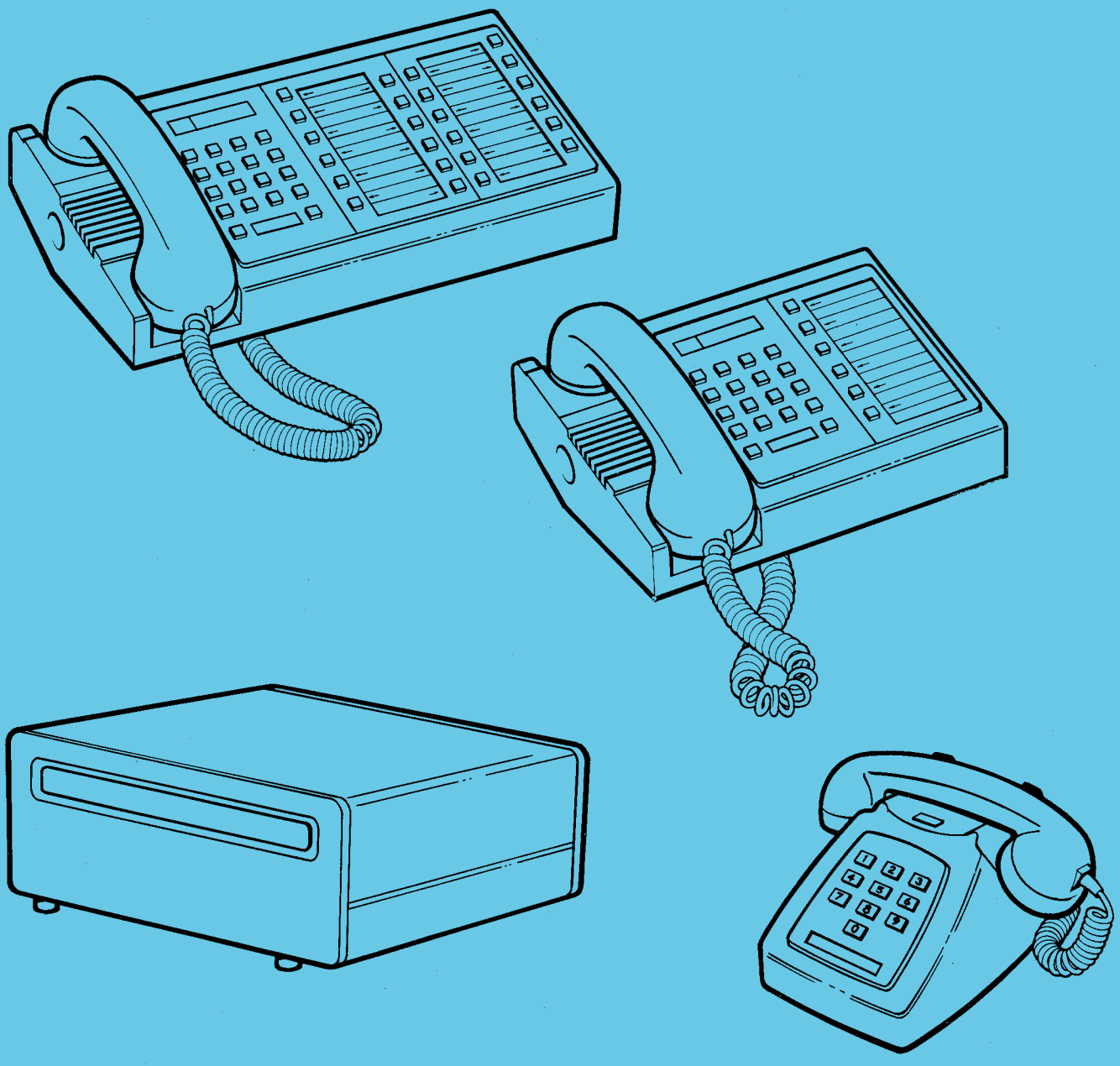
TETC COURSE STUDENT HANDBOOK

Pentara 100

Formerly Herald S 5012/B8 - Herald 'C'



British TELECOM

TRAINING & EDUCATION DIVISION

ISSUE 1

PENTARA 100
(formerly HERALD S 5102/B8 - Herald `C')

TRAINING DOCUMENT

CONFIDENTIAL INFORMATION - NOT TO BE SHOWN OUTSIDE BRITISH TELECOM

This document was produced at Harrogate TETC for TD 7.3.8.F as an integral part of the E2 - 0 - 178/9 Engineering Training courses. The document has been subsequently ammended at BTTC Bletchley Park

Whilst all possible care has been taken in the preparation of this document, there may be some inaccuracies. Therefore, if you have any constructive comments about the document please notify the Herald Training Group at BTTC Bletchley Park. The document is subject to change without notice.

B.T. MERLIN reserves the right to make changes without notice to the equipment which the document describes.

INDEX

DIFFERENCES BETWEEN HERALD S 5102 AND PREVIOUS PROCESSORS

Herald B8 Processor is used to give enhanced facilities on existing hardware. The table below compares the B8 with previous Herald processors.

ITEM	"A"	"B5"	"B8"
PROCESSOR	8085(8 bit)	8085(8 bit)	8088(16 bit)
CLOCK	2MHz	2MHz	12MHz
PROM (executive)	16Kbytes	24Kbytes	128Kbytes
EAROM	1K+4Kb (mem extn)	———	———
EEPROM	———	6-12Kb (plug in proms)	12Kb (plug in proms)
RAM	1K+2Kb	8Kb	24Kb
CONFIGURED BY	H3S	H3S	HDS or self configuration
CALL LOGGING	none	limited	full (requires call logging card)

HERALD B8 PROCESSOR COMPATIBILITY

The B8 processor is compatible with all existing Herald hardware and the new Herald S 5102 interfaces.

HERALD S 5102

The above information relating to the Herald B8 is also relevant to the Herald S 5102 control card which additionally provides tone and ringing current generation (thus combining the processor and tone card into a single CONTROL CARD). To enable tones to be distributed throughout the system crosspoint chips are also provided on this card.

HERALD S 5102 CONTROL CARD COMPATIBILITY

The Herald S 5102 control card is compatible with the Herald S 5102 hardware and all existing Herald interfaces. Not compatable with `A´ and 100B backplanes.

2. SOFTWARE CHANGES

The Herald `A´ and `100B´ systems were configured by C.W.G (data entry) using computers and floppy discs containing "Herald Software Support System (H3S)" files. The HERALD S 5102 control card and the Herald B8 processor can be self configured in two basic modes, P.A.B.X or KEYSYSTEM. These two options have standard Basic facilities which can then be modified by the customer, programming from terminals, after installation. The first terminal in a SELF CONFIGURED system is the master terminal and is the only terminal able to re-program system parameters: type of terminals, line signalling, extension class of service, etc; These systems can also be fully configured by C.W.G, to meet the customers requirements, using computer programs "Herald Documentation System (HDS)", if a more sophisticated system is required.

The system `SELF CONFIGURATION´ will inspect each logical device fitted and allocate the appropriate logical addresses to each type of card inserted.

3. HARDWARE CHANGES

The following section introduces, and gives a brief description of, the new hardware associated with the Herald S 5102 / B8 systems, and in the case of certain pieces of the hardware the Herald 100B system also.

ITEMS MARKED * WILL NOT BE AVAILABLE FOR THE NATIONAL LAUNCH

The items listed below are contained within this section.

Handle Colours

Box Connexions 335, 336 and 520

Herald Kit No. 1A/C
Herald Kit Nos. 2A, 2B, and 2C

Battery Shelf

New AC/DC P.S.U

Combined P.S.U.

Control Card (Herald S 5102 Processor)

Four Wire Display Terminal Interface

Two Wire Terminal Interface

Full Facility Line Interface

Compact Line Interface

Private circuits

Call Logging Card

External conference card

Options Mother Board (O.M.B.)

Daughter Boards:-

a) M.F.4. receivers

b) Speech Synthesis

c) Music on Hold (M.O.H.)

* d) Modem

* e) Broadcast

Operator's Console

* Low Profile Terminals

Herald HI and LS terminals

3a HERALD ASU HANDLE COLOURS

CARD	BASE COLOUR / STRIPE		LOGICAL ADDRESSES per CARD
2 WIRE TERMINAL I/F	BROWN	RED	8
4 WIRE DISPLAY TERMINAL I/F	YELLOW	RED	4
COMPACT LINE I/F	BLUE	RED	4
FULL FACILITY LINE I/F	BLUE	ORANGE	2
A/C 15 CARD	ORANGE	RED	1
EXTERNAL CONFERENCE CARD	GREY	---	
CALL LOGGING CARD	BLACK	RED	
OPTIONS MOTHER BOARD	NATURAL	BLACK	
B8 PROCESSOR	GREEN	ORANGE	
S 5102 CONTROL CARD	GREEN	YELLOW	
NEW AC/DC P.S.U	WHITE	ORANGE	
COMBINED P.S.U	WHITE	YELLOW	
EXCH LINE CARD	BLUE	---	2
FOUR WIRE TERMINAL CARD	YELLOW	---	4
SSDC5 / SSDC 10	ORANGE	---	2

MAJOR DIFFERENCES BETWEEN HERALD S 5102 / B8 AND PREVIOUS HERALDS

Herald B8 is an engineering enhancement using existing control shelf.
Herald S 5102 is an engineering change of the control shelf hardware.

The major differences between the Herald S 5102 and previous Heralds are as follows :-

1) Processor / Control card
2) New backplane
3) Combined power supply unit
4) No tone card
5) Tones fed from Control card
6) Ringing supply fed from combined PSU
7) Eight I/F slots are now available in the control shelf
8) 50 wire cord required for three additional I/F cards (PLZ)
9) Two new box connexions (335 single shelf & 336 two shelf)
10) Enhanced facilities

ITEM DESCRIPTION	ITEM CODE	REMARKS
KIT SBS NO. 1	373276	CONTROL SHELF
HERALD KIT No 1A/B5	374508	CONTROL SHELF SUPERSEDES ABOVE
HERALD KIT No 1A/C	374738	CONTROL SHELF
HERALD KIT No 2A	373277	EXTENSION SHELF
HERALD KIT No 2B	374739	EXTENSION SHELF
HERALD KIT No 2C	374772	EXTENSION SHELF
100 WAY CABLE	512215	
B8 PROCESSOR	374711	ASU 1A1/SA 20551
CONTROL CARD (C)	374712	ASU 1A1/SA 20552
COMBINED PSU	374714	ASU 1A1/SA 20553
NEW AC / DC P.S.U.	374713	ASU 1A1/SA 20554
EXCH.BOARD CURRENT	373281	ASU 1A1/SA 20008
EXCH.BOARD F/F	374715	ASU 1A1/SA 20558
EXCH.BOARD COMPACT	374716	ASU 1A1/SA 20559
EXTN.BOARD CURRENT	373279	ASU 1A1/SA 20006
EXTN.BOARD (4P+D)	374717	ASU 1A1/SA 20557
EXTN.BOARD (8P)	374718	ASU 1A1/SA 20556
OPTION MOTHERBOARD	374721	ASU 1A1/SA 20565
SPEECH SYNTHESIS	374719	HERALD CARD SA 20567
MF4 RECEIVER	374722	HERALD CARD SA 20566
MUSIC-ON-HOLD	374723	HERALD CARD SA 20568
MODEM OPTION	374724	HERALD CARD SA 20569
BROADCAST OPTION	374725	HERALD CARD SA 20571
CALL LOGGING	374726	ASU 1A1/SA 20572
EXTNL CONFERENCE	374744	ASU 1A1/SA 20011
SSAC-15 CARD	374720	ASU 1A1/SA 20555
SSDC-5A/10A CARD	373282	ASU 1A1/SA 20010
BATTERY SHELF & ALARM CARD	374742	EQUIPT.1/SA 20573
BATTERY PACK	374743	BATTERY SECONDARY NO.30

STANDBY BATTERY SHELF

The standby power for the System is provided by the addition of a further shelf to the existing Control and Extension shelves (if fitted.)
This STANDBY BATTERY SHELF is similar in appearance to and is mounted beneath the existing units to maintain a single column, the floor weight carrying capability must be taken into account prior to installation.
The Standby Battery Shelf has provision for one AC/DC power unit, one Alarm / protection card and a maximum of 3 batteries.

The more batteries that are fitted the longer the standby time of the system under conditions of mains fail, however the recharge time is also increased. The table below gives approximate standby times for different size systems.

TOTAL NUMBER OF BATTERIES	1	2	3
	APPROXIMATE STANDBY TIME IN HOURS AT 0.1 ERLANGS / LINE		
CONTROL UNIT	2	4	6
CONTROL + 1 EXTN UNIT	1.3	2.6	4
CONTROL + 2 EXTN UNITS	0.6	1.3	2

During normal operation the batteries are kept charged by the mains power supplies in the system.

BATTERY SHELF

A shelf which may contain an AC/DC power unit (to reduce recharge times), and must contain an alarm / protection card for control of the batteries, as well as modular sealed (maintenance free) plug in battery units. Each plug in battery unit has a capacity of five ampere hours (5Ah). The battery shelf will accomodate three such units giving a capability of 15 Ah per shelf. Each battery has a maximum output power of 500W at a nominal voltage of 42V. During normal operation the batteries are float charged across the 50v supply (from either the power units in the equipment shelf/s or the one provided in the battery shelf). Will not be sold for connexion to existing A or B systems.

ALARM/PROTECTION CARD

This card is always fitted to the battery shelf and ensures that under conditions of battery operation the batteries are switched off before they are exhausted thus preventing damage. This card extends the power fail alarm to the operators console if fitted.

ALARM INDICATIONS

The following will bring in the battery alarm on the operators console:

1. Faulty power supply unit.
2. Faulty, loose or incorrectly fitted harness.
3. Faulty battery.
4. Battery off or low volts

AC/DC P.S.U

There is provision for the fitting of an AC/DC P.S.U to the standby battery shelf, to provide faster recharge of the batteries in between periods of power supply failure.

FLOOR LOADING

Due to the weight of the batteries it is necessary to ensure that the proposed site of installation is level, stable and capable of withstanding the total weight of the system. The table below gives the weight for each Herald system (fully equipped) shelf.

I/F SHELVES	MAXIMUM WEIGHT (Kgs)
Control unit	16
Extension unit	18
BATTERY EQUIPMENT	
Shelf (empty)	8
Battery	10
Mains (AC/DC) P.S.U	2
MAXIMUM WEIGHT OF A THREE SHELF SYSTEM PLUS STANDBY BATTERY SHELF	
92 Kgs	

MAINS
SUPPLY

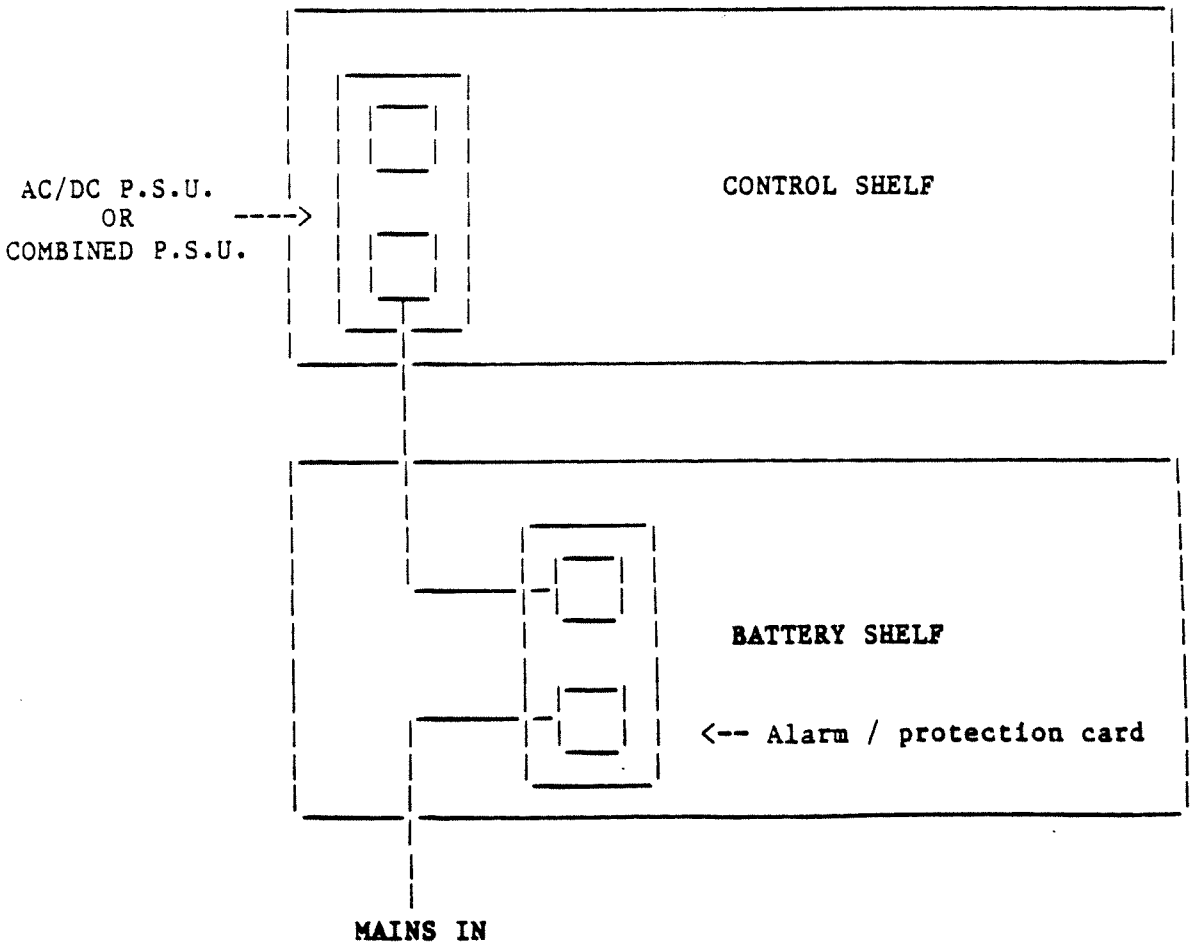
A mains supply rated at 13 amp / 240v a.c. will support four P.S.U s in one system. This allows for a three shelf system with a standby power supply. When battery standby is required the new versions of the P.S.U.s must be fitted (combined P.S.U or new AC/DC battery support P.S.U.)

ASSEMBLY

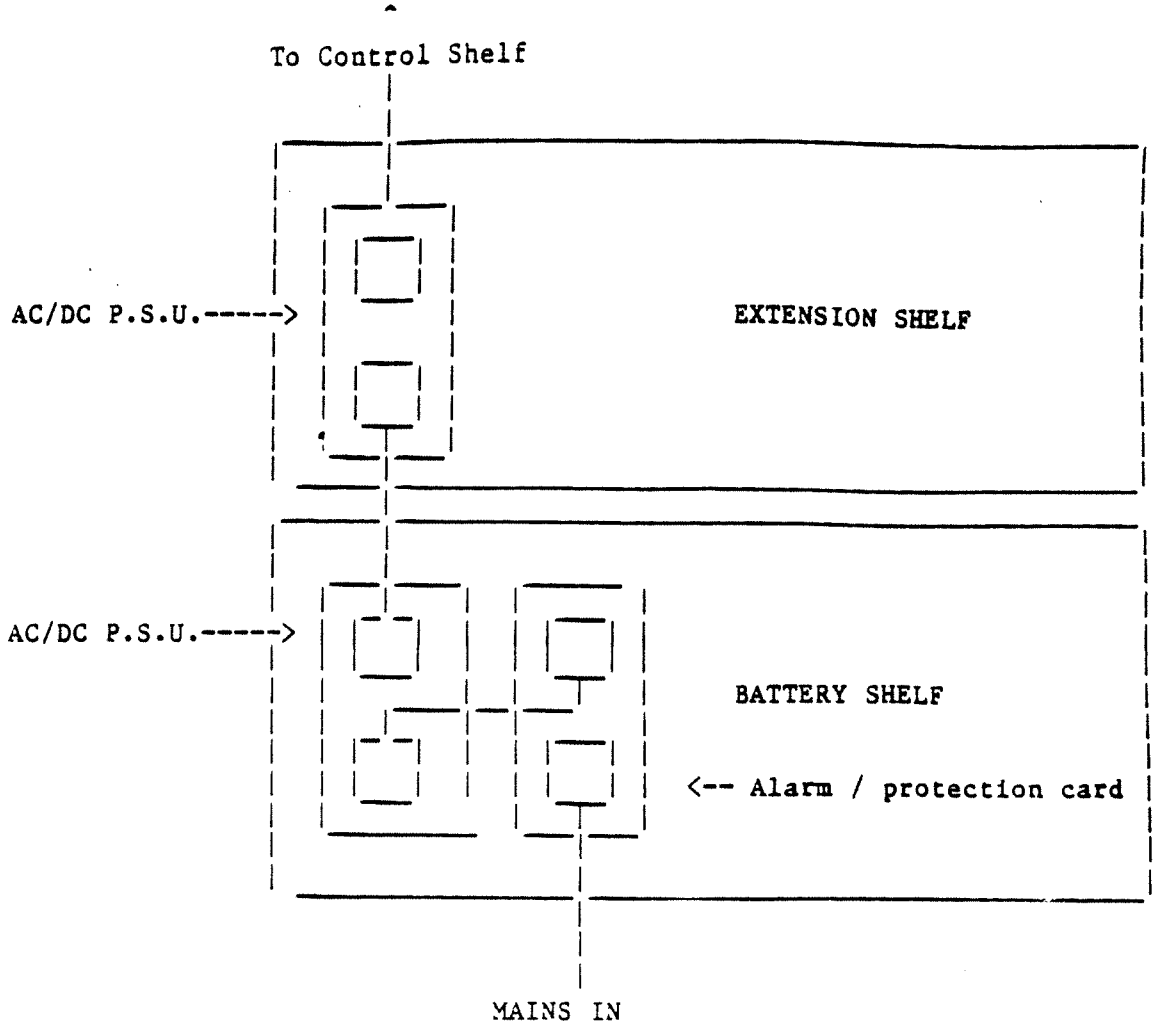
Mount the standby battery shelf underneath the system control / extension shelf(s). Mains cable must enter Alarm / Protection card first. Connect the cabling to the rear of the shelves as shown in the following diagrams:-

INTERCONNECTION OF MAINS SUPPLY TO HERALD S 5102 SYSTEMS

NO AC/DC P.S.U. FITTED TO STANDBY BATTERY SHELF

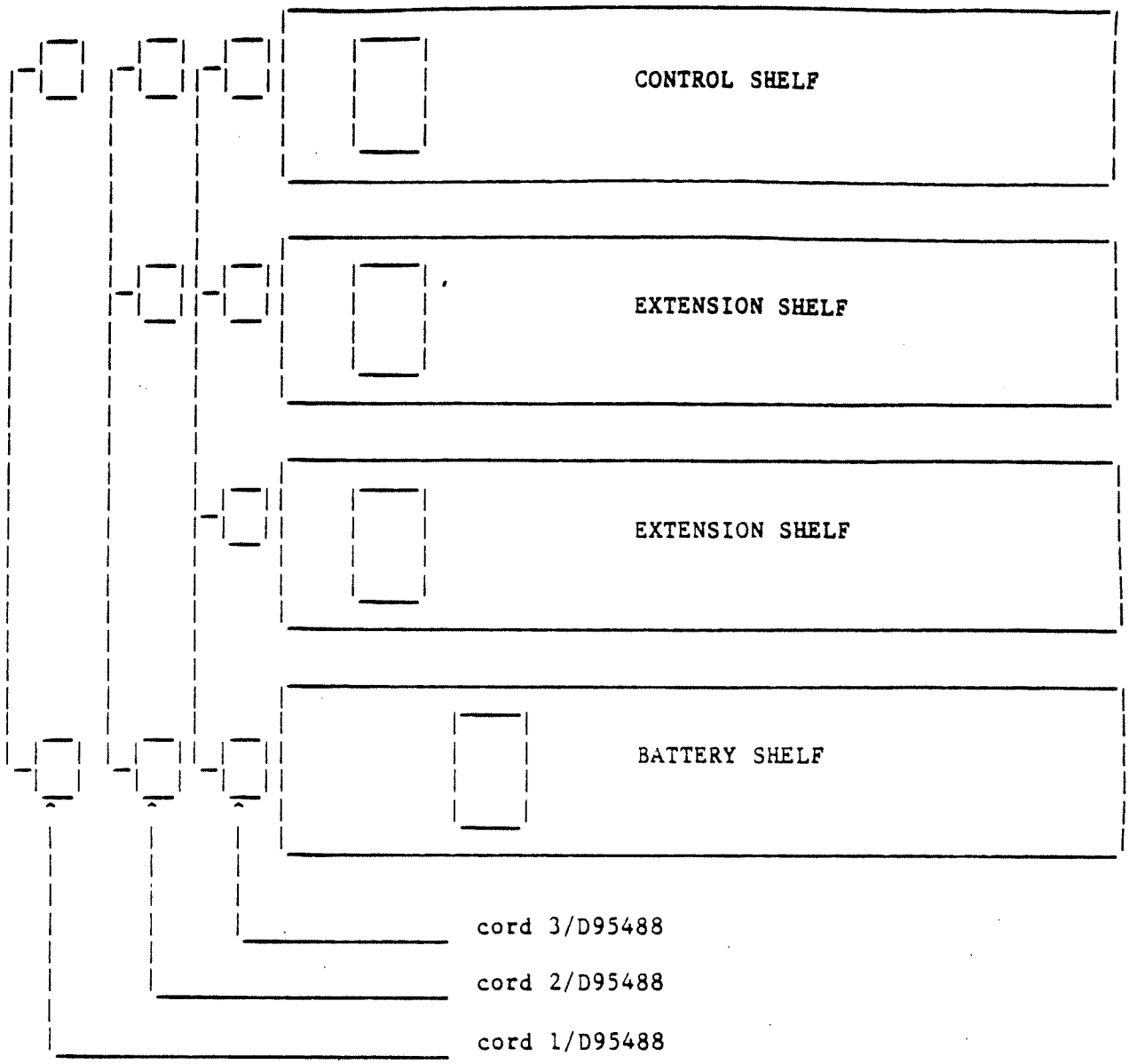


AC/DC POWER UNIT FITTED TO STANDBY BATTERY SHELF



The above diagrams show the mains cable assemblies required for different system configurations. **N.B. the mains cable always enters at the battery shelf and is connected directly into the Alarm / Protection card.** It is then fed from this card into its AC/DC P.S.U.(if fitted) and then into the power supply unit of the next shelf above.

INTERCONNEXION OF THE 50V BATTERY SUPPLY ON THE HERALD S5102 SYSTEM



The above diagram shows the interconnexion of the 50v battery supply leads and the necessary connexion cords for a one, two or three shelf system.

Because the unit connexions now comprise of mains and battery cables, the strain relief clamp on all units except the battery supply unit must be replaced by the `P´ clips supplied with the battery shelf. The `P´ clips then house both sets of cables. One of the strain relief clamps recovered from the equipment shelves should now be fitted to the battery shelf to secure the incoming mains cable.

INSTALLING THE BATTERIES

Before Installing the batteries measure the voltage of each battery at the test socket mounted on the front panel. With the switch in the ON position the reading should be no less than 42 volts. If it is, or if the battery is outside its "In service by date" then recharge the battery.

Prior to inserting the batteries ensure that the switch is in the OFF position. Insert the batteries in their respective positions. Now switch on batteries.

REMOVING THE AC/DC PSU AND ALARM/ PROTECTION CARD

WARNING: Before removal of the AC/DC P.S.U. and the Alarm/Protection card, ensure that the switch on the battery unit is in the OFF position and that the incoming mains supply to the system has been isolated.

The locking latch for securing the batteries,AC/DC P.S.U. and Alarm/Protection card is different to that employed in the control and extension units.

The locking latch is released by pressing the hinged levers situated in the inside top centre of the unit. The right hand lever releases all equipment to the right of centre, the left hand lever releases the remainder.

Before removing the AC/DC P.S.U or Alarm/Protection card, disconnect the mains and 50v interconnect cables from the rear of the units.

REMOVING THE BATTERIES

To remove the batteries it is essential that the following sequence be adopted:

1. Switch the battery OFF using the switch on the front of the battery.

2. Grip the battery handle and withdraw the battery from the shelf until the lug on the top of the battery catches on the locking latch mechanism.

3. Press the latch lever and withdraw the battery completel from the shelf, taking care to ensure that its weight i adequately supported as it is withdrawn.

TESTING AFTER INSTALLATION

When all batteries are installed, switch on the battery unit. Check for correct operation of each battery by switching each one on independently to power up the system and perform sufficient tests on the system to establish that it is functioning. Repeat this for each battery.

Correct operation of the Alarm / protection card is essential to protect the batteries from becoming exhausted under conditions of power failure. To test the Alarm / protection card, switch OFF all batteries except one and monitor the voltage across that battery whilst it is powering the system. This voltage will eventually drop below 40v at which point the Alarm / protection card will disconnect the battery, and therefore power down the system.
Reconnect the mains supply to the system and allow the battery used in the test to recharge for at least half an hour before switching on the other batteries.

NEW AC/DC POWER UNIT (white/orange)

May be used in place of existing AC/DC power units on Heralds, and also on the extension shelf of Herald S 5102 systems, in which case it can also be used to charge the battery shelf. There are no fuses on the power unit. Two test jacks, plus 50 V and minus 50 V, are fitted (the two negative voltages being combined and the ringing supply voltage being raised to plus 50V). This unit gives improved -50v regulation and performance. A socket is provided at the rear of this unit for battery charging.
Compatible with all Herald systems.

COMBINED POWER SUPPLY UNIT (white / yellow)

This PSU is a combination of the AC/DC and the DC/DC power units found on previous Herald systems and fits only in the top shelf (control unit) of a Herald S 5102 system. In addition to providing the DC power for the system this PSU also provides the following features, improved voltage regulation and performance, ringing current supply and ability to float charge batteries. The mains input is selectable in the ranges 110/120 and 220/240 A.C. There are no external fuses on the unit, all protection being internal, entry into the unit is forbidden. At the rear there is a socket, used to connect the PSU to the battery shelf if fitted, for charging the batteries. A safety interlock is provided to ensure that the PSU cannot be removed without the mains and battery power leads being disconnected first.
(See Appendix A for Voltage Tolerences)

CONTROL CARD (green / yellow)

Is a combined processor and tone card and has crosspoint chips (TMC 1505) on it. There is an audio input to the balanced termination for internal music on hold if required, which must be an electronically generated source to avoid the possibility of causing damage to the crosspoint chips on this card. The processor is an 8088 (16 bit internal) as on the Herald B8. Tones and ringing originate on this card. The tones are fed as required onto the highways via the crosspoint chips, and the ringing is fed into the combined power unit at about 2V to be amplified then fed out onto the backplane.

FOUR WIRE DISPLAY TERMINAL INTERFACE CARD

(4 ccts per card) (yellow / red)

This I/F features enhanced transmission on extn to extn and extn to exchange calls { less than 1dB }. The ringing is electronically applied giving silent and more reliable operation. A busy peg is incorporated for maintenance purposes. Will accommodate loop disconnect or MF4 signalling if an options mother board with MF4 receiver circuits is fitted. Also has increased data transmission capacity to enable it to drive terminals having the display facility.
Compatible with all Herald systems.

TWO WIRE TERMINAL INTERFACE CARD
(8 ccts per card)
(brown / red)

This gives eight circuits per card , there is a current limit of 35 - 45 mA which gives a route distance of up to 2.0 Km on 0.5mm Copper, also features enhanced transmission on extn to extn and extn to exchange calls { less than 1dB }. The ringing is electronically applied giving silent and more reliable operation. A busy peg is incorporated for maintenance purposes. Will accommodate loop disconnect or MF4 signalling if an options mother board with MF4 receiver circuits is fitted.
This I/F card is compatible with Herald S 5102 / B8 systems only.

FULL FACILITY EXCHANGE LINE INTERFACE CARD
(2 ccts per card)
(blue / orange)

Provides additional facilities to those on existing line interface cards, especially those required for PABX working. Gives, improved ringing / power fail loop detection, earth / loop calling option (achieved by movable links PLE to PLH), earth / timed break recall (achieved by movable links PLC and PLD) and improved dial tone detection. Gives Meter pulse detection, power fail switching of both ccts; improved transmission and ability to park (busy) the board for maintenance purposes. It also allows external M.O.H, in addition to existing facilities eg L/D or MF4 signalling and earth recall.
The Full Facility exchange line I/F card is compatible with Herald A and 100B systems, with loop calling only, and with Herald S 5102 / B8 systems using loop or earth calling to the exchange.

COMPACT EXCHANGE LINE INTERFACE CARD
(4 ccts per card)
(blue / red)

Contains four exchange lines on one card, loop calling, L.D. or M.F.4 signalling and earth recall. Gives improved, ringing/loop and dial tone detection. Provides improved transmission and ability to park the board for maintenance purposes.
NO POWER FAIL CIRCUITRY IS PROVIDED ON THIS CARD.

This I/F card is fully compatible with the Herald S 5102 / B8 systems but on the Herald `A´ and 100B systems only two circuits will work, the other two will be idle.

PRIVATE CIRCUITS

There are three different signalling systems available for private circuits on Herald:-

1. SSDC 5 \
   > These two signalling systems appear on the same card and are selectable. Orange Handle.
2. SSDC 10 /

3. AC 15 — Orange Handle with Red stripe.

SSDC 5. This is a four wire circuit. The first pair for speech (A and B legs), the second pair for signalling (E1 and M1). A maximum of two circuits per card.

SSDC 10. This is a two wire circuit (A and B legs), speech and signalling being transmitted over the same pair. A maximum of two circuits per card.

AC 15. This is a four wire circuit, the first pair being receive (A and B legs), the second pair being transmit (A and B legs). One circuit only per card.

EXTERNAL CONFERENCE CARD (grey)

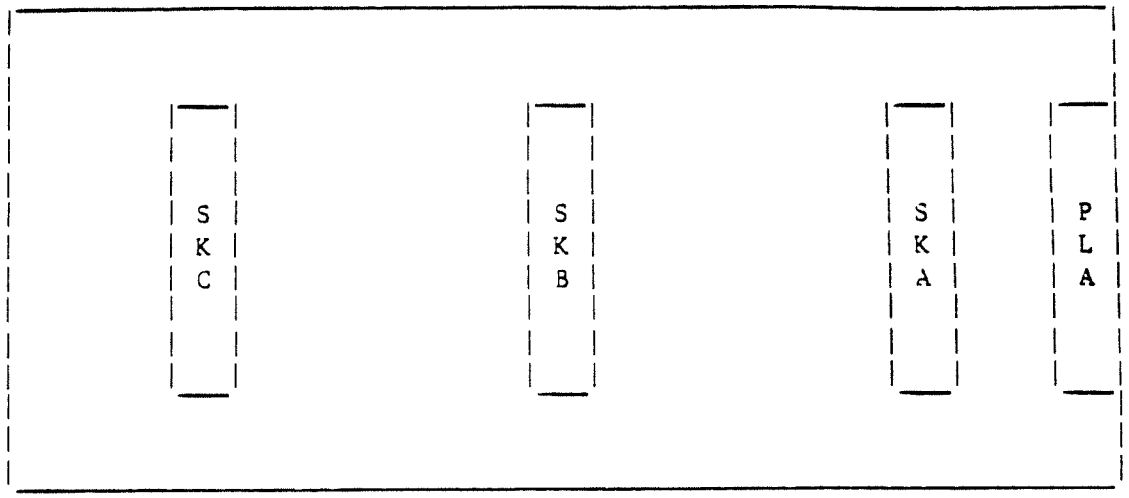
There are two independent circuits on the card both capable of connecting one exchange line and a maximum of five terminals together. The card can also be used with Herald `B5´ but not `A´ processors. There are two sockets and an L.E.D. on the leading edge of the card, the top socket is to busy the circuits out and the bottom socket is the normal (or run) position. When the plug is inserted in the top socket and either one or both circuits are in use the L.E.D. lights to indicate that circuits are in use. When the L.E.D. extinguishes, or does not light on the insertion of the plug, this indicates that both circuits are busied out.
The External Conference card is compatible with Herald 100B, B8 and S 5102 systems

OPTIONS

MOTHER BOARD (natural / black)

This card has positions on it to mount up to three daughter boards.
There are two communications pairs for each daughter board which appear on the Krone strip associated with the O.M.B's position, and are as follows :-

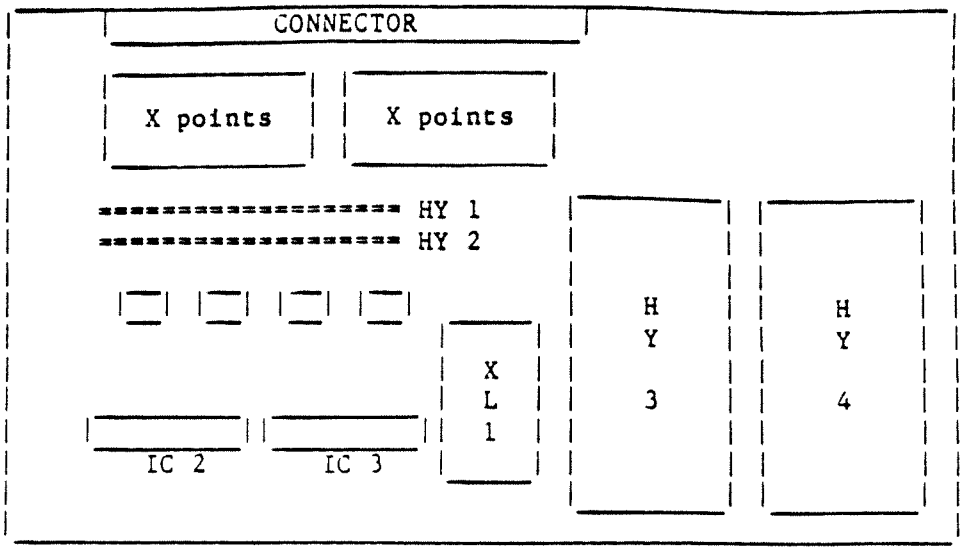
SOCKET	KRONE PAIRS
A	9 & 0
B	7 & 8
C	3 & 4



Five types of daughter board are to be made available :- MF4 receivers, Speech Synthesis, Music On Hold, Modem and Broadcast Boards

M.F.4
RECEIVERS

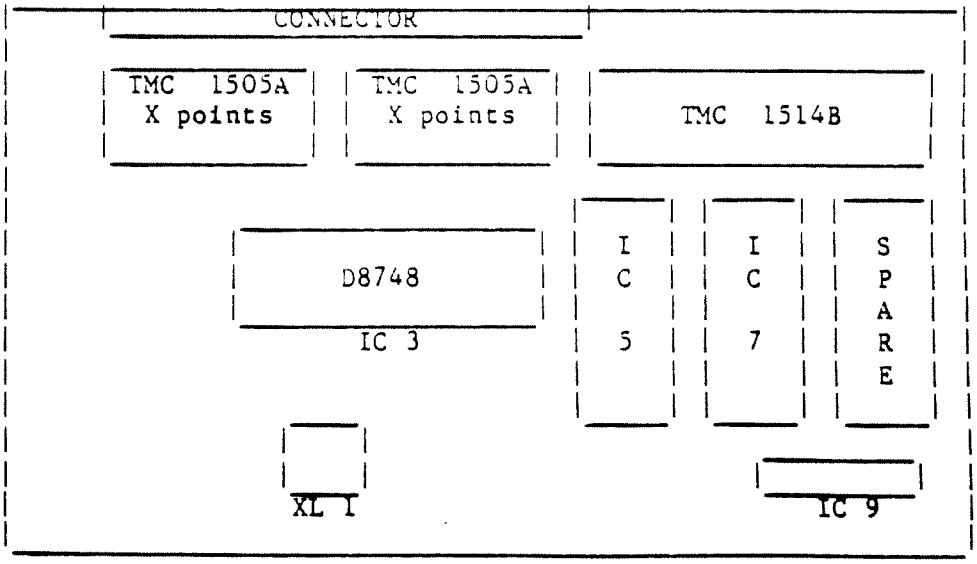
MF4 Receiver with two circuits per board which are used by two wire MF4 telephones. The ccts are only accessed during signalling.



SPEECH
SYNTHESIS

This is likely to be a standard facility, and enables the user to hear what facilities and numbers are stored under each key. Alarm calls and call metering information may also be synthesised later. An example of the electronic message being :-

"Your key is programmed to " - "Sounder on off"
- "No Function "
- "Cancel " etc.



MUSIC
ON HOLD

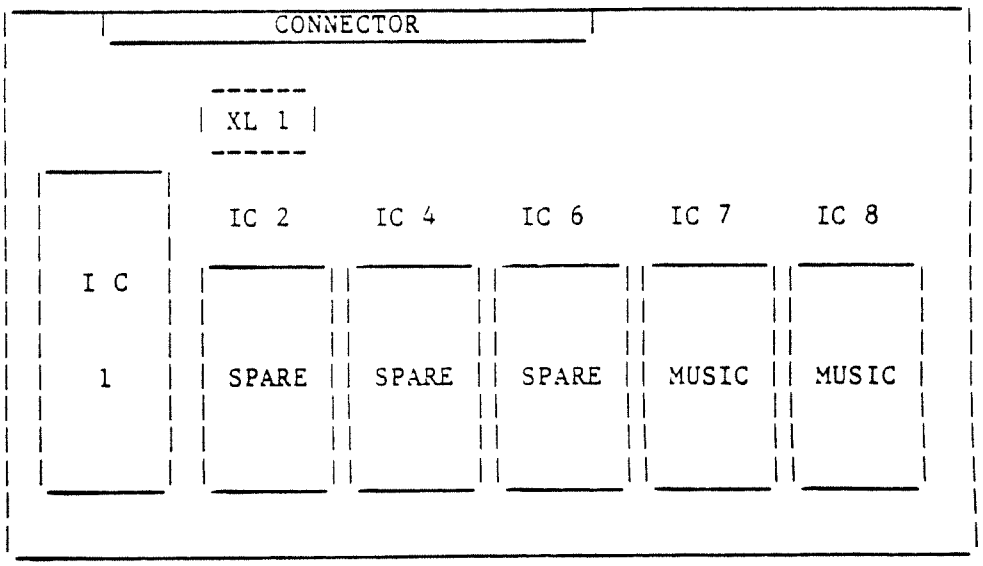
Music On Hold (M.O.H.) is available for external calls which are held by the Herald S 5102. Full facility exchange line I/F cards are required for external M.O.H, also hard wiring in the box connexion is necessary. The Music will appear on the following pairs of the appropriate Krone strip for the O.M.B. on which the M.O.H. daughter board is fitted :-

If the M.O.H. is fitted in :-
SKA of the O.M.B.the music will appear on Pair 9

SKB " " " " " " " " " 7

SKC " " " " " " " " " 3

For M.O.H. jumper source to 2b and 8b on the Krone appearance of all the full facility exchange line I/F cards.



As this board is not inspected during the Configuration or Add-On process, it can provided simply by plugging it into any spare socket of an existing or new O.M.B.
N.B. There is no need to `Add-On´ to provide this board.

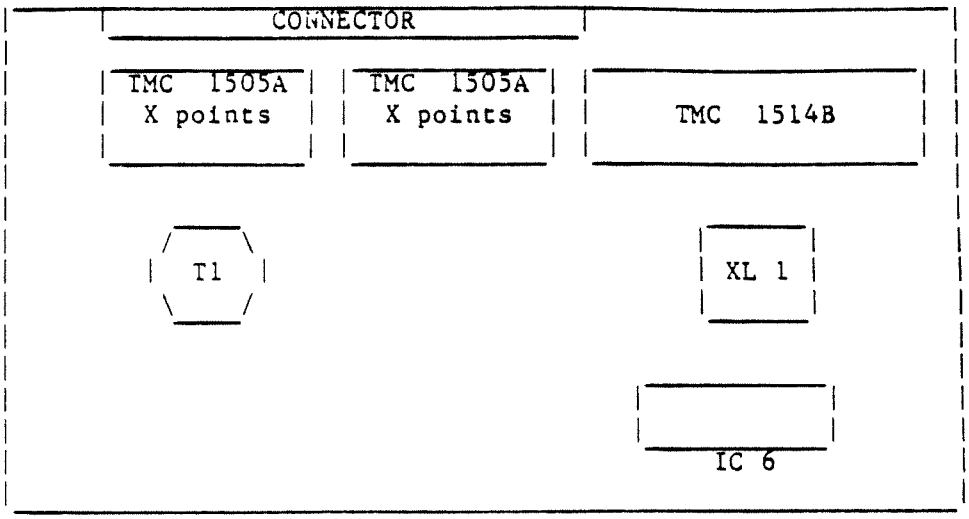
MODEM *

Modem Board to give 300 Baud Duplex Access. Provides a low cost modem which is connected to the processor V24 interface, for remote maintenance and facility changes. Accessed by call transfer from operator console or master terminal.

The connections for the modem are

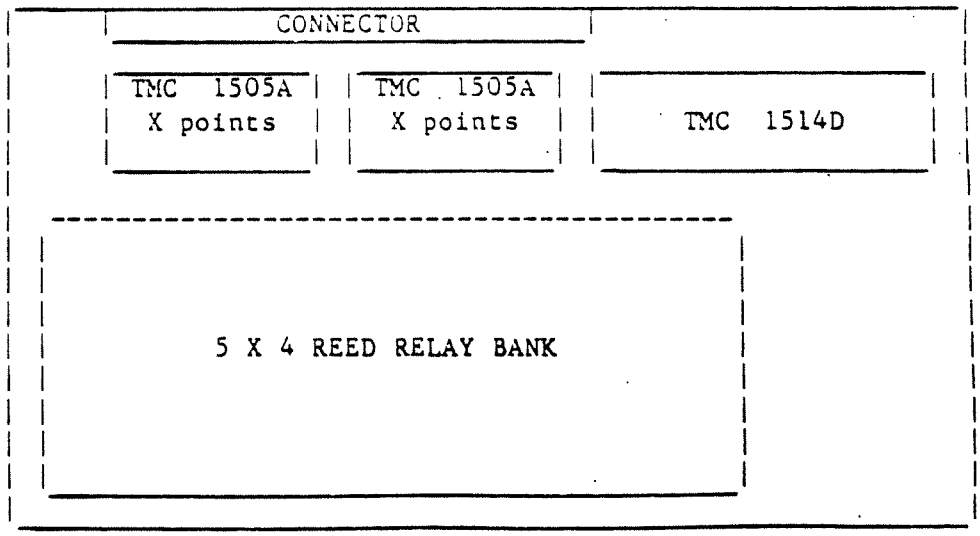
Communication pair	Function
1a	Receive lead
b	Transmit lead
2a	D.S.R lead (Data Set Ready)
b	Earth

This lead is then connected to the user port (V24) D type connector.



BROADCAST *

Broadcast Board to give multi-purpose broadcast "speak" facility, for broadcasting to up to 20 terminals.



Apart from (c) M.O.H,the above Mother board and daughter boards are compatible with Herald S 5102 / B8 systems.

CALL LOGGING CARD (black / red)

This card provides additional processing power and memory for call logging purposes. It also incorporates a real time clock and a buffered V24 interface. It is connected to a printer via a separate D - type connector which is wired out from the Krone connexion strip (see printer information). The parameters are selectable by means of DIL switches on the card. This call logging card is compatible with Herald S 5102 / B8 systems.

CALL LOGGING CARD SPEED SETTINGS

The Call Logging Card has 8 DIL switches which give 7 different transmision speed settings plus other parameters (as listed below).

Baud Rate	Switch No. 1	2	3
110	OFF	ON	ON
300	OFF	OFF	OFF
600	ON	OFF	OFF
1200	ON	ON	ON
2400	ON	ON	OFF
4800	OFF	OFF	ON
9600	ON	OFF	ON

Facility	Switch	Off	On
PARITY	4	ODD	EVEN
X-ON, X-OFF	5	IGNORED	RECOGNISED
DEVICE	6	PRINTER	CALL MANGMT. SYSTEM
ERROR SUPRESSION	7	ON	OFF
SELF TEST	8	OFF	ON

e.g. All eight switches off willgive call logging at 300 baud, odd parity, X-ON, X-OFF ignored, printer, error suppresion and normal running

NB. All switches must be set prior to powering up the Herald System.

PRINTER

Any printer in the B.T. schedule of approved apparatus is suitable for connection, examples being the Pennant printer 2A and the Facit 4510.

The printer configuration switches must be set to the same baud rate as the call logging card, see CALL LOGGING CARD SPEED SETTINGS' and Printer Handbook.

FACIT 4510 PRINTER SWITCH SETTINGS		BAUD RATE
SW1	SW2	
00110010	01011000	1200
00110010	01001000	300

D.J.U. PIN CONNECTIONS

The normal pin connections for the female D type Data Jack Unit 21B/21F are as follows :-

Pin	Function
3	Transmit data
2	Receive data
7	Signal ground
20	Data Terminal Ready

NB. LEADS SUPPLIED WITH SOME PRINTERS HAVE A REVERSAL BETWEEN PINS 2 & 3

KRONE CONNECTIONS

The connections for the printer at the KRONE strip are as follows,

Pair	Connection	
1a	Printer Transmit	\
		> The b legs of these pairs are
2a	Printer Receive	/ not connected
3a	Data Terminal Ready	
3b	Signal Ground	

These connections require wiring out from the Krone strip, associated with the call logging card, to a 25 pin female D type connector remote from the box connection. N.B. The V 24 socket within the box conn is used solely for the connection of TEAM equipment therefore the printer must not be connected to this socket.

WARNING: ONLY CONNECT APPARTUS COMPLYING WITH BS 6301 TO THIS PORT

If a printer is connected to the Herald S5102 before the system is powered up, then a message "H1 CALL LOGGING INITIATED " will be printed when power is applied. This will be followed by a number of line feeds then the standard page header will be printed:-

H DATE TIME EXTN LINE DIALLED DIGITS DURATION COST ACCOUNT LSN

Followed by: H3 SELECTIVE LOGGING ENABLE: GENERAL
H3 SELECTIVE LOGGING ENABLE: MINIMUM DURATION 00:00
H3 SELECTIVE LOGGING ENABLE: INCOMING CALLS
H3 SELECTIVE LOGGING ENABLE: OUTGOING CALLS
H3 SELECTIVE LOGGING ENABLE: DIALLED NUMBERS COMMENCING

Should the printer fail to print on powering up check the switches and the wiring, if the initial message is not followed by line feeds then check the Data Terminal Ready lead.

TYPICAL LOGGING RECORD

H	DATE	TIME	EXTN	LINE	DIALLED DIGITS	DURATION	COST	ACCOUNT	LSN
A	MAY 04	11:44	124	6	01012123214235	00:15:34	10:49	001234	021

The following is a detailed explanation of the above record :-

Record type

A = O/G call originating terminal
B = O/G call transfered terminal
C = I/C call answering terminal
D = I/C call transfered terminal
E = Alarm call answered
F = Alarm call unanswered
G = Inter P.B.X. extension (the other extl line is shown in the extn field.)
Hx = Header x can be 1 to 6 see table below

Date — Month followed by date

Time — Hours : minutes (24 hour clock)

Extn — Extension number talking to external party

Line — System line number used by extension

Digits — Digits dialled to line (maximum of 18)

Duration — Duration of call (Hours : Minutes : Seconds)

Cost — Total cost of call (Pounds : Pence) or pulses

Account — Up to an eight digit account number

LSN — Logging Sequence Number. Increments by one per record

HEADER TABLE

H1 = CALL LOGGING INITIATED (power up message)

H2 = CALL LOGGING ERROR IN ROM
= CALL LOGGING ERROR IN RAM

H3 = SELECTIVE CALL LOGGING ENABLE #
= SELECTIVE CALL LOGGING DISABLE #

H4 = *** TIME HH:MM * SYSTEM OVERLOAD RECORDS LOST

H5 = *** TIME HH:MM * BAD RECORD RECEIVED $
= *** TIME HH:MM * LINE XX RECORD LOST $

H6 = MTH dd HH:MM ** CLOCK CHANGED FROM MTH dd HH:MM

Headings marked # are usually followed by one of these supplementary messages:-

1	GENERAL	2	MINIMUM DURATION MM:SS
3	INCOMING CALLS	4	OUTGOING CALLS
5	DIALLED NUMBERS COMMENCING (A - H)	6	EXTNS XXX
		7	EXTNS XXX TO YYY

Headings marked $ are subject to error suppression (DIL switch 7).

CALL METERING *

See typical logging record page 23.
The Herald S 5102 / 38 can detect meter pulses on exchange lines and so work out the cost of an external call (subject to full facility line I/Fs being fitted). If the Herald is provided with speech synthesis, then the terminal user can also find out the cost of his last external call by either pressing his CALL METERING key or by use of the appropriate dial-up code. The system will reply with a speech synthesised message. Alternatively, users with an executive featurephone (or the operator) can key another code to place all future details on their display.
In order to allow the system to work out the actual cost of the call from the number of units used, the cost of each unit can be programmed from the operator / master terminal, or by use of the H.D.S interactive program.

* **Not available for the National launch of the system.**

OPERATOR CONSOLE

Coded as the TX 54, this is a specifically designed terminal with an integral 16 character Liquid Crystal Display, Headset Jack and Monitor Amp. It also provides a visual indication of power fail if the system is supported by a battery shelf. The console has keys laid out in an ergonomic manner for easier operator working.
The Operators Console must be connected to a new 4 wire display terminal I/F card which must be fitted in position 1/2 for the Herald S 5102 and position 1/5 for the Herald B8. Compatible with Herald B8 / S 5102 systems only.
The sounder / monitor volume is continuously variable.
By moving an internal Molex connector the sounder can be adjusted to produce one of three distinct tones.

COLOUR & STYLE

Originally only available in Brown, but the intention is to change to a Stone version which will be issued automatically as soon as existing stocks of the Brown version are exhausted. The Stone version will have an improved liquid crystal display and a revised keymap. (See page 39(a).

LOW PROFILE TERMINALS

The following is a list of low profile terminals and standard features :-
TX 55 : 7 button with built in monitor
TX 56 : 7 button loudspeaking
TX 57 :18 button loudspeaking
TX 58 :18 button loudspeaking and incorporating an LCD display.
The smaller terminals have a row of seven facility buttons down the right hand side of the terminal with dedicated monitor and mute buttons under the keypad,whilst the larger terminals have the facility buttons in a six by three matrix.The transmission cct in these terminals is electronic and when used in conjunction with the new interface cards will give improved transmission. The keypad operation has also been made more positive.
Seperate controls are provided for the monitor and tone caller volume.
By moving an internal Molex connector the sounder can be adjusted to produce one of three distinct tones.

HERALD HI TERMINAL.

This is a direct replacememt for the HS terminal and incorporates the following features:

1. A monitor amplifier is an integral feature but will still require a programmed button, to activate the feature, and therefore its use is still optional.

2. The sounder / monitor volume is continuously variable.

3. By moving an internal Molex connector the sounder can be adjusted to produce one of three distinct tones.

4. The monitor is automatically cancelled by lifting the handset, but can be subsequently re-selected when required.

HERALD LS TERMINAL

The Herald LS terminal is a loudspeaking (hands free) version of the HI previously described. It incorporates all the features of the HI with the addition of an optional MUTE facility. This is used to switch off the microphone when the terminal is used in the hands free mode.
Button 1 is programmed as a monitor and is used to originate or answer calls in the loudspeaking mode. Button 2 will normally be used as a mute button. Holding this button pressed keeps the terminal in listen mode and enables the user to hold a conversation without the caller (or called party) overhearing. It can also be used to prevent the terminal switching to speak mode due to high background noise.
If a mute button is not required, a Molex plug is provided internally and by moving the plug, button 2 can be programmed with a function. If a function is programmed to button 2, the internal molex plug overrides this function when the mute facility is selected and re-programming is not necessary. If sounder on/off or similar function is programmed to button 2 ensure that the function is not activated before assigning the mute function.

Programming

The Herald HI terminal is programmed as if a Herald HS is being provided. If the monitor facility is required, an amplifier should be declared and button 1 programmed as monitor.
When programming a Herald LS terminal an amplifier should always be declared and button 1 programmed as monitor. On new installations button 2 will not normally be programmed but, on existing installations, if a function has already been assigned this can be overridden by an internal molex plug and re-programming should not be necessary.

Restrictions

Variants of handset No 16 eg amplifying, neon and microphone cutoff, cannot be fitted on either terminal. Headset cannot be used with HI or LS terminals. No power fail facility with either terminal.

Molex connectors

Sounder Tone Selector HI and LS

The link for this is located on the underside of the PCB and is lablled tone. It is accessible after the bottom cover of the terminal has been removed. The connector is located on the rear edge of the PCB and can be inserted in one of three positions.

Mute Selection LS only

This connector is located on the top of the PCB and is accessible after the PCB has been removed from the terminal case. A locking tab is provided and this should be eased forward before the connector is removed. The connector has two positions (left = mute and right = function). The terminal is supplied with the connector in the mute position.

Stores descriptions

	Colour	Item code
TX 51 (HI terminal) (2/SA 20561)	Brown / Brown	374727
	Grey / Brown	374728
TX 53 (LS terminal) (2/SA 20563)	Brown / Brown	374731
	Grey / Brown	374732
TX 54	Brown	414733
TX 54	Stone	391286
TX 55	Brown	374946
TX 55	Stone	374947
TX 56	Brown	374948
TX 56	Stone	374949
TX 57	Brown	374942
TX 57	Stone	374943
TX 58	Brown	374944
TX 58	Stone	374945

HERALD KIT No 1A/C

Herald Kit No 1A/C will contain the following items :-

1. Control Shelf
2. `C´ control card
3. Combined power unit
4. 100 Wire cord and `Z´ 50 Wire cord (D95487)
5. 1 Bulgin female mains connector

WARNING The signwriting of PL01 & PL02 on the backplane of this shelf is misleading. The 34 wire ribbon cable for the first extn shelf must be connected to PL02.

HERALD KITS 2A, 2B, 2C

Herald Kits No 2 will comprise of the following:-

1. Extension shelf
2. A/C D/C power unit
3. 34 and 40 wire ribbon cables
4. 100 Wire cord
5. Mains cable assembly
6. 2 Ribbon cable clamps, screws and washers
7. Cable guard
8. 4 inter-shelf fixing bolts

N.B. There are no interface cards included in these kits.

Currently there are three Herald Kits No 2-,

Herald Kit No 2A - extn shelf with existing AC/DC PSU

" " 2B - " " " new AC/DC PSU

" " 2C - " " " " " "
and new style front cover.

BOX CONNEXIONS 335 AND 336

Two new box connexions are available for the Herald S 5102 system:-

Box Connexion 335, a single shelf box connexion with an additional 226 connector for the 50 wire "Z" cord, which accommodates slots 1/2 and 1/3 on the control shelf.

Box Connexion 336, as the 335 but for a two shelf system. See over for box connexion layout.

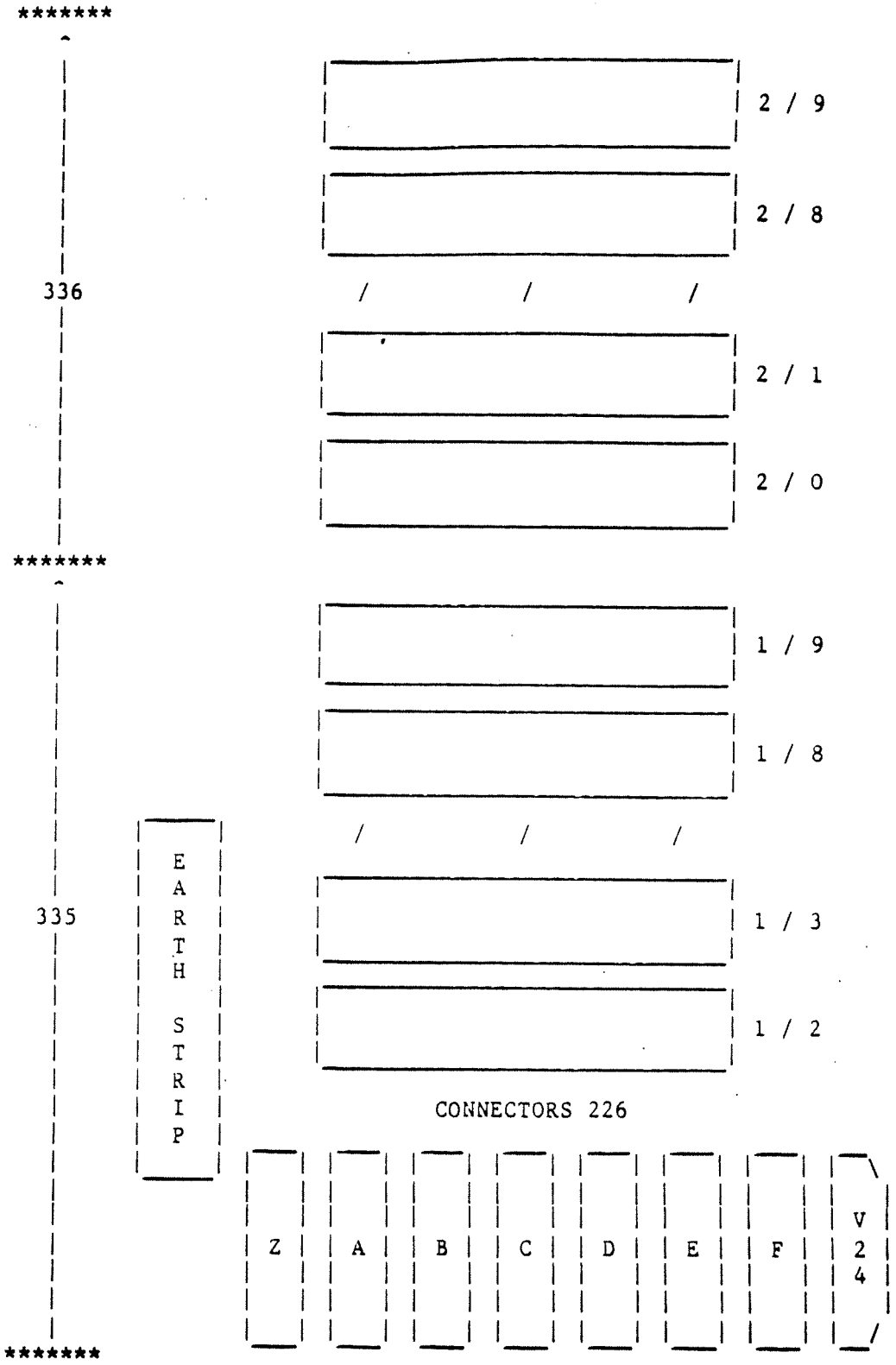
BOX CONNEXION 520

Box connexion 520A or 520B can be used where a three shelf system is required.
These box connexions comprise:
2 mounting frames No 5/50/34A
Jumper rings
Mountings for connectors 226B50A
Earth bars

To be requisitioned seperately:
Cable connection 5/D95003
" " 6/D95003
" " 7/D95003 - wired as 6/D95003 but has a longer length of wiring.
Plate cable fixing No 1D - as required
strap cable fixing No 4 - as required

Box connexion 500 series can also be used for 1 and 2 shelf systems when fitted with the correct Cables Connection.
See Product Guide section 5-12

LAYOUT OF BOX CONNEXION



Connector Z is provided to cater for slots 1/2 and 1/3 plus V24 interface.

BOX CONNEXION WIRING

ALL FOUR WIRE TERMINAL INTERFACE CARDS

PAIRS							
1	2	3	4	7	8	9	0
SPCH	DATA	SPCH	DATA	SPCH	DATA	SPCH	DATA

TWO WIRE INTERFACE CARD

PAIRS							
1	2	3	4	7	8	9	0
SPCH	SPCH	SPCH	SPCH	SPCH	SPCH	SPCH	SPCH

FULL FACILITY EXCHANGE LINE INTERFACE CARD

PAIRS							
1	2	3	4	7	8	9	0
	Music				Music		
A B	E1 *	I1 I2	T1 T2	A B	E1 *	I1 I2	T1 T2
		IN	OUT			IN	OUT
LINE		POWER FAIL	RELAY	LINE		POWER FAIL	RELAY
	1st LINE CCT				2nd LINE CCT		

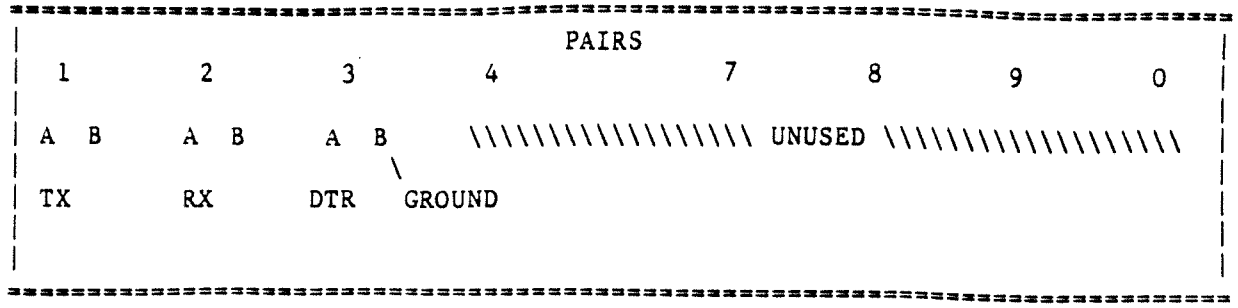
N.B If earth calling required connect to E1
* 2b and 8b Music On Hold if fitted

COMPACT EXCHANGE LINE INTERFACE CARD

PAIRS							
1	2	3	4	7	8	9	0
A B	E1 +	A B	E1 +	A B	E1 +	A B	E1 +
LINE	*	LINE	*	LINE	*	LINE	*
1st LINE CCT		2nd LINE CCT		3rd LINE CCT		4th LINE CCT	

* Connect earth to E1 if earth recall is required.

CALL LOGGING CARD



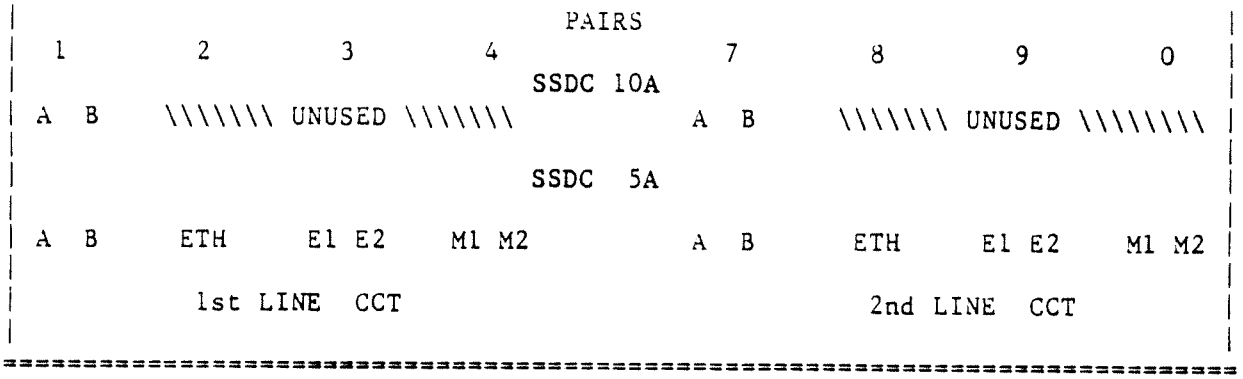
TX = Printer Transmit

RX = Printer Receive

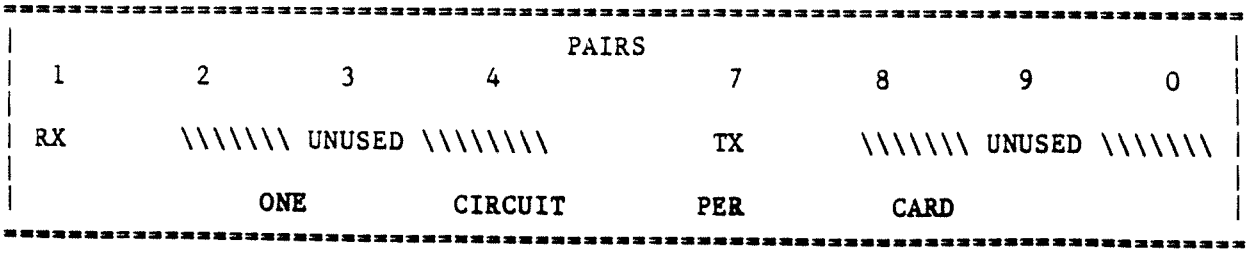
DTR = Data Terminal Ready

N.B. CONNECTIONS SHOWN ON THE CALL LOGGING CARD ARE `A' LEGS ONLY . 1B AND 2B ARE NOT CONNECTED, 3 B IS SIGNAL GROUND.

SSDC 5A / 10A INTERFACE CARD



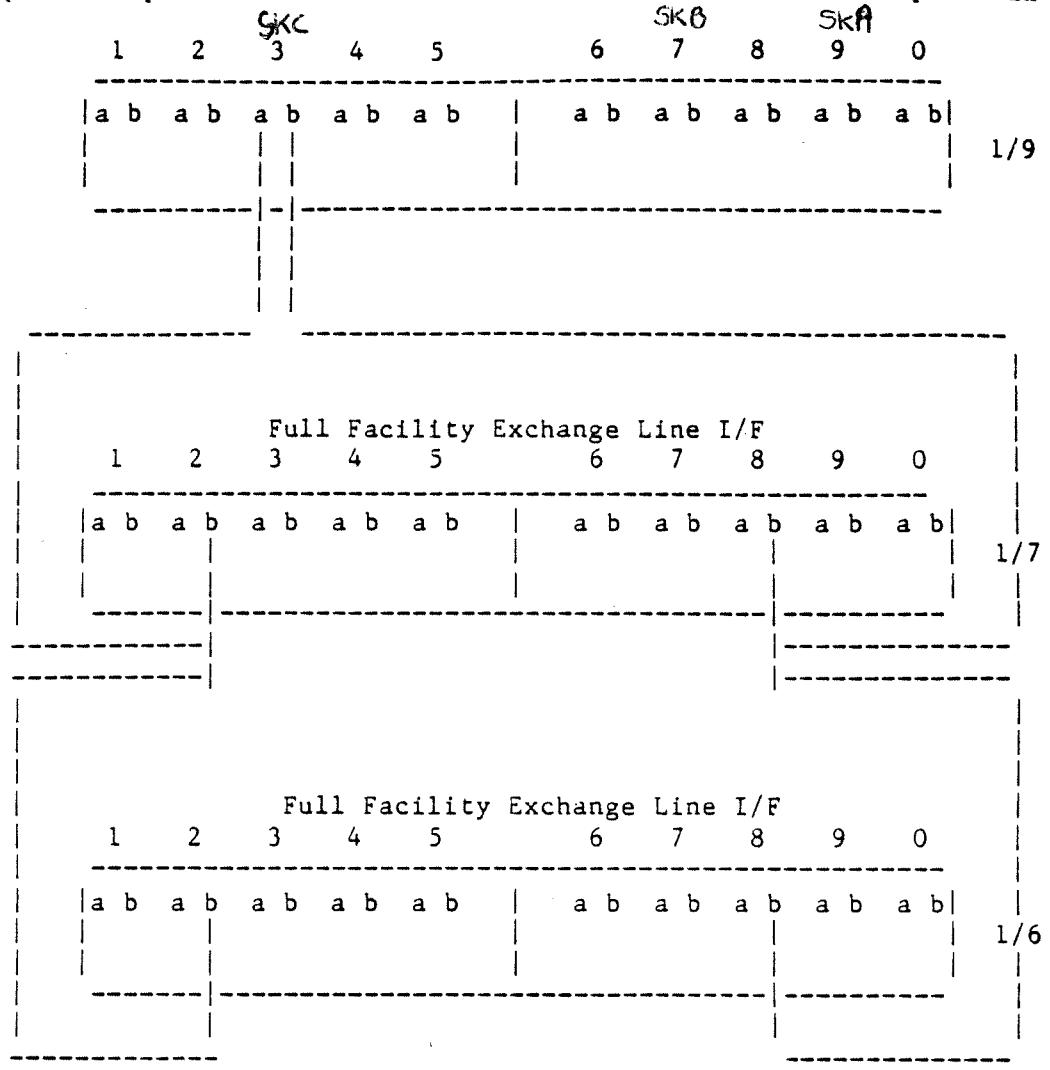
SSAC 15 INTERFACE CARD



JUMPERING

1. Music on Hold.

(Assume options Motherboard fitted in slot 1/9 & M.O.H. option in SKC)*

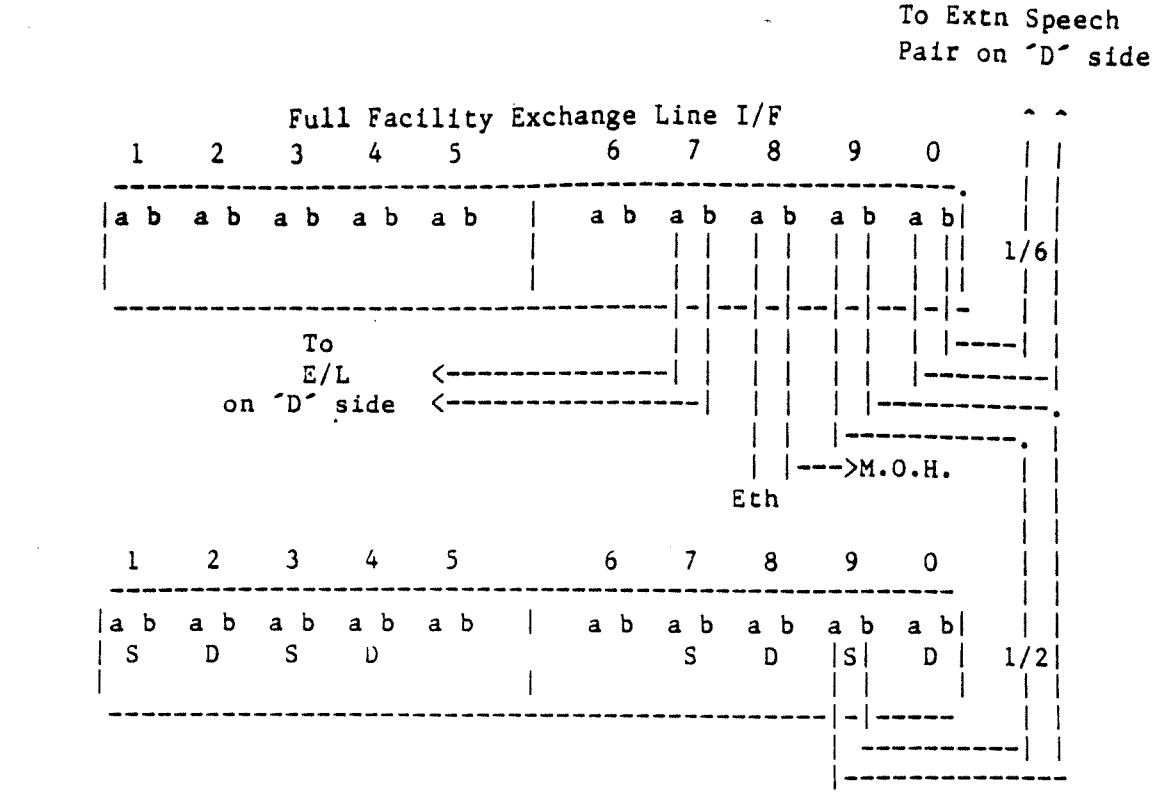


* If M.O.H is fitted in SKB then connect to pair 7 on Krone Block

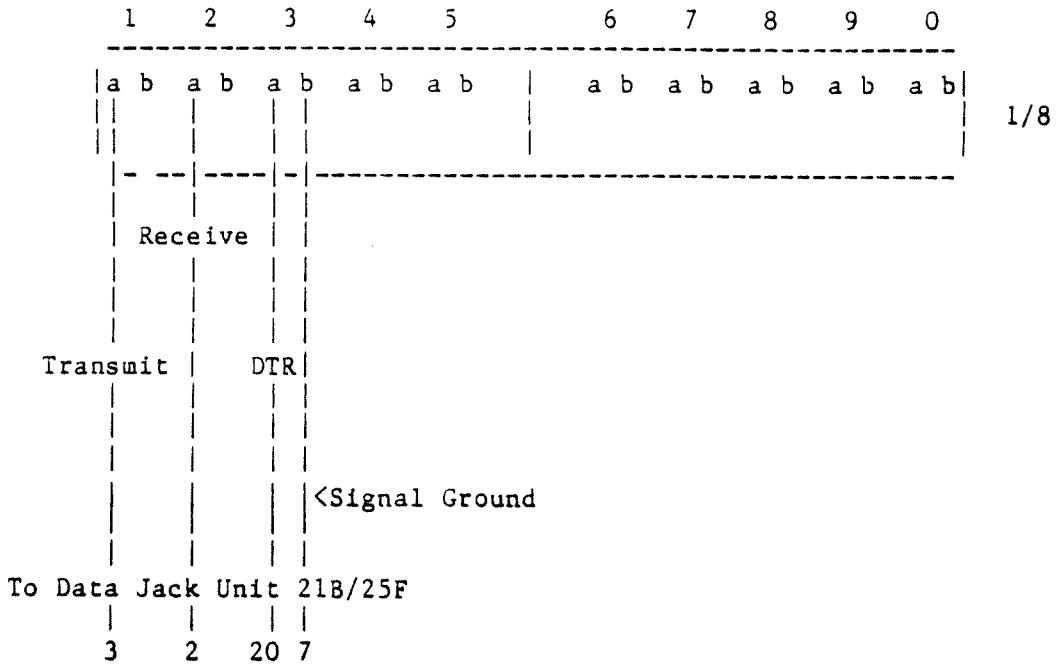
" " " " " SKA " " " " 9 " " "

Note. Both wires of the MOH option must be connected!!

2. Power Fail



3. Call Logging.



NOTE

The Transmit & Receive wires may be on different pins at the printer - check the printer manual

SELF CONFIGURATION ASSEMBLY RULES

To provide a Herald S 5102 the following rules must be obeyed :-

1. The control card and combined power unit must be fitted in their respective slots.

2. The correct interface card must be in slot 1/2 :-
   a) PABX . A four wire display terminal interface card (if operators console is fitted)
   b) KEYSYSTEM. A four wire terminal interface card

3. If sequential extension numbering is required, then the slots should be fitted with enough extension interface cards to accomodate all the terminals. ie starting from slot 1/2 to 1/9 and continuing if required at slot 2/0 and filling up right to left.

4. Exchange line cards should be provided after extension cards followed by private circuit cards.

5. Optional cards such as Call Logging and External Conference should be placed in the next available slot/s after the last interface card.

6. The Option Mother Board should be provided in the first available slot after all other interface cards and/or optional cards have been fitted. If at a later date further cards are to be fitted, the extra cards should be inserted following on directly from those already existing, unless sequential terminal numbering is desired. See PAGE 37.

7. All four wire terminals that require personal Rep Dialling and LED data **must now be wired and fitted.** This is necessary as the allocation of rep dialling blocks in the system memory is considered too difficult for customer programming.

8. If MF4 signalling is required from two wire extensions, then MF4 daughter boards will be required. The number of MF4 daughter boards to be provided is as follows :-

   1 board for up to 16 two wire extensions
   2 boards " " " 32 " " "
   3 " " over " " " "

   The above refers to the total number of 2 wire extensions MF4 and Loop Disconnect.

N.B. Following these rules will give a sequential numbering scheme to the system . After obeying these rules the system is now ready to power up and configure.

METHOD OF SELF CONFIGURING THE HERALD S 5102

REMEMBER THIS CONTROL CARD ALLOCATES FROM SHELF/SLOT 1/2 TO 1/9
AND FROM SHELF/SLOTS 2/0 TO 2/9 AND 3/0 TO 3/9

1. All control cards must be fitted before powering up

2. Slot 1/2 must be a four wire terminal I/F card.

3. The operators console / master terminal and all four wire terminals that require a personal Rep Dialling block and LED data must be wired and fitted.

4. If sequential extension numbering is required then all extension interfaces must follow each other, followed by line and private cct cards.

5. The call logging card, external conference and options mother board should be fitted in the next slots following the last I/F card.

6. The system must be powered up for at least thirty seconds before self configuration is started.

7. Remove the plug from the bottom socket (run position)

8. Place the plug in the required configuration socket :-

   a) TOP SOCKET = P.A.B.X.
   b) SECOND SOCKET = KEYSYSTEM
   c) THIRD SOCKET = ADD ON (Additional Equipment)

9. The L.E.D. will flash for 10 seconds (A warning signal meaning "DO YOU WANT TO CONFIGURE" ?). SELF CONFIGURATION IS NOT TAKING PLACE WHILST L.E.D. IS FLASHING.

10. The flashing turns to a permanent glow. CONFIGURATION IS NOW TAKING PLACE

11. After a minimum of 20 seconds the L.E.D. will extinguish indicating self configuration has taken place

12. If the permanent glow is replaced with a flash this denotes an error. The flash can be in two known distinct periods :-
    a. LED On 1.5secs Off 0.5secs no 4 wire circuit in cct 1
    b. LED On 0.5secs Off 1.5secs insufficient eeprom size

13 After configuration has taken place the plug can be removed from the configuration position and returned to the bottom socket (run position).

AFTER SELF CONFIGURATION ALLOW THE SYSTEM TO INITIALIZE. THIS MAY TAKE UP TO TWO MINUTES. UNTIL THE SYSTEM HAS INITIALIZED NO PROGRAMMING,RECONFIGURATION OR USE OF THE ADDITIONS SOCKET CAN BE EFFECTIVE

The Herald S 5102 / B8 can be configured by two different methods :-

1) Self Configuration
2) Herald Documentation System (H.D.S)

SELF CONFIGURATION

*** S.O.P = Standard Option Package**

OPTIONS OF SELF CONFIGURATION

On the front of the control board are four sockets. The top three are further forward than the bottom one which is the normal place for the plug to rest , the others are used for self configuration as follows:-

1. PABX this places extn 123 in the operator group and also allocates it the operator console key layout and Master terminal facility.

* S.O.P. 1 All I/C lines ring the operator group, all other terminals key 0 to get the operator, (keying 123 results in NU tone), night service facility.

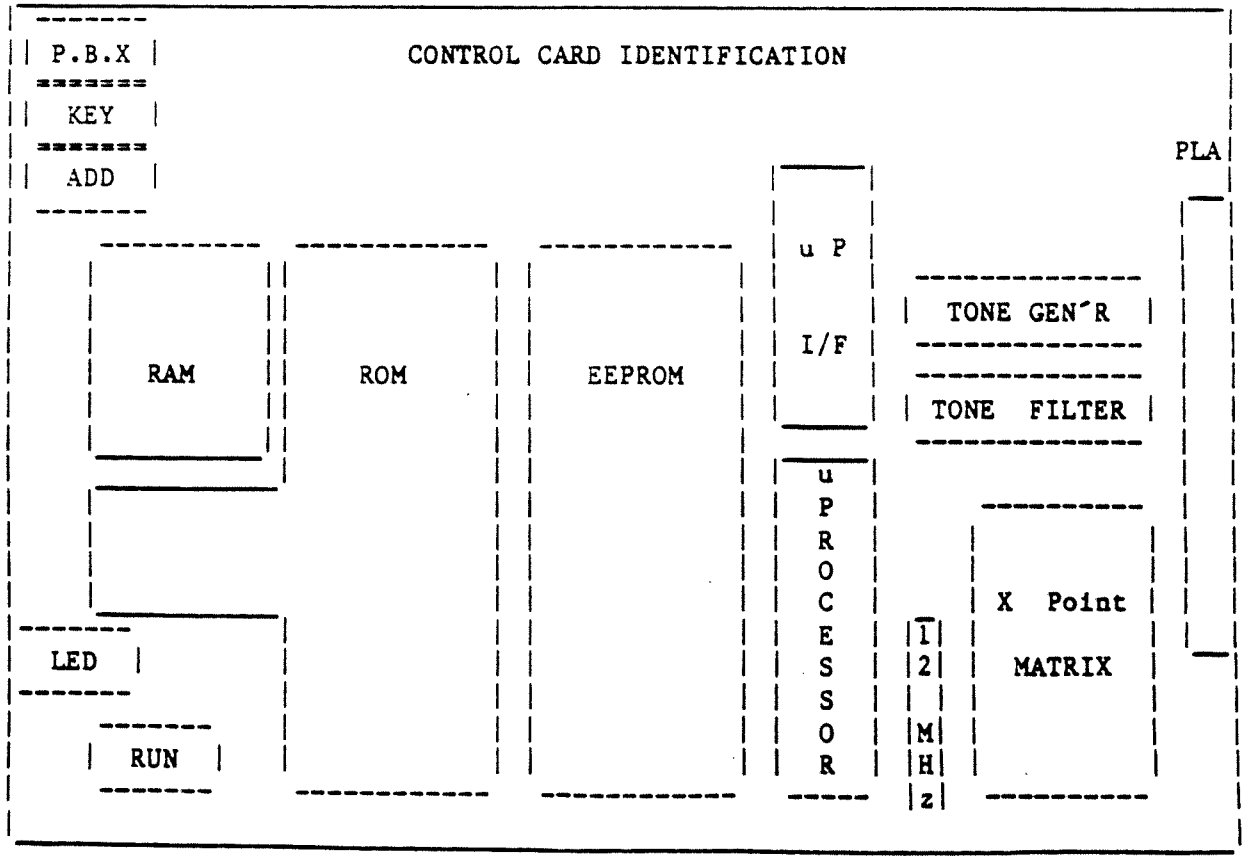
2. This socket gives KEYSYSTEM with terminal 123 as the

* S.O.P. 2 master terminal. All I/C calls will ring any terminal associated with the first twenty logical addresses. No Operator group available.

3. This socket is used to "ADD ON" to a system after additional equipment has been connected, without changing existing parameters or wiring.

!! WARNING !!

With the plug in any but the bottom socket no attempt must be made to replace the front cover of the control shelf.



THE FOLLOWING FACILITIES ARE COMMON TO BOTH THE PABX AND KEYSYSTEM ON SELF CONFIGURATION

1. Terminal Keymaps on four wire terminals are identical (except for the operator on PABX)

2. On configuration exchange lines / extensions off P.B.X 's are allocated in the following manner :-

Line 1	to	GROUP 1
Line 2	to	GROUP 2
<<<<<<<<<>>>>>>>>>		
Line 14	to	GROUP 14
Lines 15 onwards	to	GROUP 15

ALL THESE GROUPS ARE ACCESSIBLE BY KEYING 9. GROUP 16 IS NOT USED

3. On configuration all private ccts are allocated in the following manner:-

1st Private Cct	to	GROUP 17
2nd Private Cct	to	GROUP 18
<<<<<<<<<>>>>>>>>>		
14th Private Cct	to	GROUP 30
15th Private Cct onwards	to	GROUP 31

GROUPS 17 TO 24 ARE ACCESSIBLE BY 71 TO 78 RESPECTIVELY.
GROUP 25 IS ACCESSIBLE BY 79
GROUPS 26 TO 31 ARE ACCESSIBLE BY LINE KEY ONLY.

PRIVATE Ccts SHOULD NOW BE SORTED INTO THEIR CORRECT GROUPS IF REQUIRED.
EXTENSIONS OFF P.B.X's SHOULD BE IN GROUP 25.
EXCHANGE LINES SHOULD NOW BE SORTED INTO THEIR CORRECT GROUPS IF NECESSARY.

4. All terminals will have full O/G Access to the PSTN ie no barring.

5. Standard Loop Disconnect signalling for exchange lines is set.
(this may be altered as required at the operator /master terminal)
See system parameter configuration.

6. Three digit extension numbering scheme 123 - 237

7. Each 4 wire terminal has one rep dialling block of twelve numbers stored under the keypad (0 - 9, * and #)

8. System abbreviated dialling of 100 numbers accessed by three digit code in the numbering range 400 - 499.

9. All inter - pbx circuits are set to inter - pbx extensions .

10. No interconnection of external lines is permitted other than inter - pbx extension transfer.

11. There are no backstop terminals.

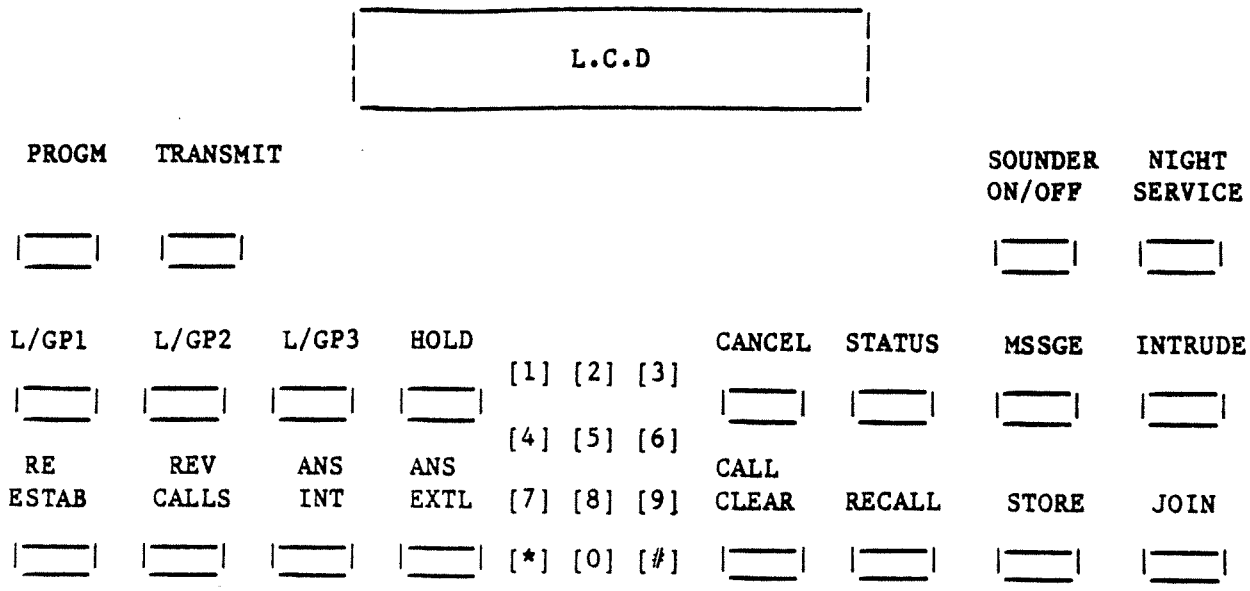
12. Call logging is enabled

P.A.B.X ONLY

On Night Service, up to the first 20 terminals will be rung.

1. OPERATORS CONSOLE KEY LAYOUT P.A.B.X. ONLY

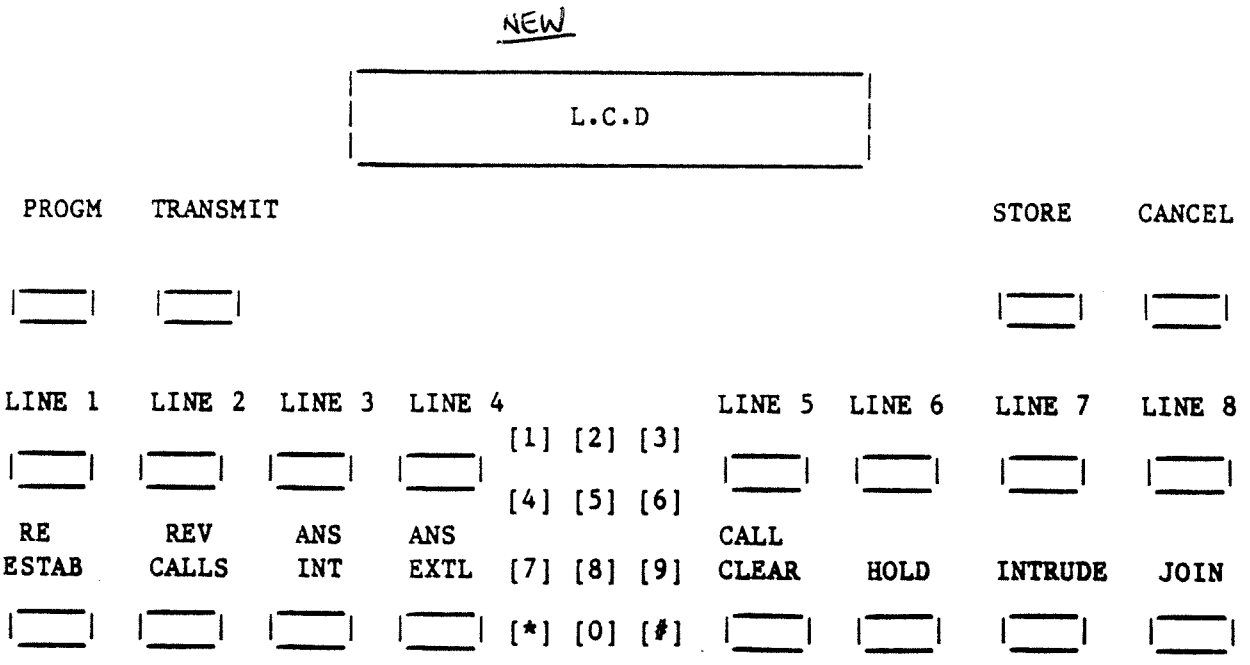
OLD



The above is the key layout for the operators console on a P.A.B.X. system. If an operators console is not required then an HL terminal may be used instead.

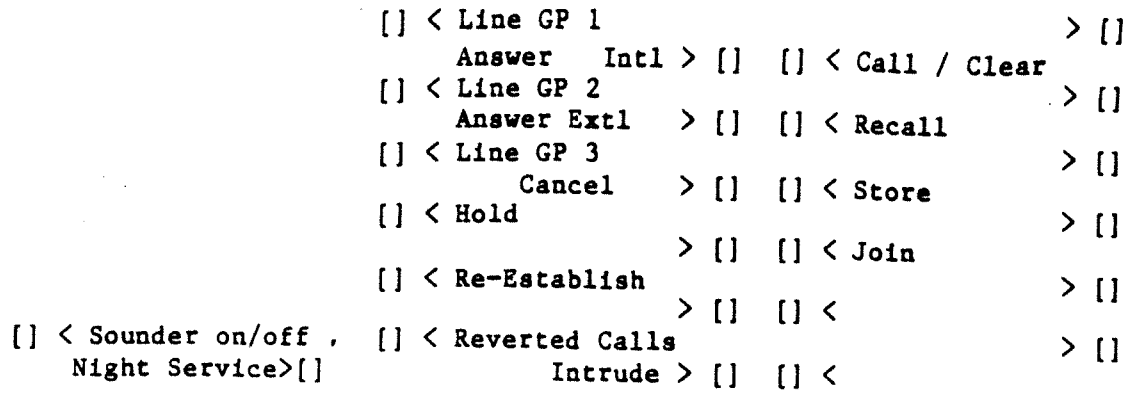
OPERATORS CONSOLE - REVISED KEY LAYOUT Colour - Stone

NEW



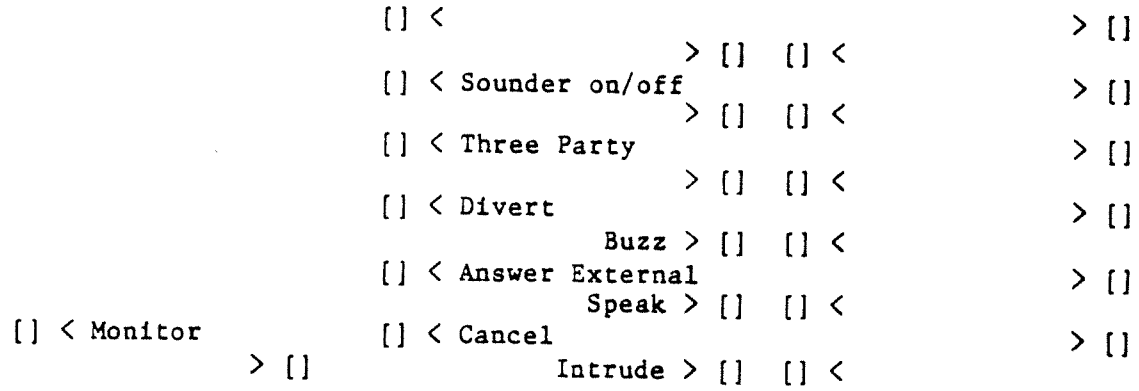
This version will automatically be issued in lieu of the Brown version as stocks of the latter are exhausted.

LAYOUT OF OPERATOR'S KEYS IF AN H.L. TERMINAL IS USED



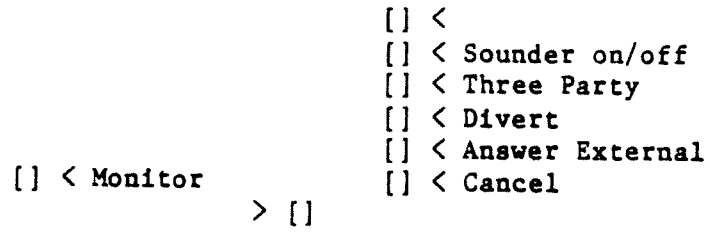
---

2. BASIC FACILITY LAYOUT ON ALL OTHER H.L. TERMINALS USED ON P.A.B.X OR KEYSYSTEMS



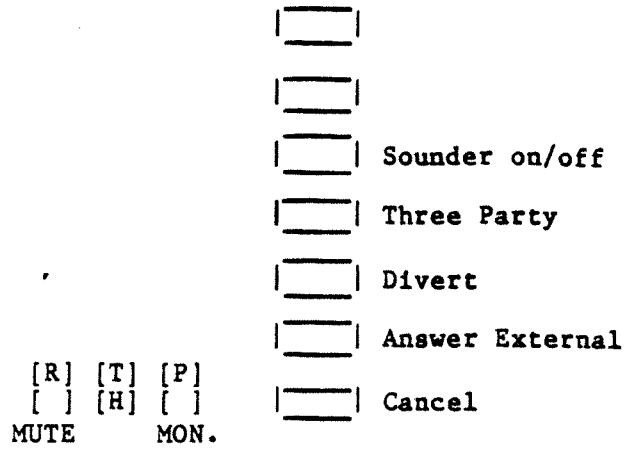
---

3. ALL H.S. TERMINALS USED ON P.A.B.X AND KEY SYSTEMS



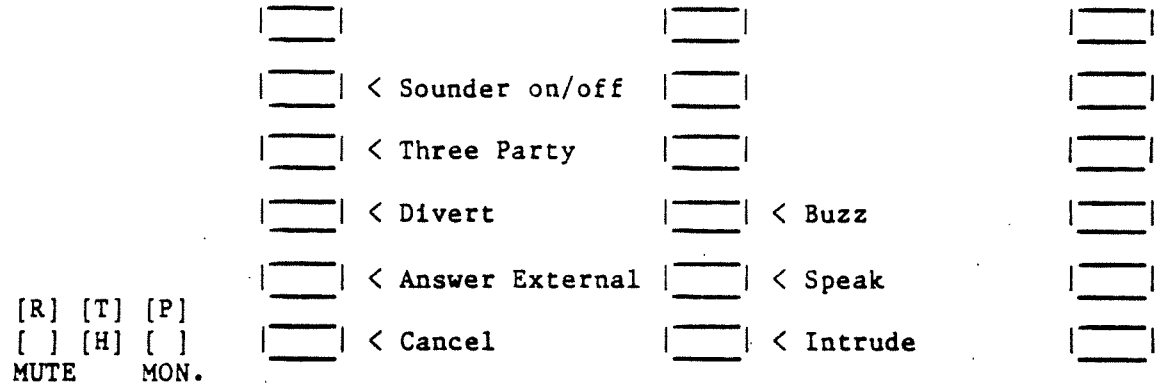
If a four wire terminal is not plugged in during self configuration then the processor assumes that a two wire terminal is to be provided at that L.A.

Key Layout for TX 55 and TX 56 Terminals



Note terminal TX 55 has a built in monitor. Terminal TX 56 is loudspeaking.

Key Layout for TX 57 and TX 58 Terminals



SELF CONFIGURING OF THE HERALD B8

If a Herald B8 is provided instead of a Herald S 5102 then the only differences are :-

1.) The B8 processor,tone card and power units must be fitted.

2.) Slot 1/5 must contain a four wire I/F card.

PARKING OF SPARE Cct's AFTER CONFIGURATION

After use of any of the configuration sockets, it is necessary to park (busy out) all spare cct's. If the spare cct/s is/are on an extension I/F card then the extension No/s must be calculated (see 5.e) and busied out as per the system parameter configuration. If there are any spare line ccts, these too must be busied out as above using system line No/s.
It is necessary to busy spare ccts out to avoid user confusion in inadvertently accessing these ccts. These spare ccts are available for any future growth by wiring out the cct and unparking(unbusying) the device.

USE OF ADDITIONS SOCKET.

This socket is used to ADD ON additional equipment. It is only possible to ADD ON additional daughter boards to existing option mother boards if the mother board was the last card in the system at the last configuration. With the exception of the above, if further expansion of the system is required, the appropiate cards may be added, commencing from the next available spare slot and adding a first or second extension shelf if necessary. After insertion of the new cards and wiring and connection of all four wire terminals has been completed, place the plug in the ADDITIONS socket, the L.E.D. will flash for 10 seconds and then will glow steadly for a period of time appropiate to the number of cards added, this will be a time period measured in seconds. **This operation does not alter any existing system parameters or box connexion** wiring. Now wait for the system to initialize before making any attempt at customer programming or busying out of spare ccts. It is important to realise that if a system was built up, CONFIGURED and DUMMY EXTENSION GROUPS allocated, then the system size is increased using ADD ON, it can only be re - configured to an exact replica by progressing through all the stages that were originally invoked to arrive at its final state. N.B ANY ADDITIONAL FOUR WIRE TERMINAL PROVIDED WILL NOT HAVE A PERSONAL REPERTORY DIAL BLOCK OR PROGRAMMABLE BUTTONS UNLESS CONNECTED DURING THE ADD ON CONFIGURATION.

RE-CONFIGURATION

This is used if equipped slots are to be reallocated (change of card type) or addition of daughter boards on existing mother boards. After the rearrangement of existing cards and the provision of any new cards, rewire the box connexion as required. Connect all four wire terminals to the system then, insert the plug in the appropiate socket (P.A.B.X. or KEYSYSTEM). The system will now self configure to the new layout, this will give basic system facilities.
N.B. All previous customer programming extra to the basic configuration layout will have been lost and must be re - entered after allowing time for the system to initialize.
Now busy out all spare ccts.

LAYOUT OF HERALD S 5102 ASU CARDS

The following diagram shows a layout for a 6+24 system with External Conference card and one Options Mother Board (O.M.B.) supporting 1 MF4 daughter board and 1 Speech Synthesis daughter board.
(see following page for box conn; layout).
The first two slots on shelf 1/- ie 1/-1 and 1/1 are standard and will be the same on every S 5102 system. All the other slots are flexible and will either be spare or contain cards dependant upon the system size and type. The golden rule for a new system is to have extension I/F cards in the early slots, followed by external line cards and then any options cards, growing from right to left. If at a later date an upgrade is desired, then unless sequential extension numbering is requested, further cards may be added. They should follow on from those existing, and up to a maximum of three shelves on both the Herald S 5102 / B8 , and are provided using the ADDITIONS socket to configure.
If exetensions are being added and sequential numbering is required, then all line cards after the last existing extension card must be moved and the new extension card/s inserted following on from the previous extension cards. Now replace the cards previously withdrawn starting at the next spare slot.

THIS PROCEDURE WILL REQUIRE SOME REWIRING IN THE BOX CONNECTION AND RECONFIGURATION USING THE P.A.B.X OR KEYSYSTEM SOCKET

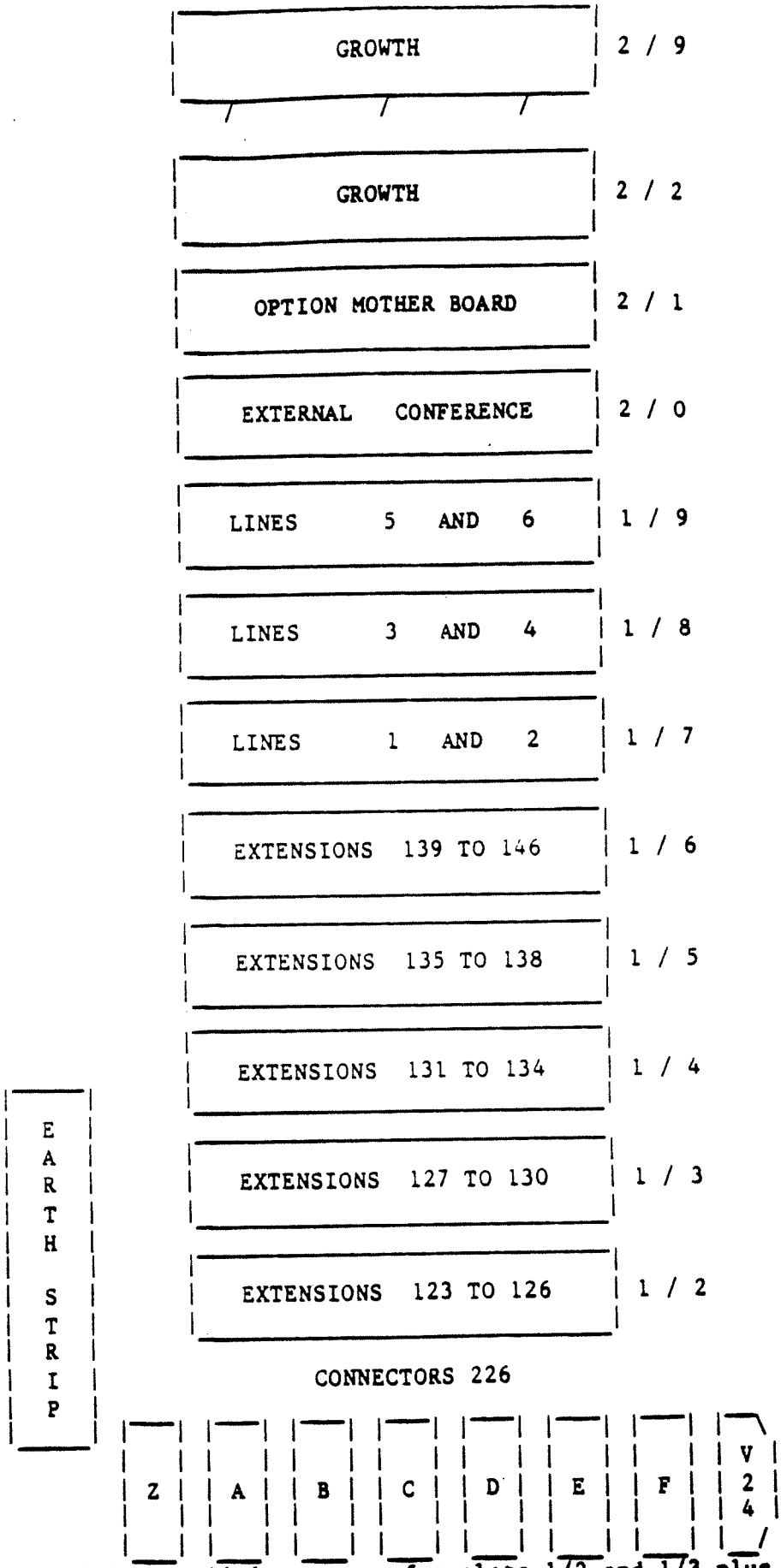
EXAMPLE LAYOUT OF HERALD S 5102 SYSTEM

1/9	1/8	1/7	1/6	1/5	1/4	1/3	1/2	1/1	1/0	1/-1
								C		
L 5	L 3	L 1	*139	*135	*131	*127	*123	O N T	COMBINED	
			TO	TO	TO	TO	TO	R O	P. S. U	
L 6	L 4	L 2	*146	*138	*134	*130	*126	L		

2/9	2/8	2/7	2/6	2/5	2/4	2/3	2/2	2/1	2/0	2/-1
								O M P O T T I H O E N R B O A R D	C O N F E R E N C E	AC/DC
	/ <<********** GROWTH ********** \									PSU

Note ` * ' Denotes extensions

BOX CONNECTION LAYOUT FOR EXAMPLE SYSTEM ON PREVIOUS PAGE



Connector Z is provided to cater for slots 1/2 and 1/3 plus V24 interface.

CONSEQUENCES OF LEAVING SPARE SLOTS DURING CONFIGURATION

It is very important to realise that immediately following a `self-configuration´ routine or `Add On´ routine, a software marker is placed at the last physical position in the one, or multi-shelf system to indicate the position of the last identified interface. Subsequent use of `Add On´ will cause the processor to begin it´s scanning routine at the point immediately after the last identified device. Therefore, gaps in a self-configured system cannot be later filled using `Add On´.

1/9	1/8	1/7	1/6	1/5	1/4	1/3	1/2	1/1	1/0	1/-1
								C		
							*123	O		
							*124	N	COMBINED	
							*125	T		
							*126	R	P S U	
								O		
								L		

2/9	2/8	2/7	2/6	2/5	2/4	2/3	2/2	2/1	2/0	2/-1
					*127					AC/DC
					*128					
					*129					PSU
					*130					

1. If the installation depicted above is self - configured then it will not be possible to subsequently `Add On´ into any position below 2/5 . If such an error is made then the system should be self-configured again.

2. Immediately after an `Add On´ has finished, the PBX will use a software restart to effect a mains off/on. Consequently, all established calls will be lost.

3. If an interface card is in place during self-configuration, it may be removed / re-inserted at any time and the interface will be brought into correct operation immediately.

LOGICAL ADDRESS ALLOCATION

During self configuration, the processor scans all cards plugged into the system, the scan is from right to left along each shelf and from the top shelf downwards. When an interface card is scanned, a Logical Address (LA) is reserved for each extension and line identified on that interface. This is subsequently used to store data regarding the device. ONLY extension and external line interfaces (and extension groups) use LA's. Data regarding ALL other optional interfaces is stored elsewhere. The system will support a maximum of 116 Logical Addresses.

Assuming that a system is created with extension interfaces followed by external line interfaces then the allocation rules would be that the first extension to be identified will be extension 123, the second will be extension 124, the third be extension 125, etc. Similarly, the first line identified will be line one, second line will be line two etc.

However, there is a fixed correlation between the Logical Address and the extension numbers on the system. Thus, when a line is identified, this device necessarily takes the place of an extension number which would normally reside in that Logical Address. This will cause that particular extension number to be `not available'. This is best explained by the example shown below.

1. Customer starts with 7 plus 18 with speech synthesis and MF4 daughter boards.

2. Customer then adds four dummy extension groups.

3. Customer then expands to 11 plus 25.

4. Customer adds another four dummy extension groups.

5. Customer expands to incorporate a Modem daughter board

6. Irreparable processor fault and the system is re-configured by simply re-inserting the self-configure plug.

1. Customer starts with a 7 plus 18 with speech synthesis and MF4 daughter boards.

1/9	1/8	1/7	1/6	1/5	1/4	1/3	1/2	1/1	1/0 1/-1
L 5	L 3	L 1	*139	*135	*131	*127	*123	C C	COMBINED
			*140	*136	*132	*128	*124	T A	
			*B O	*137	*133	*129	*125	R R	P S U
L 6	L 4	L 2	*B O	*138	*134	*130	*126	L D	

2/9	2/8	2/7	2/6	2/5	2/4	2/3	2/2	2/1	2/0	2/-1
								S S MF4 SPARE	L 7 LBO	AC/DC PSU

Result

L.A.	Ext. No.	Other Device/more information	
1	0		
2	123		
3	124		
4	125		
5	126		
6	127		
7	128		
8	129		
9	130		
10	131		
11	132		
12	133		
13	134		
14	135		
15	136		
16	137		
17	138		
18	139		
19	140		
20	141	BUSIED OUT	(parked)
21	142	BUSIED OUT	(parked)
22	~~143~~		Line 1, 0742 256438
23	~~144~~		Line 2, 0742 567890
24	~~145~~		Line 3, 0742 765432
25	~~146~~		Line 4, 0742 345678
26	~~147~~		Line 5, 0742 234567
27	~~148~~		Line 6, 0742 876543
28	~~149~~		Line 7, 0742 698766
29	~~150~~	BUSIED OUT	Line 8

Note. Delete extension number where not applicable

2. Customer then adds four extension groups.

2.1 Use dial-up codes to declare four dummy extension groups. These MUST be the next free L.A's. Once declared, these cannot be deleted. However, the extensions which make up the dummy extensions may be edited.

1/9	1/8	1/7	1/6	1/5	1/4	1/3	1/2	1/1	1/0 1/-1
L 5	L 3	L 1	*139	*135	*131	*127	*123	C C	COMBINED
			*140	*136	*132	*128	*124	T A	
			*B O	*137	*133	*129	*125	R R	P S U
L 6	L 4	L 2	*B O	*138	*134	*130	*126	L D	

2/9	2/8	2/7	2/6	2/5	2/4	2/3	2/2	2/1	2/0	2/-1
								S S MF4 SPARE	L 7 LBO	AC/DC PSU

Result

L.A.	Ext. No.	Other Device/more information	
11	132		
12	133		
13	134		
14	135		
15	136		
16	137		
17	138		
18	139		
19	140		
20	141	BUSIED OUT	
21	142	BUSIED OUT	
22	~~143~~		Line 1, 0742 256438
23	~~144~~		Line 2, 0742 567890
24	~~145~~		Line 3, 0742 765432
25	~~146~~		Line 4, 0742 345678
26	~~147~~		Line 5, 0742 234567
27	~~148~~		Line 6, 0742 876543
28	~~149~~		Line 7, 0742 698766
29	~~150~~	BUSIED OUT	Line 8
30	151	EXT GROUP	EXT: 125, 127, 131, 140
31	152	EXT GROUP	EXT:
32	153	EXT GROUP	EXT: 127, 129, 133, 139, 140
33	154	EXT GROUP	EXT: 126, 128, 131, 129, 140

Note. It is possible to nominate any physical extension as being in any extension group. Additionally, an extension may appear in any number of extension groups. Extension group 152 above has been left with no extensions in the group, but extensions may be entered and edited at any time.

3. Customer then expands to 11 plus 25.

3.1 Insert a eight cct extension interface card into slot 2/2.

3.2 Insert a four cct exchange line card in slot 2/3.

3.3 Insert self-configure plug in socket Three; ADD ON.

3.4 Return Self-configure plug to run/idle socket, when appropriate.

3.5 Use dial-up code to Un-busy extension 141 and 142.

3.6 Use dial-up codes to Busy out extension 160, 161 and 162.

3.7 Use dial-up codes to Un-busy Line 8

3.8 Use dial-up codes to Busy out Line 12.

1/9	1/8	1/7	1/6	1/5	1/4	1/3	1/2	1/1	1/0 1/-1
L 5	L 3	L 1	*139	*135	*131	*127	*123	C C	COMBINED
			*140	*136	*132	*128	*124	T A	
			*141	*137	*133	*129	*125	R R	P S U
L 6	L 4	L 2	*142	*138	*134	*130	*126	L D	

2/9	2/8	2/7	2/6	2/5	2/4	2/3	2/2	2/1	2/0	2/-1
						L 9	*155	S S	L 7	AC/DC
						L10	TO	MF4		
						L11	*159	SPARE		PSU
						LBO	*BOx3		L 8	

Result

L.A.	Ext. No.	Other Device/more information	
1	0		
2	123		
3	124		
4	125		
5	126		
6	127		
7	128		
8	129		
9	130		
10	131		
11	132		
12	133		
13	134		
14	135		
15	136		
16	137		
17	138		
18	139		
19	140		
20	141		
21	142		
22	~~143~~		Line 1, 0742 256438
23	~~144~~		Line 2, 0742 567890
24	~~145~~		Line 3, 0742 765432
25	~~146~~		Line 4, 0742 345678
26	~~147~~		Line 5, 0742 234567
27	~~148~~		Line 6, 0742 876543
28	~~149~~		Line 7, 0742 698766
29	~~150~~		Line 8, 0742 589676
30	151	EXT GROUP	EXT: 125, 127, 131, 140
31	152	EXT GROUP	EXT:
32	153	EXT GROUP	EXT: 127, 129, 133, 139, 140
33	154	EXT GROUP	EXT: 126, 128, 131, 129, 140
34	155		
35	156		
36	157		
37	158		
38	159		
39	160	BUSIED OUT	
40	161	BUSIED OUT	
41	162	BUSIED OUT	
42	~~163~~		Line 9, 0742 234555
43	~~164~~		Line 10, 0742 334455
44	~~165~~		Line 11, EX- DIRECTORY 1
45	~~166~~	BUSIED OUT	Line 12

4. Customer then adds four more extension groups.

4.1 Use dial-up codes to declare four dummy extension groups. These MUST be the next free L.A.'s. Once declared, these cannot be deleted. However, the extensions which make up the extension groups may be edited.

1/9	1/8	1/7	1/6	1/5	1/4	1/3	1/2	1/1	1/0	1/-1
L 5	L 3	L 1	*139	*135	*131	*127	*123	C C	COMBINED	
			*140	*136	*132	*128	*124	T A		
			*141	*137	*133	*129	*125	R R	P S U	
L 6	L 4	L 2	*142	*138	*134	*130	*126	L D		

2/9	2/8	2/7	2/6	2/5	2/4	2/3	2/2	2/1	2/0	2/-1
						L 9	*155	S S	L 7	AC/DC
						L10	TO	MF4		
						L11	*159	SPARE		PSU
						LBO	*BOx3		L 8	

Result

L.A.	Ext. No.	Other Device/more information
.	.	
.	.	
25	~~146~~	Line 4, 0742 345678
26	~~147~~	Line 5, 0742 234567
27	~~148~~	Line 6, 0742 876543
28	~~149~~	Line 7, 0742 698766
29	~~150~~	Line 8, 0742 589676
30	151	EXT GROUP EXT: 125, 127, 131, 140
31	152	EXT GROUP EXT:
32	153	EXT GROUP EXT: 127, 129, 133, 139, 140
33	154	EXT GROUP EXT: 126, 128, 131, 129, 140
34	155	
35	156	
36	157	
37	158	
38	159	
39	160	BUSIED OUT
40	161	BUSIED OUT
41	162	BUSIED OUT
42	~~163~~	Line 9, 0742 234555
43	~~164~~	Line 10, 0742 334455
44	~~165~~	Line 11, EX- DIRECTORY 1
45	~~166~~	BUSIED OUT Line 12
46	167	EXT GROUP EXT: 126, 129, 155, 156
47	168	EXT GROUP EXT: 156, 157, 158, 130
48	169	EXT GROUP EXT: 131, 132, 154, 155
49	170	EXT GROUP EXT: 124, 125, 126

5. Customer then expands to incorporate a Modem daughter board

5.1 Insert options mother board, containing a Modem daughter board, in slot 2/4.

5.2 As the existing 100 wire cord to this extension shelf accomodates slots 2/0 to 2/3, it will now be necessary to install a 2nd 100W cord at this stage.

5.3 Insert self-configure plug in socket Three; ADD ON.

5.4 Return Self-configure plug to run/idle socket, when appropriate.

Note. It should be remembered that because the system has expanded beyond the first options mother board, ADD ON will not scan this board, looking for further devices. Therefore, another options mother board must be provided! (or the system reconfigured).

1/9	1/8	1/7	1/6	1/5	1/4	1/3	1/2	1/1	1/0 1/-1
L 5	L 3	L 1	*139	*135	*131	*127	*123	C C	COMBINED
			*140	*136	*132	*128	*124	T A	
			*141	*137	*133	*129	*125	R R	P S U
L 6	L 4	L 2	*142	*138	*134	*130	*126	L D	

2/9	2/8	2/7	2/6	2/5	2/4	2/3	2/2	2/1	2/0	2/-1
					MODEM	L 9	*155	S S	L 7	AC/DC
					SPARE	L10	TO	MF4		
					SPARE	L11	*159	SPARE		PSU
						LBO	*BOx3		L 8	

Result

L.A.	Ext. No.	Other Device/more information	
1	0		
2	123		
3	124		
4	125		
5	126		
6	127		
7	128		
8	129		
9	130		
10	131		
11	132		
12	133		
13	134		
14	135		
15	136		
16	137		
17	138		
18	139		
19	140		
20	141		
21	142		
22	~~143~~		Line 1, 0742 256438
23	~~144~~		Line 2, 0742 567890
24	~~145~~		Line 3, 0742 765432
25	~~146~~		Line 4, 0742 345678
26	~~147~~		Line 5, 0742 234567
27	~~148~~		Line 6, 0742 876543
28	~~149~~		Line 7, 0742 698766
29	~~150~~		Line 8, 0742 589676
30	151	EXT GROUP	EXT: 125, 127, 131, 140
31	152	EXT GROUP	EXT:
32	153	EXT GROUP	EXT: 127, 129, 133, 139, 140
33	154	EXT GROUP	EXT: 126, 128, 131, 129, 140
34	155		
35	156		
36	157		
37	158		
38	159		
39	160	BUSIED OUT	
40	161	BUSIED OUT	
41	162	BUSIED OUT	
42	~~163~~		Line 9, 0742 234555
43	~~164~~		Line 10, 0742 334455
44	~~165~~		Line 11, EX- DIRECTORY 1
45	~~166~~	BUSIED OUT	Line 12
46	167	EXT GROUP	EXT: 126, 129, 155, 156
47	168	EXT GROUP	EXT: 156, 157, 158, 130
48	169	EXT GROUP	EXT: 131, 132, 154, 155
49	170	EXT GROUP	EXT: 124, 125, 126

Irreparable processor fault and is re-configured by simply re-inserting the self-configure plug.

During this configuration, the system has no idea about extension groups and busied devices, therefore these will be ignored during this routine.

1/9	1/8	1/7	1/6	1/5	1/4	1/3	1/2	1/1	1/0	1/-1
L 5	L 3	L 1	*139	*135	*131	*127	*123	C C	COMBINED	
			*140	*136	*132	*128	*124	T A		
			*141	*137	*133	*129	*125	R R	P S U	
L 6	L 4	L 2	*142	*138	*134	*130	*126	L D		

2/9	2/8	2/7	2/6	2/5	2/4	2/3	2/2	2/1	2/0	2/-1
					MODEM	L 9	*151	S S	L 7	AC/DC
					SPARE	L10	TO	MF4		
					SPARE	L11	*158	SPARE		PSU
						L12			L 8	

Result L.A.	Ext. No.	Other Device/more information
19	140	
20	141	
21	142	
22	~~143~~	Line 1, 0742 256438
23	~~144~~	Line 2, 0742 567890
24	~~145~~	Line 3, 0742 765432
25	~~146~~	Line 4, 0742 345678
26	~~147~~	Line 5, 0742 234567
27	~~148~~	Line 6, 0742 876543
28	~~149~~	Line 7, 0742 698766
29	~~150~~	Line 8, 0742 589676
30	151	
31	152	
32	153	
33	154	
34	155	
35	156	
36	157	
37	158	
38	~~159~~	Line 9, 0742 233445
39	~~160~~	Line 10, 0742 334455
40	~~161~~	Line 11, EX-DIRECTORY 1
41	~~162~~	Line 12,
42	163	
43	164	
44	165	
45	166	
46	167	
47	168	

If the eight extension groups are still required, then these will be consecutive and will begin at extension 163. Extensions 156,157,158 and line 12 require busying out. This will be done from the operator/master terminal.

The following features can only be programmed from the operators console / master terminal.

N.B. Before carrying out any programming from the operator console / master terminal, it is necessary to key the enabling code (657), followed by a discrete three digit password number in the range 000 - 254. If sixty seconds of terminal inactivity elapses after the password has been entered then programming will be automatically inhibited and the enabling code and password will have to be re-entered.

SEQUENCE OF PROGRAMMING AFTER CONFIGURATION

1. Wait for the system to initialise before attempting to alter any parameters.

* 2. Test all four wire terminals for speech and data pair continuity use button 1 or 4 to check for LED information

3. Busy spare circuits. See 4.1 below (external lines first then extensions)

4. Programme **SYSTEM PARAMETERS**, as necessary, in the following order.

Programme Terminal Facility Buttons at Terminal.
See page 64 Terminal Configuration and Facilities

*If you have merely used the "Add On" Facility then you need only check the "new" 4W Terminals for Speech & Data pair continuity.

4.1 PARKING OF LINES AND EXTENSIONS

Spare external line and extension Ccts should be parked. Working circuits may be parked for maintenance purposes.

TO PARK AND UNPARK A LINE

Dial tone accessed after password
Hold `P´ down
Key 9, then system line No (01 - 59) to be parked
Key 651
Release `P´

To unpark, as above but key 652 instead of 651

TO PARK AND UNPARK A EXTENSION

Dial tone accessed after password
Hold `P´ down
Key extn number to park then 651
Release `P´

To unpark an extension repeat this operation using 652 instead of 651

4.2 TO SET LINE SIGNALLING PARAMETERS

Dial tone accessed after password
Hold `P´ down
Key 9, then system line No (01 - 59)
Key 653
Key signalling code, (1 - 8)..... see table below
Release `P´

SIGNALLING CODES

	CODE	SIGNAL	RATIO	RECALL	RINGING	PRE-SENDING PAUSE
(^)	1	LOOP/DIS	33/66	EARTH	SHORT	N/A
[ ]	2	M.F 4	70/70	EARTH	SHORT	N/A
	3	LOOP/DIS	33/66	EARTH	LONG	N/A
	4	M.F 4	70/70	EARTH	LONG	N/A
	5	LOOP/DIS	33/66	BREAK	SHORT	N/A
	6	M.F 4	70/70	BREAK	SHORT	N/A
< >	7	N/A	N/A	N/A	N/A	YES
< >	8	N/A	N/A	N/A	N/A	NONE

(^) IS THE BASIC CONFIGURATION
[ ] IS TO BE USED IF MF 4 SIGNALLING IS PROVIDED
< > PRIVATE Ccts ONLY

4.3 DEFINE LINE GROUPS

Dial tone accessed after password
Hold `P´ down
Key 9 then system line No (01 - 59)
Key 660 then line group No (01 - 31) [see table below]
Release `P´

GROUP NUMBERS

01 - 15	Used to provide up to 15 groups on level 9	
16	Not used	
17	Used for O/G access on	71 group private ccts
18	"	72 "
19	"	73 "
20	"	74 "
21	"	75 "
22	"	76 "
23	"	77 "
24	"	78 "
25	"	79 Extns off P.B.X's only
26	"	lines with keyed access only
27	"	"
28	"	"
29	"	"
30	"	"
31	"	"

4.4 TERMINAL LINE GROUP ACCESS

Allocation of lines or groups of lines to each terminal when keying 9 or 71 - 79.

Dial tone accessed after password
Hold `P´ down
Key extension No then 661
Key `speed code´ (see table below)
Key line group No/s (01 - 31)
Release `P´

SPEED CODES

* = Bar Access to ALL groups except the following:-

\# = Do not bar Access to any groups except the following:-

0 = ADD the following groups:-

1 = DELETE the following groups:-

4.5 DEFINE DUMMY EXTENSION GROUP

To allocate a group of extensions where group calling is required.

Dial tone accessed after password
Hold `P´ down
Key 655
Key dummy extension No (must be the next unallocated extension No)
Release `P´

ADDITION OF EXTENSIONS TO A DUMMY GROUP

Dial tone accessed after password
Hold `P´ down
Key dummy extension No
Key extension /s to be added
Release `P´

DELETE EXTENSION /S FROM DUMMY GROUP

Dial tone accessed after password
Hold `P´ down
Key dummy extension No
* Key extension/s to be deleted
Key 603
Release `P´

*If All Extensions are to be deleted from the group omit this stage

4.6 DEFINE RING MAP

Allocates which extensions are to be rung by each exchange line.

DELETE EXTENSIONS FROM RING MAP

Dial tone accessed after password
Hold `P´ down
Key 9 then system line Number (01 - 59)
Key 663 then extension number to be deleted
Key 603
Key next extn number to be deleted
Key 603 then next extn. number then 603 etc until all required are deleted
Release `P´

To remove all extensions from the ring map, as above but omit extension Number i.e.After keying 663 key 603

ADD EXTENSIONS TO RING MAP (MAX 20)

Dial tone accessed after password
Hold `P´ down
Key 9 then system line No (01 - 59)
Key 663 then additional extension Numbers e.g.128,129,130
Release `P´

4.7 DEFINE NIGHT SERVICE GROUP

NOTE. The lines that will be switched to night service will be those lines that have been programmed to ring the `0´ group (not extn 123!) during day service

ADDITION AND DELETION OF EXTENSIONS TO NIGHT SERVICE GROUP

Dial tone accessed after password
Hold `P´ down
Key 631 then extension Nos to be added / deleted
Release `P´

Deletion of extensions is a similar operation but key code 603 after extension Number

e.g. To Delete Extns 128 &129 from N.S. Group

Dial Tone accessed after password
Hold `P´ down
Key 631 then key 128 603 129 603

DELETION OF NIGHT SERVICE GROUP

Dial tone accessed after password
Hold `P´ down
Key 631, 603
Release `P´

4.8 CALL BARRING
(CLASS OF SERVICE)

To bar terminals from making external calls

Dial tone accessed after password
Hold `P´ down
Key extension No (of which barring is to be changed)
Key 649, then new barring code (see below)
Release `P´

BARRING GROUPS

1. BAR ALL
2. BAR ALL EXCEPT 151 & 999
3. BAR IDD & STD (0)
4. BAR IDD (010)
5. NO BARRING
6. 20 DIGIT LIMIT

BARRING CODES

CODE	6	5	4	3	2	1	CODE	6	5	4	3	2	1
00		*					32	*	*	(20 Digit count)			
01						*	33	*					*
02					*		34	*				*	
03					*	*	35	*				*	*
04				*			36	*			*		
05				*		*	37	*			*		*
06				*	*		38	*			*	*	
07				*	*	*	39	*			*	*	*
08			*				40	*		*			
09			*			*	41	*		*			*
10			*		*		42	*		*		*	
11			*		*	*	43	*		*		*	*
12			*	*			44	*		*	*		
13			*	*		*	45	*		*	*		*
14			*	*	*		46	*		*	*	*	
15			*	*	*	*	47	*		*	*	*	*
16							48	*					
17		TOTAL BARRING					49			TOTAL BARRING			

*** = GROUPS BARRED**

EG:- Extension 124 bar I.D.D.
Dial tone accessed after password, hold down `P´
Key 124, 649, 08 release `P´

4.9 NOMINATE TERMINAL TYPE

It is advantageous to inform the processor what type of terminal is fitted at each terminal before allocating facilities to it. It is necessary to nominate a display terminal.

Dial tone accessed after password
Hold `P´ down
Key extn No then 662
Key terminal type code (see list `a´ below)
Input terminal facility (see list `b´ below)

List `a´ (terminal type)

00: dial or push button 2 wire telephone

08: HS terminal

26: HL terminal

20: operator console

List `b´ (terminal facilities)

1: display terminal

2: M.F. telephone

3: headset fitted

eg to set an H.L terminal with headset, after extension No. and 662, key 263

4.10 CALL LOGGING

Call logging is available only with the call logging card fitted. Full call logging requires full facility exchange line I/F cards.

ENABLE CALL LOGGING

Dial tone accessed after password
Hold `P´ down
Key 634
Release `P´

To disable call logging, as above but key 635.

4.11 REAL TIME CLOCK

This clock is used to give a time display at the operators console and also for call logging and alarm calls.Since there is no real time clock on the processor board the call logging card has to be fitted for this facility.

1.1 CLOCK DATE
Dial tone accessed after password
Hold `P´ down
Key 656 and six digits (yymmdd)
Release `P´.

1.2 CLOCK TIME
Dial tone accessed after password
Hold `P' down
Key 650 and four digits in the form HHMM (24 hour clock).
Release `P'.

4.12 SYSTEM ABBREVIATED DIALLING

Enables the operator/master terminal to program up to 100 exchange line numbers which can then be accessed by any terminal on the system, by keying a three digit code in the range 400 - 499.

Dial tone accessed after password
Hold `P' down
Key 400 then the full exchange number you require on this code
Release `P'
This operation can be repeated incrementing the Access code by one each time up to the maximum of 100

4.13 SET TERMINAL PROGRAMMING LEVEL.

Gives the operator the ability to set the level of programming available at each terminal.

Dial tone accessed, after password,
Hold `P' down,
Key extension No,
Then 659, followed by program level code (0 - 7) see table below
Release `P'.

Program level codes

0	=	No programming allowed at selected terminal
1	=	named extensions, lines and groups.
2	=	1 above, plus ring when free, monitor, sounder, cancel digits keyed, speech synthesis.
3	=	1 & 2 above plus repeat last No, three party, divert, divert on busy, divert no answer, call / clear, conference, buzz
4	=	1, 2 & 3 above, plus intrude, re-establish, calls for, answer external, answer internal, reverted calls.
5	=	1 to 4 above, plus speak, night service pickup.
6	=	NOT USED
7	=	1 to 5 above plus, recall, store, hold.

1 METHOD OF TERMINAL CONFIGURATION AND FACILITIES

The method of programming is as follows:-

Access dial tone
Hold `P' down
Press and release the facility button to programme
Key the appropriate code for the facility required
Release `P'
Dial tone indicates that the facility has been accepted

N.U. tone indicates either mis-keying or the system is programmed not to allow that facility at that particular terminal. If there is a facility already on that button it must be deleted first. 603

CONFIGURING TERMINAL FACILITY BUTTONS

1a ACCESS TO LINES

1b ACCESS TO LINE GROUPS

1c BUZZ, DIVERT,CALLS FOR etc.

ACCESS TO EXTERNAL LINES

This facility gives access to any external line in the system, Exchange Lines, P.B.X extensions and Private ccts;

PLACING AN INDIVIDUAL LINE ON A FACILITY BUTTON

Access dial tone
Hold down "P"
Press required facility button
Key 9 then system line No eg 01,02 etc;
Release "P"

b) PLACING A LINE GROUP UNDER A FACILITY BUTTON

Access dial tone
Hold down "P"
Press required facility button
Key 9 then group No plus 60 (eg for group No 25 add 60 = 85)
Release "P"

c) BUZZ, DIVERT, CALLS FOR

For any of the these facilities, after facility code input terminal No. eg;

TO PROGRAM BUZZ

Access dial tone
Hold down "P"
Press required facility button
key facility code 647 then terminal No
Release "P"

CODE		FACILITY	CODE		FACILITY
600		repeat last number	640		reverted calls
602		recall	641		speech synthesis
603		delete	642		store
606		ring when free	643	*	message waiting
608		three party	644	*	status
609		intrude	645		hold
610		conference	646		transmit
611		monitor	647		buzz
613		speak	648	* #	terminal hunt group
614		sounder on	649	#	barring cos
615		sounder off	650	#	program clock
616		divert	651	#	busy out device (park)
618		divert on busy	652	#	unbusy device (unpark)
620		divert no answer	653	#	line parameters
622	*	follow me	655	#	define terminal group
623	*	follow me cancel	656	#	program date
624		calls for	657	#	operator program enable
625		call/clear	658	#	set intrude priority
626	*	set follow me remote	659	#	set programming priority
628	*	cancel message	660	#	nominate group for line
629		cancel digits keyed	661	#	allocate external line hunt gp
630	#	re-establish	662	#	program terminal type
631	#	night service on	663	#	program line ring map
632	#	night service off	664*		call metering
633		night service pickup	665*		account code
634	#	call logging enable	666*		call pickup
635	#	call logging disable	668*		alarm call
636		answer internal	669*		alarm call cancel
637		answer external			
639	#	join			

The facilities marked # are operator / master terminal access only
* INDICATES THAT THE FACILITY IS UNDER DEVELOPMENT AND NOT YET AVAILABLE

ALPHABETICAL LIST OF FACILITIES AND CODES FOR HERALD S5102

CODE		FACILITY
665.	*	ACCOUNT CODE
668.	*	ALARM CALLS
669.	*	ALARM CALLS - CANCEL
661.		ALLOCATE EXTERNAL LINE HUNT GROUP
648.		ALLOCATE LINE TO EXTENSION HUNT GROUP
637.		ANSWER EXTERNAL
636.		ANSWER INTERNAL
		ANSWER GROUP
649.		BARRING CLASS OF SERVICE
647.		BUZZ
	*	BROADCAST
625.		CALL CLEAR
		CALL BARRING
624.		CALLS FOR
634.		CALL LOGGING ENABLE
635.		CALL LOGGING DISABLE
664.	*	CALL METERING
666.	*	CALL PICKUP
629.		CANCEL DIGITS KEYED
628.		CANCEL MESSAGE
650.		CLOCK
610.		CONFERENCE
603.		DELETE FUNCTION
655.		DEFINE TERMINAL GROUP
		DISPLAY DRIVER FACILITY
616.		DIVERT
620.		DIVERT ON NO ANSWER
618.		DIVERT ON BUSY
622.	*	FOLLOW ME
623.	*	FOLLOW ME CANCEL
626.	*	FOLLOW ME (REMOTE)
		GROUP CALLING
	*	GROUP HUNT
645.		HOLD
609.		INTRUSION
639.		JOIN
		KEYED ACCESS TO EXTENSIONS
643.	*	MESSAGE WAITING
		MF4 CAPABILITY
	*	MODEM
611.		MONITOR
		MUSIC ON HOLD
		NAMED INTERCOM
631.		NIGHT SERVICE ON
632.		NIGHT SERVICE OFF
633.		NIGHT SERVICE PICKUP
660.		NOMINATE GROUP FOR LINE
657.		OPERATOR PROGRAMMING - ENABLE
		OPERATORS CONSOLE
651.		PARK DEVICE
		PRIVATE CIRCUIT ACCESS
656.		PROGRAM DATE
662.	*	PROGRAM EXTENSION TYPE
658.		PROGRAM INTRUDE PRIORITY
653.		PROGRAM LINE PARAMETERS
663.		PROGRAM LINE RING MAP
659.		PROGRAM PROGRAMMING PRIORITY
602.		RECALL
630.		RE-ESTABLISH

600.		REPEAT LAST NUMBER
		REPERTORY CALLING
640.		REVERTED CALLS
606.		RING WHEN FREE (CALL BACK)
		SINGLE DIGIT ACCESS TO OPERATOR
	*	SINGLE KEY OPERATION
614.		SOUNDER ON
615.		SOUNDER OFF
613.		SPEAK
641.		SPEECH SYNTHESIS
644.		STATUS
642.		STORE
	*	TANDEM WORKING
608.		THREE PARTY CONVERSATION
		TRANSFER
	*	TRANSFER BY LINE KEY
		TRANSFER DIAL TONE TO AN EXTENSION
646.		TRANSMIT
		TRUNK ACCESS
652.		UNPARK DEVICE

* INDICATES THAT THE FACILITY IS UNDER DEVELOPMENT AND NOT YET AVAILABLE

Briefly, the ADDITIONAL facilities on Herald S 5102 / B8, over and above those available on Herald 100B are:

Abbreviated Dialling — Permits up to 100 frequently called numbers to be stored centrally, and accessed by extension users by keying three digits.

Account Codes * — Enables calls to be individually identified for accounting purposes.

Alarm Calls * — Allows user to program his terminal to ring at a pre-programmed time.

Alarm Calls Cancel * — Enables cancellation of an Alarm Call before Alarm takes place.

Answer Internal — Queueing of internal calls (Includes DDI PC's) which are part of an extension group. A group can consist of only one extension, if required eg The Operator.

Answer Group — Queueing of a group or groups of external calls

Broadcast $*

Enables a broadcast to be made to an extension group, provided that at least one member of the group is provided with a loudspeaker.

Buzz

Effects a single burst of ringing, or a tone, (if terminal is off-hook) to one pre-programmed extension.

Call Logging #* — Full Call Logging, including cost and number of units (DMU's).

Cancel	Cancels all digits keyed, and returns to dial tone.
Divert On No Answer	Calls are diverted if unanswered after 7 seconds.
Divert On Busy	Calls are diverted if the called extension is busy.
Follow Me *	Pressing this key, after it has been programmed with nominated extension number, allows calls to be diverte to that extension, in the same way as Divert. Th benefit, however, is that the nominated extension No ca be changed from the currently nominated terminal an another extension No substituted. (see below). Th nominated extensions' calls will not be affected.
Follow Me (Remote) *	Before leaving the nominated extension (to which 'Follo Me' originally invoked), it is possible to program th number of another extension, thus allowing calls t 'follow' the user to that extension. 'Follow Me' can b invoked any number of times, finally being cancelled b depressing 'Follow Me' at the originating terminal.
Group Calling	Enables a group of extensions to be rung simultaneousl
Group Hunt *	Hunts for a free extension.
Intrude	Intrudes upon any existing internal or external call.
Message Waiting *	A terminal can be rung automatically every 30 minutes until answered. This facility automatically self-cancels after eight hours.

MF4 Capability $	MF4 telephones can be used, meaning that either dial or push button telephones can be used at any extension, if desired.
Modem $ *	Enables the CWG to dial up the system in order to alter the configuration, log events generated within the system, (in order to identify faults), and obtain details of the system configuration.
Music On Hold $	Held callers hear music whilst waiting.
Night Service Pickup	Identifies Night Service Calls where a terminal also has direct incoming exchange lines.
Operators Console	Specially designed Operators terminal. (TX 54)
Private Circuit Access	Up to 8 routes, accessed by 71-78, using SSDC5/10 and AC15 signalling.
Reverted Calls	Unanswered transferred calls are returned under this key to the transferring extn, after 30 seconds.
Ring When Free	Recalls a hitherto busy extension automatically when it becomes free.
Single Key Operation *	If a terminal is fitted with a Monitor or a headset, single keystroke operations can be performed without lifting the handset.

Speak

Enables a spoken message to be passed to a nominated extension, provided that extension is fitted with a Monitor, at a single keystroke. Alternatively, if no extension is nominated at that button, any terminal having a Monitor can be called after keying the extensions' number.

Speech Synthesis $

An option enabling spoken announcements, information, etc. to be heard.

Tandem Working

Tandem switching is possible; the system can even be used as a 'stand alone' tandem switcher.

Three Party Conversation

Enables a three party conversation to take place, which can include an exchange line.

Transfer

Can be made after called party answers, or on ringing or busy.

Transfer By Line Key *

Allows exchange line call to be held, and answered at any other terminal having incoming access to, and a line key for, that line, via a line button.

.....

*: Facility under development, not available for the national launch of the system

$: Provided by means of an Daughter Board.

#: Provided by means of a dedicated card.

In addition, many features have been simplified; for example, 'DIVERT' now uses only one key.
Note, however, that the method of operating 'CONFER' has changed.

TERMINAL FACILITIES

The following is a list of terminal facilities.
Those marked with an asterisk(*) can be programed to a key.

ABBREVIATED DIALLING

Enables user to call up to 100 numbers which have been pre-programmed by the Operator, by keying a three digit number in the range 400 - 499.

To make an Abbreviated Dialling call:

1. Look up the number required in Abbreviated Dialling List.
2. Lift the handset, hear Herald dial tone. Key the Abbreviated Dialling number, in the range 400 - 499

*** ANSWER EXTERNAL**

Enables user to answer the longest waiting incoming exchange line call first. (Not Private Circuits which have dialled directly in to the extension.)

Upon hearing the terminal sounder, or seeing the ANSWER EXTERNAL lamp flash:

Lift handset

Press the ANSWER EXTERNAL key

If, when user have completed a call, the ANSWER EXTERNAL lamp is still flashing, another call is waiting to be answered.

To answer a following call:

Press the ANSWER EXTERNAL key.

There is no need to wait for the last call to clear, or to replace the receiver.

NOTE

After self configuration, every terminal will have a "ANSWER EXTERNAL" key (key No7). If this key is deleted and no "Line keys" are provided then the "sounder off key" will not function (the led will glow if the key is pressed but the sounder will remain on). Exch Line calls will now be answered "off hook" at this terminal. If "Line Keys" are provided at this terminal then selective line answering is not possible unless the sounder is off. The same is true when answering "transfered on busy" or "transfered on ringing" calls at this terminal.

ANSWER INTERNAL

Enables user to answer the longest waiting incoming internal call first when the caller has made the call to an extension group,(including the '0' group) of which the called terminal is a member (Includes Private Circuits which have dialled directly into the extension group). Incoming internal and Private Circuit calls directed specifically to the extension are answered direct off-hook.

Upon hearing the terminal sounder, or seeing the ANSWER INTERNAL lamp flash:

1. Lift handset,
2. Press the ANSWER INTERNAL key

a
If, when user has completed a call, the ANSWER INTERNAL lamp is still flashing, another call is waiting to be answered.

To answer a following call

Press the Answer Internal key
There is no need to wait for the last call to clear, or to replace the handset.

When simultaneous incoming internal and external calls are waiting to be answered, the terminal sounder will operate at the internal cadence, but user can choose which type of call to answer first by pressing the appropriate button.

LINE GROUP

If the terminal is allocated one or more groups of exchange lines, the LINE GROUP lamp will flash when a call for one (or more) of the exchange lines in that group is waiting to be answered. Press LINE GROUP in order to answer the longest waiting call in that group. If more than one group of exchange lines is allocated to the terminal, the user will have an LINE GROUP button for each one.

BROADCAST

This facility enables user to make a `broadcast' announcement to an extension group provided at least one extension in that group has a loudspeaker fitted to his extension.
To program which group of extensions user wishes to make broadcasts to:

1. Lift handset. Hear dial tone.
2. Depress and release the button against which `Broadcast' is to be programmed.
3. Key 613
4. Key the number of the extension calling group to broadcast to.
5. Release `P'.
6. Hear Herald dial tone.

To make a `Broadcast´:
1. Lift handset. Hear dial tone.
2. Press `Broadcast.´
3. Make announcement.
4. Replace receiver.

* **BUZZ**

Effects a single burst of ringing, or a tone, (if terminal is off-hook) to one pre-programmed extension.

To program a `Buzz´ extension:

1. Lift handset. Hear Herald dial tone.
2. Depress `P´, and HOLD IT DOWN.
3. Depress and release the button against which `Buzz´ is to be programmed.
4. Key 647
5. Key the extension number to `Buzz´.
6. Release `P´.
7. Hear Herald dial tone.

To attract the attention of the terminal user which has been programmed to receive BUZZ calls.

1. Do NOT lift handset.
2. Key BUZZ
3. The lamp associated with BUZZ will illuminate for about one second if the Buzz has been successful.

* CALL CLEAR

For use when a headset is fitted.

To answer a call: Press CALL CLEAR.

Press ANSWER EXTERNAL (If fitted).

To clear down: Press CALL CLEAR again.

CALL BARRING

The terminal may be barred access to certain types of call, for example, International. If this is the case, Number Unobtainable tone will be heard whilst user is keying the number.

* **CALLS FOR**

If the terminal is the recipient of diverted calls from another terminal, the lamp associated with CALLS FOR will flash, and the sounder will operate.

To answer a diverted exchange line call:

1. **Lift handset.**
2. **Press CALLS FOR.**

To answer a diverted internal call

Lift handset to answer call.

* CANCEL

If mis-keying whilst calling a number, press CANCEL in order to receive Herald dial tone, and re-start.

*** CONFERENCE**

If the terminal has a CONFER key, it is able to initiate a conference with up to six extensions.

To initiate a conference:

1. Lift receiver. Hear Herald dial tone.
2. Press CONFER. The lamp associated with CONFER will illuminate
3. Press `H´. Hear Herald dial tone again. The CONFER lamp will flash at `held´ cadence.
4. Set up the call in the usual way.
5. When the called extension answers, press H. Hear Herald dial tone.
6. Press CONFER again. The conference is now established.
7. Press `H´. Hear Herald dial tone
8. Call the next extension to be included in the conference.
9. When the called extension answers, press `H´. Hear Herald dial tone.
10. Press CONFER again
11. Repeat 5 & 6 again until all the participants are in the conference. (Maximum 6)

If External conference is fitted to the Herald, it is also possible to include one exchange line in the conference.

To initiate a conference including one exchange line

1. Press `H´ whilst talking to the exchange line caller. Hear Herald dial tone.
2. Press CONFER. The lamp illuminates and Herald dial tone is removed.
3. Press H again. Hear Herald dial tone.
4. Set up the call to the extension you wish to join the conference.
5. When the called extension answers, press H. You hear Herald dial tone.

Conference.

7. Repeat 3 & 4 until all the participants have joined the conference (Maximum 6, including the exchange line.)

Removal of a terminal or exchange line from Conference

To remove an extension (or exchange line caller) from the conference,the controler must have a named intercom button(or exchange line key) for that extension or line:

1. Press the NAMED INTERCOM (or line button) button of the extension (or exchange line caller) to be removed. Press `HOLD´. Conference controler can now speak to that extension (or exchange line) without other members of the conference overhearing.

2. Momentarily replace handset, thus removing terminal (or exchange line) from the conference.

3. Lift handset again, and press CONFER. Conference controller will have rejoined the conference.

* DIVERT

Enables diversion of all incoming calls to a nominated terminal.

To program Divert, Divert on no Answer or Divert on busy

1. Lift handset. Hear Herald dial tone.
2. Depress `P´, and HOLD IT DOWN,
3. Depress and release the button against which the Divert facility is to be programmed.
4. Key appropriate diversion code (see code table).
5. Key the extension number to Divert calls to.
6. Release `P´.
7. Hear Herald dial tone.

To divert your calls:

Press DIVERT
The associated lamp will illuminate.

To cancel DIVERT:

Press DIVERT again.
The associated lamp will extinguish.

* **DIVERT ON NO ANSWER**

Calls are diverted if unanswered after 7 seconds.

To divert calls if unanswered after 7 seconds

Press DIVERT ON NO ANSWER
The associated lamp will illuminate.

To cancel divert:

Press DIVERT ON NO ANSWER
The associated lamp will extinguish.

* DIVERT ON BUSY

Calls are diverted if the extension is busy.

To divert calls when the extension is busy

Press DIVERT ON BUSY
The associated lamp will illuminate.

To cancel divert

Press DIVERT ON BUSY
The associated lamp will extinguish.

Note that only one type of Divert is operative at any one time.

* FOLLOW ME

Pressing this key, which has been programmed with a nominated extension number, allows calls to be diverted to that extension, in the same way as Divert. The benefit, however, is that Follow Me can be cancelled at the nominated terminal, and another extension number nominated.

To invoke FOLLOW ME:

Press FOLLOW ME. The associated lamp will illuminate.

To cancel FOLLOW ME:

Press FOLLOW ME. The associated lamp will extinguish.

FOLLOW ME (REMOTE)

Before leaving the extension to which `Follow Me´ was originally invoked, it is possible to program the number of another extension, thus allowing calls to `follow´ the user to that extension. `Follow Me´ can be invoked any number of times, finally being cancelled by depressing `Follow Me´ at the originating terminal.

To invoke FOLLOW ME (REMOTE):

Key 626, followed by the invoking extension number, then the number of the extension to which transfer is required. System dial tone is then heard, which confirms that the instructions have been accepted. Calls intended for the nominated extensions are unaffected by invocation of `Follow Me´.

GROUP CALLING

Enables a group of extensions to be rung internally simultaneously

If the extension is one of a group to be rung simultaneously, all non busy extensions on the group will ring (Unless the sounder is switched off), and Answer Internal calling lamps flash, (if provided), to indicate an incoming call for this group. Any member of the group can answer the call.

* HOLD

Holds a call whilst user performs some other function.

User can hold a call in order to transfer it, or make an enquiry.

To Hold a call:

Press Hold (`H´). Hear dial tone. Make enquiry call, and on completion, press H again to regain call.

To transfer the call:

1. Press H. Hear Herald dial tone.
2. Key the extension to transfer to.
3. Replace receiver when the extension rings, or busy tone is heard.

If the terminal receiving the transfered call is engaged, on a call, then a short burst of tone will be heared, by the user, when the transfer is executed.

If the called extension fails to answer, or is still busy, after about 30 seconds, the terminal will ring, and, if there is a REVERTED CALLS button, the associated lamp will illuminate.

You may then retrieve the call:

If user mis-keys, press `H´ again to regain caller, then start again. Do not press the switch-hook, to do so will mean the call automatically being transfered to the extension mis-keyed.

* INTRUDE

Intrudes upon any existing internal or external call.

Key the desired extension. If busy tone is returned, key INTRUDE. A three way conversation will be entered into and all three parties will hear a tick tone.

Whoever clears down first will leave the remaining two parties in conversation and the tick tone will be removed.

If the Intrusion is unsuccessful, (because of attempting to intrude on a conference), Number Unobtainable tone will be heard.

JOIN

Operator Facility - see page 90

KEYED ACCESS TO EXTENSIONS

Internal access to other extensions.

To call another Herald extension:

Key that extensions' number. Ring tone, busy tone or unobtainable tone, will be returned as appropriate.

* **MESSAGE WAITING**

Allows another extension, or the Operator, to make the Herald ring an extension for 30 seconds every half-hour to indicate that someone wishes to speak to the extension user. This facility automatically cancels after eight hours have elapsed.

To invoke MESSAGE WAITING

1. Key the extension number required.
2. Press MESSAGE WAITING whilst listening to ring or busy tone. The associated lamp will illuminate.
3. Replace receiver.

When a MESSAGE WAITING call is returned

1. The originating terminals sounder operates at internal cadence.
2. The lamp associated with MESSAGE WAITING changes from steady to flashing cadence.
3. Lift handset to answer call.

To cancel MESSAGE WAITING:

MESSAGE WAITING can be cancelled at any time by keying $$$. (Code not yet allocated)

Receiving a MESSAGE WAITING call

1. The lamp associated with the MESSAGE WAITING key will flash with the `held' cadence.
2. The extension will ring for 30 seconds every 30 minutes. If the called extension is busy during this period, Message Waiting will ring the extension 5 seconds after the replacement of the handset.

On hearing ring tone, lift handset.

Hear ring tone in the receiver. This is the extension ringing which invoked Message Waiting. If there is a MESSAGE WAITING key, on the terminal the associated lamp will be extinguished when the originating extension answers.

* **MONITOR**

Loudspeaker enabling `hands free' setting up of calls. (NOT a two-way LST facility).

If a Monitor amplifier is fitted to a terminal, then that terminal will have a MONITOR button.

To activate Monitor:

Press MONITOR. Herald dial tone will be heard. A call may now be set up without touching the handset, until the called party answers.

To activate MONITOR whilst `holding on´:
Press MONITOR. Replace receiver. When called party answers, lift the receiver. The MONITOR lamp will extinguish.

NAMED INTERCOM

Enables single button calling of pre-programmed extensions, and lamp indication of their status.

To program an extension:

1. Lift handset
2. Hear dial tone
3. Press P and HOLD IT DOWN
4. Press the button beneath which extension number will be stored.
5. Key the extension number to be stored.
6. Release P
7. Hear Herald dial tone.
8. Annotate the button label.

That extension can now be rung by pressing the appropriate button, there will be a lamp indication (steady) when that extension is busy. The lamp will also flash when that extension calls this terminal.

* NIGHT SERVICE

Incoming exchange line calls to the Operator can be diverted and answered at alternative extensions.

When the Operator is not on duty, she will invoke the NIGHT SERVICE facility. This results in all incoming exchange line calls to the Operator being answerable at any extension. See also page 90

To answer a call when the Herald is in Night Service

On hearing external ringing.

1. On an extension that is ringing lift the handset. The call will be presented to the terminal, unless the terminal has an ANSWER EXTERNAL LINE button, or Night Service Pickup, and the associated lamp is flashing, in which case the appropriate button must be pressed.

2. If the extension is not ringing,
   Lift the handset
   Key `8´
   The terminal will be presented with the call

PRIVATE CIRCUIT ACCESS

If the terminal has access to Private Circuits, they can be accessed by pressing the LINE button, if fitted, or keying a two digit code.
Incoming Private Circuit calls are answered as for internal calls, but can be transferred as for external calls; ie: on ringing or busy.

Direct Dialling In (DDI) Private Circuits will ring at INTERNAL cadence, and are answered direct off-hook.

Private Circuits transferred from one extension to another will ring at EXTERNAL cadence, and are answered as would be an exchange line call.

* RECALL

If the Herald system is connected to another PBX, it is possible to recall the Operator at that PBX whilst being connected to an external call.

To recall the Operator at a PBX whilst being connected to an external call

1. If the Herald is connected to a PMBX:
   Press `R´
   The Operator will answer.

2. If the Herald is connected to a PABX:
   Press `R´
   Key `0´
   The Operator will answer.

* RE-ESTABLISH

Enables re-try of reverted calls to same extension.

When a call as been transferred to another extension, camping on busy or ring tone, the call will revert to the transfering terminal if unanswered, after about thirty seconds. To re-try the required extension:

Press RE-ESTABLISH after speaking to the reverted caller.

* REPEAT LAST NUMBER

The last exchange line number dialled can be re-dialled automatically.

To Repeat last EXCHANGE LINE number called:

Lift handset. Hear dial tone.
Press Repeat Last Number. (If programed)

Alternatively Lift Handset. Hear dial tone.
Press T twice, ie: `T´`T´.
Note that, if `9´ was used to access the last exchange line call made, use of `T´`T´ will result in `9´ being called again. If a line button was used to access a specific line in order to make the last call, `T´`T´ will result in that line only being accessed again, in order to set up the call. If that line has become `busy´ in the interim period, busy tone will be heard.

To place the last number called in the Repertory Dialing Store:

1. Lift handset. You hear dial tone.
2. Press and HOLD DOWN `P´.
3. Press and release `T´.
4. Press and release `R´.
5. Press and release the button under which you wish to store the number.
6. Release `P´.

REPERTORY CALLING

It is possible to give certain keys and buttons on a terminal the `Repertory Calling´ function. This means that an exchange number has been stored in Herald´s memory against that button. A press of this button will then instruct the Herald to call the external number previously stored under the button.

On HS and HL terminals, the Repertory Calling function can be allocated to the twelve buttons of the Keypad.

On HL terminals, it is also possible to give the Repertory Calling function to one of the other two locations listed below, if this facility has been provided on the extension using H.D.S

1. The first two rows of buttons, to the right of th keypad.

2. The second two rows of buttons.

In this case, it does not matter if other facilities are programmed under any of these buttons. They can still be used for Repertory Calling.

To give a button the Repertory calling function:

1. Lift handset, hear Herald dial tone.
2. Put the handset down on the table.
3. Press `P´ and HOLD IT DOWN,
4. Press `T´
5. Press the button under which the Repertory Called number is to be stored.

If it is desired that the call be made over a certain line, line group or Private circuit, press the appropriate line button, otherwise it will be made randomly.

1. Key the full exchange or Private Circuit number to be stored
2. Release `P´
3. Replace handset.

Note the stored number on the button label, or make a seperate note if stored under a keypad button.

To change the stored number:

Repeat the procedure shown above.

If you are connected to a parent PBX, and wish to incorporate the PBX access code, key `T´ after the access code. This results in the memory waiting for secondary dial tone, from the public exchange, or PBX, before proceeding to send the rest of the number.

To make use of the facility:

1. Lift handset. (Or press MONITOR)
2. Hear Herald dial tone.
3. Press `T´ or select an external line and then press ` T
4. Press the appropriate button against which the number to be transmitted has been stored.
5. Herald will transmit the number to line.

* REVERTED CALLS

Unanswered transferred calls are returned under this key to transferring extn.

If a call has been transferred to another extension, and that extension has remained unanswered or busy for about thirty seconds, the call will return to the transfering terminal. If there is a REVERTED CALLS button, the associated lamp will flash and the sounder operate (unless `Sounder on/off´ has been activated).

To answer a REVERTED CALL:

Press REVERTED CALLS.

If the terminal does not have a REVERTED CALLS button, the call will be presented as an incoming external call, and is answerable in the usual manner.

* **RING WHEN FREE**

Recalls a hitherto busy extension, automatically, when it becomes free.

THE MASTER /OPERATORS TERMINAL ON PABX CONFIGURED SYSTEMS CANNOT HAVE THIS FACILTY. IF THIS FACILITY IS REQUIRED ON A KEY SYSTEM MASTER TERMINAL THEN IT MUST BE PROGRAMED VIA HDS

To recall a busy extension:

1. Key required extension. On receipt of engaged tone:
2. Press RING WHEN FREE
3. The associated lamp will illuminate.
4. When the called extension becomes free, and the calling extension is also free:
5. The calling extension will ring with internal cadence.
6. Lift the handset.
7. Ring tone will be heard as the required extension is rung.
8. If busy tone is heard, then the required extension has started another call before establishing this call.

The facility can be programed on any free terminal button or is available via a "dial up code" both from 4w and 2w extns. If no programed button is available after dialling a busy extension on receipt of busy tone key or dial 606. Dial tone is returned. When the required extn becomes free your phone will ring indicating your requested ring back.

Ring When Free facility is cancelled:

1. After it has been successfully completed, OR
2. if 8 hours have elapsed, OR
3. A Ring When Free call has not been answered at the initiating terminal after 30 seconds.

SINGLE DIGIT ACCESS TO OPERATOR

The Operator can only be called by dialling or keying `0´.

To call the Operator:

Key `0´.

* **SOUNDER ON/OFF**

Silences sounder, if required, on external calls.

To silence the sounder:

Press SOUNDER ON/OFF.
The associated lamp illuminates.

To activate the sounder:

Press SOUNDER ON/OFF again.
The associated lamp extinguishes.

* **SPEAK**

Enables an announcement to be made at another extension, provided that extension has a Monitor fitted.

To make an announcement:

If the SPEAK key has a nominated terminal, which must be fitted with a Monitor, programmed:

1. Lift handset. Hear Herald dial tone.
2. Press SPEAK
3. Make announcement
4. Replace receiver.

If the SPEAK key does not have a nominated terminal programmed:

1. Lift handset. Hear Herald dial tone.
2. Key the extension number. This extension must be fitted with a Monitor.
3. Press SPEAK
4. Make announcement
5. Replace receiver.
6. If the called extension is not fitted with a monitor, ring tone will be heard after keying `SPEAK', and the extension will continue to ring in the normal way until it is answered, or call is abandoned.

* SPEECH SYNTHESIS

A synthesised voice will announce details of button allocation.

To access Speech Synthesis:

1. Lift handset.
2. Hear Herald dial tone.
3. Press Speech Synthesis or, alternatively, Key 641. Speech returned, `Your key is programmed to.....'
4. Now press any button. The voice will announce what is allocated to that button.

* THREE PARTY

Facility enabling three extension users, or two extension users plus an external caller to confer. If more extensions are required to be in a conference, see under CONFERENCE.

To initiate a Three Party conversation:

1. Whilst conversing with another extension OR an exchange line caller, press `H'.
2. Key, either the extension, OR the exchange line number, to be included in the Three Party conversation.
3. When connection has been made, press THREE PARTY.
4. All three are now in conversation.

* STORE

1 This key enables the temporary `parking' of a held call. Press STORE whilst listening to call.

2 You hear dial tone.
Lamp associated with
STORE button flashes with the `Held' cadence.

To retrieve stored call:

3 Press STORE whilst listening to Herald dial tone.
Associated lamp extinguishes.

TRANSFER OF CALLS

The transfer facility now encompases three states:-
1. Transfer after called subscriber answers.
2. Transfer on ringing.
3. Transfer on busy.

Transfer on ringing and transfer on busy applies only to external calls.
In order to initiate a transfer the extension user shall place the call into the HOLD state and make a call to any other extension.
On receiving ring tone or busy tone the extension user shall have a choice of actions as follows:
Ring tone returned: The extension user may EITHER listen until the required extension answers, replace his handset and the call shall then be transfered as required OR the extension user may replace his handset whilst listening to ringing and the caller shall be camped on ringing to be transfered when the required extension answers.

Busy tone returned: The extension user may EITHER press HOLD to inform the caller that the required extension is busy, or may replace his handset whilst listening to busy tone and the caller shall be camped on busy to be transfered when the required extension becomes free.

External callers when camped on ringing or busy will receive Music on Hold if the facility is provided.

If whilst camped on ringing or busy, the called extension does not answer or become free within n seconds the call shall revert to the transfering extension and shall cancel the camp on busy or camp on ringing. The default value of n shall be 30 seconds.

TO TRANSFER AN EXCHANGE LINE CALL OVER AN INTER PBX EXTENSION

1 On receiving the incoming exchange line call, press HOLD

2 Access the Private Circuit by your usual method

3 Key the required extension number

4 WAIT FOR CALLED EXTENSION TO ANSWER.

5 On receiving an answer, clear down.

If no answer, or busy tone is received:

Press `HOLD´
You are reconnected to your caller

TRANSFER DIAL TONE TO EXTENSION

Facility enabling the transfer of dial tone to an otherwise barred extn.

If your extension is barred from making exchange line calls:

1. Key/dial an extension that has full access to Exch. Lines
2. Ask for a line.
3. exchange dial tone will be heard.
4. Make the call in the normal way.
5. At the end of the call, replace the receiver.

(To make another call , repeat the sequence above).

TRUNK (Exchange line) ACCESS

Access to an exchange line from a terminal can be made in several ways, depending on how the terminal has been configured.

To make an Exchange Line call:

1. Lift handset.
2. Hear Herald dial tone.
3. Either key 9.
4. Herald will select a free line which is allocated to the extension.

Or, if one or more line buttons have been programmed to the terminal, select the line desired by depressing the relevant button. If the associated lamp is lit, this indicates that the line is busy.

OPERATING INSTRUCTIONS

GENERAL

The following facilities are ONLY available from the Operator/Master terminal and are in addition to the Hera S 5102 system facilities described in the Terminal Use instructions.

1 JOIN
2 NIGHT SERVICE

JOIN

This key enables the connection of two parties being supervised. For example, an incoming call is held, and an enquiry initiated to an extension, which then agrees to accept the call. Key JOIN, and both parties, plus the Operator, are in conversation. To clear from the conversation, key CALL CLEAR, if a headset is in use, or clear down.

Press JOIN. The associated lamp will illuminate.

NIGHT SERVICE (631)

When the console is unattended, depression of this key results in all incoming exchange line calls bein redirected to other extensions, who can answer, either `direct off-hook', if their extension is `ringing', or by keying `8' if another extension can be heard ringing.

Press NIGHT SERVICE. The associated lamp will illuminate. Alternatively Key 631 to select Night Service

To return to Day Service:

1 Lift handset. You hear Herald dial tone.
2 Key 632.
3 The associated lamp will extinguish.

APPENDIX A

NOTES ON HOW TO FILL IN CARDCALC

1. Information needed to calculate the No of cards will be extracted from the "CUSTOMER REQUIREMENT DOCUMENT" (C.R.D), which will have been filled in by the sales representative.

2. The Operators Console and TX 58 Terminals need a terminal display I/F card. There are 4 ccts on this card, any spare ccts can be used by non-display terminals.

3. Only one Call Logging card is needed per system.

4. External Conference. This card provides 2 ccts.

5. One Speech Synthesis board per system.

6. One Broadcast board per system.

7. One Modem board per system.

8. One Music on on Hold board per system.

9. M.F.4 daughter boards. If over 16 two wire teles including MF 4 teles are provided on the system, then a second MF 4 daughter board should be fitted.

10. Each Option Mother board takes 3 daughter boards ie;
For 3 or less daughter boards use 1 Option Mother board.
For 4 to 6 daughter boards use 2 Option Mother boards etc;
see also note 9.

11. Existing Exchange Line I/F cards (blue handle) may also be used. Add together ccts shown at No. of Exchange Lines and P.B.X ccts then divide by two to find No. of cards required. Lines not requiring PF switching, MOH or full call logging may be provided on compact line I/F cards. Add together the No. of ccts and divide by four to find the No. of cards required.

12. SSDC 5/10. As existing, two ccts per I/F card.

13. SSAC 15. One cct per card.

14. See also note 2. To find No. of four wire extension I/F cards divide total No. of ccts by four. There are four ccts per card.

	ITEM		No of CARDS
	OPERATORS CONSOLE	see note 2	[ ]
	CALL LOGGING	see note 3	[ ]
	EXTERNAL CONFERENCE CARD	see note 4	[ ]
	No of daughter BOARDS		
	SPEECH SYNTHESIS [ ]	see note 5	
*	BROADCAST [ ]	see note 6	
*	MODEM [ ]	see note 7	
	MUSIC on HOLD [ ]	see note 8	
	MF4 BOARD/S [ ]	see note 9	

==========

Total No of daughter boards [ ]

Total No of mother boards see note 9/10 [ ]

No of exchange and P.B.X line ccts requiring :- [ ]/2 see note 11 [ ]
PF switching
Music On Hold
* Full call logging

Remainder of exchange and P.B.X line ccts [ ]/4 see note 11 [ ]

PRIVATE CCTS

No of SSDC 5 / 10 [ ]/2 see note 12 [ ]

No of SSAC 15 [ ] see note 13 [ ]

TERMINALS

No of 2 wire terminals [ ]/8 see note 14 [ ]

No of 4 Wire Terminal ccts less display spares [ ]/4 see note 14 [ ]

TOTAL NUMBER OF ALL TYPES OF CARDS _____

*** Not available for launch**

TOLERANCES ON COMBINED POWER UNIT

-50v + or - 1v

-12v + or - 0.4v

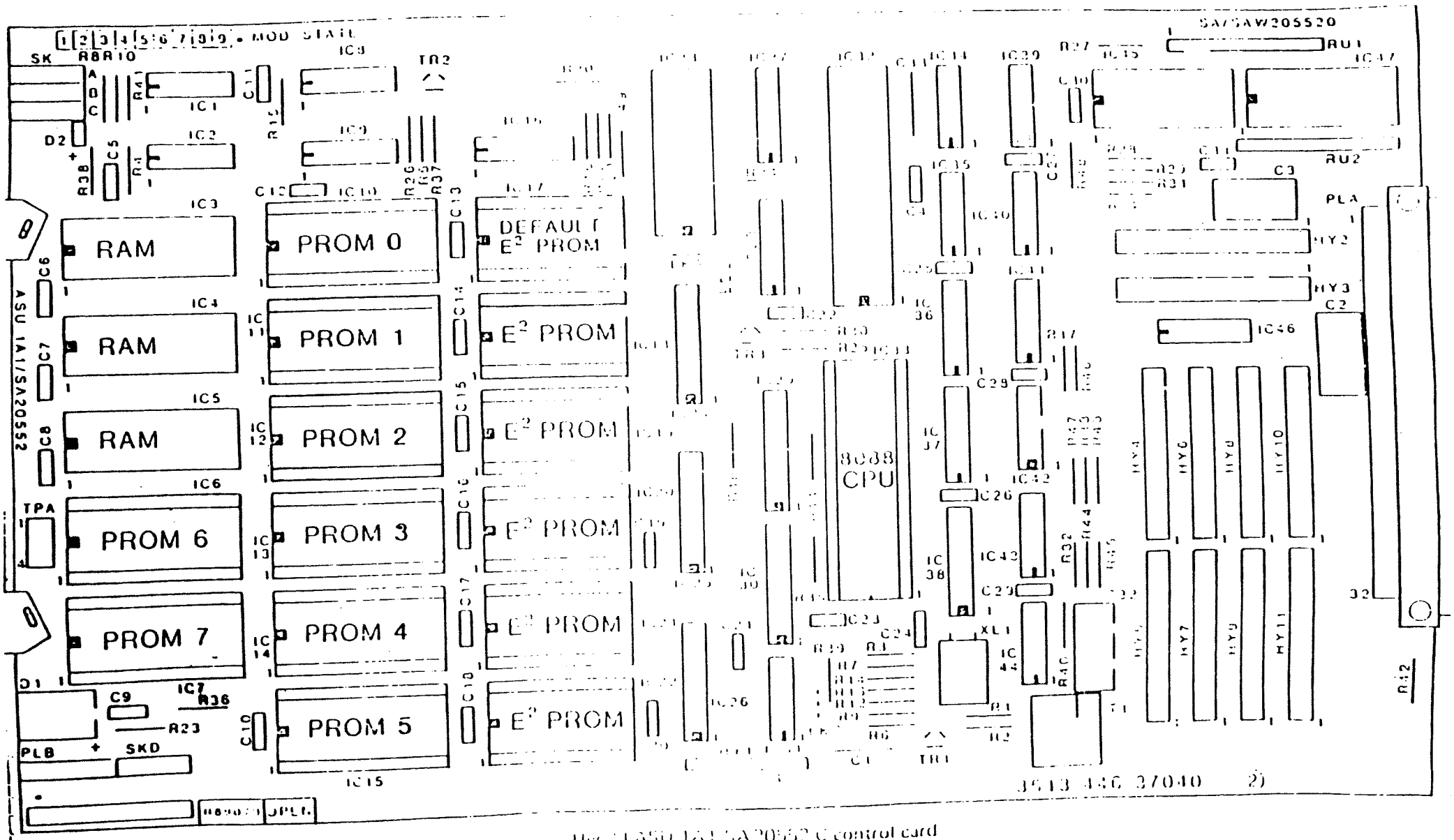
5.15v + or - 0.1

1.5v + or - 0.1v

* +12.4v + or - 0.4v

+24v + or - 1v

* Signwritten +12



H-G 1350 1A1 SA20552 C control card

BOX CONNEXION 375

PERMANENT WIRING. CONNECTOR No 226 to 'EQUIPMENT SIDE' CONNEXION BLOCKS

CONNECTOR SOCKET	CONNECTOR SOCKET PINS									CONNEXION BLOCK
F	17 42	18 43	19 44	20 45		21 46	22 47	23 48	24 49	2/9
	9 34	10 35	11 36	12 37		13 38	14 39	15 40	16 41	2/8
	1 26	2 27	3 28	4 29		5 30	6 31	7 32	8 33	2/7
E	17 42	18 43	19 44	20 45		21 46	22 47	23 48	24 49	2/6
	9 34	10 35	11 36	12 37		13 38	14 39	15 40	16 41	2/5
	1 26	2 27	3 28	4 29		5 30	6 31	7 32	8 33	2/4
D	17 42	18 43	19 44	20 45		21 46	22 47	23 48	24 49	2/3
	9 34	10 35	11 36	12 37		13 38	14 39	15 40	16 41	2/2
	1 26	2 27	3 28	4 29		5 30	6 31	7 32	8 33	2/1
C	17 42	18 43	19 44	20 45		21 46	22 47	23 48	24 49	2/0
B	17 42	18 43	19 44	20 45		21 46	22 47	23 48	24 49	1/9
	9 34	10 35	11 36	12 37		13 38	14 39	15 40	16 41	1/8
	1 26	2 27	3 28	4 29		5 30	6 31	7 32	8 33	1/7
A	17 42	18 43	19 44	20 45		21 46	22 47	23 48	24 49	1/6
	9 34	10 35	11 36	12 37		13 38	14 39	15 40	16 41	1/5
	1 26	2 27	3 28	4 29		5 30	6 31	7 32	8 33	1/4
Z	17 42	18 43	19 44	20 45		21 46	22 47	23 48	24 49	1/3
	9 34	10 35	11 36	12 37	5 30	13 38	14 39	15 40	16 41	1/2
CONNEXION BLOCK TAG No	1	2	3	4	5 6	7	8	9	10	
	1 2	3 4	5 6	7 8	earth earth	13 14	15 16	17 18	19 20	

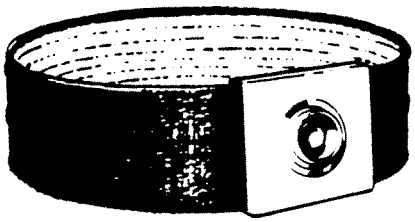
Connector Socket "Z" pins 1-4 and 26-29 are connected to "TEAM". Pins 6-8 and 31-33 are spare.
Connector Socket "C" pins 1-16 and 26-41 spare
Connector Socket "Z"-"F" pins 25&50 are connected to earth.

BRITISH TELECOM ELECTROSTATIC PROTECTION EQUIPMENT

1 ESP Equipment in BT

Note The connectors used are to a BT standard for ESP use only. The male connector will be fitted as an ESP bonding point on all new static sensitive BT equipment.

2 ESP Wrist Band



LARGE (165 mm) item code 141738
SMALL (145 mm) item code 141737

This elasticated wrist band has a conductive inner surface, and should be tested for electrical continuity occasionally. The outer protective covering is non conductive.

Most male users will need the large size, but since the wrist band should be a close fit on the wrist, some users may need the small size.

The band can be hand or machine washed when soiled.

WARNING

Do not wear when exposed to live circuits in excess of 1kV.

3 ESP Cord

Item Code 141736

The coiled ESP cord extends to 2.5 metres.

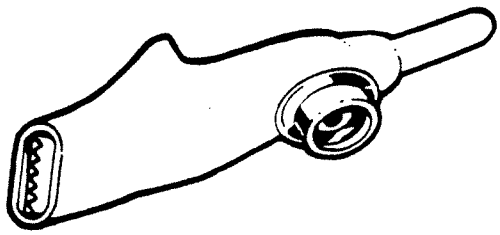
In the female connector housing at each end of the cord is a 2 megohm safety current limiting resistor.

Test continuity at monthly intervals, and ensure it is between 3-5 and 6 megohms.

WARNING

1 Never use a non BT cord which does not include limiting resistors.

4 **ESP Adaptor No. 1**

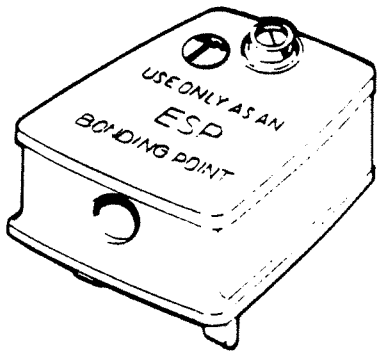


Item Code 141746 supplied in packets of 10

This BT connector to crocodile clip adaptor allows contact to be made to a variety of selected bonding points, such as equipment chassis. It is not required when the equipment is already fitted with an approved BT ESP connector bonding point.

WARNING. Do not use anodised aluminium metalwork as a bonding point.

5 **ESP Plug**



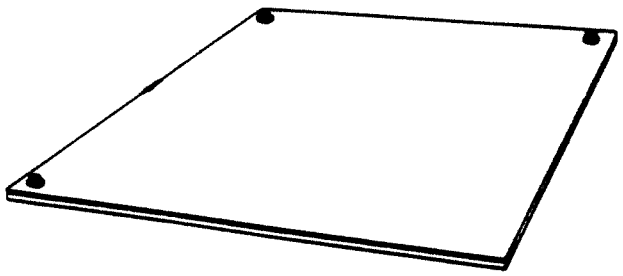
Item Code 141758

This three pin mains plug is for workshop use, and allows an ESP protected working area to be bonded to the same electrical potential as the local electricity supply earth. This is necessary when certain mains supplied soldering and test equipment is in use.

The ESP connector on the plug is connected directly to the earth pin. The plug is fully sealed to prevent access to the Live and Neutral pins, and it MUST NOT be used as an electrical supply plug.

Connection to the ESP plug is always via a BT approved ESP cord containing limiting resistors.

6 **ESP Matting**

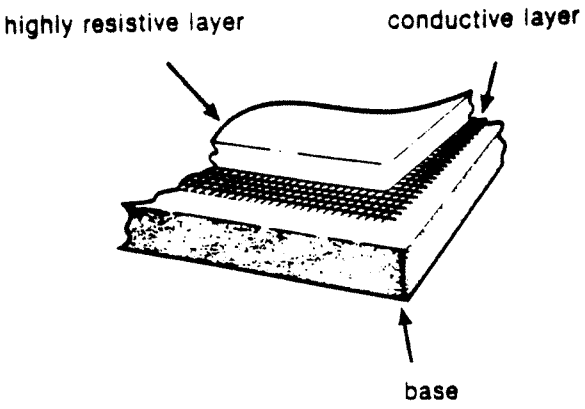


Item Code 141759

Special flexible three layer material which is volume conductive to the centre layer is used in making ESP mats.

The material has a highly resistive top surface, which permits the operator to work on powered up equipment.

The mats are tough but resilient, and provide protection for delicate equipment. They are non slip and when soiled can be cleaned with soap and water or a mild detergent. They must not be coated, polished or sprayed.



Typical recommended uses for the matting are:-

1 To cover a complete work bench top, for example in an Area Repair Centre.

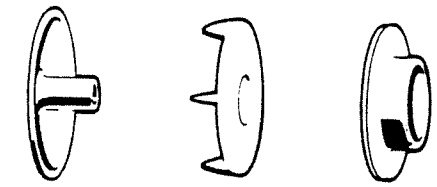
2 To cover a small servicing bench for static sensitive equipment, in modern telephone exchanges or at major PBX sites.

3 To provide small portable servicing mats for customers equipment installation and maintenance personnel. For this use, a 450 mm x 400 mm (18" x 16") size is suggested.

In the interests of economy, and to allow mat sizes to be varied to meet local needs, the matting is supplied in bulk for the manufacture of separate mats to be carried out on a Regional or Area basis.

The matting is supplied in 40' rolls, with widths of 48" or 54" depending on manufacturer. Each roll will make at least 80 of the small portable mats. The matting can be easily cut on any firm surface using a straight edge and sharp knife. The connectors are fitted in each corner, or as required.

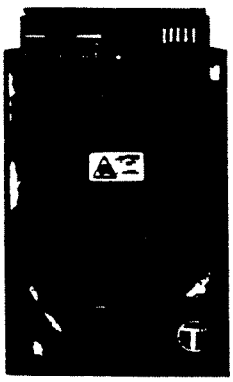
7 **ESP Connector Kit 1A**



Item Code 141764

This consists of a kit of parts for 400 male ESP connectors and suitable assembly tools for fitting them to the matting.

8 **Bags Static Shielding**



Two types are approved and are provided, these are:-

(a) Opaque Conductive Plastic suitable for all static sensitive PCBs except those fitted with "on-board" power sources such as batteries.

(b) Transparent, with a conductive outer coating, a puncture resistant centre layer and an anti-static inner layer. Essential for PCBs with "on-board" power sources and in situations where it is necessary to identify the enclosed PCB without removal from the bag.

Items stocked:-

Bag Static Shielded No. 1

Type (a) — Opaque Conductive (limited use).

Sizes (mm)	Item Code
330 x 406	235725
355 x 406	235726

These have been ordered specially for TXD boards.

Bag Static Shield No. 2

Type (b) Transparent multilayer

Size (mm)	Item Code
600 x 375	235739
500 x 425	235738
450 x 450	235731
425 x 375	235737
375 x 325	235736
375 x 275	235730
250 x 200	235729
125 x 75	235728

Bag Static Shield No. 3

Type (a) Opaque conductive

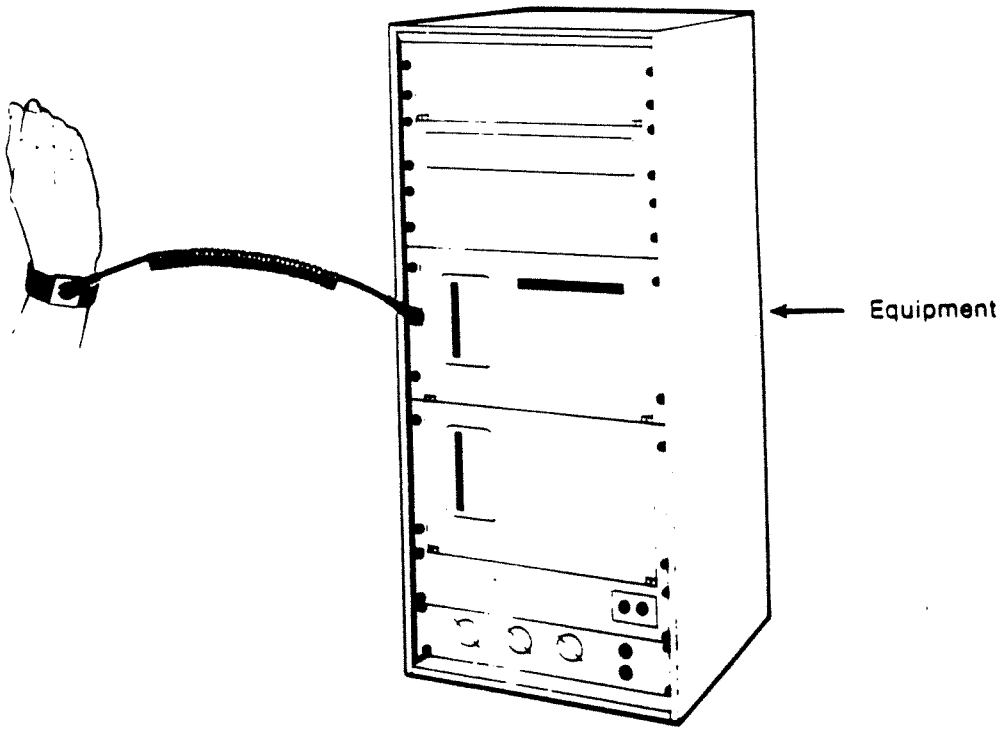
Size (mm)	Item Code
450 x 450	235735
375 x 275	235734
250 x 200	235733
125 x 75	235732

9 Typical Uses for ESP Equipment

Note Do not use ESP equipment when working on live equipment with voltages which exceed 1kV.

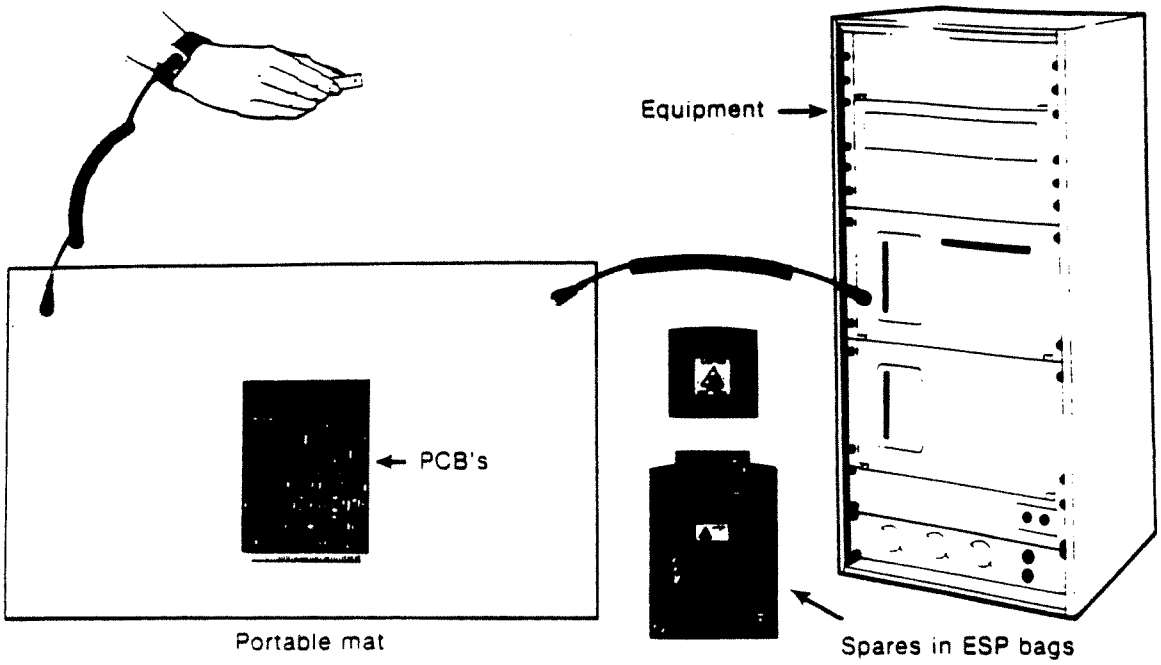
During a Short Service Visit to a Call Connect System

Wear wrist band and connect yourself via the cord to the ESP bonding point. If this is not fitted use the ESP adaptor and connect to the equipment earth or chassis.



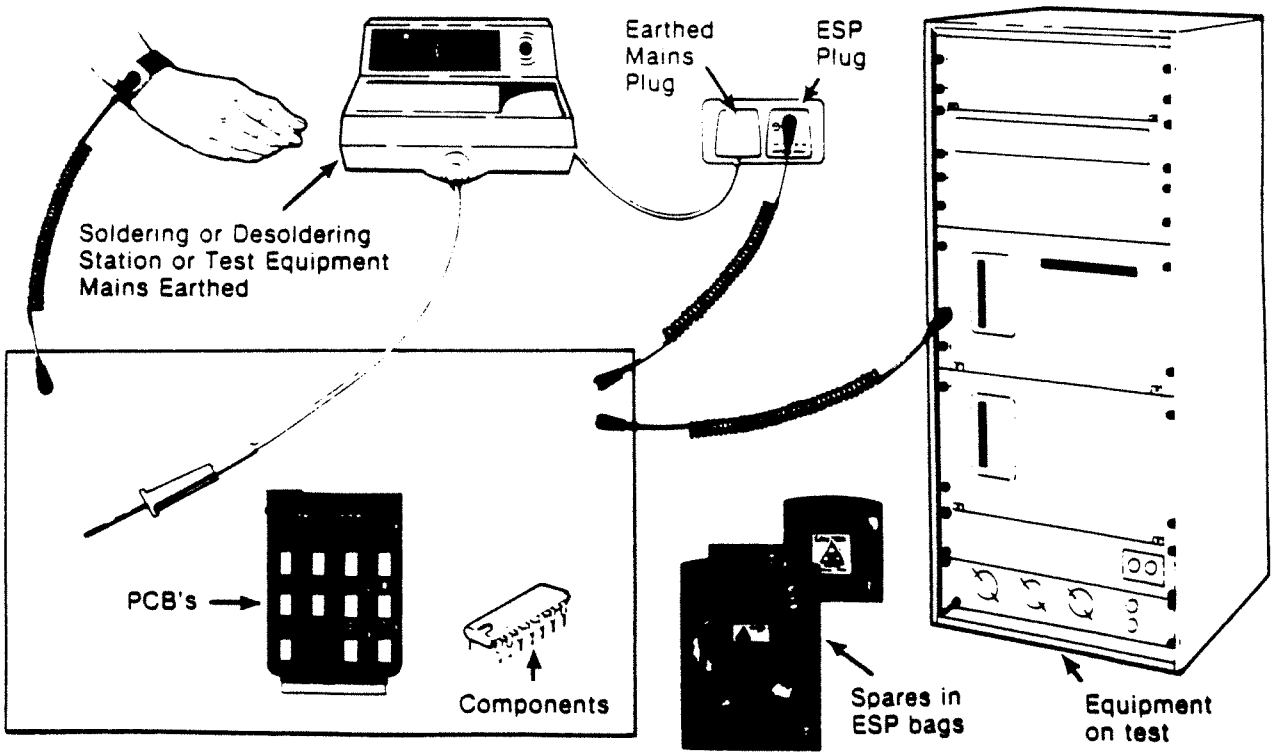
Extensive Maintenance at a Customers Installation

Wear wrist band and connect to the portable mat. Link the mat to the equipment under test. Ensure spare parts are always either on the mat or in their ESP Bags when not in use.



In a Workshop

Ensure all parts are connected as necessary. Bond soldering, desoldering and test equipment if necessary.



APPENDIX B

H.D.S.

Herald Documentation System

Overview

The Herald Documentation System, to be known as H.D.S, is a suite of software programmes which enable CWG to CUSTOMISE a Herald S5102 (B8 / C) system.
H.D.S is a very powerful tool allowing CWG to add-to or alter an existing system or create a new system.
It will also enable system documentation to be produced for Self-Configured systems as well as new H.D.S created systems.
Master default templates (TDxxxx, TNxxxx, TPxxxx)can also be created to meet customer requirements, and these templates can be merged into existing systems.

Parameters

The following parameters are alterable using H.D.S :

1. Numbering schemes (TNxxxx)
2. Numbering sequence
3. Internal digit barring
4. Deletion of logical devices (lines & extns)
5. Signalling Parameters
6. Line allocation (LA to PA) spare ccts
7. Supervisory / Operator relationship
8. Terminal facilities
9. I/C Line access
10. Dummy extension group allocation
11. Route barring
12. Call barring (TPxxxx).
13. Call barring logging options.

H.D.S databases loaded into processor EAROM memory alter certain S.O.P parameters and therefore care must be taken when re-using these control cards.

SYSTEMS CREATED UNDER H.D.S. REQUIRE THE DATABASE TO BE SENT TO THE HERALD A LABEL WITH AN APPROPRIATE TDXXXX No MUST THEN BE ADHERED TO THE FIRST EAROM CHIP, INDICATING A CHANGE IN THE S.O.P DATABASE.

Phases of HDS

H.D.S. is split into six phases by natural boundries and are as follows :-

Phase	Title and use
1	SELFCON: This obeys the same provision rules as a self configured system giving all devices the default parameters.
2	CUSTOM: Gives the customer a totally customised Herald and does not obey the same rules as phase 1 (see later on for more detailed information).
3	CALOGED: Is used to alter the call logging parameters and the route barring.
4	PRINTOUT: This gives documentation in the style of previous Heralds namely terminal labels and all installation data.
5	TRANSFER: Allows the transfer to and from Herald plus an EAROM test facility.
6	BARCODED: This is the local code barring template editor.

Some of the above Phases are too large to reside on a single diskette, and require a second diskette with more information on them to be used, these are put into the spare memory on the CWG computer (RAIR BLACK BOX) and accessed when necessary. With a utilities disk and a template source disk with TD0012 on it, a total of ten diskettes are required for the suite of H.D.S. programs.

A customised system is created using H.D.S , along similar lines to previous Heralds with H3S, entering all data such as line ring maps, O/G line access, terminal type, terminal layouts, number of operators and number of supervisory terminals N.B. The following points should be noted.

1. NUMBERING SCHEMES

May be alterable in the future.

EXISTING PRIMARY DIGIT NUMBERING SYSTEM

DIGIT	ACCESS	No	LA
Ø	EXTENSION	Ø	1
1	EXTENSION	123-199	2-78
2	EXTENSION	220-237	79-116
3	NO FUNCTION		
4	ABBREVIATED DIALLING	400-499	
5	NO FUNCTION		
6	DIAL UP FACILITY CODES	600-669	
7	PRIVATE Cct GROUP ACCESS	71-79	GRP 17-25
8	DIAL UP FACILITY CODES	8	
9	EXCHANGE GROUP ACCESS	9	GRP 1-15

2. NUMBERING SEQUENCE

a. Extension numbering need not be in sequential order, gaps will not be left in the hardware assembly.

b. Extension numbers may be reserved.
(individually or sequentially)

c. Reservation of extension numbers saves logical not physical addresses. Therefore no physical gaps will be left in the system.

d. Spare extension ccts in HDS configured systems can only be brought into service by using HDS again.

3. INTERNAL DIGIT BARRING

Barring of any leading digit from any terminal is possible. eg terminal 124 can be barred leading digit 4 prohibiting access to system abbreviated dialling.
It is also possible to bar leading digits from i/c private circuits

4. DELETION OF LOGICAL DEVICES

It is possible to delete lines, extns and dummy extn groups using H.D.S.

5. SIGNALLING PARAMETERS

External Line signalling parameters can be edited beyond the options given to a self configured system.

The following options are available under HDS:

1. Signalling Bridge -

   Short - 3 second hangover period.

   Long - 5 second hangover period.

   Manual - selectable 1 to 60 secs.

2. Recall -

   None
   Earth
   Timed (recall to a register)

Pulsing Ratio

3. Mark -

   16 - 79 Ms
   32 - 158 Ms MF

4. Space -

   16 - 79 Ms
   32 - 158 Ms MF

5. Inter Digit Pause

   240 - 1140 Ms

6. Mode -

   10 p.p.s.
   MF4

6. LINE ALLOCATION

a. Spare slots after the last I/F card can be utilised by using the ADD-ON socket on the control card. Obeying the same provision rules as SELF-CONFIGURE.

b. Spare circuits on I/F cards on H.D.S. configured systems cannot be brought into use from the supervisory terminal.

c. Gaps between existing I/F cards require H.D.S. for them to be utilised.

7. SUPERVISORY / OPERATOR RELATIONSHIP

a. The operators terminal need not be the supervisory terminal .

b. There may be more than one operator.

c. There may be more than one supervisory terminal.

d. Systems may be created without a supervisory terminal.

8. TERMINAL FACILITIES

a. Programming restrictions may be set for individual terminals

b. Personal rep. dialling blocks may be none, 1 or 2, in the following combinations:

- none:
- key pad Ø-9,* & # only:
- key pad and buttons 3 - 14:
- key pad and buttons 15 - 26:
- buttons 3 - 14 only:
- buttons 15 - 26 only:
- buttons 3 - 14 and 15 - 26:

N.B. The total number of repertory dialling blocks in a system must not exceed 3Ø before reference to the following formula:

$$\frac{231 - \{ \text{No of 4 wire terminals} \times 2 + \text{No of existing rep-dial blocks} \times 3.75 + \text{No of extension groups} \times 1 + \text{No of external lines} \times 1 \}}{3.75}$$

This formula takes the total number of usage units available, 231 and then takes away the units already used, giving the number of units remaining. This figure is then divided by the number of units required for a rep-dial block, 3.75 giving the total number of blocks still available for a particular system.

eg. Take a system having 18 four wire terminals having only 8 blocks of rep-dial, this gives us 18 x 2 + 8 x 3.75 = 66 units. Our system also has 3 extension groups, 3 x 1 = 3 and 4 external lines, 4 x 1 = 4. Therefore substituting in the formula:

$$\frac{231 - \{ 66 + 3 + 4 \}}{3.75} = 42.133$$

This means that there is memory space available for 42 more rep-dial blocks.

Definition: 1 usage unit = 32 bytes of memory.

c. Key facilities are available with H.D.S. that are not available with self-configured systems.

The following is a complete list of key facilities

1. Ring when free	16. Hold	31. Re-establish
2. Three party	17. Recall	32. Reverted call
3. Intrude	18. Transmit	33. Night Service
4. Rpt last number	* 19. Account code	34. Lamps off
5. Conference	20. Call pick up	35. Answer internal
6. NS pick up	* 21. Follow me	36. Answer External
7. Speech Synthesis	22. Divert extn	37. Call offer
8. Call clear	23. Divert on busy extn	38. Join
9. Monitor	* 24. Divert External extn	39. Line Group
10. Speak extn	25. Divert on no answer	40. Pw Group
11. Store	26. Calls for extn	41. User Program
* 12. Status	27. Buzz extn	42. Extn Key
* 13. Message Waiting	* 28. Alarm call extn	43. Line key
14. Battery alarm	29. Sounder off	
* 15. Call metering	30. Cancel	* Facility under development

9. I/C LINE ACCESS

a. Private circuits may be designated direct calling.

b. Exchange Lines may be answered direct off-hook (Prime line).

10. DUMMY EXTENSION GROUP ALLOCATION

Dummy Extension Groups need not necessarily be the next free logical address but can be anywhere in the numbering scheme (care must be exercised in allocating D.E.G s).

11. ROUTE BARRING

It may be possible to use the Herald as a tandem switch.

12. CALL BARRING.

This allows personalised barring along the lines of previous Heralds namely:_

a. Eighteen levels of barring.

b. Exceptions in the barring eg no IDD except calls to Belgium. This can be taken further to no IDD except calls to a particular number in (for example) Paris.

c. Normally the barring is arranged to the BT charge group areas.

d. If the local template (TPxxxx) is to be merged in to the customers database then it must be inserted using H.D.S.

13. CALL LOGGING OPTIONS

All parameters of call logging and route barring can be altered using H.D.S. N.B The customers database must have been created under H.D.S.

a. Call Logging may be initially disabled.

b. O/G calls may be logged from certain terminals.

c. I/C calls may be logged on certain lines.

d. Calls may be logged depending on the digits dialled.

e. Calls may be logged by duration.

f. The number of call logging records per page may be altered.

* g. Calls may also be allocated to account codes.

N.B. IF ANY OF THE ABOVE PARAMETERS HAVE BEEN ALTERED H.D.S. IS REQUIRED TO RETURN THEM TO S.O.P.

PRINTOUT

It is possible produce a detailed printout of the Herald system. H.D.S. will give a printout of either a selfconfigured (see following section) or H.D.S. configured system, this includes a correct label print on a H.D.S. configured system. The documentation is as follows:-

1. General Information.

2. History records.

3. Global Options (External conference fitted etc).

4. Stores List

5. Assembly Instructions.

6. Box Connexion (wiring & labels).

7. External Line data.

8. Extension data.

9. User Directory.

10. Call Logging information.

11. Numbering Scheme.

12. Terminal labels.

TRANSFER.

The transfer to a Herald and the recovery of a database from a Herald is possible using H.D.S. Previous Heralds required approximately twenty minutes to transfer, this has now been speeded up to about five minutes. It is therefore possible to recover a database from a self configured Herald, after programming has finished on site add the General Information and have a complete record on disk of the Herald correct at the time of commissioning.

It is also possible using H.D.S. to check the EAROM, but this requires the customers database to be re-loaded,as the check clears the memory.

SELFCON

Normally for a Self-Configured system CWG will run phase 1 inserting the general information (customers name etc) and system requirements (total number of lines, private ccts, terminals etc). When this is completed then use of Phase 4 will give the Stores list, Assembly Instructions, Jumpering Schedule and all line and extn data, but after tailoring the Herald on site, all the line and extn data on the printout will still be as at default. There is no need for the database created under SELFCON to be sent to the processor / control card.

ROUTE BARRING

The system maintains a route barring matrix that defines which private cct routes and trunk interfaces can be interconnected. This matrix can be set-up by means of the interactive program at installation. Typically, access from trunk interfaces to private ccts which are connected to private carrier may be barred. Access will also be barred from a specific private cct to other private ccts in that route.

An example of such a matrix is shown below :-

OUTGOING ROUTE

INCOMING ROUTE	71	72	73	74	75	76	77	78	79	9
71	*								*	*
72		*							*	*
73			*						*	*
74				*					*	*
75	*	*	*	*	*	*	*	*	*	*
76						*			*	*
77							*		*	*
78								*	*	*
79									*	*
9									*	*

* = ACCESS BARRED