SM 40
Surveillance Centre

Eng

Instructions for use

LBB 1360 & LBB1370

Philips
Communication &
Security Systems

PHILIPS

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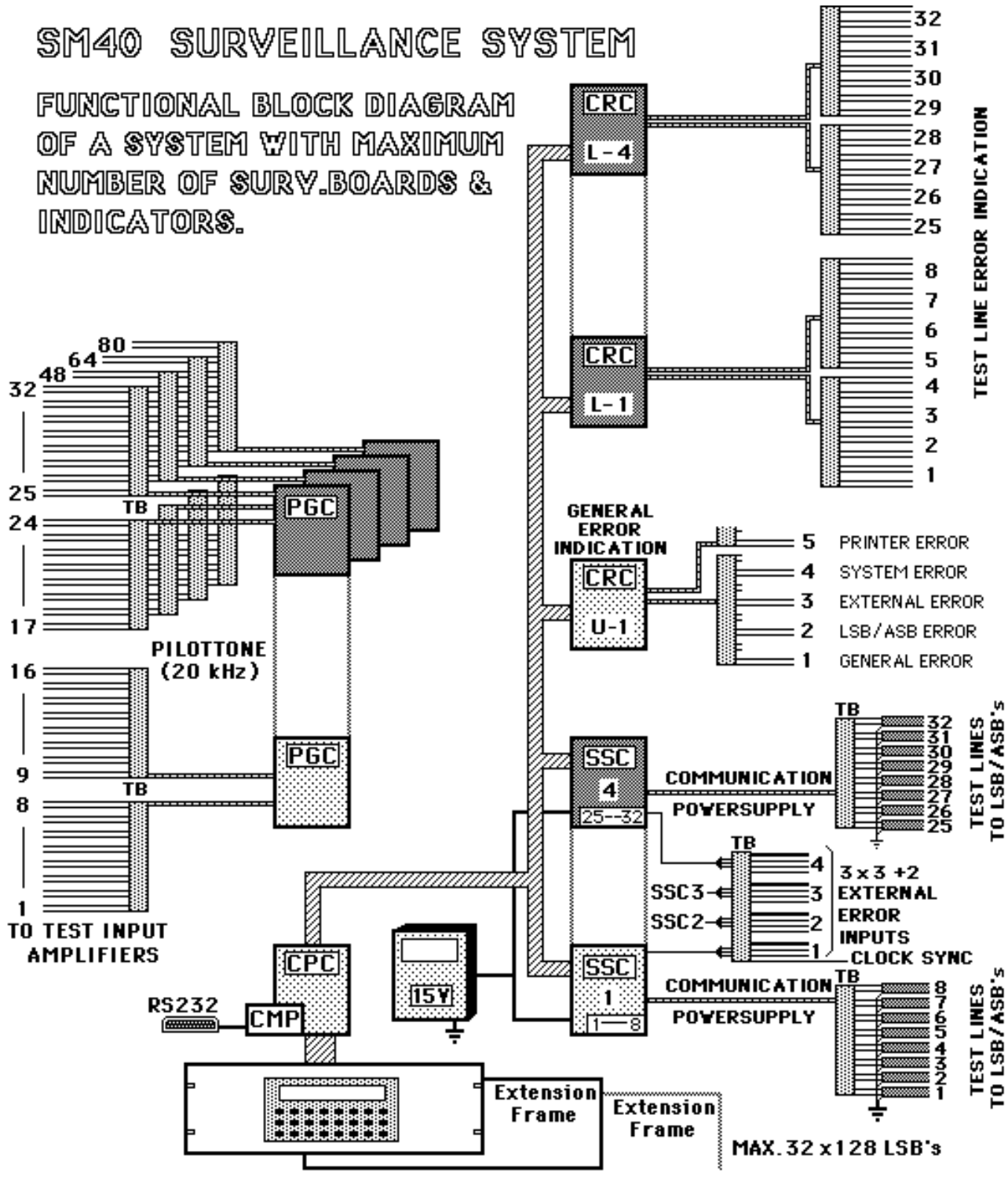
6. TECHNICAL DATA

1

SM40 SURVEILLANCE CENTRE (maximum system layout)



N.B.The number of Extension Frames depends on the required Termination Boards rather than on the number of Cards.

1 GENERAL INTRODUCTION

11 Introduction to the SM40 Surveillance Centre

In large public address distribution systems, which often play a key role in alarm and evacuation installations, it is vital that the correct functioning of the large number of amplifiers and loudspeakers used can be verified.

The SM40 Surveillance Centre is designed to monitor the status of amplifiers, loudspeakers, and cabling in large PA systems. Because it pinpoints any failures in the system, it saves a great deal of time, minimising repair costs as well as ensuring that the system is fully functional at the earliest possible moment.

On detection of a malfunction, error messages are generated automatically, giving the precise time and location of the fault. These messages can either be relayed to the system's LCD display, or sent to an external printer for a permanent hard-copy record of the malfunctions. The messages can also be linked to warning lamps, buzzers, or personal paging units, alerting security and maintenance personnel.
The possibility also exists to automatically switch in a spare amplifier in place of an amplifier which becomes faulty.

A pilot tone signal is generated which is inserted into the Test inputs of Philips SQ45 power amplifier range. The Surveillance Centre is able to scan for the presence of this signal in up to 4096 monitoring devices, located in strategic places (at amplifier outputs, loudspeaker cabling junction boxes, inside loudspeaker enclosures) throughout a PA distribution system. It can also receive 'internal error' information from an SM40 Routing System itself, as well as responding to external sensing devices such as smoke detectors and micro switches.

Being controlled by a microprocessor, the system is particularly flexible, specific functions being easily programmed and changed to allow for alterations in the PA system configuration and surveillance requirements.

Because the system is built around 19-inch rack mounted Euro Card circuit boards, expansion or alterations to the system are quickly and easily carried out.

A total Surveillance Centre would comprise:
- 19-inch rack unit, containing a microprocessor controlled SM40 Surveillance Centre
- 100V loudspeaker line, and low voltage loudspeaker, monitoring devices; external warning devices (lamps, buzzers, etc.)
- printer, or computer/printer combination.

All SM40 Surveillance Centre internal wiring is particularly installer friendly due to the 'Quick Fit' connectors used.

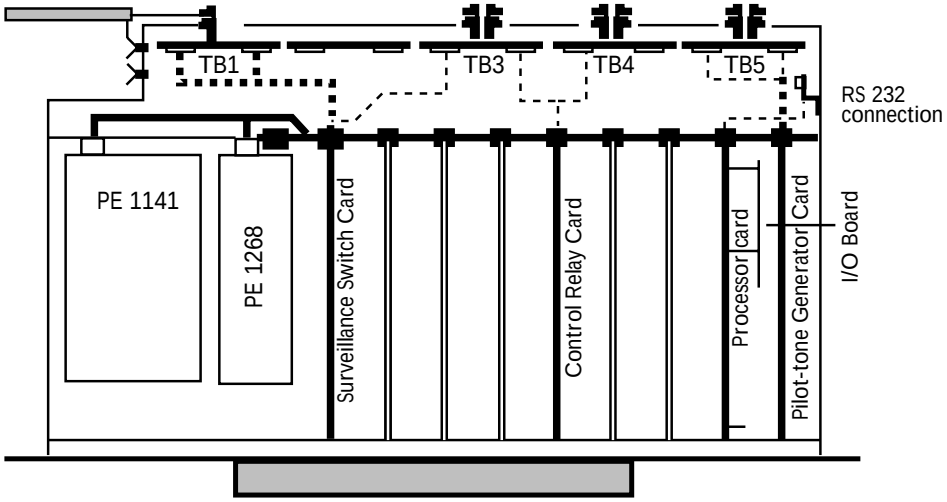
Standard twisted two core screened microphone cable is used to carry data and 15V power between the system and the interlinked Amplifier/Loudspeaker Surveillance Boards.

All SM40 Surveillance Centres are built around the LBB 1370 Basic (starter) System, which is able to sequentially scan 8 Test Lines, each containing up to 128 monitoring devices; receive error input from 2 external sources, activates several relay error sets and synchronises the real-time clock.

The single 19-inch rack frame, capable of holding 9 circuit cards, has enough room to accomodate the Basic System plus 5 extra cards. Adding these cards expands the system, enabling it to feed more amplifiers with the Pilot Test Tone; scan a greater quantity of Test Lines and/or receives a larger amount of error inputs from external devices. However the system is limited by the number of Termination Boards installed.

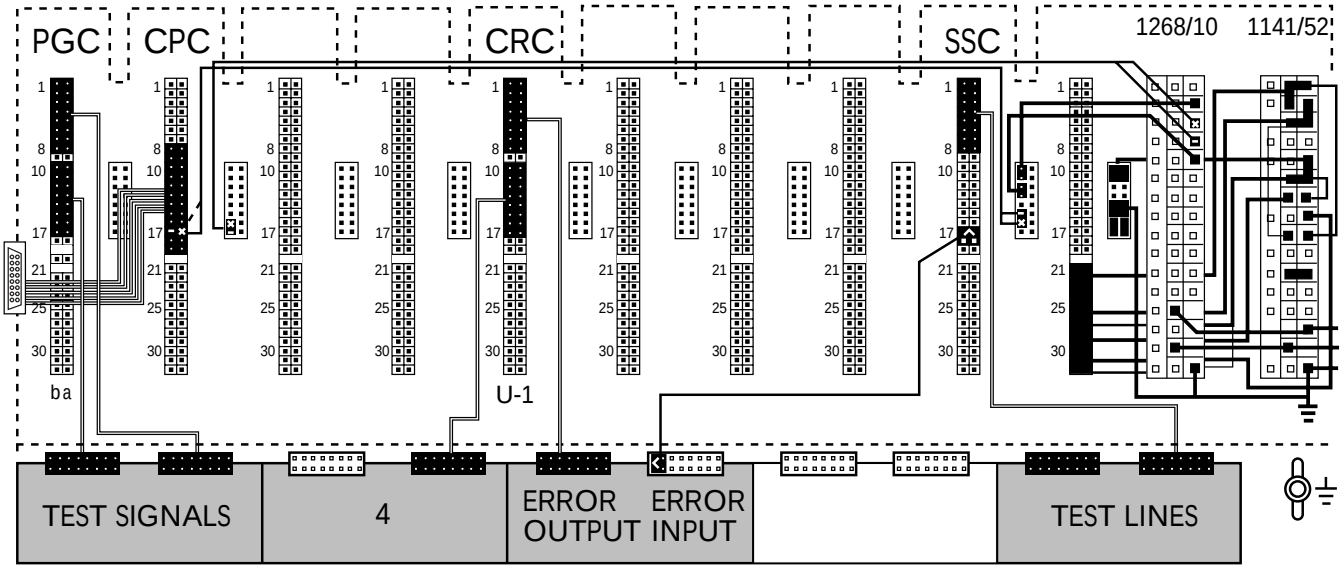
When a system's requirements exceed the space offered in a single rack frame, or extra termination boards are required the SM40 Extension Frame LBB 1360 is available. These frames can be linked together to expand the system.

SURVEILLANCE BASIC SYSTEM
LBB 1370



FRONT TOP VIEW

INTERCONNECTION BOARDS



TERMINATION BOARDS
(REAR VIEW)

2. UNPACKING AND INSTALLATION

2.1 SM40 Surveillance Centre - Unpacking and installation

In order to ensure that your SM40 Surveillance Centre functions properly, please follow these few simple instructions after unpacking your unit.

1 Carefully check the enclosed system components for physical damage caused during shipping. Any complaints should be made immediately to the shipping company.

2 Mount the Basic System frame in the appropriate position in the 19-inch rack unit (not higher than shoulder height, so that the display and keyboard can be clearly seen).

3 Extension Frames are available to expand the Basic System into a larger system. These should now be mounted, and wired according to the appropriate wiring diagrams.

4 Mount the amplifiers and auxiliary equipment in the rack(s).
If power amplifiers are mounted beneath SM40 frames, a heat shield should be installed above them to deflect hot air currents.

5 Taking care to avoid earth (ground) loops, wire the mains power to the units. The SM40 Surveillance Centre will operate successfully on mains voltages from 175 V to 264 V when tapped for 220 V, and from 90 V to 140 V when tapped for 110 V. Be sure to check that your system is wired for the correct mains voltage.

Caution: When tapping the system for the correct mains voltage, refer to the documentation supplied with the SM40 system.

NOTE: Because it is possible to touch the mains voltage terminals when the frame back panels are opened, it is advisable not to turn the power on at this stage.

6 Open the back panel of the Basic system, and check that all of the connectors on the Interconnection Board and Termination boards are firmly in place. If, in the unlikely event that one of the connectors has become disconnected, refer to the enclosed basic system wiring diagram.

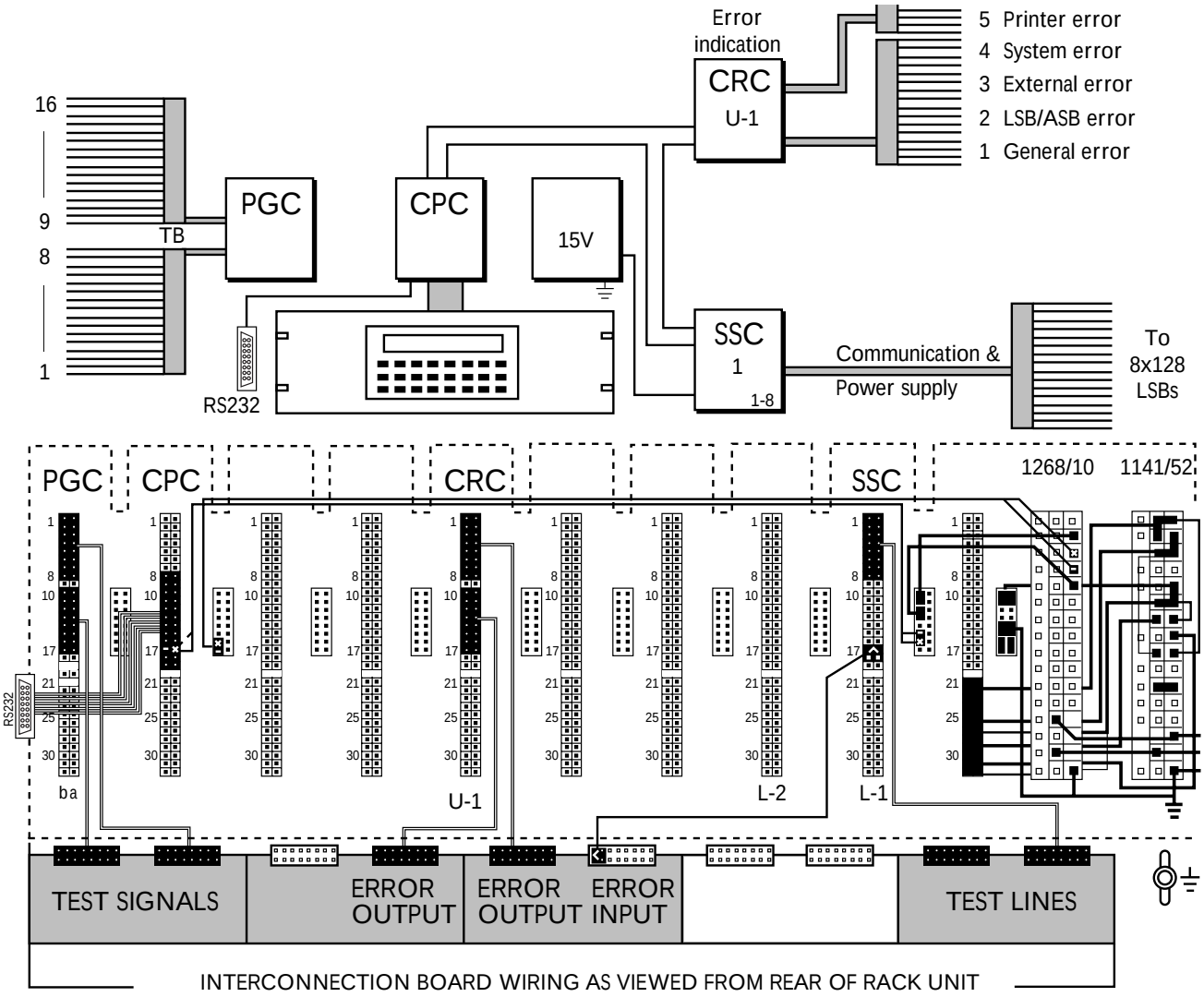
7 Refering to Termination Board illustrations in chapter 10, wire the Test Lines, Amplifier Test Inputs, and Error Inputs/Outputs, to the screwblock connectors. If a printer or computer is to be used with the system, it should be wired to the RS232 serial interface socket at this time

8 Plug the screwblock connectors into the termination boards, ensuring that they are in the correct locations.

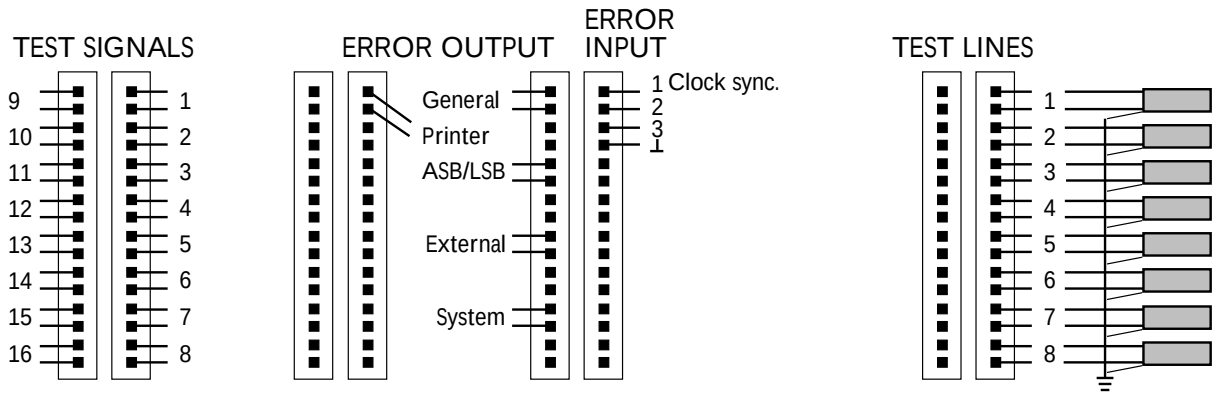
9 Open the front panel of the rack frame and gently push each of the circuit cards to make sure that they are all firmly connected to the Interconnection Board.

10 If, after double checking that all of the mains power and signal wiring is correct, and that the system is adequately earthed, switch on the mains power to the rack.

SURVEILLANCE BASIC SYSTEM
LBB 1370



INTERCONNECTION BOARD WIRING AS VIEWED FROM REAR OF RACK UNIT



TERMINATION BOARD WIRING AS VIEWED FROM REAR OF RACK UNIT

3. SM 40 SURVEILLANCE BASIC SYSTEM

3.1 SM40 Surveillance Basic System LBB 1370

Self contained, fully operational system, around which all SM40 Surveillance Centres are built. Comprises 4 circuit cards, mounted in a single 19-inch rack frame.

The Surveillance Basic (starter) System is the heart of the SM40 Surveillance Centre. When supplemented with a variety of Euro-cards and PCB's, a wide range of system configurations are possible, and many different application needs are succesfully met.

Containing, in its single rack frame, the Display and Keyboard, and the Central Processor Card (CPC); (along with its other circuit cards) the Basic System is a self contained, fully working unit in its own right.

Being supplied with one Surveillance Switch Card (SSC) the system is able to sequentially scan 8 seperate test lines, each having upto 128 Amplifier Surveillance Boards (ASB's) and/or Loudspeaker Surveillance Boards (LSB's) connected.
The +15V required to power each test line in turn is provided by the in-built PE 1268/10 power supply.unit.

The Basic System is also able to display error information generated by 2 external sources and clock synchronisation using a single contact.

The communication PCB can send information generated by the CPC, via its RS232 port, to a printer or a computer for the production of detailed hard copy of all monitored errors. The control relay card may be used to activate external warning devices (lamps, buzzers, etc.) when an error occurs.

When a centre's requirement exceed the facilities available in the Surveillance Basic System, further circuit cards (plus the extension frames LBB 1360 necessary to accomodate them) are ordered, expanding the system to meet specific application needs.

Because the Surveillance Basic system is supplied fully wired, adjusted, tested, and mounted in its own 19-inch rack unit, ready for use, it is an ideal model from which to build a larger system.

Units included with Basic System LBB 1370:

1x	Single 19-inch Rack Frame	
1x	Power Supply +15V/-15V/+5V	PE 1141/52
1x	Power Supply +15V	PE 1268/10
1x IB	Interconnection Board	
4x TB	Termination Boards	LBB 1377/00
1x CPC	Central Processor Card + I/0 + Surveillance System Software	
1x CRC	Control Relay Card	LBB 1356/00
1x SSC	Surveillance Switch Card	LBB 1374/00
1x PGC	Pilot Tone Generator Card	LBB 1369/00

Optional Euro-Cards:

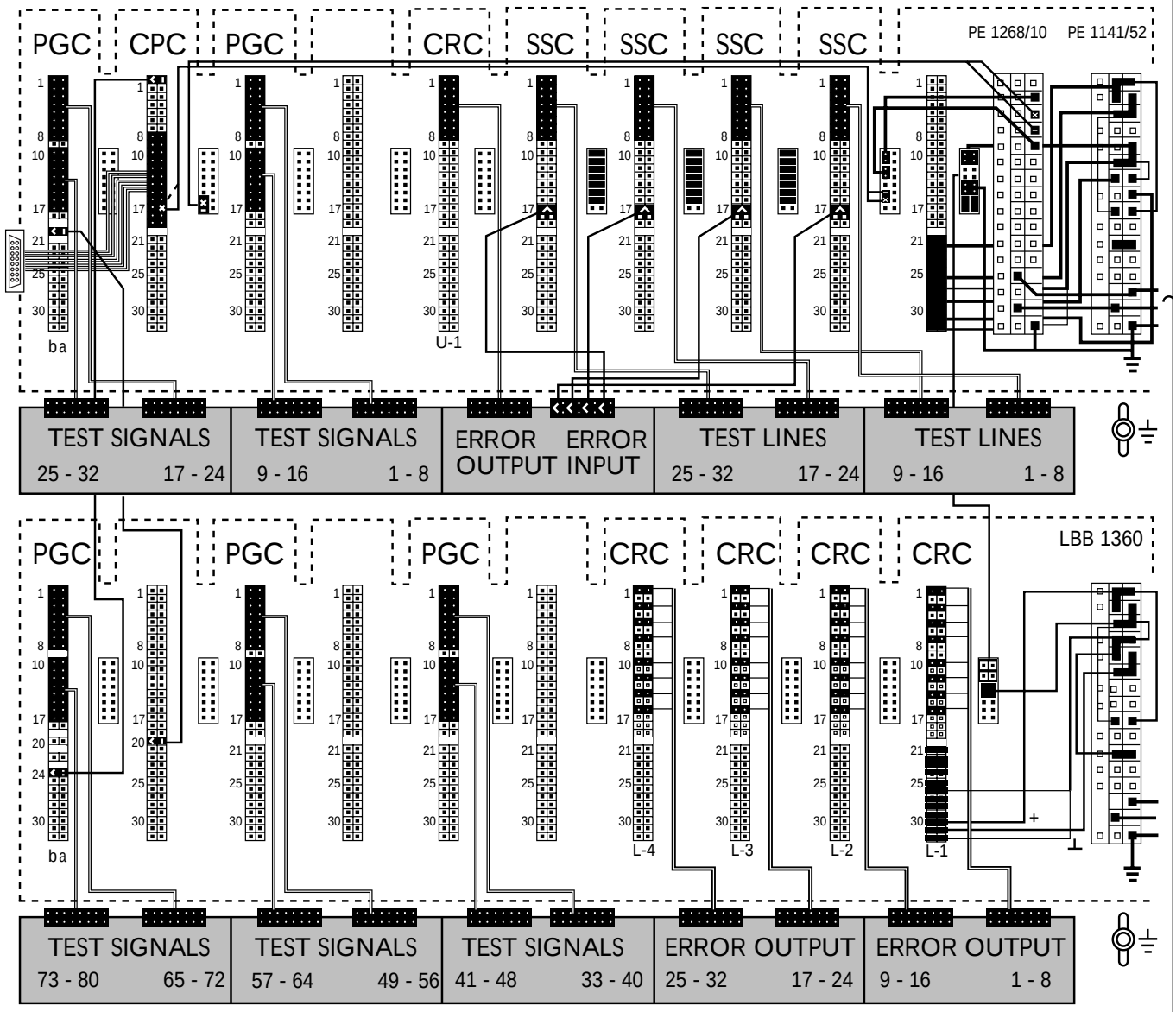
CRC	Control Relay Card	LBB 1356
SSC	Surveillance Switch Card	LBB 1374
PGC	Pilot Tone Generator Card	LBB 1369
TB	Termination Board	LBB 1377

Optional PCB's:

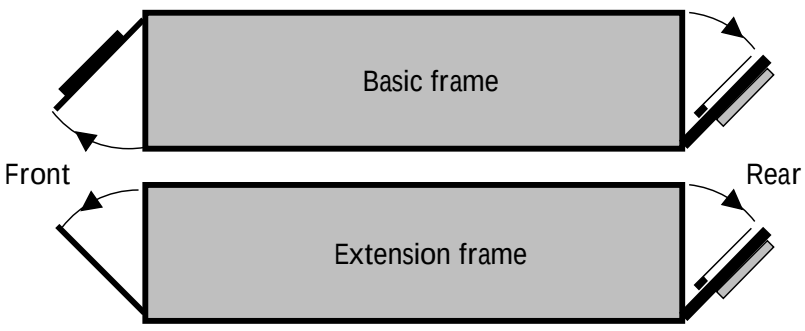
Loudspeaker Surveillance Board	LBB 1367
Amplifier Surveillance Board	LBB 1368

SURVEILLANCE BASIC SYSTEM LBB 1370
Plus 1 EXTENSION FRAME LBB 1360

INTERCONNECTION BOARD WIRING AS VIEWED FROM REAR OF RACK UNIT



SIDE VIEW FRAMES



3.2 Extension Frame LBB 1360

Single 19-inch rack frame, capable of holding 10 SM40 circuit cards. Complete with power supply, and one Interconnection and Termination Board.

A single rack frame, capable of holding, and interconnecting 10 SM40 circuit cards, has enough room to accomodate the Basic (starter) System, described elsewhere, plus additional Pilot-tone generator cards, Control Relay Cards and Surveillance Switch Cards.

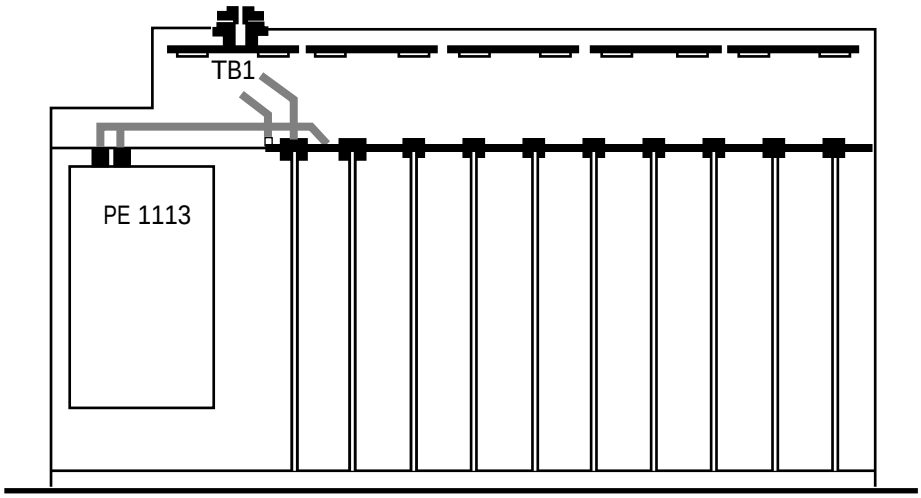
When the number of terminations boards required in an SM40 system exceeds the amount of space offered in this single rack frame, Extension Frame LBB 1360, is available.

Units included with Extension Frame LBB 1360:

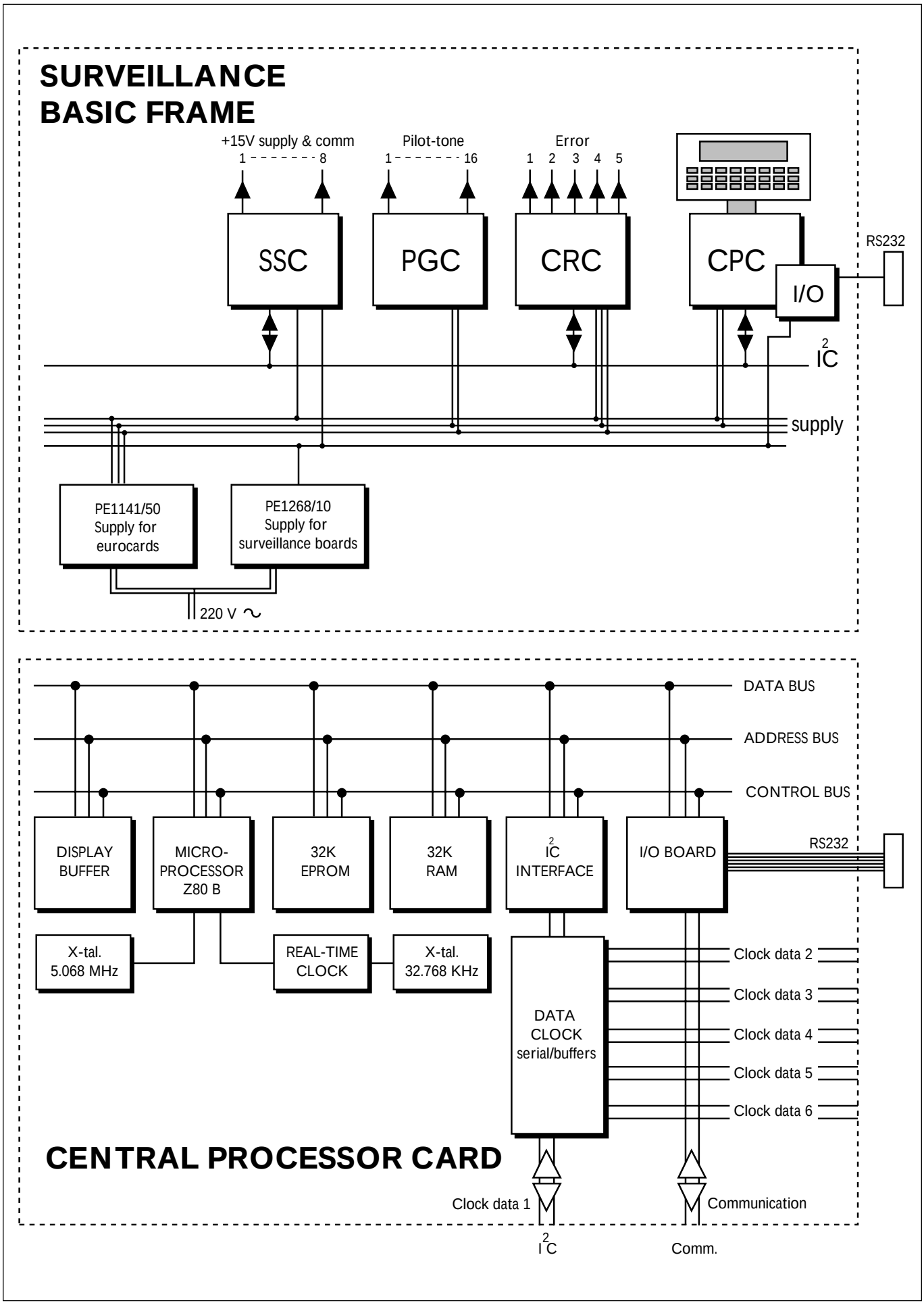
1x	Single 19-inch rack frame	
1x	Power Supply Unit +15V/ -15V	PE1113/50
1x IB	Interconnection Boards	
1x TB	Termination Boards	LBB 1377/00

These components, mounted in the 19-inch rack frame, are supplied tested, and wired to accept and power up to 10 SM40 circuit cards.

SM40 EXTENSION FRAME
LBB 1360



FRONT TOP VIEW


SURVEILLANCE
BASIC FRAME
+15V supply & comm
1 - - - - - - - 8
Pilot-tone
1 - - - - - - - 16
Error
1 2 3 4 5
SSC
PGC
CRC
CPC
I/O
RS232
I2C
supply
PE1141/50
Supply for
eurocards
PE1268/10
Supply for
surveillance boards
220 V ~
DATA BUS
ADDRESS BUS
CONTROL BUS
DISPLAY
BUFFER
MICRO-
PROCESSOR
Z80 B
32K
EPROM
32K
RAM
I2C
INTERFACE
I/O BOARD
RS232
X-tal.
5.068 MHz
REAL-TIME
CLOCK
X-tal.
32.768 KHz
DATA
CLOCK
serial/buffers
Clock data 2
Clock data 3
Clock data 4
Clock data 5
Clock data 6
CENTRAL PROCESSOR CARD
Clock data 1
Communication
I2C
Comm.

4. OPERATING AND PROGRAMMING THE SM40 SURVEILLANCE CENTRE

4.1 Central Processor Card - CPC

Eurocard 10 x 22 cm with an 'a b' connector (2 x 32). A microprocessor which can scan over 4000 monitoring devices, and activate more than 100 relays, via the communication line.

At the heart of the SM40 Surveillance Centre is the Central Processor Card (CPC). Capable of sequentially scanning 4096 monitoring devices; activating 64 SSC solid state relays, and 40 CRC relay sets; and sending error information to a display, external computer, or printer; this is a powerful piece of equipment. It provides a system of this type with a great amount of possibilities.

A Display & Keyboard mounted in the rack unit's front panel, is used to display the scanning status and any detected errors, and also to carry out the user programming.
When programming is complete the CPC returns to its normal scanning mode and, until a secret password is entered, the keyboard has no influence on the processor.

The basic functions of the Central Processor Card are as follows:

SCANNING of Amplifier Surveillance Boards (ASB's) and/or Loudspeaker Surveillance Boards (LSB's). This is done by sequentially sending 15V power to each of the 8 Test Lines of the Surveillance Switch Cards (SSC's) in turn, then sending communications data to each board in each line sequentially.

Translating the error data received from the ASB's and LSB's, along with external sensing devices, and relaying this information to the display, or via the RS232 port, to a printer or external computer.

ACTIVATING of relays, to switch on external warning devices (lamps, buzzers, paging units, etc.) via Control Relay Cards (CRC's).

CHECKING of system hardware. The processor acts as a "watchdog", continuously patrolling the SM40 Surveillance Centre hardware to check for errors, malfunctions or disconnections. If a problem exists, information, stating which card is faulty, is relayed to the display or printer.

An automatic restore function is also incorporated, so that when an internal error occurs, the system will not hang-up, and when an error is rectified no manual system reset is required.

REAL TIME CLOCK is built into the unit, and (in the program's 'Enable Print' mode) is displayed on the LCD, giving date, hours and minutes. When an error occurs, the current time and date are transmitted to the printer. Synchronisation is via A17 on Surveillance Switch Cards No.1.

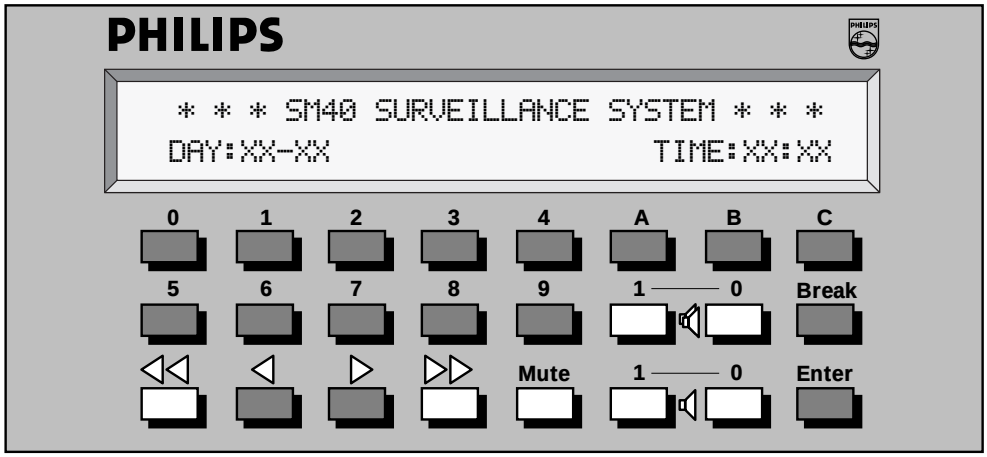
SERIAL INTERFACE. The standard RS232 serial interface connector mounted on a bracket on the frame, and wired to the CPC, allows the system to communicate with a wide variety of personal, mini, and main-frame computers as well as direct to serial printers.
The communication has 8 data bits, and the baud-rate is selectable between 300, 1200, 2400, 4800 and 9600 baud.
This, and the other I/O port parameters, such as number of Stop Bits, and Parity can be set in the installer programming menu.

SM40's standard default parameters are:
2400 baud, 8 data bits, 1 stop bit, even parity.

A yellow LED, mounted on the front edge of the card indicates that the CPC is in communication with the rest of the SM40 Surveillance Centre, and 1 green LED indicates that adequate supply voltage is present.

The CPC has additional driver stages for the communication lines of 5 of the Extension Frames used to expand the Surveillance Basic System.

DISPLAY & KEYBOARD



Grey shaded keys are functional in the programming mode. i.e

USER MENU, INSTALLER MENU & SERVICE MENU

DISPLAY READOUTS AFTER ENTERING 'USER-MENU' PASSWORD (9, 6, ENTER)

```
>WELCOME TO SURVEILLANCE PROGRAMMING<
>> VERSION 1.21     DATE: XX-XX-XX <<
```

```
*USER MENU*           Scroll with 'ENTER'
PRESS '1' TO SELECT ERROR PRINTING
```

1 ------→

```
DIPSLAY OF ERRORS ON PRINTER
PRESS '0' TO DISABLE; '1' TO ENABLE: _
```

```
*USER MENU*           Scroll with 'ENTER'
PRESS '2' TO PRINT CURRENT ERRORS
```

2 ------→

```
*USER MENU*           Scroll with 'ENTER'
PRINTER NOT READY; PLEASE CHECK
```

```
*USER MENU*           Scroll with 'ENTER'
PRESS '3' TO SET REAL-TIME CLOCK
```

3 ------→

```
ENTER       DD-MM-HH:MM
            XX-XX XX:XX
```

```
ENTER LAST 2 DIGITS OF CURRENT YEAR: XX
```

4.2 Display and Keyboard

A programming tool, containing a keyboard for user key assignment and a display which shows the sequence of programming. Mounted in the front panel of the rack unit.

Users of the SM40 Surveillance Centre are able to program and make changes to the functions of their system, quickly and easily, with the aid of the Display And Keyboard. This is a simple programming tool comprising a 24 key keyboard and a 2x40 character lcd display which shows the sequence of programming.

SM40 KEY FUNCTIONS

0-9 Numeric keys to type-in password; select programs and functions; and to insert the time and date in the User Programming menu.

▷ Moves the cursor 1 position to the right when setting the real-time clock in the User Programming menu.

◁ Moves the cursor 1 position to the left when setting the real-time clock in the User Programming menu.

▷▷ Non-functional

◁◁ Non-functional

1 Non-functional

0 Non-functional

1 Non-functional

0 Non-functional

Mute Non-functional

A Non-functional

B Non-functional

C Non-functional

Break In most cases this key will abort a command and return the user to the main menu for the next programming sequence without any new information being stored. When in the main menu, pressing will return the system to the normal scan mode.

Enter Enters numerical inputs into the memory and moves to the next program stage, or at the end of a program sequence; to the main menu ready for the next program.

When programming is completed, the system returns to its normal scanning mode and, until the correct password is entered, the keyboard has no influence on the processor, thus guarding the system from unauthorized tampering.

The unit is mounted in the rack units' front panel, which may be flipped up, locking automatically in a horizontal position. This is an ideal angle from which to view and operate the unit.

4. OPERATING AND PROGRAMMING THE SM40 SURVEILLANCE CENTRE

4.2.1 Display readout

During the remainder of this chapter, specific contexts (status) and user actions are shown in the left column, and possible display results are shown in the right column. Characters between quotes (e.g. 'Key') denote keyboard inputs, and occurrances of XX and YY in any displays shown in the right column denote information which is dependant on the system configuration, or entered by the user.

When the SM40 system is powered up, either one of the following two displays is shown:

Status / Action	Result / Remarks
When memory was cleared the display shows:	`* * * SYSTEM MUST BE PROGRAMMED * * *` `* * *  GO TO INSTALLER MENU  * * *`
When the system was installed previously, the display shows: This message will disappear after 2-seconds, and the system will start scanning.	`* * * SM40 SURVEILLANCE SYSTEM * * *` `DATE:XX-XX  TIME:XX:XX`
When scanning and error printing are enabled (refer to User Programming Menu) the display shows: The second display line is used to display the current date and time.	`SCANNING ZONE: XX UNIT XX` `DATE: XX-XX  TIME: XX:XX`
When scanning and error printing are disabled (refer to User Programming Menu) the display shows: The second display line is used to display errors. Errors are indicated one by one in a continuous cycle.	`SCANNING ZONE: XX UNIT: XXX`
Loudspeaker/amplifier errors are displayed as follows:	`SCANNING ZONE: XX UNIT: XXX` `ERROR IN ZONE: XX UNIT: XXX`
External errors are displayed as follows:	`SCANNING ZONE: XX UNIT: XXX` `<ERROR> EXTERNAL INPUT: XX`
System errors are displayed as follows:	`SCANNING ZONE: XX UNIT: XXX` `<ERROR> SWITCH CARD: XX`
	`SCANNING ZONE: XX UNIT: XXX` `<ERROR> RELAY CARD: I-XX`
	`SCANNING ZONE: XX UNIT: XXX` `<ERROR> RELAY CARD: II-XX`

The printer produces a listing of errors as follows:

```
<ERROR> DATE:XX-XX TIME:XX:XX ZONE:XX UNIT:XXX
<ERROR> DATE:XX-XX TIME:XX:XX ZONE:XX UNIT:XXX
<ERROR> DATE:XX-XX TIME:XX:XX ZONE:XX UNIT:XXX
<ERROR> DATE:XX-XX TIME:XX:XX ZONE:XX UNIT:XXX
<ERROR> DATE:XX-XX TIME:XX:XX ZONE:XX UNIT:XXX
```

If the <ERROR> is rectified the same message is sent to the printer followed by: 'RECOVERED'.

ERROR INDICATION

Errors are communicated to external indication devices (i.e warning lamps, alarm buzzers, etc..) via relay cards.

Relay cards I, 1,2,3 and 4 indicate errors in zones 1 to 32
Relay cards II, 1, indicates general error indication with the following indications:

Relay 1 is activated when any error occurs.
Relay 2 is activated when a loudspeaker/amplifier error occurs.
Relay 3 is activated when an external error occurs.
Relay 4 is activated when a system error occurs.
Relay 5 is activated when a printer error occurs.

4. OPERATING AND PROGRAMMING THE SM40 SURVEILLANCE CENTRE

4.3 SM40 USER PROGRAMMING

Specific contexts (status) and user actions are shown in the left column, and possible display results are shown in the right column. Characters between quotes (e.g. 'Key') denote keyboard inputs, and occurrances of XX and YY in any displays shown in the right column denote information which is dependant on the system configuration, or entered by the user.

Unless stated otherwise, 'Enter' stores typed information in the memory. 'Break' aborts a command without storing new information.

4.3.1 SM40 SURVEILLANCE USER PROGRAMMING

Status / Action	Result / Remarks

When the system is 'powered up', one of the next two displays is shown:
The first display shows when the memory has been cleared. The system is inoperative until installed (via the Installer menu).
The second display shows when the system is installed.
	`* * * SYSTEM MUST BE PROGRAMMED * * *`
	`* * * GO TO INSTALLER MENU * * *`
	
	`* * * SM40 SURVEILLANCE SYSTEM * * *`
	`DATE:XX-XX TIME:XX:XX`

To enter the user programming mode, press keys '9', '6', followed by the 'Enter' key. The display shows:	`> WELCOME TO SURVEILLANCE PROGRAMMING <` `>> VERSION X.X DATE XX-XX-XX <<`
	The 'welcome' display shows the current software version and its release date. After three seconds this message is cleared and the first programming mode is displayed. The first programming mode is displayed as follows:
	`*USER MENU* Scroll with 'ENTER'` `PRESS '1' TO SELECT ERROR PRINTING`
Display after pressing '1'.	`DISPLAY OF ERRORS ON PRINTER` `PRESS '0' TO DISABLE; '1' TO ENABLE`
	The current selection will be displayed. Selecting '0' will show all errors displayed on the lower line. Selecting '1' will send all errors to the printer, with the lower line showing the current date and time
Display after selection:	`*USER MENU* Scroll with 'ENTER'` `PRESS '2' TO PRINT CURRENT ERRORS`
	Pressing '2' will produce a printout of loudspeaker, external, and system errors (regardless of the settings in user menu '1' shown above). The header will show the date and time.
	This function is useful for incidental printing, when no permanent printer is connected. If the printer is not powered, off-line, or the serial board parameters are not correctly programmed (via the installer program), the display will show (see next page):

Status / Action	Result / Remarks

(Continued from previous page...)

```
PRINTER NOT READY; PLEASE CHECK
```

Printing will begin when the printer problem has been solved.

Pressing 'Break' will return the system back to display the Main Menu. The display will show:

```
*USER MENU*          Scroll with 'ENTER'
PRESS '3' TO SET REAL TIME CLOCK
```

Display after pressing '3'.

```
ENTER          DD-MM HH:MM
               XX-XX XX:XX
```

The clock can be set by either entering the complete time or by shifting the cursor to the digit that must be altered using the single arrow keys ◁ and ▷.

After pressing 'Enter' the display shows:

```
ENTER LAST 2 DIGITS OF CURRENT YEAR: XX
```

After entering the 2 digits and after pressing 'Enter' the display shows:

```
*USER MENU*          Scroll with 'ENTER'
PRESS 'BREAK' TO EXIT PROGRAMMING
```

After pressing 'Break' the system will return to its normal scanning mode.

USER PROGRAMMING IS NOW COMPLETE.

4.3.2 SM40 SURVEILLANCE INSTALLER PROGRAMMING MENU

Status / Action	Result / Remarks

To enter the INSTALLER programming mode, press keys '8', '1', followed by the 'Enter' key. Ther display shows:

```
> WELCOME TO SURVEILLANCE PROGRAMMING <
>> VERSION X:XX        DATE DD-MM-YY <<
```

The 'welcome' display shows the current software version and its release date. After three seconds this message is cleared and the first programming mode is displayed.

Programs 1, 2 and 3 are identical to that of the User Programming. In the 'installer mode' the first display is as follows:

Display if system is installed:

```
*INSTALL MENU*       Scroll with 'ENTER'
PRESS '4' TO STORE SYSTEM HARDWARE
```

To enable the system to operate correctly, the current hardware configuration must be stored. This is done by pressing key '4'.

Display after pressing '4'.

```
*INSTALL MENU*       Scroll with 'ENTER'
STORING HARDWARE CONFIGURATION
```

The display is only shown during storing, then continues as follows:

```
*INSTALL MENU*       Scroll with 'ENTER'
PRESS '5' TO DISPLAY SYSTEM SETUP
```

After pressing '5' the display shows:

```
SWITCH CARDS: XX XX XX XX
```

Display after pressing 'Enter'.

```
RELAY CARDS I: XX XX XX XX
           II: XX XX XX XX
```

Display after pressing 'Enter'.

```
I/O BOARD MOUNTED: YES
```

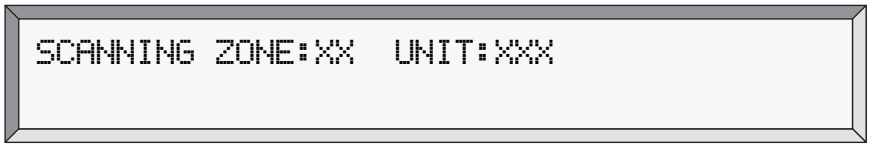
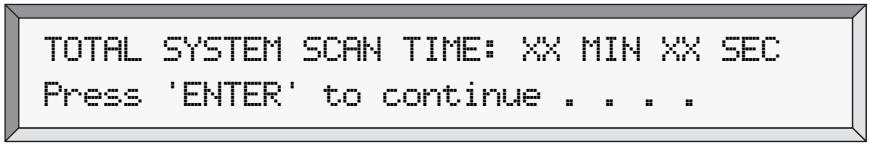
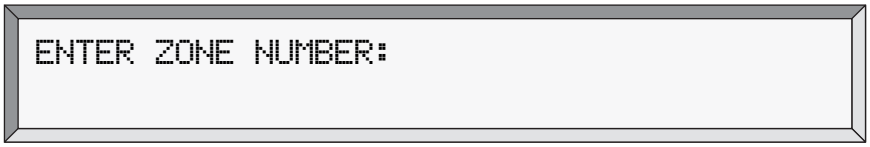
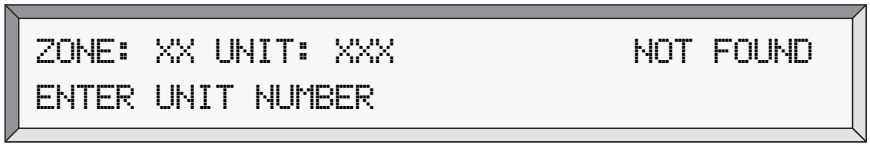
Display after pressing 'Enter'.

```
*INSTALL MENU*       Scroll with 'ENTER'
PRESS '6' FOR AUTO-STORE OF ALL UNITS
```

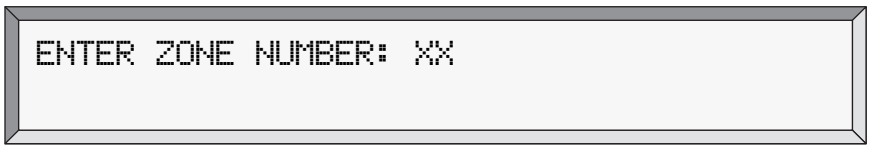
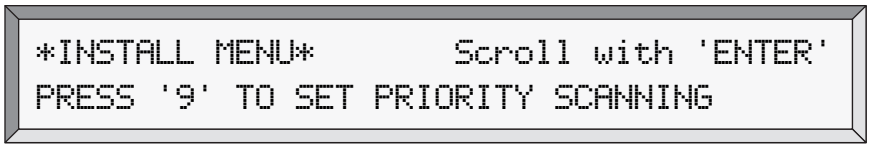
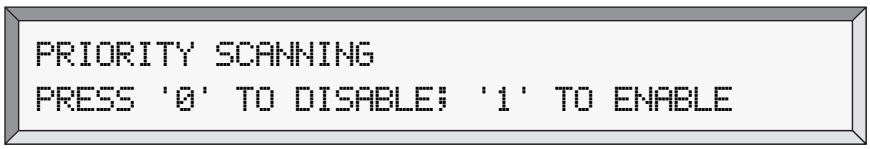
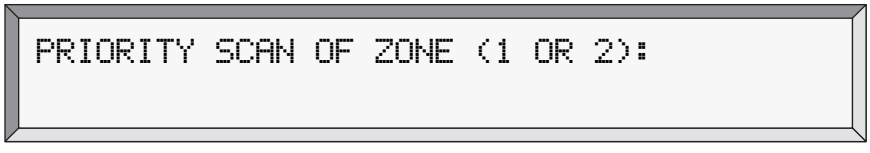
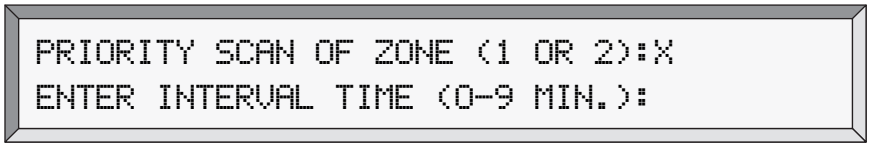
This program stores all the loudspeaker/amplifier surveillance boards which are present in the system's memory. However a zone will only be scanned if:

- The corresponding surveillance switch card is present.
- The unit with adddress '1' is connected to that zone and recognised.

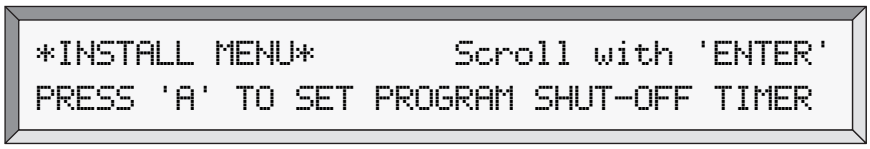
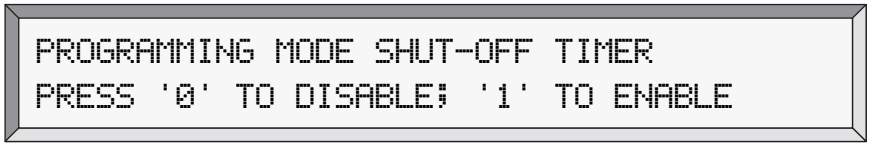
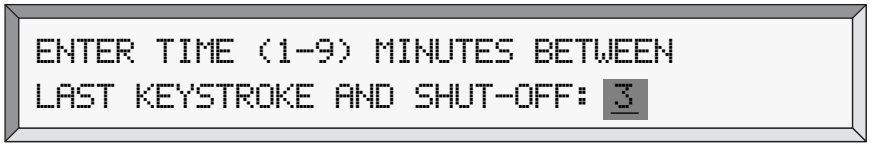
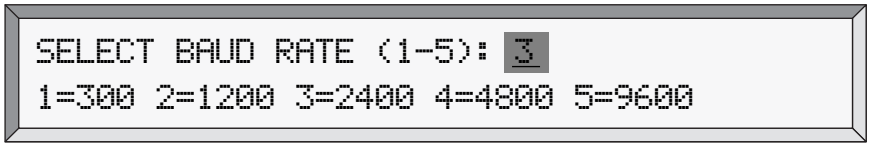
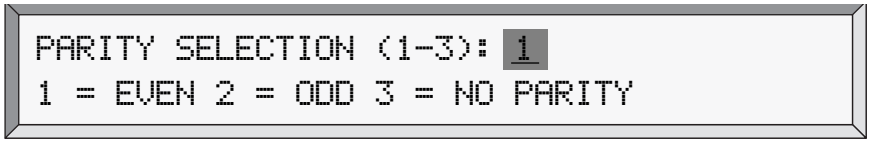
SM40 SURVEILLANCE INSTALLER PROGRAMMING MENU

Status / Action	Result / Remarks
After pressing '6' the display shows:	
	All the relevant zones will be scanned and the units present will be stored in memory.
When ready the display will show:	
	This is the time interval between two scans of the same unit. This information is relevant for 'priority scanning" programming.
Display after pressing 'Enter':	
	This program is used to manually add or delete surveillance units.
Display after pressing '7':	
Display after input of zone number (1-32) and after pressing 'Enter'.	
Display after input of zone number (1-128) and after pressing 'Enter'.	
Display after pressing '0', if the selected unit was present.	
Display after pressing '1', if the selected unit was present.	
Display if the selected unit was NOT present.	
	At this stage in the programming a new unit number may be entered, and the proces repeated. Pressing 'Break' will return to 'ENTER ZONE NUMBER'. Pressing 'Break' again will return to the main menu.

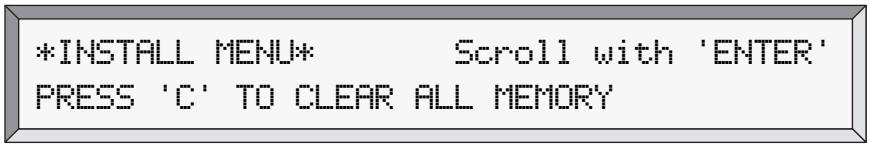
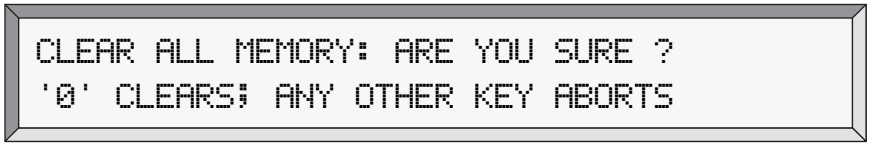
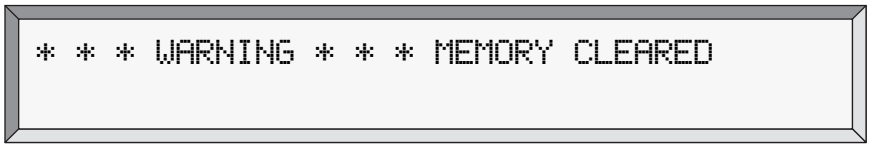
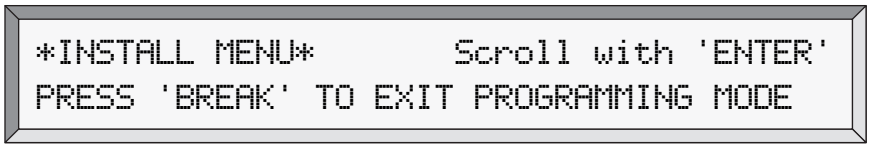
SM40 SURVEILLANCE INSTALLER PROGRAMMING MENU

Status / Action	Result / Remarks
The display shows the following:	
Display after pressing '8'.	 Pressing '1' will send a list of stored units (zone-by-zone) to the printer. The header will show date and time.
Display after pressing '2'.	
Display after input of zone number (1-32) and after pressing 'Enter'.	 Pressing 'Enter' will show the next 10 units. Pressing 'Break' will repeat zone input request, pressing 'Break' again will return to main menu. The display will show:
	 This program cause the scanning sequence to be interrupted, while zone 1 or 2 (or both) are scanned at a programmed time interval
Display after pressing '9'.	 Pressing '0' will disable priority scanning and return to main menu.
Display after pressing '1'.	
Display after input of zone '1' or '2' and 'Enter'.	 Input of '0' minutes will disable priority scanning for that zone. Input of any other time (1-9 minutes) will cause an extra scan of that zone to occur at the programmed time interval. The current zone scan however will finish first.

SM40 SURVEILLANCE INSTALLER PROGRAMMING MENU

Status / Action	Result / Remarks
	The scanning of a priority zone will be indicated by an 'asterix' in the upper right corner of the display. After entering the 'interval time' and after pressing 'Enter' the display will repeat the zone number request. Pressing 'Break' will return to the main menu.
The display shows the following:	 During installer programming scanning is halted. The program 'Shut-off Timer' causes the system to automatically exit programming, and to start scanning at the preprogrammed time after the last key stroke.
Display after pressing 'A'.	 Pressing '0' will disable the timer and return to main menu.
Display after pressing '1'.	 After input of the desired time, and after pressing 'Enter', the display will return to the main menu. The display will show. This program will set the serial (printer or P.C.) parameters. If the memory was previously cleared, the serial port will be set by default at 2400 baud, 8 databits, 1 stop bit and even parity.
Display after pressing 'B'.	
Display after entering '1', '2', '3', '4', or '5' and after pressing 'Enter'.	
Display after entering '1' or '2'.	 After entering '1', '2', or '3' and 'Enter', the display returns to the main menu.

SM40 SURVEILLANCE INSTALLER PROGRAMMING MENU

Status / Action	Result / Remarks
The display shows the following:	
	Because this program clears the complete memory, caution must be taken. The display after pressing 'C' is as follows:
	
	Pressing any key except '0' will return to the main menu
Pressing '0' will display:	
	After 3 seconds the following message is displayed
	The system is now no longer in the programming mode.
The display if the memory was not cleared.	
	Pressing 'Break' now will return to the normal scan mode.

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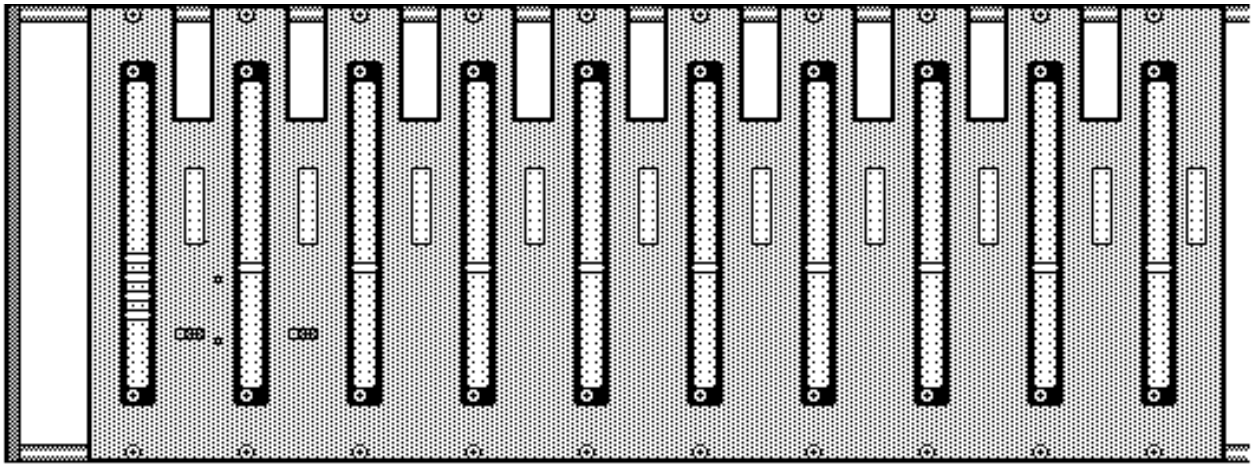
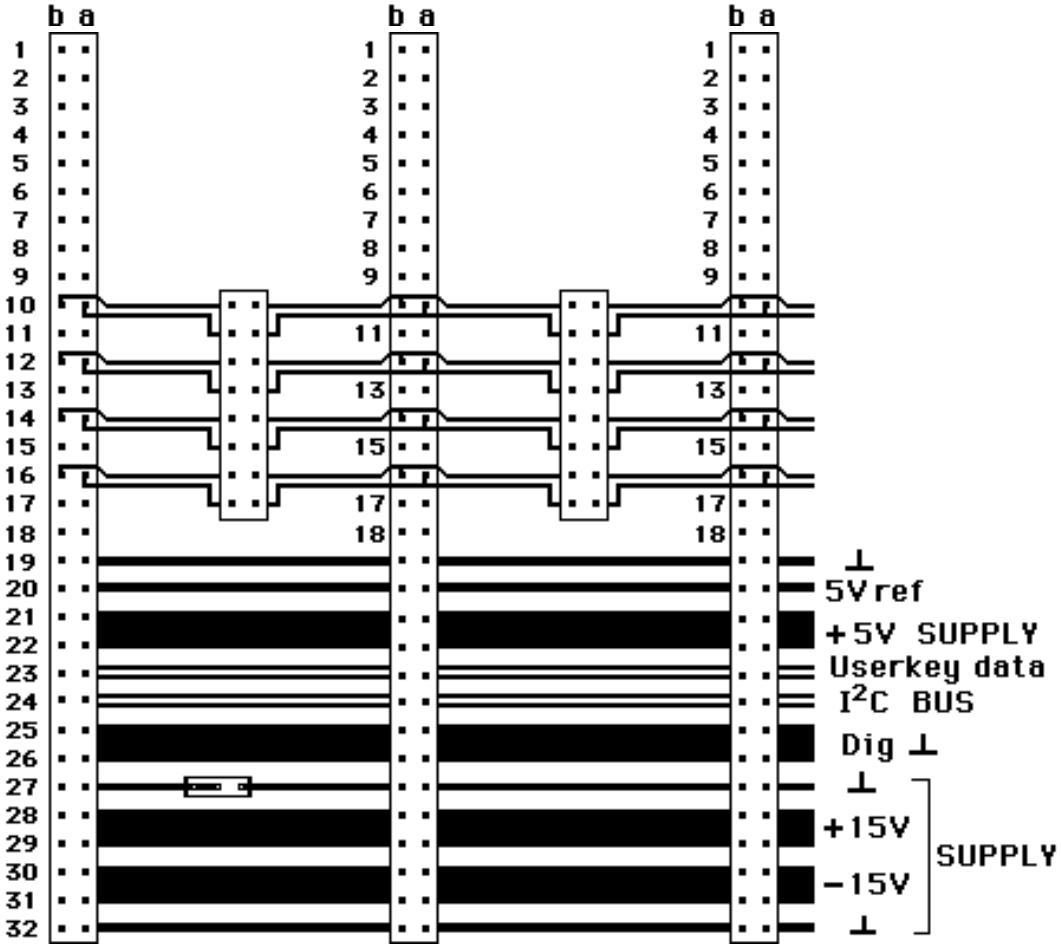
BOARD MOUNTED IN SURVEILLANCE BASIC FRAME





Interconnection Board

5. SM40 SURVEILLANCE CENTRE MODULES

5.1 Interconnection board (IB)

Interconnection board for 10 SM40 Eurocards. Eurocard pressfit a + b (2 x 32) connectors.
Mounted at the rear of the 19-inch rack frame.

In any sophisticated communications system, convenient and dependable interconnection of the various component units is vital.
The use of the Interconnection Board (IB) gives the SM40 Surveillance Centre both reliability and a great deal of flexibility.

One IB is mounted at the rear of each 19-inch frame unit, and contains 10 Eurocard 'Pressfit' connectors of the 'a+b' (2x32) format, into which 9, SM40 Surveillance Centre circuit cards can be plugged into the Basic System Frame, and 10 in the Extension Frames (see frame layout drawings in Chapters 1 & 3.2).

The SM40 circuit card slides along rails within the frame unit and, with a light extra push, is mated securely with the IB.
Removal of a card is done in the same way; a gentle tug with the special tool supplied, and the card then slides out of the frame unit for service.

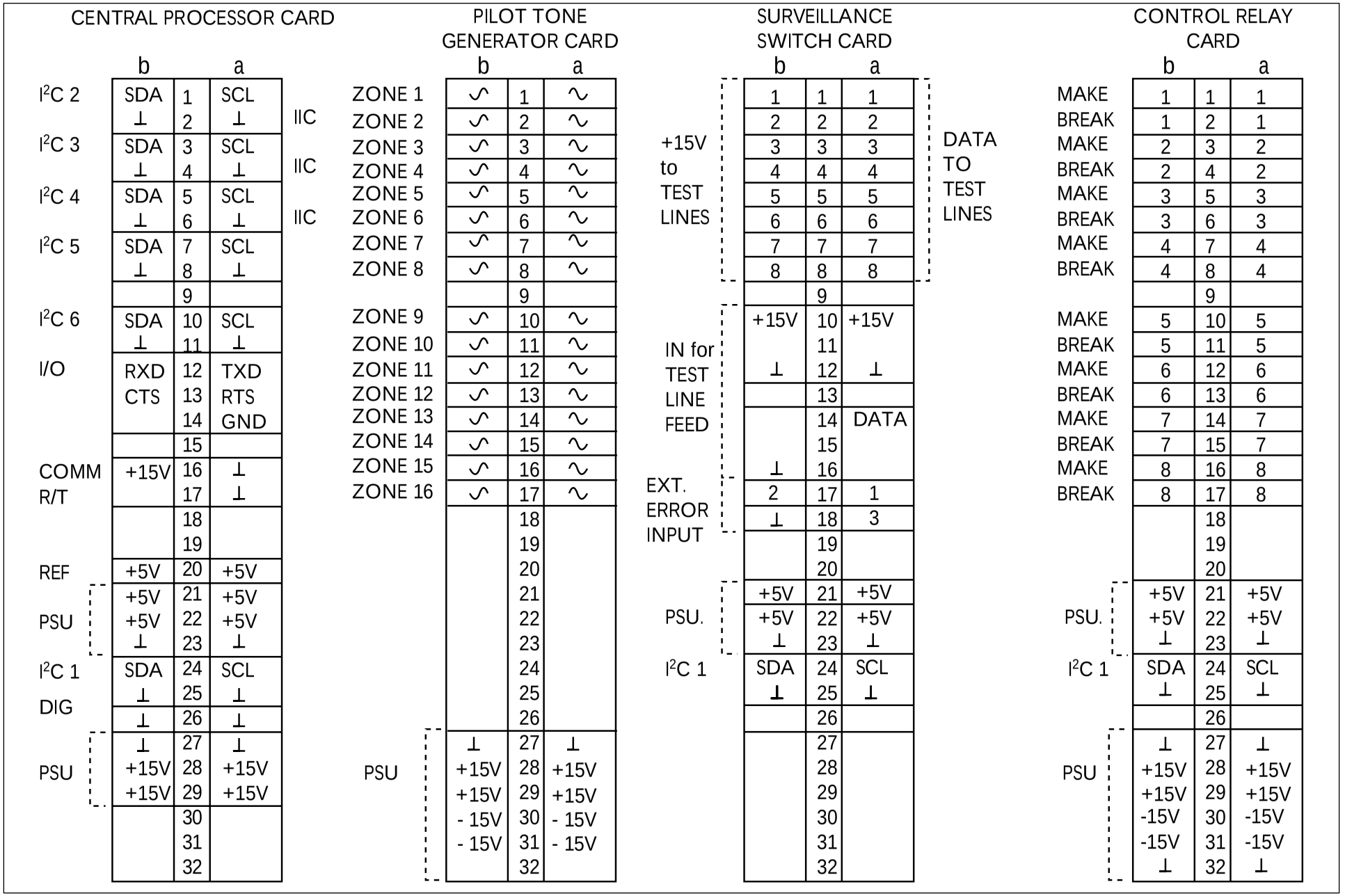
Each connector on the IB is universal, so that the cards may be located in the any position within the frame, making alteration or expansion of the system both easy and economical. Even so, a logical positioning of the circuit cards should be observed.
The system configuration should determine the position of the cards in the rack frames.
Some examples of typical systems, and the position of the cards in the frames are shown at the end of this manual.

The power supply and reference signals, common to all of the circuit cards, are carried on rails printed on the IB, but because the SM40 system has such a wide range of configuration possibilities, a certain amount of cross-wiring between circuit cards is necessary.

This is easily accomplished by terminating the individual connector wires or flat cables with female Pressfit connectors. These are then pushed onto the pins of the Eurocard connectors which are exposed on the rear side of the IB.

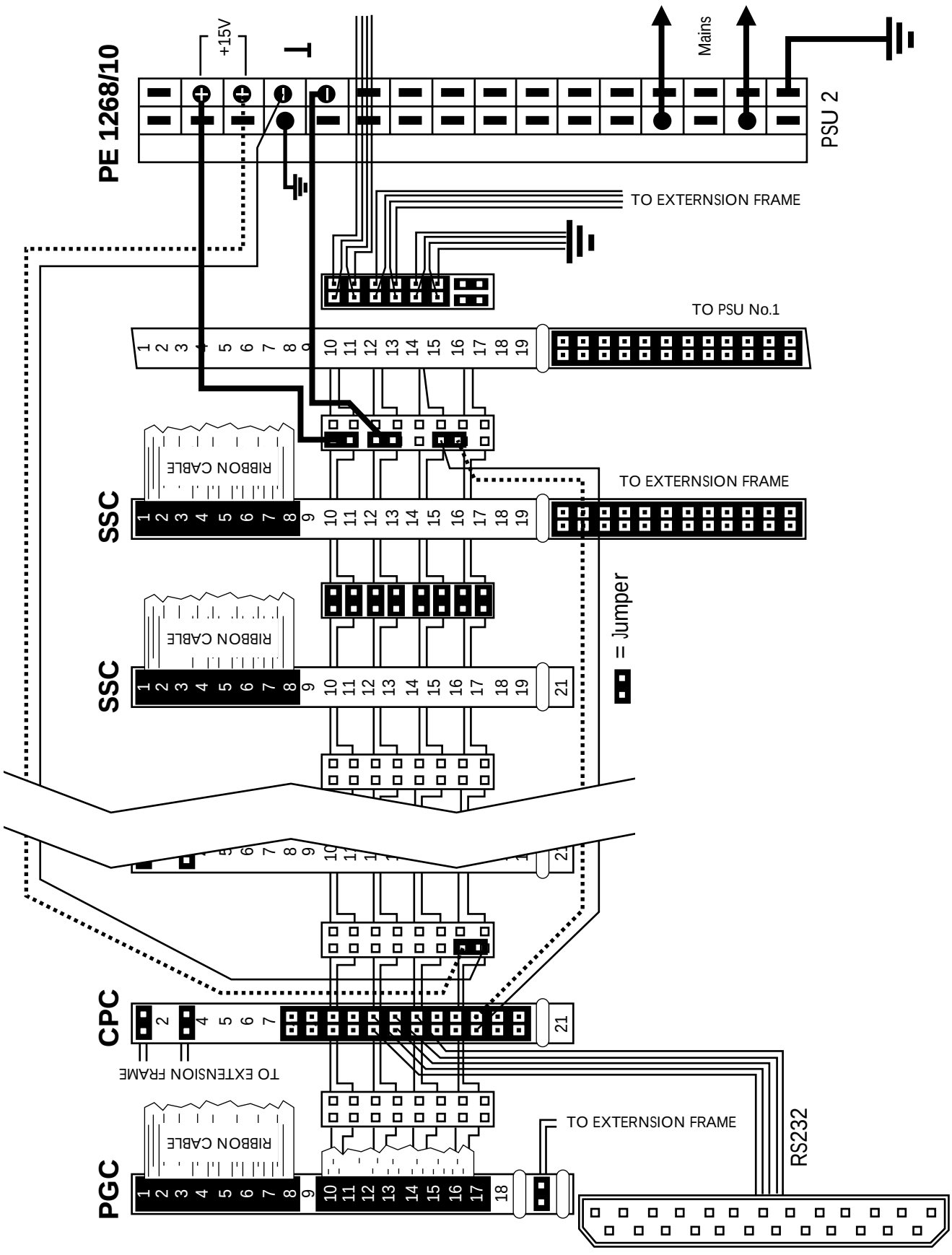
Interconnection between the IB and the Termination Boards (TB's) is also accomplished using flat cables fitted with female 'Pressfit' connectors.

Located between the 10 connectors, on the rear of the IB, are Pressfit (2x8) connector blocks, whose function is to join certain contacts of adjacent cards together.
Small Pressfit jumper plugs are used for this purpose (making the time consuming use of a soldering iron unnecessary).
This 'through connection' of boards is necessary when using more than one Surveillance Switch Card (SSC) in a frame (see System examples in Chapter 16).



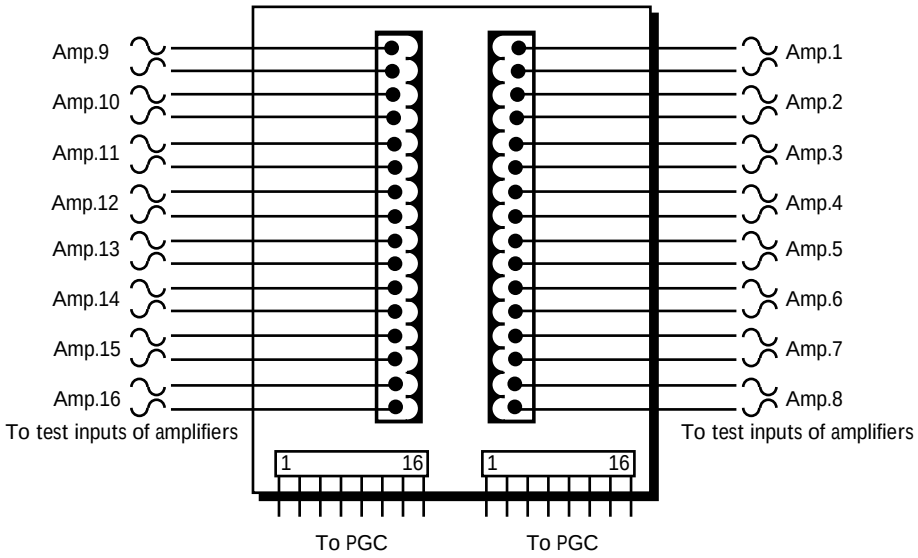
PRINTED CIRCUIT BOARDS CONNECTOR PIN CONFIGURATION

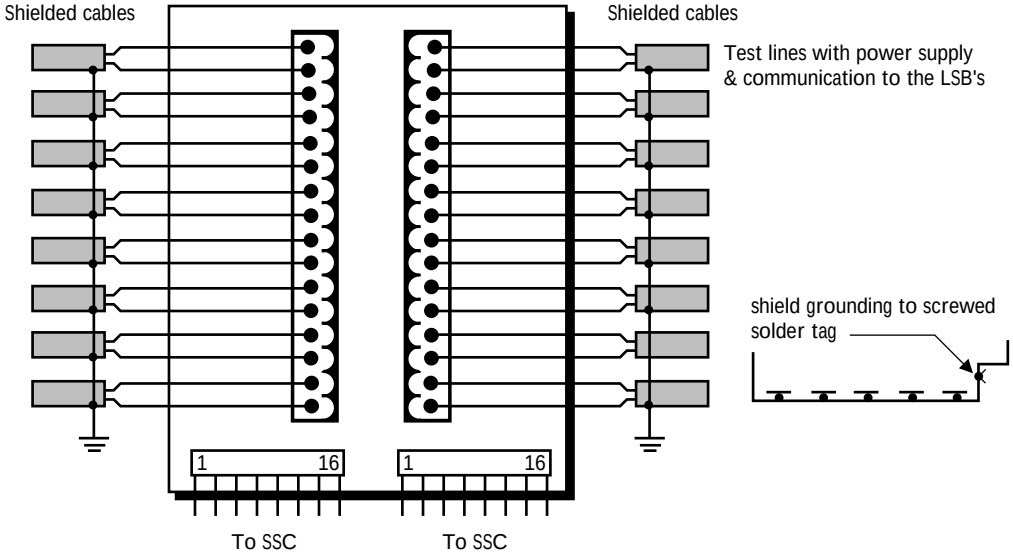
DETAILED VIEW OF INTERCONNECTIONS

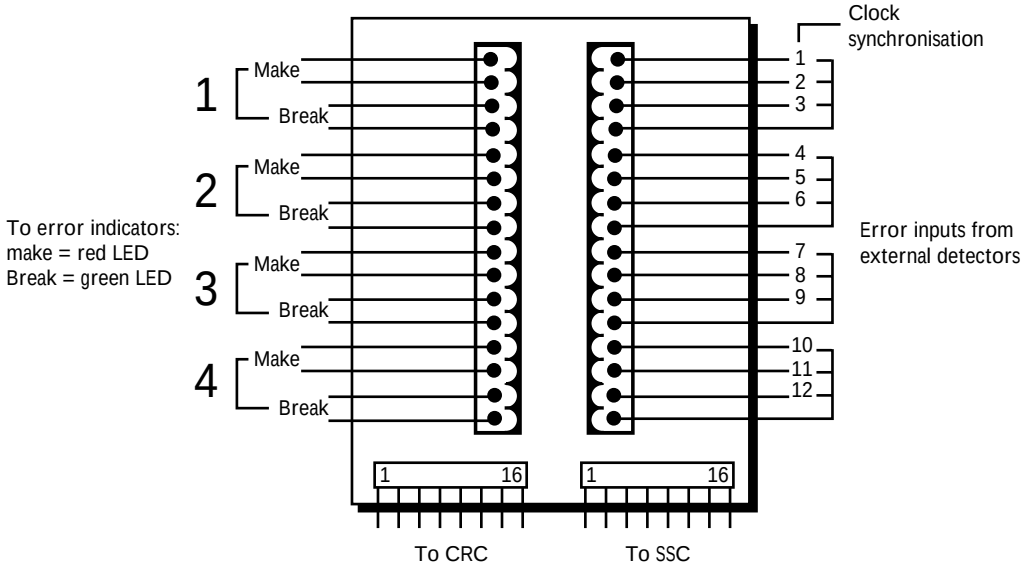


TERMINATION BOARDS

(wiring configurations as viewed from rear of unit)







5

5.2 Termination board (TB) (max. 5 per 19-inch rack frame)

Connector board mounted on the 19-inch frame back panel, connecting:

a) 16 Pilot Tone Generator Card outputs to the 'Test' inputs of Philips power amplifiers.
b) The outputs of 2 Surveillance Switch Cards to 16 individual 'Test Lines'.
c) 8 Control Relay Card relay sets to remote warning devices.
d) 11 Error inputs to 4 Surveillance Switch Cards.
e) 1 clock synchronisation contact.

The task of the termination boards described here is to connect the circuit cards, located in the central rack unit, to the amplifier inputs, monitoring boards and external warning devices which make up the external part of the SM40 Surveillance Centre.

Five boards are mounted on the back panel of each rack frame, which hinges down to expose the boards for service.
The use of 'push-fit-support-studs' to mount the boards onto the back panel makes fitting or removal a fast and simple matter.

Each Termination Board can be connected to the Interconnection Board (IB) by flat cable and/or individual wires fitted with female 'Pressfit' connectors.

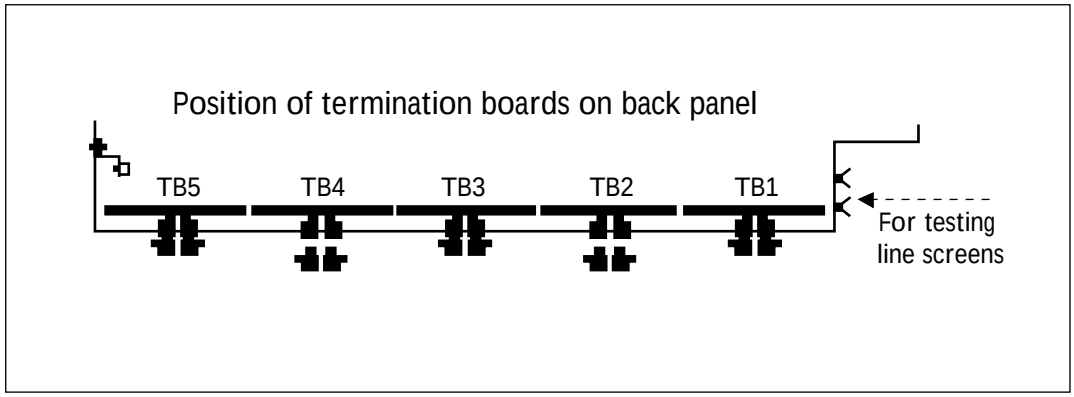
External devices are wired as shown, to screw connector blocks which are plugged into sockets mounted on the termination boards.
This has the advantage that if, for some reason, an SM40 rack frame, or a Termination Board, has to be removed, the screw connector block is simply unplugged, leaving the periferal equipment wiring intact. This avoids the tedious and risky business of rewiring the blocks in their original configurations.
Two of these connector blocks, each containing 16 screw connectors, are mounted on each Termination Board.
A Termination Board is capable of carrying out one of (or a mixture of) the following functions:

1 Connecting the 16 outputs of a Pilot Tone Generator Card to the 'Test' inputs of Philips power amplifiers (SQ45).

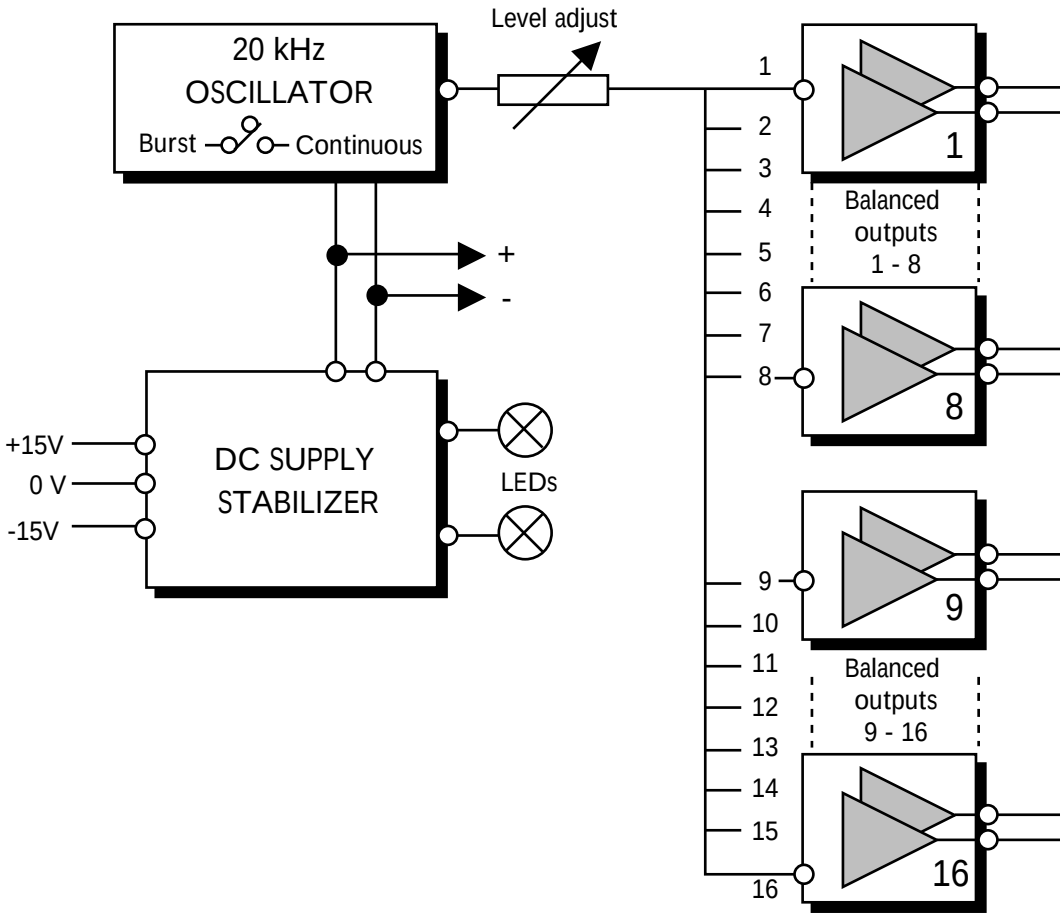
2 Connecting the data communications and +15V power outputs of a Surveillance Switch Card to 8 individual 'Test Lines'.

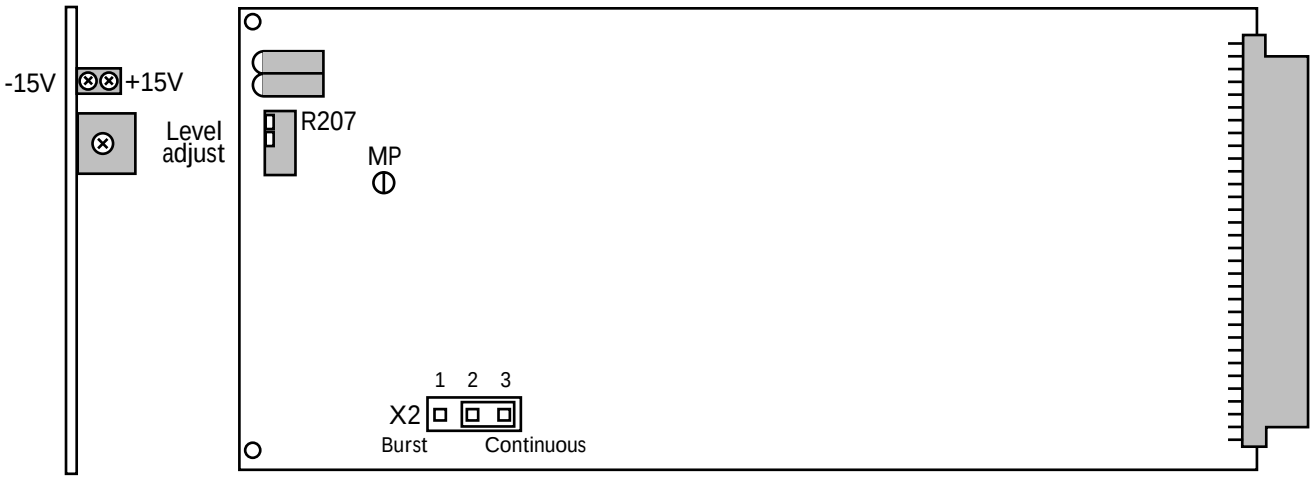
3 Connecting 8 Control Relay Card (CRC) relay sets to remote warning devices. The 'make' contacts to red ('ERROR') warning lamps, buzzers, or paging units; and the 'break' contacts to green ('FUNCTIONING') lamps.

4 Connecting 11 Error inputs from external closed contact switches (dedicated error relay in an SM40 Routing System, smoke alarm, micro-switch, etc.) to 4 Surveillance Switch Cards, plus 1 clock synchronisation contact.



PILOT TONE GENERATOR CARD LBB 1369





5.3 Pilot tone generator card (PGC) LBB 1369

Eurocard 10 x 22 cm with an 'ab' connector (2 x 32) containing a 20 kHz tone oscillator and 16 independent electronically balanced outputs. These are connected to amplifier test inputs.

The SM40 Surveillance Centre uses an ultrasonic (20kHz) pilot tone, inserted at the specially developed test input of the Philips SQ45 amplifier. This tone is then relayed to all the loudspeakers throughout the corresponding zone. The Surveillance Centre checks for the presence of this tone at various strategic points in the zone. If the tone is not present at a particular point, it is obvious that the normal audio signal is not going to be broadcast at that point either.

In each card a single oscillator is used to drive 16 electronically balanced outputs, which are floating free of earth (ground). One PGC therefore can feed 16 amplifiers/loudspeaker zones with pilot tone signals.

The Central Processor Card (CPC) does not control, and has no infuence upon, the Pilot Tone Generator Card (PGC). Neither is the PGC connected to any other card in the system.

The only dependence that the card has on the system is the fact that it requires +/- 15 Volt powering, which is normally supplied from either the Basic System or an Extension Frame. Because of this, the amount of PGC's used in a system is unlimited.

Two green leds, mounted on the front edge of the card, advise that adequate supply voltages are present.

In order for the system to operate correctly, it is essential that the Volume Adjust control (see board layout illustration) is set so that 10V is measured at the 100V output tap of the SQ45 amplifiers. All SQ45 amplifier Input Sensitivity Switches should be in the 1000 mV position. One master switch on the Pilot tone generator card then sets the sensitivity level for all SQ45 amplifiers.

5.3.1 Reduction of power dissipation in amplifiers

To reduce the power dissipation in amplifiers when surveillance is used, the Amplifier Surveillance Board (LBB 1368/00), the Loudspeaker Surveillance Board (LBB 1367/00) and the Pilot Generator Card (LBB 1369/00) have been modified. The modification enables a 20kHz 'burst-pilot-tone' to be used instead of a continuous 20 kHz 'pilot-tone'. This feature can be selected by a jumper located on the Pilot Generator Card. The modified type number versions are compatible with previous versions and can be used all together in a single system.

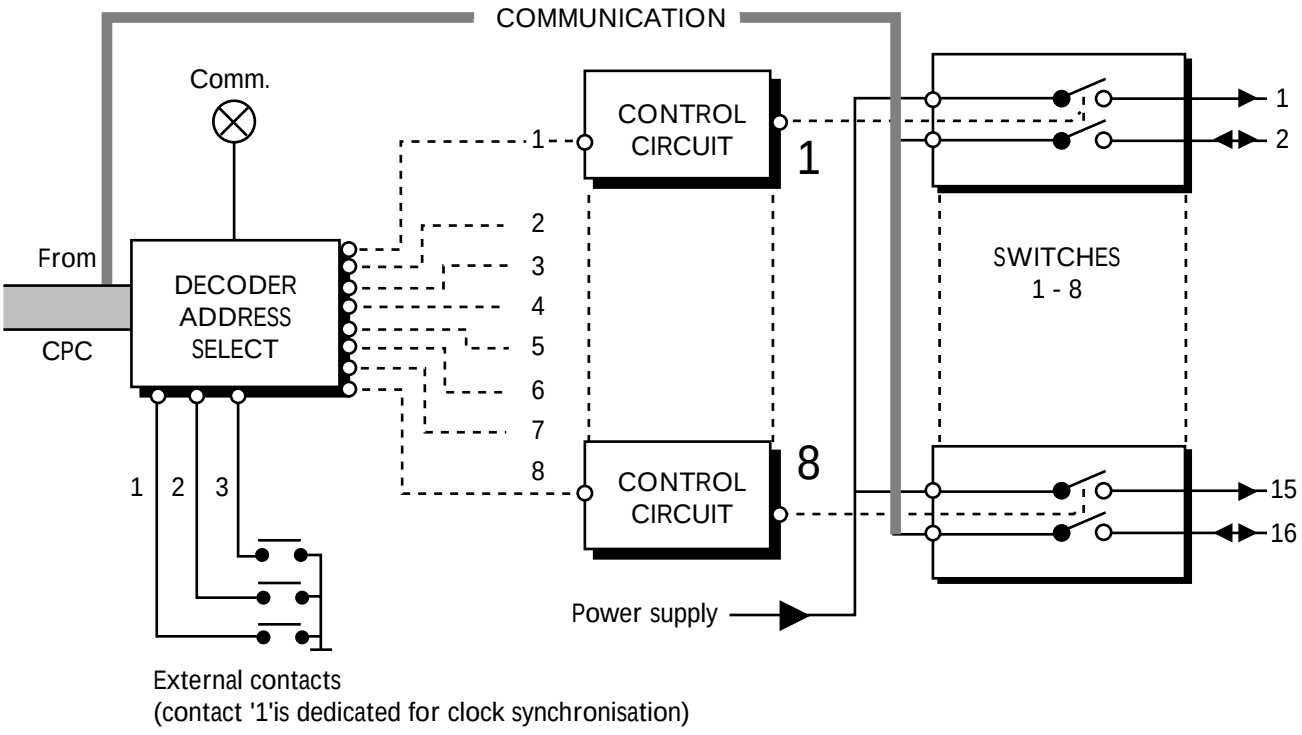
Selecting 'continuous mode' or 'burst-mode'
Using jumper X2 the following mode can be selected:

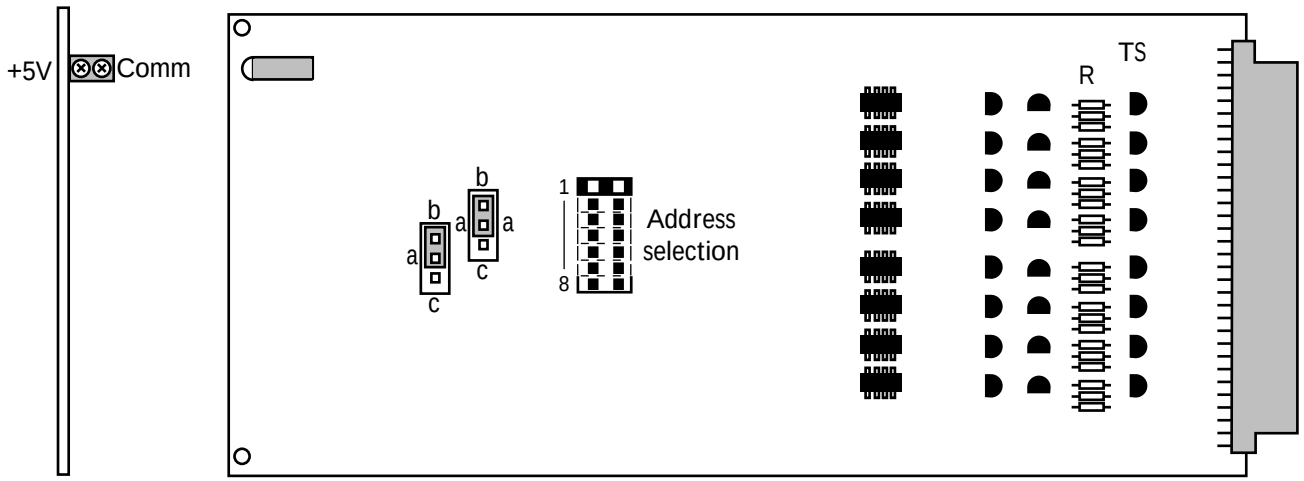
Continiuous mode:	X2 in position 2-3 (output frequency 20kHz ±1kHz).
Burst-mode:	X2 in position 1-2 (output frequency 20kHz ±1kHz).
	- 20kHz present: 35 ±5msecs.
	- 20kHz absent: 260 ±30msecs.

Note: When the modified PGC is used in a system where LSBs and/or ASBs are NOT CAPABLE of working with the 20kHz 'burst-tone', jumper X2 must ALWAYS be placed in the continuous mode to prevent malfunction of the Surveillance Centre. Where possible, it is advisable to set X2 in the 20kHz 'burst-tone' position in systems where only NEW (modified) LSBs and/or ASBs are installed. This will greatly reduce the dissipation of the SQ45 amplifier. The modification to the PGC is implemented from serial number 431 onwards. The modified PGC (LBB 1369/00) has been installed as standard in the LBB 1370/30 surveillance basic frame from serial number 734 onwards.

For modification details to the ASB and LSB refer to the relevant sections.

SURVEILLANCE SWITCH CARD LBB 1374





5

5.4 Surveillance Switch Card - SSC LBB 1374

Eurocard 10 x 22 cm with an 'a b' connector (2 x 32) containing 8 individual 'Test Line' outputs, and three 'Error' inputs. Each Test Line supplies up to 128 monitoring devices with power and individual data communications.

Because the SM40 Surveillance Centre is incapable of reading information from all of the monitoring devices at the same time, it must do this sequentially. It does this by sending and receiving data from each ASB or LSB in turn.

Up to 128 of these monitoring devices can be linked together in individual 'Test Lines', with the Surveillance Switch Card (SSC) sending +15V power and data to each of the 8 lines in sequence.

A maximum of 4 SSC's may be used in an SM40 Surveillance Centre, giving it the capability of individually scanning up to 4096 units.

The sequence in which each board in a Test Line communicates with the Central Processor Card is dependent on the address that the board has been given (refer to the address setting list at the end of this chapter).

The SSC receives its data input from the Central Processor Card and its +15V power from a separate power supply.

The common earth (ground) connection to the ASB's and LSB's are provided by wiring the cable screen to the rack frame (see the Termination Board layout illustration in chapter 5.2).

As well as supplying the monitoring devices with data and power, the SSC has 3 External Error Inputs which are activated by a closed contact. This could be supplied from the dedicated error relay (CRC U-1) in an SM40 Routing System; a smoke detector; micro switch; etc.*

An SSC's position in the Surveillance Centre is defined by the "address" it is given. This address setting is accomplished by repositioning a jumper on the Switch Card itself (see circuit board layout).

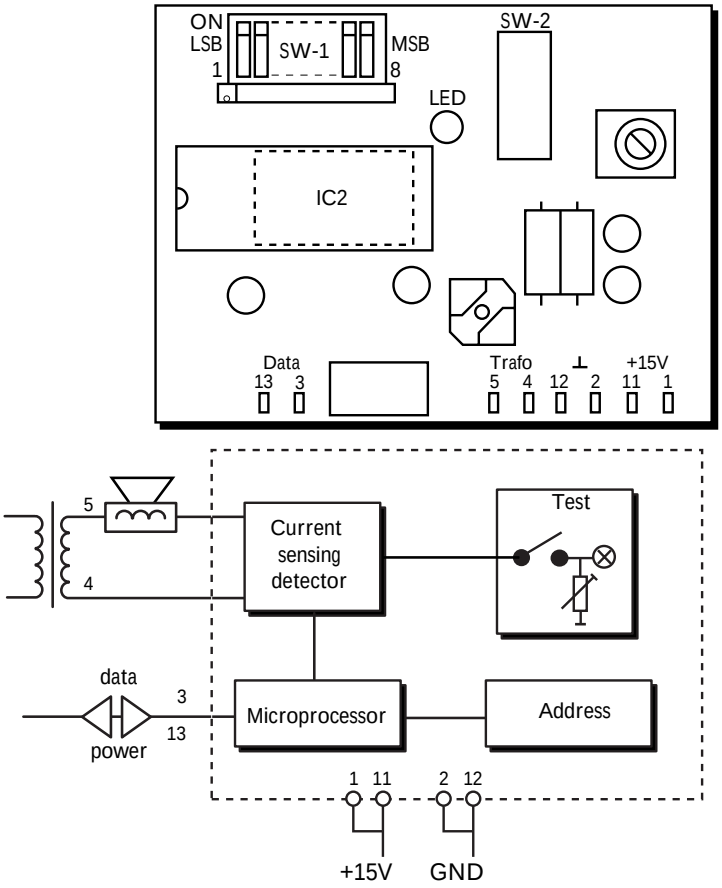
All connections to and from the SSC are made via the Interconnection Board and Termination Boards (see chapter 5.2 for correct wiring, plus the System examples at the end of this chapter).

A yellow led on the front edge of the card indicates that the SSC is in communication with the Central Processor Card (CPC) and a green led indicates that adequate supply voltage is present. If extra SSC's are to be installed, the basic frame includes 4 reserved slots at the extreme left of the basic frame.

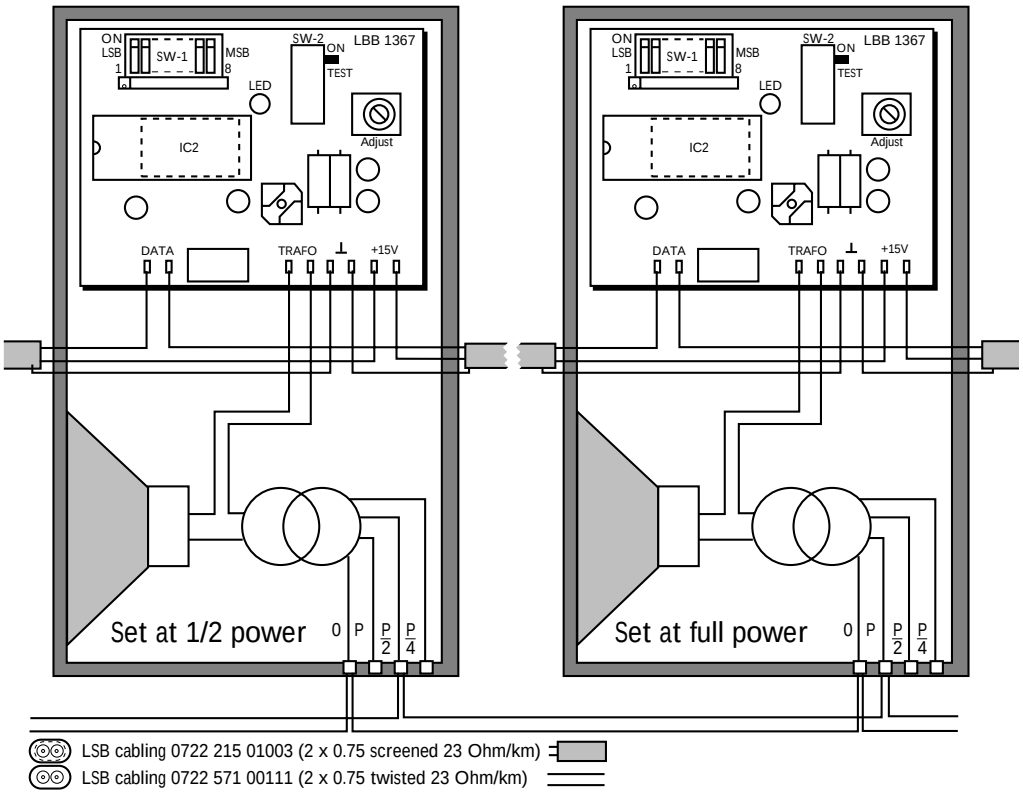
Note : These 4-slots can also be used for other purposes, but only if an SSC is not installed.

* With the exception of SSC nr. 1, contact '1' which is reserved for clock synchronisation. If the contact is closed at time x plus less than 30 seconds, the time is set to x minutes and zero seconds. If the contact is closed at time x plus closed for more than 30 seconds, the time will be set to x plus one minute and zero seconds.

LOUDSPEAKER SURVEILLANCE BOARD LBB 1367



Mounting LSBs inside loudspeaker cabinets



5.5 Loudspeaker Surveillance Board - LSB LBB 1367

PCB of 8.0 x 6.0 cm with solder-pin connection points. Used to monitor the secondary side of the loudspeaker transformer and voicecoil, and for sensing the presence of the 20kHz pilot tone signal and inside loudspeaker cabinets.

The Loudspeaker Surveillance Board is mounted inside a loudspeaker cabinet in order to monitor the continuity of the loudspeaker's transformer (secondary) the loudspeakers voice coil, and the wiring to the amplifier by checking the presence of the 20kHz pilot tone signal. A quantity of LSB's are placed at strategic points throughout the distribution system, monitoring the loudspeakers, and sending error information back to the Central Processor.

The unit, a small circuit board, can easily be mounted inside a loudspeaker cabinet using standard wood screws and spacing bushes (insulating posts). The LSB is wired in series with the secondary side of the 100V transformer and the loudspeaker voice coil (see Fig.7). In this position it is able to sense any dramatic changes in the current drawn by the loudspeaker, at 20kHz.

If the unit senses that no pilot tone signal is present, or that the loudspeaker voice coil is open circuited, a message is sent (via the system's communication line) to the CPC, which would give visual, or printed, information about the error. This unit is designed to monitor low voltage applications and is therefore not suitable for use with amplifier outputs or 100V loudspeaker lines.

In total more than 4000 Loudspeaker Surveillance Boards (LBS's) (and/or Amplifier Surveillace Boards (ASB's)) can be connected, via 4 Surveillance Switch Cards (SSC's)) (see chapter 12), to the Central Processor Card CPC. The amount of LSB's used in a system is dependent on the amount of surveillance coverage required. In principle an LSB may be used to monitor each loudspeaker in every column in the system, but one LSB per column should be adequate. Because of the wide range of variations possible using the 100V line principle, both at the amplifier output and the loudspeaker transformer, a sensitivity adjuster is provided on each LSB. When the LSB has been installed it may be adjusted for loudspeaker optimum sensitivity. Adjustment may be carried out, either in its installed position, or in a much more convenient place such as a workplace. All that is required is a 10V dc source and a pilot tone generator (20 Khz).

To adjust the LSB for the optimum sensitivity, in its installed position, place the DIL switch on the LSB (SW2) to its TEST position, and turn the ADJUST potentiometer (R8) until the LED just begins to illuminate. On the threshold of the LED illuminating carefully turn the adjust till the LED switches off. Adjustment is now complete. Place the switch back to its ON position again (see Fig.7).

To adjust the LSB in a more convenient position such as a workplace for instance, connect a +15V dc power supply between pins 1 (+15V) and pin 2 (Gnd). Now connect a 20 kHz pilot tone signal between pins 4 and 5. Adjust the LSB as described above.

Information can be communicated to the SM40 Surveillance Centre via the DATA contacts on the LSB (see Fig.5). A single, standard 2 core, 0.75mm screened microphone cable may be used for connection of all the LSB's (and ASB's), which are linked via the same SSC line, to the CPC. In order for the Central Processor to "recognise" which LSB is giving the error indication, and in which sequence it receives its communications data, each unit is given an "address". This address setting is accomplished by setting the DIP switches on the board (see address settings list in chapter 17).

The 15V power required to drive the LSB (distributed via an SSC), connected to the +15V and contacts, is provided by the Basic System. All In and Out connections are simply made using 'faston' push connector tags. The DATA, and +15V tags are duplicated in order to simplify connection of the communications line and the power supply to the following LSB (or ASB).

AMPLIFIER SURVEILLANCE BOARD LBB 1368

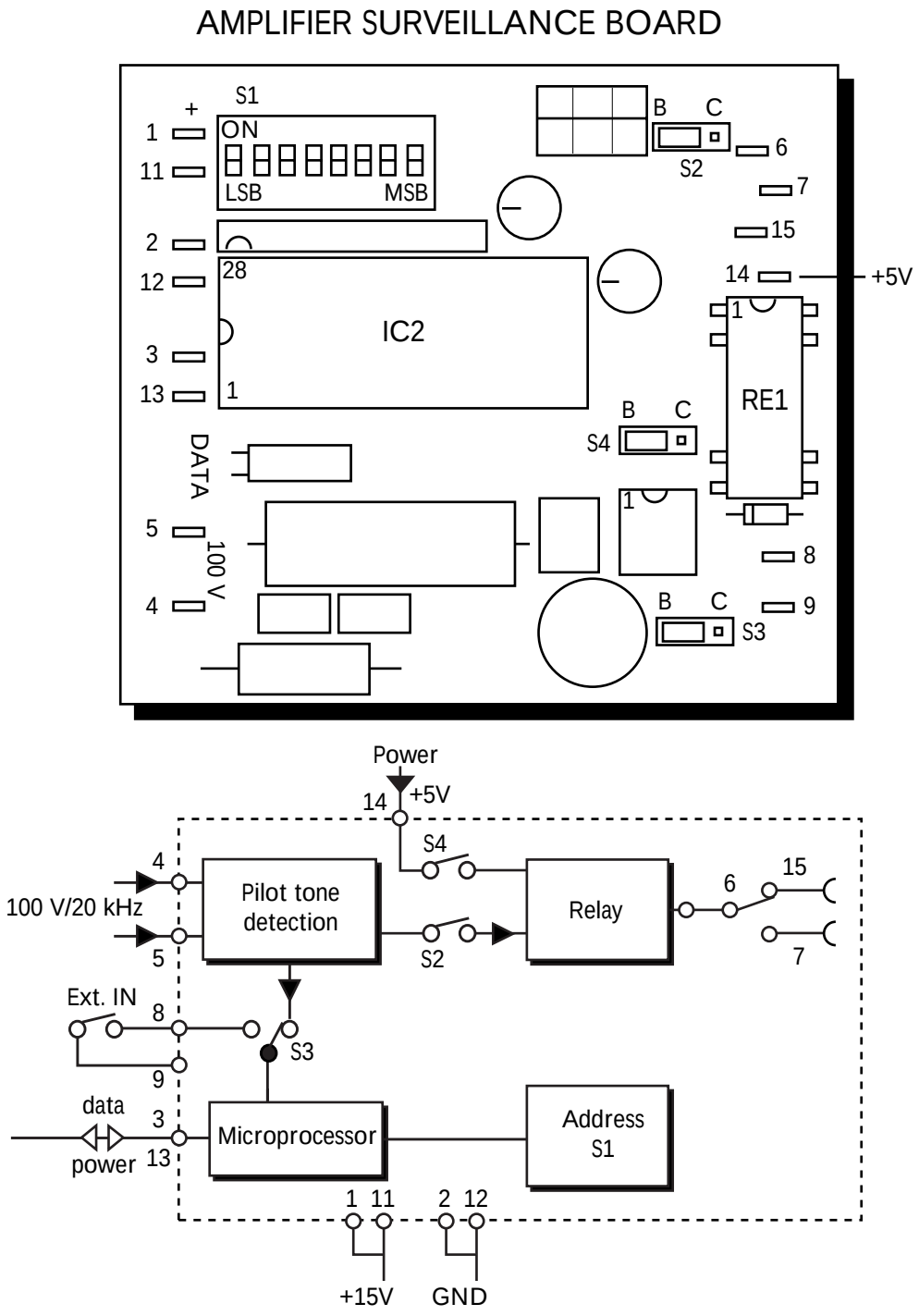


FIG.1

5.6 Amplifier Surveillance Board - ASB LBB 1368/00

P.C.B. of 6.5 x 7.2 cm with solder-pin connection points. Used for sensing the presence of the 20kHz pilot tone signal at amplifier outputs and in loudspeaker lines (100V system). Can be mounted using Phoenix interconnection modules or normal set-screws.

The Amplifier Surveillance Board is the device which constantly checks the 100V loudspeaker lines for the presence of the 20kHz pilot tone signal. It is possible to adapt the ASB for 70V and 50V loudspeaker lines by changing a resistor (see fig.4).

The unit, a small circuit board, can easily be mounted in the back of a 19-inch rack unit, near to the amplifiers, to monitor the amplifier output.

It may also be mounted in a small enclosure on a loudspeaker cabinet, or in a junction box, to monitor the 100V loudspeaker lines.

The signal is tapped off the loudspeaker line or amplifier output (in parallel with the loudspeaker line), and enters the ASB via the LINE IN contacts.

It is possible to add amplifier monitoring and spare amplifier switching to a public address system, because the ASB is fitted with a relay with one make/break contact,which can be used to activate warning devices or switch in spare amplifiers (see Figs. 2 & 4). A jumper (S2) is provided to allow this relay to be active or non-active (see Fig.4). If no errors are detected, this relay is activated and provides a contact closure between points 6 and 7 (see relay output fig.1).

In spare amplifier switching, external relays are used for switching the audio input and output signals of the defective amplifier to the spare amplifier. These external relays must be wired to the OUT contacts on the ASB (see Fig.4). The corresponding Pilot Tone Generator Card (PGC) should be mounted in the SM40 Routing and Switching frame, a separate 15V power supply must be used to power both the ASB's and the spare amplifier signal switching relays (see Fig. 2).

As well as switching in the spare amplifier, error information can be communicated to an SM40 Surveillance Centre via the DATA contacts on the ASB (see Fig.3)

If the unit senses that no pilot tone signal is present, the built in relay is de-activated and a message is sent (via the system's communication line) to the CPC, which would give visual, or printed, information about the error.

This communication function may also be used alone, where a quantity of ASB's are placed at strategic points throughout the distribution system, monitoring the loudspeaker lines, and sending error information back to the Central Processor.

The unit is also provided with an external contact input, marked EXT IN. Any external device (smoke detector, micro switch, etc,.) which provides a 'break' contact, for use as an alarm/error may be used to activate the ASB, giving the system an error warning. A jumper (S3) is provided to allow either the 20kHz LINE IN or external (EXT IN) contacts to be used (see Fig.1).

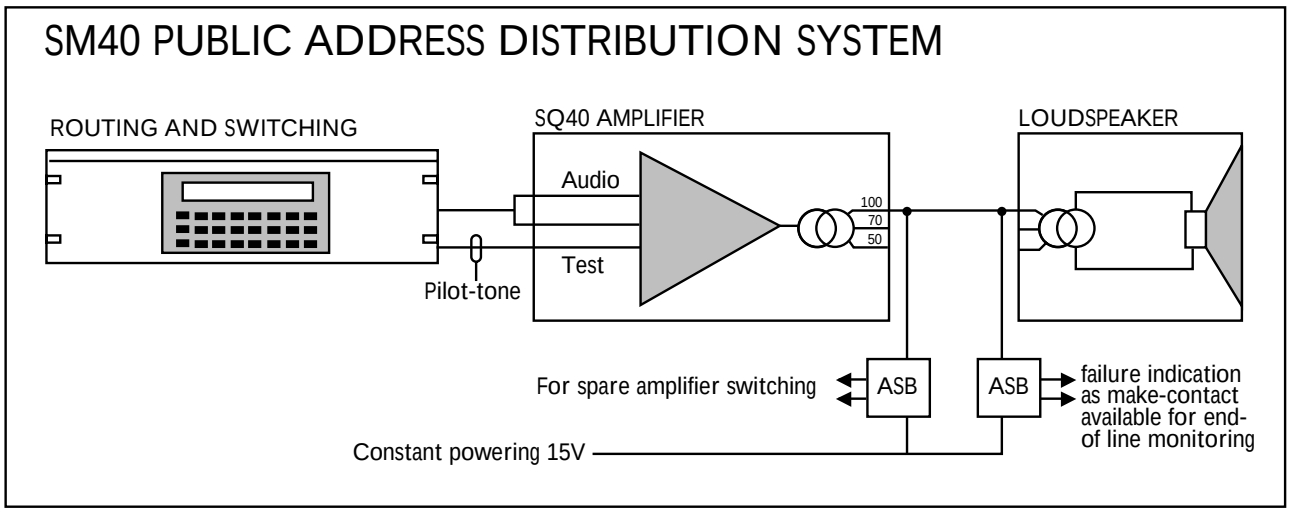
In order for the Central Processor to "recognise" which ASB is giving the error indication, and in which sequence the ASB is to receive its data communications, each unit is given an "address". This address setting is accomplished by setting the DIP switches on the board itself (see settings list at the end of this chapter).

Up to 128 ASB's, and/or Loudspeaker Surveillance Boards (LSB's), may be linked to the same communications bus.

A single, standard 2 core, 0.75mm^2 screened microphone cable may be used for connection of all the ASB's (and LSB's), linked via the same communications bus, to the Central Surveillance Centre.

The DATA, and + solder pins are duplicated in order to simplify wiring of the communications line and the power supply to the following ASB, or LSB (see Fig.4).

FIG.2


SM40 PUBLIC ADDRESS DISTRIBUTION SYSTEM
ROUTING AND SWITCHING
SQ40 AMPLIFIER
LOUDSPEAKER
Audio
Test
Pilot-tone
100
70
50
For spare amplifier switching
ASB
ASB
failure indication as make-contact available for end-of line monitoring
Constant powering 15V

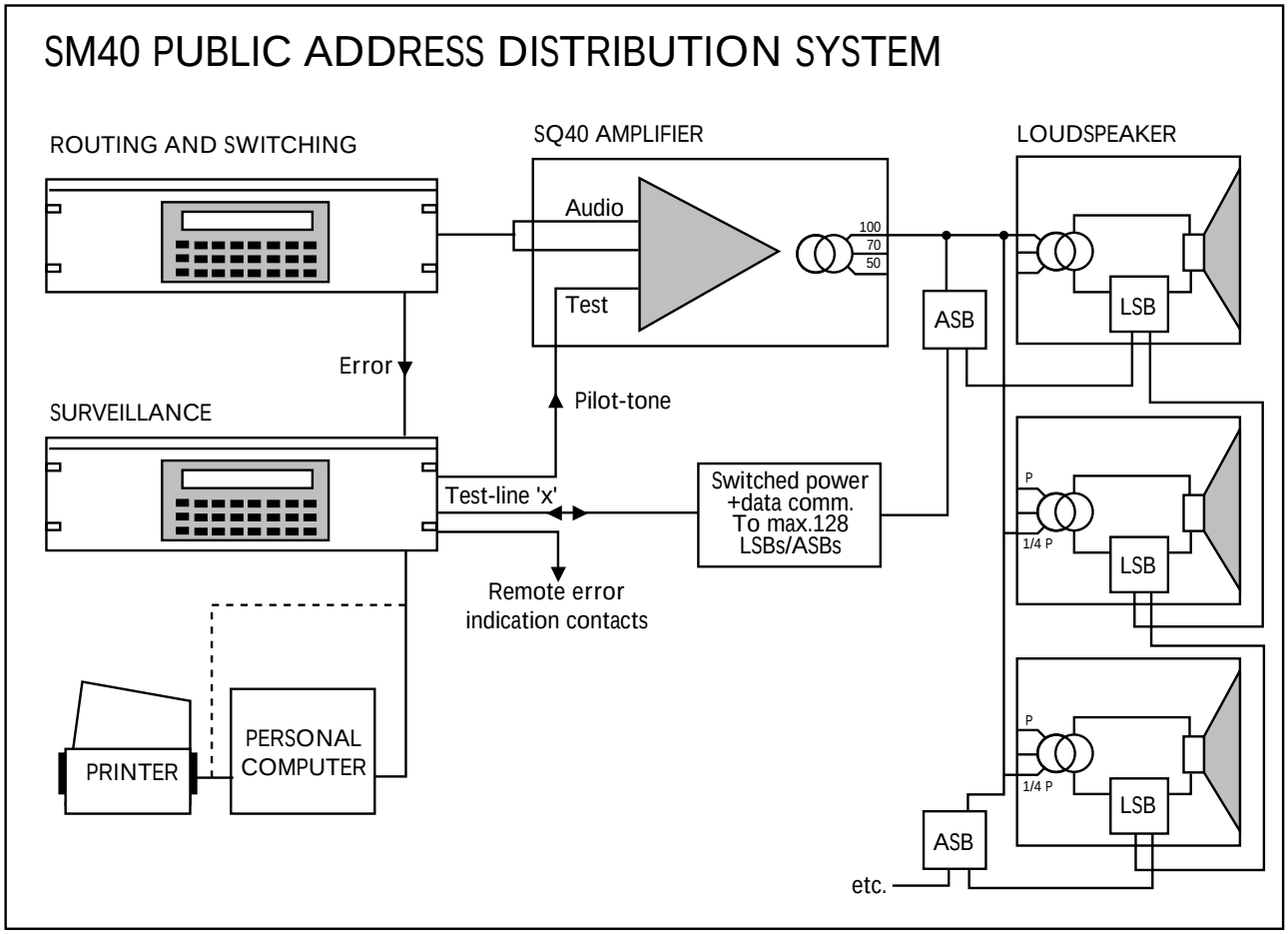

SM40 PUBLIC ADDRESS DISTRIBUTION SYSTEM
ROUTING AND SWITCHING
SQ40 AMPLIFIER
LOUDSPEAKER
Audio
Test
100
70
50
ASB
LSB
Error
Pilot-tone
SURVEILLANCE
Test-line 'x'
Switched power +data comm. To max.128 LSBs/ASBs
P
1/4 P
LSB
Remote error indication contacts
PRINTER
PERSONAL COMPUTER
P
1/4 P
LSB
ASB
etc.

FIG.3

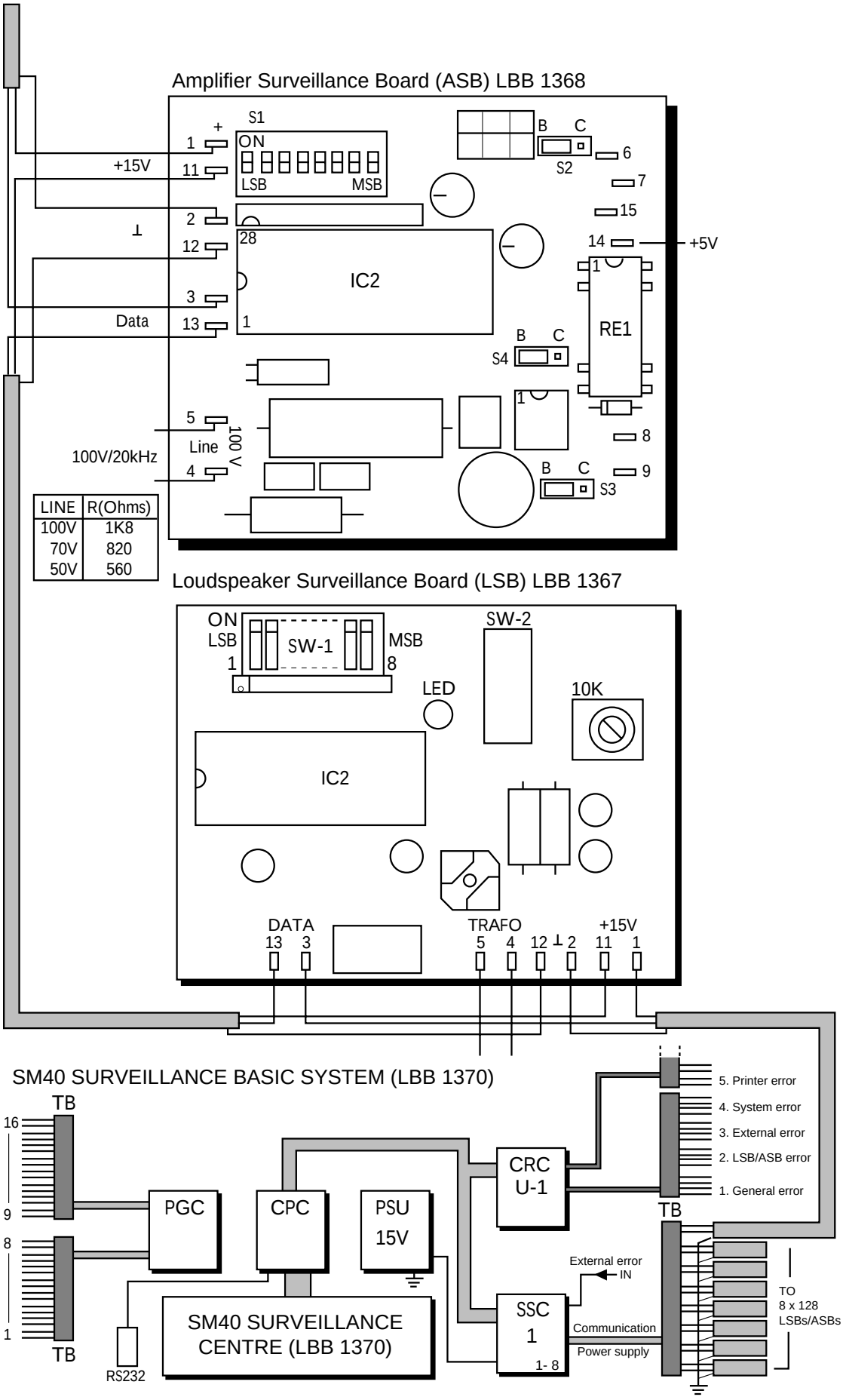
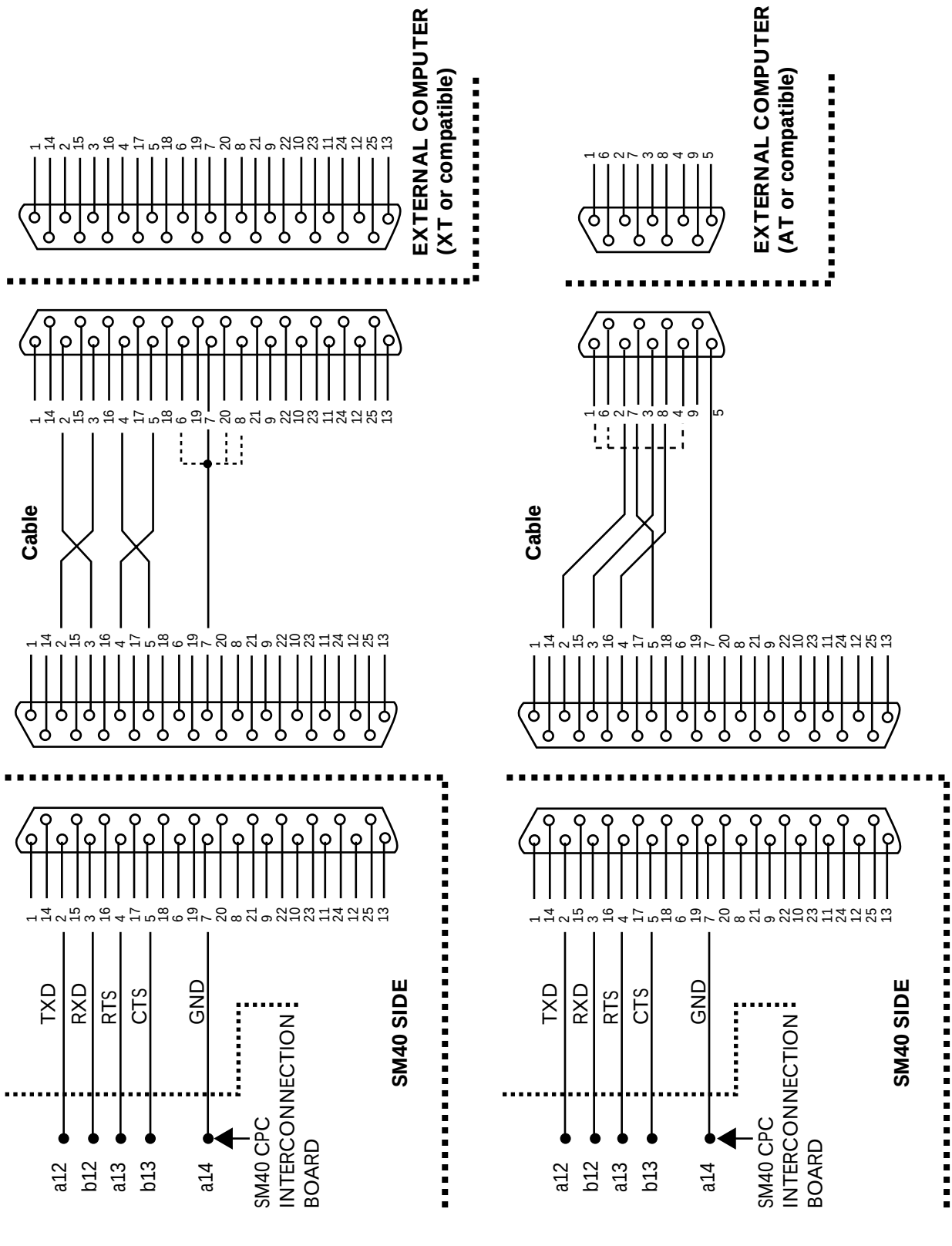

Amplifier Surveillance Board (ASB) LBB 1368
S1
ON
LSB
MSB
+15V
Data
100V/20kHz
Line
100 V
IC2
RE1
S2
S3
S4
+5V
LINE | R(Ohms)
100V | 1K8
70V | 820
50V | 560
Loudspeaker Surveillance Board (LSB) LBB 1367
SW-1
SW-2
LED
10K
IC2
DATA
TRAFO
+15V
SM40 SURVEILLANCE BASIC SYSTEM (LBB 1370)
TB
PGC
CPC
PSU
15V
CRC
U-1
SSC
1
1- 8
SM40 SURVEILLANCE
CENTRE (LBB 1370)
RS232
External error
IN
Communication
Power supply
5. Printer error
4. System error
3. External error
2. LSB/ASB error
1. General error
TO
8 x 128
LSBs/ASBs

FIG.4

SM40 I/O WIRING FOR EXTERNAL PC
(XT/AT or Compatible)



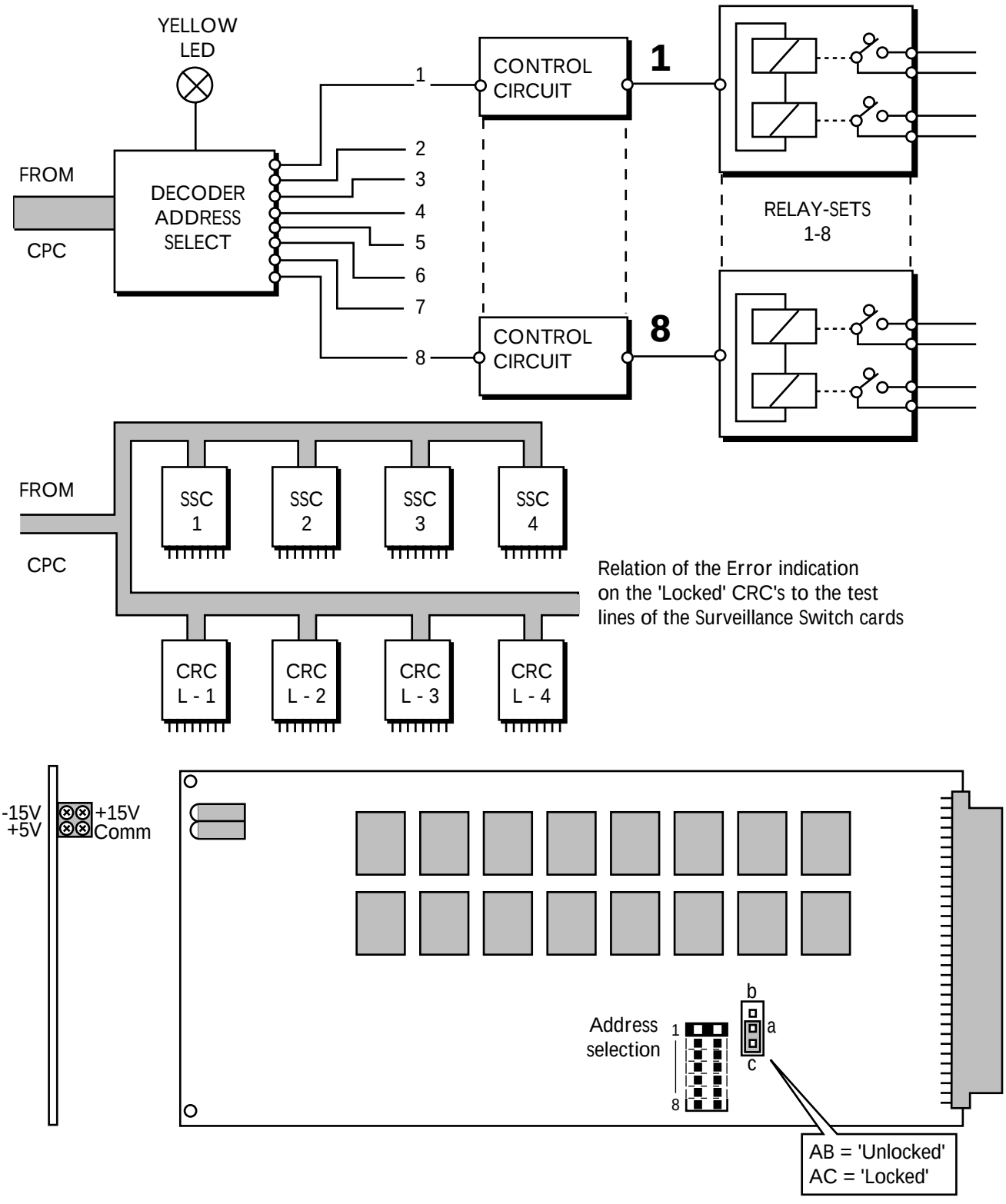
5.6.1 Reduction of power dissipation in amplifiers.

To reduce the power dissipation in amplifiers when surveillance is used, the Amplifier Surveillance Board (LBB 1368/00), the Loudspeaker Surveillance Board (LBB 1367/00) and the Pilot Generator Card (LBB 1369/00) have been modified. The modification enables a 20kHz 'burst-pilot-tone' to be used instead of a continuous 20 kHz 'pilot-tone'. This feature can be selected by a jumper located on the Pilot-tone Generator Card. The modified type number versions are compatible with previous versions and can be used all together in a single system.

Modification to Amplifier Surveillance Board LBB 1368/00
The 20 kHz detection circuit, built around TS32 is additional for the burst-mode. The relay K1 has been changed into a 'make-and-break' contact relay. The modifications are implemented in the factory from serial number 7238 onwards.

Modification to Loudspeaker Surveillance Board LBB 1367/00
The 20 kHz detection circuit, built around IC1 has been modified for the 'burst-mode'. The modification has been implemented in the factory from serial number 19366 onwards.

CONTROL RELAY CARD LBB 1356



5.7 Control Relay Card - CRC LBB 1356

Eurocard 10 x 22 cm with an 'a b' connector (2 x 32) containing 8 make and 8 break contacts to activate external warning devices. The contacts are activated by the CPC via the internal communication bus.

A Control Relay Card (CRC) has 8 'make' and 8 'break' contacts which give the system the facility to switch on remote warning lamps and buzzers, or in a more sophisticated system, to activate a personal pager, etc.. This feature is of great importance in situations where system faults must be clearly indicated and speedily investigated.

A CRC's position in the system, and the functions it carries out are defined by the "address" it is given. This address setting is accomplished by repositioning jumpers on the Control Relay Card itself (see circuit board layout).

A CRC with its function switch in the 'unlocked' (U) state (position a-b), and address 1 (this is standard upon delivery in the Basic System) provides a number of useful functions:

Relay set 1 activated when any error occurs.

Relay set 2 activated when an ASB or LSB error occurs.

Relay set 3 activated when an external error occurs.

Relay set 4 activated when an internal system error occurs.

Relay set 5 activated when a printing I/O error occurs.

Relay set 6, 7, and 8 not used

The CRC's which have their function switches in the 'Locked' (L) state (position a-c) are dedicated to indicating errors on the corresponding Surveillance Switch Card (SSC) Test Lines.

The CRC with address L1 therefore indicates faults on the SSC with the corresponding address L1. Every relay of the CRC indicates errors on the corresponding Test Line. E.g. relay 6 of CRC with address L1 indicates errors on Test Line 6 of SSC with address L1, etc.

Up to four 'Locked' CRC's may be used in an SM40 Surveillance System (see the System examples at the end of this chapter for typical applications).

Because the CRC is unique in having two relays for each circuit, the possibility exists to connect both a red 'Error' lamp, and a green 'Functioning' lamp as an external display.

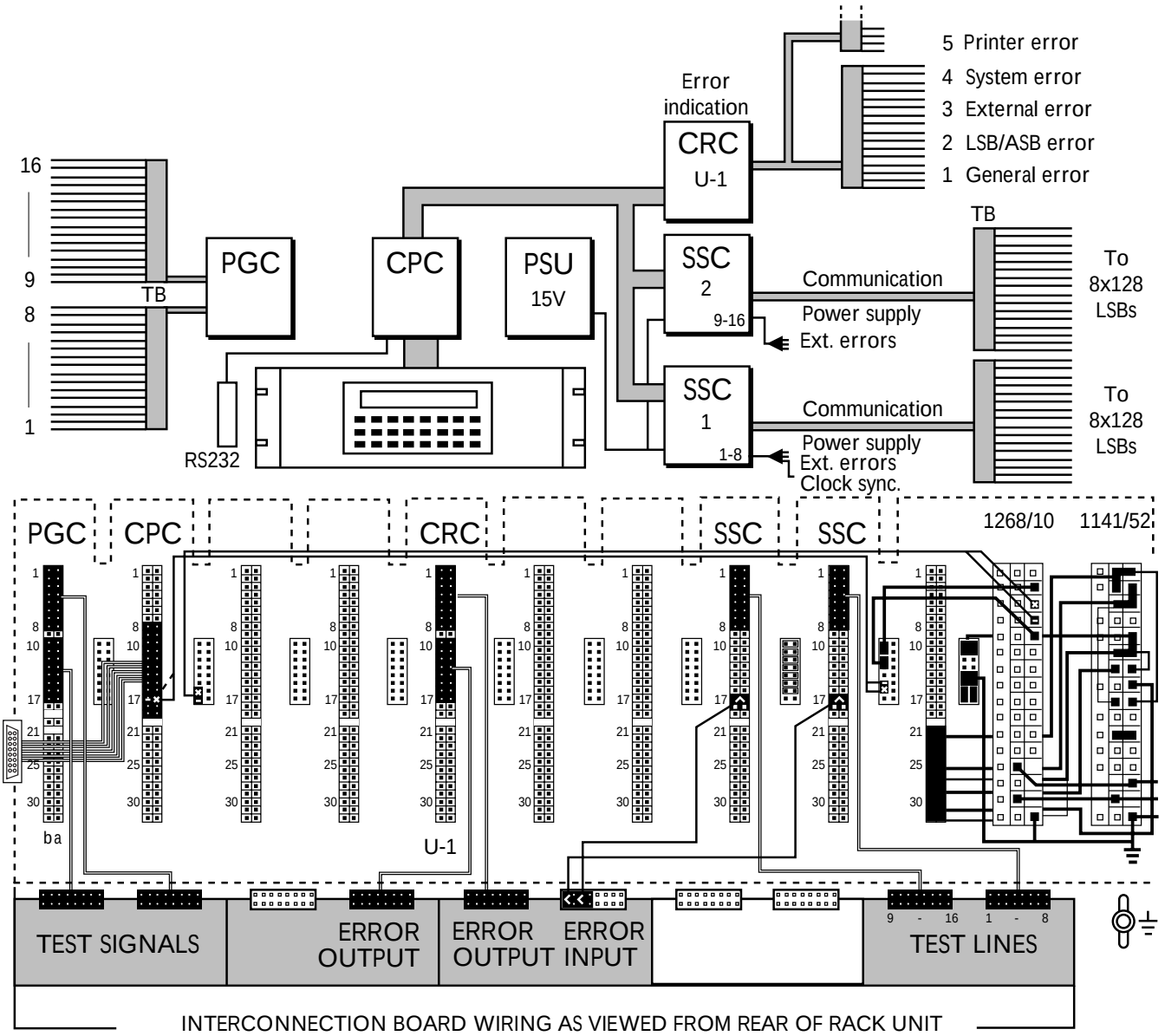
The red lamp should be connected to the make relay contact which is open when the CRC is not activated, and the green lamp should be connected to the break relay contact which is closed.

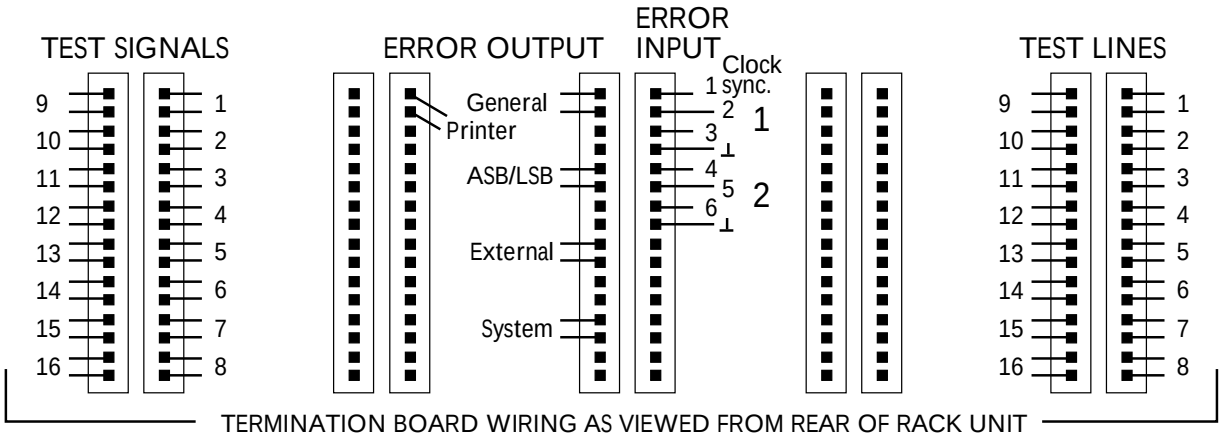
All connections to and from the CRC are made via the Interconnection Board and Termination Boards (see chapters 5.1 and 5.2 and the System examples at the end of this chapter).

A yellow led on the front edge of the card indicates that the CRC is in communication with the Central Processor Card (CPC) and the 3 green leds indicate that adequate supply voltages are present.

SM40 SURVEILLANCE SYSTEM

A

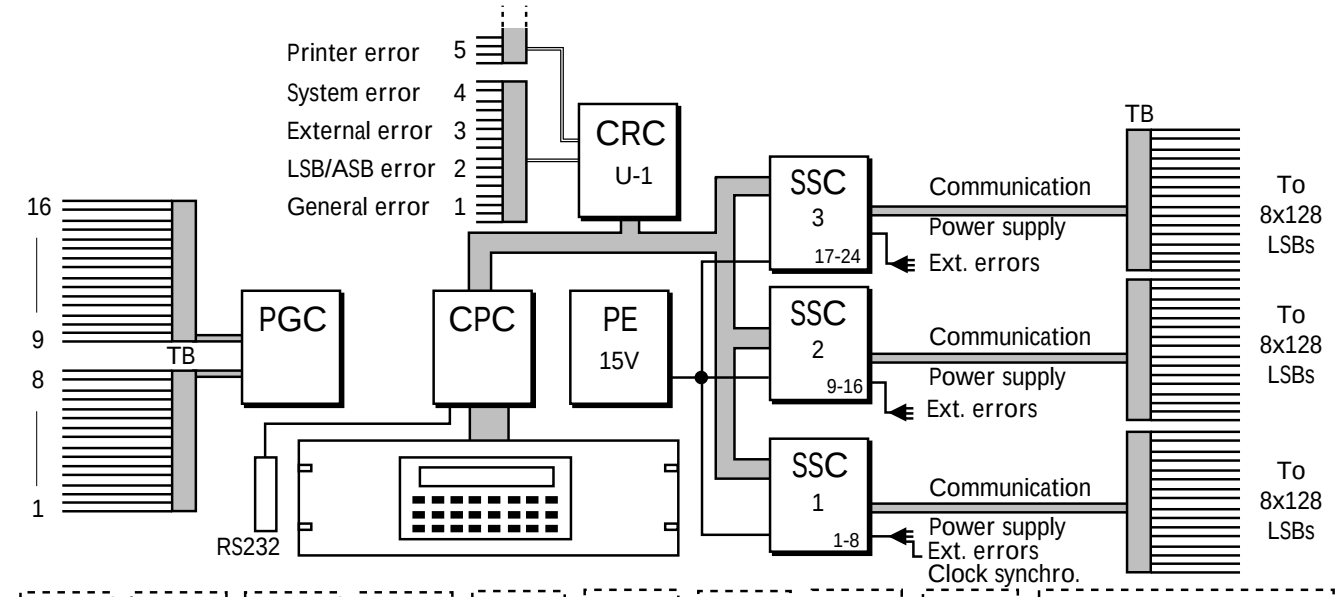


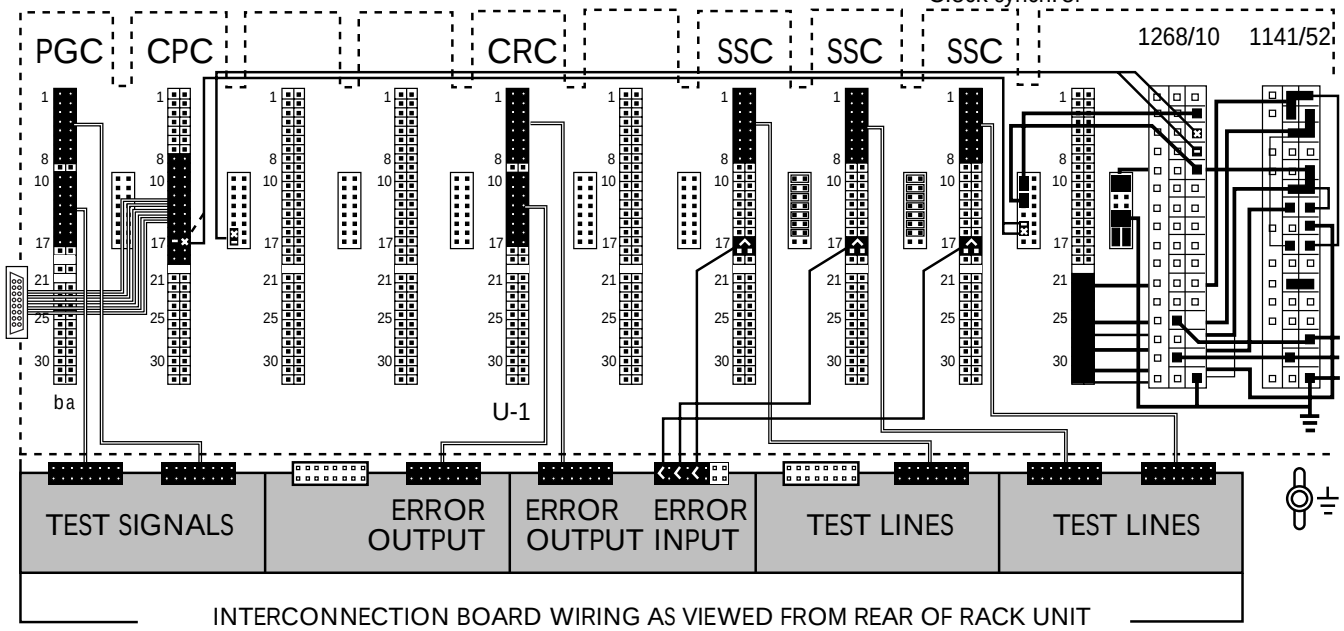


5

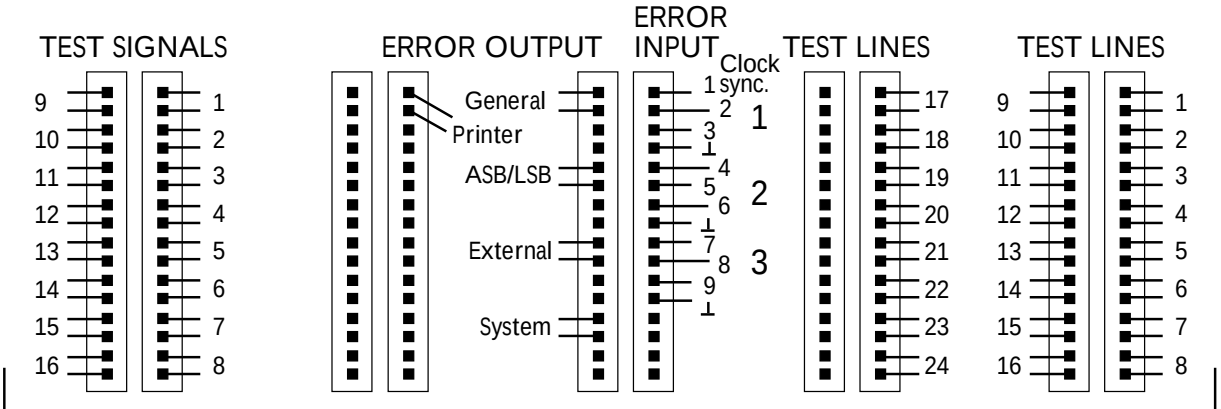
SM40 SURVEILLANCE SYSTEM

B





INTERCONNECTION BOARD WIRING AS VIEWED FROM REAR OF RACK UNIT

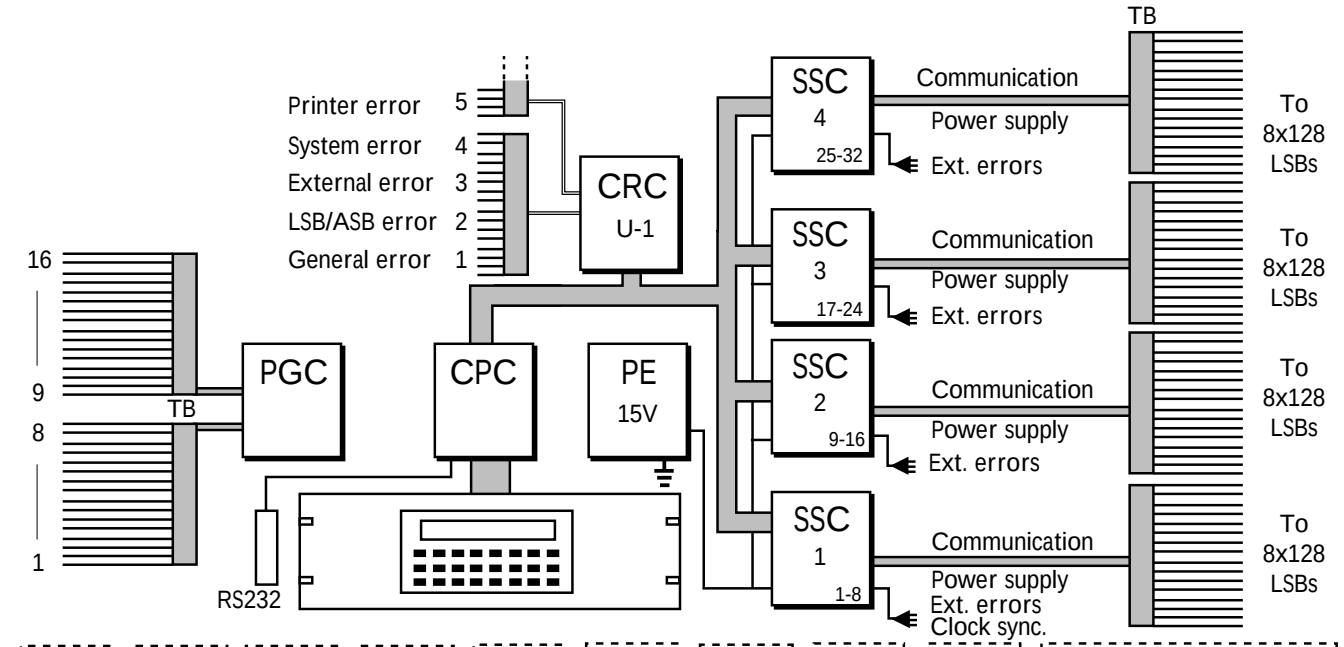


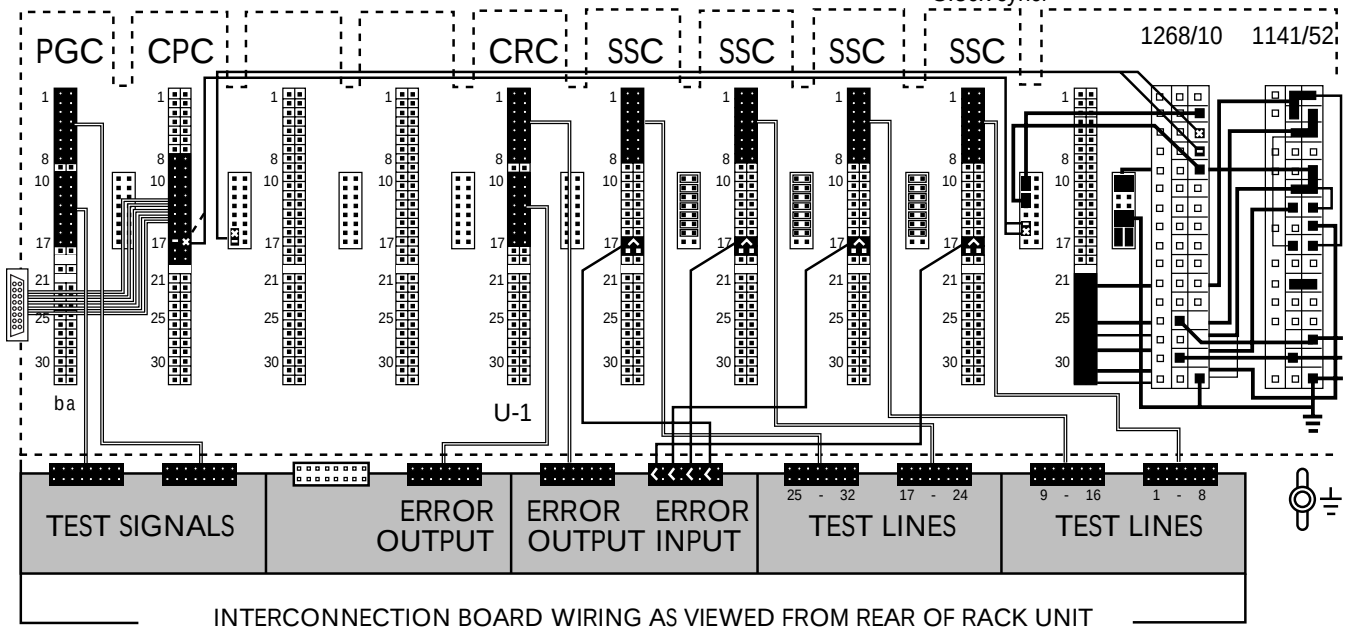
TERMINATION BOARD WIRING AS VIEWED FROM REAR OF RACK UNIT

5

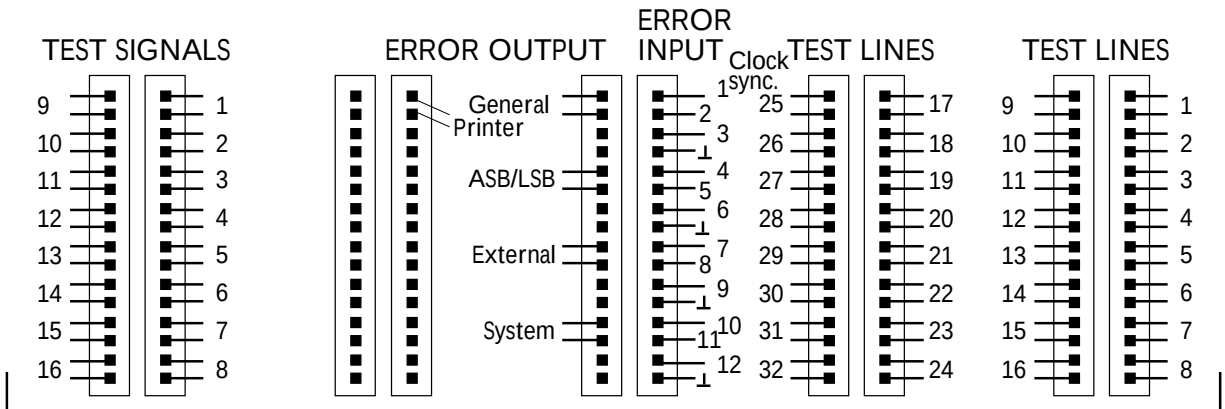
SM40 SURVEILLANCE SYSTEM

C





INTERCONNECTION BOARD WIRING AS VIEWED FROM REAR OF RACK UNIT

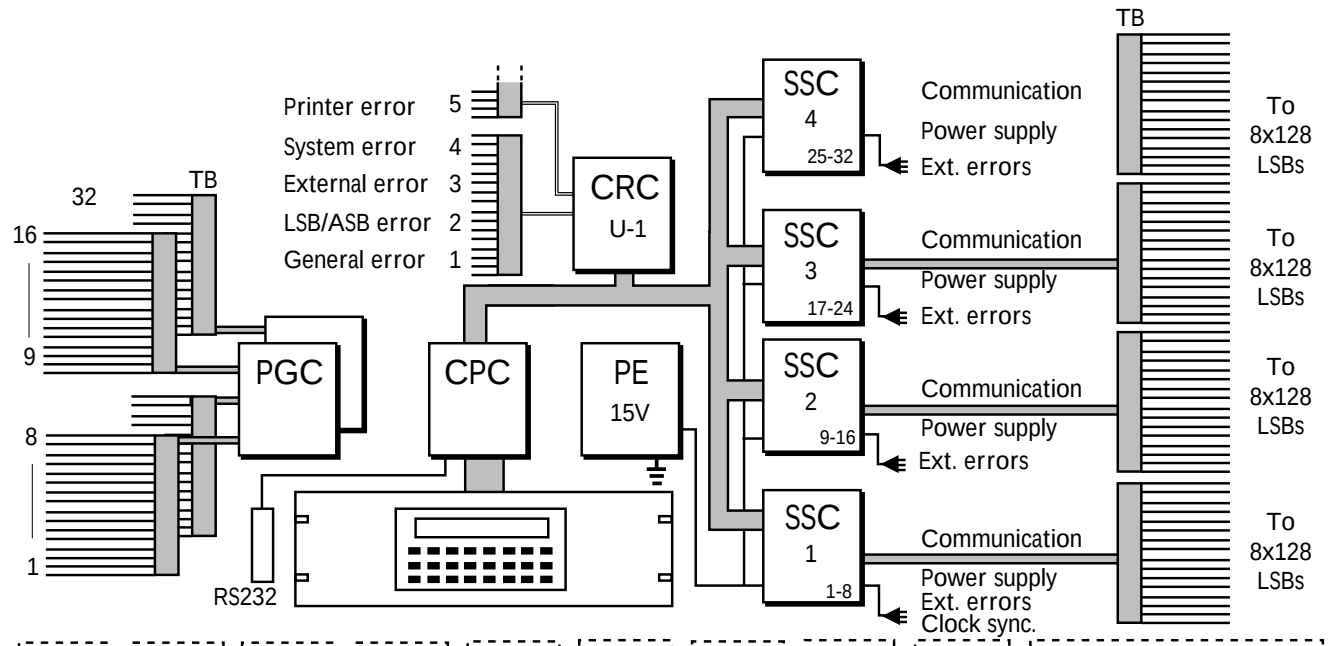


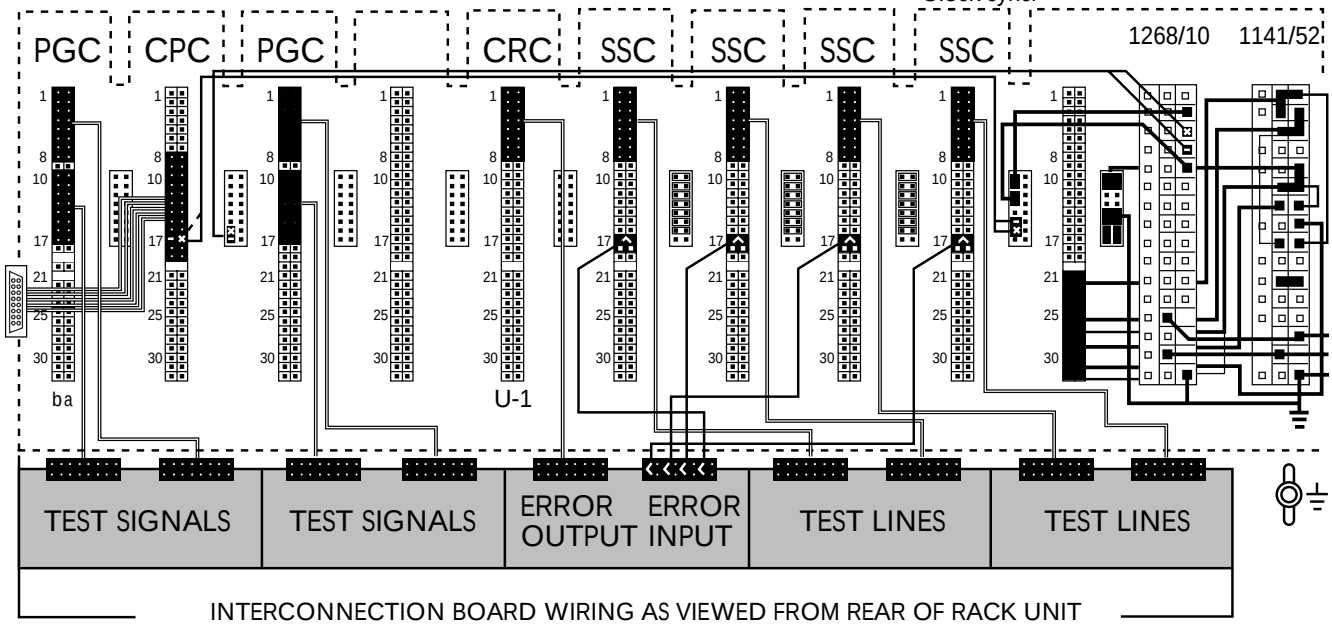
TERMINATION BOARD WIRING AS VIEWED FROM REAR OF RACK UNIT

5

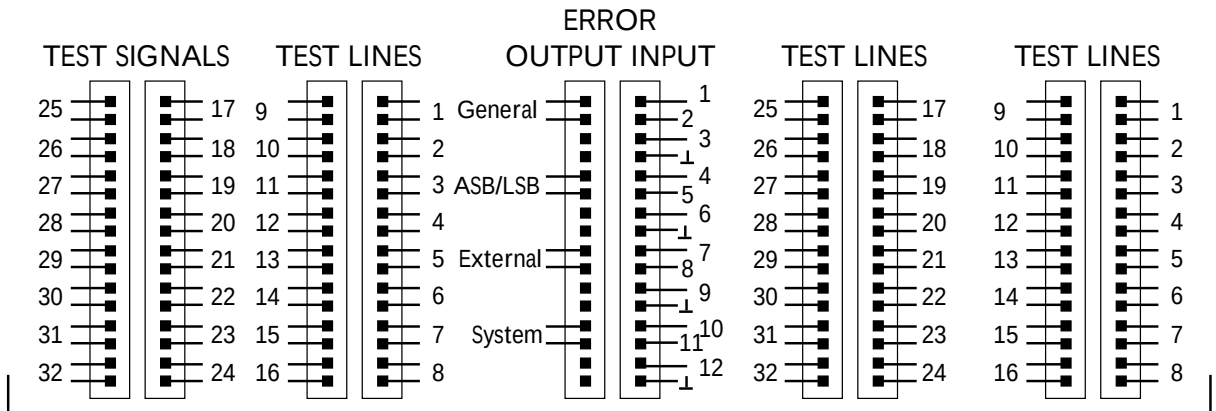
SM40 SURVEILLANCE SYSTEM

D



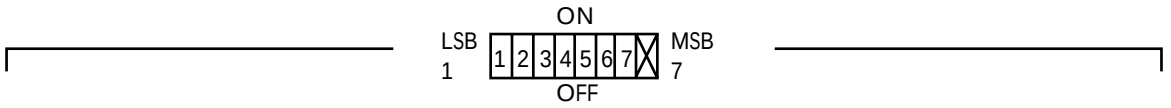


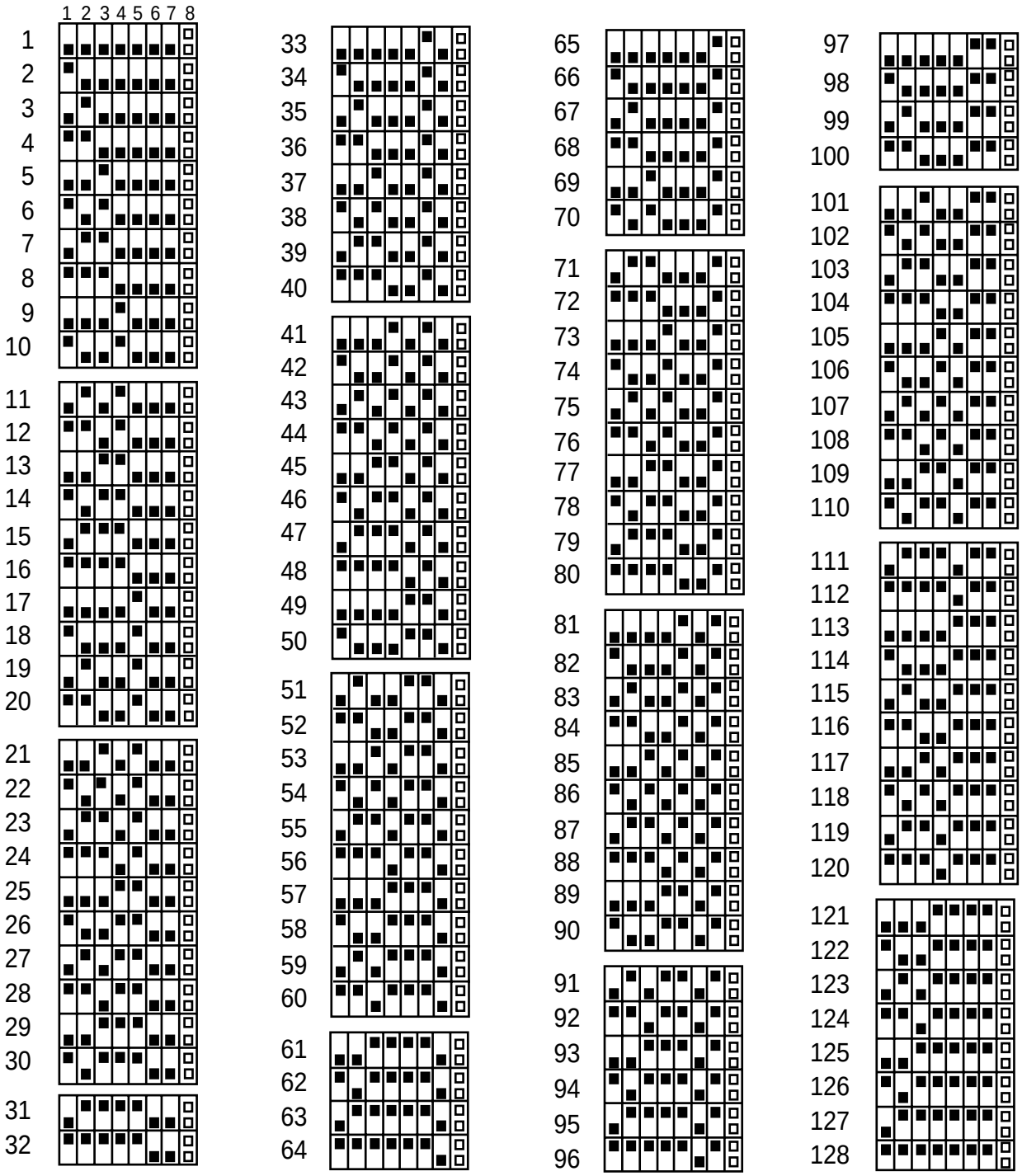
INTERCONNECTION BOARD WIRING AS VIEWED FROM REAR OF RACK UNIT



TERMINATION BOARD WIRING AS VIEWED FROM REAR OF RACK UNIT

SM40 SURVEILLANCE SYSTEM
ADDRESS SETTING ON THE LSB and ASB





GENERAL TECHNICAL SPECIFICATIONS

SUPPLY

Mains voltage		: 220 V (175 - 264 V) 110 V (90 - 140 V) (by strapping) 47 to 440 Hz
Power consumption		: 245 VA (fully loaded frame)
Battery backup time		: 30 days
Safety standard		: According to IEC 65

ENVIRONMENTAL CONDITIONS

Temperature		: +5 to +55°C

MECHANICAL

Dimensions	(rack frame) (circuit cards)	: 483 x 335 x 133 (w x d x h) : 1.6 x 220 x 100 mm
Weight		: 6.8 kg

SM40 BASIC SURVEILLANCE SYSTEM TECHNICAL SPECIFICATION OF COMPONENTS

	SUPPY CURRENT (mA)			DIMENSIONS (mm)			WEIGHT (grams)
	+15V	-15	+5V	W x	D x	H	
Basic frame	-	-	-	483	335	133	6800
Extension frame	*	*	-	483	335	133	5530
Pilot tone generator card	25	25	-	100	220	15	127
Surveillance switch card	-	-	12	100	220	15	114
Amplifier surveillance switch card	≤5	-	-	72	65	17	34.5
Loudspeaker surveillance board	≤5		-	80	60	17	32
-							
Control Relay Card	105	105	10	100	220	15	183

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