

SECTION 2 – INSTALLATION

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PART 1 — SITE CONSIDERATIONS

PART 1 - SITE CONSIDERATIONS

It is not envisaged that very much site preparation will normally be required; possibly none at all for simple configurations. However, although the computers discussed are small in size, their potentialities are such that they may well form the basis of an extensive data processing or real time application for which some of the site information given in this chapter would require consideration. The customer is advised to consult the Philips representative regarding site preparation and any subsequent problems in order to ensure that the necessary facilities are ready when the system is delivered.

The efficient use of a large data processing system depends a great deal upon the layout of the equipment. Four main activities require consideration, viz, operation, work flow, maintenance and media storage. Also to be borne in mind is the possibility of future expansion and, if this is likely, extra space should be allocated to avoid the difficult and costly task of enlarging the site at a later date.

Operation

Adequate working space must be allowed for the operators within the limitations imposed by the interconnecting cables (see Table 2.2 Chap.2) Machines which generate dust, noise or vibration, such as line printers and card punches, must be kept apart from magnetic tape and disc units; if necessary a separate card punching room should be provided.

Work Flow

Work flow is a major consideration in a data processing installation and care must be taken to ensure that incoming and outgoing data are separated. It is usual to define three separate areas: data reception, central processing, and output collation.

In real time applications communication with the central processor is mainly via interconnecting equipment, such as MIOS, obviating the need for discrete input and output areas and so preventing human errors.

Storage

Space should be assigned in the computer room for the storage of commonly used media like magnetic tape and discs or materials such as printer forms and blank paper tape; a separate fireproof vault should be provided for the long term storage of important items. The environmental conditions relating to storage are specified in Chapter 3. Magnetic tapes and disc packs must be kept in dustproof containers and stored away from sources of magnetism. Shocks and vibrations must be avoided.

Mains Supplies

A single phase supply complying with the requirements specified below should be provided for the exclusive use of the computer system. The current carrying capacity of the supply circuit must be adequate to meet the total power consumption, derived from Table 2.1., with sufficient in reserve for expected future developments.

System	3 wire: single phase, neutral and earth or two phases and earth.
Voltage	115V or 220V r.m.s. $\pm 10\%$ <u>Note:</u> These are the standard alternative mains voltage levels for the central processor and peripherals. The equipment can also be supplied to suit other levels, e.g. 240 Volts in the U.K. Further details about mains conversion can be found in <u>Part 2</u> and <u>Part 3</u> of this section.
Frequency	48 to 63 Hz <u>Note:</u> The peripheral equipments are supplied to work with a mains frequency of 50 Hz. They can be supplied to work with 60 Hz only if this frequency is specified at the time of ordering.
Voltage transients	1.5kV peak amplitude for a duration not exceeding 10 microseconds between half peak points at a repetition frequency of 3 to 10 Hz for not more than 10 minutes.
Transient state	The time between the voltage falling from nominal to zero and then returning to nominal must be not greater than 0.5 seconds.
Power interrupts	Not more often than one every 10 seconds for a duration not exceeding 10 ms.

Table 2.1. General Summary

Type	Unit Description	Operational Environment			Mission	Power consumption	Physical Characteristics						Weight kg	Floor Loading kg/m ²	Remarks			
		Temperature °C	Humidity %rh	Max %rh			Max kcal/h	Height mm	Width mm	Depth mm	Access Clearance	Front mm				Rear mm	Right mm	Left mm
P852N/P856K-100	Chassis-rack mounted	0	+45	0	90	300	0.4	133										
P852N-200	Chassis-rack mounted					200	0.4	122										
P852N/P856M/P857-400	Chassis-rack mounted					300	0.5	266										
P857M-500	Chassis-rack mounted					1100	0.5	409										
P843-001	Equipment Shelf						(a)	133										
P843-002	Equipment Shelf						(b)	222										
P843-003	Equipment Shelf						(c)	222										
P801-001	Punched Tape Reader	0	+45	20	85	100	0.15	133	(d)									
P803-001	Tape Punch 750h/s	0	+45	20	95	140	0.2	(e)190	220	432	1000							
P803-102	Card Reader *	+15	+25	50	70	495	0.2	413	585	460	1000							
P809-002	Line Printer	+10	+40	20	80	230	0.3	800	700	460	1000							
P811-001	Line Printer	+10	+43	30	80	430	0.55	1170	1232	625	1000							
P812-001	Line Printer	+10	+43	30	90	1030	1.4	1170	1232	625	600							
P816-001/002	Display Terminal	+10	+40	10	90	150	0.2	292	381	500	1000							
P821-002	Moving Head Disc	+16	+35	8	80	370	0.5	267										
P823-007	Tape Transport	+16	+32	20	80	2390	0.75	864	483	(o)364	1000							
P831-002/004/006	Tape Transport	+15	+32	15	95	230	0.5	622										
P831-010/020/030	Tape Transport	+2	+50	10	95	70	0.1	89										
P833-001	Cassette Tape Unit	0	+50	5	95	30	0.04	(k)159	123	280	1000							
P833-152	Chassis for 3 x P833-001	0	+50	5	95	70	0.11	178										
P841-101/105	I/O Typewriter ABR33	0	+45	20	85	220	0.3	1140	560	470	1000							
P842-001 to 004	Character Printer	+10	+40	20	80	120	0.15	175	513	(1)465								
PC 1800	M10S Module Frame **	+5	+45	40	85	(1)	(1)	178										
P849-016	36 Unit Rack and Cabinet							1717	585	770	1200							

* Environmental conditions quoted are those imposed by the media

** Supplied by S&I

Alternative Supplies

If mains failures are likely to cause disastrous or frequent interruptions to system operation, it may be advisable to install a standby supply source. This can be a manually or automatically started diesel generator set, with an inherent time lag, or one of several combinations of a storage battery with either a rotary motor/generator or a solid state rectifier/inverter which are almost instantaneous in providing emergency power.

However, where incompatibility with the system requirements is the problem and not power failure, then it merely becomes necessary to process the supply. Mains filters and magnetic stabilizers may suffice or it may be necessary to drive a suitable generator by a motor connected to the mains. A diesel generator set as the normal supply source also provides a solution, particularly where the unsuitability of the mains is accompanied by the likelihood of frequent breakdowns.

Interconnection Cables

Two kinds of electrical cable interconnections are used in the computer system - the cables separately conveying a.c. power to the various devices and the inter-unit signal transmission cables. Both cables are delivered with the equipment with the power cables terminating in versatile plugs which fit most types of mains outlet socket in use on the European continent - see Appendix for colour coding and plug details.

The maximum permissible lengths for the signal transmission cables between the control unit cards and the peripheral devices are given in Table 2.2. Where the shorter lengths specified give rise

to layout problems it may be necessary to house the control units cards concerned close to the peripherals instead of in the central processor basic mounting box.

Table 2.2. Peripheral to Control Unit Signal Cables

Peripheral Units	Length(m)*	
	Standard	maximum
P801-001 Punched Tape Reader - Digitronics 2540	3	15
P802-001 Punched Tape Reader - Digitronics 2540	3	15
P803-001 Tape Punch - Facit 4070	3	15
P806-102 Card Reader - Documation M300	7.5	7.5
P809-002 Line Printer - Philips PER1415	5	5
P811-001 Line Printer - Data Products 2420	7.5	15
P812-001 Line Printer - Data Products 2440	7.5	15
P824-002 Moving Head Disc - Philips PER1215	7.5	15
P825-007 Moving Head Disc - Control Data Corp.9760		
P831-010 Mag. Tape Formatter - PERTEC 25/45/37.5 /020/030 i.p.s.	1.5	3
P833-001 Cassette Tape Unit - Philips ELA	1	1.5
P841-101 Teletypewriters - ASR33 /105	7.5	15
P842-001 Character Printers - Philips PER3100 to 004	7.5	15
P818-001 Display Terminal - Hazeltine 1200 /002 (Philips Type A)	15	30
PC1800 - MIOS Modules	3	3
P837 - DIOS Controllers	dependent upon user devices	

*Note that this is the overall length between the end connectors so that when planning the physical layout allowance must be made for internal cable routing.

StructureFloors and Ceilings

A floor able to support a static loading of 500kg/m^2 is strong enough for any minicomputer system but half this value will suffice for many arrangements involving only the smaller units - see Table 2.1.

Besides enhancing the acoustic properties, the fitting of a false ceiling in the computer room conceals the air ducting, fire protection devices and lighting system. Moreover, if the false ceiling is composed of removable tile, light fittings can easily be repositioned to suit changing requirements; also, if the tiles are of the perforated type, the ventilation can be adjusted by controlling the number of unblocked holes.

The ceiling must be constructed of materials that do not generate dust and a recommended height from the floor surface is 2.8 metre; this height is not, however, mandatory.

Safety Precautions

Local regulations and conditions of insurance will determine the precise nature of fire and safety precautions; the information given here is for general guidance.

Non-combustible or fire resistant materials should be used for walls, floors, ceilings, acoustic surfaces and furniture. Where data reception and output areas are likely to contain large quantities of combustible material, they should be separated from the central processing area by floor-to-ceiling walls and self closing doors that are fireproof.

All cleaning materials and fluids should be kept enclosed in metal cabinets outside the computer room and waste paper should not be allowed to accumulate for any length of time. Records which have to be stored in the processing area for operational reasons must be kept to a minimum and housed in a fireproof safe.

Automatic sensing and warning systems are widely used in large installations; in these systems, thermal or ionization sensors can trigger alarms, switch off power and operate sprinklers should a fire occur. Where the computer is engaged in supervising industrial processes, however, automatic shutdown may lead to widespread damage; in these circumstances manual procedures are advisable.

Air Conditioning - Computer Room

High temperatures are harmful to sensitive electronic components; excessive humidity causes the handling properties of paper materials to deteriorate, e.g. punched cards curl and become unmanageable; large dust particles have an abrasive effect upon magnetic tape and discs.

The following conditions are normally adhered to in computer rooms to prevent deterioration of I/O media and machine performance while providing a suitable atmosphere for the operating personnel. In general, the tolerances quoted are well within those specified elsewhere for the individual items of equipment but although a sharp fall in temperature would not therefore result in thermal damage to the equipment, provided the rate of change was not too swift, the consequent increase in relative humidity and resultant condensation would be harmful.

Operating conditions

temperature	+18°C to +24°C	(15°C to 30°C also permissible)
relative humidity	50% to 60%	(up to 70% also permissible)
air pressure *	860 to 1060	millibars.

* It is usual to maintain the air pressure in the computer room above that of the outside atmosphere to prevent the ingress of external air.

Non-operating conditions:

When the system is not in use, and I/O materials have been removed, the following levels are satisfactory provided care is taken to ensure

condensation does not occur, especially when starting the air conditioning system.

temperature	+10% to +32°C
relative humidity	20% to 80%

Air Conditioning - Media Storage

Media needing to be readily available must be kept in environmental conditions identical to those existing in the computer room including, where magnetic tape reels and disc packs are concerned, 90% filtration of dust particles exceeding 3 microns unless these items are sealed in containers when being unloaded from the parent machine.

The long term storage conditions for the two classes of media are stated below; the manufacturers recommendations should be observed, however, if the storage period is likely to exceed one year.

Magnetic Materials

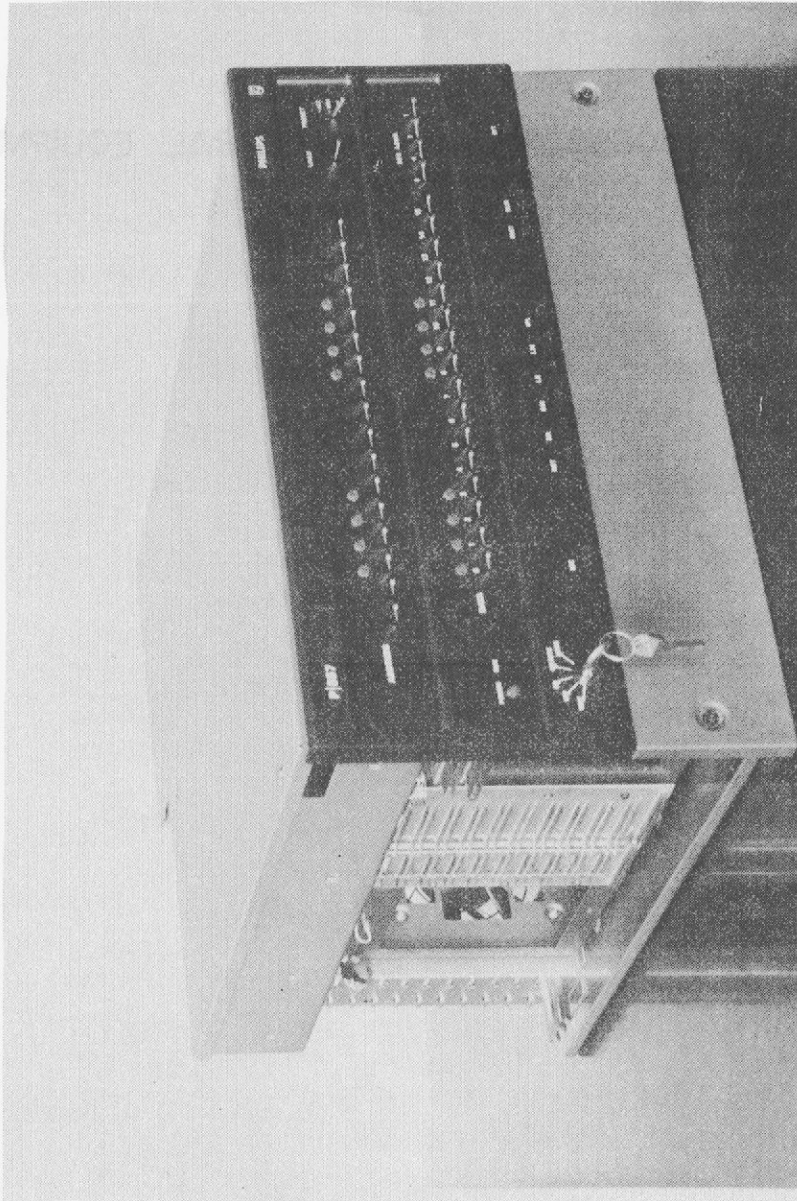
temperature	+10°C to +32°C
relative humidity	20% to 80%
max. wet bulb temp.	26°C
filtering	90% of particles exceeding 3 microns
magnetic field	not greater than 5.5 A/mm

Card and paper materials

temperature	+10°C to +32°C
relative humidity	30% to 65%

PART 2 — CENTRAL PROCESSORS AND INTEGRAL EQUIPMENT

CENTRAL PROCESSOR UNITING BOX



CENTRAL PROCESSOR MOUNTING BOX.

Standard Features

The common standard features of the P852M/P856M/P857M central processors are given below:

- 16 hardware registers, 14 of which are programmable.
- asynchronous general purpose bus control
- 63 interrupt levels
- internal interrupt for link to monitor
- DMA facility; allows character handling and packing.
- power supply.
- direct access (read/write) for up to 256 external registers
- addressing facility for up to 32k, 16-bit words.
- Interface for optional bootstrap loader
- Control panel
- mounting box with 4 slots (P852M, P856- 100 series) or 6 slots (P852M- 200 series), or 10 slots (P852M, P856M, P857M- 400 series), or 17 slots (P857M- 500 series).
- telescopic slides.
- documentation.

Also as standard for the P856M and P857M processors are the following:

- V24 serial interface unit.
- memory interleaving facility.
- automatic diagnostic facility.
- power failure automatic restart.
- real time clock, line frequency.
- IPL

For the P857M also provided as standard is a memory management unit, contained on a board which mounts in a dedicated location immediately underneath the CPU. This facility allows addressing beyond 32k, dynamic relocation and memory protect. A general purpose Initial Program Loader is provided as standard with the P856M and P857M.

P857M option: Floating Point Processor P857M-020.

The P852M is provided with a standard instruction set (with simulated Multiply/Divide instructions) and the P856M with the same instruction set but including Hardware Multiply/Divide instructions. The P857M is provided with an extended standard instruction set including Hardware Multiply/Divide and Memory Management instructions.

The physical details of the processors are shown in Figures 1.1 to 1.4

Main Variants

The main variants for the processors are summarized in Table 1.1.

The memory modules (all 16-bit words) available are as follows:

P852M-004	4k	(cycle time 1.2 μ sec)	- Used on P852M/P856M
P843-108	8k	(cycle time 1.2 μ sec)-	Used on P852M/P856M
P843-116	16k	(cycle time 1.2 μ sec)-	Used on P852M/P856M
P843-216	16k	(cycle time 0.7 μ sec)-	Used on P856M/P857M (provides interleaving facility)

Options

P843-020	I/O processor High Speed Multiplex data channel Automatic control of all data transfers. Maximum throughput 1.2M words/sec. Up to 8 I/O processors can be connected to the CPU. Includes 3.0 metre break lines cable.
P843-052	General purpose initial program loader(ROM). Mounted on P852M CPU board.
P852M-023	A special purpose CPU board which can be supplied for all variants of the P852M. The board includes the following features: - power failure/automatic restart. - real time clock(line frequency).

Table 1.1. Central Processor - Main Variants

Series	Type No	GP Slots	Mem Size	RNC	PF/Auto Restart	CU for ASR 33	CU for V24 Serial Control	Remarks
P852M-100 (3U box)	P852M-101	2	4k	Opt	Opt	Opt	-	All memories 16-bit Words and 1.2 μsec cycle time.
	P852M-102	2	8k	"	"	"	-	
	P852M-103	2	16k	"	"	"	-	
P852M-200 (3U box)	P852M-201	4	4k	"	"	"	-	
	P852M-202	4	8k	"	"	"	-	
	P852M-203	4	16k	"	"	"	-	
P852M-400 (6U box)	P852M-402	8	8k	"	"	"	-	
	P852M-403	8	16k	"	"	"	-	
P856M-100 (3U box)	P856M-102	2	8k	Yes	Yes	-	Yes	Memories 16-bit Words 1.2 μsec cycle time except those marked* which have 0.7 μsec cycle time. Automatic Diagnostic facility on all Type Nos. Memory Interleaving on P856M-406.
	P856M-103	2	16k	"	"	-	"	
	P856M-106*	2	16k	"	"	-	"	
	P856M-402	8	8k	"	"	-	"	
P856M-400 (6U box)	P856M-403	8	16k	"	"	-	"	
	P856M-406*	8	16k	"	"	-	"	
P857M-400 (6U box)	P857M-405	7	16k	"	"	-	"	All memories 16-bit Words 0.7 μsec cycle time. Automatic Diagnostic facility. Memory Inter- leaving. Memory Management Unit. P857M-405 Extension facility up to 64k P857M-505 Extension facility up to 128k
P857M-500 (11U box)	P857M-505	13	32k	"	"	-	"	

- control unit for an ASR 33 teletype.
- general purpose bus connectors.
- internal interrupt for link to monitor plus ASR 33.
- interface to full control panel.
- interface for optional general purpose initial program loader(P843-052)

Power Supplies

The power available from the internal power supply for the CPU board, the memory, and to the slots for I/O processors and I/O cards is as shown in Table 1.2.

Table 1.2 Total Power Available from Power Supply

Supply Volts	Current(100 and 200 series)	Current(400 series)	Current(500 series)
+5	18A	43A	86A
-5	0.8A	2.0A	4.0A
+16	4.5A	9.6A	18A
+18unreg	1.0A	2.0A	4.0A
-18unreg	1.0A	2.0A	4.0A

The remaining +5V supply current available at the free connectors of the mounting boxes is shown in Table 1.3.

Note: The whole of the +18V and -18V power as listed in in Table 1.2 is available.

Table 1.3. Remaining Power Available at Free Connectors

Type No.	Current Available(From +5V)
P852M-101	5.2A
-102	5.1A
-103	4.4A

Table 1.3 cont.

Type No.	Current Available(From +5V)
P852M-201	8.2A
-202	8.1A
-203	7.4A
-402	33.1
-403	32.4
P856M-102	5.2A
-103	4.5A
-106	4.5A
-402	30.2A
-403	29.5A
-406	29.5A
P857M-405	23.5A
-505	65.7A

The power consumption in amperes for different sizes of memory is given in Table 1.4 below:

Table 1.4 Power Consumption of Memories

Core Size	Speed µsec	Supply Voltage			No. of Modules
		+5V	-5V	+16V	
4k	1.2	2.5	0.2	3.6	1
8k	1.2	2.6	0.2	3.6	1
12k	1.2	5.3	0.4	4.0	2(4k + 8k)
16k	1.2	3.2	0.4	3.7	1
24k	1.2	6.1	0.6	4.2	2(8k + 16k)
32k	1.2	6.7	0.8	4.3	2(16k + 16k)
16k	0.7	4.5*	0.4*	5.7*	

Note: * Indicates maximum current consumption

Environmental Requirements

The environmental conditions specified below apply to all the central processors and also to the integral equipment defined in further chapters in this Part of the manual; the extended limits quoted for transit and storage only apply if the equipment is

correctly packaged.

<u>Temperature Range</u>	
Operating	0°C to 45°C
Non-operating	-30°C to +70°C
Transit or storage	-30°C to +70°C
<u>Humidity Range</u>	
Operating	0 to 85% r.h.
Transit or storage	0 to 100% r.h.
<u>Maximum Vibration</u>	

The following conditions apply during operation, non-operation, storage and transit and are as defined in BEAMA standard 209/2.5/69 group II requirements.

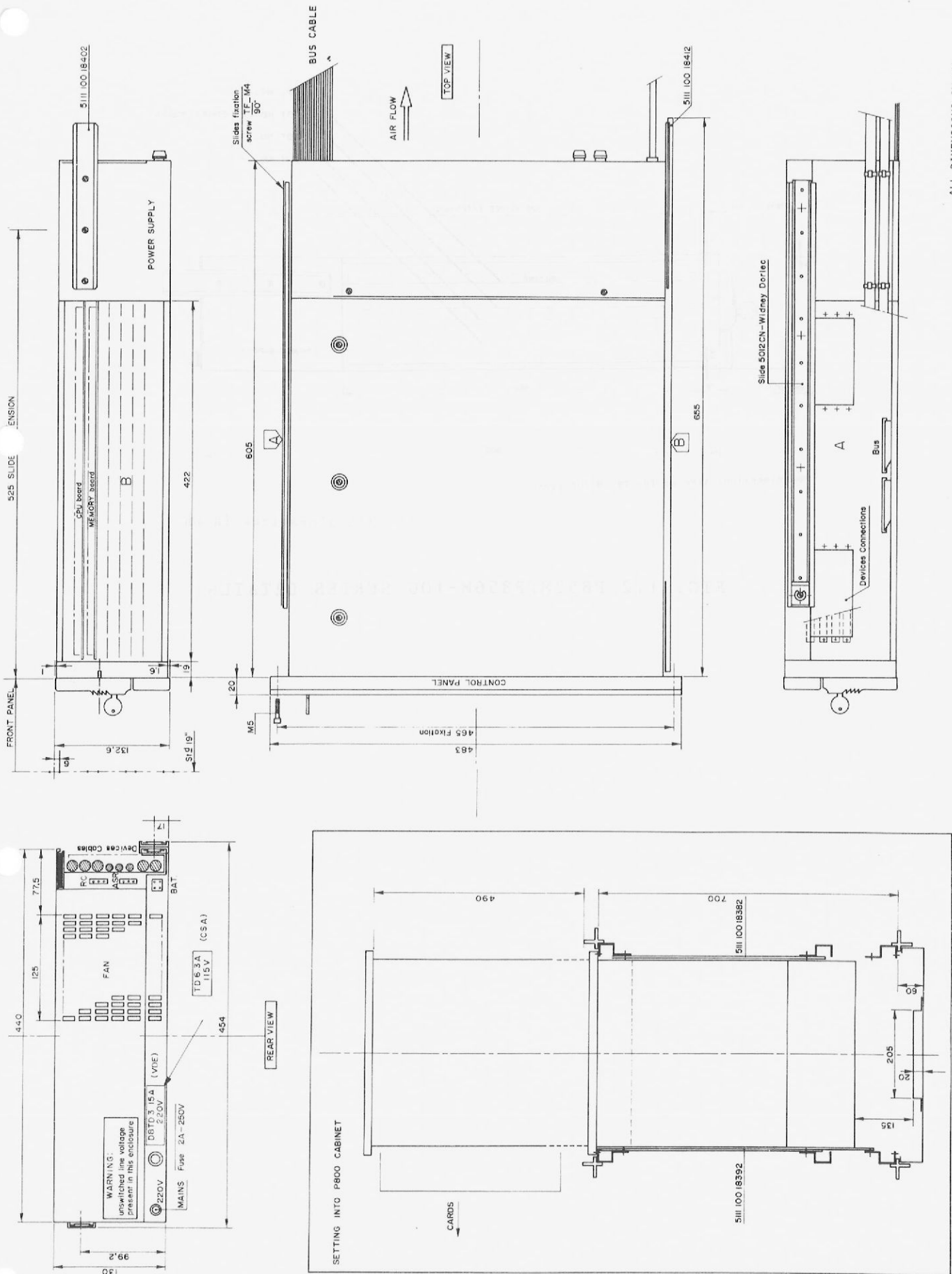
Frequency	10 - 150Hz
Acceleration	0.5g
Amplitude	0.75mm peak to peak

No. of Modules	Voltage			Speed (rpm)	Core Size
	+5V	-5V	+10V		
1	0.2	0.2	0.2	1.2	4K
1	0.2	0.2	0.2	1.2	8K
2 (1x + 8K)	0.4	0.4	0.4	1.2	16K
1	0.4	0.4	0.4	1.2	16K
2 (8K + 16K)	0.4	0.4	0.4	1.2	32K
2 (16K + 16K)	0.4	0.4	0.4	1.2	32K
1	0.4*	0.4*	0.4*	0.7	16K

Note: * Indicates maximum current consumption

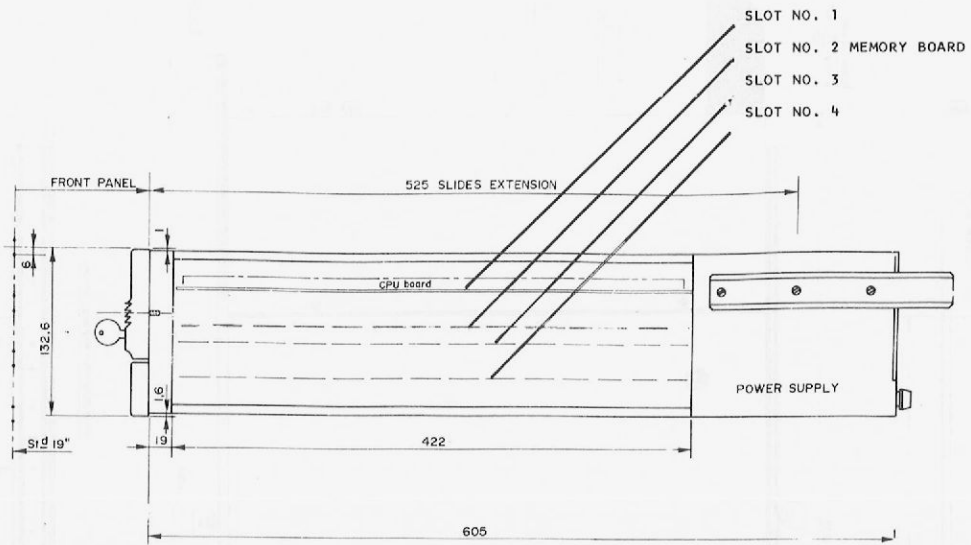
Environmental Requirements

The environmental conditions specified below apply to all the central processors and also to the integral equipment defined in further chapters in this part of the manual; the extended limits quoted for transit and storage only apply if the equipment is



ALL DIMENSIONS IN MM

FIG. 1.1 P852M-200 SERIES-DETAILS



Box dimensions same as for P852M-200 series

All dimensions in mm

FIG. 1.2 P852M/P856M-100 SERIES DETAILS

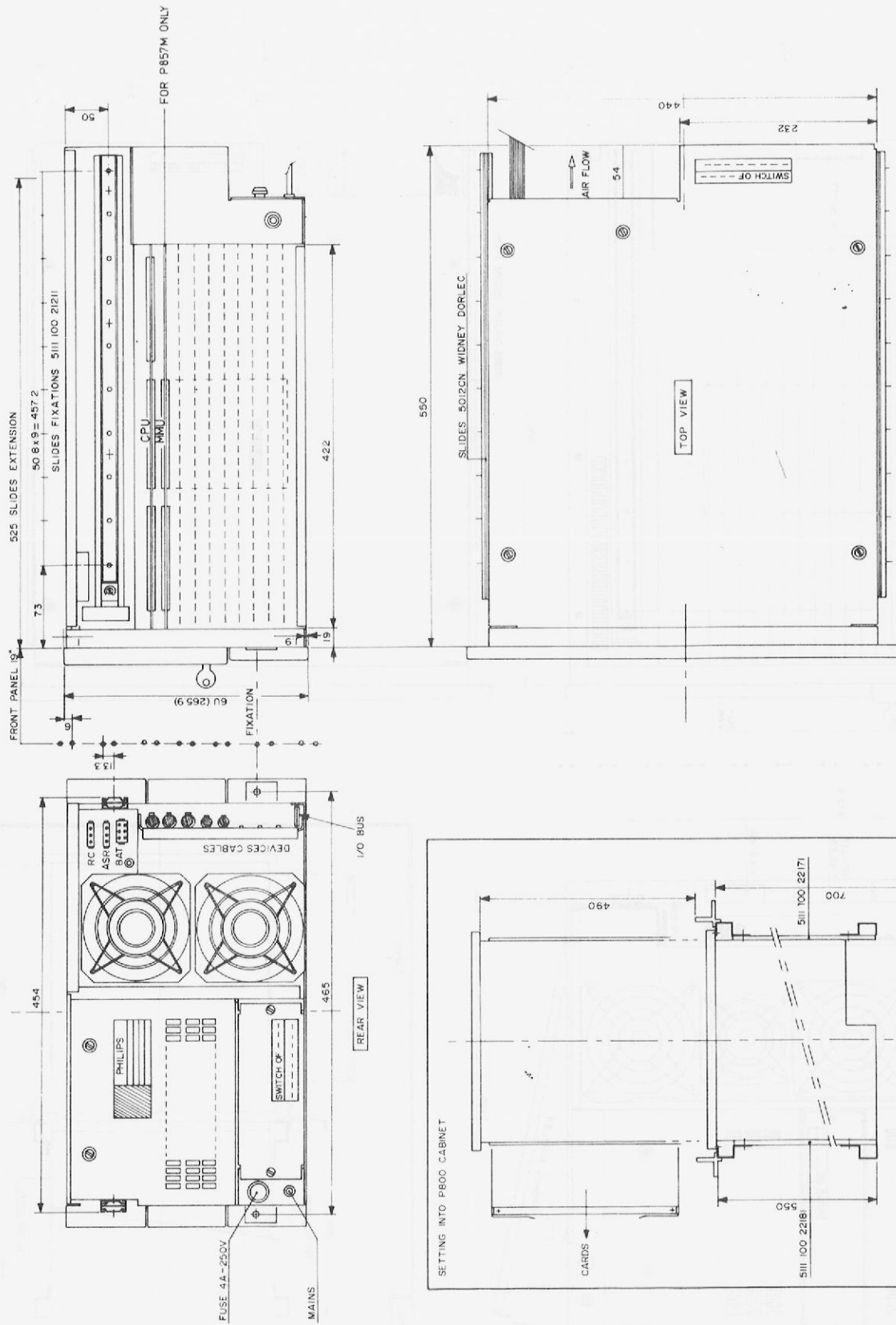


FIG. 1.3 P852M/P856M/P857M-400 SERIES DETAILS

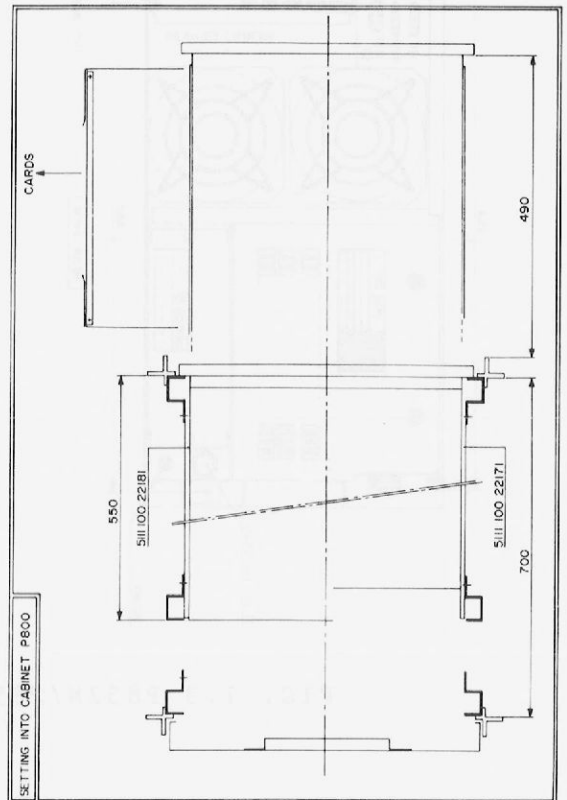
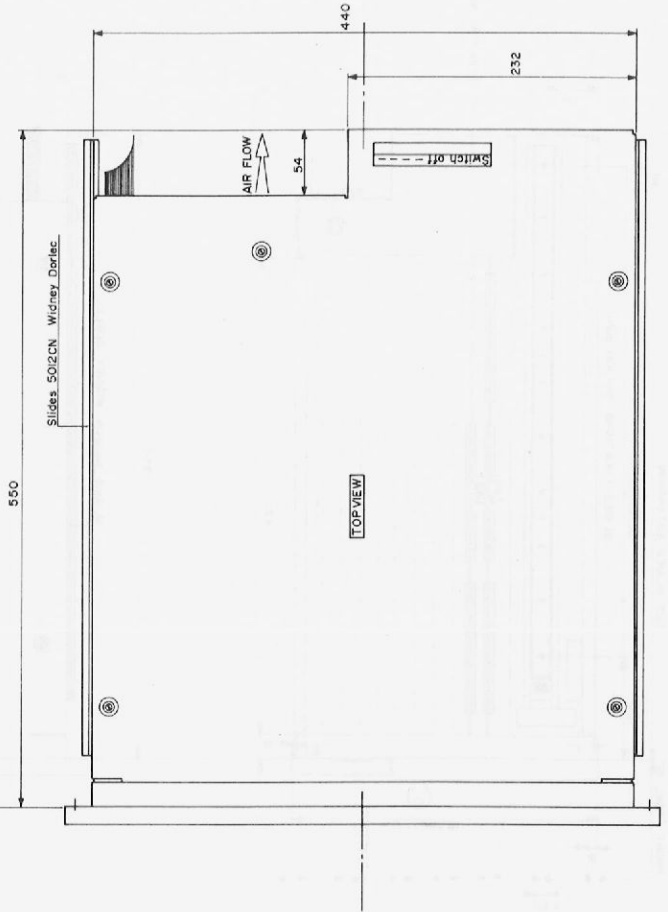
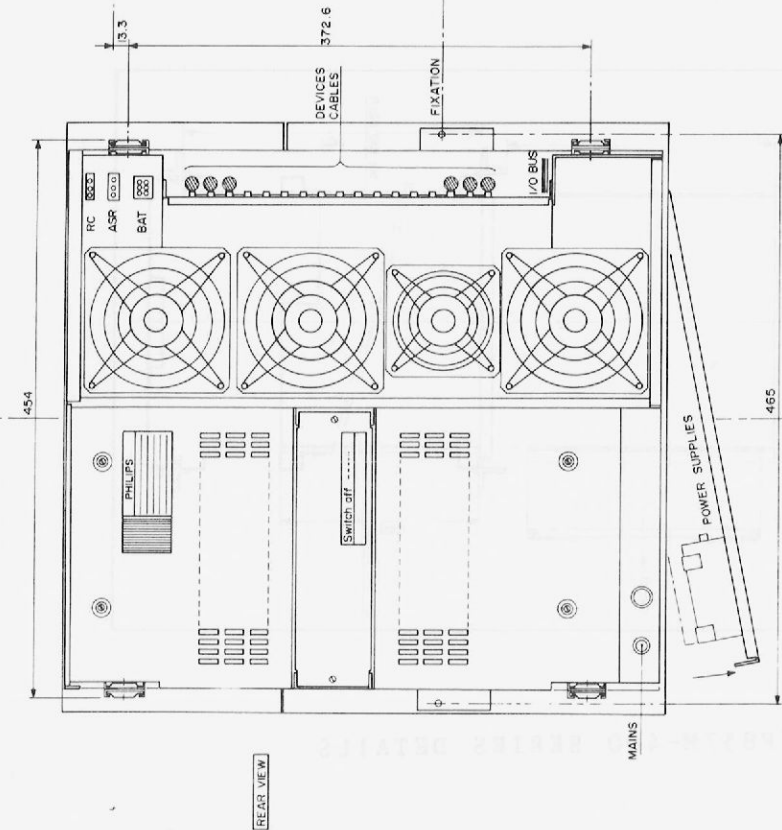
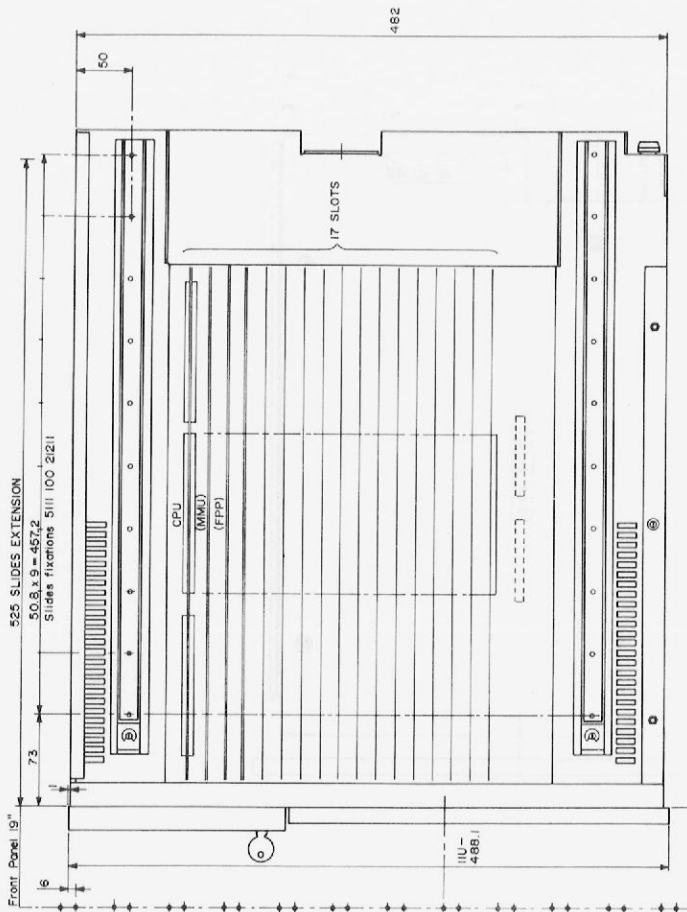
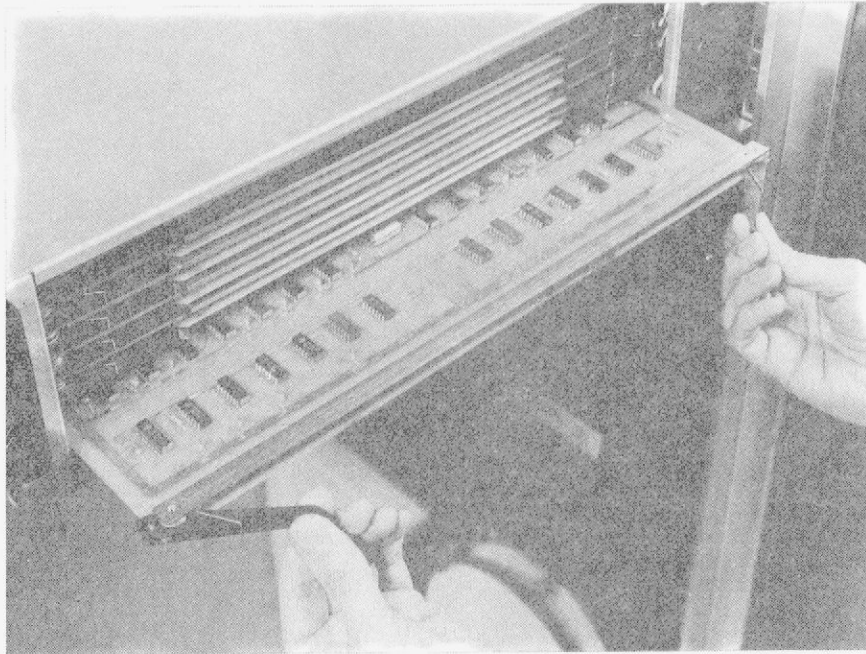
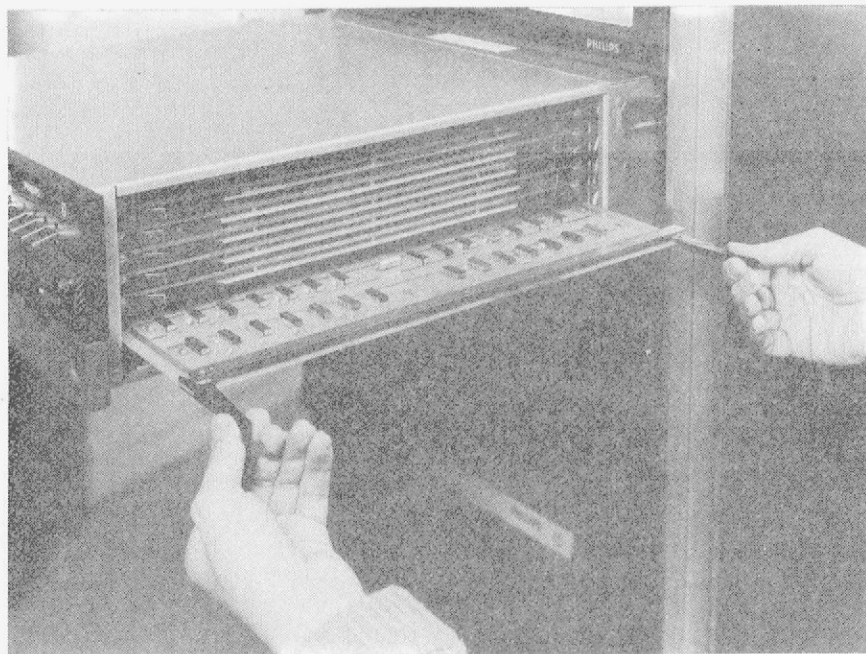


Figure 1.4. P857M-500 Series - Details



card extractor handles-construction



correct position of handles for inserting a card

USE OF CARD EXTRACTOR HANDLES



THIS EXTENSION HANDS-COMPLETED



THESE PHOTOGRAPHS WERE TAKEN BY THE INVESTIGATOR

THE DE LAUN EXHIBITION BOARD

Standard and Mini Control Panels

The Full Control Panel (2U high) shown in Figure 2.1 is provided as standard with all P852M and P856M processors. The panel contains switches and indicators which allow an operator or programmer to load, display, run and supervise a program. The central processors can also be equipped, on option, with a mini-panel (P852M-030) shown in Figure 2.2.

Extended Panel (P856M-032 4U high)

An Extended Panel, as shown in Figure 2.3., is provided as standard for P857M processors and can be provided, as an option, for P856M-400 series processors. This panel contains, on the lower half, the switches and indicators as described for the Full Control Panel and on the upper half switches and indicators for the simultaneous control and display of data and address and stop on pre-set address.

Portable Control Panel

A Portable Control Panel (P849-052) is available which contains all the facilities of a standard Full Control Panel and is fitted with a connector which enables it to be fitted in place of a standard full control panel or mini-panel; the panel is used mainly for servicing purposes.

A control panel is shown disconnected from the basic mounting box in Figure 2.4.

Note: Test position not used on P852M

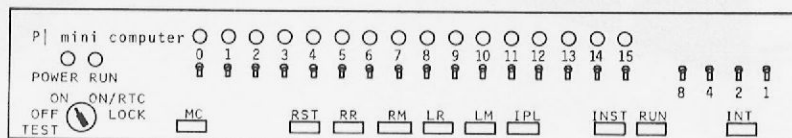
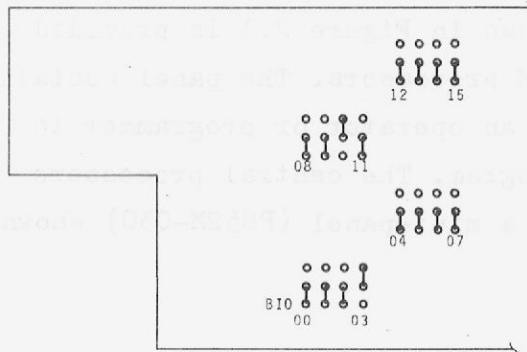
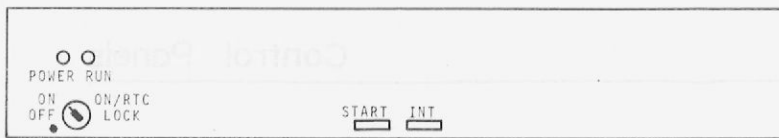


FIG. 2.1 FULL CONTROL PANEL



Position of straps

- "1" To simulate "1" on a key
- "0" To simulate "0" on a key

Example:

On this drawing the coded address is 1020

Note: Data-bit selection straps on Mini Panel

FIG. 2.2. MINI PANEL

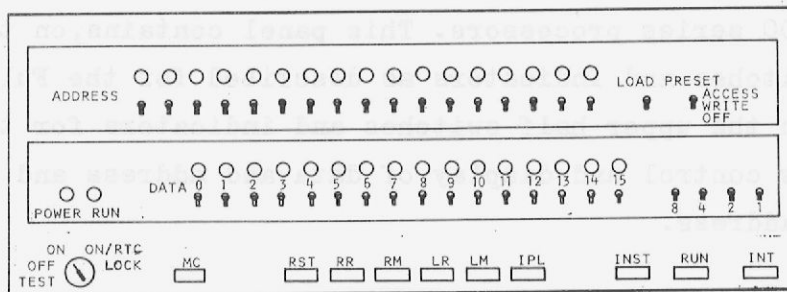


FIG. 2.3 EXTENDED PANEL

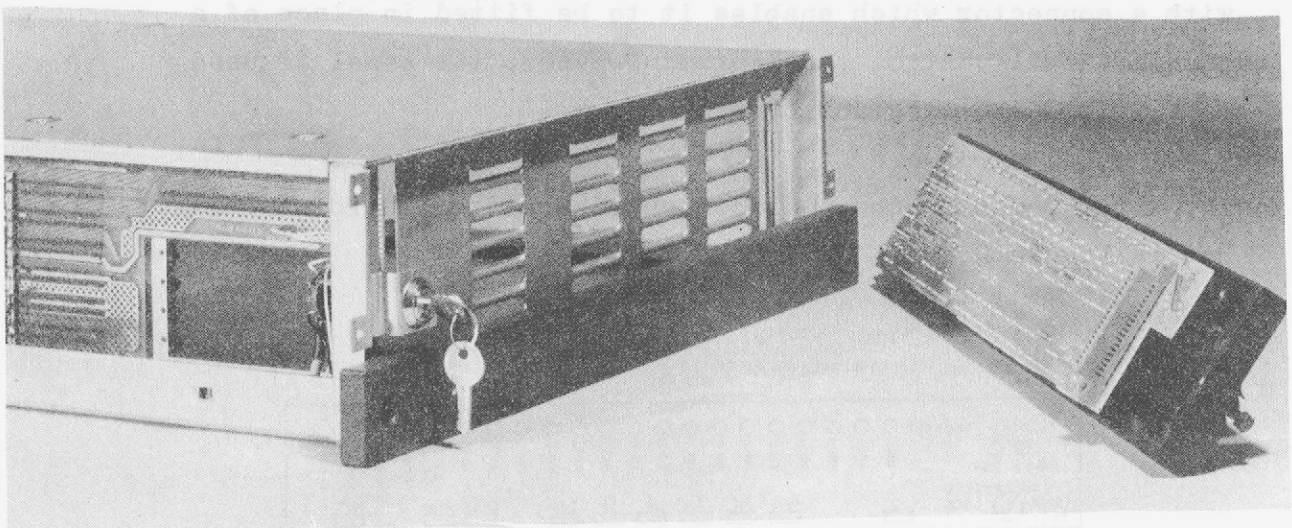


FIG. 2.4 CONTROL PANEL-DISCONNECTED

The I/O Cards are located in the general purpose slots of the basic mounting box but where there are too many of them to be accommodated the G P bus is extended, using a transmission line of two flat cables of 50 ways each, thus enabling additional cards to be contained in separate equipment shelves (described in Chapter 4.). Each shelf contains its own power supply for the cards it contains. Multicard peripheral controllers are also separately housed in this manner to form self contained units complete with power supplies.

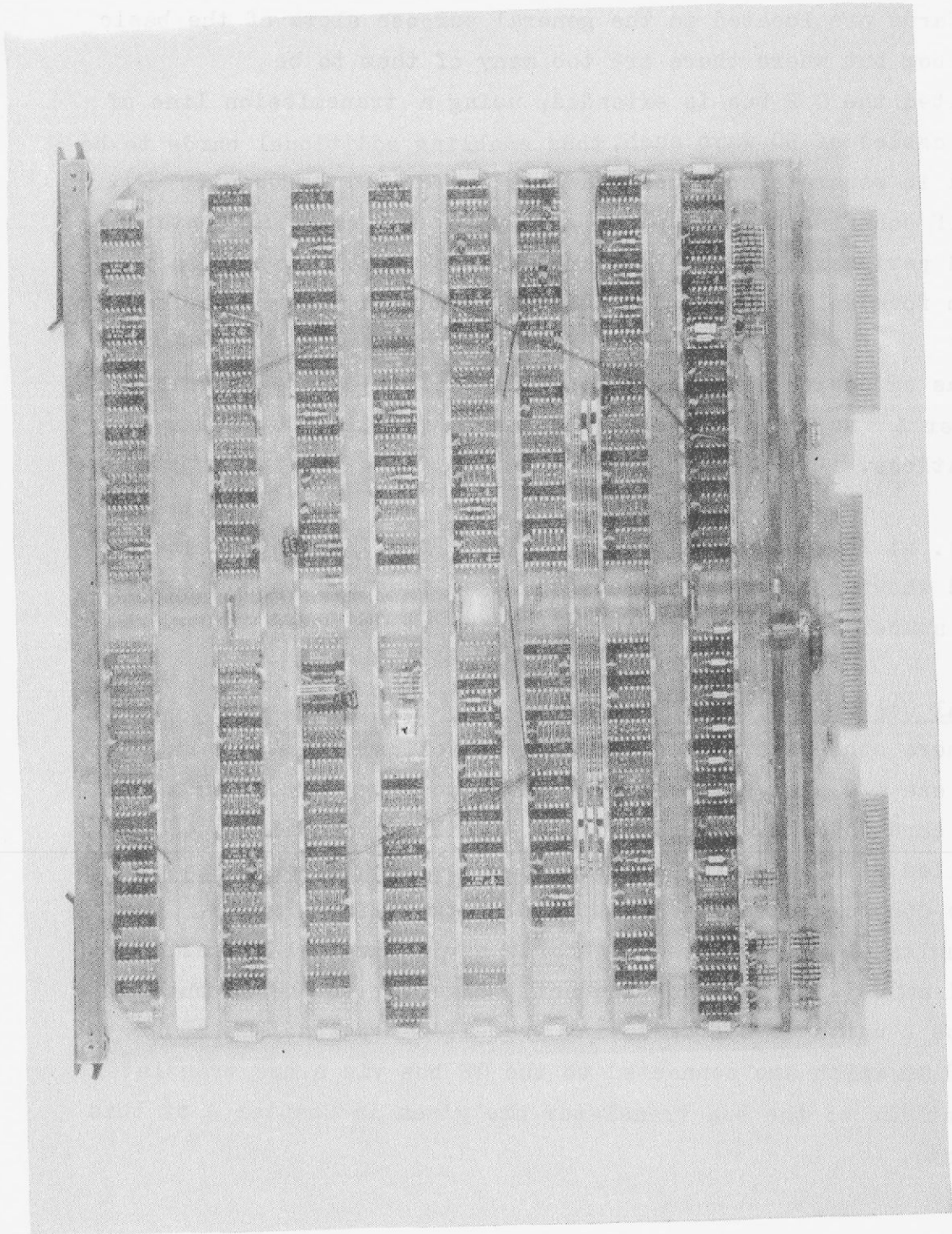
The GP bus extension and equipment shelf facilities are described in Chapter 4 as are the cables and panels relating to data communications.

Table 3.1. at the end of this chapter lists the I/O controllers discussed showing the I/O channels to which they may be connected, also the number of device addresses and interrupt lines.

Peripheral Control Units

Except where otherwise stated each of the following control units occupies one I/O slot either in the basic mounting box or in a separate card chassis. The associated signal cables and connectors are supplied with the peripheral units - see Part 3 Peripherals.

Note: The control units are identified as type 1 or 2 units. Type 1 units are constructed on boards having overall dimensions 421 mm x 371.5 mm which connect directly to the GP bus and type 2 units on boards having overall dimensions 208 mm x 310 mm which are connected to the GP bus via a bus translator (details of the bus translator are given in Chapter 4 of this part).



P824-040 Disc Control Units

- P801-040 (type 1) Control unit for punched tape reader P801-001 or P802-001.
It requires the following d.c. supply:
+5V 1.3A
- P810-040 (type 1) Control unit for lineprinter P809-002, P811-001 or P812-001.
It requires the following d.c. supply:
+5V 0.7A
- P845-040 (type 1) Control unit for the transfer of serial data with CCITT V24 and V28 interface. Speed selectable from 110, 150, 200, 300, 600, 1200, 2400, 4800 and 9600 bits/second.
It requires the following d.c. supplies:
+5V 1.9A
+18V 0.045A
-18V 0.04A
- P824-040 (type 1) Control unit for two P824-002 moving head disc units.
It requires the following d.c. supply:
+5V 4.0A
- P825-040 (type 1) Control unit for 2 P825-007 moving head disc units.
It requires the following d.c. supply:
+ 5V 6.0A
- P831-040 (type 2) Control unit for either four P831-002, four P831-004 or four P831-006 tape transports daisy-chain connected to either a P831-010, P831-020 or P831-030 tape formatter - See Part 3. The control unit comprises 2 cards which together with a P849-020 (RD1) or P849-021 (RD2) rectifier and a P849-322 (RG4) stabilizer card to provide the necessary d.c. supplies and a P843-007 or P843-008 bus translator card for connection to the GP bus are housed in a multicard equipment shelf to form a self contained unit.

- P833-152
(type 1) Equipment shelf with space for up to three cassette tape drives. Shelf includes control unit, CRC computation, power supply for 3 tape drives + 3.0m cable (see Part 3, Chapter 1).
- P840-001
(type 1) Control unit for punched tape reader P801-001 or P802-001 and tape punch P803-001.
It requires the following d.c. supply:
+5V 1.9A
- P840-002
(type 1) Control unit for punched tape reader P801-001 or P802-001 and tape punch P803-001 and V24 devices.
It requires the following d.c. supplies:
+5V 2.8A
-18V 0.04A
+18V 0.045A
- P840-003
(type 1) Control unit for card reader P806-102 and line-printer P809-002, P811-001, or P812-001.
It requires the following d.c. supply:
+5V 1.7A

Data Communications

The following data communication units, when used, occupy 1 slot in an Equipment Shelf Type E2.

- P847-060
SLCU 2S Multiple line control unit for 2 Half Duplex (HDX) or 1 Full Duplex (FDX) synchronous line connections up to 200,000 bits per second with interface according to CCITT V24/V28 recommendations. Special character recognition; CRC- VRC generation and check.
It requires the following d.c. supplies:
+5V 4.0A
+18V 0.08A
-18V 0.16A

P847-070 Multiple line control unit for 4 HDX or 2 FDX
SLCU 4 synchronous line connections up to 9600 bits per
second with interface according to CCITT V24/V28
recommendations.

It requires the following d.c. supplies:

+5V	4.0A
+18V	0.16A
-18V	0.25A

P846-070 Multiple line control unit for 4 HDX or 2 FDX
ALCU 4 asynchronous line connections 300 to 9600 bits
per second with interface according to CCITT
V24/V28/V23 recommendations.

It requires the following d.c. supplies:

+5V	4.0A
+18V	0.12A
-18V	0.18A

P846-060 Multiple control unit for 2HDX or 1 FDX asynchronous
ALCU 2 line connections 300 to 9600 bits per second with
interface according to CCITT V24/V28/V23
recommendations.

It requires the following d.c. supplies.

+5V	3.0A
+18V	0.06A
-18V	0.09A

P845-060 Asynchronous medium speed line multiplexer for
AMA 8A 8 FDX or 8 HDX connections 50 to 9600 bits per
second with interface according to CCITT V24/V28
recommendations.

It requires the following d.c. supplies:

+5V	5.0A
+18V	0.24A
-18V	0.36A

P845-070 Asynchronous medium speed line multiplexer for
AMA 8C 8 asynchronous device connections 50 to 9600 bits
per second with current loop interface (20 mA)
or TTL interface.

It requires the following d.c. supplies:

+5V	4.5A
-18V	0.1A

P844-060 Asynchronous low speed line multiplexer for 16 HDX
AMA 16 or 16 FDX connections 50 to 200 bits per second
with TTL compatible interface.

It requires the following d.c. supplies:

+5V	1.4A
-18V	0.05A

P844-110 Control module for 64 lines (32 in-32 out)with
V28 CM interface according to CCITT V24/V28 recommendations.

It requires the following d.c. supplies:

+5V	3.0A
+18V	0.16A
-18V	0.16A

Modular I/O System (MIOS)

MIOS is a separate rack mounting system (see Appendix for handbook)
for connecting the system to the GP bus.

Control unit (PC 1207/00 type M5D) for a basic
modular input and/or output system of up to 16
modules.

Digital I/O System (DIOS)

DIOS is supplied using the following Dual Input Output Digital
(DIOD) boards:

P837-001
 DIOD
 (type 1)

- Digital input output control unit providing:
- 1 gated 16-bit input word (including level adaptation)
 - 1 buffered 16-bit output word (including level adaption)
 - 1 call line per word
 - 1 response line per word
 - TTL level connection

It requires the following d.c. supply:

- +5V 2.25A (when used without output resistors)
- 3.2A (when used with output resistors)

P837-002
 DIOD
 (type 1)

- Digital input output control unit providing:
- 2 gated 16-bit input words (including level adaptation)
 - 2 buffered 16-bit output words (including level adaption)
 - 1 call line per word
 - 1 response line per word
 - TTL level connection

It requires the following d.c. supply:

- +5V 3.5A (when used without output resistors)
- 5.3A (when used with output resistors)

Table 3.1

I/O Channel Alternatives for Controllers

Type Number	Description	Prog. Channel	I/O Processor	Interrupts	No of Device Addresses
P801-040	P.T.R.	Yes	-	1	1
P840-001	P.T.R./P.T.P.	Yes	-	2	2
P840-002	P.T.R./P.T.P./V24	Yes	-	3	3
P840-003	C.R./L.P.	Yes (LP)	Yes	2	2
P810-040	L.P.	Yes	Yes	1	1
P845-045	V24/V28	Yes	-	1	1 (1)
P825-040	M.H.D. (40M 8-bit chr)	-	Yes	1	1
P824-040	M.H.D.	-	Yes	1	4
P831-040	M.T. 800/1600	-	Yes (tran)	1	4
P833-152	Cass. T.	Yes	Yes	1	3
P837-001	DIOD 2W	-	-	1	1
P837-002	DIOD 4W	-	-	2	2

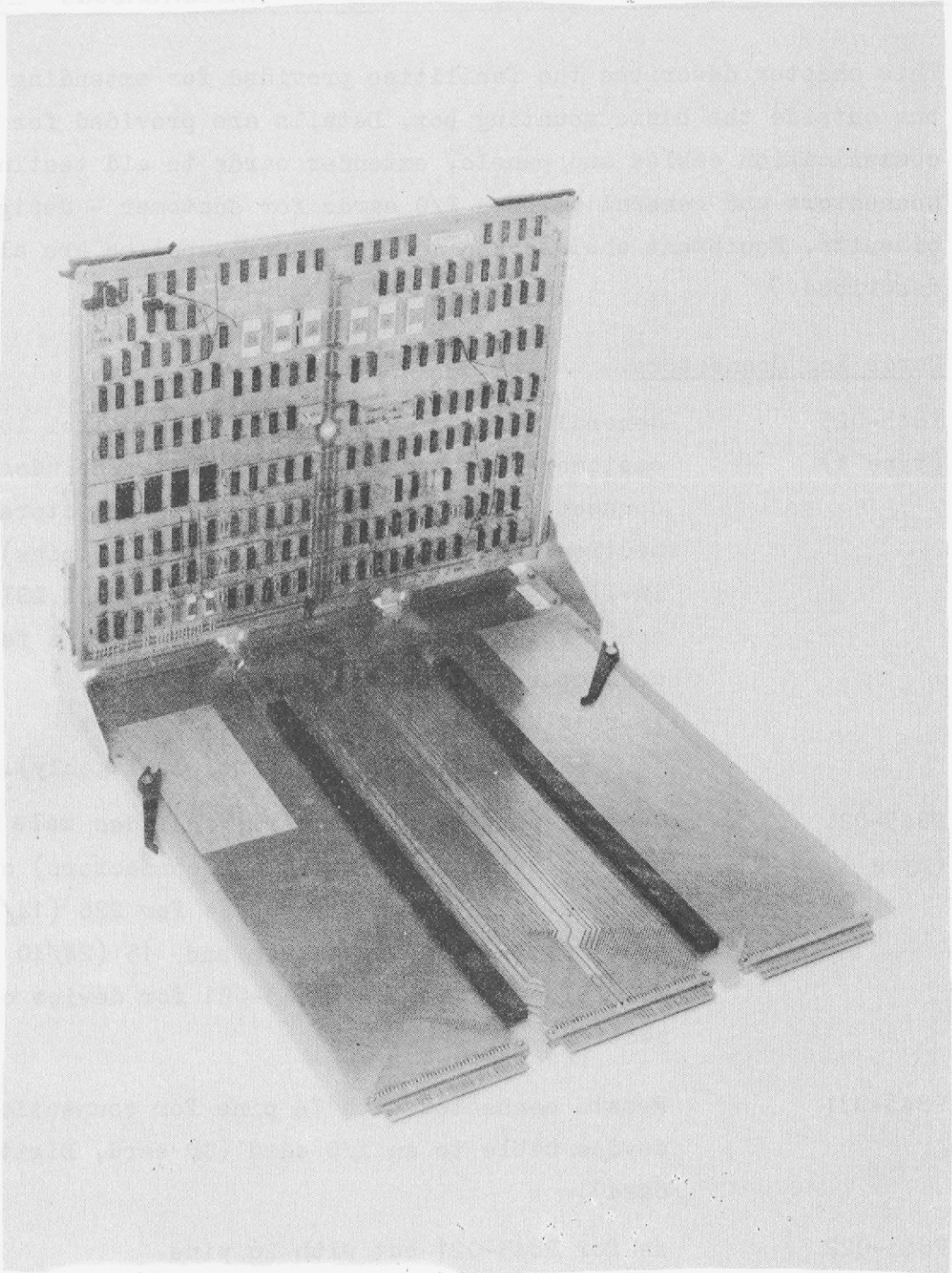
- not supported by standard software
 yes - supported by standard software

(1) These CU'S are not supported by standard software as the use of them depends on the application
 tran - connected via a translator card P843-007/008

This chapter describes the facilities provided for extending the GP bus outside the basic mounting box. Details are provided for data-communication cables and panels, extender cards to aid testing, card connectors and general purpose I/O cards for customer - designed circuits. Equipment shelves and modular power supplies are also described.

Cards and Connectors.

- P843-025
(type 1) General purpose card with GP bus control logic for customer-designed control circuit. Includes male connectors for bus and device (2 connectors) connection, and has space for 125 (14/16 pins) dual in-line-packages and 2 (24/40 pins) MSI,LSI packages. For connection of a device cable a female connector must be used (use P843-021).
It requires the following d.c. supply:
 +5V 1.0A (bus control logic only).
- P843-026
(type 1) General purpose wiring card; includes male connectors for bus and device (2 connectors) connection. Blank card with space for 226 (14/16 pins) dual in-line-packages and 15 (24/40 pins) MSI,LSI packages. Use P843-021 for device connection.
- P843-021 Female connector with 74 pins for connection of a device cable to an I/O card (GP card, Digital I/O card).
- P843-022 As for P843-021 but with 26 pins.
- P843-027 Set of 10 emitter and 10 receiver packages.
Required for a customer who is designing an interface to the GP bus.
- P843-028 Set of 10 bridge adaption networks (Ternet packages each of which terminate 14 signal lines). Required



Use of Extension Card P843-035

- P849-006 by customer designing terminations to the GP bus.
Female Connector (50 pins) for device connection to Type 2 card.
- P849-006 Female Connector (74 pins) for input isolator card P839-004.

Extenders and Adaptors

- P843-007 Bus translator card including 3 metre cable. Used (type 2) to translate signals on I/O bus into signals for GP bus. The card is always supplied as part of equipment shelf P843-002.
It requires the following d.c. supply:
+5V 1.0A.
- P843-008 Bus translator/terminator card including 3 metre (type 2) cable. Identical to P843-007 but also provides termination resistors for terminating the GP bus. The card is always supplied as part of equipment shelf P843-003.
It requires the following d.c. supply:
+5V 1.9A.
- P843-009 Bus terminator to be used in equipment connected at end of the GP bus, where the bus requires terminating. e.g. Equipment Shelf P843-001 used at the end of bus.
It requires the following d.c. supply:
+5V 0.9A.
- P843-115 GP bus extension cables (flat cable 2 x 50 way each) with connectors—overall length 3.0 metre.
- P843-031 Break lines requests cable (8 break request signal lines plus 8 signal earth lines),
- overall length 3 metre.
- P843-037 Cable for connection of a V24 interfacing device to the serial control units P840-002 or P845-040. Includes Cannon connector and control unit connector—overall length 10 metre.

Maintenance Equipment

- P843-035 Extension card for testing P852M central processor card.
- P843-135 Extension card for testing P852M type 1 control unit cards and I/O processor cards.
- P849-052 Portable control panel for P852M which is used mainly for maintenance and servicing. This is a free standing panel fitted with the same controls as a full control panel and with a flying lead and connector to enable it to be fitted in place of the full control panel.

Power Supplies

The power supplies for the system are mainly contained within the units supplied.

When using equipment shelf P843-001, which holds I/O cards type 1, the power supply is included with the shelf. When using equipment shelves P843-002/003 however, which hold I/O cards type 2 an extra power supply unit P843-011 or a D.C. Converter P849-034 can be ordered with the shelf dependent upon the type of cards fitted. See details under separate headings for these units.

Where a self contained control unit is formed from cards (type 2) contained within a multicard equipment shelf rectifiers RD1 or RD2 with stabilizer RG4 can be housed in the shelf to provide power for the neighbouring I/O Cards (See Figures 4.1. and 4.2).

Details of all power supply modules are as follows:

P843-011 Power supply unit which can be mounted in a dedicated location in equipment shelf P843-002 or P843-003. The unit consists of rectifier RD2 and stabilizer card RG3 which provide the following d.c. supplies for digital I/O equipment:

+24V	1.5A
+5V	4A
-5V	0.5A

P849-034 D.C. converter which can be mounted in a dedicated location in equipment shelf P843-002 or P843-003. It provides from an input of +5V at 2.5A the following d.c. supplies for data-communications equipment:

+6V	0.5A
-6V	0.25A
+12V	0.08A
-12V	0.1A

For the multicard equipment shelf rectifier RD1 or RD2 with stabilizer card RG4 provide outputs of +5V, 7.6A and -5V, 0.5A.

The power supply always included with shelves P843-002 or P843-003 consists of rectifier RD3 and stabilizer card RG5 which provide an output of +5V, 7.6A. The stabilizer provides also overvoltage protection.

Equipment Shelves

The equipment shelves are designed to fit into standard 19 inch racks - see Part 4 Cabinetry for mounting details.

The adaptation of the power supplies within the shelves for various mains voltage levels is described in Chapter 5 Mains Conversion and the switching arrangements for local and remote control of the shelves in Chapter 6 Local and Remote Control of d.c. Supplies.

Multicard Control Unit Equipment Shelf

Self contained equipment shelf (see Figure 4.1.) complete with wiring, connectors, fans, and local or remote on/off control for:

- Bus translator card P843-007 or 008
- 4 I/O cards (type 2)
- 1 rectifier (RD1 or RD2)
- 1 stabilizer (RG4)

Front Panel height = 3 standard rack units.

Note: This shelf is used in the system to form control unit P831-040 for 4 M.T. transports P831-102, 104 or 106.

P843-001
(E2)

Equipment shelf (see Figures 4.3 and 4.4.) with space for 6 I/O cards (type 1). Includes power supply +5V, 18A; -18V, 1A; +18V, 1A; telescopic slides, bus cable 3.0 metres and bus connector. When connected to the end of the GP bus a terminator P843-009 must be added.

Front panel height = 3 standard rack units.

P843-002
(E1)

Equipment shelf (see Figures 4.5 and 4.6) with space for 8 I/O cards (type 2), clock pulse card (P848-001) or D.C. converter (P849-034) and one extra supply unit (P843-011). The shelf includes a bus translator (P843-007) with 3.0 metre cable and a +5V, 6.6A power supply (RD3 + RG5).

Front panel height = 5 standard rack units.

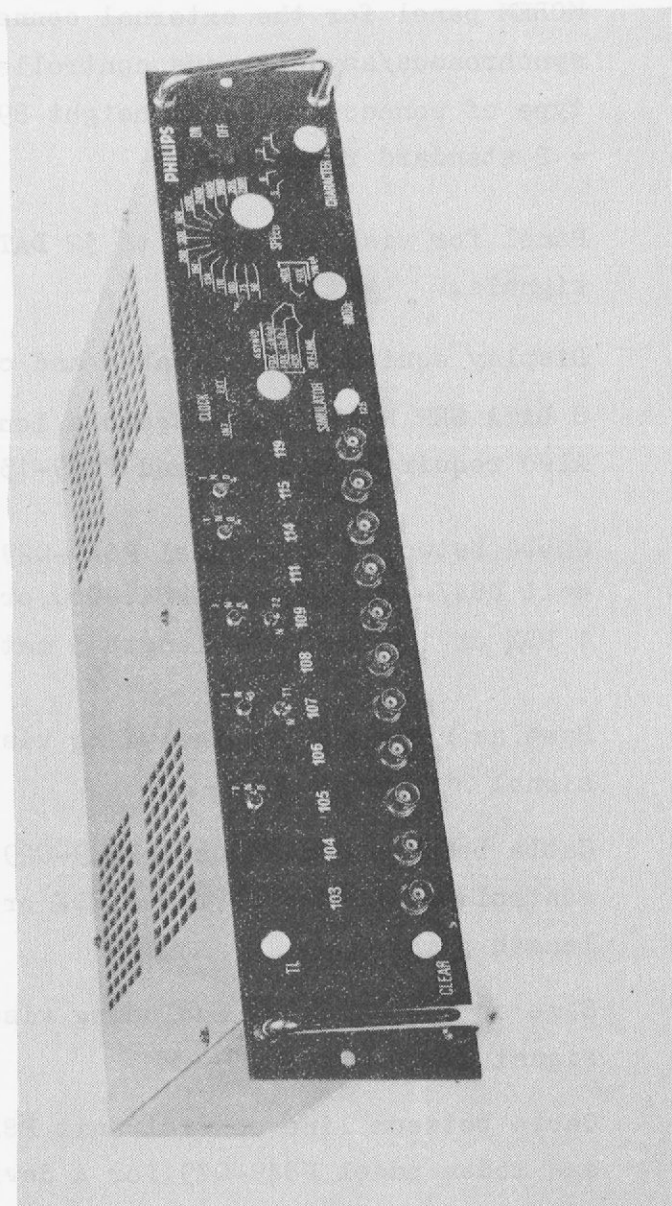
P843-003
(E1)

Equipment shelf as described for P843-002 but fitted with a bus translator/terminator (P843-008) with 3.0 metre cable and a +5V, 5.7A power supply. This shelf is for use at the end of the GP bus.

Front panel height = 5 standard rack units.

Data Communication Panels and cables

P849-029	MODEM panel for the external connection of 16 synchronous/asynchronous controllers; Cannon type of connectors. Panel height 89mm(3.5 inches) = 2 standard rack units.
P849-130	Panel for visualising up to 32 DATA SET READY' signals.
P849-230	Display equipment with cable and connectors for 8 DATA SET READY' signals; cable length 3 metre. Also required P849-029 and P849-130.
P849-524	Cable between modem panel P849-029 and line control unit P847-060, P847-070, P846-060, or P846-070 for 1 FDX or 1 HDX; Cable length 3 metre.
P849-534	Same as P849-524 but including visualisation signal for option P849-230
P849-624	Cable between modem panel P849-029 and line control unit P845-060 for 4 HDX or FDX; cable length 3 metre.
P849-634	Same as P849-624 but including visualisation signal for option P849-230
P849-724	Cable between line control unit P845-070 and modem panel P849-029 for 4 device connections; cable length 3 metre.
P849-734	Cable between line control unit P845-070 and 4 external equipments (open ended); cable length 5 metre.
P849-824	Cable between line control unit P844-110 and external equipment (open ended) 16 input and 16 output lines; cable length 5 metre.
P849-346	Cable between modem panel P849-029 and modem according to CCITT recommendation V24, includes one connector for connection to the modem panel; cable length 5 metre.



Diagnostic Box

P849-924 Cable between line control unit P844-060 and 8 external equipments (open ended); cable length 5 metre.

P849-336 Cable between modem panel P849-029 and modem according to CCITT recommendation V24, includes one connector for connection to the modem panel; cable length 5 metre.

P849-901 Diagnostic equipment for SLCU 2S, SLCU 4,ALCU4/2, AMA 8A controller types. Requires also P849-029.

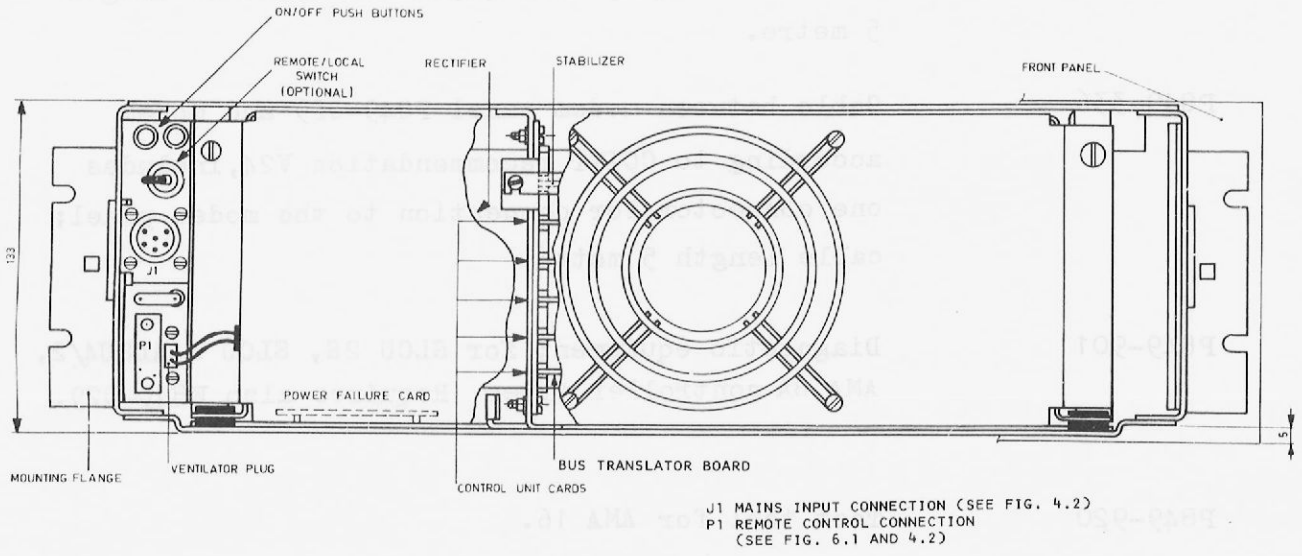
P849-920 Test tool for AMA 16.

P849-925 Test tool for V28 CM.

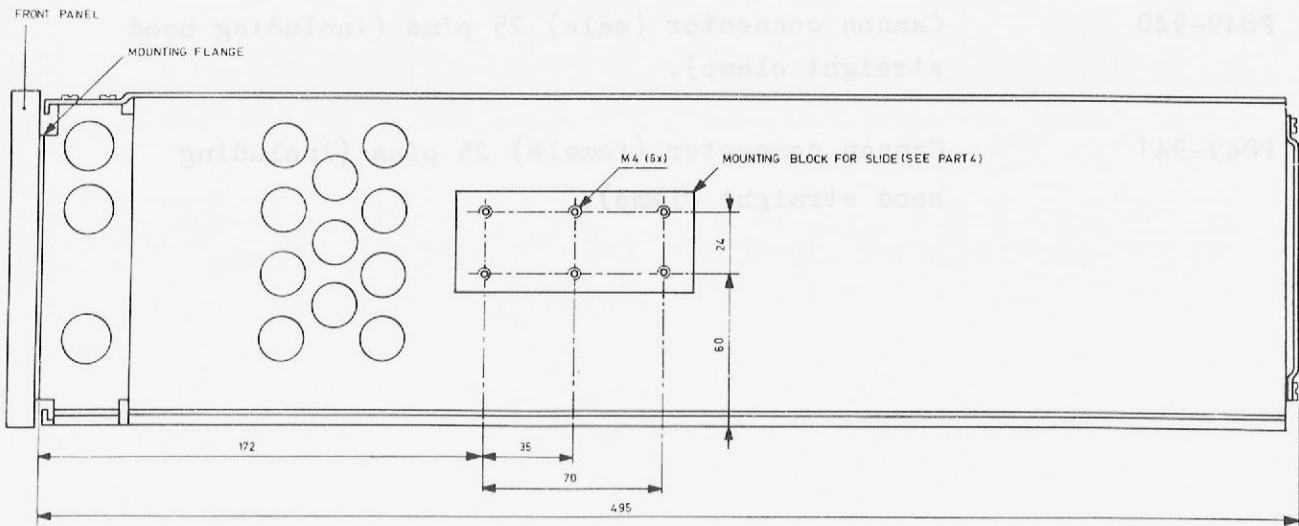
P849-930 Test tool for AMA 8C.

P849-940 Cannon connector (male) 25 pins (including hood straight clamp).

P849-941 Cannon connector (female) 25 pins (including hood straight clamp).



REAR VIEW



SIDE VIEW

ALL DIMENSIONS mm

FIG. 4.1 MULTICARD CONTROL UNIT EQUIPMENT SHELF

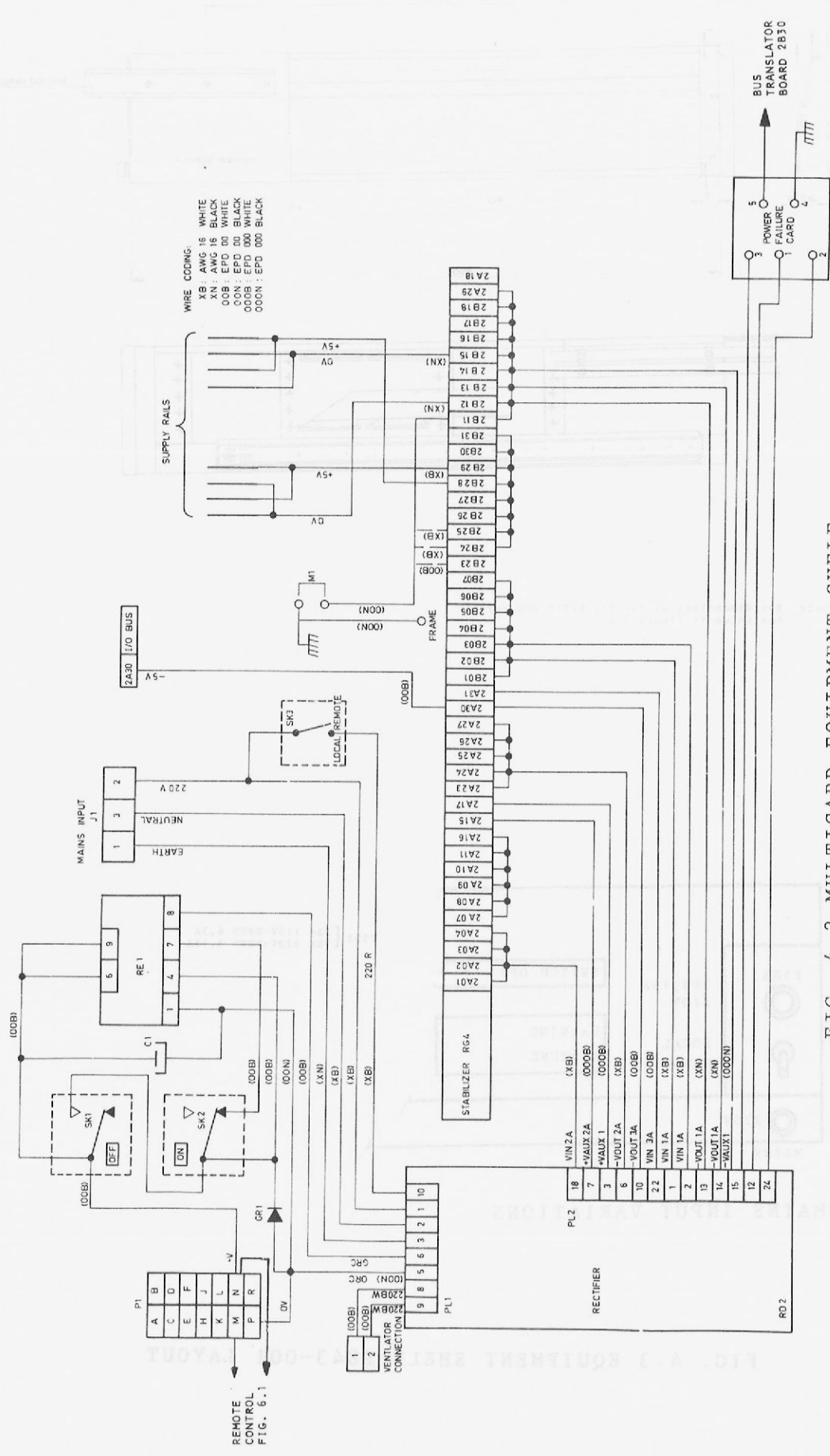
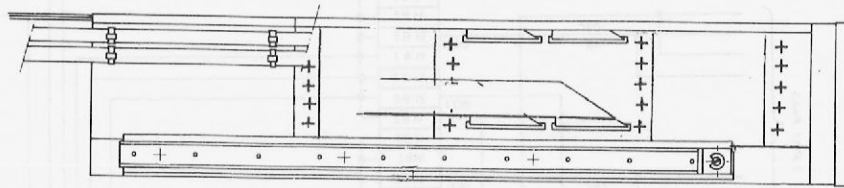
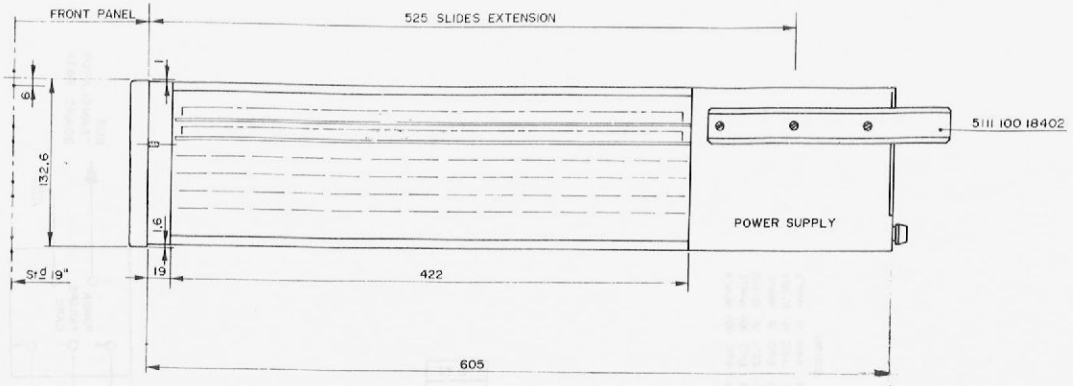
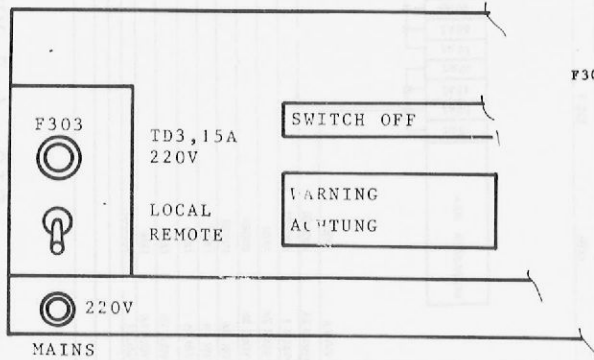


FIG. 4.2 MULTICARD EQUIPMENT SHELF
 A.C. and D.C. DISTRIBUTION



Note: Box dimensions as for the P852M-200 series box shown in Figure 1.1

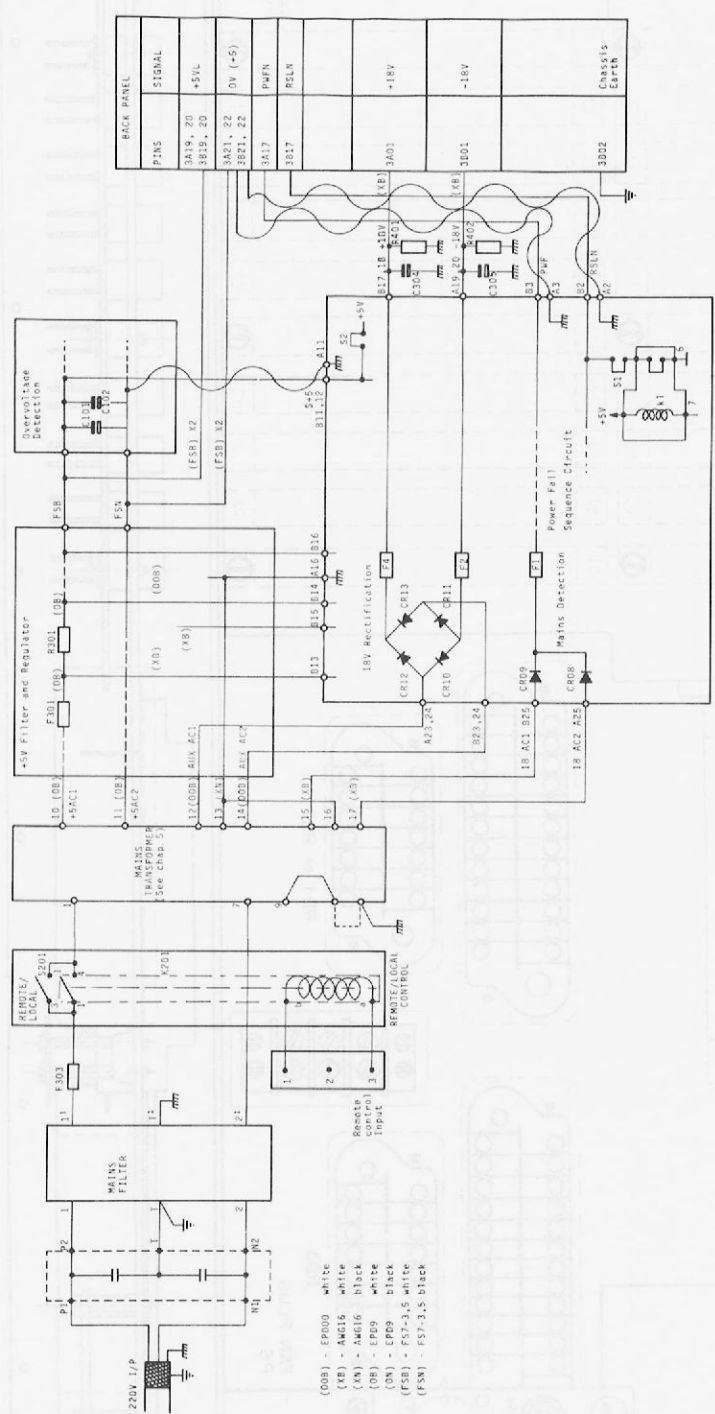


F303 { CSA 115V-D8TD 6,3A
VDE 220V-D8TD 3,15A

MAINS INPUT VARIATIONS

FIG. 4.3 EQUIPMENT SHELF P843-001 LAYOUT

818226 4-72 80010004 2P011 1017-005/001 P843-001



- (00B) - EPP00 white
- (XB) - AW616 white
- (XN) - AW616 black
- (OB) - EPP9 white
- (ON) - EPP9 black
- (FSB) - FS7-3.5 white
- (FSN) - FS7-3.5 black

FIG. 4.4 EQUIPMENT SHELF P843-001 CIRCUIT-SCHEMATIC

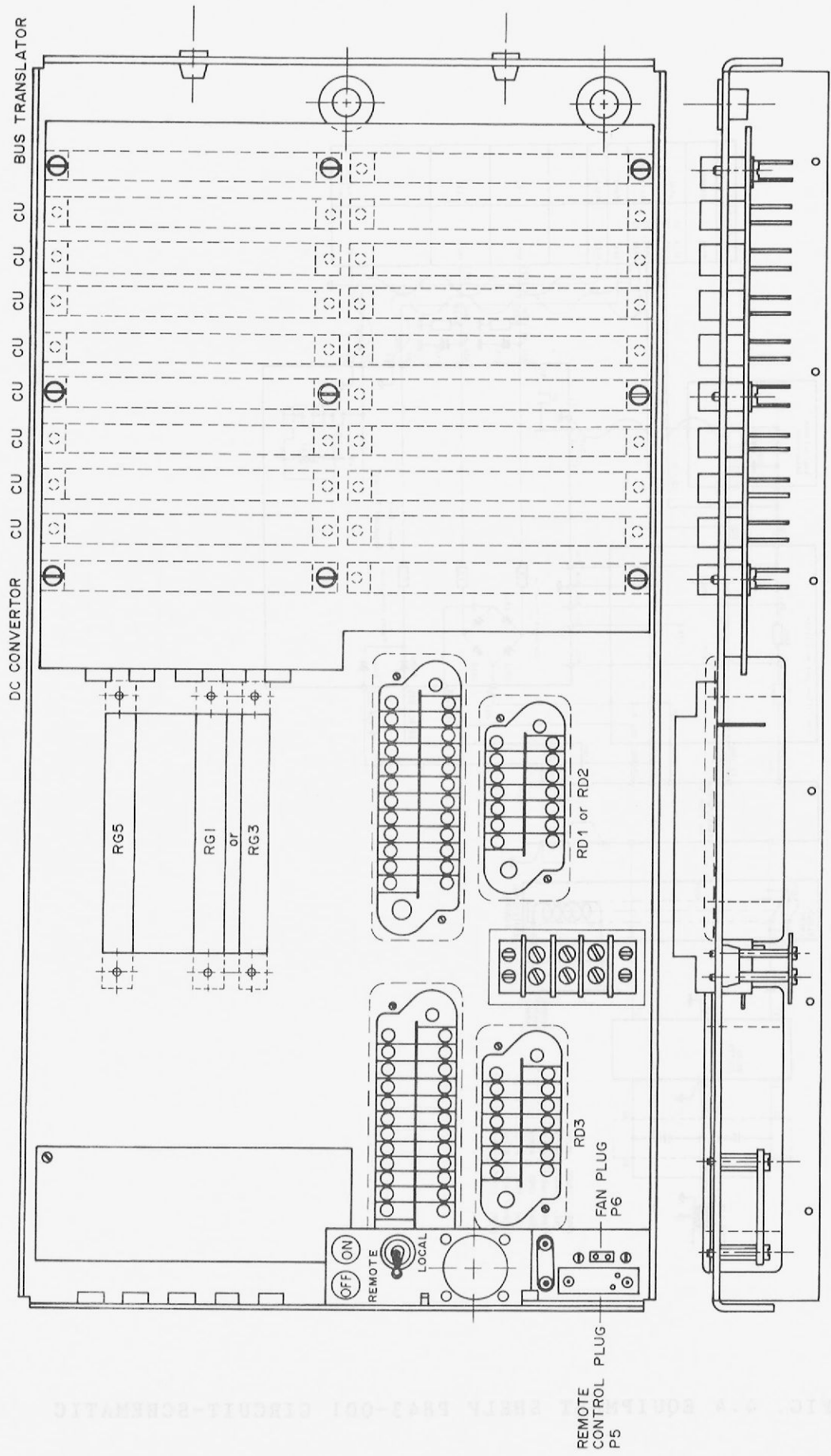


Figure 4.5. Equipment Shelf P843-002/003 Layout

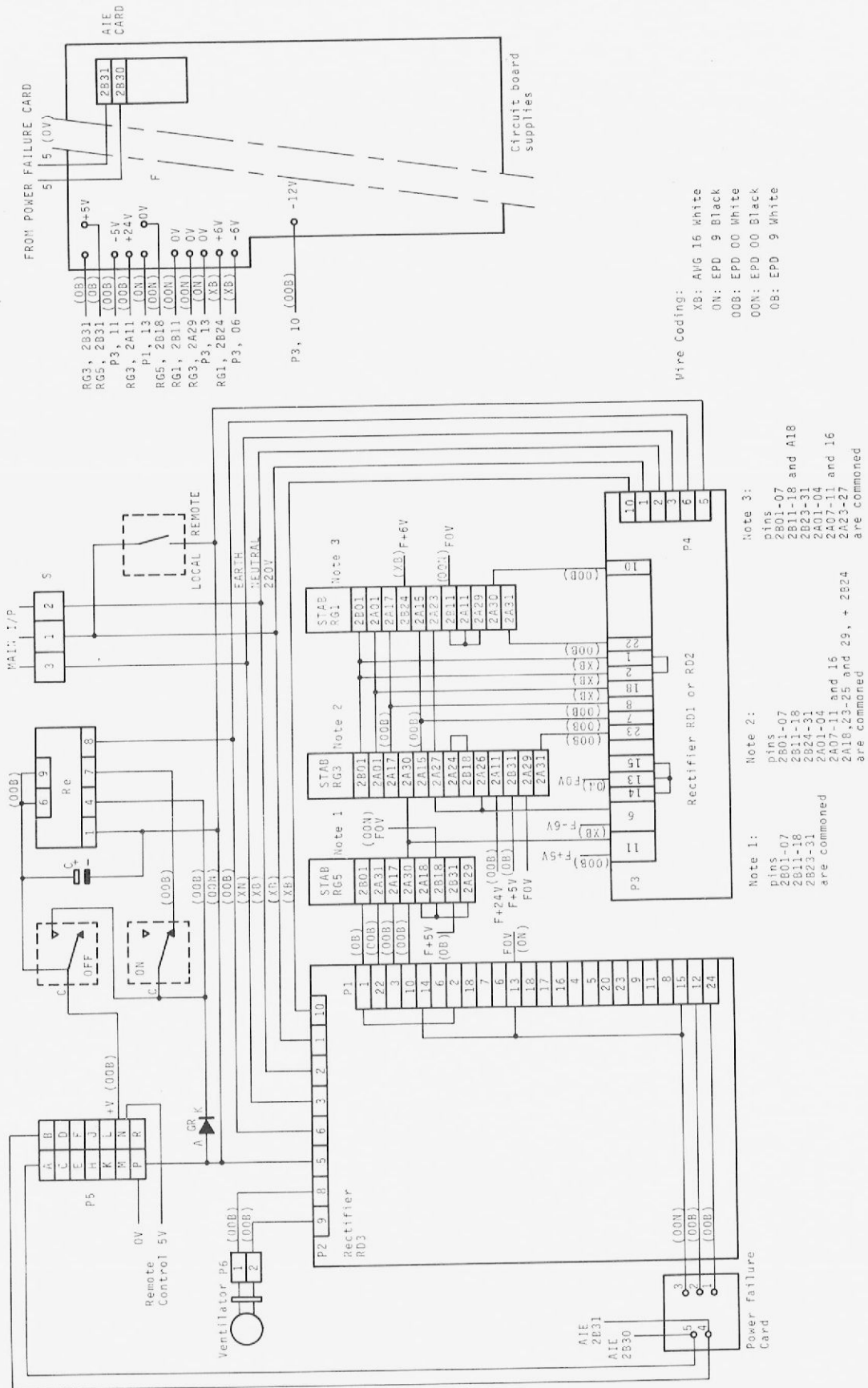


FIG. 4.6 EQUIPMENT SHELF P843-002/003 AC and DC DISTRIBUTION

NOTIFICATION

TO: SAC, NEW YORK (100-100000) FROM: SAC, NEW YORK (100-100000)

RE: [Illegible]



Adapting the power supply of the basic mounting box and the equipment shelves to suit different levels of mains voltage is achieved by altering the tapings on the mains transformers of each unit.

For basic mounting boxes (M100, M200, M400 and M500 Series) equipment shelves P843-001 (E2), and P833-152 cassette equipment shelves the tapping arrangements are as shown in Figure 5.1 and the physical location of the transformers as shown in Figures 5.2. and 5.3.

For equipment shelves P843-002 or P843-003 and for the multicontrol unit shelf the transformer tapings are shown in Figure 5.4. and the physical location of the transformer in Fig. 5.5.

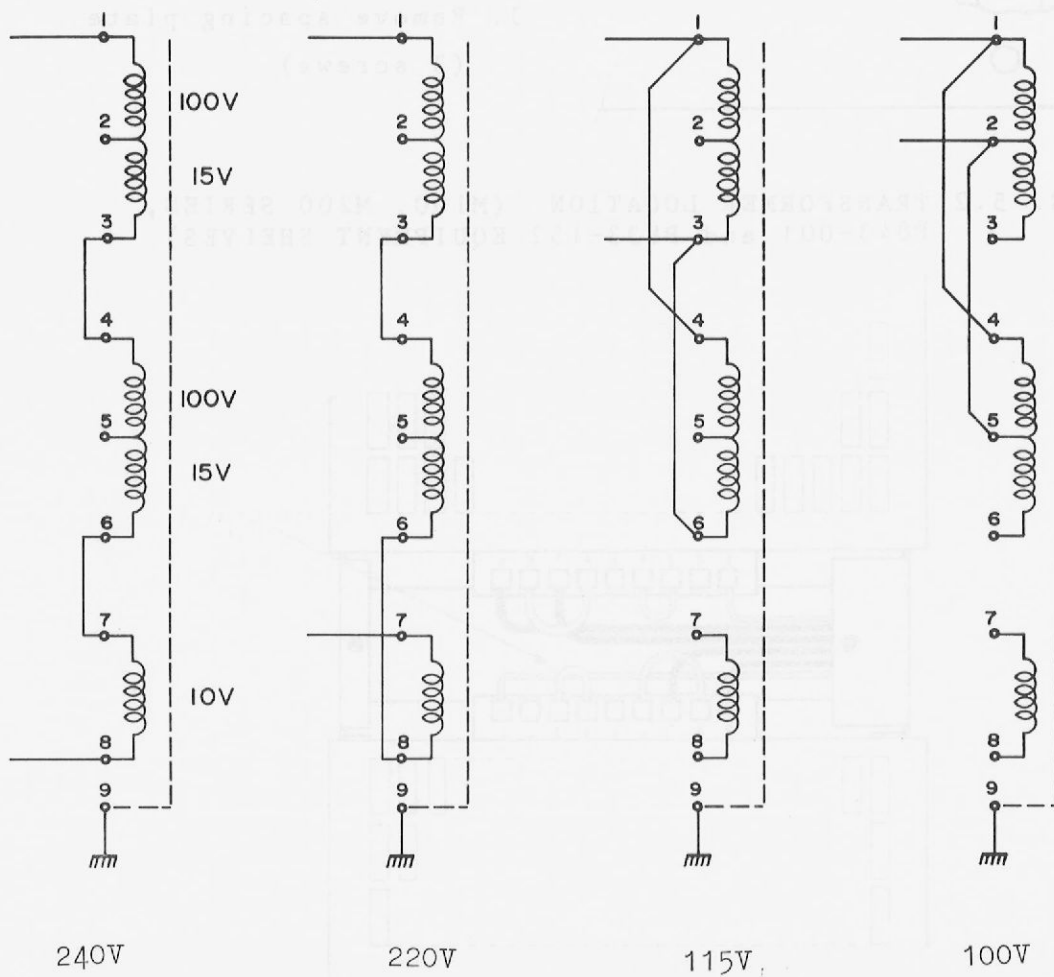
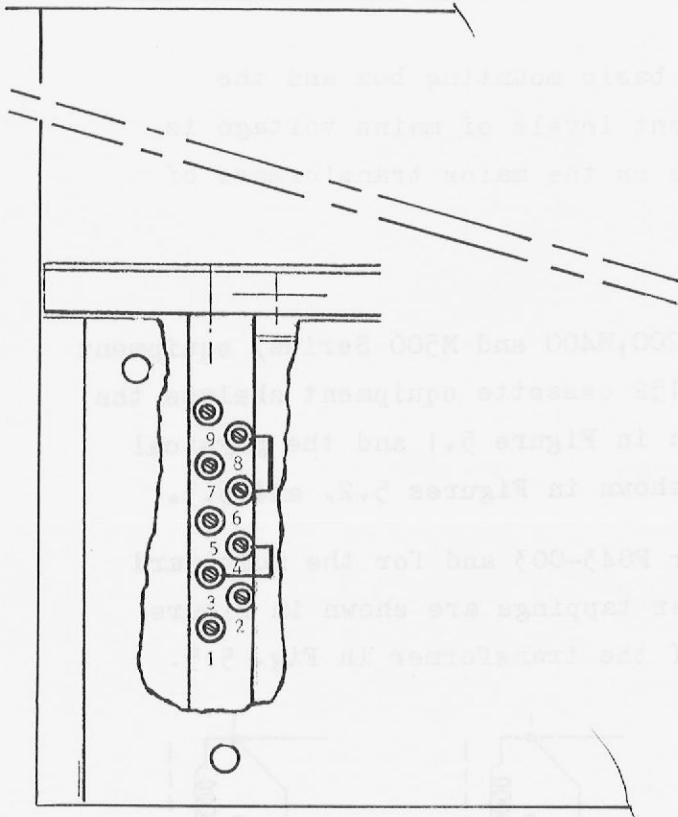


FIG. 5.1 TRANSFORMER TAPPINGS (M100|200|400|500, P843-001 and P833-152)

Control panel (or equipment shelf front panel)



Example shows
links for 220V
mains input

To reach transformer
tappings:

1. Remove top rear
cover (4 screws)
2. Remove power supply
card (4 screws) and connector
3. Remove spacing plate
(3 screws)

FIG. 5.2 TRANSFORMER LOCATION (M100, M200 SERIES,
P843-001 and P833-152 EQUIPMENT SHELVES)

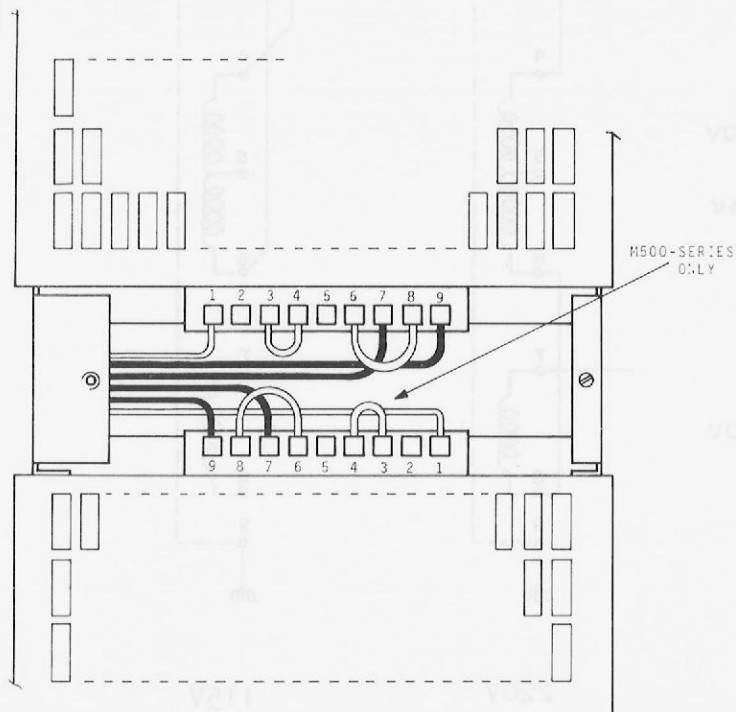
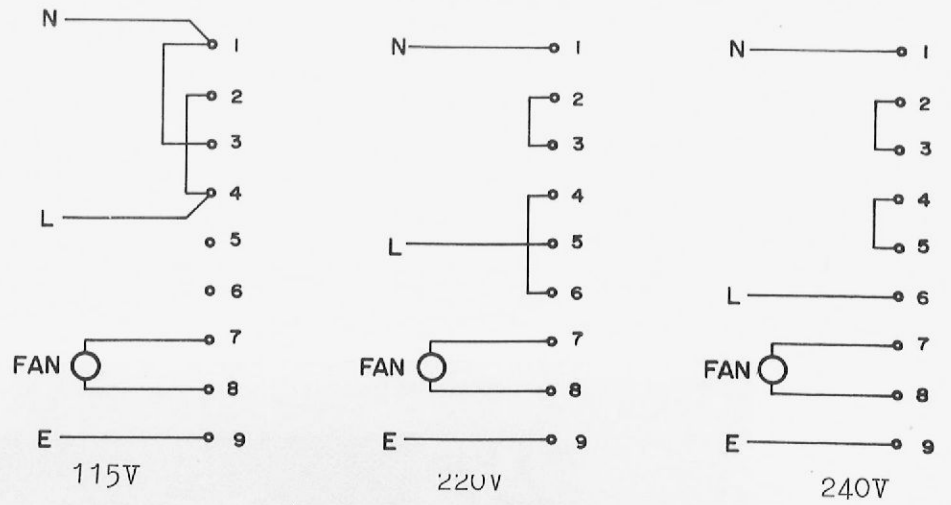


FIG. 5.3 TRANSFORMER LOCATION (M400, M500)



NOTE: 105, 110, 120, 125 AND 130V CONNECTIONS ALSO POSSIBLE

FIG. 5.4 TRANSFORMER TAPPINGS (P843-002/3 and MULTICARD CONTROL UNIT EQUIPMENT SHELF)

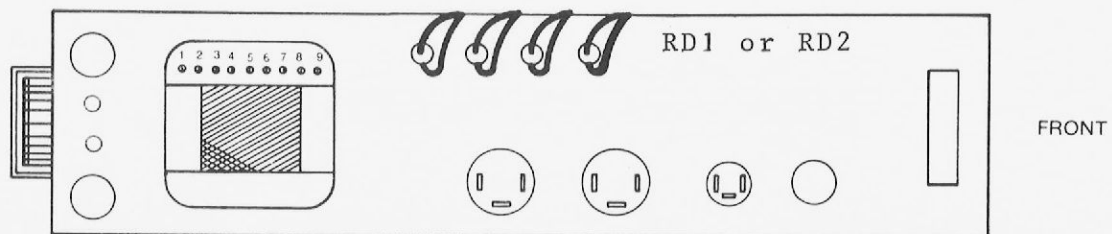
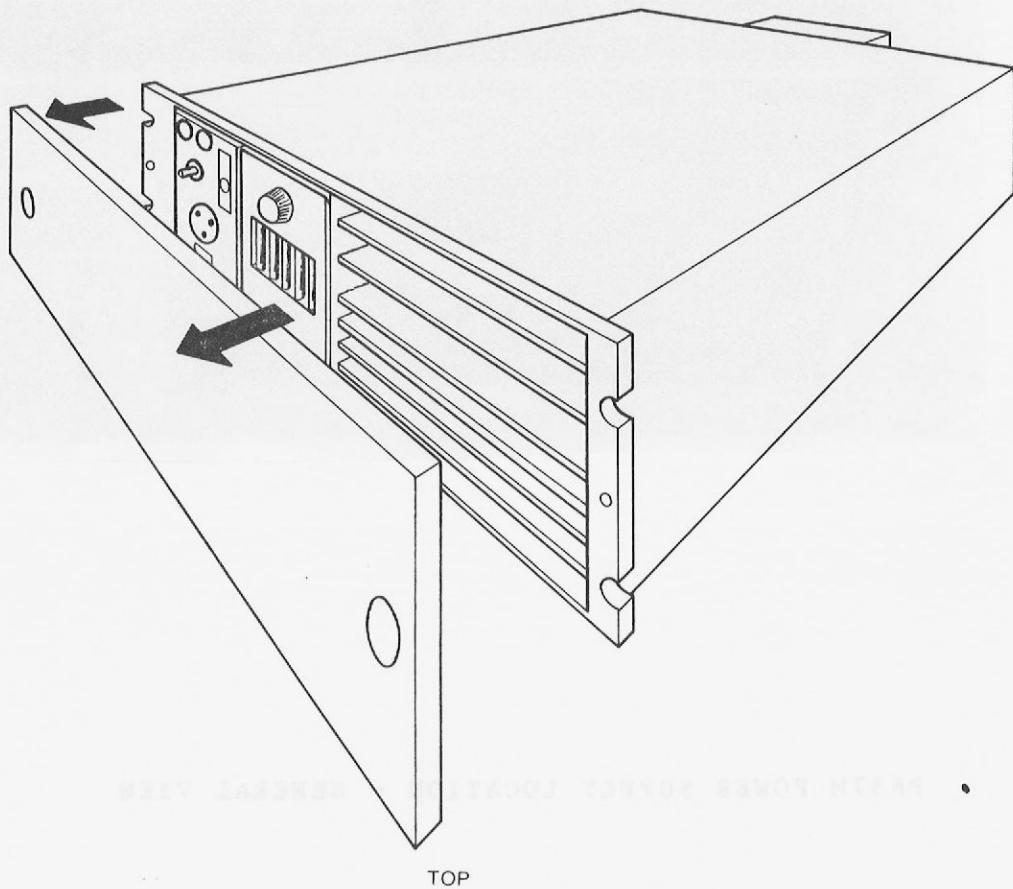
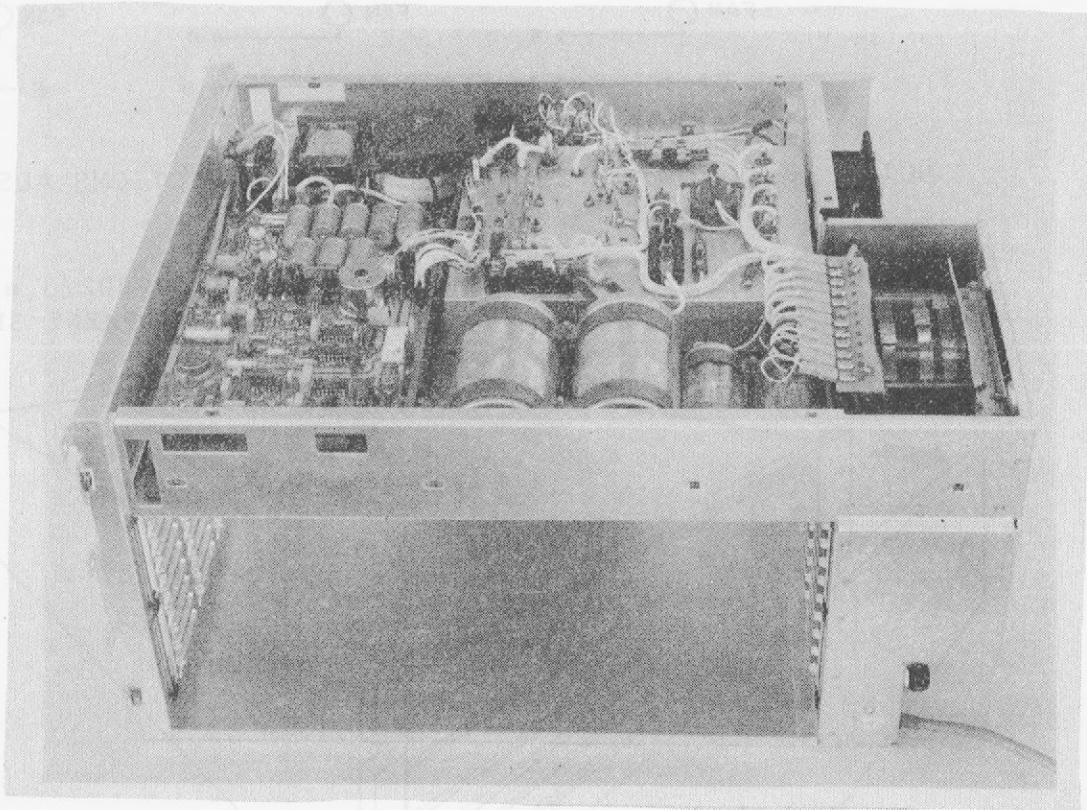


FIG. 5.5 TRANSFORMER LOCATION (MULTICARD CONTROL UNIT EQUIPMENT SHELF and P843-002/3)



P857M POWER SUPPLY LOCATION - GENERAL VIEW



FIG. 2-3 TRANSFORMER LOCATION (MULTICARD CONTROL UNIT EQUIPMENT SHELF AND P857-001/3)

The P843-001 equipment shelf (with space for 6 I/O cards - type 1), the P843-002/003 equipment shelves (with space for 8 I/O cards - type 2), and the P833-152 equipment shelves (for 3 cassettes) are all equipped with the facility for local or remote control. The equipment shelf, for self contained multiscard control units - type 2, can also be equipped with this facility. The interconnections for remote control are shown in Figure 6.1. and the control circuits for local/remote operation are shown in Figures 6.2. and 6.3.

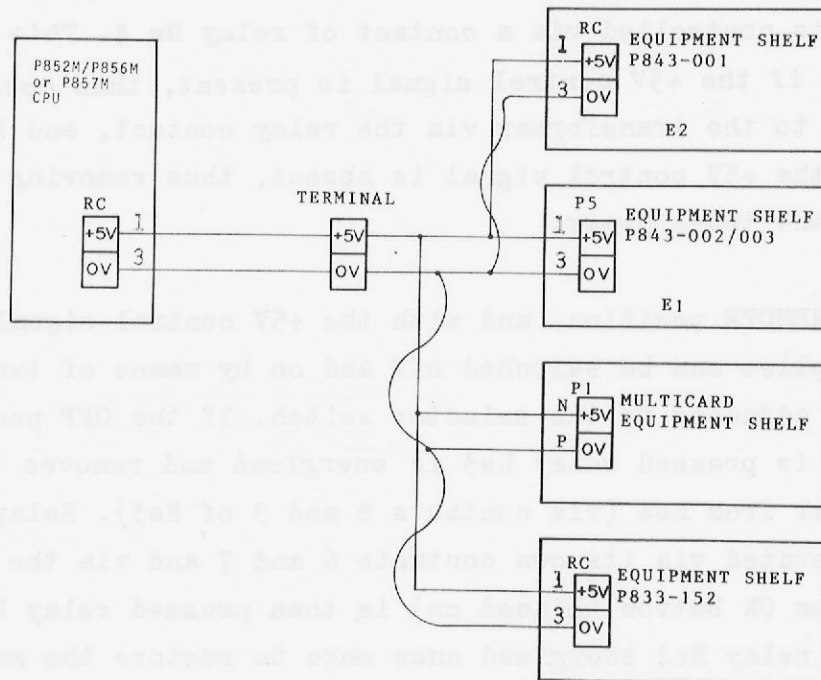


FIG. 6.1 REMOTE CONTROL INTERCONNECTIONS

Figure 6.2. shows the control circuit used in equipment shelves P843-001, P843-002 and in P833-152. In operation the supply to the equipment shelf mains transformer is connected either via a LOCAL/REMOTE switch, when the switch is in the LOCAL position, or via a solenoid operated switch which is controlled and operated with a +5V control signal derived from the P852M/P856M or P857M basic

mounting box power supply.

The control circuit incorporated in a multicard control unit equipment shelf also includes ON/OFF switches as shown in Figure 6.3. When the selector switch is set to LOCAL (with the mains switch set to ON) the supply is connected to the mains transformer and internal d.c. supplies are obtained from the unit whether or not the +5V control signal is present. The ON and OFF switch have no effect on the circuit under these conditions.

When the selector switch is set to REMOTE the mains supply to the transformer is controlled via a contact of relay Re 4. This relay is energised if the +5V control signal is present, thus applying the mains supply to the transformer via the relay contact, and is de-energised if the +5V control signal is absent, thus removing the mains supply from the transformer.

Also in the REMOTE position, and with the +5V control signal present the d.c. supplies can be switched off and on by means of two biased push buttons adjacent to the selector switch. If the OFF push button (biased off) is pressed relay Re3 is energised and removes the +5V control signal from Re4 (via contacts 8 and 9 of Re3). Relay Re3 is then held operated via its own contacts 6 and 7 and via the ON switch. If the ON button (biased on) is then pressed relay Re3 is released and relay Re4 energised once more to restore the mains supply to the transformer. If the OFF push button has been operated the control circuit is reset (Relay Re3 de-energised) if the +5V control signal is then switched off. The mains supply to the equipment shelf transformer is then restored when the +5V control signal comes on again.

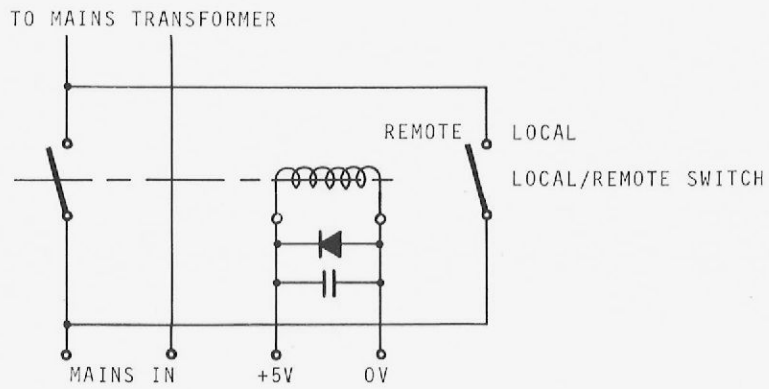


FIG. 6.2 REMOTE CONTROL CIRCUIT (P843-001 and P833-152 EQUIPMENT SHELVES)

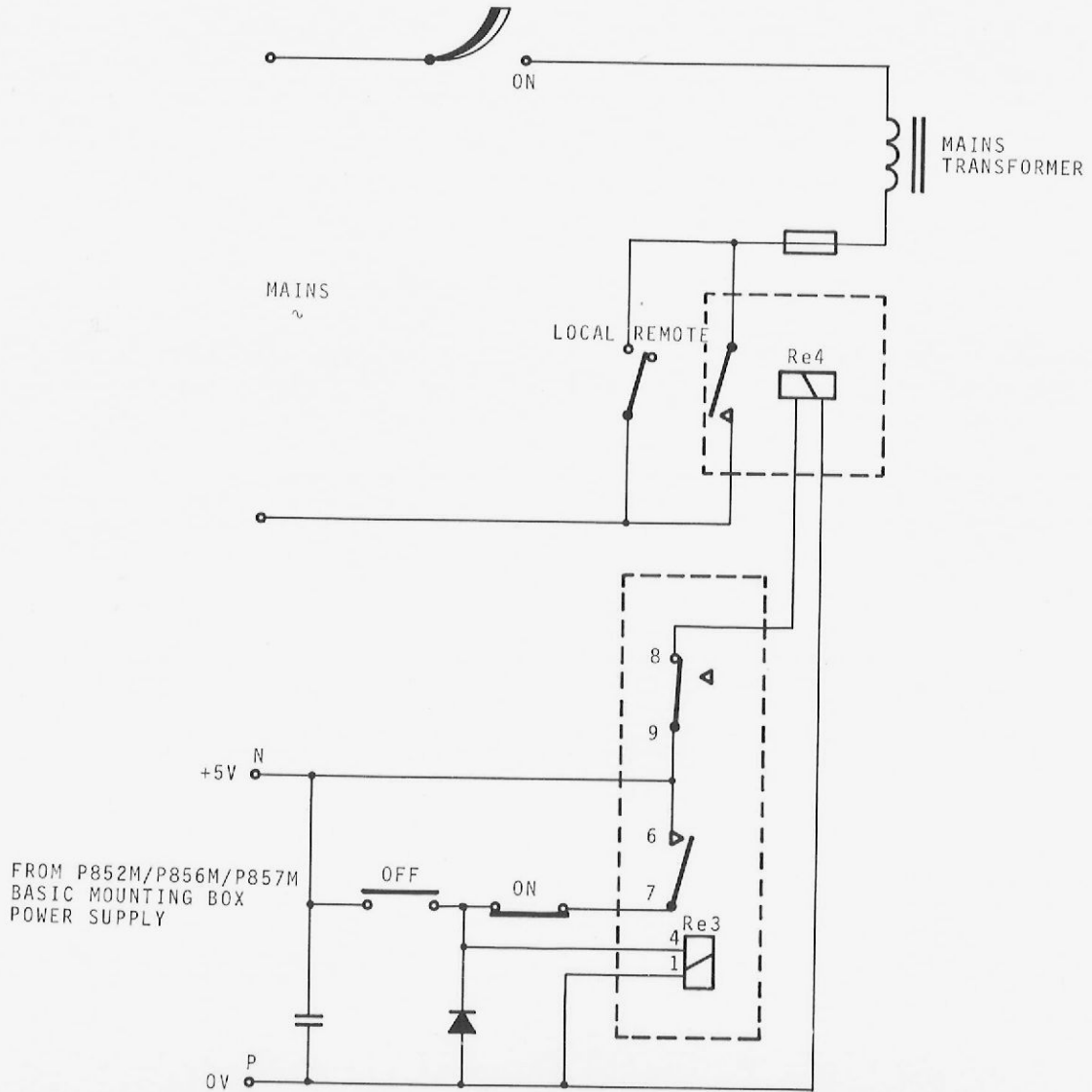


FIG. 6.3 REMOTE CONTROL CIRCUIT (MULTICARD CONTROL UNIT and P843-002/3 EQUIPMENT SHELVES)



FIG. 2-3 REMOTE CONTROL CIRCUIT (EQUIPMENT BELIEVED TO BE 1943-44)

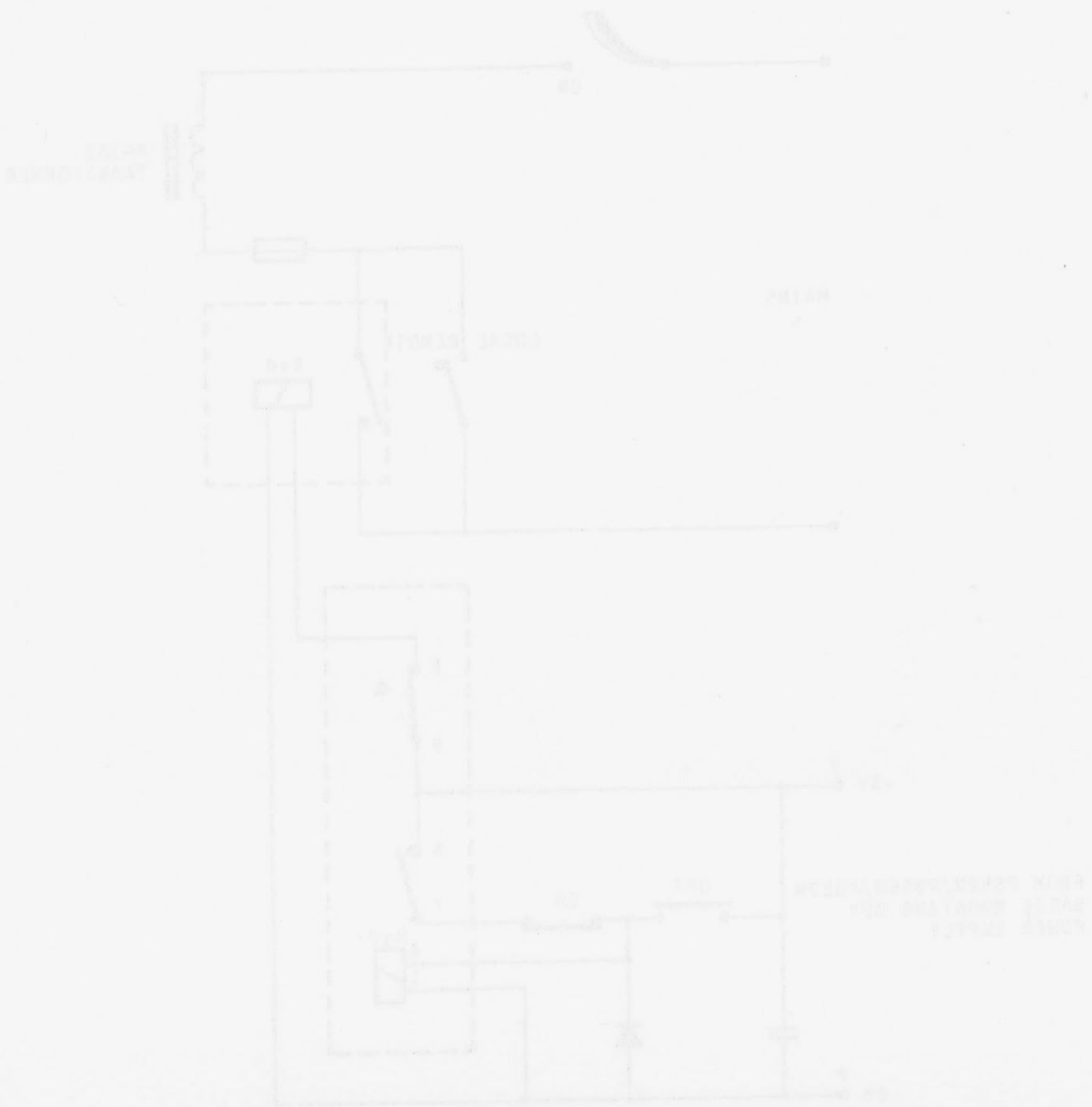
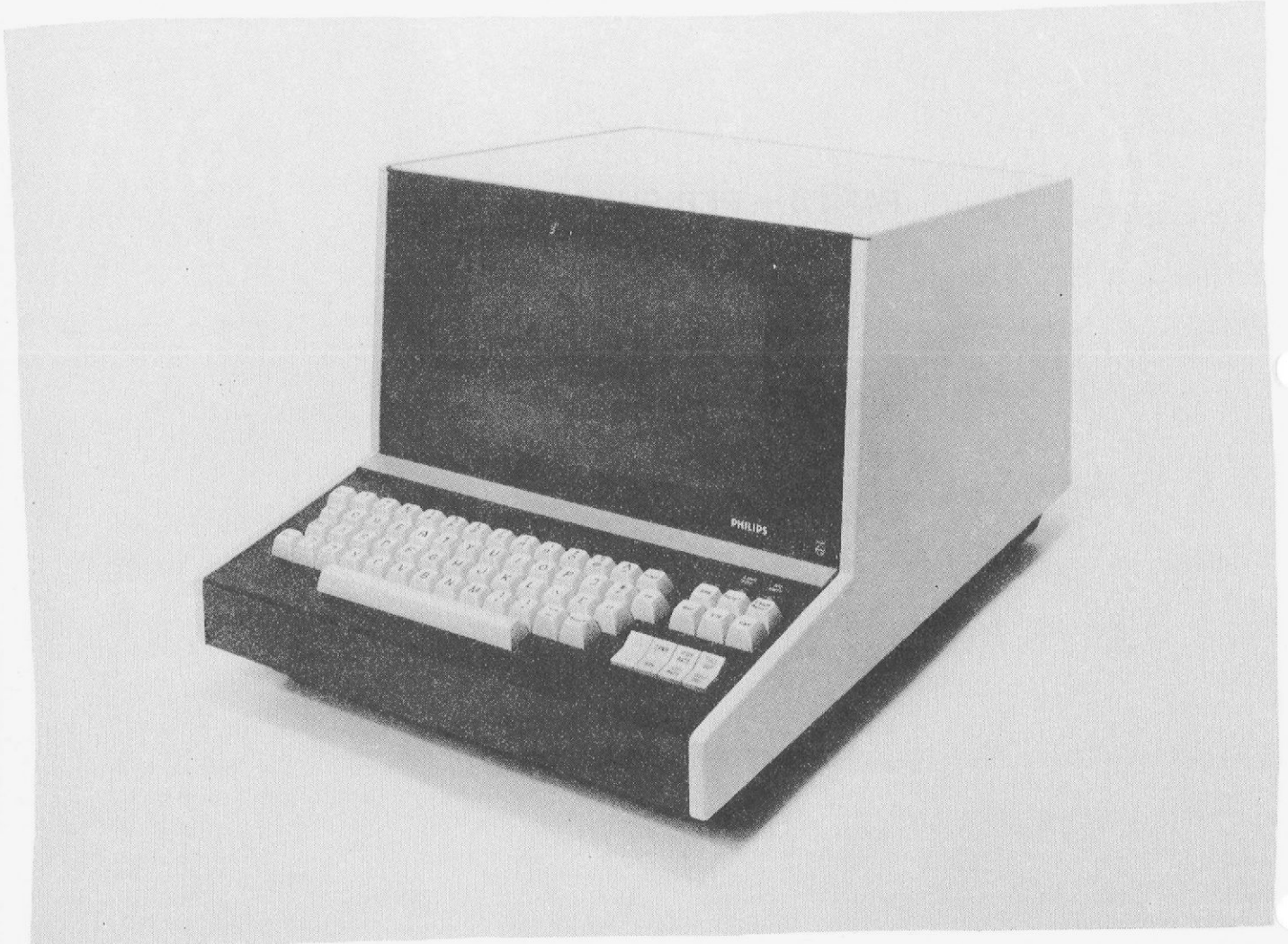


FIG. 2-3 REMOTE CONTROL CIRCUIT (EQUIPMENT BELIEVED TO BE 1943-44)

PART3 — PERIPHERALS

Security Technical



Display Terminal

This chapter describes the various input and output devices, including magnetic storage and retrieval equipment, which can be connected to the central processors via the relevant I/O cards defined in Part 2 Central Processors and Integral Equipment.

All the peripherals described operate directly from the mains supplies - the adaption of the peripherals to suit different mains voltage levels is explained in Chapter 2.

Most of the peripherals are rack mountable; of these some are secured to the front of the rack framework and the others are supported by fixed or telescopic slides. In the data given for each peripheral brief mention is made of the mounting method but for full details of this and the recommended rack positions see Part 4 Cabinetry. When a system is delivered it is accompanied by Configuration Sheets which show the assigned rack locations and list the interconnecting cables - an example is given in the Appendix.

For further information about any peripheral reference should be made to the manual issued by the manufacturer, to the relevant Control Unit Manual (listed in the Appendix) for details of signal interconnections, or to the P800M Minicomputer OEM Equipment Catalogue.

Note: Signal Cables terminating in I/O card connectors are provided with the peripherals for connection to the associated control units. The standard cable length quoted for each device is that which is normally supplied but in most cases is not the maximum permissible length - see Table 2.2 in Part 1 of this section.

Punched Tape Equipment

P801-001 Punched Tape Reader 333 characters/second

P802-001 Punched Tape Reader 600 characters/second

Apart from the operating speed, both readers are identical.

Manufacturer Digitronics Corporation

Type no. 2540 EP

Style rack mounting: secured to the front of the rack frame

Physical Characteristics

Front panel width 483 mm; standard 19 inch rack panel

Front panel height 133 mm (5.25 inches) = 3 standard rack units

Depth behind panel 203 mm (8 inches)

Protrusion from panel 58 mm (2.3 inches)

Weight 15 kg (33 lb)

Signal Cable

Standard length 3 m (3.3 yards)

Optional lengths 2 or 7.5 m (2.2 or 8.2 yards)

Power Requirements

Voltage 115 or 220 volts r.m.s. \pm 10%

Frequency 48 to 62 Hertz

Power consumption 150 VA

Electrical Safety

Protection class I

Environmental Conditions

Temperature - operating 0 °C to +45 °C

Temperature - storage -55 °C to +65 °C

Humidity - operating 20% to 85% r.h.

Humidity - storage 0 to 100% r.h. without condensation

Tape Specification

Material paper, paper-mylar, aluminized mylar or solid mylar

Thickness 0.064 to 0.124 mm (0.0025 to 0.005 inch) without mechanical adjustment

Width 17.5 to 25.4 mm ($1\frac{1}{16}$ to 1 inch), 5 to 8 channels; tape guides adjustable

Transmissivity up to 40% without electrical adjustment

P803-001 Tape Punch 75 characters/second

Manufacturer

Facit

Type no.

4070

Style

free standing or rack mounting version

Physical Characteristics - free standing version

Depth 432 mm (17 inches)
Width 220 mm (8.7 inches)
Height 190 mm (7.5 inches)
Weight 13 kg (29 lb)

Physical Characteristics - rackmounting version

Front panel width 483 mm: standard 19 inch rack panel
Front panel height 267 mm (10.5 inches) = 6 standard rack units
Depth behind panel 120 mm (4.7 inches)
Protrusion from panel 50 mm (2 inches)
Weight 17 kg (37 lb)

Signal Cable

Standard length 3 m (3.3 yards)
Optional lengths 2 or 7.5 m (2.2 or 8.2 yards)

Power Requirements

Voltage 110, 127, 220 or 240 volts r.m.s. + 15%,
-10%
Frequency 50 to 100 Hertz
Power consumption 180 VA max.
50 VA min.
power automatically cut off if supply
voltage falls 15% below nominal

Electrical Safety

Protection class I

Environmental Conditions

Temperature - operating 0 °C to +45 °C
Temperature - storage -55 °C to +65 °C
Humidity - operating 20% to 85% r.h.
Humidity - storage 0 to 100% r.h. without condensation

Tape Specification

Material paper, mylar or plastic complying with ISO standards
Thickness 0.08 to 0.11 mm (0.0031 to 0.0043 inch) without mechanical adjustment
Width 17.5 to 25.4 mm ($11/16$ to 1 inch), 5 to 8 channels

Tape Reel

Outer diameter 200 mm (8 inches) max.
Hub NAB compatible

Punched Card Equipment

P806-102 Card Reader 300 cards/minute (capacity for 1000 cards in
hopper)

Manufacturer Documation
Type no. M300

Style table top

Physical characteristics

Depth 460 mm (18 inches)
Width 585 mm (23¹/₁₆ inches)
Height 413 mm (16¹/₄ inches)
Weight 35 kg (77 lb)

Signal Cable

Standard length 7.5 m (8.2 yards)

Power Requirements

Voltage 115 or 230 volts r.m.s. \pm 10%
Frequency 60 \pm 2 or 50 \pm 2 Hertz
Power consumption 650 VA.

Electrical Safety

Protection class I

Environmental Conditions

Temperature - operating +10 °C to 38 °C (card requirement:
+15 °C to +25°C)
Temperature - storage -32 °C to +57 °C
Humidity - operating 30% to 90% r.h. (card requirement: 50%
to 70% r.h.)
Humidity - storage 5% to 90% r.h. without condensation

Card Specification

Material standard American punched card (161 \pm 8 g/m²)
complying with DIN 66018 specifications.
Length 187.32 \pm 0.13 mm (7.37 to 7.38 inches)
Width 82.55 + 0.18, -0.08 mm (3.25 +0.007 -0.003
inches)
Thickness 0.178 \pm 0.01 mm (0.007 \pm 0.0004 inch)

Line Printer Equipment

P809-002 Line Printer (with Data Products interface) 200 lines/minute
132 columns

Manufacturer Philips
Type no. PER1415

Style free standing

Physical Characteristics

Depth 460 mm (18 inches)
Width 700 mm (27.5 inches)
Height 800 mm (31.5 inches)
Weight 80 kg approx (177 lb)

Signal Cable

Standard length 5 m (5.5 yards)

Power Requirements

Voltage 100,110,115,127,220 or 245 volts r.m.s. $\pm 10\%$
Frequency 50 \pm 2 or 60 \pm 2 Hertz
Power consumption 300 VA average

Electrical Safety

Protection class I

Environmental Conditions

Temperature - operating +10 °C to +40 °C
Temperature - storage -40 °C to +70 °C
Humidity - operating 40% to 80% without condensation
Humidity - storage 0% to 95% without condensation

Paper Specification

Single Copy 15 lb bond minimum weight
Multi-copy Up to 5 parts 11 lb bond interleaved with
single - shot carbon.
Dimensions Standard fanfold, edge punched paper, 4
to 17.3 inches (102 to 440 mm) wide.

P811-001 Line Printer 245 lines/minute, 132 columns

Manufacturer Data Products
Type no. 2420

Style free standing

Physical Characteristics

Depth 622 mm (24.5 inches)
Width 1232 mm (48.5 inches)
Height 1168 mm (46 inches)
Weight 272 kg (600 lb)

Signal Cable

Standard length 7.5 m (8.2 yards)

Power requirements

Voltage 117 or 230 volts r.m.s. $\pm 10\%$
Frequency 60 ± 3 or 50 ± 3 Hertz
Power consumption 500 VA

Electrical Safety

Protection class I

Environmental Conditions

Temperature - operating +10 °C to +43 °C
Temperature - storage -18 °C to +66 °C
Humidity - operating 30% to 80% r.h. without condensation
10% to 80% r.h. with static eliminator
Humidity - storage 0 to 95% r.h. without condensation

Paper Specification

Single copy 15 lb bond minimum weight
Multi-copy up to six parts 12 lb bond, interleaved
with single-shot carbon
Dimensions standard fanfold, edge-punched paper, 4
to 19 inches (102 to 483 mm) wide

P812-001 Line Printer 670 lines/minute, 132 columns

Manufacturer Data Products

Type no. 2440

Style free standing

Physical Characteristics

Depth 622 mm (24.5 inches)

Width 1232 mm (48.5 inches)

Height 1168 mm (46 inches)

Weight 362 kg (800 lb)

Signal Cable

Standard length 7.5 m (8.2 yards)

Power Requirements

Voltage 117 or 230 volts r.m.s. $\pm 10\%$

Frequency 60 ± 3 or 50 ± 3 Hertz

Power consumption 1400 VA

Electrical Safety Protection class I

Environmental Conditions

Temperature - operating +10 °C to +43 °C

Temperature - storage -18 °C to +66 °C

Humidity - operating 30% to 90% r.h. without condensation

10% to 90% r.h. with static eliminator

Humidity - storage 5% to 95% r.h. without condensation

Paper Specification

Single copy 15 lb bond minimum weight

Multi-copy up to six parts 12 lb bond, interleaved
with single-shot carbon

Dimensions standard fanfold, edge-punched paper,
4 to 14.875 inches (102 to 378 mm) wide.

Typewriter Equipment

P841-101 I/O Typewriter 10 characters/second, light duty, with punched tape and current loop interface.

P841-105 I/O Typewriter 10 characters/second, light duty, with punched tape and V24 interface.

Manufacturer

Teletype Corporation

Type nos

ASR 33 (Automatic Send-Receive)

Style

mounted upon a stand

Physical Characteristics

Depth 470 mm (18.5 inches)

Width 560 mm (22 inches)

Height 1140 mm (45 inches)

Weight 25 kg (55 lb)

Signal Cable

Standard length 7.5 m (8.2 yards)

Power Requirements

Voltage 115 or 220 volts r.m.s $\pm 10\%$

Frequency 60 ± 0.45 or 50 ± 0.4 Hertz

Power consumption 300 VA

Electrical Safety

Protection class I

Environmental Conditions

Temperature - operating 0 °C to +45 °C

Temperature - storage -30 °C to +70 °C

Humidity - operating 20% to 85% r.h.

Humidity - storage 0 to 85% r.h. without condensation

Stationery Details

Paper width 216 mm (8.5 inches)

Diameter of paper roll 127mm (5 inches) max.

Punched tape width 25.4 mm (1 inch), 8 channels

P842-001 Character Printer with keyboard and V24 interface, 50 char/sec.

P842-002 Character Printer with keyboard and TTY interface, 50 char/sec.

P842-003 - As P842-001 but without keyboard

P842-004 - As P842-002 but without keyboard

Manufacturer Philips

Type no. PER 3100

Style table top

Physical Characteristics

Depth 310 mm (12.4 inches) - without keyboard

465 mm (18.3 inches) - with keyboard

Width 513 mm (20.2 inches)

Height 170 mm (7.0 inches)

Weight 20 kg (44 lb)

Signal Cable

Standard length 7.5 m (8.2 yards)

Power Requirements

Voltage 110, 115, 220 or 240 volts r.m.s. $\pm 10\%$

Frequency 50 ± 1.0 or 60 ± 1.2 Hertz

Power consumption 150 VA average

Electrical Safety Protection class I

Environmental Conditions

Temperature - operating +10 °C to +40 °C

Temperature - storage -40 °C to +70 °C

Humidity - operating 20% to 80% r.h.

Humidity - storage 20% to 90% r.h.

Stationery Details

Paper width 314 mm (12.375 inches) between pegs
for peg fed paper. Up to 306 mm (12 inches)
for friction fed paper.

Magnetic Disc Equipment

P824-002 Moving Head Disc Unit (1 fixed and 1 removable cartridge)

2 x 2.7 M 8-bit characters.

Manufacturer Philips
Type no. PER1215

Style rack mounting on slides

Physical Characteristics

Front panel width 480 mm: fits into standard 19 inch rack
Front panel height 267 mm (10.5 inches) = 6 standard rack units
Depth 797 mm (28.5 inches)
Protrusion from rack front:
- withdrawn for loading 500 mm (19.7 inches)
- fully pushed in 50 mm (2 inches)
Weight 66 kg approx. (145.2 lb)

Signal Cable

Standard length 3.5 m (3.8 yards)

Power Requirements

Voltage 110, 115, 220 or 240 volts r.m.s. $\pm 10\%$
Frequency 50 ± 1.0 or 60 ± 1.2 Hertz
Power consumption 500 W

Electrical Safety Protection class I

Environmental Conditions

Temperature - operating +16 °C to +38 °C
Temperature - storage -15 °C to +65 °C
Temperature - rate of change 0.2 °C/minute max.
Humidity - operating 8% to 80% r.h.
Humidity - storage 5% to 85% r.h.

P825-007 Moving Head Disc Unit 40M 8-bit characters

Manufacturer Control Data Corporation
Type no. 9760

Style free standing

Physical Characteristics

Width 483 mm
Height 864 mm
Depth 864 mm
Weight 100 kg max. (165 lb)

Signal Cable

Standard length 7 m

Power Requirements

Voltage 100 (+10), 120 (+8-18), 220 (+15-25),
240 (+17-27) volts r.m.s.
Frequency 50 +0.5 - 1.0 Hertz 100/220/240 volts:
60 +0.6 - 1.2 Hertz 100/120 volts:
Power Consumption 750 W (max.)

Electrical Safety

Environmental Conditions

Temperature - operating +15.5 °C to +32.2 °C
Temperature - storage - 34.4 °C to +65.6 °C
Temperature - rate of change 6.7 °C/hour (operating), 20 °C/hour (storage)
Humidity - operating 20% to 80% r.h.
Humidity - storage 5% to 95% r.h.

P825-100 Exchange Cartridge for disc Unit P825-007

Type no. CDC 876

P824-100 Exchange Cartridge for Disc Unit P824-002

Type no. IBM 5440 compatible ("16 sector") type

Magnetic Tape Equipment

P831-002 Tape Transport 9 tracks 25 inches/second 800 bits/inch
NRZI recording method

P831-004 Tape Transport 9 tracks 45 inches/second 800 bits/inch
NRZI recording method

P831-006 Tape Transport 9 tracks 37.5 inches/second 1600 bits/inch
PE recording method

Up to four transports of the same speed can be connected to P831-040 control unit using a tape formatter type P831-010 or P831-020 or P831-030.

Manufacturer PERTEC

Type no. 6840-9 25 i.p.s. (P831-002)
6840-9 45 i.p.s. (P831-004)
6640-9 37.5 i.p.s. (P831-006)

Style rack mounting: secured to the front of
the rack on hinges

Physical Characteristics

Front panel width 483 mm: standard 19 inch rack panel
Front panel height 622 mm (24.5 inches) = 14 standard rack
units
Depth behind panel 318 mm (12.5 inches)
Protrusion from panel 75 mm (3 inches)
Weight 38 kg (85 lb)

Signal Cable See under P831-110 tape formatter

Power Requirements 95, 100, 110, 115, 125, 190, 200, 210, 215, 220,
Voltage 225, 230, 235, 240, 250 volts r.m.s. \pm 10%
Frequency 47 to 400 Hertz
Power consumption 300 Watts - maximum

Electrical Safety

Protection class I

Environmental Conditions

Temperature - operating +2 °C to +50 °C (tape requirements +15 °C to +32 °C)
Temperature - storage -45 °C to +71 °C (tape requirement +5 °C to +32 °C)
Humidity - operating 15% to 95% r.h. without condensation
Humidity - storage 0 to 100% r.h. without condensation

Tape Specification

Material Computer grade magnetic tape
Thickness 0.038 mm (0.0015 inch)
Width 12.7 mm (0.5 inch).

Tape Reels

Outer diameter 267 mm (10.5 inches)
Reel capacity 731 m (800 yards)

P831-010, 020 or 030 Tape Formatters

The P831-010, 020 or 030 formatters must be used with the P831-002, P831-004 or P831-006 transports respectively to provide the control and timing logic for reading, writing, and error checking; the signal cable is coupled between the P831-040 control unit and the formatter. Up to four tape transports can be daisy-chain connected to the formatter using a PERTEC multiple Transport Adaptor (MTA) - see Figure 1.1.

Manufacturer

PERTEC

Type no.

F849-20/13.9 (P831-010)
F849-36/25.02 (P831-020)
(P831-030)

Style

rack mounting on slides at the rear of the rack

Physical Characteristics

Front panel width 483 mm: standard 19 inch rack panel
Front panel height 89 mm (3.5 inches) = 2 standard rack units
Depth behind panel 508 mm (20 inches)
Protrusion from panel 0
Weight 11kg (25 lb)

Signal Cable from Formatter to Control Unit
Standard length 1.5 m (1.6 yards)

Interconnecting Cables between Formatter and First

Transport and between Transports
Standard length 3 m (3.3 yards)

Power Requirements

Voltage 100, 110, 115, 125, 200, 210, 220, 230, 240 or
250 volts r.m.s. $\pm 10\%$
Frequency 47 to 400 Hertz
Power consumption 100 VA

Environmental Conditions

Temperature - operating +2 °C to +50°C
Temperature - storage -45 °C to +71 °C
Humidity - operating 10% to 95% r.h. without condensation
Humidity - storage 0 to 100% r.h. without condensation

Electrical Safety Protection class I

Cassette Tape Equipment

P833-001 Cassette Tape Drive Unit 7.5 inches/sec. 800 bits/inch

Manufacturer Philips ELA
Type no. 8920 401 40201 - rack version

Style Up to three units can be fitted into a
P833-152 equipment shelf (see Part 2
Chapter 4) for rack mounting on slides.

Physical Characteristics - table top model

Depth 280 mm (11 inches)
Width 123 mm (4.8 inches)
Height 139 mm (5.5 inches)
Weight 3.5 kg (8 lb)

Signal Cable

Standard length 1 m (1.1. yard)

Power Requirements

Voltage 24 volts d.c. \pm 5%

Current 1.5 amperes peak

850 milliamperes steady state.

Note: The 24 volt d.c. supplies are provided by the P833-152 equipment shelf (see Figures 1.2 and 1.3).

Electrical Safety

Protection class I

Environmental Conditions

Temperature - operating 0°C to +50°C

Temperature - storage -40°C to +70°C

Humidity - operating and storage 5% to 95% r.h. without condensation

Tape Cassette

Philips LGH 6003

Tape length 86 m (282 feet)

Tape width 3.81 mm (0.15 inch)

Tape thickness 0.019 mm (0.00075 inch)

No of tracks 2

Capacity 2.8 million bits/track.

P833-152 Equipment Shelf

Front panel width 483 mm; standard 19 inch rack panel

Front panel height 178 mm (7 inches) = 4 standard rack units

Capacity 3 rack version P833-001 units

Voltage 100, 115, 220 or 240 volts r.m.s. \pm 10%

Frequency 50 \pm 2 or 60 \pm 3 Hertz

Display Equipment

P818-001 Display Terminal with keyboard, 24 lines 80 characters/line and current loop interface.

P818-002 Display Terminal with keyboard, 24 lines 80 characters/line and V24 interface.

Manufacturer Hazeltine

Type no. 1200 A

Style Table top

Physical Characteristics

Depth 500 mm (20 inches)

Width 381 mm (15 inches)

Height 292.1 mm (11.5 inches)

Weight 17.4kg approx (39.4 lb)

Signal Cable

Standard Length 15 m (16.5 yard)

Power Requirements

Voltage 110,115,220,230,240 volts r.m.s. $\pm 10\%$

Frequency 50 ± 1.0 or 60 ± 1.2 Hertz

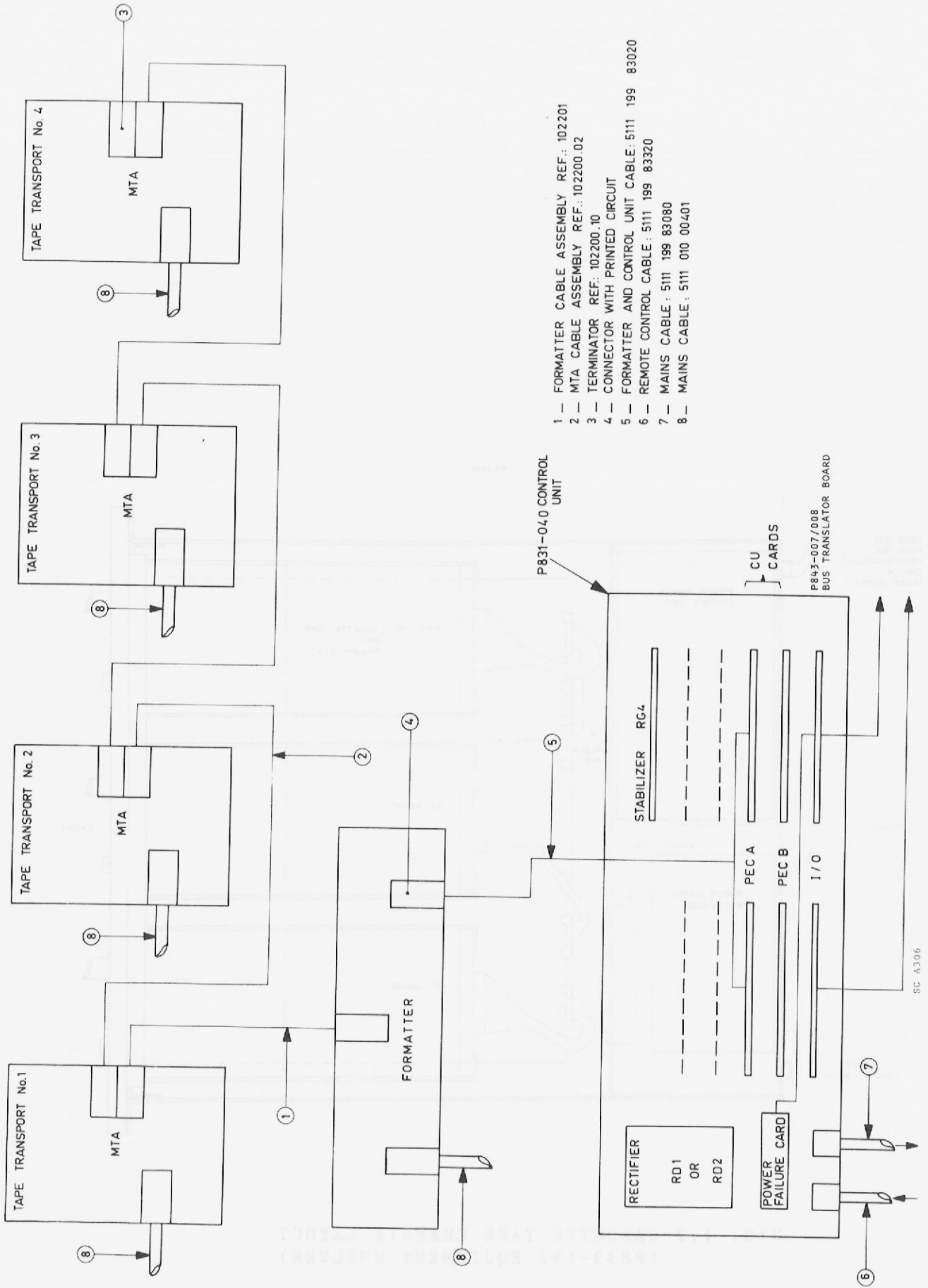
Power 200 VA

Electrical Safety Protection class I

Environmental Conditions

Temperature - operating + 10°C to + 40°C

Humidity - operating 10% to 90% r.h.



- 1 — FORMATTER CABLE ASSEMBLY REF.: 102201
- 2 — MTA CABLE ASSEMBLY REF.: 102200.02
- 3 — TERMINATOR REF.: 102200.10
- 4 — CONNECTOR WITH PRINTED CIRCUIT
- 5 — FORMATTER AND CONTROL UNIT CABLE: 5111 199 83020
- 6 — REMOTE CONTROL CABLE: 5111 199 83320
- 7 — MAINS CABLE: 5111 199 83080
- 8 — MAINS CABLE: 5111 010 00401

FIG. 1.1. MAGNETIC TAPE SYSTEM

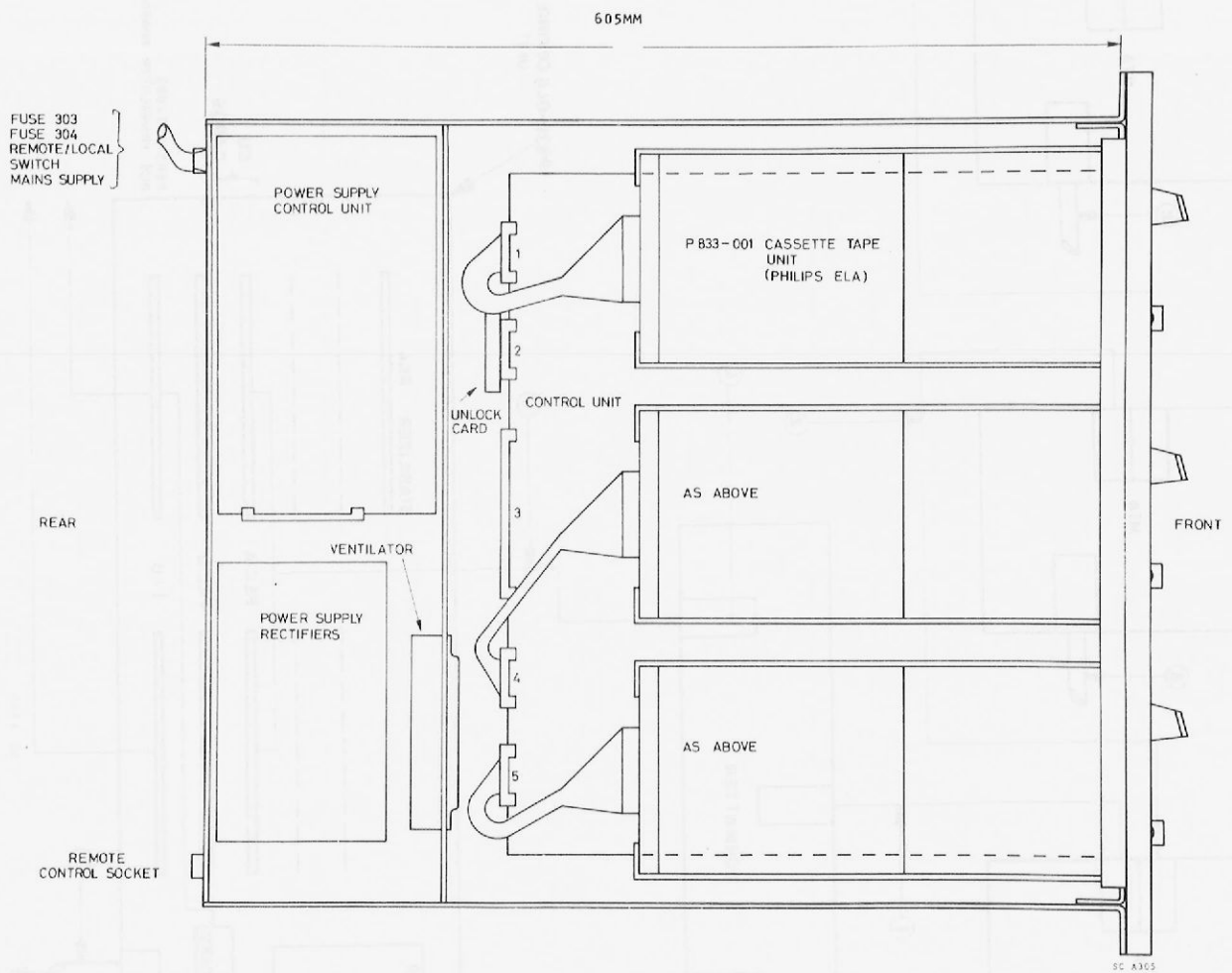


FIG. 1.2 CASSETTE TAPE CHASSIS LAYOUT
(P833-152 EQUIPMENT SHELVES)

The peripheral devices are normally delivered already adapted to suit the site mains supply and thus mains conversion is not required during installation. However, should the device be relocated elsewhere at a later date mains conversion may be required and therefore Table 2.1 below briefly summarizes the conversion method for each device.

Note: In some cases mains conversion requires components to be changed. Reference to the suppliers manual is necessary therefore not only to obtain full details regarding the conversion procedure, but also to obtain the manufacturers reference numbers for the components concerned so that their replacements can be ordered.

Table 2.1 Peripheral Mains Conversion

Type no.	Description	Method of Conversion [*]
P801-001	Punched Tape Reader	} Alter the connection to the primary winding of the mains transformer and change motor Alter transformer connections
P802-001	Punched Tape Reader	
P831-002	Mag. Tape Transport	
P831-004	Mag. Tape Transport	
P831-006	Mag. Tape Transport	
P831-010/ 020/030	Tape Formatters	
P803-001	Tape Punch 75 ch.p.s.	Adjust the setting of mains voltage selector switch S1
P806-102	Card Reader	Alter connections to mains transformer
P809-002	Line Printer	Alter connections to mains transformer
P811-001	Line Printer	For voltage change mains transformer (if other than 115V). For different freq. change pulley (50 or 60 Hz)

Table 2.1 Peripheral Mains Conversion continued

Type no.	Description	Method of Conversion*
P812-001	Line Printer	For voltage change tapplings to auto-transformer. For different freq. change pulley (50Hz to 60Hz)
P841-101/105	I/O Typewriter	For voltage change tapping to mains transformer. For different frequency change parts of drive such as motor pulley, belt and, in some instances, the motor.
P842-001 to 004	Character Printer	Change mains transformer connections.
P824-002	M.H. Disc Unit	Alter mains TFMR. tapplings Change pulley for 60Hz.
P825-007	M.H. Disc Unit	Alter connector wiring for mains and frequency conversion
P818-001/002	Display Terminal	Alter Mains TFMR tapplings using program boards (inside terminal) for HI/MED/LO and 115V/230V

*Unless otherwise stated the action required only related to mains voltage, no conversion being necessary for a change in frequency within the permitted range for the particular device.



PART4 — CABINETRY



Cabinets

This chapter gives details of the basic and extension cabinets which are used for housing the rack mounting equipment defined in Part 2 and 3. Details of the mounting methods and associated hardware are also provided.

Note: When a system is delivered the assigned rack locations for the equipment within the cabinet together with the interconnections are shown in the accompanying Configuration Sheets. A sample set of these sheets is given in the Appendix.

Cabinets

- P849-016 Basic cabinet comprising a 19 inch rack with a usable depth of 700 mm (27.5 inches) and mounting height of 36 standard units enclosed by side panels and rear door (see Figures 1.1 and 1.3).
- P849-017 Basic cabinet as per P849-016 but including air ventilation unit with 2 fans (P849-040) and 10 ampere power distribution panel (P849-042).
- P849-116 Extension cabinet for P849-016. Similar to P849-016 but without side panels. One of the side panels is removed from the basic cabinet in order to attach this extension; the side panel is then secured to the open side of the extension (see Figures 1.2, 1.3 and 1.4).
- P849-117 Extension cabinet for P849-017. Same as P849-116 but including air ventilation unit with 2 fans (P849-040) and power distribution panel (See Figure 1.12).
- P849-039 Mounting Kit which is required for a cabinet in which P824-002 moving head disc units are fitted. It consists of a new rear door, containing a ventilation unit, and a pedestal to be fitted at the front of the cabinet (see Figure 1.5).

Ancillaries

Table 2.1. in Part 1 should be used when assessing the total heat dissipation and power consumption levels for the Air Ventilation and Power Distribution requirements.

Air Ventilation

Convection cooling is sufficient for a cabinet housing equipment with a total heat dissipation up to 700 kcal/h (800 watts). Above this level of heat dissipation, forced air circulation by one of the following ventilation units is necessary. Apart from the number of fans, both units are similar and require 1 standard unit of rack height; details are shown in Figure 1.6.

- P849-040 Air ventilation unit with 2 fans for heat dissipation levels between 700 and 1030 kcal/h (800 to 1200 watts).
- P849-041 Air ventilation unit with 4 fans for heat dissipation levels between 1030 and 1300 kcal/h (1200 to 1500 watts).

Power Distribution

Two types of power distribution panel are available to suit different power consumption levels. Each panel is 2 standard rack unit in height; the details are shown in Figures 1.7, 1.8, 1.9, 1.10 and 1.11. The small distribution panel which is provided with the extension cabinet is shown in Figure 1.12.

- P849-042 Power distribution panel with mains filter and switch; current capacity 10 amperes.
- P849-043 Power distribution panel with mains filter and switch; current capacity 25 amperes.

Mounting Devices

The telescopic slides for the P831-110 tape formatter and P824-002 moving head disc, the mounting hinges for the P831-102/104 tape transports, and the fixed slides for all other items not mentioned are included as part of the unit.

Details of the telescopic slides used on the basic mounting boxes and equipment shelves will be found in Part 5 Chapter 2 of this manual.

Front Panels

- P849-046 Front panel; height 1 standard rack unit
- P849-047 Front panel; height 3 standard rack units
- P849-048 Front panel; height 5 standard rack units
- P849-049 Front panel; height 7 standard rack units



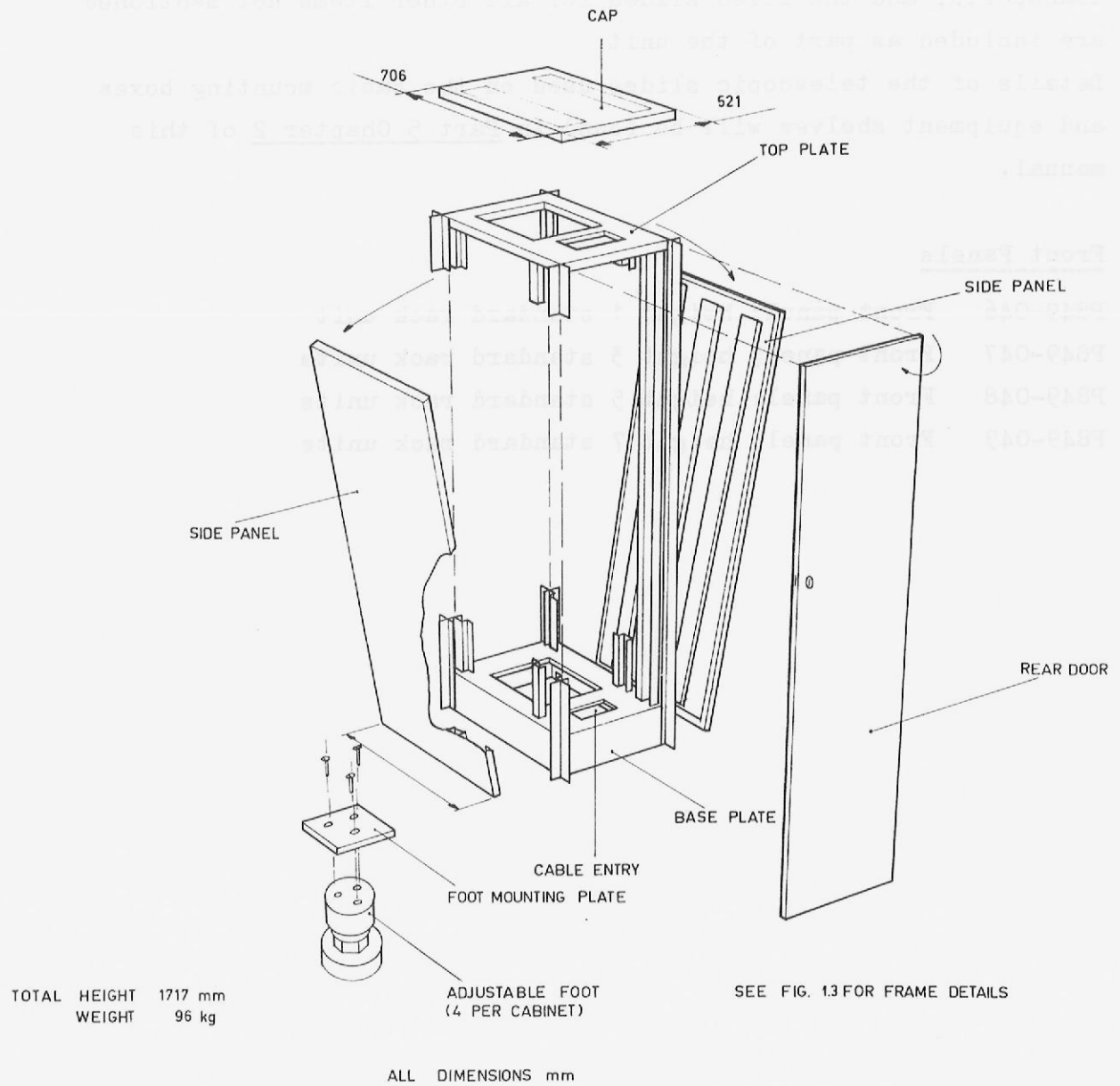
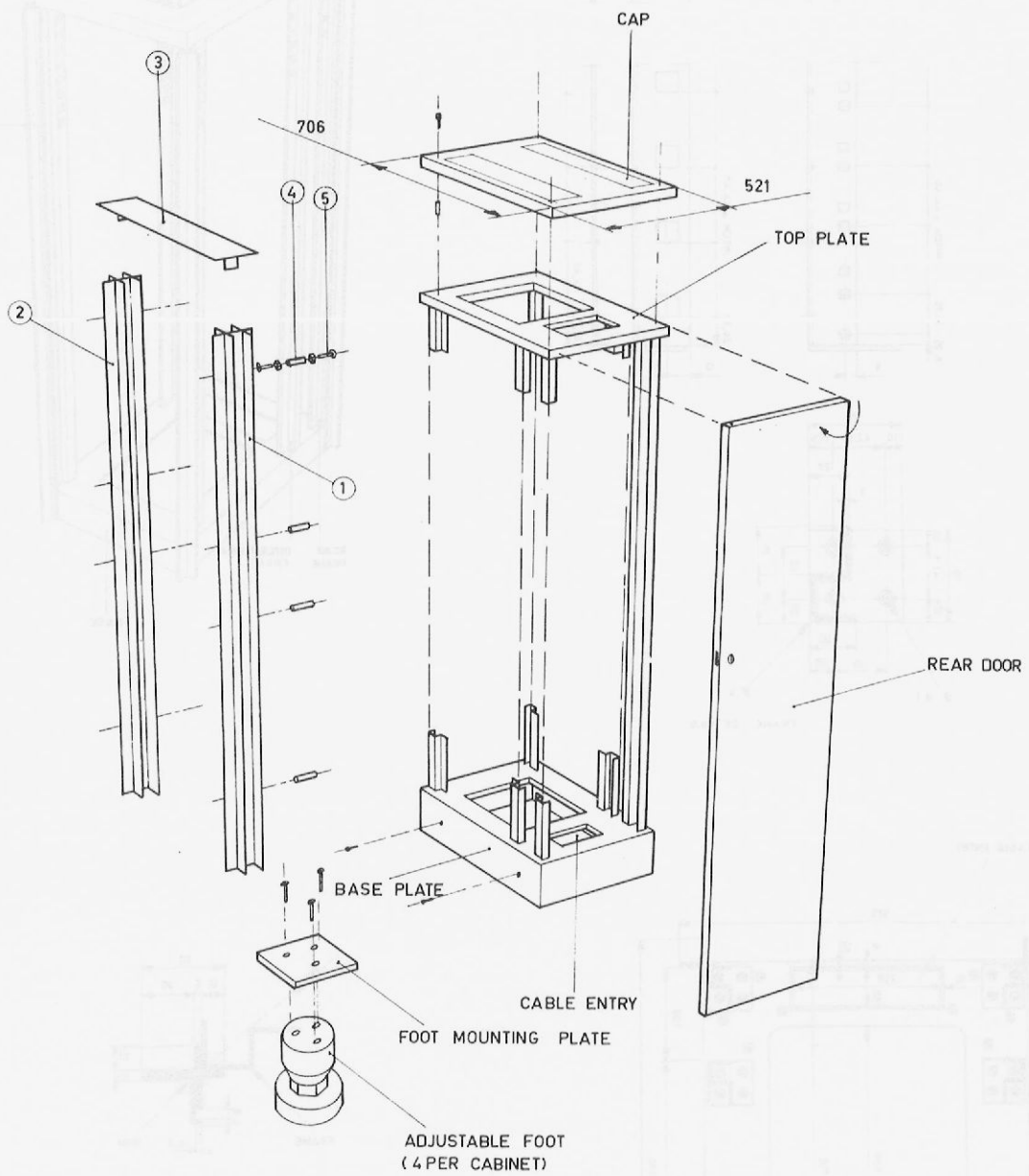


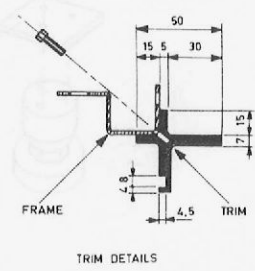
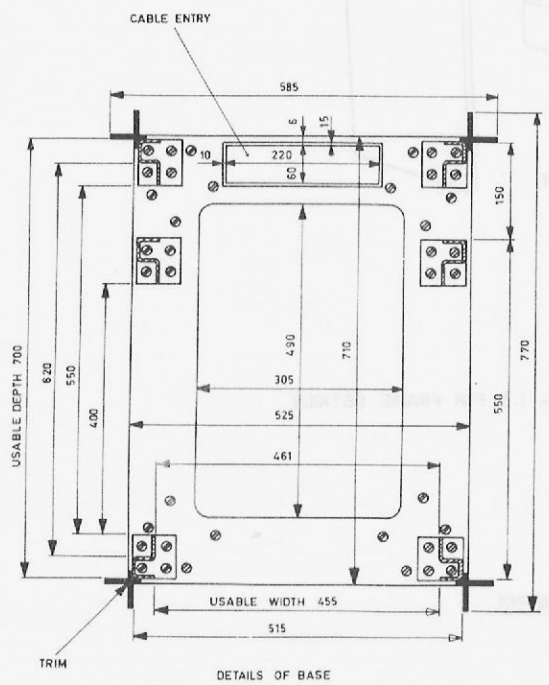
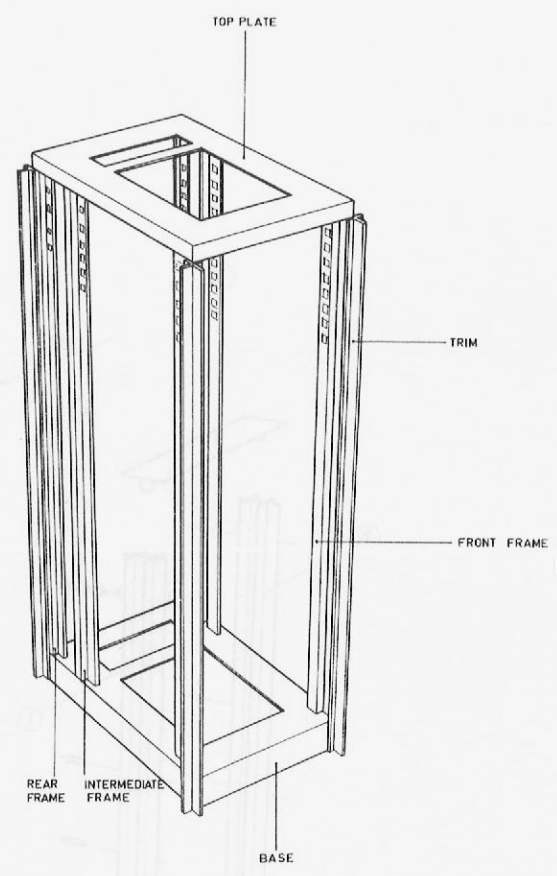
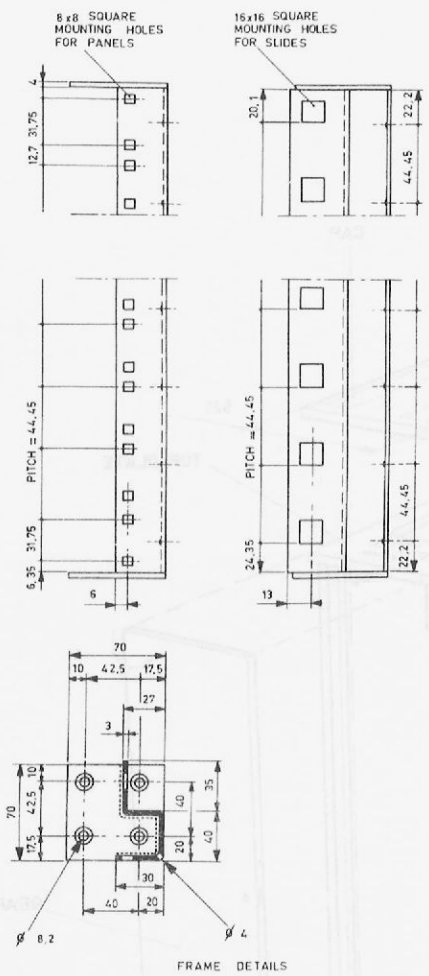
FIG. 1.1. BASIC CABINET



SEE FIG. 1.4 FOR DETAILS OF ITEMS 1,2,3,4 AND 5

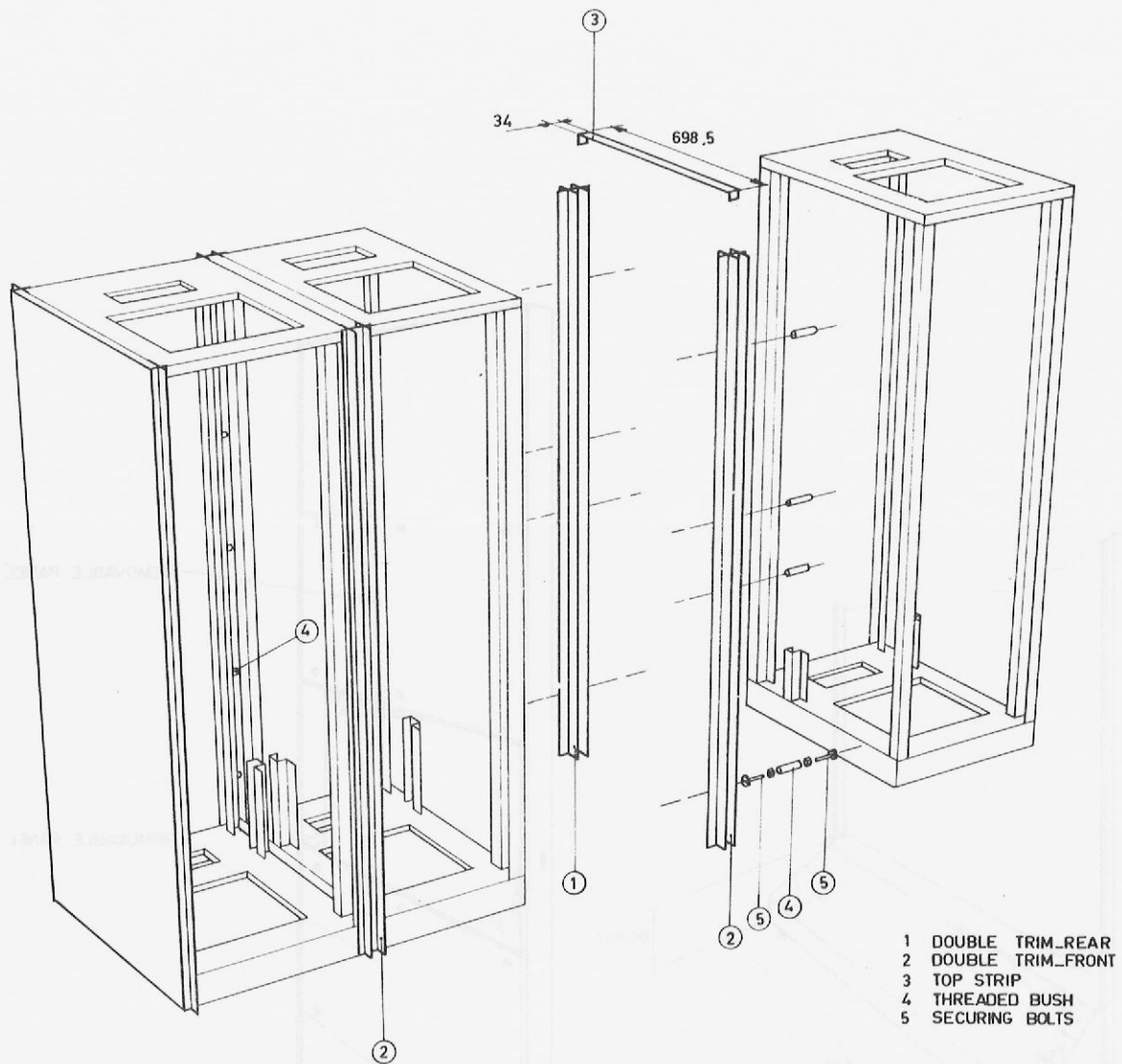
SEE FIG. 1.3 FOR FRAME DETAILS

FIG. 1.2. EXTENSION CABINET



All dimensions are in mm

FIG. 1.3. CABINET FRAME



All dimensions are in mm

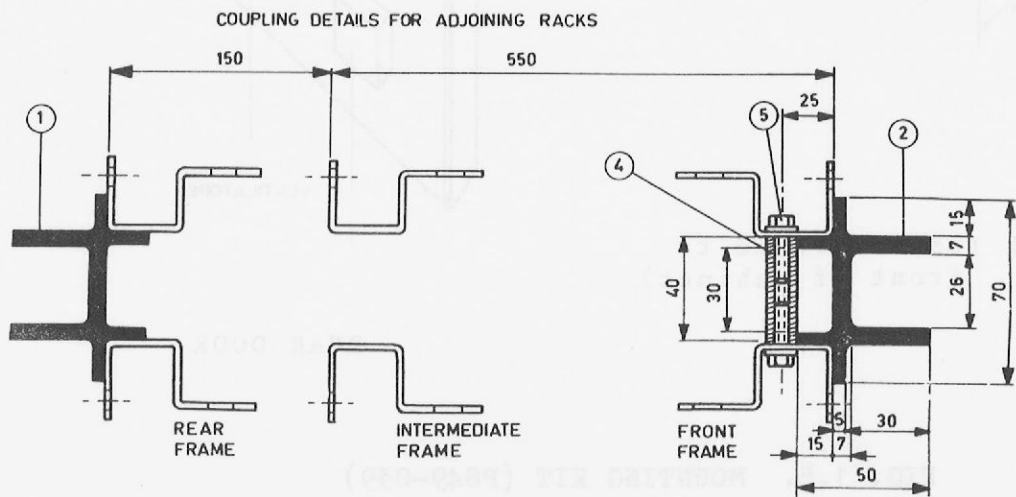
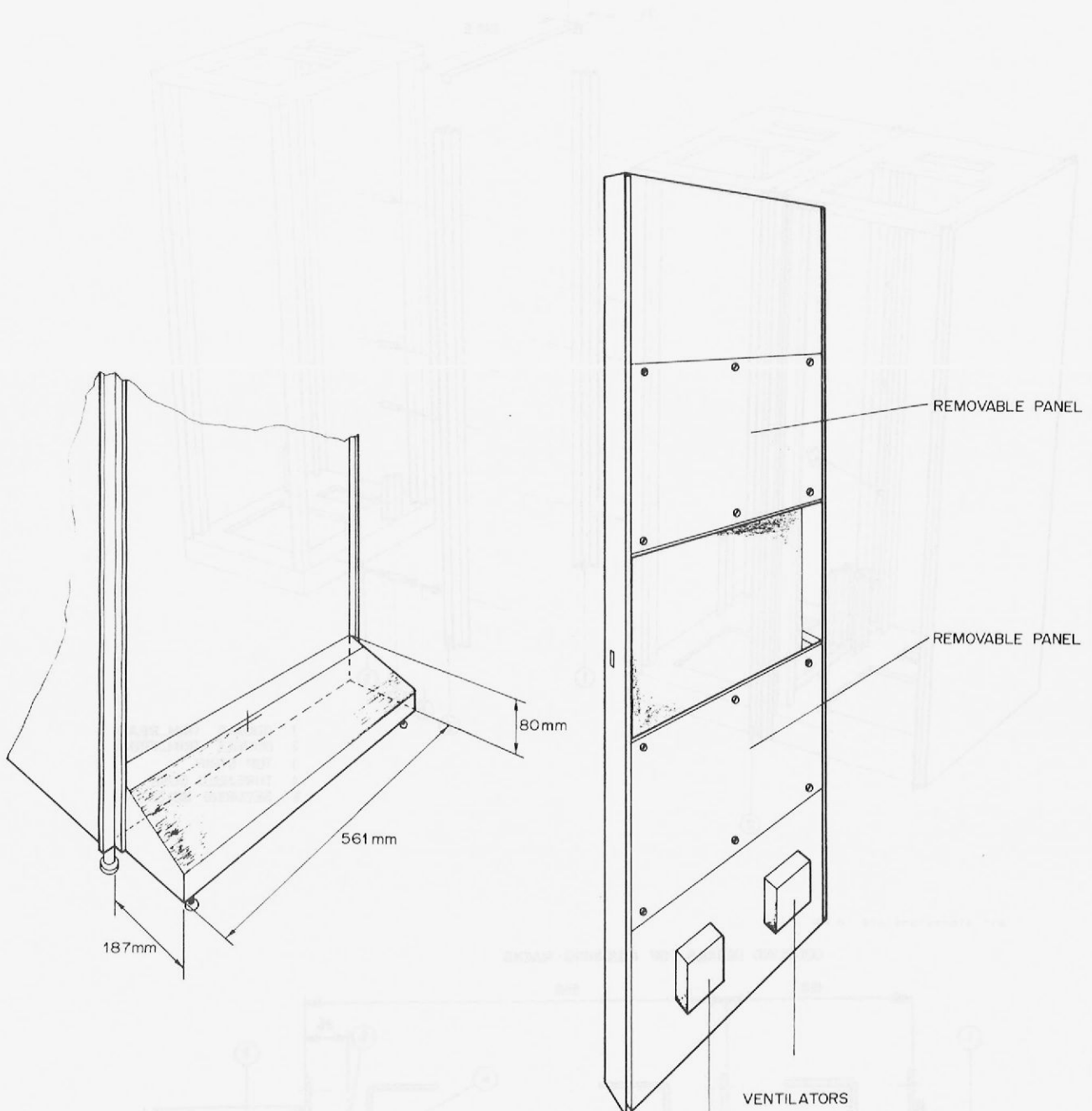


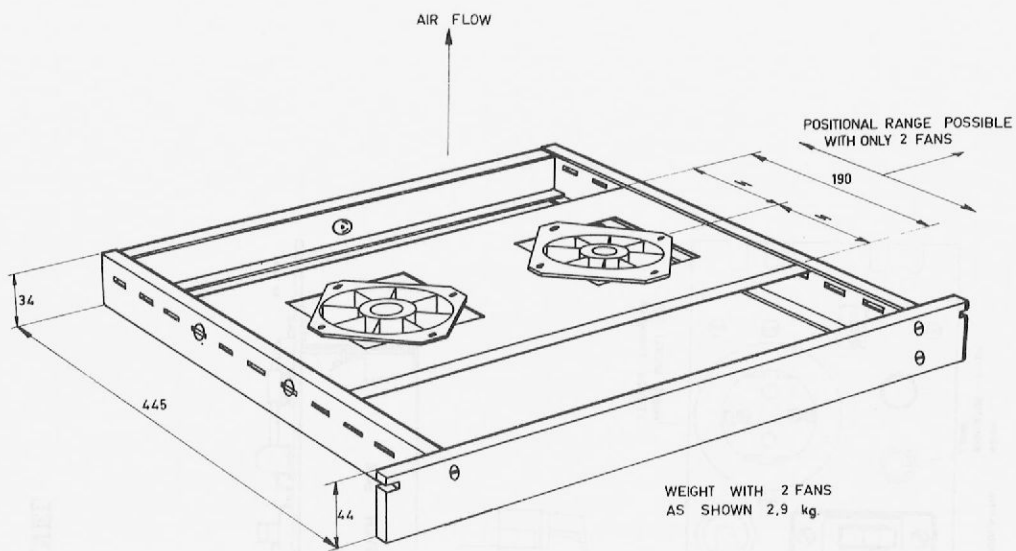
FIG. 1.4. METHOD OF ASSEMBLING BASIC AND EXTENSION CABINETS



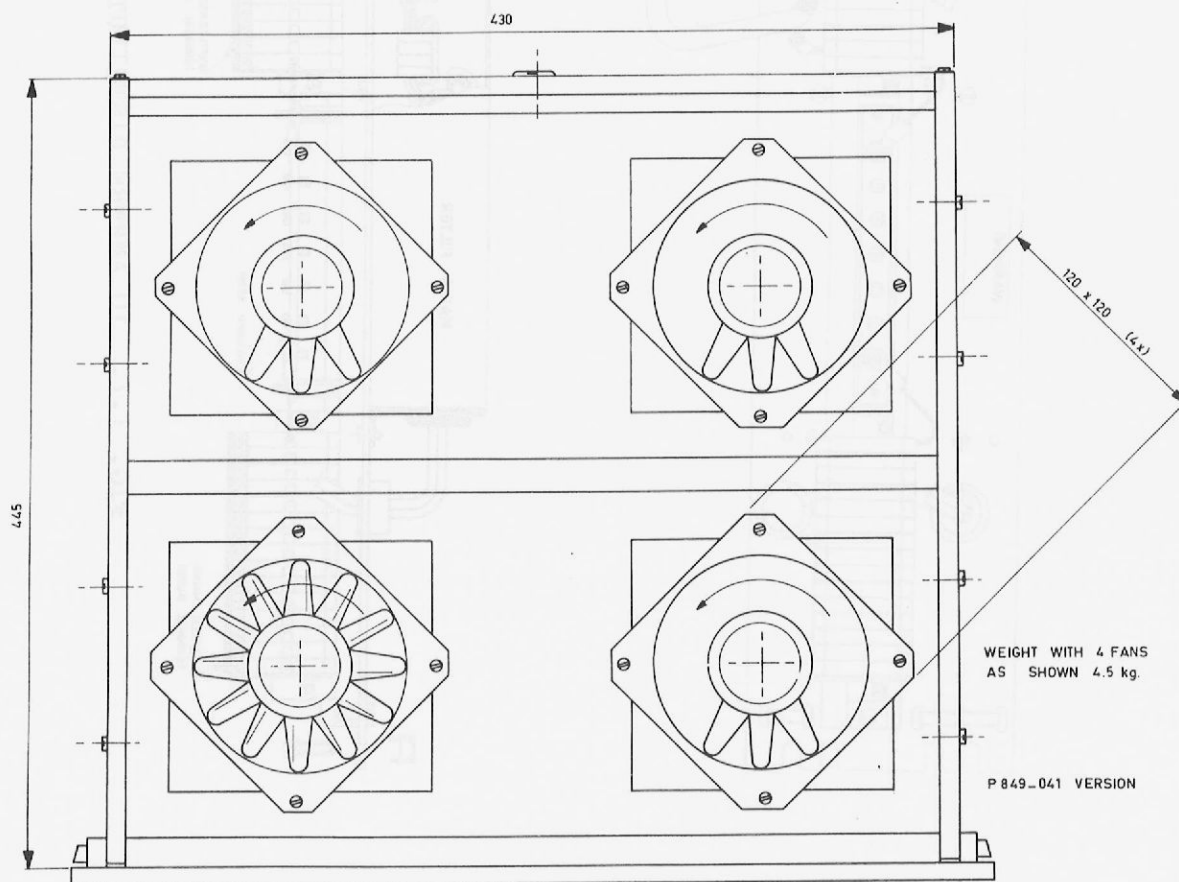
PEDESTAL (shown fitted to front of cabinet)

REAR DOOR

FIG. 1.5. MOUNTING KIT (P849-039)



P849-040 VERSION



All dimensions are in mm

VENTILATOR UNITS ARE SUPPLIED WITH THE FIXED SLIDES AS SHOWN IN FIGURE 1.13

FIG. 1.6. VENTILATOR UNITS

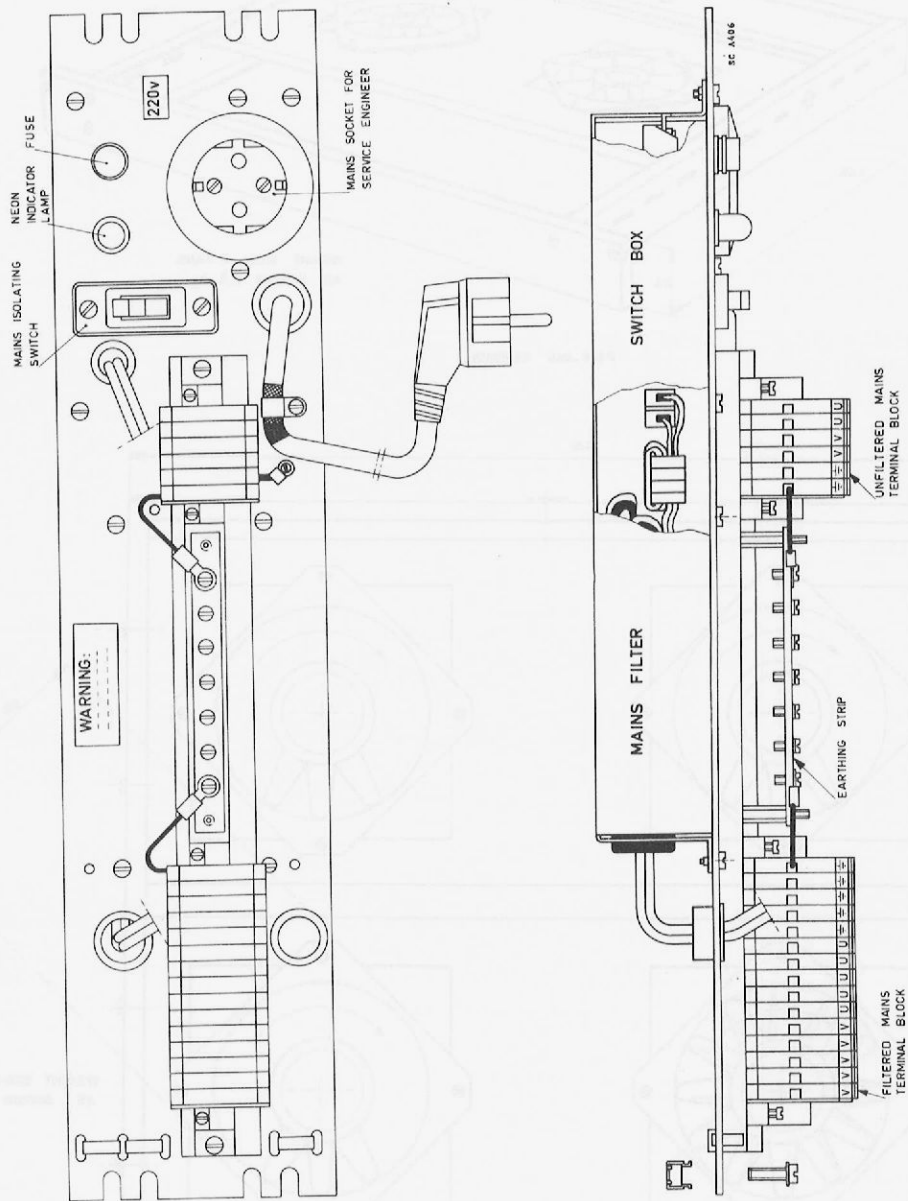


FIG. 1.7. 10 AMPERE DISTRIBUTION PANEL

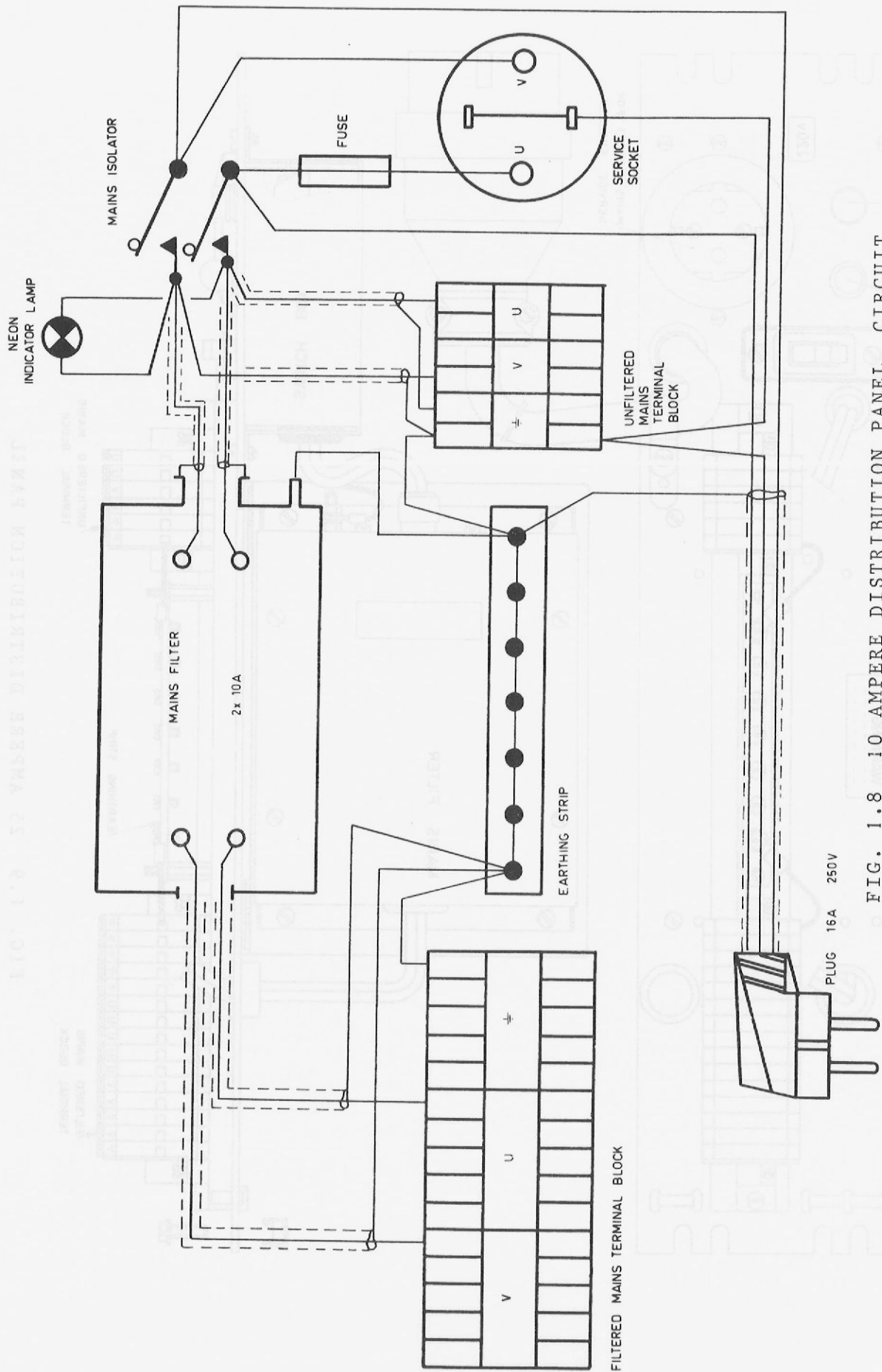


FIG. 1.8 10 AMPERE DISTRIBUTION PANEL, CIRCUIT

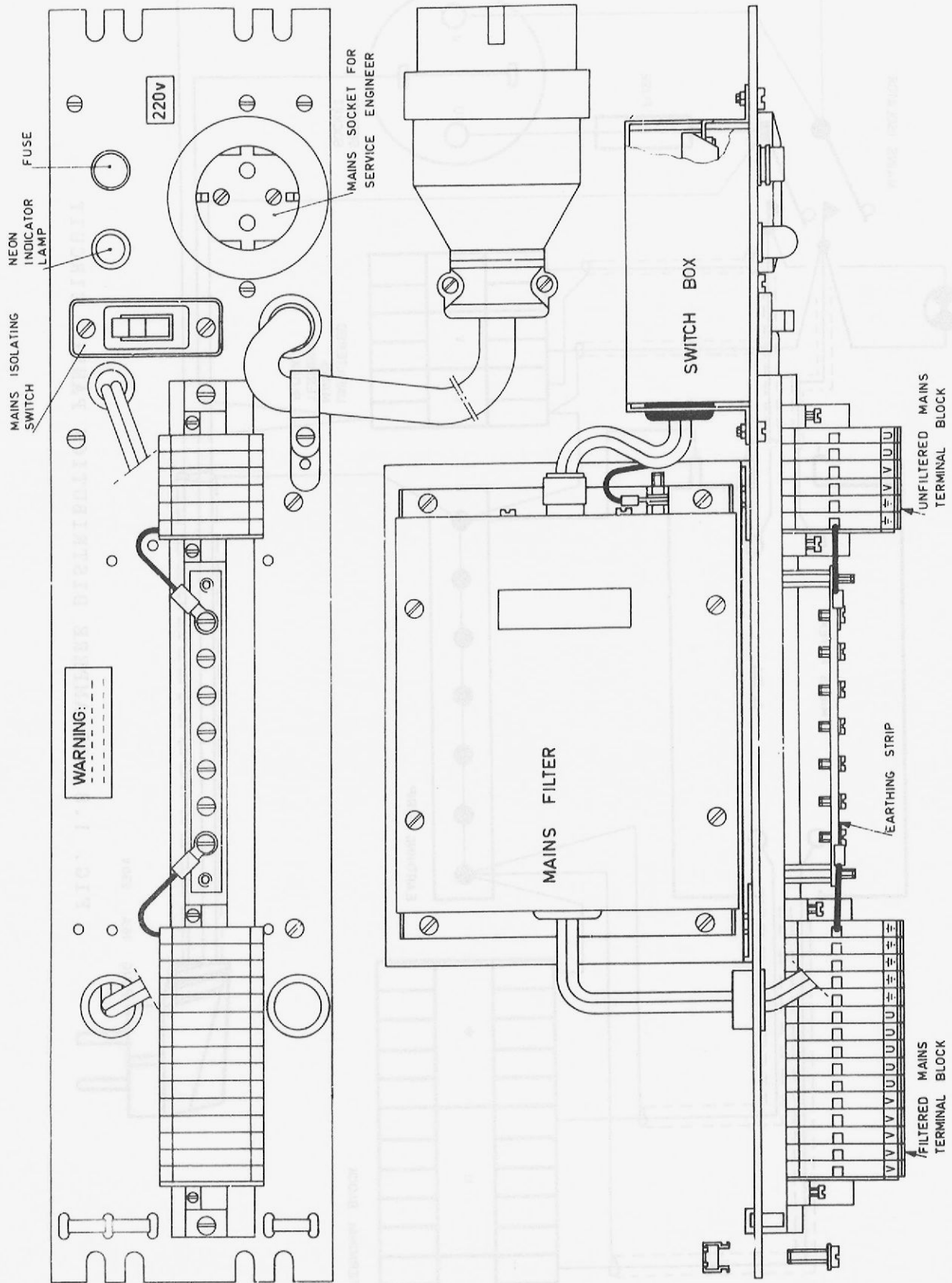


FIG. 1.9 25 AMPERE DISTRIBUTION PANEL

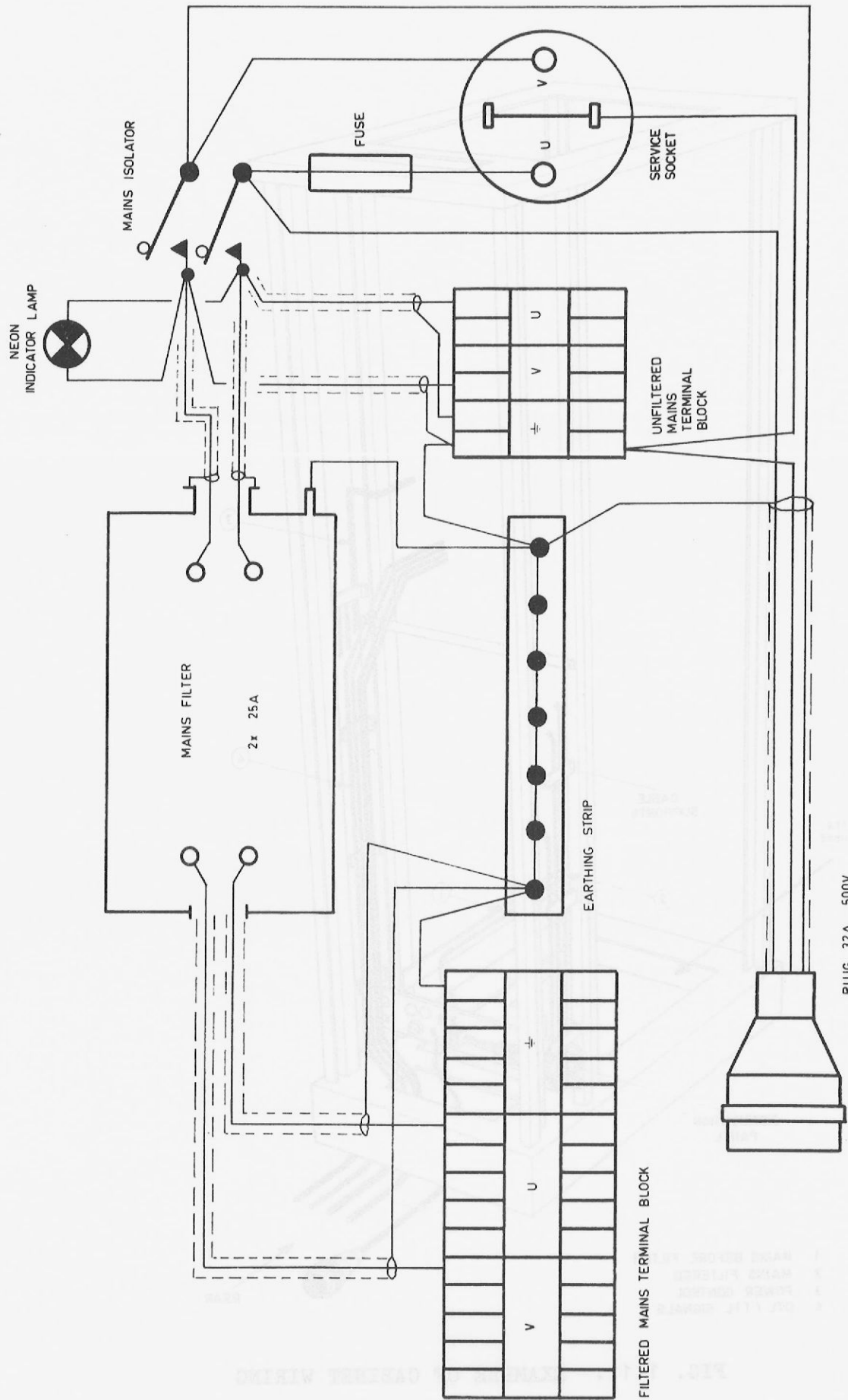


FIG. 1.10 25 AMPERE DISTRIBUTION PANEL, CIRCUIT

FIG. 1.10. 32 THE DISTRIBUTION SYSTEM CIRCUIT

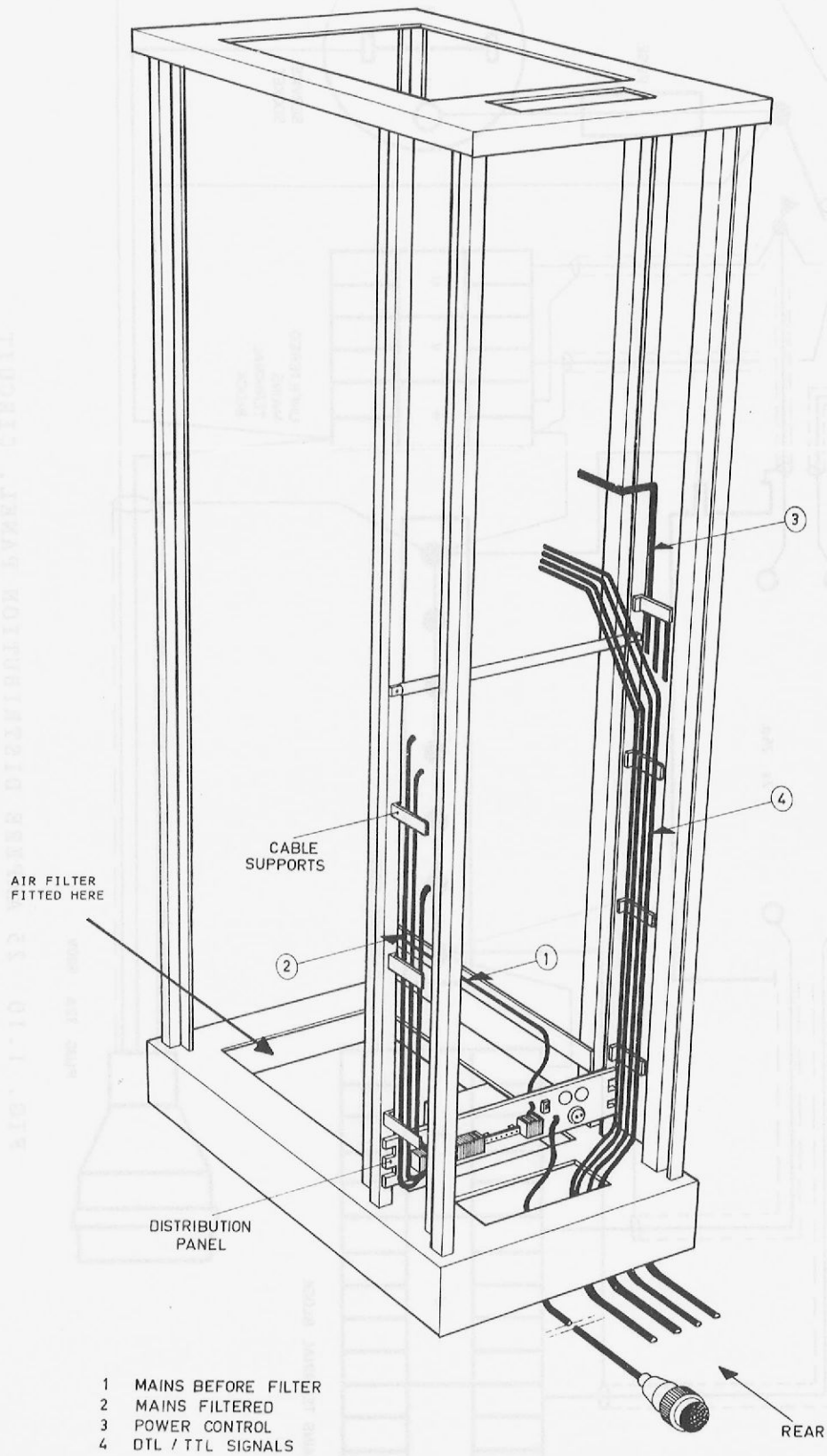


FIG. 1.11. EXAMPLE OF CABINET WIRING

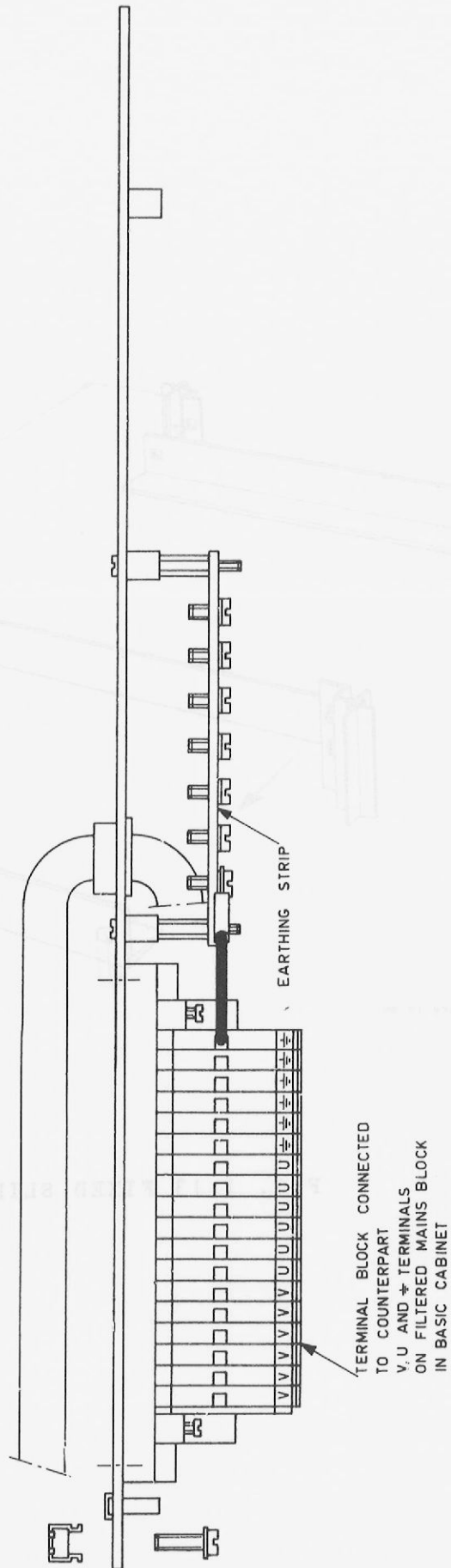
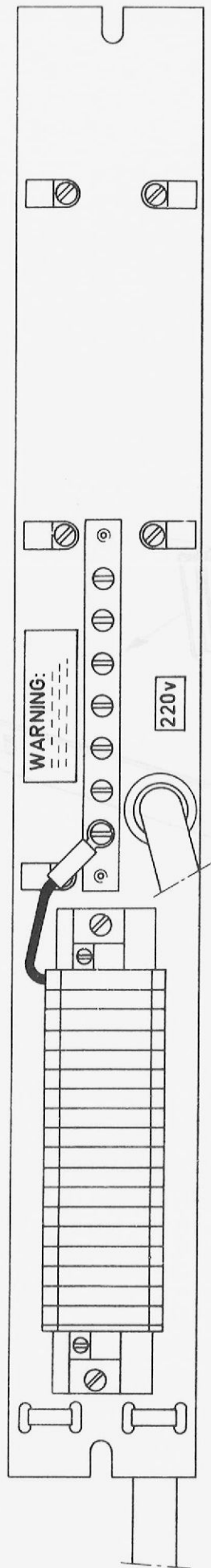
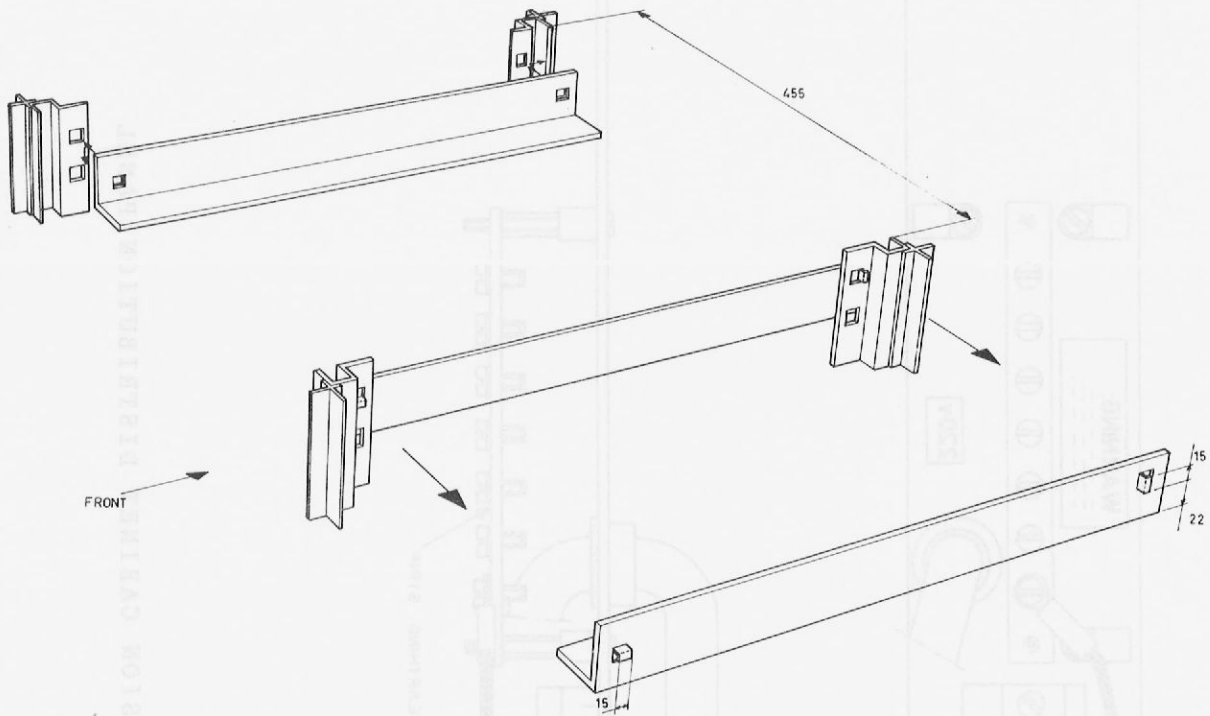


FIG. 1.12 EXTENSION CABINET DISTRIBUTION PANEL



All dimensions are in mm

FIG. 1.13 FIXED SLIDES

This chapter contains a general outline of the rules normally adhered to in the factory when deciding the rack arrangement for a complete system configuration ordered by a customer. These rules are given here as they may be a useful guide for a customer who is either planning his own rack layout or wants to extend an existing rack configuration in the same layout pattern.

The rules are concerned mainly with uniformity of appearance and operational access and are not important from the system performance aspect. The only critical layout restrictions are with respect to certain interconnecting peripheral signal cables and transmission lines which are mentioned in Location Considerations as well as in earlier parts of this manual. As a general rule all the components of a sub-system (i.e. disc control unit, disc units, disc power supplies) are located in the same cabinet. This rule does not apply for a configuration including 4 tape transports or 4 fixed head discs.

The useful height of the rack is divided into the 7 imaginary levels shown in Table 2.1. and, apart from certain mounting positions for tape punch P803-001 and the circumstances where two tape transports are to be stored in one rack, all the items of equipment are mounted between the confines of these boundaries. The remaining space to completely fill a particular level is then occupied by whichever is appropriate of the 1,3,5 or 7 unit blank front panels available.

When complete systems are delivered, which are assembled at the factory, maximum use of 7U panels is made to enhance the appearance of the system assembly and when separate items are delivered without cabinets each item is equipped with a front plate adapted to its height as follows:

Multicard Control Unit Equipment Shelf with a 3U plate.

Equipment shelf P843-001 with a 3U plate.

Equipment shelves P843-002/003 with a 5U plate.

The following levels have specific purposes:

- Level 7 - nameplate (at front) and ventilation unit (at rear)
- Levels 3,4 and 5 - primarily for devices requiring operator attention such as CPU basic mounting box, moving head disc unit, and punched tape reader with spare space used for tape punch or cassette tape drives.
- Levels 1 and 2 - power distribution and tape formatter (at rear)

Location Considerations

Table 2.1. gives a resumé of possible unit locations within the defined levels but reference should also be made to Table 2.2. which gives a more comprehensive summary including the standard units of height needed at the front and rear of the rack.

In this section, the various location possibilities and limitations are discussed for each of the rack mounting devices.

P852M/P856M or P857M Basic Mounting Box (containing CPU)

These units, which contain their own power supply, are nearly always mounted in either level 5 or the upper part of level 4 for operational convenience. They can, however, be mounted in the lower part of level 4 or level 3 if other equipment requiring operator manipulation also needs to be located in the rack.

P801-001/P802-002 Punched Tape Reader

A punched tape reader is mounted in level 4 or level 5 under the basic mounting box for operational convenience.

P803-001 Tape Punch

It is usual to house a tape punch in the same rack as a punched tape reader. If levels 3,4 and 5 are fully occupied by other equipment it can be mounted in level 6 as the next choice or, if this level is also required for other equipment, it can be mounted in level 1 (part)

+ level 2. If the basic cabinet is fully occupied the tape punch can be mounted in an extension cabinet at a convenient level.

P824-002 Moving Head Disc

Moving head disc units include a power supply and are mounted in level 3, 4 or 5 for operational convenience. When using these disc units the cabinets are modified using kit P849-039.

P824-040 Moving Head Disc Control Unit

The interconnecting signal cable length of 7.5 metres (standard) necessitates this unit being housed in the same rack as the moving head discs. The unit (which can be fitted in the basic mounting box or in equipment shelf P843-001 - location details of which are given in this section) is located wherever it is most convenient for the system and where it complies with the signal cable length requirement.

P833-152 Equipment Shelf (containing up to 3 cassette tape drive units type P833-001)

This unit, which is self contained with its own power supply and control unit, can be mounted in level 5 or 6 for operator access and in either the basic cabinet or in an extension cabinet.

P843-001/P843-002/P843-003 and Multicard Control Unit Equipment Shelves

The equipment shelves can generally be located in whichever level is most convenient for the installation the main requirement being that the signal cable from the peripheral device will reach the control unit mounted within the shelf.

There are, however, certain rules which are intended to preserve the characteristics of the transmission medium when using the equipment shelves in a system. This may effect the location decided upon for a particular shelf. The rules are summarised as follows:

1. The transmission lines (GP bus) are always terminated in the basic mounting box at the CPU end but only at the other end of the line if the line is longer than 1 metre.
2. In addition to the basic mounting box a maximum number of 7 equipment shelves may be connected to the transmission line and it is recommended, though not obligatory that the boxes are connected at regular distances along the transmission line.
3. For shelves connected at regular distances the distance between consecutive boxes should be 2 metres minimum.

P831-002/004/006 Tape Transport

P831-010/020/030 Tape Formatter

P831-040 Tape Control Unit

If there is only one tape transport then this is mounted in either level 5 + level 6 or level 3 + level 4 whichever is most convenient in relationship to the other equipment fitted in the racks. The control unit (which is mounted in the multicard control unit equipment shelf) is located to conform to the location rules given for this shelf, and the formatter is located in level 1 at the rear.

If two transports are fitted they are located in an extension cabinet with one unit in level 5 + level 6 and the other in level 3 + level 4 leaving enough space to fit the control unit at the bottom in level 2. The formatter is mounted in level 1 at the rear.

Table 2.1 Rack Mounting Levels

Level 7 1 unit	Nameplate - Ventilation Unit		1-unit
Level 6 7 units	P803-001 Tape Punch P833-152/3 Equipment Shelf P843-001 Equipment Shelf P843-002/003 Equipment Shelf P831-040 Tape Control Unit	P831-102 Tape Transport P831-104 Tape Transport	14 units
Level 5 7 units	P852M/P856M/P857M Basic Mounting Box (CPU) P801-001 Punched Tape Reader P802-001 Punched Tape Reader P803-001 Tape Punch Equipment Shelves - As for level 6	P831-106 Tape Transport	
Level 4 7 units	P852M/P856M/P857M Basic Mounting Box (CPU) P801-001 Punched Tape Reader P802-001 Punched Tape Reader P803-001 Tape Punch P824-002 Moving Head Disc Equipment Shelves - As for level 6	P831-102 Tape Transport P831-104 Tape Transport	14 units
Level 3 7 units	P852M/P856M/P857M Basic Mounting Box (CPU) P803-001 Tape Punch P824-002 Moving Head Disc Equipment Shelves - As for level 6		
Level 2 3 units	Equipment Shelves (NOT P833-152) - As level 6 P831-010/020/030 Formatter P803-001 Tape Punch	Multicard Control Unit Equipment Shelf (Tape C.U.)	3 units
Level 1 4 units	P849-042/043 Power Distr. Panel	P831-010/020/030 Formatter	2 units (at rear)

Normal 7 level Concept

Tape Transport

Cabinet Layouts

Examples of standard cabinet layouts are given in Figures 2.1 and 2.2. Non -standard configurations are also possible.

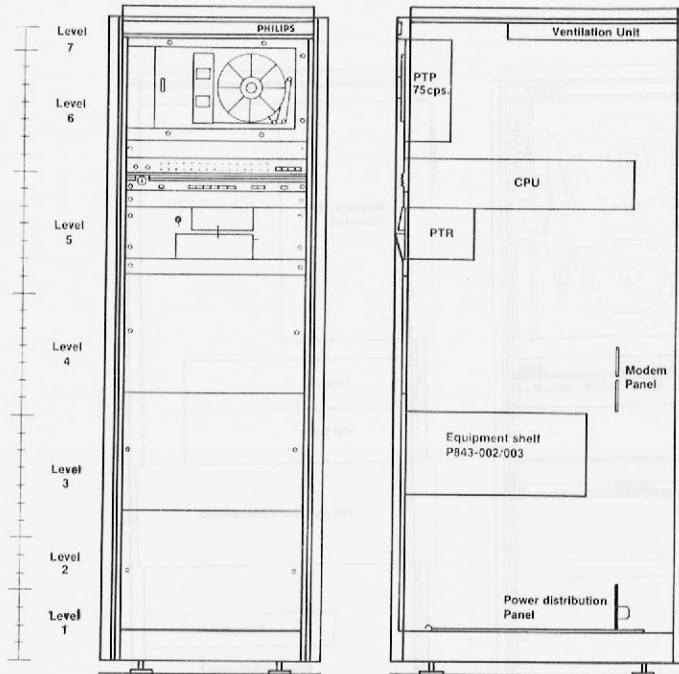
Table 2.2 Rack Location Summary

Location	Item	Units* Required	
		Front	Rear
Level 7	Nameplate Ventilation Unit	1 -	- 1
Level 6 (7 units)	P803-001 Tape Punch P833-152 Equipment Shelf P843-001 Equipment Shelf P843-002/003 Equipment Shelf P831-155 Tape Control Unit	6 4 3 5 3	- 4 3 5 3
Level 5 (7 units)	P852M/P856M/P857M Basic Mounting Box (CPU) P801-001 Punched Tape Reader P802-001 Punched Tape Reader P803-001 Tape Punch Equipment Shelves - As for level 6	3 3 3 6	3 - - -
Level 4 (7 units)	P852M/P856M/P857M Basic Mounting Box (CPU)* P801-001 Punched Tape Reader P802-001 Punched Tape Reader P803-001 Tape Punch P824-002 Moving Head Disc Equipment Shelves - As for level 6	3, 6 or 11 3 3 6 6	3, 6 or 11 - - - 6
Level 3 (7 units)	Equipment Shelves - As for level 6 P803-001 Tape Punch P824-002 Moving Head Disc	3 or 5 6 6	3 or 5 - 6
Level 2 (3 units)	Equipment Shelves (P843-001)	3	3
Level 1 (4 units)	Power Distribution Panel P831-010/020/030 Formatter	- -	3 2
Level 5 + Level 6 (14 units)	P831-102/104/106 Tape Transport	14	-
Level 3 + Level 4 (14 units)	P831-102/104/106 Tape Transport	14	-
Level 2 + Level 1 (part)	P831-010/020/030 Formatter P803-001 Tape Punch	- 6	2 -

*1 Unit = 1.75 inch = 44.45 mm

* If P857M - 500 Series fitted (11 units) Level 5 + Level 4 (part) used

1 Central processor cabinet including PTR, PTP and equipment shell



2 Central processor cabinet including Cassette tape drives, PTR, PTP and 2 MH discs.

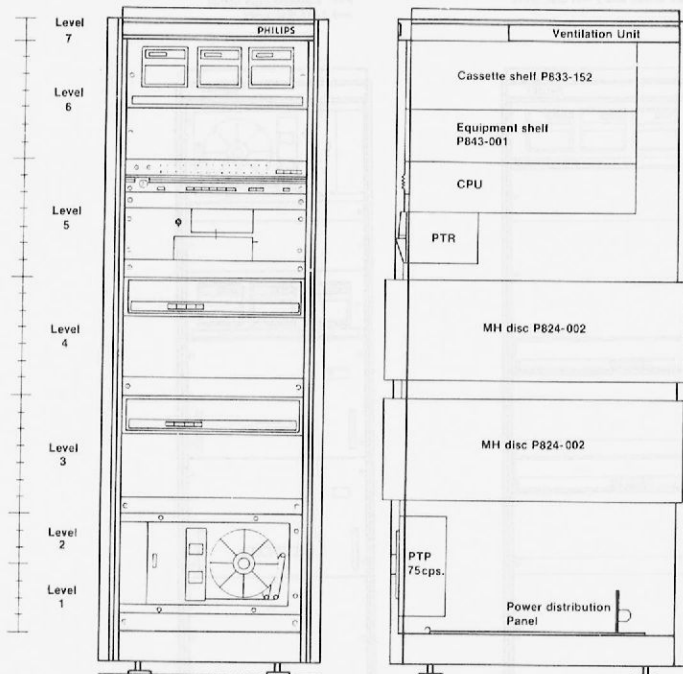
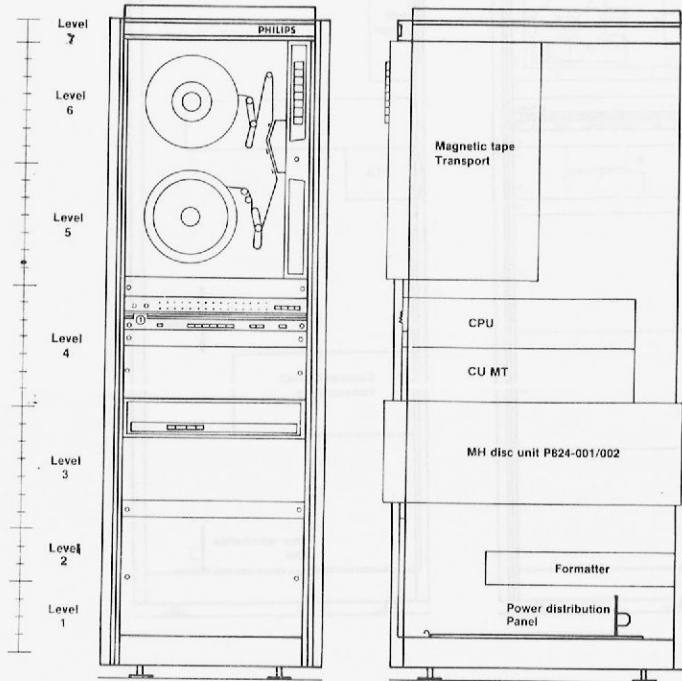
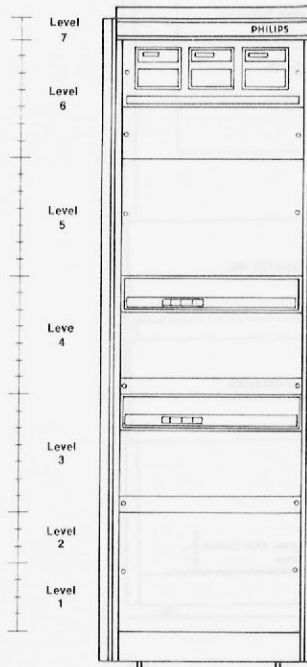


FIG. 2.1 P852M/P856M/P857M STANDARD CABINET LAYOUTS - 1

3 Central processor cabinet including MT unit and MH disc unit



4 Extension cabinet including Cassette tape drives and 2 MH disc units



5 Extension cabinet including PTP, Cassette tape drives and 2 FH disc units

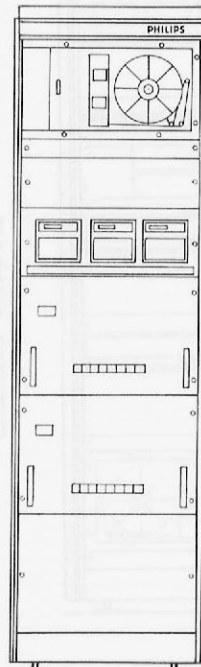


FIG. 2.2 P852M/P856M/P857M STANDARD CABINET LAYOUTS - 2

System Earthing Rules

The following is a general summary of the earthing rules for the rack equipment.

- a) Each rack mounting unit must have an electrical ground (0 Volts) point and a mechanical ground or safety earth point. Both these points must be galvanically isolated and be accessible externally for electrical connection.
- b) Each rack must have a mechanical ground or safety earth point to which the safety earth points of all the units mounted in the rack must be connected. The rack safety earth point must be electrically connected to the rack frame and to the earth wire of the power cable from the rack to the site mains.
- c) The shields of cables must not be used as the inter unit safety earth conductor for although the shield is connected to mechanical earth at the CPU it is not necessarily so connected at the other end as this is dependent upon the particular system configuration requirements.
- d) To minimize interference, the front panels, side plates and doors must be in good electrical contact with the rack framework.
- e) The symbols used to identify the ground or earth points are:



Electrical ground (0 Volts)



Mechanical ground or safety earth.

Cabinet Cabling Rules

The rules given below for the cables and wiring inside the cabinets should be adhered to so that the system performance is not degraded by either internal or inter-rack electro-magnetic interference.

Separation of Circuits

Insulated Conductors which operate at different voltages must be separated by barriers or must be segregated from each other unless all the conductors are insulated for the highest voltage. Norms:

VDE 0804/4.65. part 11 - g.2.

0804/5.72. part 14 - a.1.

UL 478 parts 6.29 - 6.30 and 6.31

CSA C22.2 no.154 part 4.13

Note: The shielding of a cable can be considered as a barrier when it is connected to the protection wire.

(Norm: VDE 0804/4.65 par 11 - 9.23)

Proximity

Six categories of internal cables or wires are denoted in Table 3.1 with respect to the supplies or signals conveyed. Conductors of the same category can be bundled together but parallel runs of different categories must be separated by not less than the specified distance: the only permitted exception is for the mains wiring, provided that the shielding is increased - see Shielding-Mains Wiring.

The figures quoted in Table 3.1. are the minimum separation distances in centimetres between different categories of conductors running in parallel for a length of 100 centimetres. The actual separation distance for other lengths of parallel run is calculated using the following formula:

$$D_a = D_t - 4 \cdot x \log_{10} \frac{100}{L_a} \text{ cm}$$

where D_a = actual separation distance required in cm.

D_t = distance given in table 3.1.

L_a = actual length of parallel run required in cm.

Example

The parallel run (L_a) required for mains before filter and mains filtered (1 and 2 in table) is a distance of 40 cm.

D_t (from table) = 12 cm.

therefore $D_a = 12 - 4 \log \frac{100}{40}$

$D_a = \underline{10.4}$ cm

Note: Zero or negative values derived from the formula signify that no separation is necessary.

Where different categories of conductors are crossing each other at right angles there is no minimum separation distance requirement.

Shielding-general

The damping effect of the shielding specified in Table 3.1. must be at least 20 dB from 150 kHz to 30 MHz.

Shielding should extend over the entire length of the cable, preferably including the connectors but, where this is impracticable, the length of the unshielded portion of cable must not exceed 30 millimetres.

The shielding must be connected to safety earth, using earthing leads that are as short as possible and are of the same cross sectional area as the shielding.

Shielding-Mains Wiring

The mains wiring must be shielded and mounted against the rack frame. If the minimum separation distance from the other categories of conductor specified in Table 3.1. cannot be met then the damping effect of the shielding must be increased by 0.5 dB for each millimetre that the separation distance is reduced below the permitted minimum (leading the mains through an iron pipe may provide a solution)

Table 3.1. Cabinet Wiring Rules

with respect to →	1	2	3	4	5	6	Remarks
1. Mains - before filter	-	12	12	12	12	12	Shielded
2. Mains - after filter	12	-	4	4	4	10	Shielded
3. Power Control	12	4	-	0	2	6	Shielded or twisted
4. DC - unstabilized	12	4	0	-	2	6	Twisted
5. DC - stabilized	12	4	2	2	-	2	Rails or twisted
6. DTL-TTL Signals	12	10	6	6	2	-	Twisted, coax, flatcable etc.

Note: 0 means - in the same cable

Return Connection

Each connection must have its own return connection running as close as possible to it. Under no circumstances must the rack frame be used as a direct or secondary return path. The minimum possible cable length should always be used.

PART 5 — INSTALLATION PROCEDURE

PART 5 - INSTALLATION PROCEDURE

Most items of equipment are sent fully assembled and unpacking is straightforward, providing care is used and attention is paid to any accompanying instructions - see Fig 1.1 for a typical example of packaging. Certain points that should not be overlooked are given in the following paragraphs.

During unpacking check all of the items against the packing slips and carefully inspect for damage in transit. Missing or damaged items should be reported to the address of the despatcher quoted on the invoice.

A P841 typewriter and its stand are packed into one box. The typewriter should be unbolted from the protective transit base board before being mounted upon the stand, inside which will be found the suppliers manual giving the reassembly details.

The transport lock string of the P824 moving head disc unit carriage must be disconnected after the unit has been unpacked, as explained in the suppliers manual.

On the PER1415 line printer the carriage and platen are blocked for transit. Items marked REMOVE BEFORE OPERATING must be removed therefore and stored safely for possible future use.

On the Documation M300 Card reader the blower motor is secured for transit. Two red screws in the bottom plate should be removed therefore (using Phillips screwdriver) to release the motor. The screws should be retained for possible future use.

A P811-001 or P812-001 (Data Products) line printer should be moved into position, using a fork lift truck, before it is unbolted from the shipping pallet and set level on its adjustable feet.

Unpacking

Note: When unpacking equipment it should be borne in mind that the equipment may require re-packing again later for forwarding to a new location. Care should therefore be exercised to preserve all packing materials and to note the methods used in the original packing.

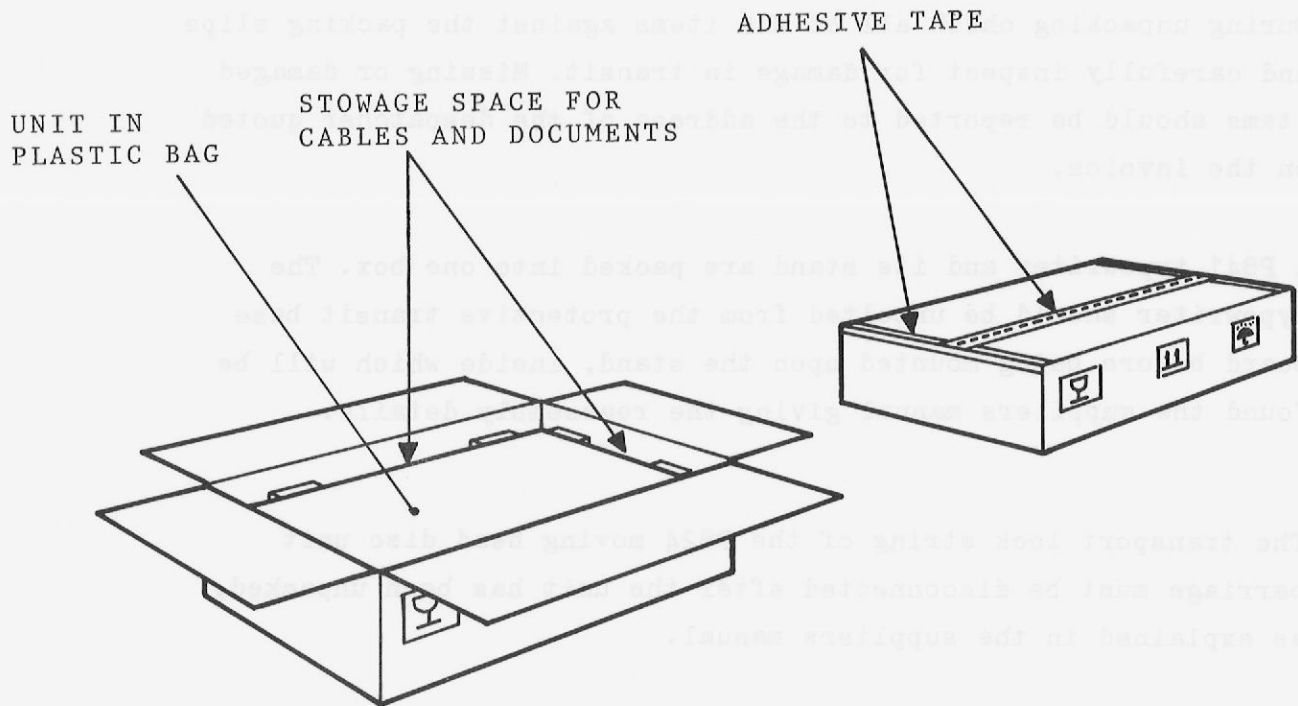


FIG. 1.1 TYPICAL P852M/P856M/P857M PACKAGE

This chapter outlines the steps to be taken when installing the equipment; if difficulties should arise during the installation the service office quoted in the Service Contract should be contacted for specialist assistance. If there is no service contract contact the nearest Philips office. Prior to packing and despatch to the site the equipment will have undergone an overall system check during which all the necessary settings and adjustments will have been made. Thus, installation on site primarily involves unpacking (described in Chapter 1), checking that nothing has been damaged or disturbed during transit, locating the various units in position, and then making all the required interconnections. A few preliminary checks are then applied to ensure that the system is ready for commissioning in accordance with the test programs devised for the particular system configuration.

Installation

The following installation steps are for general guidance and the order in which the steps are given need not necessarily be followed. Specific information about I/O locations and rack layout and cabling is given in the Configuration Sheets which are delivered with the equipment (See example in the Appendix). Refer to the earlier parts of this manual for the relevant details concerning cabinet assemblies, rack mounting fixtures, unit and rack interconnections.

- (a) Internally inspect each unit to ensure that circuit cards and connections have not become loosened during transit. Also check that the mains input settings correspond to the site supplies and that the mains connections cables terminate in the correct plugs - DO NOT CONNECT TO THE MAINS AT THIS STAGE. Refer to Part 2 Chapter 5 and Part 3 Chapter 2 for information regarding mains input adaption (the equipment is normally delivered suited to the site mains supplies so that adaption should not be necessary). Refer also to the Appendix for details of mains cable colour codings and the standard plug which is usually fitted.

WARNING

As the colour coding may vary for different units it is advisable to ensure that the correct earth wire has been selected by checking for low resistance between the wire and frame with an ohmmeter.

- (b) Assemble the rack cabinets in accordance with the pre-determined layout then check that the internal wiring is undamaged and conforms to the wiring diagrams (provided in configuration sheets).

Note: If a P849-039 kit for mounting a P824-002 disc unit is included with the equipment it is convenient at this stage to fit the pedestal part of the kit as this is most easily done by tilting the cabinet backwards to secure the pedestal to the cabinet using the bolt provided.

- (c) Insert any separately packed I/O cards into the assigned basic mounting box or equipment shelf locations. For card identification see the part number list given in the Appendix.

Note: Remove the intercard transit protection sheets from the basic mounting box and from the equipment shelves.

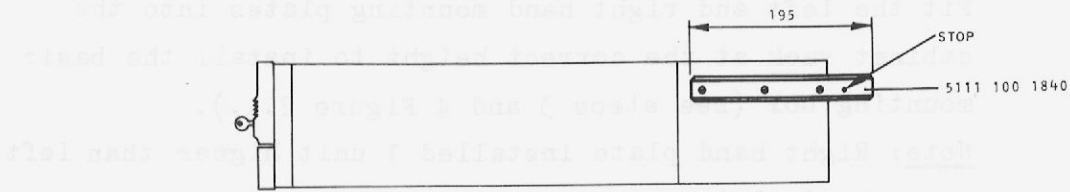
- (d) Assemble the telescopic slide assembly to the basic mounting box (See Fig 2.1.) and fit the mounting box into the rack as follows:

Step 1. Attach the two runners to the basic mounting box using the screws provided.

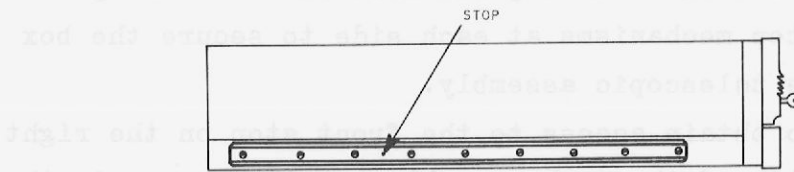
Step 2. Fit the two locking assemblies to the black glider and attach the glider over the runner on the left side of the basic mounting box, securing in position using the rear locking assembly. (see back view step 2 in Fig. 2.1.).

Step 3. Attach the rack runner to the left hand rack mounting plate provided using the screws supplied.

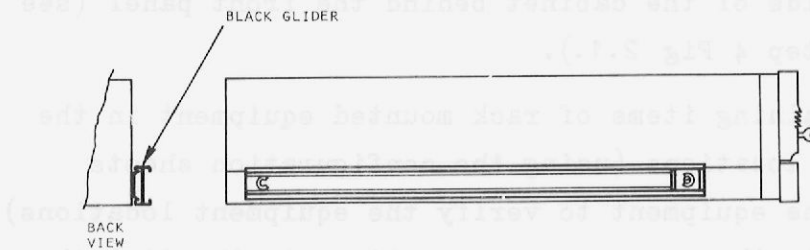
Step 4. Fit the locking assembly to the remaining black glider (see side view step 4 Fig 2.1.) and attach the glider



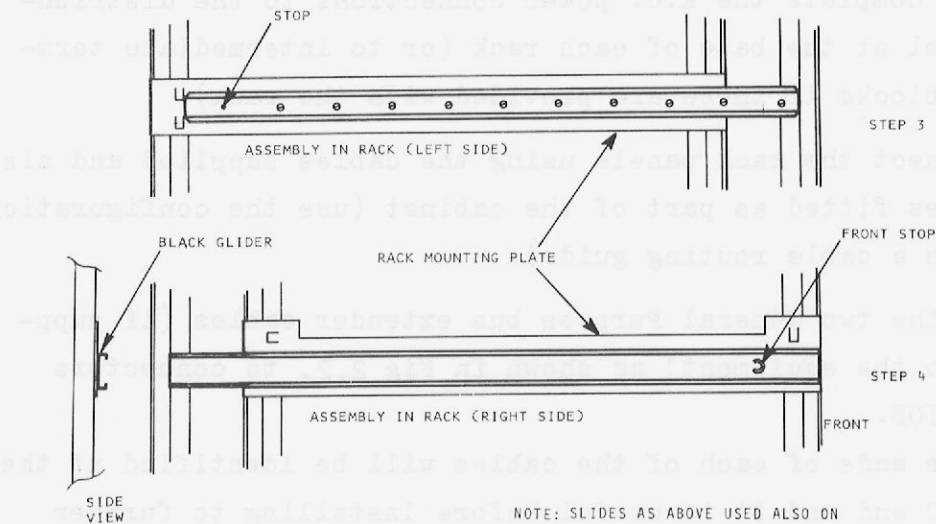
STEP 1



STEP 2



STEP 3



STEP 4

NOTE: SLIDES AS ABOVE USED ALSO ON
 PB43-001 EQUIPMENT SHELF.
 SLIDE SHOWN ON LEFT HAND SIDE
 OF BOX ABOVE IS USED ON BOTH
 SIDES OF EQUIPMENT SHELVES
 PB33-152 (CASSETTE SHELF) AND
 ON BOTH SIDES (UPPER HALF) OF
 PB52M/PB56M/PB57M-400 SERIES
 AND PB57M-500 SERIES MOUNTING
 BOXES

FIG. 2.1. ASSEMBLING TELESCOPIC SLIDES

to the right hand rack mounting plate provided using the screws supplied.

Fit the left and right hand mounting plates into the cabinet rack at the correct height to install the basic mounting box (see steps 3 and 4 Figure 2.1.).

Note: Right hand plate installed 1 unit higher than left hand plate.

Mount the basic mounting box into the rack using the front stop mechanisms at each side to secure the box into the telescopic assembly.

Note: To obtain access to the front stop on the right side of the rack assembly entails access to the side of the cabinet behind the front panel (see step 4 Fig 2.1.).

- (e) Install the remaining items of rack mounted equipment in the prescribed rack locations (using the configuration sheets provided with the equipment to verify the equipment locations) and then complete the a.c. power connections to the distribution panel at the base of each rack (or to intermediate terminating blocks if these are provided with the rack).
- (f) Interconnect the rack panels using the cables supplied and also the cables fitted as part of the cabinet (use the configuration sheets as a cable routing guide).
- (g) Connect the two General Purpose bus extender cables (if supplied with the equipment) as shown in Fig 2.2. to connectors IOM and IOB.

Note: The ends of each of the cables will be identified at the CPU end and it is useful before installing to further identify the other appropriate ends of each of the cables as IOM or IOB to avoid confusion when the cables are installed.

- (h) Connect the break request cable (if used with the system) to the basic mounting box as shown in Figure 2.2.

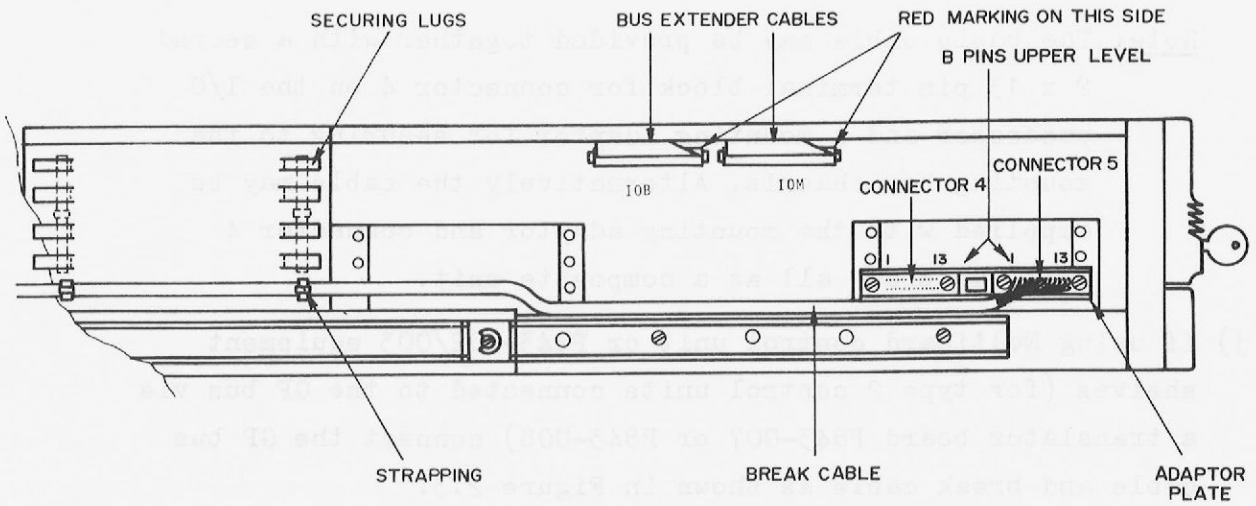


FIG. 2.2. GP BUS AND BREAK CABLE CONNECTION

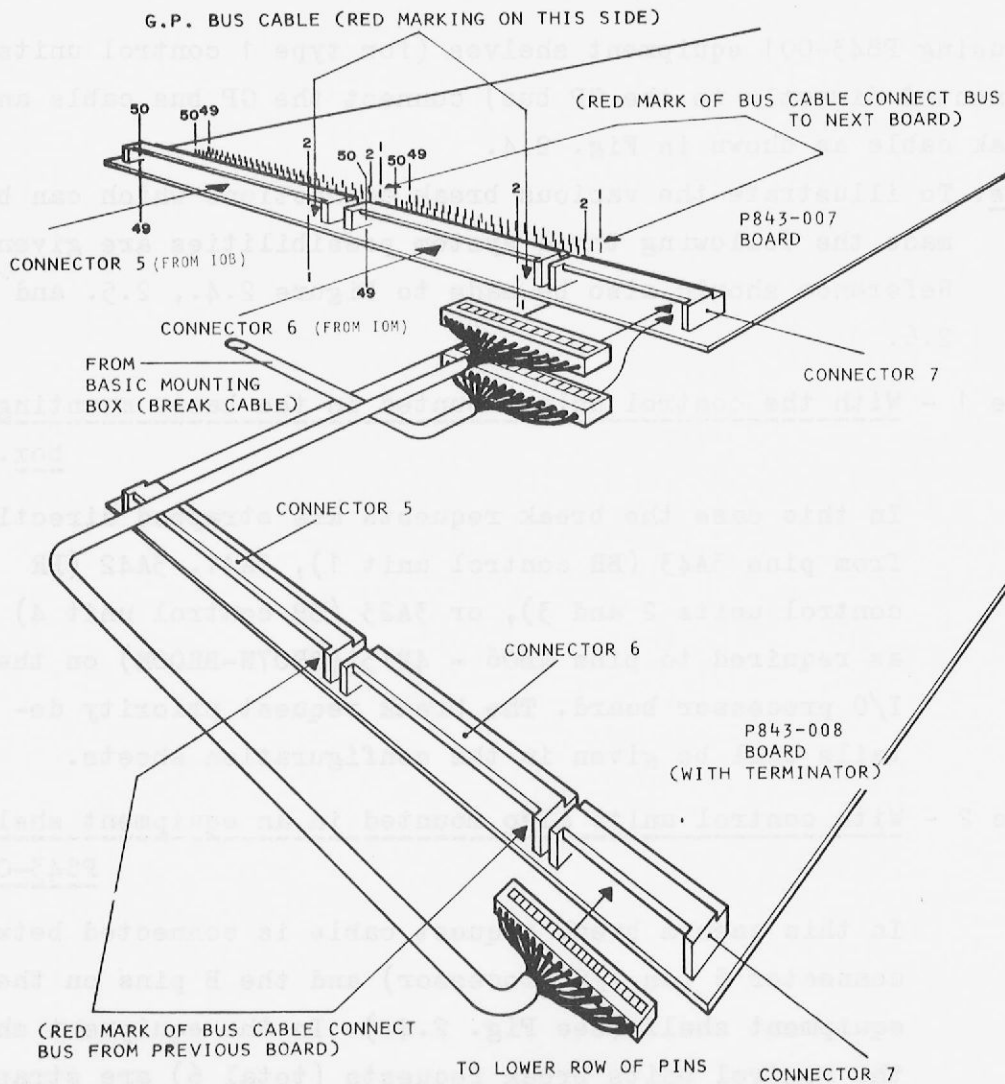


FIG. 2.3. BUS AND BREAK CABLE EXTENSION (using BUS TRANSLATOR BOARDS)

Note: The basic cable may be provided together with a second 2 x 13 pin terminal block for connector 4 on the I/O processor and a mounting adaptor for securing to the mounting box chassis. Alternatively the cable may be supplied with the mounting adaptor and connector 4 terminal block all as a composite unit.

- (j) If using Multicard control unit or P843-002/003 equipment shelves (for type 2 control units connected to the GP bus via a translator board P843-007 or P843-008) connect the GP bus cable and break cable as shown in Figure 2.3.

Note: The figure shows the extension to a second equipment shelf in which the GP bus is terminated using a P843-008 bus translator/terminator board.

- (k) If using P843-001 equipment shelves (for type 1 control units connected directly to the GP bus) connect the GP bus cable and break cable as shown in Fig. 2.4.

Note: To illustrate the various break connections which can be made the following three system possibilities are given. Reference should also be made to Figure 2.4., 2.5. and 2.6.

Case 1 - With the control units mounted in the basic mounting box.

In this case the break requests are strapped directly from pins 3A43 (BR control unit 1), 3A41, 3A42 (BR control units 2 and 3), or 3A23 (BR control unit 4) as required to pins 4B06 - 4B13 (BR07N-BR00N) on the I/O processor board. The break request priority details will be given in the configuration sheets.

Case 2 - With control units also mounted in an equipment shelf P843-001

In this case a break request cable is connected between connector 5 (on I/O processor) and the B pins on the equipment shelf (see Fig. 2.4.). In the equipment shelf the control units break requests (total 6) are strapped to pins A00-A07 (BR00N-07N) as required. At the I/O processor in the basic mounting box the appropriate BR

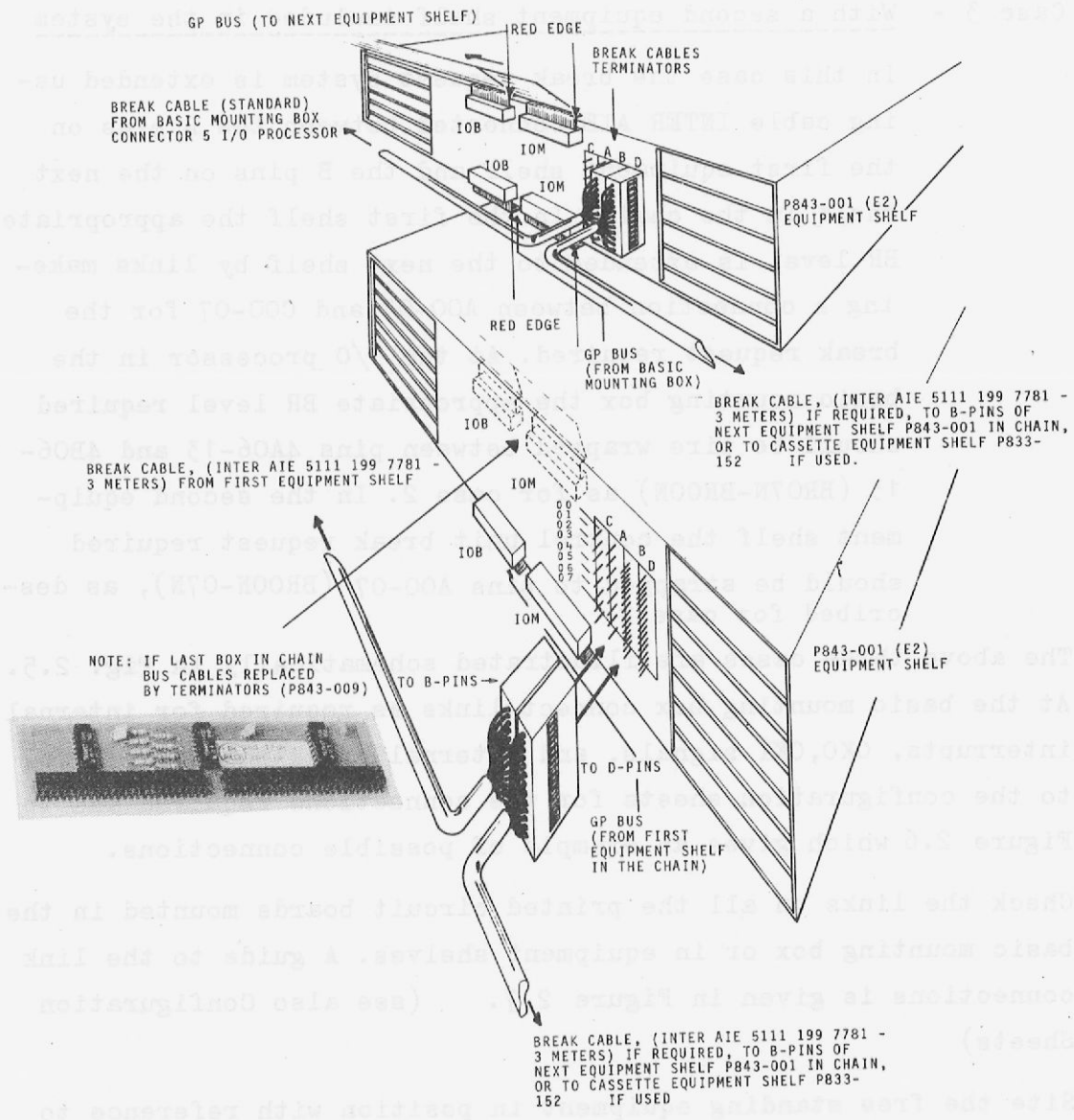


FIG. 2.4 BUS and BREAK CABLE EXTENSION
(using P843-001 EQUIPMENT SHELF)

level is wire wrapped between pins 4A06-13 and 4B06-13 (BRO7N-BROON) as required.

Case 3 - With a second equipment shelf included in the system

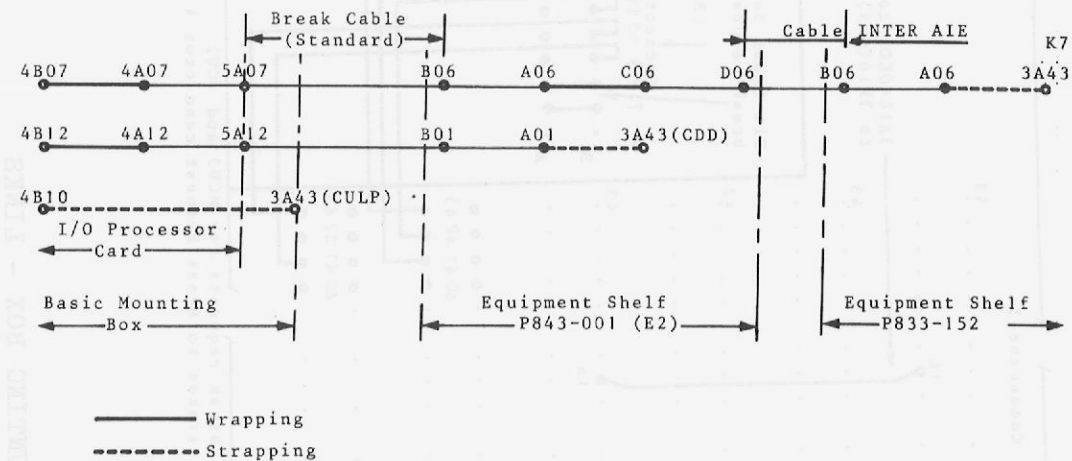
In this case the break request system is extended using cable INTER AIE connected between the D pins on the first equipment shelf and the B pins on the next shelf in the chain. In the first shelf the appropriate BR level is extended to the next shelf by links making a connection between A00-07 and C00-07 for the break request required. At the I/O processor in the basic mounting box the appropriate BR level required should be wire wrapped between pins 4A06-13 and 4B06-13 (BRO7N-BROON) as for case 2. In the second equipment shelf the control unit break request required should be strapped to pins A00-07 (BROON-07N), as described for case 2.

The above three cases are illustrated schematically in Fig. 2.5.

- (l) At the basic mounting box connect links as required for internal interrupts, OKO, OKI signals, and internal break requests. Refer to the configuration sheets for the connections required and to Figure 2.6 which gives an example of possible connections.
- (m) Check the links on all the printed circuit boards mounted in the basic mounting box or in equipment shelves. A guide to the link connections is given in Figure 2.7. (see also Configuration Sheets)
- (n) Site the free standing equipment in position with reference to any suppliers instructions; ensure that table top models requiring air from underneath are not stood upon loose materials which are liable to block the ventilation louvres.
- (o) Remove from the peripheral devices any items which are identified with - REMOVE BEFORE OPERATING - labels.
- (p) Using the Configuration Sheets as a guide, connect all signal cables from the peripheral devices to the associated I/O cards housed either in the basic mounting box or in equipment shelves

Example of one possible arrangement:

Configuration for CULP (BRO3N) mounted in basic mounting box
 CDD (BRO1N) mounted in equipment shelf
 P843-001 (E2)
 Cassette (BRO6N) mounted in equipment shelf
 P833-152.



Note: The above is an example of only one possible arrangement - other arrangements are also possible.

FIG. 2.5 BREAK CABLE INTERCONNECTIONS

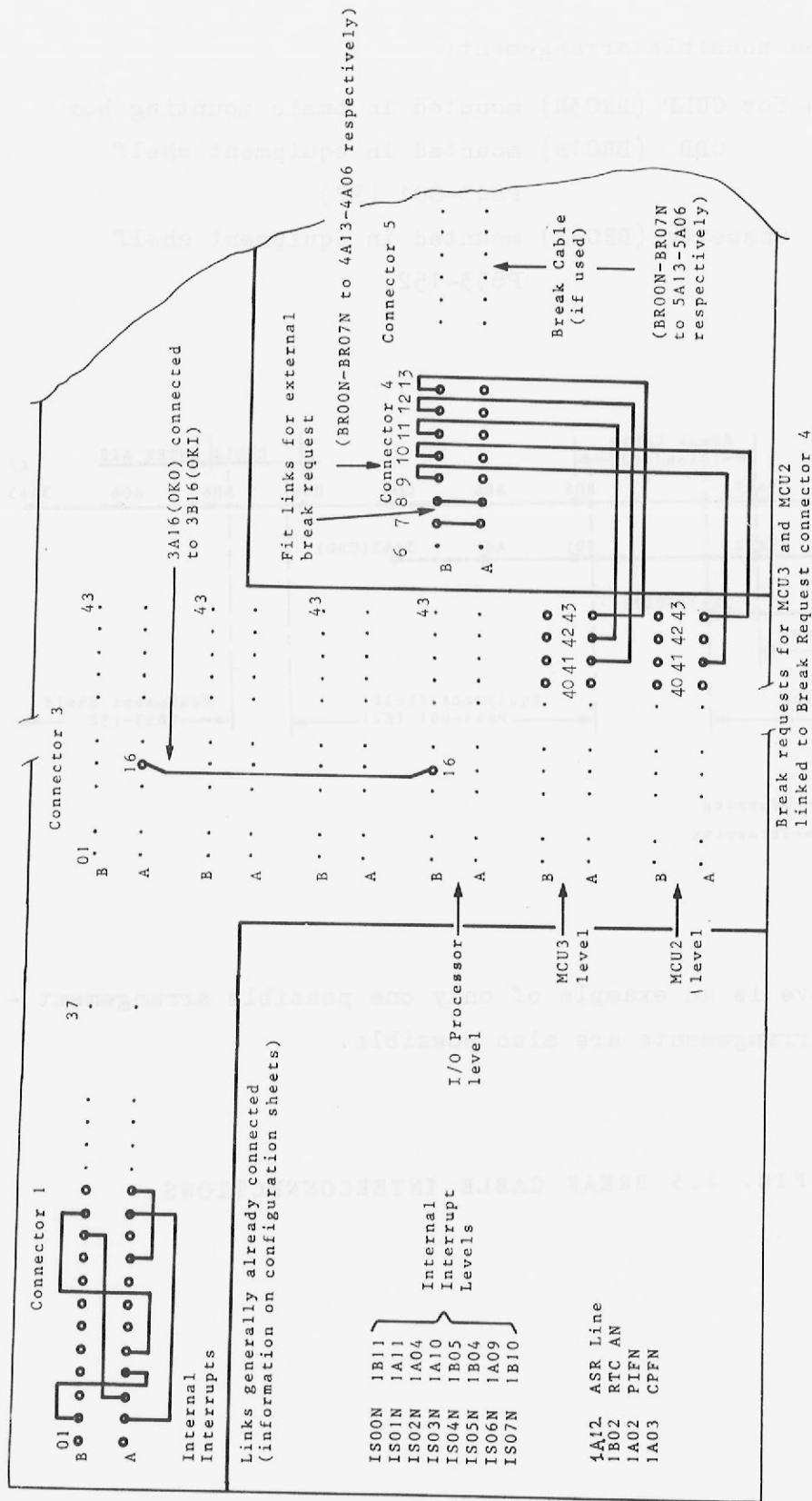


FIG. 2.6 BASIC MOUNTING BOX - LINKS

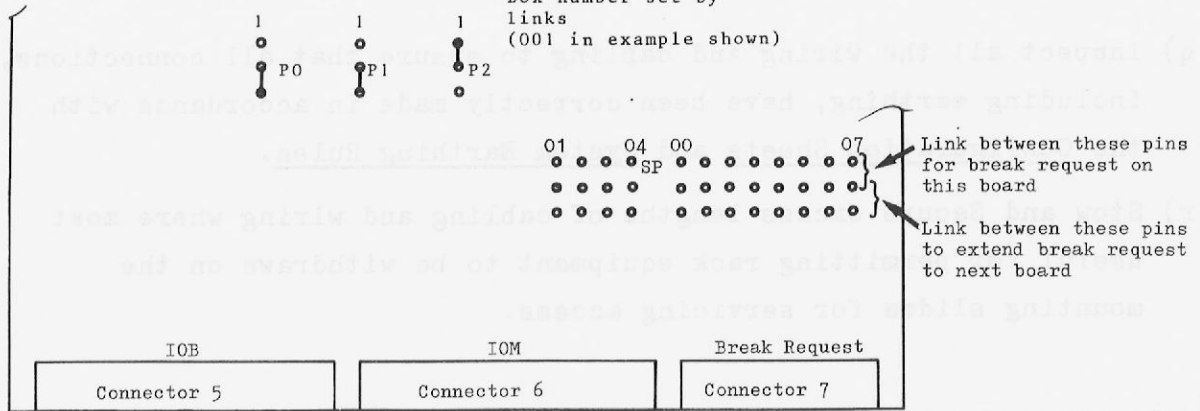
- (q) Inspect all the wiring and cabling to ensure that all connections, including earthing, have been correctly made in accordance with the Configuration Sheets and System Earthing Rules.
- (r) Stow and Secure excess lengths of cabling and wiring where most useful for permitting rack equipment to be withdrawn on the mounting slides for servicing access.

Preliminary Checks

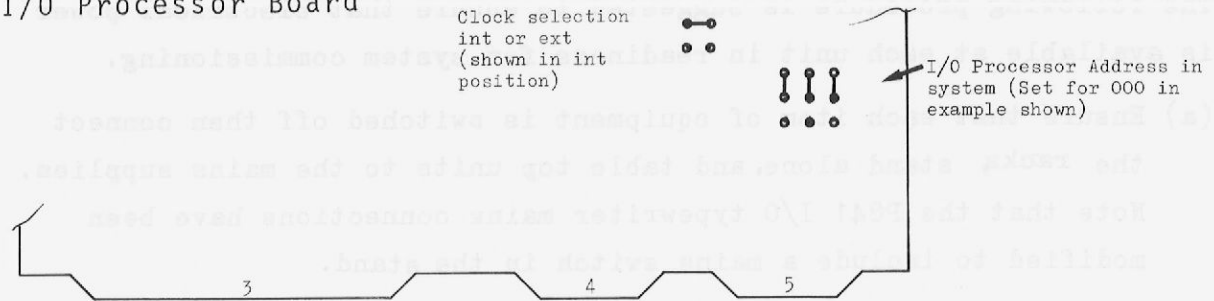
The following procedure is suggested to ensure that electrical power is available at each unit in readiness for system commissioning.

- (a) Ensure that each item of equipment is switched off then connect the racks, stand alone, and table top units to the mains supplies. Note that the P841 I/O typewriter mains connections have been modified to include a mains switch in the stand.
- (b) Switch on the mains input to the racks and check that the rack cooling fans are running. If not, disconnect the mains and examine fuses and connections.
- (c) Switch on each device in turn, starting with the central processor so that the peripheral controllers are activated before the peripheral devices become operable. In each case check that power is present by observing the indicator lamps display and that the internal cooling fans are running or, if necessary, by a trial start. Where power remains absent disconnect the unit concerned from the mains and examine the associated fuses and connections.

Bus Translator Board



I/O Processor Board



MCU3 Board

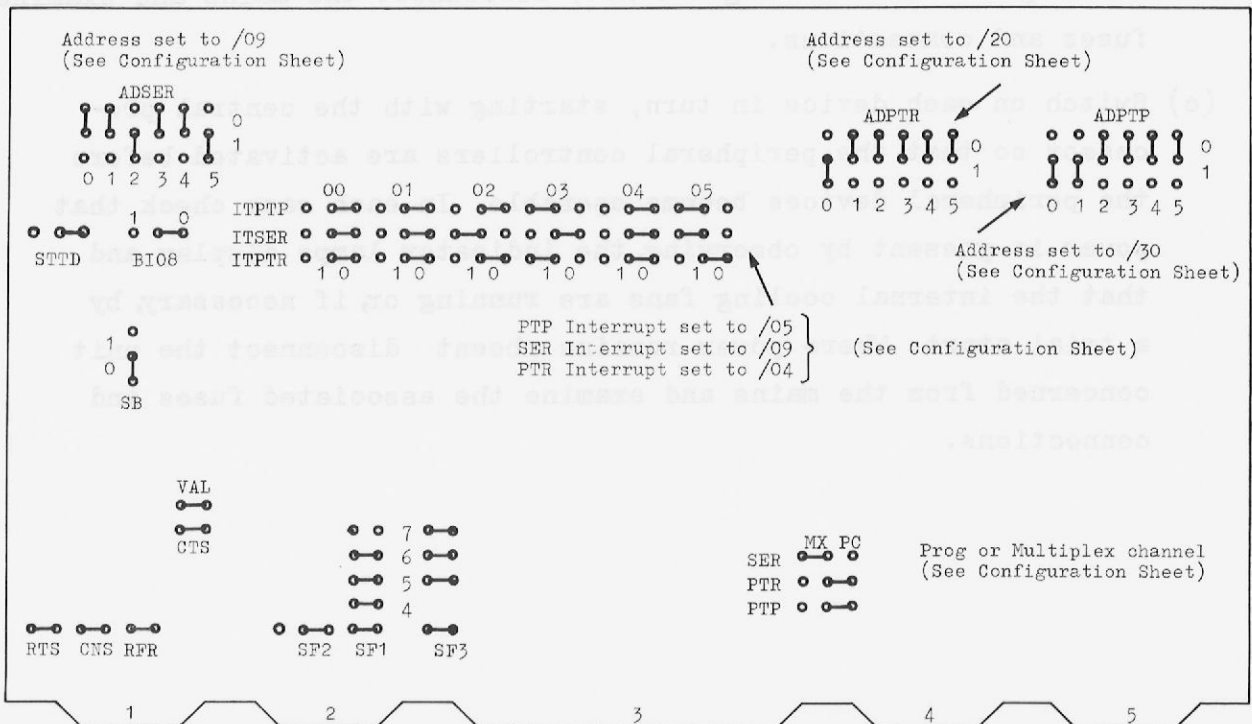


FIG. 2.7A. LINKS ON PRINTED CIRCUIT BOARDS

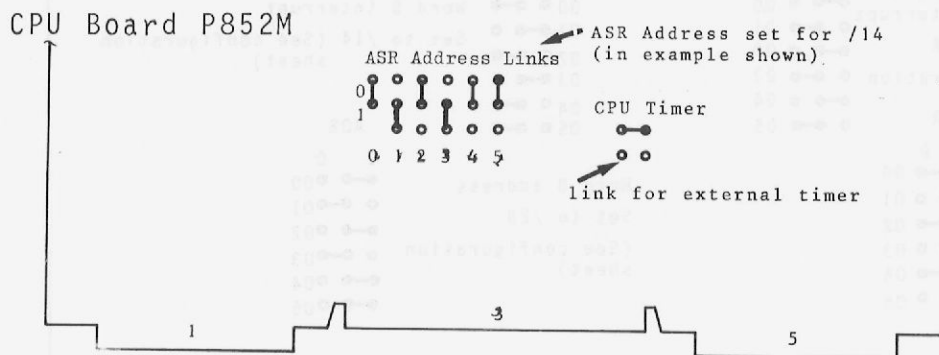
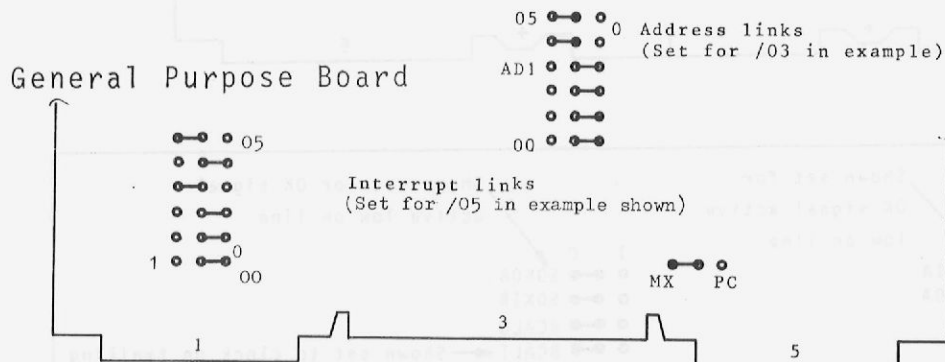
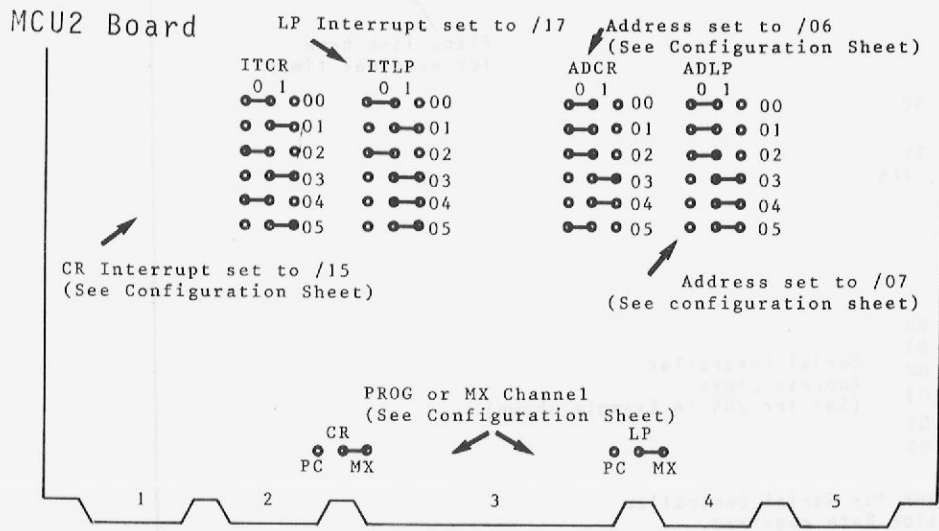
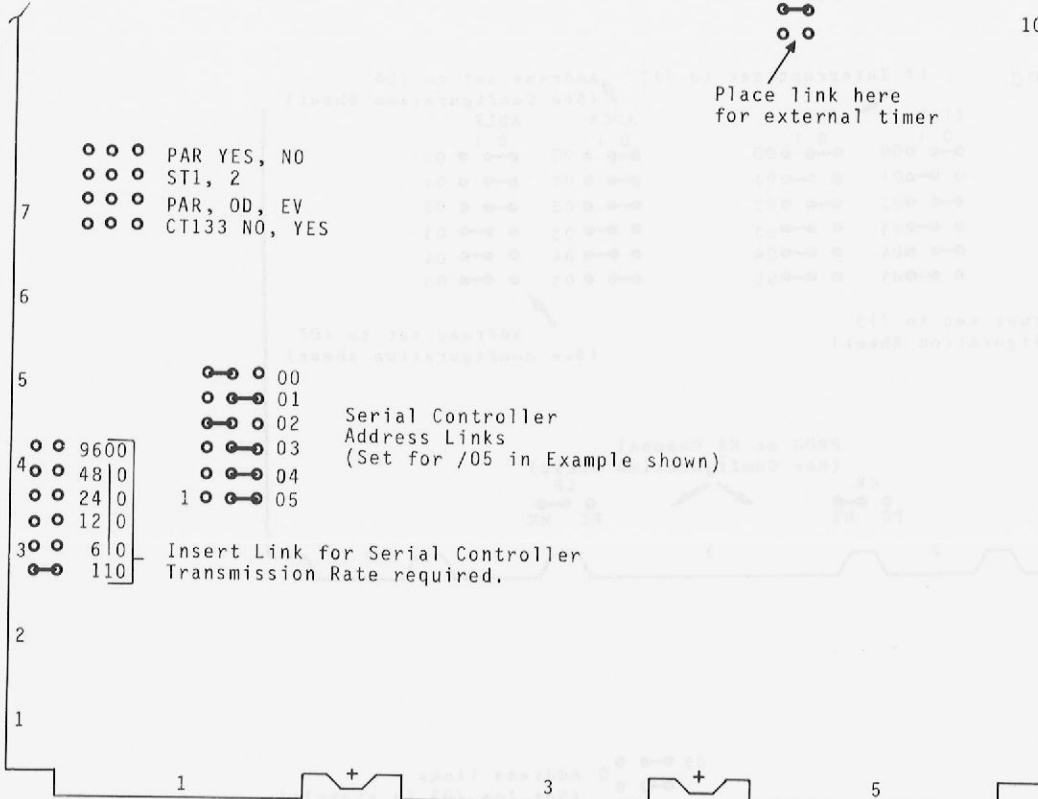


FIG. 2.7B. LINKS ON PRINTED CIRCUIT BOARDS

CPU Board P856M/P857M



DIOD Board

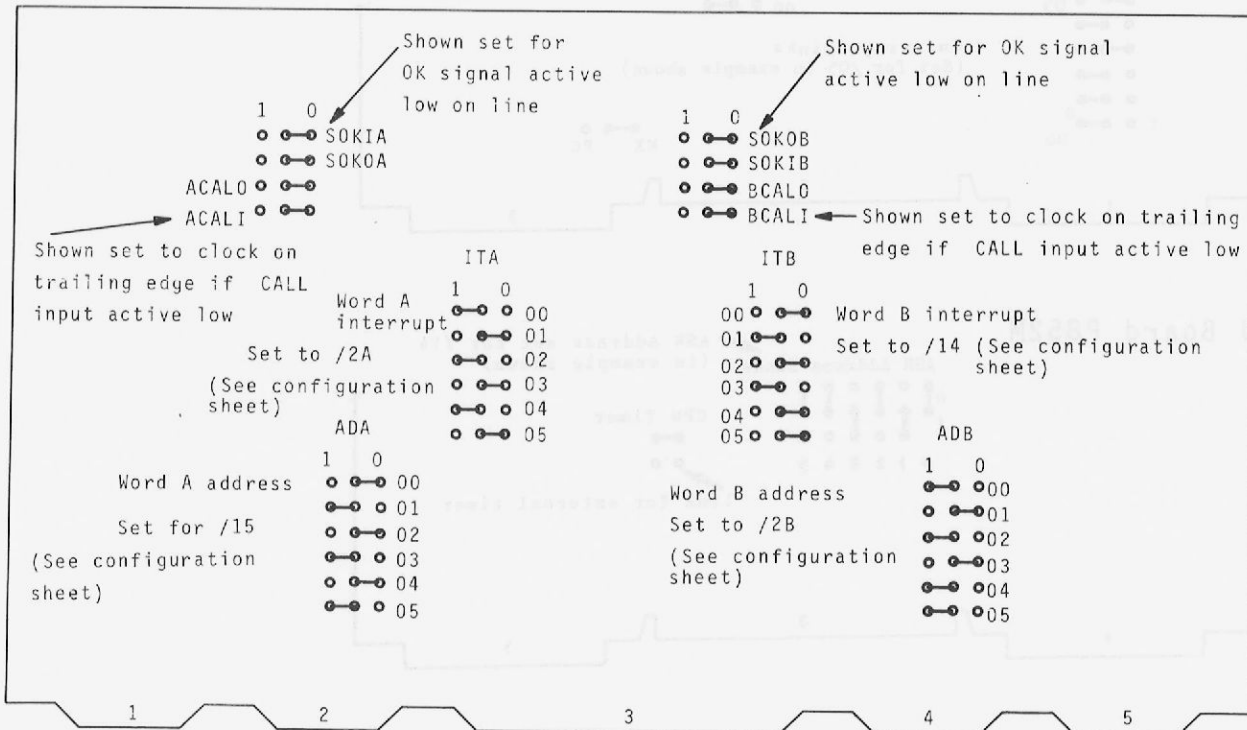
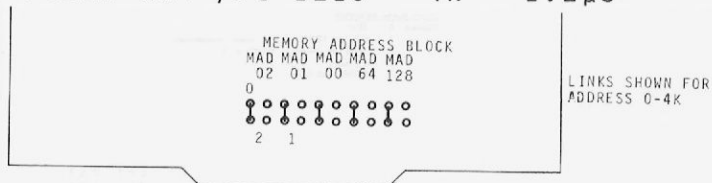
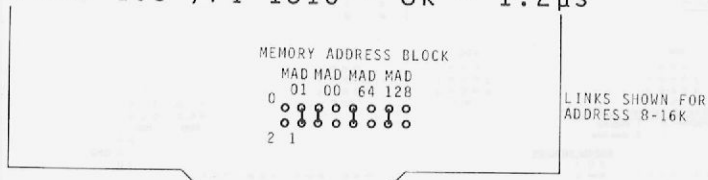


FIG. 2.7C LINKS ON PRINTED CIRCUIT BOARDS

1 P852M-004 /FI 1216 - 4k - 1.2 μ s



2 P843-108 /FI 1316 - 8k - 1.2 μ s



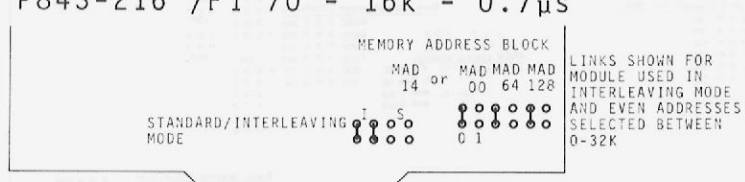
3 P843-116 /FI 1416 - 16k - 1.2 μ s



4 P843-116 /FTI 252 - 16k - 1.2 μ s



5 P843-216 /FI 70 - 16k - 0.7 μ s



6 P843-216 /FTI 251 - 16k - 0.7 μ s

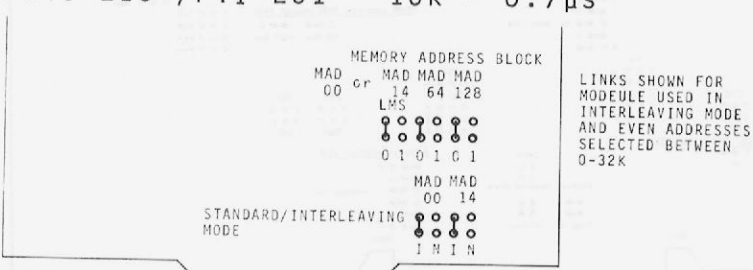
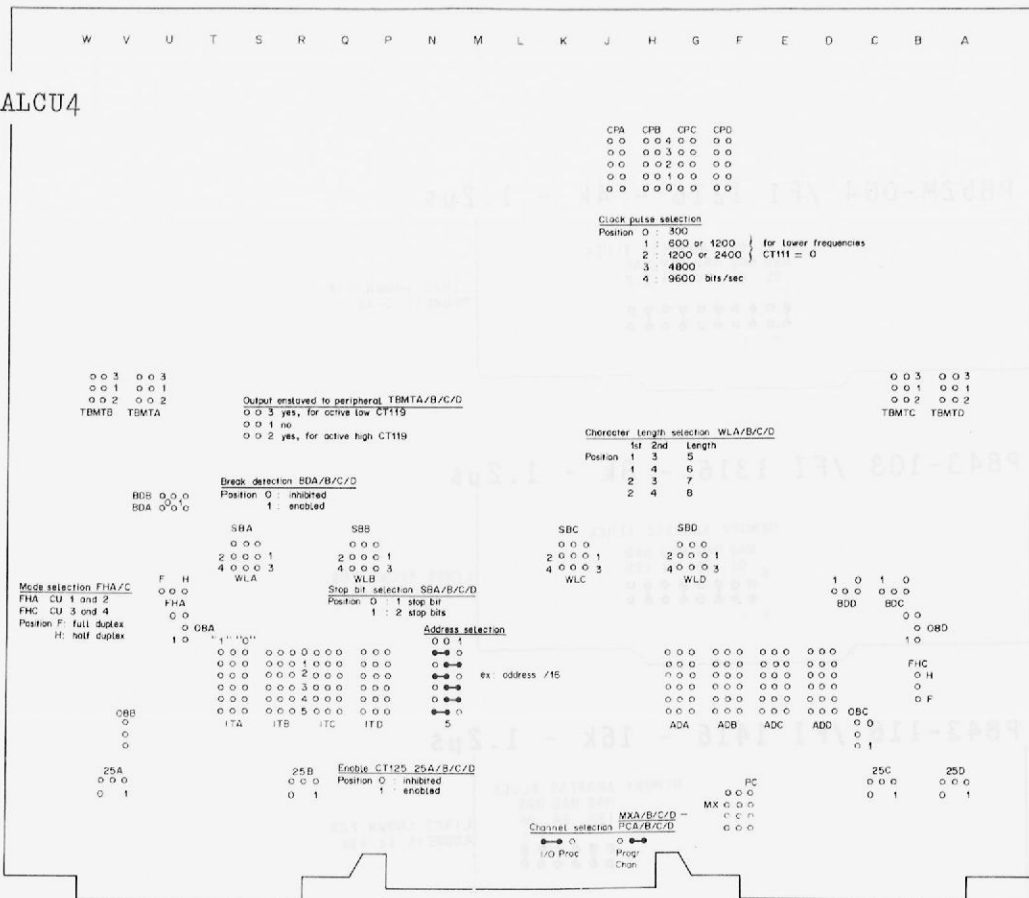


FIG. 2.7D LINKS ON PRINTED CIRCUIT BOARDS

ALCU2 & ALCU4



AMA8A

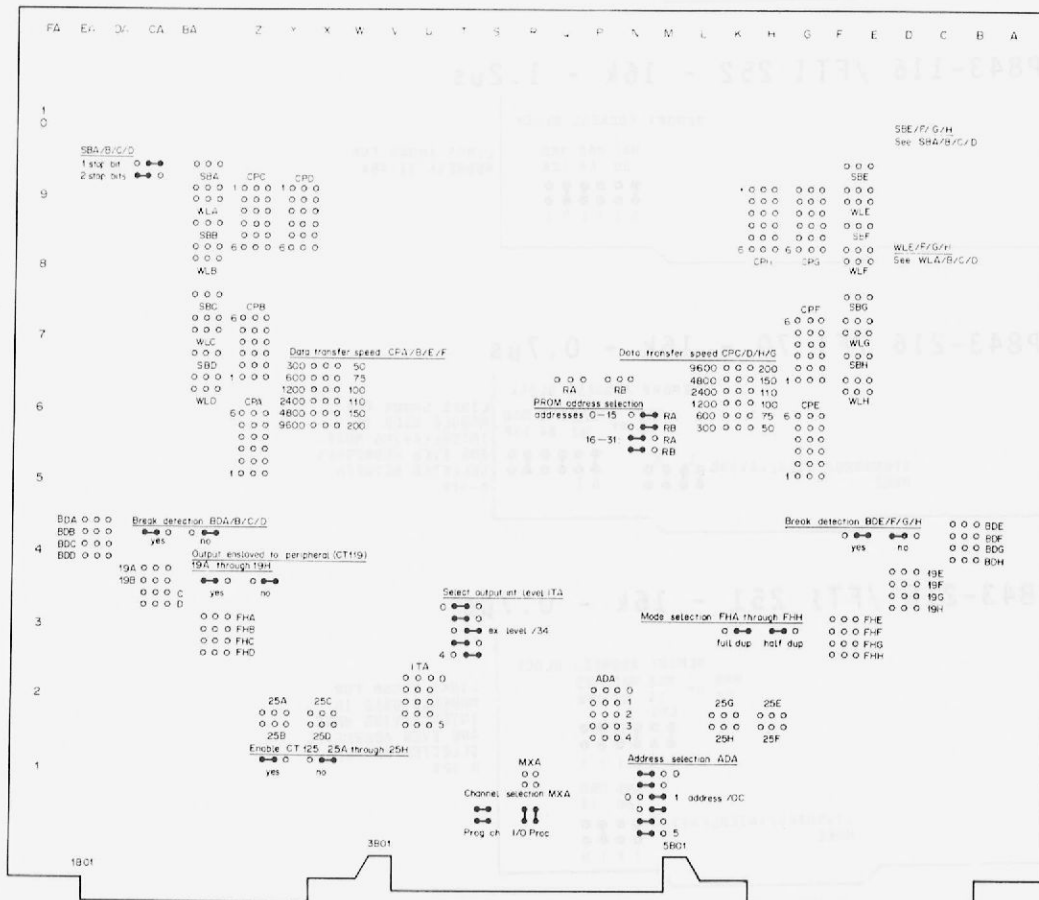


FIG. 2.7E LINKS ON PRINTED CIRCUIT BOARDS

Memory Board Links

The Memory location selection is preselected using links (see Figure 2.7B) - 5 links for the 4k module and 4 links for the 8k module. The complete memory location selection is shown in Table 2.1. below:

Table 2.1. Memory Location Selection

4k module. (MAD 64 and MAD 128 are always linked with 0)

	MAD 00	MAD 01	MAD 02
0-4k	0	0	0
4-8k	0	0	1
8-12k	0	1	0
12-16k	0	1	1
16-20k	1	0	0
20-24k	1	0	1
24-28k	1	1	0
28-32k	1	1	1

8k module. (MAD 64 and MAD 128 are always linked with 0)

	MAD 00	MAD 01
0-8k	0	0
8-16k	0	1
16-24k	1	0
24-32k	1	1

BREAK CABLE (DETAILS AS FOR TERMINATORS ON P843-001 EQUIPMENT SHELF) (SEE FIG. 2.4)
TERMINATORS

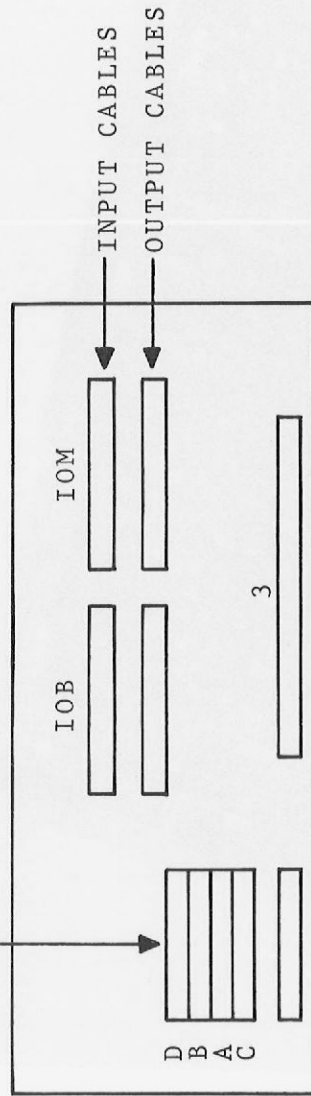
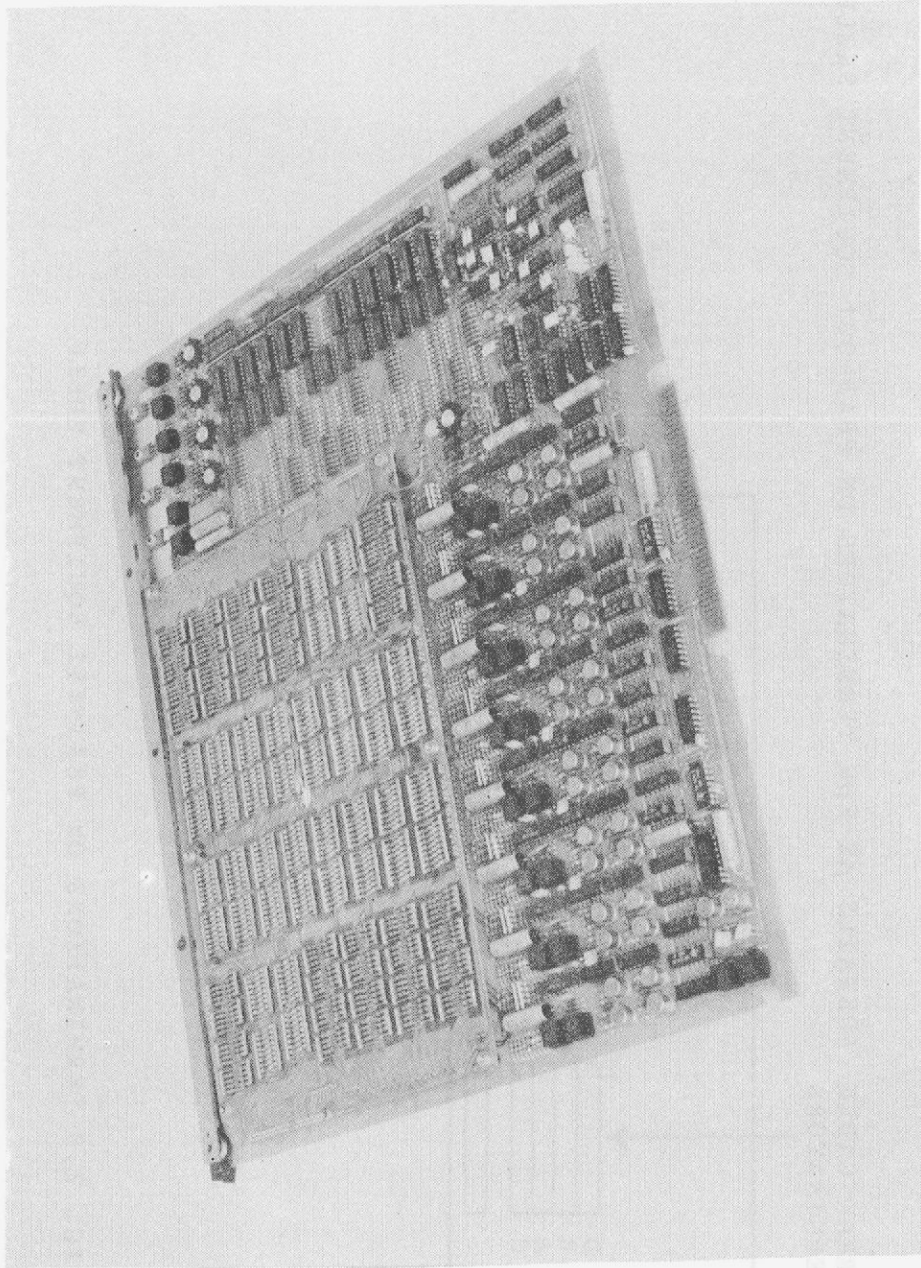


FIG. 2.8 TERMINATIONS ON P833-152 EQUIPMENT SHELF



Memory Board

- PROCEDURE: 1. MOUNT DISC ON TELESCOPIC SLIDES AND DRAW FORWARD
2. REMOVE L-SHAPED PROTECTIVE PLATE (2 SCREWS)
3. REMOVE CABLE BRACKET FROM PROTECTIVE PLATE (2 SCREWS)-STORE PROTECTIVE PLATE
4. ATTACH CABLE BRACKET TO BRACKET MOUNTING PLATE (2 SCREWS)

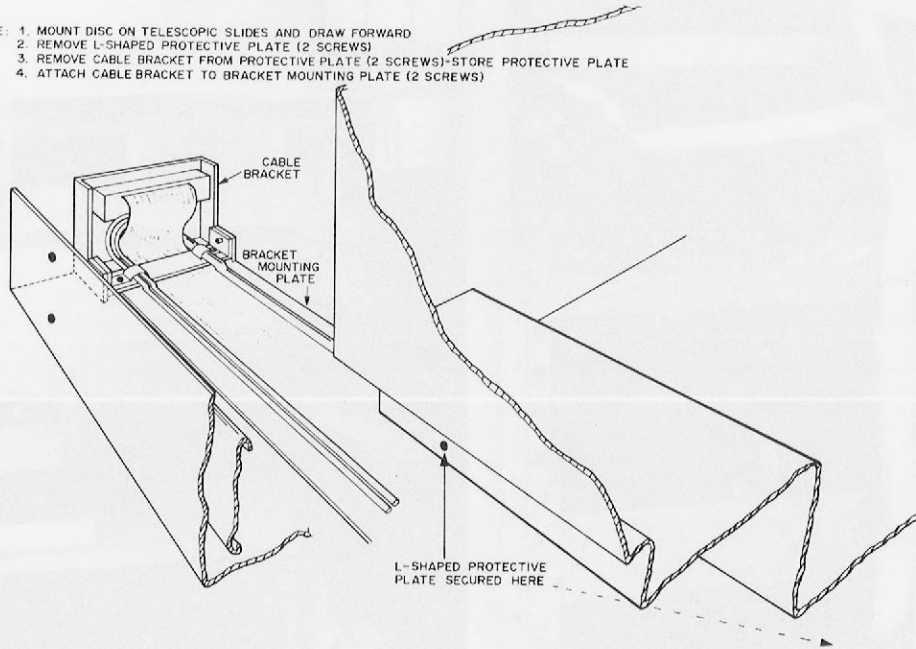
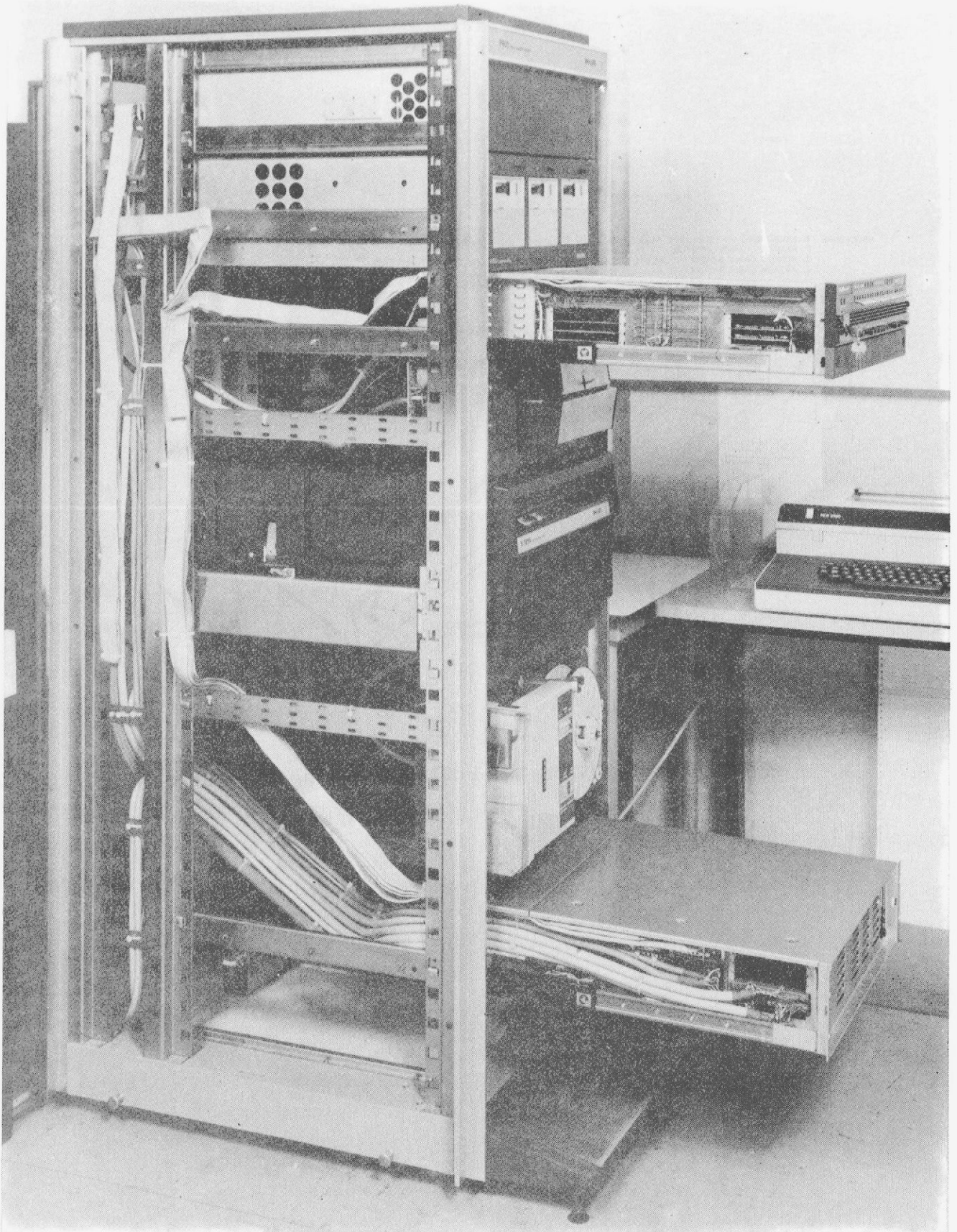
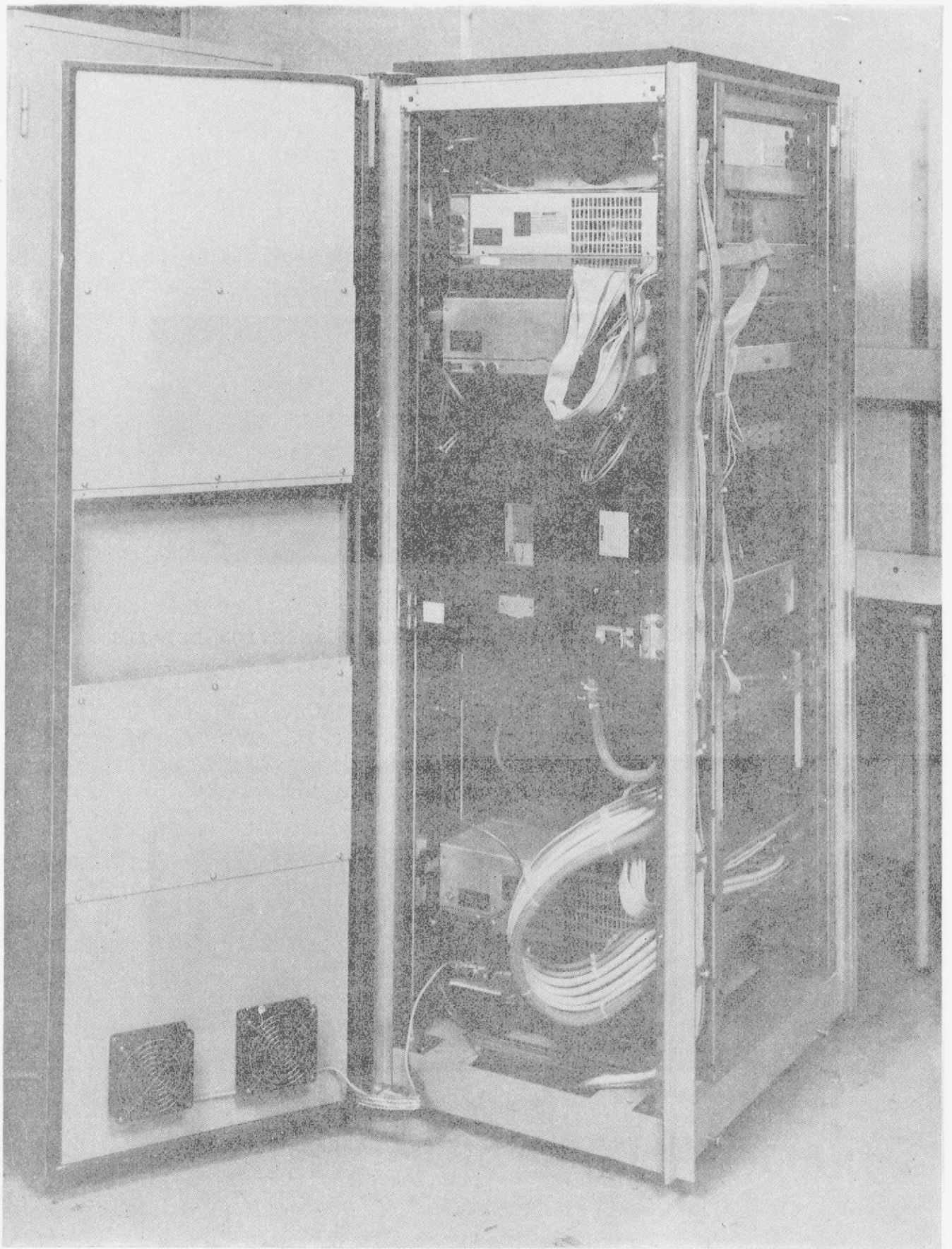


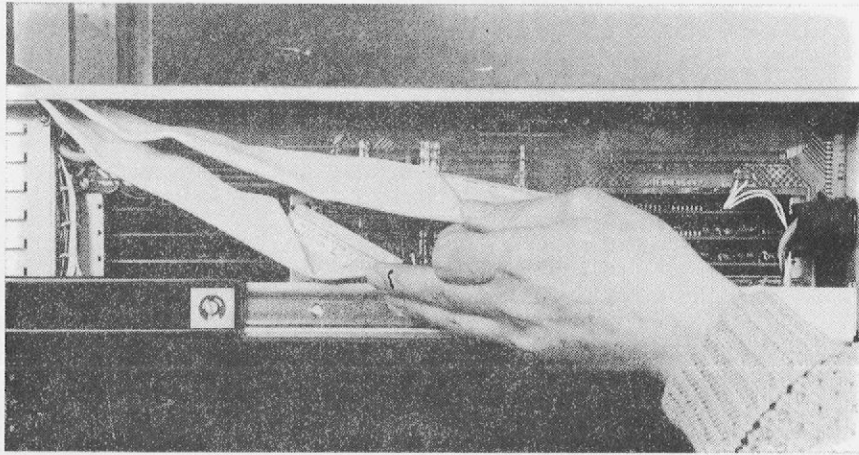
Figure 2.9. Mounting the P824-002 Moving Head Disc



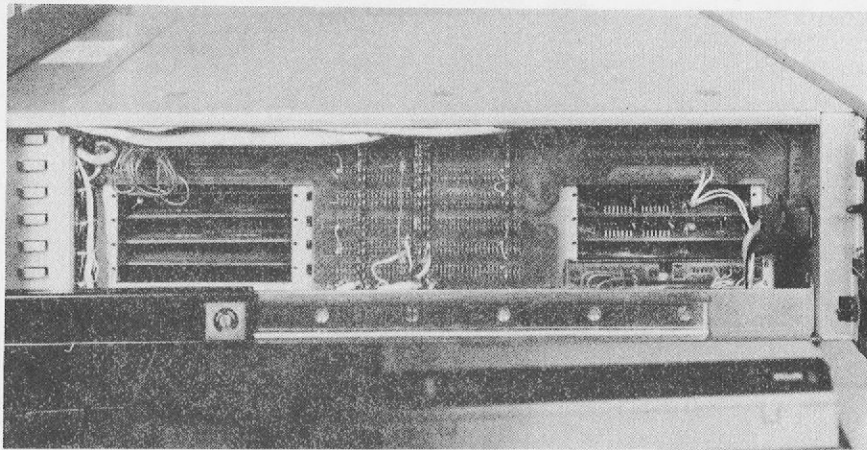
TYPICAL RACK WIRING - SIDE VIEW WITH SHELVES EXTENDED



TYPICAL RACK WIRING - REAR VIEW



BASIC MOUNTING BOX - BUS CABLE CONNECTION DETAILS



BASIC MOUNTING BOX - BUS CABLE CONNECTED

TYPICAL BAY WIRING - REAR VIEW

APPENDICES

APPENDICES

In this manual, for descriptive purposes only, Type 1 control units have been defined as those control units connected directly to the GP bus and Type 2 control units as those units connected to the I/O bus.

When using Type 2 control units in an Equipment shelf E1 (described in Section 1 Part 2) a Bus Translator board is provided with the shelf to translate signals on the I/O bus into GP bus signals. The translator board contains signal and timing facilities, interrupt encoding circuits, and break request line terminations which enable up to eight Type 2 control units to be added to the system. The additional control units can be connected to the I/O processor channel or to the programmed channel but they cannot act as bus master. System protection against power failure is also provided on the board.

If the total GP bus length is greater than 1 metre, then the bus must be terminated at both ends and if less than 1 metre in length then it is only required to terminate at the basic mounting box end. To allow for the two possibilities the Equipment Shelf E1 is provided in two forms; in one form it contains a Bus Translator board on which bus termination facilities are provided (P843-008) and in a second form the bus line terminations are omitted (P843-007)

SYSTEM EXTENSION

A possible system arrangement showing the interconnections when using 3 Equipment Shelves E1 is shown in Figure A1.1. Note that the Bus Translator also provides the facility for extending the GP bus between Equipment Shelves. If all the eight break request lines connected to a Bus Translator are not required in an Equipment Shelf then the lines can be daisy-chained to the next Equipment Shelf as described later in this Chapter.

INTERFACE SIGNALS - GP BUS

The diagram in Figure A1.2 shows the GP Bus and I/O signals which are interfaced when using the Bus Translator boards.

Only the GP Bus interface signals used for control unit transactions are needed and these signals are described in Section 1, Part 1, Chapter 2 of this manual. The interface timing for a master to control unit exchange using programmed channel is given in Section 1, Part 1, Chapter 3 and the timing for a memory to control unit exchange using the I/O processor channel is described in Section 1, Part 1, Chapter 4. Details of the component characteristics used for transmitting or receiving the signals are given in Section 1, Part 2, Chapter 2.

is provided with the ability to translate signals on the I/O bus into GP bus signals. The translator board contains signal and timing facilities, interrupt encoding circuits, and break request line terminations which must be of the type 2 control units to be added to the system. The additional control units can be connected to the I/O processor channel or to the programmed channel but they cannot act as bus master. System protection against power failure is also provided on the board.

If the total GP bus length is greater than 1 metre, then the bus must be terminated at both ends and if less than 1 metre in length then it is only required to terminate at the basic mounting box end. To allow for the two possibilities the Equipment Shelf H1 is provided in two forms; in one form it contains a Bus Translator board on which bus termination facilities are provided (P443-008) and in a second form the bus line terminations are omitted (P443-007).

SYSTEM EXTENSION

A possible system arrangement showing the interconnections when using 5-Equipment Shelves H1 is shown in Figure A.1. Note that the Bus Translator also provides the facility for extending the GP bus between Equipment Shelves. If all the eight break request lines connected to a Bus Translator are not required in an Equipment Shelf then the lines can be daisy-chained to the next Equipment Shelf as described later in this Chapter.

INTERFACE SIGNALS - GP BUS

The diagram in Figure A.2 shows the GP Bus and I/O signals which are interposed when using the Bus Translator boards.

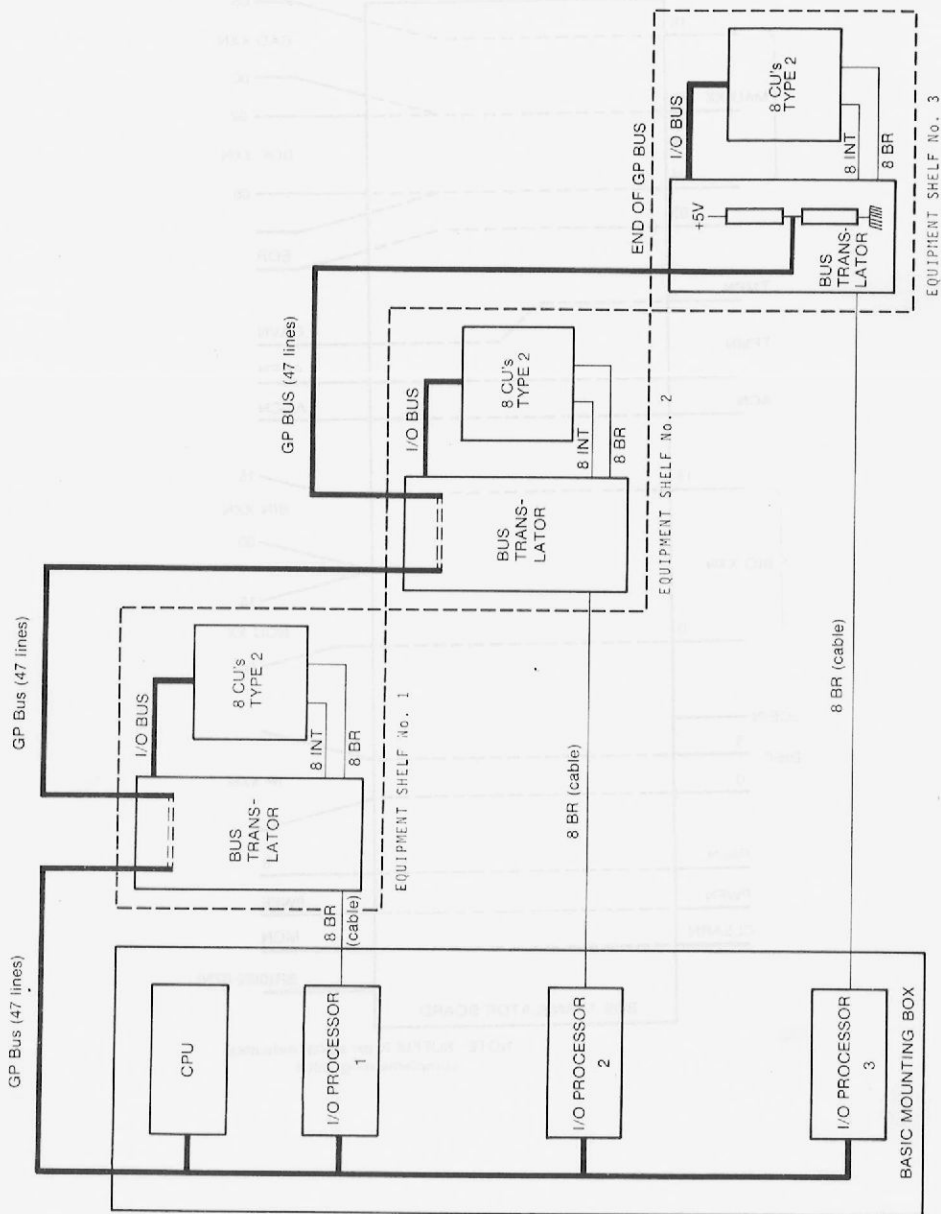


Figure A1.1 System using bus translator boards

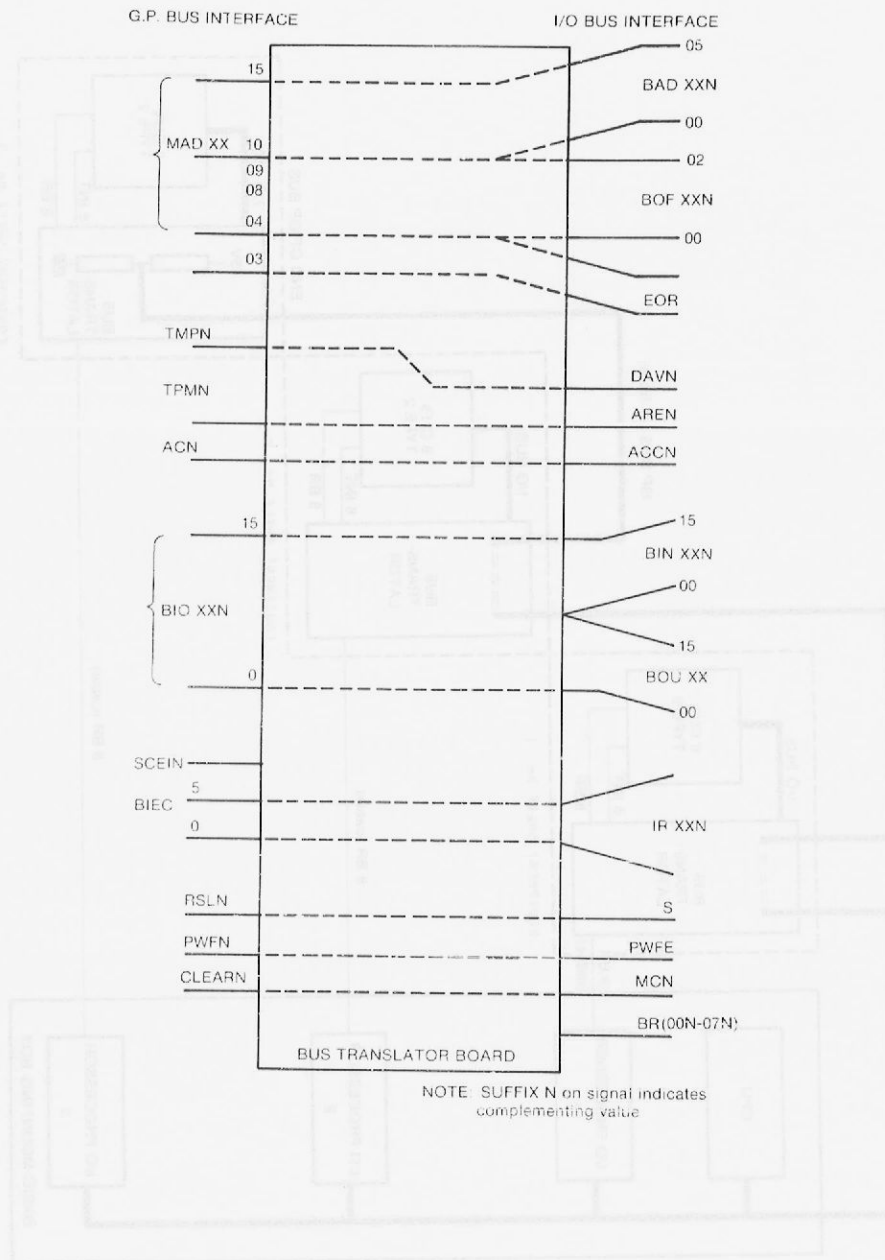


Figure A1.2 Interface signals

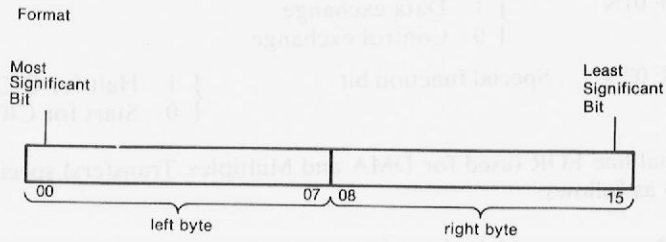
INTERFACE SIGNALS - I/O BUS

The I/O Bus interface signals shown in Figure A1.2 are described below:

Data Lines

Data Input Lines BIN 00N to 15N.

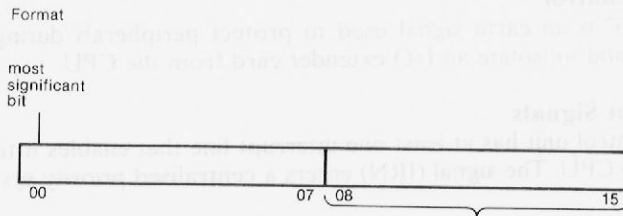
These are 16 unidirectional lines carrying data from a control unit connected on the bus.



When a control unit exchanges less than 16 bits it uses the rightmost bits of the BIN lines. If the control unit transfers per character (byte) in multiplex mode it should use the right character.

Output Lines BOU 00 to 15

These are 16 unidirectional lines carrying data to a control unit connected on the bus (the value transferred is the true value).

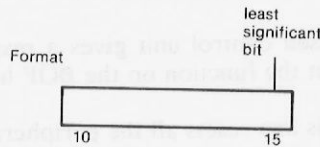


When a control unit exchanges less than 16 bits per word it uses the rightmost bits. If the control unit receives characters in multiplex mode it should use the right character.

Address Lines

Address Lines BAD 00N to 05N

These lines carry the 6-bit number defining the device address.



Function Lines

Function lines *BOF 00N to 02N*

These 3 lines carry a code which specifies the function to be performed. The code on each line is as follows:

BOF 00N	{	1	Exchange to control unit
		0	Exchange from control unit
BOF 01N	{	1	Data exchange
		0	Control exchange
BOF 02N	Special function bit	{	1 Halt for CIO
			0 Start for CIO

Signal line EOR (used for DMA and Multiplex Transfers) specifies the function also as follows:

EOR	{	1	Last data exchange
		0	Not the last data exchange.

Timing Signal

Timing signal *DAVN*

This signal provides Device Address Validation and is used for address validation and exchange synchronisation within the control unit.

Power Control

Signal "S" is an earth signal used to protect peripherals during a decrease of voltage and to isolate an I/O extender card from the CPU.

Interrupt Signals

Each control unit has at least one interrupt line that enables it to obtain service from the CPU. The signal (IRN) enters a centralised priority system.

Break Requests

One break request signal BRN is sent from each control unit directly to the multiplex that handles its transfers.

Miscellaneous Signals

The following signals are also used during an exchange:

- AREN: The addressed control unit gives a response on this signal line to indicate that the address on the BAD lines has been recognised.
- ACCN: The addressed control unit gives a response on this signal line to indicate that the function on the BOF lines has been accepted.
- MCN: A "0" on this line resets all the peripheral control units.

INTERFACE TIMING I/O BUS

The interface timing for a data transfer to a control unit (OTR/CIO instruction) is shown in Figure A1.3

During this exchange the control unit that decodes its address asserts AREN and ACCN, if it accepts the function. The unit samples the data on the DAVN rising edge, which occurs at a fixed time whatever the control unit answer is.

The interface timing for a data transfer to a control unit (INR/SST/TST instruction) is shown in Figure A1.4

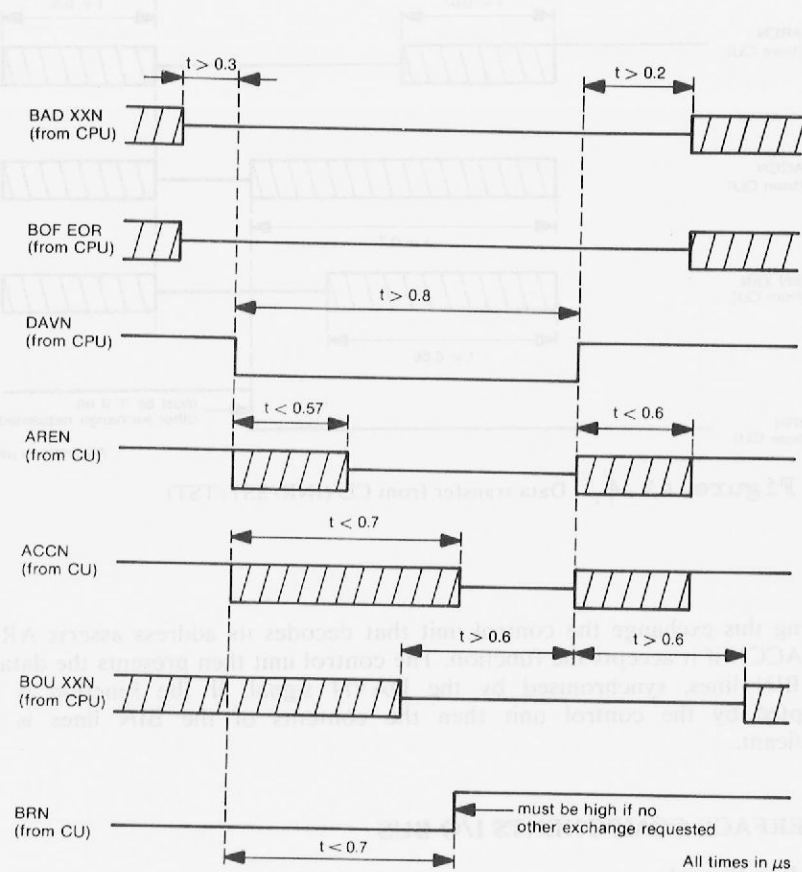


Figure A1.3 Data transfer to CU (OTR/CIO)

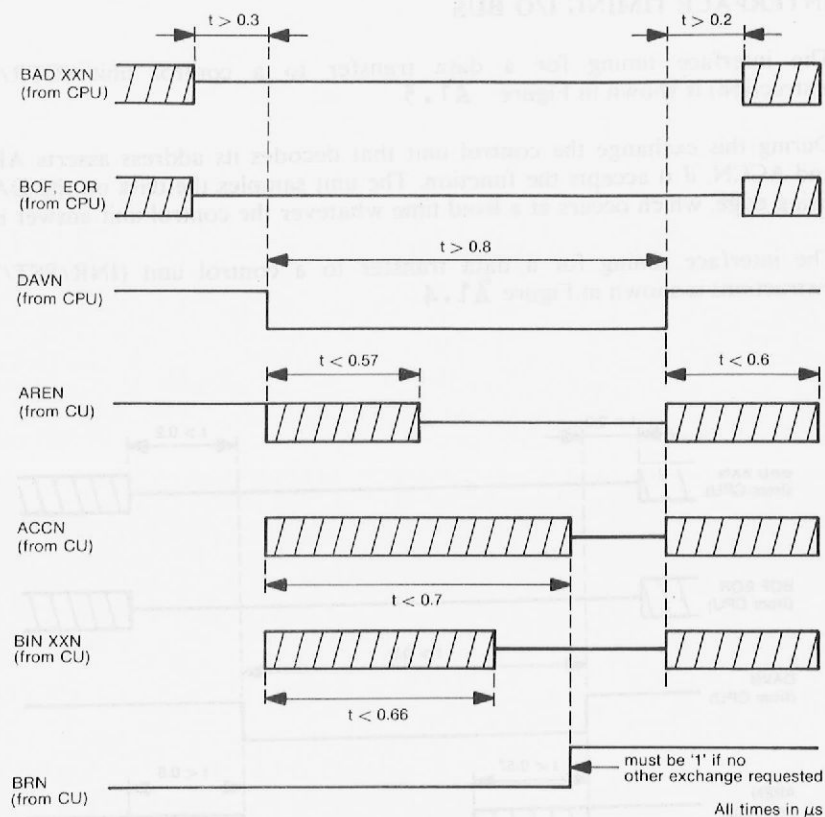


Figure A1.4. Data transfer from CU (INR/SST/TST)

During this exchange the control unit that decodes its address asserts AREN and ACCN if it accepts the function. The control unit then presents the data on the BIN lines, synchronised by the DAVN signal. If the function is not accepted by the control unit then the contents of the BIN lines is not significant.

INTERFACE COMPONENTS I/O BUS

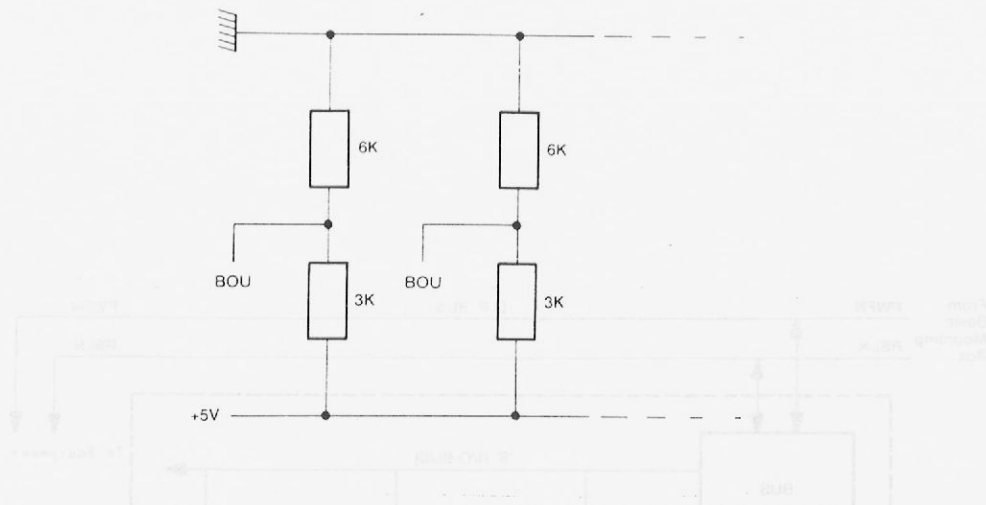
I/O Bus Signals

The I/O bus is designed to interface with standard TTL components operating at the following levels:

d.c. Supply	+5V \pm 5%
Logic High Level	not less than +2.4V; typically above +3V
Logic Low Level	not greater than +0.4V; typically below +0.2V
One TTL Level	1.6 mA at +0.4V.

The control unit input for each of the BOU, BAD/, BOF/, DAV/, EOR/ and MC/ lines must present a fan in of one TTL load.

If only some of the BOU lines are used on a control unit board then the remaining ones must each be terminated on the board by either an inverter or by a 3K resistor connected to +5V and a 6K resistor connected to ground as shown:



Control unit outputs BIN/, ARE/ and ACC/ must each emanate from an open collector NAND gate.

Interrupt and Break Requests

PIL/ and BRL/ signals should be transmitted via one of the following circuits able to drive a matched long line up to 15 metres in length:

- An open collector NAND buffer (SN 7438) without resistor, if the signals are coupled by a wired OR to produce only a PIL/ interrupt for the programmed channel.
- A NAND buffer (SN 7437 or SN 7440).
- An inverter driver (SN 7416)
- A driver (SN 7417).

POWER CONTROL SYSTEM EXTENSION USING BUS TRANSLATOR BOARDS

The operation of the PWFN and RSLN signals for safeguarding the control units connected to the GP bus are described in Section 1, Part 2, Chapter 5. When using Type 2 control units connected via the Bus Translator boards power control signals are connected to extend the power protection system. The arrangement is shown in Figure A1.5.

In this arrangement signals PWFN and RSLN are connected to each bus translator board via the GP bus and signal PWFE1 (or PWFE2) from the equipment shelf power supply is also connected in an "OR" function on the bus translator board. The timing of the signals is shown in Figure A1.6

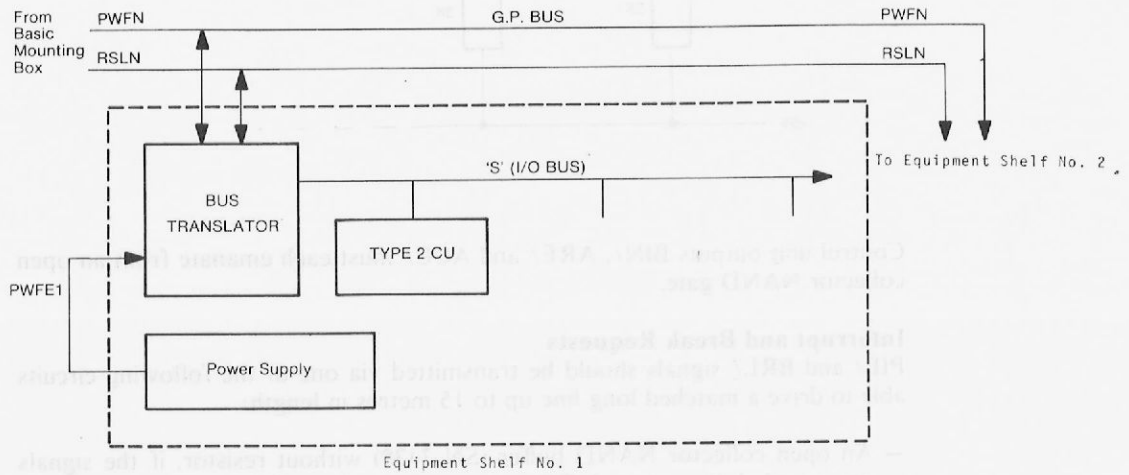


Figure A1.5 Power control system using bus translator boards

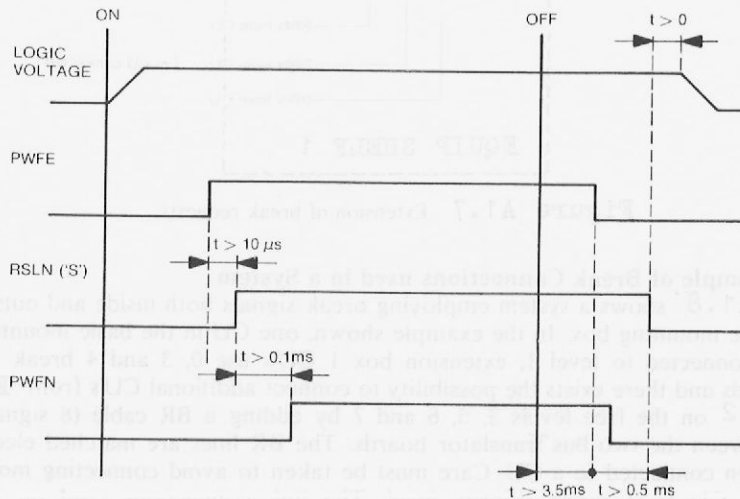


Figure A1.6 P852M/P856M/P857M power control timing

The timing of the signals is in accordance with I/O timing for switching off (due to the low energy reserve of the power supply) and with GP Bus timing for switching on (to obtain a correct master clear function in the P852M, /P856M/P857M system).

Fan in: PWFE 2TTL loads
 PWFN Receiver 1 REC0612 (see GP bus configuration rules)
 Fan out: PWFN Emitter 1 1801 (see GP bus configuration rules)

Remark: RSLN(5): 1 sink 250 mA 15T2L
 Loads max. for each Equipment shelf (7 Equipment shelves, in max. configuration).

BREAK CONNECTIONS ON BUS TRANSLATOR BOARD

A bus translator board receives one BR cable containing 8 signal lines to convey 8 break requests to the multiplex blocks in one I/O processor mounted in the basic mounting box. Figure A1.7 illustrates how the BR lines can either be connected to CU's in the shelf in which the Bus Translator board is situated (in this case the lines are electrically matched) or can be daisy-chained to the next shelf for extra CU connection or to be terminated if they are not to be used in the system. The matching resistors are provided on the Bus Translator boards and at the basic mounting box on the I/O processor board.

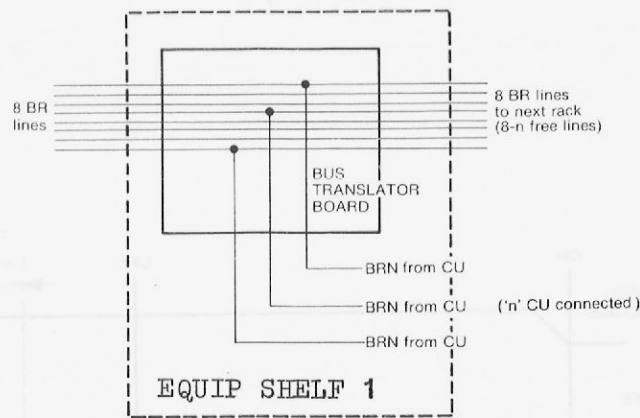


Figure A1.7 Extension of break requests

Example of Break Connections used in a System

Figure A1.8 shows a system employing break signals both inside and outside the basic mounting box. In the example shown, one CU in the basic mounting box is connected to level 1, extension box 1 CU's use 0, 3 and 4 break priority levels and there exists the possibility to connect additional CU's from 'Equipment shelf 2 on the free levels 2, 5, 6 and 7 by adding a BR cable (8 signal lines) between the two Bus Translator boards. The BR lines are matched electrically when connected to a CU. Care must be taken to avoid connecting more than one CU to a break priority level. The link connections used on the Bus Translator boards are illustrated in Figure A1.9.

SPARE LINES

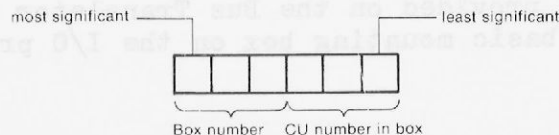
4 spare lines are provided on the GP bus and are accessible, via the Bus Translator board, on the I/O bus. The lines can be matched electrically on any Bus translator board and in this case they are not further daisy chained.

INTERRUPT SIGNAL ENCODING USING BUS TRANSLATOR BOARDS

The block diagram in Figure A1.10 shows a typical system arrangement using Type 2 control units. Extension boxes 1 to 7 are each given a 3-bit binary number from 001 to 111 which is coded by straps on the bus translator board interrupt encoding circuit and each of the 8 control units allocated to each rack is also identified by a 3-bit number which is coded by the interrupt encoder. The basic mounting box internal interrupts are coded in a similar manner; the interrupt encoder straps give the box number as 000.

Note: If all interrupt levels in one box are not employed then the numbering can be continued in the next box in the chain. In this manner two boxes may be identified with the same 3-bit binary number.

The box number and control unit number are combined so that each of the interrupts from 0 to 63 is identified by a single composite 6-bit number which has the following format:



The interrupt encoder logic ensures that both the box number and the control unit number are sampled in logical order of priority, the lowest number in each case having highest priority. When several signals are active therefore only the encoded signal for the interrupt with the highest priority appears on the 6 lines into the comparator.

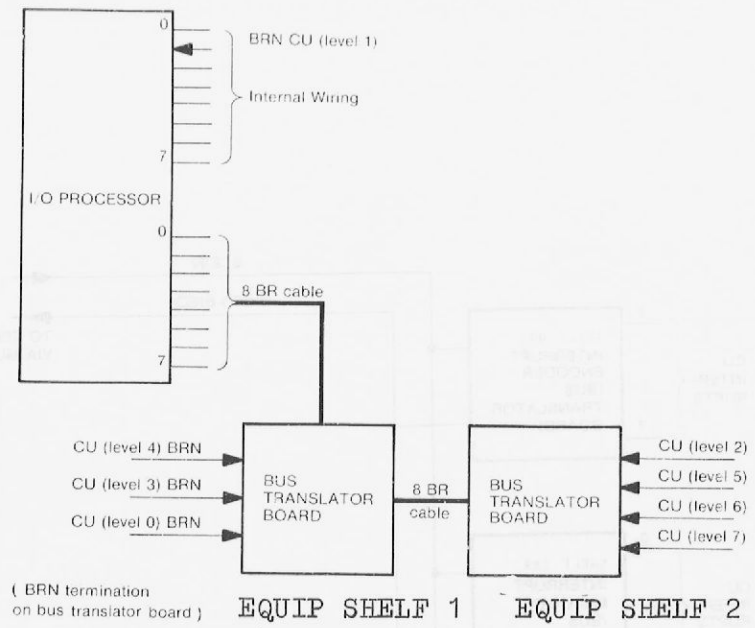
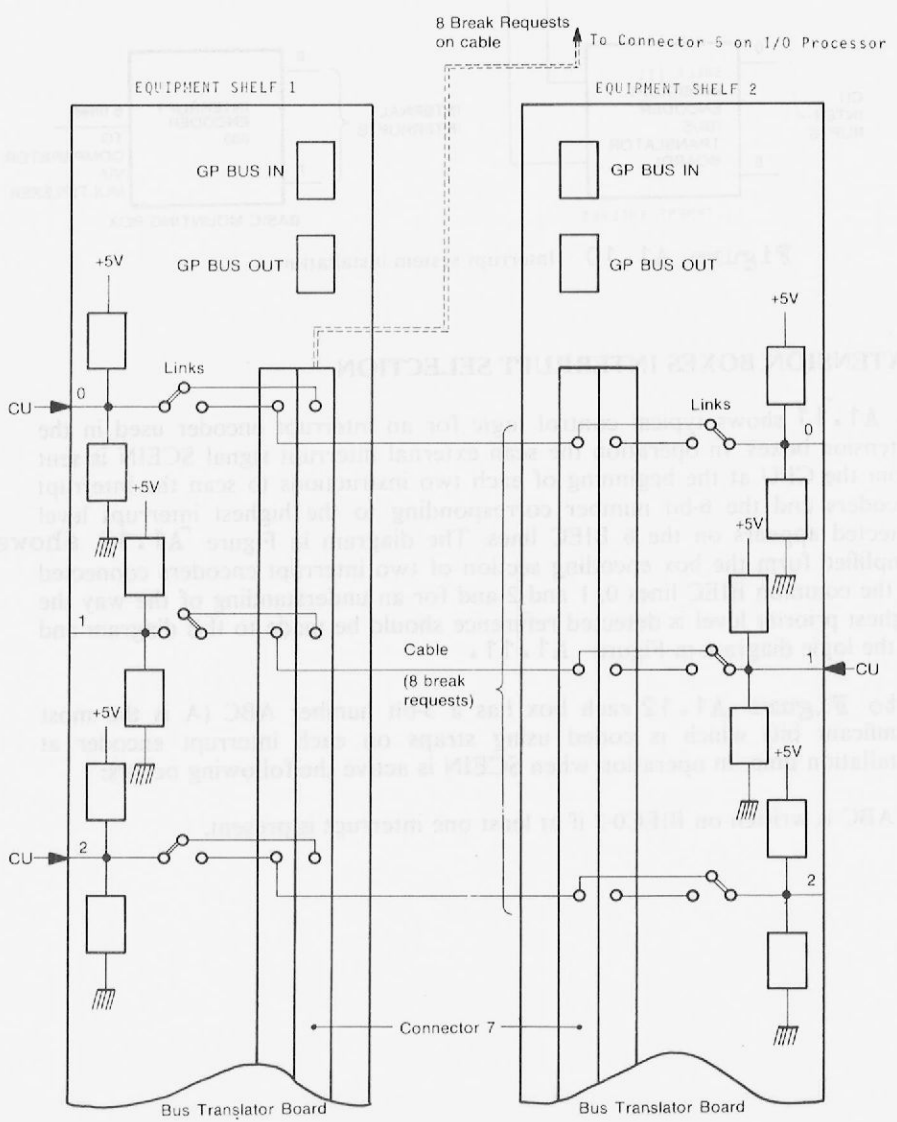


Figure A1.8 Break requests used in a system



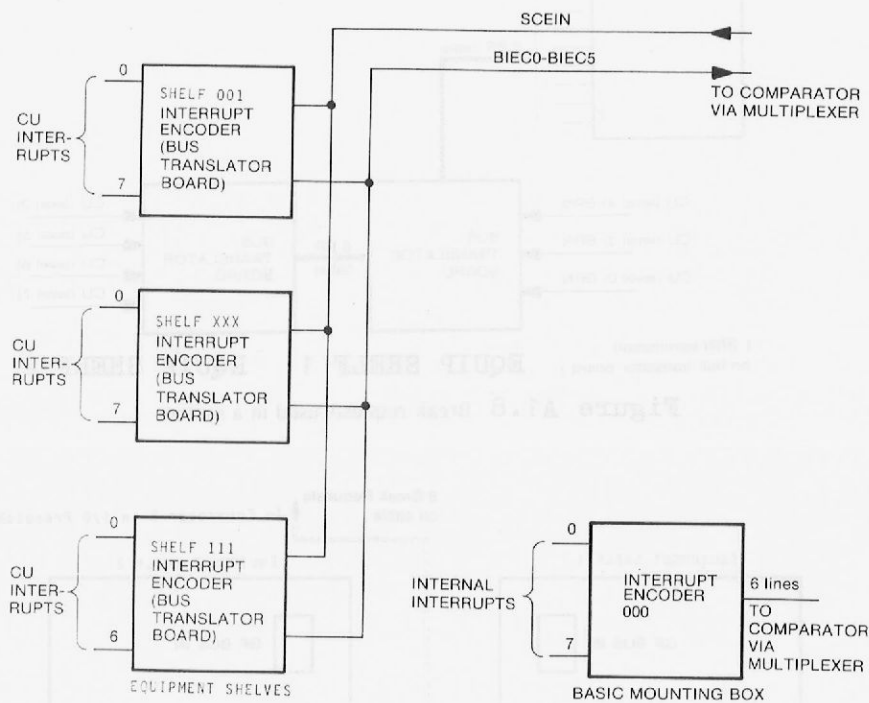


Figure A1.10 Interrupt system installation

EXTENSION BOXES INTERRUPT SELECTION

Figure A1.11 shows typical control logic for an interrupt encoder used in the extension boxes. In operation the scan external interrupt signal SCEIN is sent from the CPU at the beginning of each two instructions to scan the interrupt encoders and the 6-bit number corresponding to the highest interrupt level detected appears on the 6 BIEC lines. The diagram in Figure A1.12 shows in simplified form the box encoding section of two interrupt encoders connected to the common BIEC lines 0, 1 and 2 and for an understanding of the way the highest priority level is detected reference should be made to this diagram and to the logic diagram in Figure A1.11.

Referring to Figure A1.12 each box has a 3-bit number ABC (A is the most significant bit) which is coded using straps on each interrupt encoder at installation time. In operation when SCEIN is active the following occurs:

1. ABC is written on BIEC0-2 if at least one interrupt is present.

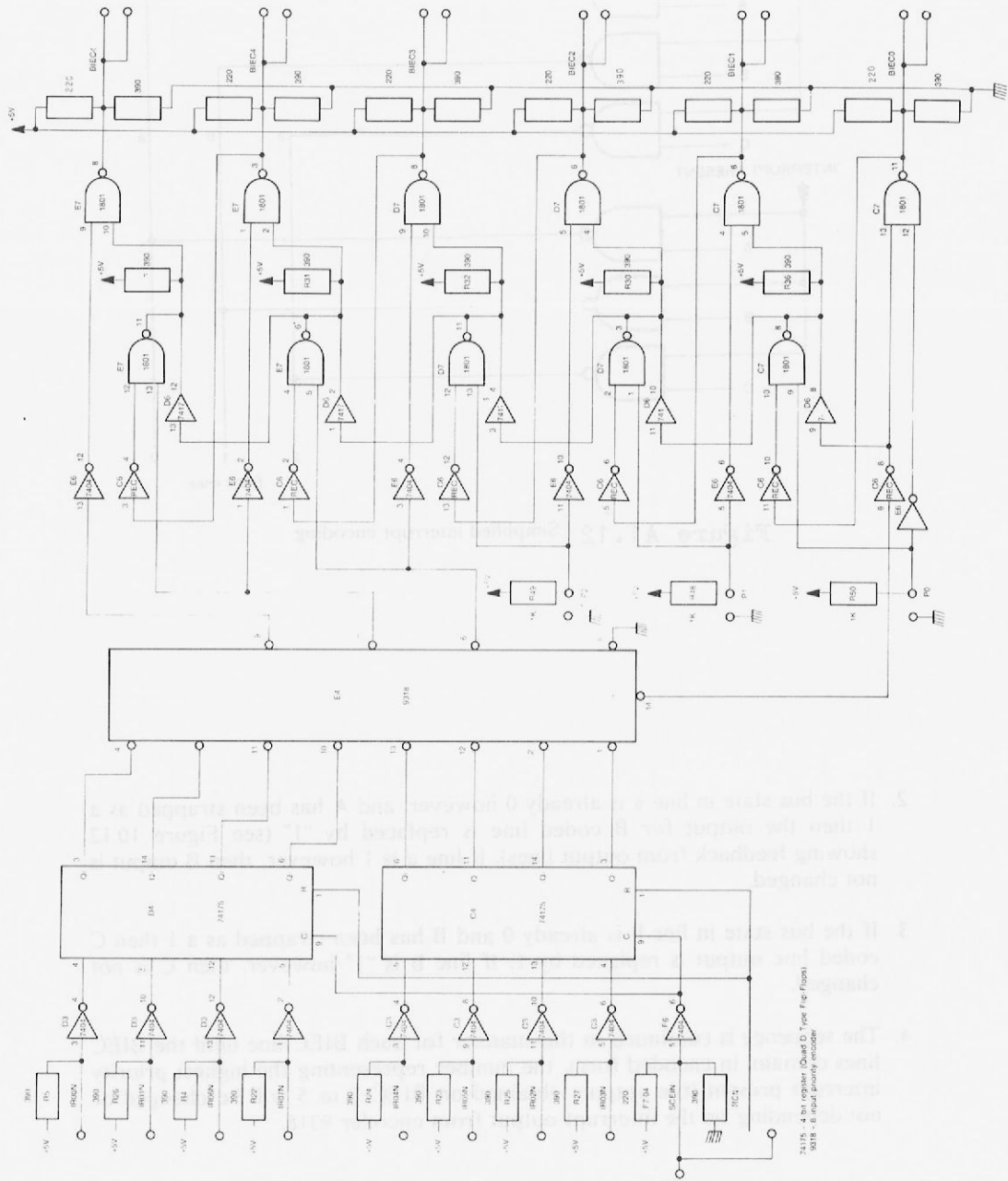


Figure A1.11 Interrupt encoding logic- bus translator

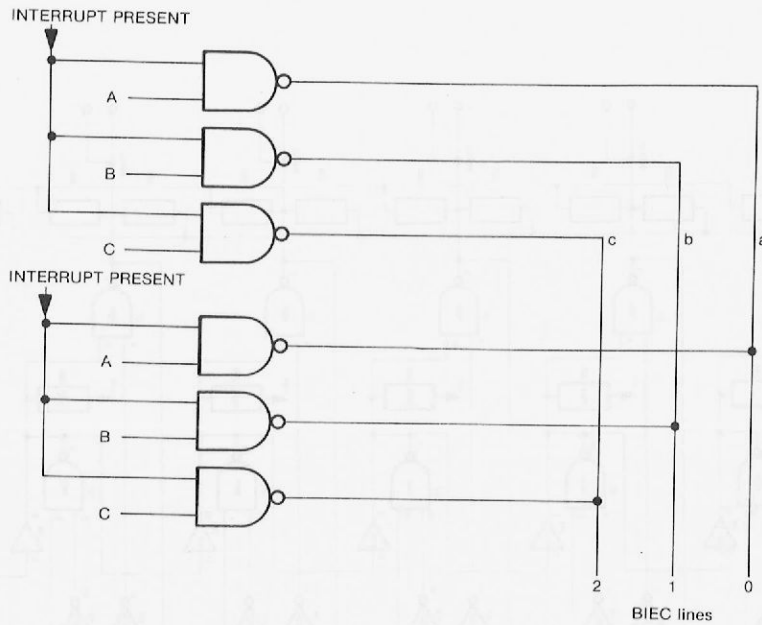


Figure A1.12 Simplified interrupt encoding

2. If the bus state in line a is already 0 however, and A has been strapped as a 1 then the output for B coded line is replaced by "1" (see Figure 10.12 showing feedback from output lines). If line a is 1 however, then B output is not changed.
3. If the bus state in line b is already 0 and B has been strapped as a 1 then C coded line output is replaced by 1. If line b is "1" however, then C is not changed.
4. The sequence is continued in this manner for each BIEC line until the BIEC lines contain, in encoded form, the number representing the highest priority interrupt present (the outputs obtained on BIEC 3 to 5 will be changed or not depending on the interrupt output from encoder 9318).

TIMING OF SCEIN SIGNAL

The diagram in Figure A1.13 shows the BIEC line signals in relationship to SCEIN. The BIEC lines are required to be stabilized within 1800 ns after SCEIN.

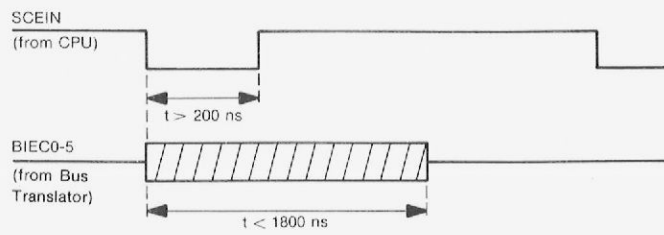


Figure A1.13. Signal SCEIN timing

TIMING OF REFIN SIGNAL

The diagram in Figure A1.13 shows the BICC bus signals in relationship to REFIN. The BICC bus signals are required to be established within 1000 ns after REFIN.



Figure A1.13 Signal REFIN timing

When using a DIOS system which is constructed on small format boards (Type 2) it is necessary to use equipment shelf P843-002 or P843-003 which incorporates a bus translator board P843-007 or 008 respectively to translate signals from the I/O bus to the GP bus. The following small format boards are available.

Control Boards

P839-050 Digital input output control unit for 2 (DIOC) gated 16-bit input words and 2 buffered output words for programmed channel connection.

P839-150 Digital input control unit for 4 gated (DIC) 16-bit input words for programmed channel connection.

P839-250 Digital output control unit for 4 (DOC) buffered 16-bit output words for programmed channel connection.

Input Option Boards for DIOC, DOC, and DIC.

Note: These boards include cable and connectors for connection to the control board.

P839-001 Input buffer board for 2 words, 16-bits each.

P839-002 Input adaptor board for 2 words, 16-bits each. Low threshold 1.5V. Input voltage level adaption. Max. voltage rating $\pm 48V$.

P839-003 Input adaptor board for 2 words, 16-bits each. High threshold 5.9V. Input voltage level adaption. Max voltage rating $\pm 48V$.

P839-004 Input isolator board for 2 words, 16-bits (IIS) each. Can be used with input buffer and input change of state detector options.

P839-005 Input buffer and change of state detector board for 2 words, 16-bits each.

- P839-006 Input buffer and adaptor board for 2 words
16-bits each, Low threshold 1.5V.
- P839-007 Input buffer and adaptor board for 2 words
16-bits each. High threshold 5.9V.
- P839-008 Input buffer, change of state detector and
adaptor board for 2 words, 16-bits each.
Low threshold 1.5V.
- P839-009 Input buffer, change of state detector
and adaptor board for 2 words, 16-bits
each. High threshold 5.9V.

Output Option Boards for DIOC, DOC, and DIC.

- P839-010 Output level adaption board for 2 words
16-bits each. No isolation. Low threshold
1.5V.
- P839-011 Output isolator and level adjustment
(OIS) board for 2 words, 16-bits each
- P839-012 Output level adaption board for 2 words
16-bits each. No isolation. High threshold
5.9V.

Physical Construction

The small format boards have the dimensions as shown in Figure A2.1. Note also that the Bus Translator is constructed on a similar board.

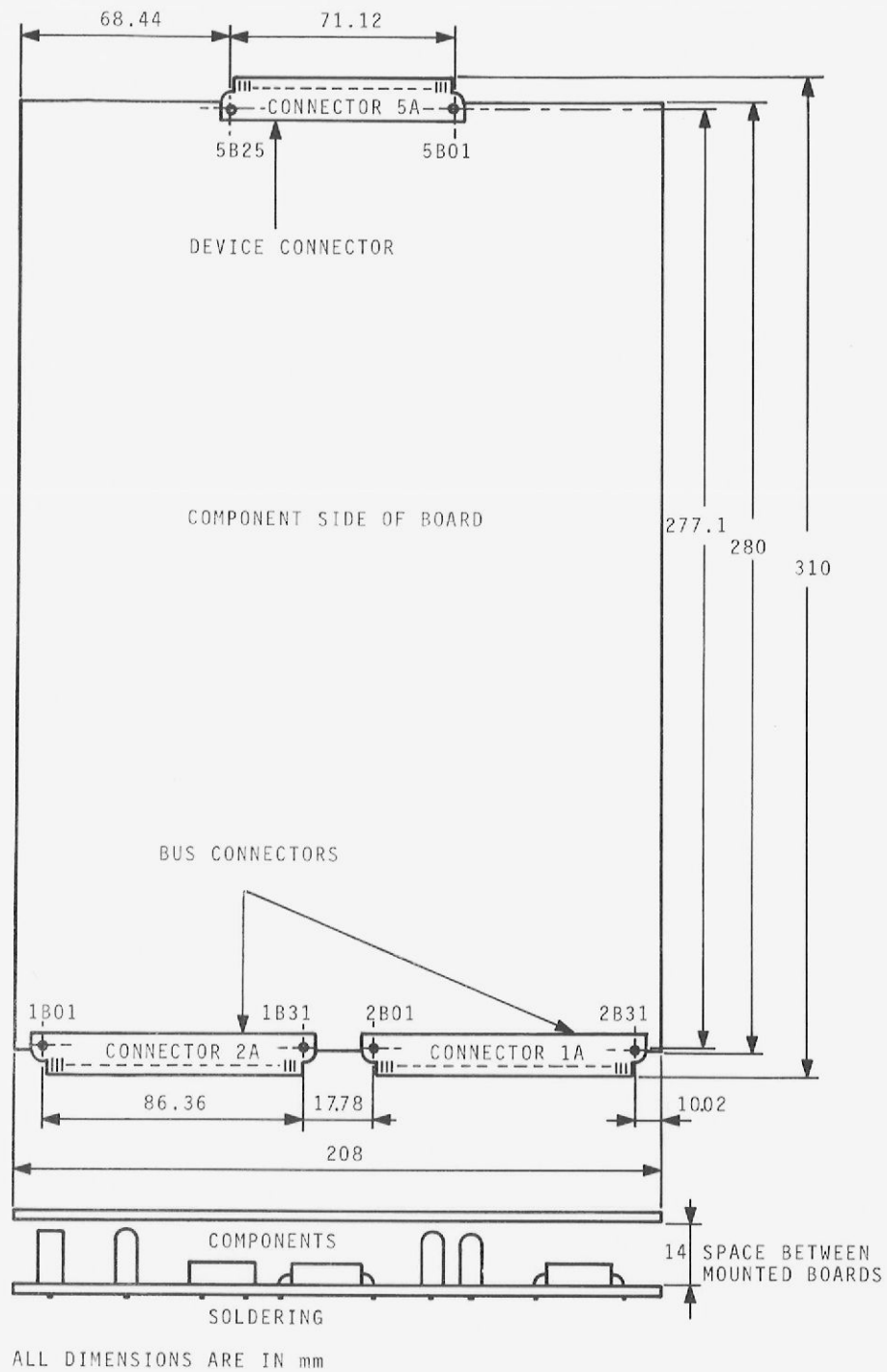


Figure A2.1. Dimensions of Small Format Board.

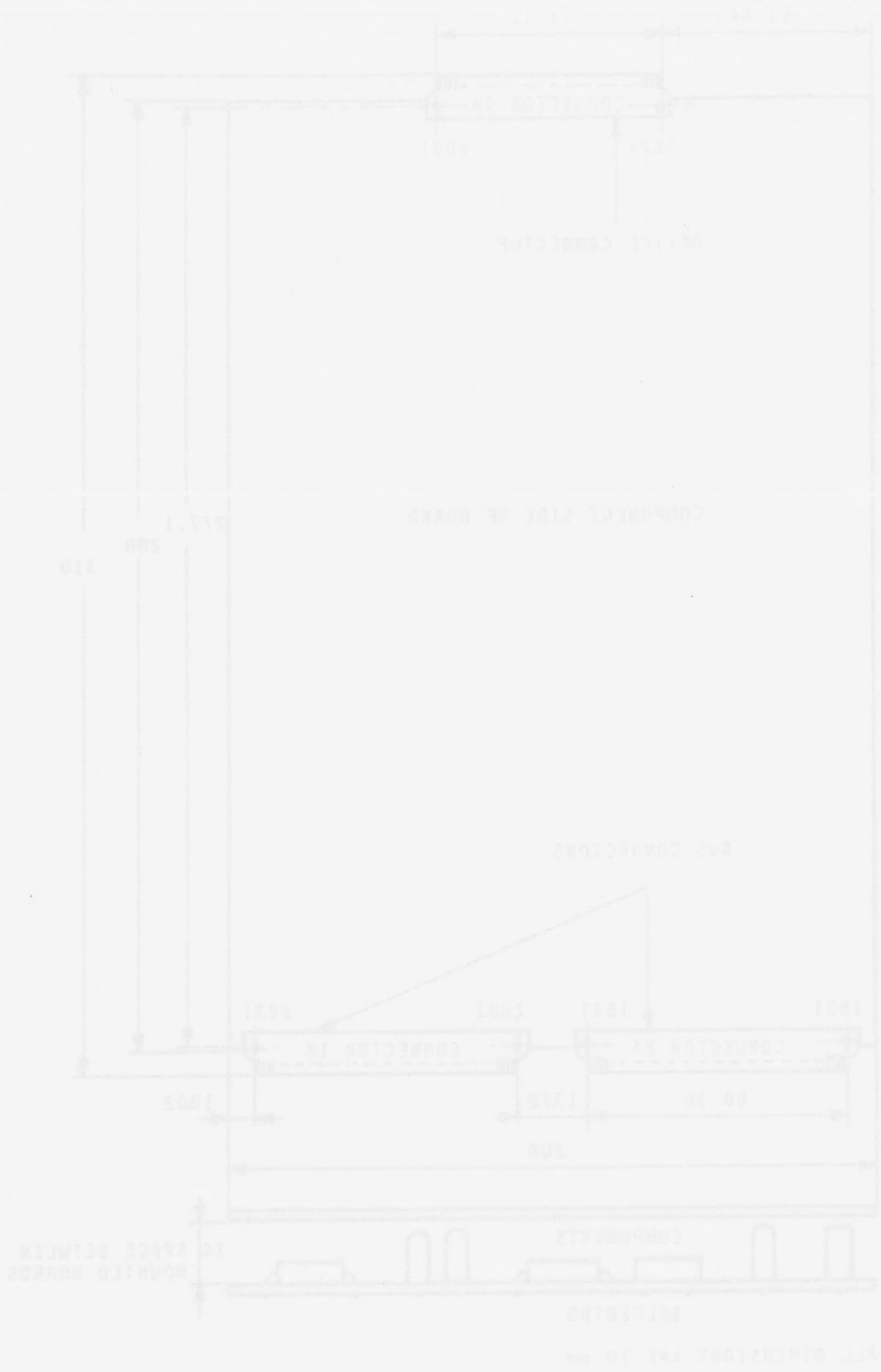
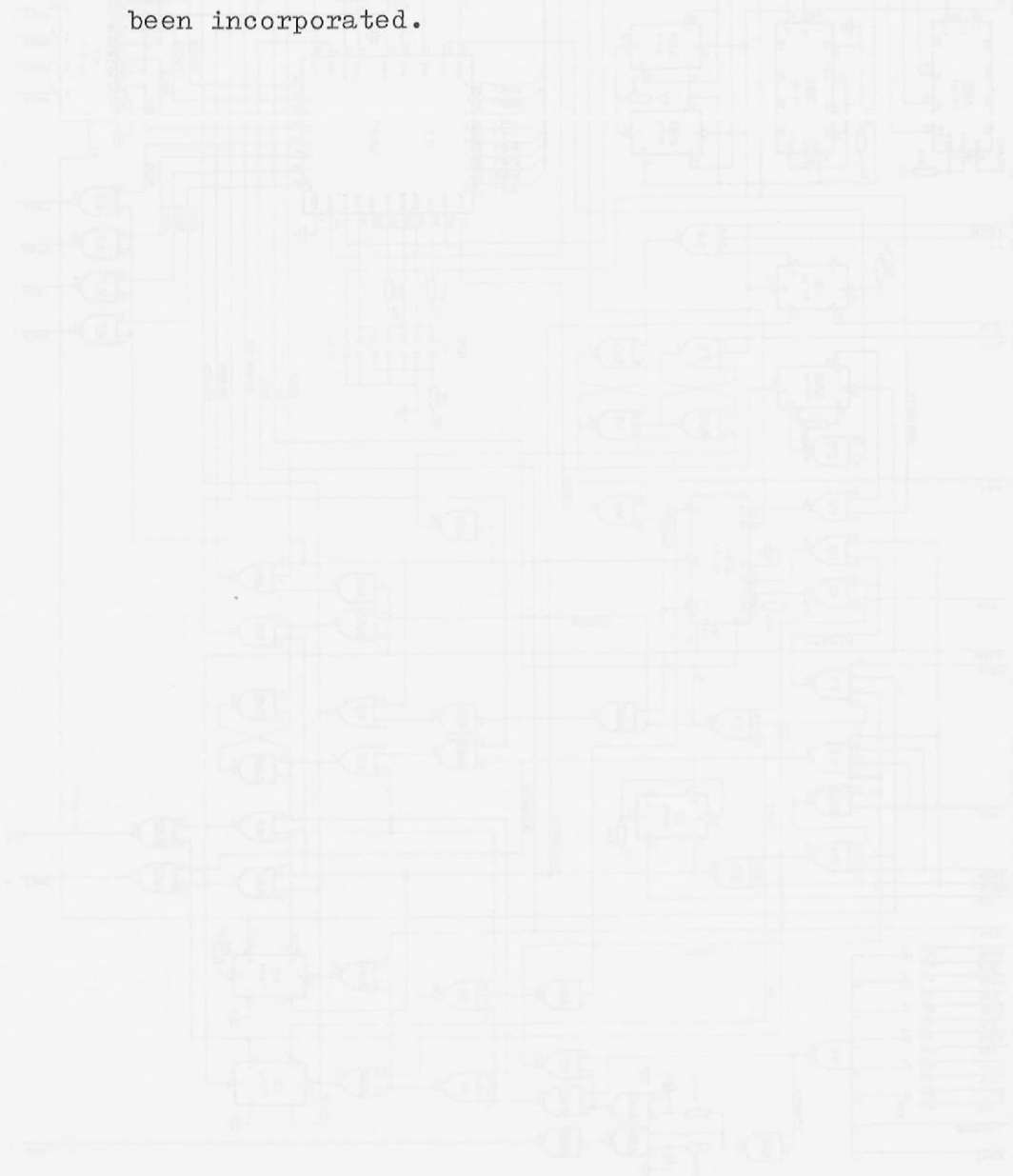


Figure A2.1. Dimensions of 2Malt format board.

On the following page is the logic diagram of the standard control unit (mounted on MCU'3 board) for a V24 Serial controller. The diagram shows how the decoding, sequencing and control flip-flops circuits dicussed in Section 1, Part 2, Chapter 3 have been incorporated.



Appendix 4 Printed Wiring Board (Motherboard)

On the following page is given an outline drawing for the printed wiring board (motherboard) into which the circuit boards mounted in the basic mounting box are plugged. The drawing shown is for the motherboard used in a Type M2 basic mounting box.

The backpanel P852M-801 is a sub assembly which includes:

- a frame with mechanical holders
- a printed circuit with the connection facility to carry the GP bus to external racks and the connection for:
 1. Six HE 901 connectors 2 x 43 pins (pitch 0.55 inch)
 2. Two connectors HE 901 2 x 37 pins, one each side of the CPU board connector 3. One connector (connector 5) is for the control panel signals and the other (connector 1) is for the ASR33 and the interrupt signals.
 3. On each side of the four lower connectors is a cutting to receive four HE 901 2 x 37 pins connectors or eight 2 x 13 pins connectors with an adaptor.

Pin connection details are given on the drawing for the control panel signals and for the ASR33 and interrupt signals to the CPU board. Further pin connection details not shown on the drawing will be found in **Section 1, Part 2, Chapter 2** of this manual.

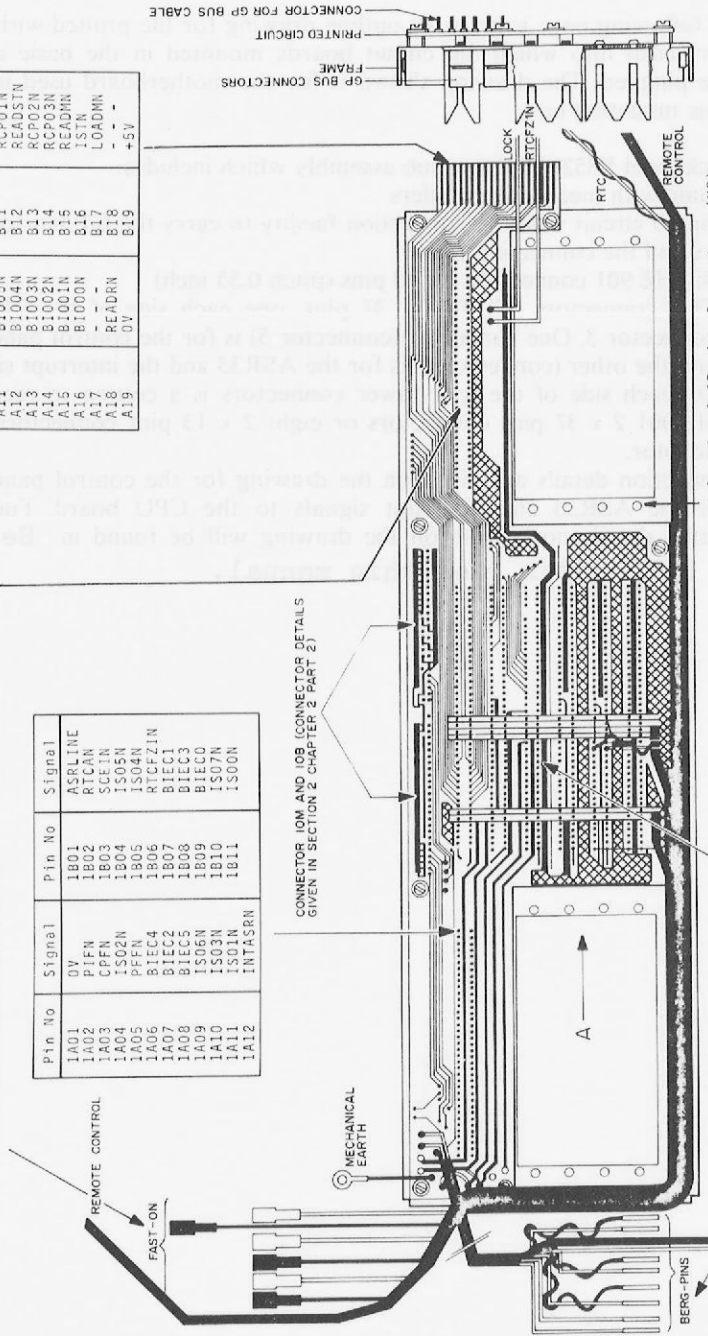
Fast-on Connector Colour Code

Colour	Signal Carried	Pin Connected to
Green	+5V	3A19
		3A20
Yellow	+16V	3A06
Blue	-5V	3B25
Red	+Dat	3B23
Black	0V	3A21
		3A22
		3A07
		3B24

Pin No	Signal	Pin No	Signal
5A29	010KEY	5B29	CPMCN
5A30	ULOCKN	5B30	TPCKEY
5A31	RUNN	5B31	START
5A32	CPINT	5B32	UNLOCKN
5A33	LOADRN	5B33	RUNN
5A34	READRN	5B34	CPINT
5A35	RCOORN	5B35	RUNN
5A36	LOADRN	5B36	RCOORN
5A37	READRN	5B37	INSTRN

Pin No	Signal	Pin No	Signal
4A1	B101N	B01	CPMCN
4A2	B101N	B02	TPCKEY
4A3	B101N	B03	UNLOCKN
4A4	B101N	B04	START
4A5	B101N	B05	RUNN
4A6	B101N	B06	CPINT
4A7	B100N	B07	RUNN
4A8	B100N	B08	RCOORN
4A9	B100N	B09	RUNN
4A10	B100N	B10	LOADRN
4A11	B100N	B11	LOADRN
4A12	B100N	B12	READRN
4A13	B100N	B13	RCOORN
4A14	B100N	B14	RCOORN
4A15	B100N	B15	RCOORN
4A16	B100N	B16	RCOORN
4A17	B100N	B17	RCOORN
4A18	READRN	B18	LOADRN
4A19	0V	B19	+5V

Pin No	Signal	Pin No	Signal
1A01	0V	1B01	ASRLINE
1A02	PIFN	1B02	RTCAN
1A03	CPFN	1B03	SCEIN
1A04	ISO2N	1B04	ISO5N
1A05	PPFN	1B05	ISO4N
1A06	BIEC4	1B06	RTCFZIN
1A07	BIEC2	1B07	BIEC1
1A08	BIEC5	1B08	BIEC3
1A09	ISO6N	1B09	BIEC0
1A10	ISO3N	1B10	ISO7N
1A11	ISO1N	1B11	ISO0N
1A12	INTASRN		



Holes for 2x37 pins Connectors (M3)
OR two 2x13 Connectors - with Adaptor

CONNECTOR 3 (CONNECTOR DETAILS GIVEN IN SECTION 2 CHAPTER 2 PART 2)

Note:

- Power distribution is made via a set of wire and bus-bars
- +5V 20A for logic
- 5V 1A and 16V 5A for Philips memories
- +18V 2A and -18V 2A for Philips Control Unit

Berg-Pins Colour Code

Colour	Signal Carried	Pin Connected to
Yellow	PMFN	3A17
Blue	RSLN	3B17
Orange	RTIC	3B01
Red	-18V	3A01
Brown	+18V	

Figure A4.1 Printed wiring board (Motherboard)

Certain I/O Cards might be delivered separately packed and therefore, to aid in identification, the following list is given containing the 12-digit part numbers with which they are marked; the last digit is shown as an 'X' because it varies with the card issue level. The cards of self-contained control units are not included.

Peripheral CU

	Type Number	Part Number
Punched Tape Reader	P801-040	5111 199 7746X
Line Printer	P810-040	5111 199 7747X
Display (V24/V28 Interface)	P845-040	5111 199 7744X
DISC Units M.H. (X2)	P824-040	5111 199 7817X
Punched Tape Reader and Tape Punch	P840-001	5111 199 7745X
Punched Tape Reader, Tape Punch and V24 devices	P840-002	5111 199 7819X
Line Printer and Card Reader	P840-003	5111 199 7818X

Data Communication

Multiple Line Control Unit SLCU2S	P847-060	5111 199 7611X
Multiple Line Control Unit SLCU 4	P847-070	5111 199 7610X
Multiple Line Control Unit ALCU 4	P846-070	5111 199 7609X
Multiple Line Control Unit ALCU 2	P846-060	5111 199 7514X
Medium Speed Line Multiplexer AMA8A	P845-060	5111 199 7531X
Medium Speed Line Multiplexer AMA8C	P845-070	5111 199 7609X
Low Speed Line Multiplexer AMA16	P844-060	5111 199 7508X
Control Module 64 lines V28CM	P844-110	5111 199 7507X

DIOS

DIOD (1W)	P837-001	5111 199 7682X
DIOD (2W)	P837-002	5111 199 7740X

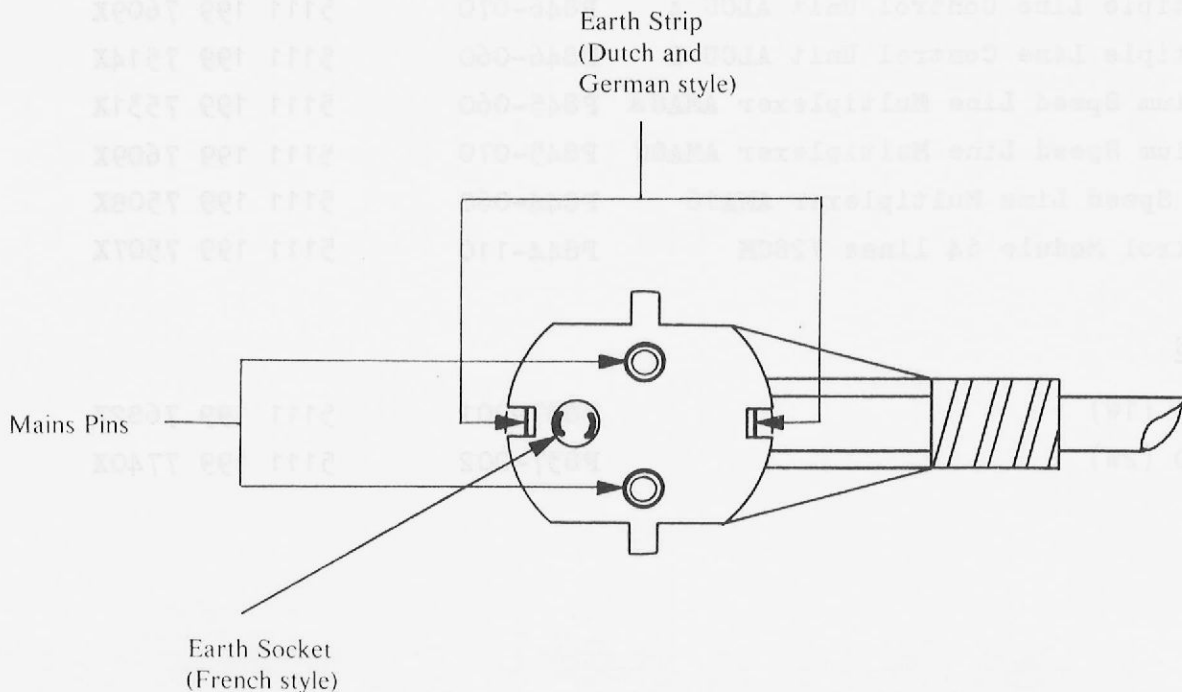
Shown below is a sketch of the versatile power plug with which the power cables are normally terminated; the plug fits most European types of single phase outlet socket.

Shielded Cables

Core size AWG 13-gauge - cross section 1.91 mm^2

Green/Yellow	}	Earth
Blue (neutral)		Mains
Black (line)		

General European Plug



The following pages provide an example of the Configuration Sheets which accompany the equipment when it is delivered.

The first page is merely an invoicing sheet.

Next are parts lists specifying the major items in the system, including I/O cards and logic options, together with the 12 digit part numbers.

The parts lists are followed by drawings showing the I/O and logic card locations, rack configuration and connections for the equipment.

The set concludes with sheets giving wiring interconnection and signal cable details.

CPD-DEM *12/75* FACTORY ORDER DATE 16/10/75 PAGE 1 OF 6 COVER NUMBER: 03446-01 27 OCT 1975

TYPE: PARAM 6045

C.T.I.
12 NOV 1975

ORDER: FLYEM SPIERVERKET A/S.
P.O. BOX 42.
3001 POSTGRUNN,
NORWAY.

FROM ADDRESS: APFLDOORN
TO ADDRESS: APFLDOORN

ORDER REFERENCE: 5132 DATED: 75/10/03

TEST DATES: PHASE I REQUESTED 550 CONFIRMED 549 12NG OF PHASE: 5/11 150 372/0
Phase II 612

KS1

PRODUCTION: MR. M. DELAVALLÉE.
PARQUILLET.

AUTHERENTÉ BY
R. VAN NESTE
J. GAMBART 4
28/10/75

SUPPERSEDES FG-NR: PHILIPS-ELECTROLOGICA APFLDOORN DEPT: P.P.S.C.

SPECIMEN

QUANTITIES PER INSTALLATION PHASE		JOB ORD	EST TYPE NUMBER:	COMMERCIAL DESCRIPTION :	CORRESPONDING MASTER NUMBER 12NC NUMBER:	0 K 3 L K W U W 8 8346 01 REMARKS:
--------------------------------------	--	------------	---------------------	-----------------------------	---	--

PHASE	QTY	UNIT	DESCRIPTION	12NC NUMBER
1	1	M	P856 M403 P856 M400	5III 199 74950
			Telescopic slides	5III 199 74910
			Identification label	5III 100 II602
			Remote Cont. cable 3m	5III 199 77490
			MEMORY MODULE 8K I, 2u	43II 027 7306I
			Configuration label	5III 100 23220
			MEMORY MODULE 16K I, 2u	5III 199 76240
			MEMORY MODULE 16K O, 7u	5III 199 74900
			P856 M10_ P856 M100	5III 199 74960
			Telescopic slides	5III 199 79360
			Identification label	5III 100 II602
			Remote Cont. cable 3m	5III 199 77490
			MEMORY MODULE 8K I, 2us	43II 027 7306I
			Configuration label	5III 100 23210
			MEMCRY MODULE 16K I, 2u	5III 199 76240
			MEMORY MODULE 16K O, 7u	5III 199 74900
			P85_ MO08 MEMORY MODULE 8K I, 2us	43II 027 73060
			P85_ MO16 MEMORY MODULE 16K I, 2u	5III 199 76240 or 4322 027 69690
1	1		P856 MO16 MEMORY MODULE 16K O, 7u	5III 199 74900
			P85_ MO20 Multiplex card	5III 199 79330
			Standard cable breaks3	5III 199 79630
			Connector holder	5III 100 I954I
			Connector 2x13 pins	24II 029 II20I
			Screw CM3x10	4x2522 002 4I099
			Packing	5III 199 78220
			Strap	8x5III 199 88410

SPECIMEN

2/6

PHILIPS

à des fins...
 8 des fins...
 toutes...
 sans...

Page 1 de 120 pages de liste
 50 Avenue...
 92 100 Paris 16e

Document...
 any from...
 without...
 the...

OR...
 2446 01

QUANTITIES PER INSTALLATION PHASE					MOD.	LST	COMMERCIAL	CORRESPONDING MASTER NUMBER		12NC NUMBER:	REMARKS:	CLASS NO:
PH0	PH1	PH2	PH3	PH4	QTY	CRD.	TYPE NUMBER:	DESCRIPTION :				
							P 849 010	RACK EXTENSION 4 CARTES EMBALLAGE KIT FIXATION CABLES	5111 199 82260 5111 199 82730 5111 199 79960			
							P 849 011	RACK EXTENSION 22 CARTES MON CABLE EMBALLAGE KIT FIXATION CABLES	5111 199 82690 5111 199 82720 5111 199 79940			
							P 649 013	RACK EXTENSION 22 CARTES EMBALLAGE KIT FIXATION CABLES	5111 199 84840 5111 199 82720 5111 199 79240			
							P 849 018	RACK EXTENSION 11 CARTES EMBALLAGE KIT FIXATION CABLES	5111 199 82780 5111 199 82720 5111 199 79950			
							P 849 019	RACK ALIMENTATION MODULAIRE EMBALLAGE	5111 199 84660 5111 199 82730			
							P 849 016	CABINET 36 U - 19 POUNCES EMBALLAGE	5111 199 83040 5111 199 81240			
							P 849 116	CABINET EXTENSION 36 U - 19 POUNCES EMBALLAGE	5111 199 83030 5111 199 81240			
	1				1		P 849 017	CABINET 36 U - 19 POUNCES EQUIPE EMBALLAGE KIT BASIC SPARE PARTS GLISSIERES TELESCOPIQUES	5111 199 81610 5111 199 81240 5111 199 81130 5111 199 82960			
							P 849 117	CABINET EXTENSION 36U - 19 POUNCES EMBALLAGE KIT BASIC SPARE PARTS	5111 199 81620 5111 199 81240 5111 199 81130			
							P 849 040	ENSEMBLE 2 VENTILATEURS	5111 199 82850			
							P 849 041	ENSEMBLE 4 VENTILATEURS	5111 199 82860			
							P 849 042	POWER DISTRIBUTION PANEL 10A KIT BASIC SPARE PARTS	5111 199 83000 5111 199 81170			
							P 849 043	POWER DISTRIBUTION PANEL 25A KIT BASIC SPARE PARTS	5111 199 83010 5111 199 81170			
							P 849 044	GLISSIERES TELESCOPIQUES ADAPTATION	5111 199 82980			
							P 849 045	GLISSIERES TELESCOPIQUES POUR PHD	5111 199 82590			
	2				2		P 849 046	PANNEAU 1 U	5111 199 82870			
	1				1		P 849 047	PANNEAU 3 U	5111 199 85260			
	1				1		P 849 048	PANNEAU 5 U	5111 199 85250			
							P 849 049	PANNEAU 7 U	5111 199 85240			
							P 849 002	GENERAL PURPOSE CARD	5111 199 85000			
							P 849 005	CONNECTEUR MALE (PERIPHERIQUE)	5411 029 11032			
							P 849 006	CONNECTEUR FEMELLE EQUIPE	5111 199 81220			
							P 849 012	GENERAL PURPOSE CARD INTERFACE	5111 199 82030			
							P 849 035	CONNECTEUR MALE (COTE I/O BUS)	5411 029 11033			
							P 849 036	CONNECTEUR FEMELLE FOR IIS	5411 029 11024			
							P 849 015	I/O EXTENDER, INCLUS CABLES 5M	5111 199 82570			
							P 849 115	I/O EXTENDER AVEC CARTE INTER INCL CABLES DE 5M	5111 199 81210			
							P 849 215	CABLES ET BOITIERES POUR LESS SIGNA	5111 199 80130			
							P 849 315	I/O EXTENDER INCLUS CABLE 5M (P850)	5111 199 79450			
							P 849 031	I/O EXTENDER DMA INCL CABLES 5M	5111 199 85690			
							P 849 003	PROLONGATEUR DOUBLE	5111 199 82680			
							P 849 004	PROLONGATEUR SIMPLE	5111 199 82690			
							P 849 050	CONTROL PANEL PORTATIF POUR P850 M	5111 199 80030			
							P 849 055	CONTROL PANEL PORTATIF POUR P850M	5111 199 79390			

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QUANTITIES PER INSTALLATION PHASE				MOD.	LST	COMMERCIAL	CORRESPONDING MASTER NUMBER	12NC NUMBER:	REMARKS:	PART NO:
PH1	PH2	PH3	PRIORITY	QTY	ORD.	TYPE NUMBER:	DESCRIPTION :			
						P 852M 016	Memory module 16K Packing	8222 297 0793 5111 199 7822		
1				1		P 843M 020	Multiplex card Cable for break Connector holder Connector 2 x 13 pins Screw CM 3 x 10 Packing	5111 199 7933 5111 199 7963 5111 100 1954 2411 029 1120 2522 002 41099 5111 199 7822	if extension	
1				1		P 843M 052	Integrated circuit 1821 Female plug F088	5111 010 0182 2422 024 88003		
						P 852M 030	Mini panel Control panel	5111 199 7577 5111 199 8145		
						P 849 052	Portable control panel	5111 199 7757		
						P 843 025	General purpose card Packing	5111 199 7938 5111 199 7822		
						P 843 026	C P Card with hole pattern Packing	5111 199 8251 5111 199 7822		
						P 843 021	Female connector 74 pins 2 x Screw CM 3 x 10 2 x Washer Z3 U	2411 029 11024 2522 002 41099 2511 618 37003		
						P 843 022	Female connector 26 pins Connector holder 4 x Screw CM 3 x 10 4 x Washer Z3 U	2411 029 11204 5111 100 19541 2522 002 41099 2511 618 37003		
						P 843 027	10 x Circuit intégré REC 0612 10 x Circuit intégré 1801	5111 010 00612 5111 010 01801		
						P 843 035	Extender board Packing	5111 199 7802		
						P 843 135	Extender board Cepd ADAP	5111 199 7801 5111 199 7793		
1				1		P 824 040	Control unit Strap Packing	5111 199 7817 5111 199 8841 5111 199 7822	x if extension	
						P 824 001	Disc x 1215.001	5111 199 7748		
1				1		P 824 002	Disc x 1215.002	5111 199 7991		
1				1		P 824 100	Cartridge for X 1235	5122 021 0225		
1				1		P 833 001	Cassette type EIA A-35	5111 199 0043		

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QUANTITIES PER INSTALLATION PHASE					MOD.	LST.	COMMERCIAL	CORRESPONDING MASTER NUMBER		12NC NUMBER:	REMARKS:	MARK NO:
PH0	PH1	PH2	PH3	PH4	QTY	QTY	TYPE NUMBER:	DESCRIPTION :				
							P 840 003	Control unit <u>LP CK</u> 2 Straps Packing	<u>MCU2</u>	5111 199 7810 5111 199 8641 5111 199 7822	if extension	
							P 006 101	Card Reader M200		5111 199 8010		
							P 810 040	Control unit <u>LP</u> Strap Packing		5111 199 7747 5111 199 8041 5111 199 7822	if extension	
							P 809 <u>002</u>	Line printer x 1415		<u>5111 199 7658</u>		
							P 810 001	Line printer DP 2310		5111 199 8568		
							P 811 001	Line printer DP 2420		5111 199 8569		
							P 812 001	Line printer DP 2440		5111 199 8430		
							P 801 040	Control unit <u>PTR</u> Strap Packing		5111 199 7746 5111 199 8041 5111 199 7822	if extension	
							P 840 001	Control unit <u>PTR PTP</u> 2 Strap Packing	<u>MCRP</u>	5111 199 7745 5111 199 8041 5111 199 7822	if extension	
							P 840 002	Control unit <u>PTR PTP V24</u> 3 Straps Packing	<u>MCU3</u>	5111 199 7819 5111 199 8041 5111 199 7822	if extension	
							P 801 001	PTR 333		5111 199 8434		
							P 802 001	PTR 600		5111 199 8435		
							P 803 001	PTP 75		5111 199 8432		
							P 804 001	PTP 150		5111 199 8431		
							P 818 040	Control unit <u>V 24</u> Strap Packing		5111 199 7744 5111 199 8041 5111 199 7822	if extension	
							P 841 001	ASR 33		5111 199 8330		
							P 841 002	ASR 35		5111 199 8329		
							P 841 003	KSR 33		5111 199 9827		
							P 841 004	KSR 35		5111 199 9826		
							P 832 001	Character printer (V 24)		5111 199 7947		
							P 842 002	Character printer (TTY)		5111 199 7705		
							P 837 001	DIGD 1W		5111 199 7682		
							P 837 002	DIGD 2W		5111 199 7740		
							P 843 010	Stabilizer RG 1 Restifier RD 1 Packing for RD 1 Packing for RG 1		5111 199 8716 5111 199 6511 5111 199 8129 5111 199 7000		

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