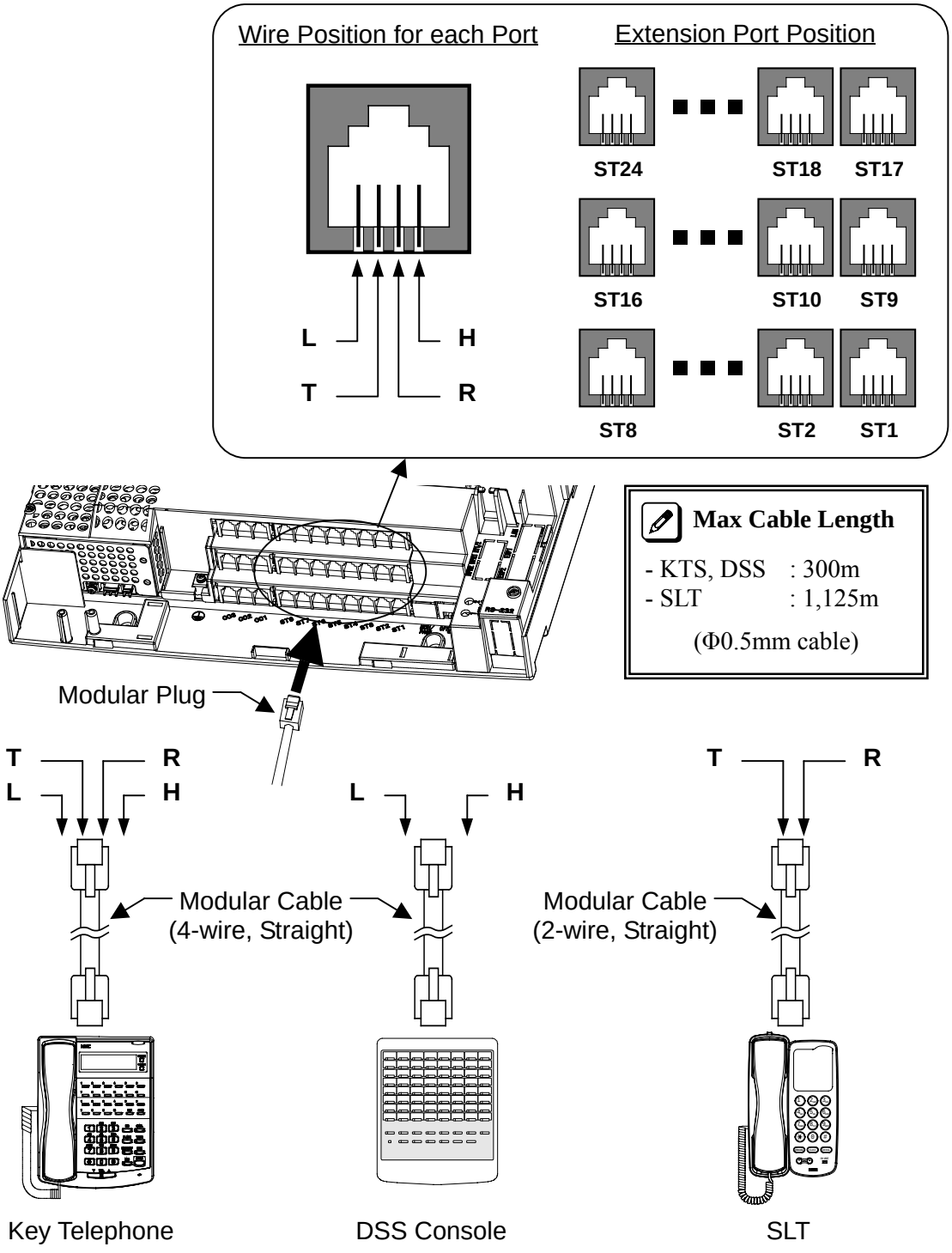
1. Open the Sub-Cover.
2. Insert the modular plugs of the trunk line cords (2-wire) into the Analog Trunk Modular Jacks on the system.



The Lighting Protectors MUST BE INSTALLED on a Trunk.

1-4 : Extension Cabling

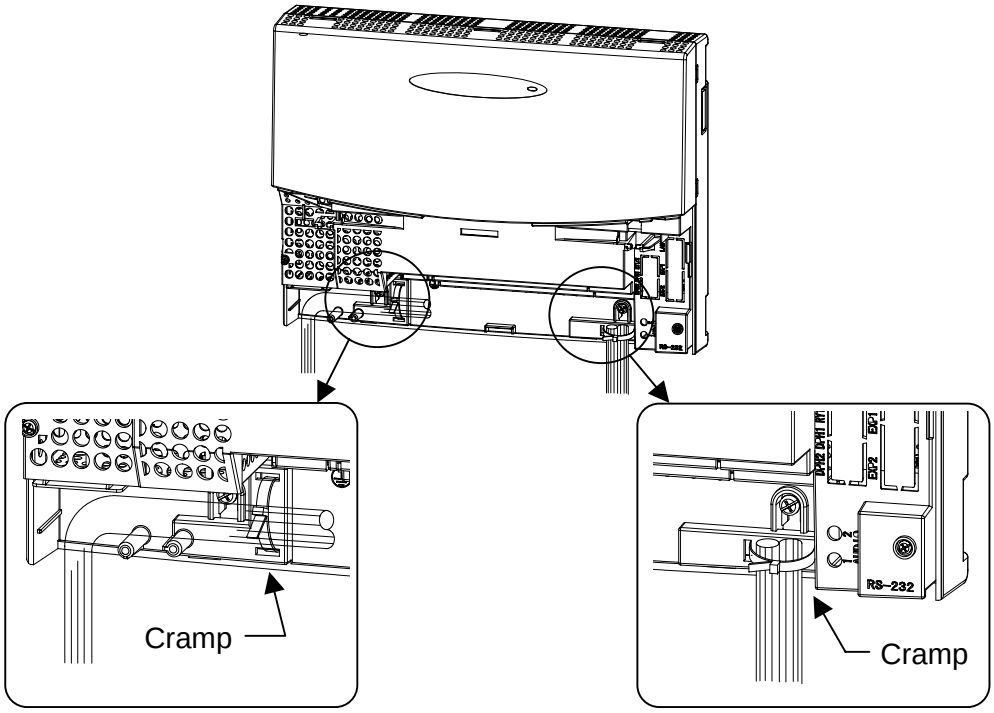
1. Open the Sub-Cover.
2. Insert the modular plugs of the extension line cords (2-wire / 4-wire) into the Extension Modular Jacks on the system.



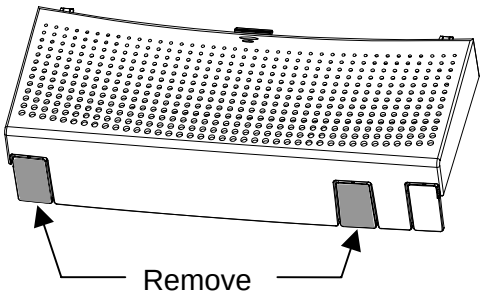
- AK Key Telephone does NOT work properly.
- DSS Console must be connected to the LAST PORT of each 308/008 Card.

1-5 : Cable Routing and Cramping

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



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



3. Replace the Sub-Cover.

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 per a KSU.

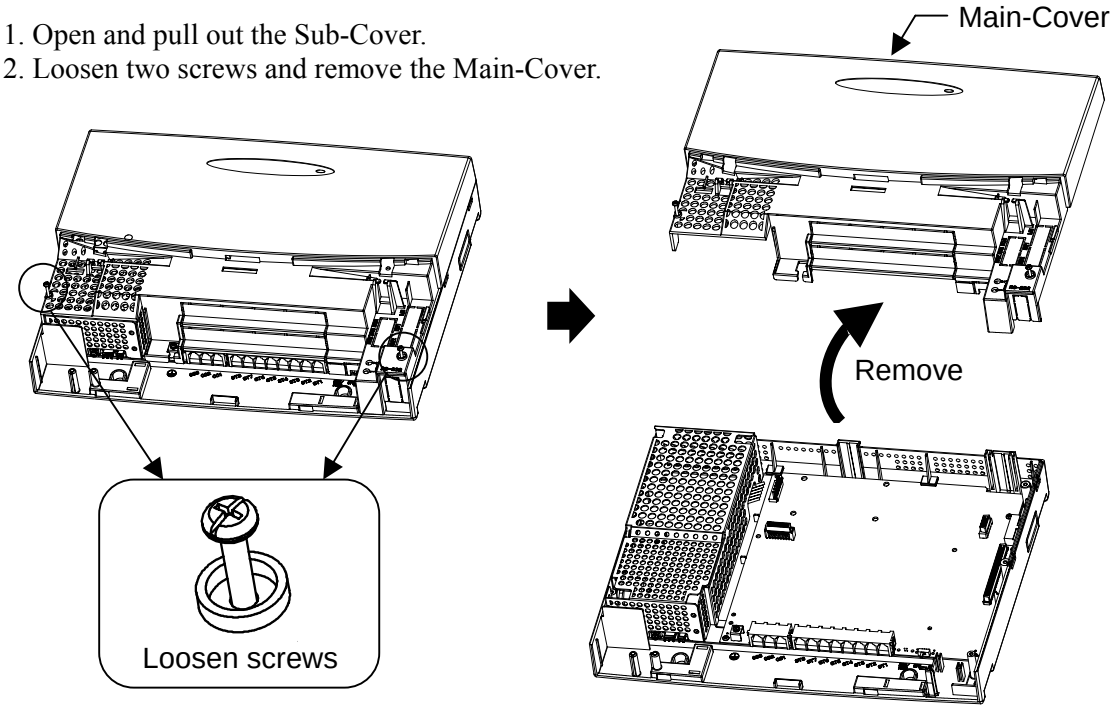
2-2 : Unpacking

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

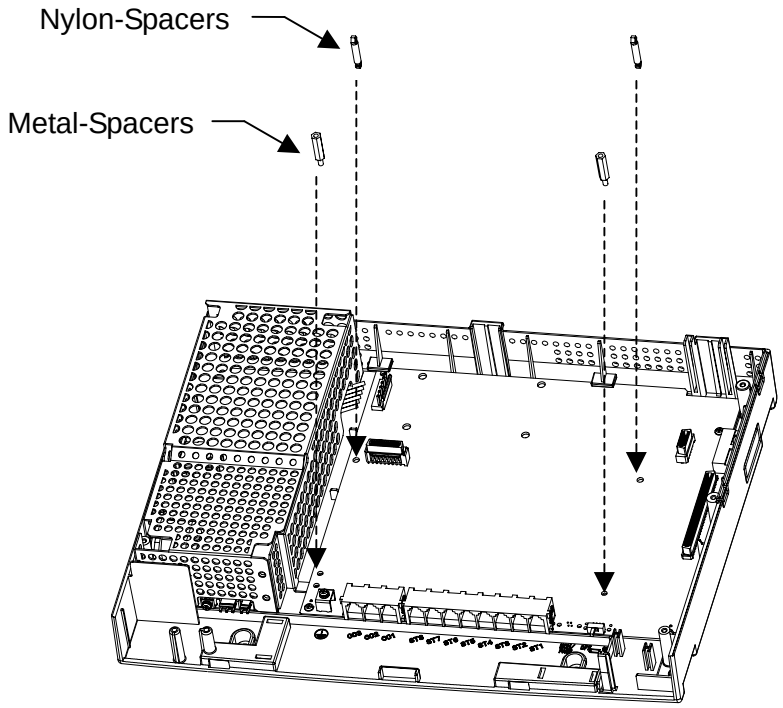
Items	List of Contents	QTY
308E-A1	308E-A1 PCB	1
	Nylon Spacers	2
	Metal Spacers	2
	Screws	2
008E-A1	008E-A1 PCB	1
	Nylon Spacers	2
	Metal Spacers	2
	Screws	2

2-3 : Installing the 308E/008E PCB

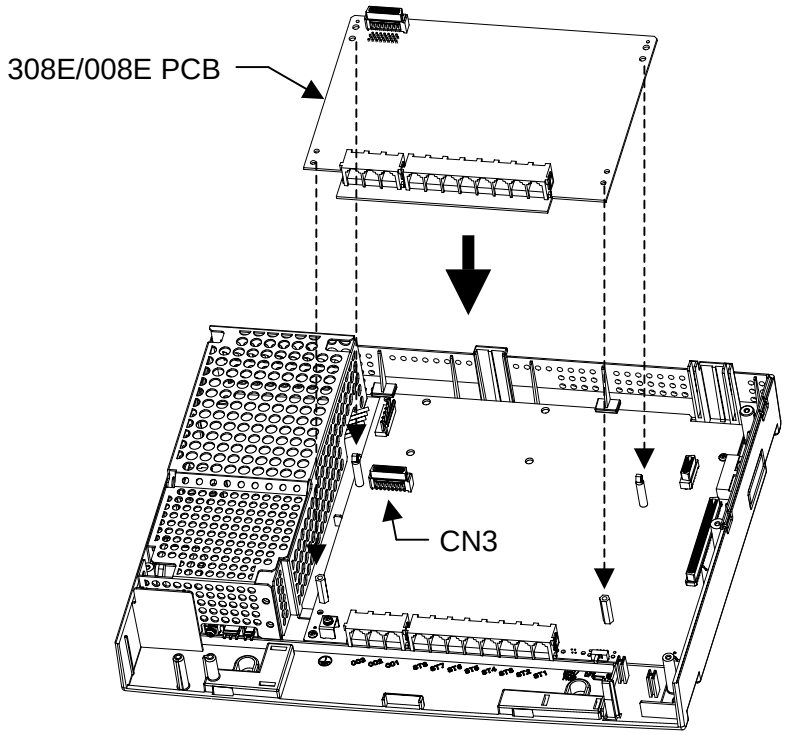
1. Open and pull out the Sub-Cover.
2. Loosen two screws and remove the Main-Cover.



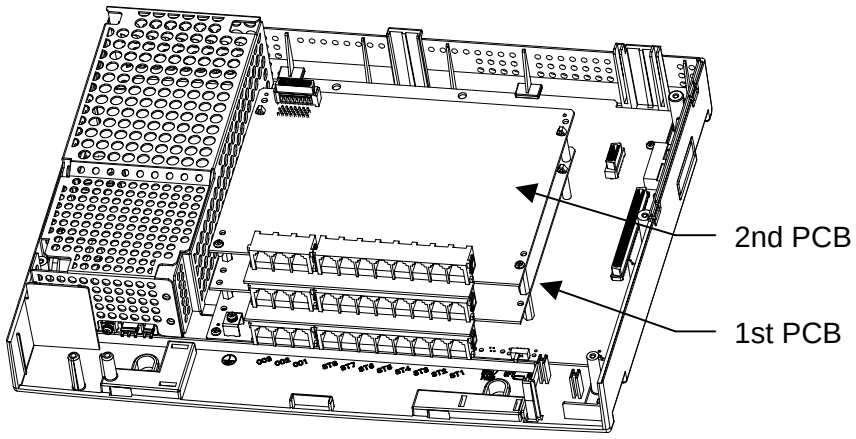
3. Insert two Nylon-Spacers into the specified holes, and fasten two Metal-Spacers into the specified holes. (Both Nylon and Metal Spacers are provided with 308E/008E)



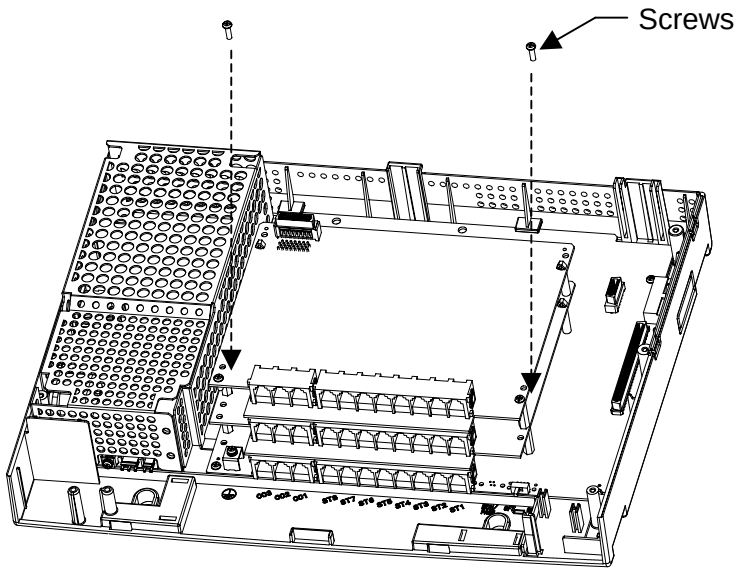
4. Mount the 308E/008E PCB to the "CN3" Connector.



5. In case 2nd PCB is installed, repeat Step-3 and 4. (Refer to the previous page)

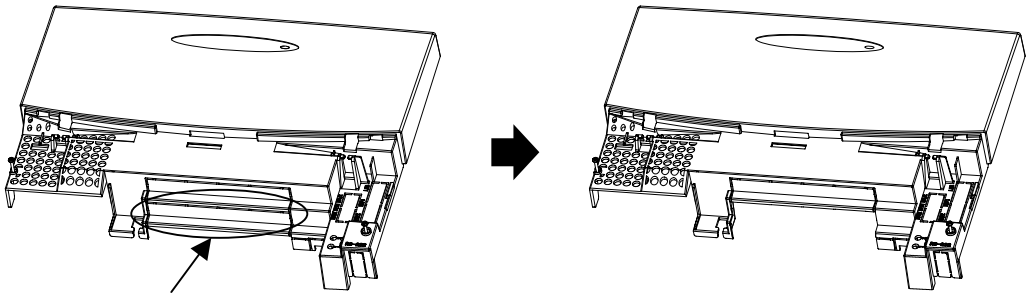


6. Fasten two screws to fix the expansion PCB at the top of 308E/008E PCB.

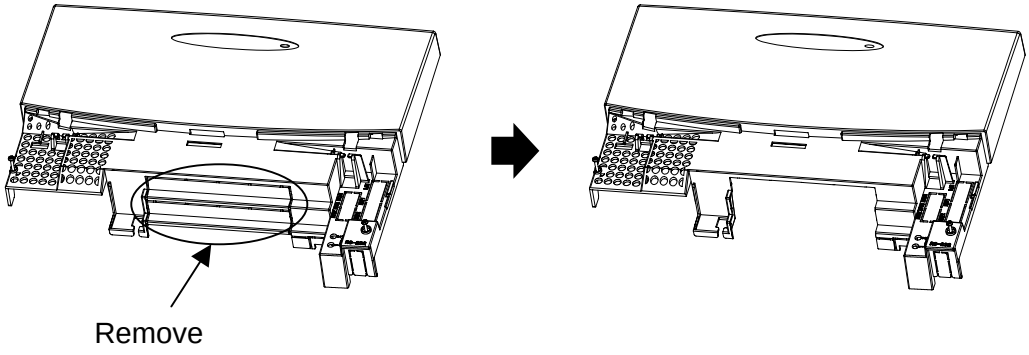


7. Use a blunt object to remove the plastic filter piece for 308E/008E connectors.

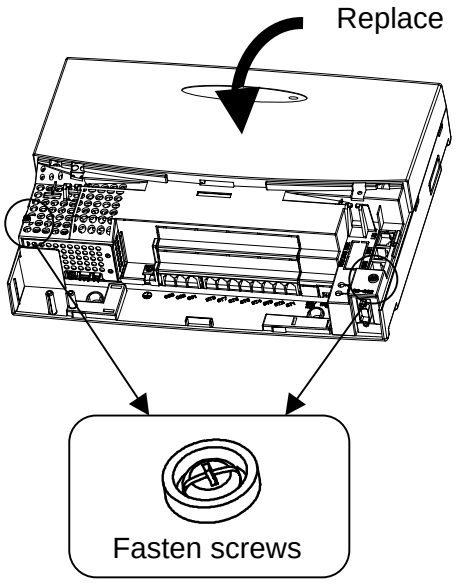
In case of 1st PCB Only



In case of 1st and 2nd PCBs



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



3. Power Failure Transfer

3-1 : General

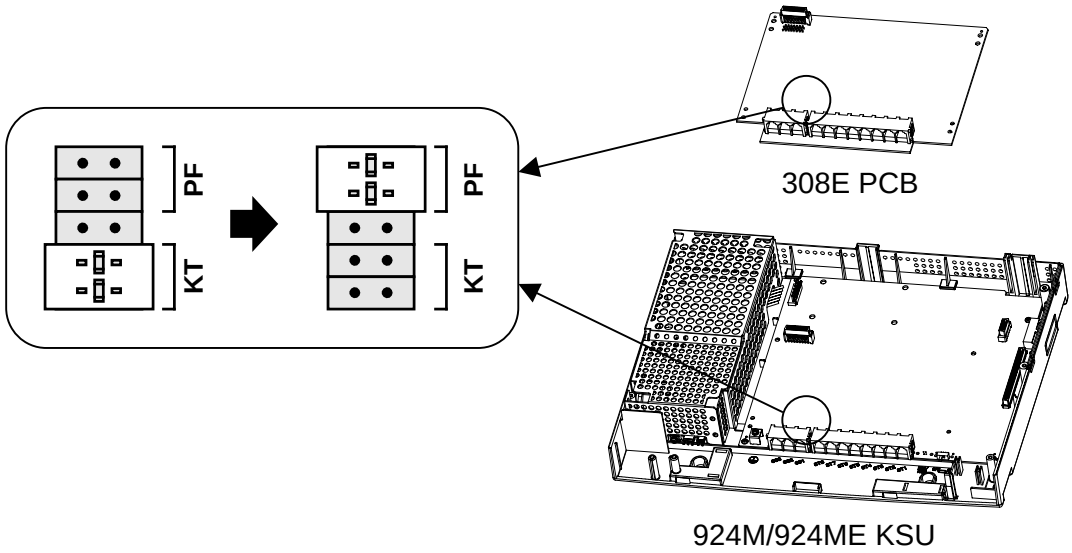
In the event of AC Power failure, the specified trunks are directly connected to the specified extension ports as below.

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)*



- For Your Notes -

Section 4 : Key Telephone & Console Installations

Table of Contents

1. Key Telephones 4-2
1-1 : Location of Controls
1-2 : Key Telephone Legs Adjustment
1-3 : Key Telephone Wall Mounting

2. DLS Console 4-7
2-1 : General
2-2 : Installing the DLS Console

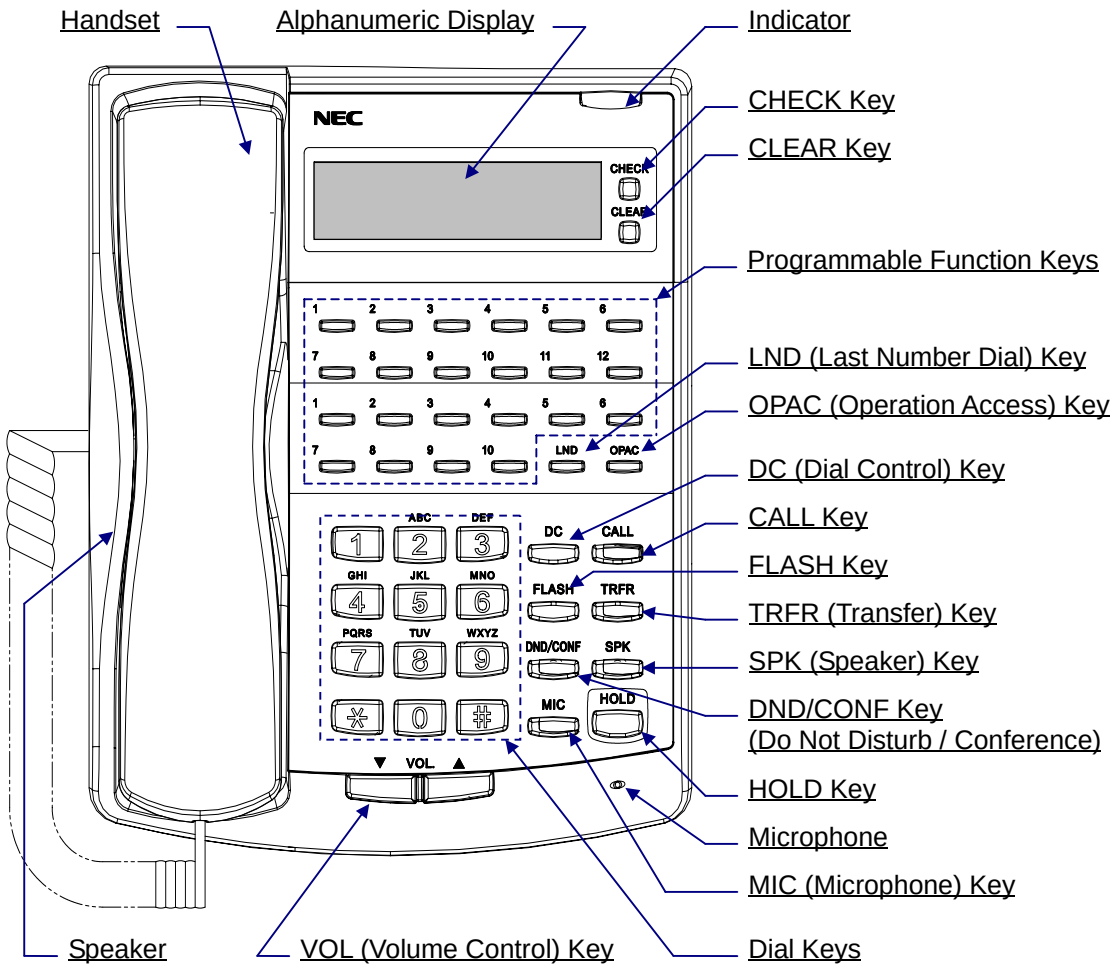
3. DSS Console 4-10

4. Headset 4-10

Section 4
Key Telephone & Console Installations

1. Key Telephones

1-1 : Location of Controls



Functions	12TXH	12TH	6TXD	6TD
Programmable Keys	12	12	6	6
Additional Prg. Keys	10	10	10	10
Display	Yes	No	Yes	No
CHECK/CLEAR Keys	Yes	No	Yes	No
Handsfree	Yes	No (Talkback)	Yes	No (Talkback)
Accept DLS Console	Yes	No	Yes	No
Wall Mount Kit	Yes (Built-in)	Yes (Built-in)	Yes (Built-in)	Yes (Built-in)

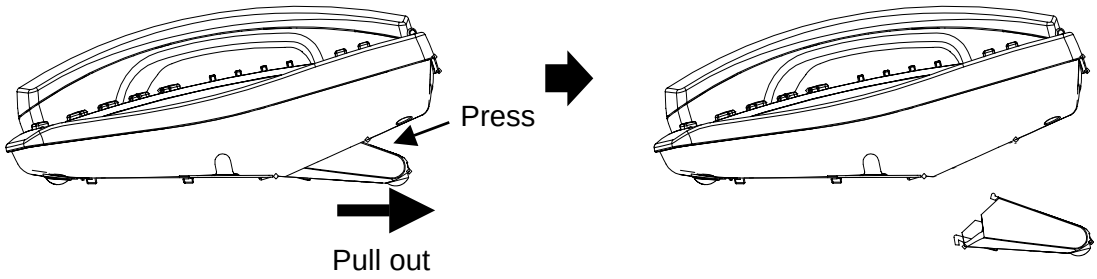
The BLF (Busy Lamp Field) on Additional Programmable Keys are not available on the standard type Key Telephones (12TD / 6TD).

1-2 : Key Telephone Legs Adjustment

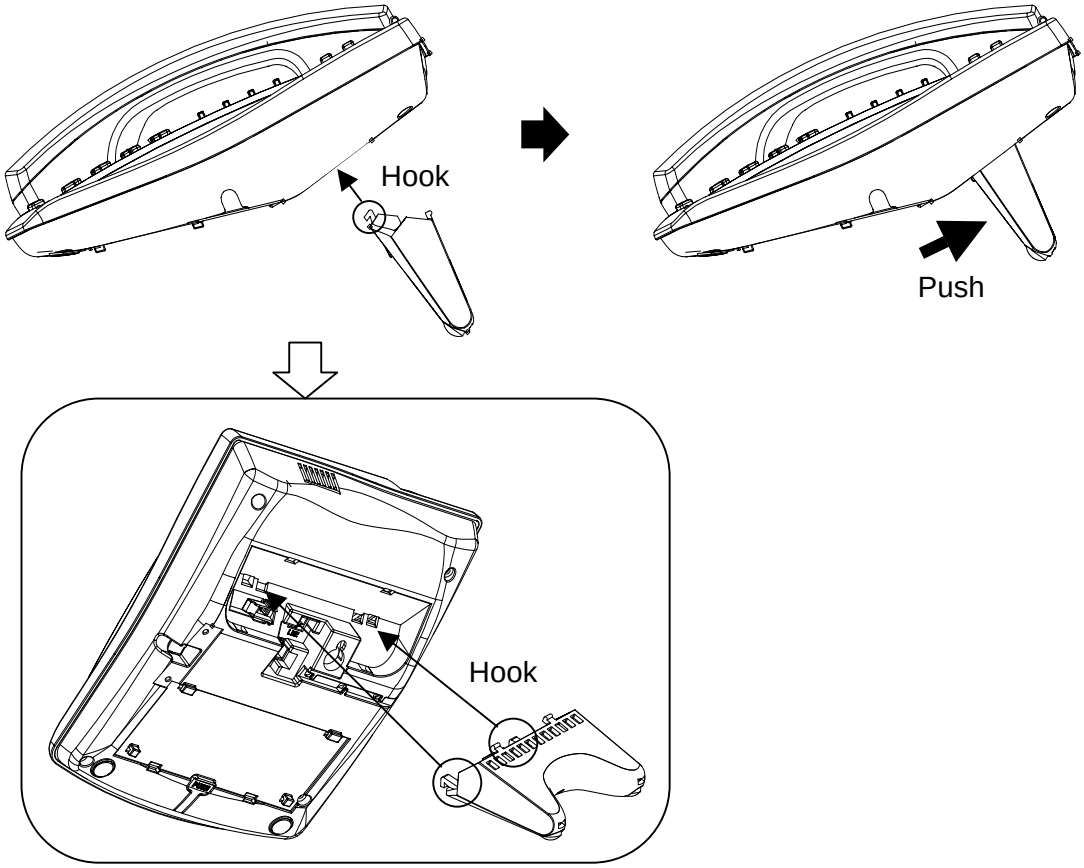
The Key Telephone provides the leg for angling the phone to best suit each user. The leg can be set for two different heights (Low / High). For the factory setting, the leg is set for "Low" position.

When the DLS 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.

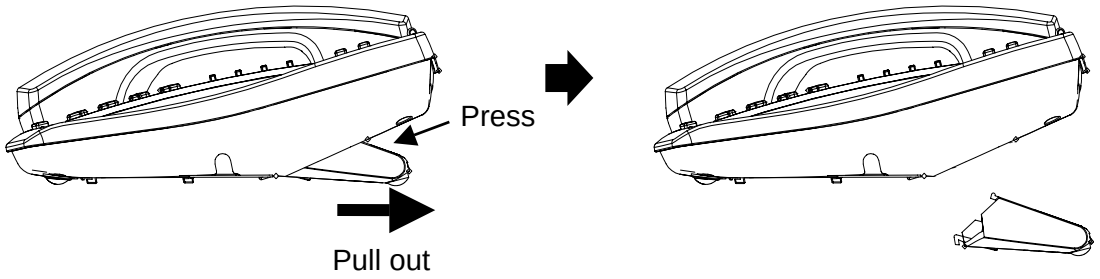


1-3 : Key Telephone Wall Mounting

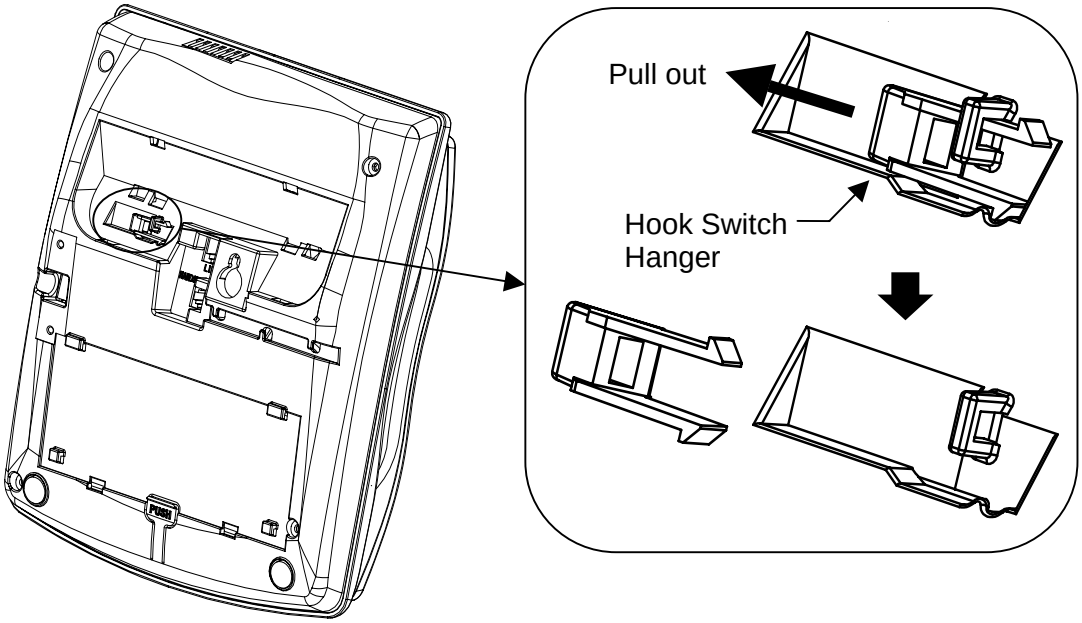
The Key Telephone's leg is able to use as Wall Mounting bracket. This allows the phone to be mounted to a wall at a convenient location. The Key Telephone also contains the hook-switch hanger, clipped at the back of phone.

- 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.

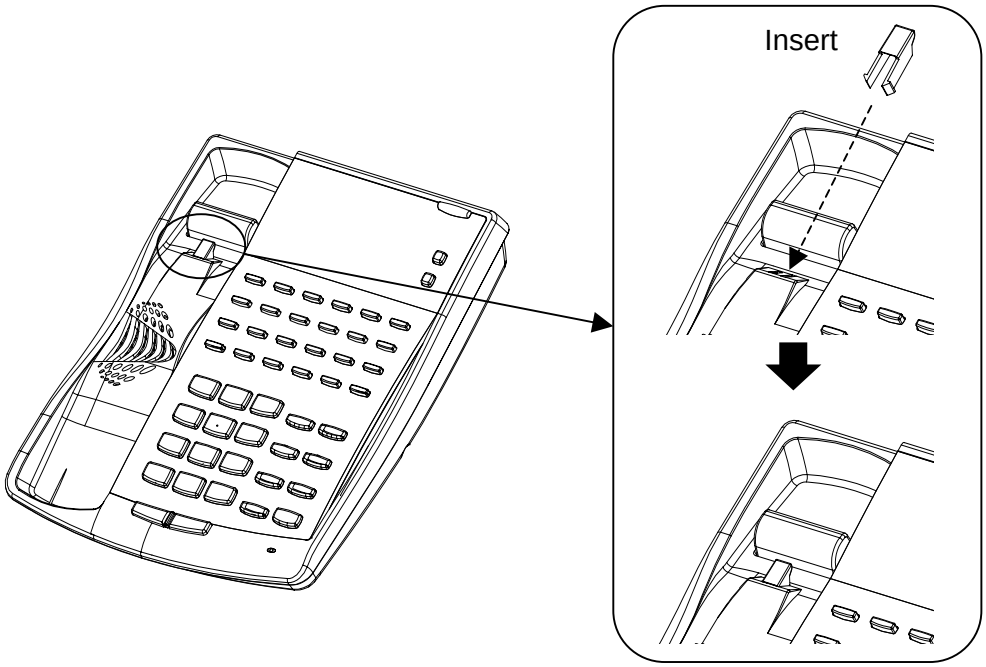
1. Remove the leg from the phone.



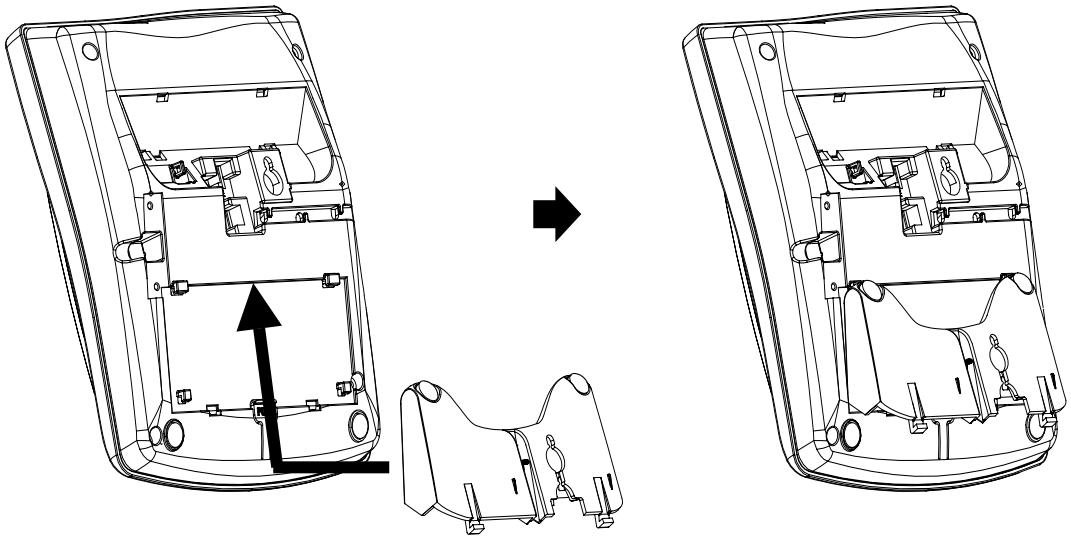
2. Remove the hook-switch hanger located at the back of phone.



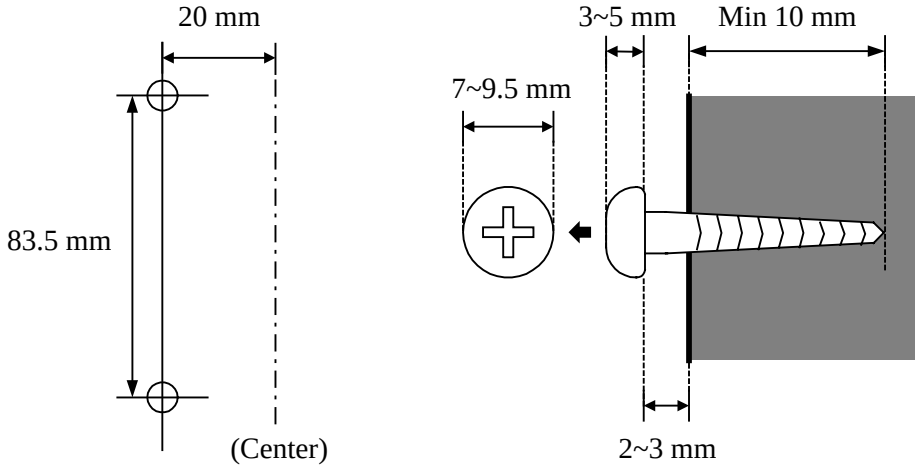
3. Insert the hook-switch hanger in the slot below the hook-switch.



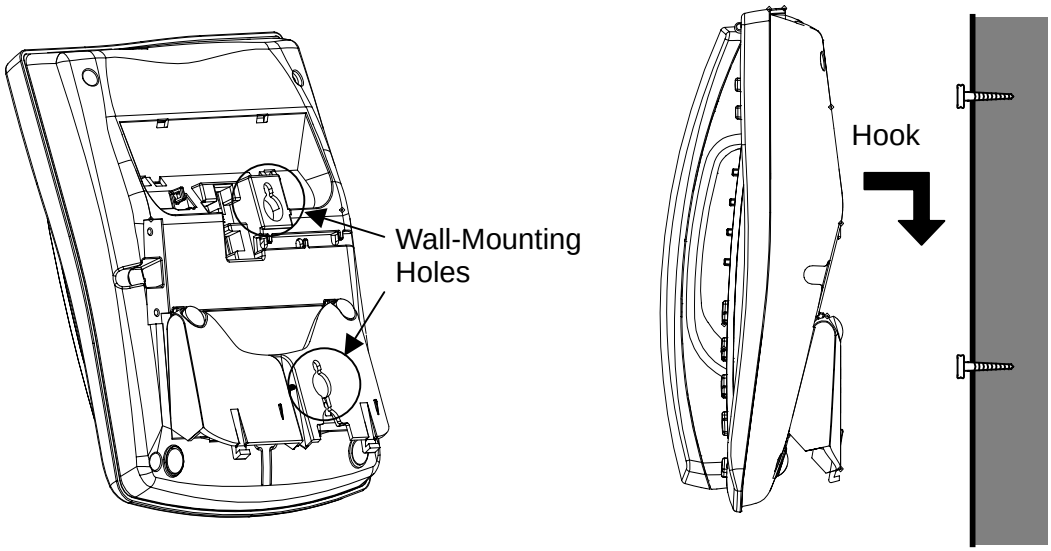
4. Fix the leg at the back of phone.



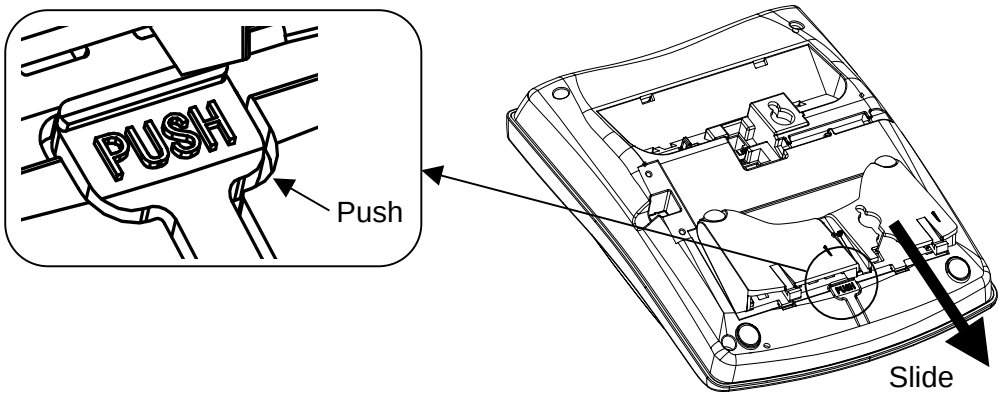
5. Install 2 screws into a wall. The screw heads must be remained about 3 mm.



6. Hook the phone to a wall.



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



2. DLS Console

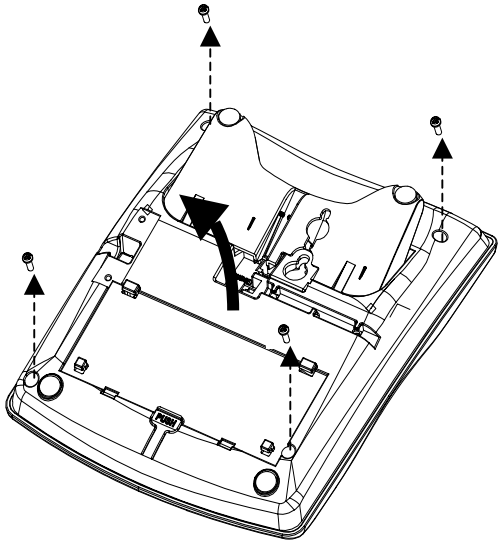
2-1 : General

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.

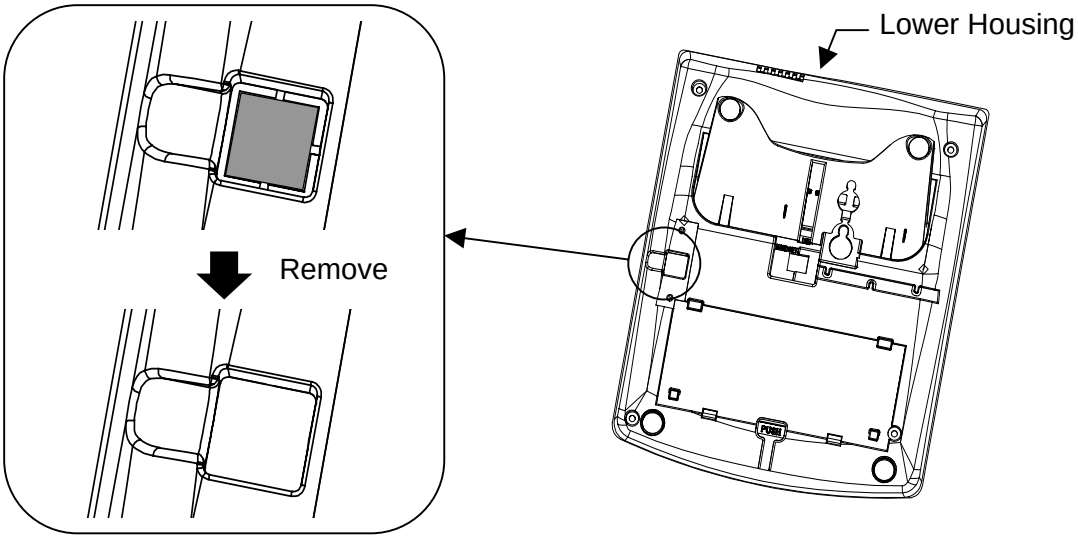
- When the DLS Console is connected to the Key Telephone, the height should be set to "Low" position.
- The Key Telephone with DLS Console can not be mounted to a wall.
- DLS Console can not be connected to the Standard Type Key Telephone.

2-2 : Installing the DLS Console

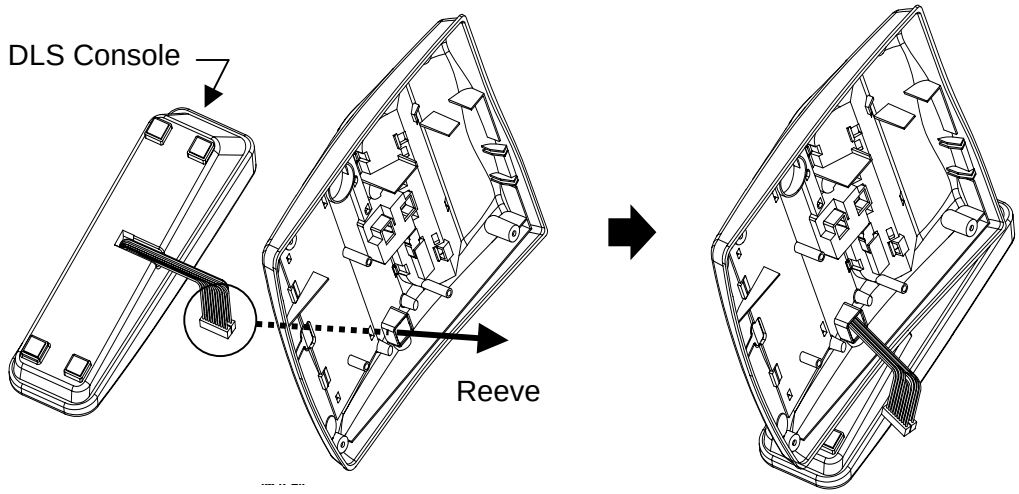
1. Turn the phone upside down and remove four screws from each corner. Lift the lower housing off.



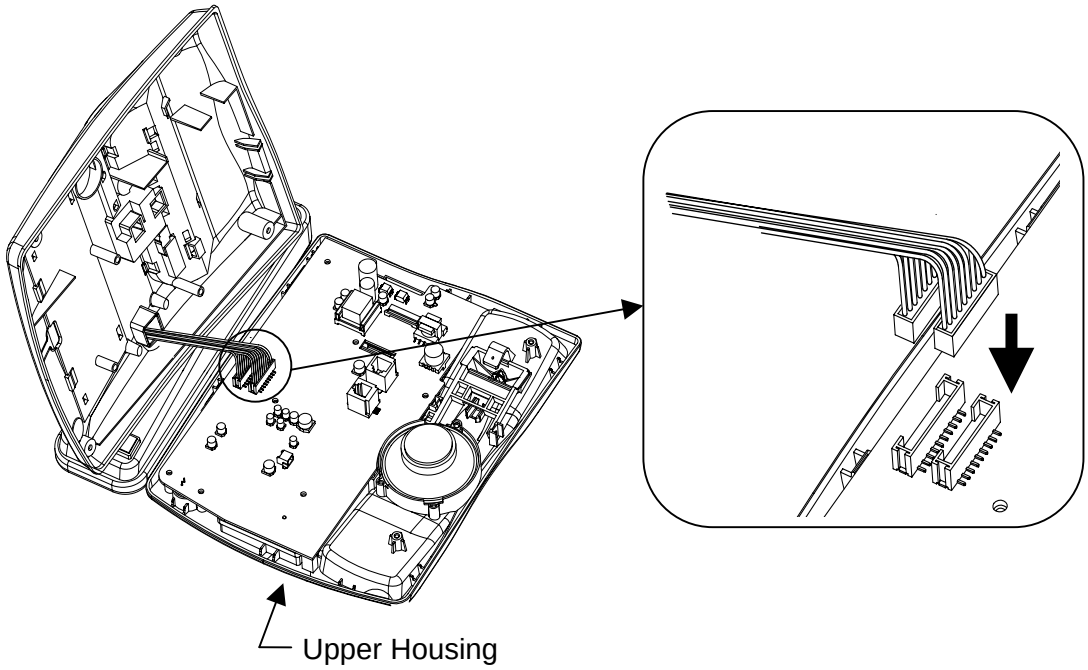
2. On the lower housing, use a blunt object to remove the plastic filter piece that covers the hole for DLS connector.



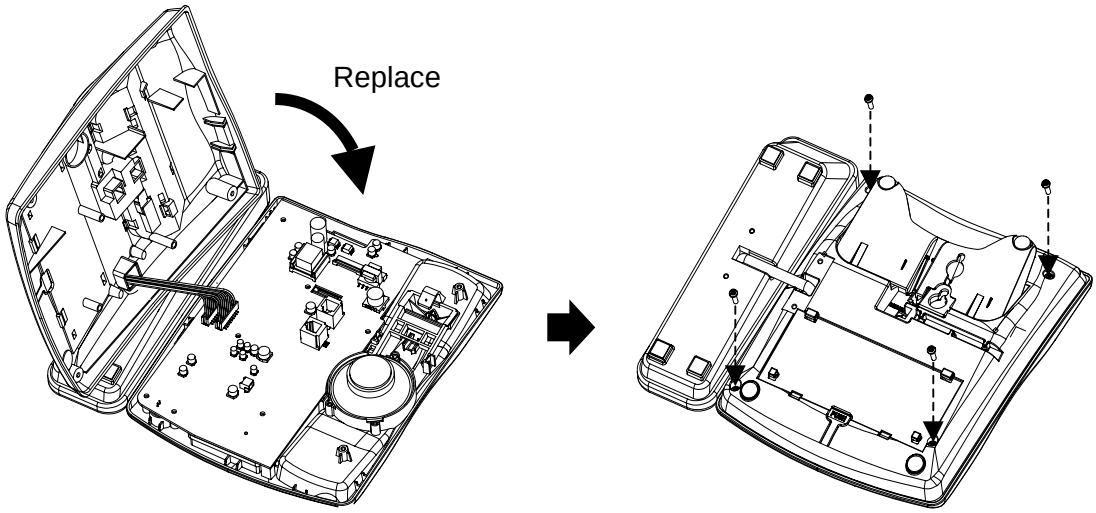
3. Reeve DLS cable into the hole.



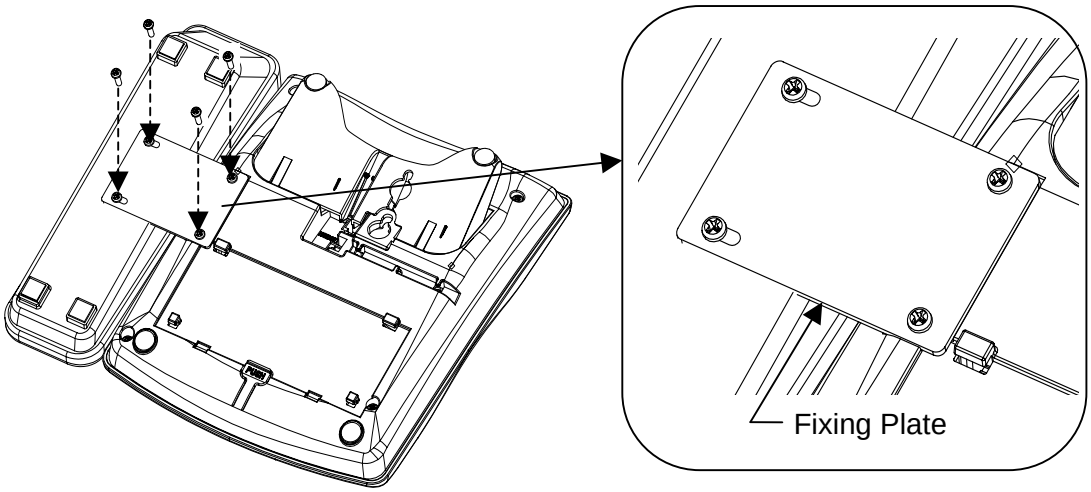
4. Insert the DLS Connectors on the DLS Cable into “DLCN1” and “DLCN2” on the PCB in the upper housing.



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



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



3. DSS Console

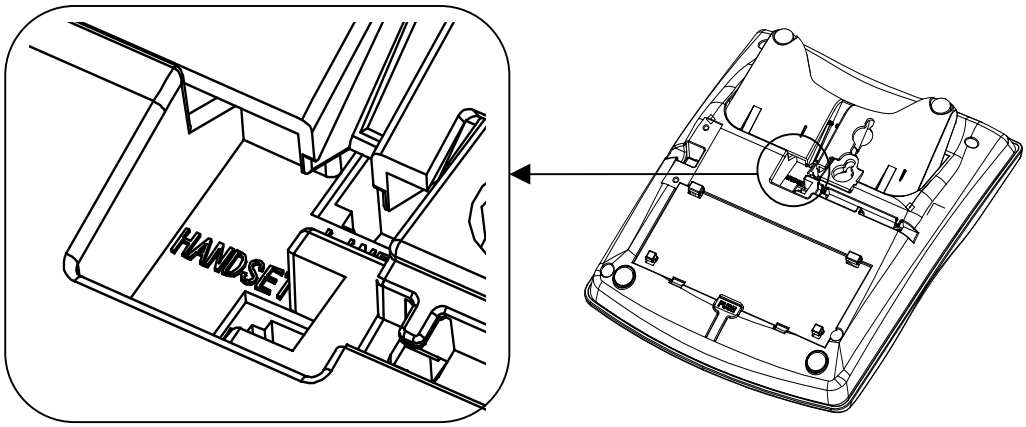
64BD DSS Console should be installed to the **Last Hybrid Extension Ports of each 308/008 Card directly**. The pair extension for DSS Console shall be assigned by system programming.

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

4. Headset

The Key Telephone user can utilize a customer-provided headset in place of the handset. Like using Handsfree, using the headset frees up the user's hands for other work. However, Headset Operation provides privacy not available from Handsfree.

1. Remove the Handset from the Key Telephone.
2. Connect the headset into the Handset socket.



<Recommended Headset>

- Multi Purpose Amplifier (8833-81-00)
- Profile (1861-00, 1862-00 or 1863-00)
- Cable (8800-01-01 or 8800-00-01)

All items are made by GN Netcom

GO *For the details of setting & operation, refer to the Software Manual. (separate issue)*

Section 5 : Installing the Optional Equipment

Table of Contents

1. SMDR (Station Message Detail Recording) 5-2
1-1 : General
1-2 : Unpacking (EXIFU)
1-3 : Switches and Connectors Location
1-4 : Installing the EXIFU PCB
1-5 : Connecting the SMDR Device
1-6 : Serial Cable Specification
1-7 : Connecting the PC / LAN

2. Doorphone / External Paging / External MOH / BGM 5-10
2-1 : General
2-2 : Unpacking (2PGDU)
2-3 : Switches and Connectors Location
2-4 : Installing the 2PGDU PCB
2-5 : Installing the Doorphone Boxes
2-6 : Installing the Door Unlock Devices
2-7 : Installing the External Paging Speaker / ExMOH / BGM Sources

3. VRS (Voice Response System) 5-18
3-1 : General
3-2 : Unpacking (DSPDB-A1)
3-3 : Switches and Connectors Location
3-4 : Installing the DSPDB-A1 PCB
3-5 : Installing the CF-B1

4. External Backup Battery 5-21
4-1 : General
4-2 : Unpacking (Battery Box)
4-3 : Battery Specifications
4-4 : Installing the Backup Battery

Section 5
Installing the Optional Equipment

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.

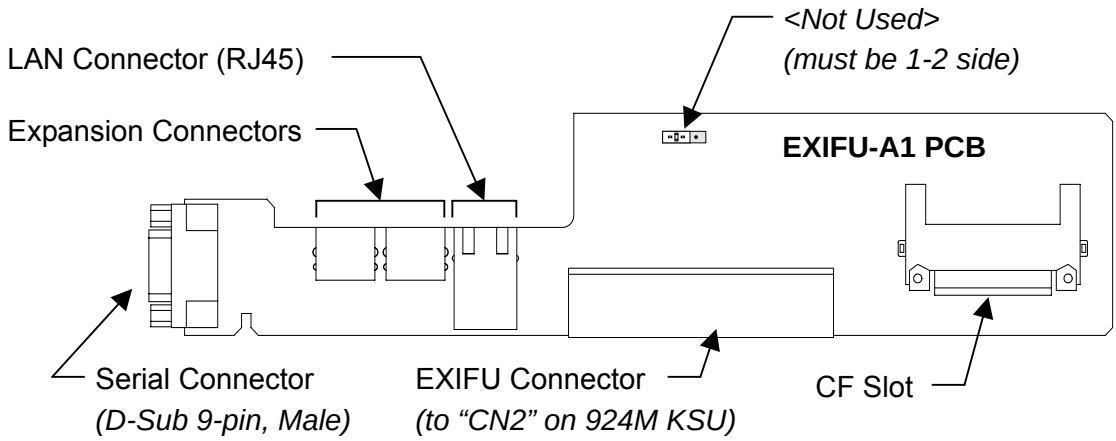
There are 2 types of EXIFU PCB, and either EXIFU-A1 or B1 is installed to the specified slot in the 924M KSU.

1-2 : Unpacking (EXIFU)

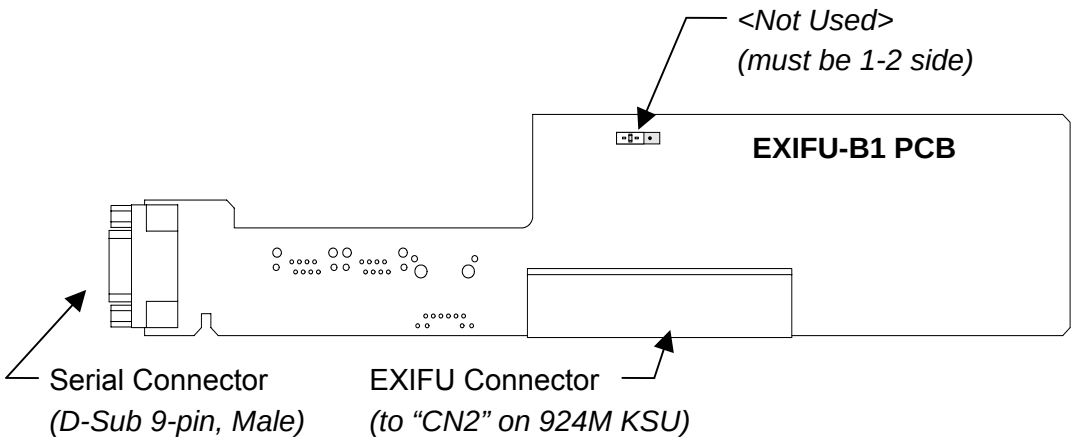
Unpack the EXIFU-A1/B1 and check it against the following list. Inspect for physical damage.

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 Connectors Location



Connectors	Connectable Devices
Serial Connector (D-Sub 9-pin)	- Serial Printer (for SMDR) - PC (for SMDR)
LAN Connector (RJ45)	- PC (for SMDR / PC Programming) - Switching HUB (for LAN)
CF Slot	- CF (Compact Flash) Card (for Data Saving / Main Software Upgrading)
Expansion Connectors (EXP1, EXP2)	- 924ME KSUs (Expansion KSUs)

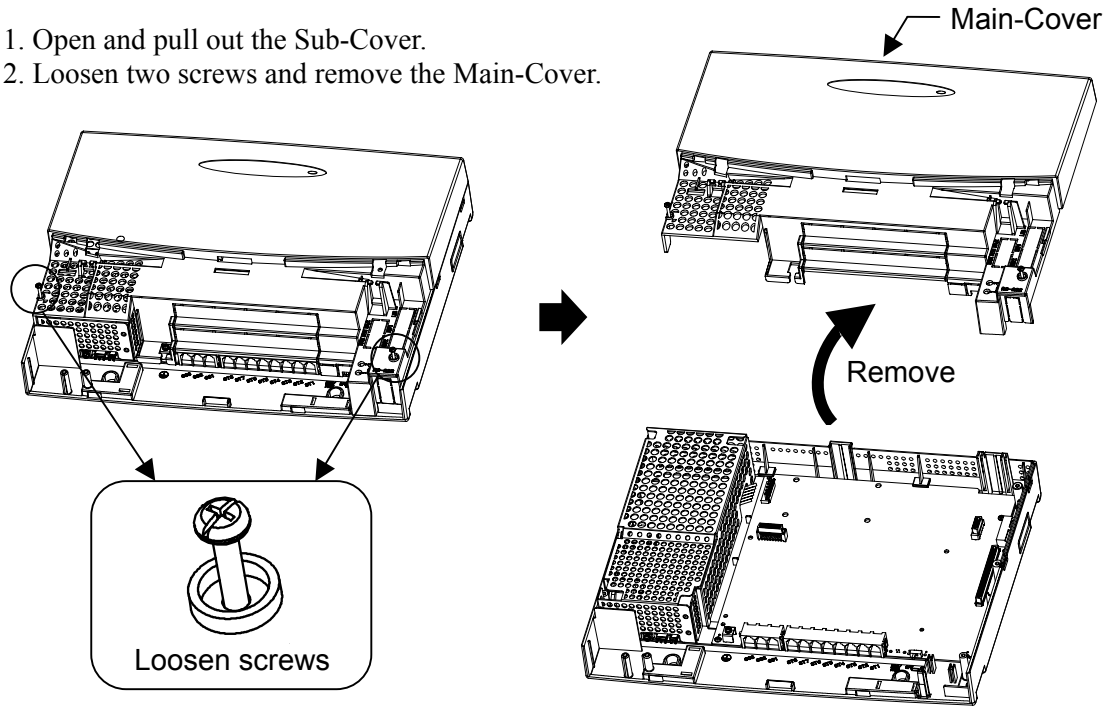


Connectors	Connectable Devices
Serial Connector (D-Sub 9-pin)	- Serial Printer (for SMDR) - PC (for SMDR)

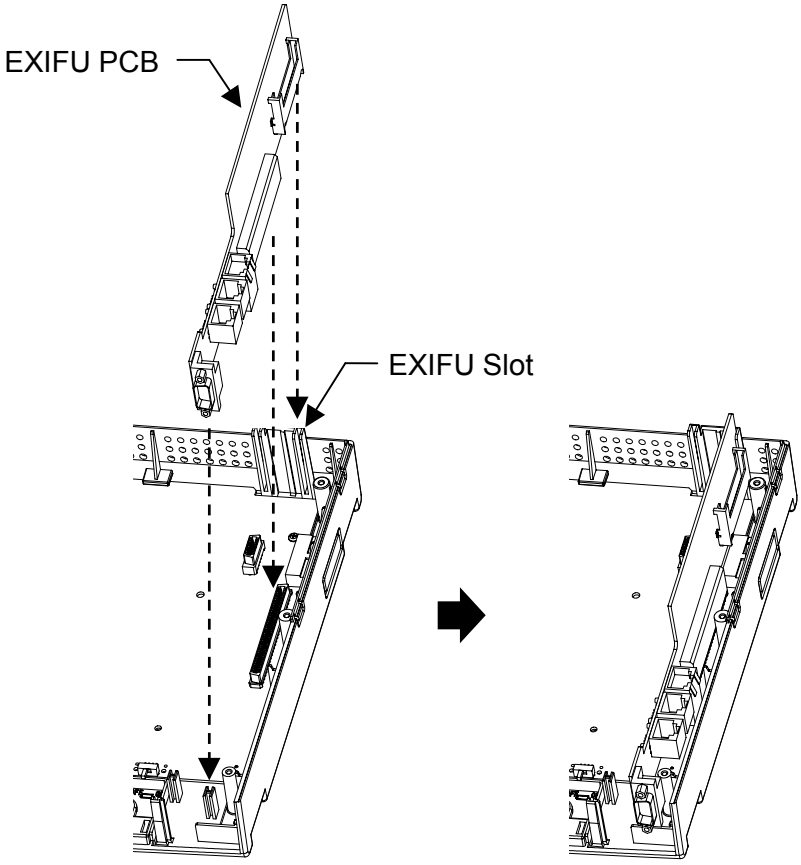
GO - *For the details of Expansion Connectors, refer to the Section 2. (Page 2-8)*
- *For the details of Data Saving, refer to the Section 7. (Page 7-5)*
- *For the details of Main Software Upgrading, refer to the Section 8. (Page 8-4)*

1-4 : Installing the EXIFU PCB

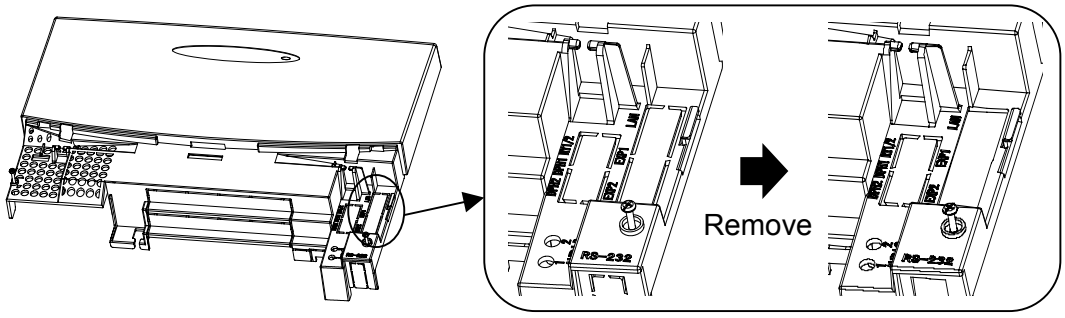
1. Open and pull out the Sub-Cover.
2. Loosen two screws and remove the Main-Cover.



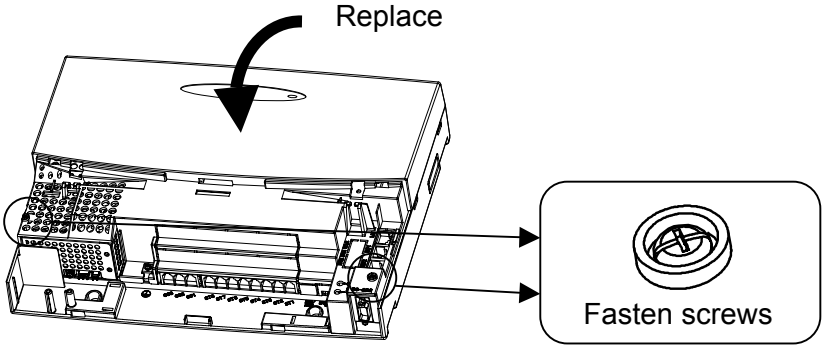
3. Insert the EXIFU PCB to the EXIFU Slot.



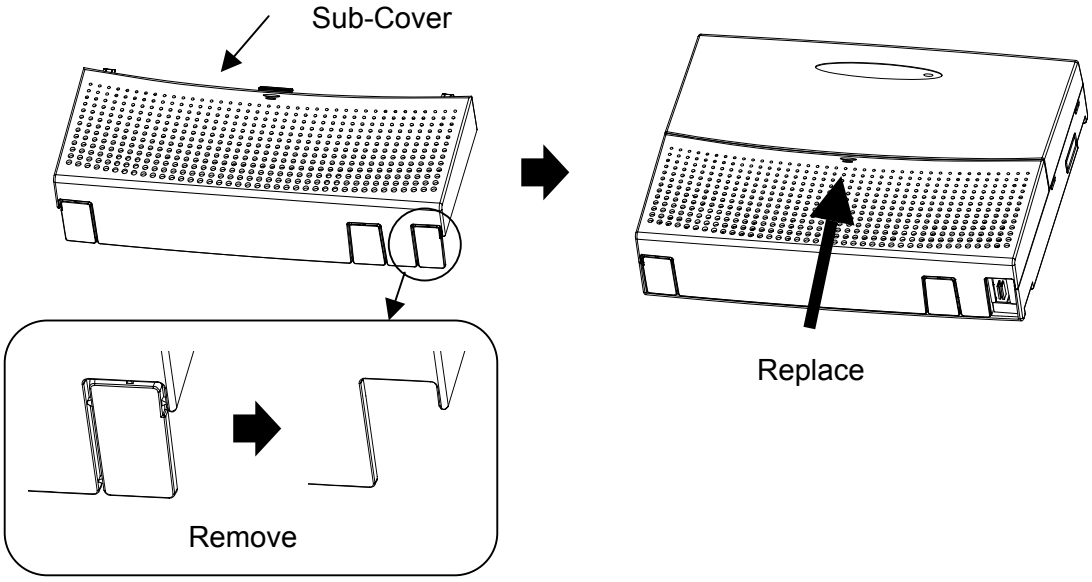
4. In case of EXIFU-A1 installation, use a blunt object to remove the plastic filter piece for EXP and Ethernet Connectors.



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

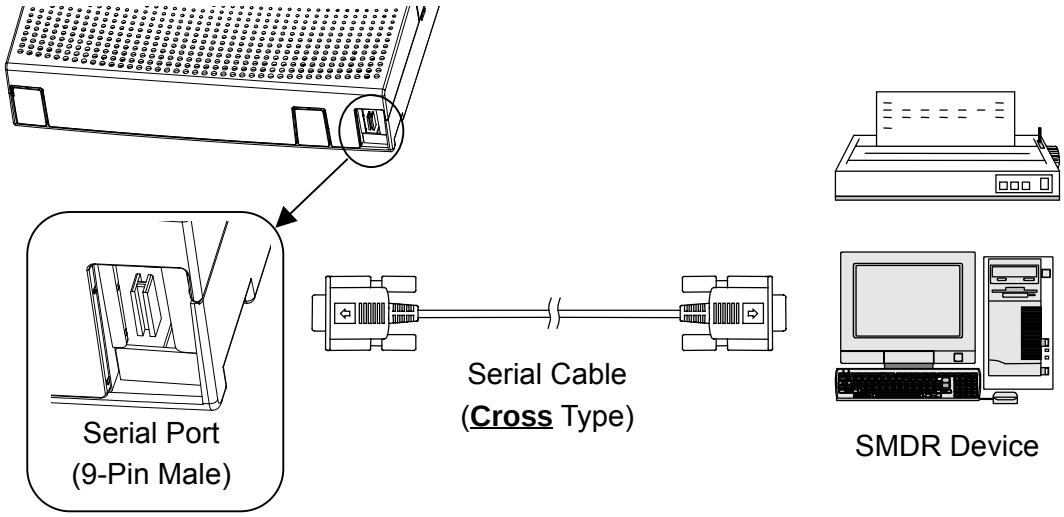


6. Use a blunt object to remove the plastic filter piece for Serial Connector.
7. Replace the Sub-Cover.



1-5 : Connecting the SMDR Device (Serial Port)

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



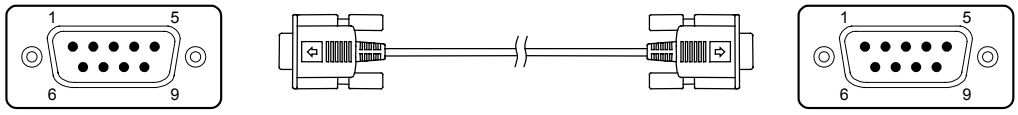
The Serial Cable must be shielded, and the maximum cable length is 15m.

1.6 : Serial Cable Specification

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

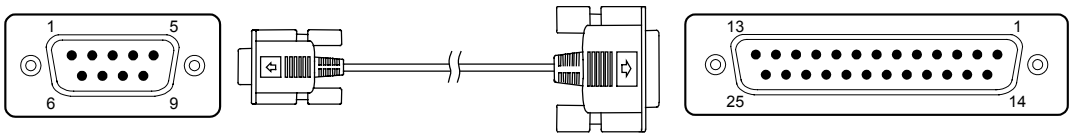
9-Pin to 9-Pin Cable

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



9-Pin to 25-Pin Cable

System		SMDR Device	
Signal Name	**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

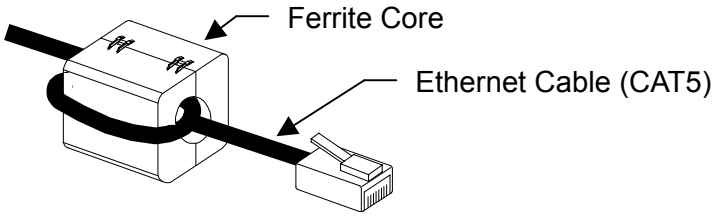


1.7 : Connecting the PC / LAN

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)

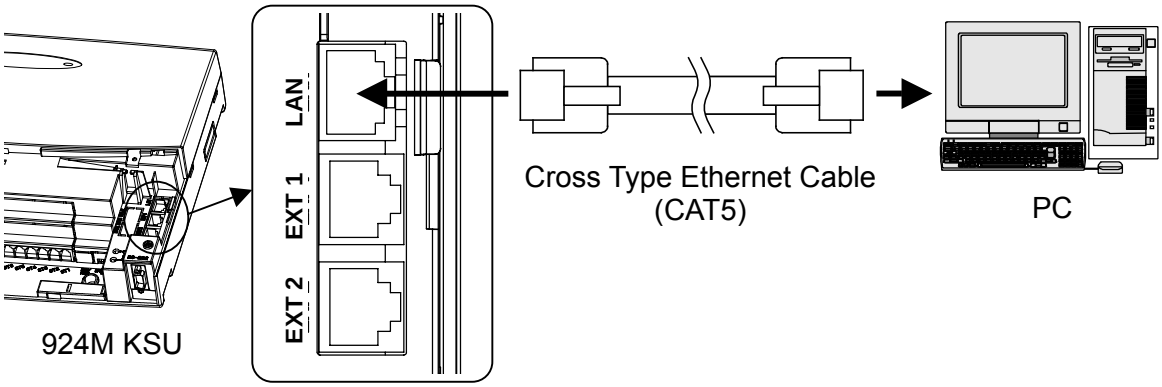
<Before the cabling>

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

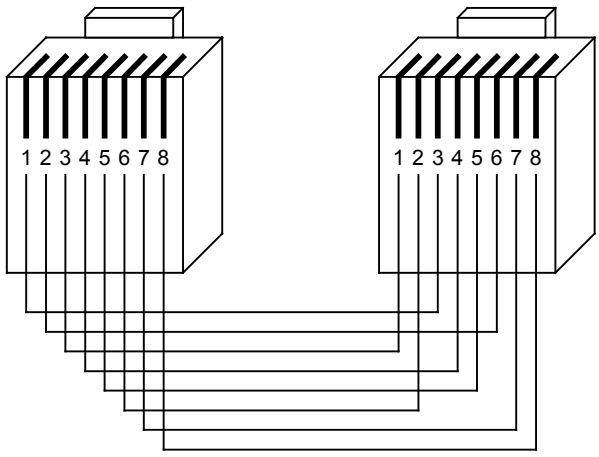


<Case 1 : PC Direct Connection>

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

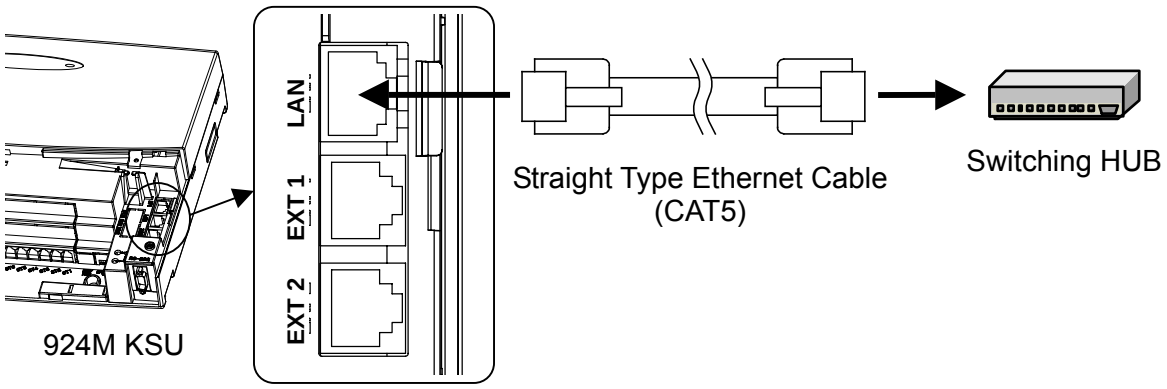


Cross Type Ethernet Cable

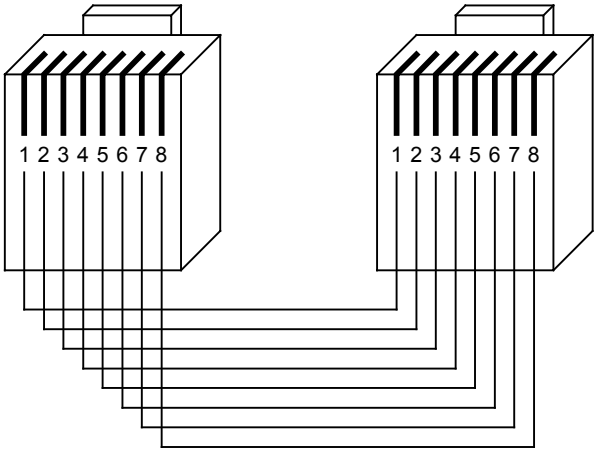


<Case 2 : In-house LAN Connection>

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



Straight Type Ethernet Cable



2. Doorphone / External Paging / External MOH / BGM

2-1 : General

2PGDU PCB provides :
- Doorphone Box Connection
- External Paging Speaker Connection
- External MOH (Music On Hold) source Connection
- BGM (Background Music) source Connection

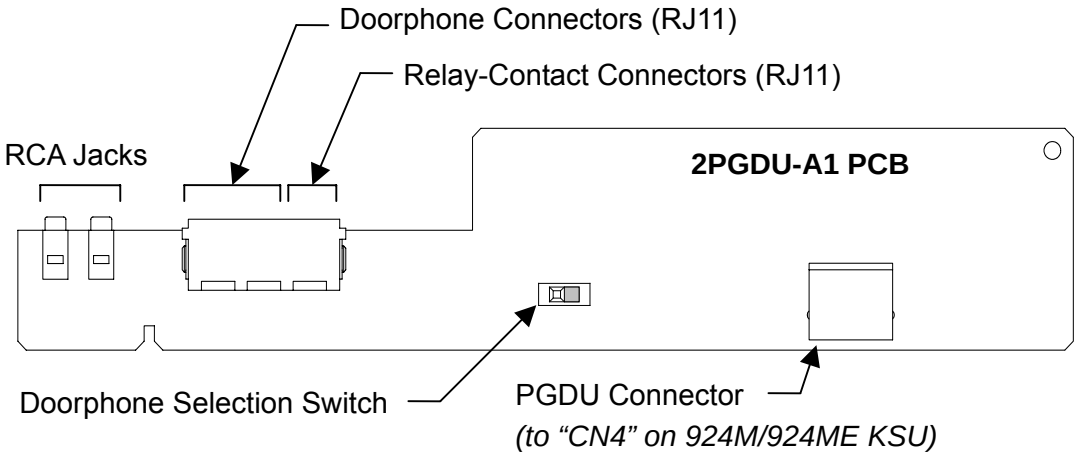
and is installed to the specified slot in the 924M/924ME KSU. (Max three 2PGDU PCB)

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

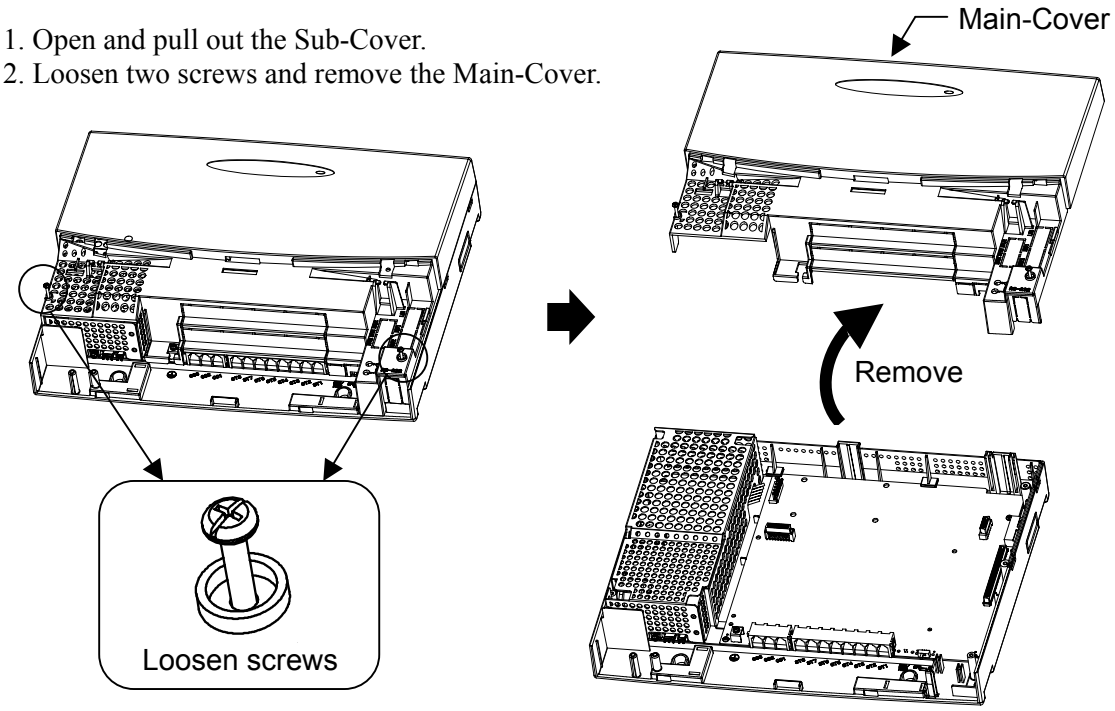
2-3 : Switches and Connectors Location



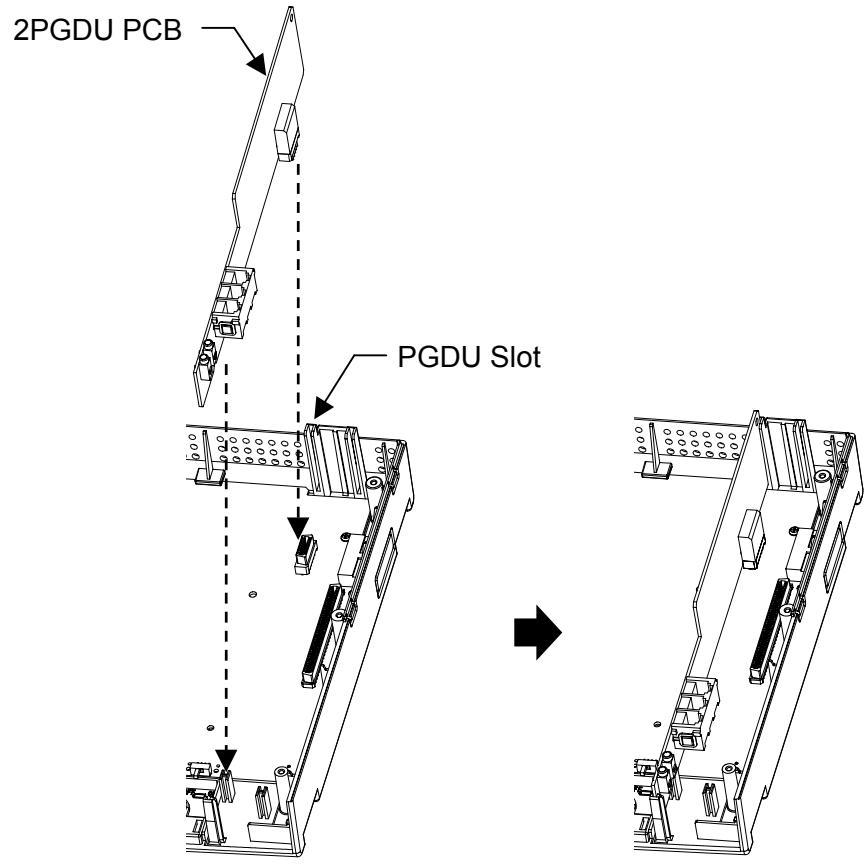
Connectors	Connectable Devices
RCA Jacks (AUDIO 1, 2)	- Music Sources (for External MOH, BGM) - Paging Systems (for External Paging)
Doorphone Connectors (DPH1, DPH2)	- Doorphone Boxes
Relay-Contact Connectors (RY 1/2)	- Door Unlock Devices - Music Sources - Paging Systems

2-4 : Installing the 2PGDU PCB

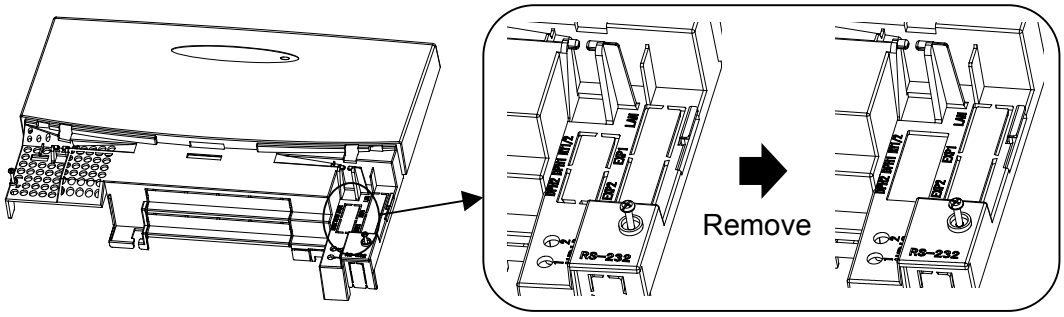
1. Open and pull out the Sub-Cover.
2. Loosen two screws and remove the Main-Cover.



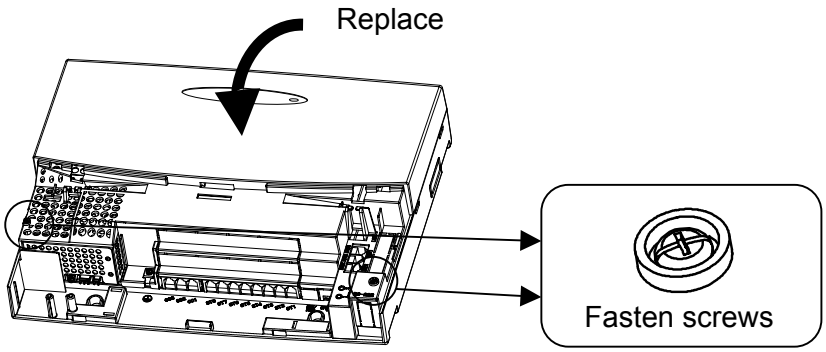
3. Insert the 2PGDU PCB to the PGDU Slot.



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



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

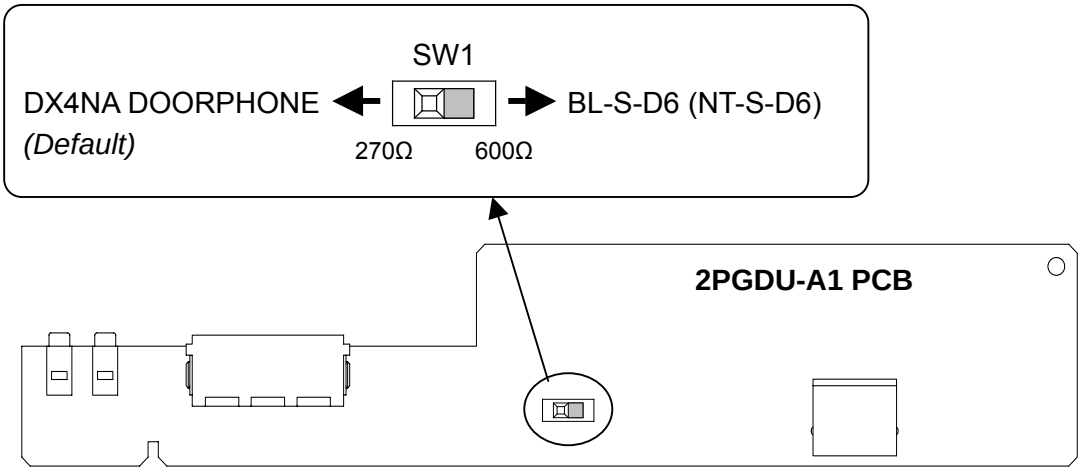


2-5 : Installing the Doorphone Boxes

Up to 2 Doorphone Boxes can be connected per a 2PGDU PCB. The connectable Doorphone Boxes are as below.

Product Code	Name
6DBM	DX4NA DOORPHONE
65V2	BL-S-D6 (NT-S-D6)

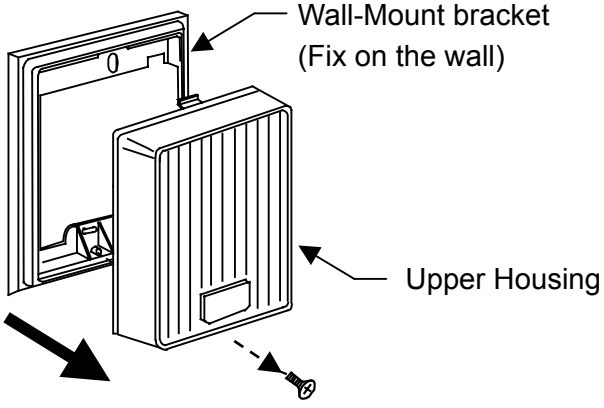
Before connecting the Doorphone Box, the Doorphone Selection Switch (SW1) must be set in accordance with the type of Doorphone.



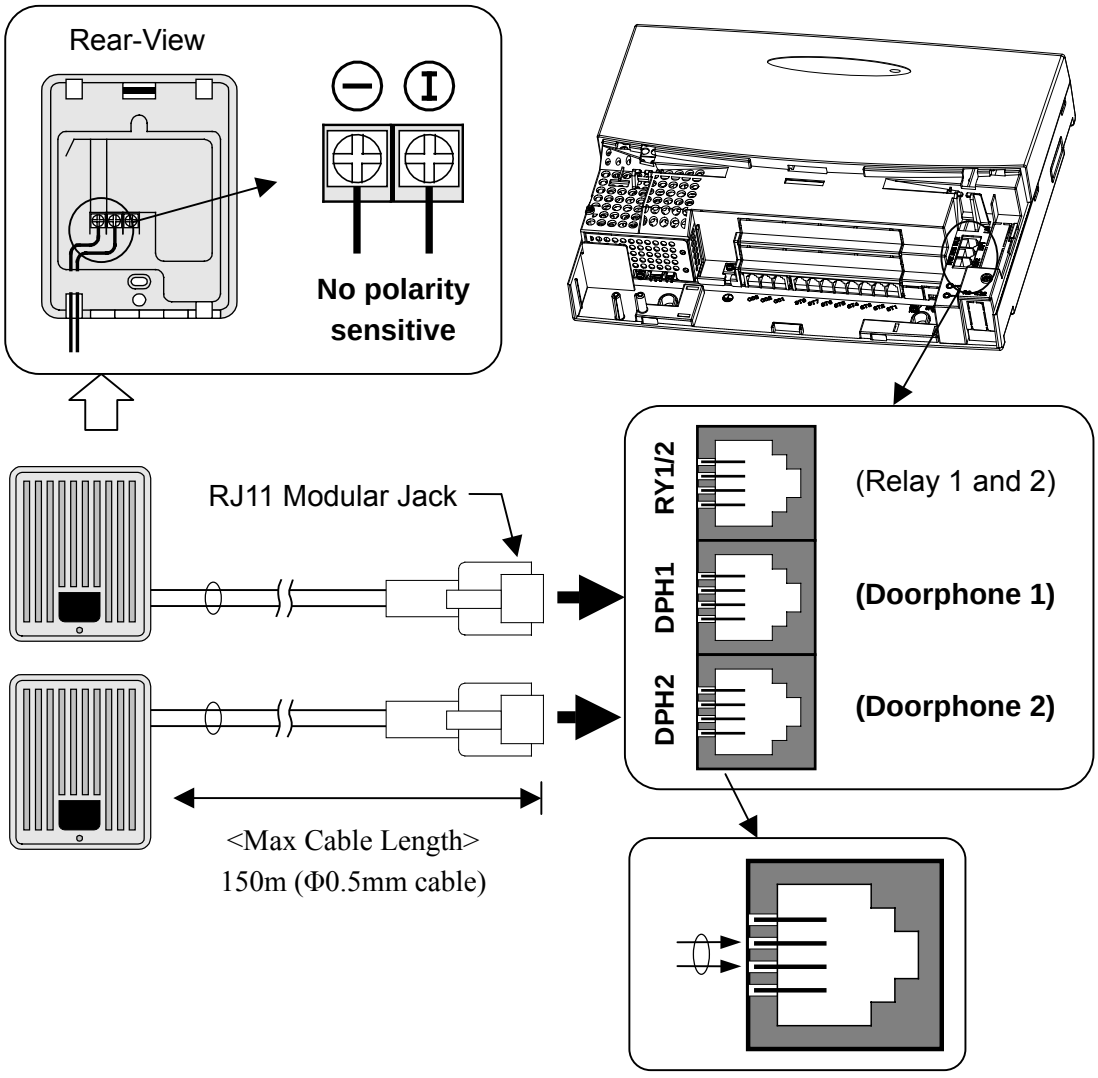
The 3rd Party Doorphone Boxes can NOT be connected to the 2PGDU PCB.

DX4NA DOORPHONE

1. Remove the screw on the front of the Doorphone Box.
2. Remove the Wall-Mount bracket from the Doorphone Box, then fix it on the wall by attached screws.

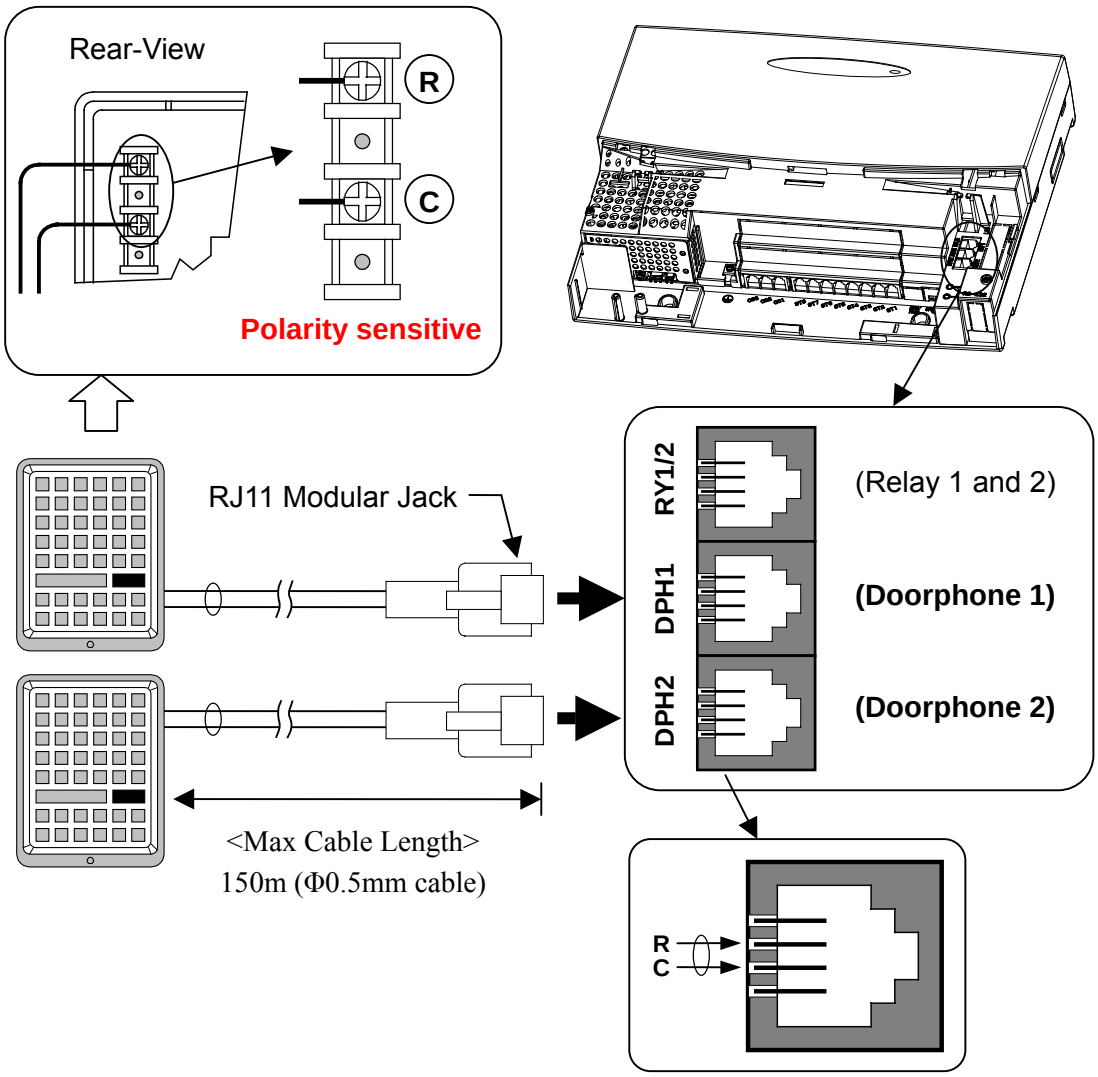


3. Connect two cables from the "DOOR" Connector at the 2PGDU PCB. These cables must be routed through the opening in the bottom of the Wall-Mounting bracket.
4. Replace the Upper Housing and re-fix the screw.



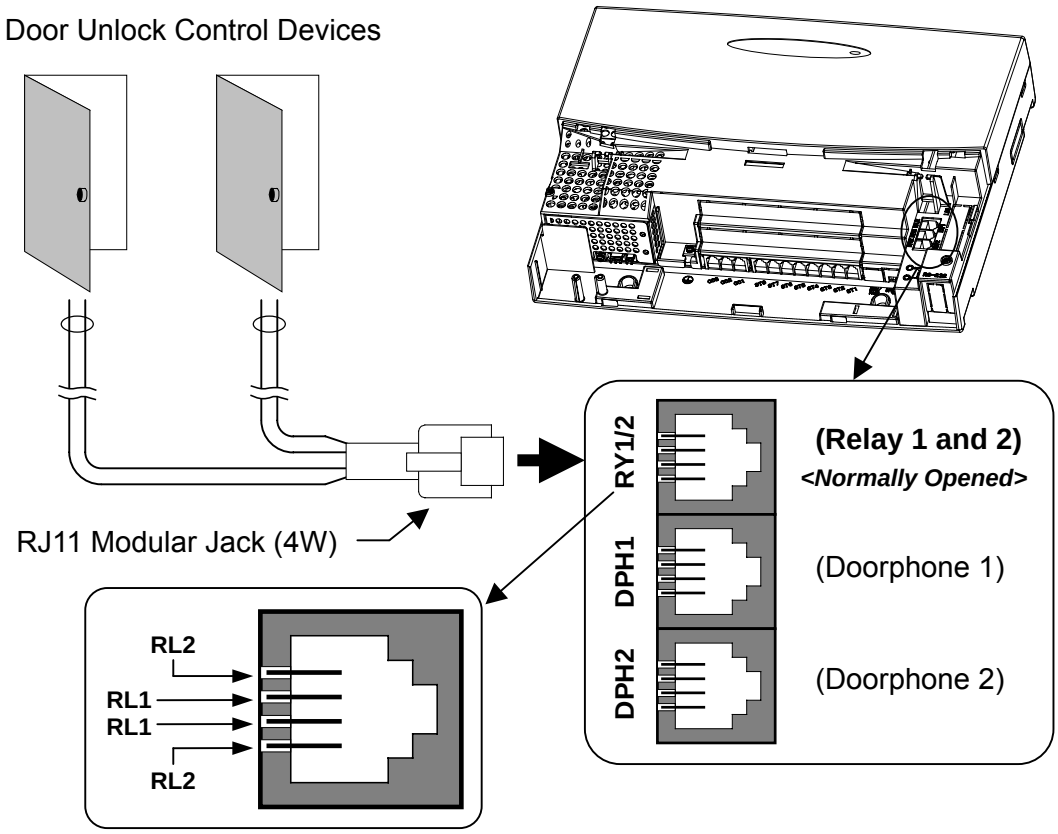
BL-S-D6 (NT-S-D6) DOORPHONE

BL-S-D6 (NT-S-D6) Doorphone also can be connected to the 2PGDU PCB, however the wiring polarity is sensitive.

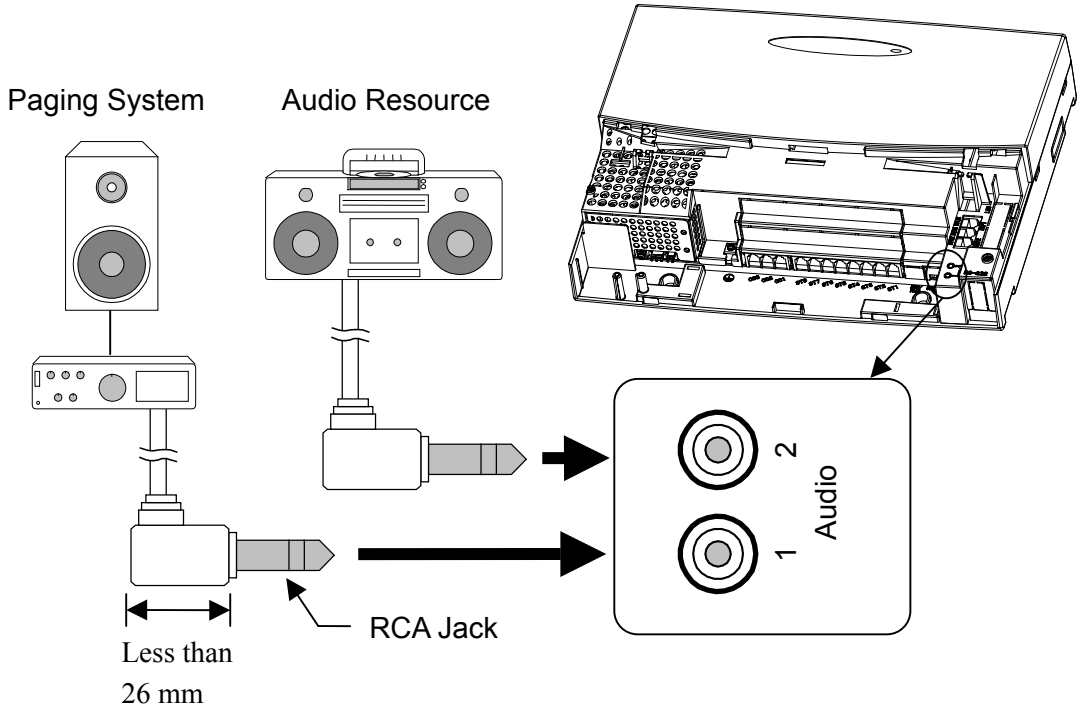


2-6 : Installing the Door Unlock Devices

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



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

3. VRS (Voice Response System)

3-1 : General

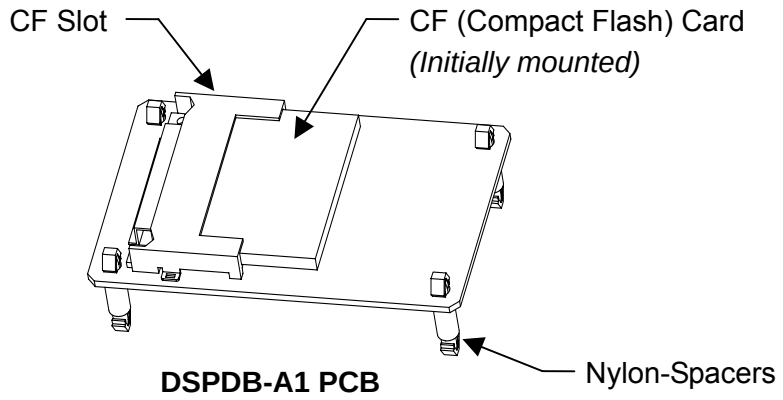
The DSPDB-A1 PCB provides additional DSP resources with 16ch VRS (Voice Response System). It is installed in the main KSU (924M).

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 Connectors Location

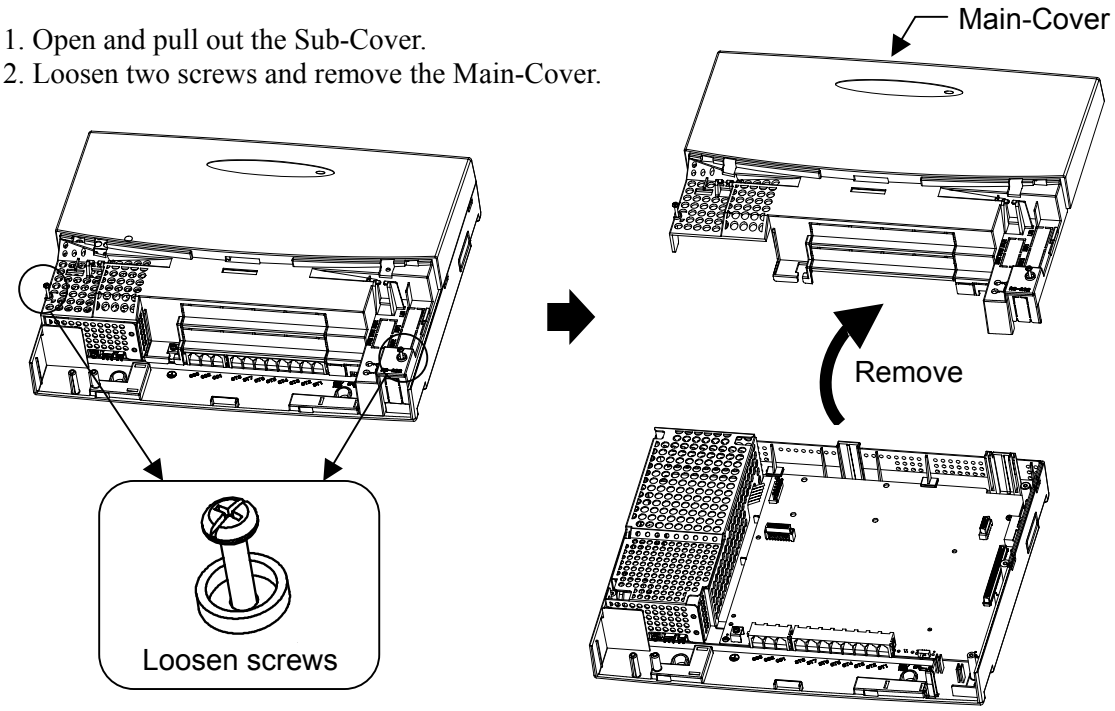


DSPDB-A1 PCB

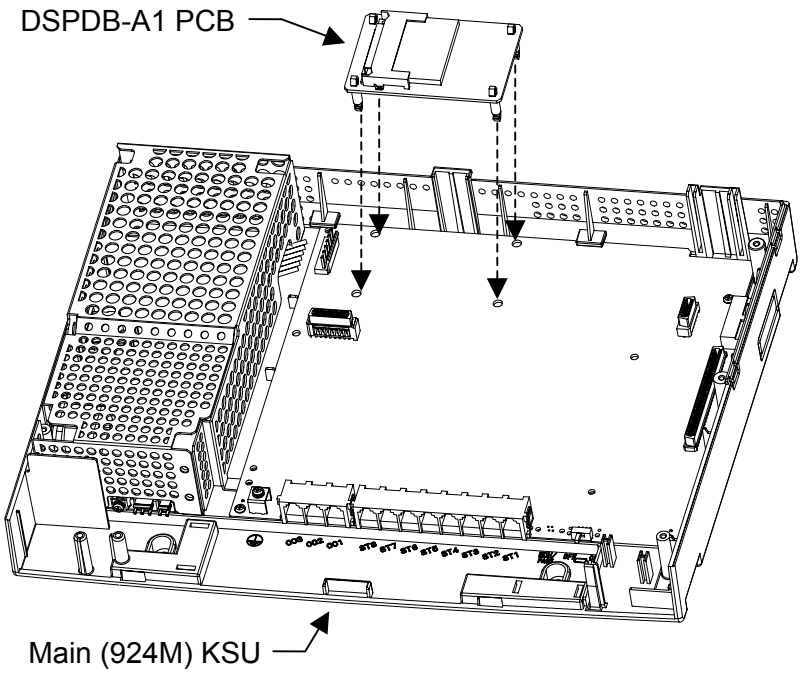
Make sure the Nylon-Spacers are inserted in each corner of the DSPDB-A1 PCB.
The spacers must be attached from the back of the DSPDB-A1 PCB so when installed, the CF slot is facing up.

3-4 : Installing the DSPDB-A1 PCB

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



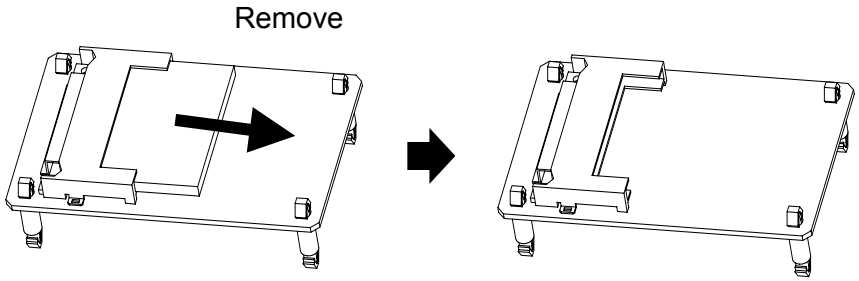
3. Mount the DSPDB-A1 PCB to the "CN6" Connector at the Main (924M) KSU.



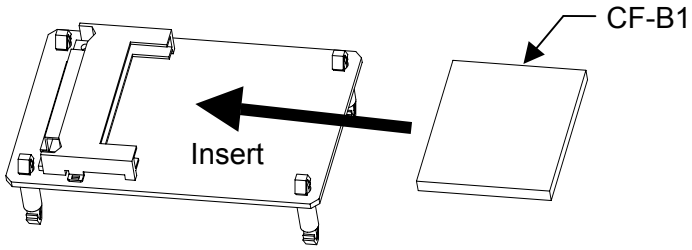
For easy installation, DSPDB-A1 PCB is recommended to install before 308E/008E installations.

3-5 : Installing the CF-B1

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



2. Insert the “CF-B1” to the CF slot of DSPDB-A1 PCB.



3. Install the DSPDB-A1 PCB to the 924M KSU. (Refer to the previous page)

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

- When the CF-B1 is installed, the removed CF Card may use for other purposes such as PC storage, System Data backup, etc.. The contents must be erased by PC.

4. External Backup Battery

4-1 : General

The external backup battery box with batteries provide the power to the system when the AC power is failed. It is connected to the Power Supply for **each KSU**.

- The Batteries itself must be prepared by local supplier.
- Each KSU should have own Backup Battery Box respectively.

4-2 : Unpacking (Battery Box)

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

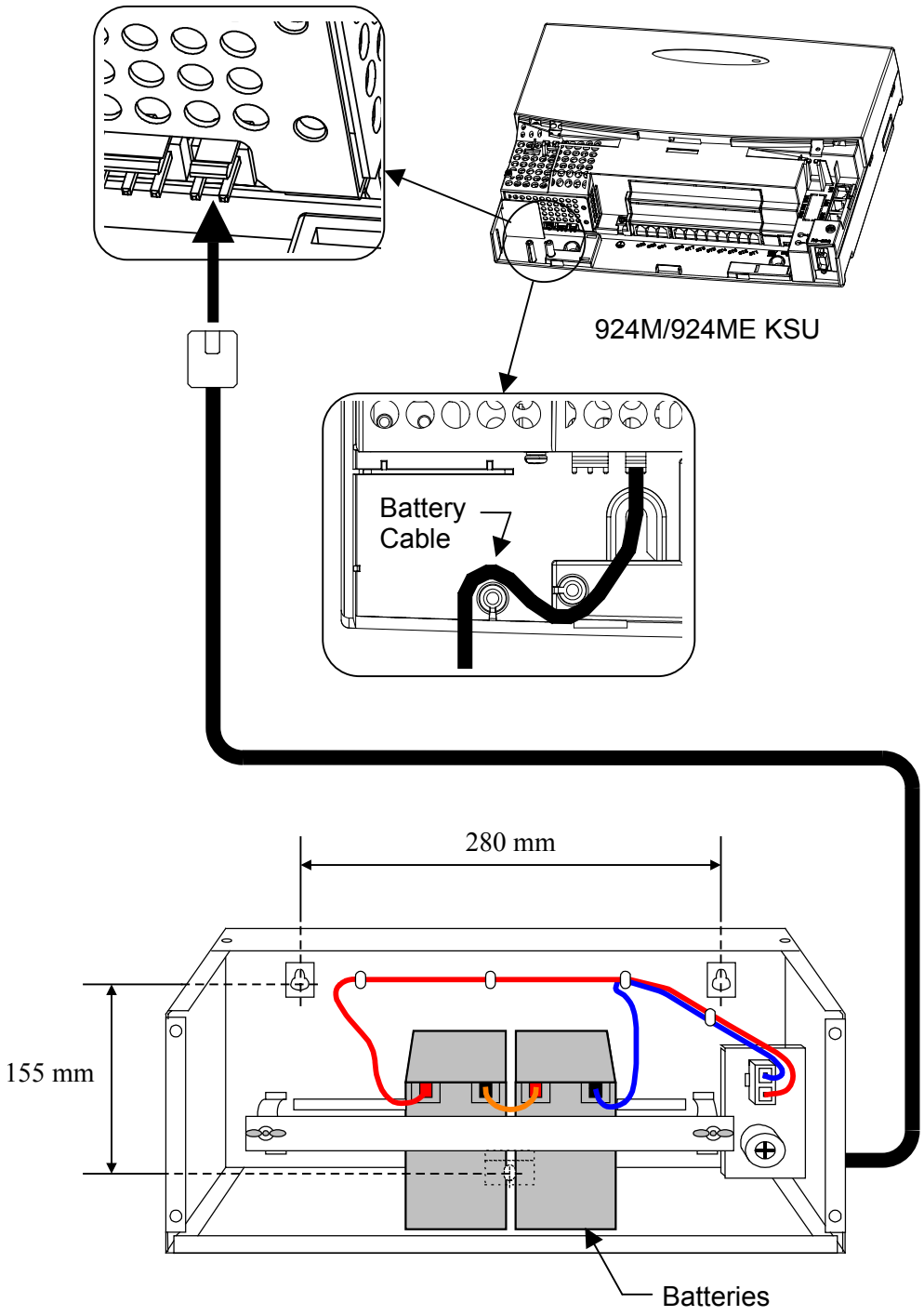
Items	List of Contents	QTY
32i/NX7E Battery Box	Battery Box	1
	Cable with Connector (Blue & Red)	1
	Cable (Orange)	1
	Screws	2

4-3 : Battery Specifications

Item	Data
Capacity	12V, 2.6Am/H or equivalent (Voltage must be 12V)
Recommended Battery	Yuasa NP2.6-12 (134x67x64 mm / 1.12kg) <Yuasa Corporation>
Number of Batteries (per a Box)	2 pcs
Backup Duration (Estimated)	1 Hour

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.



Section 6 : Installing the Optional Facilities

Table of Contents

1. Installing the Optional BOX 6-2
1-1 : General
1-2 : Unpacking
1-3 : Installing the OPBOX
1-4 : Installing the Option PCBs to the OPBOX

2. ISDN BRI (Basic Rate Interface) 6-7
2-1 : General
2-2 : Unpacking
2-3 : Switches and Connectors Location

Section 6
Installing the Optional Facilities

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 (Euro-ISDN) I/F
IP1WW-4BRIU-S1	4 BRI (Euro-ISDN) I/F

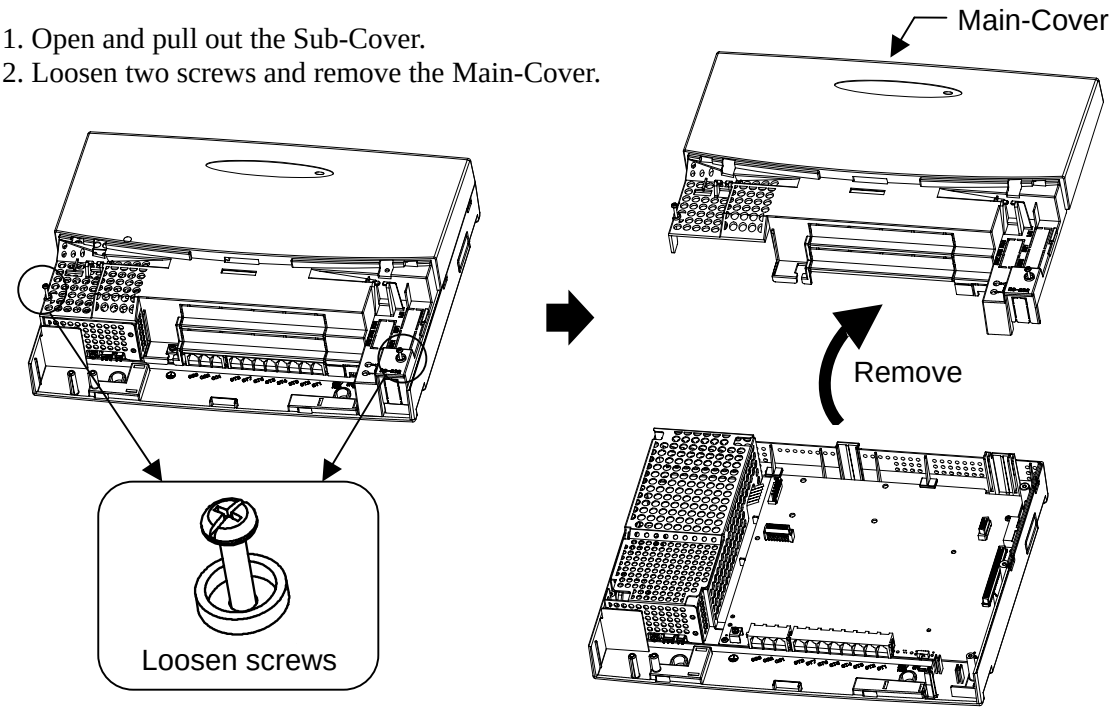
1-2 : Unpacking

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

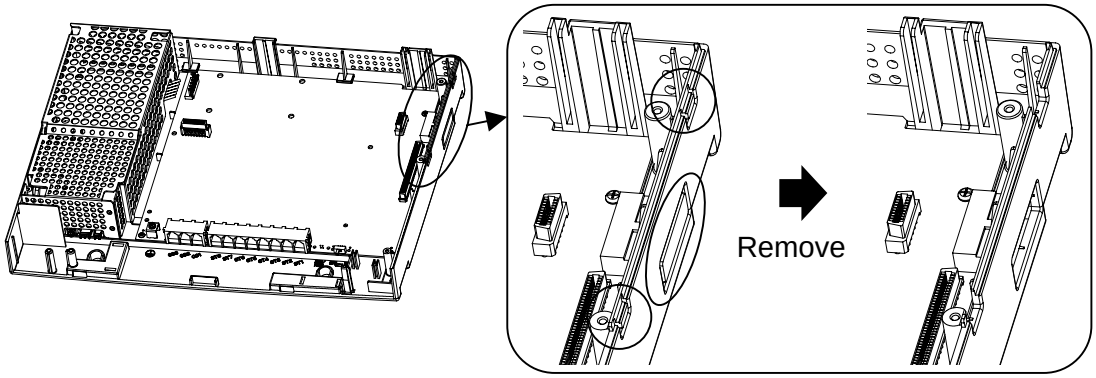
Items	List of Contents	QTY
OPBOX	OPBOX	1
	Short Screw	1
	Screws (with circular washer)	2
	Screws	4

1-3 : Installing the OPBOX

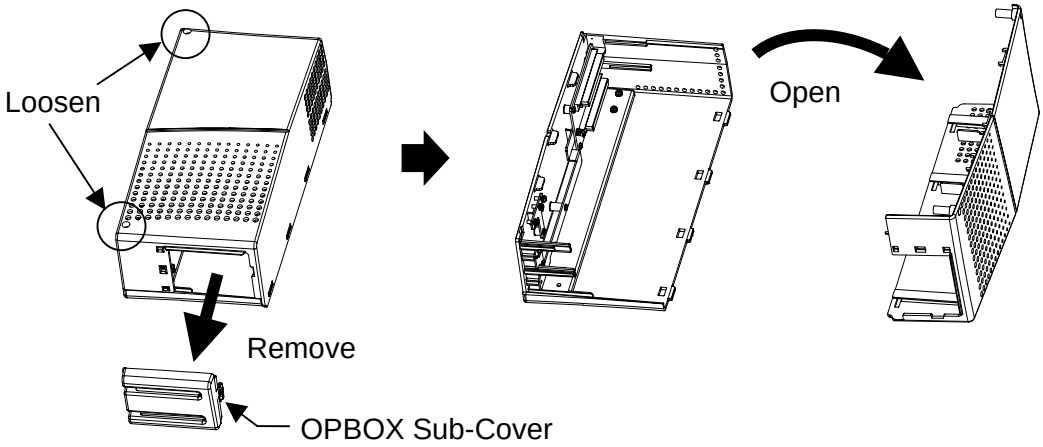
1. Open and pull out the Sub-Cover.
2. Loosen two screws and remove the Main-Cover.



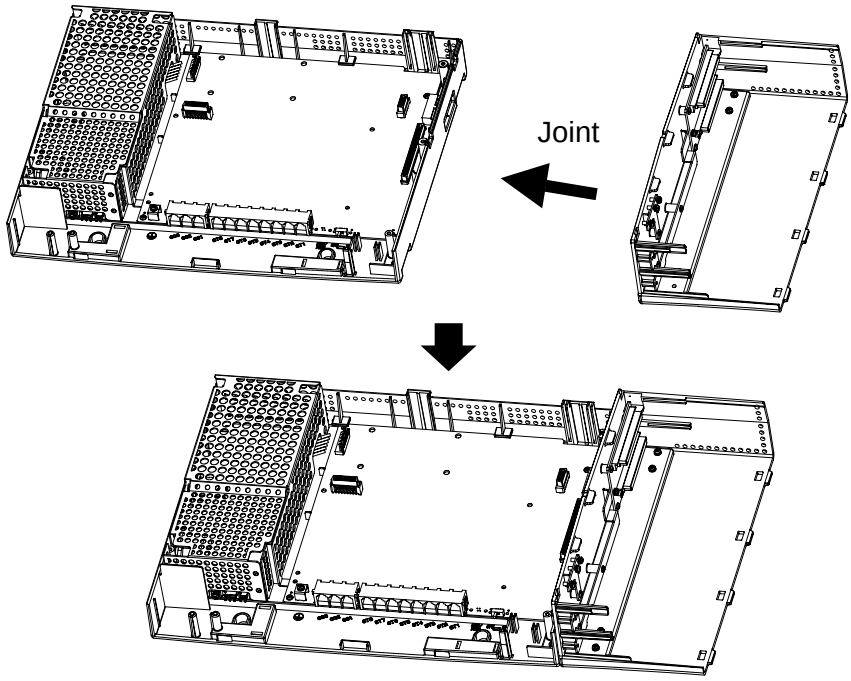
3. Use a blunt object to remove the plastic filter piece that covers the hole.



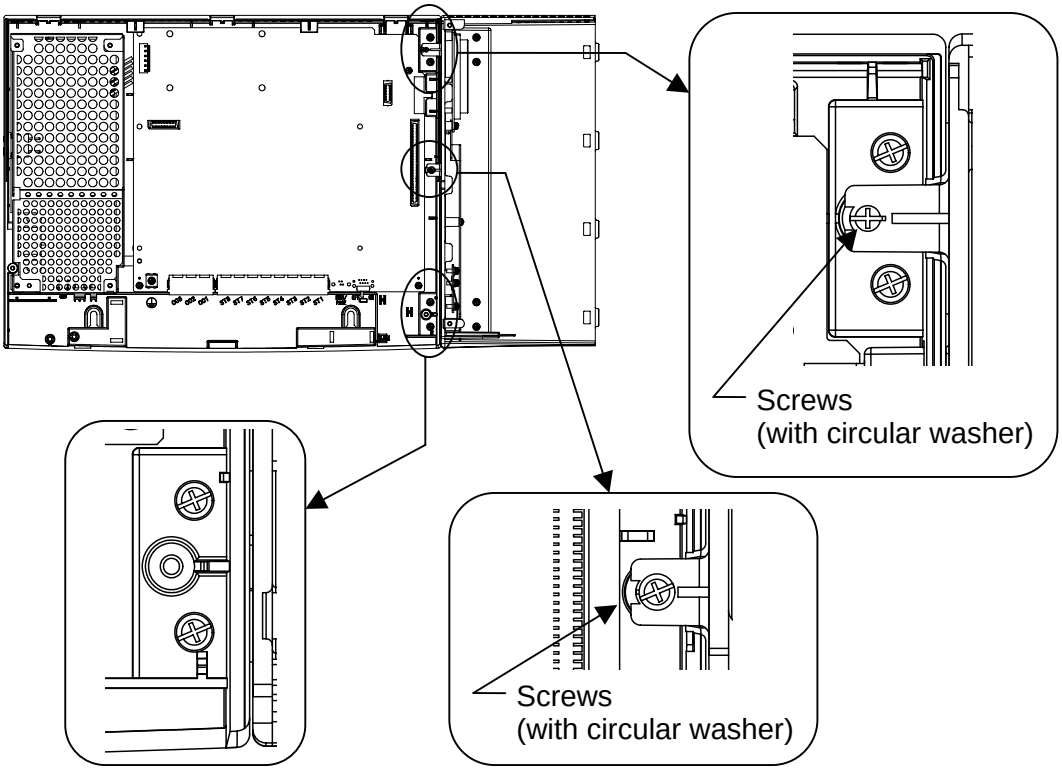
4. Remove the OPBOX Sub-Cover, loosen two screws on OPBOX, and open the cover.



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



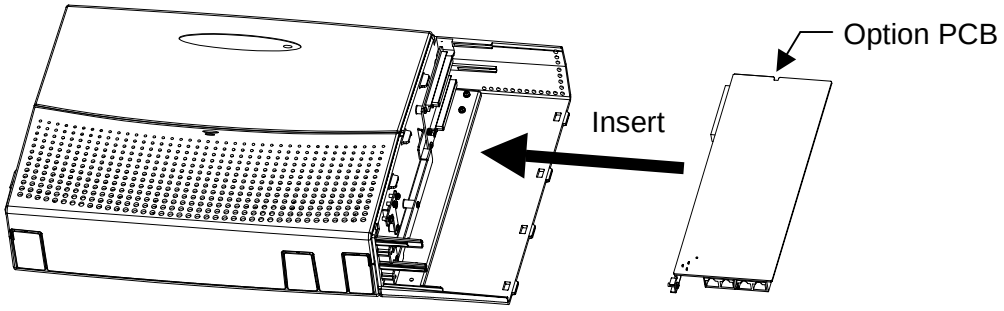
6. Fasten six screws to fix the OPBOX to KSU.



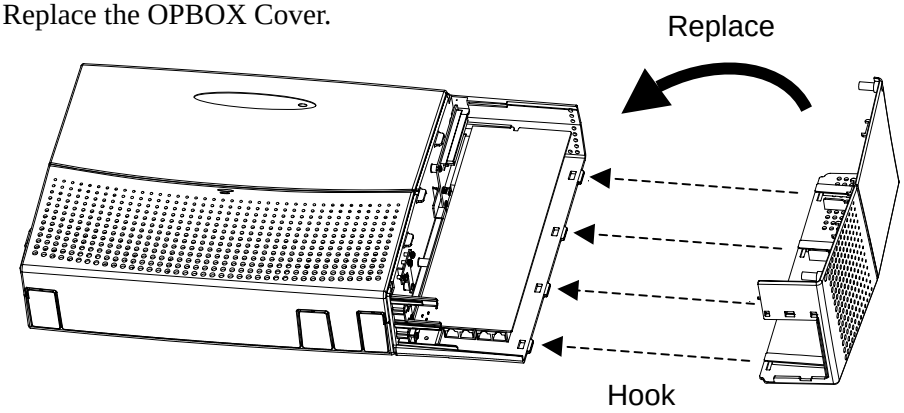
The screws are attached to the OPBOX.

1-4 : Installing the Option PCBs to the OPBOX

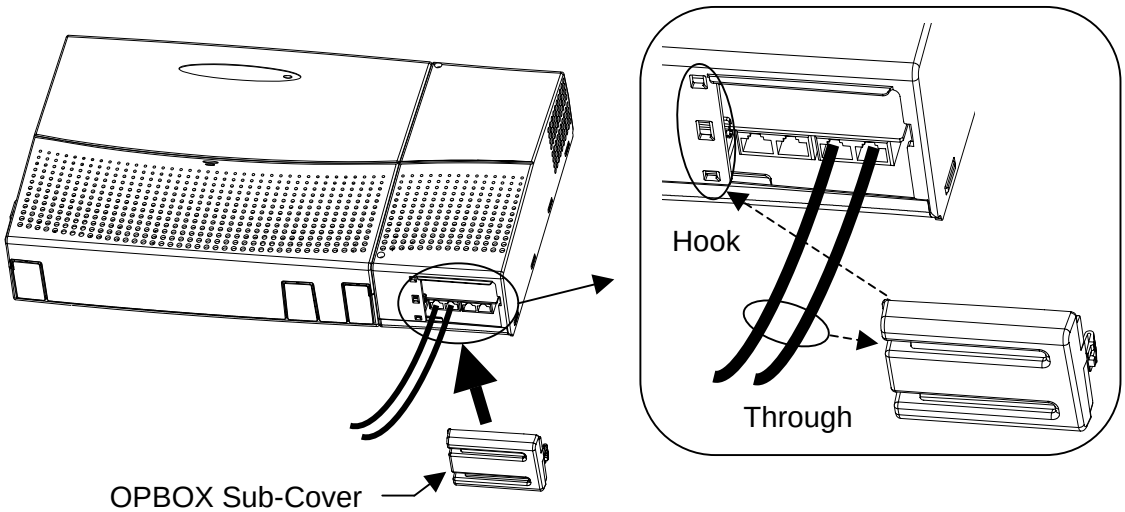
1. Insert the Option PCBs into the universal slot at OPBOX.



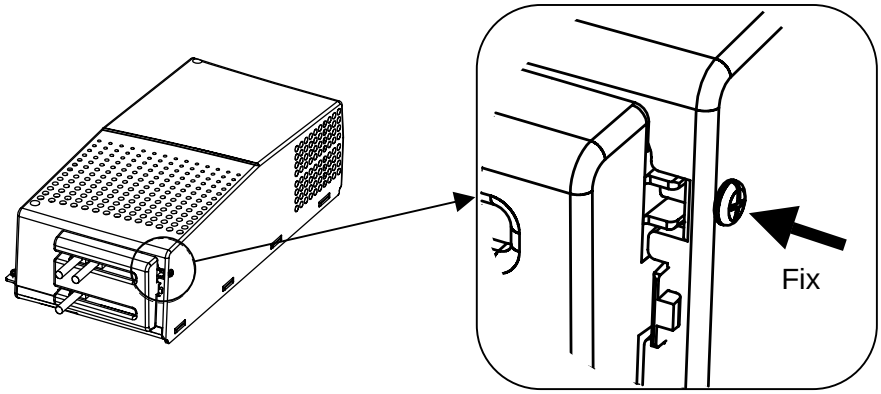
2. Replace the OPBOX Cover.



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



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



2. ISDN BRI (Basic Rate Interface)

2-1 : General

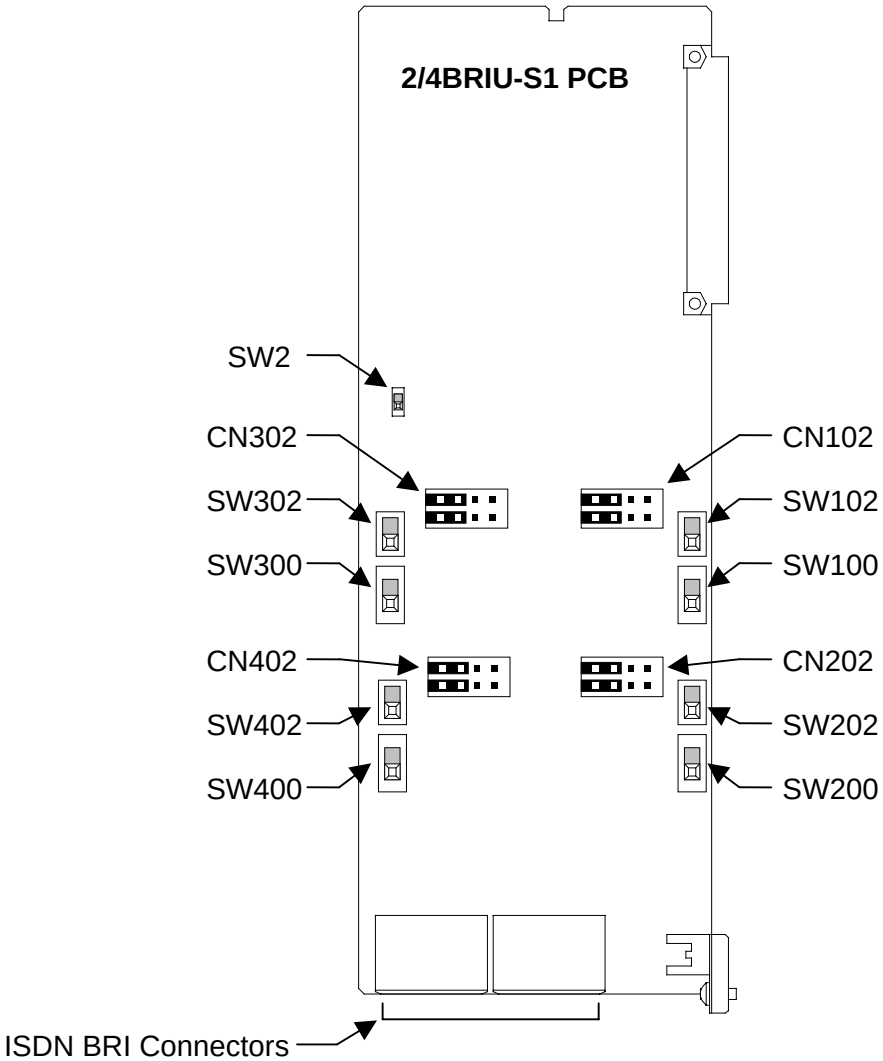
The ISDN BRI (Basic Rate Interface) can be accommodated to the system. The specified PCB called “BRIU-S1” is necessary, and shall be installed to the OPBOX.

2-2 : Unpacking

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

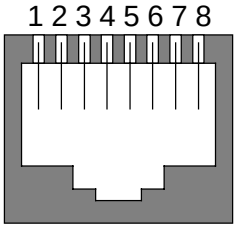
Items	List of Contents	QTY
2BRIU-S1	2BRIU-S1 PCB (2 circuit type)	1
4BRIU-S1	4BRIU-S1 PCB (4 circuit type)	1

2-3 : Switches and Connectors Location



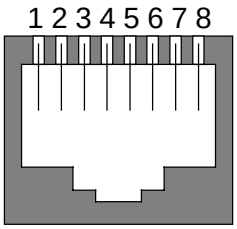
Switch No.	Condition	Description
SW2	RUN	Normal operating mode
	BLK	Blocking mode (PCB is OFF)
SW100~400	ON	Termination register is ON. This SW should be ON in case : T-Bus Point-to-Point connection is selected. T-Bus Point-to-Multipoint is selected, and if the system is (Terminal 8), S-Bus
	OFF	P-MP (Terminal 7)
SW102~402	T	T-Bus connection
	S	S-Bus connection
CN102~402	ON	Feeding Power is ON for S-Bus
	OFF	Feeding Power is OFF for S-Bus

ISDN BRI Connector (RJ45) T-Bus Connection



Pin No.	Connection
1	---
2	---
3	TA
4	RA
5	RB
6	TB
7	---
8	---

ISDN BRI Connector (RJ45) S-Bus Connection



Pin No.	Connection
1	---
2	---
3	RA
4	TA
5	TB
6	RB
7	---
8	---

Section 7 : System Start Up

Table of Contents

1. System Start Up 7-2
1-1 : Before Starting Up the System
1-2 : Powering Up the System

2. Programming Mode..... 7-4
2-1 : Enter the Programming Mode
2-2 : Exit the Programming Mode
2-3 : Save (Backup) the Customer Data
2-4 : Load the Customer Data

3. System Shut Down..... 7-7
3-1 : Powering OFF the System
3-2 : Resetting the System

Section 7
System Start Up

1. System Start Up

1-1 : Before Starting Up the System

Before starting up the system, make sure :

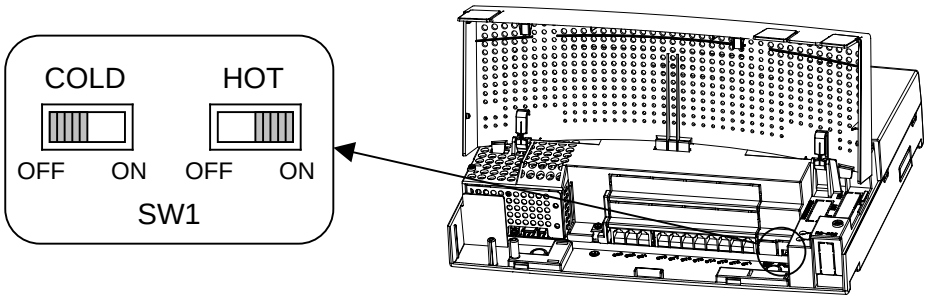
- KSUs are installed correctly.
- All extensions are cabled correctly.
- All Earth Ground and PSTN Trunks are cabled correctly.
- All PCBs are configured, equipped, and strapped correctly.
- AC Power cord is cabled correctly.
- At least one Display type Key Telephone is connected to the system. (for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

1-2 : Powering Up the System

There are 2 types of start up method as below.

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

1. Open the Sub-Cover at the main KSU, and make sure the SW1 position.



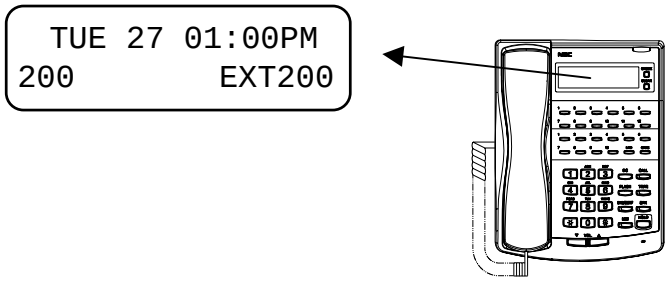
924M Main KSU

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

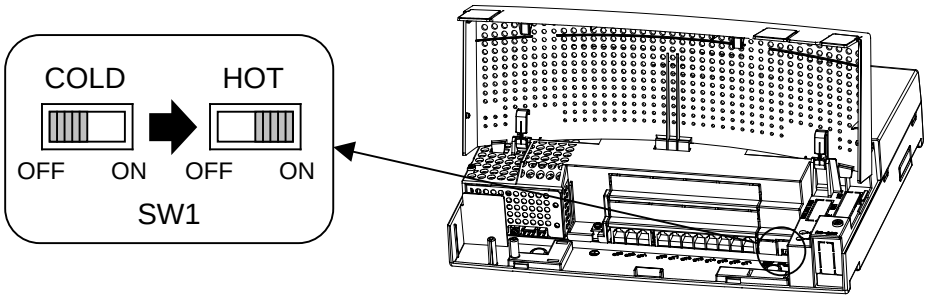
> **If the Expansion KSU(s) is/are installed, the AC Power Switch must be ON from Expansion KSU(s).**

3. Wait about 1-2 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 "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 shall 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 issue)

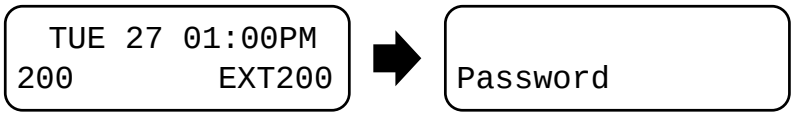
2. Programming Mode

2-1 : Enter the Programming Mode

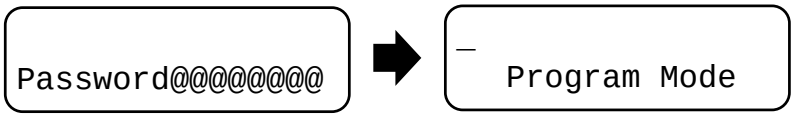
The installer/system administrator can enter to the system programming mode from the **Display Type Key Telephone**. (Up to 2 users can enter to the mode at the same time)

1. Press SPK (Do not lift the handset)

2. Dial # * # *



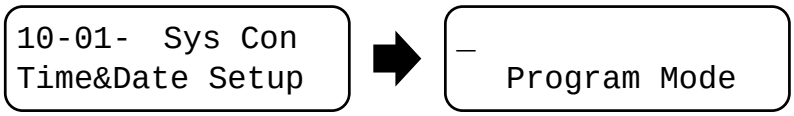
3. Dial the system password, then press HOLD



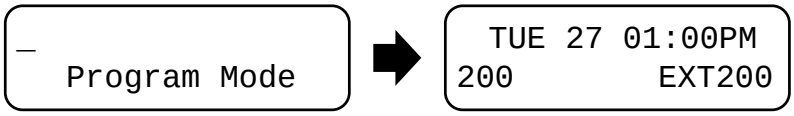
GO *For the details of programming, refer to the Programming Manual. (separate issue)*

2-2 : Exit the Programming Mode

1. Press DC several times to return the “PRG No. Entering Screen”.



2. Press SPK to exit.



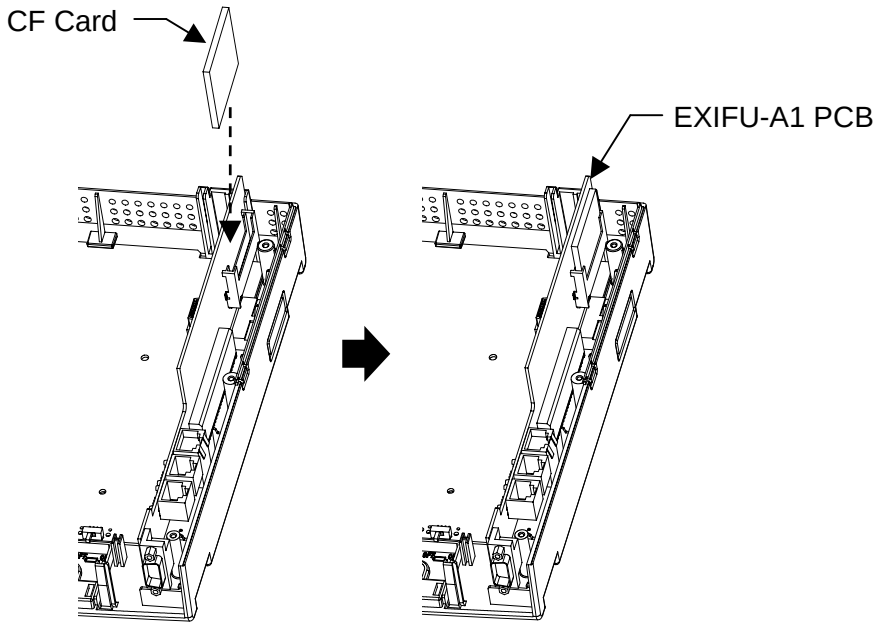
The system shall automatically save the customer data to the memory which is backed up by lithium battery.

2-3 : Save (Backup) the Customer Data

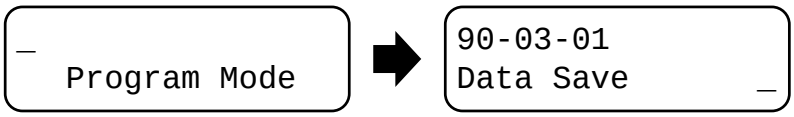
When the installer/system administrator exit from the programming mode, the system shall automatically save the customer data to the on-board memory which is backed up by lithium battery. On the other hands, this customer data can be saved to the CF Card for the backup purpose. If the it is necessary,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

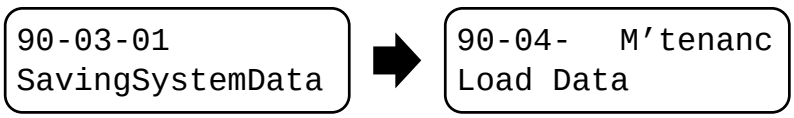


2. Enter to the PRG90-03.



3. Dial [1] and press [HOLD]

4. When the data backup to CF Card is completed, the display will be changed to the next PRG.



5.Remove the CF Card and exit from the Programming Mode.

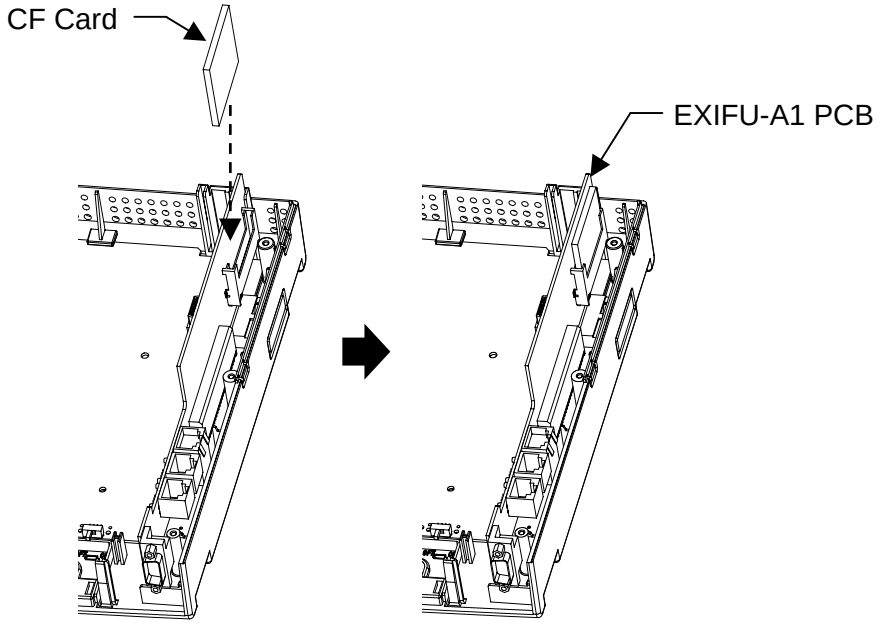
The saved data on CF Card can not be edited by the PC.

2-4 : Load the Customer Data

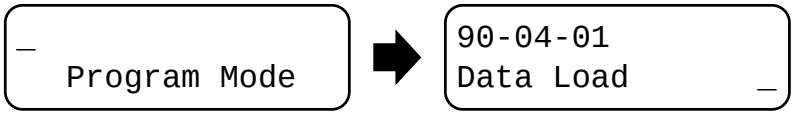
The backed up customer data can be loaded to the system by CF Card. If the it is necessary, **EXIFU-A1 PCB** must be installed to the system.

GO *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.

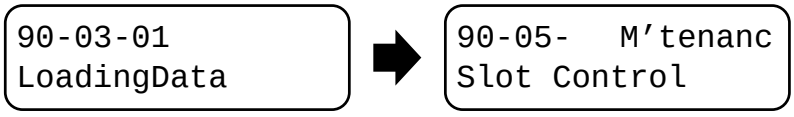


2. Enter to the PRG90-04.



3. Dial [1] and press [HOLD]

4. When the data backup to CF Card is completed, the display will be changed to the next PRG.

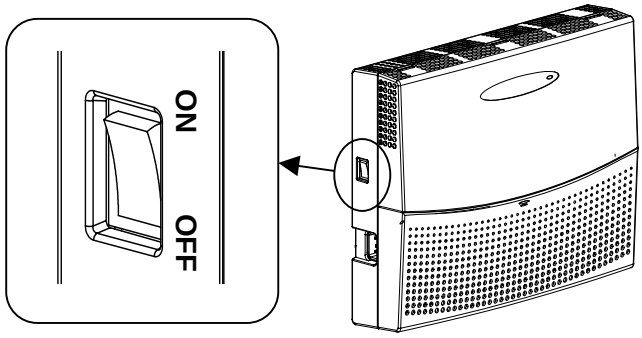


5. Remove the CF Card and exit from the Programming Mode.

3. System Shut Down

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/924ME KSU

- If the Expansion KSU(s) is/are installed, the AC Power Switch must be OFF from Expansion KSU(s).

- DO NOT power off by disconnecting the AC (or DC for battery backup) power. Always use the AC Power Switch on the 924M/924ME KSU.

- All calls in progress will be cut off when the system is powered off, and if the Power Failure is set, the applicable extension will become operational.

- All user's setting (such as Call Forward, Camp-On, etc) will be kept.

3-2 : Resetting the System

The system reset is carried out by "Power OFF and ON" operation.

Before resetting the system, make sure the SW1 is set to "HOT" side.

- For Your Notes -

Section 8 : Maintenance

Table of Contents

1. Lithium Battery Replacement 8-2
1-1 : General
1-2 : Lithium Battery Specification
1-3 : Replacing the Lithium Battery

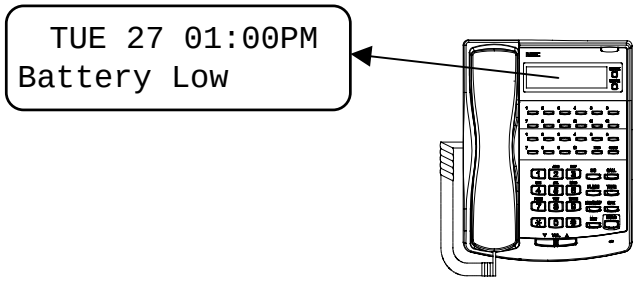
2. Main Software Upgrading 8-4
2-1 : General
2-2 : Before Upgrading the Main Software
2-3 : Main Software Version Confirmation
2-4 : Upgrading the Main Software

Section 8
Maintenance

1. Lithium Battery Replacement

1-1 : General

The Lithium Battery (SONY CR2450) 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

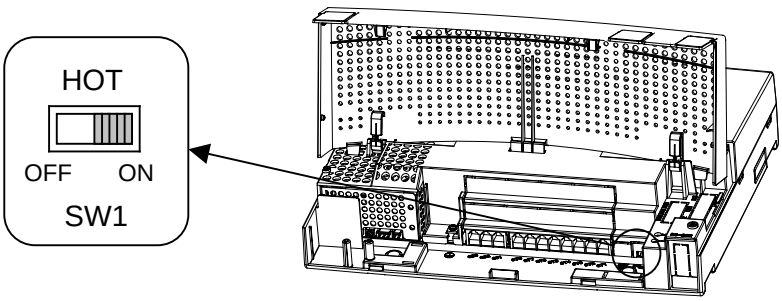
1-2 : Lithium Battery Specification

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

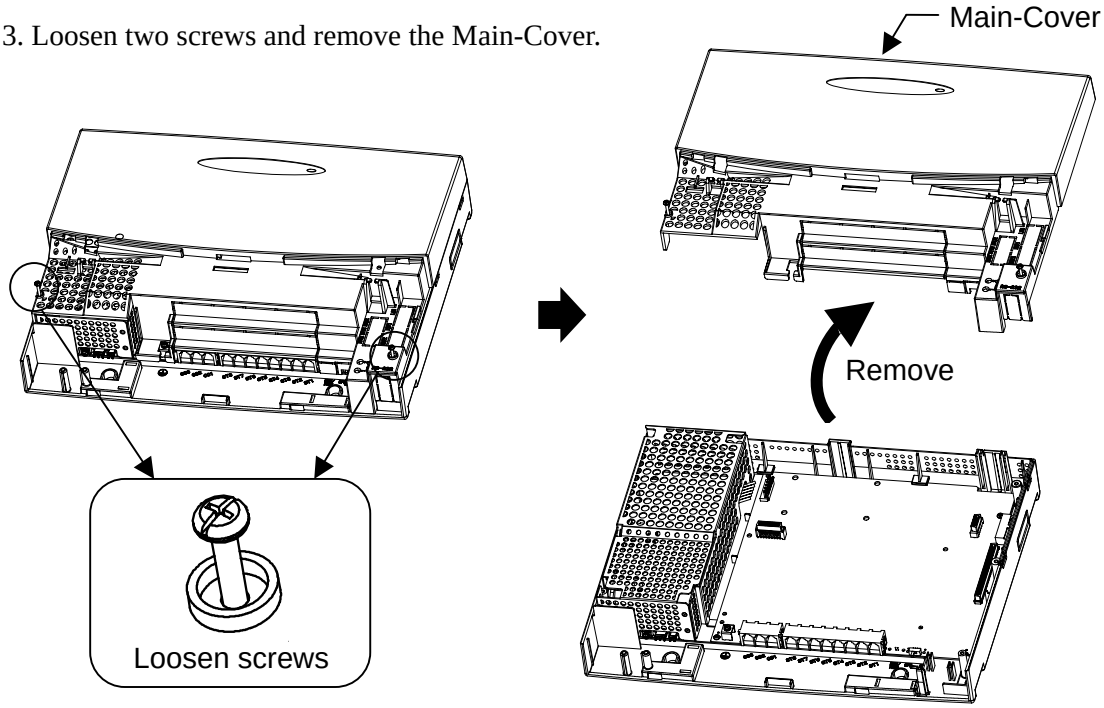
1. Open the Sub-Cover at the main KSU and make sure the SW1 is set to "ON" (HOT Start).



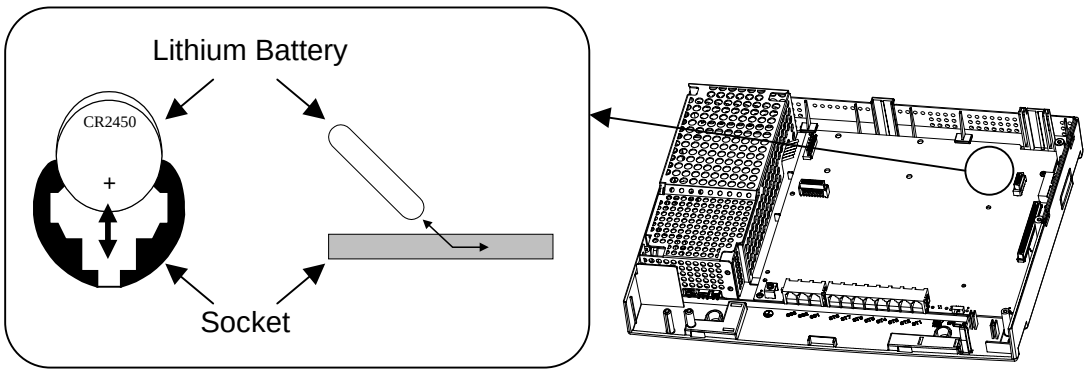
924M Main KSU

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

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 new one to the socket.



The polarity "+" symbol must be on top.

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

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.

- Prepare the CF Card (8MB, or upwards), and store the new main software on the CF Card by PC. (New Main Software shall be supplied from NEC Infrontia.)

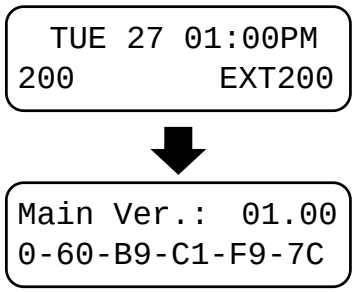
- Prepare the EXIFU-**A1** PCB (if the system does not have it.)

2-3 : Main Software Version Confirmation

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

1. On-Hook Condition.

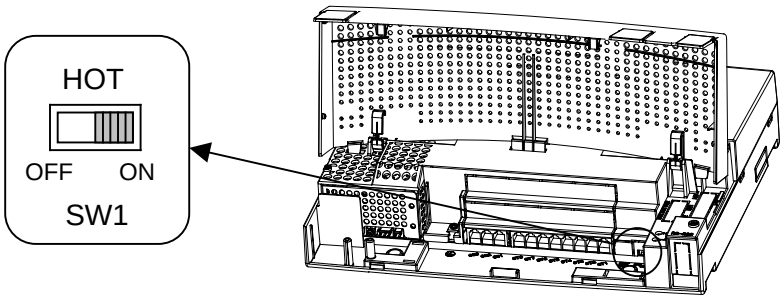
2. Press OPAC and Dial 3



The display shall automatically be returned to "Time & Date" after 3 seconds.

2-4 : Upgrading the Main Software

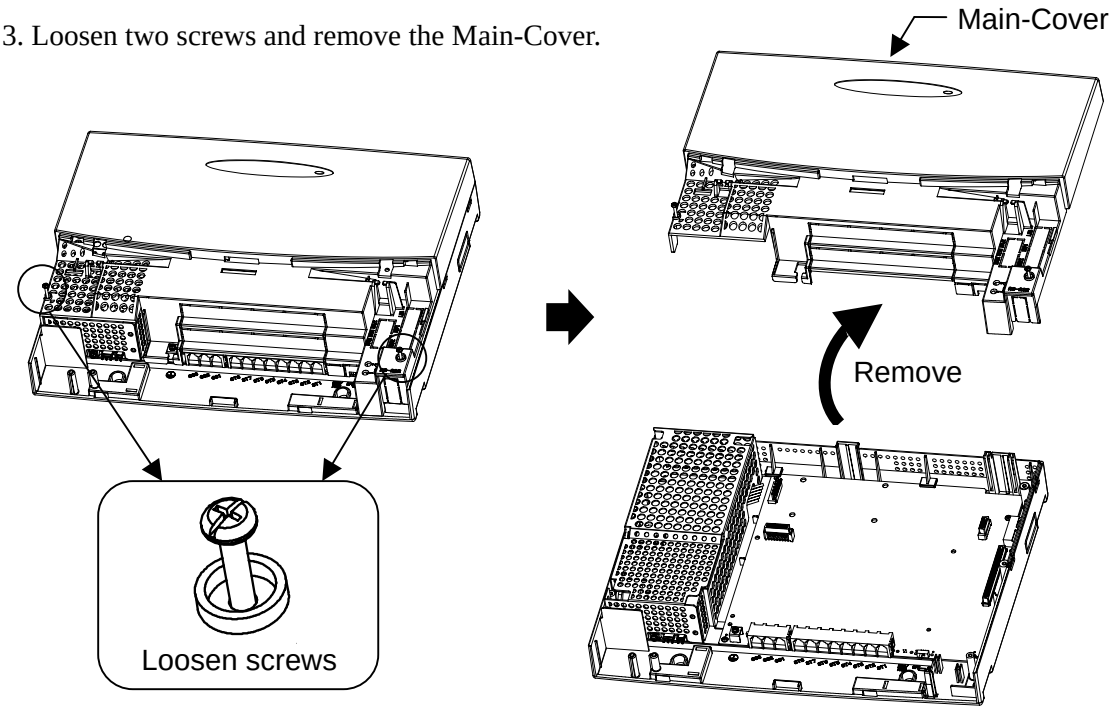
1. During the system power ON, open the Sub-Cover and make sure the SW1 is set to “HOT".



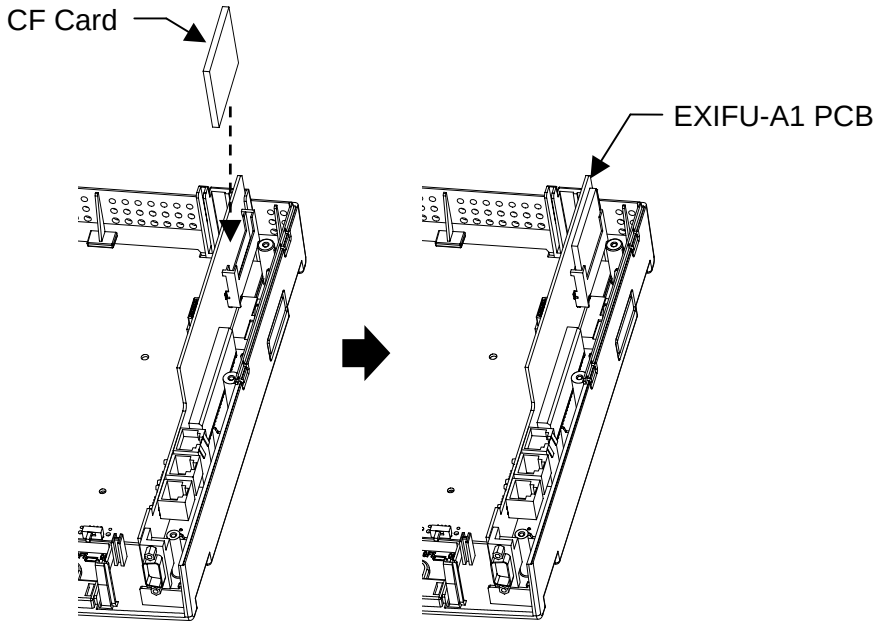
924M Main KSU

2. Power OFF the system.

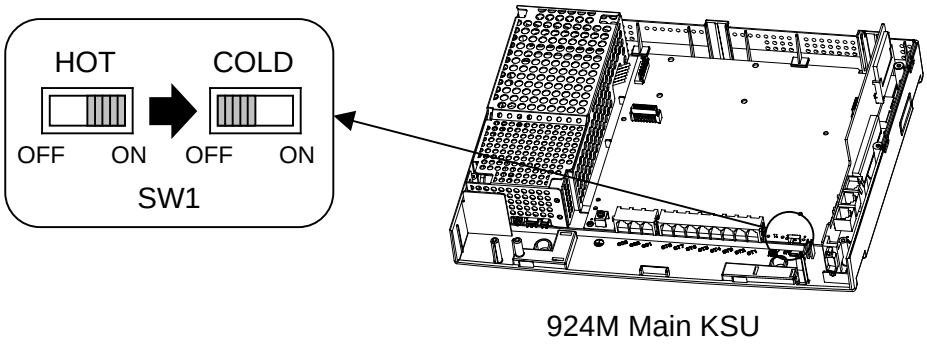
3. Loosen two screws and remove the Main-Cover.



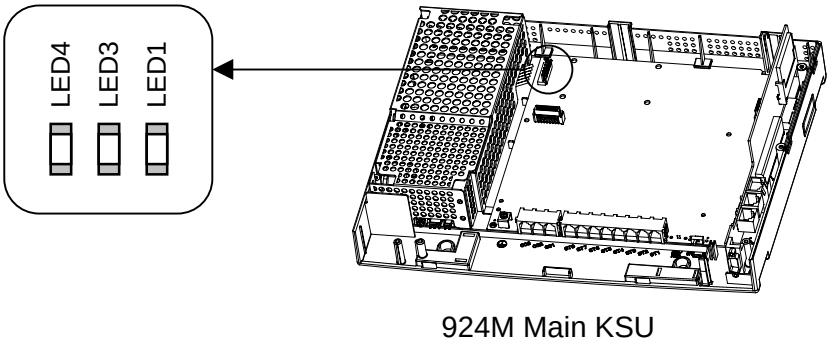
4. Insert CF card to the CF Slot on EXIFU-A1.
   (EXIFU-A1 should be temporary installed if the system does not have it.)



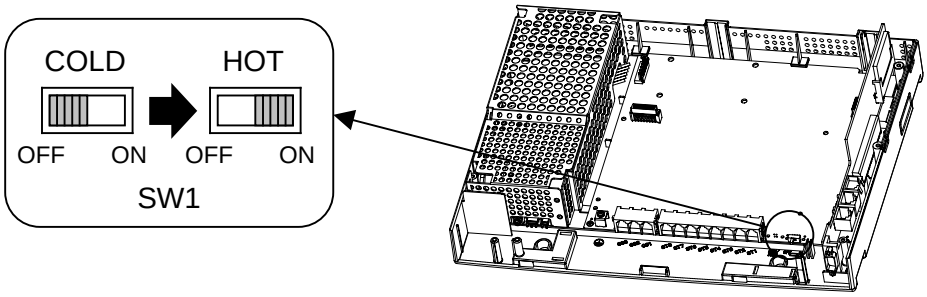
5. SW1 is set to “OFF” (COLD Start).



6. Power ON the system. LED1 lights on and LED4 starts fast blinking. (Approx 2~3 min)
   When the loading is completed, the fast blinking of LED4 will stop.



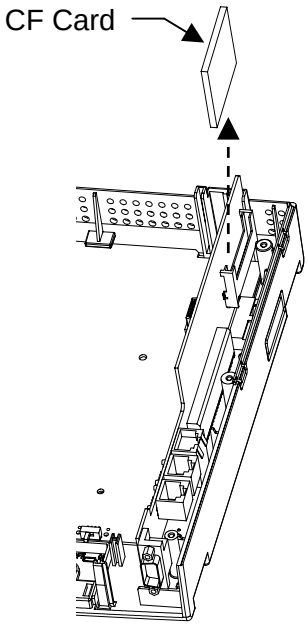
8. SW1 is set to “ON” (HOT Start).



924M Main KSU

9. Power OFF the system.

10. Remove the CF Card from the CF Slot on EXIFU-A1.
(Remove EXIFU-A1 if it is temporally installed.)



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

12. Power ON the system.

13. Confirm the main software version number by “OPAC” and “Dial 3” operation.

- For Your Notes -

Section 9 : Specifications

Table of Contents

1. System Capacity 9-2

2. System Specifications 9-3

General Precautions 9-3
Environmental Requirements 9-3
Environmental Specifications 9-3
Site Requirements 9-3
AC Power Requirements 9-3
Electrical Specifications <Power Supply> *(per a KSU)* 9-4
Mechanical Specifications 9-4
Doorphone Interface Specifications 9-5
BGM / ExMOH Source Input Specifications 9-5
External Paging Output Specifications 9-5
EXIFU-A1 LAN Port Specifications 9-5
Cabling Requirements 9-6
Cable Requirements 9-6

Section 9
Specifications

1. System Capacity

Items	Main KSU	Main KSU + 1 Exp. KSU	Main KSU + 2 Exp. KSU
Analog Trunk	9	18	27
Key Telephone	(24)	(48)	(72)
Single Line Telephone	(24)	(48)	(72)
DSS Console	(3)	(6)	(9)
	24 (Total)	48 (Total)	72 (Total)
Virtual Extension	50	50	50
Euro-ISDN (BRI)	8 (16ch)	16 (32ch)	24 (48ch)
DLS Console	24	48	72
Doorphone Box	2	4	6
External Paging Output	(2)	(4)	(6)
External MOH Input	(2)	(2)	(2)
BGM Input	(2)	(2)	(2)
	2 (Total)	4 (Total)	6 (Total)
Power Failure Transfer	3	6	9

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
- Euro-ISDN (BRI) T-Bus / S-Bus

2. System Specifications

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 cloth.

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 degree (32 ~ 104 degree F)
	Humidity	: 10 ~ 90% (non-condensing)
Doorphone Box	Temperature	: -20 ~ +60 degree (-4 ~ 140 degree F)
	Humidity	: 20 ~ 80% (non-condensing)

Site Requirements

The KSU should be **wall-mounted** only. Ensure that enough space is available to allow the installation of KSUs and/or OPBOX.

AC Power Requirements

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

Electrical Specifications <Power Supply> *(per a KSU)*				
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~0.2A
Ripple/Noise	100mVp-p	100mVp-p	200mVp-p	200mVp-p
Over Voltage Protection	3.7V~8.0V	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)**
924M/924ME 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	219	84 (Low) 115 (High)	0.829 (12TXD) 0.822 (6TXD)
Standard Type TEL	178	219	84 (Low) 115 (High)	0.819 (12TD) 0.812 (6TD)
DSS Console	315.5	177	59	0.483
DLS Console	212	60	59	0.196
Doorphone Box	100	34.5	132	0.2

Doorphone Interface Specifications	
Output Impedance	47Ω
Output Level	Nominal 250mV (-10dBm)
Maximum Output	400 mV RMS
Configuration	Normally open

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

Cable Requirements

Device	Cable Type	Cable Run Length (m)
Key Telephone	4-wire, 24AWG (Φ0.5mm)	300
DSS Console	2-wire, 24AWG (Φ0.5mm)	300
Single Line Telephone Analog Terminals (25mA)	2-wire, 24AWG (Φ0.5mm)	1500
Doorphone Box	2-wire, 24AWG (Φ0.5mm)	150
EXIFU LAN Port to External Device	Ethernet Cross Cable	100
EXIFU LAN Port to Switching Hub	Ethernet Straight Cable	100
EXIFU Serial Port to External Device	Serial Cross Cable	15
ISDN Terminals (from 2/4BRIU)	4-wire, 24AWG (Φ0.5mm)	100 (P-MP Short-passive) 300 (P-MP Long-passive) 500 (P-P)
924ME KSU	Ethernet Straight Cable (Attached to 924ME KSU)	1

- For Your Notes -

NEC

NEC INFRONTIA ASIA PACIFIC

NEC Infrontia Asia Pacific Sdn. Bhd.

24, Jalan Juruhebah U1/50,
Temasya Industrial Park Phase 2,
Seksyen U1 Glenmarie, 40150 Shah Alam,
Selangor Darul Ehsan, Malaysia
TEL : +60-3-5569-5888
FAX : +60-3-5569-3898
http://www.necinfrontia-ap.com