Customer Engineer Manual
P3500/P3800

PHILIPS Data Systems

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Great care has been taken to ensure that the information
contained in this handbook is accurate and complete.
Should any errors or omissions be discovered, however,
or should any user wish to make a suggestion for improving
this handbook, he is invited to send the relevant details to:

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REFERENCES TO OTHER MANUALS:

- Printer P5360 (TEC F10-40)   FSM P5000 Chapter 13 / 5122 991 2937*
- Printer P2121 (TEC)   FSM P2000 / 5122 991 3070*
- Printer P2123 (EPSON)   FSM P2000 / 5122 991 3070*
- General Printer   CEM GP 5122 991 3329*

LIST OF ABBREVIATIONS

A.C.	Alternating Current
ASSH	Automatic Single Sheet Handler
b.p.s.	bits per second
BBU	Battery Back-up Unit
CDC	Control Data Corporation (brand name)
c.p.i.	characters per inch
c.p.s.	characters per second
CRT-CO	Cathode Ray Tube - COntroller
CS	Continuous Stationary
CUA	Control Unit Address
DC	Data Communication(s)
D.C.	Direct Current
DIMO	DIsplay MOdule (old name for Terminal)
FDD	Flexible Disc Drive
FF	Front Feed device
FIXCO	FIXed disc COntroller
FLEXCO	FLEXible disc COntroller
FXD	FiXed Disc drive
H/S	Hardware/Software
KB	KeyBoard
MFI	Mains Filter
MODEM	MOdulator/DEModulator
N.A.	Not Applicable
N.S.O.	National Sales Organisation
PCB	Printed Circuit Board (assemby)
PME	Processor Memory Extension
PMU-xx	Processor Memory Unit-xx
PS	Power Supply
PSU	Power Supply Unit
PUC	Philips Universal Connector
RS	Relay Set
SAS-EX	SASI EXternal
SASI	Shugart Associates System Interface
SESCO	SEcondary Storage COntroller
SCSI	Small Computer System Interface
STOMO	STOrage MOdule (old name for System Cabinet)
T.B.F.	To Be Fixed
T.B.S.L.	To Be Supplied Later
TEC	Tokyo Electric Company (brand name)
TF	Tractor Feed device
V	Volt
VDU	Visual Display Unit
WS	WorkStation
XEBEC	(brand name)

1   ·SYSTEM SPECIFICATION

1.1 CONFIGURATIONS

1.1.1 P3500 SYSTEM CABINET WITH SASI-FLEXCO

04534 A

1.1.2 P3500 SYSTEM CABINET WITH SESCO

04534 B

1.1.3 P3500 SYSTEM CABINET WITH DUAL FLEXIBLE DISC
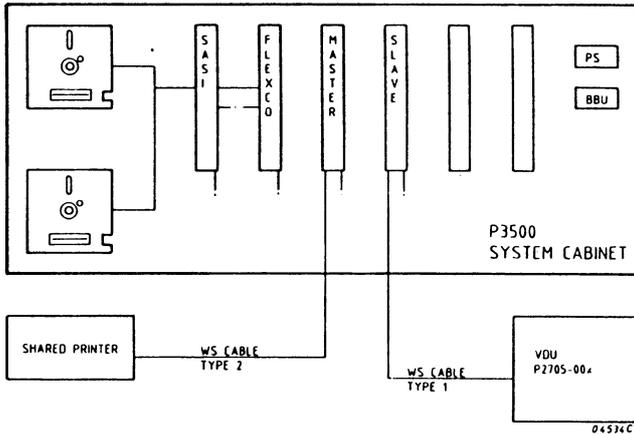
1.1.4 P3500 SYSTEM CABINET WITH EXTENSION UNIT
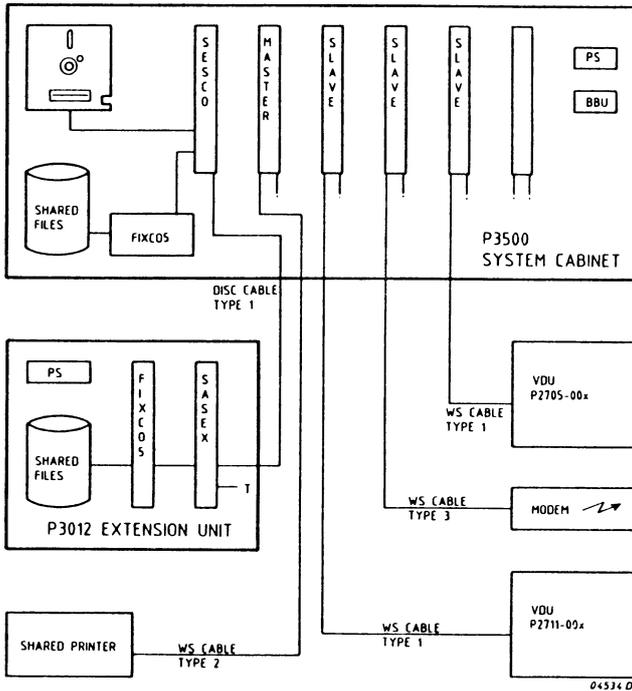
1.1.5 P3800-03 SYSTEM CABINET (60M)
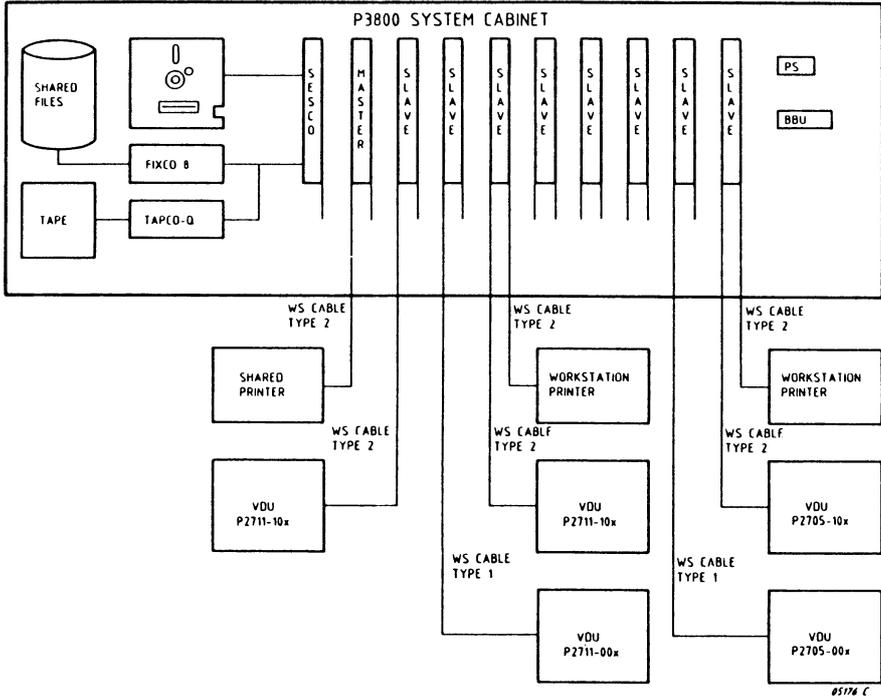
1.1.6 P3800-04 SYSTEM CABINET (10M)
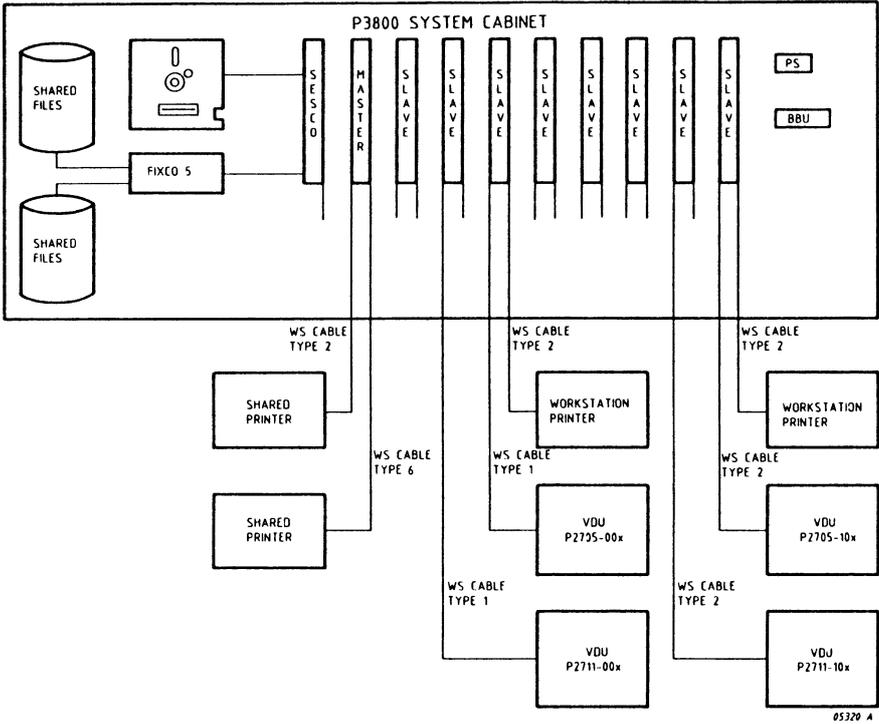
1.1.7 P3800-03 SYSTEM CABINET WITH EXTENSION UNITS
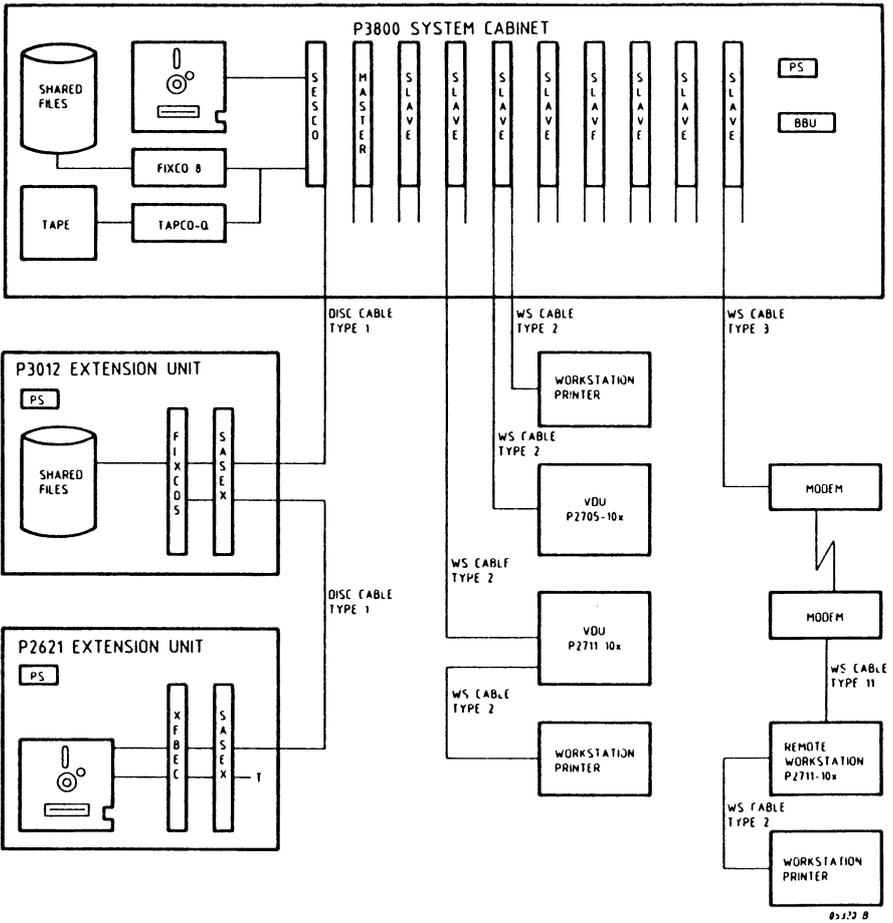
1.2 COMMERCIAL TYPE NUMBERS P3500 UNITS

The National Sales Organisations should provide
the commercial 12NC numbers for those items they
do support.

Commercial Typenumber	Description	Release 1/2	3/4
CENTRAL UNITS			
	Dual Flex. Disk System 2x640 kB (FLEXCO) (excl. BBU)	*	
	Dual Flex. Disk System 2x640 kB (excl. BBU)	*	
	Fixed Disk System 10 MB, 1x640 kB (FLEXCO) (excl. BBU)	*	
	Fixed Disk System 10 MB, 1x640 kB (excl. BBU)	*	
	Dual Flex. Disk System 2x640 kB (FLEXCO)	*	
	Dual Flex. Disk System 640 kB (FLEXCO)	*	
	Fixed Disk System 10 MB, 1x640 kB	*	
	Fixed Disk System 10 MB	*	
	Fixed Disk System 5 MB, 1x640 kB (excl. BBU)	*	
	Fixed Disk System 5 MB, 1x640 kB (FLEXCO)	*	
	Fixed Disk System 5 MB, 1x640 kB	*	
P3500	Fixed Disk System 5 MB, 1x640 kB (FLEXCO) (excl. BBU)	*	
	Dual Flex. Disk System (excl. BBU, excl. fan) 2x640 kB	*	
	Dual Flex. Disk System (excl. BBU, (FLEXCO) excl. fan) 2x640 kB	*	
	Fixed Disk System 10 MB Rodime	*	
	Dual Flex. Disk System (excl. BBU, excl. fan) 2x320 kB	*	
	Dual Flex. Disk System (excl. BBU) 2x320 kB	*	
	Dual Flex. Disk System (excl. BBU, (FLEXCO) excl. fan) 2x320 kB	*	
	Dual Flex. Disk System (excl. BBU) (FLEXCO) 2x320 kB	*	
	Dual Flex. Disk System Rel.3/4		*
	Fixed Disk System 10 MB Rel.3/4 (SEAGATE)		*
	Fixed Disk System 10 MB Rel.3/4 (RODIME)		*
P3800-03	CU 60 MB, Streamer, No Disk		*
P3478-003	Fixed Disk Drive 60 MB		*
P3800-04	CU 10 MB, MFD 640 kB, FXD 10MB, No Streamer		*
P3500 OPTIONS			
P3030-70	Fan for P3500 Central Unit	*	
P3030-72	Battery Back-up for P3500 Centr. Unit	*	
P3030-071	Low Noise Kit - P3500 CU		*
P3530-80	Upgrade Kit Rel. 3/4 - P3500 CU		*
P3800 OPTIONS			
P3545	Cartridge Streamer Drive 20 MB		*
P3700-30	Tape Streamer Contr. TAPCO-Q		*
P3810-02	Mounting Acc. Tape Streamer		*
P3411	Fixed Disk Drive 10 MB 5¼"		*
P3810-03	Mounting Acc. 2nd FXD 10 MB 5¼"		*
P3700-82	Power Supply AOC 12V		*
P3012-30	Extension Unit FXD 5 MB	*	
P3012-33	Extension Unit FXD 10 MB		*
P3013-12	Extension Unit Tape Streamer		*
PROCESSOR CARDS			
P3030-10	Processor Card 8 Bit PMU 80-1V	*	*
P3030-11	Processor Card 8 Bit PMU 80-3V		*
P3030-12	Processor Card 16 Bit PMU186-1V		*
TELETEX ADAPTOR			
X3710-01	Single Flex. Disk System TTA		*
X3710-11	Second MFD Drive 320 kB - TTA		*

COMMERCIAL TYPE NUMBERS P3500 UNITS (CONT'D)

-2-

Commercial Typenumber	Description	Release 1/2 3/4
Workstations		
P2705-001	WS Display Unit Amber, 12"	*
P2705-002	WS Display Unit Green, 12"	*
P2705-101	WS Display Unit Amber, 12" (220V)	*
P2705-102	WS Display Unit Green, 12" (220V)	*
P2705-101	WS Display Unit Amber, 12" (240V)	*
P2705-102	WS Display Unit Green, 12" (240V)	*
P2711-001	WS Display Unit Amber, 15"	*
P2711-002	WS Display Unit Green, 15"	*
P2711-101	WS Display Unit Amber, 15"	*
P2711-102	WS Display Unit Amber, 15"	*
P2712-001	WS Display Unit Amber, 15"	*
P2712-002	WS Display Unit Green, 15"	*
	Upgrading kit P2712 / P2711	*
P2710-006	Swivelstand for P2711	*
P2756-005	Swivelstand for P2711	*
P2841	Alphanumeric Keyboard Version *)	*
P2841	Alphanumeric keyboard version *)	*
PRINTERS		
P2932	WS Printer 120 cps 340 mm	* *
P2933	WS Printer 300 cps 340 mm	* *
P2934-003	WS Printer 300 cps 400 mm	* *
P5360-02	Daisywheel Printer 40 cps (TEC)	* *
P2908-01	Matrix Printer FX- 80 220V	*
P2908-02	Matrix Printer FX- 80 240V	*
P2909-01	Matrix Printer FX-100 220V	*
P2909-02	Matrix Printer FX-100 240V	*
GP PRINTER OPTIONS		
P2930-003	CS-TR-Feed + Paper Run 340	* *
P2930-107	Noise Shield for ASSH (340)	* *
P2930-005	Printer Pedestal (P2932/34)	* *
P2930-006	CC-Forms Stacker	* *
P2930-007	ASSH Incl. 1 ASSH Sheet 210 mm	* *
P2930-008	ASSH - Magazine Env. 220 mm	* *
P2930-009	ASSH - Magazine Sheet 210 mm	* *
P2930-010	Front- Feed + CU (PH-Opt)	* *
P2930-018	ASSH - Magazine Env. 229 mm	* *
P2930-019	ASSH - Magazine Sheet 216 mm	* *
P2930-020	Combiset addit. fonts 18x50	* *
P2930-021	Combiset addit. fonts 18x25	*
P2930-022	Gothic TX-1.0 - TTX PROM	*
P2930-004	CS-TR-Feed + Paper Run 400	* *
P2930-207	Noise Shield for ASSH (400)	* *
P2930-210	Noise Shield for TR+FF (400)	* *
DAISYWHEEL PRINTER OPTIONS		
P5131-03	Single Sheet Feeder ASF 560	* *
P5131-05	Dual Sheet/Env. Feeder ASF 580	* *
P5131-06	PROM Set - ASF 580	* *
P5131-04	Sound Shield - ASF 560	* *
P5140-13	Sound Cover without Window SC	* *
P5140-11	Adaptor Window - SC	* *
P5140-08	Sound Cover Version V	* *
P5130-15	Bi-directional Tractor Feed	* *

*) National Versions:

Germany/Austria	Sweden	Finland
English	Swiss/German	Spain
France/Belgium	Denmark	Italy
Netherland	Swiss/French	USA/Austr/Can.
Belgium/Netner. (AZERTY)	Norway	Portugal

COMMERCIAL TYPE NUMBERS

Commercial Typenumber	Description	Release 1/2	3/4
CABLES			
	Cable Type 1 (5 m)	*	*
	Cable Type 1 (15 m)	*	*
	Cable Type 2 (5 m)	*	*
	Cable Type 2 (15 m)	*	*
	Cable Type 3 (5 m)	*	*
	Cable Type 5 (5 m)		*
	Cable Type 5 (15 m)		*
	Cable Type 6 (5 m)	*	*
	Cable Type 6 (15 m)	*	*
	Cable SCSI	*	*
	Cable Type 11 (15 m)		*
	Cable Type 10 (5 m)		*
SUPPLIES			
	Logo Matrix Printer FX- 80 (100 pcs)		*
	Logo Matrix Printer FX-100 (100 pcs)		*
	5¼" Flexible Diskettes SS DD	*	*
	5¼" Flexible Diskettes DS DD	*	*
	Head Cleaning Kit 5¼"	*	*
	P293x Ribbon Black Multi-strike	*	*
	P293x Ribbon Fabric Black	*	*
	Dust Cover for P293x (340 mm)	*	*
	Dust Cover for P293x (340 mm) incl. ASSH	*	*
	Dust Cover for P2934 (400 mm)	*	*
	Dust Cover for P2934 (400 mm) incl. ASSH	*	*
	PUC Kit	*	*
	Cannon Kit	*	*

The National Sales Organisations should
provide the commercial 12NC numbers for those
items (and languages) they do support.

Typenumber	Description	8/16 BIT	Release 2	3/4
OPERATING SYSTEMS				
P3050-002	TurboDOS vs 1.40 *)	8		★
P3050-002	TurboDOS vs 1.40 *) DEMO	8		★
P3050-004	TurboDOS vs 1.40 *)	16		★
P3050-004	TurboDOS vs 1.40 *) DEMO	16		★
	TurboDOS vs 1.40 REL Modules	8		★
	TurboDOS vs 1.40 O Modules	16		★
	TurboDOS vs 1.40 Sp Conf. Util.	8		★
P3050-001	TurboDOS vs 1.22 ss *)	8	★	
P3050-001	TurboDOS vs 1.22 ss *) 320	8	★	
P3050-002	TurboDOS vs 1.22 ms *)	8	★	
P3050-002	TurboDOS vs 1.22 ms German 320	8	★	
.	Upgrade TurboDOS 2.0 to 2.1 *)	8	★	
	CONPHIB / 8 Inch Driver	8	★	
	Slave Network Driver	8	★	
	EPSON FX-80/-100 Nat. Vs. Tables	8	★	
	TurboDOS Vs 1.22 Tr. Files English		★	
	TurboDOS Vs 1.22 Tr. Files German		★	
COMMUNICATIONS FACILITIES				
P3080-001	BIS 3780 emulator vs 5.1	8	2/	3/4
P3080-001	BIS 3780 emulator vs 5.1 DEMO	8	2/	3/4
P3080-002	BIS 3270 emulator vs 4.1	8	2/	3/4
P3080-002	BIS 3270 emulator vs 4.1 DEMO	8	2/	3/4
P3080-010	Teletex Mailing System	8	3/	4
P3080-010	Teletex Mailing System DEMO	8	3/	4
P3080-100	File Transfer Util (ADINFO)	8	2	
P3080-100	File Transfer Util (ADINFO) 320	8	2	

320 in Description means on 320 kB diskettes, all other
     products on 640 kB diskettes

DEMO in Description means demonstration only (does not in-
     clude documention, not for resale

 ss in description means single station

 ms in description means multi station

 *) available in more than one language; refer to the
     Product Catalog

Typenumber	Descriptions	8/16 BIT	Release 2	3/4
	DEVELOPMENT TOOLS			
P3050-101	RM/COBOL 1.5F Comp. + Runtime	8	*	
P3050-101	RM/COBOL 1.5F Comp. + Runtime 320	8	*	
P3050-103	RM/COBOL 1.5F Runtime	8	*	
P3050-103	RM/COBOL 1.5F Runtime 320	8	*	
P3050-103	RM/COBOL 1.5F Runtime DEMO	8	*	
P3050-103	RM/COBOL 1.5F Runtime DEMO 320	8	*	
P3050-101	RM/COBOL 2.0B Comp. + Runtime	8	*	*
P3050-101	RM/COBOL 2.0B Comp. + Runtime DEMO	8	*	*
P3050-103	RM/COBOL 2.0B Runtime	8	*	*
P3050-102	RM/COBOL 2.0B Comp. + Runtime	16		*
P3050-104	RM/COBOL 2.0B Runtime	16		*
P3050-104	RM/COBOL 2.0B Runtime DEMO	16		*
P3050-125	CIS COBOL Compiler	8		
P3050-124	FILESHARE	8	*	
P3050-124	FILESHARE 320	8	*	
P3050-124	FILESHARE DEMO	8	*	
P3050-124	FILESHARE DEMO 320	8	*	
P3050-201	MS-BASIC Interpreter ms	8	*	*
P3050-203	MS-BASIC Interpreter ss 320	8	*	
P3050-200	MS-BASIC Interpreter ss	8	*	*
P3050-202	MS-BASIC Compiler ms	8	*	*
P3050-204	MS-BASIC Compiler ss 320	8	*	
P3050-205	MS-BASIC Compiler ss	8	*	*
P3050-231	Personal BASIC 1.1	16		*
P3050-221	KSAM80	8	*	*
P3050-221	KSAM80 320	8	*	
P3050-304	PASCAL/MT+86 3.2	16		*
P3050-305	SSP 3.0	16		*
P3050-306	PASCAL/MT+86 3.2 with SSP 3.0	16		*
P3050-301	PASCAL MT+	8		
P3050-302	SPP	8		
P3050-311	Bi-280 vs 1.34	8	*	
P3050-321	Multiplan	8		

   320   in Description means on 320 kB diskettes, all other
         products on 640 kB diskettes

   DEMO in Description means demonstration only (does not in-
         clude documention, not for resale

    ss   in description means single station

    ms   in description means multi station

    *)   available in more than one language; refer to the
         Product Catalog

Typenumber	Descriptions	8/16 BIT	Release 2	3/4
	OFFICE TOOLS			
P3060-011	WordStar Norwegian vs 3.0	8	*	*
P3060-012	MailMerge *) vs 3.0	8	*	*
P3060-015	WordStar/MailMerge *) vs 3.0	8	*	*
P3060-015	WordStar/MailMerge *) vs 3.30	8	*	*
P3060-035	WordStar/MailMerge *) vs 3.30	16		*
P3060-015	WordStar/MailMerge *) vs 3.0 DEMO	8	*	
P3060-015	WordStar/MailMerge *) vs 3.30 DEMO	8	*	
P3060-035	WordStar/MailMerge *) vs 3.30 DEMO	16		*
P3060-015	WordStar/MailMerge *) vs 3.0 DEMO	8	*	
P3060-015	WordStar/MailMerge *) vs 3.30 DEMO	8	*	
P3060-035	WordStar/MailMerge *) vs 3.30 DEMO	16		*
P3060-013	SpellStar *) vs 1.21	8	*	
P3060-013	SpellStar *) vs 3.3	8	*	*
P3060-013	SpellStar *) vs 3.3 DEMO	8	*	*
P3060-033	SpellStar English vs 3.30	16		*
P3060-033	SpellStar English vs 3.30 DEMO	16		*
P3060-014	Starindex English vs 1.01	8	*	*
P3060-014	Starindex English vs 1.01 DEMO	8	*	*
P3060-034	Starindex English vs 1.01	16		*
P3060-034	Starindex English vs 1.01 DEMO	16		*
P3060-016	Wordstar Prof. English vs 3.3	8	*	*
P3060-016	Wordstar Prof. English vs 3.3 DEMO	8	*	*
P3060-036	Wordstar Prof. English vs 3.30	16		*
P3060-036	Wordstar Prof. English vs 3.30 DEMO	16		*
P3060-025	SuperSort *) vs 1.61	8	*	*
P3060-025	SuperSort English vs 1.60	8	*	*
P3060-045	SuperSort English vs 1.63	16		*
P3060-025	SuperSort *) vs 1.61 DEMO	8	*	*
P3060-025	SuperSort English vs 1.60 DEMO	8	*	*
P3060-045	SuperSort English vs 1.63 DEMO	16		*
P3060-026	CalcStar *) vs 1.2	8	*	*
P3060-026	CalcStar English vs 1.45	8	*	*
P3060-046	CalcStar English vs 1.45	16		*
P3060-026	CalcStar *) vs 1.2 DEMO	8	*	*
P3060-026	CalcStar English vs 1.45 DEMO	8	*	*
P3060-046	CalcStar English vs 1.45 DEMO	16		*
P3060-021	InfoStar German vs 1.00-2.0	8	*	*
P3060-021	InfoStar English vs 1.02	8	*	*
P3060-021	InfoStar French vs 1.00	8	*	*
P3060-041	InfoStar Dutch vs 1.00	8	*	*
P3060-041	InfoStar English vs 1.00	16		*

Typenumber	Descriptions
	DOCUMENTATION
F 1A	P3000 an Introduction *)
F 2A	TurboDOS Operator Ref. Man. *)
F 3A	Your First Steps English
F 4A	TurboDOS Reference Card *)
F 5A	TurboDOS Quick Ref. Booklet *)
F 9A	MicroPro Beginner's Guide
F10A	An Introduction to WordStar
F15A	An Introduction to DataStar
F20A	An Introduction to InfoStar
F25A	An Introduction to SuperSort
F30A	MS-BASIC Interpr. Docum. Set English
F40A	An Introduction to CalcStar
F41A	P2932/3/4 Printers *)
F42A	BIS-3270 Introduction English
F43A	BIS-3780 Introduction English
F51H	TurboDOS 1.4 Guide for Programmers
F52H	TurboDOS Configuration Guide (A4)
F56H	P3000 KSAM 80 Manual (A4)
F57H	WordStar Install. Manual English
F58H	Software Install. Manual English
F500A	MS-BASIC Comp. English Docum. Set
F501A	WordStar *) Docum. Set
F502A	WordStar/Mailmerge *) Docum. Set
F503A	DataStar *) Docum. Set
F504A	SuperSort *) Docum. Set
F505A	CalcStar *) Docum. Set
F506A	InfoStar *) Docum. Set
F507A	TurboDOS *) Docum. Set
F508A	BIS 3270 Docum. Set
F509A	BIS 3780 Docum. Set
F510A	CIS COBOL FileShare Docum. Set
F511H	RM COBOL English Docum. Set
F512H	P3000 System Manual Docum. Set
F513A	WordStar Prof. 3.3 English Docum. Set
F514A	SpellStar 3.3 English Docum. Set
F515A	StarIndex 3.3 English Docum. Set
F516A	Your First Steps English Docum. Set
F522A	Personal BASIC Docum. Set
F523A	PASCAL MT+ incl. SPP Docum. Set

1.3 TECHNICAL DATA

1.3.1 TECHNICAL DATA SYSTEM CABINETS

1.3.1.1 TECHNICAL DATA P3500 SYSTEM CABINET

* Processor Board (PMU80) (Master or Slave) includes:

- CPU Z80A Microprocessor (PMU 80-3: Z80B)
- Frequency: 4 MHz (PMU 80-3: 6MHz)
- 64K RAM (Random Access Memory)
- 8K ROM (Read Only Memory)
- Two RS 232C/V24 interfaces for connection of workstation, printer or data
  communication. Transmission speed: 1 200 - 19 200 b.p.s.
  One of these interfaces is extended with modem control facilities.

* 5.25" Flexible Disc Unit (X3114)

    - Uses double density/double sided (96 tpi) 5.25" flexible discs
    - Formatted capacity 0.64 Mbyte (1 Mbytes unformatted)
    - Average positioning time: 147 ms
    - Average access time: 247 ms
    - Transfer rate: 250 kilobits/s

* 5.25" Fixed Disc Unit

    - Formatted capacity:
      5 Mbyte (6.13 Mbyte unformatted) or
     10 Mbyte (12.7 Mbyte unformatted)
    - Average positioning time: 85 ms
    - Average access time: 93.3 ms
    - Transfer rate: 5   Mbits/s

The central unit either will have 2 built-in flexible disc units, or 1 flexible
disc and 1 fixed disc unit.

* Environmental Conditions:

- Ambient Temperature   : 10-35°C
- Relative Humidity   : 20-80%
- Absolute Humidity   : 20 g/m^3

* Dimensions and Weight:

- Dimensions   .
  - height   : 230 mm
  - width   : 475 mm
  - depth   : 300 mm
- Weight   : 18 kg

* Electrical Specifications:

- Voltage   : 100-127/200-240 VAC (± 10%)
- Frequency   : 50/60 Hz (± 2%)
- Consumption   : 120 W max.

1.3.1.2 TECHNICAL DATA P3800 SYSTEM CABINET

Processor Board PMU80 (master or slave) includes:

- CPU Z80A microprocessor (PMU 80-3:Z80B)
- Frequency: 4MHz (PMU 80-3: 6MHz)
- 64K RAM (Random Access Memory)
- 8K ROM (Read Only Memory)
- Two V24 Interfaces

Processor Board PMU 186 includes:

- CPU IAPX 80186 microprocessor
- Frequency: 8MHz
- 256K RAM (Random Access Memory)
- 16K ROM (Read Only Memory)
- Two serial interfaces

* 5.25" Flexible Disc Unit
  - uses double density/double sided (96 tpi) flexible discs
  - formatted capacity 0.64 MByte (1 MByte unformatted)
  - average positioning time : 153 msec.
  - average access time : 253 msec.
  - transfer rate : 250 kilobits/s

* 8" Fixed Disc Drive (PRIAM) (P3800-03)
  - formatted capacity : 60 MBytes (70 MBytes unformatted)
  - average positioning time : 42 msec.
  - average access time : 50,3 msec.
  - transfer rate : 806KBytes/a

* Streamer Tape (Archive)
  - formatted capacity : 20 MBytes (216 Mbytes unformatted)
  - tape speed : 90 inch/s
  - start/stop time : 300 ms
  - transfer rate: 86,7 KBytes/S

* 5.25" Fixed Disc Unit

- Formatted capacity:
   5 Mbyte (6.13 Mbyte unformatted) or
  10 Mbyte (12.7 Mbyte unformatted)
- Average positioning time: 85   ms
- Average access time: 93.3 ms
- Transfer rate: 5   Mbits/s

* Dimensions and Weight:

- Dimensions
  - height   : 690 mm
  - width   : 560 mm
  - depth   : 600 mm
- Weight   : 60 kg

* Electrical Specifications:

  - Voltage   : 100-127/200-240 VAC ($\pm$ 10%)
  - Frequency : 50/60 Hz. ($\pm$ 2%)
  - Consumption : 700 W max.

1.3.2 TECHNICAL DATA WORKSTATIONS

1.3.2.1 TECHNICAL DATA VIDEO DISPLAY P2711

- Televideo compatible
- 15" screen, amber or green phosphor
- 24 lines of 80 or 132 characters plus one status/user line
- Character set
  - alpha-numeric upper/lower case, national versions
  - restricted graphics
- Attributes:
  - high/low intensity
  - blinking and blanking
  - underlining
  - inversion
- Refresh frequency : 50 Hz.
- Character matrix : 7 x 9 or 5x7 dot matrix
- Character size   : 2.4x3.5 mm or 1.7x2.6 mm
- Display size   : height 164 mm, width 258 mm
- Optional swivel stand

* Dimensions and Weight:

- Dimensions
  - height   : 321 mm
  - depth   : 300 mm
  - width   : 375 mm
- Weight   : 15 kg

* Electrical Specifications:

  - Voltage   : 100-120/200-240 VAC
  - Frequency   : 60 or 50 Hz. (± 2%)
  - Consumption : 50 W max.

* Environmental Conditions:

- Ambient Temperature : 10-35°C
- Relative Humidity   : 20-80%
- Absolute Humidity   : 20 g/m^3

1.3.2.2 TECHNICAL DATA VIDEO DISPLAY P2705

- Televideo compatible
- 12" screen, amber or green phosphor
- 24 lines of 80 characters plus one status/user line.
- Character set
  - alpha-numeric upper/lower case, national versions
- Attributes:
  - high/low intensity or inversion (strap selectable)
- Refresh frequency : 50 Hz.
- Character matrix : 9 dots/12 scanlines
- Character size   : 2.0x3.6 mm
- Display size   : height 136 mm, width 220 mm

* Dimensions and Weight:

- Dimensions
  - height   : 290 mm
  - depth   : 320 mm
  - width   : 360 mm
- Weight   :   9 kg

* Electrical Specifications:

  - Voltage   : 115/120/200 or 240 VAC (± 10%)
  - Frequency   : 60 or 50 Hz. (± 2%)
  - Consumption : 45 W

* Environmental Conditions:

- Ambient Temperature : 5-40°C
- Relative Humidity   : 15-90%
- Absolute Humidity   : 20 g/m^3

1.3.2.3 TECHNICAL DATA KEYBOARD P2841

- N-key Rollover
- Sculptured keys
- Low profile
- Numeric / cursor movement pad
- 5 programmable indicators
- 14 pre-programmable function keys
- 11 user programmable function keys
- National lay-outs are available

* Dimensions and Weight:

- Dimensions

  - height :   20 mm at front row
           :   43 mm at rear edge of housing
  - depth : 215 mm
  - width : 457 mm
- Weight :   3 kg

1.3.3 TECHNICAL DATA EXTENSION UNITS

1.3.3.1 TECHNICAL DATA EXTENSION CABINET P3012

* Fixed Disc

  - 5.25" Fixed Disc
  - Formatted Capacity 10 MB or
    Formatted Capacity 5 MB
  - Average Access Time : 98 ms
  - Transfer Rate   : 5 megabits/s

* Electrical Specifications:

  - Voltage   : 100-127 or 200-240 VAC (±10%)
  - Frequency   : 60 or 50 Hz (± 2%)
  - Consumption : 120 W max.

* Dimensions and Weight:

-Dimensions
- depth   : 300 mm
- height   : 230 mm
- width   : 475 mm
- Weight   : 15 kg

* Environmental Conditions

- Ambient Temperature   : 10-35°C
- Relative Humidity   : 20-80%
- Absolute Humidity   : 20 g/m^3

1.3.3.2 TECHNICAL DATA EXTENSION CABINET P2621

* Flexible Disc

  8" Flexible Disc

  - Data Capacity   : 140 KB (TurboDOS), 246 KB IBM Diskettes

* Electrical Specifications:

- Voltage   : 100-127 or 200-240 VAC
- Frequency   : 60 or 50 Hz (± 2%)
- Consumption   : 120 W max.

* Dimensions and Weight

- Dimensions
  - depth   : 513 mm
  - height   : 285 mm
  - width   : 270 mm
- Weight   : 21.5 kg

* Environmental Conditions

- Ambient Temperature : 10-38°C
- Relative Humidity   : 20-80%
- Absolute Humidity   : 20 g/m^3

1.3.3.3 TECHNICAL DATA EXTENSION CABINET P3013

* Streamer Tape

    - Formatted capacity: 20 MBytes (216 MBytes unformatted)
    - Tape Speed   : 90 inch/s
    - Start/Stop Time   : 300 ms
    - Transfer Rate   : 86,7 KBytes/s

* Dimensions and Weight

- Dimensions
    - height   : 355,6 mm
    - depth   : 114,3 mm
    - width   : 217,2 mm
- Weight   : 15 kg

* Electrical Specifications

    - Voltage   : 100-127 or 200-240 VAC
    - Frequency   : 60 or 50 Hz (± 2%)
    - Consumption   : 100 W max.

* Environmental Conditions

    - Ambient Temperature : 5-45°C
    - Relative Humidity   : 20-80%
    - Absolute Humidity   : 29g/m^3

1.3.4 TECHNICAL DATA PRINTERS

1.4.3.1 TECHNICAL DATA GENERAL PRINTERS P2932, P2933, P2934

* General Printer P2932, P2933, P2934

- Dot matrix : P2932-   9 x 9 or 18 x 25
               P2933/34- 9 x 9 or 18 x25 or 18 x 50 or 36 x 50

- Print speed : Depending on font, typical 120 char/s at 12 cpi

- Pitch   : P2932   - 10 or 12 cpi
                P2933/34 - 10, 12 or 15 cpi

- Print width : P2932/33 - 340 mm max.
                P2934   - 400 mm max.

- Line spacing : adjustable from 1 upto 48 lpi

- Character set: national versions, upper/lower case,
                 various styles especially for P2933/34

- Form handling:
  - adaptable to various continuous form sizes
  - optional automatic sheet handler, front feed and/or tractor
    feed
- Optional noise shield and pedestal

* Dimensions and Weight:

- Dimensions   P2932   P2933   P2934   Pedestal

  - height : 185 mm   185 mm   198 mm   596 mm
  - depth   : 445 mm   445 mm   518 mm
  - width   : 520 mm   520 mm   636 mm
- Weight   : 15 kg   16.4 kg   20.4 kg   20 kg

* Electrical Specifications:

- Voltage   : 100-120 or
                200-240 VAC (± 10%)
- Frequency   : 60 or 50 Hz (± 2%)
- Consumption
  P2932/33 : 120 W max.
  P2934   : 160 W max.

* Environmental Conditions:

- Ambient Temperature   : 10-35 °C
- Relative Humidity   : 20-80 %
- Absolute Humidity   : 20 g/m ^{3}

1.3.4.2 TECHNICAL DATA MATRIX PRINTER P2123

* Matrix Printer P2123

- Dot matrix   : 9 x 9
- Print speed   : 80 char/s , line feed 200 ms
- Pitch   : 10 or 12 c.p.i.
- Print width   : 254 mm max.
- Line spacing   : 6 l.p.i. or programmable
- Character set   : national versions, upper/lower case, graphics
- Type style   : normal, condensed, enlarged characters
- Form handling   : tractor feed

* Environmental Conditions:

- Ambient Temperature : 10-35 °C
- Relative Humidity   : 20-80 %
- Absolute Humidity   : 20 g/m³

* Dimensions and Weight:

- Dimensions
  - width   : 374 mm
  - height   : 107 mm
  - depth   : 305 mm
- Weight   : 5.5 kg

* Electrical Specifications:

- Voltage   : 115/220 or 240 VAC (± 10%)
- Frequency   : 60 or 50 Hz (± 2%)
- Consumption   : 100 W max.

1.3.4.3 TECHNICAL DATA DAISY WHEEL PRINTER P5360

* Daisy Wheel Printer P5360

  - Print Speed   : 40 char/s , line feed 940 ms
  - Print Width   : 406 mm
  - Line Spacing   : 6 l.p.i or programmable
  - Font   : DIABLO, Qume
  - Form Handling   : tractor feed, front feed
  - Sheet Feeder   : optional
  - Copies   : 2 + original
  - Inkribbon   : Cassette (black)

* Environmental Conditions:

- Ambient Temperature : 10-35 °C
- Relative Humidity   : 20-80 %
- Absolute Humidity   : 20 g/m^3

* Dimensions and Weight:

- Dimensions
  - height   : 154 mm
  - depth   : 405 mm
  - width   : 574 mm
- Weight   : 14 kg

* Electrical Specifications:

- Voltage   : 180-254 or 90-127 VAC
- Frequency   : 50 or 60 Hz (± 2%)
- Consumption   : 160 W max.

1.3.4.4 TECHNICAL DATA MATRIX PRINTERS P2908, P2909

* Matrix Printer P2908, P2909

```
  - Dot Matrix    : 11x9
  - Print Speed   : 160 char/s
  - Pitch         : 10 char/inch, programmable
  - Print Width
    - P2908       : 114-216 mm friction feed
                    241-254 mm tractor feed
    - P2909       : 184-366 mm friction feed
                    102-406 mm tractor feed
  - Line Spacing  : programmable
  - Character Set : national versions, upper/lower case, dot graphics
  - Type Style    : normal, condensed, enlarged, double strike
  - Form Handling : friction feed, tractor feed
```

* Dimensions and Weight:

- Dimensions

	P2908	P2909
- height	: 100 mm	150 mm
- depth	: 347 mm	354 mm
- width	: 420 mm	594 mm
- Weight	: 7.5 kg	10,5 kg

* Electrical Specifications:

```
- Voltage        : 220V or 240V AC (±10%)
- Frequency      : 49.5 - 60.5 Hz.
- Consumption    : 70 W max.
```

* Environmental Conditions:

```
- Ambient Temperature   : 5-35°C
- Relative Humidity     : 10-80 %
```

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2 TEST DIAGNOSTIC PROGRAMS

After power-on or reset automatically an inside test will be started in the
system. This program is kept in ROM. The hardware is checked on correct work-
ing. All workstations and the central unit have an own inside test. These tests
are restricted to the unit itself so they are independent of the configuration.
If an error is detected in a workstation this will be displayed on the LEDs of
the keyboard.

An error in the central unit is indicated on the LEDs of the Operator Panel.
After a successful inside test all test LEDs will be extinguished. Additional to
this inside test there are Test and Diagnostic programs. For release 1,2 these
programs are distributed on three levels:

- for the User   : HWTEST
- for the Customer Engineer : FETEST
- for System Engineer   : SETEST

Every program contains tests for the following devices:

- VDU/Keyboard
- Flexible Disc
- Fixed Disc

For Release 3,4 the Testprograms are distributed only at the System Engineer
level.

In the diagnostic programs the messages are displayed on the screen while input
is expected from the keyboard.

2.1 INSIDE TEST

2.1.1 INSIDE TEST SYSTEM CABINET

After power-on every PMU-80 starts inside test. The programs are all identical, only the execution differs depending on the function in the system (master or slave). It is a stand alone program. Every PMU checks its own hardware. The results are collected by the master PMU. After that the master performs some tests to check the disc(s) and the logic circuits involved.
The result of the inside test is displayed on the operator panel. Only in case of an error one or more of the test LEDs will be illuminated.

Additional to the code displayed on the operator panel a LED on the erroneous PCB will be lit. The FLEXCO and SASI-ADAPTER are treated as one PCB in this case.

The sequence of the inside test is:

- For Master + Slave
  - Microprocessor
  - Memory Mapping Unit
  - ROM
  - RAM
  - SIO
  - CTC

- Additional for Master

  - Master/Slave Communication
  - Flexible Disc Controller
  - SASI Interface Adapter
  - Fixed Disc Controller
  - Fixed Disc Drive
  - Flexible Disc Drive (if installed)

Explanation of the error codes on the operator panel:

LED				ERROR
1	2	3	4	
-	-	-	-	No Error
X	X	X	X	PMU
X	X	-	X	SESCO/FLEXCO-SASI Adapter
X	-	X	X	Internal Fixed Disc Controller
X	-	-	X	Internal Fixed Disc Drive
-	X	X	X	Internal Flexible Drive
-	X	-	X	No Internal Flexible Drive Ready
-	-	X	X	External 8" Flexible
-	X	X	-	PMU 186 as MASTER (Rel. 4 only)

X = illuminated

- = extinguished

2.1.2 INSIDE TEST P2711

The test in a terminal is started after power-on/reset command. The state of the
workstation after the test is the same as before entering it. The actual program
is executed by the processor on the PMU-88.
An error will be displayed on the LEDs of the keyboard. During the test the
LEDs on the PCBs are illuminated. They are switched off at the moment the test
of that PCB is completed successfully.
The sequence of the inside test for P2711-00X is:

```
- PMU-88    - Microprocessor
            - ROM
            - RAM
            - Interrupt Controller
            - Remaining Circuits
- PME1      - ROM
            - Timer
            - USARTS
- CRTCO     - Refresh Memory
            - Monitor Signals
            - Real Time Clock
- Keyboard - Test String
```

The testsequence for P2711-10X is:

```
TERCO    - CPU
         - ROM
         - RAM
         - Programmable Interrupt Controller
         - CRT Controller
         - Real Time Clock
         - Monitor Signals
         - Programmable Interval Timer
         - Serial Interfaces
```

Keyboard - Test String

Explanation of the error codes on the keyboard LEDs.

LED				ERROR
1	2	3	4	
-	-	-	-	No Error
X	X	X	X	PMU-88/TERCO
X	X	X	-	PME1
X	X	-	X	CRTCO
X	X	-	-	Keyboard

X = illuminated
- = extinguished

2.2 TEST PROGRAMS REL. 1,2

With use of the program FE TEST a number of devices can be tested, such as:
VDU/KEYBOARD, PRINTER, FLEXIBLE DISC, FIXED DISC. The intention of the program
is to give diagnostic on exchangeable unit level. The tests run under control of
the operating system.
To run the program preconditions have to be fulfilled before loading. The
conditions for the various devices are:

- VDU/KEYBOARD: the test must be started from the terminal to be tested. It
  doesn't matter whether the test runs in the master or slave PMU.

- PRINTER: if the printer to be tested is connected to the master PMU-80 then
  the program must be loaded into the master (shared printer). If the printer is
  connected to a slave PMU-80 (Local Printer) then the test must be loaded in
  that slave.

- FLEXIBLE/FIXED DISC; these programs must always run in the master and the num-
  ber of buffers has to be reduced to a minimum. Before starting these tests
  execute the Turbodos commands: MASTER
                                 BUFFERS N2

When these conditions are fulfilled the actual program can be started: FE TEST.
The next menu appears on the screen:

DEVICE:
0 EXIT
1 VDU/KEYBOARD   3 MINI FLEXIBLE DISC
2 PRINTER   4 FIXED DISC
SELECT:

The test of a device is started after entering the number that is preceding the
device name. In the next section the tests of each device are discussed.

2.2.1 FE TEST OF VDU/KEYBOARD

After selecting this test the next menu appears on the screen:

```
DEVICE: VDU/KEYBOARD
0  EXIT
1  DIAGNOSIS                     5  SCREEN ALIGNMENT CHECK
2  INSIDE TEST                   6  CHARACTER ATTRIBUTE TEST
3  CHARACTER GENERATOR TEST      7  GRAPHICS TEST 1
4  CHARACTER CONTROL TEST        8  GRAPHICS TEST 2
SELECT:
```

[1] DIAGNOSIS

With the selection of this step, the Inside Test, the Character Generator Test, and the Character Control Test will be performed automatically.
Diagnosis starts with the Inside Test of the display and the following steps are called if no error has been found. Otherwise diagnosis stops and the error message of the Inside Test is displayed.

[2] INSIDE TEST

This step calls the Inside Test of the display module. If no error is detected during the test the character generator test is executed as well. Otherwise the program stops and an error message will be displayed.

[3] CHARACTER GENERATOR TEST

The operator has to check the following image:

```
ABCDE...YZ 01....89 ab......yz....01....89 ABC
BCDE...YZ 01....89 ab......yz....01....89 ABCD
CDE...YZ 01....89 ab......yz....01....89 ABCDE
DE...YZ 01....89 ab......yz....01....89 ABCDEF
```

If the test pattern is not displayed correctly, the CRTCO PCB should be replaced.

[4] CHARACTER CONTROL TEST

This test shows some lines of test pattern with attributes like inverse video, intensified, blinking and underline.
The attributes should be checked visually by the operator.

[5] SCREEN ALIGNMENT CHECK

After selection of this step the screen shows a frame like the following picture:

```
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHH                                              HHHHHH
HHHHHH                                              HHHHHH
HHHHHH                                              HHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
H     H                                         H     H
H     H                                         H     H
H     H                                         H     H
H     H                                         H     H
H     H                                         H     H
H     H                                         H     H
H     H                                         H     H
H     H                                         H     H
H     H             HHHHHHHHHHHHH                H     H
H     H             HHHHHHHHHHHHH                H     H
H     H             HHHHHHHHHHHHH                H     H
H     H             HHHHHHHHHHHHH                H     H
H     H                                         H     H
H     H                                         H     H
H     H                                         H     H
H     H                                         H     H
H     H                                         H     H
H     H                                         H     H
H     H                                         H     H
H     H                                         H     H
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHH                                              HHHHHH
HHHHHH      PRESS KEY OR EXIT WITH   STOP           HHHHHH
HHHHHH                                              HHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
```

This frame is useful to check horizontal and vertical linearity and to adjust it, if necessary.

[6] CHARACTER ATTRIBUTE TEST

This is an additional test step to the Character Control Test. It shows the whole character string with four attributes and their possible combinations. This test is to check the acceptance of attributes and their combinations in each position on the screen.

⌐[7] GRAPHICS TEST 1

A test pattern which consists of graphic characters is displayed. The operator is asked to check the pattern visually.

[8] GRAPHICS TEST 2

In this step a football ground is shown, composed of some graphic characters. The operator is asked to check the pattern visually.

2.2.2 FE TEST OF GENERAL PRINTER (P2932, P2933)

After selecting the test module for the general printer, the message:

ERROR IN POWER SUPPLY UNIT OR PRINTER NOT CONNECTED

is displayed on the screen and removed, if the printer is connected, switched on, and the correct PMU is selected.
If all conditions are fulfilled, the following submenu will be displayed:

```
DEVICE: PRINTER
PAPER FEED DEVICES:
0  EXIT                    3  FRONT FEED
1  FRICTION FEED           4  TRACTOR FEED 340 MM
2  ASSH                    5  TRACTOR FEED 400 MM
SELECT:
```

With the numbers [1] to [5], the paper device of the installed printer will be selected.

C A U T I O N :   DO NOT SELECT A NOT INSTALLED PAPER DEVICE!

If more than one paper device has to be tested, the operator has to leave test program step with "EXIT". Then he may select the new paper device.
After selecting the paper device, the program starts diagnostics by calling the power-on self-test of the printer. The following message will be displayed:

INSERT A FORM AND PRESS START KEY

If the form is inserted the printer starts printing the following test pattern:

```
ABCDE...YZ    ab....yz    01....89:; = ?    !"£$%&´()
BCDE...YZ     ab....yz    01....89:; = ?    !"£$%&´()*
CDE...YZ      ab....yz    01....89:; = ?    !"£$%&´()*+
DE...YZ       ab....yz    01....89:; = ?    !"£$%&´()*+,
```

After pressing the Start/Stop key on the printer, the test is stopped and status is sent to the system. The status will be displayed on the screen. After this a new menu appears on the screen to start other tests.

```
DEVICE: PRINTER
0  EXIT              ˊ   3  FF TEST
1  DIAGNOSIS             4  TYPE WRITER TEST
2  ASSH TEST             5  ADJUSTMENT TEST
SELECT:
```

If a test is entered for a not connected paper device then an error message is displayed.

[1] DIAGNOSIS

This test returns to the previous menu. Another paper device can be selected.

[2] ASSH TEST (Test of Automatic Single Sheet Handler)

Both hoppers of the ASSH may be selected by the test step. Dependent on the selection, the form will be inserted from hopper 1, hopper 2 or both. Before a form is inserted, the previous one is ejected. The positioning mechanism of the friction feed is tested by printing a text on lines 8 and 64. The text must not slide, neither in vertical nor in horizontal position.

[3] TEST OF FRONT FEED

The vertical positioning is tested. Two lines consisting of horizontal bars are printed on top of the form. After printing these bars, the form is positioned backwards to the last printed line. Printing of the horizontal bars is repeated. A similar procedure is applied in the middle of the form. The Front Feed Device positions correctly, if the double printed bars are superjacent.

[4] TYPEWRITER TEST

Any character entered via the alphanumeric keyboard will immediately be displayed on the screen and printed on the selected paper device. Admissible control keys are Carriage Return, Line Feed, Backspace and Shift. This step shows the possibility of typing all characters and the national variants. Printing is done only with the default font, pitch and line. This step is left by pressing key 'STOP' or ˆU.

[5] PRINTER ADJUSTMENT STEP

Dependent on the selection of loop no/yes, ten or a multiple of ten lines of vertical bars are printed, thus forcing an image like:

```
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
```

At the end of each line the print direction changes. That means, every second line is printed in the same direction. This pattern can be used to decide if a correction of the print needles or print head inclination is necessary.

2.2.3 FE TEST OF MINI FLEXIBLE DISC

After selecting the test of mini flexible disc, the menu offers the following steps:

```
DEVICE:
0  EXIT                      3  EXTENDED STEPS
1  DIAGNOSIS
2  GENERATE TEST DISC
SELECT:
```

If the program is loaded into a slave PMU instead of the master, then the message:

CONSOLE NOT ATTACHED TO MASTER PROCESSOR

will be displayed.

[1] DIAGNOSIS

The diagnosis of the mini flexible disc is performed in 4 steps:

- Pre-Test
- Seek Test
- Read Test
- Write Test

- PRE-TEST: this step checks if the drive is ready and a test discette is mounted. The program returns with **MOUNT TEST DISC AND PRESS RETURN.** The expected volume label is **MFD-DIAG.** If another discette is inserted, the program returns with **WRONG MEDIUM** and the menu appears on the screen again. By starting test [2] a test disc is generated.

- SEEK TEST: first a sequential seek for all cylinders is executed (beginning with cylinder 80). Before every positioning the heads are recalibrated. The correct positioning is checked by reading the identifier. If all cylinders are found without an error random seeks will be performed.

- READ TEST: during the read test the heads are positioned to the cylinders 3, 4, 39, 40, 45, 46, 71 and 72. On these cylinders the worst-case pattern, hexadecimal 'DB6', are expected on each sector. If these patterns are not found, the test stops and an error message will be displayed.

- WRITE TEST: during the write test the first half of every sector of the cylinders 1, 2, 41, 42, 43, 44, 74 and 75 is overwritten by the pattern 00 (16x).
When all sectors are compared, the cylinders are overwritten by the value 'DB6'H.

[2] GENERATE TEST DISC

After a pre-test the volume label - if one is found - will be displayed and the operator is asked to confirm.
After writing the volume label **MFD-DIAG** all sectors of cylinders 1, 2, 3, 4, 39, 40, 41, 42, 43, 44, 45, 46, 71, 72, 74 and 75 are written with the worst case pattern 'DB6'H.
In case of an error the message **TEST DISC NOT GENERATED** will be displayed.

[3] EXTENDED STEPS

This test can be executed with any formatted discette.

C A U T I O N :   The information of that disc will be lost!

The following tests may be selected:

```
DEVICE: MINI FLEXIBLE DISC        EXTENDED STEPS
0  EXIT                         4  SEQUENTIAL READ
1  RANDOM WRITE                 5  WRITE ONE SECTOR
2  RANDOM READ                  6  READ ONE SECTOR
3  SEQUENTIAL WRITE
SELECT:
```

All steps are offered with loop facilities, thus continuous tests may be execut-
ed. If a test step detects an error, a detailed error protocol is displayed,
giving the following information:

- Loop Counter
- Error Message
- Command
- Volume Label
- Drive Indication
- Cylinder and Sector Number

[1] RANDOM WRITE

The whole flexible disc volume is written. The sector address is evaluated by a
pseudo random generator. Each sector is written only once. If the loop feature
is switched on, writing is repeated until the step is interrupted by 'STOP' or
^U.
The operator selects whether the worst case pattern ('DB6'H) or the random pat-
tern shall be written.

[2] RANDOM READ

Each sector is read. If the operator selects data comparison, the read data are
compared with the selected pattern. If the read data differs from the expected
data, the sector is displayed in 16-byte size, showing expected and obtained
data.

[3] SEQUENTIAL WRITE

The whole volume is sequentially written sector by sector. If the loop feature
is chosen, the sequence is repeated. The operator may select the worst case or
the random pattern.

[4] SEQUENTIAL READ

All sectors are read sequentially. If wanted, the read data is compared with the
worst case pattern or the random pattern. If the read data differs from the
expected data, the sector is displayed in 16-byte size, showing the expected and
the obtained data.

FE TEST OF MINI FLEXIBLE DISC (CONT'D)

[5] WRITE ONE SECTOR

This step test writes one sector. The sector can be selected by entering the
cylinder number and sector number. The operator may select writing of the worst
case or the random pattern and a loop facility.

[6] READ ONE SECTOR

The sector to be read can be selected by entering the cylinder and sector num-
ber. If data comparison is selected, the read data will be compared with the
worst case or the random pattern. As in the write test a loop facility may be
selected.

2.2.4 FE TEST OF FIXED DISC DEVICE

The program tests the following units:

- SASI Adapter or SASI part of SESCO
- Fixed Disc Controller
- Fixed Disc Drive

The test module contains the following sub modules and steps:

DEVICE: FIXED DISC
0 EXIT   4 READ MEDIUM
1 DIAGNOSIS   5 DUMP AND CHANGE SECTOR
2 SEEK TEST   6 UTILITY SERVICE COMMANDS
3 READ/WRITE TEST
SELECT:

[1] DIAGNOSIS

After selection the following steps are performed:

- Controller and Drive Test
- Seek Random
- Seek Sequential
- Read/Write Test

- CONTROLLER AND DRIVE TEST
  This step first checks the correct function of the PMU interface part, SASI
  adaptor and the interface part of the disc controller. After that the disc
  controller is checked by issueing the controller self-test commands and asking
  for the status.

- SEEK RANDOM
  The address of a cylinder is calculated by a pseudo random pattern generator.
  To check the right position of the heads the sector addresses are read and
  compared with the expected addresses.

- SEEK SEQUENTIAL
  Starting with cylinder 0 the heads are positioned to all cylinders in sequen-
  tial order (0 1 0 2 0 3). If the heads are positioned to the highest cylinder,
  seek will be performed to cylinders 1, 2, 3, etc. starting from the highest
  possible cylinder. As in the SEEK RANDOM test the sector addresses wil be com-
  pared.

- READ/WRITE TEST
  This step works only at the service cylinder. After reading one sector the
  read data is inverted and written to the same sector. Then the sector is read
  again and compared with the expected data. The same is done with the other
  nine sectors.

[2] SEEK TEST

This test is split into two parts. First a random seek and then a sequential
seek is performed as described in DIAGNOSIS.
If the user has selected the offered loop facility, the test is repeated until
an error occurs or the user presses the key 'STOP'.

[3] READ/WRITE TEST

This test is performed as described in DIAGNOSIS. Additionally the loop facility
can be selected by the user.

[4] READ MEDIUM

T.B.S.L.

[5] DUMP AND CHANGE SECTOR

For this step the operator can select from the next menu:

DEVICE:
0 EXIT   4 UPDATE HEXADECIMAL
1 SELECT SECTOR   5 CONTINUE
2 READ SECTOR   6 WRITE SECTOR
3 UPDATE CHARACTERS
SELECT:

-[1] SELECT SECTOR: on the screen appears the next header:

    HEAD: CYLINDER: SECTOR:

    The operator is asked to type in the head number (0-3), cylinder number
    (0-305) and sector number (0-16). Each input is followed by 'CR'. The
    information is used for one of the other steps.

-[2] READ SECTOR: the data of sector indicated by the headers (step -[1]) is
    read and dumped on the screen. Only a part is displayed. To display the
    rest execute step -[5]: CONTINUE.

FE TEST OF FIXED DISC DEVICE (CONT'D)

-[3] UPDATE CHARACTERS: the data of the sector indicated by the headers (step
    -[1]) may be changed. The operator is asked:

    DISPLACEMENT: (O-512)   REPETITION FACTOR: (O-512)

    The displacement points to the first byte that has to be changed in the
    sector. The repetition factor gives the number of bytes to be changed. On
    XXXX: the character can be typed in. This character is automatically trans-
    lated into a hexadecimal code.

-[4] UPDATE HEXADECIMAL: identical to the previous step only on XXXX. A hexa-
    decimal code is expected which will be written in the requested location.

-[5] CONTINUE: during the display of a sector the execution of this step causes
    the not displayed part to appear on the screen.

-[6] WRITE SECTOR: data is written to the sector indicated by the header
    (step -[1]).

[6] UTILITY SERVICE COMMANDS

A new menu is displayed:

DEVICE:
0 EXIT   4 DRIVE DIAGNOSTIC
1 CONTROLLER DIAGNOSTIC   5 RECALIBRATE
2 RAM DIAGNOSTIC   6 SEEK TO SELECTABLE
3 TEST DRIVE READY   CYLINDER
SELECT:

Commands [1]-[4] are executed using the test facility. In case of faillure an
error message is displayed. In step [5] the read/write heads are positioned over
cylinder 0.
On execution of step [6] the operator is asked:

CYLINDER 1 (0-305)
CYLINDER 2 (0-305)

Both inputs must be followed by 'CR'. After the second input the heads start
seeking between the specified cylinders. The command can be interrupted by
'STOP'.

2.3 TESTPROGRAM REL. 3/4

2.3.1 VDUS FOR VDU/KEYBOARD

This test should not be started in the master! In an 8-bit slave the program is called VDUS.COM, in an 16-bit slave the program is called VDUS.CMO.
After selecting this test the next menu appears on the screen:

```
DEVICE: VDU/KEYBOARD
0  EXIT
1  DIAGNOSIS                   5  SCREEN ALIGNMENT CHECK
2  INSIDE TEST                 6  CHARACTER ATTRIBUTE TEST
3  CHARACTER GENERATOR TEST    7  GRAPHICS TEST 1
4  CHARACTER CONTROL TEST      8  GRAPHICS TEST 2
SELECT:
```

[1] DIAGNOSIS

With the selection of this step, the Inside Test, the Character Generator Test, and the Character Control Test will be performed automatically.
Diagnosis starts with the Inside Test of the display and the following steps are called if no error has been found. Otherwise diagnosis stops and the error message of the Inside Test is displayed.

[2] INSIDE TEST

This step calls the Inside Test of the display module. If no error is detected during the test the character generator test is executed as well. Otherwise the program stops and an error message will be displayed.

[3] CHARACTER GENERATOR TEST

The operator has to check the following image:

```
ABCDE...YZ 01....89 ab......yz....01....89 ABC
BCDE...YZ 01....89 ab......yz....01....89 ABCD
CDE...YZ 01....89 ab......yz....01....89 ABCDE
DE...YZ 01....89 ab......yz....01....89 ABCDEF
```

[4] CHARACTER CONTROL TEST (NOT FOR P2705)

This test shows some lines of test pattern with attributes like inverse video, intensified, blinking and underline.
The attributes should be checked visually by the operator.

[5] SCREEN ALIGNMENT CHECK

After selection of this step the screen shows a frame like the following
picture:

```
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHH                                          HHHHHH
HHHHHH                                          HHHHHH
HHHHHH                                          HHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
   H    H                                    H    H
   H    H                                    H    H
   H    H                                    H    H
   H    H                                    H    H
   H    H                                    H    H
   H    H                                    H    H
   H    H                                    H    H
   H    H                                    H    H
   H    H         HHHHHHHHHHHHH              H    H
   H    H         HHHHHHHHHHHHH              H    H
   H    H         HHHHHHHHHHHHH              H    H
   H    H         HHHHHHHHHHHHH              H    H
   H    H                                    H    H
   H    H                                    H    H
   H    H                                    H    H
   H    H                                    H    H
   H    H                                    H    H
   H    H              .                     H    H
   H    H                                    H    H
   H    H                                    H    H
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
HHHHHH                                          HHHHHH
HHHHHH      PRESS KEY OR EXIT WITH   STOP       HHHHHH
HHHHHH                                          HHHHHH
HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
```

This frame is useful to check horizontal and vertical linearity and to adjust
it, if necessary.

[6] CHARACTER ATTRIBUTE TEST (NOT FOR P2705)

This is an additional test step to the Character Control Test. It shows the
whole character string with four attributes and their possible combinations.
This test is to check the acceptance of attributes and their combinations in
each position on the screen.

[7] GRAPHICS TEST 1 (NOT FOR P2705)

A test pattern which consists of graphic characters is displayed. The operator
is asked to check the pattern visually.

[8] GRAPHICS TEST 2 (NOT FOR P2705)

In this step a football ground is shown, composed of some graphic characters.
The operator is asked to check the pattern visually.

2.3.2 GPRS FOR GENERAL PRINTERS

This test shall be executed in the master (for shared printers) with buffers minimized to 2.
The printer shall be strapped with auto status = YES. Printer routing shall be Direct printing.

After selecting the test module for the general printer, the message:

ERROR IN POWER SUPPLY UNIT OR PRINTER NOT CONNECTED

is displayed on the screen and removed, if the printer is connected, switched on, and the correct PMU is selected.
If all conditions are fulfilled, the following submenu will be displayed:


```
DEVICE: PRINTER
PAPER FEED DEVICES:
0  EXIT                    3  FRONT FEED
1  FRICTION FEED           4  TRACTOR FEED 340 MM
2  ASSH                    5  TRACTOR FEED 400 MM
SELECT:
```

With the numbers [1] to [5], the paper device of the installed printer will be selected.

C A U T I O N :   DO NOT SELECT A NOT INSTALLED PAPER DEVICE!

If more than one paper device has to be tested, the operator has to leave test program step with "EXIT". Then he may select the new paper device.
After selecting the paper device, the program starts diagnostics by calling the power-on self-test of the printer. The following message will be displayed:

INSERT A FORM AND PRESS START KEY

If the form is inserted the printer starts printing the following test pattern:


```
ABCDE...YZ      ab....yz    01....89:; = ?     !"£$%&´()
BCDE...YZ       ab....yz    01....89:; = ?     !"£$%&´()*
CDE...YZ        ab....yz    01....89:; = ?     !"£$%&´()*+
DE...YZ         ab....yz    01....89:; = ?     !"£$%&´()*+,
```

After pressing the Start/Stop key on the printer, the test is stopped and status is sent to the system. The status will be displayed on the screen. After this a new menu appears on the screen to start other tests.

GPRS FOR GENERAL PRINTERS (CONT'D)

```
DEVICE: PRINTER
0  EXIT                3  FF TEST
1  DIAGNOSIS           4  TYPE WRITER TEST
2  ASSH TEST           5  ADJUSTMENT TEST
SELECT:
```

If a test is entered for a not connected paper device then an error message is displayed.

[1] DIAGNOSIS

This test returns to the previous menu. Another paper device can be selected.

[2] ASSH TEST (Test of Automatic Single Sheet Handler)

Both hoppers of the ASSH may be selected by the test step. Dependent on the selection, the form will be inserted from hopper 1, hopper 2 or both.
Before a form is inserted, the previous one is ejected. The positioning mechanism of the friction feed is tested by printing a text on lines 8 and 64. The text must not slide, neither in vertical nor in horizontal position.

[3] TEST OF FRONT FEED

The vertical positioning is tested. Two lines consisting of horizontal bars are printed on top of the form. After printing these bars, the form is positioned backwards to the last printed line. Printing of the horizontal bars is repeated. A similar procedure is applied in the middle of the form.
The Front Feed Device positions correctly, if the double printed bars are superjacent.

[4] TYPEWRITER TEST

Any character entered via the alphanumeric keyboard will immediately be displayed on the screen and printed on the selected paper device.
Admissible control keys are Carriage Return, Line Feed, Backspace and Shift.
This step shows the possibility of typing all characters and the national variants. Printing is done only with the default font, pitch and line. This step is left by pressing key 'STOP' or ^U.

[5] PRINTER ADJUSTMENT STEP

Dependent on the selection of loop no/yes, ten or a multiple of ten lines of vertical bars are printed, thus forcing an image like:

```
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
```

At the end of each line the print direction changes. That means, every second line is printed in the same direction.
This pattern can be used to decide if a correction of the print needles or print head inclination is necessary.

2.3.3 MFDS FOR MINI FLEXIBLE DISC

This test shall be started in the master, buffers shall be decreased to two.
After selecting the test of mini flexible disc, the menu offers the following
steps:

```
DEVICE:
0  EXIT                          3  TEST AND REPAIR MEDIUM
1  DIAGNOSIS                     4  EXTENDED TESTS
2  GENERATE TEST DISC
SELECT:
```

If the program is loaded into a slave PMU instead of the master, then the
message:

CONSOLE NOT ATTACHED TO MASTER PROCESSOR

will be displayed.

[1] DIAGNOSIS

Select the drive to be tested.

The diagnosis of the mini flexible disc is performed in 4 steps:

- Pre-Test
- Seek Test
- Read Test
- Write Test

- PRE-TEST: this step checks if the drive is ready and a test discette is mount-
  ed. The program returns with **MOUNT TEST DISC AND PRESS RETURN.** The expected
  volume label is **MFD-DIAG.** If another discette is inserted, the program returns
  with **WRONG MEDIUM** and the menu appears on the screen again. By starting test
  [2] a test disc is generated.

- SEEK TEST: first a sequential seek for all cylinders is executed (beginning
  with cylinder 80). Before every positioning the heads are recalibrated. The
  correct positioning is checked by reading the identifier. If all cylinders are
  found without an error random seeks will be performed.

- READ TEST: during the read test the heads are positioned to the cylinders 3,
  4, 39, 40, 45, 46, 71 and 72. On these cylinders the worst-case pattern, hexa-
  decimal 'DB6', are expected on each sector. If these patterns are not found,
  the test stops and an error message will be displayed.

- WRITE TEST: during the write test the first half of every sector of the
  cylinders 1, 2, 41, 42, 43, 44, 74 and 75 is overwritten by the pattern 00
  (16x).
  When all sectors are compared, the cylinders are overwritten by the value
  'DB6'H.

[2] GENERATE TEST DISC

After a pre-test the volume label - if one is found - will be displayed and the
operator is asked to confirm.
After writing the volume label **MFD-DIAG** all sectors of cylinders 1, 2, 3, 4, 39,
40, 41, 42, 43, 44, 45, 46, 71, 72, 74 and 75 are written with the worst case
pattern 'DB6'H.
In case of an error the message **TEST DISC NOT GENERATED** will be displayed.

MFDS FOR MINI FLEXIBLE DISC (CONT'D)

[3] TEST AND REPAIR MEDIUM

This step enables the operator to repair a defective data part of a sector.

The chosen flexible disk volume is checked upon irrecoverable read errors. If the data part of a sector is found to be fault, the contents is displayed and correction can be done. The operator may update the data and rewrite to disk. If this is not possible the step displays an error message.

[4] EXTENDED TESTS

This test can be executed with any formatted discette.

C A U T I O N :   The information of that disc will be lost!

The following tests may be selected:

DEVICE: MINI FLEXIBLE DISC   EXTENDED TESTS
0 EXIT   4 SEQUENTIAL READ
1 RANDOM WRITE   5 WRITE ONE SECTOR
2 RANDOM READ   6 READ ONE SECTOR
3 SEQUENTIAL WRITE   7 HEAD ADJUSTMENT
SELECT:

All steps are offered with loop facilities, thus continuous tests may be executed. If a test step detects an error, a detailed error protocol is displayed, giving the following information:

- Loop Counter
- Error Message
- Command
- Volume Label
- Drive Indication
- Cylinder and Sector Number

[1] RANDOM WRITE

The whole flexible disc volume is written. The sector address is evaluated by a pseudo random generator. Each sector is written only once. If the loop feature is switched on, writing is repeated until the step is interrupted by 'STOP' or ^U.
The operator selects whether the worst case pattern ('DB6'H) or the random pattern shall be written.

[2] RANDOM READ

Each sector is read. If the operator selects data comparison, the read data are compared with the selected pattern. If the read data differs from the expected data, the sector is displayed in 16-byte size, showing expected and obtained data.

[3] SEQUENTIAL WRITE

The whole volume is sequentially written sector by sector. If the loop feature is chosen, the sequence is repeated. The operator may select the worst case or the random pattern.

[4] SEQUENTIAL READ

All sectors are read sequentially. If wanted, the read data is compared with the worst case pattern or the random pattern. If the read data differs from the expected data, the sector is displayed in 16-byte size, showing the expected and the obtained data.

[5] WRITE ONE SECTOR

This step test writes one sector. The sector can be selected by entering the cylinder number and sector number. The operator may select writing of the worst case or the random pattern and a loop facility.

[6] READ ONE SECTOR

The sector to be read can be selected by entering the cyclinder and sector number. If data comparison is selected, the read data will be compared with the worst case or the random pattern. As in the write test a loop facility may be selected.

[7] HEAD ADJUSTMENT

Together with a hardware tool e.g. an oscilliscope and a calibrated mini flexible disc this step enables the operator to adjust the heads of the mini flexible disc drive. The operator selects track and head the data are read from, till the step is interrupted.

2.3.4 DK5S FOR FIXED DISC 5¼"

This program shall be loaded from flexible drive, started in the master with buffersize reduced to 512 and number of buffers reduced to 2.

The program tests the following units:

- SASI Adapter or SASI part of SESCO
- Fixed Disc Controller
- Fixed Disc Drive

The test module contains the following sub modules and steps:

```
DEVICE: FIXED DISC
0  EXIT                    4  READ MEDIUM
1  DIAGNOSIS               5  DUMP AND CHANGE SECTOR
2  SEEK TEST               6  UTILITY SERVICE COMMANDS
3  READ/WRITE TEST         7  WRITE MEDIUM
SELECT:
```

[1] DIAGNOSIS

After selection the following steps are performed:

- Controller and Drive Test
- Seek Random
- Seek Sequential
- Read/Write Test

- CONTROLLER AND DRIVE TEST
  This step first checks the correct function of the PMU interface part, SASI adaptor and the interface part of the disc controller. After that the disc controller is checked by issueing the controller self-test commands and asking for the status.

- SEEK RANDOM
  The address of a cylinder is calculated by a pseudo random pattern generator. To check the right position of the heads the sector addresses are read and compared with the expected addresses.

- SEEK SEQUENTIAL
  Starting with cylinder 0 the heads are positioned to all cylinders in sequential order (0 1 0 2 0 3). If the heads are positioned to the highest cylinder, seek will be performed to cylinders 1, 2, 3, etc. starting from the highest possible cylinder. As in the SEEK RANDOM test the sector addresses wil be compared.

- READ/WRITE TEST
  This step works only at the service cylinder (305). After reading one sector
  the read data is inverted and written to the same sector. Then the sector is
  read again and compared with the expected data. The same is done with the
  other nine sectors.

[2] SEEK TEST

This test is split into two parts. First a random seek and then a sequential
seek is performed as described in DIAGNOSIS.
If the user has selected the offered loop facility, the test is repeated until
an error occurs or the user presses the key 'STOP'.

[3] READ/WRITE TEST

This test is performed as described in DIAGNOSIS. Additionally the loop facility
can be selected by the user.

[4] READ MEDIUM

All tracks are read sequentially. The read data may be compared with worst case
or random pattern. Worst case pattern is 'DB6DB...'X.
This test uses the information written during WRITE MEDIUM test.

[5] DUMP AND CHANGE SECTOR

For this step the operator can select from the next menu:

DEVICE:
0 EXIT   4 UPDATE HEXADECIMAL
1 SELECT SECTOR   5 CONTINUE
2 READ SECTOR   6 WRITE SECTOR
3 UPDATE CHARACTERS
SELECT:

-[1] SELECT SECTOR: on the screen appears the next header:

    HEAD: CYLINDER: SECTOR:

    The operator is asked to type in the head number (0-3), cylinder number
    (0-305) and sector number (0-16). Each input is followed by 'CR'. The
    information is used for one of the other steps.

-[2] READ SECTOR: the data of sector indicated by the headers (step -[1]) is
    read and dumped on the screen. Only a part is displayed. To display the
    rest execute step -[5]: CONTINUE.

DK5S FOR FIXED DISC 5¼" (CONT'D)

-[3] UPDATE CHARACTERS: the data of the sector indicated by the headers (step
    -[1]) may be changed. The operator is asked:

    DISPLACEMENT: (0-512)   REPETITION FACTOR: (0-512)

    The displacement points to the first byte that has to be changed in the
    sector. The repetition factor gives the number of bytes to be changed. On
    XXXX: the character can be typed in. This character is automatically trans-
    lated into a hexadecimal code.

-[4] UPDATE HEXADECIMAL: identical to the previous step only on XXXX. A hexa-
    decimal code is expected which will be written in the requested location.

-[5] CONTINUE: during the display of a sector the execution of this step causes
    the not displayed part to appear on the screen.

-[6] WRITE SECTOR: data is written to the sector indicated by the header
    (step -[1]).

[6] SERVICE COMMANDS

A new menu is displayed:

DEVICE:
0 EXIT   4 DRIVE DIAGNOSTIC
1 CONTROLLER DIAGNOSTIC   5 RECALIBRATE
2 RAM DIAGNOSTIC   6 SEEK TO SELECTABLE
3 TEST DRIVE READY   CYLINDER
SELECT:

Commands [1]-[4] are executed using the test facility. In case of faillure an
error message is displayed. In step [5] the read/write heads are positioned over
cylinder 0.
On execution of step [6] the operator is asked:

·CYLINDER 1 (0-305) ˙
 CYLINDER 2 (0-305)

Both inputs must be followed by 'CR'. After the second input the heads start
seeking between the specified cylinders. The command can be interrupted by
'STOP'.

[7] WRITE MEDIUM

Do not use this test on a customer disc, all data will be overwritten.

All tracks except the directory tracks of the disk are written sequentially. The
operator may select if random or worst case pattern shall be written. Besides,
it is possible to write any individual pattern, which may be entered by the
operator in hexadecimal or character code.

2.3.5 DK8S FOR FIXED DISC 8"

This program shall be loaded from flexible drive. The program shall be started
in the master. Buffers are reduced to 512, number of buffers 2.
It is sufficient to specify only one logical volume.

The program tests the following units:

- SASI Adapter or SASI part of SESCO
- Fixed Disc Controller
- Fixed Disc Drive

The test module contains the following sub modules and steps:

DEVICE: FIXED DISC
0 EXIT   4 READ MEDIUM
1 DIAGNOSIS   5 DUMP AND CHANGE SECTOR
2 SEEK TEST   6 SERVICE COMMANDS
´3 READ/WRITE TEST   7 WRITE MEDIUM
SELECT:

[1] DIAGNOSIS

After selection the following steps are performed:

- Controller and Drive Test
- Seek Random
- Seek Sequential
- Read/Write Test

- CONTROLLER AND DRIVE TEST
  This step first checks the correct function of the PMU interface part, SASI
  adaptor and the interface part of the disc controller. After that the disc
  controller is checked by issueing the controller self-test commands and asking
  for the status.

- SEEK RANDOM
  The address of a cylinder is calculated by a pseudo random pattern generator.
  To check the right position of the heads the sector addresses are read and
  compared with the expected addresses.

- SEEK SEQUENTIAL
  Starting with cylinder 0 the heads are positioned to all cylinders in sequen-
  tial order (0 1 0 2 0 3). If the heads are positioned to the highest cylinder,
  seek will be performed to cylinders 1, 2, 3, etc. starting from the highest
  possible cylinder. As in the SEEK RANDOM test the sector addresses wil be com-
  pared.

- READ/WRITE TEST
  This step works only at the service cylinder. After reading one sector the
  read data is inverted and written to the same sector. Then the sector is read
  again and compared with the expected data. The same is done with the other
  nine sectors.

DK8S FOR FIXED DISC 8" (CONT'D)

[2] SEEK TEST

This test is split into two parts. First a random seek and then a sequential
seek is performed as described in DIAGNOSIS.
If the user has selected the offered loop facility, the test is repeated until
an error occurs or the user presses the key 'STOP'.

[3] READ/WRITE TEST

This test is performed as described in DIAGNOSIS. Additionally the loop facility
can be selected by the user.

[4] READ MEDIUM

All tracks are read sequentially. The read data may be compared with worst case
or random pattern. Worst case pattern is 'DB6DB...'X.
This test uses the information written during WRITE MEDIUM test.

[5] DUMP AND CHANGE SECTOR

For this step the operator can select from the next menu:

DEVICE:
0 EXIT   4 UPDATE HEXADECIMAL
1 SELECT SECTOR   5 CONTINUE
2 READ SECTOR   6 WRITE SECTOR
3 UPDATE CHARACTERS
SELECT:

-[1] SELECT SECTOR: on the screen appears the next header:

       HEAD: CYLINDER: SECTOR:

       The operator is asked to type in the head number (0-3), cylinder number
       (0-305) and sector number (0-16). Each input is followed by 'CR'. The
       information is used for one of the other steps.

-[2] READ SECTOR: the data of sector indicated by the headers (step -[1]) is
       read and dumped on the screen. Only a part is displayed. To display the
       rest execute step -[5]: CONTINUE.

-[3] UPDATE CHARACTERS: the data of the sector indicated by the headers (step
       -[1]) may be changed. The operator is asked:

       DISPLACEMENT: (0-512)   REPETITION FACTOR: (0-512)

       The displacement points to the first byte that has to be changed in the
       sector. The repetition factor gives the number of bytes to be changed. On
       XXXX: the character can be typed in. This character is automatically
       translated into a hexadecimal code.

-[4] UPDATE HEXADECIMAL: identical to the previous step only on XXXX. A
       hexadecimal code is expected which will be written in the requested
       location.

-[5] CONTINUE: during the display of a sector the execution of this step causes
       the not displayed part to appear on the screen.

-[6] WRITE SECTOR: data is written to the sector indicated by the header (step -[1]).

[6] SERVICE COMMANDS

A new menu is displayed:

```
DEVICE:
0 EXIT                          4 DRIVE DIAGNOSTIC
1 CONTROLLER DIAGNOSTIC         5 RECALIBRATE
2 RAM DIAGNOSTIC                6 SEEK TO SELECTABLE
3 TEST DRIVE READY                CYLINDER
SELECT:
```

Commands [1]-[4] are executed using the test facility. In case of faillure an error message is displayed. In step [5] the read/write heads are positioned over cylinder 0.
n execution of step [6] the operator is asked:

CYLINDER 1 (0-305)
CYLINDER 2 (0-305)

Both inputs must be followed by 'CR'. After the second input the heads start seeking between the specified cylinders. The command can be interrupted by 'STOP'.

[7] WRITE MEDIUM

Do not use this test on a customer disc, all data will be overwritten.

All tracks except sector 0 through 3 of the disk are written sequentially. The operator may select if random or worst case pattern shall be written. Besides, it is possible to write any individual pattern, which may be entered by the operator in hexadecimal or character code.

2.3.6 TAPS FOR STREAMER TAPE

This testprogram must be started in master, number of buffers minimized to 2.

The program tests the following units:

- TAPCO-Q
  STREAMER TAPE DRIVE
- MEDIUM

The next menu appears on the screen when the test is started:

DEVICE: STREAMER TAPE

0	EXIT	4	WRITE MEDIUM
1	DIAGNOSIS	5	FILL MEDIUM
2	VERIFY MEDIUM	6	SERVICE COMMANDS
3	READ MEDIUM		

[1] DIAGNOSIS

The diagnosis part of the streamer tape test program uses the test commands of the tape controller and executes read/write operations on tape to find the defective exchangeable hardware units.
This step needs a tape which will be erased and completely filled.

- CONTROLLER SELFTEST
  At first the test commands provided by the tape controller are exeucted:

  - Test Controller
  - Test RAM
  - Test Unit Ready

- READ/WRITE AND DRIVE TEST
  If no errors have been found during controller Selftest, the program continues with tests of read/write-channels and - heads and drive mechanics. Therefore the following functions will be executed:

  - Read/Write Tests
    The tape is moved to BOT (Begin of Tape) position, a data block of worst case patterns is written, then the data are read and compared.

  - Erase Test
    The tape is erased and it is checked whether the tape is empty.

  - Fill and Verify
    The tape is completely filled with worst case pattern and the data are verified by checking the CRC.

The time needed for the diagnosis step is up to 12 minutes, without error recovery.

[2] VERIFY MEDIUM

This step verifies the data on tape. The CRCs of the data blocks are checked by the TAPCOQ. No data are written on tape. In case of an error the block number of defective block is displayed and the program continues verifying.

[3] READ MEDIUM

This utility reads data blocks from tape. The operator enters the numbers of the
first and last blocks to be read. Additionally he selects if the read data are
compared with worst case or random pattern or if the data are dumped on
display. When the operator has answered all prompting messages, the program
performs a 'space' command till the first data block to be read is reached.
File marks are ignored. If the end of data is reached an error message is issued
and the utility is aborted.

Reading starts with the selected data block. If data comparison has been
selected the read data are compared. In case of an error the expected and
obtained data are displayed. At the end of the step a 'rewind' command is
executed. If the utility is executed in loop mode the loop counter is
incremented and the utility is started anew with the 'space' command.
Select at least a loop of 10.000 blocks.

[4] WRITE MEDIUM

Data blocks are written on tape by using the 'write' command of the controller.
The operator selects if worst case, random or individual data pattern are
written. Another operator input is*the number of blocks and loop mode. If the
operator selects loop mode, writing of data blocks starts at BOT and when all
blocks have been written, a 'rewind' command is performed, the loop counter is
incremented and the utility starts anew. If loop mode is not selected the
message:

                    APPEND DATA (Y/N):

is issued and the operator decides if writing starts at BOT or at end of data,
i.e. the data blocks are appended. After writing a 'rewind' command is executed.

Note: If loop is selected, specify at least 10.000 blocks.

[5] FILL MEDIUM

This utility writes data blocks on tape, using the 'fill' command of the
controller. The operator selects the type of data pattern: worst case, random or
individual data and the number of blocks to be written. The utility starts to
write data at BOT always. When all data blocks have been written a 'rewind'
command is executed.

[ ] SERVICE COMMANDS

For this step a new menu appears on the screen.

0 EXIT   4 REWIND
1 TEST CONTROLLER AND RAM   5 RETENSION
2 TEST UNIT READY   6 ERASE MEDIUM
3 SEND FIRMWARE REVISION
SELECT:

2.3.7 LINS FOR DATA COMMUNICATION

Its main task is to check the physical data connection between host and local modem.
Various data pattern can be sent under different test conditions and will be recieved again. In case of a hardware malfunction the program gives an indication of the erroneous hardware component. It is not qualified for testing DC-protocols or DC-software components.

2.3.7.1 CONFIGURATION

The program needs a special generated system which contains a specially developed service provider called CCLIFT, so IPL must be performed before the program can be started.
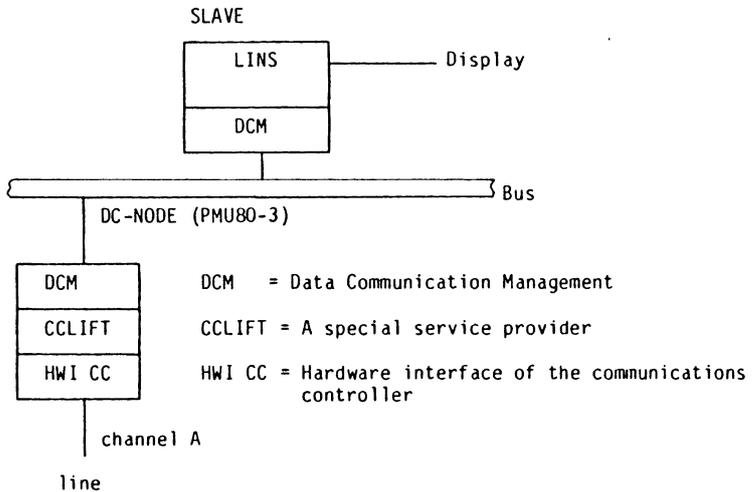
The following loops will be installed by program or have to be installed by the operator before the appropriate teststep can be performed:
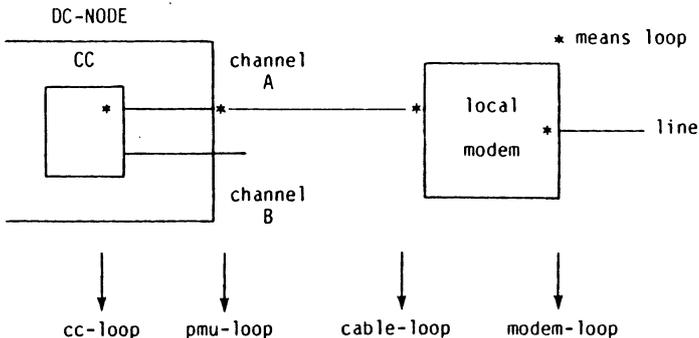
2.3.7.2 TEST STEPS

After starting the test program the following menu appears on the screen:

```
0  EXIT              4  CABLE-LOOP
1  DIAGNOSIS         5  MODEM-LOOP
2  CC-LOOP           6  CHANGE MODE
3  PMU-LOOP          7  CHANGE TESTPATTERN
```

SELECT:

Number of Pattern: dddddd   Mode: async   Testpattern: AA55

SCC-RR0 : xx   SCC-RR1 : xx   Received Pattern : xxxx

Refer to the DC-NODE PAR FILE to obtain the SAP number! (Normally the PMU position of the DC-NODE).

[1] DIAGNOSIS

Choosing this step has the same effect as selecting the steps:

CC-LOOP
PMU-LOOP
CABLE-LOOP
MODEM-LOOP

one after the other.

[2] CC-LOOP

The loop via CC is established by the local loop back mode of the CC. In this mode the transmitter output of the CC is connected directly to its receiver input. The loop is installed automatically by software when the operator has selected this test step.

[3] PMU-LOOP

At the beginning the operator is asked to establish the short circuit plug at connector A of the DC-Mode.
The plug must have short circuits as follows:

b2 - b3
b4 - b5
b6 - b7 - b8 - a7
a2 - a4 - a11

[4] CABLE-LOOP

At the beginning the operator is asked to disconnect the cable from the modem and to establish the short circuit plug at this end of the cable.
The plug must have short circuits as follows (Type Cannon, female, 25 pins):

2 - 3
4 - 5
6 - 8 - 20
15 - 17 - 24

TEST STEPS (CONT'D)

[5] MODEM-LOOP

In this test step the short circuit between transmit and receive line is established in the modem. Therefore, the operator must connect the local modem and establish the loop in the modem.

This test can be performed with all types of modems which provide the ability to establish a test loop via a test-loop switch.

[6] CHANGE-MODE

Selecting of this step means to adjust another transmission mode and display it (current mode).
Transmission modes can be synchronous, asynchronous or HDLC/SDLC.

Below a list of other important transmission parameters which are fixed in this program:

Speed   - 9600 Baud
Bits/Char. - 8
Stop Bits   - 1 (in Asynchronous Mode)

Any teststep will at first initialize the CC using the current mode.

[7] CHANGE TESTPATTERN

By selecting this step the testpattern can be changed to another two byte value.

The testpattern is predefined with 'AA55'H. During test the CC will be fed with one testpattern at a time.

2.3.7.3 ERROR CONDITIONS

Whenever an error status of the CC is detected or a comparison error between the transmitted and received pattern occurs, the following error protocol is issued:

SCC-RRO: xx   SCC-RR1: xx   Received Pattern: xxxx

where SCC-RRO and SCC-RR1 are read registers of the SCC.

Read Register 0

```
bit 7  6  5  4  3  2  1  0
                        └──── Rx Character Available
                     └─────── Zero Count
                  └────────── Tx Buffer Empty
               └───────────── Data Carrier Detect
            └──────────────── Sync/Hunt
         └─────────────────── Clear to  Send
      └────────────────────── Tx Underrun/EOM
   └───────────────────────── Break/Abort
```

Read Register 1

```
bit 7  6  5  4  3  2  1  0
                        └──── All Sent
                     └─────── Residue Code 2
                  └────────── Residue Code 1
               └───────────── Residue Code 0
            └──────────────── Parity Error
         └─────────────────── Rx Overrun Error
      └────────────────────── CRC/Framing Error
   └───────────────────────── End of Frame (SDLC)
```

3   INSTALLATION

3.1 P3500 HARDWARE INSTALLATION

```
┌─────────────────────────────────────────────────────────┐
│                    W A R N I N G :                        │
│                                                            │
│   To avoid light reflections from the System Cabinet,     │
│   it is advised to place this cabinet not in the direct   │
│   viewing angle of the user.                              │
└─────────────────────────────────────────────────────────┘
```

3.1.1 P3500 SYSTEM CABINET HARDWARE INSTALLATION PROCEDURE

	ACTION	REFERENCE SECTION
A	Remove rear cover	5.1
B	Remove cover	5.1
C	Check strap setting PMU's	20.5
D	Connect required workstations, printers and extensions	3.3.1
	Note: If a 16-bit operating system must be generated, a PMU 186 should be installed in PMU1 position	
E	Switch battery off	
F	Install covers	5.1
G	Connect all mains cables	
H	Switch one workstation power on	
	Note: If a 16-bit operating system must be generated, it should be the workstation connected to PMU1	
I	At power-on of system insert distribution discette in first flexible drive	
J	Perform SOFTWARE INSTALLATION	3.2
K	Switch workstation power off	
L	At power-off of system, set battery ON (if installed)	
M	Switch workstations power on	

3.1.2 P3800 SYSTEM CABINET HARDWARE INSTALLATION PROCEDURE

	ACTION	REFERENCE SECTION
A	Remove rear and top cover	11.1
B	Check strap setting PMU's	20.xx
C	Connect required workstations, printers and extension(s).	3.3.1
	Note: If a 16-bit operating system must be generated a PMU 186 should be installed in PMU position 1.	
D	Install covers	11.1
E	Connect all mains cables	
F	Switch one workstation power on. Note: If a 16-bit operating system must be generated it should be the workstation connected to PMU 1	
G	At power-on of system insert distribution discette in first flexible drive	
H	Perform SOFTWARE INSTALLATION	3.2

3.1.3 P3500 WORKSTATIONS HARDWARE INSTALLATION PROCEDURES

3.1.3.1 P2705 HARDWARE INSTALLATION PROCEDURE

	ACTION	REFERENCE section
A	Connect interface cables K/B, System	3.3.1 & 20.20
B	Switch workstation power on	
C	Push SETUP key (P2705-00X) or CNTRL SETUP (P2705-10X)	.
D	Adjust screen brightness	
E	Enter required set-up parameters	USER MANUAL
F	Push SETUP key (P2705-00X) or CNTRL SETUP (P2705-10X)	
G	Switch power off	

3.1.3.2 P2711 HARDWARE INSTALLATION PROCEDURE

	ACTION	REFERENCE SECTION
A	Remove rear cover	8.1
B	Connect interface cables K/B, System, Aux. Printer (opt.)	3.3.1
C	Switch workstation power on	
D	Push SETUP key	
E	Adjust screen brightness	
F	Enter required set-up parameters, press shift-S to save	USER MANUAL
G	Push SETUP key	
H	Switch power off	
I	Install back cover	
J	Switch power on	

3.1.4 EXTENSIONS HARDWARE INSTALLATION PROCEDURES

3.1.4.1 P3012 FXD EXTENSION HARDWARE INSTALLATION PROCEDURES

	ACTION	REFERENCE section
A	Remove cover	9.1
B	Check strap setting	20.12.2
C	Check correct installation of terminators	3.3.2
D	Connect SCSI-interface cable to system	3.3.2 & 20.22
E	Install covers	
F	Connect mains cable	
G	Switch system power on	
H	Perform software installation of extension unit	3.2

3.1.4.2 P2621 8" FDD EXTENSION HARDWARE INSTALLATION PROCEDURES

	ACTION	REFERENCE SECTION
A	Remove cover	10.1
B	Check strap setting	20.24.2
C	Check correct installation of terminators	3.3.2
D	Connect SCSI-interface cable to system	3.3.2 & 20.22
E	Install covers	
F	Connect mains cable	
G	Switch system power on	
H	Perform software installation of extension unit	3.2

3.1.4.3 P3013 TAPE EXTENSION HARDWARE INSTALLATION PROCEDURES

	ACTION	REFERENCE SECTION
A	Remove cover	12.1
B	Check strap setting	
C	Check correct installation of terminators	20.35.2
D	Connect SCSI-interface cable to system	3.3.2
E	Install cover	3.32 & 20.22
F	Connect mains cable	
G	Switch system power-on	
H	Perform software installation of extension unit	3.2

3.1.5 PRINTER HARDWARE INSTALLATION PROCEDURES

	ACTION	REFERENCE SECTION
A	Refer to printer service manual for installation details	page 0-4
B	Use printer interface cable according to figure	3.3.1
C	Default strap setting for P3500: - SPEED : 9600 BPS - PARITY : OFF - CHAR.LEN. : 8 BITS - PROTOCOL : READY/BUSY (DTR)	
D	For General Printer: AUTO STATUS = YES for test program	

3.2 SOFTWARE INSTALLATION

3.2.1 P3500 RELEASE 1 INSTALLATION TURBODOS

	ACTION	REFERENCE section
A	Start-up (IPL) the system with a copy of the distribution discette in the first flexible drive	
B	Enter USERID : SYSTEM	
C	Enter PASSWORD: SYSTEM	
D	On prompt OA enter: USER 1	
E	On prompt 1A enter: CONFIG	
F	Answer the questions from CONFIG according to the required configuration	SOFTWARE BULLETINS
G	Use Workstar to make additional changes in the CFG*.* files	
H	On prompt 1A enter: DO STARTUP	
J	Switch all workstations power off at end of DO STARTUP	
K	At system power-off wait 15 seconds and switch a configured workstation power on	
L	Enter USERID : SYSTEM	
M	Enter PASSWORD: SYSTEM	
N	On prompt OA enter: USER 1	
O	On prompt 1A enter: DO GEN	
P	Switch workstation power off on request from screen	
Q	Remove distribution discette from flexible and save if for later use	
R	Switch workstation power on at least 15 seconds after system power-off	
S	Start-up is now done from the customer disc	
T	Make a back-up of the customer disc	
U	Install application software (if applicable)	

3.2.2 P3500 RELEASE 2 SOFTWARE INSTALLATION PROCEDURE TURBODOS

	ACTION	REFERENCE section
A	Start-up (IPL) the system with a copy of the distribution discette in the first flexible drive	
B	Enter USERID : SYSTEM	
C	Enter PASSWORD: SYSTEM	
D	On prompt 0A enter: USER 1	
E	On prompt 1A enter: CONFIG	
F	Enter required configuration parameters of screen 01 to 06	SOFTWARE
G	Push STOP key when ready	BULLETINS
H	Save printout of CONFIG for registration purposes	
I	On prompt 1A enter: DO GEN	
K	At system power-off wait 15 seconds and switch a configured workstation power on	
L	Enter USERID : SYSTEM	
M	Enter PASSWORD: SYSTEM	
N	On prompt 0A enter: USER 1	
O	On prompt 1A enter: DO CUSTOMER	
P	Switch workstation power off on request from screen	
Q	Remove distribution discette from flexible and save if for later use	
R	Switch workstation power on at least 15 seconds after system power-off	
S	Start-up is now done from the customer disc	
T	Make a back-up of the customer disc	
U	Install application software (if applicable)	

3.2.3 P3500/P3800 RELEASE 3/4 INSTALLATION TURBODOS

|	ACTION	REFERENCE SECTION
A	Start-up (IPL) the system with a copy of the distribution discette in the first flexible drive containing the starter-system. Note: To generate a 16-bit operating system a PMU 186 must be inserted in PMU 1 position (system cabinet) and the worksta-tion connected to that PCB should be used	
B	Enter USERID : SYSTEM	
C	Enter PASSWORD: SYSTEM	
D	On prompt 0A enter: CONFIG	
E	Note: If a Fixed Disc has to be formatted and/or logical volumes have to be installed CONFIG must be left after finishing the first screen to run these utilities. This can be done on the message: "SYSTEM DRIVE X: NOW ACCESSIBLE. CONTINUE (Y/N):" The disc can be accessed by specifying drive number X:	F58H
F	Enter required configuration parameters of screens	
G	Push STOP key when ready	
H	Save printout of CONFIG.REG for registration purposes	
I	On remark "Now Enter" DO X: GEN to start the DO-file GEN.DO! enter DO X: GEN	
J	Switch workstation power off at end of DO GEN	
K	Switch workstation power on at least 15 seconds after system power off	
L	Start-up is now done from the customer disc	

3.3 INTERCONNECTIONS

3.3.1 SERIAL INTERFACE CONNECTIONS

This section lists the possible connections of peripheral devices to the P3500/P3800.
Refer to section 20.28 for cable lay-outs.
Channel B of the new PMU's (PMU80-3/PMU 186) can be strapped for DCE (default) or DTE connections. The cable type for both strapsettings is given.

### 3.3.1.1 PRINTER CONNECTIONS
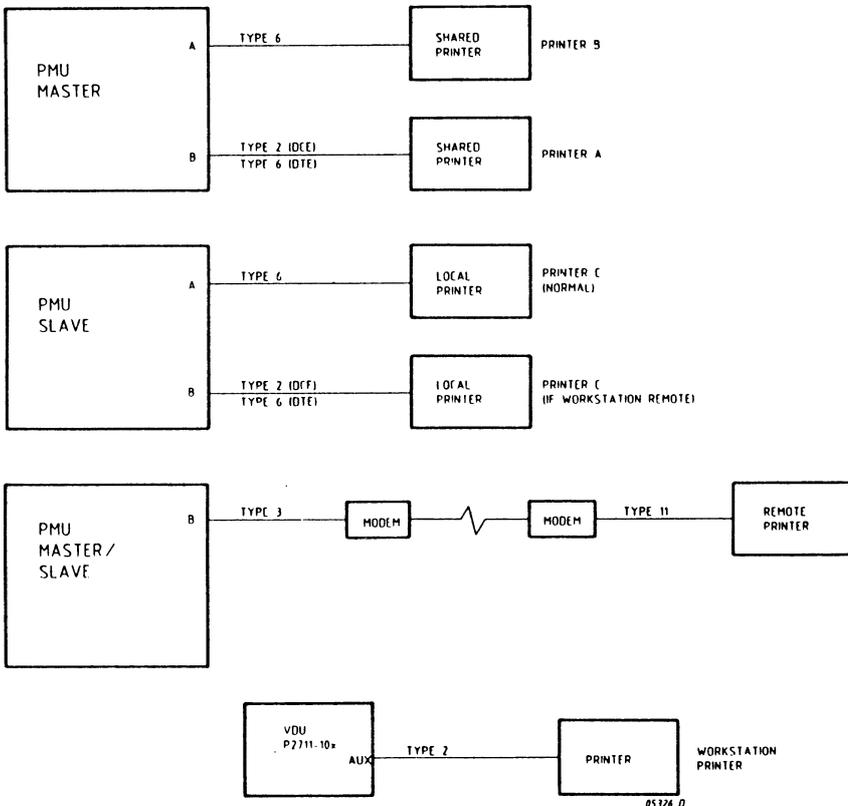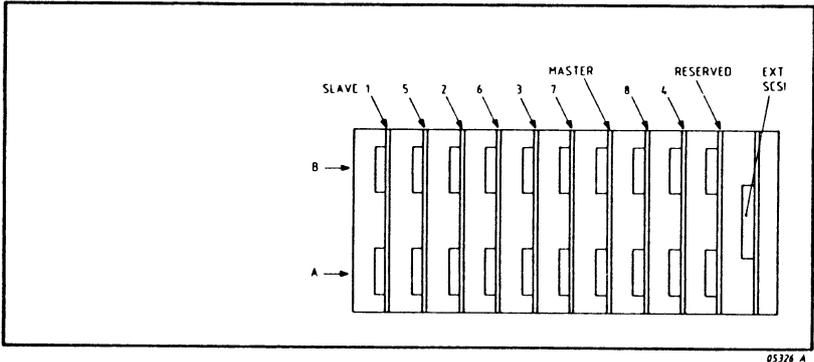
System Cabinet P3800 (top view)
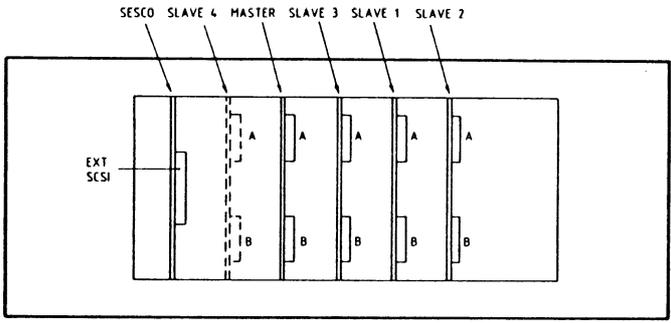
System Cabinet P3500 (rear view)

3.3.1.2 WORKSTATION CONNECTIONS

```
┌─────────────┐
│             │ A    TYPE 3    ┌───────┐           ┌───────┐   TYPE 11   ┌──────────┐
│   PMU       │────────────────│ MODEM │───/\/──────│ MODEM │─────────────│   VDU    │
│   SLAVE     │                └───────┘           └───────┘             │ P2711-10x│
│             │                                                          │ P2711-10x│
│             │                                                          └──────────┘
│             │ B   TYPE 1 (DCE)   ┌──────────┐   NORMAL WORKSTATION       REMOTE
│             │─────TYPE 6 (DTE)───│   VDU    │   CONNECTION               WORKSTATION
│             │                    │ P2705/P2711│
└─────────────┘                    └──────────┘
                                       05326 B
```

3.3.1.3 DC-CONNECTIONS

```
┌─────────────┐
│             │ A    TYPE 3    ┌───────┐
│   PMU       │────────────────│ MODEM │───/\/──── TO OTHER SYSTEM
│   SLAVE     │                └───────┘
│             │
└─────────────┘


┌─────────────┐
│             │ A    TYPE 5    ┌───────┐  TYPE 10   ┌───────┐
│   PMU       │────────────────│  TTA  │────────────│ MODEM │──/\/──── DATA NETWORK
│   DC NODE   │                │ X3710 │            │  X21  │
│             │                └───────┘            └───────┘
│             │                                      05326 C
└─────────────┘
```
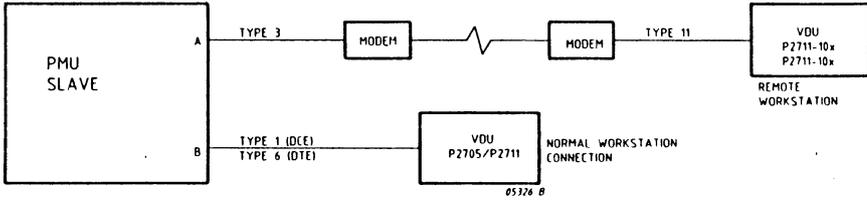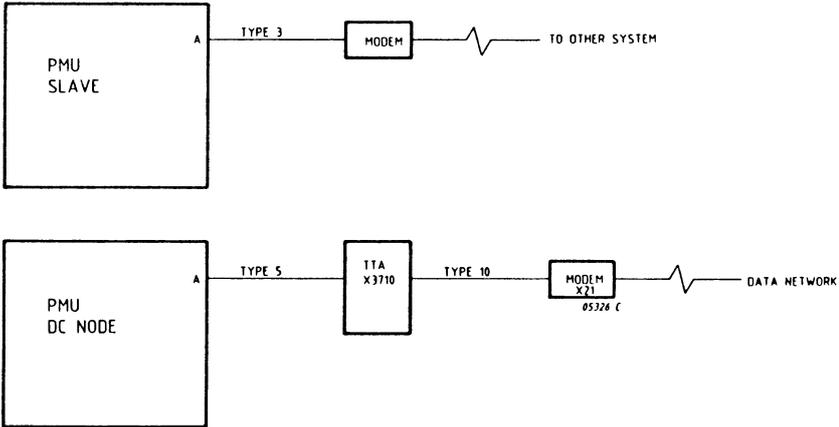
3.3.1.4 SINGLE USER SYSTEM INTERCONNECTIONS P3500

```
┌─────────────┐
│             │ A    TYPE 6    ┌───────────┐
│   PMU       │────────────────│  PRINTER  │
│   SINGLE    │                │     A     │
│             │                └───────────┘
│             │   TYPE 1 P2711-00x
│             │   TYPE 2 P2711/P2705-10x (DCE)
│             │   TYPE 6 P2711/P2705-10x (DTE)        ┌──────────┐
│             │ B──────────────────────────────────────│   VDU    │
│             │                                        │ P2705/P2711│
└─────────────┘                                        └──────────┘
                                                         05326 E
```

PME1

KEYBOARD ——
(KB)

SYSTEM ——
(V 24)

HARDCOPY ——
PRINTER
(AUX)

04688 D

VDU P2711-00X (rear view)

TERCO

K/B

SYSTEM

AUX

K/B   SYSTEM

04688 G

VDU P2711-10X (rear view)

PCB LOGIC

SYSTEM ——

KEYBOARD ——

04688 E
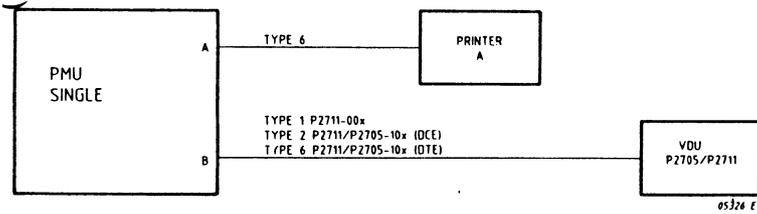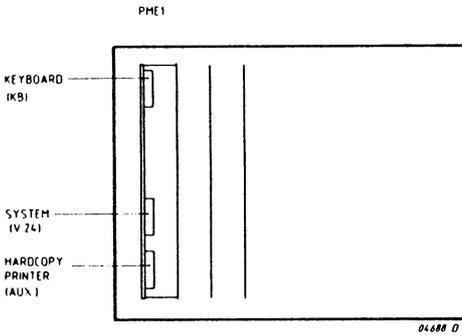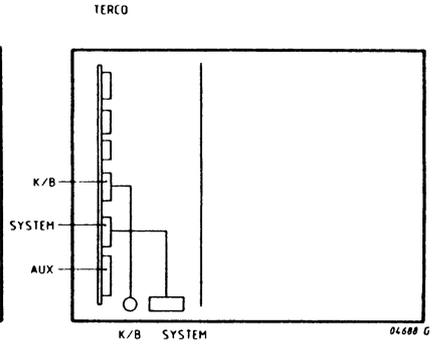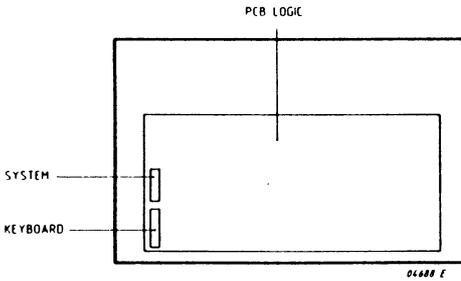
VDU P2705-00X (top view)

04688 F
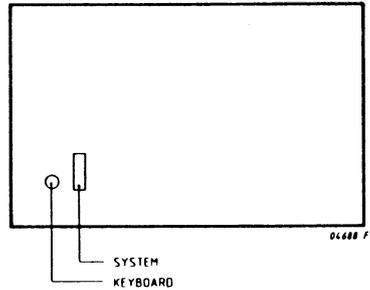
SYSTEM
KEYBOARD

VDU P2705-10X (rear view)

3.3.2 DISC CABLING / TERMINATORS (Refer to section 20.28)

FXD
(INTERNAL)

MFD

OPERATOR PANEL

SCSI
(EXTERNAL)

PCB SESCO

04688 A

BUS CONNECTOR

System Cabinet P3500/P3800

TO/FROM XEBEC

SCSI IN
(FROM SESCO OR
PREVIOUS SASEX)

PCB SAS-EX

SCSI OUT
(TO NEXT SASEX OR
TERMINATOR)

04688 B

BUS CONNECTOR
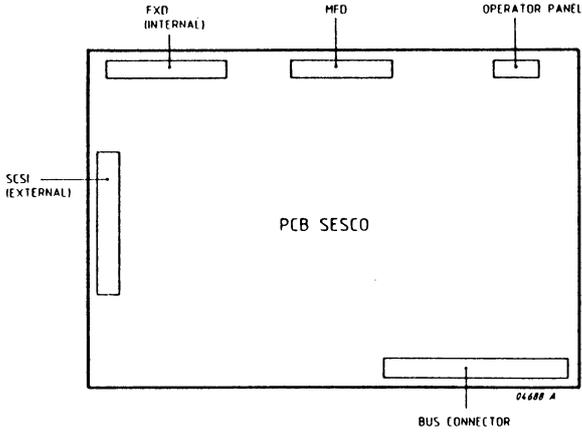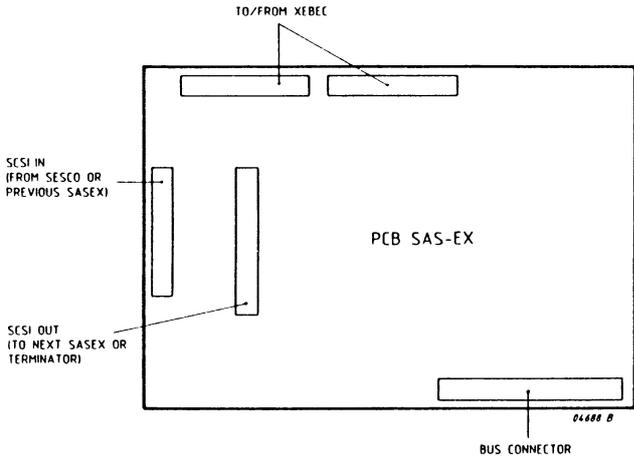
Disc Extension Cabinets P3012 / P2621/P3013

3.3.2.1 P3500 DISC CABLING / TERMINATORS
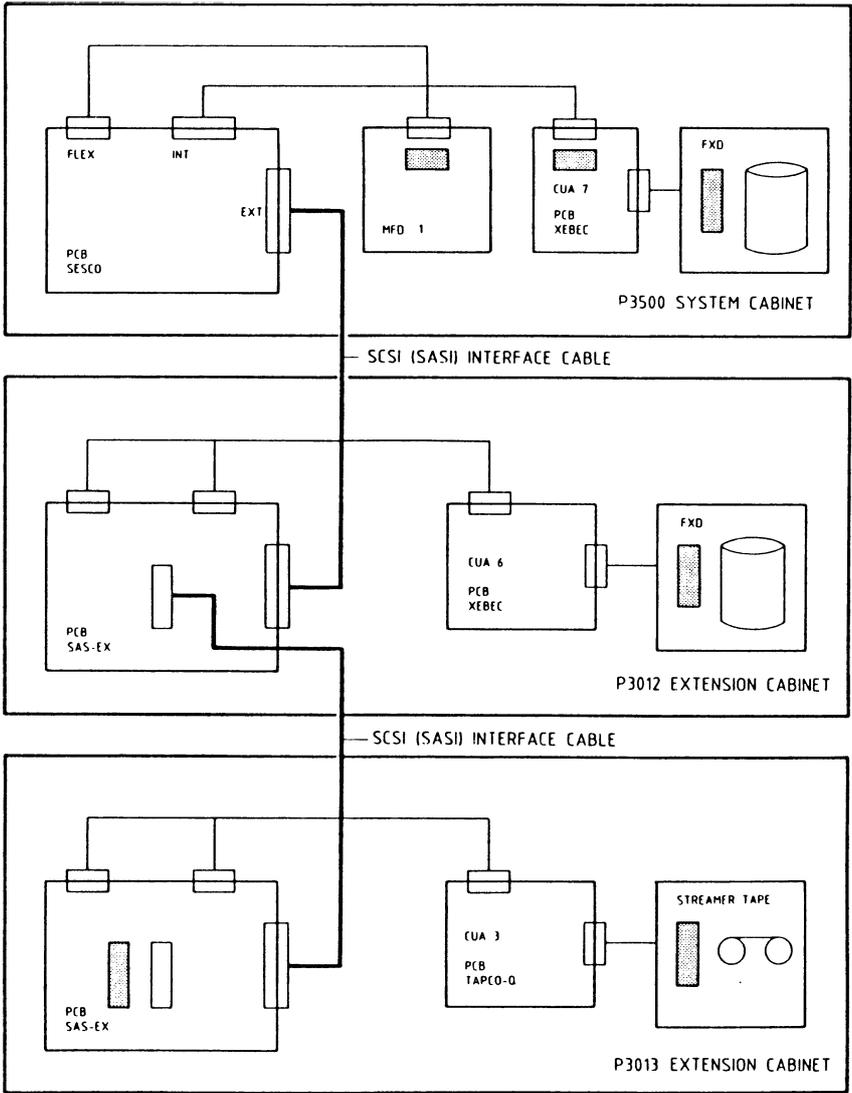
FIXED P3500 - TWO EXTENSIONS

04547 A

FLEX   INT

EXT

PCB
SESCO

MFD 1

MFD 2

P3500 SYSTEM CABINET
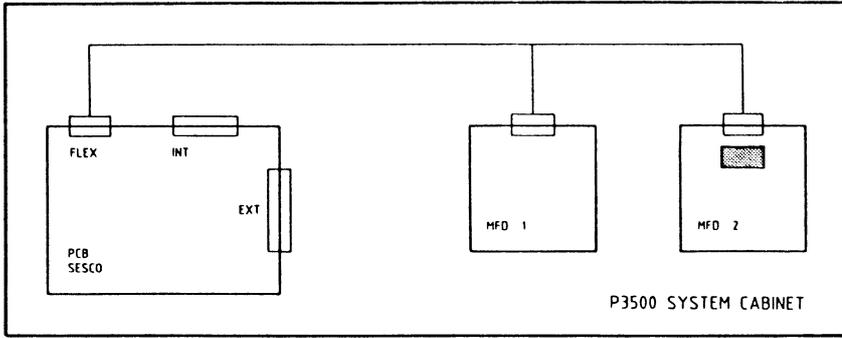
04546 B

P3500 DUAL FLEX - NO EXTENSIONS

FLEX   INT

EXT

PCB
SESCO

MFD 1

MFD 2

P3500 SYSTEM CABINET

SCSI (SASI) INTERFACE CABLE

CUA 6

FXD

PCB
XEBEC

PCB
SAS-EX
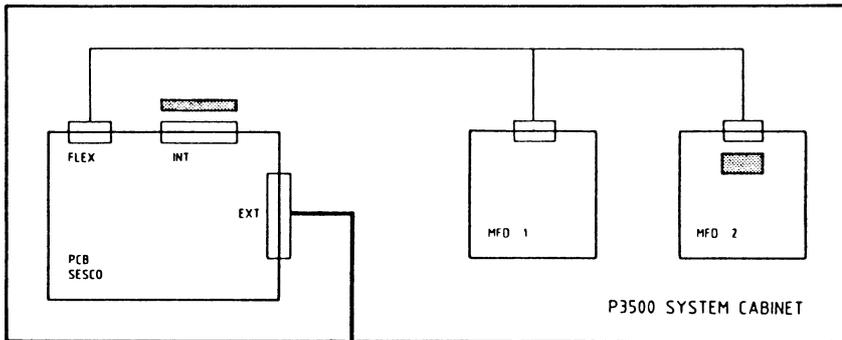
P3012 EXTENSION CABINET
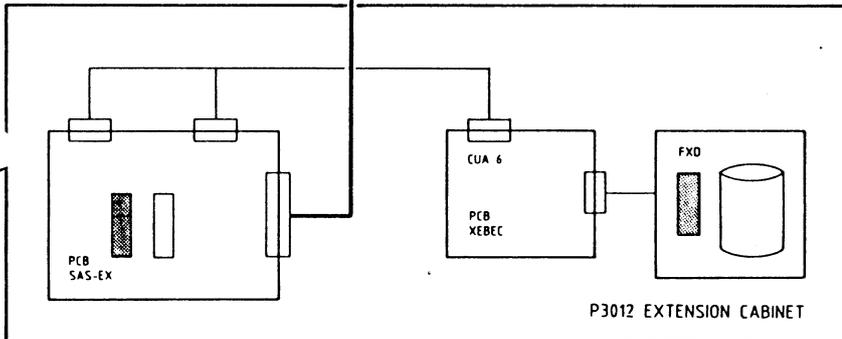
04546 C

P3500 DUAL FLEX - ONE EXTENSION CABINET

TERMINATOR

3.3.2.2 P3800 DISC CABLING / TERMINATOR

P3500 SYSTEM CABINET

— SCSI (SASI) INTERFACE CABLE

P3012 EXTENSION CABINET

— SCSI (SASI) INTERFACE CABLE.

P2621 EXTENSION CABINET
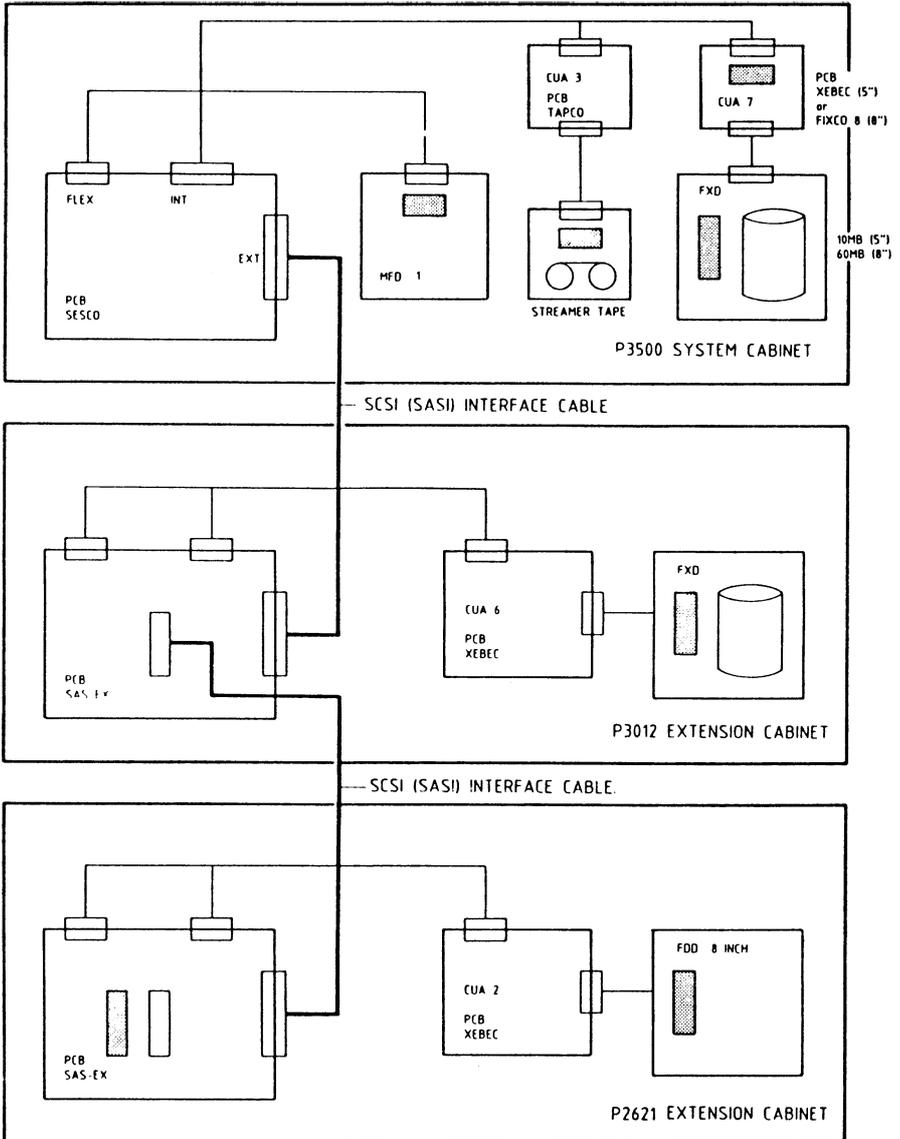
P3800 - TWO EXTENSIONS

05127 A

▓ TERMINATOR

3.4 P3500 HARDWARE / SOFTWARE COMPATIBILITY

3.4.1 SYSTEM CABINET P3500

PCB	MOD. LEVEL	SOFTWARE RELEASE	REMARKS
PMU80 (7573x)	6 8 -	Rel.1 Rel.2 Rel.3/4	Not possible for FXD RODIME
(9976x)	1	Rel.3/4	If RODIME FXD installed
PMU80-1 (7560x)	4 5 8	Rel.1 Rel.2 Rel.3/4	If RODIME FXD installed
PMU80-1A (8735x)	3	Rel.3/4	If RODIME FXD installed
PMU80-3 (8076x)	3	Rel.3/4	
PMU-186 (9565x)	2	Rel.3/4	Also modification to improve airflow shall be installed
SASI-AD (7576x)	4 6 6	Rel.1 Rel.2 Rel.3/4	If EXTENSION CABINET installed Not possible if STREAMER installed
(7740x)	2 4 4	Rel.1 Rel.2 Rel.3/4	If EXTENSION CABINET installed Not possible if STREAMER installed
FLEXCO (6986x)	3 3	Rel.1 Rel.3/4	Not possible if STREAMER installed
SESCO (7742x)	- 2 8	Rel.1 Rel.2 Rel.3/4	If STREAMER installed
WS-120 (7572x)	3 4	Rel.1 Rel.3/4	If PMU-186 installed
PSU-M2 (6976x)	2 4	Rel.1 Rel.3/4	If PMU-186 installed

3.4.2 P2711 VDU H/S COMPATIBILITY

PCB	MOD. LEVEL	SOFTWARE RELEASE	REMARKS
PMU 88	3 5	Rel.1 Rel.2	
PMU 88-1	1 3	Rel.1 Rel.2	
PME 1-1	3 4	Rel.1 Rel.2	
CRTCO	5	Rel.1	
TERCO	1	Rel.3/4	

3.4.3 SYSTEM CABINET P3800 H/S COMPATIBILITY

T.B.F.

3.5 HARDWARE COMPATIBILITY

T.B.F.

4   TROUBLE SHOOTING

4.1 TROUBLE SHOOTING SYSTEM GENERATION

	PROBLEM	REPAIR ACTION	REFERENCE section
A	No IPL from Distribution Discette	- Use copy of distribution discette - Continue with SYSTEM CABINET	4.2
B	Error Code after IPL	- Software configuration not in accordance with hardware configuration *Generate new system Hardware failure on disc controller as indicated: <table><tr><td>LAMP 1 2 3 4</td><td>FAILURE</td></tr><tr><td>X X - - X - X - - - X -</td><td>MFD-Controller FXD-Controller 8"FD-Controller</td></tr></table> X = set - = not set - Continue with SYSTEM CABINET	3.2 4.2
C	Not all Workstations signed-on after Generation	- Check if workstations connected to a configured slave in CONFIG.REG - Continue with WORKSTATION	 4.3 / 4.4
D	Not all Disc Drives usable after Generation	- Check if disc configuration correct in CONFIG.REG - Continue with SYSTEM CABINET 　　　　　　　　　DISC EXTENSION	. 4.2 4.5 / 4.6
E	Printer not working after Generation	- Check if printer assignment correct in CONFIG.REG - Continue with PRINTERS	 4.7

4.2.1 TROUBLE SHOOTING SYSTEM CABINET P3500

	PROBLEM	REPAIR ACTION	REFERENCE section

A	System doesn't switch Power-on	- Check mains supply
		- Check workstation interface cable
		- Check PMU-80 strap setting (RPON)
		- Try other workstation power-on:
		  Okay?: * Check workstation
		        * Replace PMU-80
		- Try PSU in local mode:
		  Okay?: * Replace PMU-80
		- Replace PSU-WS120
			
			3.3.1
			20.xx
			
			4.3 / 4.4
			
			20.2.2

	Error Code on Operator Panel at Power-on	- See INSIDE TEST	2.1
C	Error Code after IPL	- See section SYSTEM GENERATION	4.1

D	No IPL executed (Continous Searching on Drives)	- Medium failure customer disc:
		  * insert other customer disc or
		  * generate new customer disc
		- Replace IPL-drive	

E	IPL not completed	- See section SYSTEM GENERATION	4.1
F	Disc Drive not ready	- See section SYSTEM GENERATION - Check wiring of erroneous drive - Replace SESCO (FLEXCO) - Replace disc drive	4.1
G	Printer not working	- Check printer assignment (see operator manual) - See SYSTEM GENERATION - Check printer installation	 4.1 3.1.4

H	R/W Errors on many Discettes	- Perform head-cleaning
		- Run MFD TEST
		  * On message "NO ERRORS": continue I
		  * Replace SESCO (FLEXCO)
		  * Replace drive
			
			2

I	Medium Failure MFD	- Save bad file(s)
		- DELETE bad file(s) on bad medium
		- VERIFY bad medium:
		  * Too many bad blocks:
		   - BACKUP or COPY discette
		   - If no copy of defective file
		    available: ask specialist for
		    data-repair action
		- Do not use medium again
		  * Mark bad blocks and copy files back
		  to the medium
			
			USER MAN.
			.
			.
			.
			.
			.
			.
			.
			USER MAN.

TO BE CONTINUED

	PROBLEM	REPAIR ACTION	REFERENCE section
J	No Read or Write possible on MFD	- Replace SESCO (FLEXCO/SASI-AD) - Replace disc drive	

K	R/W Errors Fixed Disc	- Save bad file(s)
		  DELETE bad files
		  VERIFY fixed disc
		  Mark bad block and copy files back to
		  fixed disc
		- Too many bad files:
		  FMTFXD: if not successful replace
		  disc drive
			USER MAN.

L	No Read or Write possible on FXD	- Run FXD Test	2

	PROBLEM	REPAIR ACTION	REFERENCE section

A	System doesn't switch Power-on	- Check key switch
		- Check workstation interface cable
		- Check PMU strap setting (RPON)
		- Try other workstation power on:
		  Okay? * Check workstation
		          * Replace PMU
		- Replace power supply
		- Replace back panel
			3.3.1
			20.xx

B	Error Code on Operator Panel at Power-On	- See INSIDE TEST	2.1
C	Error Code after IPL	- See section SYSTEM GENERATION	4.1

D	No IPL executed (Continuous Searchifng on Drives)	- Medium failure customer disc:
		  * insert other customer disc or
		  * generate new customer disc
		- Replace IPL-drive	

E	IPL not completed	- See section SYSTEM GENERATION	4.1
F	Disc Drive not ready	- See section SYSTEM GENERATION - Check wiring or erroneous drive - Replace SESCO (FLEXCO) - Replace disc drive	4.1
G	Printer not working	- Check printer assignment (see operator manual) - See SYSTEM GENERATION - Check printer installation	4.1 3.1.4

H	R/W Errors on many Discettes	- Perform head-cleaning
		- Run MFD Test
		  * On message "NO ERRORS": continue I
		  * Replace SESCO (FLEXCO)
		  * Replace drive	

I	Medium Failure MFD	- Save bad file(s)
		- DELETE bad file(s) on bad medium
		- VERIFY bad medium:
		  * Too many bad blocks:
		    - BACKUP or COPY discette
		    - If no copy of defective file
		      available: ask specialist for
		      data-repair action
		- Do not use medium again
		  * Mark bad blocks and copy files back
		    to the medium
			USER MAN.

J	No Read or Write possible on MFD	- Replace SESCO (FLEXCO/SASI-AD) - Replace disc drive	

	PROBLEM	REPAIR ACTION	REFERENCE section

K	R/W Errors Fixed Disc	- Save bad file(s)
		  DELETE bad files
		  VERIFY fixed disc
		  Mark bad block and copy files back to
		  fixed disc
		- Too many bad files:
		  FMTFXD: if not successful replace disc
		  drive
		- Restore from back-up
			USER MAN.

L	No Read or Write possible on FXD	- Run FXD Test	2

4.3 TROUBLE SHOOTING WORKSTATION P2711

	PROBLEM	REPAIR ACTION	REFERENCE section
A	Station doesn't switch Power-on	- Check mains supply - Check strap PSON on BP-DIMO (if available) - Check strap LOC on PSU-WS120/WS50 - Check fuse on MFI-SBS / MFI-WSF - Replace PSU-WS120 / WS50	20.13.2 20.2.2 20.3.1 20.2.3
B	Error Indication on Keyboard	- See INSIDE TEST	2.1

D	No Screen, Keyboard on-line	- Push any key (time-out)
		- Push SETUP-key:
		  * if setup screen appears, set
		    required parameters
		- Increase brightness
		- Check CRT-wiring
		- Check / replace video-amplifier PCB
		- Check / replace CRT-electronics PCB
			USER MAN.
			
			8.4

E	Bad Screen Quality	- Adjust screen picture, using VDU TEST for screen alignment check	2 20.18
F	No Keyboard-Entry possible	- Switch station power-off/power-on - If appearing regular: replace keyboard	

	PROBLEM	REPAIR ACTION	REFERENCE section
A	Station doesn't switch Power-on	- Check mains supply - Check fuse - Check internal cabling - Replace power supply - Replace logic PCB	7.1 7.4 20.19 20.20
B	No Screen, Keyboard On-line	- Adjust screen brightness at front panel - Push any key (time-out) - Select SET-UP mode: * If setup screen appears, enter required parameters - Check CRT wiring - Check / Replace video-amplifier PCB - Check / Replace CRT-electronics PCB - Replace power supply - Replace CRT-unit	USER MAN. 20.21
C	No Keyboard Indicator On	- Check keyboard interface connection - Replace keyboard - Replace logic PCB - Replace station	3.3.1 20.19
D	No keyboard-Entry possible	- Switch station power-off/power-on - If appearing regular: replace keyboard	

4.5 TROUBLE SHOOTING DISC EXTENSION P3012

	PROBLEM	REPAIR ACTION	REFERENCE section
A	No Power-on at System Power-on	- Check mains supply - Check interface connection - Check SAS-EX wiring - Check strap setting PSU-WS120 - Replace PSU - Replace SESCO / SASI-AD	3.3.2 20.22 20.2.2 20.2.3 20.8.4
B	Disc not ready	- Check/Perform software installation - Check strap setting controller Check strap setting drive - Check internal wiring - Replace controller - Replace drive	20.11.2 20.12.2 9.3 / 9.4 20.11.4 20.12.4

C	R/W Errors Fixed Disc	- Save bad file(s)
		  DELETE bad files
		  VERIFY fixed disc
		  Mark bad block and copy files back to fixed disc
		- Too many bad files:
		  FMTFXD: if not successful replace disc drive
		  Restore from back-up
			2.2.4
			USER MAN.
			
			2.2.4

D	No Read or Write possible on FXD	- Run FXD Test	

4.6 TROUBLE SHOOTING DISC EXTENSION P2621

PROBLEM	REPAIR ACTION	REFERENCE section
A	No Power-on	- Check mains supply - Check interface connection - Check SAS-EX wiring - Check strap setting PSU-WS120/E - Replace PSU - Replace RS PCB - Replace SESCO / SASI-AD	3.3.2 20.22 20.27 10.1 5.1
B	Disc not Ready	- Check/perform software installation - Check strap setting controller/drive - Check internal wiring - Replace controller - Replace drive	3.2.2 10.1 10.4
C	R/W Failure	- Perform head cleaning - Replace drive	

4.7 TROUBLE SHOOTING PRINTERS

- Check Cabling
- Check Strap setting
- Check Printer Assignment (PRINT, PRINTER)
- Refer to Printer Field Manual for specific details.

4.8 TROUBLE SHOOTING STREAMER TAPE

PROBLEM	REPAIR ACTION	REFERENCE section
A	No Power-on	- Check mains supply - Check interface connection - Check SAS-EX wiring - Check strap setting PSU-WS120E - Replace PSU - Replace SESCO/SASI-AD	3.3.2 20.22 20.27
B	Tape not Ready	- Check /strapsetting controller /drive - Check internal wiring - Replace controller - Replace drive	20.34/20.35 13.4 20.35
C	R/W Failure	- Perform head cleaning Replace drive	

5   SYSTEM CABINET P3500

```
+-------------------------------------------------+
|                  N O T E                        |
|                                                 |
| For                                             |
|                                                 |
|      - Connectors                               |
|      - Strap Setting                            |
|      - Modification History                     |
|      - Replacement                              |
|                                                 |
| of Exchange Units, please refer to the relevant |
| chapter 20-sections as indicated in the LOCATOR.|
+-------------------------------------------------+
```

5.1 REMOVAL COVER P3500 SYSTEM CABINET

- Press the bottom edges of the plastic rear cover and lift it as shown in the figure.
- Remove two screws at the top edges at the rear side (marked '2' in figure).
- Loosen the two screws (marked '3' in figure) at the bottom side.
- Shift the complete cover to the front side leaving the frame behind.

W A R N I N G :
      A powered system with removed rear cover can become
      overheated because of a disturbed air flow.

04549 A

04549 B

Labels (left diagram):
- power supply pcb WS 120 (ref. 20.2)
- pcb PMU slave 2 (ref. 20.5)
- pcb PMU slave 1 (ref. 20.5)
- pcb PMU slave 3 (ref. 20.5)
- pcb PMU master (ref. 20.5)
- pcb PMU slave 4 (ref. 20.5) *)
- pcb SESCO (ref. 20.8) *)
- battery
- FXD control board
- pcb MFI-SBS (ref. 20.3)
- hour counter
- battery on switch
- mains fuse
- pcb PSU M2 (ref. 20.4)
- fan
- back panel (ref. 20.1)
- operator panel (ref. 20.9)
- MFD (ref. 20.10)
- FXD (ref. 20.12)
- pcb XEBEC (S1410) (ref. 20.11)
- FXD motor board

03897
03898
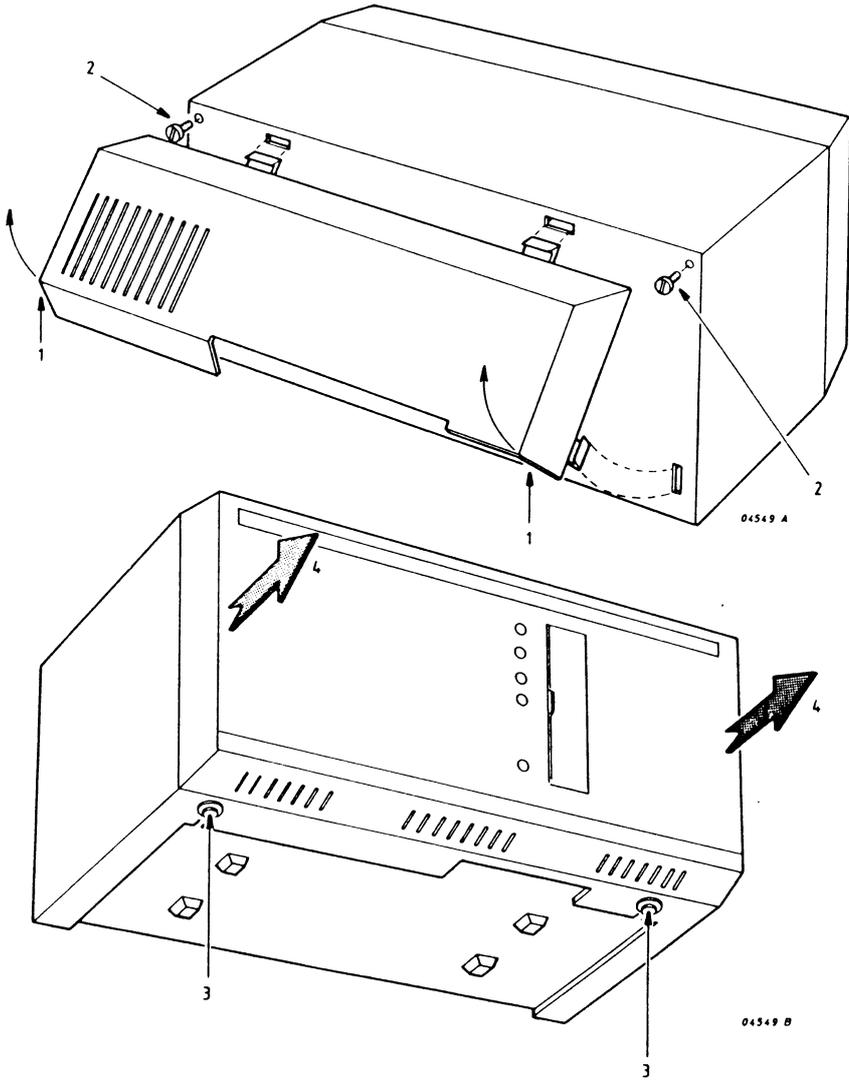
*) Before release 2
the pcb PMU slave 4 position
is occupied by pcb FLEXCO (ref. 20.6)
and the pcb SASI-AD position is
occupied by pcb SASI-AD (ref. 20.7)
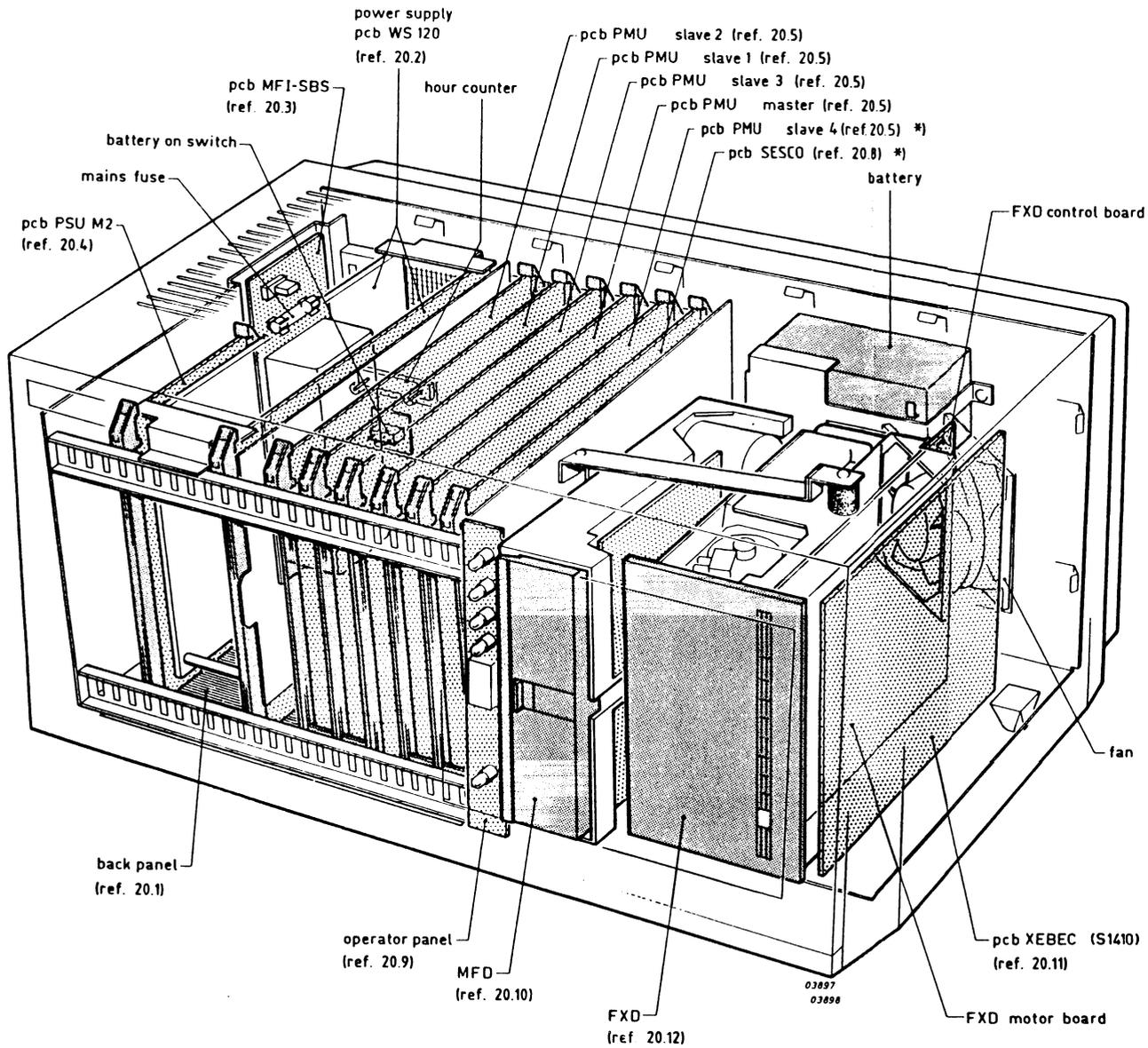
MASTER \ SLAVE	PMU80-1V SLAVES	PMU80-3V DC-PROC.	PMU186-1V SLAVES
PMU80-1V	0	0	2
	1	0	1
	2	0	1
	3	0	0
	4	0	0
PMU80-3V	0	0	2
	1	0	1
	2	0	1
	3	0	0
	4	0	0
	0	1	2
	1	1	0
	2	1	0
	3	1	0

Each line in a table gives the possible
number of cards which can be combined in a
configuration with the master indicated.

power supply
pcb WS 120
(ref. 20 2)

pcb MFI-SBS
(ref. 20.3)

hour counter

battery on switch

mains fuse

pcb PSU M2
(ref. 20.4)

pcb PMU   slave 2 (ref. 20.5)
pcb PMU   slave 1 (ref. 20.5)
pcb PMU   slave 3 (ref. 20.5)
pcb PMU   master (ref. 20.5)
pcb PMU   slave 4 (ref. 20.5) *)
pcb SESCO (ref. 20.8) *)

battery

back panel
(ref. 20.1)

operator panel
(ref. 20 9)

MFD
(ref. 20.10)

MFD
(ref. 20.10)

04603
04604
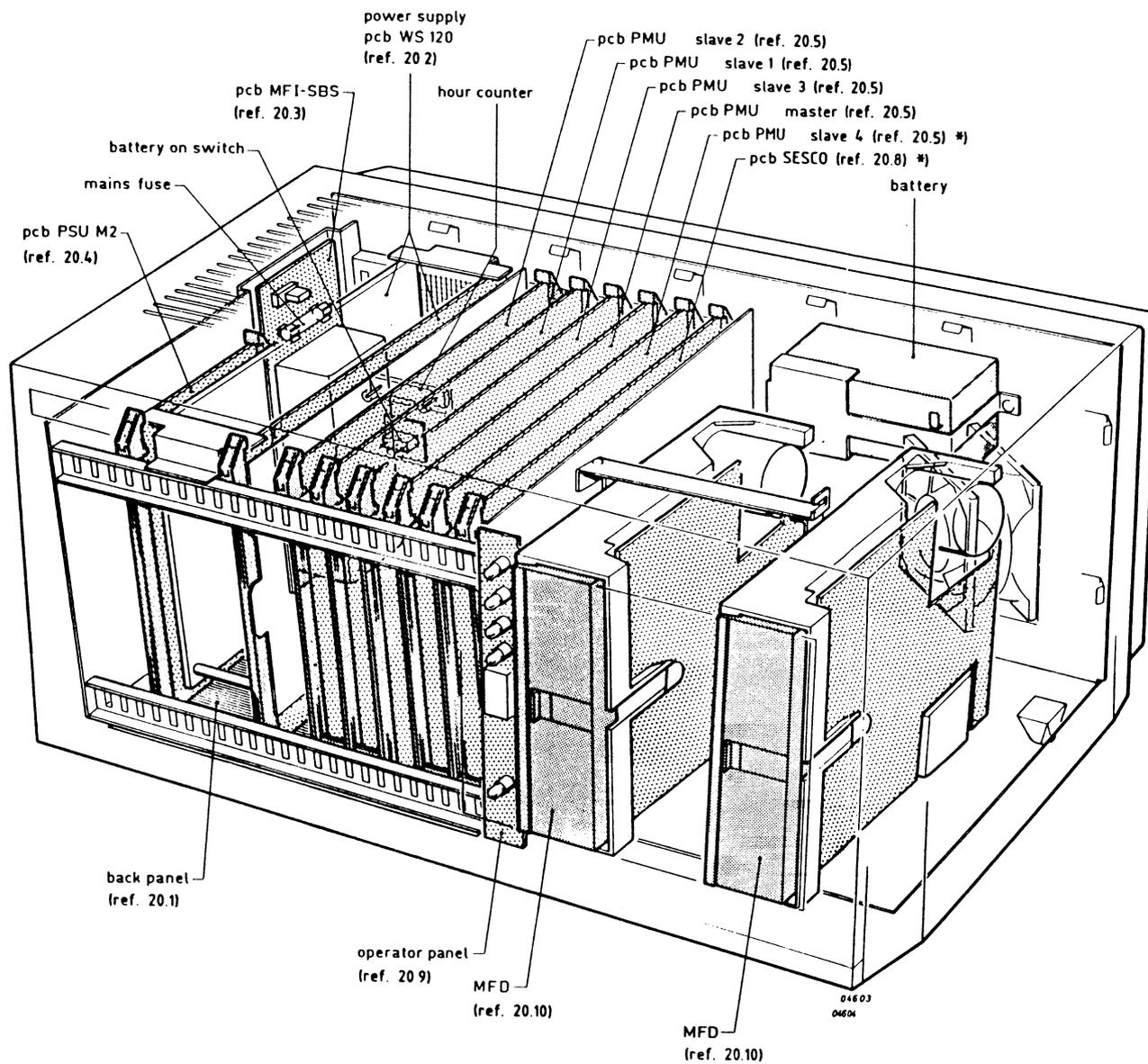
*) Before release 2
the pcb PMU   slave 4 position
is occupied by pcb FLEXCO (ref. 20.6)
and the pcb SASI-AD position is
occupied by pcb SASI-AD (ref. 20.7)

SLAVE MASTER	PMU80-1V SLAVES	PMU80-3V DC-PROC.	PMU186-1V SLAVES
PMU80-1V	0	0	2
	1	0	2
	2	0	2
	3	0	1
	4	0	0
PMU80-3V	0	0	2
	1	0	2
	2	0	2
	3	0	1
	4	0	0
	0	1	2
	1	1	1
	2	1	1
	3	1	0

Each line in a table gives the possible
number of cards which can be combined in a
configuration with the master indicated.

MAINS FILTER
MFI-SBS

MAINS

BP SYSTEM
CABINET

- 12V
+ 12V
0V
+ 5V
+ 5VM

PMU 1

PSU WS-120

PRIMARY
(SWITCHED)

SECUNDARY

- 12V
+ 12V
0V
+ 5V

- 12V
+ 12V
0V
+ 5V
+ 5VM

PMU 2

PSU M2

BROWN
BLUE

+ 5VM
0V

BROWN   BLUE

- 12V
+ 12V
0V
+ 5V

FLEXCO/
SESCO

BATTERY

0V
+ 5V

SASI-AD.

BROWN
GREY
YELLOW/GREEN

+ 12V
+ 5V
0V

FLEX/
FIXED

RED
BLUE

+ 12V
0V

FAN

BROWN
BLUE

+ 5V
0V

HOUR
COUNTER

BROWN
GREY
YELLOW/GREEN

+ 12V
+ 5V
0V

XEBEC

04550 B

HOUR COUNTER   BATTERY SWITCH   MAINS

FAN   BATTERY

MAINS FILTER MFI-SBS

BACK PANEL SYSTEM CABINET (STOMO)

TRAFO

PSU M2

POWER SUPPLY

PMU80 SLAVE 2

PMU80 SLAVE 1

PMU80 SLAVE 3

PMU80 MASTER

PMU80 SLAVE 4

SESCO

OP-WS

MFD 1

FXD

XEBEC

04549 C
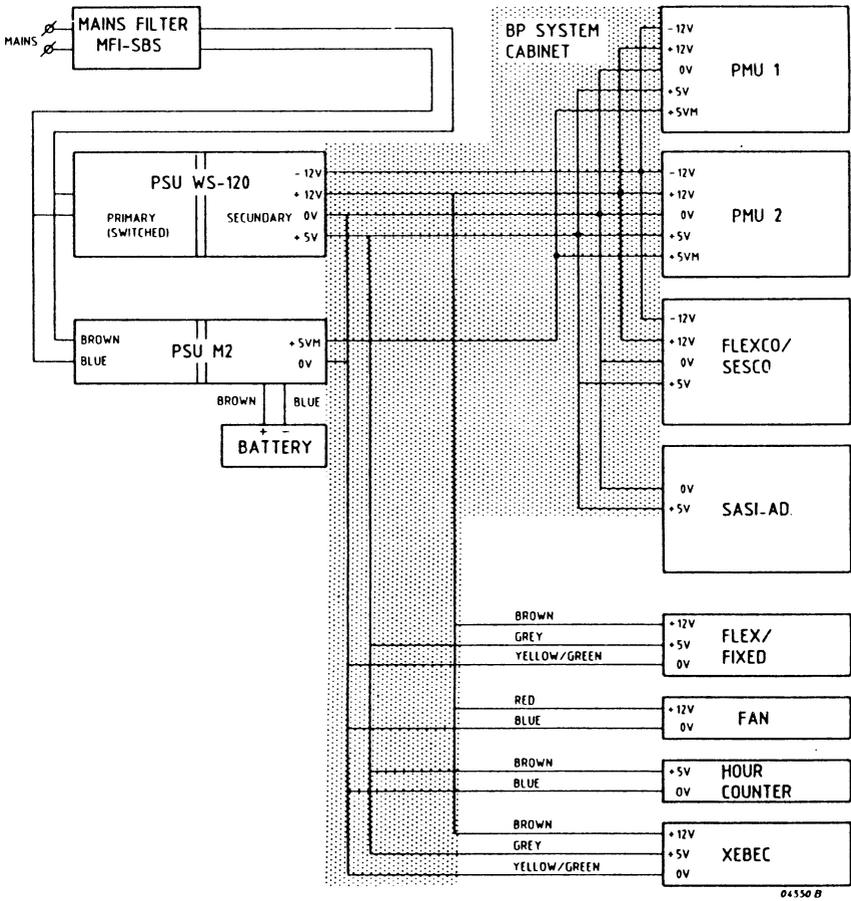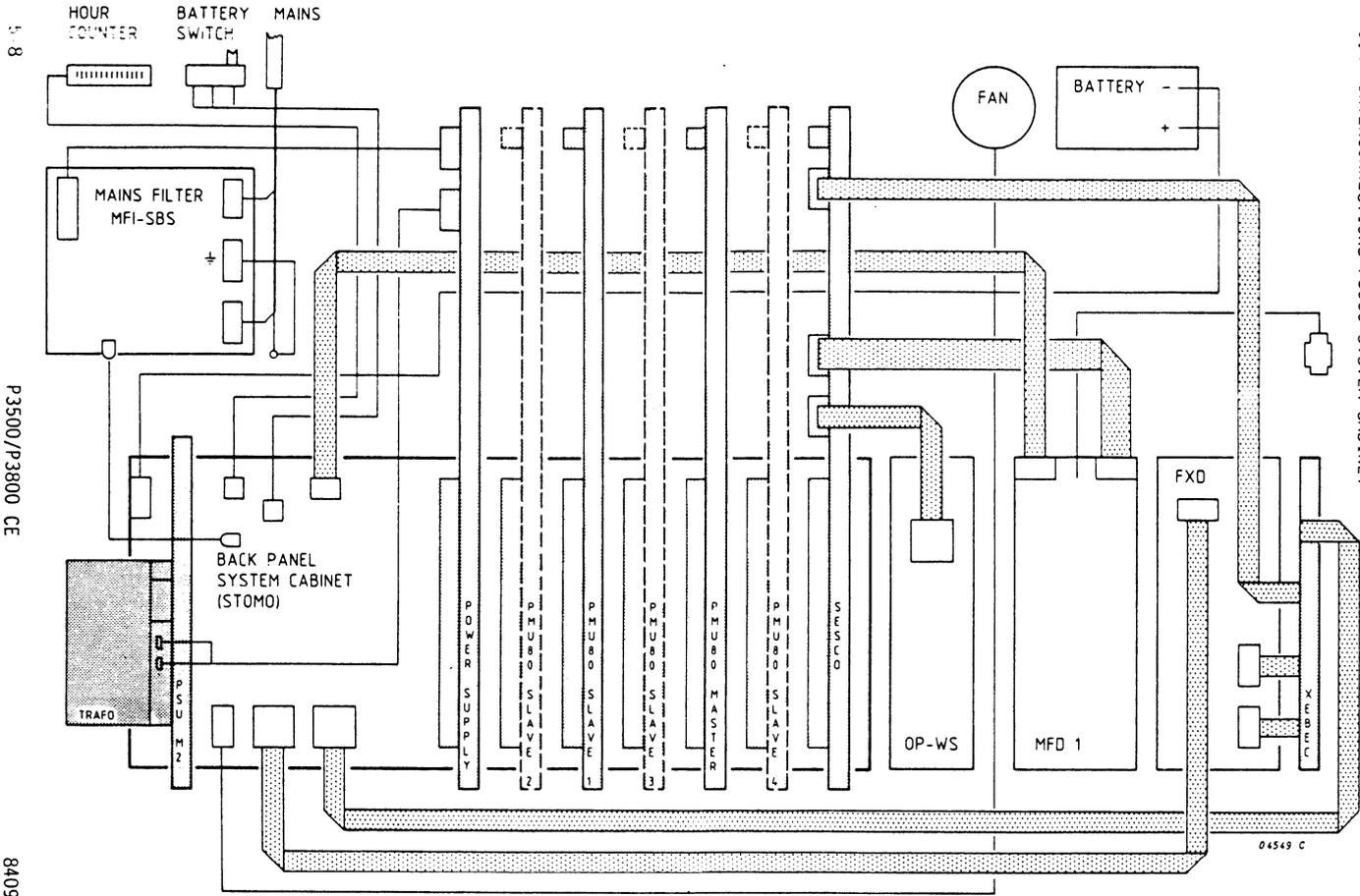
5.5 SERVICE INFORMATION BULLETINS ISSUED ON P3500 SYSTEM CABINET

SI-No. P3500-...	TITLE
001	PUC Handling
002	Insulating Ring SEAGATE ST412
003	Upgrading PMU-80 to Level 6
004	Upgrading SASI-AD
005	Obsolete
006	Start Circuit WS-120: PSU-WS120/02, 12NC: 5112 291 75721 becomes ...75722
007	New PMU-80-1
008	Upgrade PMU-80 to Level 7
009	PMU-80-1 to Level 3
010	Resolving Temperature Problem on PMU-80-1
011	FE Testprogram
012	Deleted: see SI P2711-002
013	ON/OFF Switching
014	SASI-AD Versions
015	SASI for Extension Box
016	Mini Flexible Disc Doors
017	Start-up Problems with MFD
018	n.a.
019	Survey of DC-Cables
020	Deleted: see SI P2841-001
021	Deleted: see SI P2841-002
022	New IPL-PROM Release 2
023	Deleted: see SI P2711-003
024	Deleted: see SI P2841-001
025	Reorganisation of SI
026	Read Errors FXD
027	2 Levels PSU-M2
028	Backpanel STOMO P3500
029	HW-SW Relations
030	Mini Flexible Disc Ready Signal
031	Switch On Problems PMU 80-1 without PSU-M2
032	Switch On Problems PMU 80 without PSU-M2
033	New PSU WS120
034	SESCO to Level 4
035	SESCO to Level 5
036	PSU-M2 to Level 3
037	Component Replacement Tool
038	Switch Off Problems Extension Box (SESCO)
039	Switch Off Problems Extension Box (SASI-AD)
040	New PMU80-1A
041	SI Numbering for P3000 Systems
042	Wrong Formatted Diskettes
043	Failure of Starter System WS120
044	No Switch-Off with Local Printer

6   KEYBOARD P2841

6.1 REMOVAL COVER OF KEYBOARD P2841

- For access to PCB only, remove the three Allen screws (A) and take off the PCB
  cover.
- To free the PCB, remove the remaining twelve Allen screws from the keyboard
  housing, and the four screws from the cable clamp assembly (B).
- Slide the PCB from the housing.

04563 B
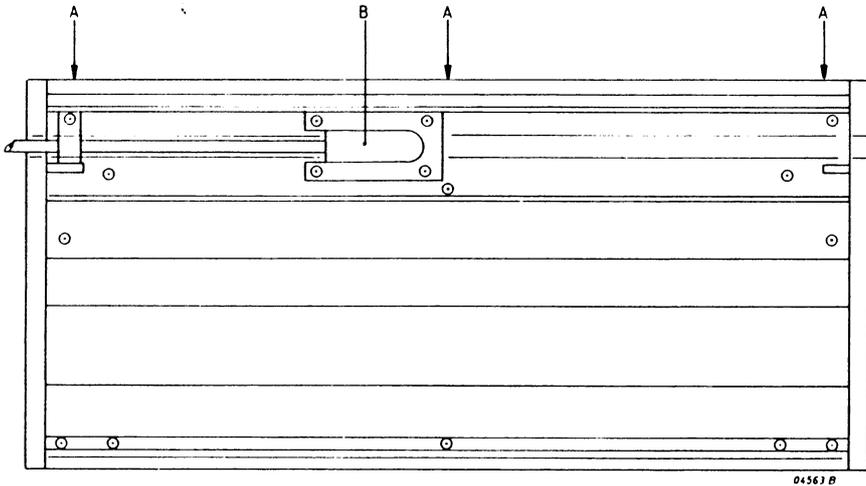
6.2 KEYBOARD P2841 INTERCONNECTIONS

- The only connector present in the keyboard is the one for the system cable.
- This connector can be accessed after the PCB cover is removed.

Connector Layout

1	OUT READY
2	+5V
3	DATA OUT
4	DATA IN
5	OV

6.3 KEYBOARD P2841 MODIFICATION HISTORY

T.B.S.L.

6.4 SERVICE INFORMATION BULLETINS ISSUED ON P2841 KEYBOARD

SI-No. P2841-...	TITLE
001	Keytop Exchange on Keyboards
002	Keytop Exchange Action for KB P2841
003	Keyboard Plug

7   VDU P2705

```
┌─────────────────────────────────────────────────────────┐
│                       N O T E                           │
│                                                          │
│  For                                                     │
│                                                          │
│          - Connectors                                    │
│          - Strap Setting                                 │
│          - Modification History                          │
│          - Replacement                                   │
│                                                          │
│  of Exchange Units, please refer to the relevant         │
│  chapter 20-sections as indicated in the LOCATOR.        │
└─────────────────────────────────────────────────────────┘
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7.1 REMOVAL COVER P2705 VDU

- Remove the screws A and B, see figure (A).

- Remove the ornamental front - first from one corner and then from the other ones, see figure (B).

- Remove the upper part of the cabinet lifting it from the rear side.

(A)

04564 B

(B)

ORNAMENTAL
FRONT

04564 D

(C)
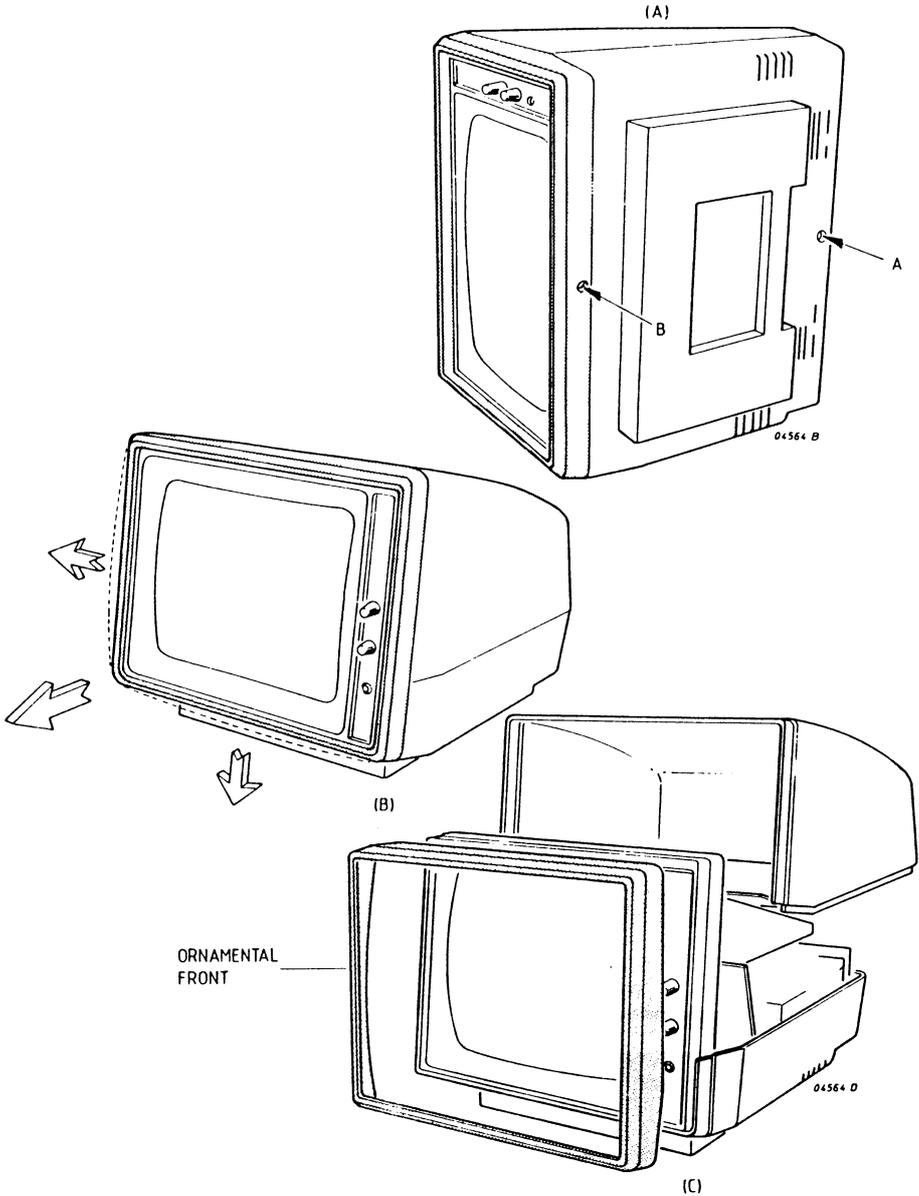
7.2 LOCATOR P2705 VDU

7.2.1 LOCATOR P2705-00X VDU (WITH PUCs)

CRT ASSY   LOGIC PCB (REF 20 20)

04567 A
04568 A

PSU   CRT ELECTRONICS   VIDEO AMPLIFIER
(REF 20 19)   PCB   PCB
                   (REF 20.21)   (REF 20.21)

PCB LOGIC

SYSTEM

KEYBOARD

04688 E
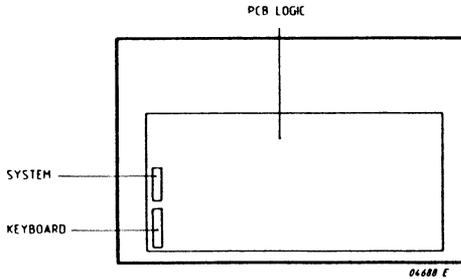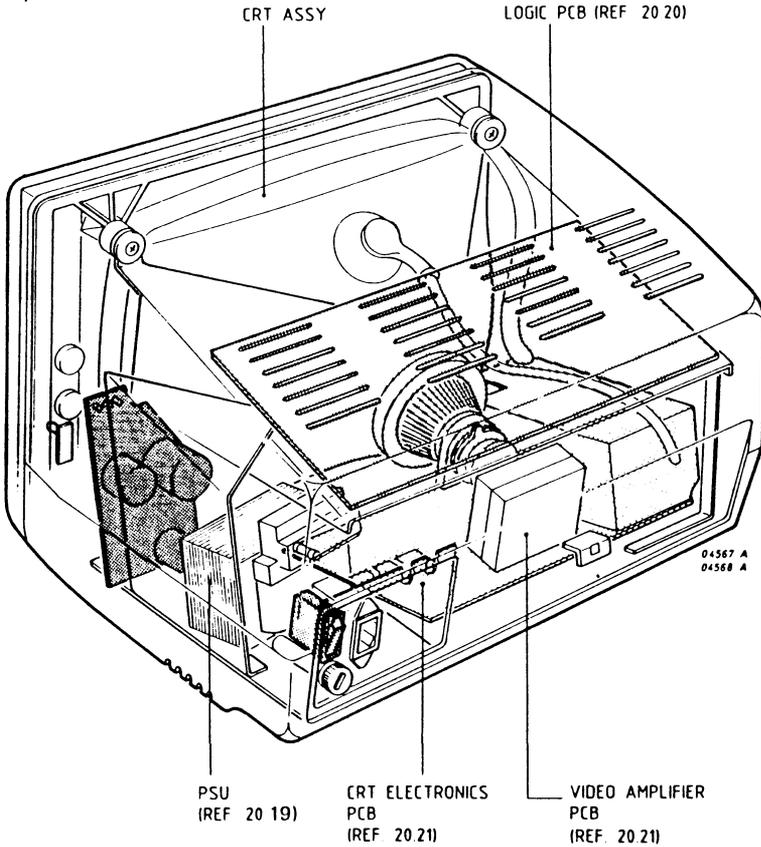
7.2.2 LOCATOR P2705-10X VDU (WITH CANNON AND DIN CONNECTORS

CRT ASSY   LOGIC PCB (REF. 20.20)

04567B
0456 8B

PSU   CRT ELECTRONICS   VIDEO AMPLIFIER
(REF. 20.19)   PCB   PCB
                       (REF. 20.21)   (REF. 20.21)

04688 F

SYSTEM
KEYBOARD
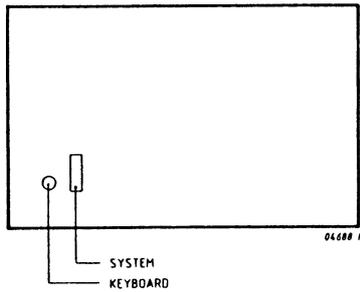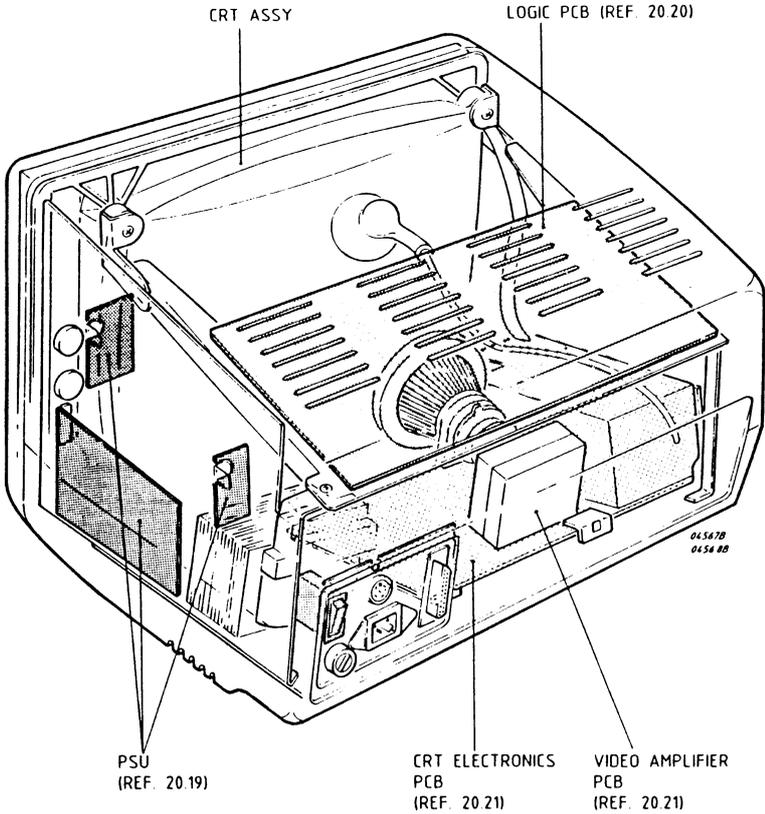
7.3 POWER DISTRIBUTION P2705 VDU
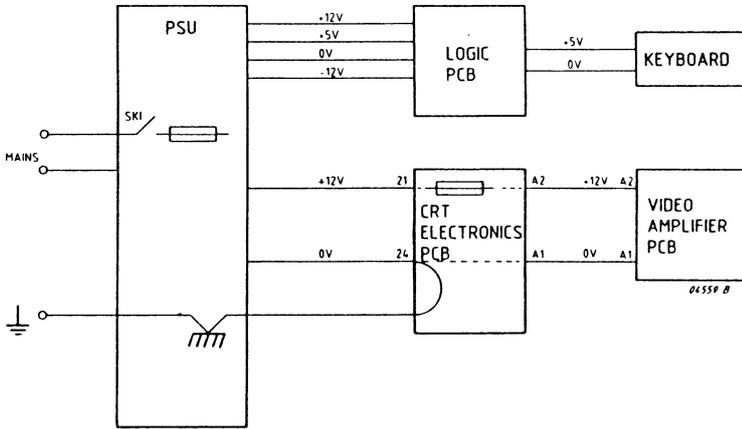
7.4 INTERCONNECTIONS P2705 VDU
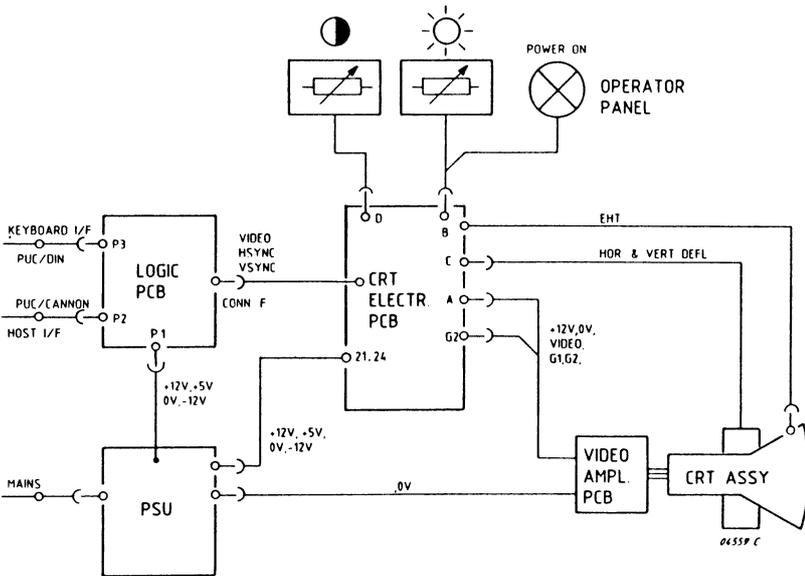
7.5 SERVICE INFORMATION BULLETINS ISSUED ON P2705 VDU

SI-No. P2705-...	TITLE
001	Introduction of the P2705-10X
002	Identification CRT 01
003	P2705-00X new firmware
004	P2705-10X new firmware

8   VDU P2711

```
┌─────────────────────────────────────────────────────────┐
│                      N O T E                             │
│                                                          │
│   For·                                                   │
│                                                          │
│         - Connectors                                     │
│         - Strap Setting                                  │
│         - Modification History                           │
│         - Replacement                                    │
│                                                          │
│   of Exchange Units, please refer to the relevant        │
│   chapter 20-sections as indicated in the LOCATOR.       │
└─────────────────────────────────────────────────────────┘
```

8.1 REMOVAL COVER P2711 VDU

- Shift rear cover upwards (A).
- Pull out underside (B).
- Shift rear cover down and remove. Take care of earth connection (C).
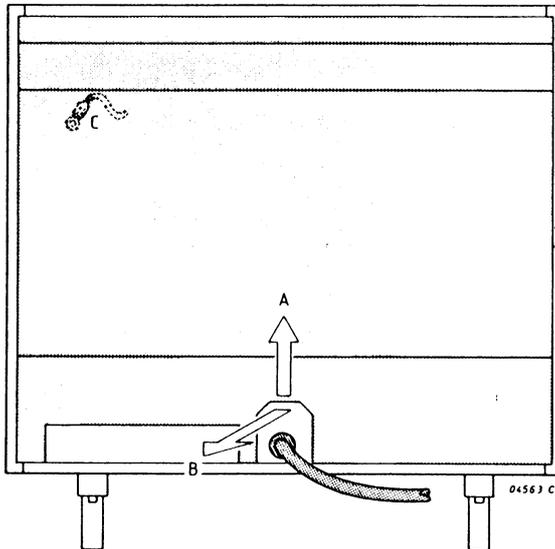
8.2 LOCATOR P2711 VDU

8.2.1 LOCATOR P2711-00X VDU (PMU-88, PME1, CRT-CO)

PME1

8.2.2 LOCATOR P271101OX VDU (TERCO)

PCB TERCO (ref 20 41)   PCB MONITOR ELECTRONICS (ref 20 18)   PCB VIDEO AMPLIFIER (ref 20 18)   CRT

MAINS SWITCH   BRIGHTNESS POTENTIOMETER   PCB MFI DIMO (ref 20 3)   PCB PSU WS-50 (ref 20 14)

TERCO

K/B

SYSTEM

AUX

K/B   SYSTEM
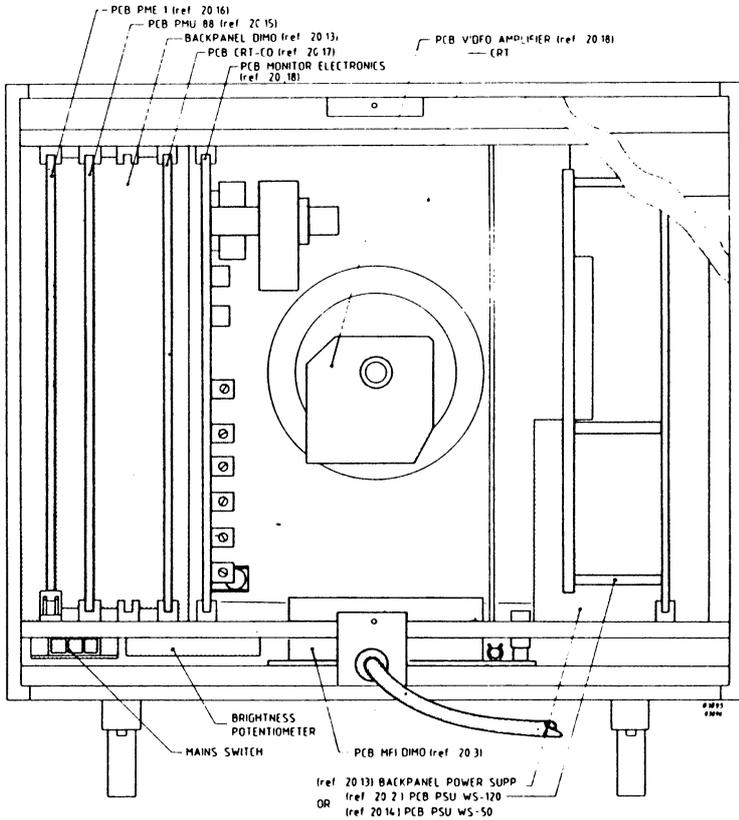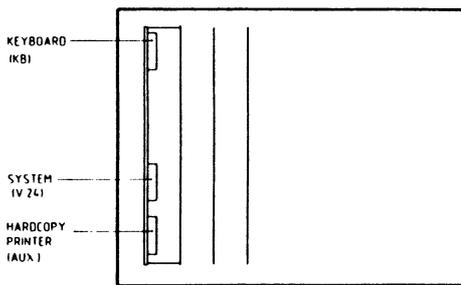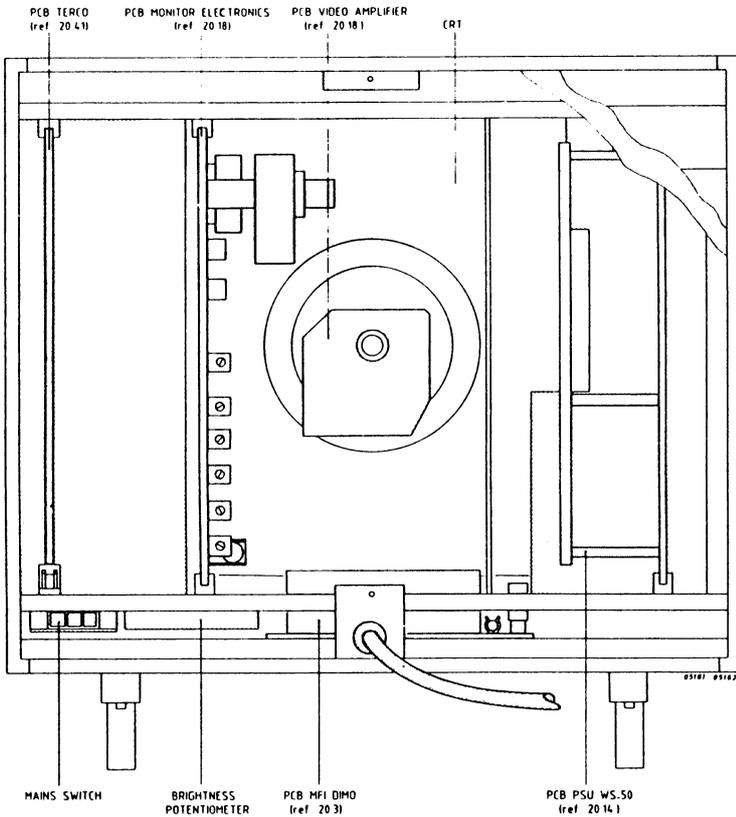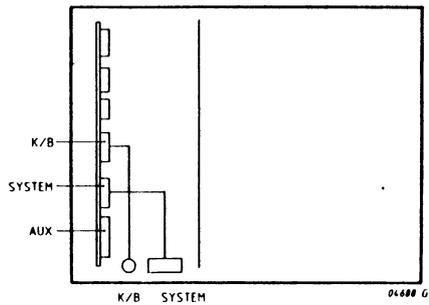
8.3 POWER DISTRIBUTION P2711 VDU

8.3.1 POWER DISTRIBUTION P2711-00X VDU (PMU-88, PME1, CRT-CO)

04550A
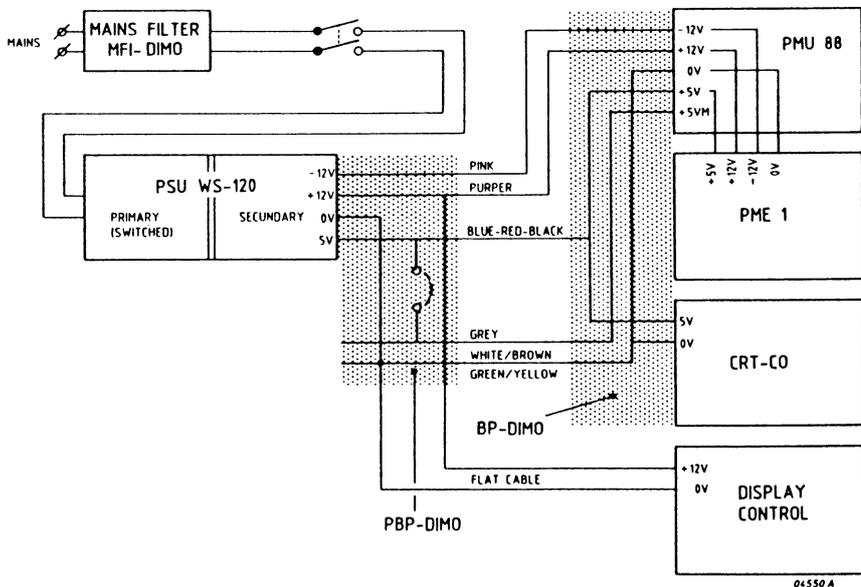
8.3.2 POWER DISTRIBUTION P2711-10X VDU (TERCO)

05176 B
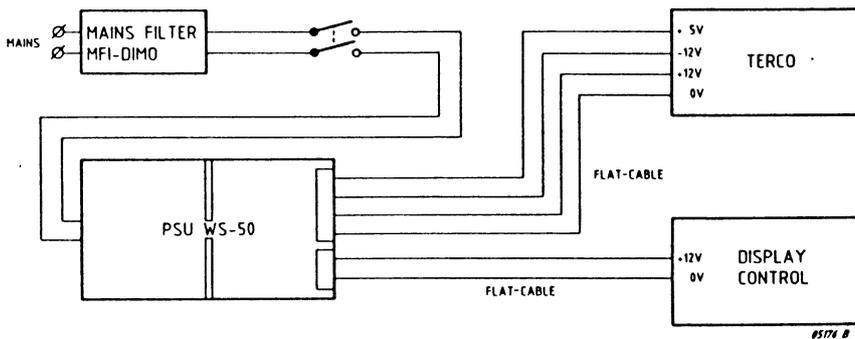
Note: It is possible to have a P2711 VDU (PMU-88, PME1, CRT-CO) with a WS-50 power supply. The power and control lines for PMU-88, PME1 and CRT-CO are connected via PBP and BP-DIMO. The supply for the display control is directly connected to the WS-50 (refer to P2711 TERCO).

8.4.1 INTERCONNECTIONS P2711-00X VDU (PMU-88, PME1, CRT-CO)
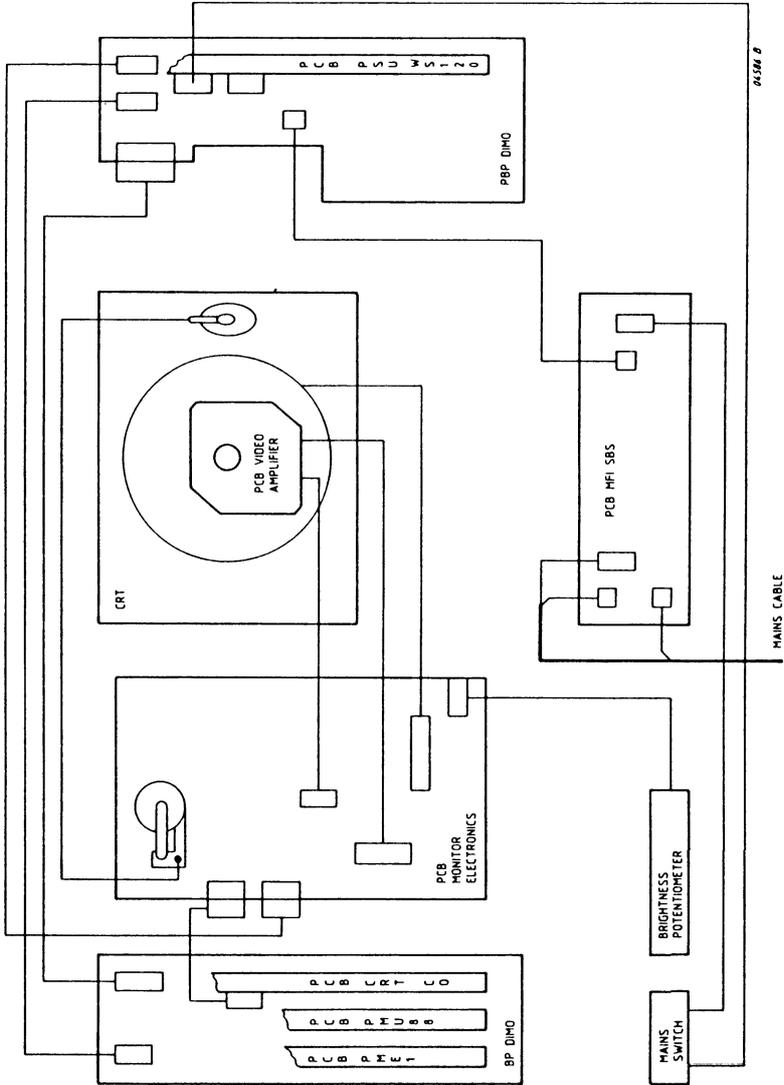
8.5 SERVICE INFORMATION BULLETINS ISSUED ON P2711 VDU

SI-No. P27011...	TITLE
001	Start Circuit WS 120, PSU-WS120 5112 291 75721 becomes 75722
002	Rebuild P2712 to P2711
003	Supplementary Kit Rebuild P2712-P2711
004	VDU Regulation
005	Set-Up Modification PMU-88 (-1) 16K
006	Release 2.01 Firmware
007	Introduction WS-50
008	CRT-CO Modification
009	Introduction CRT-CO-1
010	New Power Supply WS120
011	CRT Device Logic
012	Video Amplifier
013	Tool for Swivel Stand
014	Transistor V7 fails due to over heating

9.1 REMOVAL COVER EXTENSION CABINET P3012

- Press the bottom edges of the plastic rear cover and lift it as shown in the figure.
- Remove two screws at the top edges at the rear side (marked '2' in figure).
- Loosen the two screws (marked '3' in figure) at the bottom side.
- Shift the complete cover to the front side leaving the frame behind.

W A R N I N G :
    A powered system with removed rear cover can become
    overheated because of a disturbed air flow.

04549 A

04549 B

9.3 POWER DISTRIBUTION EXTENSION CABINET P3012

BP-P3012

MAINS FILTER
MFI-SBS

MAINS

PSU WS-120

PRIMARY
(SWITCHED)

SECUNDARY

-12V
+12V
0V
+5V

SAS-EX

0V
+5V

BROWN
GREY
YELLOW/GREEN

+12V
+5V
0V

FIXED

RED
BLUE

+12V
0V

FAN

BROWN
GREY
YELLOW/GREEN

+12V
+5V
0V

FIXCO 5
(XEBEC)

046552A

10   EXTENSION CABINET P2621

```
┌─────────────────────────────────────────────────┐
│                   N O T E                       │
│  For                                            │
│                                                 │
│         - Connectors                            │
│         - Strap Setting                         │
│         - Modification History                  │
│         - Replacement                           │
│                                                 │
│  of Exchange Units, please refer to the relevant│
│  chapter 20-sections as indicated in the LOCATOR.│
└─────────────────────────────────────────────────┘
```

SCREW COVERS

04547 C

8 INCH FDD (REF. 20.24)
PCB PSU WS 120E (REF. 20.27)
PCB XEBEC S1401 (REF. 20.23)

04564 A
04565 A

MAINS FILTER
MAINS FILTER (REF. 20.3)
PCB RS (REF. 20.26)
MAINS POWER TRANSFORMER
BACK PANEL-T (REF. 20.25)
PCB SAS-EX (REF. 20.22)

```
MAINS ───▶┌──────────────────┐─────▶ 24V
          │   POWER SUPPLY   │
          │                  │─────▶ 5V
          └──────────────────┘

TERMINATOR
(OR SASI BUS OUT)┌──────────────────┐
                 │    SAS-EX PCB    │◀──── 5V
SASI BUS IN      │                  │
                 └──────────────────┘

          ┌──────────────────┐◀──── 12V
          │    XEBEC         │
          │    PCB           │◀──── 5V
          └──────────────────┘

MAINS ──▶[ 3|ξ ]   ┌──────────────────┐◀──── 24V
                   │    DRIVE         │
   RELAY           │    PCB           │◀──── 5V
   [ o╱  o ]       ├──────────────────┤
        ▲          │  SPINDLE MOTOR   │
        │          └──────────────────┘
       24V                     06589 A
```

11   SYSTEM CABINET P3800

11.1 REMOVAL OF COVERS

11.2.1 P3800-03 (8" FIXED DISC)

OPERATOR PANEL
(ref. 20.36)

TAPE
(ref. 20.35)

MFD
(ref. 20.10)

PCB FIXCO 8
(ref. 20.32)

FXD PRIAM
(ref. 20.33)

PSU M3
(ref. 20.45)

PBP M3
(ref. 20.46)

CONNECTOR
BLOCK
(ref. 11.7)

HOUR COUNTER

BATTERY

04681A
05257A

11.2.1 P3800-03 (8" FIXED DISC (CONT'D)

FAN

PCB TAPCO-Q
(ref. 20.31)

FAN

LBP P3800
(ref. 20.30)

PCB SESCO
(ref. 20.8)

PCB PMU* 4
PCB PMU* 8
PCB PMU* 0
PCB PMU* 7
PCB PMU* 3
PCB PMU* 6
PCB PMU* 2
PCB PMU* 5
PCB PMU* 1

*PMU80-3
(ref. 20.31)
*PMU186
(ref. 20.42)
*PMU80-1
(ref. 20.5)

04881B
05257B

PCB PBP1
20.38)

PCB PF42M
(ref. 20.37)

FAN

PSU AOC 24/5V (ref. 20.40)

PSU B1E (ref. 20.39)

OPERATOR PANEL
(ref. 20.36)

TAPE
(ref. 20.35)

MFD
(ref. 20.10)

FXD
(ref. 20.12 or
ref. 20.29)

PCB XEBEC (S1410)
(ref. 20.11)

PSU M3
(ref. 20.45)

PBP M3
(ref. 20.46)

CONNECTOR BLOCK
(ref. 11.7)

HOUR COUNTER

05254 A
05260A

BATTERY

FAN

PCB TAPCO-Q
(ref. 20.31)

FAN

LBP P3800
(ref 20.30)

PCB SESCO
(ref 20.8)

PCB PMU* 4
PCB PMU* 8
PCB PMU* 0
PCB PMU* 7
PCB PMU* 3
PCB PMU* 6
PCB PMU* 2
PCB PMU* 5
PCB PMU* 1

*PMU80-3
(ref 20.31)
*PMU186
(ref 20.42)
*PMU80-1
(ref 20.5)

052548
052608

PBP1
20.38)

PCB PF42M
(ref. 20.37)

FAN

PSU AOC 12V (ref 20.40)

PSU B1E (ref 20.39)

HOUR COUNTER

FAN 1

FAN 2

FAN 3

BROWN BLUE

BLUE BROWN

BLUE BROWN

BLUE BROWN

BROWN BLUE

BROWN
MAINS
BLUE

FILTER

TRAFO

+12V
0V

PF42M

WHITE
YELLOW/BROWN
GREEN

BLUE

BROWN

BLACK

BLACK
BROWN
BLUE

(REFER TO SECTION 11.7)

BATTERY

BLACK
RED

PBP M3

PSU M3

+5Vm
0V

MAINS

BLACK

BLACK

RING TRAFO

RED
RED

RECTIFIER

BROWN/WHITE

YELLOW/GREEN

PSU B1E

24V -12V 12V 5V 0V

PSU AOC

0V +5V 24V

0V 24V

+12V -5V

PBP1

METAL STRIP

YELLOW
BROWN

WHITE
YELLOW
BROWN/GREEN

WINDOW A *

FIXED DISC

+12V
+5V
FLEX 0V

LBP P3800

24V
5V
BROWN/GREEN
TAPE 0V

WHITE
YELLOW

* FOR WINDOW A
SEE NEXT FIG

BLACK
RED

-12V 12V 5V +5Vm

PMU

0V 5V

SESCO

0V
TAPCO +5V

GREEN
YELLOW

05251

11.3 POWER DISTRIBUTION (CONT'D)

WINDOW A FIXED DISC

PRIAM FIXED DISC
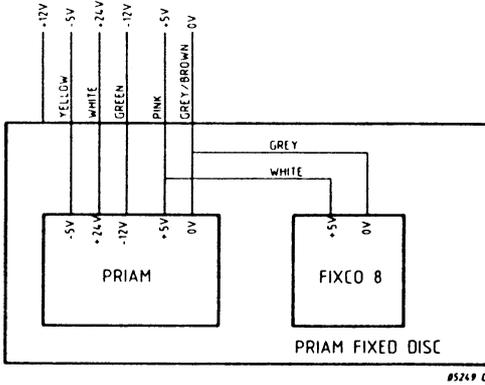
SEAGATE FIXED DISC

P3500/P3800 CE
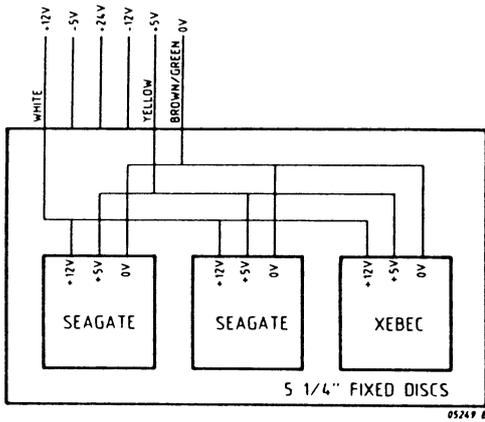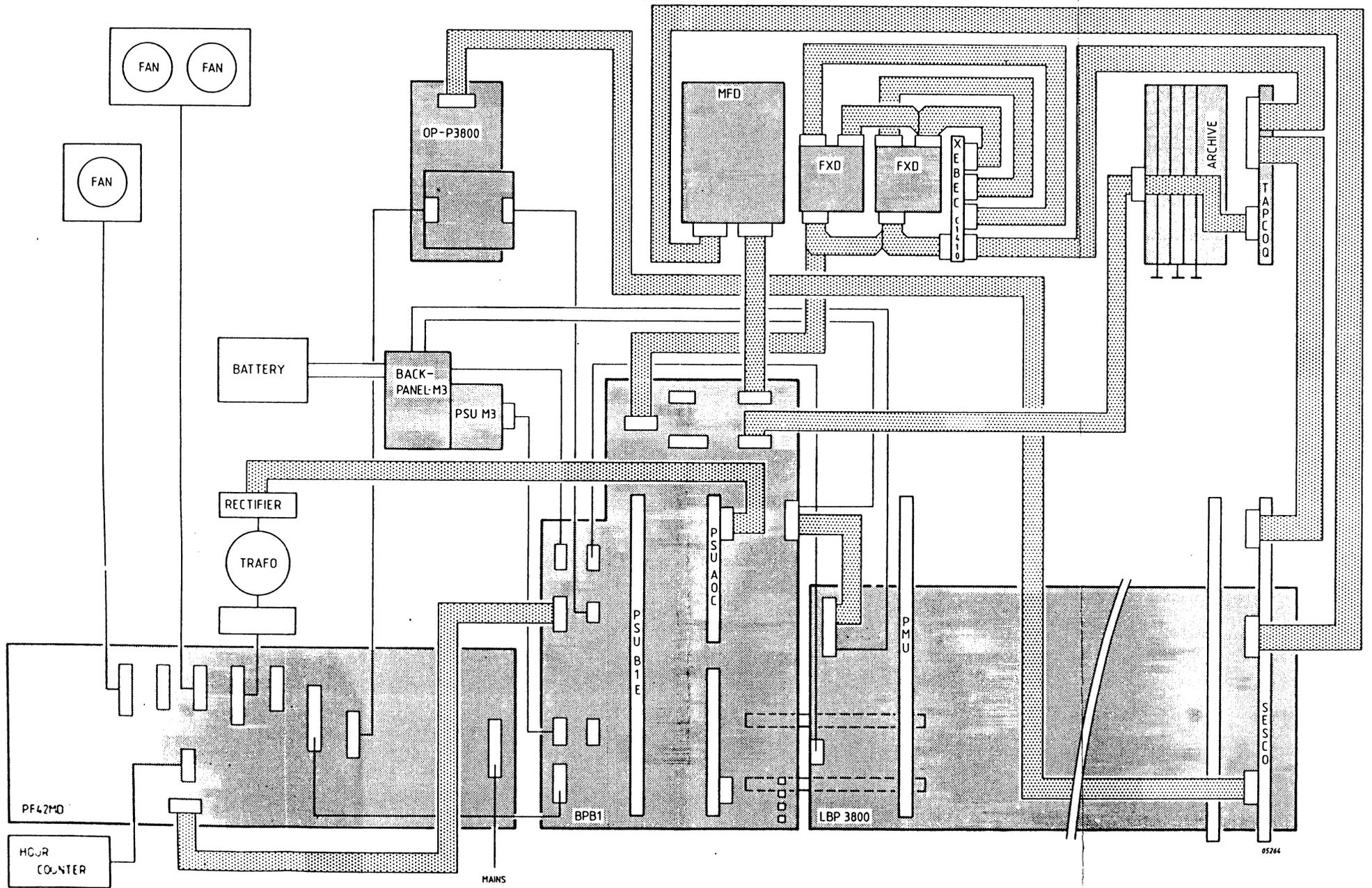
11.5 SERVICE INFORMATION BULLETINS ISSUED ON P3800

SI-NO P3800	TITLE
001	Skip defect area straps on PRIAM
002	Introduction PSU-B1E
003	Spindle speed variations PRIAM
004	PRIAM power on timing
005	Read/Write PCB PRIAM

11.6 POWER SUPPLY OVERVIEW

P3800 CONFIGURATION   NEEDS   POWER SUPPLIES

P3800	1ST 10M FXD	2ND 10M FXD	BACKUP TAPE	60M FXD
★	★			
★	★	★		
★	★		★	
★	★	★	★	
★			★	★

B1E	M3	AOC 12V	AOC 24/5V
★	★		
★	★	★	
★	★	★	
★	★	★	
★	★		★

11.7 MAINS VOLTAGE SELECTION

- Change strap setting power supplies (PSU B1E, PSU M3, PF 42M)
- Adjust wiring on connector block (ref. 11.2.1 / 11.2.2).

12   EXTENSION CABINET P3013

```
┌─────────────────────────────────────┐
│               N O T E               │
│ For                                 │
│                                     │
│        - Connectors                 │
│        - Strap Setting              │
│        - Modification History       │
│        - Replacement                │
│                                     │
│ of Exchange Units, please refer to  │
│ the relevant chapter 20-sections    │
│ as indicated in the LOCATOR.        │
└─────────────────────────────────────┘
```

SCREW COVERS

05227 C

PCB TAPCO-Q
(REF.20.34)

PCB SAS-EX
(REF.20.22)

PCB PSU WS 120E
(REF.20.27)

MAINSFILTER (REF.20.3)

MAINSFUSE

PCB RS (REF.20.26)

STREAMER TAPE ARCHIVE
(REF.20.35)

05220A

05221A

BACK PANEL BP-T (REF.20.25)

12.3 POWER DISTRIBUTION EXTENSION CABINET P3013

Diagram showing power distribution. MAINS connects to MAINS FILTER MFI-SBS. PSU WS-120-E with outputs 0V, 5V, +24V, 0V. BP-T backplane connects to SAS-EX (0V, 5V), TAPCO-Q (+5V, 0V), and TAPE DRIVE (0V, +5V, +24V, 0V) with wires labeled GREEN, YELLOW, GREY, BROWN.

05210 A
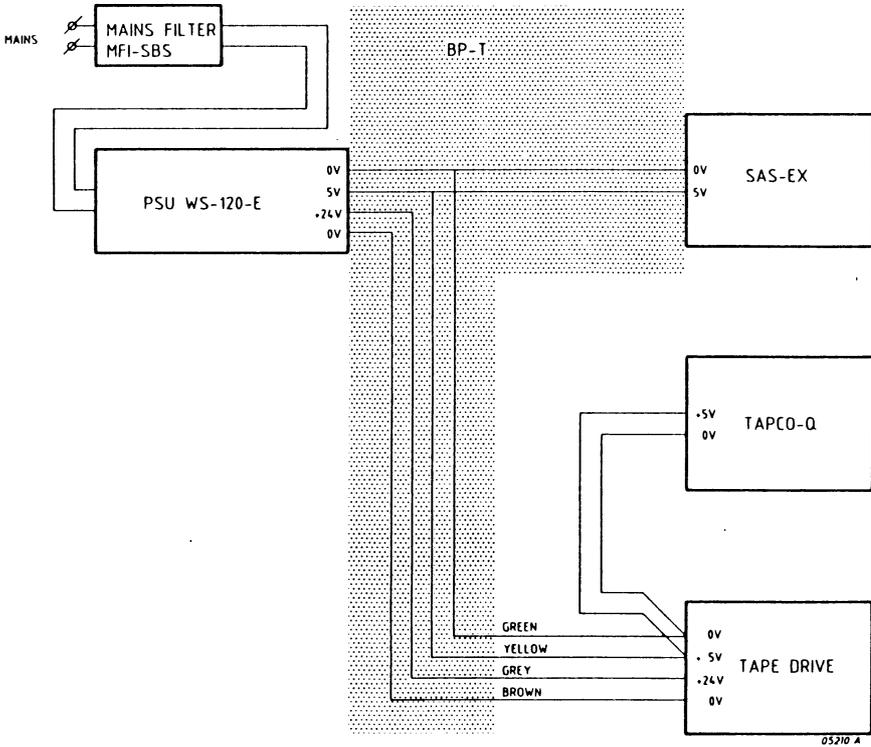
12.4 INTERCONNECTIONS EXTENSION CABINET P3013


```
MAINS →  FILTER  →  POWER SUPPLY

         TERMINATOR
         (OR SCSI BUS OUT)      SAS-EX-PCB

         SCSI BUS IN

                                TAPCO-Q
                                PCB

                                TAPE DRIVE
                                PCB
                                              05176 A
```
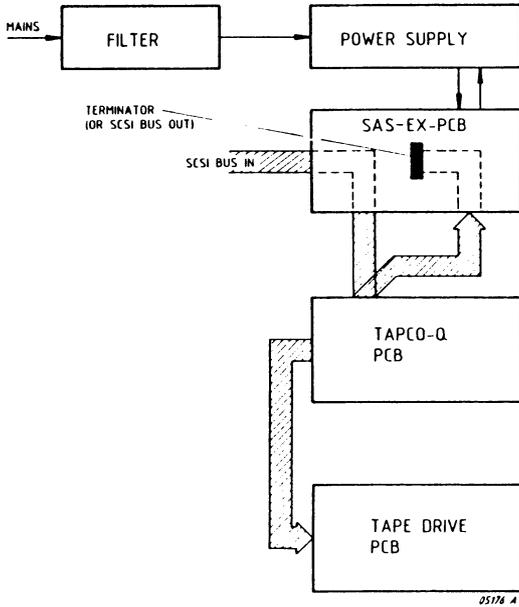
13   PRINTER P2908/P2909

13.1 REMOVAL COVER PRINTER P2908/P2909

- Remove the manual paper feeding knob
- Remove the screws from the upper case. In case of a P2908 the two screws in the middle are not available.
- Raise the upper case and remove the connector for supply of signals from control circuit board to the control panel and the hook fastening the signal lines.
- Remove the upper case.

MAINS | MAINS   FMBD PCB   SUM1 PCB   SERIAL INTERFACE PCB
FILTER PCB TRANSFORMER   (ref 20.43)   (ref 20.44)

PAPER
FEEDING
MOTOR

TIMING
SENSOR

HOME POSITION SENSOR   PRINT HEAD   CARRIAGE MOTOR ASSY
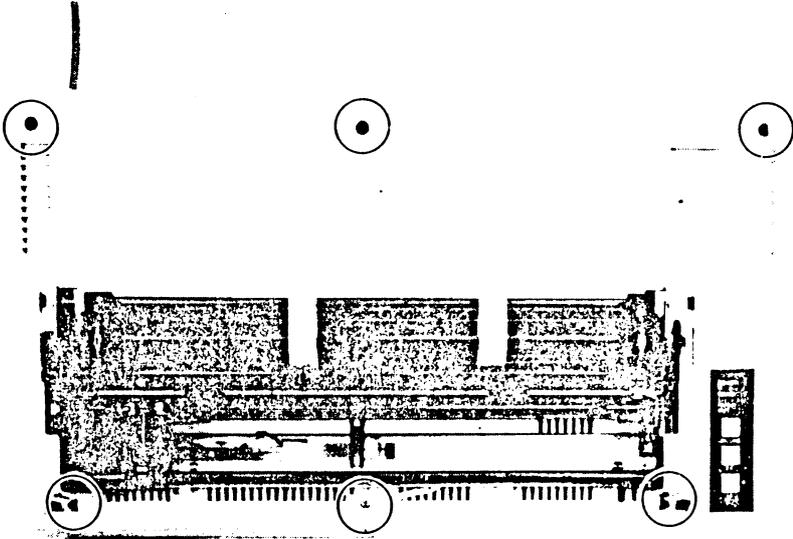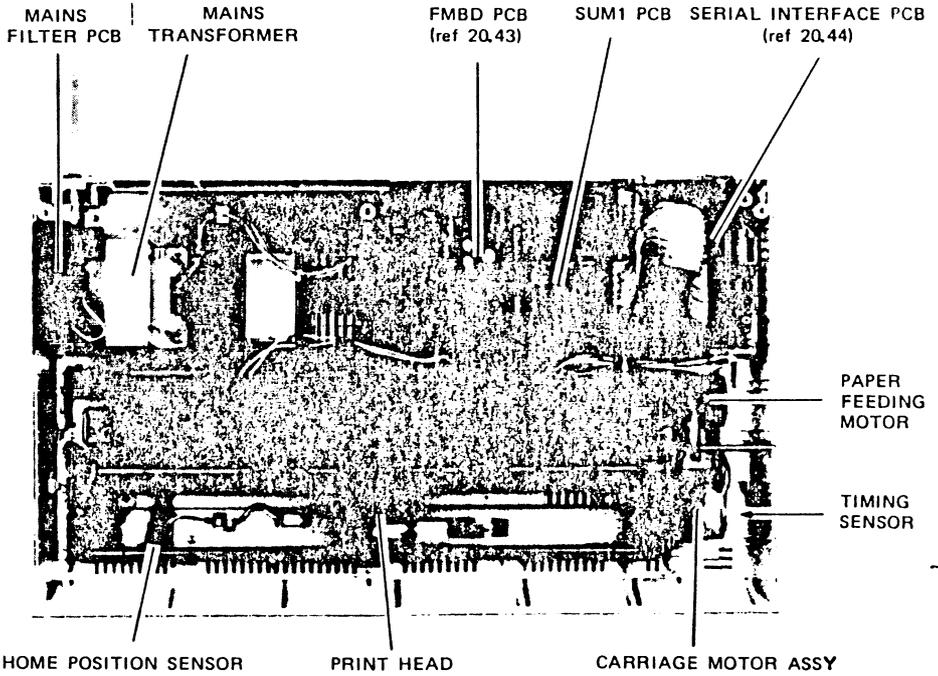
13.3 POWER DISTRIBUTION PRINTER P2908/2909

PTS SENSOR

CARRIAGE MOTOR

PRINTHEAD

HOME POSITION SENSOR

PRINTER MECHANISM

OPERATOR PANEL

LINE FEED MOTOR

PAPER-END SENSOR

FMBD BOARD

SERIAL INTERFACE BOARD

SUMI BOARD

TRAFO

MAINS FILTER

MAINS PLUG

05104
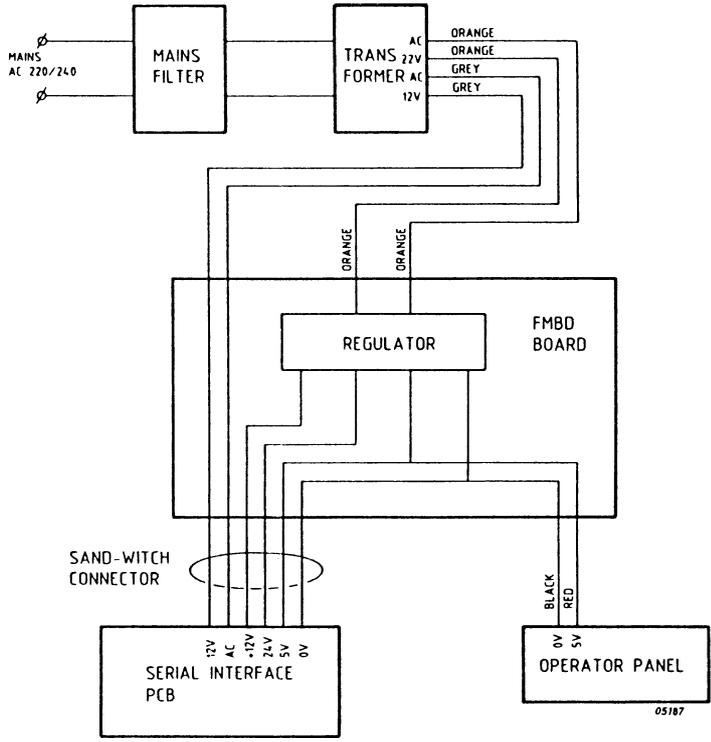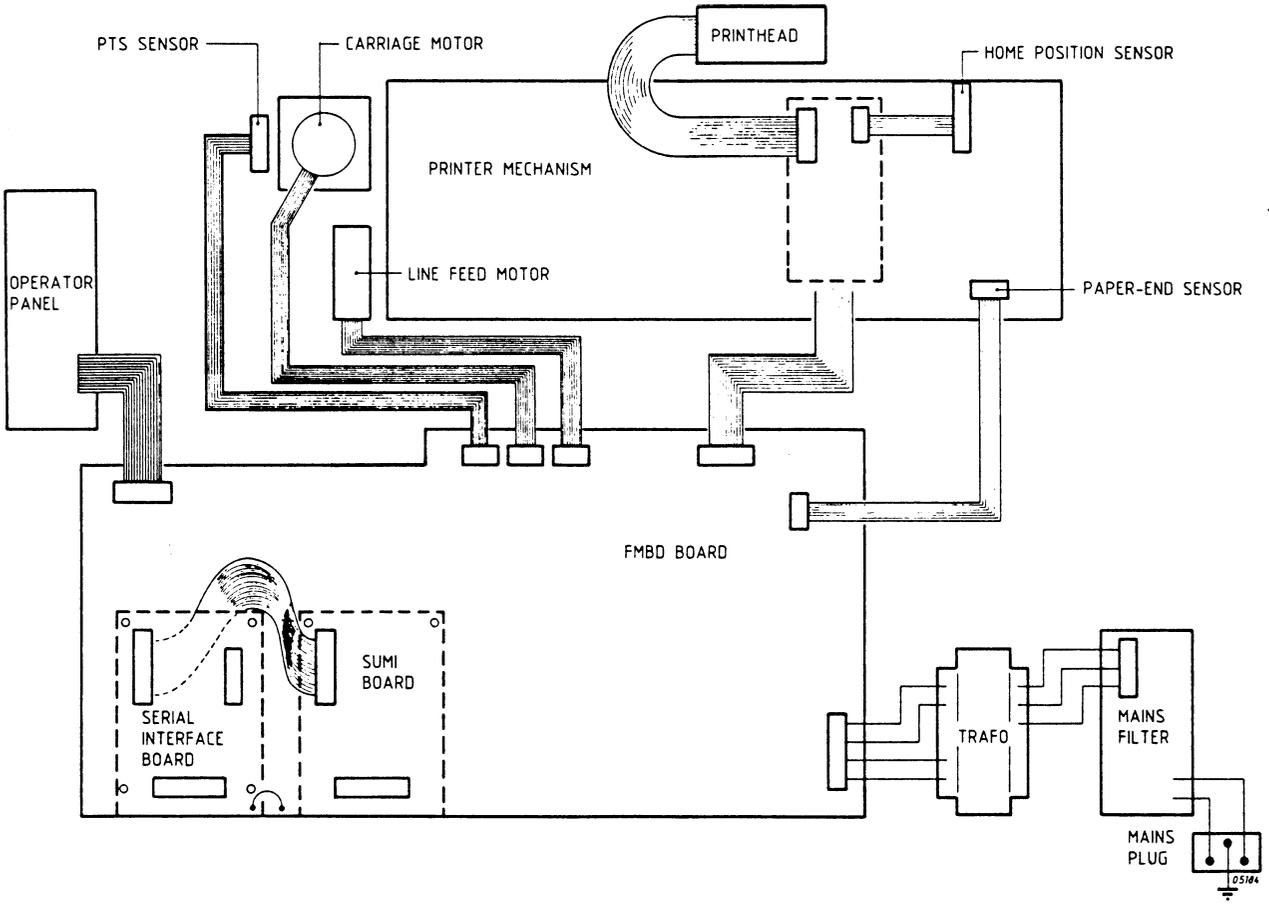
13.5 SERVICE BULLETINS ISSUED ON PRINTER P2908/P2909

T.B.S.L.

13.6 REPLACEMENTS PRINTER P2908/2909

13.6.1 REPLACEMENT OF CONTROL CIRCUIT BOARD (FMBD BOARD)

- Unplug the connector CN6 supplying alternating current from the power transformer.
- Unplug the connector CN8 supplying the paper empty signal from the printer mechanism.
- Unplug the connectors CN4 and CN5 from the printer mechanism.
- Remove the two screws (1) securing the control circuit board and the the screw (2) secured to the chassis for connector heat dissipation of the power supply circuit.
- Unhook the control circuit board from the lower case (three places).
- Remove the control circuit board.

Connector CN4

Connector CN5   Connector CN8

Hook

Hook

Hook

Screw ①

Hook

Screw ②

Connector CN6
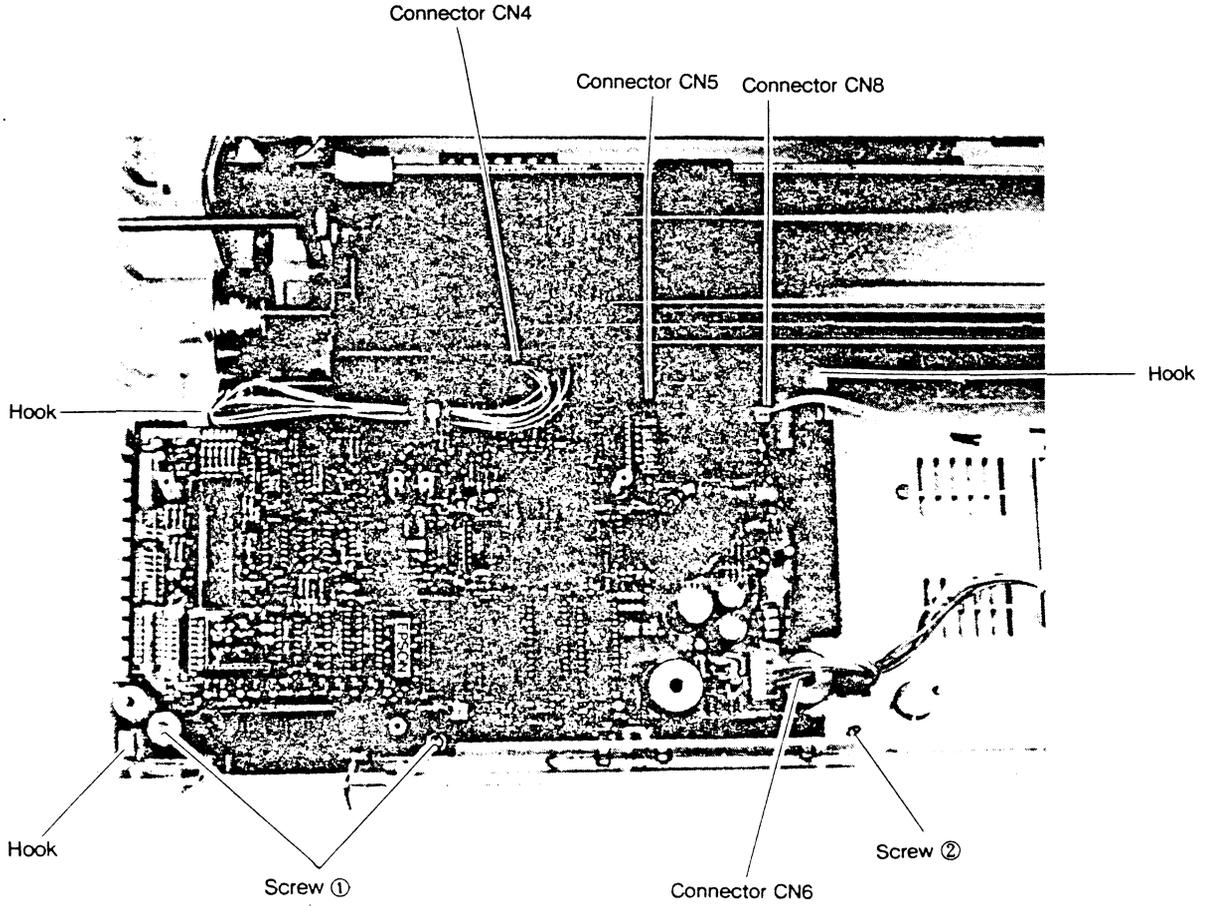
13.6.2 REPLACEMENT OF PRINTER MECHANISM

- Dismount the SUMI/serial interface board, if available, and control circuit board.
- Remove the screw (1) securing the shielding plat of the printer mechanism.
- Remove the six screws (2) securing the printer mechanism.
- Remove the printer mechanism.
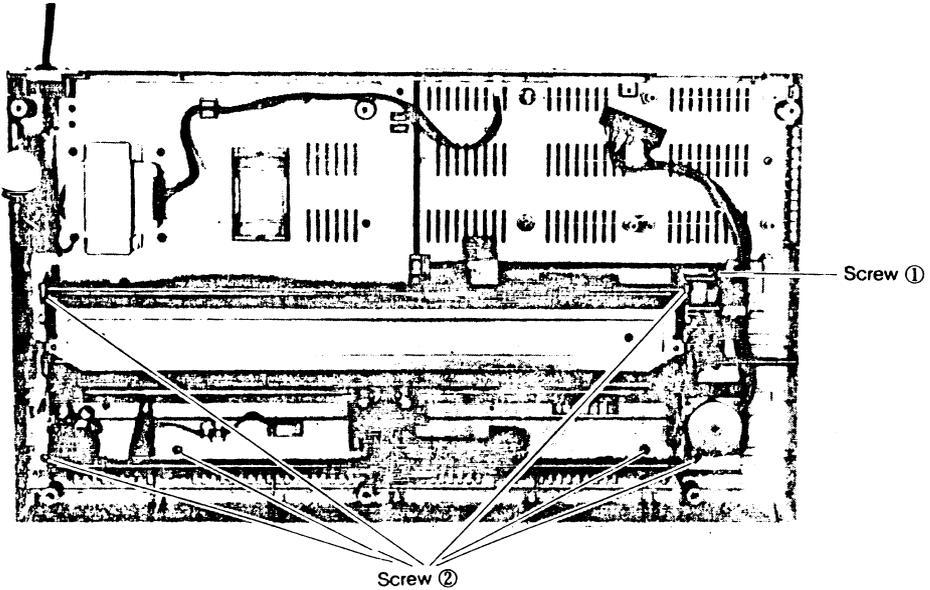
13.6.3 REPLACEMENT OF HOME POSITION SENSOR

- Unplug the connector of the home position sensor assembly from the B-2 on the terminal board.
- Remove the cup screw.
- Remove the home position sensor assembly.
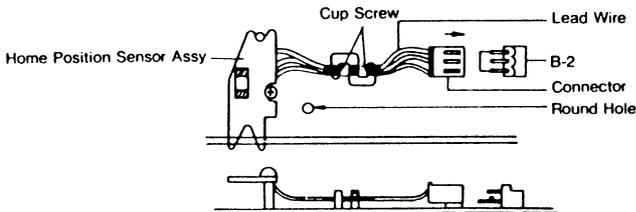
13.6.4 REPLACEMENT OF PRINTHEAD

- Manually move the print head unit to the right end.
- Remove the head cable from the connector on the terminal board.
- Turn the head lock lever clockwise and lift and remove the print head unit.

Print Head Unit

Head Cable

Terminal Board

Head Lock Lever
Head Connector
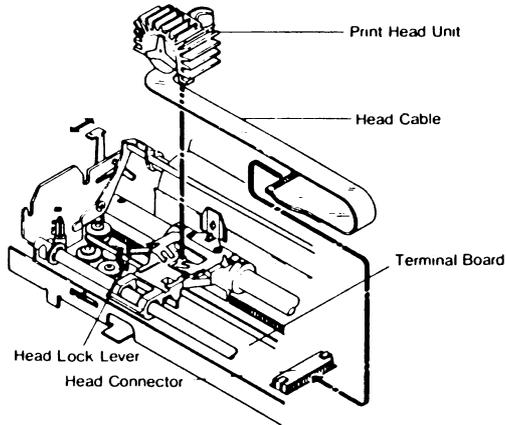
13.6.5 REPLACEMENT PTS SENSOR

- Remove the cup screw securing the PTS sensor board assembly to the motor heat sink.
- Remove the PTS sensor board assembly.

PTS Sensor Board Assy

CS(M2.5x4)
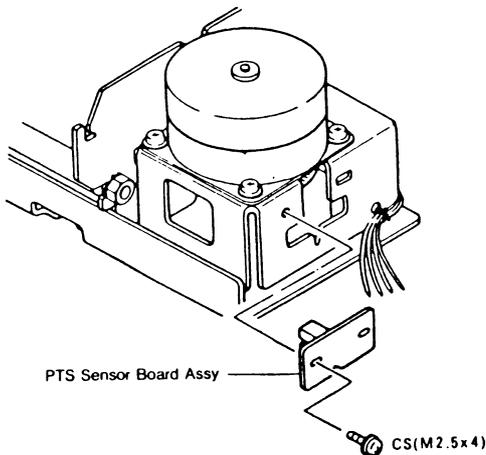
- When installing a new PTS sensor insert the sensor but don't fix the cup screw. Put the printer in the selftest and move the sensor to the left and to the right until the speed of the carriage in both directions is about the same. Then fix the screw.

13.6.6 REPLACEMENT OF THE PAPER FEEDING MOTOR

- Dismount the printer mechanism in accordance with paragraph 13.6.2 above.
- Until the wire band securing the bundle of lead wires supplying signals to the paper feeding rotor (two places).
- Unplug the connector of the paper feeding motor from the connector CN4.
- Remove the three cup screws securing the paper feeding motor.

CPO(M2.5× 5)
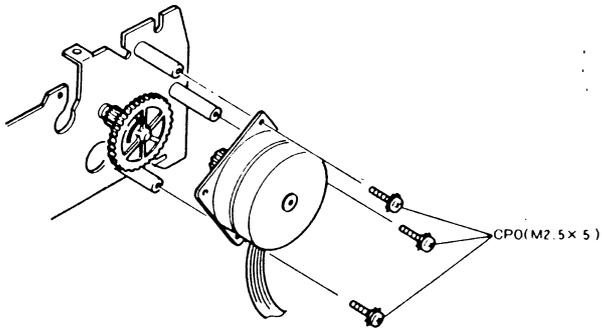
13.6.7 REPLACEMENT OF PAPER-END SENSOR BOARD

- Unplug the connector CN8 supplying PE signals to the control circuit board.
- Unhook the PE lever spring from the outer paper guide.
- Remove the PE board assembly.

CN8
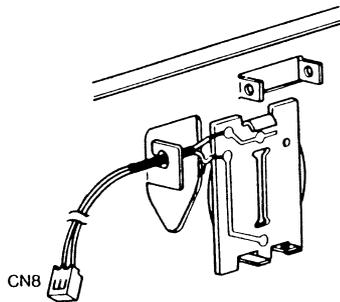
13.6.8 REPLACEMENT OF TIMING BELT MOTOR ASSY

- Dismount the printer mechanism.
- Until the wire band securing the bundle of lead wires supplying signals to the timing belt motor (2 places).
- Remove the four cup screws securing the timing belt motor assembly to the motor heat sink.
- Unplug the connector of the timing belt motor assembly from the connector CN4.
- Remove the timing belt motor assembly.

CPO(M2 5 × 5)

Timing Belt Motor Assy

Timing Belt Motor Support
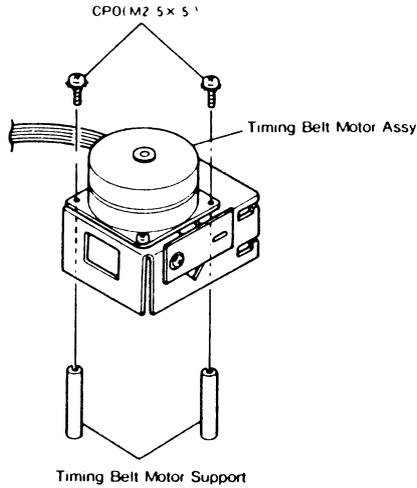
13.7 SOFTWARE COMPATIBILITY PRINTER P2908/2909

13.7.1 SOFTWARE COMPATIBILITY PRINTER P2909

| CPU (POS.) | | ROM (POS.) | | | STRAP |
MAIN 3B	SLAVE 9B	4A	5A	4B	J1
7810G or 78010BC	C42010EC or SUMI-BOARD SC2-A1 or C42010ED	FC4-A0	FC5-A1	MO2010GA	N
7810G or 78010BB	C42010EC or SUMI-BOARD SC2-A1 or C42010ED	FC4-A1	FC5-A2	MO2010GA	N
7810G or 78010BC	C42010EC or SUMI-BOARD SC2-A1 or C42010ED	FC4-A2	FC5-A3 or M64104CA	MO2010GA	N
78010BC or 7810G	C42010EC or SUMI-BOARD SC2-A1 or C42010ED	M64102BA	FC5-A3 or M64104CA	MO2010GA	N
78010BD	C42010EC or SUMI-BOARD SC2-A1 or C42010ED		M64102BA	MO2011GA	Y

13.7.2 SOFTWARE COMPATIBILITY P2908

| CPU (POS.) | | ROM (POS.) | | | STRAP |
MAIN 3B	SLAVE 9B	4A	5A	4B	J1
7810G or C78010BC	C42010EB or SUMI-BOARD SA2-A0 or C42010EC	FA4-A1	FA5-A2	M02010GA	N
7810G or C78010BC	C42010EB or SUMI-BOARD SA2-A0 or C42010EC	FA4-A2	FA5-A3	M02010GA	N
C78010BB	C42010EB or SUMI-BOARD SA2-A0 or C42010EC		M64100BA	M02011GA	Y
C78010BC	C42010EC or C42010ED	M64100BB or M64100KB	FC5-A3 or M64104CA	M02010GA	N
C78010BD	C42010EC or SUMI-BOARD SC2-A1 or C42010ED		M64100BB or M64100KB	M02011	Y
7810G or C78010BC	C42010EC or SUMI-BOARD SC2-A1 or C42010ED	M64100BB or M64100KB	M64104CA	M02010GA	N
7810G or C78010BC	C42010ED or C42010EC	M64100BB or M64100KB	M64104CA	M02010GA	N

19   PARTS LIST

Pos.	Factory Nr.	Service Nr.	Description
A	-	*8702 350 01008	P3500 Fixed 10M,(FLEXCO)
A	-	*8702 350 01009	P3500 Fixed 10M,(SESCO)
A	-	*8702 350 01004	P3500 Fixed 10M, No BBU (FLEXCO)
A	-	*8702 350 01005	P3500 Fixed 10M, No BBU (SESCO)
A	-	*8702 350 01012	P3500 Fixed 5M,(FLEXCO)
A	-	*8702 350 01013	P3500 Fixed 5M, (SESCO)
A	-	*8702 350 01014	P3500 Fixed 5M, No BBU (FLEXCO)
A	-	*8702 350 01011	P3500 Fixed 5M, No BBU (SESCO)
1B	5112 291 75720	5322 214 40086	PCB PSU WS120
2B	5112 291 75730	5322 214 40087	PCB PMU80] or
2B	5112 291 93240	5322 214 40238	PCB PMU186] or
2B	-	*8702 300 09013	P3030-12 PMU186 Exp. Board] or
2B	5112 291 75600	5322 214 40121	PCB PMU80-1] or
2B	-	*8702 350 09007	P3030-10 PMU80-1 Exp. Board] or
3B	5112 291 69860	5322 214 40083	PCB FLEXCO] or
3B	5112 291 75730	5322 214 40087	PCB PMU80] or
3B	5122 291 75600	5322 214 40121	PCB PMU80-1] or
3B	5122 291 93240	5322 214 40238	PCB PMU186] or
3B	5112 291 80760	5322 216 21433	PMU80-3U] or
4B	5112 291 75760	5322 214 40088	PCB SASI-AD-00] or
4B	5112 291 77400	5322 214 40118	PCB SASI-AD-02] or
4B	5112 291 77420	5322 214 40091	PCB SESCO
5B	5112 291 76310	5322 214 40082	PCB XEBEC S1410
B	-	*8702 350 09008	P3030-72 BBU Assy
6C	2412 526 00123	8702 300 00002	Battery
7B	5112 212 15380	-	Top Cover
8B	5112 212 05820	-	Logo Strip
9B	5112 212 03180	-	Back Cover
B	-	*8702 350 09009	P3030-70 Fan Assy
10C	5112 291 73280	5322 361 10273	Fan
12B		5322 693 21447	FXD SEAGATE ST412 (see 19.13)
12B		-	FXD SEAGATE ST406(see 19.13)] or
12B	2822 062 40031	5322 218 70077	FXD RODIME R202 (see 19.14)] or
13B	5112 291 75730	5322 214 40087	PCB PMU80] or
13B	5112 291 80760	5322 216 21433	PCB PMU80-3] or
13B	-	*8700 300 09012	P3030-11 PMU80-3 Expander Board
14B	5112 291 75590	*8700 034 01001	MFD X3114
11B	2822 030 90259	-	Foot
15B	5112 291 84440	5322 214 40093	PCB OP-WSF
16C	9332 589 00112	5322 130 34393	LED Red] or
16C	9332 860 80112	5322 130 34634	LED Yellow] or
17C	9332 860 60112	4822 130 31249	LED Green
18C	9332 860 80112	5322 130 34634	LED Yellow
19B	5112 211 40200	5322 462 34185	Card Guide
20B	5112 211 40170	5322 462 34184	Card Guide
21B	5112 211 40220	5322 405 46352	Card Ejector (Lock)
22B	5112 291 84460	5322 214 40094	PCB BP-STOMO
23B	2422 120 00558	5322 271 30356	Battery Switch Assy
24B	5112 291 69760	5322 214 40178	PCB PSU M2
25B	5112 291 75700	5322 214 40085	PCB MFI-SBS
26C	2422 086 01058	5322 253 54034	Fuse 6.25A - 250V
27C	2422 549 26002	5322 267 34069	Strap
28B	2422 549 01075	*8702 350 00006	Time Counter
31B	5112 291 79780	-	Front Cover Plate Fixed Disc

* Commercial Code Number
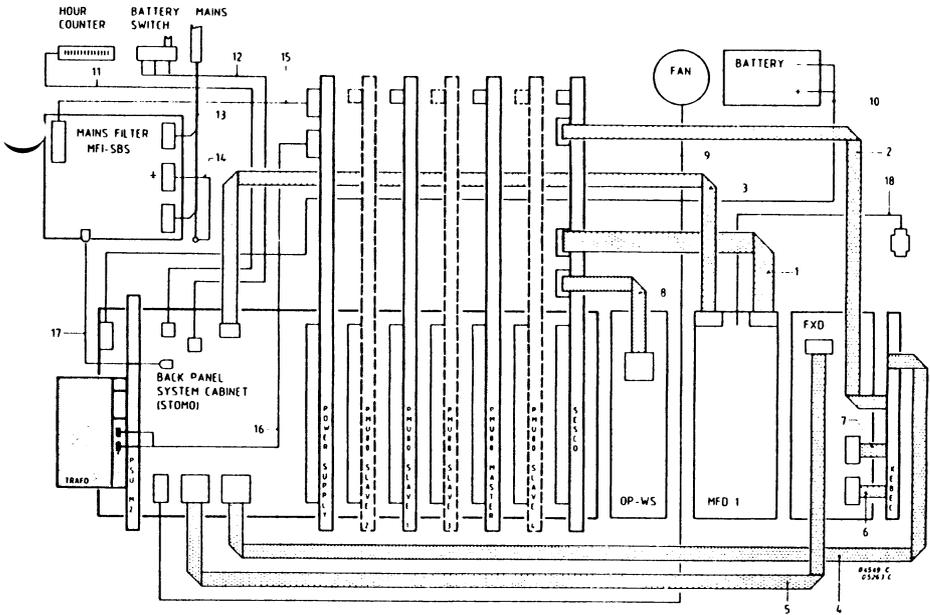
Pos.	Factory Nr.	Service Nr.	Description
1B	5112 280 03980	-	Flat Cable FLEXCO/SESCO-MFD
2B	5112 280 04220	-	Flat Cable SASI-AD/SESCO-XEBEC
3B	5112 280 94500	-	Power Cable BP - MFD
4B	5112 280 03990	-	Power Cable BP - XEBEC
5B	5112 280 03990	-	Power Cable BP - FXD
6B	5112 280 04060	-	Flat Cable FXD-XEBEC Data
7B	5112 280 08740	-	Flat Cable FXD-XEBEC Control
8B	5112 280 03930	-	Flat Cable SASI-AD/SESCO-OP-WS
9B	5112 280 04030	-	Cable BP - Fan
10B	5112 280 03960	-	Cable BP - Battery
11B	5112 280 04010	-	Cable BP - Hour Counter
12B	5112 280 03950	-	Cable BP - Battery Switch
13B	5112 280 04080	-	Cable Mains - MFI-SBS
14B	5112 280 00660	-	Cable Earth Screw - MFI-SBS/PSU
15B	5112 280 04000	-	Cable MFI-SBS - Power Supply
16B	5112 280 04040	-	Cable Power Supply - PSU-M2
17B	5112 280 03970	-	Cable BP - MFI-SBS (Ground)
18B	5112 280 04020	-	Cable Ground MFD
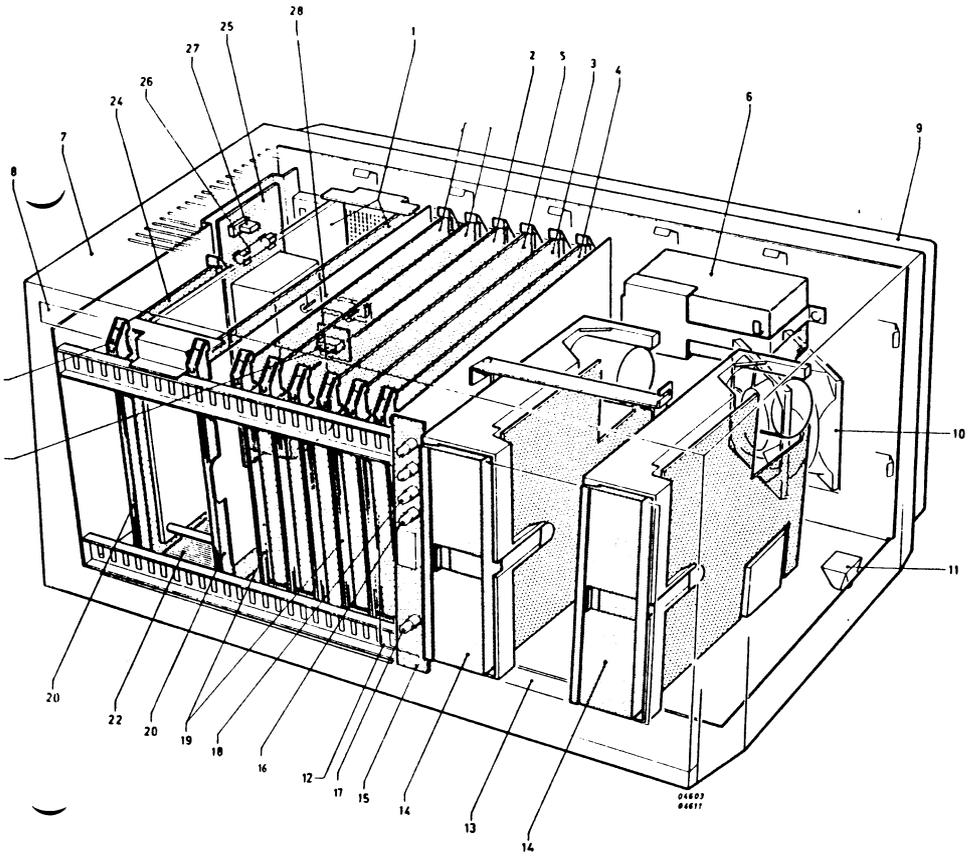
Pos.	Factory Nr.	Service Nr.	Description
A	-	*8702 350 01006	P3500 Dual Fl. 640K FLEXCO
A	-	*8702 350 01007	P3500 Dual Fl. 640K SESCO
A	-	*8702 350 01012	P3500 Dual Fl. 640K No BBU FLEXCO
A	-	*8702 350 01013	P3500 Dual Fl. 640K No BBU SESCO
A	-	*8702 350 01016	P3500 Dual Fl. 640K No BBU No Fan FLEXCO
A	-	*8702 350 01015	P3500 Dual Fl. 640K No BBU No Fan SESCO
A	-	*8702 350 01024	P3500 Dual Fl. 320K BBU FLEXCO
A	-	*8702 350 01022	P3500 Dual Fl. 320K No BBU SESCO
A	-	*8702 350 01023	P3500 Dual Fl. 320K No BBU No Fan FLEXCO
A	-	*8702 350 01021	P3030 Dual Fl. 320K No BBU No Fan SESCO
1B	5112 291 75720	5322 214 40086	PCB PSU WS120
2B	5112 291 75730	5322 214 40087	PCB PMU80] or
2B	5112 291 75600	5322 214 40121	PCB PMU80-1] or
2B	5112 291 93240	5322 214 40238	PCB PMU186] or
2B	-	*8702 300 09013	P3030-12 PMU186 Expander Board] or
2B	-	*8702 350 09007	P3030-10 PMU Expander Board] or
3B	5112 291 69860	5322 214 40083	PCB FLEXCO] or
3B	5112 291 75730	5322 214 40087	PCB PMU80] or
3B	5112 291 75600	5322 214 40121	PCB PMU80-1] or
3B	5112 291 93240	5322 214 40238	PCB PMU186] or
4B	5112 291 75760	5322 214 40088	PCB SASI-AD-00] or
4B	5112 291 77400	5322 214 40118	PCB SASI-AD-02] or
4B	5112 291 77420	5322 214 40091	PCB SESCO] or
5B	5112 291 75600	5322 214 40121	PCB PMU80-1] or
5B	5112 291 80760	5322 216 21433	PCB PMU80-3] or
5B	-	*8702 300 09012	P3030-11 PMU80-3 Expander Board] or
B	-	*8702 350 09008	P3030-72 BBU Assy
6C	2412 526 00123	*8702 300 00002	Battery
7B	5112 212 15380	-	Top Cover
8B	5112 212 05820	-	Logo Strip
9B	5112 291 03180	-	Back Cover
B	-	*8702 350 09009	P3030-70 Fan Assy
10C	5112 291 73280	5322 361 10273	Fan
11B	2822 030 90259	-	Foot
12B	-	-	Front Cover Plate Operator Panel
13B	5112 291 78000	-	Front Cover Plate Flexible Disc
14B	5112 291 75590	*8700 034 01001	Mini Flexible Disc X3114 complete] or
14B	5122 291 77860	-	Mini Flexible Disc X3113 complete] or
15B	5112 291 84440	5322 214 40093	PCB OP-WSF
16C	9332 589 00112	5322 130 34393	LED Red] or
16C	9322 860 80112	5322 130 34634	LED Yellow] or
17C	9332 860 60112	4822 130 31249	LED Green
18C	9332 860 80112	5322 130 34634	LED Yellow
19B	5112 211 40200	5322 462 34185	Card Guide
20B	5112 211 40170	5322 462 34184	Card Guide
21B	5112 211 40220	5322 405 46352	Card Ejector (Lock)
22B	5112 291 84460	5322 214 40094	PCB BP-STOMO
23B	2422 120 00558	5322 271 30356	Battery Switch Assy
24B	5112 291 69760	5322 214 40178	PCB PSU M2
25B	5112 291 75700	5322 214 40085	PCB MFI-SBS
26C	2422 086 01058	5322 253 54034	Fuse 6.25A - 250V
27C	2422 549 26002	5322 267 34069	Strap
28B	2422 549 01075	*8702 350 00006	Time Counter
B	5112 280 04050	-	Flat Cable FLEXCO/SESCO - MFD 1 & 2 [1])

* Commercial Code Number

[1]) Note: For other cables see 19.1
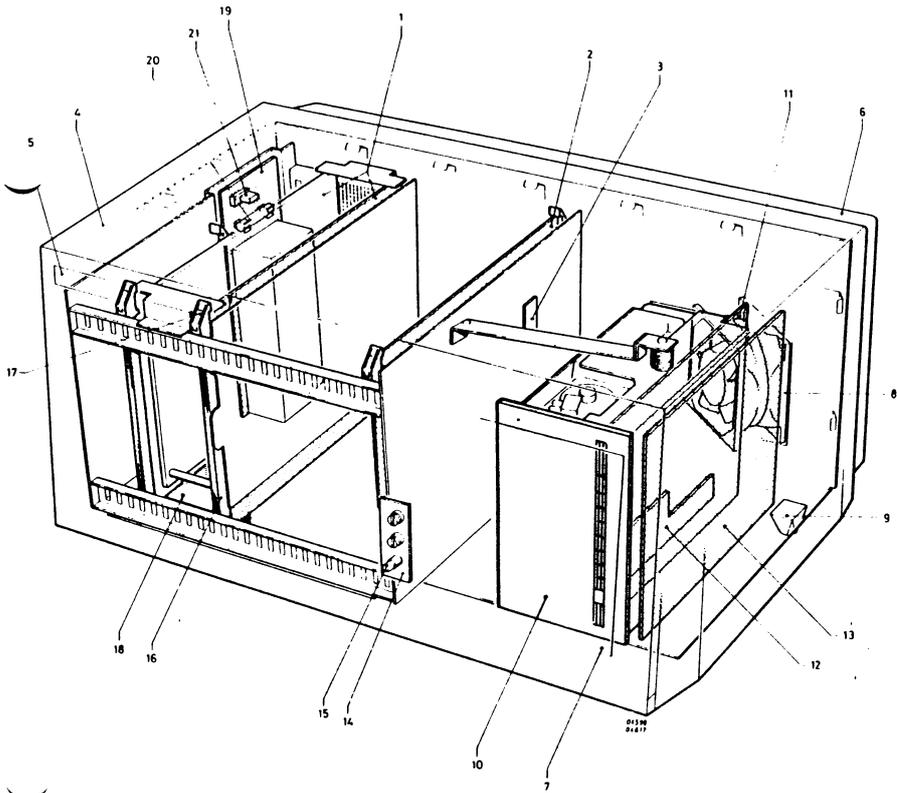
Pos.	Factory Nr.	Service Nr.	Description
A	-	*8702 300 02001	P3012-30 Extension 5M
A	-	*8702 300 02002	P3012-33 Extension 10M
1B	5112 291 75720	5322 214 40086	PCB PSU WS120
2B	5122 291 75550	5322 214 40144	PCB SAS-EX
3B	5122 291 75560	5322 214 40145	PCB TERM-WS
4B	5112 212 15380	-	Top Cover
5B	5112 212 06240	-	Logo Strip
6B	5112 291 03180	-	Back Cover
7B	5112 212 25380	-	Front Cover Plate
B	-	*8702 350 09009	P3030-70 Fan Assy
8C	5112 291 73280	5322 361 10273	Fan
9B	2822 030 90259	-	Foot
10B		5322 693 21447	Fixed Disc 10M Compl. ST412
			(see 19.13)
10B	5112 291 77190	*8709 012 00297	Fixed Disc 5M Compl. ST406
			(See 19.13)
10B'	2822 062 40031	5322 218 70077	Fixed Disc Complete R202
			(See 19.14)
14B	5122 291 77170	5322 214 40154	PCB Power-on Indicator
15C	54037 - 001	5322 693 21431	Led green
16B	5122 211 40170	5322 462 34184	Card guide
17B	5112 211 40220	5322 405 46352	Card Ejector (Lock)
18B	5122 291 76370	5322 214 40143	PCB BP-Stomo Ext.
19B	5112 291 75700	5322 214 40085	PCB MFI-SBS
20C	2422 086 10158	5322 253 54034	Fuse 6.25A-250V
21C	2422 549 26002	5322 267 34069	Strap

* Commercial Code Number
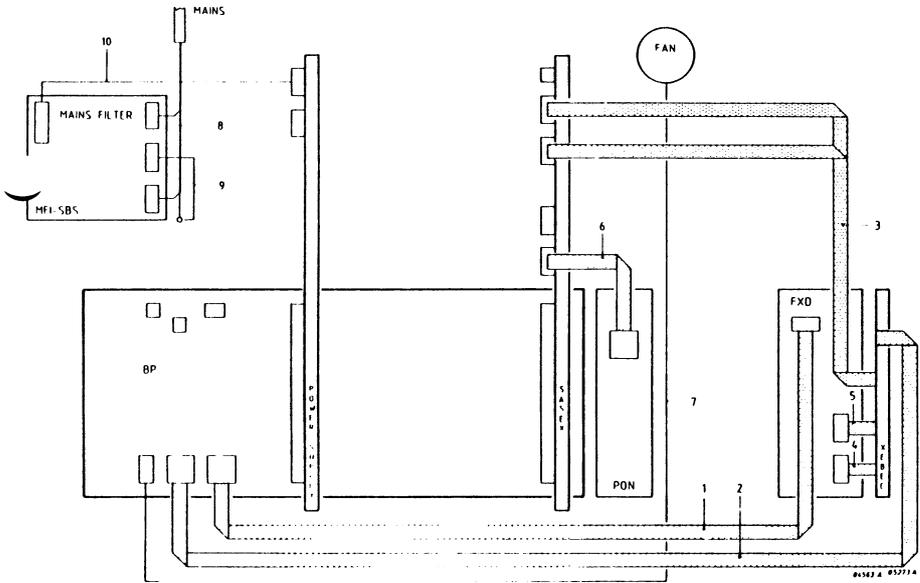
Pos.	Factory Nr.	Service Nr.	Description
1B	5112 280 03990	-	Flat cable BP - FXD (power)
2B	5112 280 03990	-	Flat cable BP - XEBEC
3B	5112 280 04610	-	Flat cable SASEX - XEBEC
4B	5112 280 04060	-	Flat cable XEBEC - FXD (date)
5B	5112 280 08740	-	Flat cable XEBEC - FXD (control)
6B	5112 280 04640	-	Flat cable SASEX - PON (LED)
7B	5112 280 04030	-	Cable BP - FAM (power)
8B	5112 280 04080	-	Cable MAINS - MFI
9B	5112 280 00660	-	Cable EARTH SCREW - MFI/PSU
10B	5112 280 04000	-	Cable MFI - PSU
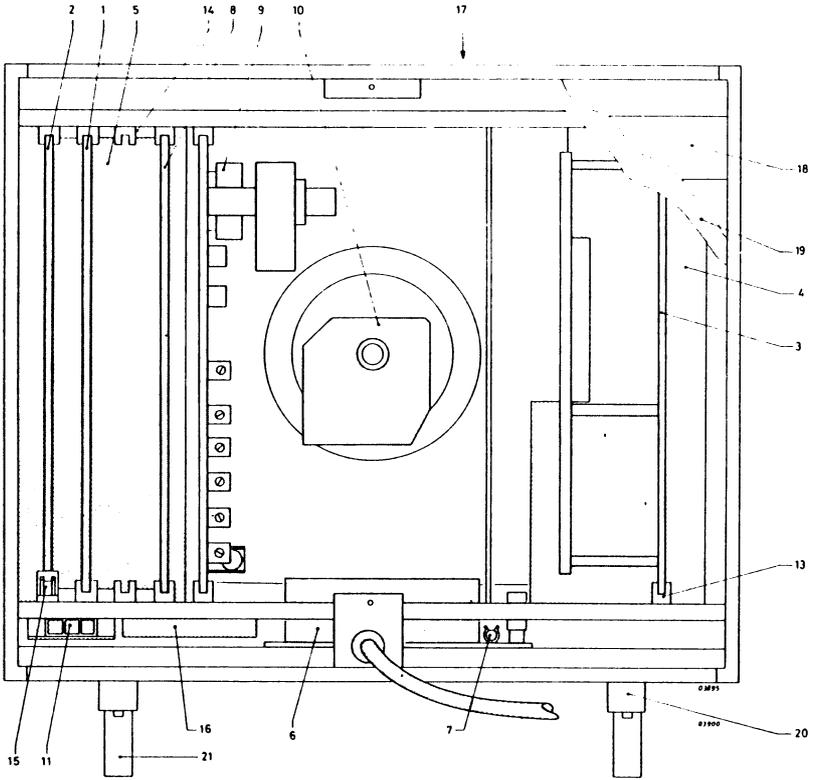
Pos.	Factory Nr.	Service Nr.	Description
A	-	*8702 300 01002	P2711-002 Workstat. green compl.
A	-	*8702 300 09005	P2710-006 Swivel Stand complete
1/2B	5112 291 73350	-	PCB PMU88-1-16K + PME1-1-8K
1B	5112 291 77730	5322 214 40117	PCB PMU88-1-16K
2B	5112 291 77460	5322 214 40119	PCB PME1-1-8K
3B	5112 291 75720	5322 214 40086	PSU WS 120] or
3B	5112 291 75610	5322 218 80032	PSU WS 50
4B	5112 291 84520	5322 214 40096	PCB PBP-DIMO
5B	5112 291 84510	5322 214 40095	PCB BP-DIMO
6B	5112 291 75700	5322 214 40085	PCB MFI-SBS] or
6B	5112 291 77580	5322 214 40132	PCB MFI-DIMO
7C	2422 086 01058	5322 253 54034	Fuse 6.25A 250V
8B	5112 291 75790	5322 214 40089	PCB CRT-CO] or
8B	5112 291 80750	5322 214 40196	PCB CRT-CO 01
9B	3119 208 55570	5322 216 21235	PCB CRT Device Electronics
10B	3119 208 54950	5322 216 21038	PCB Video Amplifier
11B	5112 291 77220	5322 277 20872	Slide Switch Assy
12B	5122 110 94780	5322 414 30005	Knob (not drawn)
13B	5112 211 40170	5322 462 34184	Card guide 1
14B	5112 211 40200	5322 462 34185	Card guide 3
15C	5112 211 40220	5322 405 46352	Card Ejection (Lock)
16B	3119 208 05020	-	Potmeter Brightness Control
17B	5112 212 06230	-	Logo Strip
18B	5112 212 05770	-	Back Cover
19B	5112 212 04310	-	Protection Mask
20B	2712 028 00176	5322 462 10217	Foot
21B	2712 028 00175	5322 462 10216	Adjustable Foot

* Commercial Code Number

CRT

PCB VIDEO
AMPLIFIER

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PCB
MONITOR
ELECTRONICS

BP DIMO

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PBP DIMO

PCB MFI SBS

MAINS
SWITCH

BRIGHTNESS
POTENTIOMETER

MAINS CABLE

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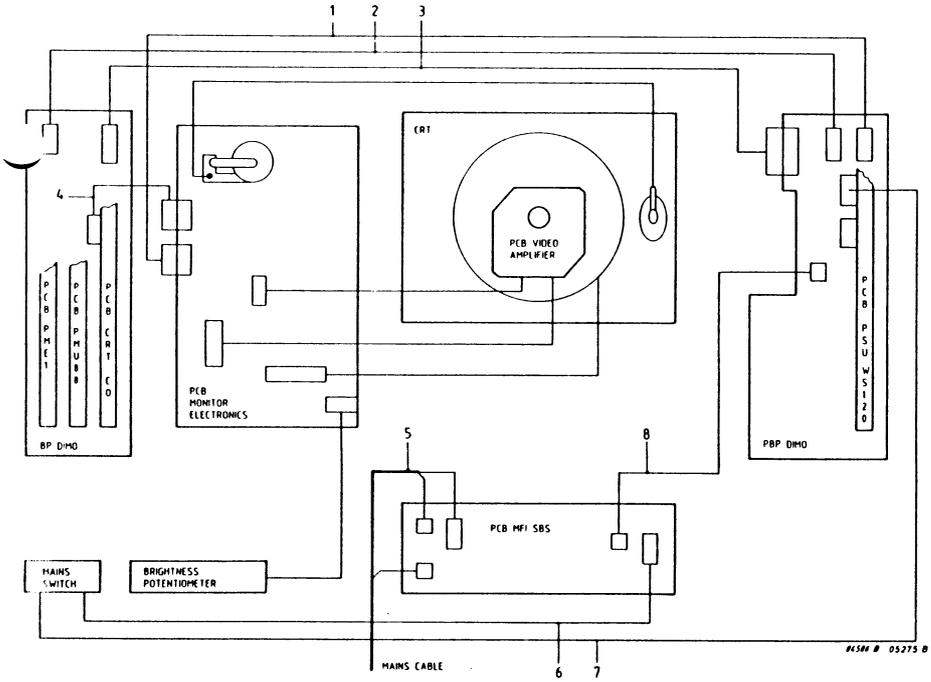
Pos.	Factory Nr.	Service Nr.	Description
1B	5112 280 04300	-	Flat cable PBP DIMO - MON.EL. (power)
2B	5112 280 04240	-	Flat cable PBP DIMO - BP DIMO (control)
3B	5112 280 04230	-	Flat cable PBP DIMO - BP DIMO (power)
4B	5112 280 04290	-	Flat cable CRT CO - MON.EL.
5B	5112 280 04080	-	Cable Mains - MFI
6B	5112 280 04470	-	Cable MFI - Mains Switch
7B	5112 280 04480	-	Cable Mains Switch - PSU
8B	5112 280 04270	-	Cable MFI - PBP DIMO (ground)

04567 A
04618 A
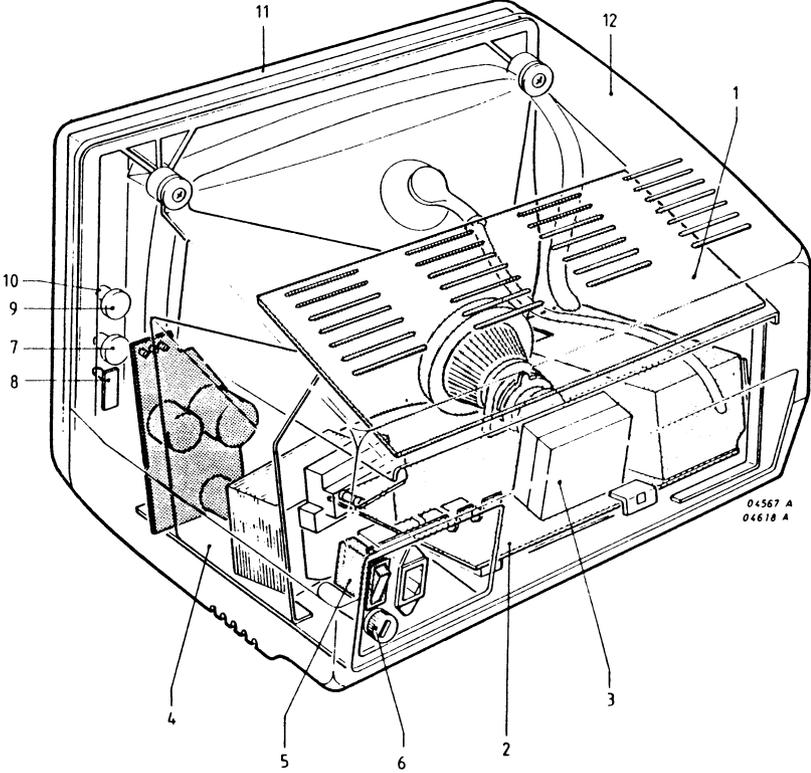
Pos.	Factory Nr.	Service Nr.	Description
A	-	*8702 300 01014	P2705-001 Workstation Amber Compl.
A	-	*8702 300 01015	P2705-002 Workstation Green Compl.
1B	3119 208 55970	5322 216 21308	PCB Logic
2B	3119 208 53990	5322 216 21306	PCB CRT-Electronics
3B	3119 208 55980	5322 216 21309	PCB Video Amplifier
4B	3119 208 59120	5322 218 80041	Power Supply Compl.
5B	2419 128 01015	5322 277 10712	Mains switch
6C	2422 086 01003	4822 253 30014	Fuse Power Supply
7B	3119 208 05110	5322 693 21425	Potmeter Brightness Control + LED
8B	9334 821 70112	4822 130 31106	LED
9B	3119 208 05340	5322 693 21426	Potmeter Contrast Control
10B	3119 204 12280	-	Knob
11B	3119 208 71480	-	Cover, Frontal Ring
12B	3119 208 71500	-	Top Cover
B	-	-	Foot

Pos.	Factory Nr.	Service Nr.	Description
A	-	*8702 028 41xx1	Keyboard Complete (PUC)
A	-	*8702 028 41xx2	Keyboard Complete (DIN)
1B	5112 211 71520	-	Cover Left
2B	5112 211 71530	-	Cover Right
3B	5112 291 73770	-	Cover Top
4B	5112 212 04570	-	Cover Back/Top
5B	5112 212 06231	-	Logo Strip
6B	5112 211 70960	5322 462 44482	Foot (4x)
7B	5112 280 03660	-	Interface Cable PUC
7B	5112 280 05601	-	Interface Cable DIN
8B	5112 291 84060	5322 214 40092	PCB KB 2841
8B	5112 291 78180	5322 214 40146	PCB KB-P2841
9C	5112 291 43290	5322 278 14006	Keyswitch (100x)
10C	5112 291 42910	5322 278 14005	Keyswitch (2x)
11C	5112 209 20110	-	LED (Keytop)
12C	9335 051 40112	5322 130 32021	LED (1-7)
13B	5112 291 73430	-	Set Keytops (GB)
13B	5112 291 78740	-	Set Keytops (S)
13B	5112 291 76580	-	Set Keytops (I)
13B	5112 291 75290	-	Set Keytops (D)
13B	5112 291 78390	-	Set Keytops (F)
13B	5112 291 75350	-	Set Keytops (NL)
13B	5112 291 78920	-	Set Keytops (B-NL)
13B	5112 291 76480	-	Set Keytops (CH-D)
13B	5112 291 78720	-	Set Keytops (DK)
13B	5112 291 78750	-	Set Keytops (CH-F)
13B	5112 291 78260	-	Set Keytops (N)
13B	5112 291 78780	-	Set Keytops (SF)
13B	5112 291 75210	-	Set Keytops (E)
13B	5112 291 78760	-	Set Keytops (USA)
13B	5112 291 78730	-	Set Keytops (P)
14B	5112 211 63690	5322 492 64752	Tool Keytop Remover

* Commercial Code Number
  (xx = language dependent)
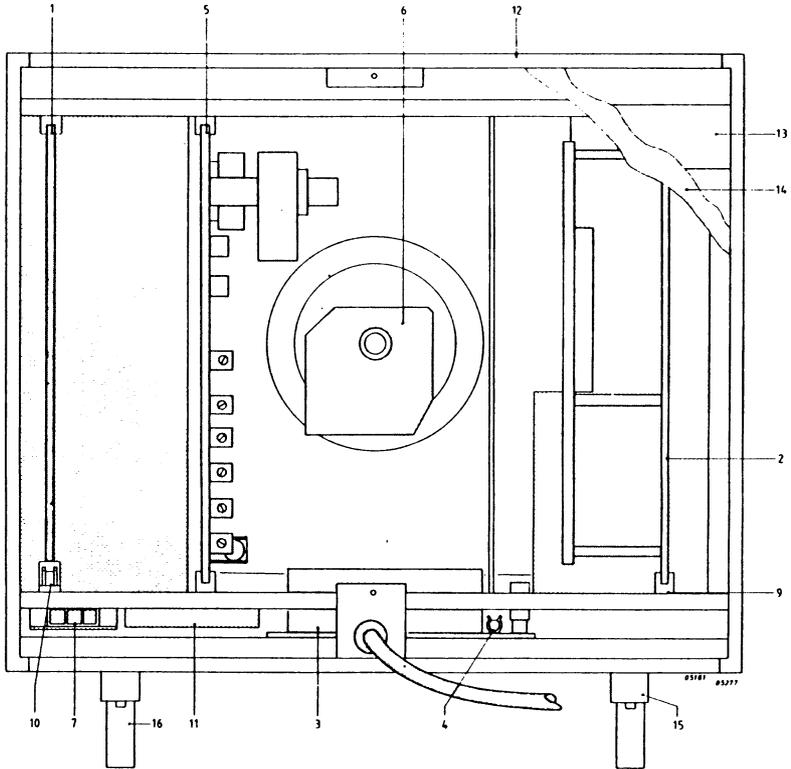
Pos.	Factory Nr.	Service Nr.	Description
A	-	*8702 300 01018	P2711-101 Workstat. Amber Compl.
A	-	*8702 300 01019	P2711-102 Workstat. Green Compl.
A	-	*8702 300 09005	P2711-006 Swivel Stand Compl.
1B	5112 291 92631	5322 214 40266	PCB TERCO 1
2B	5112 291 75610	5322 218 80032	PSU WS 50
3B	5122 291 77580	5322 214 40132	PCB MFI-DIMO
4C	2422 086 01058	5322 253 54034	Fuse 6.25A - 250V
5B	3119 208 55570	5322 216 21235	PCB CRT Device Electronics
6B	3119 208 54950	5322 216 21038	PCB Video Amplifier
7B	5112 291 77220	5322 277 20872	Slide Switch Assy
B	5112 111 94780	5322 414 30005	Knob
9B	5112 211 40170	5322 462 34184	Card Guide
10C	5112 211 40200	5322 405 46352	Card Ejector (Lock)
11B	3119 208 05020	-	Potmeter Brightness Control
12B	5122 212 06230	-	Logo Strip
13B	5112 212 05770	-	Back Cover
14B	5112 212 04310	-	Protection Mask
15B	2712 028 00176	-	Foot
16B	2712 028 00175	-	Adjustable Foot

* Commercial Code Number

(TO BE CONT'D)
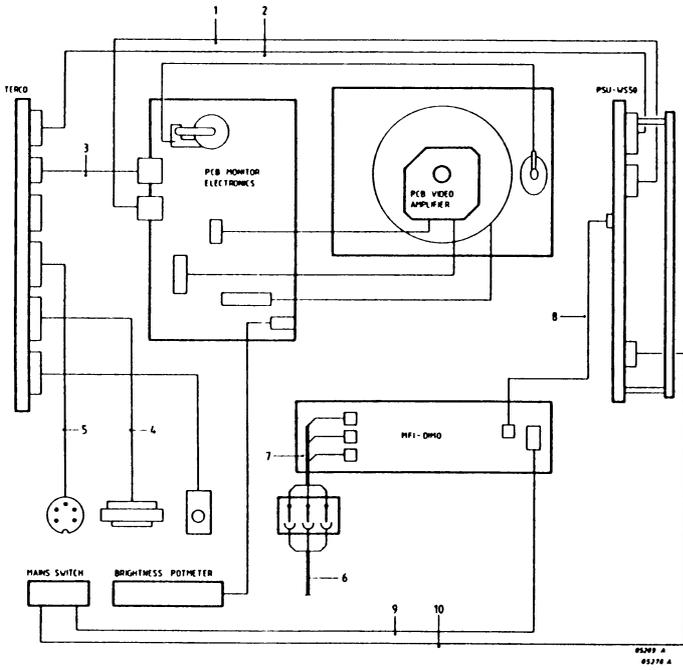
Pos.	Factory Nr.	Service Nr.	Description
1B	5112 280 05780	-	Flat cable PSU - MON.EL. (12V)
2B	5112 280 05840	-	Flat cable PSU - TERCO (power)
3B	5112 280 05860	-	Flat cable TERCO - MON.EL
4B	5112 280 06010	-	Flat cable TERCO - CANNON CONN.
5B	5112 280 05850	-	Cable TERCO - DIN CONN.
6B	2412 073 45023	-	Cable Mains - Mains Conn.
7B	5112 280 06030	-	Cable Mains Conn. - MFI
8B	5112 280 06050	-	Cable MFI - PSU (ground)
9B	5112 280 04470	-	Cable MFI - Mains Switch
10B	5112 280 04480	-	Cable Mains Switch - PSU
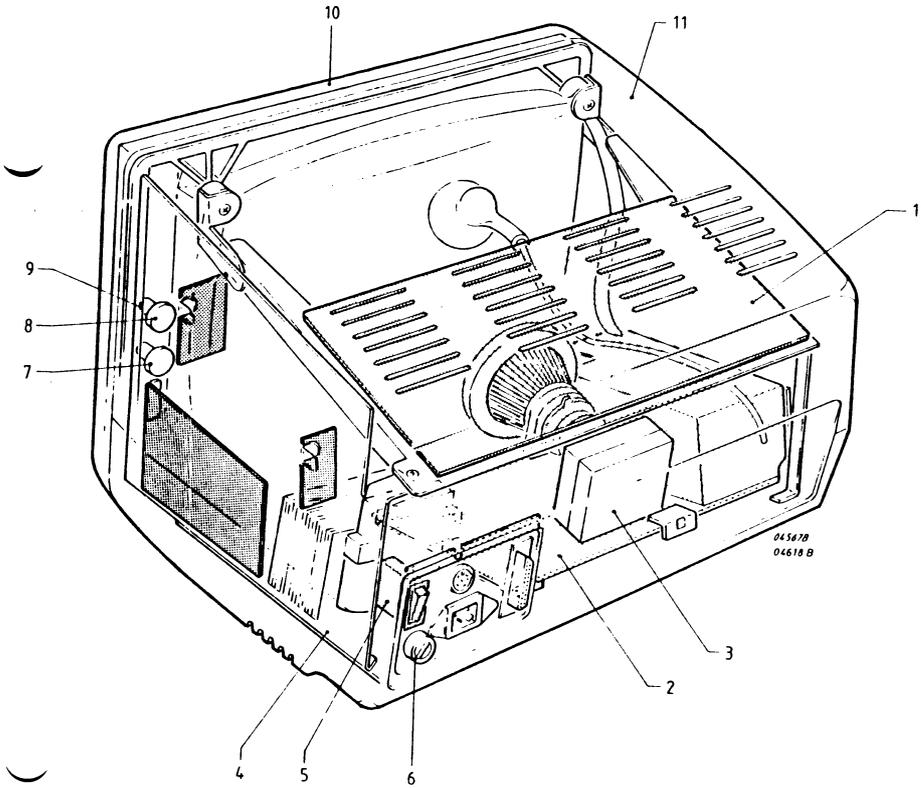
Pos.	Factory Nr.	Service Nr.	Description
A	3119 208 89780	*8702 300 01005	P2705-101 VDU Amber 220V
A	3119 208 89730	*8702 300 01007	P2705-102 VDU Green 220V
A	3119 208 89790	*8702 300 01006	P2705-101 VDU Amber 240V
A	3119 208 89770	*8702 300 01008	P2705-102 VDU Green 240V
1B	3119 208 56080	5322 216 21499	Pcb Logic
2B	3119 208 53990	5322 216 21306	Pcb CRT Electronics
3B	3119 208 53980	5322 216 21309	Pcb Video Amplifier
4B	3119 208 59140	-	Power Supply Compl.
5C	2422 126 01225	-	Mains Switch
6C	2422 086 01013	4822 253 30014	Fuse 315 mA T 5x20
7B	3119 208 05110	5322 693 21425	Potm. Brightness Contr. + led
8B	3119 208 05340	5322 693 21426	Potm. Contrast Contr.
9B	3119 204 12280	-	Knob
10B	3119 208 71480	-	Cover, Frontal Ring
11B	3119 208 71710	-	Top Cover
B			Foot

* Commercial Code Number

04564 A
05266 A
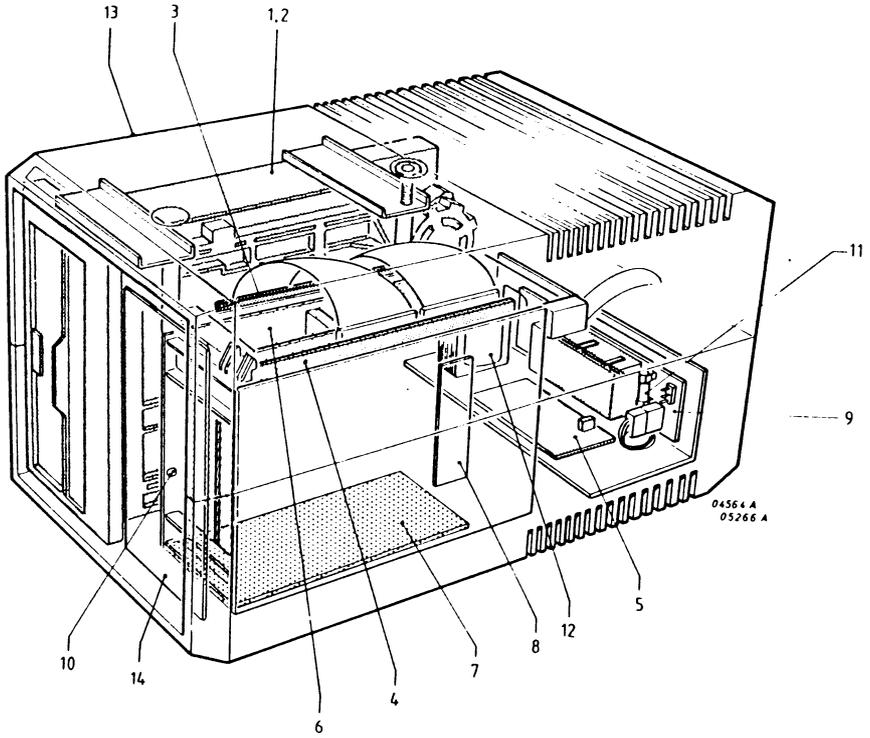
Pos.	Factory Nr.	Service Nr.	Description
A	5112 291 89020	*8702 300 02011	P2621 Complete
1B	5112 291 60250	-	DRIVE CDC9406 Compl.
2C	77615653 (CDC Nr.)	5322 216 25373	PCB CDC9406
3B	5112 291 82730	5322 214 40208	PCB XEBEC S1401
4B	5112 291 75550	5322 214 40144	PCB SASEX
5B	5112 291 89010	5322 214 40209	PCB RS
6B	5112 291 77780	5322 218 80044	PCB WS120E
7B	5112 291 78540	5322 214 40207	PCB BP-T
8B	5112 291 75560	5322 214 40145	PCB Terminator WS
9B	5112 291 75700	5322 214 40085	PCB MFI-SBS
10B		5322 130 32197	LED
11B	2422 086 01058	5322 253 54034	Fuse
12B	-	-	Trafo P2621
13B	5122 291 78080	-	Top Cover
14B	5112 291 78100	-	Front Cover Plate

* Commercial Code Number

(TO BE CONT'D)
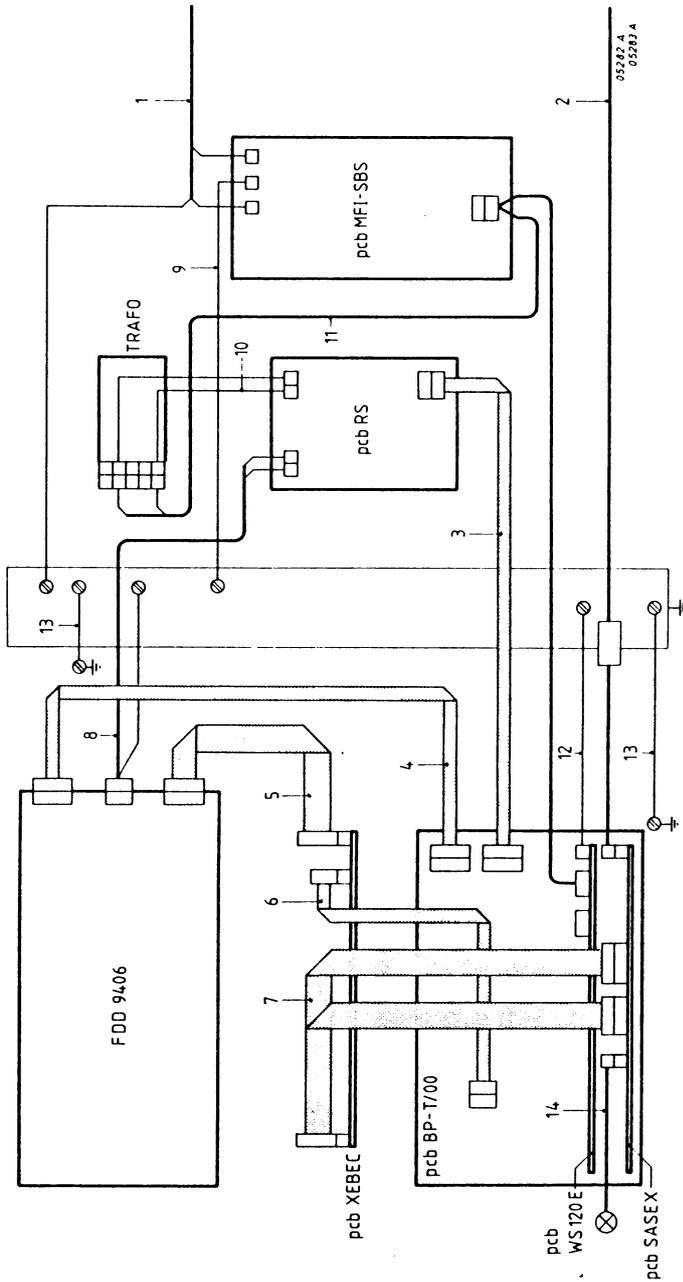
Pos.	Factory Nr.	Service Nr.	Description
1B	2412 073 00021	-	Mains Cable
2B	-	*8702 300 00005	Cable External
3B	5112 280 08500	-	Flat Cable RS - PS 24V
4B	5112 280 08510	-	Flat Cable BP - DRIVE Power
5B	5112 280 08520	-	Flat Cable XEBEC - DRIVE
6B	5112 280 08530	-	Flat Cable BP - XEBEC Power
7B	5112 280 08540	-	Flat Cable SASEX - XEBEC
8B	5112 280 08550	-	Cable RS - DRIVE Power
9B	5112 280 08560	-	Cable Earth MFI
10B	5112 280 08570	-	Cable TRAFO - RS
11B	5112 280 08580	-	Cable MFI-PSU - TRAFO
12B	5112 280 08590	-	Cable Earth PSU
13B	5112 209 21000	-	Cable Earth Bridge
14B	5112 280 08610	-	Cable SASEX - LED

*Commercial Code Number

05220A
05285A
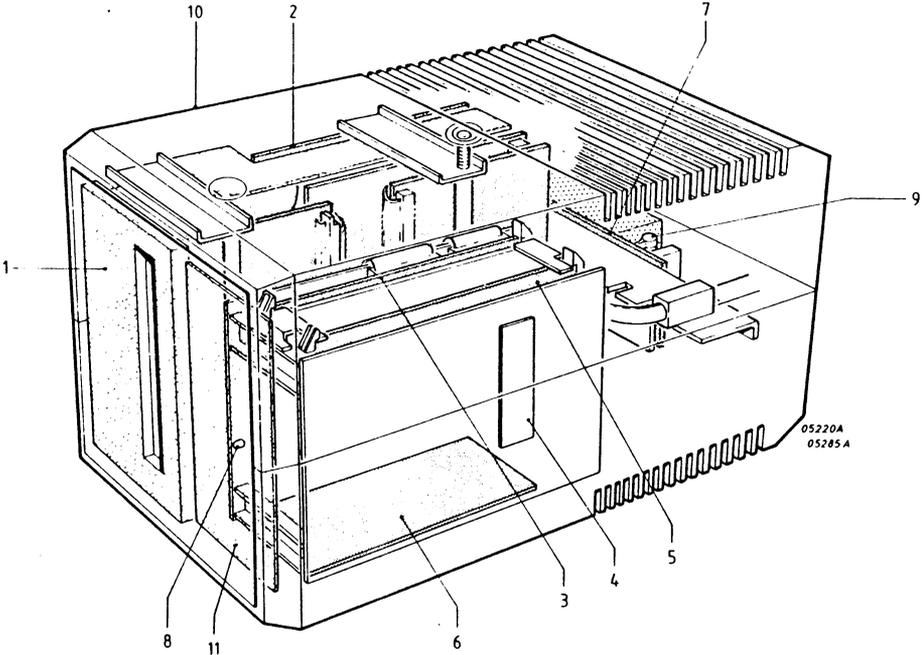
Pos.	Factory Nr..	Service Nr.	Description
A	5112 291 89060	*8702 300 02013	P3013-12 Complete
1B	5112 291 70060	5322 218 80016	Tape Drive 9020I Compl.
2B	5112 291 85380	5322 216 21435	PCB TAPCO-Q
3B	5112 291 75550	5322 214 40144	PCB SAS-EX
4C	5112 291 75560	5322 218 40145	PCB Terminator WS
5B	5112 291 77780	5322 218 80044	PCB PSU WS120E
6B	5112 291 78540	5322 214 40207	PCB BP-T
7B	5112 291 75700	5322 214 40085	PCB MFI-SBS
8B	–	5322 130 32197	LED
9C	2422 086 01058	5322 253 54034	Fuse 6.25A - 250V
10B	5112 291 78080	–	Top Cover
11B	5112 291 78100	–	Front Cover Plate
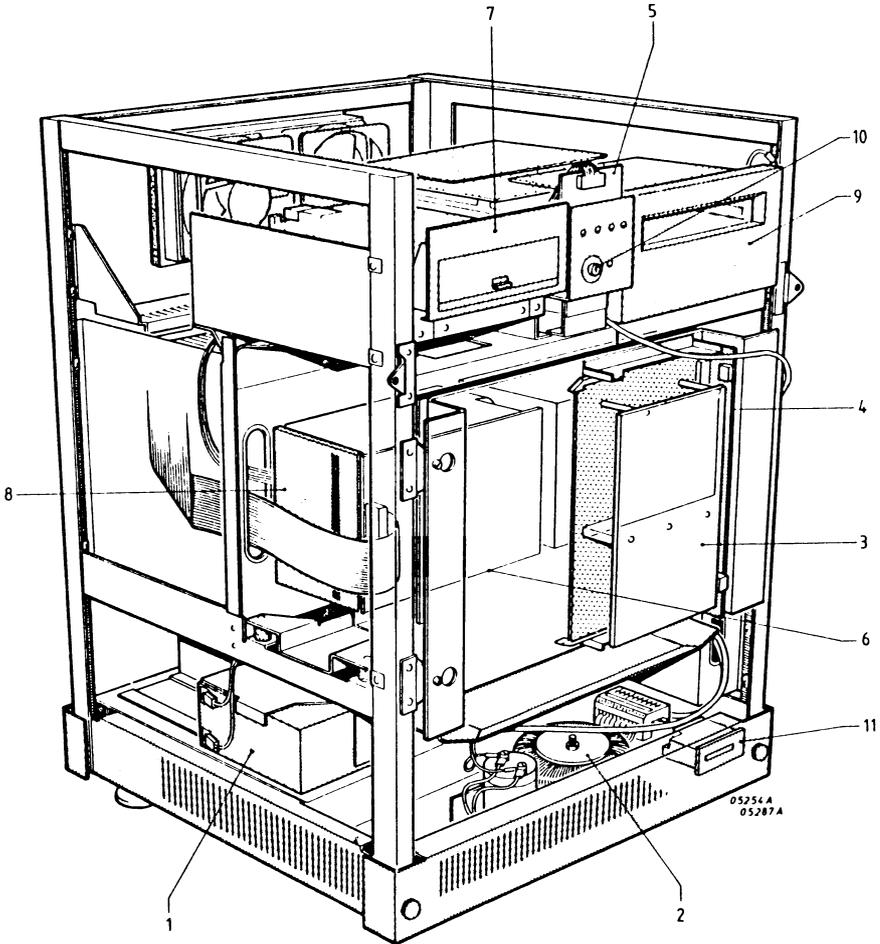
Pos.	Factory Nr.	Service Nr.	Description
A	-	*8702 380 01004	P3800-04
1B	2422 526 00041	5322 138 14024	Battery 12V
2B	5112 209 15011	5322 146 80098	Trafo 270VA
3B	5112 291 93200	5322 216 61067	PCB PSU-M3
4B	5112 291 94750	5322 214 40239	PCB PBP-M3
5B	5112 291 78590	5322 216 21432	PCB OP-P3800
6B	5112 291 76310	5322 214 40082	PCB XEBEC S1410
7B	5112 291 75590	*8700 034 01001	MFD X3114
			] or
8B	-	-	FXD RODIME R202 (see 19.14)
9B	5112 291 70060	5322 218 80016	STREAMER ARCHIVE 9020I
10B	2912 715 00025	5322 417 34076	Lock with Key
11B	2612 799 05054	5322 344 40068	Hour Counter

* Commercial Code Number

(TO BE CONT'D)

05254 B
05287 B
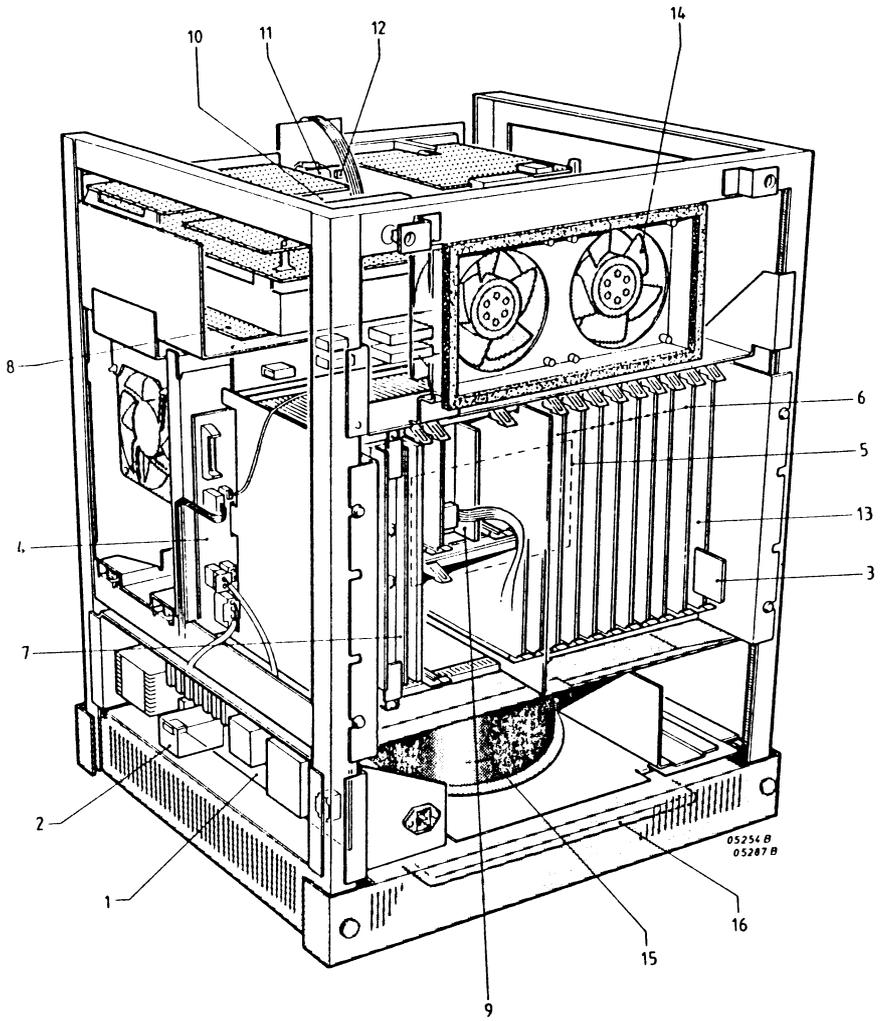
Pos.	Factory Nr.	Service Nr.	Description
1B	5112 291 69780	5322 214 40069	PCB PF42M
2C	2403 120 07002	5322 280 80464	Relay
3B	5112 291 92100	-	PCB AD-OP
4B	5112 291 69920	5322 216 21428	PCB PBP-1
5B	5112 291 78460	5322 216 21431	PCB LPB-P3800
6B	5112 291 80760	5322 216 21433	PCB PMU80 - 3V
	5112 291 75600	5322 216 21437	PCB PMU80 - 1V
	5122 291 94800	5322 214 40238	PCB PMU186 - 1V 256K
7B	5112 291 80880	5322 216 21434	Power Supply PSU-B1E
8B	5112 291 85380	5322 216 21435	PCB TAPCO-Q
9B	5112 291 88600	5322 214 40229	PCB PSU-AOC 12V
10B	2412 120 00027	5322 271 34089	Micro Switch
11B	2422 120 00548	5322 271 34254	Micro Switch
12B	5112 209 21041	5322 271 30389	Micro Switch
13B	5112 291 77420	5322 214 40091	PCB SESCO
14B	2812 031 01099	5322 361 10229	Fan
15B	2822 031 01183	5322 361 14136	Fan 61W 1650 220V
16B	5112 291 70240	5322 480 40131	Air Filter

TO BE CONTINUED
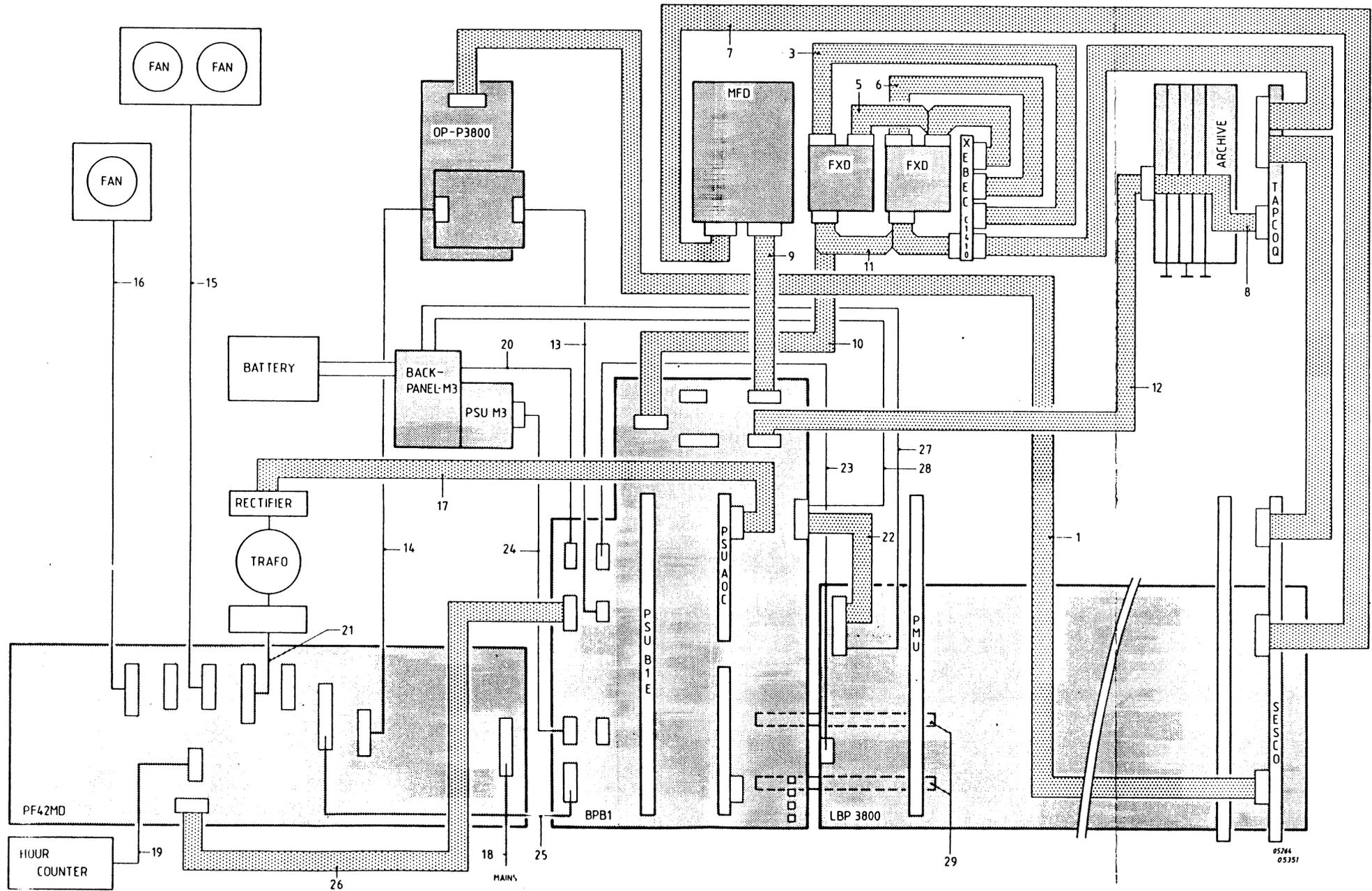
Pos.	Code Number	Description
1	5112 280 05040	Flatcable Operator Panel - SESCO
2	5112 280 05050	Flatcable SESCO - TAPCO - FIXCO
3	5112 280 05960	Flatcable 2nd FXD (Data)
4	5112 280 05970	Flatcable 2nd FXD (Control)
5	5112 280 04060	Flatcable 1st FXD ST412 (Control)
6	5112 280 08740	Flatcable 1st FXD R202 (Data)
7	5112 280 05000	Flatcable SESCO - MFD
8	5112 280 08620	Flatcable Tape - TAPCO
9	5112 280 05010	Power Cable MFD
10	5112 280 05760	Power Cable 1st FXD
11	5112 280 05880	Power Cable 2nd FXD
12	5112 280 05030	Power Cable Tape
13	5112 280 05070	Cable PBP - BONN
14	5112 280 05080	Cable Mains Switch
15	5112 280 05090	Power Cable Fans
16	5112 280 03060	Power Cable Fan
17	5112 280 03100	Cable Trafo - AOC
18	5112 280 02700	Power Cable Mains - FIBO
19	5112 280 02670	Power Cable Hours Counter
20	5112 280 06290	Cable PBP - PSU M3
21	5112 280 02740	Cable Trafo - FIBO
22	5112 280 05060	Cable PBP - LBP
23	5112 280 02720	Power Cable PBP - LBP
24	5112 280 03120	Power Cable PBP - PSU M3
25	5112 280 05380	Power Cable PBP - FIBO
26	5112 280 03320	Cable PBP - FIBO
27	5112 280 06250	Cable BP M3 - Battery +
28	5112 280 08260	Cable BP M3 - Battery -
29	5112 280 20790	Cable Bridge LBP - PBP

04881A
05348 A
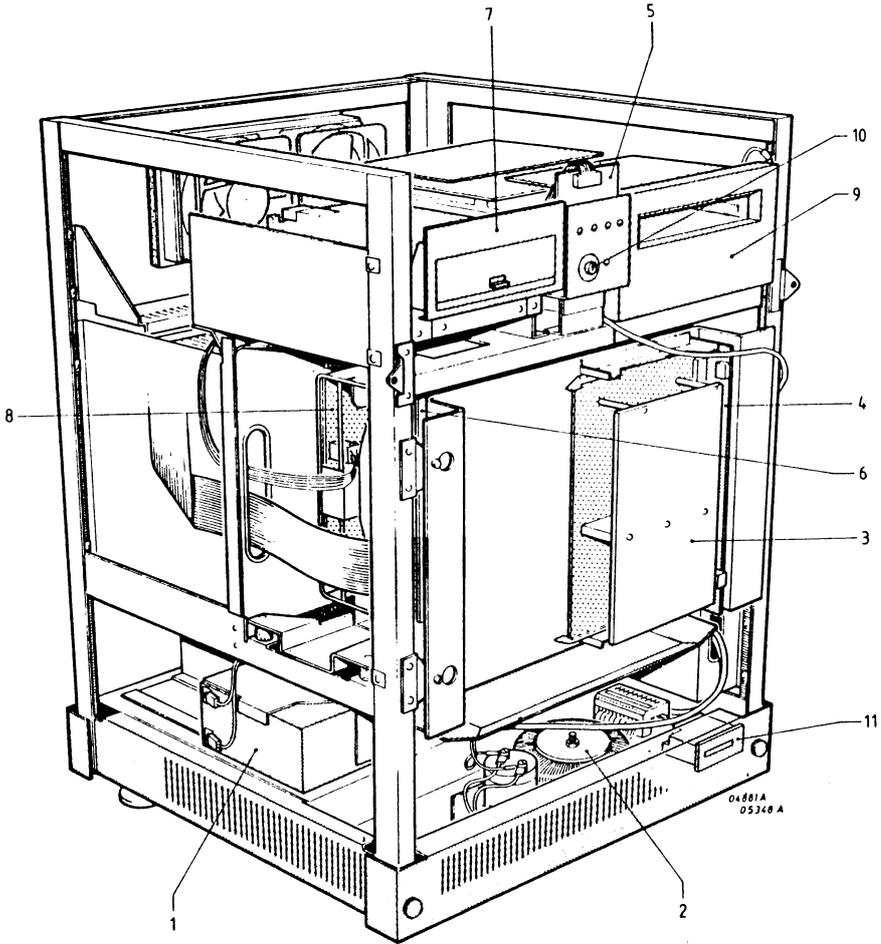
Pos.	Factory Nr.	Service Nr.	Description
1	2422 526 00041	5322 138 14024	Battery 12V
2	5112 209 15011	5322 146 80098	Trafo 270VA
3	5112 291 93200	5322 216 61067	PCB PSU-M3
4	5112 291 94750	5322 214 40239	PCB PBP-M3
5	5112 291 78590	5322 216 21432	PCB OP-P3800
6	5112 291 77870	5322 216 21429	PCB FIXCO 8
7	5112 291 75590	*8700 034 01001	MFD X3114
8	5112 291 80131		FXD PRIAM 7050D (see 19.5)
9	5112 291 70060	5322 218 00016	Streamer Archive 90201
10	2912 715 00025	5322 417 34076	Lock with Key
11	2612 799 05054	5322 344 40068	Hours Counter

04881 B
05348 B
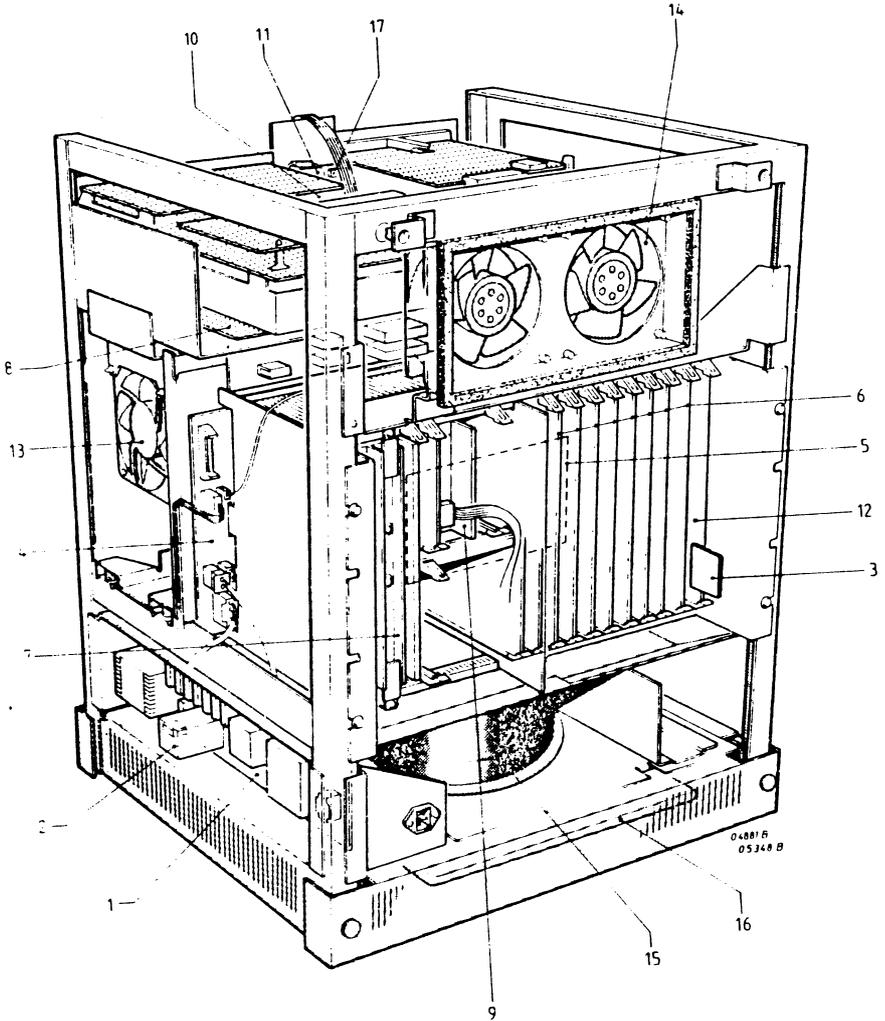
Pos.	Factory Nr.	Service Nr.	Description
1	5112 291 69780	5322 214 40069	PCB PF42M
2	2403 120 07002	5322 280 80464	Relay
3	5112 291 92100		PCB AD-OP
4	5112 291 69920	5322 216 21428	PCB PBP1
5	5112 291 78460	5322 216 21431	PCB LBP-P3800
6	5112 291 80760	5322 216 21433	PCB PMU 80-3V
6	5112 291 75600	5322 216 21437	PCB PMU 80-1V
6	5112 291 94800	5322 214 40238	PCB PMU 186-1V
7	5112 291 80880	5322 216 21434	Power Supply PSU B1E
8	5112 291 85380	5322 216 21435	PCB TAPCO-Q
9	5112 291 88590	5322 216 21446	PCB PSU-AOC +5/24V
10	2412 120 00027	5322 271 34089	Microswitch
11	2422 120 00548	5322 271 34254	Microswitch
2	5112 291 77420	5322 214 40091	PCB SESCO
13	5112 291 73330		Fan Right
14	2812 031 01099	5322 361 10229	Fan
15	2822 031 01183	5322 361 14136	Fan 61W 1650 220V
16	5112 291 70240	5322 480 40131	Air Filter
17	5112 209 21041	5322 271 30389	Microswitch

TO BE CONTINUED
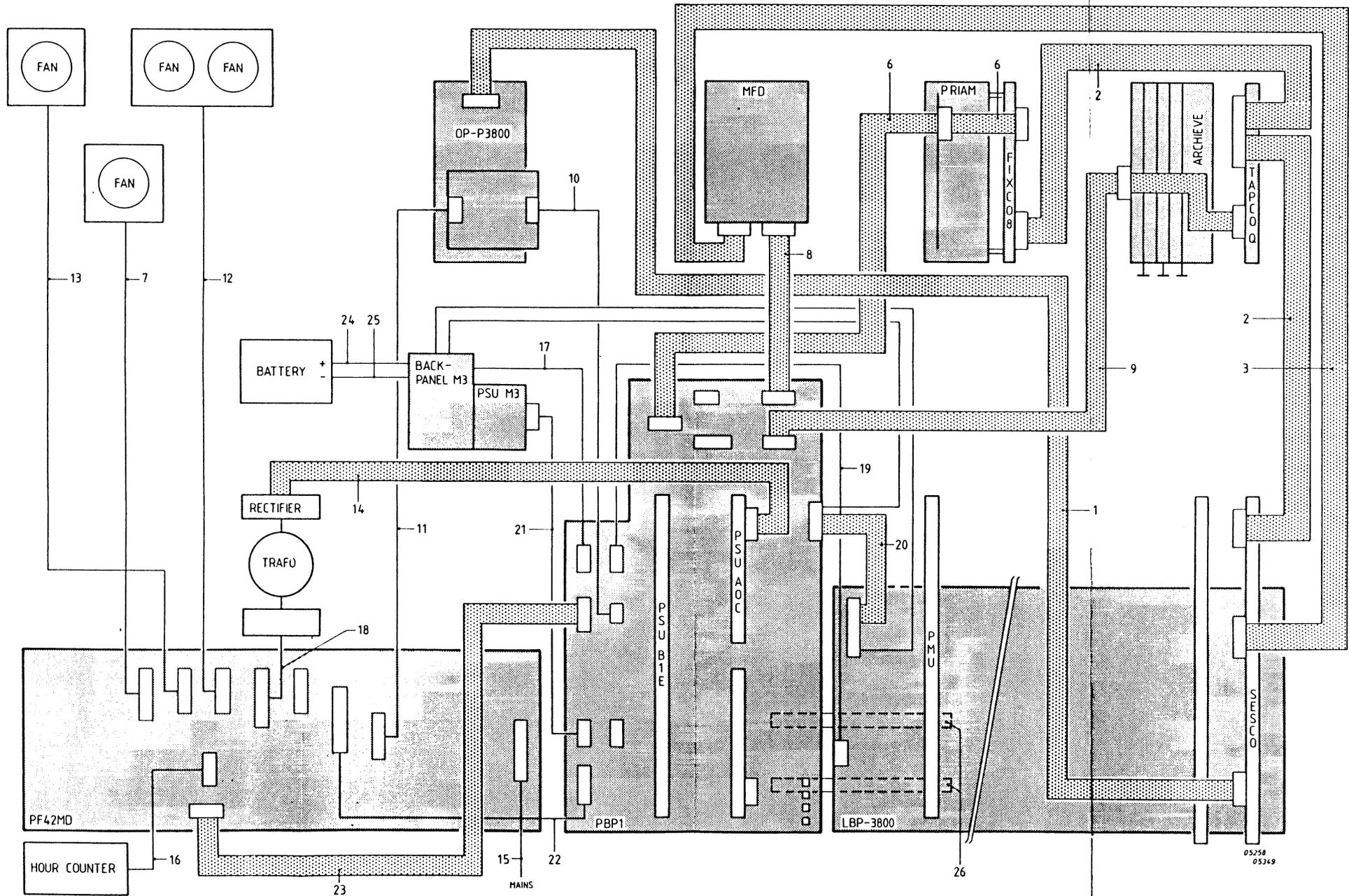
Pos.	Code Number	Description
1	5112 280 05040	Flatcable Operator Panel - SESCO
2	'5112 280 05050	Flatcable SESCO - TAPCO - FIXCO
3	5112 280 05000	Flatcable SESCO MFD
4	5112 280 08620	Flatcable Tape - TAPCO
5	5112 280 05890	Flatcable FXD PRIAM
6	5112 280 05370	Power Cable FXD PRIAM
8	5112 280 05010	Power Cable MFD
9	5112 280 05030	Power Cable Tape
10	5112 280 05070	Cable PBP - BONN
11	5112 280 05080	Cable Mains Switch
12	5112 280 05090	Power Cable Fans XD
13	5112 280 03060	Power Cable Fan (Big Fan)
14	5112 280 03100	Flatcable Traco - AOC
16	5112 280 02670	Power Cable Hour Counter
17	5112 280 06290	Cable PBP - PSU M3
18	5112 280 02740	Cable Trafo - FIBO
19	5112 280 05060	Cable PBP - LBP
20	5112 280 02720	Power Cable PBP - LBP
21	5112 280 03120	Power Cable PBP - PSU M3
22	5112 280 05380	Cable PBP - FIBO
23	5112 280 03320	Cable PBP - FIBO
24	5112 280 06250	Cable BP M3 - Battery +
25	5112 280 06260	Cable BP M3 - Battery -
26	5112 280 20740	Cable Bridge LBP - PBP

19.13 PARTS FXD SEAGATE ST412/ST406

Factory Nr.	Service Nr.	Description
58330-001	5322 693 21447	FXD Seagate ST412 10M Compl.
5112 291 77190		FXD Seagate ST406 5M Compl.
20110-001	5322 216 21325	PCB Main Control
20136-001	5322 216 21326	PCB Motor Control
12620-001	5322 693 21428	Sensor Track 0
54026-001	5322 693 21429	Brake Assy **)
54037-001	5322 693 21431	Index LED Assy
58061-001	5322 693 21432	Spring Assy, Ground
10850-001	5322 130 32197	LED, front cover

**) Only installed with old MOTOR CONTROL PCB.

19.14 PARTS RODIME FXD R202

Factory Nr.	Service Nr.	Description
2822 062 40031	* 8709 012 00305	FXD RODIME RO202 10M Compl.
	5322 218 70077	FXD RODIME RO202 10M Compl.
	5322 216 21505	PCB, Master Compl.
	5322 216 21503	PCB, Speed Compl.
	5322 216 21504	PCB, PRE-AMP Compl.
	5322 280 60476	Brake, Fail Save
	5322 111 90554	Terminator, RNW785-5-R220/330
	5322 290 60489	Contact, Ground

*) Commercial Code Number

19.15 PARTS FXD PRIAM 7050D

Factory Nr.	Service Nr.	Description
5112 291 80131		FXD PRIAM 7050D Compl.
200178-02	5322 216 21158	PCB SMD Adaptor
200228	5322 216 21159	PCB SERVO (old)
200505-2	5322 216 21408	PCB SERVO (auto)
200233-01	5322 216 21161	PCB RWD 3450
200233-02	5322 216 21264	PCB RWD 7050
200233-21/22	5322 216 21292	pcb RWD 3450/7050 *
340503	5322 218 80013	HDA 3450 (old)
340782	5322 218 80063	HDA 3450 (auto)
340693	5322 218 80028	HDA 7050 (old)
340783	5322 218 80064	HDA 7050 (auto)
00128	5322 320 50051	Terminator SMD
00153	5322 320 50052	Terminator PRIAM
340786	5322 280 60472	Solenoid Autolock

*) Order same PCB type for small disk drives.

19.16 PARTS P2908/09 PRINTER (EPSON FX80/100)

Factory Nr.	Service Nr.	Description
Y440205000	tt22 216 21464	PCB, FMBD
	t.b.s.	PCB, SUMI
	t.b.s.	Tractor Feed Unit FX100
8143	5322 216 21466	PCB, Interface
Y4405030000	5322 146 10066	Mains Transformer 220V
F404100000	5322 693 21461	Printhead FX80
F404300000	5322 693 21462	Printhead FX100
	t.b.s.	Operator Panel
F317055000	5322 218 80053	Sensor, Home Position
F317008000	5322 405 50051	Sensor, Paper-End
F315060000	5322 218 80052	Sensor, Timing (PTS)
F315059000	5322 361 80082	Carriage Motor Assy
F303001092	5322 405 50049	Ribbon Mask .
Y440010001	5322 414 40025	Platen Knob
F303014010	5322 358 30402	Timing Belt FX80
F310057020	5322 358 30403	Timing Belt FX100
Y440203200	5322 218 80054	PCB, Mains Filter, 220/240V
X502014020	4822 253 20017	Fuse 800mA

20.1   BACKPANEL SYSTEM CABINET P3500

Pin Assignment
Connector 1-6
(PMU)

	a	b	c
1	+ 5V	+ 5V	+ 5V
2	0V	+ 5V	SLL3
3	0V	0V	0V
4	SLL0	SLL1	SLL2
5	NBUSY	NBCLK	NCBRQ
6	NDRQ1	NIR3	NDACK1 (SLL9)
7	NDRQ2	SYN	NTC1 (SLL10)
8	NIR0	TOUT 2	NIR1
9	NIR4	BARE	NIR5
10	NIR6	RSLN	NIR7
11	0V	0V	0V
12	NDAT0	NDAT1	NDAT2
13	NDAT3	NDAT4	NDAT5
14	NDAT6	NDAT7	NDAT8
15	NDAT9	NDAT10	NDAT11
16	NDAT12	NADAT13	NADAT14
17	PFWN	RPON	NDAT15
18	0V	0V	0V
19	NADR0	NADR1	NADR2
20	NADR3	NADR4	NADR5
21	NADR6	NADR7	NADR8
22	NADR9	NADR10	NADR11
23	NADR12	NADR13	NADR14
24	NADR15	NADR16	NADR17
25	NADR18	NADR19	NBHE
26	NAIOWC	RESV1	RESV5
27	NIOWC	RESV2	NAMWC
28	NIORC	RESV3	NMWC
29	NXACK	RESV4	NMRC
30	NBPRI *	NLOCK	NBPRO *
31	+12V	+ 5VM	+ 5VM
32	-12V	- 5V	NBREQ

Pin Assignment
Connector 7
(PSU WS-120)

	a	b	c
1	BONN	0V	
2		0V	RPON
3	BARE	0V	PWFN
4	0V	0V	RSLN
5	SYN	0V	
6	0V	0V	
7		0V	
8	0V	0V	0V
9	0V	0V	0V
10			
11	0V	0V	0V
12			
13	0V	0V	0V
14			
15	0V	0V	0V
16	+BATT	+BATT	+BATT
17	0V	0V	0V
18	+5VM	+5VM	+5VM
19	0V	0V	0V
20	+12V	+12V	+12V
21	0V	0V	0V
22	-12V	-12V	-12V
23	0V	0V	0V
24			
25	0V	0V	0V
26	+ 5V	+5V	+ 5V
27	0V	0V	0V
28	+ 5V	+5V	+ 5V
29	0V	0V	0V
30	+ 5V	+5V	+ 5V
31	0V	0V	0V
32	+ 5V	+ 5V	+ 5V

* With Backpanel STOMO/O1 Connector 2,
(FLEXCO) pin 30a and pin 30c are
interconnected.

On backpanel STOMO/O1, /O3 connector 1,
pin 30a is connected to 0V.

20.1 BACKPANEL SYSTEM CABINET P3500

20.1.1 INTERCONNECTIONS BACKPANEL SYSTEM CABINET P3500

BP-STOMO/01

BP-STOMO/03
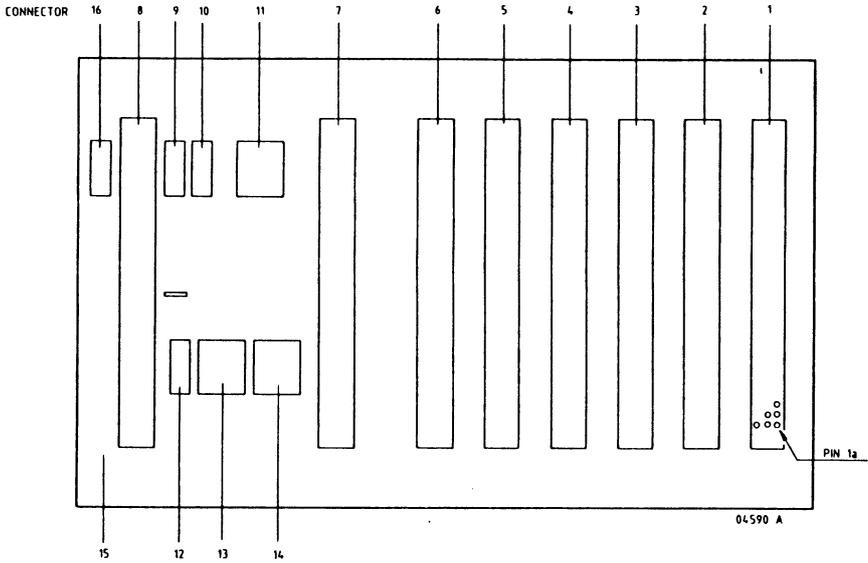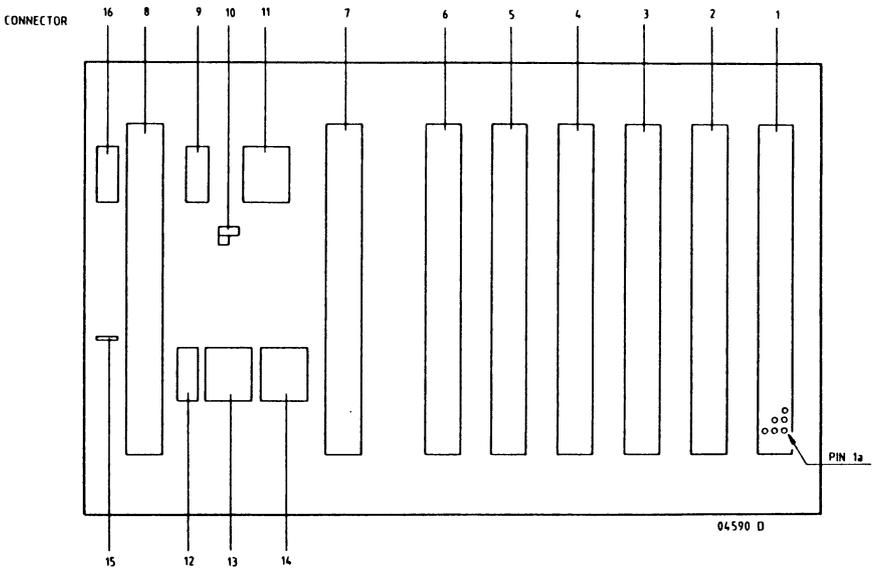
	a	b	c
1	BONN	0V	
2		0V	
3	BARE	0V	
4	0V	0V	RSLN
5	SYN	0V	
6	0V	0V	
7		0V	
8	0V	0V	0V
9	0V	0V	0V
10			
11	0V	0V	0V
12			
13	0V	0V	0V
14			
15	0V	0V	0V
16			
17	0V	0V	0V
18	+ 5VM	+ 5VM	+ 5VM
19	0V	0V	0V
20	+ BAT	+ BAT	+ BAT
21	0V	0V	0V
22			
23	0V	0V	0V
24			
25	0V	0V	0V
26			
27	0V	0V	0V
28			
29	0V	0V	0V
30			
31	0V	0V	0V
32			

Connector 9 (hour counter)

+ 5V ——[ ] [ ]—— 0V
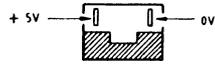
Connector 10 (Battery-On Switch)

Backpanel STOMO/01

BONN ——[ ] [ ]—— 0V

Backpanel STOMO/03

0V .	BAWOFFN BARE
BONN	

Connector 11 MFD1

0V

+ 12V ——[ ] [ ] [ ] [ ]—— + 5V

Connector 12 (fan)

0V ——[ ] [ ]—— + 12V
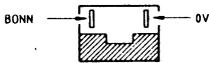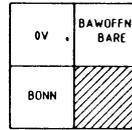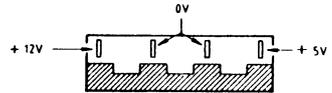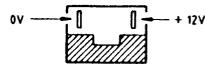
Connector 13 (FIXED, MFD2)   same as Connector 11

Connector 14 (XEBEC, FIXCO) same as Connector 11

Connector 15 (logical 0V)

Connector 16 (battery)

0V ——[ ] [ ]—— + 5V

04597 D

20.1.2 STRAP SETTINGS

20.1.2.1 STRAPS BACKPANEL STOMO/01

STRAP   W1   W2   W3

065M A
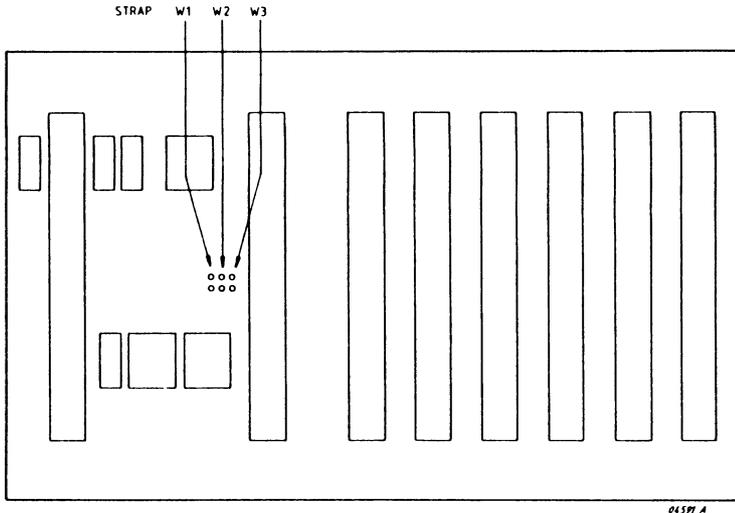
STRAP Nr.	FUNCTION	STRAP 1-2
W1	Connection of BBU Status Line to Ground - BBU available - BBU not available	 N Y
W2	Connection of +5V to +5VM - BBU available - BBU not available	 N Y
W3	Connection of +5V to +5VM - BBU available - BBU not available	 N Y

20.1.2.2 STRAPS BACKPANEL STOMO/03

04591 C
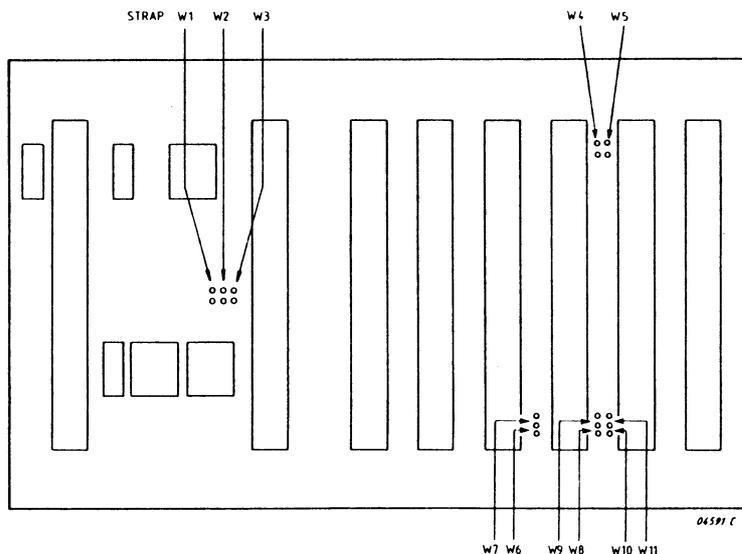
STRAP Nr.	FUNCTION	STRAP 1-2	2-3
W1	Connection of BBU Status Line to Ground - BBU available - BBU not available	 N Y	
W2	Connection of +5V to +5VM - BBU available - BBU not available	 N Y	
W3	Connection of +5V to +5VM - BBU available - BBU not available	 N Y	
W4	Connection of NBPRI-NBPRO on P3	N	
W5	Connection of NBPRI-NBPRO on P4 - Slave 4 installed - Slave 4 not installed	 N Y	

STRAP Nr.	FUNCTION	STRAP W6	W7
W6/W7	No Function (default)	Y	N

STRAP Nr.	FUNCTION	STRAP W8	W9
W8/W9	No function (default)	Y	N

STRAP Nr.	FUNCTION	STRAP W10	W11
W10/W11	No Function (default)	N	Y

1.3 MODIFICATION HISTORY BACKPANEL SYSTEM CABINET P3500

5112 291 8446*

LEVEL	SI NR. P3500
2	
3	
4	28

20.1.4 REPLACEMENT BACKPANEL SYSTEM CABINET P3500

Removal:

- Remove all PCBs from the system cabinet backpanel.

- Disconnect all connectors from the backpanel.

- Remove the four screws that fix the backpanel and the card guides to the ground plate.

  Lift the complete assy.

- Remove the eight screws that fix the backpanel to the rails.

Replacement:

- Opposite the previous procedure.

20.2   PSU WS-120

20.2 PSU WS-120

20.2.1 INTERCONNECTIONS PSU WS-120
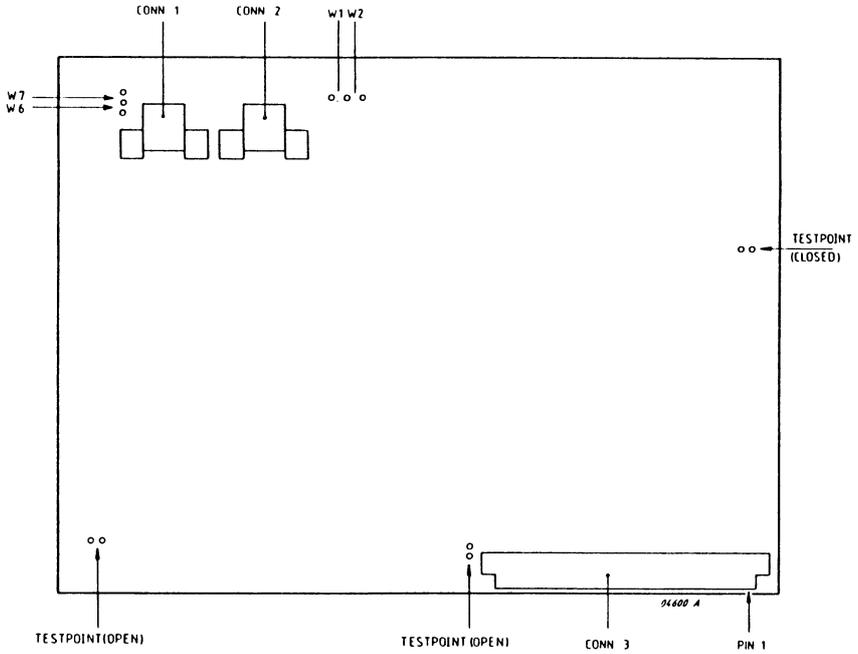
Connector 1   Mains Supply from Filter Board

Connector 2   Mains Supply to PSU M2 Board

Connector 3   Connection to EMM-Bus

Pin Assignment Connector 3

See section 20.1.1, Connector 7

20.2.2 STRAP SETTING PSU WS-120 (Refer to figure in section 20.2.1)

STRAP Nr.	FUNCTION	STRAP W1	W2
W1/W2	Mains Supply - 115V - 230V	 Y N	 N Y

STRAP Nr.	FUNCTION	STRAP W6	W7
W6/W7	Power On - Remote - Local	 N Y	 Y N

20.2.3 MODIFICATION HISTORY PSU WS-120

5122 291 7572*

LEVEL *		SI-NR. P3500-..	SI-NR. P2711
1		-	-
2		6	1
3		33	10
-		43	14

20.3   . MFI-SBS/MFI-DIMO

20.3 MFI-SBS

20.3.1 INTERCONNECTIONS MFI-SBS/MFI-DIMO
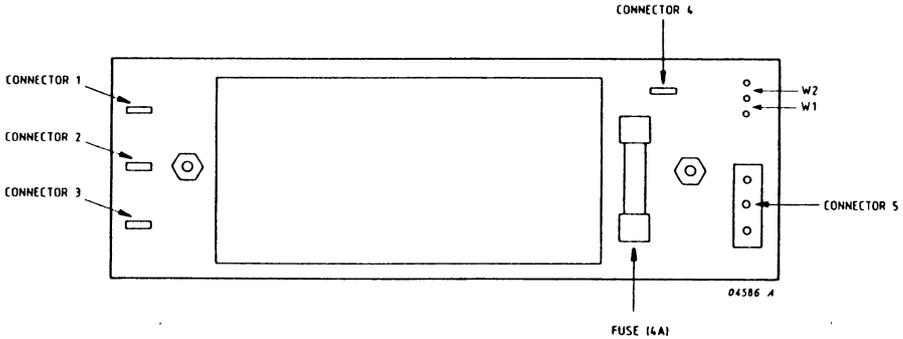
Connector 1 Mains Supply 115V or 220V (IN)
Connector 2 Ground
Connector 3 Mains Supply 115V or 220V (IN)

Connector 4 Ground - LOGIC 0

Connector 5
- Mains Supply (OUT)
- Ground
- Mains Supply (OUT)

20.3.2 STRAP SETTING MFI-SBS/MFI-DIMO (refer to figure in section 20.3.1)

20.3.2.1 STRAPSETTING MFI-SBS (5112 291 7570X)

STRAP Nr.	FUNCTION	STRAP W1	W2
W1/W2	Ground - Logic 0 Connection: - for System Cabinet - for Workstation P2711 and Ext. Cabinet - for Extension Cabinet	 Y N N	 N N N

20.3.2.2 STRAP SETTING MFI-DIMO (5122 291 7758*)

STRAP Nr.	FUNCTION	STRAP W1	W2
W1/W2	Ground - Logic 0 Connection: - for Workstation P2711	 N	 N

20.3.3 MODIFICATION HISTORY MFI-SBS/MFI-DIMO

20.3.3.1 MODIFICATION HISTORY MFI-SBS 5122 291 7570*

LEVEL *		SI NR. P3500-..	SI NR. P2711-..
2			7

20.3.3.2 MODIFICATION HISTORY MFI-DIMO 5112 291 7758*

LEVEL *		SI NR. P3500-..	SI NR. P2711-..
1			7

20.4   PSU M2

20.4 PSU M2

20.4.1 INTERCONNECTIONS PSU M2
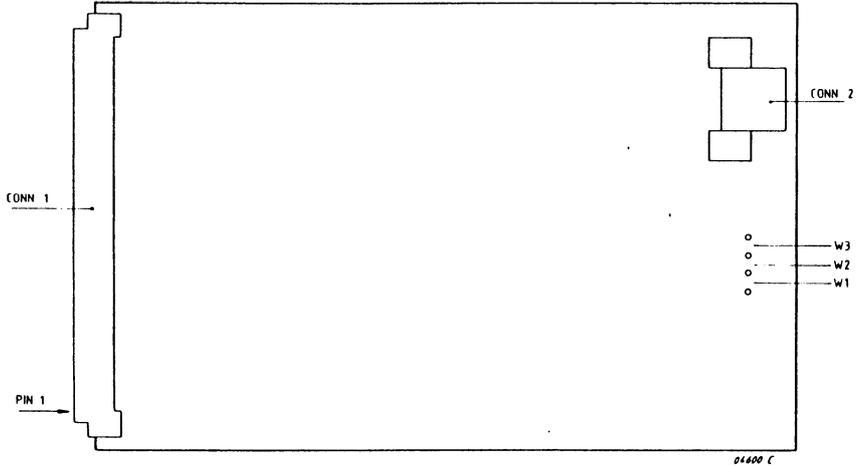
Pin Assignment Connector 1 (P3500 : System Bus)

See Section 20.1.1, Connector 8 for P3500.

Connector 2

1	Mains
2	Mains

20.4.2 STRAP SETTING PSU M2 (Refer to figure in section 20.4.1)

STRAP Nr.	FUNCTION	STRAP		
		W1	W2	W3
W1/W2/W3	Selection Mains Supply Voltage - 220 V (Default) - 115 V	N Y	Y N	N Y

20.4.3 MODIFICATION HISTORY PSU M2

5112 291 6976*

LEVEL		SI NR. P3500-..
1		27
2		27
3		36

20.5   PMU-80 / PMU-80-1/PMU-80-1A

20.5 PMU-80/PMU80-1/PMU-80-1A

20.5.1 INTERCONNECTIONS PMU-80/PMU-80-1/PMU-80-1A
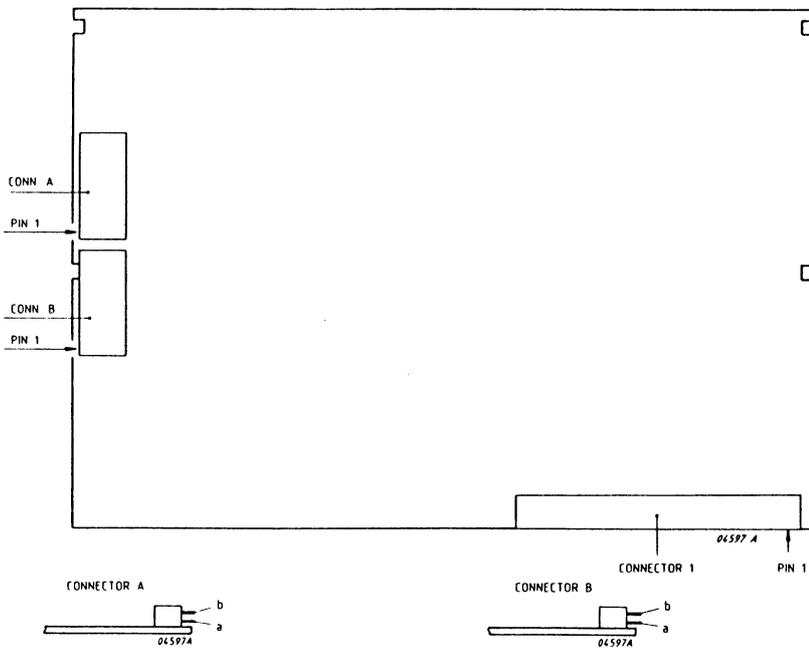
Connector 1 (System Bus), see section 20.1.1, Connector 1-6 (P3500)
                        see section 20.30.1, Connector 1-11 (P3800)

Connector A
(V.24 Interface)

	a	b
1		
2	A114 TXC	A103 TXD
3		A104 RXD
4	A115	A105
5	A141	A106
6		A107
7	A108.2	A102 GND
8	A140	A109 DLD
9	A125	
10	A111	
11	A113	
12	A142	
13	(Dummy)	(Dummy)

Connector B
(Aux.V.24 Interface)

	a	b
1		
2		B103 RXD
3		B104 TXD
4		
5		B106 DTR
6		B107 CTS
7	B108.2 CTS	B102 GND
8		
9		
10		
11		
12		
13	(Dummy)	(Dummy)

20.5.2 STRAP SETTING PMU-80/PMU-80-1/PMU-80-1A

20.5.2.1 STRAPS PMU-80 (5122 291 7573*)
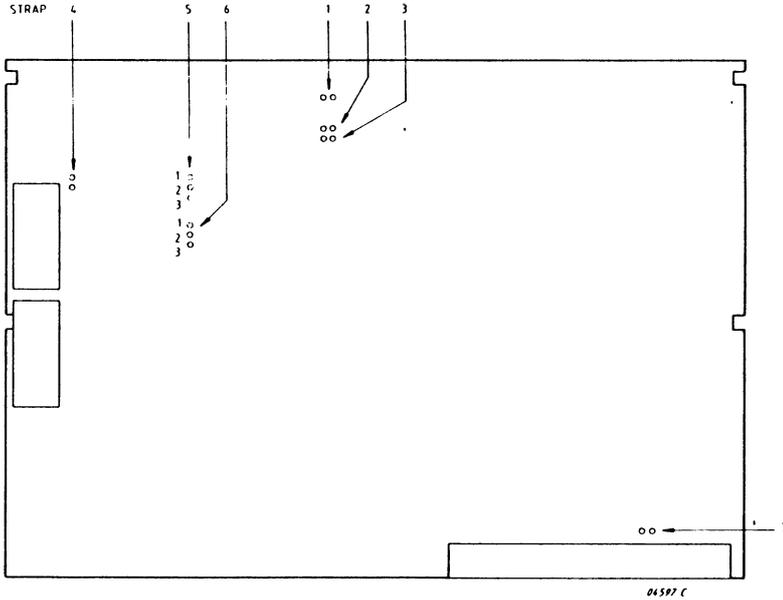
STRAP Nr.	FUNCTION		STRAP 1-2	STRAP 2-3
1	Test Purpose (BUS Acknowledge)	(E2F9)	Y	
2	Test Purpose (Machine Cycle 1)	(E2F5)	Y	
3	Test Purpose (Refresh)	(E2F4)	Y	
4	Master: Channel B (CT 108.2) Slave : Remote Power-On	(A8E8)	N Y	
5	Channel A V.24 Interface - Internal Transmit Clock - External Transmit Clock	(C4F0)	 Y N	 N Y
6	Channel A V.24 Interface - Internal Receive Clock - External Receive Clock	(C4E5)	 Y N	 N Y
7	Bus CLock Source Selection	(IOA7)	N	

20.5.2.2 STRAPS PMU-80-1 (5122 291 7560*)
PMU-80-1A (5122 291 8735*)
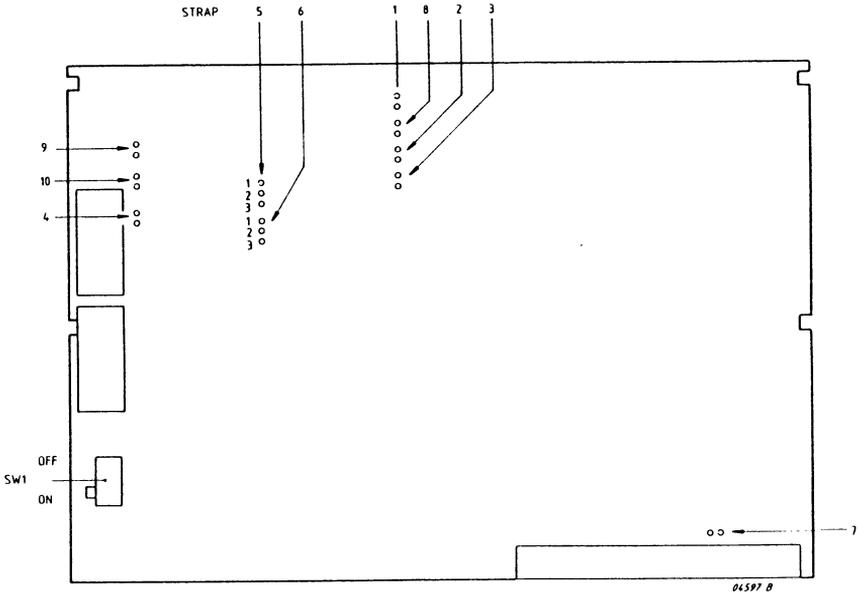
STRAP Nr.	FUNCTION		STRAPS 1-2	STRAPS 2-3
1	Test Purpose (BUS Acknowledge)	(E1G0)	Y	
2	Test Purpose (Machine Cycle 1)	(E1F0)	Y	
3	Test Purpose (Refresh)	(E1F4)	Y	
4	Master: Channel B (CT 108.2) Slave : Remote Power-On	(A8E8)	N Y	
5	Channel A V.24 Interface - Internal Transmit Clock - External Transmit Clock	(C4F0)	Y N	N Y
6	Channel A V.24 Interface - Internal Receive Clock - External Receive Clock	(C4E5)	Y N	N Y
7	Bus CLock Source Selection	(I0A7)	N	
8	Test Purpose (Bus Request)	( )	Y	
9	Remote Power-On (Chan. A CT125)	(A8F5)	N	
10	Remote Power-On (Chan. A CT109)	(A8F3)	N	

SWITCH	FUNCTION	POSITION
SW1	Channel A V.24 Interface CT108.2 - Active (default) - Inactive	ON OFF

20.5.3 MODIFICATION HISTORY PMU-80/PMU-80-1/PMU-80-1A

20.5.3.1 PMU-80 (5122 291 7573*)

| LEVEL | ROM (pos) | | PAL (pos) | | | | | SI-NR |
*	C3C3	G8D3	G8C1	G3D0	G3E3	G8E3	F7A8	P3500-..
5	19821	19811	19771	20121	19801	19781	19791	3
6	19822	"	"	"	"	"	"	3
7	"	"	"	"	"	"	"	8
8	19824	"	"	"	"	"	"	22
9	"	"	"	"	"	"	"	32

20.5.3.2 PMU-80-1 (5122 291 7560*)

| LEVEL | ROM (pos) | | PAL (pos) | | | | | SI-NR |
*	C3C3	G8D3	G8C1	G3D0	G3E3	G8E3	F7A8	P3500-..
2	19822	19811	19771	20121	20521	19781	19791	7
3	"	"	"	"	"	"	"	9
4	"	"	"	"	"	"	20731	10
5	19824	"	"	"	"	"	"	22
6	"	"	"	"	"	"	"	31
7	"	"	"	"	"	"	"	31

20.5.3.3 PMU-80-1A 5122 291 8735*

| LEVEL | ROM (pos) | | PAL (pos) | | | | | SI-NR |
*	C3C3	G8D3	G8C1	G3D0	G3E3	G8E3	F7A8	P3500-..
2	19824	19811	19771	20121	20521	19781	20731	40

20.6   FLEXCO

20.6 FLEXCO

20.6.1 INTERCONNECTIONS FLEXCO
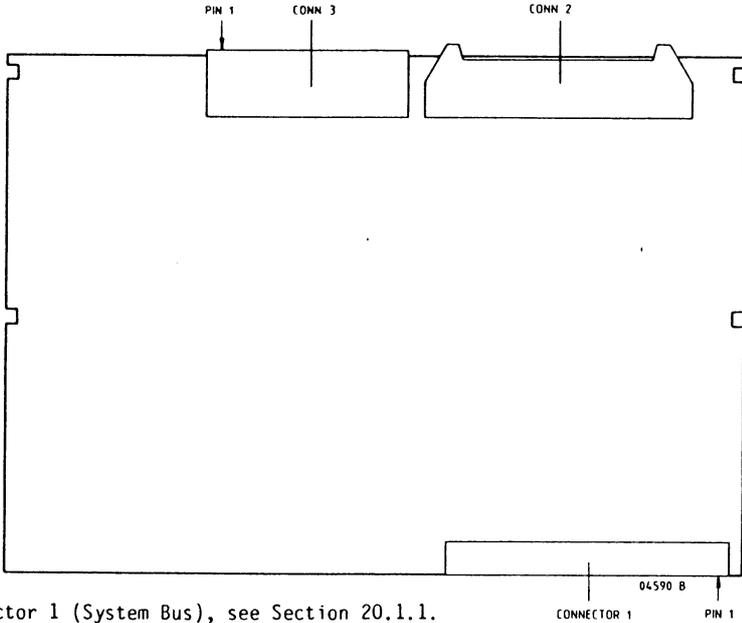
Connector 1 (System Bus), see Section 20.1.1.

Connector 3 Flexible Disc Drive 5¼"

1	0V	2	NURDY1
3	0V	4	NDUN1S*
5	0V	6	NUS4S*
7	0V	8	NIND
9	0V	10	NUS1S
11	0V	12	NUS2S
13	0V	14	NUS3S
15	0V	16	NMOT1S
17	0V	18	NDIRS
19	0V	20	NSTPS
21	0V	22	NWRDAS
23	0V	24	NWRENS
25	0V	26	NTRO
27	0V	28	NWRP
29	0V	30	NREDA
31	0V	32	NHDSS
33	0V	34	NDUN2S*

```
     FLEXCO    SESCO
*  NDUN1S : NINU1
   NUS4S  : NMOT2
   NDUN2S : NINU2
```

Connector 2 - Not installed (only in pre-series)

20.6.2 STRAP SETTING FLEXCO

STRAP 3

2

04590 C
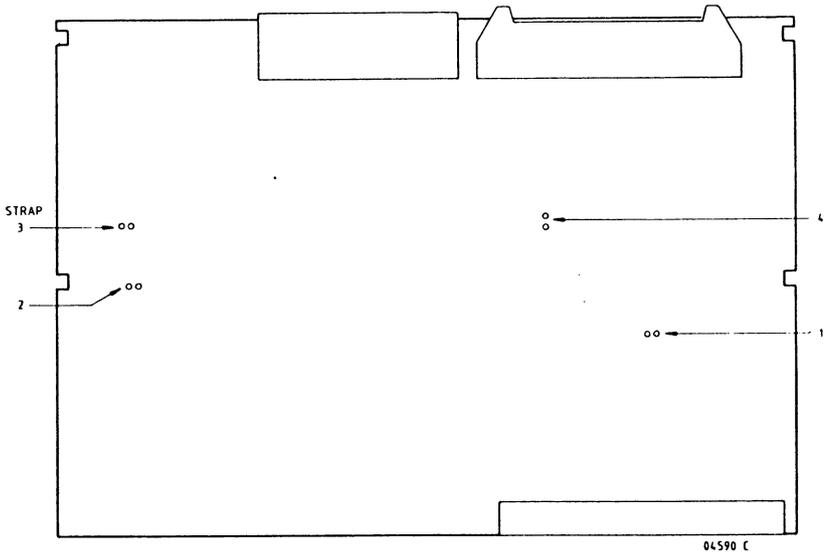
STRAP Nr.	FUNCTION		STRAP 1-2
1	Clock 4 MHz	(H5C5)	Y
2	Clock 16 MHz	(B0D0)	Y
3	VCO Clock 16 MHz	(A9D7)	Y
4	Ready Signal Drive 2	(G0D8)	Y

20.6.3 MODIFICATION HISTORY FLEXCO

5122 291 6986*

LEVEL *	ROM (pos)		SI-NR P3500-..
	C5B1	G7B8	
2	18851	18861	
3	"	"	

20.7   . SASI-AD

20.7 SASI-AD

20.7.1 INTERCONNECTIONS SASI-AD
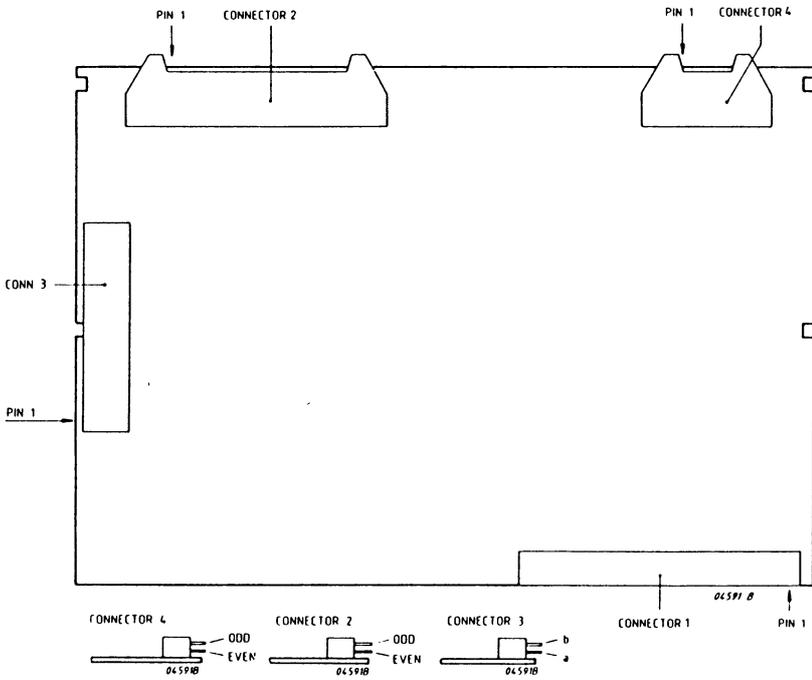
Connector 4, Operator Panel

1	DAT 0	2	0V
3	DAT 1	4	0V
5	DAT 2	6	0V
7	DAT 3	8	0V
9	NWRDI	10	0V
11	NWRHX	12	0V
13	DAT 4	14	NMR
15	+5V	16	+5V

Connector 1 (System Bus), see Section 20.1.1, Connector 1-6

Connector 2
(SASI Internal to XEBEC-S1410)

Connector 3
(SASI External)

1	0V		2	NDB0
3	0V		4	NDB1
5	0V		6	NDB2
7	0V		8	NDB3
9	0V		10	NDB4
11	0V		12	NDB5
13	0V		14	NDB6
15	0V		16	NDB7
17	0V		18	
19	0V		20	
21	0V		22	
23	0V		24	
25	0V		26	
27	0V		28	
29	0V		30	
31	0V		32	
33	0V		34	
35	0V		36	NBSY
37	0V		38	NACK
39	0V		40	NRST
41	0V		42	NMSG
43	0V		44	NSEL
45	0V		46	C/D
47	0V		48	NREQ
49			50	I/O

	a	b
1	NDB0E	0V
2	NDB1E	0V
3	NDB2E	0V
4	NDB3E	0V
5	NDB4E	0V
6	NDB5E	0V
7	NDB6E	0V
8	NDB7E	0V
9		0V
10		0V
11		0V
12		0V
13		0V
14		0V
15		0V
16		0V
17		0V
18	NBSYE	0V
19	NACKE	0V
20	NRSTE	0V
21	NMSG	0V
22	NSELE	0V
23	C/D	0V
24	NREQ	0V
25	I/O	

20.7.2 STRAP SETTING SASI-AD

STRAP 1

06591 D
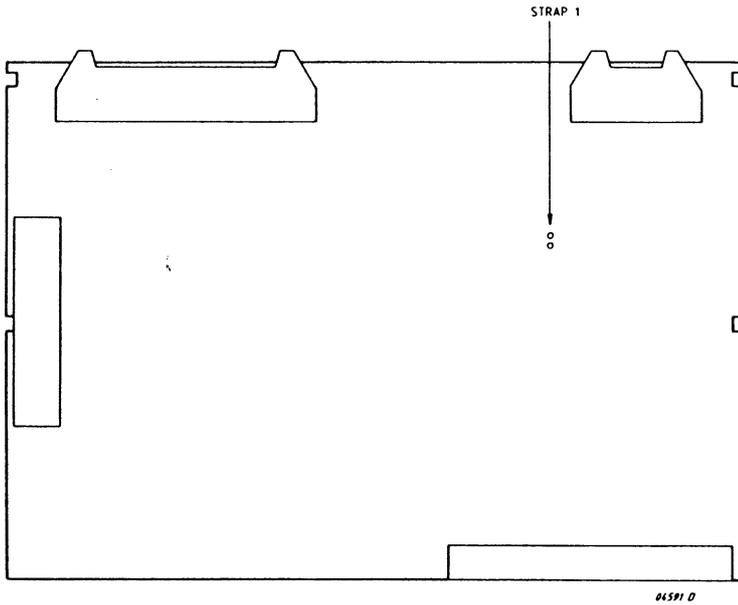
STRAP Nr.	FUNCTION		STRAP 1-2
1	Clock 16 MHz	(G9E2)	Y

20.7.3 MODIFICATION HISTORY SASI-AD

20.7.3.1 SASI-ADAPTOR-OO (5122 291 7576*)

LEVEL *	ROM (pos) D8E3	E4A6	F2B1	SI-NR P3500-..
2	19491	19751	19761	
3	"	"	"	
4	"	"	"	4
4	"	"	"	14
5	"	"	"	15
6	"	"	"	39

20.7.3.2 SASI-ADAPTOR-02 (5122 291 7740*)

LEVEL *	ROM (pos)			SI-NR P3500-..
	D8E3	E4A6	F2B1	
1	19491	19751	19761	
2	"	"	"	4
2	"	"	"	14
3	"	"	"	15
4	"	"	"	39

20.8   SESCO

20.8 SESCO

20.8.1 INTERCONNECTIONS SESCO
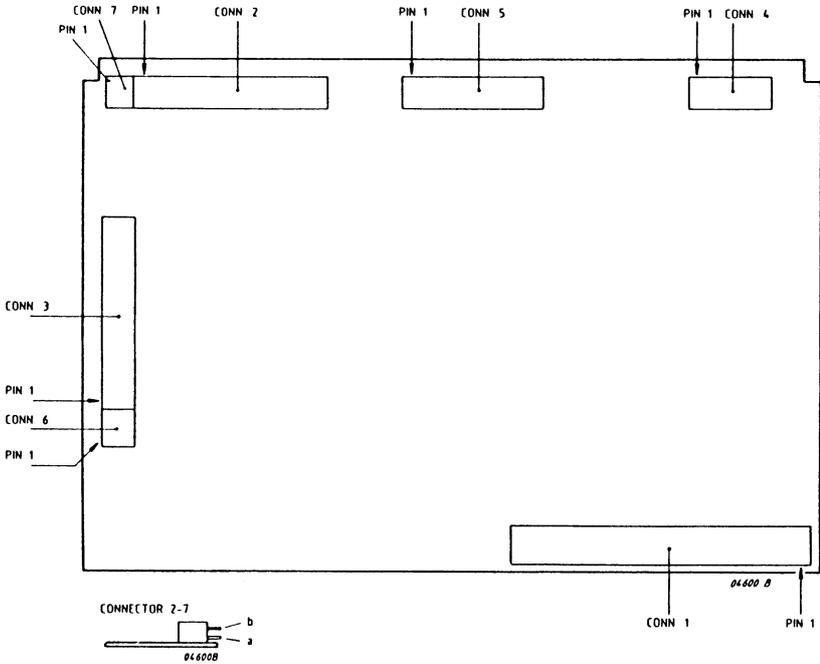
Connector 1 (System Bus), see Section 20.1.1, Connector 1-6 (P3500)
   see Section 20.30.1, Connector 1-11 (P3800)

Connector 6 .

+
Connector 7
Power for Terminator
SASI-Bus)

	a	b
1	+5V	+5V
2		+5V
3		/////

Connector 5

(5¼" Flexible Disc Drive)

	a	b
1	NURDY	0V
2	NINU1	0V
3	NMOT2	0V
4	NIND	0V
5	NUS1	0V
6	NUS2	0V
7	NUS3	0V
8	NMOT1	0V
9	NDIR	0V
10	NSTP	0V
11	NWRDA	0V
12	NWREN	0V
13	NTRO	0V
14	NWRP	0V
15	NREDA	0V
16	NHDS	0V
17	NINU2	//////

Connector 2
SASI-Bus (internal)
+
Connector 3
SASI-Bus (external)

	a	b
1	NDB0	0V
2	NDB1	0V
3	NDB2	0V
4	NDB3	0V
5	NDB4	0V
6	NDB5	0V
7	NDB6	0V
8	NDB7	0V
9		0V
10		0V
11		0V
12		0V
13		0V
14		0V
15		0V
16	NATN	0V
17		0V
18	NBSY	0V
19	NACK	0V
20	NRST	0V
21	NMSG	0V
22	NSEL	0V
23	NCD	0V
24	NREQ	0V
25	NIO	//////

Connector 4
(Operator Panel)

	a	b
1	0V	DATIV0
2	0V	DATOV1
3	0V	DATIV2
4	0V	DATIV3
5	0V	NWRDI
6	NPRIV	
7	NMR	DATIV4
8	+5V	///////

20.8.2 STRAP SETTING SESCO

04600 D

STRAP 2   1   3
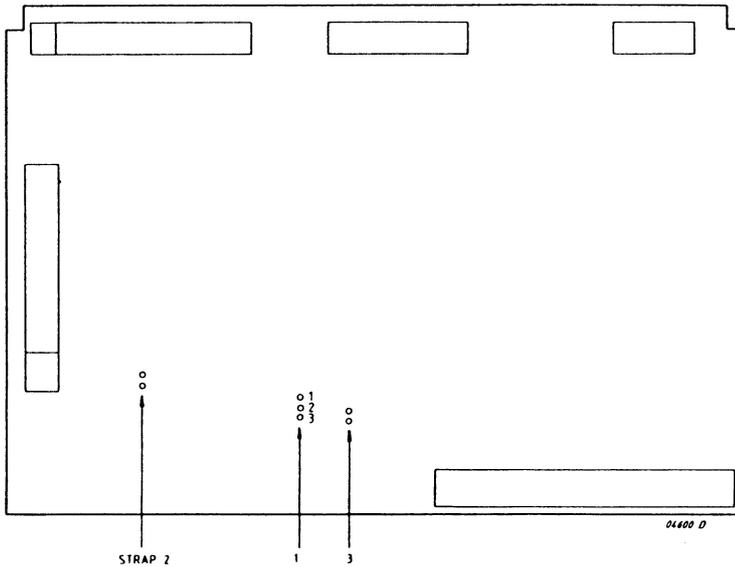
STRAP Nr.	FUNCTION		STRAP 1-2	2-3
1	Select Write Clock to FDC	(D7B6)	Y	N
2	Clock 16 MHz	(E3B2)	Y	
3	VCO Clock 16 MHz	(B7B8)	Y	

20.8.3 MODIFICATION HISTORY SESCO

5112 291 7742*

LEVEL *	ROM (pos) B6F0	C6F0	PAL (pos) H1F3	H7F3	SI-NR P3500-..
3	918851	919491	800091	800081	
4	"	"	"	"	34
5	"	"	800092	"	35
6	"	"	"	"	38
7	"	"	"	"	42

20.9   OPERATOR PANEL

20.9 OPERATOR PANEL

20.9.1 INTERCONNECTIONS OPERATOR PANEL

1	DAT0	2	0V
3	DAT1	4	0V
5	DAT2	6	0V
7	DAT3	8	0V
9	NWRDI	10	0V
11	NWRHX	12	0V
13	DAT4	14	NMR
15	+5V	16	+5V

FROM SASI AD OR SESCO

STRAP 1

SCREWS

06586 C
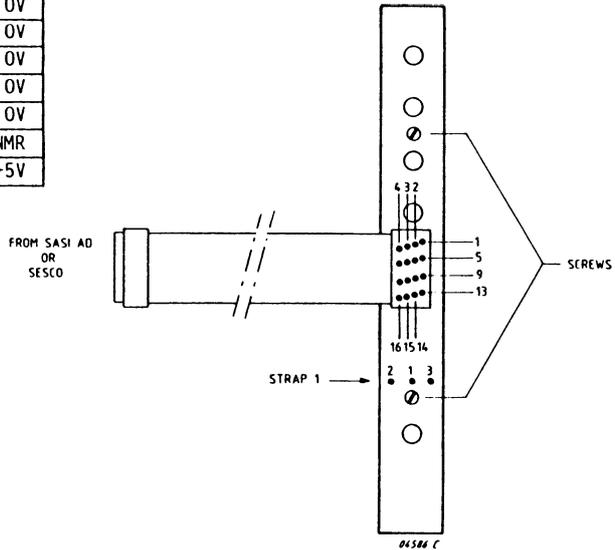
20.9.2 STRAP SETTING OPERATOR PANEL

STRAP Nr.	FUNCTION	STRAP 1-2	1-3
1	P3500	N	Y

9.3 MODIFICATION HISTORY OPERATOR PANEL

T.B.S.L.

20.10   FLEXIBLE DISC DRIVE 5¼" (X3113/X3114)

20.10 FLEXIBLE DISC DRIVE FDD 5¼"

20.10.1 INTERCONNECTIONS FDD 5¼"
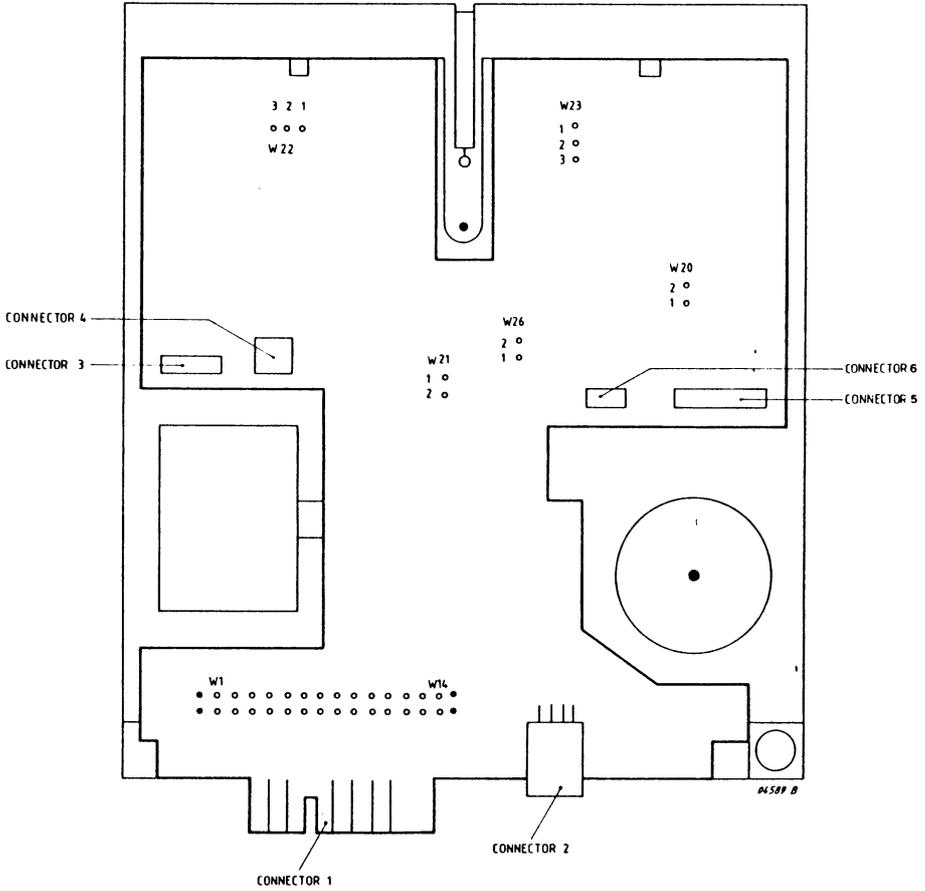
Connector 3 to read/write heads

Connector 4 to stepper motor

Connector 5 to sensors

Connector 6 to spindle motor

Connector 1
(Interface Connector)

Connector 2

1	0V	2	NURDY
3	0V	4	NINU1
5	0V	6	NMOT2
7	0V	8	NIND
9	0V	10	NUS1
11	0V	12	NUS2
13	0V	14	NUS3
15	0V	16	NMOT1
17	0V	18	NDIR
19	0V	20	NSTP
21	0V	22	NWRDA
23	0V	24	NWREN
25	0V	26	NTRO
27	0V	28	NWRP
29	0V	30	NREDA
31	0V	32	NHDS
33	0V	34	NINU2

PIN	USE
1	+12 V
2	+12 V Return
3	+ 5 V Return
4	+ 5 V

DC CONNECTOR
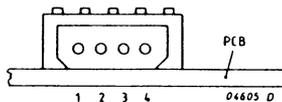
TOP VIEW
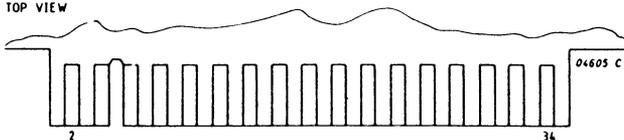
KEY
ALL ODD NUMBERED PINS (BELOW) ARE GROUNDED

Connector 1 Layout

20.10.2 STRAP SETTING FDD 5¼"

	3 2 1		1 ○
	○ ○ ○		2 ○ W23
	W22		3 ○.

TERMINATOR

W1   W14

NOTE : NOT THE FIRST STRAP!

04608 A
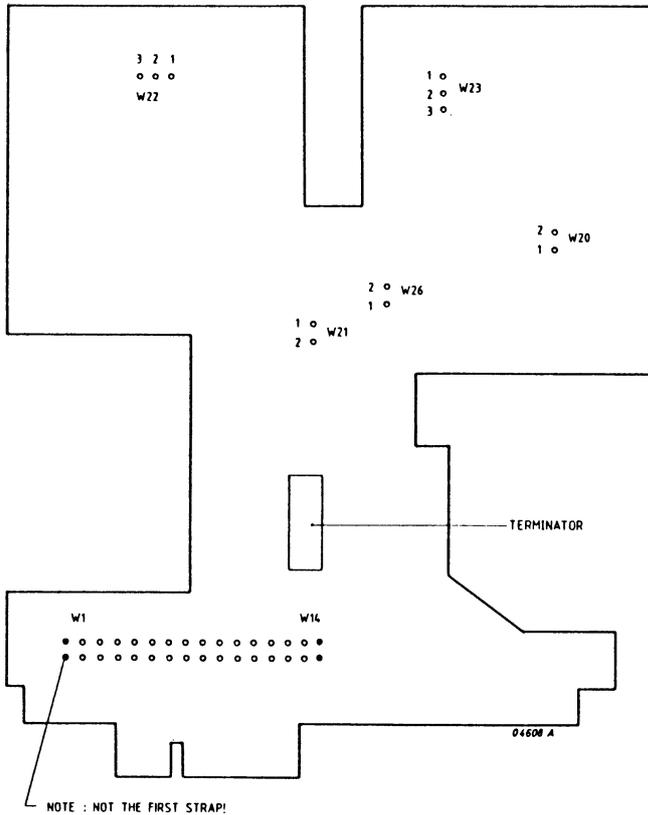
CONFIGURATION	TERMINATOR
System with 1 x FDD 5¼ - Drive 1 - Drive 2	Y not applicable
System with 2 x FDD 5¼ - Drive 1 - Drive 2	N Y

STRAP Nr.	FUNCTION	STRAP 1-2
1	Ready Line	
	- Drive 1	Y
	- Drive 2	Y
2	Option Head Load	
	- Drive 1	N
	- Drive 2	N
3	In-Use-1	
	- Drive 1	Y
	- Drive 2	N
4	Motor-On-2	
	- Drive 1	N
	- Drive 2	Y
5	]	N
6	] Not Used	N
7	]	N
8	Unit-Select-3	
	- Drive 1	N
	- Drive 2	N
9	Motor-On-1	
	- Drive 1	Y
	- Drive 2	N
10	In-Use-2	
	- Drive 1	N
	- Drive 2	Y
11	Not Used	N
12	Unit-Select-1	
	- Drive 1	Y
	- Drive 2	N
13	Unit-Select-2	
	- Drive 1	N
	- Drive 2	Y
14	Continuous Select	
	- Drive 1	N
	- Drive 2	N
20	Motor-On: Software Select	
	- Drive 1	Y
	- Drive 2	Y
21	Test Point: Disable Step Motor	
	- Drive 1	Y
	- Drive 2	Y
22	Test Point: Analog Read Signal	
	- Drive 1	N
	- Drive 2	N
23	Test Point: TKO and Index	
	- Drive 1	N
	- Drive 2	N
26	Test Point: Disable Ready Signal	
	- Drive 1	Y
	- Drive 2	Y

20.10.3 MODIFICATION HISTORY FDD 5¼"

SI-Nr. P3500-..
16
17
30

20.10.4 REMOVAL AND REPLACEMENT FDD 5¼"

20.10.4.1 P3500 CABINET

SCREW B

SCREW A

SCREW C

04602 A
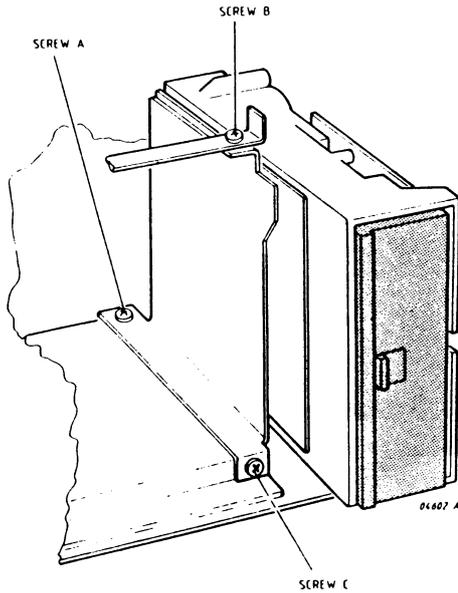
.10.4.2 P3800 CABINET

screw
A

20.11   XEBEC CONTROLLER S1410
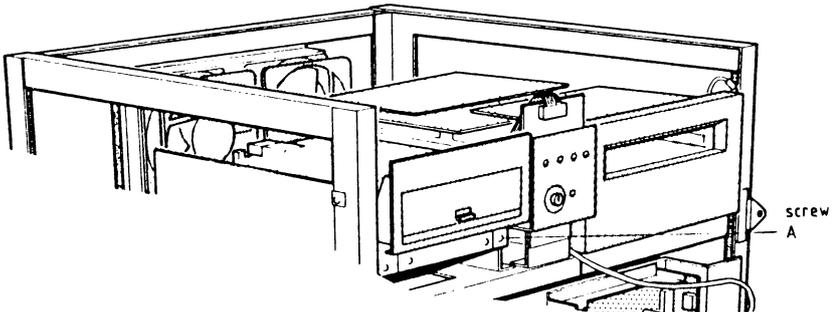
20.11 XEBEC CONTROLLER S1410

20.11.1 INTERCONNECTIONS XEBEC CONTROLLER S1410

POWER CONNECTOR

1
2
3
4

PIN 2

CONN 1

PIN 1

PIN 1

CONN 2
(NC)

CONN 5

PIN 1

CONN 3

FACTORY TEST ONLY
DO NOT USE

CONN 4

0446 A

CONNECTOR 1
TOP VIEW

2   34

04616A

ALL ODD NUMBERED PINS
(BELOW) ARE GROUNDED

1

CONNECTOR 3
TOP VIEW

04616A

ODD   EVEN
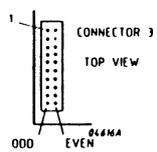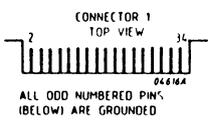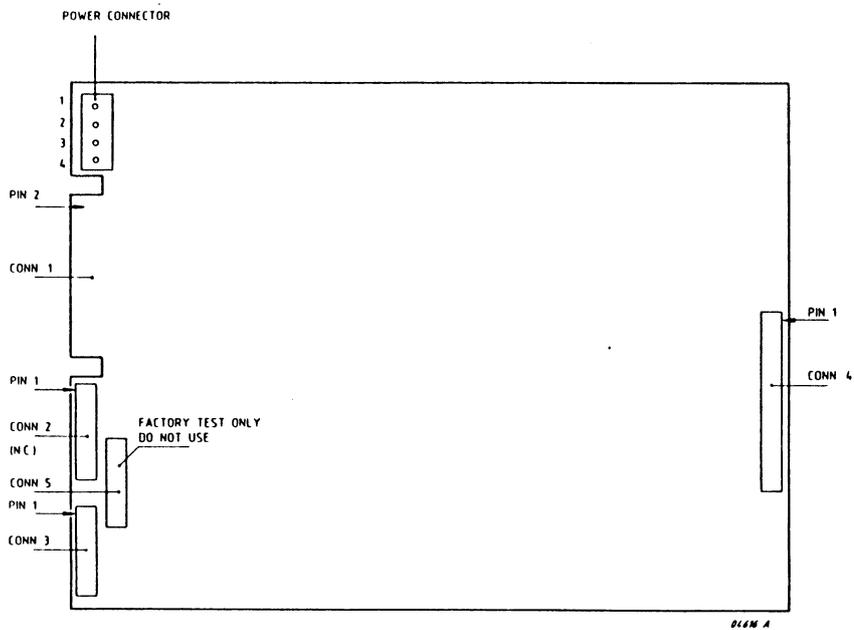
Connector 1, Control Signals
(to Fixed Disc Drive)

1	0V		2	Reduced Write Current
3	0V		4	Head Select 2^2
5	0V		6	Write Select Gate
7	0V		8	Seek Complete
9	0V		10	Track 00
11	0V		12	Write Fault
13	0V		14	Head Select 2^0
15	0V		16	Reserved
17	0V		18	Head Select 2^1
19	0V		20	Index
21	0V		22	Ready
23	0V		24	Step
25	0V		26	Drive Select 1
27	0V		28	Drive Select 2
29	0V		30	Reserved
31	0V		32	Reserved
33	0V		34	Direction In

Connector 3, Data Signals
(to Fixed Disc Drive)

1	Drive Selected		2	0V
3	Spare		4	0V
5	Spare		6	0V
7	Reserved		8	0V
9	Spare		10	Spare
11	0V		12	0V
13	MFM Write Data +		14	MFM Write Data -
15	0V		16	0V
17	MFM Read Data +		18	MFM Read Data -
19	0V		20	0V

Connector 4, (to SASI Adaptor, SESCO or SAS-EX)

See Section 20.8, Connector 2-3

Power Connector

PIN	USE
1	+12 V
2	0V
3	0V
4	+ 5 V

20.11.2 STRAP SETTING XEBEC CONTROLLER S1410
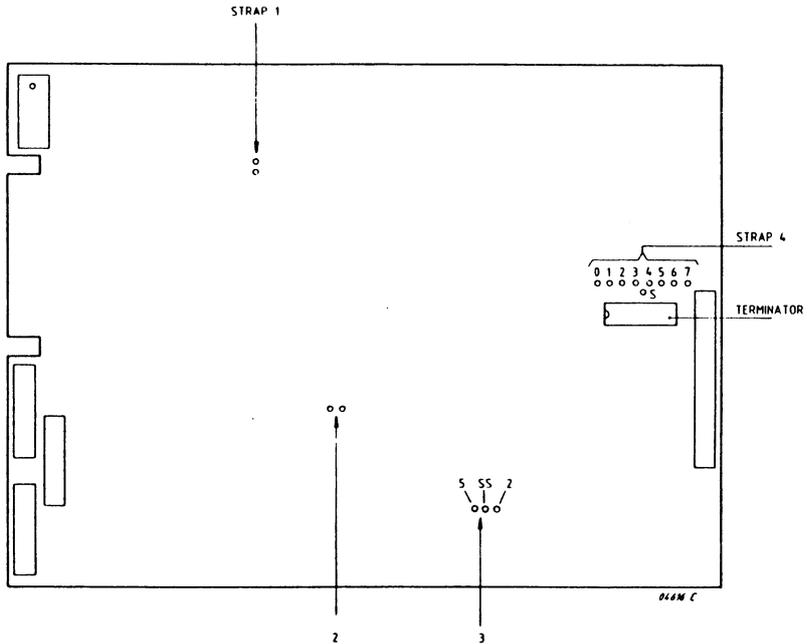
STRAP Nr.	FUNCTION	STRAP
1	Factory Test - System Cabinet - Extension Cabinet P3012	 Y Y
2	Factory Test - System Cabinet - Extension Cabinet P3012	 Y Y
3	Selector Sector Size - System Cabinet - Extension Cabinet P3012	 SS-5 SS-5
4	Controller Select - System Cabinet - Extension Cabinet P3012	 S-7 * S-6

* Mind the disc assignment of a dual flex system.

CONFIGURATION	TERMINATOR
- System Cabinet	Y
- Extension Cabinet P3012	N

20.11.3 MODIFICATION HISTORY XEBEC CONTROLLER S1410

T.B.S.L.

20.11.4 REPLACEMENTS XEBEC CONTROLLER S1410

Removal XEBEC - S1410

- Disconnect interface cable on the XEBEC and interface cables to the fixed disc
  drive.
- Disconnect the Power Connector.
- Remove the screw near connector 4 (see Note).
- Unclip and remove the PCB.

Replacement:

Opposite the previous procedure.

Note: take care of the separator at the screw between the chassis and the PCB.

20.12   .   FIXED DISC DRIVE SEAGATE (ST406/ST412)

20.12 FIXED DISC DRIVE SEAGATE (ST406/ST412)

20.12.1 INTERCONNECTIONS FXD

20.12.1.1 EXTERNAL
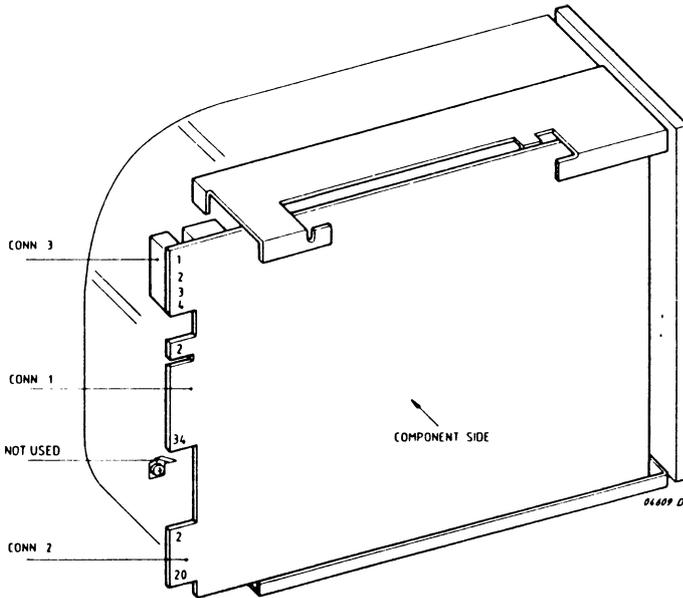
Connector 3, (Power Supply)

1	+12 V
2	0 V
3	0 V
4	+ 5 V

Connector 1, Control Signals

GROUND RETURN	SIGNAL PIN	SIGNAL NAME
1	2	Reserved
3	4	Reserved
5	6	Write Gate
7	8	Seek Complete
9	10	Track 00
11	12	Write Fault
13	14	Head Select 2^0
15	16	Reserved (row 2 pin 7)
17	18	Head Select 2^1
19	20	Index
21	22	Ready
23	24	Step
25	26	Drive Select 1
27	28	Drive Select 2
29	30	Drive Select 3
31	32	Drive Select 4
33	34	Direction In

Connector 2, Data Signals

1	Drive Selected	2	0V
3	Reserved	4	0V
5	Reserved	6	0V
7	Reserved (row 1 pin 16)	8	0V
9	Spare	10	Spare
11	0V	12	0V
13	MFM Write Data +	14	MFM Write Data −
15	0V	16	0V
17	MFM Read Data +	18	MFM Read Data −
19	0V	20	0V

CONN 4

MOTOR CONTROL PCB

CONN 8

CONN 7

CONN 6

MAIN CONTROL PCB

05209 C

CONN 5

CONN 4

MOTOR CONTROL PCB

CONN 10

CONN 9

COMPONENT SIDE

05209 B

Connector 4   to motor control PCB (Power)   .

Connector 5   to read/write head

Connector 6   to LED, index sensor

Connector 7   to stepper motor

Connector 8   to track 00 sensor

Connector 9   to spindle motor

Connector 10 to brake
              (only on motor control PCB series 20099)

20.12.2 STRAP SETTING FXD

*) WHEN MORE THAN ONE FXD ARE INSTALLED,
THE TERMINATOR SHALL BE PUT ONLY IN THE
LAST ONE OF THE STRING

STRAP W1   STRAP 1 TO 16

04609 B
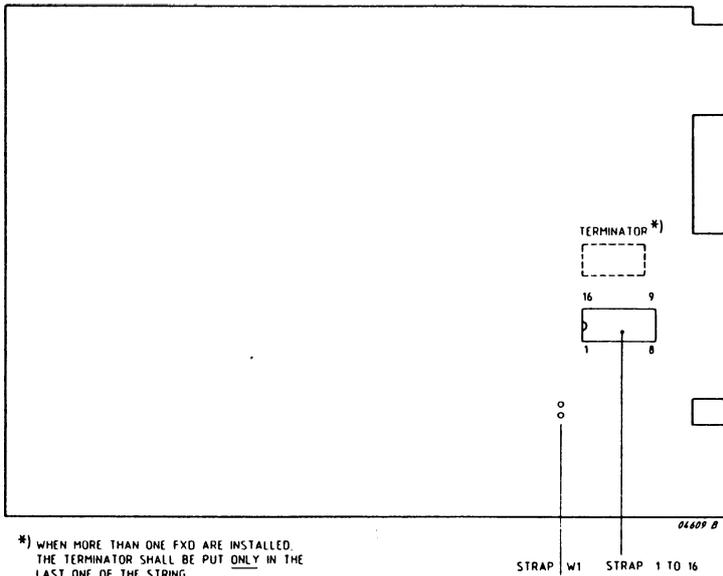
Terminator must be in.

STRAP Nr.	FUNCTION	STRAP		P3500	P3012	P3800-DRIVE #1	#2
1...16	Drive Select	8- 9	Y	Y	Y	Y	N
	Drive Select	7-10	Y	D	D	N	Y
	Drive Select	6-11	Y	D	D	D	D
	Drive Select	5-12	Y	D	D	D	D
	Not Used	4-13	Y	D	D	D	D
	Not Used	3-14	Y	D	D	D	D
	Not Used	2-15	Y	D	D	D	D
	Continuous selected	1-16	N	N	N	N	N
W1	Continuous seek	1-2	N	N	N	N	N

20.12.3 MODIFICATION HISTORY FXD

Main control PCBs: 20096; 20110; 20221
are compatible
Motor control PCBs: 20099; 20136; 20217
are compatible; however, in combination with
20099 a brake assy must be used.

SI-NR P3500-..
26

20.12.4 REPLACEMENTS FXD

Caution:

- The drive must not be subjected to mechanical shock in excess of 20 g in any axis, otherwise permanent damage may occur.
- Do not rotate the stepper motor or the spindle motor. Heads or discs can be damaged.
- It is not allowed to open the sealed area so do not remove any screw that secures the disc cover.

20.12.4.1 REPLACEMENT FIXED DISC DRIVE

Removal:

- Disconnect the interface cable on the XEBEC.
- Loosen screw A, B. Remove screws C and D.
- Slide out the Fixed Disc, disconnect the power cable and remove the Fixed Disc.
- Remove the XEBEC and the parts belonging to the chassis.

Replacement:

Opposite the previous procedure.
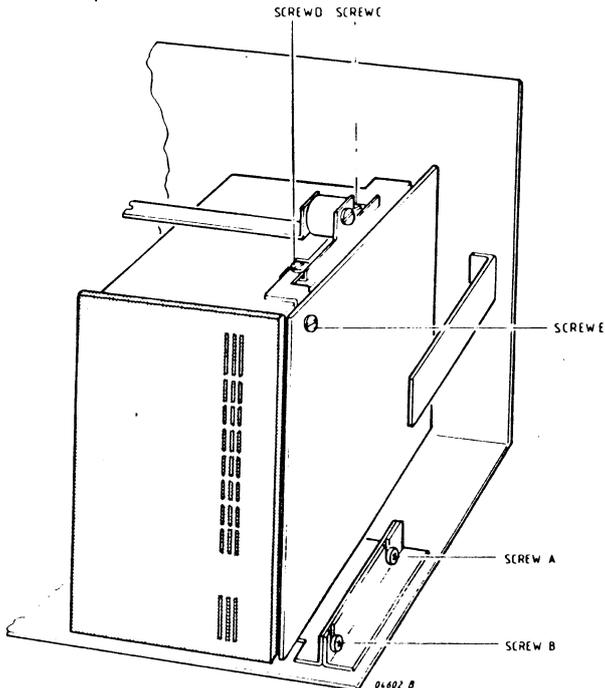
20.12.4.2 REPLACEMENT MAIN CONTROL PCB

Removal:

- Remove fixed disc drive.

- Remove screws 1, 2, 3, 4 which hold the clamps that fix the XEBEC controller.

- Remove screws D, E, F, G. Mind the clamp that fixes connector 5.

- Pull off the connector 1-8 carefully.

- Slide out main control PCB to the rear.

Replacement:

- Opposite the previous procedure.

05207 B
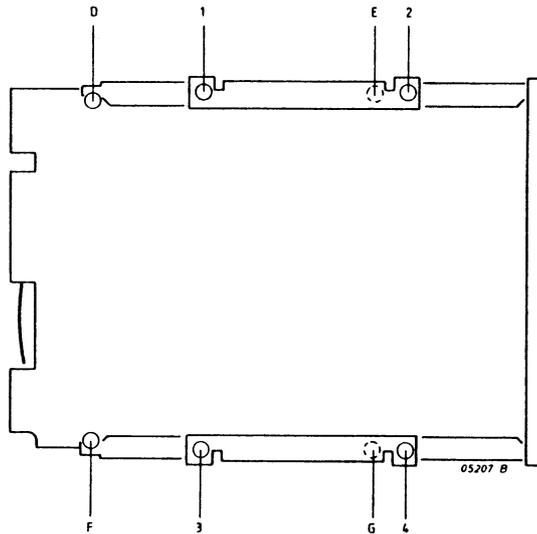
20.12.4.3 REPLACEMENT MOTOR CONTROL PCB

Removal:

- Remove fixed disc drive.

- Remove main control PCB.

- Remove connectors 9 (-10 if available).

- Remove two screws H, I.

- Slide out motor control PCB to the rear.

Replacement:

- Opposite the previous procedure.

05207 A
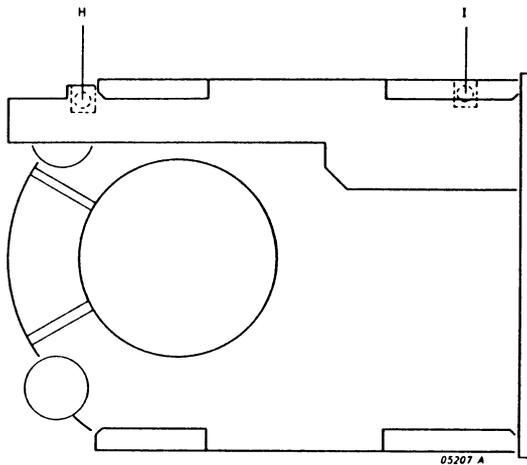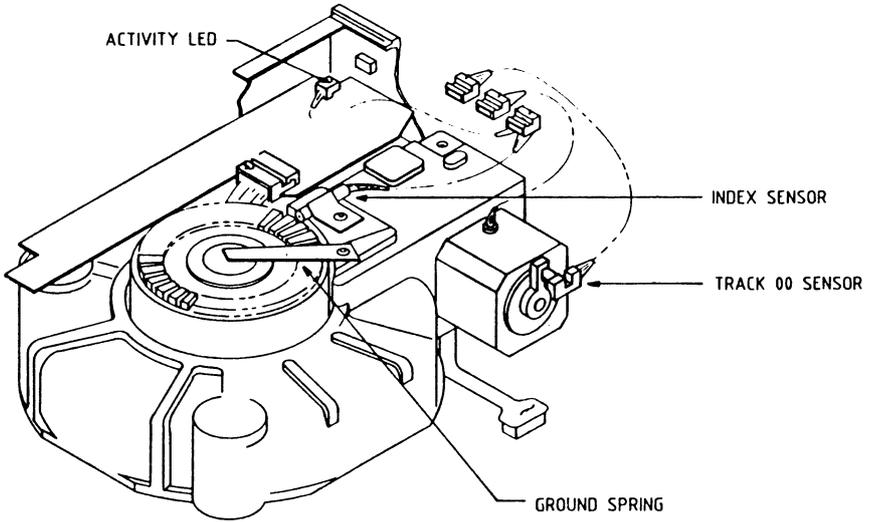
No special directions necessary.

20.13   BACKPANELS P2711

20.13 BACK PANELS P2711

20.13.1 INTERCONNECTIONS BACKPANELS P2711

20.13.1.1 BACKPANEL DIMO
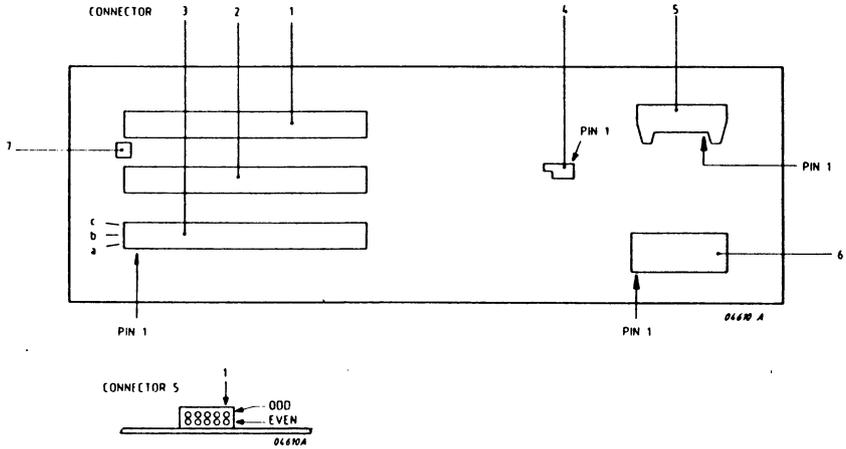
Connector 1,
Pin Assignment
(PMU-88 PME)

	a	b	c
1	+5V	+5V	+5V
2	0V	+5V	SLL3
3	0V	0V	0V
4	SLL0	SLL1	SLL2
5	NBUSY	NBCLK	NCBRQ
6	NDRQ1	NIR3	NDACK1
7	NDRQ2	SYN	NTC1
8	NIR0	TOUT2	NIR1
9	NIR4	BARE	NIR5
10	NIR6	RSLN	NIR7
11	0V	0V	0V
12	NDAT0	NDAT1	NDAT2
13	NDAT3	NDAT4	NDAT5
14	NDAT6	NDAT7	NDAT8
15	NDAT9	NDAT10	NDAT11
16	NDAT12	NDAT13	NDAT14
17	PWFN	RPON	NDAT15
18	0V	0V	0V
19	NADR0	NADR1	NADR2
20	NADR3	NADR4	NADR5
21	NADR6	NADR7	NADR8
22	NADR9	NADR10	NADR11
23	NADR12	NADR13	NADR14
24	NADR15	NADR16	NADR17
25	NADR18	NADR19	NBHE
26	NAIOWC	RESV1	PSON
27	NIOWC	RESV2	NAMNC
28	NIORC	RESV3	NMWC
29	NXACK	RESV4	NMRC
30	NBPRI	NLOCK	NBPRO
31	+12V	+5VM	+5VM
32	-12V	-5V	NBREQ

Connector 2 (option) and
Connector 3 (CRT-CO).,

Pin Assignment same as

Connector 1.

Connector 4

1	+ 5V	0V
2	-12V	0V
3	+12V	0V
4	RSLN	

Connector 5,
(Backpanel
 Power Supply)

1	0V	2	SYN
3	0V	4	BARE
5	0V	6	RSLN
7	0V	8	PWFN
9	0V	10	RPON

Connector 6,
(Backpanel
 Power Supply)

1	+12V
2	+ 5V
3	+ 5V
4	+ 5V
5	-12V
6	+ 5VM
7	0V
8	0V
9	0V
10	0V

Connector 7,
(Power Supply On)
    PSON

1	0V
2	PSON

20.13.1.2 POWER BACKPANEL DIMO
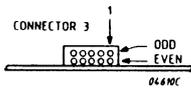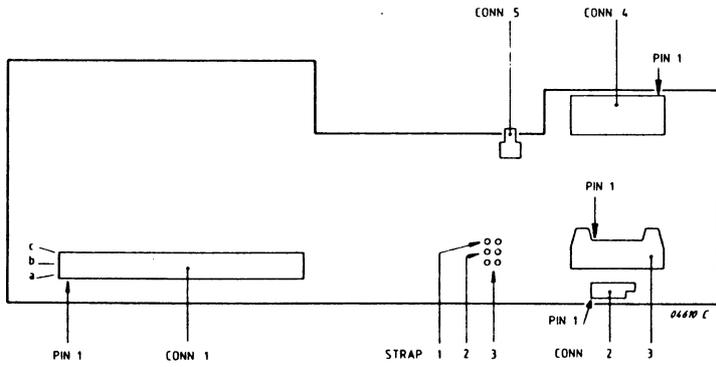
Connector 1,
to PSU WS-120 / WS-50

	a	b	c
1	BONN	0V	
2		0V	RPON
3	BAWOFFN	0V	PWFN
4	0V	0V	RSLN
5	SYN	0V	
6	0V	0V	
7		0V	
8	0V	0V	0V
9	0V	0V	0V
10			
11	0V	0V	0V
12			
13	0V	0V	0V
14			
15	0V	0V	0V
16	+BAT	+BAT	+BAT
17	0V	0V	0V
18	+5VM	+5VM	+5VM
19	0V	0V	0V
20	+12V	+12V	+12V
21	0V	0V	0V
22	-12V	-12V	-12V
23	0V	0V	0V
24			
25	0V	0V	0V
26	+5V	+5V	+5V
27	0V	0V	0V
28	+5V	+5V	+5V
29	0V	0V	0V
30	+5V	+5V	+5V
31	0V	0V	0V
32	+5V	+5V	+5V

Connector 2,
to Monitor Electronics

	a	b
1	+12V	0V
2	+12V	0V
3	+12V	0V
4	+12V	0V
5	+12V	

Connector 3,
to BP-2711

1	RPCN	2	0V
3	PWFN	4	0V
5	RSLN	6	0V
7	BARE	8	0V
9	SYN	10	0V

Connector 4,
to BP-2711

1	0V
2	0V
3	0V
4	0V
5	+ 5VM
6	-12V
7	+ 5V
8	+ 5V
9	+ 5V
10	+12V

20.13.2 STRAP SETTING BACKPANELS P2711 (Refer to figure in section 20.13.1.2)

20.13.2.1 STRAP SETTING BP-DIMO

STRAP Nr.	FUNCTION	STRAP
7	PSON ·	Y

20.13.2.2 STRAP SETTING PBP-DIMO

STRAP Nr.	FUNCTION	STRAP
1	BAWOFFN: - BBU Installed - No BBU Installed (Default)	N Y
2	+5VM: - BBU Installed - No BBU Installed (Default)	N Y
3	+5VM: - BBU Installed - No BBU Installed (Default)	N Y

20.13.3 MODIFICATION HISTORY BACKPANELS P2711

T.B.S.L.

20.14   PSU WS-50

20.14 PSU WS-50

20.14.1 INTERCONNECTIONS PSU WS-50
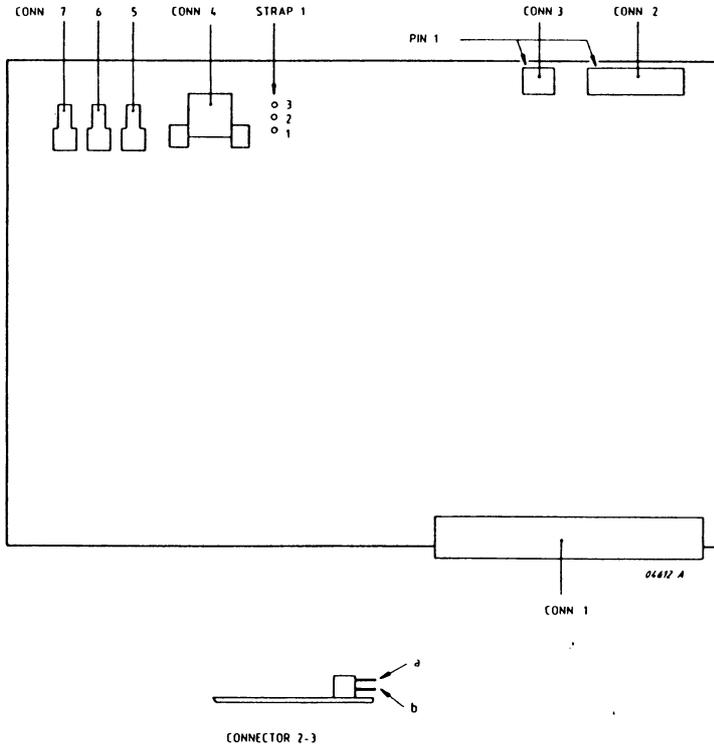
CONNECTOR 2-3

Connector 1
(to EMM-Bus)

	a	b	c
1		0V	
2	0V	0V	
3		0V	
4	0V	0V	RSLN
5		0V	
6	0V	0V	
7		0V	
8	0V	0V	0V
9	0V	0V	0V
10			
11	0V	0V	0V
12			
13	0V	0V	0V
14			
15	0V	0V	0V
16	+12V*	+12V*	+12V*
17	0V	0V	0V
18			
19	0V	0V	0V
20	+12V	+12V	+12V
21	0V	0V	0V
22	-12V	-12V	-12V
23	0V	0V	0V
24			
25	0V	0V	0V
26	+5V	+5V	+5V
27	0V	0V	0V
28	+5V	+5V	+5V
29	0V	0V	0V
30	+5V	+5V	+5V
31	0V	0V	0V
32	+5V	+5V	+5V

Connector 2

	a	b
1	0V	+ 5V
2	0V	+ 5V
3	0V	+ 5V
4	0V	+ 5V
5	0V	+ 5V
6	0V	+ 5V
7	0V	+ 5V
8	0V	+ 5V
9	0V	+ 5V
10	0V	+ 5V
11	0V	-12V
12	0V	+12V
13	///////	RSLN

Connector 3

	a	b
1	+12V*	0V
2	+12V*	0V
3	+12V*	0V
4	+12V*	0V
5	+12V*	///////

Connector 4

1	Mains
2	Mains

* Special 12V output line to supply CRT-Monitor

20.14.2 STRAP SETTING PSU WS-50

STRAP Nr.	FUNCTION	STRAP 1-2	2-3
1	Mains Supply -230V -115V	 N Y	 Y N

20.14.3 MODIFICATION HISTORY PSU WS-50 (5112 291 7561*)

LEVEL *		SI-NR. P2711-..
2	Introduction WS-50	007

20.15   ⸳ PMU-88 / PMU-88-1

20.15 PMU-88 / PMU-88-1

20.15.1 INTERCONNECTIONS PMU-88 / PMU-88-1
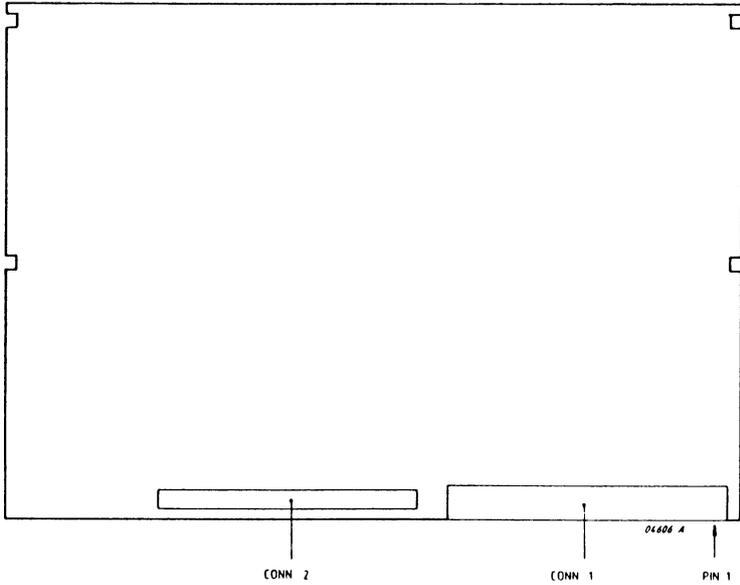
Connector 1, Pin Assignment (EMM-Bus), see Section 20.13.1.1, Connector 1-3

Pin Assignment (PME1)

Connector 2, PMU-88-1

	a	b
1	+12V	-12V
2	0V	0V
3	NMRCL	NMWCL
4	NXACKL	NHLDRQ
5	ADRL19	NBCLKO
6	NIORCL	NLBRQ
7	ADRL6	ADRL5
8	DATL6	DATL7
9	DATL4	DATL5
10	ADRL0	DATL3
11	DATL1	DATL2
12	NIOWCL	ADRL8
13	ADRL2	ADRL1
14	ADRL7	ADRL9
15	ADRL3	ADRL13
16	ADRL10	ADRL12
17	ADRL17	ADRL16
18	ADRL18	DATL0
19	NIOL	NAEN
20	NBACK	NBUSCON
21	NIRL4	ADRL14
22	NIRL3	ADRL15
23	NHLDAP	PCLK
24	NIRL1	CLK
25	NIRL5	ADRL11
26	NIRL2	ADRL4
27		NIRL6
28	NMR	NINTAL
29	RPON	NINTA
30		
31	+5V	+5V
32	0V	0V

Connector 2, PMU-88

	a	b
1	+12V	-12V
2	0V	0V
3	NMRCL	NMWCL
4	NXACKL	NHLDRQ
5	ADRL19	NBCLK
6	NIORCL	NLBRQ
7	ADRL6	ADRL5
8	DATL6	DATL7
9	DATL4	DATL5
10	ADRL0	DATL3
11	DATL1	DATL2
12	NIOWCL	ADRL8
13	ADRL2	ADRL1
14	ADRL7	ADRL9
15	ADRL3	ADRL13
16	ADRL10	ADRL12
17	ADRL17	ADRL16
18	ADRL18	DATL0
19	NIOL	NAEN
20	NBACK	NBUSCON
21		ADRL14
22	NIRL1	ADRL15
23	NHLDAP	PCLK
24	NIRL3	CLK
25	NIRL5	ADRL11
26	NIRL4	ADRL4
27		
28	NMR	NIRL2
29		
30		
31	+5V	+5V
32	0V	0V

CONNECTOR 2
TOP VIEW

06606A
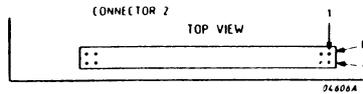
20.15.2 STRAP SETTING PMU-88 / PMU-88-1

20.15.2.1 STRAP SETTING PMU-88 (5122 291 7554*)

STRAP Nr.	FUNCTION			STRAP 1-2	2-3
1	PMU 88 PCB Number	(E4A6)		Y	
2	PMU 88 PCB Number	(E5A6)		Y	
3	PMU 88 PCB Number	(E6A6)		Y	
4	PMU 88 PCB Number	(E7A6)		Y	
5	IC C4FO - pin 23:	(C9F7)			
	- RAM: Write		(default)	Y	N
	- ROM: Address Line 11			N	Y
6	IC C4FO - pin 20:	(D3F7)			
	- RAM: Chip Select 2		(default)	N	Y
	- ROM: Chip Enable			Y	N
7	IC C4FO - pin 22:	(D7F7)			
	- RAM: Chip Select 1		(default)	Y	N
	- ROM: Memory Read			N	Y
8	Power Lithium Cell (W11)(D8GO)			Y	
9	Source Bus Clock	(IOF8)		Y	

20.15.2.2 STRAP SETTING PMU-88-1 (5122 291 7773*)

STRAP Nr.	FUNCTION			STRAP 1-2	2-3
1	PMU 88 PCB Number	(E4A6)		Y	
2	PMU 88 PCB Number	(E5A6)		Y	
3	PMU 88 PCB Number	(E6A6)		Y	
4	PMU 88 PCB Number	(E7A6)		Y	
5	IC C4FO - pin 23	(C9F7)			
	- RAM: Write		(default)	Y	N
	- ROM: Address Line 11			N	Y
6	IC C4FO - pin 20	(D3F7)			
	- RAM: Chip Select 2		(default)	N	Y
	- ROM: Chip Enable			Y	N
7	IC C4FO - pin 22	(D7F7)			
	- RAM: Chip Select 1		(default)	Y	N
	- ROM: Memory Read			N	Y
8	Power Lithium Cell	(D6G2)		Y	
9	Source Bus Clock	(H9F8)		Y	
10	Test Purpose (HOLD)	(GOF5)		Y	
11	Test Purpose (HLDA)	(GOF4)		Y	
12	Test Purpose (ALE)	(GOF3)		Y	
13	Interrupt Line 1	(F9D2)			
	- PME1		(default)	Y	N
	- System Bus			N	Y
14	Interrupt Line 3	(GOD2)			
	- PME1		(default)	Y	N
	- System Bus			N	Y
15	Interrupt Line 2	(G2D2)			
	- PME1		(default)	Y	N
	- System Bus			N	Y
16	Interrupt Line 5	(G1D2)			
	- PME1		(default)	Y	N
	- System Bus			N	Y
17	Interrupt Line 6	(I2A6)			
	- PME1			Y	N
	- System Bus		(default)	N	Y
18	Interrupt Line 4	(I1A6)			
	- PME1			Y	N
	- System Bus		(default)	N	Y

20.15.3 MODIFICATION HISTORY PMU-88 / PMU-88-1

20.15.3.1 MODIFICATION HISTORY PMU-88-16K (5122 291 7554*)

LEVEL *	ROM		PAL					SI-Nr. P2711-..
	C4D5	C4E3	D1C5	D2B5	D1B0	E4B5	E4A9	
2	20082	20092	20532	20072	20051	20141	20032	
3	20083	20093	20533	20073	"	"	"	
4	"	"	"	"	"	"	20033	5
5	20084	20094	"	"	"	"	"	6
6	20085	20095	"	"	"	"	"	6

20.15.3.2 MODIFICATION HISTORY PMU 88-1-16K (5122 281 7773*)

LEVEL *	ROM		PAL					SI-Nr. P2711-..
	C4D5	C4E3	D1C5	D2B5	D1B0	E4B5	E4A9	
1	20083	20093	20533	20073	20051	20141	20032	
2	"	"	"	"	"	"	20033	5
3	20084	20094	"	"	"	"	"	6
4	20085	20095	"	"	"	"	"	6

20.16   ʹ PME 1-1

20.16 PME1-1

20.16.1 INTERCONNECTIONS PME1-1

CONN 3   CONN 4   CONN 6

04601 A

CONNECTOR 3,4-6   1
b
a
04601A

CONN 1
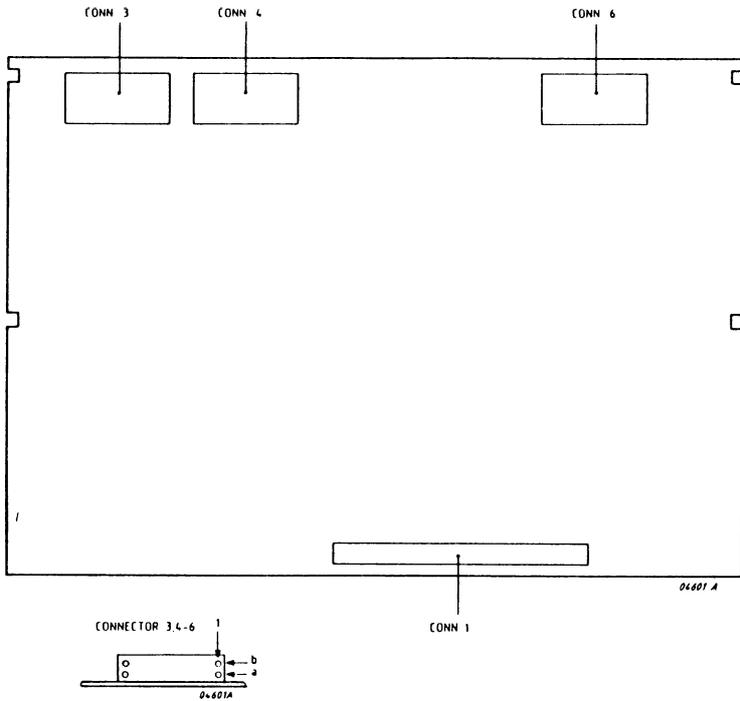
Connector 1 (Sandwich PMU-88)
Pin Assignment see section 20.15.1, Connector 2.

Connector 4, Pin Assignment
(System Cabinet)

	a	b
1		
2	R114	R103
3	TRxD	R104(TRDX)
4	R115	R105
5	R141	R106
6		R107
7	R108.2	R102
8	R140	R109
9	R125	TTXD
10	R111	TTXDR
11	R113	TTRXD
12	R142	TTRXDR
13	////////	

Connector 3, Pin Assignment
(Auxiliary V24)

	a	b
1		
2		S103
3		S104
4		
5		S106
6		*
7	S108.2	S102
8		
9		
10		
11		
12		
13	////////	

Connector 6. Pin Assignment
(Keyboard)

	a	b
1	KRXD	
2		
3	KTXD	
4		
5	KOUTR	
6		
7		
8	OV	
9		
10		
11		
12	+5V	
13	////////	

20.16.2 STRAP SETTING PME1-1
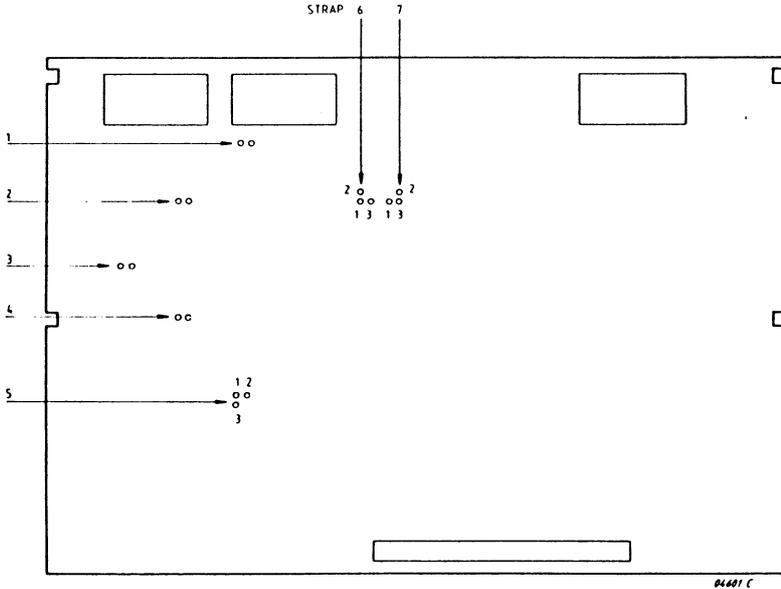
STRAP Nr.	FUNCTION		STRAP 1-2	1-3
1	CURRENT LOOP (C5F4)			
	- No Current Loop	(DEFAULT)	N	
	- Current Loop: TRANSMITTER CURRENT SOURCE		Y	
2	CURRENT LOOP (B7E6)			
	- No Current Loop	(DEFAULT)	N	
	- Current Loop: RECEIVER FLOATING		N	
3	CURRENT LOOP (B1D8)			
	- No Current Loop	(DEFAULT)	N	
	- Current Loop: RECEIVER CURRENT SOURCE		Y	
4	CURRENT LOOP (B8D2)			
	- No Current Loop	(DEFAULT)	N	
	- Current Loop: TRANSMITTER FLOATING		N	
5	CURRENT LOOP (C4C3)			
	- No Current Loop	(DEFAULT)	N	N
	- Current Loop:			
	- transmit data		N	Y
	- invert transmit data		Y	N
6	TRANSMIT CLOCK (E0E6)			
	- from modem		Y	N
	- internal	(DEFAULT)	N	Y
7	RECEIVE CLOCK (E4E6)			
	- from modem		Y	N
	- internal	(DEFAULT)	N	Y

20.16.3 MODIFICATION HISTORY PME1-1 (5122 991 7746*)

| LEVEL | ROM (pos) | | | | | SI-Nr. |
*	G6B5	H7B5	H1D0	H1D9	H1E8	P2711-..
1	20021	20011	20452			
2	"	"	"			
3	"	"	20453			
4	"	"	20454			003
5	"	"	20455			006

20.17   CRT-CO/CRT-CO 01

20.17 CRT-CO

20.17.1 INTERCONNECTIONS CRT-CO/CRT-CO 01
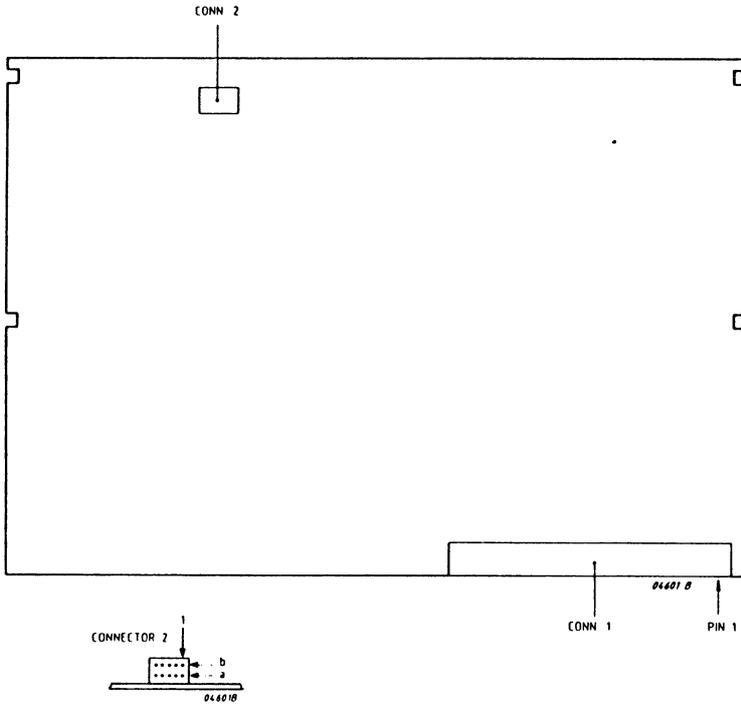
Connector 1 Pin Assignment (EMM-Bus), see section 20.13.1.1, Connector 1-3

Connector 2
(Display Control)

	a	b
1		
2		
3	VIDEOM	0V
4	VSYNC	0V
5	HSYNC	0V

20.17.2 STRAP SETTING CRT-CO/CRT-CO 01
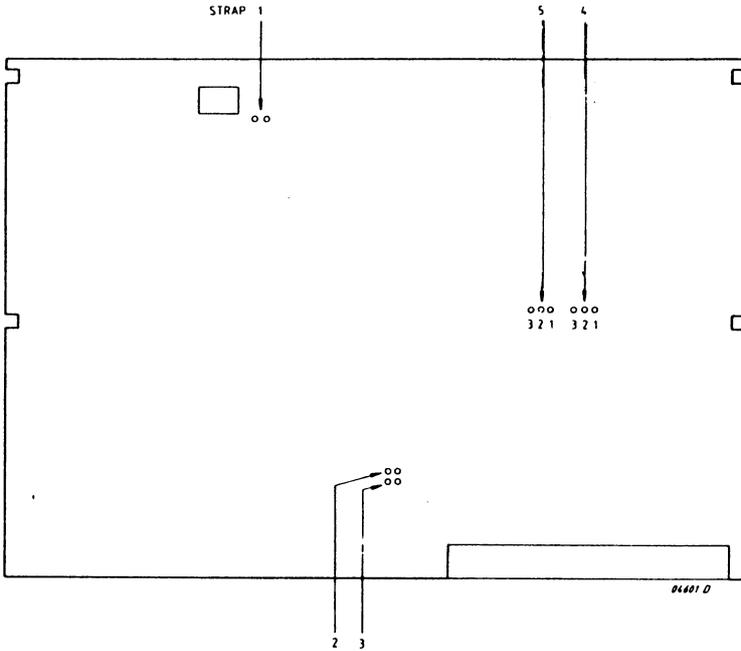
STRAP NO.	FUNCTION		STRAP 1-2	2-3
1	Dot Frequency	(D2F7) *	Y	
2	CRTC Character Clock	(E9B4)	Y	
3	CRTC Clock	(E8B3)	Y	
4	Character Generator Matrix 7x9 (default) (H3D3) - 2764 - 2732		Y N	N Y
5	Character Generator Matrix 5x7 (G8D9) - 2764 - 2732		Y N	N Y

* Note: on CRT-CO 01 (D2G2)

20.17.3 MODIFICATION HISTORY CRT-CO/CRT-CO 01

20.17.3.1 MODIFICATION HISTORY CRT-CO (5122 291 7579*)

| LEVEL | ROM | | | PAL | | | | SI-Nr. |
*	B2D5	G2D5	G2E3	B3A9	D9A3	G5C9	F2C9	P2711-..
3	19861	20841	-----	20361	19881	19871	19892	
4	19862	20631	-----	"	"	"	"	
5	19863	"	-----	20362	"	"	"	8
6	19864	20632*	-----	"	"	"	"	8

* Also PROM 20631 is allowed. Refer to S.I. P2711-008.

20.17.3.2 MODIFICATION HISTORY CRT-CO 01 (5112 291 8075*)

| LEVEL | ROM | | | PAL | | | | SI-Nr. |
*	B2D5	G2D5	G2E3	B3A9	D9A3	G5C9	F2C9	P2711-..
1	19864	20632	-----	20362	19881	19871	19892	9

20.18   MONITOR ELECTRONICS P2711

20.18 MONITOR ELECTRONICS P2711

20.18.1 INTERCONNECTIONS MONITOR ELECTRONICS P2711

PCB CRT ELECTRONICS

04605 A

PCB VIDEO AMPLIFIER

04605 B

Xe   Xp

CONN X1 (FROM CRT CO)

CONN Xe (TO VIDEO AMPLIFIER)

CONN X2 (FROM POWER SUPPLY)

CONN Xp (TO VIDEO AMPLIFIER)

CONN Xt (TO DEFLECTION COILS)

PCB

06602 F
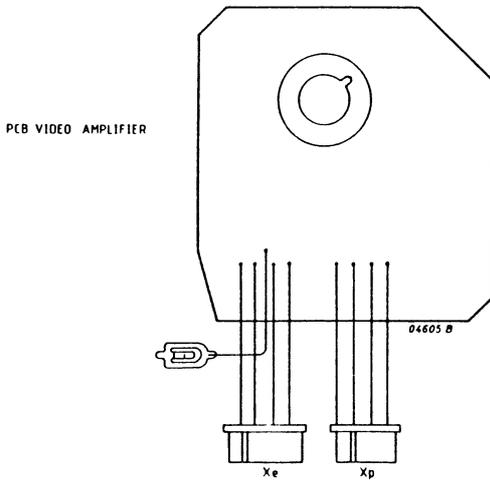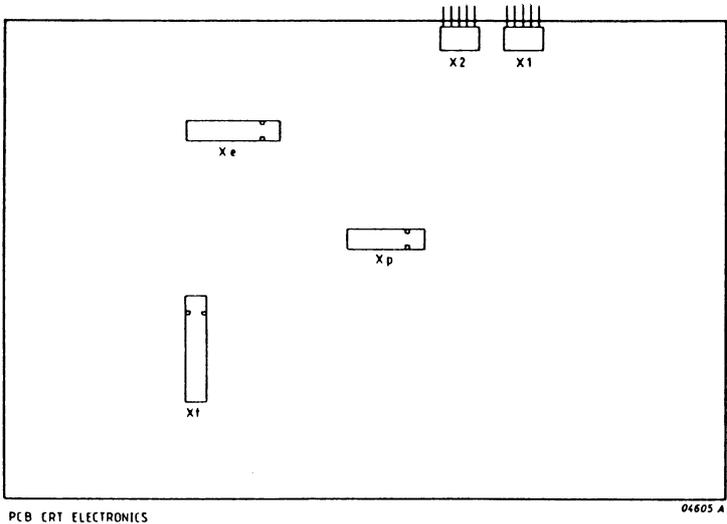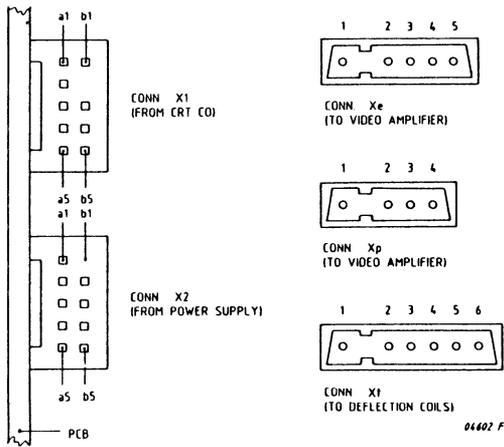
SIGNAL NOMENCLATURE	CONNECTOR	PIN Nr.
Horizontal Sync	X1	b-1
Vertical Sync	X1	b-2
Video	X1	b-3
Spare	X1	b-4
Dummy	X1	a-1
0V (Signal Ground)	X1	a-2
0V	X1	a-3
0V	X1	a-4
Spare	X1	a-5
Spare	X1	
+12V	X2	a1, a2, a3, a4, a5
0V (Signal Ground)	X2	b1, b2, b3, b4, b5
Dynamic Focus	Xe	1
0V (Signal Ground)	Xe	2
Video	Xe	3
Spare	Xe	4
Brightness	Xe	5
Focus	Xp	1
CRT heater	Xp	2
+64V	Xp	3
+12V	Xp	4
Vertical Deflection Return	Xt	3
Horizontal Deflection Return	Xt	4
Horizontal Deflection	Xt	5
Vertical Deflection	Xt	6
Brightness	Xd	1
Brightness Return	Xd	2

20.18.2 ADJUSTMENT MONITOR ELECTRONICS P2711

COMPONENT	FUNCTION
Pot. R2	Vertical Synchronization
Pot. R5	Vertical Height
Pot. R7	Vertical Linearity
Pot. R53	Horizontal Synchronization
Pot. R72	External Brightness Control
Pot. R73	Preset Brightness
Pot. R76	Focus
Var. Ind L51	Horizontal Amplitude
Var. Ind L52	Horizontal Linearity
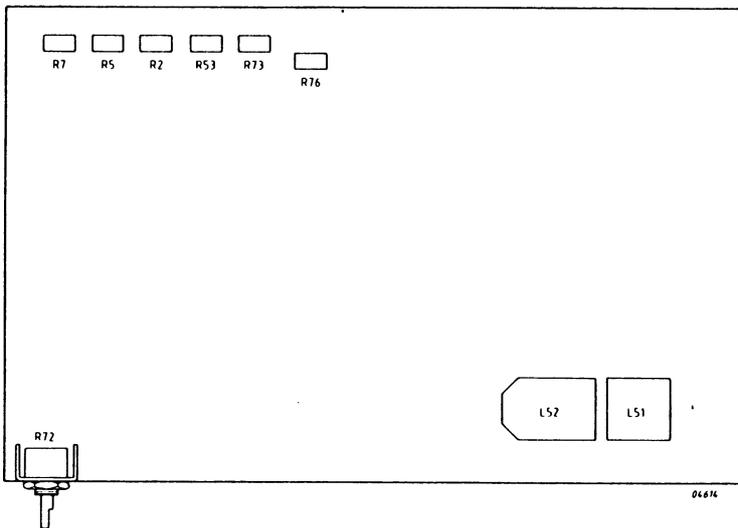
Adjustment Procedure:

- With the monitor connected in either a system or test configuration, switch on the respective supplies and allow a three minute warm-up period.
- Fill the screen with "test display" characters (the character "E" is suggested for this purpose. (E.g. televideo command "ESC $" in local mode).

- Set the EXTERNAL BRIGHTNESS potentiometer R72EXT, located at the bottom front right side of the monitor, to a mid-range position. By adjusting the PRESET BRIGHTNESS potentiometer R73 obtain optimum character contract without noticeable character blooming with raster lines extinguished.

- Adjust the FOCUS potentiometer R76 for optimum overall focus of the picture within the area between centre and upper left of the display.

- Adjust the HORIZONTAL AMPLITUDE variable inductor L51 using the short head of the trimming tool. The width of the picture response is shown in the figure below.
  The initial positioning of the picture is achieved with the HORIZONTAL SYNCHRONIZATION potentiometer R53.

- Set the VERTICAL HEIGHT potentiometer R5 for a picture height as shown in the figure. If necessary, adjust VERTICAL SYNCHRONIZATION potentiometer R2.

- Adjust the VERTICAL LINEARITY potentiometer R7 for optimum linearity of the picture.

- Adjust the HORIZONTAL LINEARITY variable inductor L52 using the short head of the trimming tool for optimum horizontal linearity.
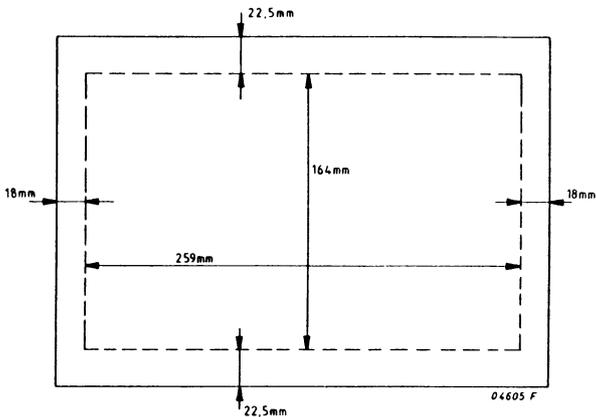
20.18.3 MODIFICATION HISTORY MONITOR ELECTRONICS P2711

SI NR. P2711-..
11
12

20.18.4 REPLACEMENT MONITOR ELECTRONICS P2711

20.18.4.1 REPLACEMENT CRT-ELECTRONICS PCB

Removal:

a. Remove cables from X1, X2.
b. Release the two board clips.
c. Remove cables from Xe, Xt, Xp and Xd.
d. Remove power supply and power supply cable.   .
e. Loosen the 4 backpanel screws and slide backpanel to the right-most position.
f. Remove the EHT-cable from the CRT.
g. Remove the CRT-electronics board.

Replacement:

a. Slide the PCB in its holders.
b. Connect the EHT-wire to the CRT-socket.
c. Re-align the backpanel.
d. Install power connection/power supply.
e. Fix the 4 backpanel screws.
f. Connect cable to Xd, Xp, Xt, and Xe.
g. Clip the PCB in its position.
h. Connect wiring to X1 and X2.

20.18.4.2 REPLACEMENT VIDEO-AMPLITUDE PCB

Removal:

a. Remove PCB from CRT-socket.
b. Remove cable from Ct, Cp.
c. Unclip black wire from CRT ground assembly.

Replacement:

Reverse sequence.

.

20.19   . PSU P2705

20.19 PSU P2705

20.19.1 INTERCONNECTIONS PSU P2705

20.19.1.1 PSU 3119 208 5912*
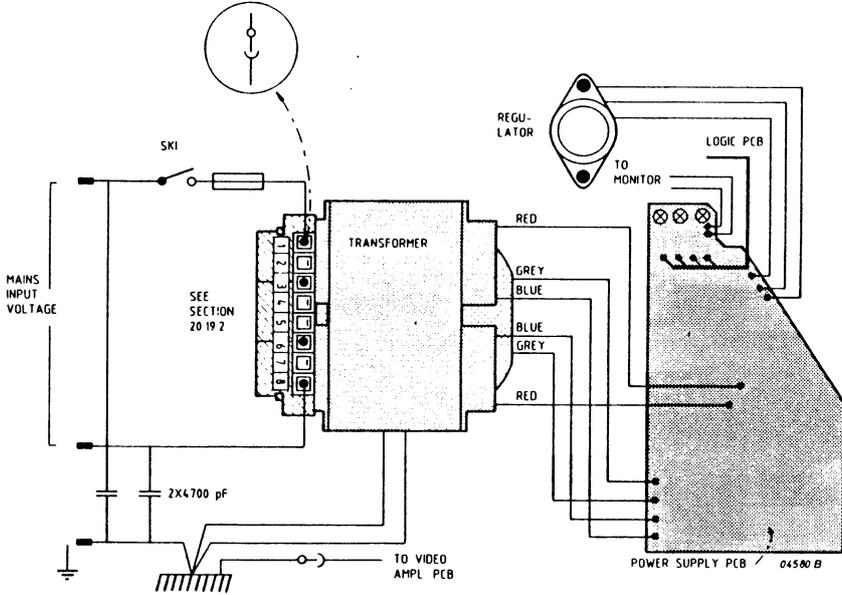
20.19.1.2 PSU 3119 208 5914*
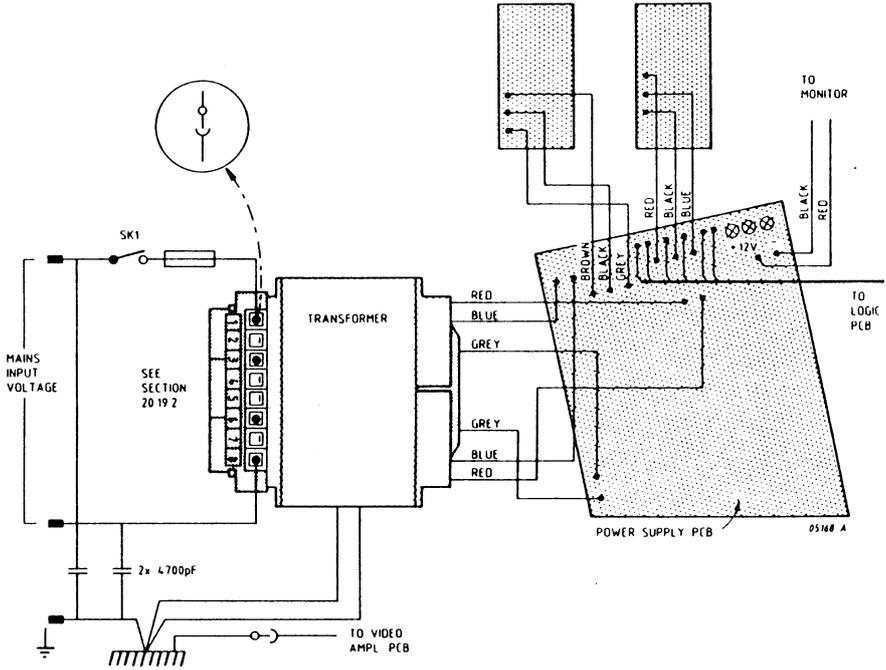
20.19.2 STRAP SETTINGS PSU P2705
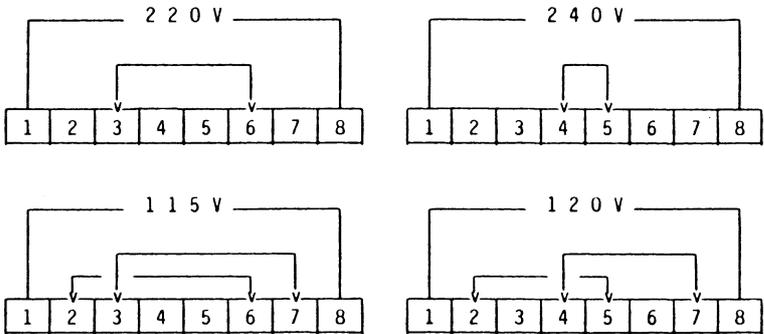
20.19.3 MODIFICATION HISTORY PSU P2705

T.B.S.L.

20.19.4 REPLACEMENT

T.B.S.L.

20.20   LOGIC PCB P2705

20.20 LOGIC PCB P2705

20.20.1 INTERCONNECTIONS LOGIC PCB P2705

20.20.1.1 INTERCONNECTIONS LOGIC PCB P2705 (3119 208 5597*) (WITH PUC)
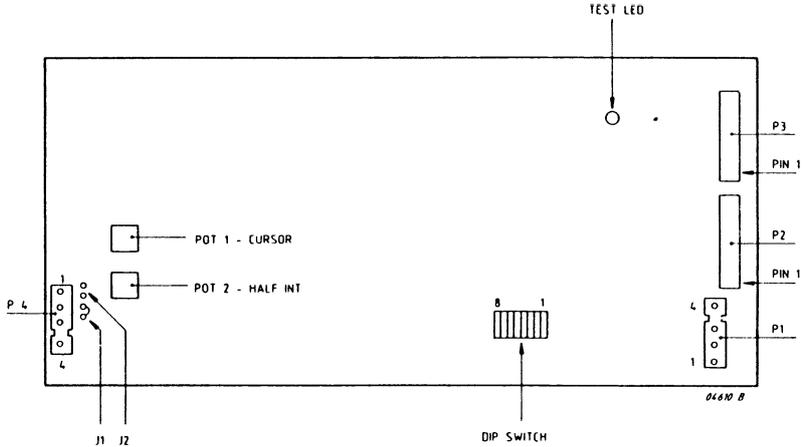
Connector P1
(Power)

1	GND
2	-12V
3	+ 5V
4	+12V

Connector P4
(Monitor Electronics)

1	HSYNC
2	VIDEO
3	VSYNC-N
4	GND
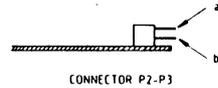
Connector P2
(Host I/F)

	a	b
-		
1		
2		TxDATA
3		RxDATA
4		RTS
5		CTS
6		DSR
7	DTR	GND
8		
9		
10		
11		
12		
13		
--		

Connector P3
(Keyboard I/F)

	a	b
-		
1	DATA OUT	
2		
3	DATA IN	
4		
5		
6		
7		
8	GND	
9		
10		
11		
12	+5V	
13		
--		

20.20.1.2 INTERCONNECTIONS LOGIC PCB (3119 208 5608*) (WITH CANNON)
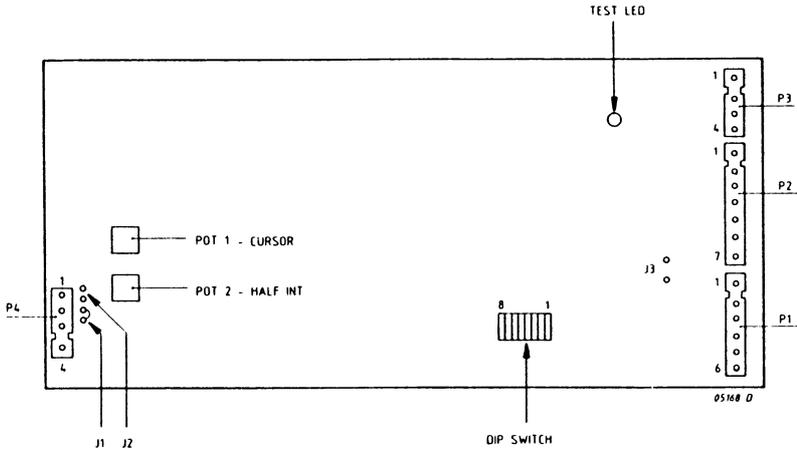
Connector P1
(Power)

1	+12V
2	+ 5V
3	+ 5V
4	-12V
5	0V
6	0V

Connector P2
(Host Interface)

1	DTR
2	0V
3	DSR
4	CTS
5	RTS
6	RxDATA
7	TxDATA

Connector P3
(Keyboard)

1	+5V
2	0V
3	DATA IN
4	DATA OUT

Connector P4
(Monitor Electronics)

1	HSYNC
2	VIDEO
3	VSYNC-N
4	0V

20.20.2 STRAP SETTINGS LOGIC PCB P2705 (Refer to figure in section 20.20.1)

J1	J2	FUNCTION
IN	OUT	Attribute bit set to 'half intensity'
OUT	IN	Attribute bit set to 'inverse video'

J3	FUNCTION
IN	Screen shut down timer disabled
OUT	Screen shut down timer enabled

Note: J3 is only available on logic PCB series 3119 208 5608*.

DIP SWITCH 1-3: SPEED OF HOST INTERFACE

SPEED (bps)	SWITCH	1	2	3	
300		--	--	--	
600		ON	--	--	
1200		--	ON	--	
2400		ON	ON	--	
4800		--	--	ON	
9600		ON	--	ON	DEFAULT
19200		--	ON	ON	
19200		ON	ON	ON	

DIP SWITCH   4: Reserved

DIP SWITCH 5-8: National Version

VERSION	SWITCH	5	6	7	8	
- - -						
GERMA		--	--	--	--	
U.K		ON	--	--	--	DEFAULT
F/B/L		--	ON	--	--	
SP		ON	ON	--	--	
ITALY		--	--	ON	--	
SWDN		ON	--	ON	--	
DK		--	ON	ON	--	
PORTU		ON	ON	ON	--	
SWI G			--	--	ON	
USA		ON	--	--	ON	
FINL			ON	--	ON	
NETH		ON	ON	--	ON	
NORW			--	ON	ON	
SWI F		ON	--	ON	ON	

20.20.3 ADJUSTMENTS LOGIC PCB P2705 (refer to figure in section 20.20.1).

POT1: CURSOR POSITION. Display a few test characters (e.g. E's) on the screen.
Set cursor on a character, and adjust POT1 till the character is in the
centre of the cursor block.

POT2: HALF INTENSITY LEVEL. Can only be used if straps are set to "Half
Intensity". For adjustment, first display half-intensity characters on
screen (TELEVIDEO Command 'ESC'), and then adjust POT2.

20.20.4 MODIFICATION HISTORY LOGIC PCB P2705

3119 208 5597*

LEVEL	ROM		SI-NR
*	IC3	IC4	P2705-..
1	51341	51351	
2	51342	51352	3

3119 208 5608*

LEVEL	ROM		SI-NR
*	IC3	IC4	P2705-..
1	51391	51401	
2	51392	51402	4

2.20.5 REPLACEMENT

T.b.s.l.

20.21   MONITOR ELECTRONICS P2705

Connector A

1	GND
2	+12V
3	
4	Control Grid G1
5	Video
6	Brightness

Connector B

1	+12V Power-On LED
2	0V
3	]
4	] Brightness Potentiometer
5	]

Connector C

1	Horizontal Deflection
2	Horizontal Deflection Return
3	Vertical Deflection Return
4	Vertical Deflection

Connector D

1	]
2	Contrast Potentiometer
3	]
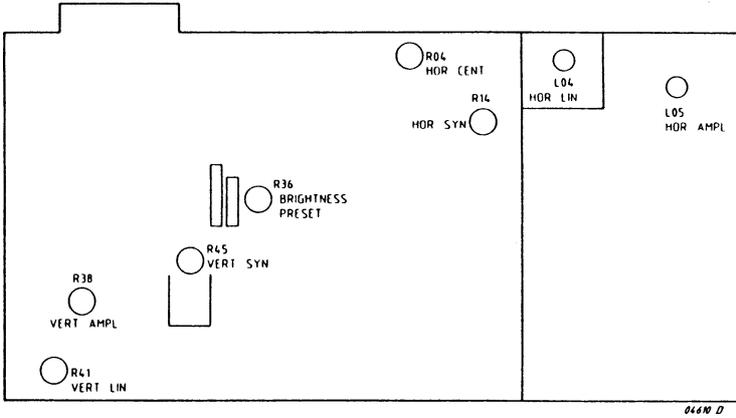
MONITOR ELECTRONICS PCB

COMPONENT	FUNCTION
Pot. R04	Horizontal Centering
Pot. R14	Horizontal Synchronization
Pot. R36	Brightness Preset
Pot. R38	Vertical Amplitude
Pot. R41	Vertical Linearity
Pot. R45	Vertical Synchronization
Var. Ind. L04	Horizontal Linearity
L05	Horizontal Amplitude
Pot. R83	Focus
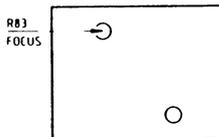
VIDEO AMPLIFIER PCB

ADJUSTMENT PROCEDURE

WARNING: Do not use metallic tools!

- With the monitor connected in either a system or test configuration, switch on the respective supplies and allow a three minute warm-up period.
- Fill the screen with "test display" character (the character "E" is suggested for this purpose; TELEVIDEO Command 'ESC' '~' '$').
- Set the EXTERNAL BRIGHTNESS potentiometer, located at the front right side of the monitor, to a mid-range position. By adjusting the PRESET BRIGHTNESS potentiometer R36 obtain optimum character contrast without noticeable character blooming with raster lines extinguished.
- Adjust the FOCUS potentiometer R83 for optimum overall focus.
- Adjust the HORIZONTAL AMPLITUDE by variable inductor L05.
  The initial positioning of the picture is achieved with the HORIZONTAL SYNCHRONIZATION potentiometer R14.
- Set the VERTICAL AMPLITUDE potentiometer R38 for a picture height as shown in the figure hereafter. If necessary, adjust VERTICAL SYNCHRONIZATION potentiometer R45.
- Adjust the VERTICAL LINEARITY potentiometer R41 for optimum linearity of the picture.
- Adjust the HORIZONTAL LINEARITY variable inductor L04 for optimum horizontal linearity.

04605 E
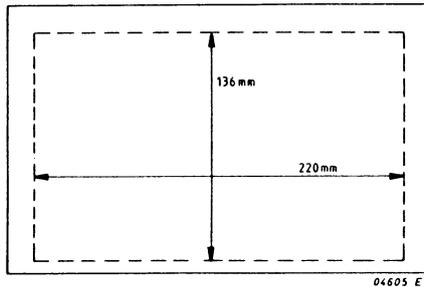
PICTURE SIZE

20.21.3 MODIFICATION HISTORY MONITOR ELECTRONICS P2705

T.B.S.L.

20.21.4 REPLACEMENT MONITOR ELECTRONICS P2705

T.B.S.L.

20.22　　　　　　　.　SAS-EX

20.22 SAS-EX

20.22.1 INTERCONNECTIONS SAS-EX
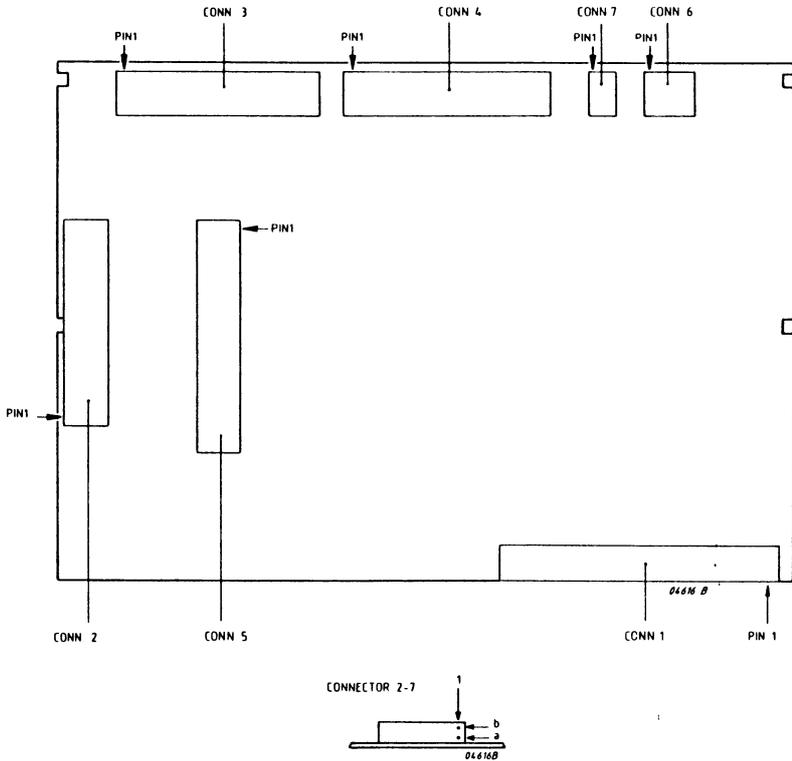
The Interface Cable to the next Extension Cabinet is connected to Connector 5.
To terminate the string of Extension Cabinets, a Terminator is put on Connector
of the last Extension Cabinet of that string.

Connector 1
(to Power Supply)

	a	b	c
1	+5V	+5V	+5V
2		+5V	0V
3	0V	0V	0V
4			
5			
6			
7			
8			
9			
10		RSLN	
11	0V	0V	0V
12			
13			
14			
15			
16			
17		RPON	
18	0V	0V	0V
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			

Connector 2
(Input SASI BUS)

	a	b
1	NDB0I	0V
2	NDB1I	0V
3	NDB2I	0V
4	NDB3I	0V
5	NDB4I	0V
6	NDB5I	0V
7	NDB6I	0V
8	NDB7I	0V
9	NU1I	0V
10	NU2I	0V
11	NU3I	0V
12	NU4I	0V
13	NU5I	0V
14	NU6I	0V
15	NU7I	0V
16	NATNI	0V
17	NSPAREI	0V
18	NBSYI	0V
19	NACKI	0V
20	NRSTI	0V
21	NMSGI	0V
22	NSELI	0V
23	NC/DI	0V
24	NREQI	0V
25	NI/OI	/////

Connector 3
(SASI BUS Controller)

	a	b
1	NDB0I	0V
2	NDB1I	0V
3	NDB2I	0V
4	NDB3I	0V
5	NDB4I	0V
6	NDB5I	0V
7	NDB6I	0V
8	NDB7I	0V
9	NU1I	0V
10	NU2I	0V
11	NU3I	0V
12	NU4I	0V
13	NU5I	0V
14	NU6I	0V
15	NU7I	0V
16	NATNI	0V
17	NSPAREI	0V
18	NBSYI	0V
19	NACKI	0V
20	NRSTI	0V
21	NMSGI	0V
22	NSELI	0V
23	NC/DI	0V
24	NREQI	0V
25	NI/OI	/////

INTERCONNECTIONS SAS-EX (CONT'D)

Connector 4
(SASI BUS FROM
 CONTROLLER)

	a	b
1	NDB00	0V
2	NDB10	0V
3	NDB20	0V
4	NDB30	0V
5	NDB40	0V
6	NDB50	0V
7	NDB60	0V
8	NDB70	0V
9	NU10	0V
10	NU20	0V
11	NU30	0V
12	NU40	0V
13	NU50	0V
14	NU60	0V
15	NU70	0V
16	NATN0	0V
17	NSPARE0	0V
18	NBSY0	0V
19	NACK0	0V
20	NRST0	0V
21	NMSG0	0V
22	NSEL0	0V
23	NC/D0	0V
24	NREQ0	0V
25	NI/O0	/////

Connector 5
(to next extension
 or terminator)

	a	b
1	+5V	+15V
2		+5V
3		DUMMY
4	NDB00	0V
5	NDB10	0V
6	NDB20	0V
7	NBD30	0V
8	NDB40	0V
9	NDB50	0V
10	NDB60	0V
11	NDB70	0V
12	NU10	0V
13	NU20	0V
14	NU30	0V
15	NU40	0V
16	NU50	0V
17	NU60	0V
18	NU70	0V
19	NATN0	0V
20	NSPARE0	0V
21	NBSY0	0V
22	NACK0	0V
23	NRST0	0V
24	NMSG0	0V
25	NSEL0	0V
26	NC/D0	0V
27	NREQ0	0V
28	NI/O0	/////

Connector 6
(not connected)

	a	b
1	0V	
2	0V	
3	0V	
4	0V	
5	0V	
6	0V	
7		
8	+5V	//////

Connector 7
(to LED)

	a	b
1	0V	PON
2	0V	PON
3	0V	//////

20.22.2 STRAP SETTING SAS-EX
Not applicable.

20.22.3 MODIFICATION HISTORY SAS-EX
T.B.S.L.

20.23   XEBEC S1401

20.23 XEBEC S1401

20.23.1 INTERCONNECTIONS XEBEC S1401

06609 A
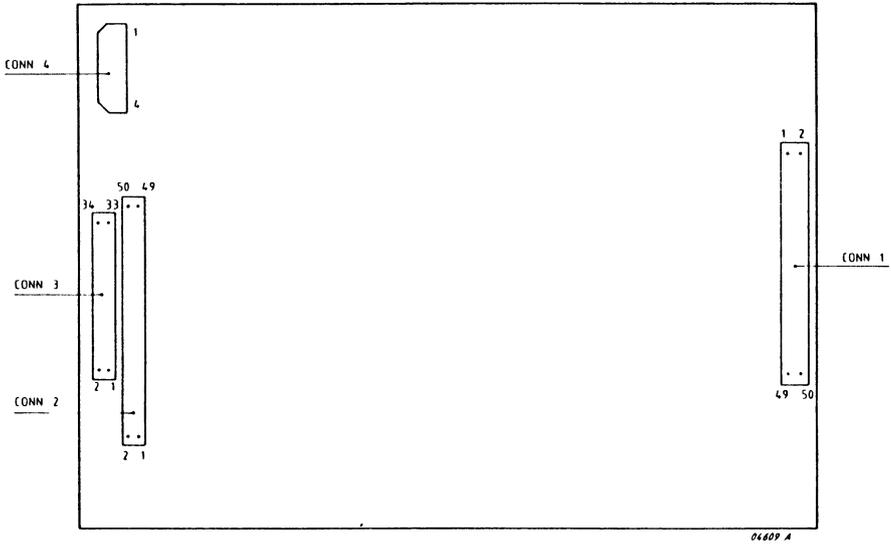
Connector 1
(to and from SAS EX)

1	0V	2	DATA0-
3	0V	4	DATA1-
5	0V	6	DATA2-
7	0V	8	DATA3-
9	0V	10	DATA4-
11	0V	12	DATA5-
13	0V	14	DATA6-
15	0V	16	DATA7-
17	0V	18	Spare
19	0V	20	Spare
21	0V	22	Spare
23	0V	24	Spare
25	0V	26	Spare
27	0V	28	Spare
29	0V	30	Spare
31	0V	32	Spare
33	0V	34	Spare
35	0V	36	BUSY-
37	0V	38	ACK-
39	0V	40	RST-
41	0V	42	MSG-
43	0V	44	SEL-
45	0V	46	C/D
47	0V	48	REQ-
49	0V	50	I/O

Connector 2
(8" Flex. Disc Drive)

1	0V	2	LOW CURRENT
3	0V	4	--
5	0V	6	--
7	0V	8	--
9	0V	10	TWO SIDED-
11	0V	12	DOOR OPENED-
13	0V	14	SIDE SELECT-
15	0V	16	IN USE-
17	0V	18	HEAD LOAD-
19	0V	20	INDEX-
21	0V	22	READY-
23	0V	24	--
25	0V	26	DRIVE SELECT 0-
27	0V	28	DRIVE SELECT 1-
29	0V	30	DRIVE SELECT 2-
31	0V	32	DRIVE SELECT 3-
33	0V	34	DIRECTION-
35	0V	36	STEP-
37	0V	38	WRITE DATA-
39	0V	40	WRITE ENABLE-
41	0V	42	TRACK 00-
43	0V	44	WRITE PROTECT
45	0V	46	READ DATA-
47	0V	48	--
49	0V	49	--

Connector 3 (Not Used)
5¼" Flex. Disc Drive

1	0V	2	--
3	0V	4	IN USE-
5	0V	6	DRIVE SELECT 3-
7	0V	8	INDEX-
9	0V	10	DRIVE SELECT 0-
11	0V	12	DRIVE SELECT 1-
13	0V	14	DRIVE SELECT 2-
15	0V	16	MOTOR ON-
17	0V	18	DIRECTION-
19	0V	20	STEP-
21	0V	22	WRITE DATA-
23	0V	24	WRITE ENABLE-
25	0V	26	TRACK 00-
27	0V	28	WRITE PROTECT-
29	0V	30	READ DATA-
31	0V	32	SIDE SELECT-
33	0V	34	--

Connector 4

1	+12 VDC
2	0 V
3	0 V
4	+ 5 VDC

20.23.2 STRAP SETTING XEBEC S1401
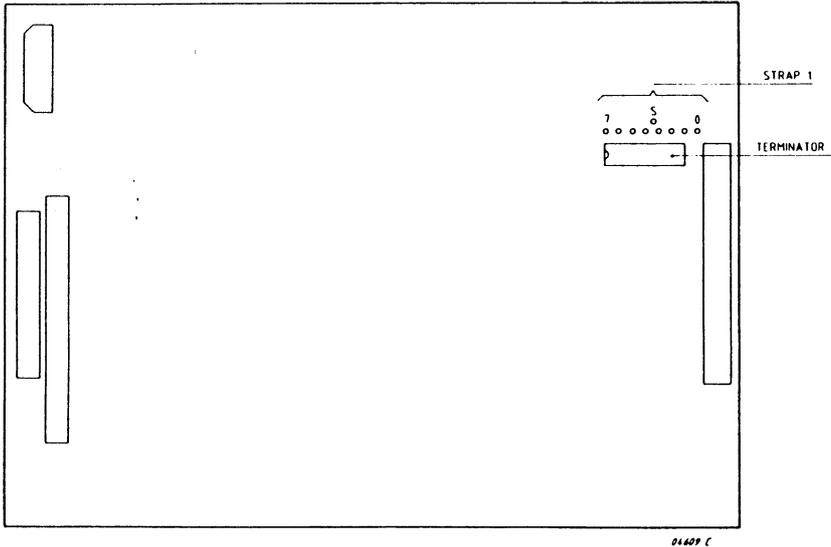
STRAP Nr.	FUNCTION	STRAP
1	SCSI Control Unit Address	S-2

TERMINATOR: <u>Not</u> Installed.

20.23.3 MODIFICATION HISTORY XEBEC S1401

T.B.S.L.

20.23.4 REPLACEMENT XEBEC S1401

Removal:

- Remove WS 120-E.
- Remove SAS-EX.
- Loosen the 4 screws of the mounting plate which hold the XEBEC S1401 PCB on the card guide holder.
- Pull out the PCB and mounting plate.
- Remove the 4 screws that fix the XEBEC PCB on the mounting plate. Mind the 4 isolating rings between XEBEC and mounting plate.

Replacement:

Opposite previous procedure.

20.24   FLEXIBLE DISC DRIVE 8" (CDC9406)

20.24 FLEXIBLE DISC DRIVE 8" (CDC9406)

20.24.1 INTERCONNECTIONS FLEXIBLE DISC DRIVE 8" (CDC9406)

RED

BLUE

04614

CONN 3   CONN 1   CONN 2
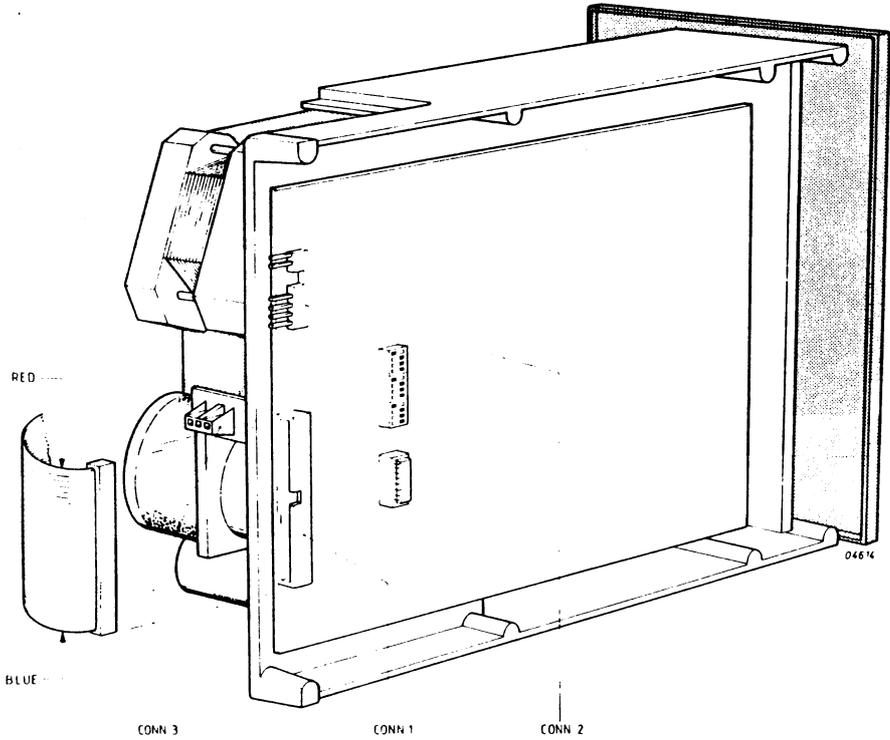
Connector 1, (XEBEC S1401)

PIN NUMBER	SIGNAL MNEMONIC	SIGNAL FUNCTION
01, 03, .. 49 (odd numbers)	0V	Ground
02	RDLN	Read Data/Clock Composite Signal
04	HLN	Head Load Signal
06	TRON	Track Zero Detect
08	INDN	Index Pulse
10	LWCN	Low Write Current Select
12	STEPN	] Each Pulse of STEPN moves the Head one Track
14	DIRN	] in the direction specified by DIRN
16	WEN	Write Enable Signal
18	WDN	Write Data Signal
20	SELON	Drive Unit 1 Ready Selection Signal
22	SEL1N	Drive Unit 2 Ready Selection Signal
24	SEL2N	Drive Unit 3 Ready Selection Signal
26	SEL3N	Drive Unit 4 Ready Selection Signal
28	RDYON	Drive Unit 1 Ready Signal
30	RDY1N	Drive Unit 2 Ready Signal
32	RDY2N	Drive Unit 3 Ready Signal
34	RDY3N	Drive Unit 4 Ready Signal
36	WRPN	Write Protected Disc
38,44,46	--	not used
40	DC40N	Head Select
42	DC42N	Lock Unit 1
48	DC48N	Lock Unit 2
50	DC50N	Disc Type

I / O CONN 1
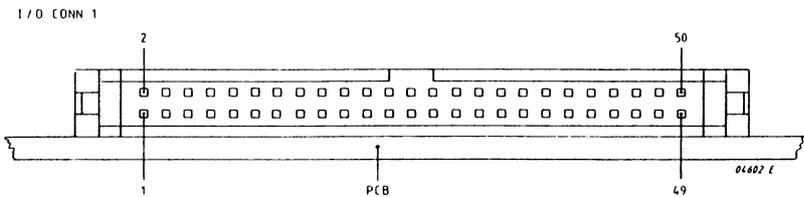
INTERCONNECTIONS FLEXIBLE DISC DRIVE 8" CDC9406 (CONT'D)

DC Power Connector 2

DC POWER CONN 2

PCB

04602 C
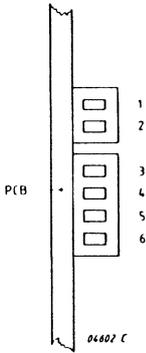
PIN	USE
1	- 5V (not used)
2	0V
3	+24V
4	GROUND
5	+ 5V
6	-12V (not used)

AC Power Connector 3

AC POWER CONN 3

1   2   3

04602 D
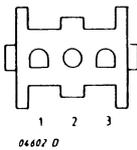
PIN	USE
1	LINE
2	GROUND
3	NEUTRAL
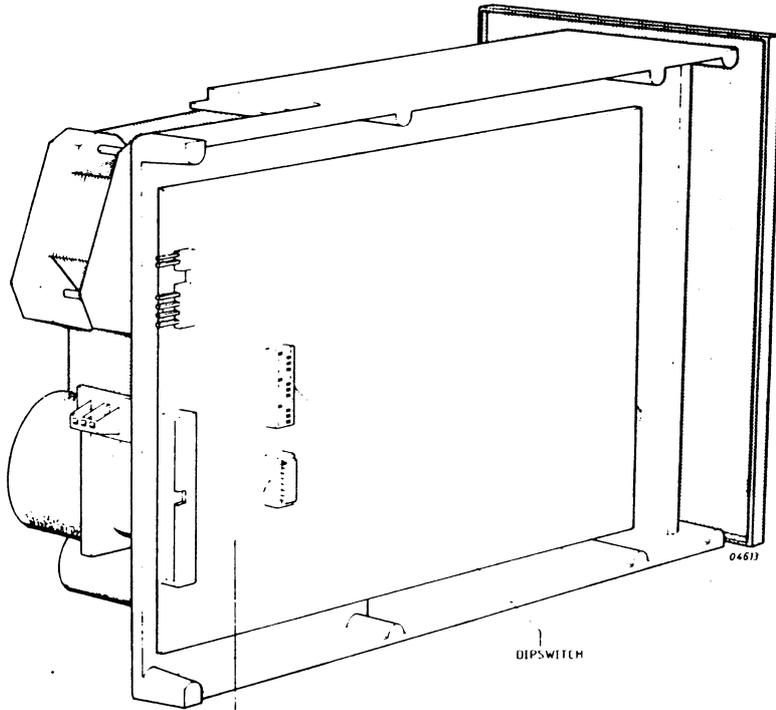
TERMINATOR
MUST BE IN

DIPSWITCH

04613

1	UNIT SELECT	1	Y
2	UNIT SELECT	2	N
3	UNIT SELECT	3	N
4	UNIT SELECT	4	N
5	READY	1	Y
6	READY	2	N
7	READY	3	N
8	READY	4	N
9	INT ERASE		Y
10	DOOR LOCK	1	N
11	DOOR LOCK	2	N
12	EXERASE		N

Note 1: Dependent on the type of dipswitches:

    - Press the switch on the wanted state
    - Shift the marker to the wanted state

Note 2: Open   = OFF = N
        Closed = ON = Y

20.24.3 MODIFICATION HISTORY FLEXIBLE DISC DRIVE 8" (CDC9406)

T.B.S.L.

20.24.4 REPLACEMENT FLEXIBLE DISC DRIVE 8" (CDC9406)

Removal:

- Remove power supply WS-120E.

- Remove SAS-EX PCB.

- Remove XEBEC S1401.

- Disconnect power cables to the backpanel.

- Unscrew and remove the 4 screws that fix the tripple card guide.

- Lift the tripple guide.

- Disconnect the power and interface cables to the flexible drive.

- Remove the final two screws.

- Lift the flexible disc drive including mounting bracket.

Replacement:

Opposite previous procedure.

20.25   . BACKPANEL P2621/P3013

20.25 BACKPANEL P2621/3013

20.25.1 INTERCONNECTIONS BACKPANEL P2621/3013

20.25.1.1 BACKPANEL P2621 PRE VERSIONS
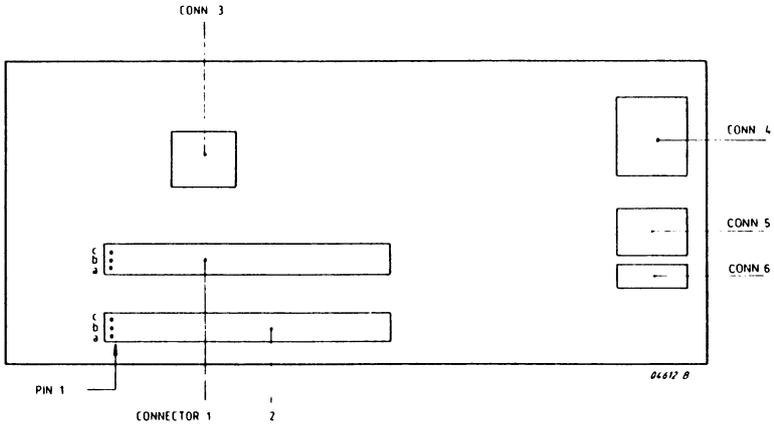
20.25.1.2 BACKPANEL P2621/P3013 (BP-T)
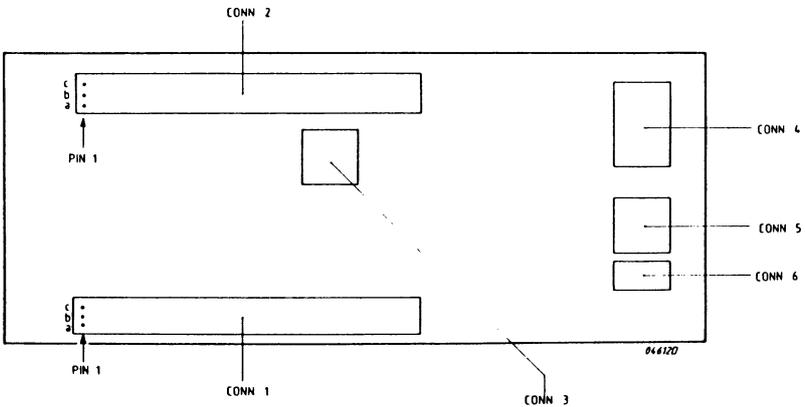
Connector 1
(Power Supply
WS 120-E)

	a	b	c
1		0V	
2	0V	0V	RPON
3		0V	PWFN
4	0V	0V	RSLN
5		0V	
6	0V	0V	
7		0V	
8	0V	0V	0V
9	0V	0V	0V
10			
11	0V	0V	0V
12			
13	0V	0V	0V
14	+24V	+24V	+24V
15	0V	0V	0V
16			
17	0V	0V	0V
18			
19	0V	0V	0V
20	+12V	+12V	+12V
21	0V	0V	0V
22	-12V	-12V	-12V
23	0V	0V	0V
24	- 5V	- 5V	- 5V
25	0V	0V	0V
26	+ 5V	+ 5V	+ 5V
27	0V	0V	0V
28	+ 5V	+ 5V	+ 5V
29	0V	0V	0V
30	+ 5V	+ 5V	+ 5V
31	0V	0V	0V
32	+ 5V	+ 5V	+ 5V

Connector 2
(SAS EX)

	a	b	c
1	+5V	+5V	+5V
2		+5V	0V
3	0V	0V	0V
4			
5			
6			
7			
8			
9			
10		RSLN	
11			
12	0V	0V	0V
13			
14			
15			
16			
17		RPON	
18	0V	0V	0V
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			

CONNECTOR 3
(P2621 TO XEBEC
P3013 NOT USED)

-12V   0V   -5V
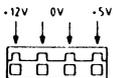
CONNECTOR 4
(P2621 TO 8 FLEXIBLE DISC
P3013 TO TAPCO AND TAPE DRIVE)

0V   -24V 0V   -5V 0V
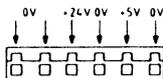
CONNECTOR 5
(P2621 TO RS RELAY
P3013 NOT USED)

0V -24V 0V -12V
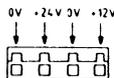
CONNECTOR 6
FAN - NOT USED

0V   -12V

046126

20.25.2 STRAP SETTING BACKPANEL P2621

None.

20.25.3 MODIFICATION HISTORY BACKPANEL P2621

T.B.S.L.

20.25.4 REPLACEMENT BACKPANEL P2621

Removal Backpanel:

a. Remove PSU-WS120-E, SAS-EX and XEBEC
b. Disconnect power cables to the backpanel
c. Remove the 4 screws that fix the backpanel

Replacement:

Opposite the previous procedure.

20.26   . RS RELAY PCB P2621

20.26 RS RELAY PCB P2621

20.26.1 CONNECTORS RS RELAY PCB P2621
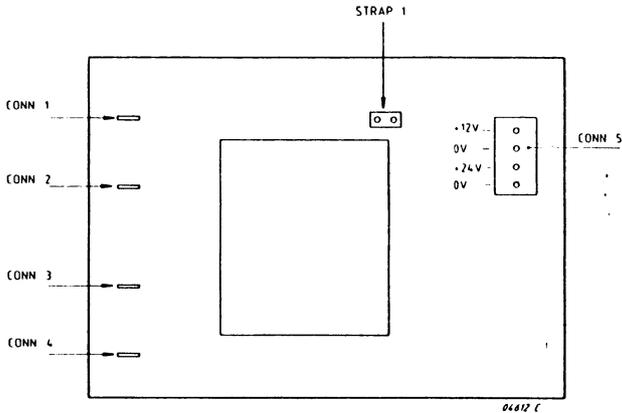
Connector 1 AND 2   From Voltage Adaption Transformer (mains)

Connector 3 AND 4   To Spindle Motor 8" Flexible Disc Drive

Connector 5   From Back Panel Disc

20.26.2 STRAP SETTING RS RELAY PCB P2621

STRAP Nr.	FUNCTION	STRAP 1-2
1	12V Supply: - P2621 with PSU WS 120/24* - P2621 with PSU WS 120E	Y N

* Note: PSU WS 120/24 is a modified PSU WS-120.
      12-NC PSU WS 120/24: 5112 291 77540
      This power supply is only to be used in P2621 cabinets.

20.26.3 MODIFICATION HISTORY RS RELAY PCB P2621

T.B.S.L.

20.26.4   REPLACEMENT RS RELAY PCB P2621

Removal:

- Remove grounding bracket.

- Disconnect connectors to RS relay PCB P2621.

- Remove 4 screws that fix the relay PCB to the cabinet. Mind the 4 spacers
  between the RS relay PCB and the ground plate.

Replacement:

Opposite previous procedure.

20.27   , PSU WS-120E

20.27 PSU WS-120E

20.27.1 INTERCONNECTIONS PSU WS-120E
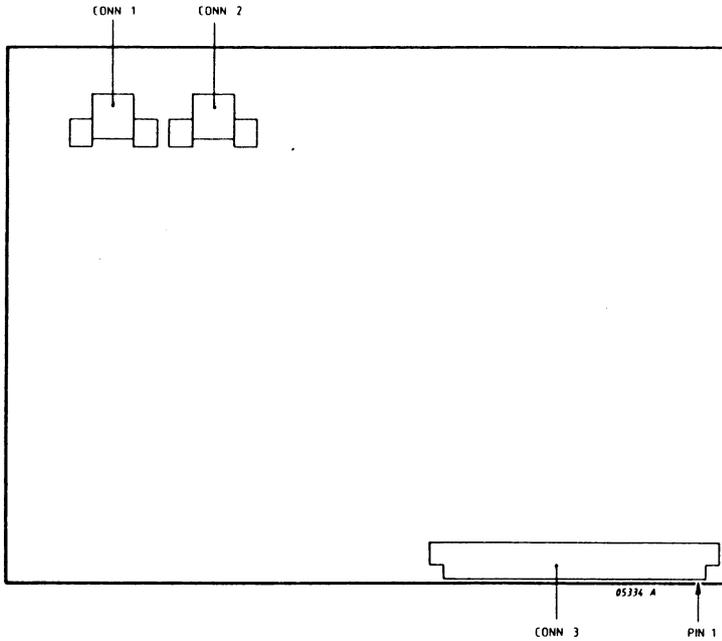
Connector 1 : Mains Supply from Filter Board

Connector 2 : Mains Supply to PSU M2 Board

Connector 3
(Backpanel)

	a	b	c
1		0V	
2	0V	0V	RPON
3		0V	PWFN
4	0V	0V	RSLN
5		0V	
6	0V	0V	
7		0V	
8	0V	0V	OV
9	0V	0V	0V
10			
11	0V	0V	0V
12			
13	0V	0V	0V
14	+24V	+24V	+24V
15	0V	0V	0V
16			
17	0V	0V	0V
18			
19	0V	0V	0V
20	+12V	+12V	+12V
21	0V	0V	0V
22	-12V	-12V	-12V
23	0V	0V	0V
24	- 5V	- 5V	-12V
25	0V	0V	0V
26	+ 5V	+ 5V	+ 5V
27	0V	0V	0V
28	+ 5V	+ 5V	+ 5V
29	0V	0V	0V
30	+ 5V	+ 5V	+ 5V
31	0V	OV	0V
32	+ 5V	+ 5V	+ 5V

20.27.2 STRAP SETTING PSU WS-120E
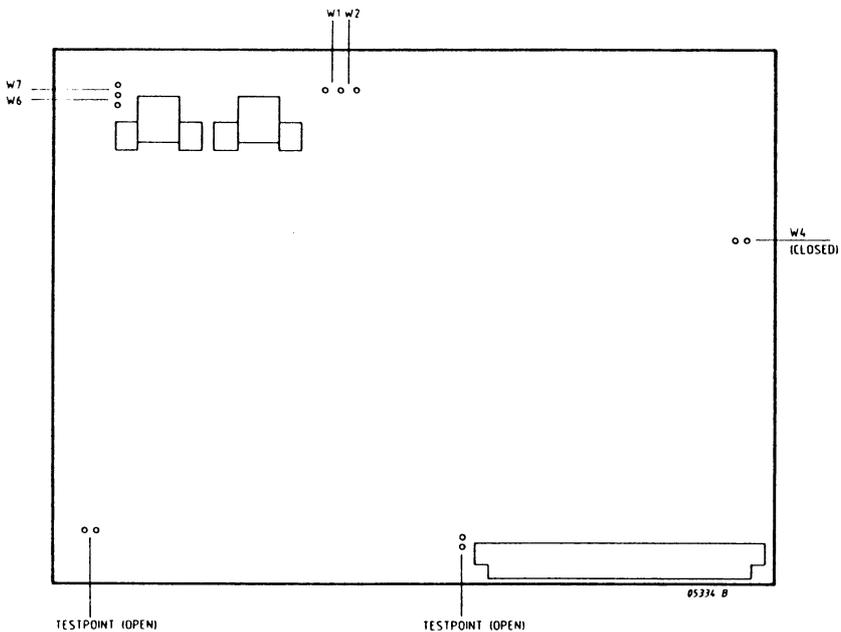
STRAP Nr.	FUNCTION	STRAP W1	W2
W1/W2	Mains Supply - 115V - 230V	 Y N	 N Y

STRAP Nr.	FUNCTION	STRAP W4
W4	Test Purpose (default)	Y

STRAP Nr.	FUNCTION	STRAP W6	W7
W6/W7	Power On - Remote (default) - Local	 N Y	 Y N

20.28   .CABLE TYPES

20.28 CABLE TYPES

20.28.1 CABLE TYPE 1: WORKSTATION/CHANNEL B

SYSTEM CABINET   TYPE 1   SEEN FROM WIRING SIDE   WORKSTATION

PCB

13

YELLOW
PINK
GREY
WHITE

GREEN
BROWN
1

a   b

PCB

13

PINK
YELLOW

GREY
WHITE

GREEN
BROWN
1

a   b

05189A

		DCE			DTE	
(b7)	PINK	102	L		102	(b7)
(b2)	BROWN	103	TxD		103	(b2)
(b3)	GREEN	104	RxD		104	(b3)
(b5)	WHITE	106	CTS		106	(b5)
(b6)	GREY	107	DSR		107	(b6)
(a7)	YELLOW	108	DTR		108	(a7)

5M   8702 300 00004
15M   8702 300 00011
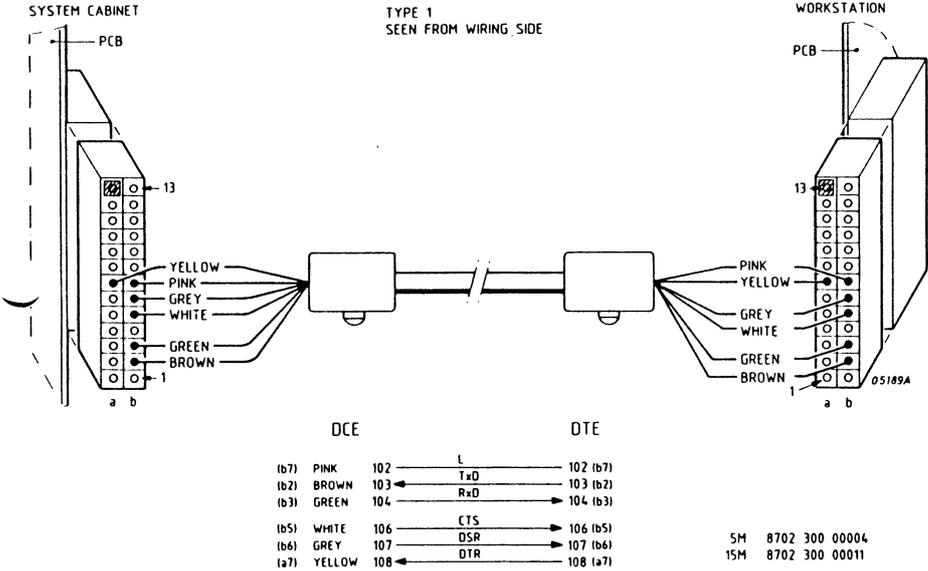
20.28.2 CABLE TYPE 2: PRINTER/CHANNEL B

SYSTEM CABINET   TYPE 2   SEEN FROM WIRING SIDE

PCB

13

YELLOW
PINK
GREY
WHITE

GREEN
BROWN
1

a   b

PRINTER

1   14

SHIELD
BROWN
GREEN

WHITE
GREY
PINK
YELLOW

13   25

051898

		DCE			DTE	
		PUC	SHIELD		101	(1)
			L			
(b7)	PINK	102			102	(7)
(b2)	BROWN	103	TxD		103	(2)
(b3)	GREEN	104	RxD		104	(3)
(b5)	WHITE	106	CTS		106	(5)
(b6)	GREY	107	DSR		107	(6)
(a7)	YELLOW	108	DTR		108	(20)

5M   8702 300 00003
15M   8702 300 00015
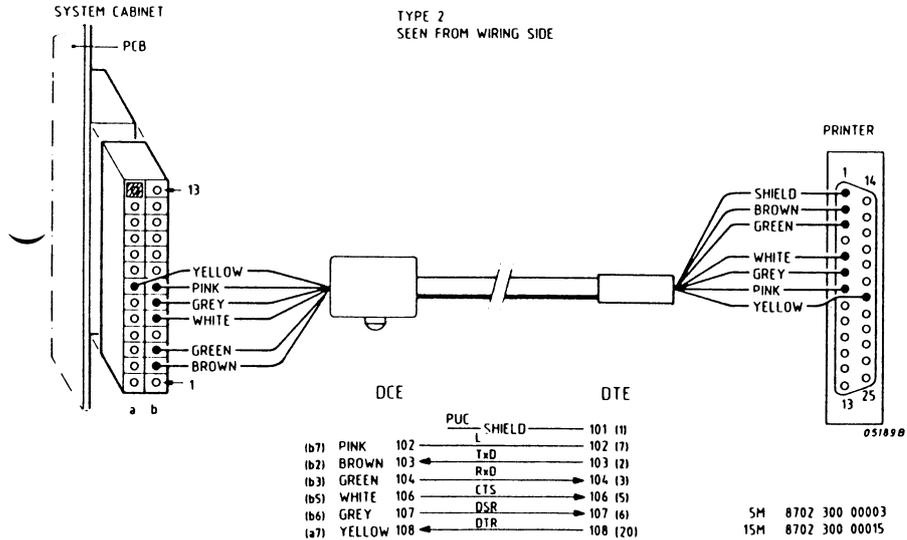
20.28.3 CABLE TYPE 3: MODEM/CHANNEL A

SYSTEM CABINET

PCB

TYPE 3
SEEN FROM WIRING SIDE

MODEM

WHITE-BLUE
BROWN-RED
WHITE-PINK
BLACK
GREY-PINK
BROWN-BLUE
WHITE-GREEN
YELLOW-BROWN
GREY-BROWN
WHITE
YELLOW
PINK
RED
GREY
BROWN
WHITE-GREY

13

1

a b

DTE

DCE

WHITE-GREY
BROWN
GREY
SHIELD
RED
PINK
YELLOW
WHITE
GREY-BROWN
YELLOW-BROWN
WHITE-GREEN
BROWN-BLUE
GREY-PINK
BLACK
WHITE-PINK
BROWN-RED
WHITE-BLUE

1
14

25
13

05189C

ALL OTHER PINS ALSO 11
CONNECTED BUT NOT REQUIRED

5M   8702 300 00008

					SHIELD	101	(1)
(b7)	YELLOW-BROWN	102		L	102	(7)
(b2)	RED	103		TxD	103	(2)
(b3)	PINK	104	◄	RxD	104	(3)
(b4)	YELLOW	105		RTS	105	(4)
(b5)	WHITE	106	◄	CTS	106	(5)
(b6)	GREY-BROWN	107	◄	DSR	107	(6)
(a7)	BROWN-BLUE	108		DTR	108	(20)
(b7)	WHITE-GREEN	109	◄	DCD	109	(8)
(a10)	WHITE-PINK	111		DRS	111	(23)
(a11)	BROWN-RED	113		TSET	113	(24)
(a2)	GREEN	114	◄	TSET	114	(15)
(a4)	BROWN	115	◄	RSET	115	(17)
(a9)	BLACK	125	◄	CIN	125	(22)
(a8)	GREY-PINK	140		RL	140	(21)
(a5)	WHITE-GREY	141		LL	141	(18)
(a12)	WHITE-BLUE	142	◄	TI	142	(25)

20.28.4 CABLE TYPE 6: PRINTER/CHANNEL A

SYSTEM CABINET

TYPE 6
SEEN FROM WIRING SIDE

PRINTER

13

PINK
WHITE
YELLOW

BROWN
GREEN

1

a b

DTE

DTE

SHIELD
BROWN
GREEN

WHITE
YELLOW
PINK

1
14

13
25

05189D

				SHIELD	101	(1)
(b7)	PINK	102		102	(7)
(b2)	GREEN	103	TxD	103	(2)
(b3)	BROWN	104	◄ RxD	104	(3)
(b5)	YELLOW	106	◄ CTS	106	(5)
(b6)		107	DSR	107	(6)
(a7)	WHITE	108	DTR	108	(20)
(b8)		109	DCD	109	(8)

5M   8702 300 00013
15M 8702 300 00014
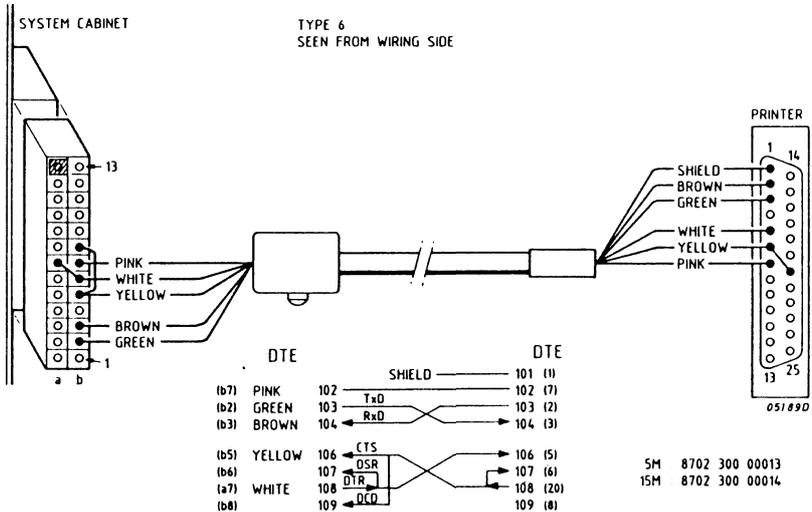
20.28.5 CABLE TYPE 5: P3000/TTA


```
P3000 SIDE                                                    TTA SIDE

         13                                                        13
                                              GREY
      PINK

      YELLOW                                  YELLOW
      GREY                                    PINK
      GREEN                                   BROWN
      BROWN                                   GREEN            05350 B
         1                                                         1
    a   b                                                     a   b
              DTE                    DTE
```

YELLOW	(b7)	102	GND	102	(b7)	
BROWN	(b2)	103	TxD	103	(b2)	
GREEN	(b3)	104	RxD	104	(b3)	
	(b4)	105	RTS	105	(b4)	
	(b5)	106	CTS	106	(b5)	
	(b6)	107	DSR	107	(b6)	
	(a7)	108	DTR	108	(a7)	
	(b8)	109	DCD	109	(b8)	
PINK	(a11)	113	TxC(H)	113	(a11)	
GREY	(a2)	114	TxC	114	(a2)	
	(a4)	115	RxC	115	(a4)	

```
5M   8700 300 00019
15M  8700 300 00021
```

20.28.6 CABLE TYPE 10: TTA/X21 MODEM


```
TTA SIDE                                           MODEM SIDE

   BROWN-GREEN                              BROWN
   VIOLET                                   RED-BLUE
   PINK                                     YELLOW
   GREY                                     BLACK       9
   WHITE-GREEN                              GREEN
   BLUE                                     GREY-PINK
   WHITE                                    WHITE
   GREY-PINK                                BLUE
   GREEN                                    WHITE-GREEN
   YELLOW                                   GREY
   RED-BLUE                                 PINK
   BROWN                                    VIOLET
   RED                                      BROWN-GREEN
 a   b                                      RED         05350 D
              DTE                    DCE
```

b2	GREEN	T(A)	2	
a1	YELLOW	T(B)	9	
b3	GREY-PINK	C(A)	3	
a2	RED-BLUE	C(B)	10	
b4	WHITE	R(A)	4	
a3	BROWN	R(B)	11	
b5	BLUE	I(A)	5	
a4	RED	I(B)	12	
b6	WHITE-GREEN	S(A)	6	
a5	BROWN-GREEN	S(B)	13	
b7	GREY	B(A)	7	
a6	VIOLET	B(B)	14	
b8	PINK	GROUND	8	
		SHIELD	1	

```
15M   8700 300 00017
```

DTE

DCE

(1)		101	SHIELD	101	(1)	
(7)	YELLOW-BROWN	102	L	102	(7)	
(2)	RED	103	T×D	103	(2)	
(3)	PINK	104	R×D	104	(3)	
(4)	YELLOW	105	RTS	105	(4)	
(5)	WHITE	106	CTS	106	(5)	
(6)	GREY-BROWN	107	DSR	107	(6)	
(20)	BROWN-BLUE	108	DTR	108	(20)	
(8)	WHITE-GREEN	109	DCD	109	(8)	
(23)	WHITE-PINK	111	DRS	111	(23)	
(24)	BROWN-RED	113	TSET	113	(24)	
(15)	GREEN	114	TSET	114	(15)	
(17)	BROWN	115	RSET	115	(17)	
(22)	BLACK	125	CIN	125	(22)	
(21)	GREY-PINK	140	RL	140	(21)	
(18)	WHITE-GREY	141	LL	141	(18)	
(25)	WHITE-BLUE	142	TI	142	(25)	

ISM 8709 100 49997

20.28.8 DISC CABLE TYPE 1

All pins connected 1:1 as follows:

PIN		COLOR	PIN		COLOR
b 1	-	white *	a 1	-	brown *
b 2	-	green *	a 2	-	yellow *
b 3	-	grey *	a 3	-	pink
b 4	-	blue/black	a 4	-	red/black
b 5	-	grey/black	a 5	-	pink/black
b 6	-	grey/red	a 6	-	pink/red
b 7	-	grey/blue	a 7	-	pink/blue
b 8	-	green/black	a 8	-	yellow/black
b 9	-	green/red	a 9	-	yellow/red
b10	-	green/blue	a10	-	yellow/blue
b11	-	pink/green	a11	-	yellow/pink
b12	-	grey/green	a12	-	yellow/grey
b13	-	white/black	a13	-	brown/black
b14	-	white/red	a14	-	brown/red
b15	-	white/blue	a15	-	brown/blue
b16	-	white/pink	a16	-	pink/brown
b17	-	white/grey	a17	-	grey/brown
b18	-	white/yellow	a18	-	yellow/brown
b19	-	white/green	a19	-	brown/green
b20	-	grey/pink	a20	-	red/blue
b21	-	black	a21	-	violet
b22	-	blue	a22	-	red
b23	-	grey	a23	-	pink
b24	-	green	a24	-	yellow
b25	-	dummy	a25	-	brown

* Wire in inner cable.

20.29   FIXED DISC DRIVE RODIME (RO201/RO202)

20.29 FIXED DISC DRIVE RODIME (RO201/RO202)

20.29.1 INTERCONNECTIONS FXD RODIME

20.29.1.1 EXTERNAL

Connector 3,
(Backpanel)

1	+12V
2	0V
3	0V
4	+ 5V

Connector 1
(XEBEC Controller)

PIN	FUNCTION	PIN	FUNCTION
1	OV	2	Reduced Write Current
3	OV	4	Head Select 2^2
5	OV	6	Write Gate
7	OV	8	Seek Complete
9	OV	10	Track 00
11	OV	12	Write Fault
13	OV	14	Head Select 2^0
15	OV	16	Reserved
17	OV	18	Head Select 2^1
19	OV	20	Index
21	OV	22	Ready
23	OV	24	Step
25	OV	26	Drive Select 1
27	OV	28	Drive Select 2
29	OV	30	Drive Select 3
31	OV	32	Drive Select 4
33	OV	34	Direction In

Connector 2

PIN	FUNCTION	PIN	FUNCTION
1	Drive Select	2	OV
3	Reserved	4	OV
5	Spare	6	OV
7	Reserved	8	OV
9	Spare	10	Spare
11	OV	12	OV
13	MFM Write Data +	14	MFM Write Data -
15	OV	16	OV
17	MFM Read Data +	18	MFM Read Data -
19	OV	20	OV

20.29.1.2 INTERNAL
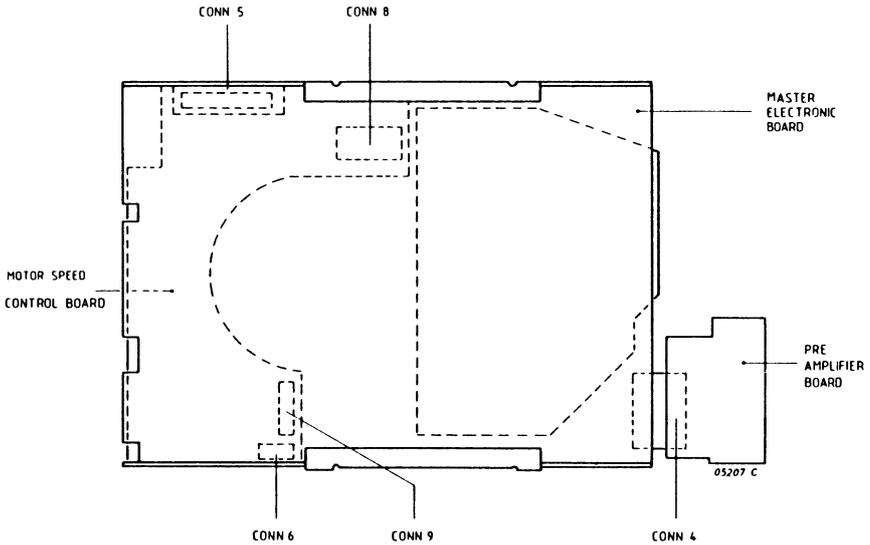
Connector 4, to read/write heads

Connector 5, to motor speed control board

Connector 6, to brake

Connector 8, to stepper motor and sensor

Connector 9, to spindle motor

20.29.2 STRAP SETTING FXD RODIME

20.29.2.1 MASTER ELECTRONIC BOARD
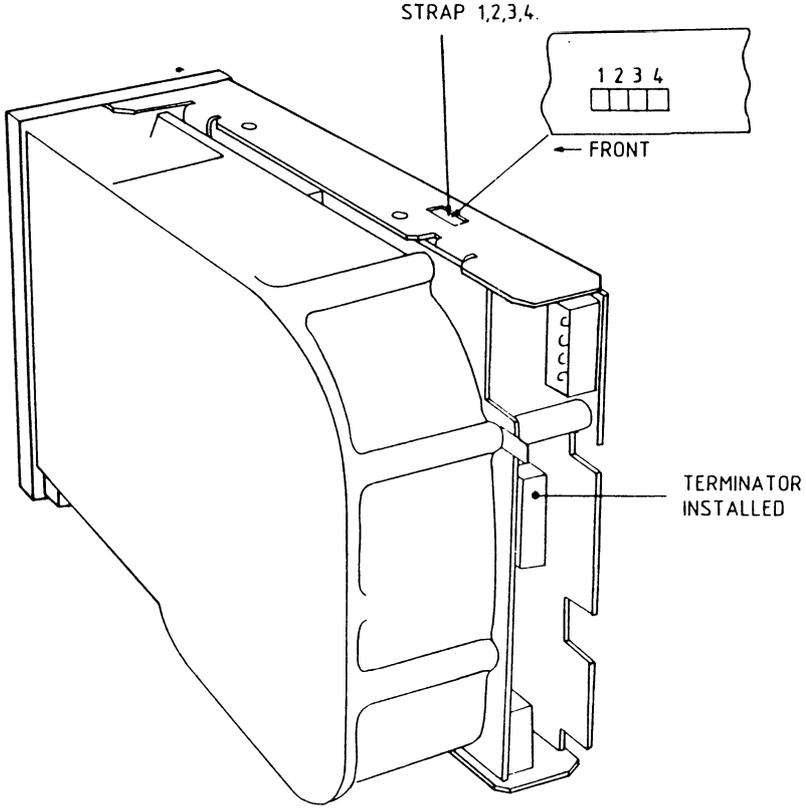
STRAP Nr.	FUNCTION	P3500	P3012	P3800-DRIVE #1	#2
1	Unit Select 1	Y	Y	Y	N
2	Unit Select 2	D	D	N	Y
3	Unit Select 3	D	D	D	D
4	Unit Select 4	D	D	D	D

Note: D = don't care

B A

NOT COMP SIDE

05205 B
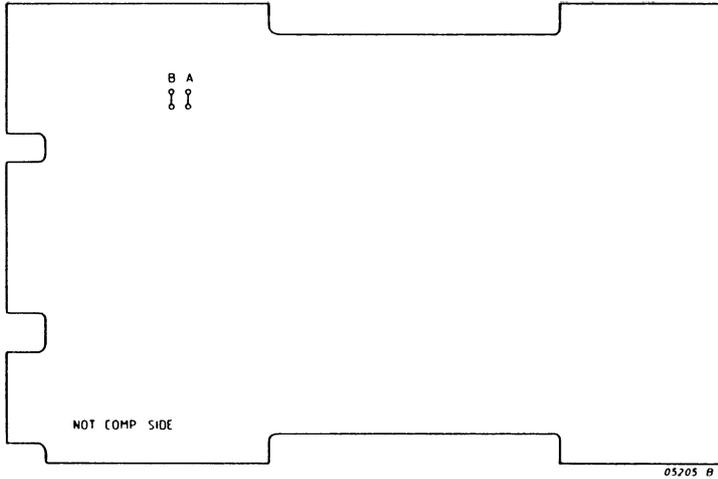
STRAP	FUNCTION
A	Step Rate between 3,1 - 8 ms
B	Fault on Loss of Index Calibration Tracks

20.29.2.2 MOTOR SPEED CONTROL PCB

05206 C
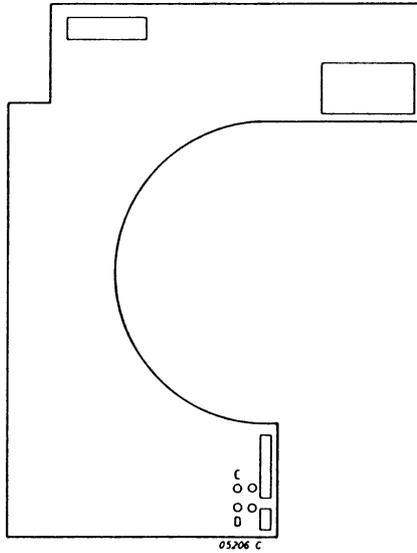
FUNCTION	STRAP	
	D	C
Select First Hall Element	Y	N
Select Spare Hall Element	N	Y

Note: One Hall element is spare. This element can be selected if the other is
      defect.

20.29.3 MODIFICATION HISTORY FXD RODIME

Not applicable.

20.29.4 REPLACEMENTS FXD RODIME

Caution:

- The drive must not be subjected to mechanical shock in excess of 20 g in any axis, otherwise permanent damage may occur.
- Do not rotate the stepper motor or the spindle motor. Heads or discs can be damaged.
- It is not allowed to open the sealed area so do not remove any screw that secures the disc cover.

20.29.4.1 REPLACEMENT FIXED DISC DRIVE

Removal:

- Disconnect the interface cable on the XEBEC.
- Loosen screw A, B. Remove screws C and D.
- Slide out the Fixed Disc, disconnect the power cable and remove the Fixed Disc.
- Remove the XEBEC and the parts belonging to the chassis.

Replacement:

Opposite the previous procedure.
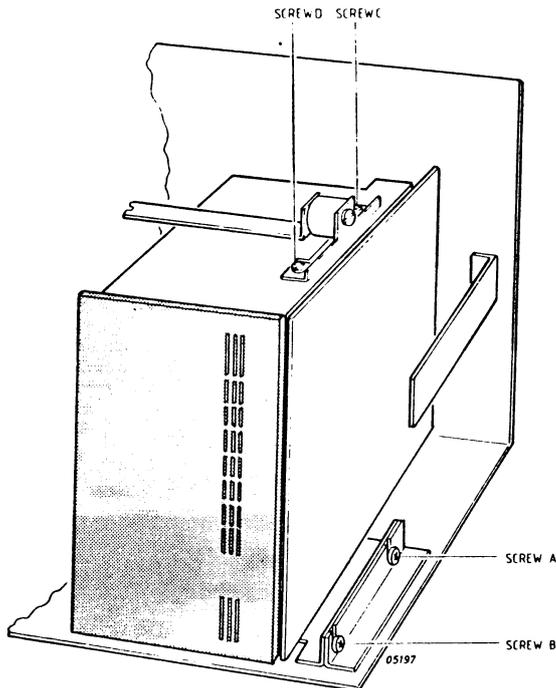
20.29.4.2 REPLACEMENT MASTER PCB

Removal:

- Remove fixed disc drive.
- Remove screws, A, B, C, D, E and F.
- Take care of metal PCB separator under screw E.
- Lift the PCB carefully. Mind the sandwich connector after the front side.

05206 A
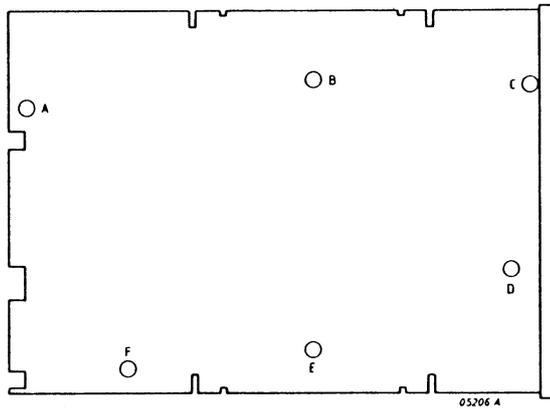
Replacement:

Opposite previous procedure.

20.29.4.3 REPLACEMENT MOTOR SPEED CONTROL PCB

Removal:

- Remove fixed disc drive.
- Remove master PCB.
- Disconnect connectors.
- Remove screws 1, 2, 3, 4 and 5.
- Lift the PCB.

Replacement:

Opposite the previous procedure.

BRAKE

05206 D
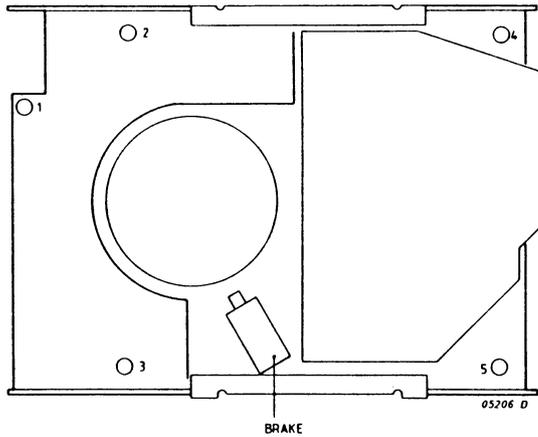
20.29.4.4 ADDITIONAL REPLACEMENT BRAKE

No special directions necessary.

20.30 ` LBP-P3800 (BACKPANEL P3800)

.

.

20.30.1 INTERCONNECTIONS LBP-P3800

CONNECTOR 1 2 3 4 5 6 7 8 9 10 11

CONNECTOR 12

CONNECTOR 13

PUNT 1
C B A

05179 A

TOPVIEW

TOPVIEW
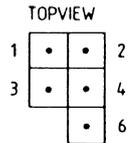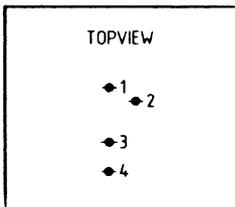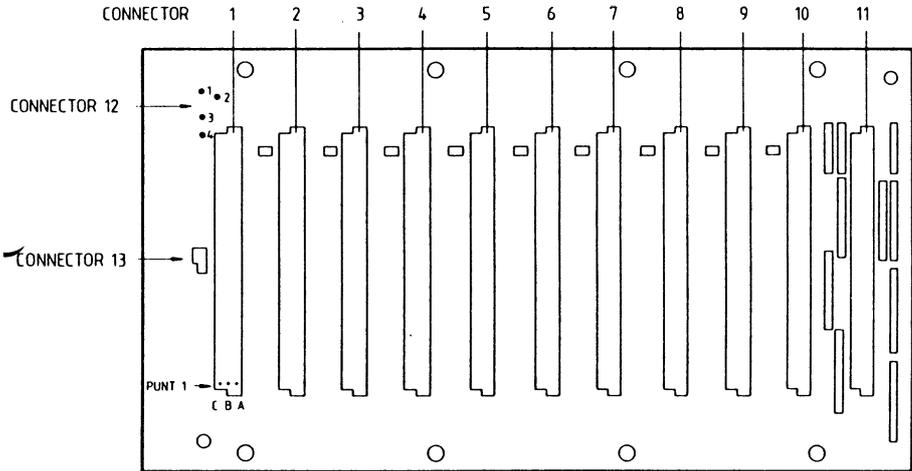
Connector 12 (PBP1/PBP 3M)

1	+ 5V VM
2	+12V
3	-12V
4	- 5V

Connector 13 (PBP1)

Pin	Function	Pin	Function
1	N.C.	2	PWFNP
3	RSLN	4	RPON
5	/////	6	BARE

Pin Assignment
Connector 1-10 PMU
Connector 11 SESCO

	a	b	c
1	+ 5V	+ 5V	+ 5V
2	OV	+ 5V	SLL3
3	OV	OV	OV
4	SLL0	SLL1	SLL2
5	NBUSY	NBCLK	NCBRQ
6	NDRQ1	NIR3	NDACK1 (SLL9)
7	NDRQ2	SYN	NTC1 (SLL10)
8	NIR0	TOUT 2	NIR1
9	NIR4	BARE	NIR5
10	NIR6	RSLN	NIR7
11	OV	OV	OV
12	NDAT0	NDAT1	NDAT2
13	NDAT3	NDAT4	NDAT5
14	NDAT6	NDAT7	NDAT8
15	NDAT9	NDAT10	NDAT11
16	NDAT12	NADAT13	NADAT14
17	PFWN	RPON	NDAT15
18	OV	OV	OV
19	NADR0	NADR1	NADR2
20	NADR3	NADR4	NADR5
21	NADR6	NADR7	NADR8
22	NADR9	NADR10	NADR11
23	NADR12	NADR13	NADR14
24	NADR15	NADR16	NADR17
25	NADR18	NADR19	NBHE
26	NAIOWC	RESV1	RESV5
27	NIOWC	RESV2	NAMWC
28	NIORC	RESV3	NMWC
29	NXACK	RESV4	NMRC
30	NBPRI*	NLOCK	NBPRO
31	+12V	+ 5VM	+ 5VM
32	-12V	- 5V	NBREQ

* Connected to OV on connector 11

20.30.2 STRAP SETTING

05179 B
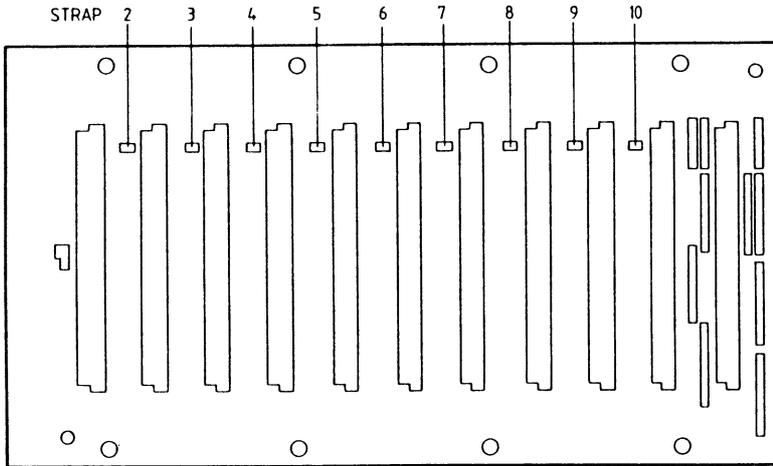
STRAP NR.	FUNCTION Connection of NBPRI-NBPRO	STRAP 1-2
2	Slave 5 installed Slave 5 not installed	N Y
3	Slave 2 installed Slave 2 not installed	N Y
4	Slave 6 installed Slave 6 not installed	N Y
5	Slave 3 installed Slave 3 not installed	N Y
6	Slave 7 installed Slave 7 not installed	N Y
7	Master	N
8	Slave 8 installed Slave 8 not installed	N Y
9	Slave 4 installed Slave 4 not installed	N Y
10	No function	Y

20.30.3 MODIFICATION HISTORY

Not applicable.

20.30.4 REPLACEMENT

Removal:

- Remove all boards from the LBP-P3800 and PBP1 backpanels.

- Disconnect all connectors from the LBP-P3800 and the PBP1 boards.

- Loosen the screws A, B and C (next page). Shift the fan assy to the left and put it on top of the cabinet.

- Remove screws D, E, F, G, H, I, J and K .

- Lift the interface cable ground connector and shift the complete backpanel cabinet (LBP and PBP1) to the rear.
  * Mind the screw that fixes the left ground cable from the interface cable ground connector to the cabinet. It can damage the PBP1 PCB.

- Remove the two screws (L) that connect the two metal strips to the rear of the backpanel.

- Remove the 8 screws (M) that connect the LBP-P3800 board to the backpanel cabinet.

Replacement:

Opposite the previous procedure.

04881 B
05259B

P3500/P3800 CE
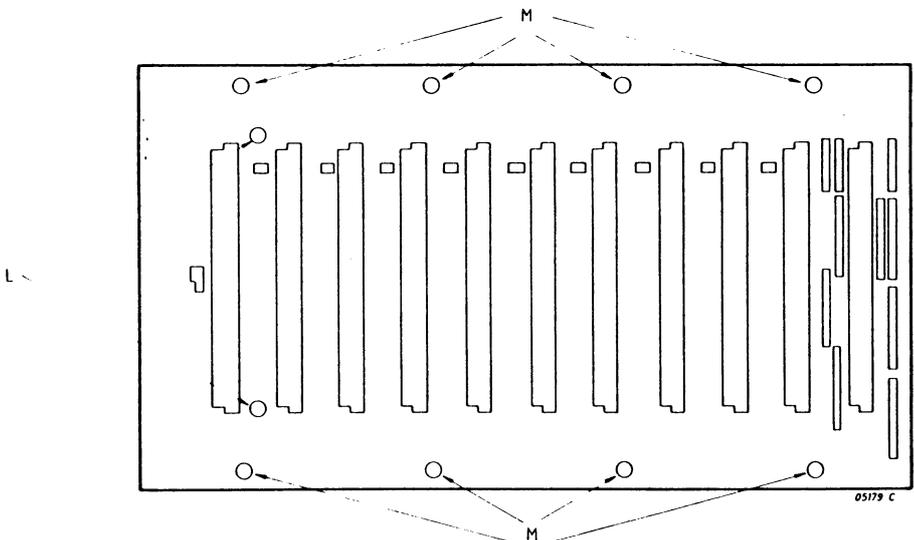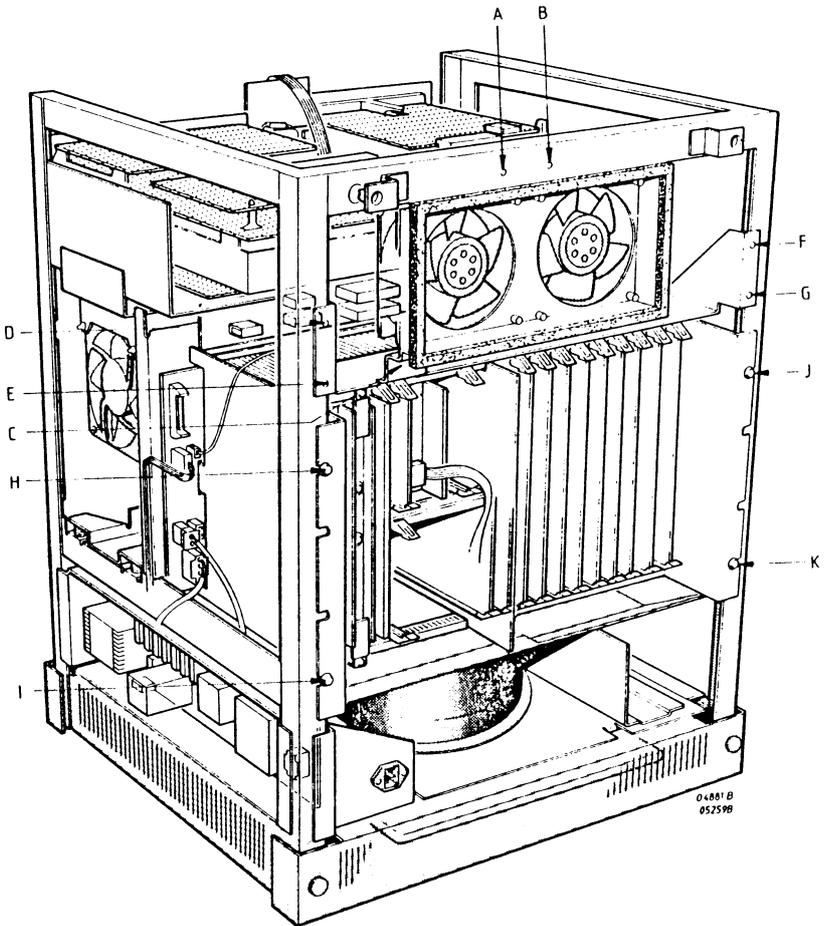
20.31   PMU 80-3

20.31.1 INTERCONNECTIONS PMU 80-3


```
CONN 3 ───
PIN 1 ───

CONN 2 ───
PIN 1 ───
CONN 5 ───
PIN 1 ───

CONN 2,3,5          ─ b            05334 C
                    ─ a
     05334 C        CONN 1
```
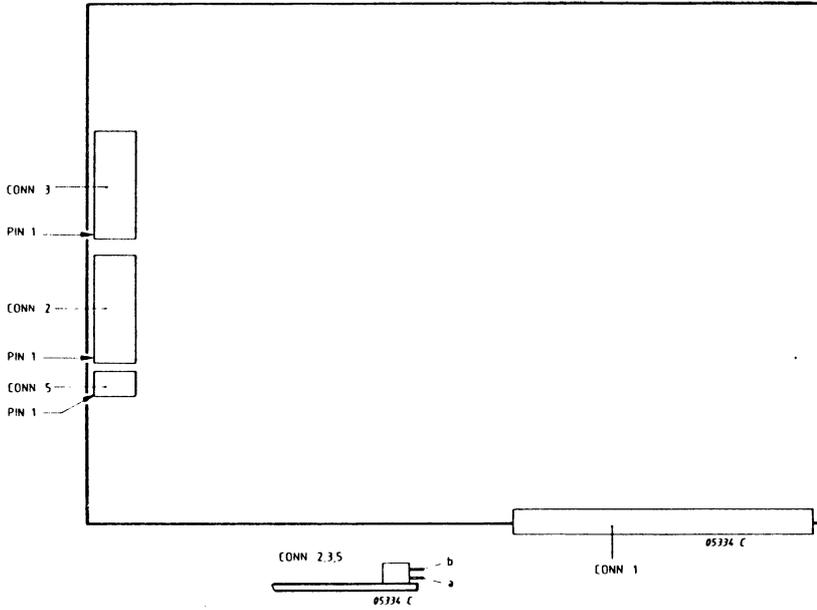
Connector 2, 3, 5

Connector 1 (System Bus), see section 20.1.1, Connector 1-6 (P3500)
                           see section 20.30.1, Connector 1-11 (P3800)

Connector 2, (Auxiliary Interface, Channel B)

	a	b
1		101
2		103
3		104
4		105
5		106
6		107
7	108.2	102
8		109
9		
10		
11		
12		
13	DUMMY	

Connector 3, (V24 Interface, Channel A)

	a	b
1		101
2	114	103
3		104
4	115	105
5	141	106
6		107
7	108.2	102
8	140	109
9	125	
10	111	
11	113	
12	142	
13	DUMMY	

Connector 5

	a	b
1	0V	NOLS
2	+5V	NOLI
3		DUMMY
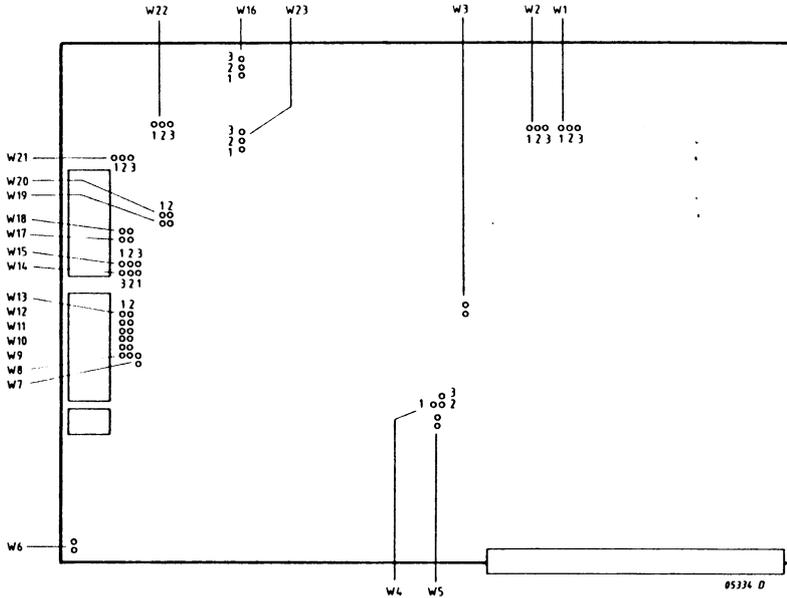
STRAP Nr.	FUNCTION		STRAP 1-2	2-3
W1 (G3F4)	Processor Clock: 6MHz	(default)	Y	N
	3MHz		N	Y
W2 (F9F4)	Transmit Control Clock: 3.072MHz	(default)	Y	N
	1.536MHz		N	Y
W3 (F1D1)	Bus Clock Source Selection	(default)	N	
W4 (F7C0)	Test Purpose: Normal Operation	(default)	N	Y
	Emulator		Y	N
W5 (E8B8)	Memory Write to EMM Bus:			
	- Master	(default)	Y	
	- Slave		N	
W6 (A2A3)	Test Purpose: Memory Refresh Clock			
	- Active	(default)	Y	
	- Inactive		N	
W7 (B0C5)	Testpurpose Interrupt Acknowledge			
	- Active	(default)	Y	
	- Inactive		N	

STRAP Nr.	FUNCTION		W8 1-2	STRAP W8/9 1-1	2-2	W9 1-2
W8 (A9C6) W9 (A9C7)	Channel B DCE: - CT 104 is output - CT 103 is input	(default)	Y	N	N	Y
	Channel B DTE: - CT 104 is input - CT 103 is output		N	Y	Y	N

STRAP Nr.	FUNCTION		W10 1-2	STRAP W10 11 1-1	2-2	W11 1-2
W10 (A9C8) W11 (A9C9)	Channel B DCE: - CT 109 is output - CT 105 is input	(default)	Y	N	N	Y
	Channel B DTE: - CT 109 is input - CT 105 is output		N	Y	Y	N

STRAP Nr.	FUNCTION		W12 1-2	STRAP W12/13 1-1	2-2	W13 1-2
W12 (A9D0) W13 (A9D1)	Channel B DCE: - CT 106 is output - CT 108 is input	(default)	Y	N	N	Y
	Channel B DTE: - CT 106 is input - CT 108 is output		N	Y	Y	N

STRAP Nr.	FUNCTION		STRAP 1-2	2-3
W14 (A9D6)	Remote power on channel B: - DCE, CT 108 - DTE, CT 109	(default)	N Y	Y N
W15 (A9D7)	CT 107 channel B: - is output (DCE) - is inut (DTE)	(default)	Y N	N Y
W16 (C3G1)	Channel B: - int. power off via CT 108 (DCE) - int. power off via CT 109 (DTE)	(default)	Y N	N Y
W17 (A9E0)	Hysteresis CT 107 channel A - normal - fail safe	(default)	Y N	
W18 (A9E1)	Hysteresis CT 104 channel A - normal - fail safe	(default)	Y N	

STRAP Nr.	FUNCTION	STRAP W19 1-2	W19/20 1-1	2-2	W20 1-2
W19 (B4E2)	Channel A - CT 109 or CT 125 int. enabled	N	N	N	Y
W20 (B4E3)	- CT 107 int. enabled	N	N	Y	N

STRAP Nr.	FUNCTION		STRAP 1-2	2-3
W21 (A8F0)	Remote power on channel A: - CT 125 - CT 109		Y N	N Y
W22 (B3F4)	Channel A: - CT 113 from baudrate gen. - external transmit timing (CT114)	(default)	N Y	Y N
W23 (C3F2)	Channel A: - external receive clock (CT115) - receive/transmit clock internal	(default)	Y N	N Y

20.31.3 MODIFICATION HISTORY PMU 80-3

PMU 80-3 5122 291 8076Xx

| LEVEL * | PAL | | | | | | | SI-NR. | |
	G0C0	G8C0	E7B4	G4C0	F6C0	F1A8	F2C0	P3500-	P3800-
3	00721	00751	00931	00731	00741	00761	00771		

| LEVEL * | ROM | | SI-NR. | |
	E2E4	E6C5	P3500-	P3800-
3	00711	00691		

20.32   FIXCO 8

20.32 FIXCO 8

20.32.1 INTERCONNECTIONS FIXCO 8
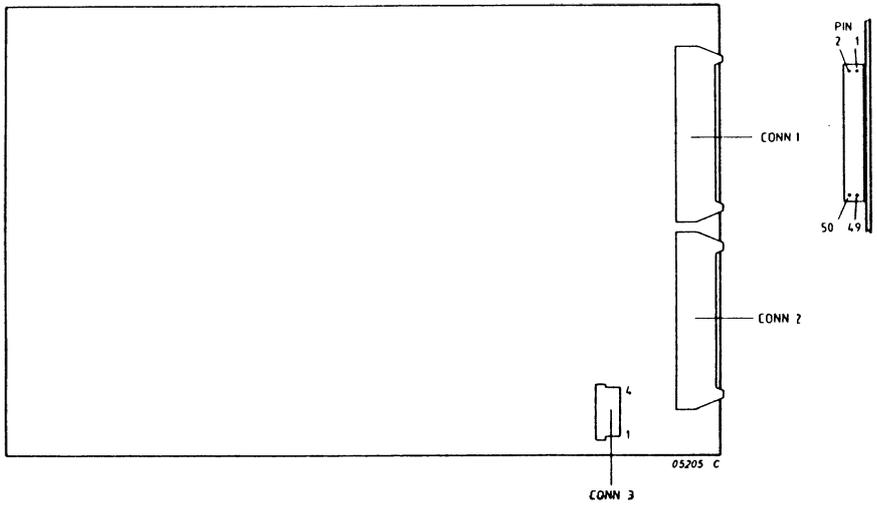
Connector 3 (from PBP1)

PIN	FUNCTION
1	--
2	--
3	Ground
4	+5V

Connector 1 (from SESCO)

Connector 2 (DISC DRIVE)

PIN	FUNCTION	PIN	FUNCTION
1	0V	2	NDB0
3	0V	4	NDB1
5	0V	6	NDB2
7	0V	8	NDB3
9	0V	10	NDB4
11	0V	12	NDB5
13	0V	14	NDB6
15	0V	16	NDB7
17	0V	18	NDBP
19	0V	20	0V
21	0V	22	0V
23	0V	24	0V
25	0V	26	TERMP
27	0V	28	0V
29	0V	30	0V
31	0V	32	NATN
33	0V	34	0V
35	0V	36	NBSY
37	0V	38	NACK
39	0V	40	NRST
41	0V	42	NMSG
43	0V	44	NSEL
45	0V	46	NCD
47	0V	48	NREQ
49	0V	50	NIO

PIN	FUNCTION	PIN	FUNCTION
1	0V	2	DBUS0
3	DBUS1	4	DBUS2
5	DBUS3	6	DBUS4
7	DBUS5	8	DBUS6
9	DBUS7	10	0V
11	NRDGAT	12	0V
13	NRESET	14	0V
15	NWTGAT	16	0V
17	0V	18	NWT
19	A1	20	A0
21	0V	22	NDRS1
23	NDRS2	24	NDRS3
25	NDRS4	26	0V
27	0V	28	TPP51
29	NHDS4	30	NHDS2
31	NHDS1	32	0V
33	NIND	34	0V
35	NREADY	36	0V
37	NSEC	38	0V
39	WDAT+	40	WDAT-
41	0V	42	WTCK+
43	WTCK-	44	0V
45	RDCK+	46	RDCK-
47	0V	48	RDDAT+
49	RDDAT+	50	0V

20.32.2 STRAP SETTING FIXCO 8
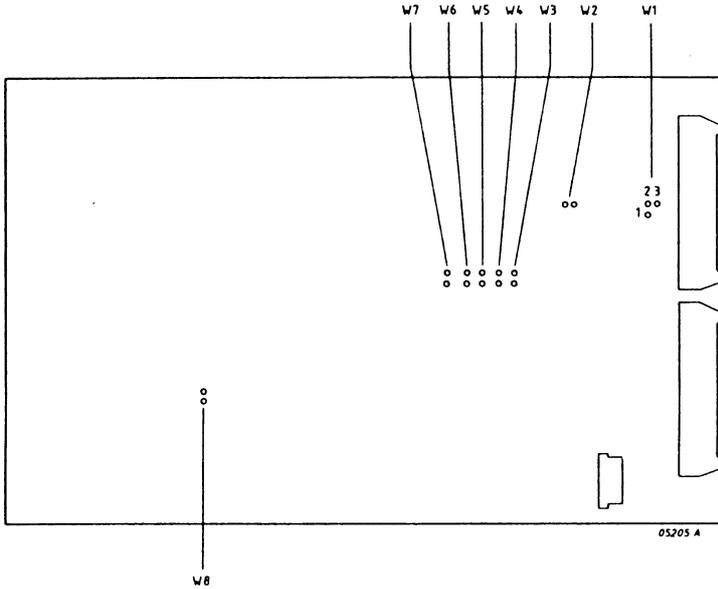
STRAP Nr.	FUNCTION	STRAP 1-2	2-3
W1	Power Terminator - from FIXCO 8 - from SCSI-Bus	Y N	N Y
W2	Test Strap (enable clock uP)	Y	
W3,4,5	Refer to Table below		
W6	No arbitration and Reselection (default) Arbitration and Reselection	Y N	
W7	Test Strap	Y	
W8	Test Strap	Y	

	W3	W4	W5
Controller Select 0	Y	Y	Y
Controller Select 1	N	Y	Y
Controller Select 2	Y	N	Y
Controller Select 3	N	N	Y
Controller Select 4	Y	Y	N
Controller Select 5	N	Y	N
Controller Select 6	Y	N	N
Controller Select 7	N	N	N	(Default)

20.32.3 MODIFICATION HISTORY FIXCO 8

None.

20.33.3　　　　　　FIXED DISC DRIVE PRIAM 7050

20.33 FIXED DISC DRIVE PRIAM P7050

20.33.1 INTERCONNECTIONS PRIAM P7050

20.33.1.1 EXTERNAL

CONNECTOR J1

CONNECTOR J2
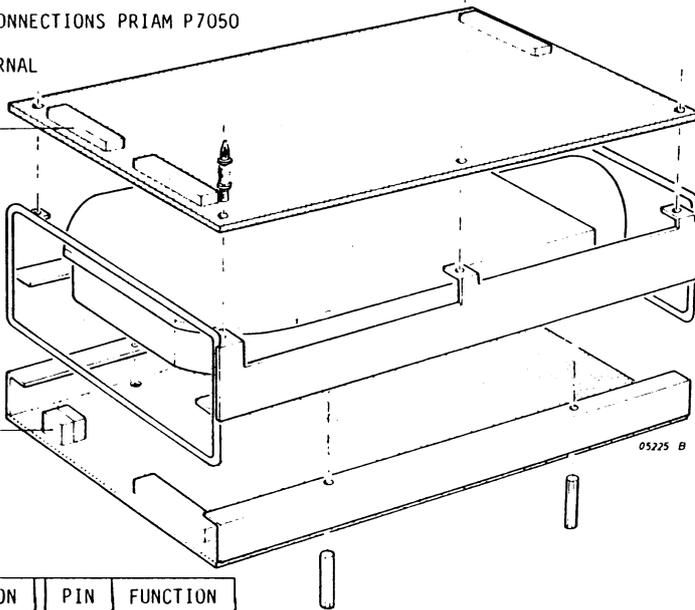
05225 B

PIN	FUNCTION	PIN	FUNCTION
1	0V	2	DBUS0
3	DBUS1	4	DBUS2
5	DBUS3	6	DBUS4
7	DBUS5	8	DBUS6
9	DBUS7	10	0V
11	NRDGAT	12	0V
13	NRESET	14	0V
15	NWTGAT	16	0V
17	NRD	18	NWT
19	A1	20	A0
21	0V	22	NDRS1
23	NDRS2	24	NDRS3
25	NDRS4	26	0V
27	0V	28	+5VDC
29	NHDS4	30	NHDS2
31	NHDS1	32	0V
33	NIND	34	0V
35	NREADY	36	0V
37	NSEC	38	0V
39	WTDAT+	40	WTDAT-
41	0V	42	WTCK+
43	WTCK-	44	0V
45	RDCK+	46	RDCK-
47	0V	48	RDDAT+
49	RDDAT-	50	0V

Power Connector (PROM PBP1)

PIN	FUNCTION
1	0V
2	+24V
3	- 5V
4	-12V
5	+ 5V
6	0V

05214

PIN 49   PIN 1
PIN 50   PIN 2

05214

20.33.1.2 INTERNAL

READ/WRITE
DIGITAL BOARD

POWER
CONNECTION

SERVO AND MOTOR
CONTROL BOARD

DRIVE LOCK CABLE

05225 A

P5/J5

P6/J6

TOP VIEUW

05269 A
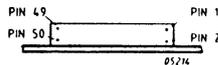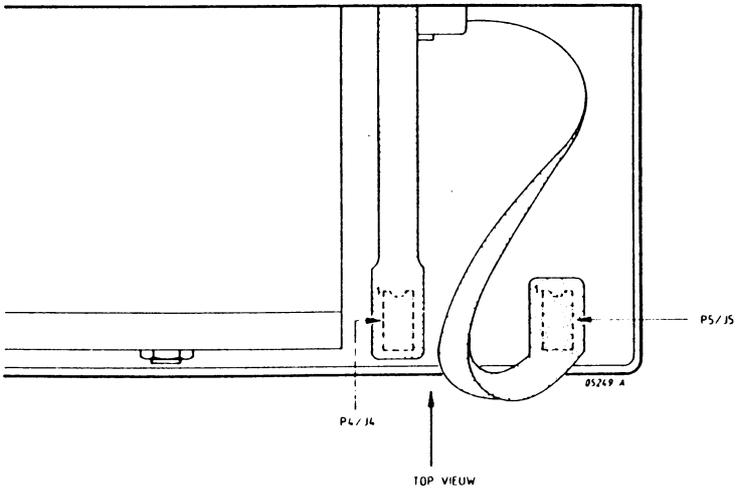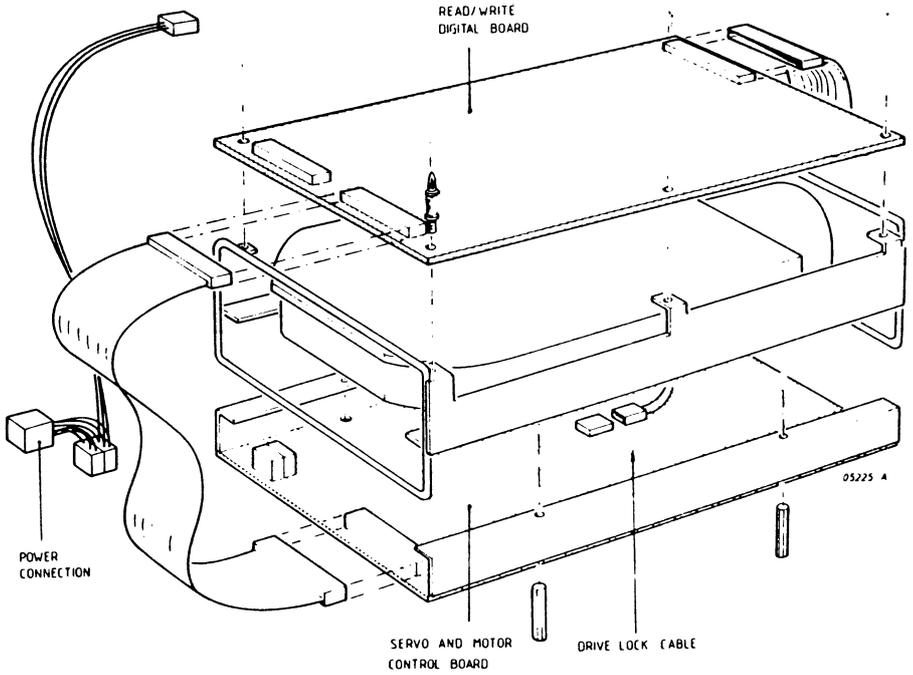
20.33.2 STRAP SETTING

20.33.2.1 STRAP SETTING READ WRITE AND DIGITAL PCB (20233-22)
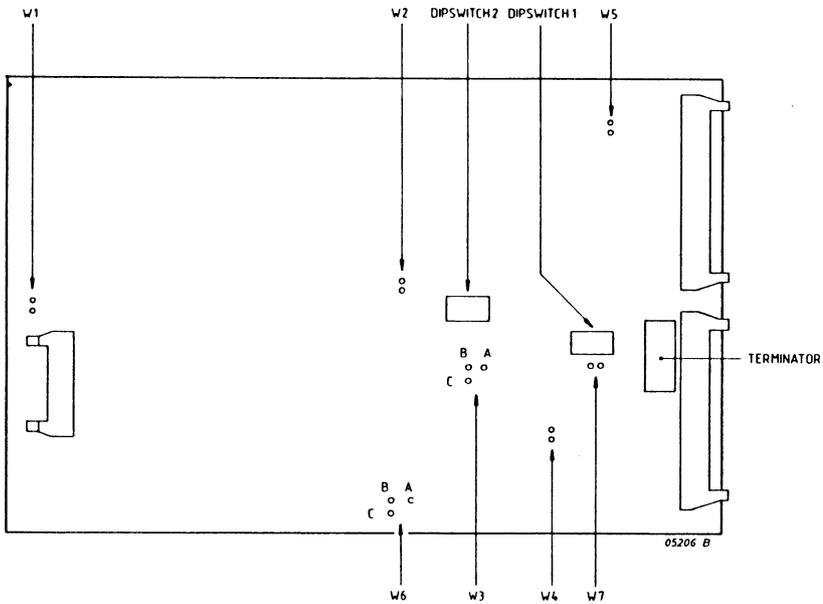
STRAP Nr.	FUNCTION	1-2 (A-B)	2-3 (B-C)
W1		N	
W2	Long Reset Time	N	
W3	Skip Defect Record Protected	Y	N
W4	Default	Y	
W5	Default	N	
W6	Default	Y	N
W7	Default	Y	

DIPSWITCH 1

SWITCH Nr.	FUNCTION	
1	DRIVE SELECT1	Y
2	DRIVE SELECT2	N
3	DRIVE SELECT3	N
4	DRIVE SELECT4	N
5	NOT USED	N
6	NOT USED	N
7	CLOCK SELECTION	Y
8	WRITE ENABLE	Y

DIPSWITCH 2

SWITCH Nr.	FUNCTION	
1	NUMBER OF SECTORS 1	N
2	NUMBER OF SECTORS 2	N
3	NUMBER OF SECTORS 4	Y
4	NUMBER OF SECTORS 8	Y
5	NUMBER OF SECTORS 16	N
6	NUMBER OF SECTORS 32	N
7	NUMBER OF SECTORS 64	N
8	INDICATION IF NUMBERS OF SECTORS	N

Terminator: must be in.

Note 1: Dependent on the type of dip-switches:

- Press the wanted state
- Shift the marker to the wanted state

Note 2: Open = OFF = N
        Closed = ON = Y

20.33.2.2 STRAP SETTING SERVO AND MOTOR CONTROL PCB (200505-2)
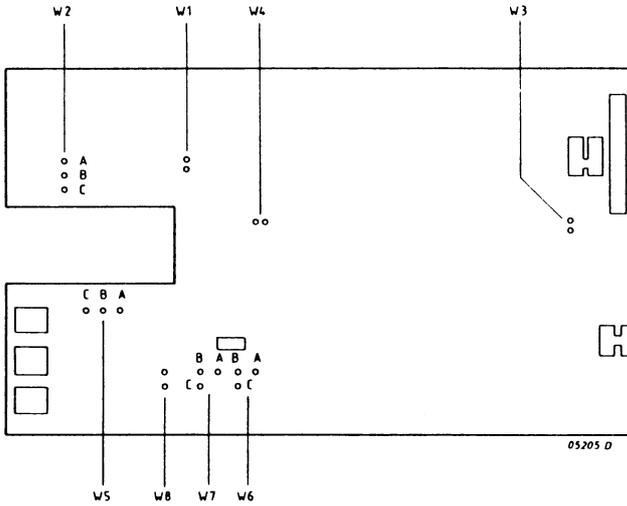
STRAP Nr.	FUNCTION	1-2 (A-B)	2-3 (B-C)
W1	Drive with Auto Lock	Y	
W2	Default	N	Y
W3	Default	Y	
W4	Default	Y	
W5	Default	Y	N
W6	Default	Y	N
W7	Default	Y	N
W8	Default	N	

20.33.3 MODIFICATION HISTORY

20.33.3.1 MODIFICATION HISTORY READ AND WRITE AND DIGITAL PCB (20233-22)

5322 216 2129*

LEVEL *	PROM (POS) 9H	SI NR. P3800-..
2	300276 - E/C 2004	4

20.33.3.2 MODIFICATION HISTORY SERVO AND MOTOR CONTROL PCB (200505-2)

5322 216 2126*

LEVEL *	PROM (POS) 5E	SI NR. P3800-..
4	300273 - E/C 1999	3

20.33.4 REPLACEMENT PRIAM 7050

Caution: Avoid manual rotation of the spindle or movement of the carriage.
Damage to the disc surface may occur if the heads are moved across a
non-rotating disc surface.
In any case, take great care of the disc drive because it is carrying
vital data.

20.33.4.1 REPLACEMENT OF THE COMPLETE PRIAM DISC DRIVE

- Remove the interface cable of the FIXCO8 and the power cable.

- Pull the drive to left side of the cabinet till the mechanical stop.

- Pull the clip of mechanical stop up with a screw driver so it is possible to
  remove the complete drive.

- Remove the FIXCO8 PCB.

20.33.4.2 REPLACEMENT OF THE READ/WRITE AND DIGITAL PCB

- Remove complete PRIAM disc drive (section 2U.33.4.1).

- Remove the interface cables.

- Remove the FIXCO-8 PCB (section 20.32.4).

- Unscrew the four plastic holders of the FIXCO8, and the two screws in the
  middle of the BOARD.

- Install the new PCB.

20.33.4.3 REPLACEMENT OF THE SERVO AND MOTOR CONTROL PCB

- Take out the complete drive.

- Remove the interface cables.

- Remove the four Hexagonal Bolts (don't remove one of the 8 screws for the
  cooling plate).

- Remove carefully the cables to the sealed area.

- Install a new Board.

20.34   . TAPCO-Q

20.34 TAPCO-Q

20.34.1 INTERCONNECTIONS TAPCO-Q

CONN 3   PIN 1   CONN 2   CONN 1   PIN 1

CONNECTOR 2   CONNECTOR 1
                    EVEN   ODD
                    ODD   EVEN
05211B   05211B
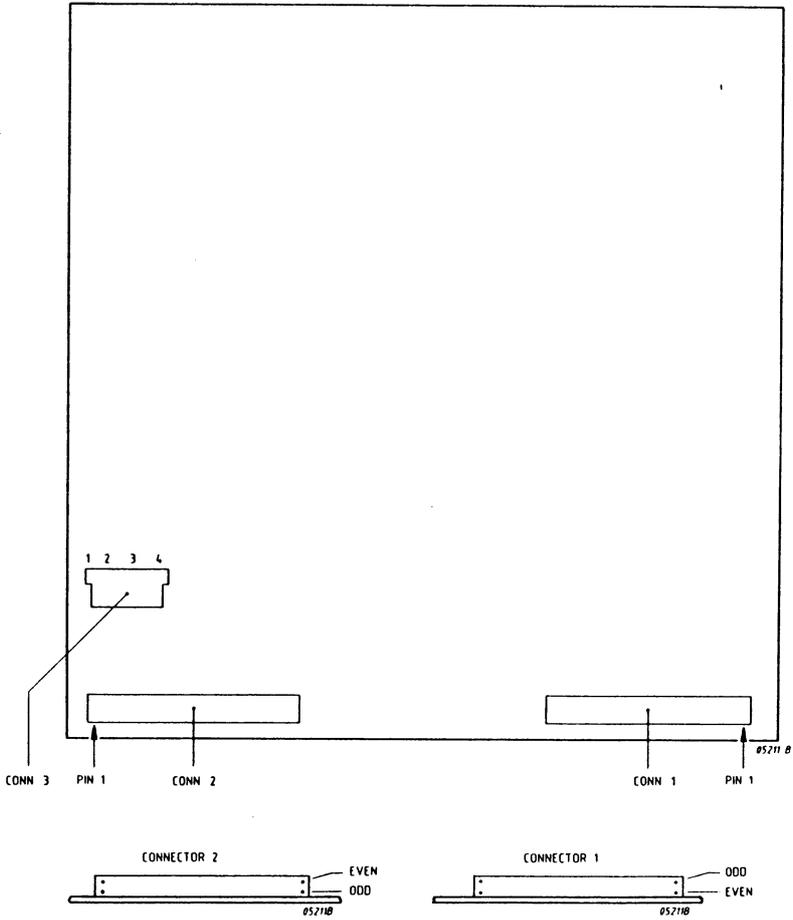
Connector 3
(Power Connector)

PIN	FUNCTION
1	--
2	--
3	0V
4	+5V

Connector 1
(from SESCO, SCSI-Bus)

Connector 2
(to Tape Drive, QIC-2 Bus)

1	0V		2	NDB0
3	0V		4	NDB1
5	0V		6	NDB2
7	0V		8	NDB3
9	0V		10	NDB4
11	0V		12	NDB5
13	0V		14	NDB6
15	0V		16	NDB7
17	0V		18	NDBP
19	0V		20	0V
21	0V		22	0V
23	0V		24	0V
25	0V		26	TERMPS
27	0V		28	0V
29	0V		30	0V
31	0V		32	NATN
33	0V		34	0V
35	0V		36	NBSY
37	0V		38	NACK
39	0V		40	NRST
41	0V		42	NMSG
43	0V		44	NSEL
45	0V		46	NCD
47	0V		48	NREQ
49	0V		50	NIO

1	0V		2	
3	0V		4	
5	0V		6	
7	0V		8	
9	0V		10	
11	0V		12	NHB7
13	0V		14	NHB6
15	0V		16	NHB5
17	0V		18	NHB4
19	0V		20	NHB3
21	0V		22	NHB2
23	0V		24	NHB1
25	0V		26	NHB0
27	0V		28	NONL
29	0V		30	NRQ
31	0V		32	NRES
33	0V		34	NXFR
35	0V		36	NDAC
37	0V		38	NRDY
39	0V		40	NEXC
41	0V		42	NDIR
43	0V		44	
45	0V		46	
47	0V		48	
49	0V		50	

20.34.2 STRAP SETTING

20.34.2 STRAP SETTING

STRAP Nr.	FUNCTION	STRAP 1-2	STRAP 1-3
W 1	(EOF1) Controller ID 2 refer to table below	-	
W 2	(EOF3) No Arbitration Selected	Y	
W 3	(D3A9) Clock Enable	Y	
W 4	(IOF3) External Address	Y	
W 5	(F8G5) 6116, Chip Select (DEFAULT) 6264, Chip Select (NAD-13)	Y N	N Y
W 6	(F7G8) 6116, Write Enable ·(DEFAULT) 6264, Address Line 11	Y N	N Y
W 7	(G6G5) 6116, Chip Select (DEFAULT) 6264, Chip Select (AD-13)	Y N	N Y
W 8	(G5G8) 6116, Write Enable (DEFAULT) 6264, Address Line 11	Y N	N Y
W 9	(EOE7) Controller ID 0 refer to table below	-	
W10	(EOE9) Controller ID 1 refer to table below	-	
W11	(B9D1) TCT1 Tape Drive Type	N	
W12	(C2D1) TCT2 Tape Drive Type	N	

FUNCTION	STRAP W 1	STRAP W10	STRAP W 9
Controller Select 0	Y	Y	Y
Controller Select 1	Y	Y	N
Controller Select 2	Y	N	Y
Controller Select 3 (DEFAULT)	Y	N	N
Controller Select 4	N	Y	Y
Controller Select 5	N	Y	N
Controller Select 6	N	N	Y
Controller Select 7	N	N	N

20.34.3 MODIFICATION HISTORY

T.b.s.l.

20.34.4 MODIFICATION HISTORY

T.S.B.L.

20.34.4 REPLACEMENT

Removal:

- Disconnect connectors from TAPCO-Q.

- Unscrew 4 screws and remove PCB and metal holder.

- Unclip TAPCO-Q.

Replacement:

Opposite previous procedure.

20.35   STREAMER TAPE ARCHIVE 9020I

POWER CONNECTOR

CONNECTOR 1

4

1 50

2

1

05232 05230
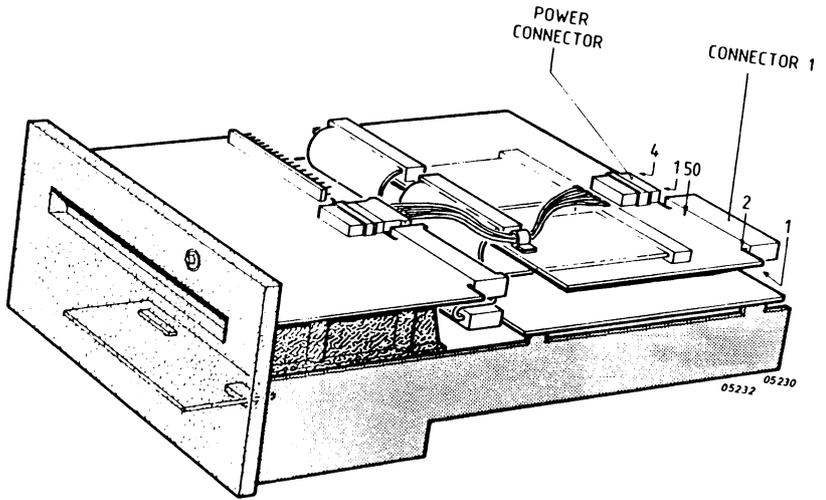
Power Connector

PIN	FUNCTION
1	+12V
2	0V
3	0V
4	+5V

P3500/P3800 CE

Connector 1
(from TAPCO-Q, QIC-2 Bus)

1	0V	2	--
3	0V	4	--
5	0V	6	--
7	0V	8	--
9	0V	10	--
11	0V	12	HB7
13	0V	14	HB6
15	0V	16	HB5
17	0V	18	HB4
19	0V	20	HB3
21	0V	22	HB2
23	0V	24	HB1
25	0V	26	HB0
27	0V	28	ONL
29	0V	30	REQ
31	0V	32	RST
33	0V	34	XFR
35	0V	36	ACK
37	0V	38	RDY
39	0V	40	EXC
41	0V	42	DIR
43	0V	44	--
45	0V	46	--
47	0V	48	--
49	0V	50	--

20.35.1.2 INTERNAL

SLOT

POWER INTERFACE

LOGIC INTERFACE

05230

05231

CONTROLLER

MOTOR PWB

MAIN PWB

20.35.2 STRAP SETTING

TERMINATOR
MUST BE
INSTALLED

05218 D

MAINS PWB

STRAP 2B

1 2 3 4 5 6 7

TERMINATORS
NOT INSTALLED

STRAP 5C

05227 A
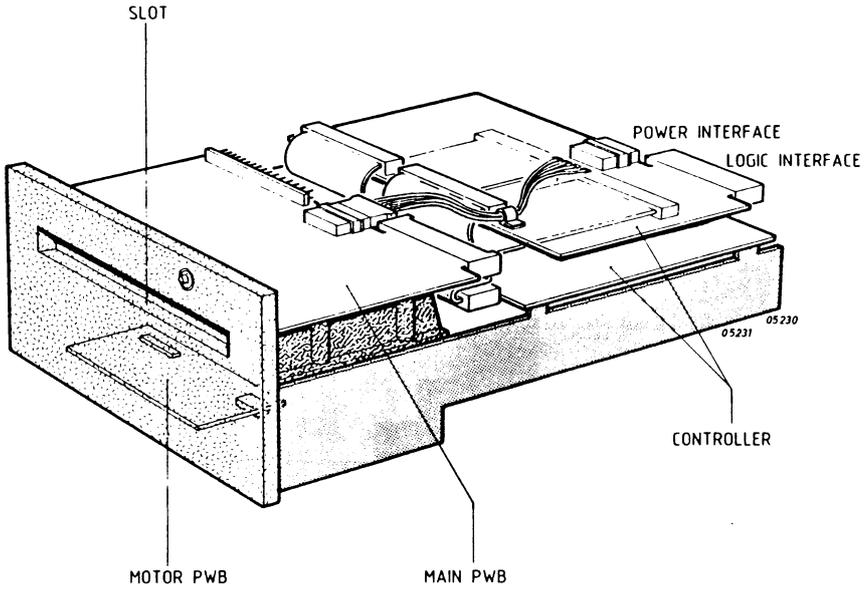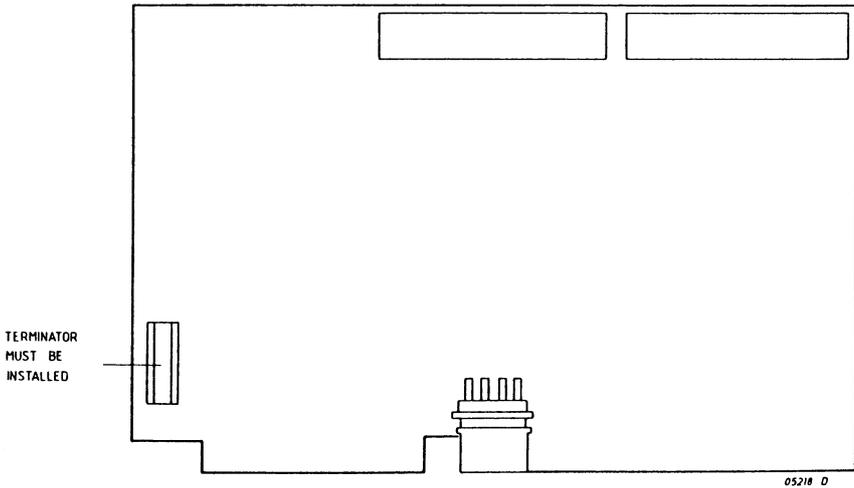
STRAP Nr.	FUNCTION	1-2	
2B1	Drive Select 3	N	
2	Drive Select 2	N	
3	Drive Select 1	N	
4	Drive Select 0	Y	
5	NC	N	
6	NC	N	
7	Continuous Select	N	
5C1			]
2			]
3	Depending		] Don't change this
4	on mechanical		] strap setting
5	adjustment of		] (workshop adjustment)
6	the head		]
7			]

```
                                          30
                                      90 [1 2 3] ────── STRAP 1
                                          05218 A
```
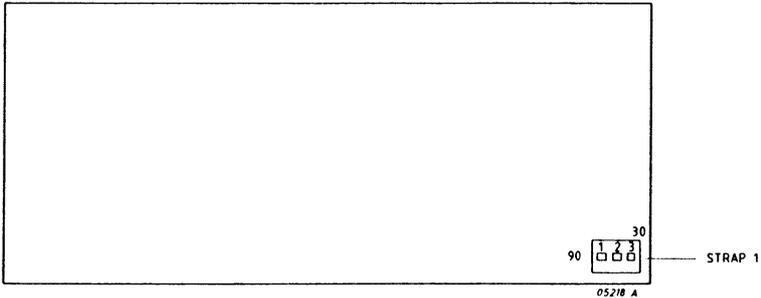
STRAP Nr.	FUNCTION	STRAP 1-2	2-3	
1	30 inch/s	N	Y	
	90 inch/s	Y	N	default

20.35.3 MODIFICATION HISTORY

Not applicable.

20.35.4 REPLACEMENT

Removal:

- Disconnect the power cables to controller and TAPCO-Q.

- Disconnect the SCSI cable from TAPCO-Q.

  Disconnect the three ground cables.

- In P3800 cabinet: remove the two screws at the front and take out the complete unit.

- In P3013 cabinet: press complete unit to the rear side and lift it out.

Replacement:

Opposite previous procedure.

20.36   OP-P3800

20.36.1 INTERCONNECTIONS OP-P3800

CONN 2   CONN 1

05215 C
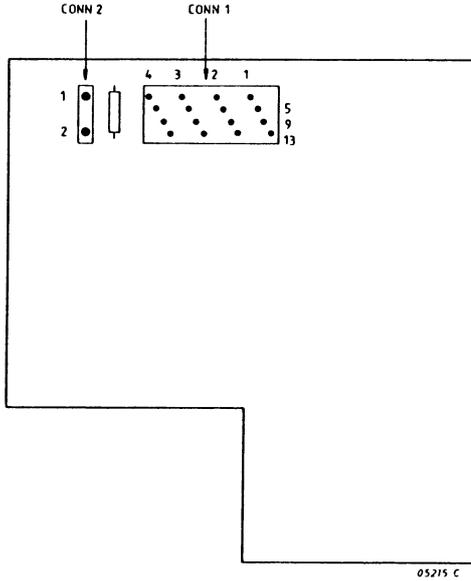
Connector 1
(from SESCO)

Connector 2
(to Privileged Switch)

1	DATI0	9	NWRDI
2	0V	10	DATI7
3	DATI1	11	NSYSID
4	0V	12	NPRIV
5	DATI2	13	DATI4
6	DATI5	14	NMR
7	DATI3	15	--
8	DATI6	16	+5V

1	NPRIV
2	0V

20.36.2 STRAP SETTING OP-P3800

None.

20.26.3 MODIFICATION HISTORY OP-P3800

Not applicable.

20.36.4 REPLACEMENT OP-P3800

Removal:

- Disconnect the interface cable on the SESCO PCB.

- Unsolder the wires to the privileged/non privileged switch.

- Remove 4 screws.

Replacement:

Opposite previous procedure.

20.37   PF42MD

20.37 PF42MD

20.37.1 INTERCONNECTIONS PF42MD
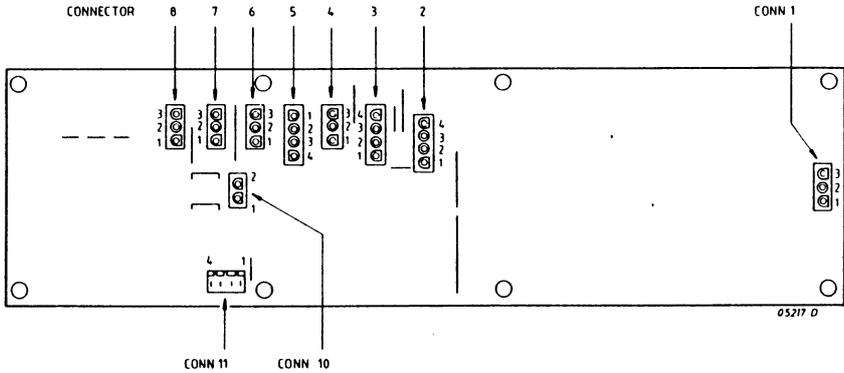
Connector 1
(Mains)

1   MAINS (220V/110V)
2   GROUND
3   MAINS (220V/110V)

Connector 2
(to Operator Panel Key Switch)

PIN	FUNCTION
1	FROM KEY SWITCH (220V)
2	FROM KEY SWITCH (220V)
3	PROTECTIVE GROUND
4	TO KEY SWITCH (220V)

Connector 3
(to PBP1)

PIN	FUNCTION
1	LFS (220V FROM RELAY
2	LFS (220V FROM KEY SWITCH)
3	LF (220V)
4	LF (220V RETURN)

Connector 4
(Not Used)

PIN	FUNCTION
1	L1 (220V)
2	GROUND
3	NF (220V RETURN)

Connector 5
(to Ringtransformer)

PIN	FUNCTION
1	NF (220V RETURN)
2	GROUND
3	L1 (220V)
4	220V

Connector 6, 7, 8
(to Fan)

PIN	FUNCTION
1	220V
2	GROUND
3	NF (220V RETURN)

Connector 10
(to Hour Counter)

PIN	FUNCTION
1	NF (220V RETURN)
2	220V

Connector 11
(to PBP1)

PIN	FUNCTION
1	0V
2	PCL
3	0V
4	12 VS

20.37.2 STRAP SETTING PF42MD
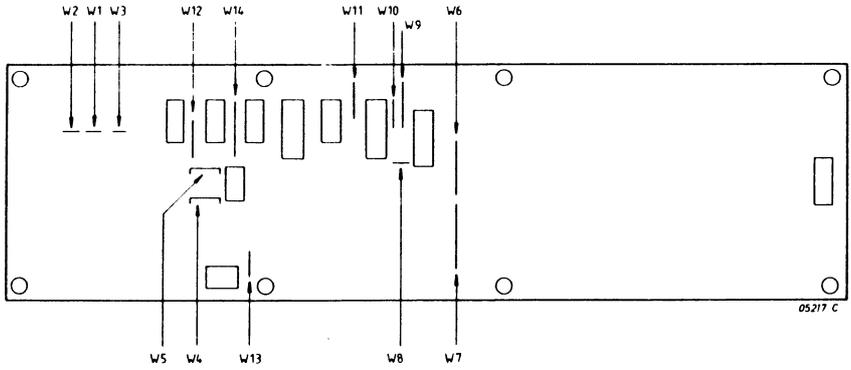
STRAP Nr.		1-2
W1		Y
W2		N
W3		N
W4		Y
W5		Y
W6		Y
W7		Y
W8		N
W9		Y
W10		N
W11		Y
W12		N
W13		Y
W14		Y

20.37.3 MODIFICATION HISTORY PF42MD

Not applicable.

20.37.4 REPLACEMENT PF42MD

Removal:

- Disconect all connectors to the PF42MD board.

- Remove screws A-H.

Replacement:

Opposite previous procedure.
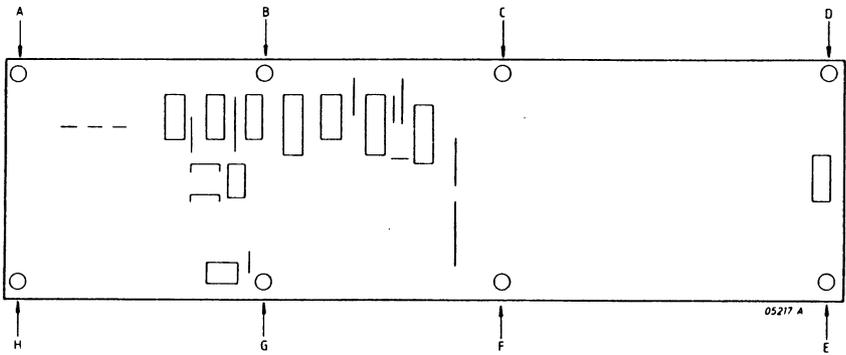
05217 A

20.38   PBP1 (BACKPANEL POWER SUPPLIES P3800)

20.38 PBP1 (BACKPANEL POWER SUPPLIES P3800)

20.38.1 INTERCONNECTIONS PBP1
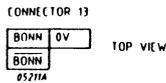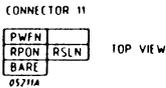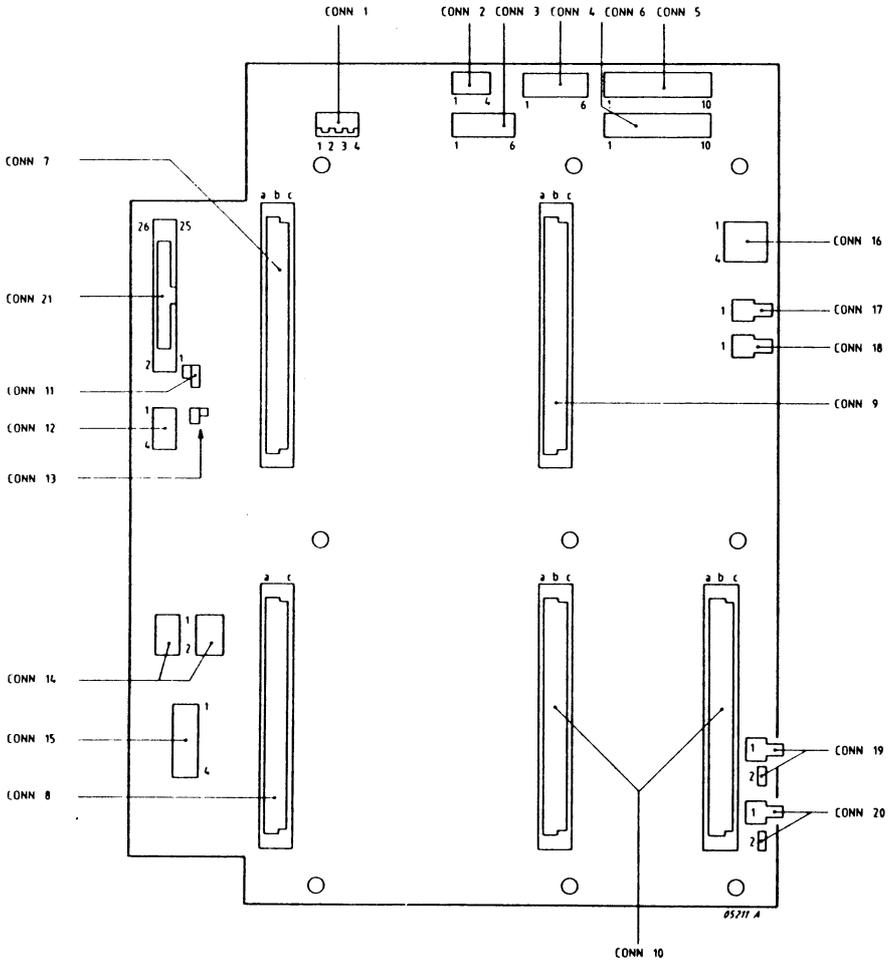
Connector 1
(to Streamer Tape)

PIN	FUNCTION
1	+24V
2	0V
3	0V
4	+5V

Connector 2
(Not Used)

PIN	FUNCTION
1	-12V
2	+ 5V
3	0V
4	RSLN1

Connector 3/Connector 4
(to Flexible Disc /
1st 5¼" Fixed Disc)

PIN	FUNCTION
1	+12V
2	+ 5V
3	0V
4	+24V
5	0V
6	RSLN1

Connector 21
(PBP M3)

PIN	FUNCTION	PIN	FUNCTION
1	0V	2	+12VS
3	0V	4	+ 5VM
5	0V	6	+ 5V
7	0V	8	MONN
9	0V	10	BONN
11	0V	12	0V
13	PSON	14	PSOFN
15		16	RUNN
17	0V	18	RUNN
19	0V	20	PWFNP
21	0V	22	RSLN
23	0V	24	BAWOFFN
25		26	RTCN

Connector/Connector 6
(to Fixed Disc 8" or 2nd
5¼" Fixed Disc)

PIN	FUNCTION
1	+ 5V
2	+ 5V
3	0V
4	- 5V
5	0V
6	+12V
7	-12V
8	0V
9	0V
10	+24V

INTERCONNECTIONS PBP1 (CONT'D)

Connector 7
(to PSU-B1E)

PIN	FUNCTION		
	A	B	C
1	--	0V	MONN
2	PSOFN	0V	PSON
3	--	0V	PWFNP1
4	0V	0V	RSLN1
5	SYNI	0V	RCL
6	0V	0V	RS-
7	SYNO	0V	RS+
8	0V	0V	0V
9	0V	0V	0V
10	--	--	--
11	0V	0V	0V
12	--	--	--
13	0V	0V	0V
14	+24V	+24V	+24V
15	0V	0V	0V
16	--	--	--
17	0V	0V	0V
18	--	--	--
19	0V	0V	0V
20	+12V	+12V	+12V
21	0V	0V	0V
22	-12V	-12V	-12V
23	0V	0V	0V
24	--	--	--
25	0V	0V	0V
26	+5V	+5V	+5V
27	0V	0V	0V
28	+5V	+5V	+5V
29	0V	0V	0V
30	+5V	+5V	+5V
31	0V	0V	0V
32	+5V	+5V	+5V

Connector 8
(PSU-B1E)

PIN	FUNCTION	
	A	C
2	+5V	+5V
4	0V	0V
6	+5V	+5V
8	0V	0V
10	+5V	+5V
12	0V	0V
14	+5V	+5V
16	0V	0V
18	+5V	+5V
20	0V	0V
22	--	--
24	--	--
26	NF	NF
28	LFS	LFS
30	LFSS	LFSS
32	--	--

Connector 9
(to PSU AOC)

PIN	FUNCTION A	B	C
1		0V	
2		0V	
3		0V	PWFNP1
4	0V	0V	RSLN1
5	SYNI	0V	
6	0V	0V	
7		0V	
8	0V	0V	0V
9	0V	0V	0V
10	+24V	+24V	+24V
11	0V	0V	0V
12	+24V	0V	+24V
13	0V	0V	0V
14	+24V	+24V	+24V
15	0V	0V	0V
16			
17	0V	0V	0V
18			
19	0V	0V	0V
20	+12V	+12V	+12V
21	0V	0V	0V
22	-12V	-12V	-12V
23	0V	0V	0V
24	-5V	-5V	-5V
25	0V	0V	0V
26	+5V	+5V	+5V
27	0V	0V	0V
28	+5V	+5V	+5V
29	0V	0V	0V
30	+5V	+5V	+5V
31	0V	0V	0V
32	+5V	+5V	+5V

Connector 10
(Not Used)

PIN	FUNCTION A	B	C
1	BONN	0V	
2		0V	
3	BAWOFN	0V	
4	0V	0V	RSLN1
5	SYNI	0V	
6	0V	0V	
7		0V	
8	0V	0V	0V
9	0V	0V	0V
10			
11	0V	0V	0V
12			
13	0V	0V	0V
14	+24VI	+24VI	+24VI
15	0V	0V	0V
16			
17	0V	0V	0V
18	+5VM	+5VM	+5VM
19	0V	0V	0V
20	+12VB	+12VB	+12VB
21	0V	0V	0V
22			
23	0V	0V	0V
24			
25	0V	0V	0V
26			
27	0V	0V	0V
28			
29	0V	0V	0V
30			
31	0V	0V	0V
32			

Connector 11
(to LBP-P3800)

PWFN		Topview
RPON	RSLN	
BARE		

Connector 12
(from PF42MD)

PIN	FUNCTION
1	+12Vs
2	0V
3	PCL
4	0V

Connector 13
(to OP-P3800)

BONN	0V	Topview
BONN		

INTERCONNECTIONS PBP1 (CONT'D)

Connector 14
(to PSU-M3)

PIN	FUNCTION
1	LF
2	NF

Connector 15
(from PF42MD)

PIN	FUNCTION
1	LFSS
2	LFS
3	LF
4	NF

Connector 16
(to LBP-P3800)

PIN	FUNCTION
1	-12V
2	
3	+12V
4	-5V

Connector 17
(Not Used)

PIN	FUNCTION
1	+5V

Connector 18
(From PBP M3)

PIN	FUNCTION
1	0V

Connector 19
(Not Used)

PIN	FUNCTION
1	+ BATT
2	+ BATT

Connector 20
(Not Used)

PIN	FUNCTION
1	- BATT
2	- BATT
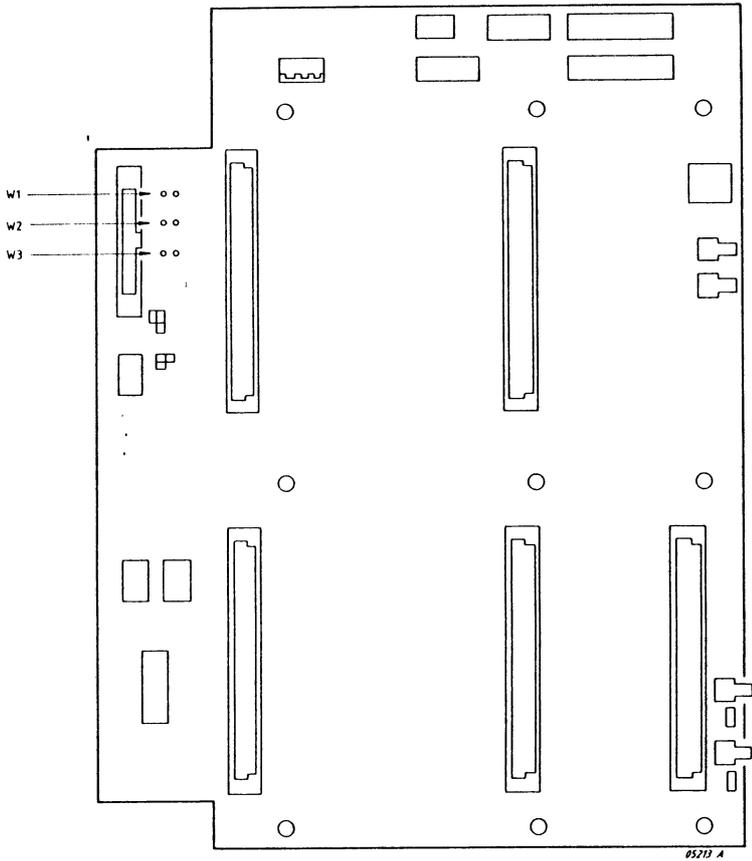
STRAP Nr.	FUNCTION	STRAP 1-2
W1	Connection RSLN-RSLN1	Y
W2	Connection PWFN-PWFN1	Y
W3	Connection PSON-Ground	Y

20.38.3 MODIFICATION HISTORY PBP1

Not applicable.

20.38.4 REPLACEMENT PBP1

Removal:

- Remove all boards from the LBP-P3800 and PBP1 backpanels.
- Disconnect all connectors from the LBP-P3800 and the PBP1 board.
- Loosen the screws A, B and C (next page). Shift the fan assy to the left and put it on top of the cabinet.
- Remove screws D, E, F, G, H, I, J and K.
- Lift the interface cable ground connector and shift the complete backpanel cabinet (LBP and PBP1) to the rear.
  * Mind the screw that fixes the left ground cable from the interface cable ground connector to the cabinet. It can damage the PBP1 PCB.
- Remove the two screws (L) that connect the two metal strips to the rear of the backpanel.
- Remove the 9 screws (M) that connect the LBP-P3800 board to the backpanel cabinet.

Replacement:

Opposite previous procedure.

05210 C

04881B
05259B
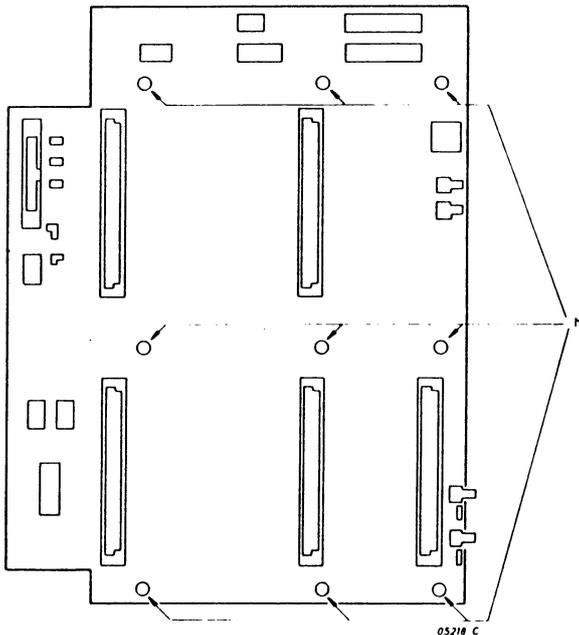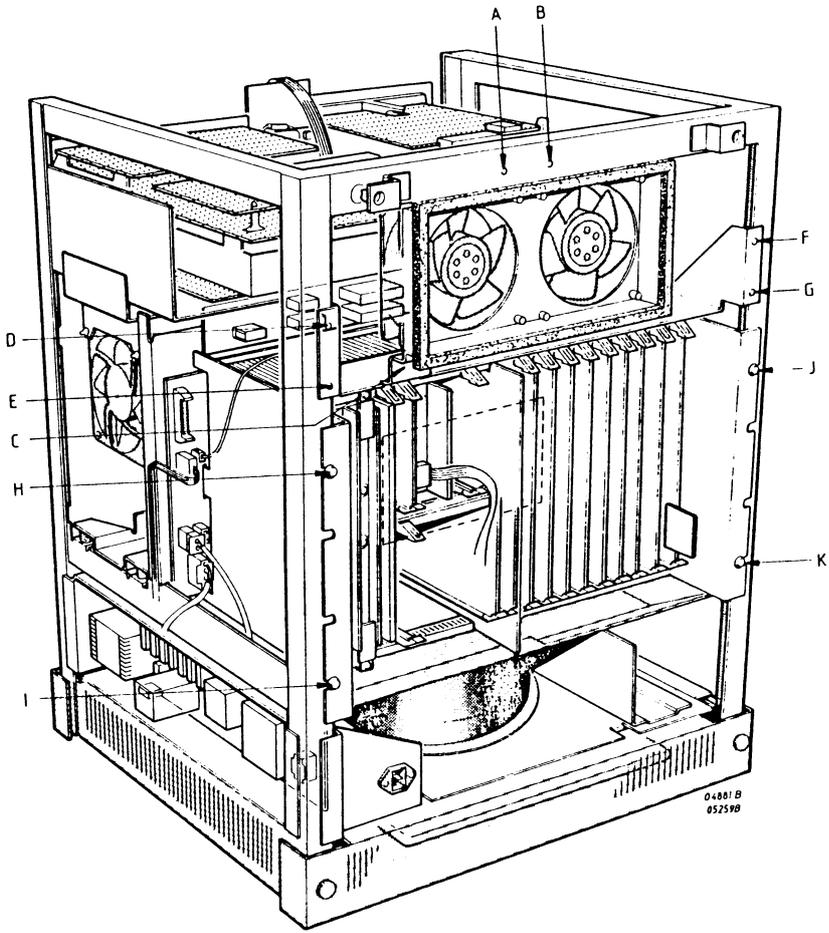
20.39   PSU-B1E

20.39 PSU-B1E

20.39.1 INTERCONNECTIONS PSU-B1E

ST9

4 3 2 1 A B

ST10
ST7
1 2 3

05214 A

W2
W1

B A
1 2 3
ST6

CONN 2

CONN 1

05214 B
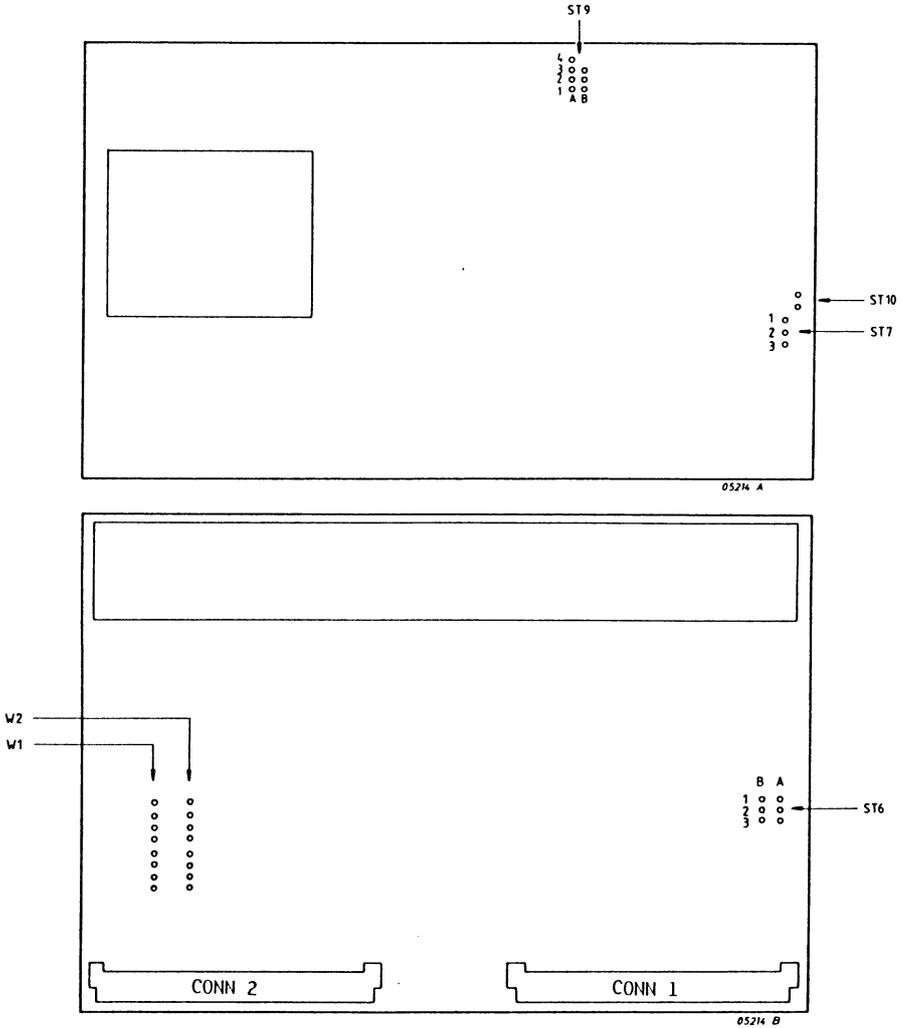
20.39.2 STRAP SETTING PSU-B1E

Connector 1 (to PBP1)

For pin assignment refer to section 20.38.1, Connector 7.

Connector 2 (to PBP1)

For pin assignment refer to section 20.38.1, Connector 8.

STRAP Nr.	FUNCTION	STRAP 1-2	2-3
ST6	A: connection $0V_c$-0V (default) B: connection $5V_c$-5V (default)	N N	Y Y
ST7	connection PcL-PcLL (default) connection PcL-PcLM	Y N	N Y
ST10	connection PSOFN-(PSOFN) (default)	N	

STRAP Nr.	FUNCTION	
W1	230V Mains 1-2, 3-4, 5-6, 7-8 (default)	Y
W2	120V Mains 1-2, 3-4, 5-6, 7-8	Y
ST9	Test Purpose 3A-4A (default)	Y

20.40   . PSU-AOC +5/+24V, +12V

20.40 PSU-AOC +5/+24V, +12V

20.40.1 INTERCONNECTIONS PSU-AOC
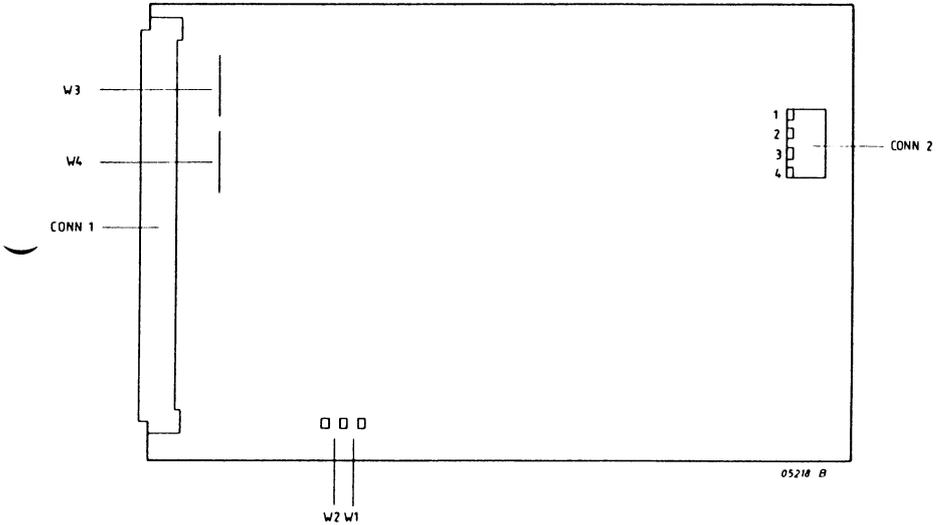
Connector 1 (to PBP1)

for pin assignment refer to section 20.38.1, Connector 9.

Connector 2
(TRAFO)

1	24V
2	24V
3	0V
4	0V

20.40.2 STRAP SETTING PSU-AOC

STRAP Nr.	FUNCTION	STRAP W1	W2
W1/W2	Synchronisation - Internal - External (default)	 Y N	 N Y

STRAP Nr.	FUNCTION	STRAP W3	W4
W3/W4	Output Voltage - AOC +5/+24V - AOC +12V	 Y N	 N Y

20.40.3 MODIFICATION HISTORY (PSU-AOC)

T.B.S.L.

20.41   . TERCO

20.41 TERCO

20.41.1 INTERCONNECTIONS TERCO

CONN 6   PIN 1   CONN 5 PIN 1   CONN 4 PIN 1   CONN 3   PIN 1   CONN 2   PIN 1   CONN 1   PIN 1

CONNECTOR 1-6

05214C
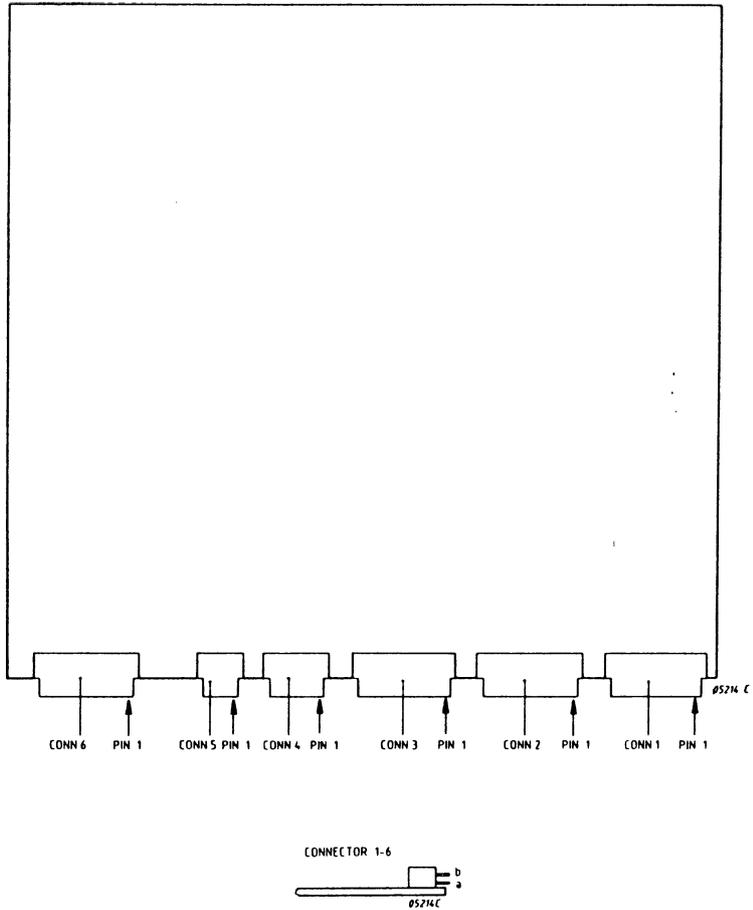
Connector 1
(Auxiliary V24)

	A	B
1		
2		A103
3		A104
4		
5		A106
6		A108.2
7	A108.2	A102
8		
9		
10		
11		
12		
13		

Connector 2
(System Cabinet)

	A	B
1		
2	V114	V104
3	TRXD	V104
4	V115	V105
5	V141	V106
6		V107
7	V108.2	V102
8	V140	V109
9	V125	TTXD
10	V111	TTXDR
11	V112	TTRXD
12	V142	TTRXDR
13		

Connector 3
(Keyboard)

	A	B
1	KRXD	
2		
3	KTXD	
4		
5	KOUTR	
6		
7		
8	0V	
9		
10		
11		
12	+5V	
13		

Connector 4
(GRACO)

	A	B
1	0V	DCL
2	0V	CBL
3	0V	CCL
4	0V	LINT
5	0V	HOSY
6	0V	VESY
7	0V	VIDEO
8		VIDE

	A	B
1	0V	HSYNC M
2	0V	VSYNC M
3	0V	VIDEO M
4		
5		

Connector 6
(Power Supply)

	A	B
1	0V	+5V
2	0V	+5V
3	0V	+5V
4	0V	+5V
5	0V	+5V
6	0V	+5V
7	0V	+5V
8	0V	+5V
9	0V	+5V
10	0V	+5V
11	0V	-12V
12	0V	+12V
13		RSLN

20.41.2 STRAP SETTING TERCO

05187 B
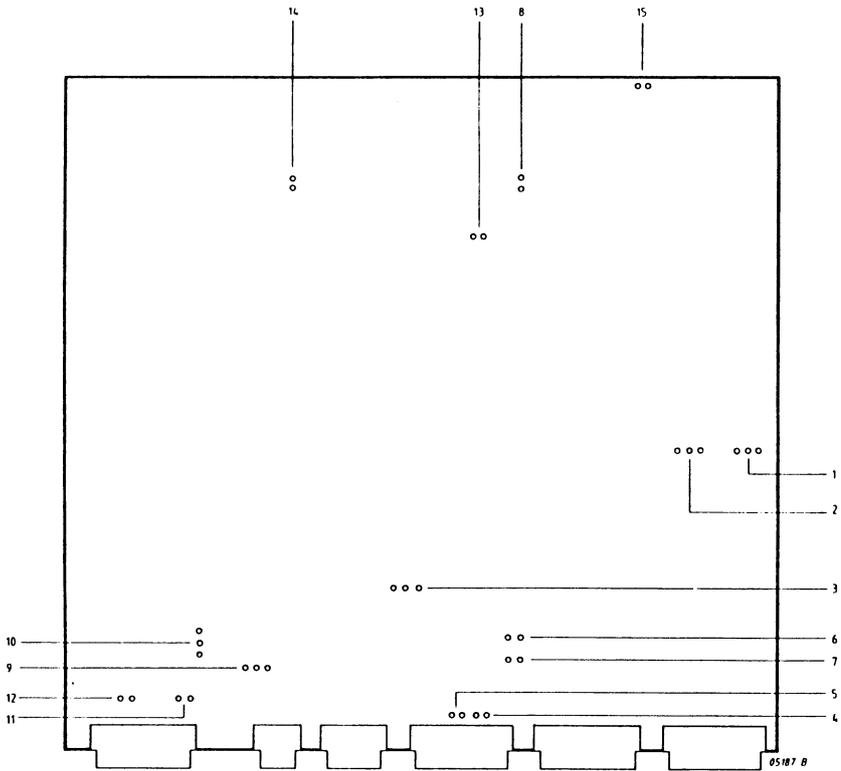
STRAP Nr.	FUNCTION	STRAP 1-2	2-3
1	Receive Clock - from modem - internal (default)	Y N	N Y
2	Transmit Clock - from modem - internal (default)	Y N	N Y

3	Current Loop
	- no current loop (default)
	- current loop
	  - transmit data
	  - transmit data inverted
		N
		
		N
		Y
			N
			
			Y
			N

4	Current Loop - no current loop (default) - current loop: transmitter floating	N Y	
5	Current Loop - no current loop (default) - current loop: transmitter current source	N Y	
6	Current Loop - no current loop (default) - current loop: receiver current source	N Y	
7	Current Loop - no current loop (default) - current loop: receiver floating	N Y	
8	Power Lithium Cell	Y	
9	Character Matrix Size - character window 7x15 (default) - character window 8x15	N Y	Y N
10	Character Matrix Size - character window 7x15 (default) - character window 8x15	Y N	N Y
11	Dot Frequency (OSC1-16MHz)	Y	
12	Dot Frequency (OSC2-22.118MHz)	Y	
13	Test Purpose (HLDA)	Y	
14	Test Purpose (ALE)	Y	
15	Test Purpose (PCLK)	Y	

20.41.3 MODIFICATION HISTORY TERCO

T.B.S.L.

20.42   PMU 186 CPV/M

20.42.1 INTERCONNECTIONS PMU 186 CPV/M
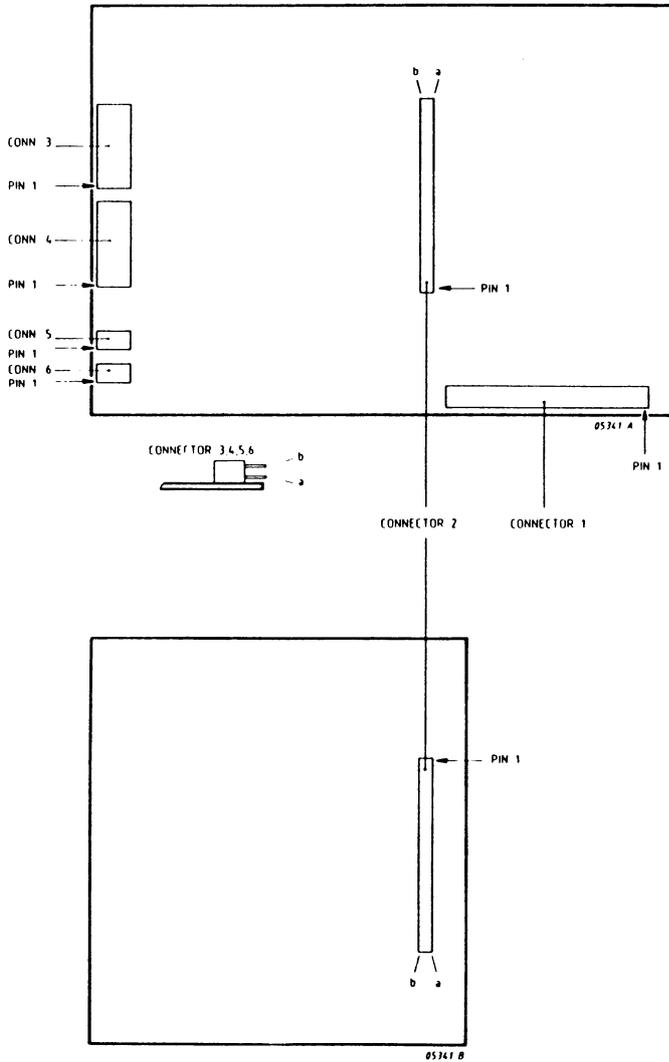
Connector 1 (System Bus), see section 20.1.1, Connector 1-6 (P3500)
                        see section 20.30.1, Connector 1-10 (P3800)

Connector 2, (Sandwich Board)

	a	b
1	0V	0V
2	+5VM	+5VM
3	ADRL1	ADRL2
4	ADRL3	ADRL4
5	ADRL5	ADRL6
6	ADRL7	ADRL8
7	ADRL9	ADRL10
8	ADRL11	ADRL12
9	ADRL13	ADRL14
10	ADRL15	ADRL16
11	ADRL17	DATL0
12	DATL1	DATL2
13	DATL3	DATL4
14	DATL5	DATL6
15	DATL7	DATL8
16	DATL9	DATL10
17	DATL11	DATL12
18	DATL13	DATL14
19	DATL15	NUCSI
20	NRASO	NRASI
21	X	X
22	NOELA	NOEEPR
23	NMWCL2	NMRX
24	MUX	RFCOUNT
25	NRFSH	LC373
26	X	X
27	NE1	NW
28	E3	NE2
29	+5V	+5V
30	0V	0V

Connector 3 (V.24 Interface, Channel A)

	a	b
1		101
2	114	103
3		104
4	115	105
5	141	106
6		107
7	108.2	102
8	140	109
9	125	
10	111	
11	113	
12	142	
13	DUMMY	

Connector 4 (Auxiliary Interface, Channel B)

	a	b
1		101
2		103
3		104
4		105
5		106
6		107
7	108.2	102
8		109
9		
10		
11		
12		
13		

Connector 5

	a	b
1	0V	NOLS
2	+5V	NOLI
3	DUMMY	

Connector 6 (Diagnostic Test Interface)

	a	b
1	0V	SDUTN
2	0V	SDTUN
3	DUMMY	RESETN

20.42.2.1 STRAP SETTING PMU 186 CPV

Master   Slave

W 26   ja   nein

W 11   offen   1-2

W 22   offen   2-3

STRAP Nr.	FUNCTION		STRAP 1-2	STRAP 2-3
W1	System memory area - 80000-BFFFF	(default)	Y	-
	= A0000-BFFFF		N	-
W2	RAM size - 256K		Y	-
	- 256K	(default)	N	-
W3	System memory area - 8000-BFFFF	(default)	Y	-
	- A000-BFFFF		N	-
W4	RAM size - 256K		Y	-
	- 256K		N	-
W5	Memory Mapping version - A		Y	-
	- B (default)		N	-
W6	Selftest covers RAM size - 256K		Y	-
	- 256K	(default)	N	-
W7	EPROM access - with wait states		N	-
	without wait states	(default)	Y	-
W8	Buslock source selection	(default)	N	-
W9	External receive clock (CT 115)		Y	N
	Receive/transmit clock internal	(default)	N	Y
W10	Interrupt on - remote power off	(default)	Y	N
	- local power off		N	Y
W11	Remote power on, Channel B:			
	- CT 108.2 (DCE)	(default)	Y	N
	- CT 109 (DTE)		N	Y
	- not used		N	N.
W12	DCE - CT 107 is outpt	(default)	Y	N
	DTE - CT 107 is input		N	Y

Macker

STRAP Nr.	FUNCTION		STRAP			
			W13 1-2	W13/14 1-1	W13/14 2-2	W14 1-2
W13/W14	DCE: (default) - CT 109 is output - CT 105 is input DTE: - CT 109 is input - CT 105 is output		Y N	N Y	N Y	Y N

STRAP Nr.	FUNCTION		STRAP			
			W15 1-2	W15/16 1-1	W15/16 2-2	W16 1-2
W15/W16	DCE: (default) - CT 104 is output - CT 103 is input DTE: - CT 104 is input - CT 103 is output		Y N	N Y	N Y	Y N

STRAP Nr.	FUNCTION		STRAP			
			W17 1-2	W17/18 1-1	W17/18 2-2	W18 1-2
W17/W18	DCE: (default) - CT 106 is output - CT 108 is input DTE: - CT 106 is input - CT 108 is output		Y N	N Y	N Y	Y N

STRAP Nr.	FUNCTION		STRAP			
			W19 1-2	W19/20 1-1	W19/20 2-2	W20 1-2
W19/W20	Channel A: - Ct 107 int. enabled (via SCC) (default) - CT 109/125 port inputs Channel A: - CT 107 port input - Ct 109/125 int. enabled (via SCC)		N Y	Y N	Y N	N Y

STRAP Nr.	FUNCTION	STRAP 1-2	2-3
W21	Channel A: - CT 113 from baudrate gen.　　　(default) - external transmit timing (CT 114)	Y N	N Y
W22	Channel B: - int. power off via CT 109 (DTE) - int. power off via CT 108 (DCE　(default) - no power off int.	Y N N	N Y N
W23	Remote power on Channel A: - via CT 109 - via CT 125 - not selected　　　　　　　　(default)	Y N N	N Y N
W24	Hysteresis CT 104 Channel A: - normal　　　　　　　　　(default) - fail safe	Y N	- -
W25	Hysteresis CT 104 Channel A: - normal　　　　　　　　　(default) - fail safe	Y N	- -

Master

DGE= Standart
DTE = für Modem

20.42.3 MODIFICATION HISTORY PMU 186 CPV/M

20.42.3.1 MODIFICATION HISTORY PMU 186 CPV (5112 291 9565*)

05345 A
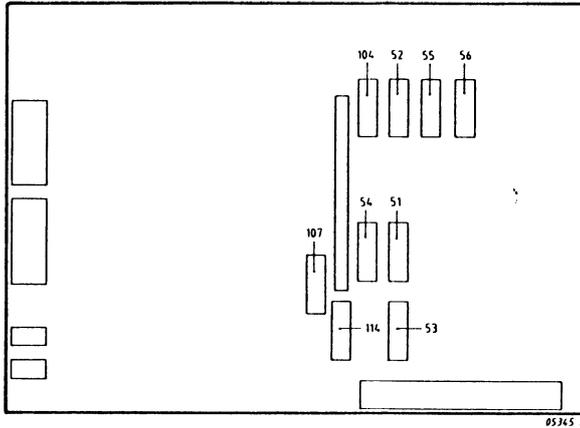
PMU 186 CPV (5112 291 9565*)

LEVEL *	PAL						SI-Nr.	
	IC51	IC52	IC53	IC54	IC55	IC56	P3500	P3800
1	00572	00581	00591	00601	00611	00621		

LEVEL *	PAL			SI-Nr.	
	IC104	IC107	IC114	P3500	P3800
1	00901	00911	01301		

IC 1   IC 2

05365 B

PMU 186 M (5112 291 9262*)

LEVEL	ROM		SI-Nr.	
*	IC1	IC2	P3500	P3800
1	01591	01601		
2	"	"		
3	01592	01602		

20.43   , FMBD BOARD

20.43 FMBD BOARD

20.43.1 INTERCONNECTIONS FMBD BOARD
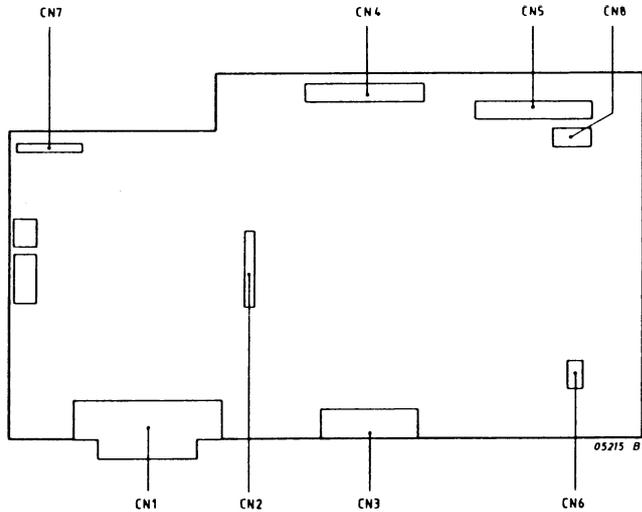
CN2   to interface option

CN3   option

CN4   to carriage motor, line feed motor, PTS sensor

CN5   to print head, home position sensor

CN6   from mains trafo

CN7   to operator panel

CN8   to paper end sensor

CN1 (PARALLEL INTERFACE)

PIN	FUNCTION
1	STROBE
2	DATA 1
3	DATA 2
4	DATA 3
5	DATA 4
6	DATA 5
7	DATA 6
8	DATA 7
9	DATA 8
10	ACKNLG
11	BUSY
12	PE
13	SLCT
14	AUTO FEED XT
15	
16	0V
17	0V
18	
19	0V
20	0V
21	0V
22	0V
23	0V
24	0V
25	0V
26	0V
27	0V
28	0V
29	0V
30	0V
31	LNIT
32	ERROR
33	0V
34	
35	+5V
36	SLCT IN

CN2 (TO SERIAL INTERFACE BOARD)

PIN	FUNCTION
1	ERR
2	PE
3	D7
4	RDY (BUSY)
5	D6
6	ACK
7	D5/PAR DIS
8	INIT
9	D4/OE
10	STB
11	D8/SI
12	AC12
13	R
14	AC12
15	D3/B2
16	+5V
17	D2/B1
18	+24V
19	D1/78
20	+12V
21	P/S
22	
23	SELIN
24	0V
25	TXD
26	0V

20.43.2 STRAP SETTING FMBD BOARD
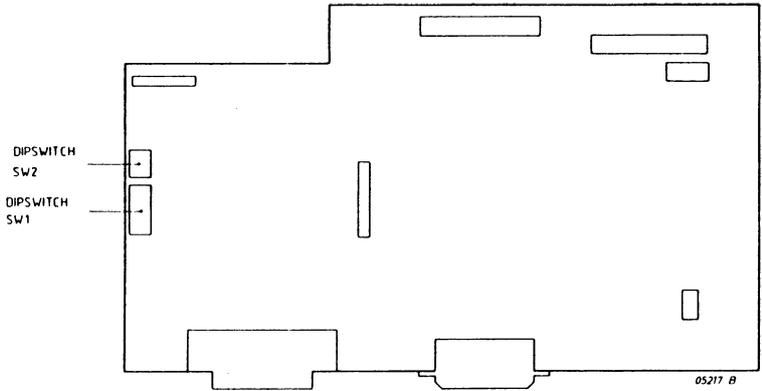
DIPSWITCH SW2   DEFAULT

SWITCH Nr.	FUNCTION	
1	Select In	Y
2	Buzzer	Y
3	1 Inch Skip Over	N
4	Automatic Line Feed	N

Note: Y = ON
      N = OFF

DIPSWITCH SW1

SWITCH Nr.	FUNCTION	
1	Print Mode at Power On: - PICA (default) - Condensed	N Y
2	Zero Font: - 0 (default) - Ø	N Y
3	Paper End Detector: - Valid (default) - Invalid	N Y
4	Input Buffer: - Valid - Invalid (default)	Y N
5	Print Mode at Power On: - PICA (default) - Emphasized	N Y
6	Character Set, refer to next table	
7	Character Set, refer to next table	
8	Character Set, refer to next table	

CHARACTER SET DESIGNATION

COUNTRY	SW1		
	6	7	8
U.S.A.	Y	Y	Y
FRANCE	Y	Y	N
GERMANY	Y	N	Y
ENGLAND	Y	N	N
DENMARK	N	Y	Y
SWEDEN	N	Y	N
ITALY	N	N	Y
SPAIN	N	N	N

20.43.3 MODIFICATION HISTORY FMBD BOARD

T.B.S.L.

20.43.4 REPLACEMENT FMBD BOARD

T.B.S.L.

20.44   SERIAL INTERFACE BOARD

20.44 SERIAL INTERFACE BOARD

20.44.1 INTERCONNECTIONS SERIAL INTERFACE BOARD

05215 A
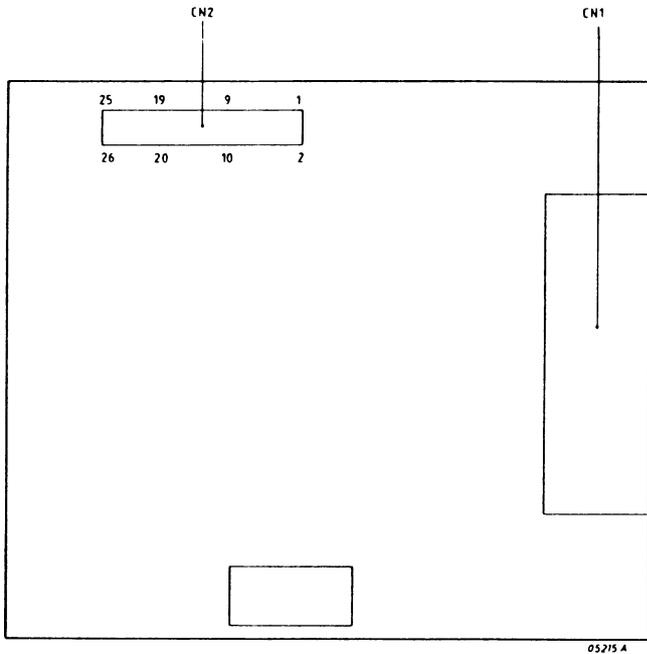
CN1 SERIAL INTERFACE

PIN	FUNCTION
1	PROT GND
2	TXD
3	RXD
4	
5	
6	DSR
7	SIGNAL GND .
8	DCD
9	
10	
11	REVERSE CHANNEL (2nd RTS)
12	
13	
14	
15	
16	
17	TTY-TXD
18	
19	
20	DTR
21	
22	
23	TTY-RXD RETURN
24	TTY-TXD RETURN
25	TTY-RXD
26	

CN2 (to FMBD Board)

Refer to section 20.43.1, Connector CN2.

20.44.2 STRAP SETTING SERIAL INTERFACE BOARD
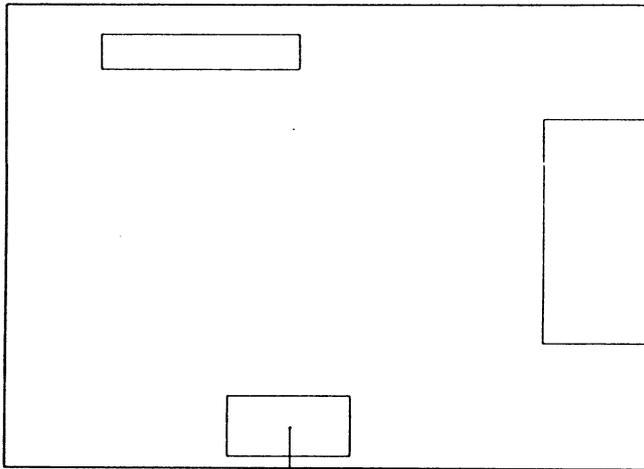
DIPSWITCH SW1

DIPSWITCH SW1

05215 D

SWITCH	FUNCTION	
1	Baud Rate Selection: (refer to table below)	-
2	Word Length: - 8 bit (default) - 7 bit	N Y
3	Baud Rate Selection: (refer to table below)	-
4	Baud Rate Selection: (refer to table below)	-
5	Parity Check: - Even - Odd	Y N
6	Parity Check: - Enabled - Disabled (default)	Y N
7	Baud Rate Selection: (refer to table below)	-
8	Interface Selection: - Serial Interface (default) - Parallel Interface	Y N

Note: Y = ON   N = OFF

BAUD RATE SELECTION TABLE

BPS		SW1			
		7	1	4	3
75		Y	Y	Y	Y
110		Y	Y	Y	N
134,5		Y	Y	N	Y
150		Y	Y	N	N
200		Y	N	Y	Y
300		Y	N	Y	N
600		Y	N	N	Y
1200		Y	N	N	N
1800		N	Y	Y	Y
2400		N	Y	Y	N
4800		N	Y	N	Y
9600		N	Y	N	N
19200		N	N	Y	Y
19200		N	N	Y	N
19200		N	N	N	Y
19200		N	N	N	N

Note: Y = ON
      N = OFF

20.44.3 MODIFICATION HISTORY SERIAL INTERFACE BOARD

T.B.S.L.

20.45   .   . PSU-M3

20.45 PSU M3

20.45.1 INTERCONNECTIONS PSU M3

05365 C

CONNECTOR 2   CONNECTOR 1
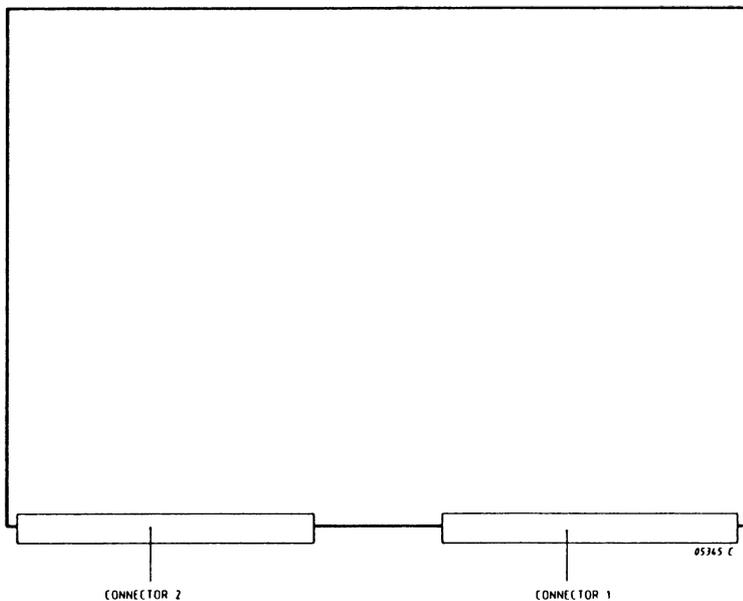
Connector 1 (PBP M3)

	a	b	c
1	BONN	0V	
2	0V	0V	RPON
3	BAWOFF	0V	PWFN
4	0V	0V	RSLN
5	SYNI	0V	
6	0V	0V	
7		0V	
8	0V	0V	0V
9	0V	0V	0V
10			
11	0V	0V	0V
12			
13	0V	0V	0V
14			
15	0V	0V	0V
16			
17	0V	0V	0V
18	+5VM	+5VM	+5VM
19	0V	0V	0V
20	+12VB	+12VB	+12VB
21	0V	0V	0V
22			
23	0V	0V	0V
24			
25	0V	0V	0V
26	+5VM	+5VM	+5VM
27	0V	0V	0V
28	+5VM	+5VM	+5VM
29	0V	0V	0V
30	+5VM	+5VM	+5VM
31	0V	0V	0V
32	+5VM	+5VM	+5VM

Connector 2 (PBP M3)

	a	b
2		
4		
6		
8		
10		
12		
14		
16		
18		
20		
22		
24		
26	N	N
28	L	L
30		
32		

05345 D
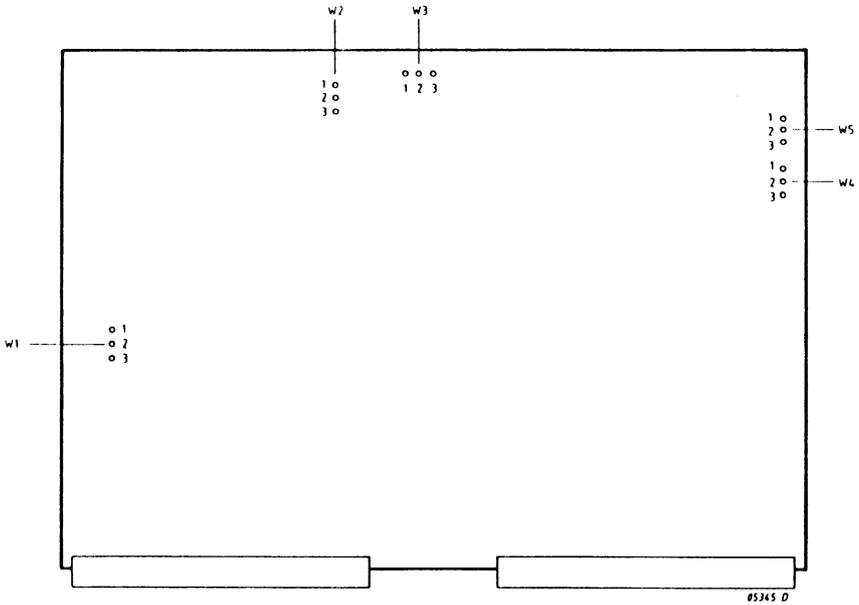
STRAP Nr.	FUNCTION		STRAP	
			1-2	2-3
W1	Mains Supply: -115V -230V		Y N	N Y
W2	Power On: - remote - local	(default)	Y N	N Y
W3	Master/slave power supply configuration Battery back-up power supply	(default)	Y N	N Y
W4	Source RSLN No source RSLN	(default)	N Y	Y N
W5	Source PWFND No source PWFND	(default)	N Y	Y N

20.45.3 MODIFICATION HISTORY PSU M3

T.B.S.L.

20.46   PBP M3

20.46 PBP M3

20.46.1 INTERCONNECTION PBP M3
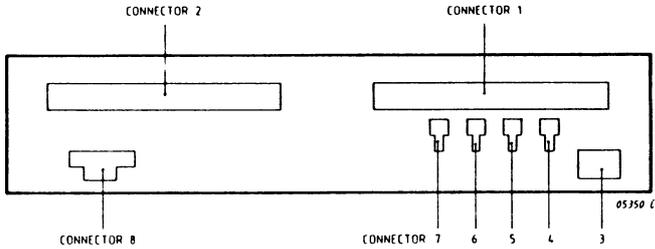
Connector 1
(to PSU M3)

	a	b	c
1	BONN	0V	
2	0V	0V	RPON
3	BAWOFFN	0V	PWFN
4	0V	0V	RSLN
5	SYNI	0V	
6	0V	0V	
7		0V	
8	0V	0V	0V
9	0V	0V	0V
10			
11	0V	0V	0V
12			
13	0V	0V	0V
14			
15	0V	0V	0V
16			
17	0V	0V	0V
18	+5VM	+5VM	+5VM
19	0V	0V	0V
20	+12VB	+12VB	+12VB
21	0V	0V	0V
22			
23	0V	0V	0V
24			
25	0V	0V	0V
26	+5VM	+5VM	+5VM
27	0V	0V	0V
28	+5VM	+5VM	+5VM
29	0V	0V	0V
30	+5VM	+5VM	+5VM
31	0V	0V	0V
32	+5VM	+5VM	+5VM

Connector 2
(to PSU M3)

	a	c
2		
4		
6		
8		
10		
12		
14		
16		
18		
20		
22	////	////
24	////	////
26	N	N
28	L	L
30	////	////
32	////	////

Connector 3
(from PBP 1)

OV	RSLN	1
OV	PWFN	2
OV	RPONN	3 (top view)
OV	BONN	4
OV	BAWOFFN	5
/////	SYNI	6

Connector 4   (to BPB1)   0V

Connector 5   (to LBP-P3800)   +5V
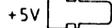
Connector 6   (from battery)   +12V
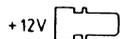
Connector 7   (from battery   0V

Connector 8
(from PBP1)   N
                        MAINS
                   L

20.46.2 STRAP SETTING PBP M3

Not applicable.

20.46.3 MODIFICATION HISTORY PBP M3

Not applicable.