SAMSUNG

DCS-24

DIGITAL COMMUNICATION SYSTEM

INSTALLATION
MANUAL

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1   SITE REQUIREMENTS

The installation site for the Samsung DCS, DCS 70, DCS 24 and DCS Compact Systems should meet the following requirements -

- The location for the key service unit (KSU) must provide enough space for easy installation and have adequate lighting. The DCS 24 KSU Key Service Unit measures 46.5cm high by 31.5cm wide by 12cm deep.

- Select a location that will minimize cable lengths. See the maximum cable length limits in Chapter 6.

- The equipment should not be exposed to moisture, direct sunlight, corrosive fumes, dust, constant vibration or strong magnetic fields such as those generated by motors and copy machines.

- A single phase, correctly earthed, 240V, 10Amp, 50Hz, AC General Purpose Outlet (GPO) must be provided within two metres of the KSU. The GPO must be easily accessible and kept clear of obstructions. Extension cords must not be used. A dedicated, separately fused circuit should be used to minimize the risk of other electrical equipment being connected that could adversely affect system operation.

- Ensure that all wires and cable going to and coming from the KSU are properly routed. The cables should not cross fluorescent lights or run parallel with AC wires.

- The equipment must be located in an environment that will remain within the Temperature range of $0^{\circ}C$ to $45^{\circ}C$ and 10% to 95% Relative Humidity, non-condensing.

- Allow at least 30cm clearance on both sides and 30cm clearance on top of the KSU to ensure proper ventilation. Refer to Figure 2.1

- Do not install the KSU in close proximity to a fire sprinkler head or other sources of water.

Meeting these requirements will help to ensure proper performance and greater life expectancy of the system.

Immunity to Interference.

The DCS, DCS 24, DCS 70 and DCS Compact Systems have been designed to be immune to the levels of interference normally found within residential and commercial premises (for example, mains dips and breaks, electro-static discharge, overvoltages and transients, electromagnetic fields).

It is the customer's responsibility to provide an environment for the DCS systems, Keysets and cabling that does not contain excessive sources of interference that could affect the operation of the systems.

NOTICE

Note that the Samsung DCS 24 system should only be installed by fully trained and qualified personnel.

2   INSTALLING THE BASIC KSU

2.1   SYSTEM CONFIGURATION AND CAPACITY

The **DCS-24** system consists of the Basic Key Service Unit (KSU), Option boards, Trunk Interface cards, Interface modules and Digital keysets. The **Key Service Unit** (KSU) is a Single metal cabinet with an initial configuration of two (2) analogue C.O. line ports and 16 station ports: twelve (12) keyset ports and four (4) SLT (single line telephone) ports. The Basic Key Service Unit (KSU) contains one (1) Trunk Expansion slot, two option card connectors for fitting one serial interface cards, connections for an optional AA card and miscellaneous circuits: one (1) External Page Interface, one (1) general-purpose dry contact and one (1) Music interface selectable to Internal built-in Music (a Melody chip) or External Music.

Two types of telephones can be connected to the system: proprietary digital stations – DCS keysets that connect to DLI (Digital Line Interface) ports, and standard telephone sets – Single Line Telephones that connect to SLI (Single Line Interface) ports.

The Trunk Expansion slot has the provision for installation of an Analogue trunk card or an ISDN Basic Rate card.

The DCS-24 system also has capacity for the fitting of Option boards to provide Serial I/O ports, an analogue Caller ID (FSK) decoder or AA facilities. The 24SIM card provides 2 serial ports (2RS232C) for connection to a PC, printer or modem. The 24SIMCID provides an 8 channel CID signal decoder in addition to the 2 serial ports provided on the 24SIM. The AA option board (24AA) is equipped with a 4 channel Auto Attendant.

The Key Service Unit (KSU) basic configuration is 2 analogue trunk ports and 16 extensions (12 digital, 4 SLT); the maximum capacity is achieved by installing the 4BRI card in the trunk expansion slot – this configuration provides 10 trunk ports (2 analogue exchange lines and 8 BRI channels) and 16 extensions. Lesser trunk capacities of 4 and 6 exchange lines respectively are achieved by installing the 4TRKCID or 6TRKCID cards.

The system maximum capacity is as follows:

Stations	**16**	**(12 Keysets, 4 SLTs)**
ISDN channels	**8**	**(4 BRI ports)**
Analogue Exch. lines	**8**	
Music channel	**1**	**(Internal or External)**
External Page	**1**	
General-purpose Dry Contact	**1**	
Serial I/O ports	**2**	**(DB9 connectors)**
Auto Attendant channels	**4**	
Analogue Caller ID channels	**8**	**(Non-blocking)**

2.1.1   CONFIGURATION NOTES

1. The DCS 24 <u>does not</u> provide for installation of Keyset Daughter-Boards for additional DLI or SLI expansion.
2. Only one (1) trunk expansion card (4BRI-C, 4TRK24 or 6TRK24) is possible.
3. Capacity is provided for the installation of one SIO option board (SIM24) and one AA option board (AA24).
4. The system cannot accommodate any cards from other Samsung Digital Systems except for the DCS Compact BRI card (4BRI-C).
5. The Analogue Caller-ID presentation facility requires installation of the in addition to an analogue trunk card (a 4TRK24 or a 6TRK24). This facility will not be activated for the two analogue trunk lines connecting to the Basic KSU.
6. Every analogue trunk interface contains an interface for MPD or PRS modules (these are the same as those used on the DCS).

2.2   UNPACKING AND INSPECTION

After unpacking the KSU, inspect for any signs of physical damage. If any damage is detected, do not attempt to install. Contact the local distributor for advice.

Check to see that the Basic KSU carton includes the following items.

✓   Basic Key Service Unit (KSU)

✓   AC Power Cord

✓   Wall-mount kit consisting of mounting bracket, cable ties, 4 screws, battery connection cable and spare fuses

✓   SLT User's Guide (Standard telephone)

2.3   MOUNTING THE KSU

(See Figure 2-1)
The DCS-24 must be wall-mounted in a vertical position. The KSU should be mounted on a section of the wall capable of holding the weight of the system (approximately 5 Kg fully loaded) and cables eg close to a stud or noggin.
Attach the wall-mount bracket to the backboard with screws supplied and hang the KSU on the bracket.
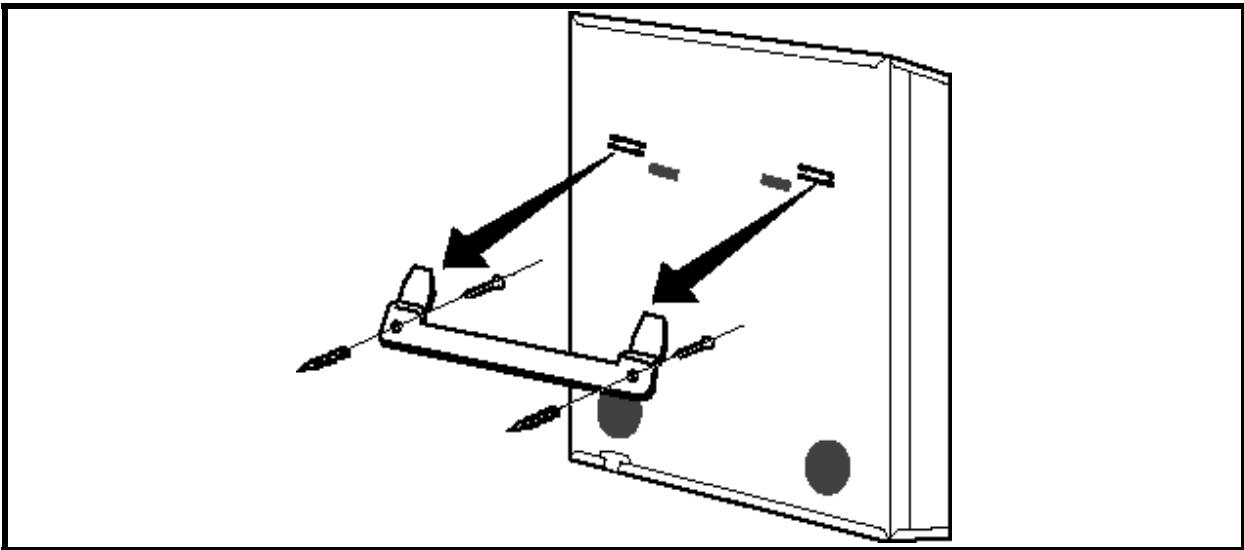
Figure 2-1 Attaching Mounting Bracket to Backboard

2.4 PROTECTIVE EARTHING

The protective earth connection to the DCS 24 is provided via the three core mains lead. The earth wire in the mains cord (Green/Yellow) is connected in the factory to the earth terminal within the system. The Earth wire is connected directly to the bottom left hand corner of the Power Supply case

The protective earth (PE) is used for surge protection and for the electrical safety of the system. The system must be plugged into a GPO socket that is correctly earthed. The PE provides all system earthing requirements, a TRC is not required and should not be connected.

WARNING

The equipment, users and service personnel must be protected against possible surges of current down exchange lines. This must be done using one, or both, of the following methods when installing or working on the system -

- Plug the mains lead into the GPO socket, ensuring that the socket is turned off.

- Isolate the exchange lines from the system. This may be done by isolating the lines at a distribution frame.

The Power Supply has fuses in both the mains active and neutral legs, therefore caution should be used when working on or near the power supply. Turn OFF the power supply switch on the KSU before working on the system.

2.5   DISTRIBUTION FRAME CABLING

All connections to the DCS-24 system are made by way of a customer – provided system distribution frame (SDF). All connections are made via the SDF except for the serial data ports, 240VAC mains and the battery back up.

The KSU is connected to the SDF using a 25-pair male AMP Champ cable and a 4-pair modular plug (RJ-45) plus cable (for connection of Single Line Telephones. The cables should be routed into the KSU cabinet via the bottom of the cabinet and clamped to the cable anchoring point using a nylon cable tie. The retaining screw on the AMP Champ connector should be used to hold the connector in place.

Details of the cable connections are in Section 5.

BOTTOM VIEW

FRONT VIEW AFTER REMOVING THE FRONT COVER

FROM 50-PIN CHAMP CONNECTOR

FROM 8-PIN RJ-45
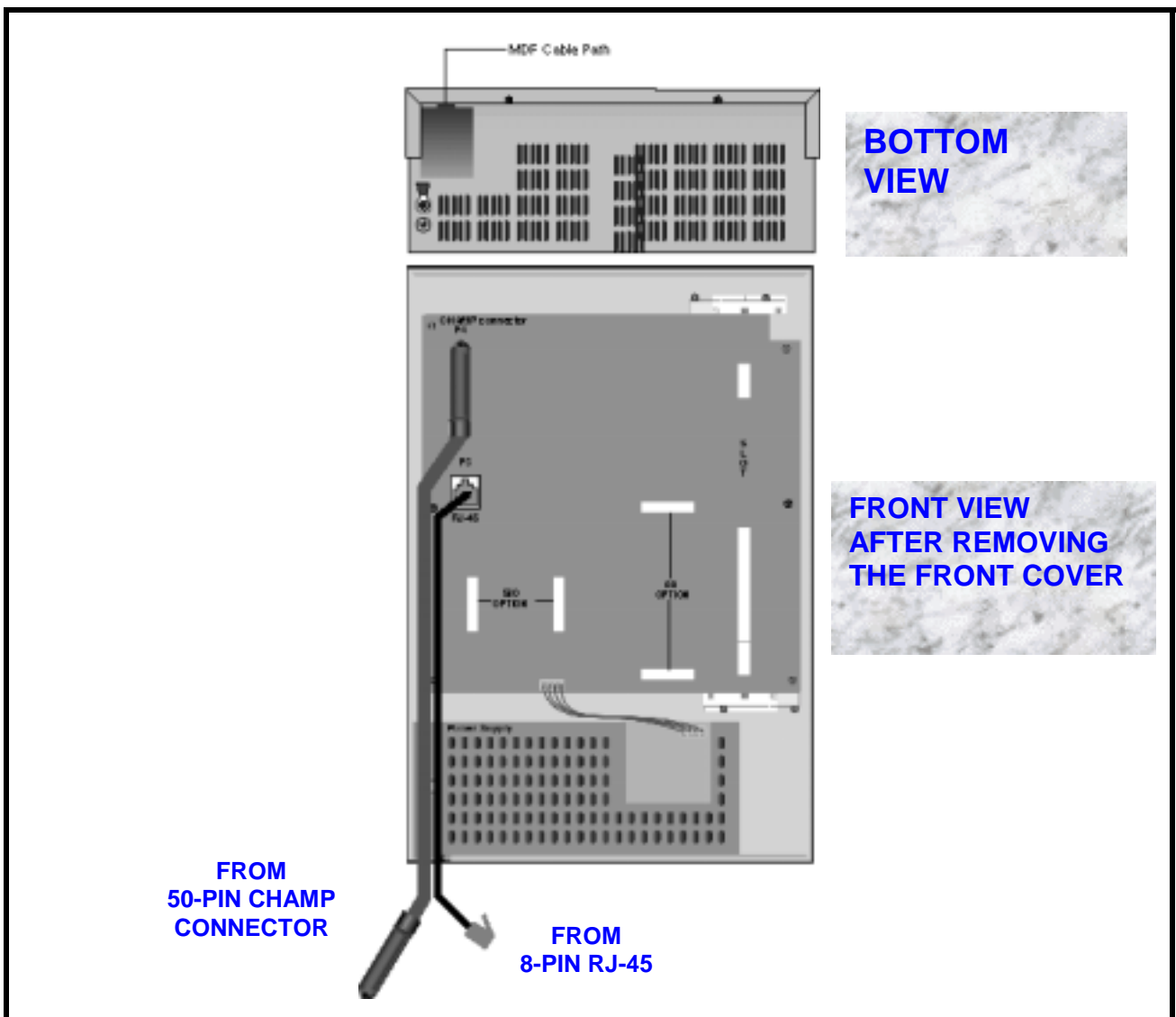
FIGURE 2-2 SDF Cables Distribution

2.6   EXTERNAL BATTERY CONNECTION

See (Figure 2-3)
A socket is provided on the KSU for connection of an external battery for system during AC power failure. The DCS-24 system is equipped with a battery charging and a discharging circuit to interface with an external battery.

The capacity of a backup battery must be 48 volts and should be rated at greater than 6AH and less than 26AH. The DCSBBU backup battery is rated at 7AH.

To connect an external battery use the connection plug and cable supplied, and connect the RED wire lead of the cable to the positive (+) terminal of the battery and the BLACK wire lead to the negative (-) terminal. The plug should be inserted into the socket in the power supply.

Note that the actual connection should be done as the final step in the installation process.

Figure 2-3   **Connecting a System Backup Battery**

2.7   SELECTING OPTIONS ON THE BASIC KSU

See figure 2-4.
There are some hardware options to select in the Basic KSU; Memory Backup Selection, Music Source Selection and MPD/ PRS selection for the two (2) analogue trunk lines on the Base board.

2.7.1   MEMORY BACKUP SELECTION

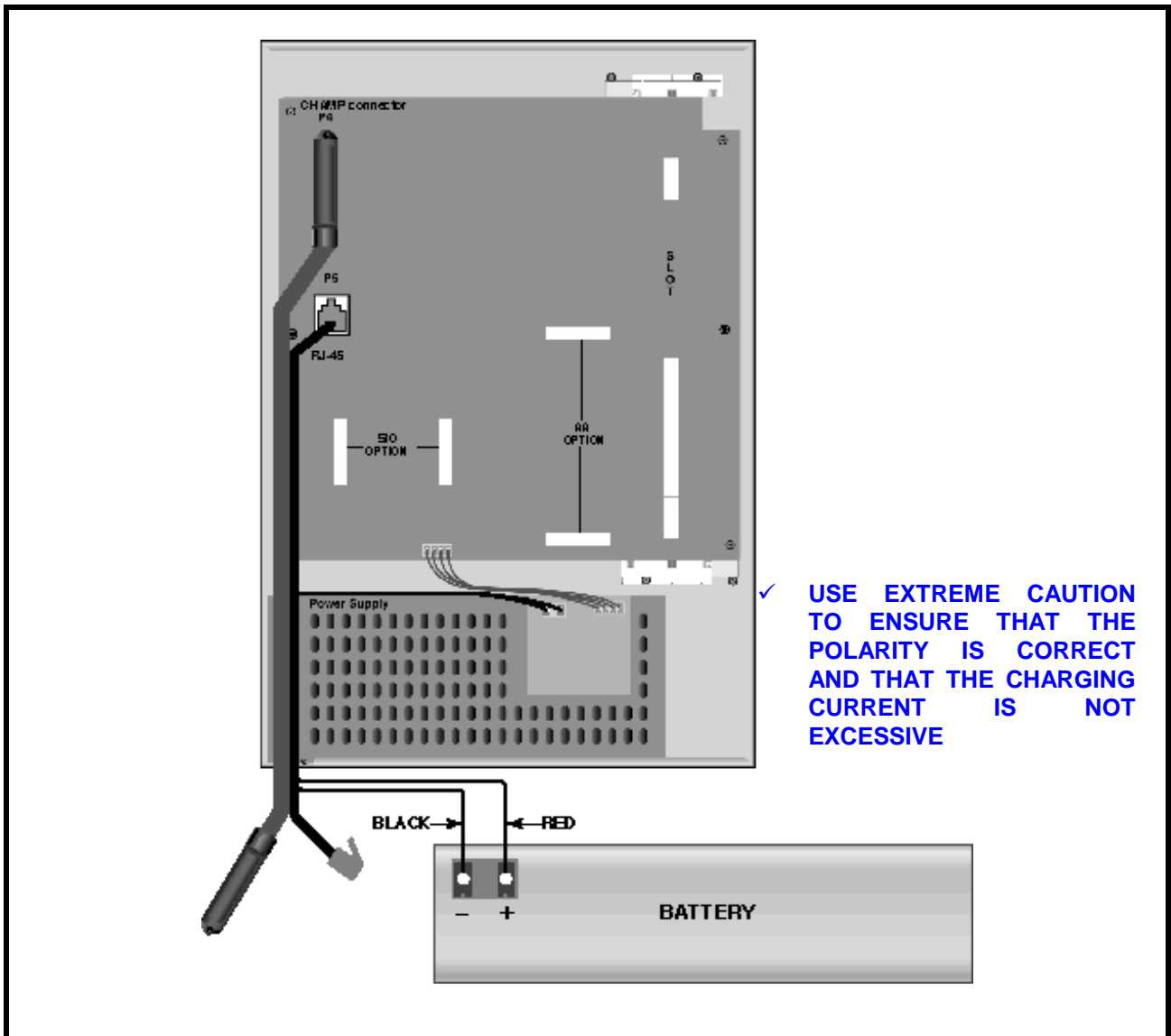The system is equipped with data memory, 256Kbyte and memory backup circuitry (a super capacitor) to protect customer data in case of any power failure. The memory backup circuitry has a shunt-pin switch to toggle enabling backup. Before shipment, the switch is selected OFF to prevent the super capacitor from discharging during shipment and storage and it should be moved to ON after installing and programming the system. If this is not done, the customer data will be lost in the event of power failure.

2.7.2   MUSIC SOURCE SELECTION

The Basic KSU is equipped with a melody chip to provide music to stations and trunk lines as Music-on-Hold or Background music. In addition, an interface is provided for an external music source such as a CD player or a radio etc.

The system provides a single music channel for Music-on-Hold or Background music. Reference should be made to Figure 2-5 for the selection of the music source at the end of installation - a shunt-pin switch is used to select the music source between the internal melody chip or an external music source.

The connection of the external music source is explained in Part 6.

2.7.3   MPD/ PRS SELECTION AND INSTALLATION

Both the two analogue trunk interfaces mounted on the KSU motherboard have positions for a single hybrid (MPD-HYB or PRS-HYB) for each exchange line. The motherboard is supplied ready for use with MPD hybrids; ie. the hybrid sockets are connected to line via decoupling capacitors. The motherboard must be modified before PRS hybrids can be used. This modification involved soldering a wire link across the decoupling capacitors used for the MPD so that the PRS hybrid is connected directly to the line. Capacitors C214 and C215 relate to TRK1, and C224 and C225 relate to TRK 2. Figure 2-5 indicates the hybrid insertion sockets. Ensure that the chips are firmly inserted in the sockets - one chip per line.
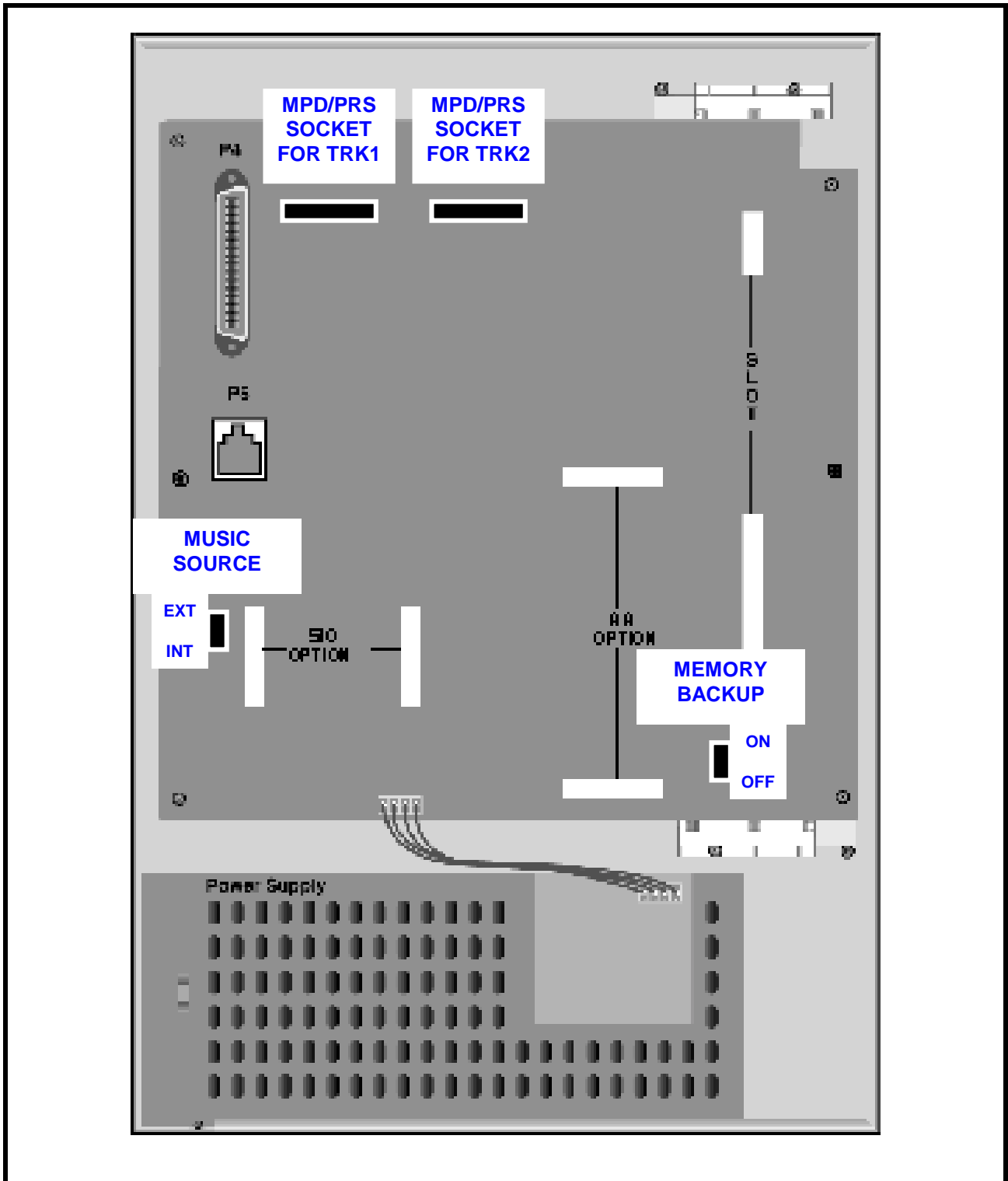
Figure 2-4 Selecting Options On the Basic KSU

3   INSTALLING OPTION BOARDS AND TRUNK CARDS

(Figure 3-1)
Unpack and inspect each card for physical damage before installation. Contact the supplier if any damage to the card is detected. Do not attempt to install a damaged card.

> **WARNING**.   The Samsung DCS 24 system contains many static sensitive components. To reduce the incidence of premature equipment failure, observe the following precautions -

- Always discharge static from yourself before handling any Printed Board Assemblies (PBA's) and wear an anti-static wrist strap connected to the KSU earth lug.

- Always handle boards by the edges.

- Never touch PBA tracks or connectors. Contaminants introduced by fingers can cause corrosion and high resistance connections.

- Never touch or straighten components, especially the ceramic sub-assemblies. They are physically delicate and finger pressure can fracture component leads (even if the leads do not actually break).

- To protect PBAs against physical damage and damage due to static discharge, always wrap them in an anti-static bag and replace them in the packaging provided with the new item.

> **WARNING**
>
> **Power must be switched OFF before any cards are removed or installed.**

The DCS-24 system has one (1) trunk expansion slot for a trunk card and two (2) option connections for a SIM card and AA card respectively. Figure 3-1 indicates the option board and trunk card expansion slots.
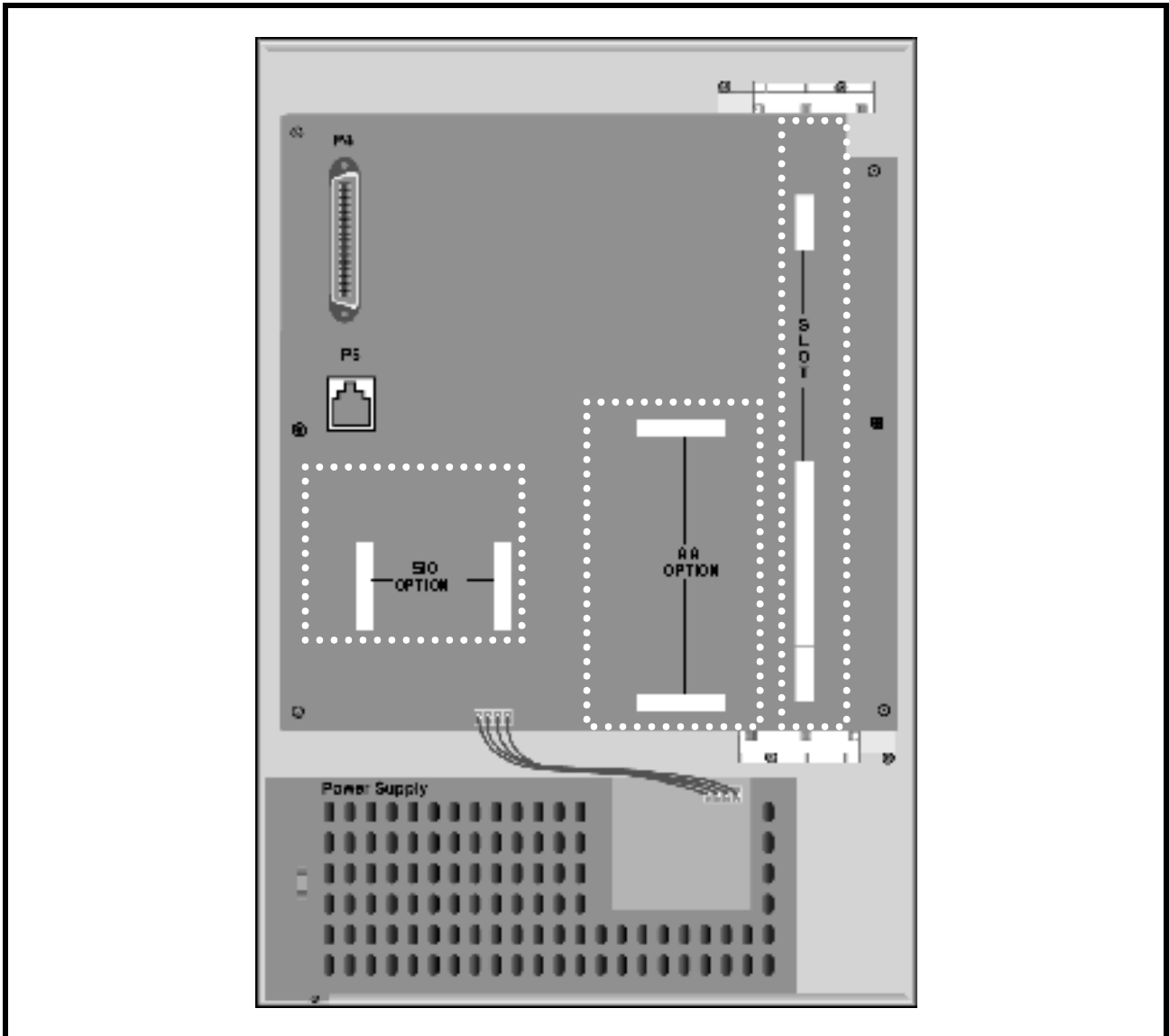
Figure 3-1   Installing Option Boards and Trunk Card

3.1   SIO OPTION BOARD

(See Figure 3-2
The DCS-24 system provides a dedicated interface for the connection of serial interface devices. One SIM board – 24SIM is available. The DCS 24 can house only one serial interface board.

3.1.1   24SIM Option board
Two (2) serial interfaces with DB9 connectors

There are no hardware options to select on this board. Install the card firmly and ensure that it is fully inserted into two (2) board connectors.

3.1.2   24SIMCID Option board
Two (2) serial interfaces with DB9 connectors and Analogue Caller ID (FSK) decoder chip

There are no hardware options to select on this board Install the card firmly and ensure that it is fully inserted into the two (2) board connectors.

ANALOGUE CID DECODER

TWO DB9 CONN

BOARD CONNECTORS

AA MEMORY BACKUP ON - UPPER

BOARD CONNECTORS
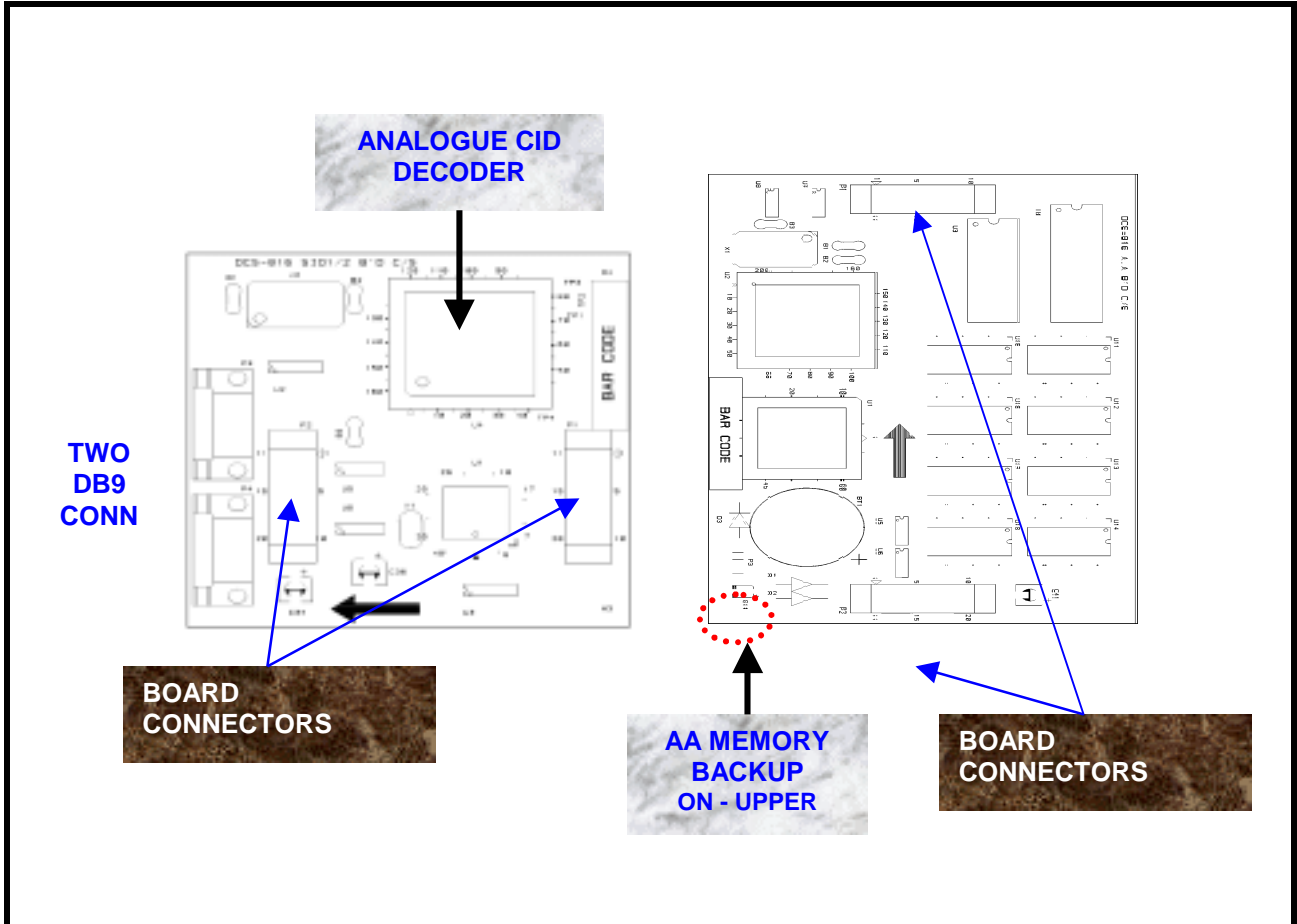
Figure 3-2 Serial and AA Option Cards

3.2   AA OPTION BOARD - AA24

Four (4) channel built-in Auto Attendant
See Figure 3-2.
A dedicated connection is provided for the fitting of the AA card. The memory backup selection switch (a shunt pin) should be selected to ON after installation. Install firmly and ensure that it is fully inserted into the two (2) board connectors.

3.3 4TRK24 CARD

Four (4) Analogue Trunk Interfaces with Caller ID relays

See Figure 3-3.

The card has four (4) interfaces for MPD or PRS optional chips. If MPD or PRS hybrid chips are required, these should be installed before inserting the card in the trunk expansion. The 4TRKCID card is supplied ready for use with MPD hybrids; ie. the hybrid sockets are connected to line via decoupling capacitors (2 per line). The card must be modified before PRS hybrids can be used. This modification involved soldering a wire link across the decoupling capacitors used for the MPD so that the PRS hybrid is connected directly to the line. See table in 3.4 – 6TRK-CID. Install the card and ensure that it is fully inserted into the slot.

2 CAPACITORS PER PORT

MPD/PRS SOCKETS FOR TRK1 TO TRK6 FROM THE TOP

Figure 3-3 **4TRK/6TRK and 4BRI Cards**

3.4 6TRK24 CARD

Six (6) Analogue Trunk Interfaces with Caller ID relays

See Figure 3-3.

This card uses the same printed circuit board (PCB) as the 4TRK-CID card; however, it is equipped with an additional two trunk circuits. .The card has six (6) interfaces for MPD or PRS optional chips. If MPD or PRS hybrid chips are required, these should be installed before inserting the card in the trunk expansion. The 6TRKCID card 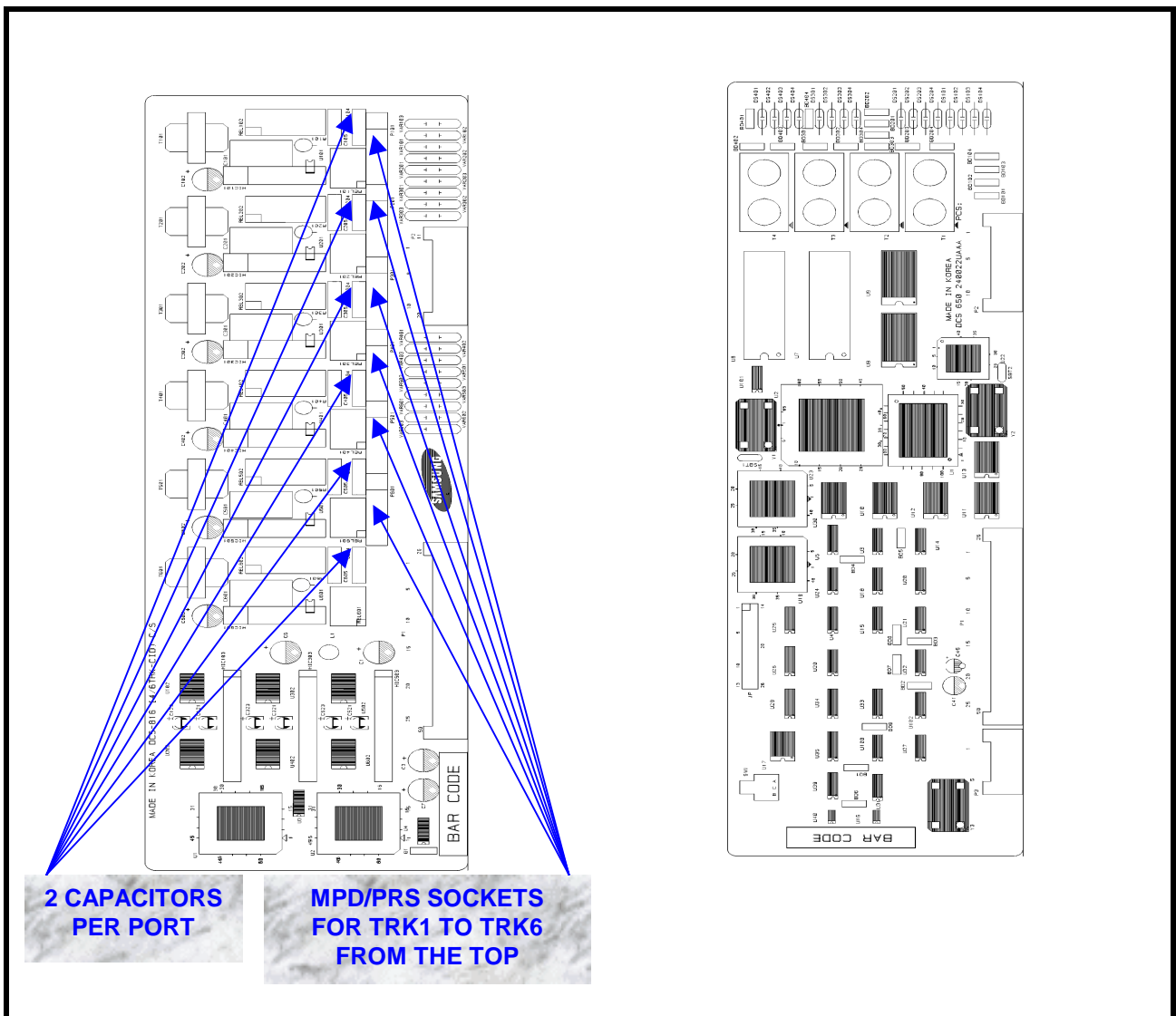is supplied ready for use with MPD hybrids; ie. the hybrid sockets are connected to line via decoupling capacitors (2 per line). The card must be modified before PRS hybrids can be used. This modification involved soldering a wire link across the decoupling capacitors used for the MPD so that the PRS hybrid is connected directly to the line – see the table below for details. Install the card and ensure that it is fully inserted into the slot. Install the card and ensure that it is fully inserted into the slot.

3.4.1   MODIFYING THE 4TRK AND 6TRK CARDS FOR USE WITH PRS HYBRIDS

The cards are supplied ready for use with MPD hybrids. i.e. the hybrid sockets are connected to line via decoupling capacitors.
1. Solder wire links across the capacitors on each exchange line that will be used for PRS. (Two capacitors per line - see Table below)
2. Insert the hybrid into the required socket on the board ensuring that hybrids are fitted with the correct orientation.

Line	4 TRK Card Capacitors	6 TRK Card Capacitors
1	C104 & C105	C104 & C105
2	C204 & C205	C204 & C205
3	C304 & C305	C304 & C305
4	C404 & C405	C404 & C405
5		C504 & C505
6		C604 & C605

3.5 ISDN 4 BASIC RATE CARD

Four (4) ISDN BRI ports

See Figure 3-3
This card is the same Basic Rate card as that used on the DCS Compact - 4BRI-C. There are no hardware options to select on this card The BRI card is an optional expansion board that supports up to four BRA Trunks and BRA extensions. The selection of BRA trunks or extensions is via MMC 423. Note that the card does not provide power to ISDN terminal equipment even when So mode is selected.

Insert the card and be assured that it is fully inserted into the slot.

The DCS 24 must be the only equipment connected to each Basic Rate line when the ISDN lines are being used for Indial.

Standard installation procedures should be used for cable lengths, cable types and earthing when connecting the ISDN lines from the SDF to the NT1.

4   POWER-UP PROCEDURE

4.1   DCS 24 POWER SUPPLY & FUSING

The DCS 24 system is shipped with the power supply already fitted to the system. The power supply includes four fuses (Figure 4-3) which should be checked if there is a suspected power supply problem.

To remove the PSU cover to check the fuses, turn the system off at the GPO and the system ON/OFF switch and remove the four screws fixing the power supply cover. Disconnect the cables in connectors 1 and 2, taking care not to strain any of the wiring or connectors and remove the power supply cover. Ensure that any replacement fuse is the same type and value as the one being replaced. (250VAC 1.6 amp for the active and neutral mains input and 250 VAC 2 amp for the -55VDC output and Battery input)

> **WARNING**
> The DCS 24 employs fuses in both the mains ACTIVE and NEUTRAL legs. Turn OFF the switch on the KSU and at the GPO prior to any work on the system power supply.

4.2   POWERING UP THE SYSTEM

During the initial installation, disconnect the cables to the SDF.

Verify that the battery switch is OFF.

Power the system on and check that the green LEDS for AC and DC (above the ON/OFF switch – see Figure 4.1) on the power supply come on. The LEDs will light steady to confirm the presence of power. If the AC LED is off and the DC LED is on this indicates the system is operating off external batteries.

Check that the RUN LED on the motherboard flashes 10s after power on. Set the BACK UP switch on the motherboard to ON (see Figure 2.5).

4.3   POWER UP PROBLEMS

If the PSU AC LED does not illuminate the problem must be corrected before proceeding further with the KSU installation. Follow the steps below to isolate the problem.

1. Turn OFF the switch on the KSU and at the GPO prior to any work on the system power supply, remove the power supply cover and check the fuses (see Figure 4.2).

2. Power off the system and unplug all of the cards (option cards, trunk expansion card). Power the system on again. If the PSU AC LED now illuminates, one of the cards is faulty.

3. If the PSU AC LED still fails to illuminate, replace the PSU. If the system still fails a replacement KSU is required.
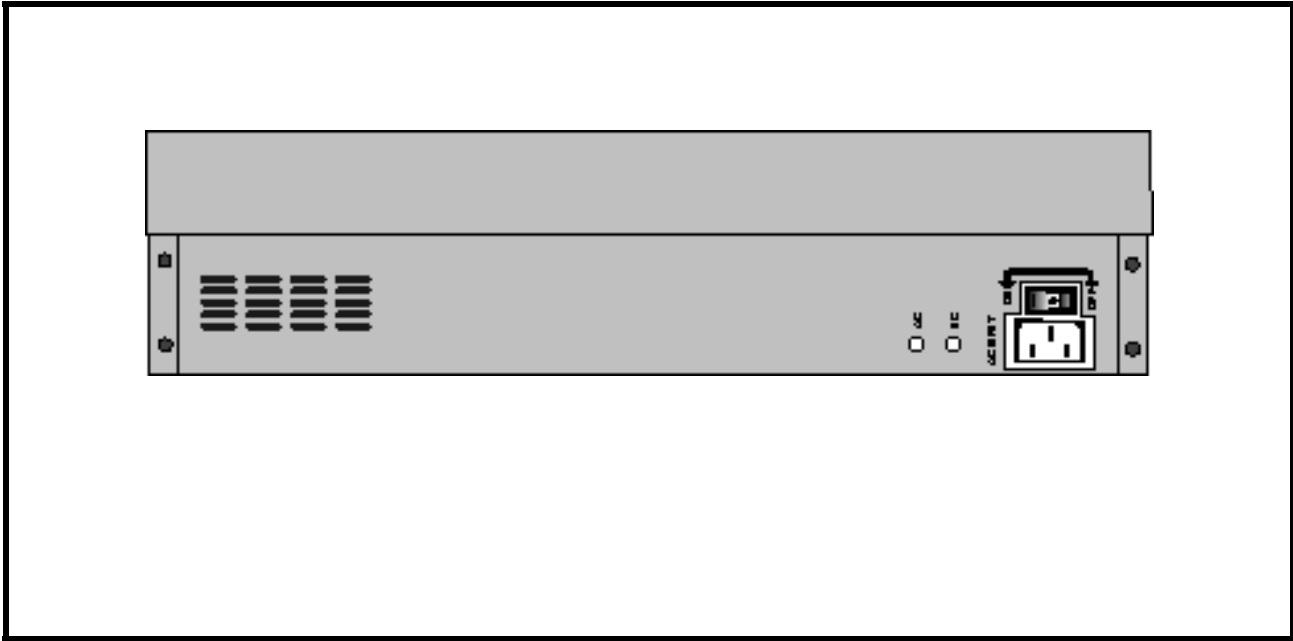
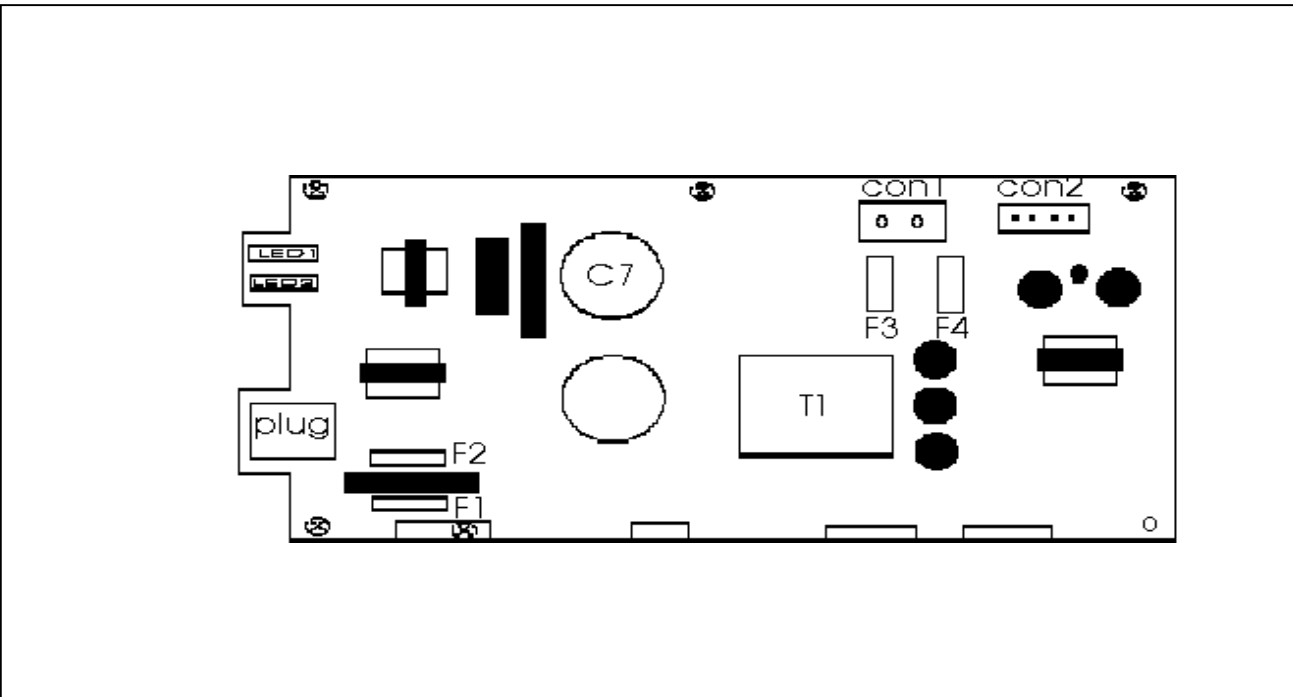**Figure 4-1** **Power Connections to the System**

Figure 4-2 **Location of Power Supply Fuses**

4.4   MEMORY LED INDICATIONS

Having verified proper operation of the power supply, check the motherboard LED. The LED should flash rapidly indicating the main processor is functioning. The battery switch should now be turned ON.

If the LED is not flashing after 10s, power off the system and replace the MEM card. If the LED still fails to flash a replacement KSU is required.

The Memory Backup Selector should be moved to the ON position (See Figure 2-5). Failure to do so may result in a loss of programming data as well as customer data in the event of mains power failure.

4.5   DEFAULT TRUNK AND STATION NUMBERING

Upon initial power up, the CPU reads each slot for the existence of a card and identifies the type of card. It stores this as the default configuration.
The system assigns default trunk numbers beginning with 701 upwards. The lines are numbered sequentially from 701 upwards including both analogue exchange lines and BRI and PRI ISDN lines.

The system assigns default station numbers from 201 upwards.
Keyset daughter boards are assigned numbers from 301 upwards. For example, the daughterboard plugged into keyset 203 will have the default number 303.

The default configuration assigns the operator position to the lowest DLI port and all incoming trunks ring that station.

Once the cabling has been completed, the keysets, exchange lines and single line telephones should be tested for correct operation.

Station and trunk numbers can be changed, rearranged and reassigned as required using system programming.

5   DCS 24 System Cabling

5.1   SAFETY PRECAUTIONS

To limit the risk of personal injury, always follow these precautions before connecting analogue and digital exchange line circuits and ODX circuits :

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

5.2   SYSTEM CABLING

All connections to the DCS 24 system are made by way of a system distribution frame (SDF) except for the 240VAC power and back-up battery. All cabling to and from the SDF should be made using ACA approved 0.4mm or 0.5mm twisted pair cable.

Refer to Chapter 9 of DCS I&M manual for details of maximum cable lengths

The main connection from the KSU to the SDF uses a cable assembly terminated with an AMP-Champ type connector on one end and a 10 Pair Krone connector on the other. The AMP-Champ connector inserts into a

socket on the KSU. The cable assemblies can be customer-supplied or are available as items supplied with the systems.

The first 20 pins of the AMP Champ connector are assigned to connections of trunk interfaces on a trunk interface card as well as on the Base board, the next 6 pins are for connections of miscellaneous circuits and the last 24 pins are assigned to connections of 12 DLI ports on the Base board. Refer to tables below. The retaining screw on the Champ connector should be secured to hold the connector in place on the KSU. Connection for the SLT's is via a 4-pair modular jack (RJ-45) on the motherboard.

5.2.1   CABLE TAIL DESCRIPTION

PART NUMBER
S25-44

DESCRIPTION
25 Pair Tail Assembly - 1 Amp Champ, 3 Krone Connectors.

USE
Connects to KSU Motherboard

5.3   DCS 24 DISTRIBUTION FRAME CIRCUIT ALLOCATION

25 Pair Tail

5.3.1 TRUNK CARD CONNECTIONS

Amp Pins	Krone Module	Krone Module Pair	Circuit		Colour
			4TRK / 6TRK	4BRI	
26,1	1	1	Trunk 1*	Not Used	White - Blue
27,2	1	2	Trunk 2*	Not Used	White - Orange
28,3	1	3	Trunk 3	Port 1Tx+, Tx- (to NTU)	White - Green
29,4	1	4	Trunk 4	Port 1 Rx+, Rx- (from NTU)	White - Brown
30,5	1	5	Trunk 5	Port 2Tx+, Tx- (to NTU)	White - Slate
31,6	1	6	Trunk 6	Port 2 Rx+, Rx- (from NTU)	White - Blue\White
32,7	1	7	Trunk 7	Port 3Tx+, Tx- (to NTU)	White - Blue\Orange
33,8	1	8	Trunk 8	Port 3 Rx+, Rx- (from NTU)	White - Blue\Green
34,9	1	9	Not Used	Port 4Tx+, Tx- (to NTU)	White - Blue\Brown
35,10	1	10	Not Used	Port 4 Rx+, Rx- (from NTU)	White - Blue\Slate
36,11	2	1	Not Used	Not Used	White - Orange\White
37,12	2	2	Not Used	Not Used	White - Orange\Green
38,13	2	3	Not Used	Not Used	White - Orange\Brown
39,14	2	4	Not Used	Not Used	White - Orange\Slate
40,15	2	5	Not Used	Not Used	White - Green\White
41,16	2	6	Not Used	Not Used	White - Green\Brown
42,17	2	7	Not Used	Not Used	White - Green\Slate
43,18	2	8	Not Used	Not Used	White - Brown\White
44,19	2	9	Not Used	Not Used	White - Brown\Slate
45,20	2	10	Not Used	Not Used	White - Slate\White
46,21	3	1	Not Used	Not Used	Yellow - Blue
47,22	3	2	Not Used	Not Used	Yellow - Orange
48,23	3	3	Not Used	Not Used	Yellow - Green
49,24	3	4	Not Used	Not Used	Yellow - Brown
50,25	3	5	Not Used	Not Used	Yellow - Slate

*Trunk 1 and Trunk 2 circuits are located on the KSU motherboard and provide power fail transfer to extensions 15 and 16 respectively
# 6TRK Card Only

5.3.2 DLI AND OPTIONAL EQUIPMENT CONNECTIONS

Amp Pins	Krone Module	Krone Module Pair	Circuit		Colour
			DLI	Other	
26,1	1	1	Not Used	Not Used	White - Blue
27,2	1	2	Not Used	Not Used	White - Orange
28,3	1	3	Not Used	Not Used	White - Green
29,4	1	4	Not Used	Not Used	White - Brown
30,5	1	5	Not Used	Not Used	White - Slate
31,6	1	6	Not Used	Not Used	White - Blue\White
32,7	1	7	Not Used	Not Used	White - Blue\Orange
33,8	1	8	Not Used	Not Used	White - Blue\Green
34,9	1	9	Not Used	Not Used	White - Blue\Brown
35,10	1	10	Not Used	Not Used	White - Blue\Slate
36,11	2	1	Not Used	Normally Open Contact	White - Orange\White
37,12	2	2	Not Used	Paging Output	White - Orange\Green
38,13	2	3	Not Used	External MOH	White - Orange\Brown
39,14	2	4	DLI Port 1	Not Used	White - Orange\Slate
40,15	2	5	DLI Port 2	Not Used	White - Green\White
41,16	2	6	DLI Port 3	Not Used	White - Green\Brown
42,17	2	7	DLI Port 4	Not Used	White - Green\Slate
43,18	2	8	DLI Port 5	Not Used	White - Brown\White
44,19	2	9	DLI Port 6	Not Used	White - Brown\Slate
45,20	2	10	DLI Port 7	Not Used	White - Slate\White
46,21	3	1	DLI Port 8	Not Used	Yellow - Blue
47,22	3	2	DLI Port 9	Not Used	Yellow - Orange
48,23	3	3	DLI Port 10	Not Used	Yellow - Green
49,24	3	4	DLI Port 11	Not Used	Yellow - Brown
50,25	3	5	DLI Port 12	Not Used	Yellow - Slate

5.4   DETAILS OF THE RJ45 CONNECTIONS

Eight pins of the RJ-45 connector are assigned to connections of Single Line telephone interface ports on the Base board.

Pin No.	Circuits/ Functions	Remark
1 8	SLT Port 1	No polarity
2 7	SLT Port 2	No polarity
3 6	SLT Port 3	No polarity
4 5	SLT Port 4	No polarity
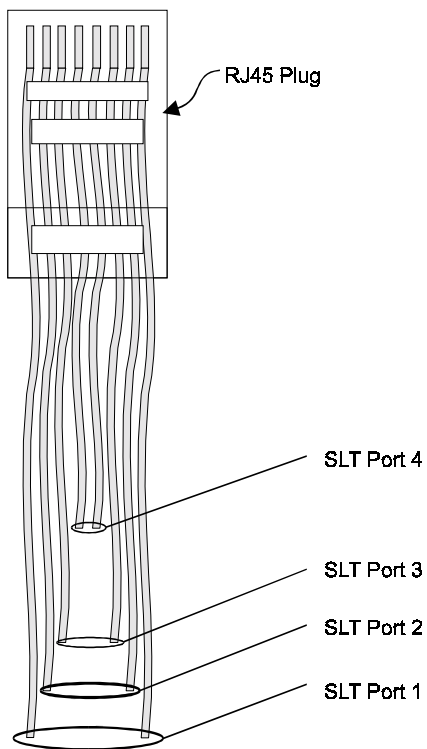
6   CONNECTING STATION AND OPTIONAL EQUIPMENT

The **DCS and Compact Installation Manual Chapter 9** provides connection information for the following:

- Keysets, Add On Modules, SLT's, Door Phone and Headsets,

In addition, general information is provided for:

- MOH, External Paging, Common Bell, Ring Over Page,

Information is also provided for:

- SMDR and PCMMC and Remote Programming.

The following provides additional information:

6.1   MUSIC ON HOLD

The DCS-24 system provides for one MOH source – either from the built-in melody chip (Internal) or an external music source, i.e. CD player or radio. Figure 2.5 indicates the position of the Internal/External switch. An external source is wired via the SDF – Krone Module 2, 3rd pair

6.2   EXTERNAL PAGING

The DCS-24 system is equipped with an interface for connection to customer-supplied paging equipment. The interface is designed to match 600 ohm and an impedance matching transformer may be required if the impedance of the paging equipment is not 600 ohm. Connection is via the Krone Module 2, Pair 2.

6.3   COMMON BELL

A customer-provided loud ringing device can be controlled by the general purpose dry contact of the DCS-24 system by means of relevant MMC. Note that the dry contact is rated 24VDC, 1 Ampere. The system requires MDF connection for the dry contact and the connection can be through the champ connector. See Figure 2-3 and refer to the section 2.5 (MDF Cabling).
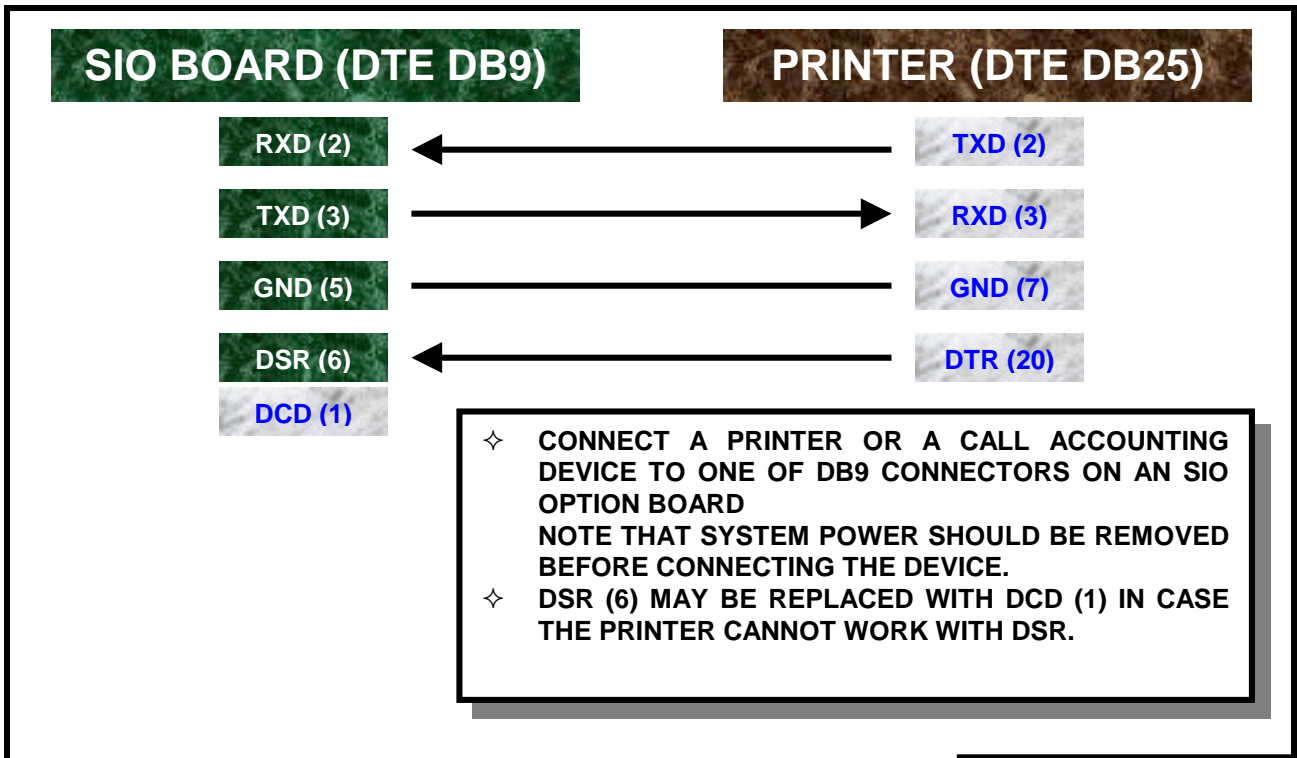
6.4   RING OVER PAGE

When a customer-provided paging system is installed, incoming calls can be assigned to Ring Over Page (ROP). By means of relevant MMC, program a line or lines to ring a hunt group and assign ROP as a destination in this hunt group. Ring over Page can be used for day or night operation or both. Refer to the programming manual.

6.5   STATION MESSAGE DETAIL RECORDING (SMDR)

(See Figure 6-1)

To receive an SMDR printout, connect a customer-provided printer to one of the serial interface connectors (DB9) on the SIM24 SIO option board (See Figure 3-2). **In order to prevent damage to the external device or the DCS24 system, before connecting the printer or the call accounting device, ensure that the system power is turned OFF. Any external battery if installed should also be removedl.**

SIO BOARD (DTE DB9)		PRINTER (DTE DB25)
RXD (2)	←	**TXD (2)**
TXD (3)	→	**RXD (3)**
GND (5)	→	**GND (7)**
DSR (6)	←	**DTR (20)**
DCD (1)		

> ✧ **CONNECT A PRINTER OR A CALL ACCOUNTING DEVICE TO ONE OF DB9 CONNECTORS ON AN SIO OPTION BOARD**
> **NOTE THAT SYSTEM POWER SHOULD BE REMOVED BEFORE CONNECTING THE DEVICE.**
> ✧ **DSR (6) MAY BE REPLACED WITH DCD (1) IN CASE THE PRINTER CANNOT WORK WITH DSR.**

PIN CONNECTIONS TO PRINTER   FIGURE 6-1

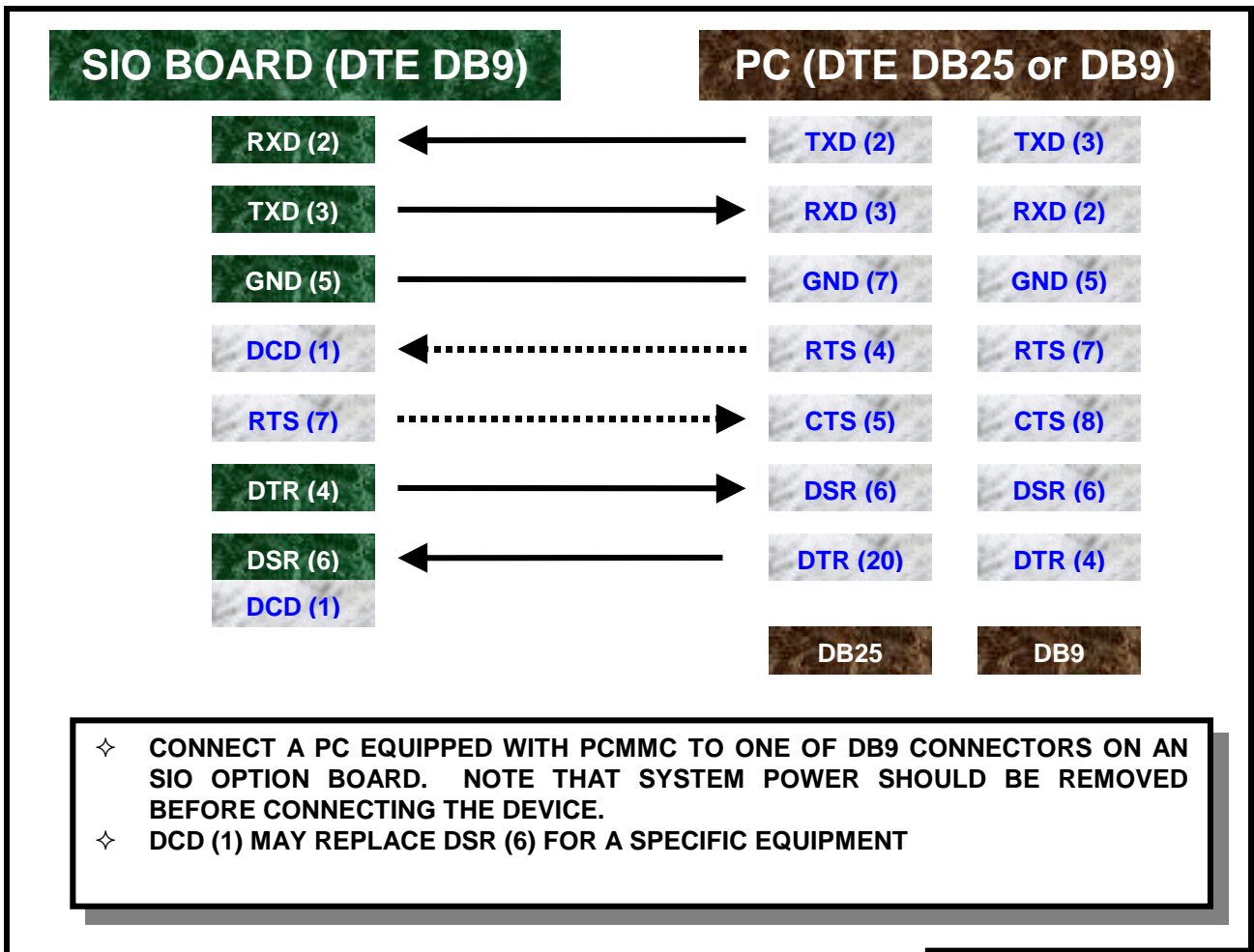Use a pin to pin RS232C cable. Only pins 2, 3, 5 and 6 are required. When the printer or optional call accounting device needs to be more than 5 meters away from the system, shielded computer cable is required. Connect a male DB9 connector to the SIO board and then connect a connector that meets the requirement of the printer or the call accounting device to the other end. The cable must not exceed 100 meters.

6.6   PC PROGRAMMING

(See Figure 6-2)

To program the system via a personal computer (PC), connect a PC equipped with the proprietary program, PCMMC to one of the serial interface connectors (DB9) on an SIO option board (See Figure 3-2). **In order to prevent damage to the PC or the DCS24 system, before connecting PC, ensure that the system power is turned OFF. Any external battery if installed should also be removed**.

SIO BOARD (DTE DB9)		PC (DTE DB25 or DB9)	
RXD (2)	←	TXD (2)	TXD (3)
TXD (3)	→	RXD (3)	RXD (2)
GND (5)	→	GND (7)	GND (5)
DCD (1)	◄····	RTS (4)	RTS (7)
RTS (7)	····►	CTS (5)	CTS (8)
DTR (4)	→	DSR (6)	DSR (6)
DSR (6)	←	DTR (20)	DTR (4)
DCD (1)			
		DB25	DB9

✧ **CONNECT A PC EQUIPPED WITH PCMMC TO ONE OF DB9 CONNECTORS ON AN SIO OPTION BOARD. NOTE THAT SYSTEM POWER SHOULD BE REMOVED BEFORE CONNECTING THE DEVICE.**
✧ **DCD (1) MAY REPLACE DSR (6) FOR A SPECIFIC EQUIPMENT**

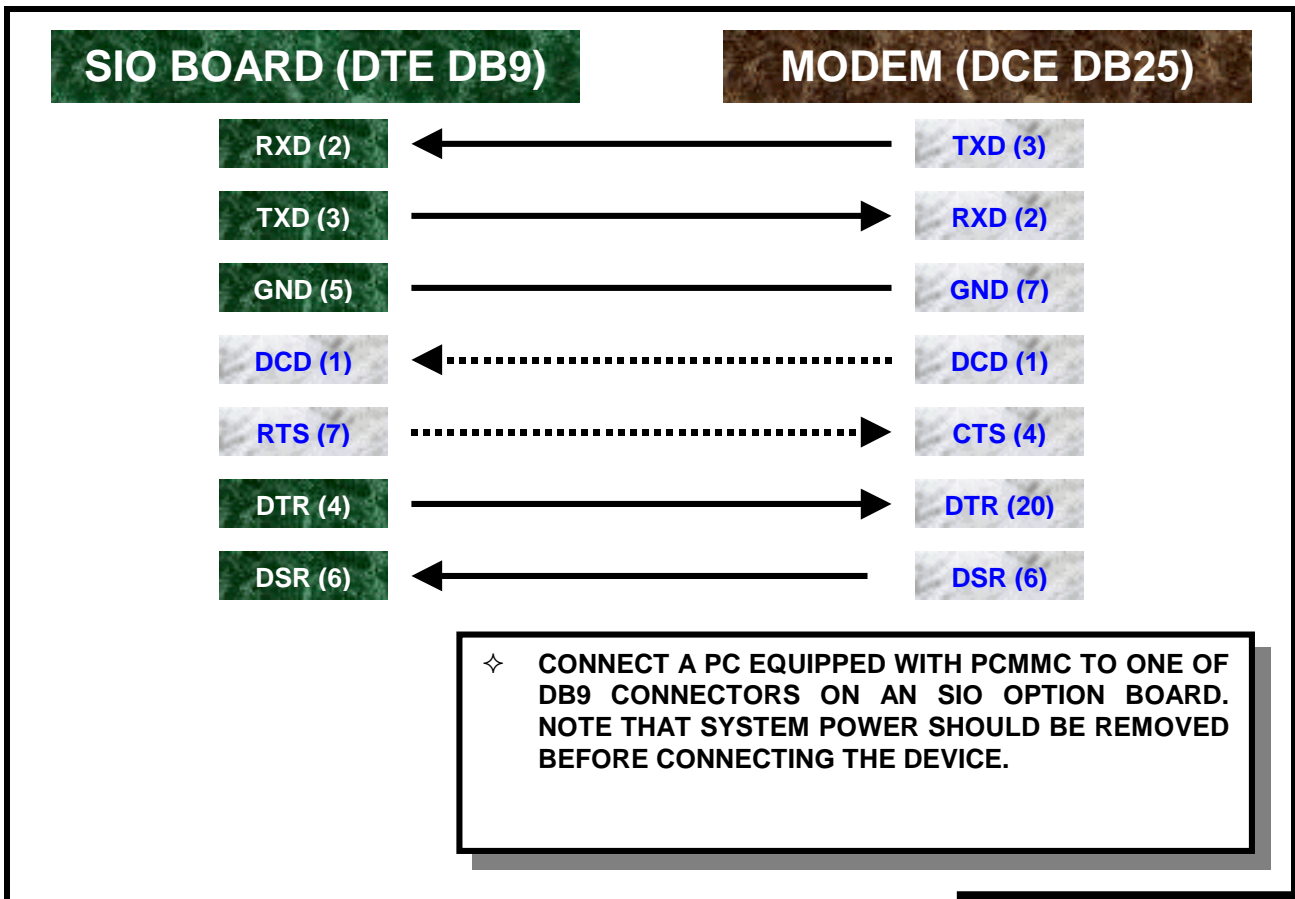## PIN CONNECTIONS TO PC   FIGURE 6-2

Use a pin to pin RS232C cable. Only pins 2, 3, 4, 5, and 6 are required. When the personal computer needs to be more than 5 meters away from the system, shielded computer cable is required. Connect a male DB9 connector to the SIO board and then connect a connector that meets the requirement of the personal computer to the other end. The cable must not exceed 100 meters.

The signal DCD (1) and RTS (7) are optional - the system does not refer to the signal status. For some equipment, the DSR (6) may not detect the DTR signal from the external device. In this case, connect the DTR signal wire to the DCD(pin 1) of the DCS-24 serial interface.

6.7   REMOTE PROGRAMMING

(See Figure 6-3)

To remotely program the system, connect a customer-provided modem to one of serial interface connectors (DB9) on an SIO option board (See Figure 3-1 and Figure 3-2). Before connecting the modem, be assured that the system power is turned OFF.). **In order to prevent damage to the modem or the DCS24 system, before connecting PC, ensure that the system power is turned OFF. Any external battery if installed should also be removed.**

SIO BOARD (DTE DB9)		MODEM (DCE DB25)
RXD (2)	←	TXD (3)
TXD (3)	→	RXD (2)
GND (5)	→	GND (7)
DCD (1)	← (dotted)	DCD (1)
RTS (7)	→ (dotted)	CTS (4)
DTR (4)	→	DTR (20)
DSR (6)	←	DSR (6)

✧   **CONNECT A PC EQUIPPED WITH PCMMC TO ONE OF DB9 CONNECTORS ON AN SIO OPTION BOARD. NOTE THAT SYSTEM POWER SHOULD BE REMOVED BEFORE CONNECTING THE DEVICE.**

PIN CONNECTIONS TO MODEM

FIGURE 6-3

Use a pin to pin RS232C cable. Only pins 2, 3, 4, 5, 6, 7 and 8 are required. When the modem needs to be more than 5 meters away from the system, shielded computer cable is required. Connect a male DB9 connector to the SIO board and then connect a connector that meets the requirement of the modem to the other end. The cable must not exceed 100 meters.

6.8   POWER FAILURE TRANSFER

When the system loses AC power and has no external battery, the two (2) analogue trunk lines on the Base board are automatically switched to the last two (2) stations.

1st Trunk line   to   Station 15 (SLT)
2nd Trunk line   to   Station 16 (SLT)

7   CHANGING SOFTWARE

(See Figure 7-1)

7.1   ACCESSING THE EPROM'S

The system software is contained on the motherboard. This procedure should be performed in the following sequence -

1.   Check that the battery switch on the motherboard is ON.

Note. If the documentation with the new software indicates that reprogramming will be necessary, the battery switch may be switched OFF at this stage to ensure the system is properly returned to default data.

2.   Switch off the KSU and remove plug of battery back-up cable. If used**. Do not unplug the KSU from the GPO**.

7.1.1   REPLACING THE EPROMS

1.   Remove the four EPROMs using a suitable IC extraction tool and set them aside in case they need to be re-installed.

2.   Remove the four new EPROMs from their protective packaging and check that the legs are straight and undamaged. Damaged EPROMs should be returned to the supplier and replaced with an undamaged firmware set

3.   Carefully insert the new EPROMs, commencing with the one closest the Power Supply (ODD2) into the designated sockets. The new EPROMs are labelled with EV-1, OD-1, EV-2 and OD-2. The EPROM positions are marked on the motherboard adjacent to each IC socket. Refer to Figure 7-1.

4.   Switch on the KSU and verify that the system is operating. If the KSU does not operate, remove the new EPROMs, re-install the old EPROMs and test again.

5.   When the system is operating correctly switch ON the battery switch on the motherboard and replace the cover.
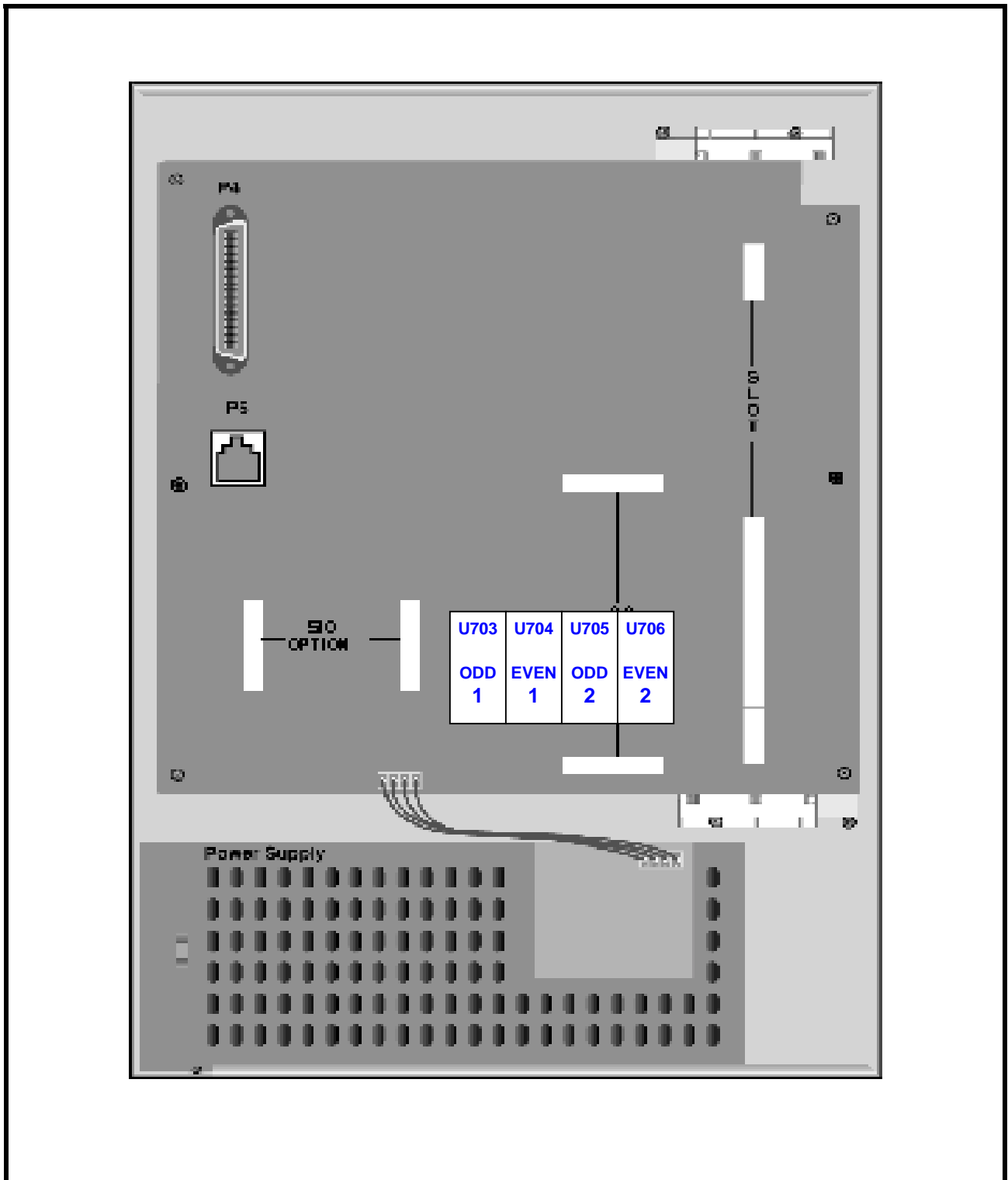
Figure 7-1 **Location of EPROM's**