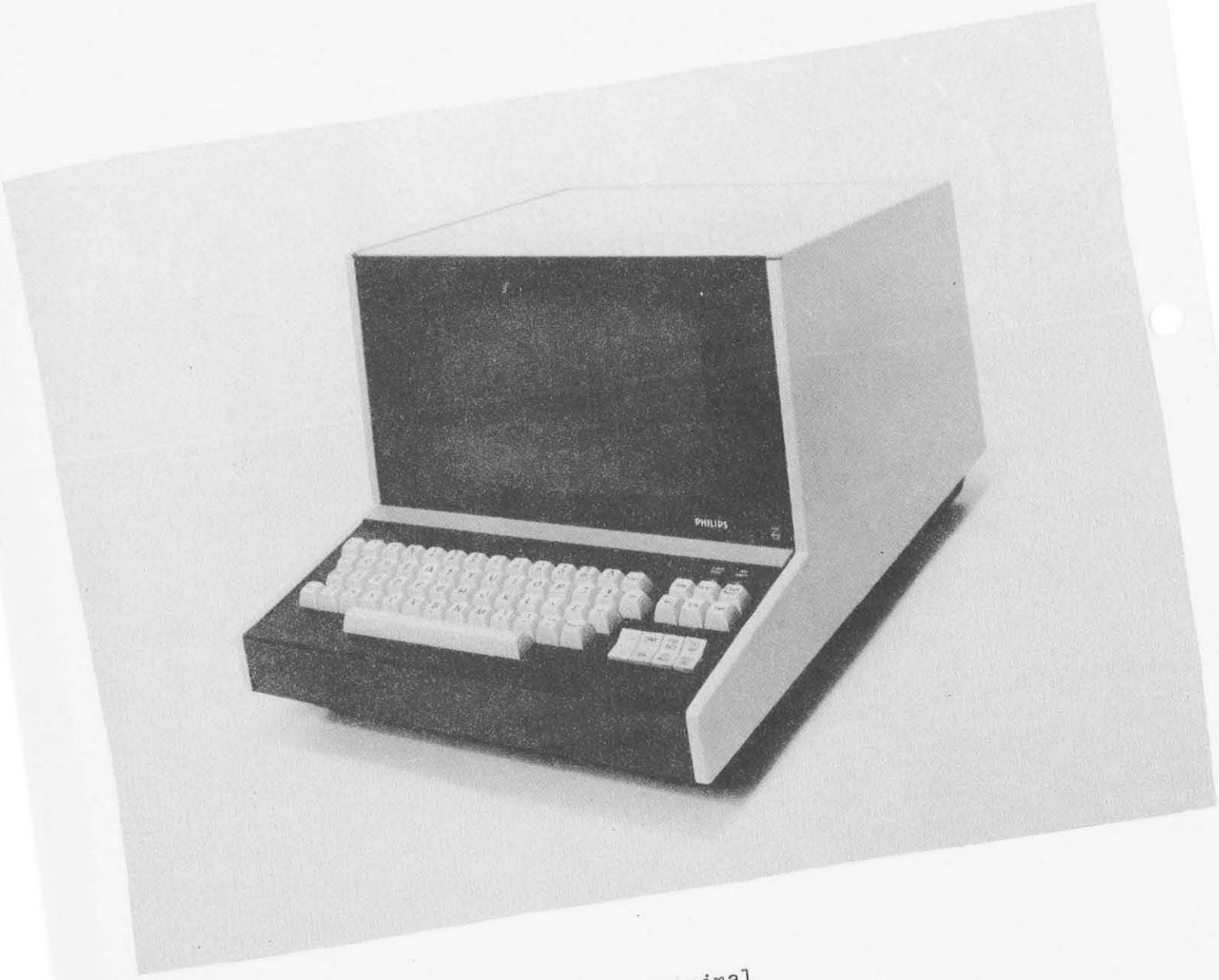
PART3 — PERIPHERALS



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 relevent 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/C 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 permissable 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. ± 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 ($^{11}/_{16}$ 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 ($23\frac{1}{16}$inches)
Height	413 mm ($16\frac{1}{4}$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. ± 10%
Frequency	60 ±2 or 50 ± 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 ±8 g/m^2) complying with DIN 66018 specifications.
Length	187.32 ± 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 ± 0.01 mm (0.007 ± 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.±10%
Frequency	50 ± 2 or 60 ± 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. ± 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. ± 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 ±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.
Humidty - 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. ±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. ±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. ± 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. ±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)

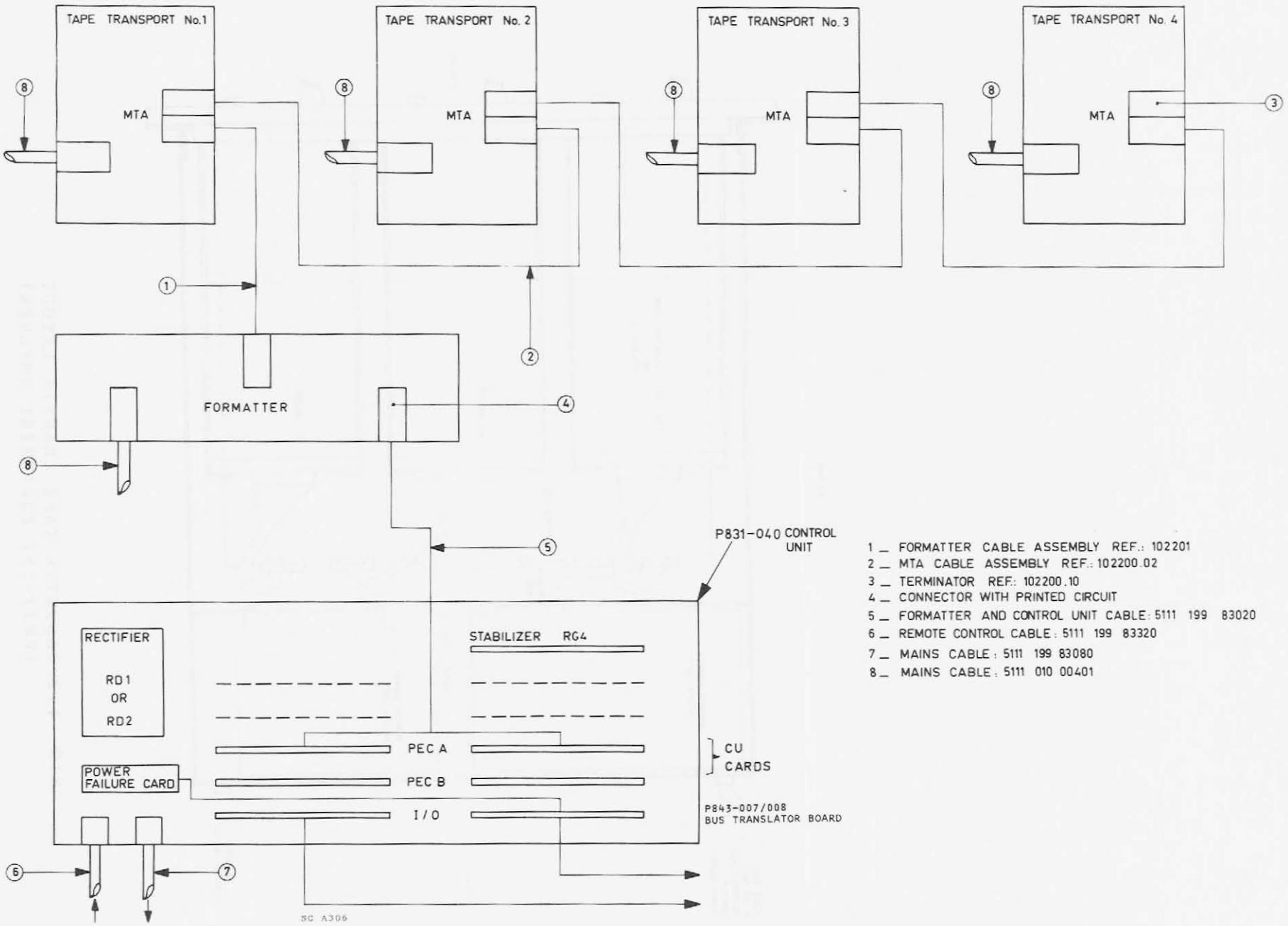
Signal Cable	
Standard length	1 m (1.1. yard)
Power Requirements	
Voltage	24 volts d.c. ± 5%
Current	1.5 amperes peak 850 milliamperes steady state. Note: The 24 volt d.c. supplies are provided by the P833-152 equipment shelf (see Figures 1.2 and 1.3).
Electrical Safety	Protection class I
Environmental 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. ±10%
Frequency	50 ± 2 or 60 ± 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. ± 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

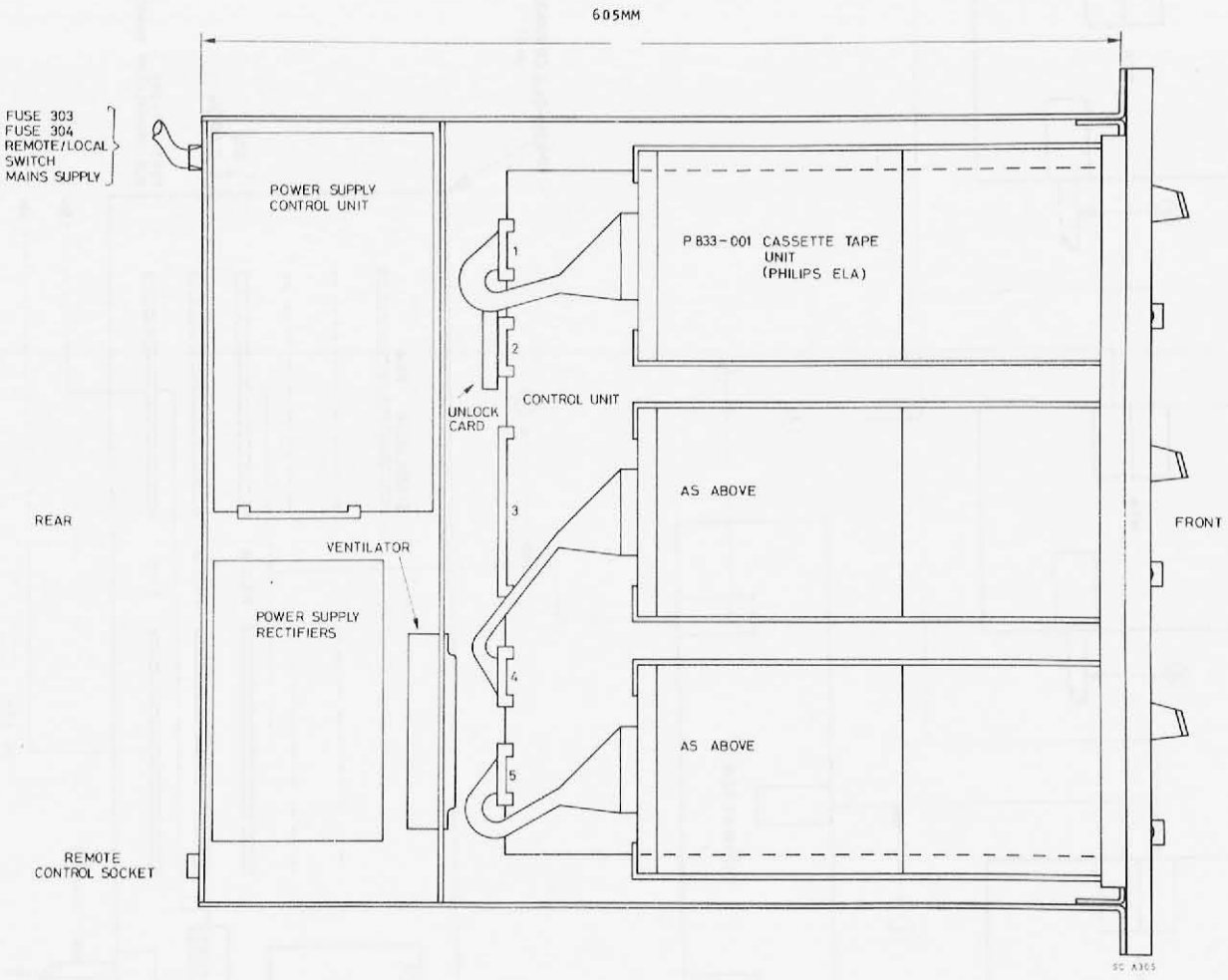


FIG. 1.2 CASSETTE TAPE CHASSIS LAYOUT
(P833-152 EQUIPMENT SHELVES)

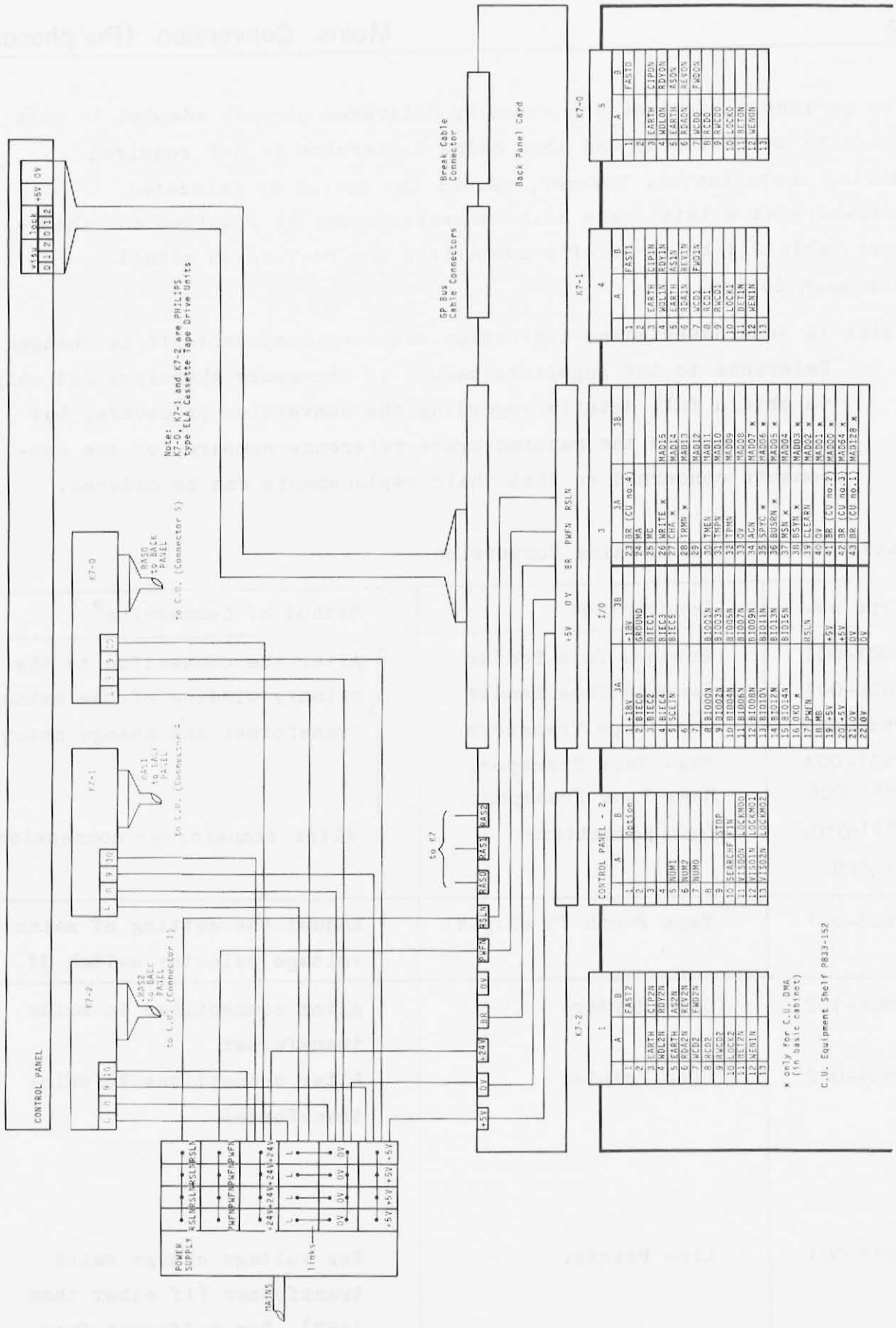


FIG. 1.3 CASSETTE TAPE CHASSIS CIRCUIT (P833-152 Equipment (Shelves)

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
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	Alter transformer connections
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 tappings 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. tappings 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 tappings 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.