L1

M34-M44-M54

Service Manual

olivetti

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PREFACE

This manual is intended for technicians required to service the M34, M44 and M54 systems in field.

SUMMARY

The contents of each of the six chapters and the appendix comprising the manual are outlined below.

Chapter one is an introduction to the systems, specifying in particular the position of the boards in the rack and the compatibility of the boards in relation to the different versions existing.

The second chapter concerns installation of the basic modules, lines and workstations.

The third chapter describes all aspects of power supply.

Chapter four is on the controllers and hardware modules, illustrating settings and specific connections required.

The fifth chapter provides the most important details of the magnetic peripherals which can be connected to the systems.

The sixth chapter relates to the system autodiagnostic and stand alone test programs.

A summary of the "Progetto di Gestione" and a full system bibliography can be found in the appendix.

PREREQUISITES: Attendance on a specific system course.

DISTRIBUTION: Internal (Z)

FIRST EDITION: June 1985

FOREWORD

This manual is for technicians who are called on to service M34 and M44 systems in field.

SUMMARY

The manual consists of six chapters and an appendix; the subject matter of each is as follows:

Chapter one is an introduction to the systems, with particular emphasis on the positions of the boards in the racks and compatibility between boards in relation to the different versions existing.

Chapter two deals with installation of the basic modules, lines and workstations.

Chapter three deals with all aspects of power supply.

In chapter four, the controllers and hardware modules are described with exact details of settings and connections.

Chapter five gives the main characteristics of the magnetic peripheral units which can be connected to the two systems.

Chapter six refers to system autodiagnostics and stand alone test programs.

The appendix summarises relevant aspects of the "Progetto di Gestione" and gives the full system bibliography.

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CONTENTS

1. GENERAL

1.1 INTRODUCTION

This manual deals with the L1 line systems M34, M44 and M54.

The M34 and M44 systems are compatible, both at hardware and at software level with the corresponding M30 and M40 models, whether in MOS or emulated environment.
The major innovations are the new CPU with 8 MHz clock and the use of RAM storage boards with an access time of 150 ns. Most of the previous controllers have now been adapted to the new working frequency.
No modifications have been made to the casings already used on the M30/M40 models. In addition, external cabinets to house magnetic peripherals in addition to those integrated in the basic cabinet may also be used with the M44, as on the M40.

The M54 system, with the same casing as the M30/M34, is perfectly compatible with these models.
The main innovations here are the central unit, use of RAM storage memories with ECC and a system which may be configured with three magnetic peripherals.

The central unit (UC070) is a monoprocessor model with greater processing efficiency than either the M30/M34 models as it uses a 10 MHz clock processor, decoupled from the system bus through a cache memory.
Such an architecture grants processing power of from 0.85 to 0.95 MIPS, which is 1.6 times the M34 model and 2.3 times the M30 model.

M34/M44 systems can be upgraded by replacing the C.U. UC048 or UC048/A with the UC070.

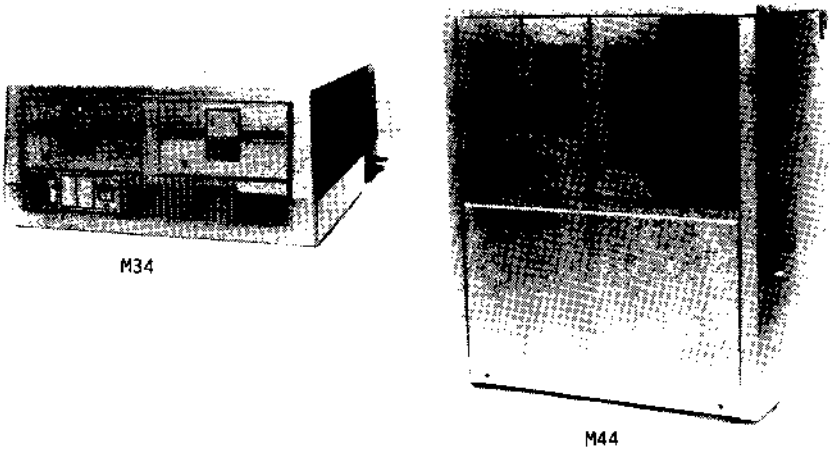

Fig. 1-1 M34, M44 and M54, front view

The **M34/M54** systems consist of a "desk top" type box, containing:

- Power supply unit
- Board rack (max. 9 board slots) holding the control and memory boards
- Shelf space for magnetic peripherals
- Connection cable

N.B.: External magnetic peripherals may not be used.

The **M44** system (desk size cabinet) consists of the following basic modules:

- BASIC UNIT, including:
  - Power supply unit
  - Board rack (max. 14 board slots) for the control and memory boards
  - Space for magnetic peripherals
  - Connection cable
- SB3 CABINET, capable of holding all types of magnetic peripheral, except the MTU
- SB2 CABINET, specifically for the MTU, but can also contain 60/120 MByte hard disk units

Possible SB3 and SB2 configurations are shown in the tables in chapter 5.

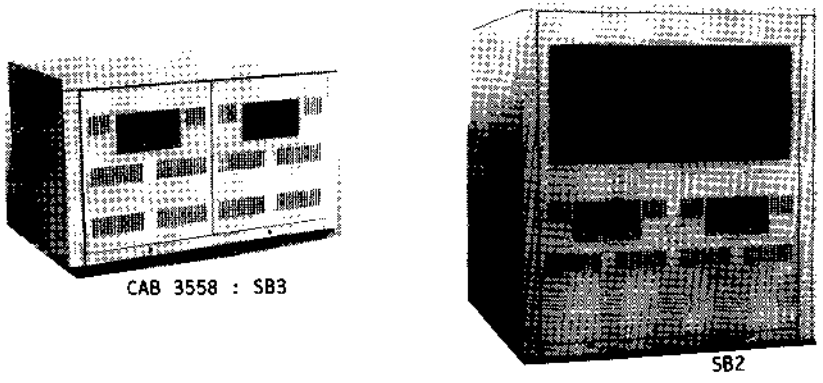

Fig. 1-2 SB3 and SB2: external cabinets for magnetic peripherals

1.2 POSITION OF THE BOARDS IN THE RACK

For the M34/M54, board slots are numbered starting from the bottom and moving upwards, whereas, for the M44, numbering goes from right to left, as seen from the front.

Drawbacks

The central unit boards have the following fixed positions:

- M34/M54 central unit: 2nd position
- M44 central unit: 1st position

As for the RAM storage boards, in an M34/M54 system, slot 1 holds the first memory module. This position is not considered in the priority daisy chain and cannot, therefore, be used to house control boards.
In an M44 system, the first memory module goes into slot 2.
To avoid delays in the transmission of control board signals, any memory expansion boards should be set in the last two slots.

There must be no vacant slots between boards.

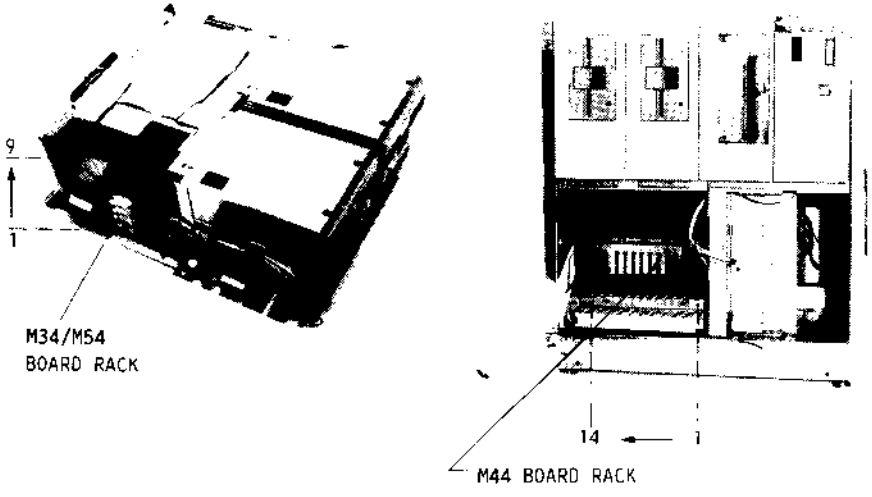

Fig. 1-3 M34/M54 and M44 board racks

The exact order for boards in the rack is dictated by the following criteria:

DMA priority:

The priority of controllers working in DMA decreases in relation to their proximity to the central unit.

Interrupt priority

There are three interrupt levels which, in decreasing order, are:

Level 1A: Highest priority: the closer a board is to the central unit, the higher its priority.

Level 1B: Priority decreases in function of proximity to the central unit.

Level 2: Lowest priority: a board's priority is greater the closer it is to the central unit.

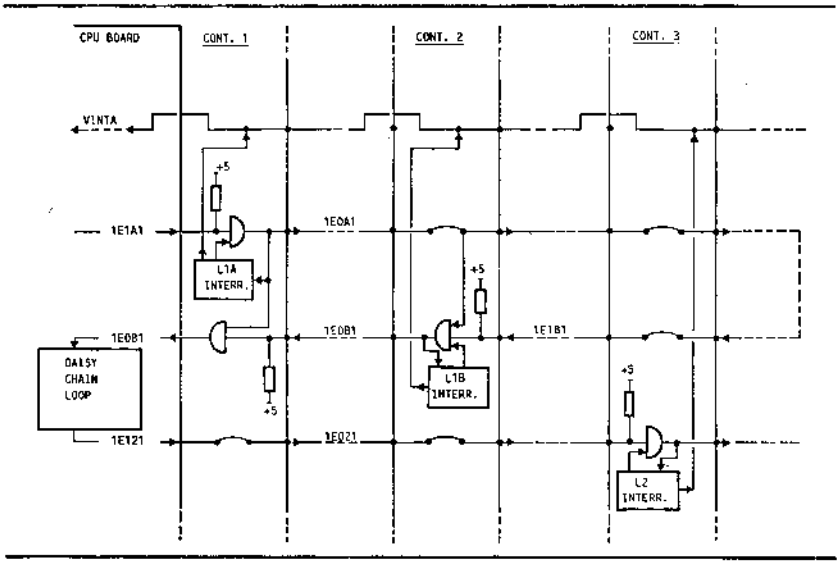

Fig. 1-4 Priority daisy chain

The following section contains a table illustrating the correct order for insertion of boards in board rack. The systems have certain configurability limits which makes it important to consult the list of modules found in the product evolution plan ("Progetto di Gestione") in Appendix A.

1.2.1 ORDER OF BOARDS IN BOARD RACK

The table below applies to the M34/M54 systems and to the M44.

HARDWARE MODULE	BOARD NAME	LOGIC NAME	INTERRUPT LEVEL	
Central Unit for M34/M44 Central Unit for M54, M34SP and M44SP	UC048/A UC070	FF	ACIA: L1A or L1B (programmed by Software); TIMER: L2	
MTU Controller	G0278/B	62	L2	Has highest priority on level L2
Encryption and RTC control	G0257	21	L1B	
Real Time Clock Module	G0257/A	20	L1B	
Encryption cont.(pin check)	G0257/B	21	L1B	
Encryption cont.(CAT algor.)	G0257/C	21	L1B	
V24 + V24 line controller	G0236	22/28	L1B	
V24 + LION200 line control	G0256	23/27	L1B	Intelligent controllers (with microprocessor)
V24 + LION9.6 line control	G0340/A	25/26	L1B	
Ethernet line control	G0212/A	6F	L1B	
Multiplexer control	G0322	30	L1B/L2	
B/W alphanum. KDC control	G0252	FE	L1B	Video controllers not connected to ELB 1382: have lesser priority than those connected to ELB. B/W or colour alphanum. controllers should not be set between 2 B/W graphic video controls.
Colour alphanum. KDC control	G0224	FE	L1B	
Graphics board (with G0252)	G0255/A	FD		
Colour graphic KDC control	G0261	F7	L1B	
Graphics interface	G0260	--		
Alphanum. video control	G0259	FB		
Omninet local network cont.	G0308	6B	L1B	
B/W alphanum. KDC control	G0252	FE	L1B	Video controllers connected to ELB1382 positioned after video contrs. not connected to ELB 1382. B/W or colour alphan. contrs. cannot be positioned between 2 B/W graphic video controllers
Graphics board (with G0252)	G0255/A	FD		
Alphanum. colour KDC control	G0224	FE	L1B	
Colour graphic KDC control	G0261	F7	L1B	
Graphics interface	G0260	--		
Alphanum. video control	G0259	FB		

HARDWARE MODULE	BOARD NAME	LOGIC NAME	INTERRUPT LEVEL	
External V24 line control	G0300	D3/D2	L1A	Non-intelligent controllers (no microprocessor)
X24 line control	G0303	D5	L1A	
LION 9.6 line control	G0333	D7	L1A	
Twin controller, Current Loop	G0327	CF	L1B	In emulated environment programmed on level L1A
18 MB HDU Control (XU 5010) Controller and Formatter	G0230 G0231	E4 --	L2	These control boards operate in DMA. They should be positioned immediately after the video/keyboard contrs. connected to ELB
Inter. con. ST506 (XU1707/9)	G0363	65	L2	
HDU SMD Control (XU 1700/03) Controller and Formatter	G0302/A G0301/A	61 --	L2	
Bus adapter and control for HDU 14MB (XU5006)	G0299 DTC510B0	60	L2	
45/60 MB STC Control Controller/Formatter	G0417 G0418	E7	L2	
20 MB STC Control (XU 1120) Controller and Formatter	G0200/B G0201/B	E6 --	L2	
320 KB mFDU Control	G0280/E	E0	L2	
1 MB FDU/mFDU Control	G0280/D	E0	L2	
Integrated modem MOIN 5.2	IF 192	Set in the last rack position: a control board must be allocated a position depending on its priority		

N.B.: - Logic names "22","23" and "25" refer to boards with whole memory segments; logic names "28","27" and "26" refer to boards with a half segment.

- Logic name "D3" represents normal mode, "D2" unattended mode.

1.3 COMPATIBILITY OF BOARDS TO SYSTEMS

Compatibility of the hardware modules to the M30 (BU 3415), M40 (BU 3515), M34, M44, M54 and M64 systems is illustrated in the table below:

BOARD NAME	BOARD DESCRIPTION	M30	M40	M34	M44	M54	M64
	CENTRAL UNITS AND VARIOUS MODULES						
UC042	Central unit	yes	yes	no	no	no	no
UC048	Central unit	no	no	yes	yes	no	no
UC070	Central unit	no	no	(*)	(*)	yes	yes
AT 112	Automatic Start Device	yes	yes	yes	yes	no	no
GO 257	Encryption + Real time clock	yes	yes	yes	yes	yes	yes
GO 257/B	Encryption (pin check)	yes	yes	yes	yes	no	no
GO 257/C	Encryption (pin check + CAT alg.)	yes	yes	yes	yes	yes	yes
GO 257/A	Real Time Clock Module	yes	yes	yes	yes	no	no
INO 52	Back plane	yes	no	no	no	no	no
INO 62	Back plane	yes	no	yes	no	yes	no
INO 51/61	Back plane	no	yes	no	no	no	no
INO 74	Back plane	no	yes	no	yes	no	no
INO 80	Back plane	no	no	no	no	no	yes
	RAM STORAGE BOARDS						
ME027-32	256/384/512 KByte: 64 Kb chip	yes	yes	no	no	no	no
RA57/E	512 KByte: 64 Kb chip	yes	yes	yes	yes	yes	yes
RA57/C-B-A	1/1.5/2 MByte: 256 Kb chip	yes	yes	yes	yes	yes	yes
RA65/B	1 MByte: 256 Kb chip (ECC)	no	no	(*)	(*)	yes	yes
RA065	2 MByte: 256 Kb chip (ECC)	no	no	(*)	(*)	yes	yes
	POWER SUPPLIES						
LA 13	130 W	yes	no	no	no	no	no
LA 17	170 W	yes	no	yes	no	yes	no
LA 30	360 W	no	yes	no	no	no	no
LA 40	345 W (PSU 3567)	no	yes	no	yes	no	no
LA 40	345 W (PSU 3545) for SB3	no	$	no	$	no	no
LD 10	100 W (expansion for PSU 3567)	no	yes	no	yes	no	no
LB 40	350 W for SB0 cabinet	no	no	no	no	no	yes

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N.B. : (*) boards used in upgrading to M34/SP and M44/SP
($) installed in SB3 cabinet

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BOARD NAME	BOARD DESCRIPTION	M30	M40	M34	M44	M54	M64
	DISPLAY/KEYBOARD CONTROLLERS						
GO 157	B/W, alphanumeric	yes	yes	no	no	no	no
GO 207	Graphic expansion, with GO 157	yes	yes	no	no	no	no
GO 252-A-B	B/W, alphanumeric, trivalent	yes	yes	yes	yes	yes	yes
GO 255	Graphic expansion, with GO 252	yes	yes	no	no	no	no
GO 255/A	Graphic expansion, with GO 252	yes	yes	yes	yes	yes	yes
GO 224	Alphanumeric, colour	yes	yes	yes	yes	no	no
GO259-60-61	Colour, graphic and alphanumeric	yes	yes	yes	yes	no	no
	FLOPPY/mFLOPPY CONTROLLERS						
GO 240	320 KB minifloppy unit	yes	yes	no	no	no	no
GO 280/A	320 KB minifloppy unit	yes	yes	no	no	no	no
GO 280/C-E	320 KB minifloppy unit	yes	yes	yes	yes	yes	no
GO 229	1 MB floppy unit	no	yes	no	no	no	no
GO 280	1 MB floppy/minifloppy unit	no	yes	no	no	no	no
GO 280/B-D	1 MB floppy/minifloppy unit	yes	yes	yes	yes	yes	yes
	STC AND MTU CONTROLLERS						
GO200A+201A	20 MB STC Dei (XU 1120)	no	yes	no	no	no	no
GO200X+201B	20 MB STC (XU 1120)	no	yes	no	no	no	no
GO200B+201B	20 MB STC (XU 1120)	no	yes	no	yes	no	no
GO200B+342	20 MB STC Cypher (XU 1130)	no	yes	no	yes	no	no
GO200B+342	20 MB STC Cypher (Archive)	no	no	no	yes	no	yes
GO417+418	45/60 MB STC	no	no	no	yes	yes	yes
GO 278/B	40 MB MTU (XU 1705)	no	yes	no	yes	no	yes
	HARD DISK CONTROLLERS						
DTC510BP/B0	14MB HDU controller, SASI interf.	yes	no	yes	no	no	no
GO 298-299	Bus adapter for 14 MB HDU	yes	no	yes	no	no	no
GO 363	ST506 interface controller	yes	yes	yes	yes	yes	yes
GO230-231	18 MB HDU controller (XU 5010)	no	yes	no	no	no	no
GO230-231/A	18 MB HDU controller	no	yes	no	yes	no	no
GO301-302	SMD3 interface controller	no	yes	no	no	no	no
GO301A-302A	SMD3 interface controller	no	yes	no	yes	no	yes
GO404-405	ESDI interface controller	no	no	no	no	yes	yes

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BOARD NAME	BOARD DESCRIPTION	M30	M40	M34	M44	M54	M64
	LINE CONTROLLERS AND SERIAL INTERFACES						
GO 156	V24, remote internal/external	yes	yes	no	no	no	no
GO 300	V24, remote internal/external	yes	yes	yes	yes	yes	yes
IF 192	MOIN 5.2 integrated modem	yes	yes	yes	yes	yes	yes
GO 234	Lion 9.6	yes	yes	no	no	no	no
GO 333	Lion 9.6	yes	yes	yes	yes	yes	yes
GO 303 ($)	X21, external line	yes	yes	yes	yes	yes	yes
GO 236 ($)	V24 + V24, with microprocessor	yes	yes	yes	yes	no	no
GO 331 ($)	V24 + V24, with microprocessor	yes	yes	yes	yes	yes	yes
GO 256 ($)	V24 + Lion 200, with micropro.	yes	yes	yes	yes	no	no
GO 340 ($)	V24 + Lion 200, with micropro.	yes	yes	yes	yes	yes	yes
GO 340/A($)	V24 + Lion 9.6, with micropro.	yes	yes	yes	yes	yes	yes
GO 308 ($)	Omninet local network	yes	yes	yes	yes	yes	yes
GO 212/A($)	Ethernet internal line	yes	yes	yes	yes	yes	yes
GO 322 ($)	Multiplexer controller	yes	yes	yes	yes	yes	yes
GO 151	RS 232 and current loop interface	yes	yes	no	no	no	no
GO 327	RS 232 and current loop interface	yes	yes	yes	yes	no	no
GO 195	Pin pad and badge reader interface	yes	yes	no	no	no	no

N.B.: All control boards marked $ are "Dual Port Memory" type boards. There are two versions of this type of board, whole segment and half segment, the latter being the most recent.
Exceptions to the above are the GO212/A, GO303, GO340/A and GO322, which exist only in the new version.
The GO 236 and the GO 331 are interchangeable if the former is modified to half segment.

It is imperative that Dual Port Memory boards on the same system are all of the same type, whole segment or half segment.

2. INSTALLATION

This chapter is divided into 5 sections, each treating one specific aspect of system installation.

The first section is a brief introduction on preparation of the site chosen for system installation.

The second part deals with aassembly and disassembly of the M34/M44/M54 basic units and the relative SB3 and SB2 modules.

The third section is on workstation organization, while the fourth part relates to regulations for the installation of internal lines and local networks. The fifth and final part describes the upgrading of M34/M44 systems to M34SP/M44SP.

2.1 ENVIRONMENT CONDITIONS CHECK

The hints given below should be followed to prepare the site for installation of M34/M44/M54 systems and system peripherals. For more detailed information, see the "Site Preparation Guide", code number 3932790 N.

Main Power Supply Network

Wires and switches must be able to support both the scheduled work load and the high surge currents at power-on.
Ground resistance must be to national standard requirements. A resistance of 50 ohms covers disturbance and, as operator protection, Italian ENPI standards demand a resistance of 20 ohms maximum.

Electrical noise

The system must be insulated against sources of electrical noise and devices causing excessive voltage level variations or which introduce large inductance or capacitance loads into the system.
However, some of the smaller, general office machines may be admitted on the same line as the system just as several L1 systems may be connected to the same mains power source, provided each mechine has its own plug.

Temperature and humidity

The tables below indicate the minimum amd maximum temperature and humidity values for the system and magnetic peripherals in operation, when stationary and in storage. All readings are calculated with no condensation.

	OPERATION		STATIONARY		STORAGE	
	TEMP.°C	HUMID. %	TEMP.°C	HUMID. %	TEMP. C	HUMID. %
M34-M44-M54	10 - 40	10 - 95	5 - 50	5 - 95	-15 - +55	5 - 95
FDU - mFDU	10 - 40	20 - 80	5 - 50	8 - 80	-30 - +53	8 - 90
HDU	10 - 40	8 - 80	5 - 50	5 - 95	-34 - +55	5 - 95
SCT	5 - 45	20 - 80	5 - 50	5 - 90	-30 - +55	5 - 95
MTU	10 - 26	15 - 95	5 - 50	10 - 90	-30 - +50	10 - 90
BADGE READER	10 - 40	10 - 90	5 - 50	5 - 95	-35 - +55	5 - 95

Static electricity

Extremely low humidity may cause electrostatic charges to be generated effecting the magnetic media in read/write operations and operation of the electronic devices and paper service equipment.
Carpets and mats can also cause electrostatic charge generation.
Humidity must be kept to required levels and anti-static floor coverings used.

Dust

Systems may be installed in a normal room designed for office purposes so maximum dust level permitted is 0.25 mg/mc.
A high dust level effects, in particular, the magnetic media, reducing effective head life.

Operating area

All parts of the system must be accessible to allow for technical service.
Systems should not be installed in full sunlight or near direct heat sources.
A free flow of air should be guaranteed the system and all inlets left unobstructed.

2.2 ASSEMBLY AND DISASSEMBLY

2.2.1 REMOVING THE M34/54 CASING

To remove the M34/M54 casing, slacken the two screws shown in figure 2-1 and lift up firmly.

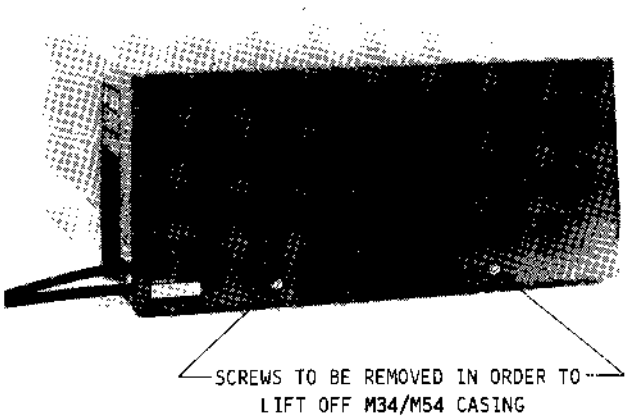


Fig. 2-1 Removing the M34/M54 casing

2.2.2 REMOVING THE M44 CASING

The M44 casing consists of a number of panels which are removed as described below (see fig 2-2):

- Front panel: slacken the 2 screws A and remove the panel, drawing it out and upwards
- Rear panel: slacken the 2 screws B and remove panel, drawing it upwards
- Upper shelf: slacken the two screws at the rear securing the shelf, push it slightly forwards and lift out
- Side panels: after the upper shelf has been removed, slacken the 2 screws C holding each panel and remove panels by lifting upwards.

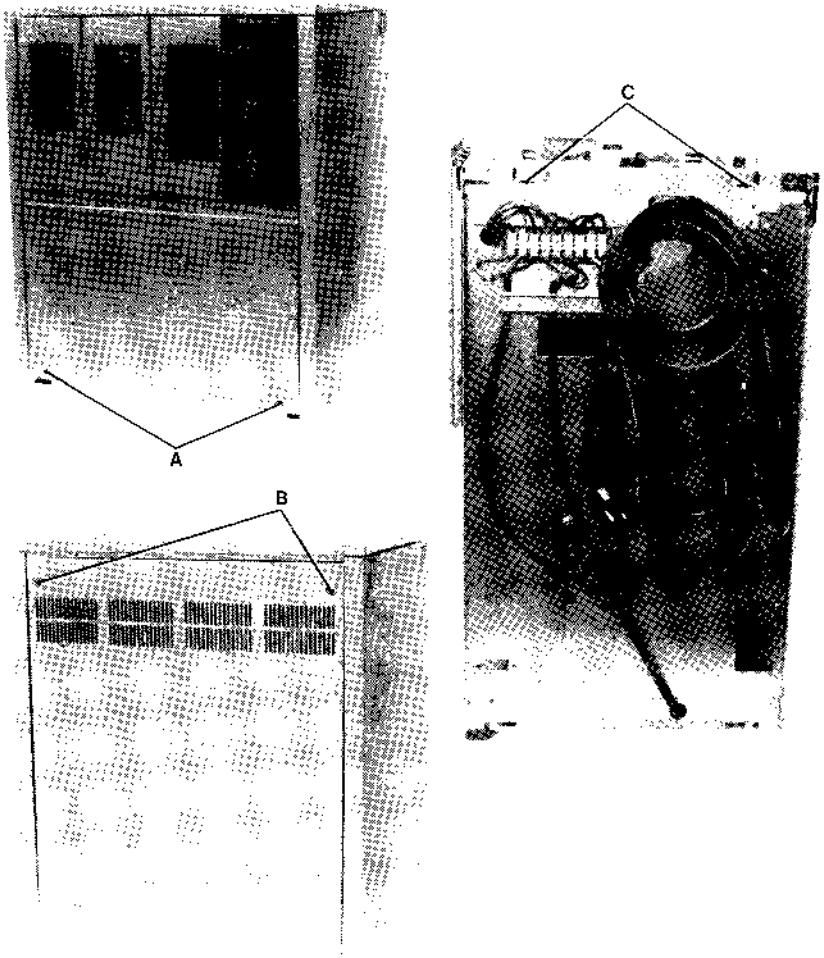


Fig. 2-2 Removing the M44 casing panels

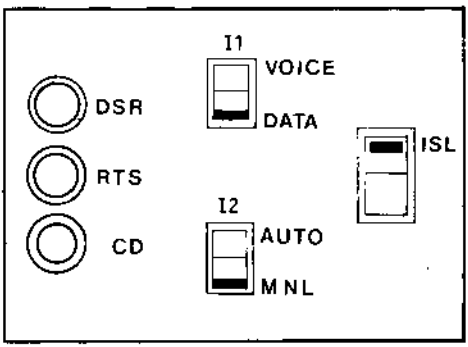
2.2.3 LINE CONSOLE: CDL 3313

The line console module is in three distinct parts:

- DSR, RTS and DCD line LEDs indicating, respectively, the "Data Set Ready", "Request to Send" and "Data Carrier Detector" signals required by the RS 232 interface.

- Switch I1: in the DATA position, enables normal mode data transmission with signals at logic level one or zero; in the VOICE position, data is converted into signals of varying frequency for transmission on telephone lines.
  Switch I2: in AUTO position, lines are set for unattended operation with remote switch-on from modem; in MNL position, lines are set for normal operation.
  These two switches are connected to MODEM when the modem setting is for switching lines.

- ISL (Initial System Loading) Switch: decides from which peripheral programs are to be loaded.



SWITCH I1	SWITCH I2	LINE LEDS	ISL SWITCH
VOICE - grey	AUTO - red	DSR - LED	ISL1 - black=M
- green	- yellow	RTS - LED	ISL2 - white
DATA - brown	MNL - white	DCD - LED	
		connected to line controller	connected to the Central Unit UC048 or UC070

Fig. 2-3 Line Console

Line Console installation on M34

Referring to figure 2-4, proceed as described below:

1. Remove casing
2. Remove the section of plug A, breaking the contact points on cover H
3. Remove cover H from support C
4. Slacken screws B and remove support C
5. Insert LED guides, LEDs and collars in holes D
6. Position LEDs with reference mark (cathode) down
7. Connect connector F of the controller-console cable to the LEDs with reference marks G on the left
8. Insert the ISL switch in hole M and tighten with two accompanying screws and connect cable to connector on central unit
9. Replace support C on box frame
10. Insert front cover H in holes E of cover C, tightening H and C with screws P.
11. Connect cable to appropriate line controller connector.

Line Console installation on M44

Referring to figure 2-5, proceed as described below:

1. Remove front panel and upper shelf of cabinet
2. Slacken screws A and remove front panel B
3. Slacken screws C and remove cover D
4. From cover D, remove the section of plug E required by breaking the contact points on the cover
5. Insert ISL switch in hole G and tighten with accompanying screws, then connect cable to relative connector of central unit
6. Insert LEDs in holes F of front panel B and connect controller-console connection cable as described earlier for the M34
7. Connect the cable to the line controller connector.

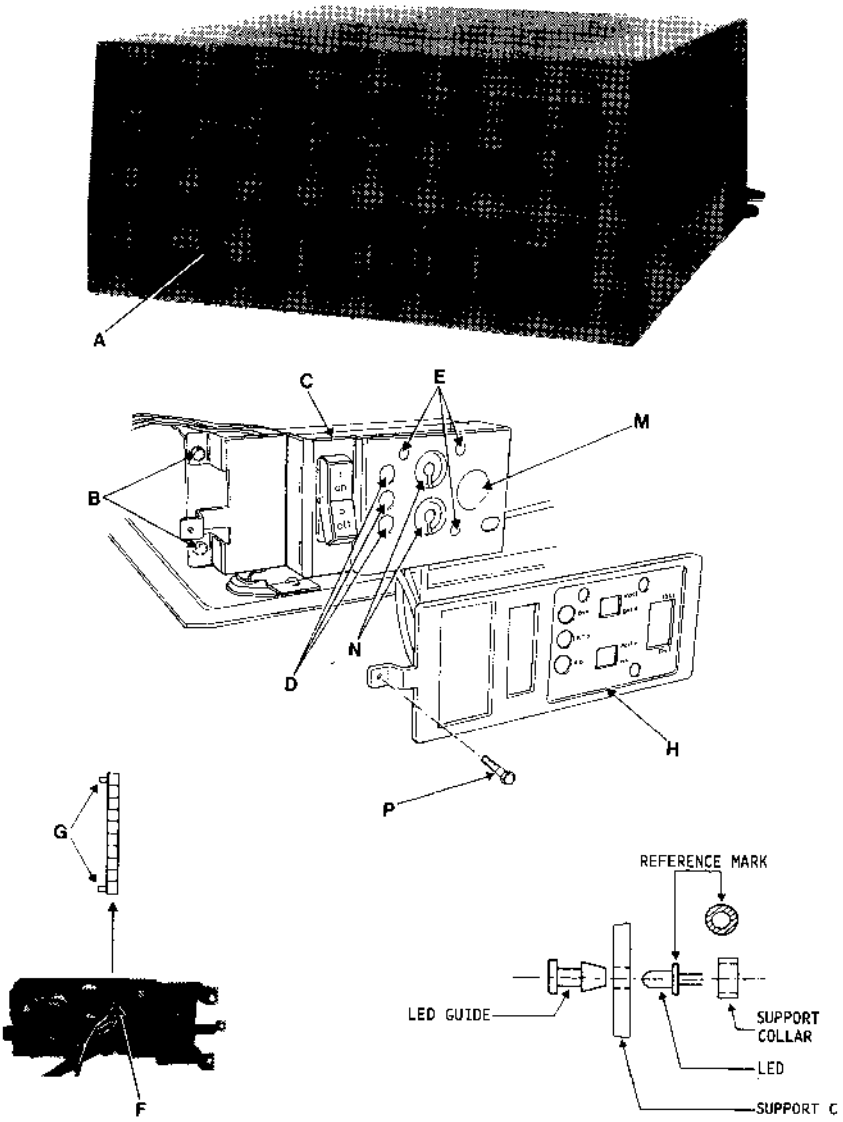


Fig. 2-4 Line Console installation on M34

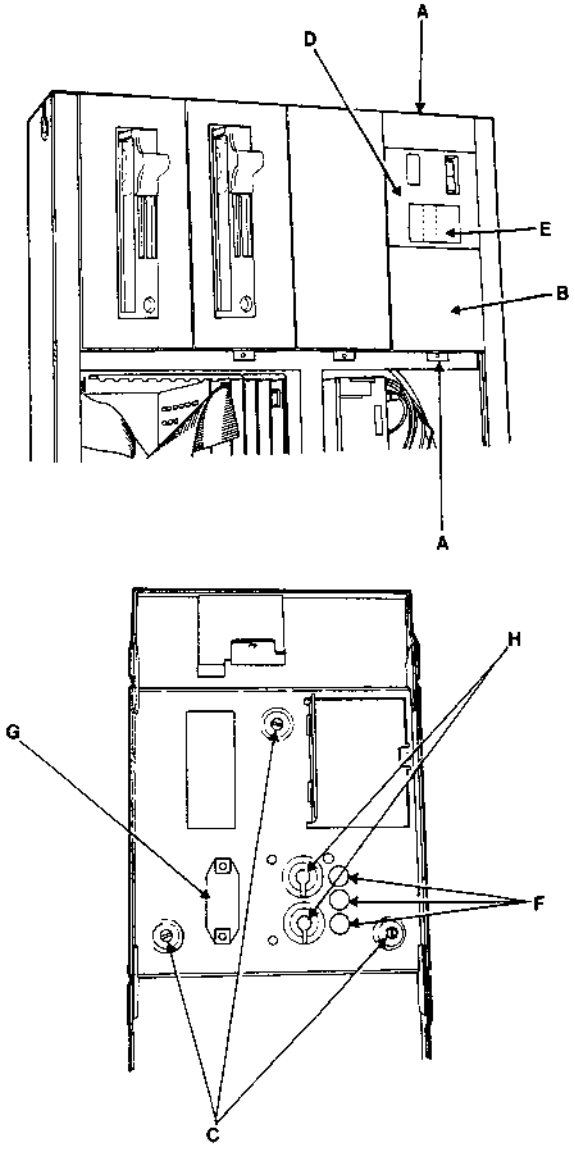


Fig. 2-5 Line Console installation on M44

2.2.4 INSTALLATION OF THE CAB 3558 (SB3) ON M44

To mount the SB3 cabinet on an M44 system, proceed as follows:

Remove the M44 upper shelf and rear panel

Set the SB3 module with its 4 stands over the 4 slots where the upper shelf was fixed earlier. Slide the module forwards and tighten the 4 screws.
The power cable may exit on the right or the left at the rear of the cabinet.

If the SB3 module is already configured, remove the M44 left side cover and join the signal cables to their respective controllers in the board rack.
Cover the cables with the lateral duct, longer side up, and secure with the 4 screws (do not catch the cables). Push the cable cover under the tongue on the SB3 and tighten the 2 screws.

If the module is not configured, fit additional peripheral units into their appropriate vents after removing the cover plates (for procedures, see chapter 5).
To remove the cover plates, dismantle the SB3 upper shelf by pulling it upwards firmly and slackening the 2 screws securing the panel to be removed.

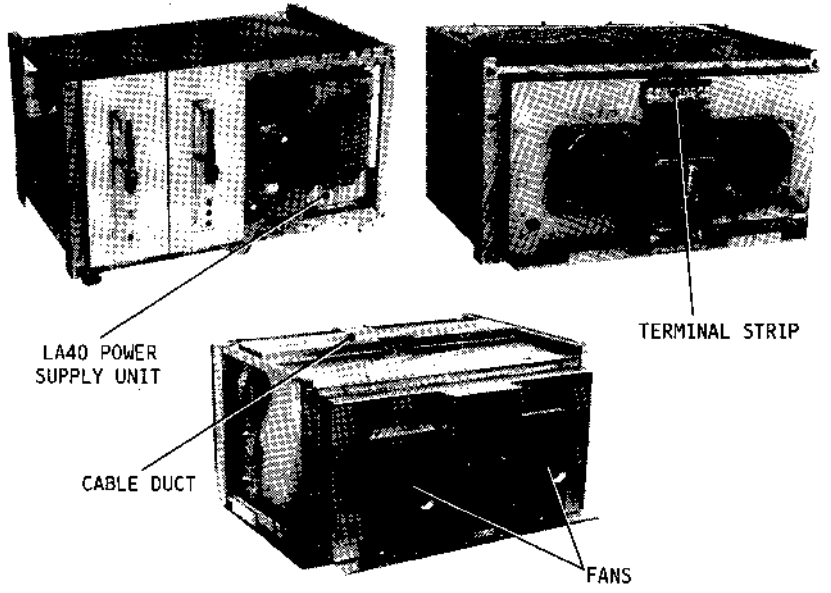


Fig. 2-6 Front and rear view of SB3 cabinet

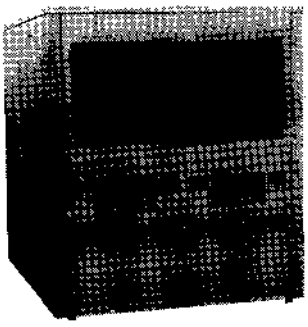
2.2.5 INSTALLATION OF THE MTU CABINET (SB2)

There are no particular difficulties in installing this module. The procedure is decribed below:

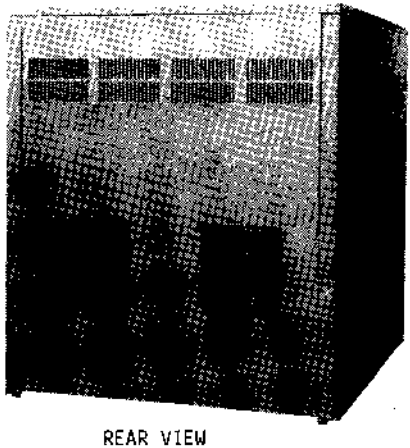
Check that the power supply cables are connected correctly.

Connect the control board cables to the appropriate peripherals.

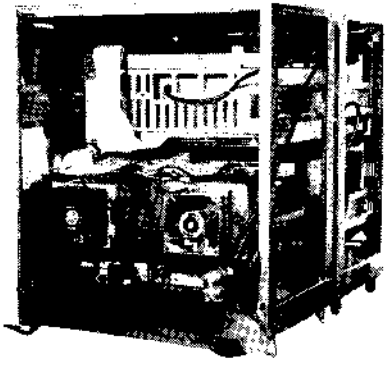
Remove the hard disk unit head protectors and the MTU protection after assembling the units; for installation of the peripherals, see the relative sections of chapter 5).



FRONT VIEW



REAR VIEW



CABINET INTERIOR

Fig. 2-7 Front and rear views of the SB2 cabinet

2.3 WORKSTATIONS

M34/M54 and M44 system workstations consist basically of the following elements:

- Multiplexer controller GO 322
- Distribution box D-BOX (DBX 3389)
- Electronics box ELB 3683
- Current Loop connection line
- Galvanic separation box T-BOX (TBX 9020)

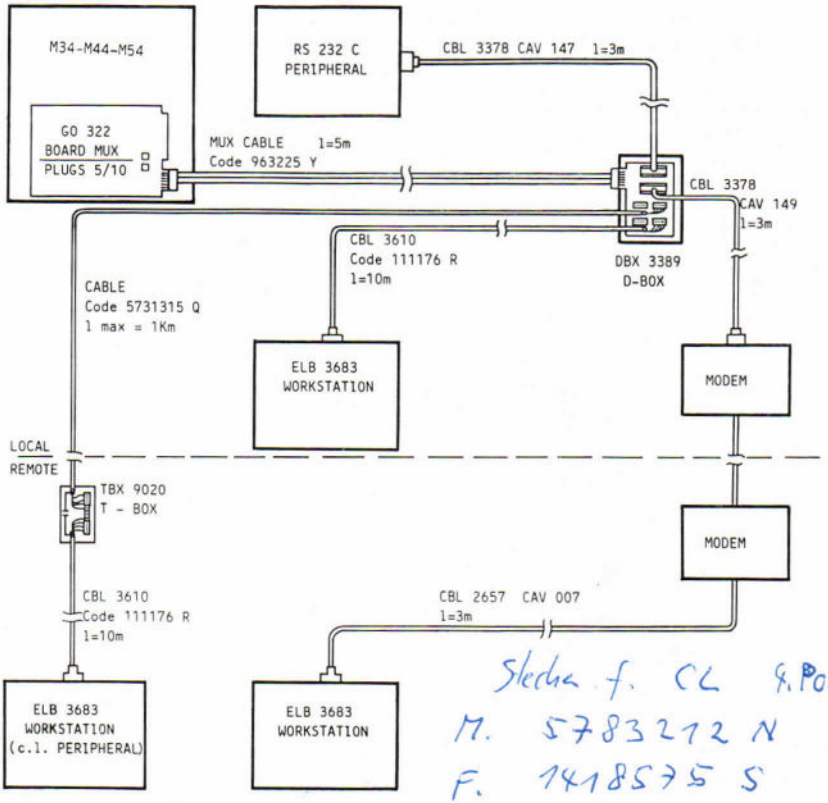


Fig. 2-8 Workstation installation diagram

2.3.1 MULTIPLEXER CONTROLLER

This is an intelligent module, capable of handling 4 full duplex connections at speeds of up to 19,200 baud and transfer rate of up to 76,800 bits/sec.
Its interfaces are the "20 mA Current Loop" and "RS 232 C".
All connections between this controller and peripherals are by way of the external D-BOX device.

2.3.2 DISTRIBUTION BOX D-BOX

This is a passive device connecting the system multiplexer controller to the different peripherals; in other words, it "distributes" connections (RS 232 and/or Current Loop) to the peripherals.
The cable for connection to the multiplexer controller is 5 metres long.

The D-box must be set close to the system and secured to the wall or the floor at a maximum distance of 4 metres.
There are two slot holes on the base of the D-box for wedge type pressure screws.
To have access to the slot holes, the D-box cover, held in place by embedded wings, should be removed. While the anti-disturbance frame can be left in place, the protective cover plugs must be taken off the male Cannon connectors.

To secure the D-BOX, two holes must be made at a distance of 102 mm centre-to-centre with diameter depending on the wedge used. The screws used should be 3.2 mm in diameter.

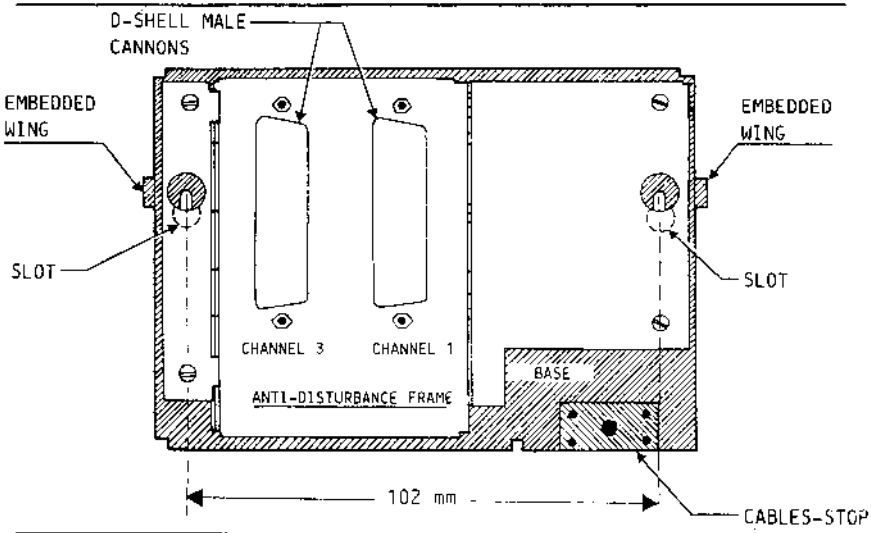


Fig. 2-9 D-BOX with casing removed

2.3.3 ELECTRONICS BOX ELB 3683

This intelligent module is the central element of the workstation and consists of:

- COMPOSITION:
  - . Power supply unit LG03
  - . Electronics mother board BA126
  - . Pin pad and badge reader optional board G0329
- EXCHANGE WITH SYSTEM: serial, point to point, asynchronous, free running, via multiplexer controller
- INTERFACES WITH SYSTEM:
  - . 20 mA Current Loop for distances of up to 1 km
  - . RS 232 C for distances of up to 15 metres
- INTERFACES WITH PERIPHERALS:
  - . keyboard interface
  - . video controller interface
  - . two RS 232 C interfaces
  - . two TTL interfaces

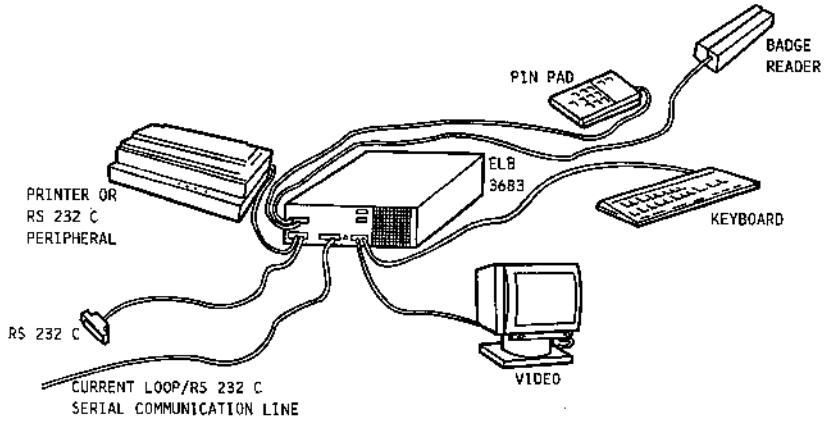


Fig. 2-10 Diagram of connection between ELB 3683 and peripherals

Installation of ELB 3683

The ELB 3683 has a felt-padded base and a cooling fan.
In its workstation context, the ELB may either be set on a table or in a semi-enclosed housing; however, in both cases, a free supply of air must be guaranteed. The ELB 3683 does not have any holes on its upper cover to take a monitor.

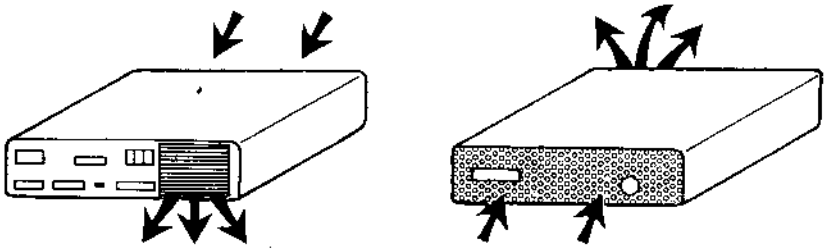


Fig. 2-11 ELB 3683 Ventilation

To remove the ELB 3683, the securing screws on the rear panel must first be slackened and the casing pulled slightly forward so that it can then be turned over backwards and lifted off the base of the ELB without damaging the copper earth springs in the framework contact zones.

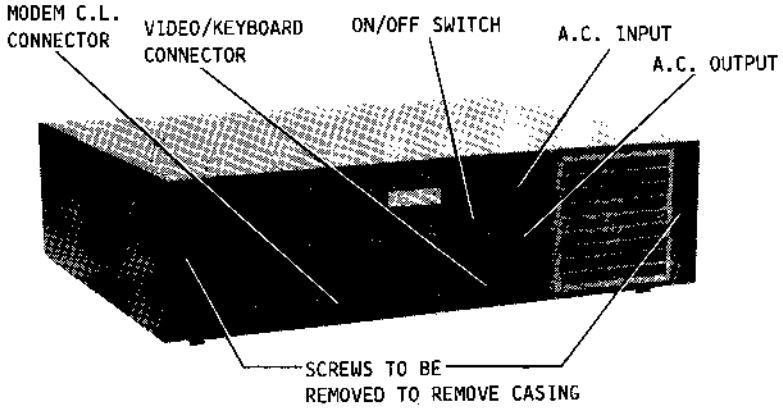


Fig. 2-12 Removing the ELB 3683 casing

Assembly of the pin pad and badge reader option board G0329

To mount the pin pad and badge reader option board in the ELB, the procedure is as follows (see also figure below):

- Remove the ELB 3683 casing as described earlier
- Mount the option board, securing it with the 3 screws shown in the figure
- Connect the option board to the motherboard and the power supply unit via the 40-way flat cable, plugging into the J124 connectors of BA126 and G0329.

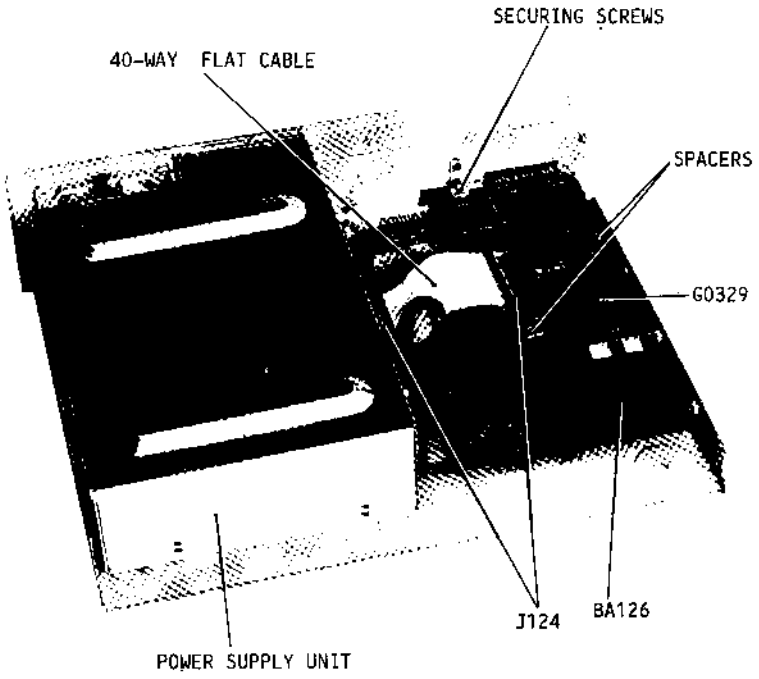


Fig. 2-13 Assembly of pin pad and badge reader option board

Power supply assembly

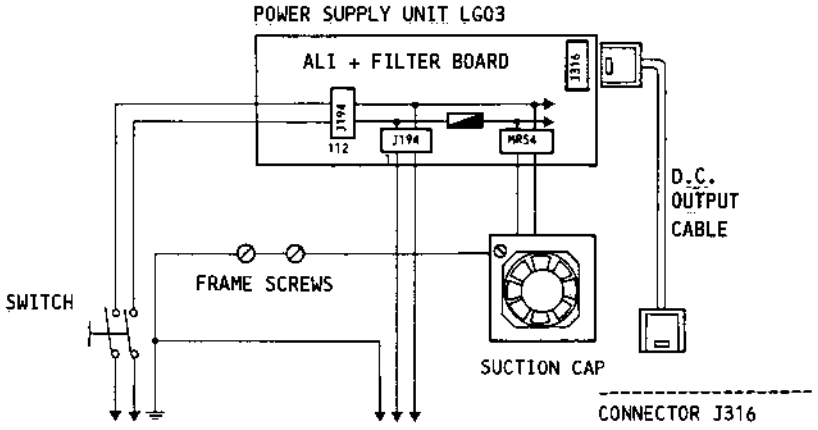
The power assembly LG03 is contained in a sheet metal structure including the fan, switch, power plug and video socket. The assembly is in two parts:

- Electronics board
- A.C. distribution

The electrical characteristics of the electronics board, which also includes the mains filter, are:

- Frequency: 50-60 Hz ±5%
- Jumper-selected mains voltage: 100-120 V or 220-240 V
- Power absorption: 50 VA
- Power raised: 35 watt

How the alternating current is distributed is illustrated in the figure below:



CONNECTOR J316		
1	+5V	RED
2	+5V	RED
3	M	BLACK
4	M	BLACK
5	+12V	ORANGE
6	-12V	ORANGE

Fig. 2-14 ELB 3683 a.c. distribution

2.3.4 CURRENT LOOP AND T-BOX CONNECTION LINE

For a Current Loop type connection between system and ELB 3683, for distances not greater than 10 metres from the D-Box, the Current Loop standard cable CBL 3610 is used.
The ELB 3683 can take a twin leaf connection as it has a polarity key; it should be inserted in the "CL/MODEM" connector.

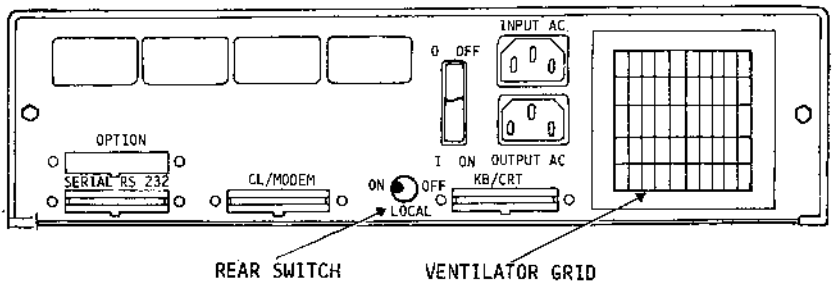


Fig. 2-15 ELB 3683 rear view

Th conditions listed below must be respected in connecting the CBL 3610 cable:

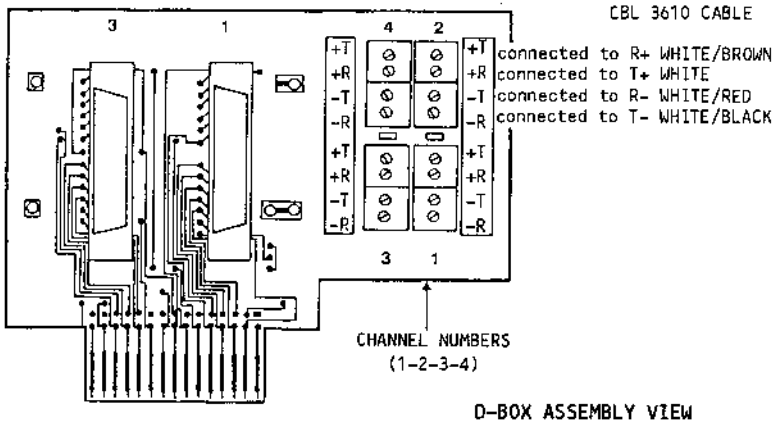


Fig. 2-16 Connection of a CBL 3610 cable

Note: to connect a printer to the D-Box, a 120 Ohm, 1/2 W resistor must be inserted between D-Box terminals Rx+ and Rx-.

T-Boxes are inserted in remote connections of over 10 metres and also in shorter, local connections where the ELB 3683 and D-Box grounds are not of equal potential.
This has a dual purpose: a) it ensures galvanic separation between the shield grounds of the two devices and b), junction of the CBL 3610 cable and the quadripole, shielded AWG 24 D-Box connector cable.
The cable connecting D-Box and T-Box can be 1 km in length and is available from "Gestione Ricambi" in reels of 500 metres.
The 4 ELB 3683 wires are connected to the T-Box in the same way as seen earlier for the D-Box and illustrated in figure 2-16.

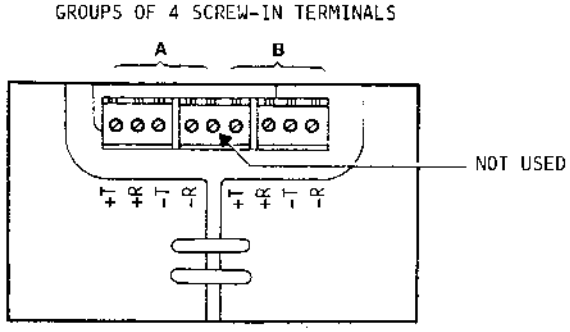
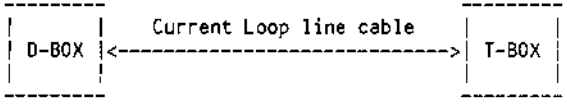


Fig. 2-17 T-Box assembly view

The T-Box has two sets of 4 terminal posts each to which the ELB and D-Box devices may be connected indifferently.
D-Box and T-Box are interconnected in the same way as seen earlier for connection of the D-Box to the ELB, and as is now shown in the two figures below:



T+	WHITE (Wh)/BROWN (Br)	connected to	R+
R+	WHITE	connected to	T+
T-	WHITE/RED (Re)	connected to	R-
R-	WHITE/BLACK (Bl)	connected to	T-

Fig. 2-18 Connection between D-Box and T-Box

The T-Box and D-Box terminal posts are accessed after the covers are removed from the two devices.

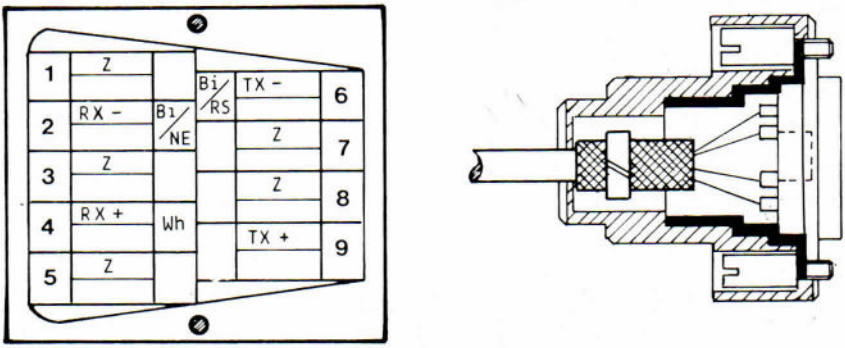


Fig. 2-18/1 9-way D-shell connector and cable connections

T-Box installation

The T-BOX is set at a maximum distance of 10 metres from the ELB 3683 and is secured to the wall or floor by wedge-type pressure screws.
The holes are 4.5 mm in diameter and are at a distance of 49 mm, centre to centre.
The T-Box can only be secured after the cover is lifted off and the printed circuit removed as shown in figure 2-19.

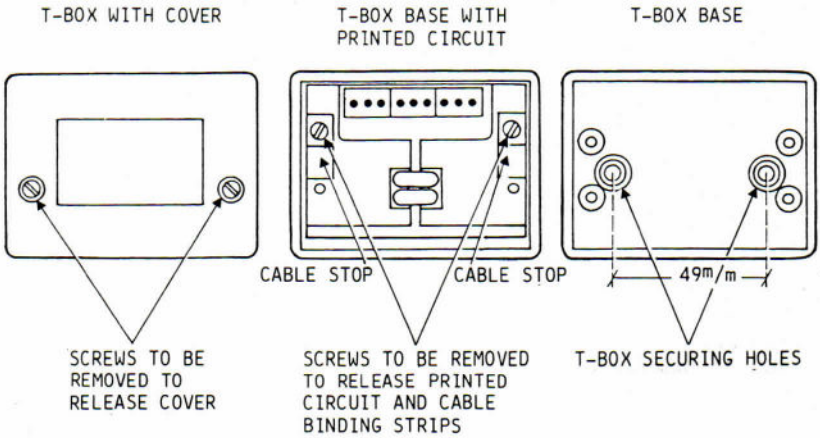
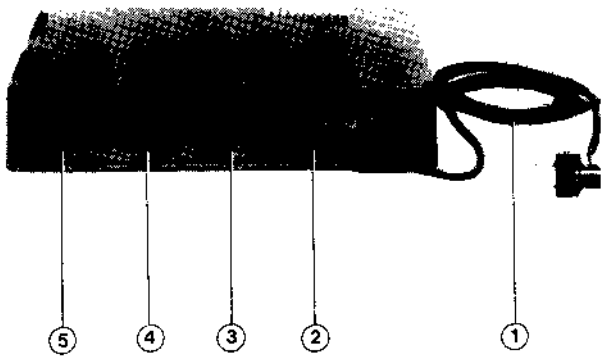


Fig. 2-19 Disassembly of T-Box

2.3.5 ELB 1381/1382 ADAPTER

In addition to the ELB 3683, there is a further type of ELB with, however, more modest performances.
With the 1381 version, workstations with video and keyboard only can be set up at a maximum distance of 100 metres from the system.
The 1382 version should be used to connect workstations with peripherals with RS 232 serial interfaces and pin pad/badge reader devices as well as the video and keyboard. Maximum distance is still 100 metres.

The ELB 1382 adapter connectors are illustrated in the figure below.



1- Cable for connection to mains voltage

2- Connector for video/keyboard controller (in M60 rack)

3- Connector for connection to video and keyboard

4- Connector for peripherals with RS 232 serial interface

5- Connector for Pin pad and Badge reader

Fig. 2-20 ELB 1382 Cables and Connectors

N.B.: The ELB 1381 does not have the connectors numbered 4 and 5 present on the 1382.

2.4 INSTALLATION OF LINES

Some general points are given below and apply to all types of line.

The cable must not be positioned close to electric power devices which could cause harmful electromagnetic interference. Such noise sources are:

- Electric lighting systems (neon lights in particular)
- Energy generators and distributors, such as transformers and alternators
- Air conditioner motors, elevators and large fans
- Radio and TV transmitters
- Signal generators, communications and safety systems

Another factor influencing line noise level is the distance the line runs parallel to the noise source.

The table below gives the minimum distance the line is to be kept from the noise source in relation to the distance they run parallel.

IN PARALLEL	MINIMUM DISTANCE BETWEEN LINE CABLE AND NOISE SOURCE
from 0 to 100 m	10 cm
over 100 m	0.30 - 0.50 cm.

N.B.: When a line cable and an a.c. cable cross over, they must be kept 15 cms. apart.

The line must also be guaranteed adequate mechanical protection in the more exposed zones of the installation, such as particularly busy passageways. Here, the use of cableducts is strongly recommended.

2.4.1 MOIN INTERNAL LINE NOP 1117

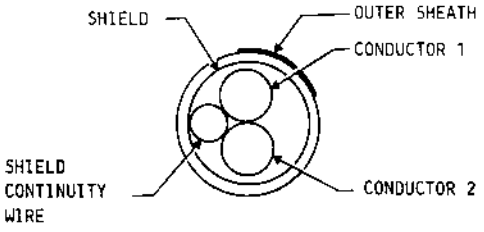
The following types of network can be obtained in master-slave configurations:

- Point to point
- Multipoint

In both types, maximum trunk length is 4 km., maximum number of systems to be connected 32 with a transmission speed of from 1,200 to 19,200 bps.

Description of transmission means

The MOIN internal line trunk is a cable with specific characteristics, code number 5715270 R. The cable is shielded with continuity wire and consists of two teflon-insulated AWG22 conductors.



OLIVETTI CODE 5715270 R

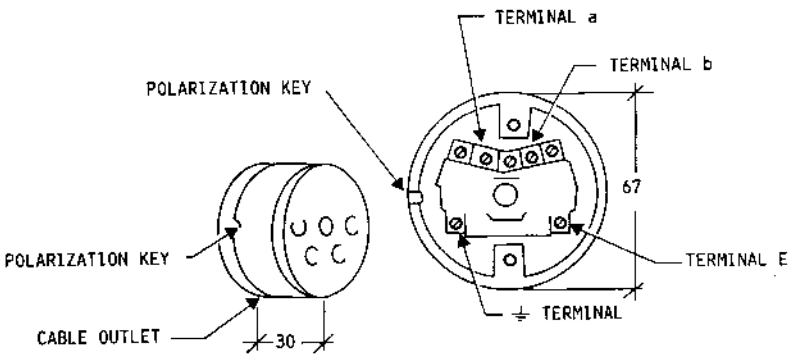
Fig. 2-21 MOIN line cable

Description of junction

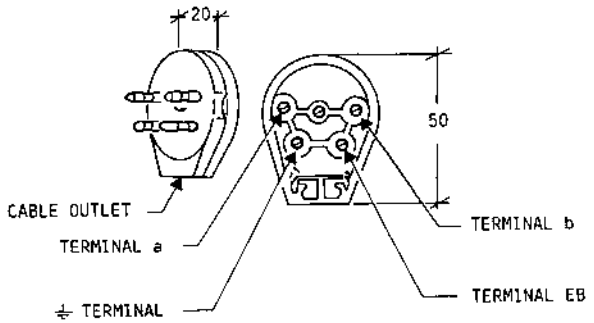
Systems are conected to the trunk by way of junction points. A telephone type junction box, better known as "Ackermann" plug, is recommended for use on the MOIN line.
The system is connected to the Ackermann plug via a cable code no. 335228 D with the following characteristics:

- Double connector for connection to controller
- Shielded cable with twin AWG24 conductors, length 5 metres
- Ackermann socket for connection to junction

SOCKET



PLUG



N.B. ALL DIMENSIONS ARE IN MILLIMETRES

Fig. 2-22 Ackermann socket and plug

Wiring of lines with two wires

In a two-wire connection, great care should be taken with the polarity of the conductors when connecting the cable to the Ackermann plugs to avoid completely disabling communications between the terminals.

Looking at the figure below, it will be seen that the white wire (dotted line) of the trunk is connected to post "a" of the plugs and the blue wire (continuous line) to post "b".
The shields of the various trunk sections are interconnected to ensure shield continuity.
The shield is grounded at one point only of the trunk, generally the beginning or end of the line. The ground plug the system is connected to may also be used simply by connecting the trunk shield to junction cable shield. However, only one system should have its ground connected to the trunk shield to avoid a dangerous lack of equilibrium between grounds.

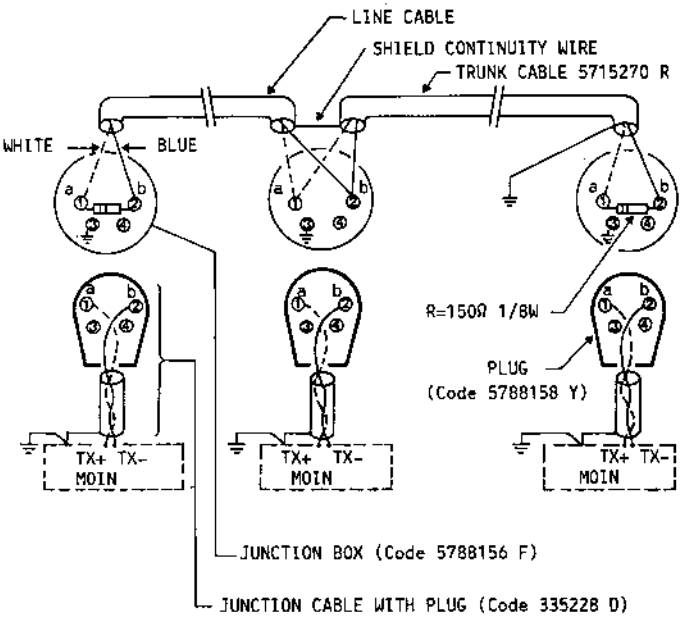


Fig. 2-23 Extremity and intermediate junction boxes

Wiring of lines with 4 wires

In a 4-wire connection, as well as the points made on conductor polarity in 2-wire connection, another important factor is the crossing of the line on the master system terminals: the two conductors of the master transmission line become the reception line of all the slaves while the two conductors of the master reception line become the transmission line of all the slaves. This signal crossing should, therefore, be made in the Ackermann plug of the master junction cable, leaving the trunk wires inside the Ackermann sockets connected to the same terminals, as illustrated in the figure below. In this way, the master is not subject to particular considerations regarding position and may be connected to any junction of the trunk.

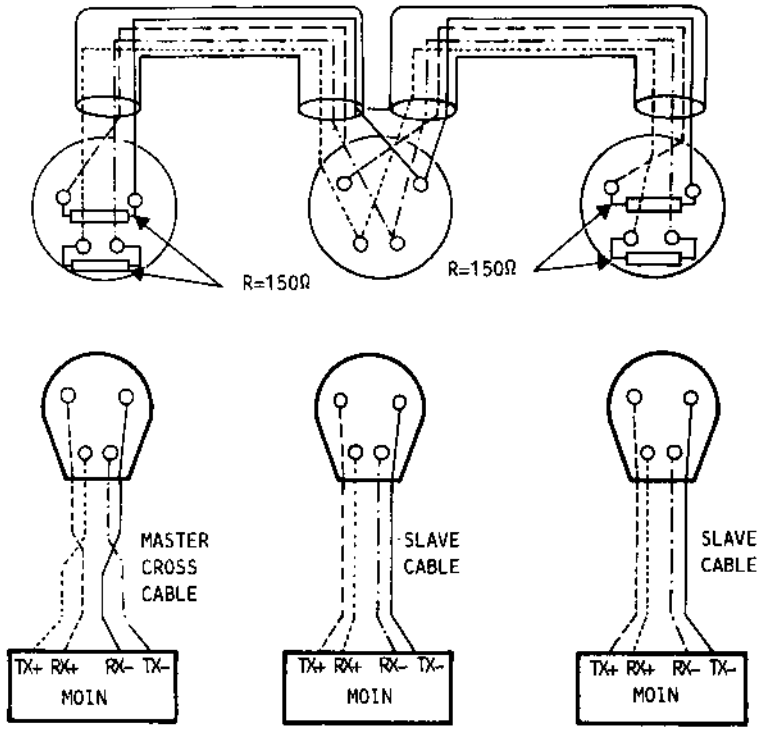


Fig. 2-24 Four-wire connection

2.4.2 LION INTERNAL LINE NOP 111A 112A

The LION (Local Internal Olivetti Network) internal line is used with systems in cluster configurations. With LION controllers, internal lines can have two wires only. The following types of network can be obtained:

- Point to point
- Multipoint

In both types, maximum trunk length is 2 Km. The maximum number of systems connected to the trunk is 32 for LION 200 and LION 9.6 operating at 9,600 - 19,200 bps and 16 for LION 9.6 operating at 4,800 bps.
LION lines use a polling-selecting type protocol (master-slave).
Previous installations with an internal MOIN type line can be replaced with LION 9.6, with the subsequent liberation of a slot in the board rack.

Description of the transmission means

The LION internal line trunk must have a cable with specific characteristics, code no. 5731835 M. The cable has two twisted AWG20 conductors.

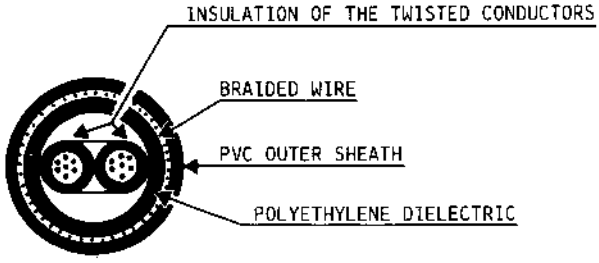


Fig. 2-25 LION line cable

Description of junction

A junction box, known as TAP-BOX, is used in LION internal lines, allowing for connection on a terminal strip of the two trunks, the trunk shield and one or two junctions for terminals.

Tap-boxes come without plugs. The plugs are part of the corresponding line controller commercial module and have the capacitor and wires needed for connection of the junction to the trunk soldered across their pins. Each Tap-box allows one or two junctions to be connected: to order the correct number of Tap-boxes, a precise installation plan should be drawn up.

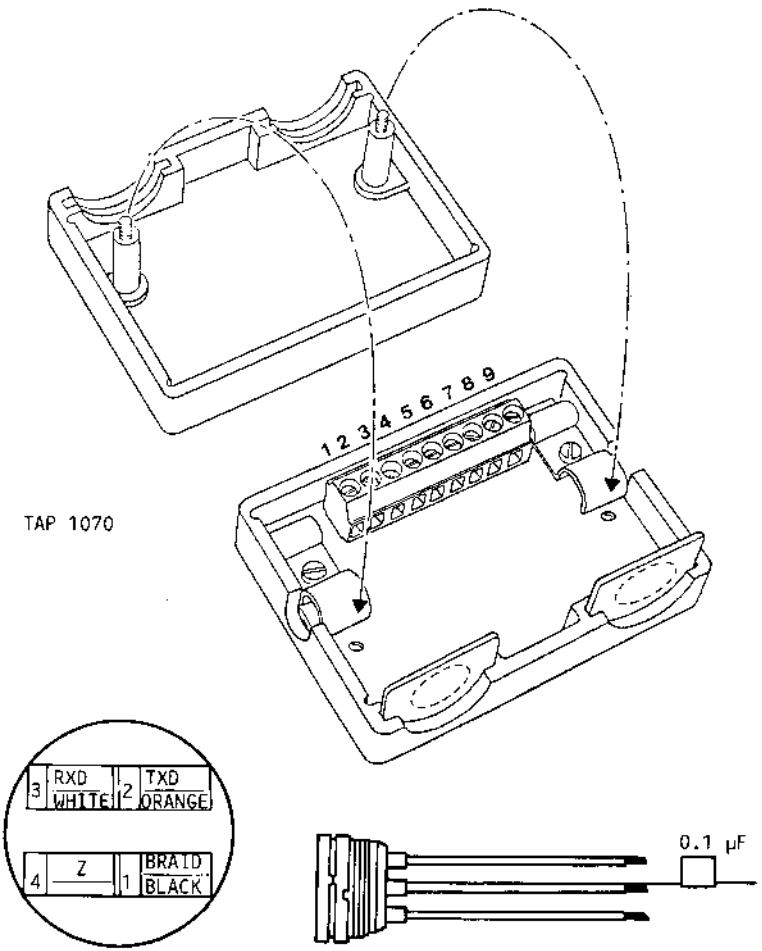


Fig. 2-26 Tap-Box for LION internal line

Connection of trunk to Tap-Box

Each Tap-box connects a maximum of two junctions, one per system; the only restriction is that there should be a minimum of 2.5 metres between tap-boxes.
Inside the Tap-box, there is a terminal strip with 9 points to take all the cables. When the Tap-box has been attached to the wall, the two trunks should be connected as described (see figure 2-27):

- The trunk cables enter the Tap-box via two inlets on the sides.

- The two AWG20 wires of each trunk, incoming and outward, are connected, respectively to terminal strip points 1-2 and 8-9. The red copper wires are connected to points 1 and 9 and the copper plate wires to points 2 and 8.

- The trunk shields are taken to the Tap-box ground via the cable clips at the lateral inlets. The cable clips also hold the trunk cable in position. However, it must be fixed securely, by the braiding wire, after an appropriate amount (11 mm approx.) of the of the PVC insulating cover has been stripped off.

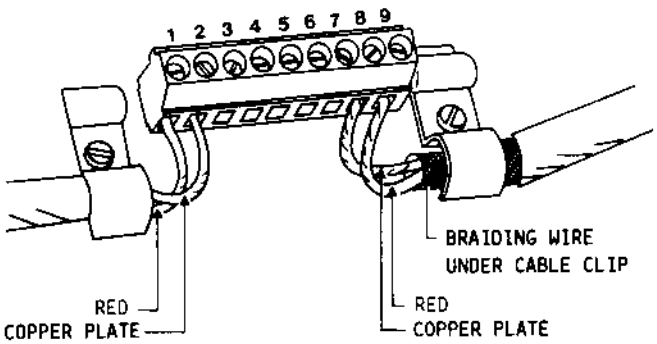


Fig. 2-27 Connection of trunk to Tap-box

- Each Tap-box has a 110 Ohm, 1/2 W terminator resistor, mounted between terminal strip pins 1 and 2 or 8 and 9.
This resistor should be removed from intermediate Tap-boxes and left in place only in the Tap-boxes at either end of the line (see fig. 2-28).

Trunk shield ground connection

The trunk shield must be connected to ground at one of the ends of the line.
A 4 mm, unipolar, AWG18 wire with an eyelet to be positioned under the cable clip on the same side as the terminator resistor should be inserted.
The other end of the wire should be attached to the ground terminal of a nearby a.c. mains socket or of a Tap-box. One of the Tap-boxes at the end of the trunk must, therefore, be set close to a mains source.

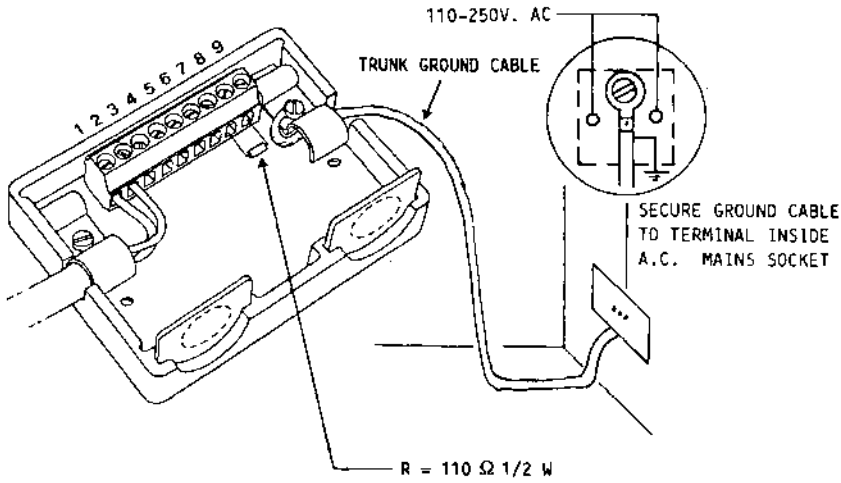


Fig. 2-28 Tap-box at end of trunk

Junction connections

The outlets towards junctions in the Tap-box are sealed with plastic plugs. The female connector code no. 336470 D can only be inserted after the plug is removed. Three wires are soldered to this connector, one white, one orange and the third black with a capacitor on the free end. The type of connection to be made is shown in the table below:

WIRE COLOUR	CONNECT TO TERMINAL STRIP PIN NO. - FIRST JUNCTION	- SECOND JUNCTION
WHITE	4	6
ORANGE	3	7
BLACK	5	5

The capacitors on the trunk shields ensure that there is no galvanic coupling between the junction shields and the trunk shield while a.c. coupling is maintained.

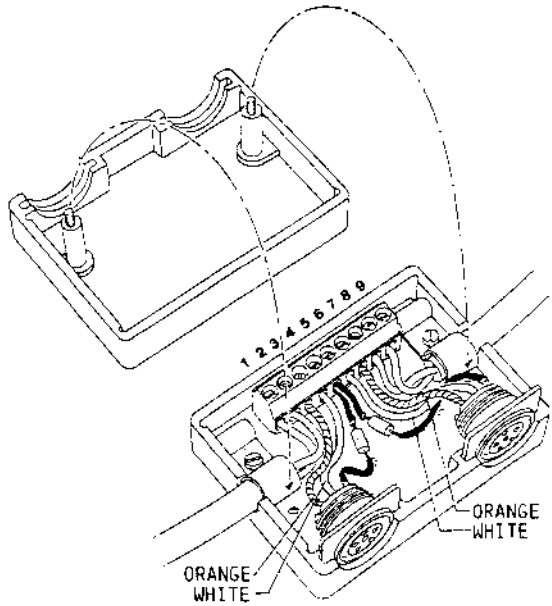


Fig. 2-29 Example of a two terminal junction

2.4.3 OMNINET LOCAL NETWORK

The OMNINET local network is a fast (1 MHz), internal line consisting essentially of:

- Trunk cable
- TAP-BOX
- Ground cable
- Workstation connection cables
- Repeater

Network configuration

The Omninet network must meet the following conditions:

- Maximum distance between Tap-boxes or Repeaters: 150 metres
- Minimum distance between Tap-boxes: 2.5 metres
- Maximum length of segment without Repeater: 150 metres
- Maximum number of Repeaters to be used: 3
- Maximum length of line: 600 m
- A maximum of 16 systems can be connected to a line segment. Two systems can be connected to a Repeater.

An example of a network is shown in the figure below.

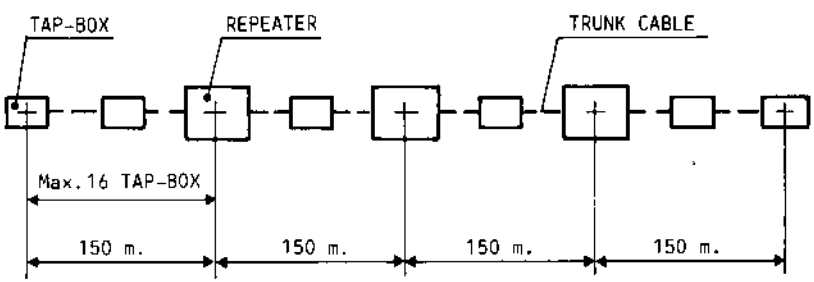


Fig. 2-30 Example of an Omninet network

Trunk

A twisted, shielded pair code no. 5731835 M is used as trunk.

TAP-BOX

Both the Tap-boxes described earlier for the LION network and a more recent type with capacitors inserted in the printed circuit can be used in an Omninet network. The female connector coming with the cable has both the capacitor and a bracket on its ground cable. Depending on the type of Tap-box used, either the capacitor or the bracket will have to be removed.

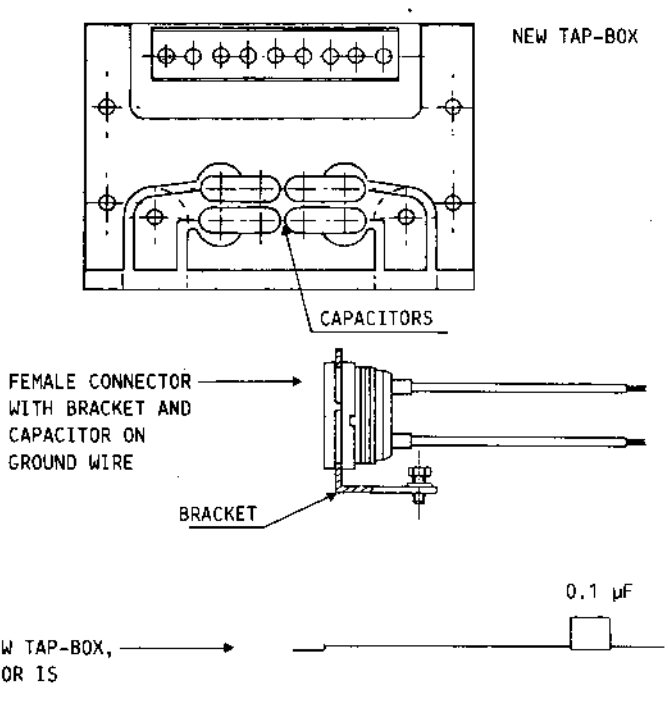


Fig. 2-31 Tap-box with capacitor inserted in printed circuit

Junction cable (drop cable)

The cable used to connect systems to the network, like the trunk, is of AWG20 wires, and is a maximum of 2.5 metres long.

Repeater

Repeaters must be used when the trunk exceeds 150 metres in length.

Safety of line

For correct Omninet operation, these conditions should be satisfied:

- the entire area served by the network is to be connected to the same ground
- all systems connected, including repeaters and the trunk braiding wire, are to be connected to the same ground
- there should, if possible, be only one power supply station; if not possible, all stations should have the same ground
- the entire network should be installed inside one building
- maximum voltage should be 3V; a potential difference of more than 12 V could damage the line drivers connected.

2.4.4 ETHERNET LOCAL NETWORK

The Ethernet local network uses a co-axial cable with characteristic impedance of 50 Ohm to link the systems (nodes) by way of transceivers. The main considerations for network configuration are:

- Co-axial cable segments must not exceed 500 metres in length and must have a terminator resistor of 50 Ohm, or the same as the characteristic line impedance.

- Up to 100 nodes, a minimum of 2.5 metres apart, can be connected on any one cable segment.
  As seen in figure 2-32, systems are conected to the network by a receive/ transmit cable and a transceiver supplied with cable.

- Repeaters are used to interconnect Ethernet segments (see figure 2-33).
  There may not be more than two repeaters between any two nodes. A repeater has to be connected to a transceiver (node position) on both segments it connects and, by regulation, it must have local a.c. power supply.

- Maximum length of the transceiver cable (from a transceiver to a control unit) is 50 metres.

- The network extends to a maximum of 2800 metres, as outlined below:

  . Five 500 metre segments (total: 2500 metres)

  . 100 metres per repeater (2 repeaters = 200 metres)

  . 50 metres per system (2 machines in end positions = 100 metres)

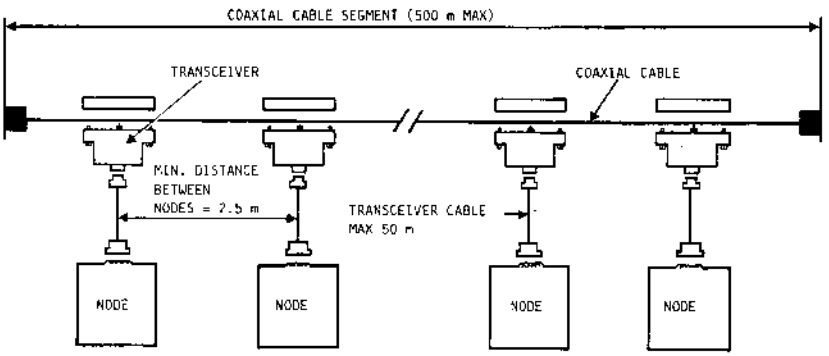
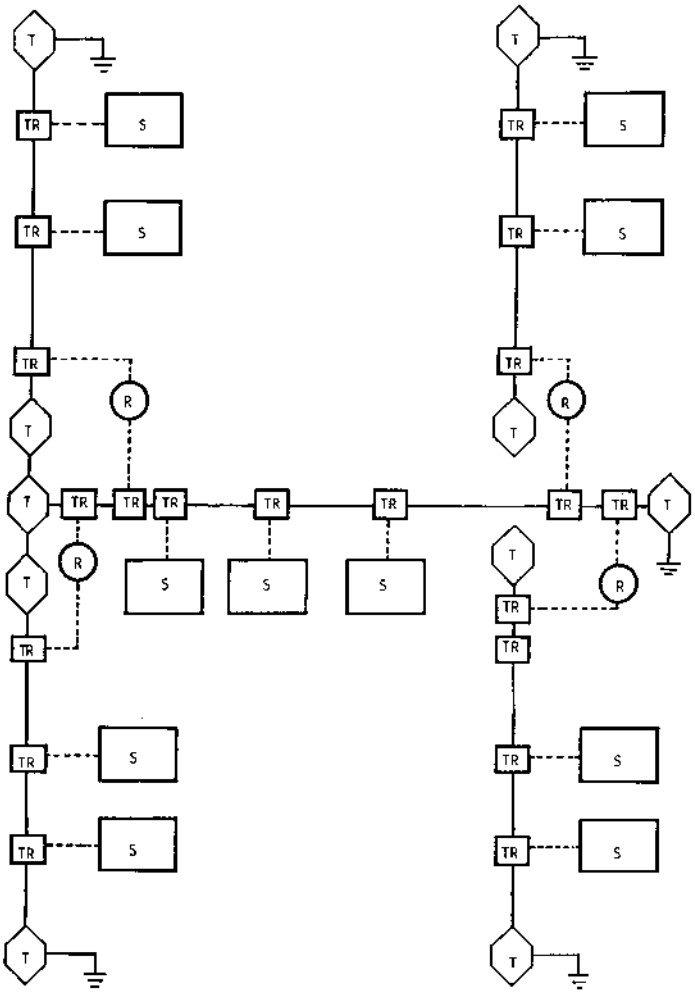


Fig. 2-32 Ethernet segment configuration



KEY: R = Repeater
S = System (node)
T = Terminator
TR = Transceiver

Fig. 2-33 Ethernet network extended configuration

2.4.5 RS232 INTERFACE STATIC MULTIPLIER (MSW 3369)

This is a manual, mechanical two-way switch used in connections to devices with RS 232 interface. It comes in a desk-top version and consists of one board with three RS 232 outputs.

Typical applications of the static multiplier are:

1. Alternating an external line between two systems
2. Alternating a printer between two systems
3. Alternate connection of two printers to the same system.

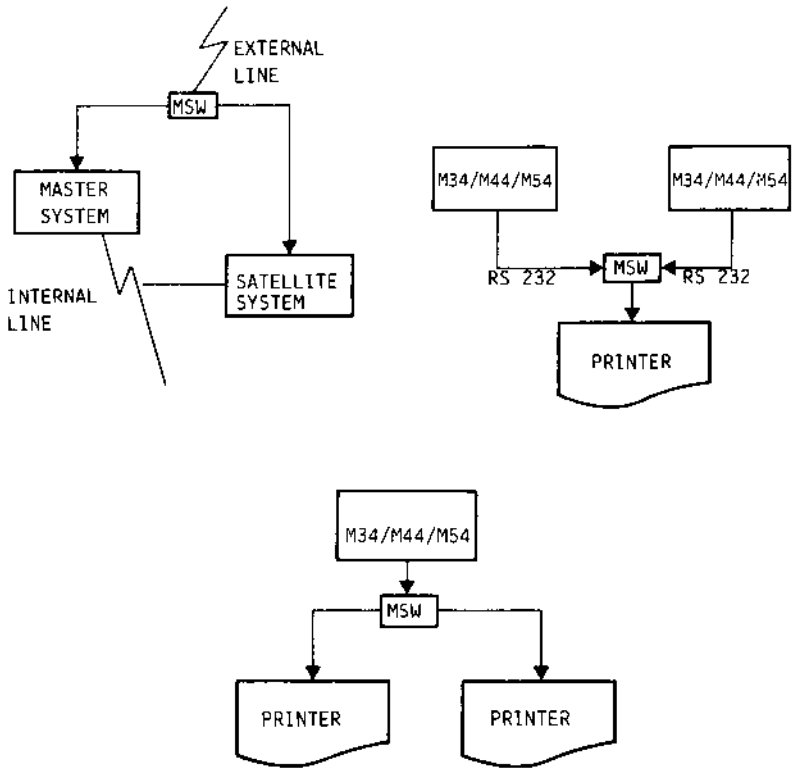


Fig. 2-34 Configurations with the RS232 interface static multiplier

2.4.6 V24 INTERFACE DYNAMIC MULTIPLIER (DIM 3379)

This is a desk-top device, consisting of one board only.
It is used to regenerate interface signals, broadcast messages and to branch multi-point lines.
It has five V24 outputs, one of the "common" type, the other four "expanded". Signals arriving on the common output are also sent simultaneously to the other four outputs; similarly, signals coming from the four outputs are also sent to the common output.

The dynamic multiplier is transparent to the type of protocol used and can be used for synchronous and asynchronous transmission in full or half duplex.
Used for multi-point trunk connections, it allows for a reduction in the number of modems required. It means, in practise, that an internal/external line modem can be dynamically shared between four stand alone/satellite systems as illustrated in the figure below.

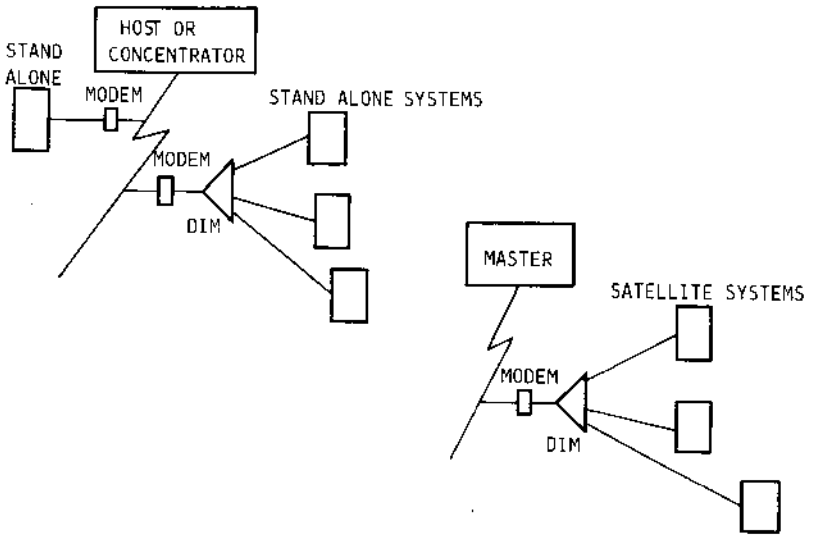


Fig. 2-35 Diagram of connection using a V24 interface dynamic multiplier

2.5 UPGRADING OF M34/M44 SYSTEMS TO M34SP/M44SP

The M34/M44 systems can be upgraded to M34SP/M44SP by replacing the central unit. The following factors should also be checked:

1. The MEM storage modules and the LCU modules must be updated in line with the modifications which make them compatible with all L1 environments as shown in the table below:

COMMERCIAL NAME	BOARD	MODIFICATION	FUNCTION
MEM 3374 0.5 MB	RA57 E	CDM 3875602 K 529	RAM
MEM 3361 1.0 MB	RA57 C	" 531	"
MEM 3362 1.5 MB	RA57 B	" 532	"
MEM 3363 2.0 MB	RA57 A	" 530	"
LCU 3376	GO 300/A	" 542	V24
LCU 3397	GO 333	" 541	LION 9.6
LCU 3326	GO 303	" 543	X21

Note: the modifications have been introduced starting from May 1986

2. Mixing of storage memories some with, some without ECC is not permitted.

If upgrading is possible, it should be performed as outlined below:

- Switch off system
- Remove the panels as described in section 2.2 so as to have access to the rack containing the boards
- Disconnect the connectors from the C.U.
- Remove the C.U. board, in second position on the M34, in first position on the M44
- Insert the UC070 central board and reconnect the connectors disconnected previously
- Replace the name label and close up system
- Power up system.

3. POWER SUPPLY

3.1 GENERAL

The power supply for M34/M54 and M44 systems and the external peripheral cabinets SB3 and SB2 is described in this chapter.
For each system, a.c. distribution diagrams, information on the power units used, diagrams illustrating interconnection between power units and back planes and absorption figures for the hardware modules will be given.

The M34/M44/M54 power supply units are listed below:

- M34/M54: LA17, 170 W

- M44: LA40, 345 W

  LD10, 100 W module for LA40 expansion

- BBU (Battery Backup Unit) with 5 A/h battery

N.B.: The LA40 is also used in the SB3 cabinet to supply the internal magnetic peripherals, with the exception of the 60/120 MB hard disk unit which has its own specific power supply unit XU 1701.

Current characteristics for each power unit are given in the table below:

POWER SUPPLY UNIT	POWER (watt)	ABSORPTION (amps) + 5V	+12V	-12V	+24V	-24V
LA17 - PSU 3470	170	25.5	4.3	0.7	--	--
LA40 - PSU 3567 (in M44)	345	30.0	4.5	2.8	5.2	0.9
LA40 - PSU 3545 (in SB3)	345	30.0	4.5	2.8	5.2	1.0
LD10 - PSE 3519	100	20.0	--	--	--	--

3.2 M34/M54 SYSTEM POWER

3.2.1 A.C. POWER DISTRIBUTION

Distribution of a.c. power in the M34/M54 is illustrated in the diagram below.

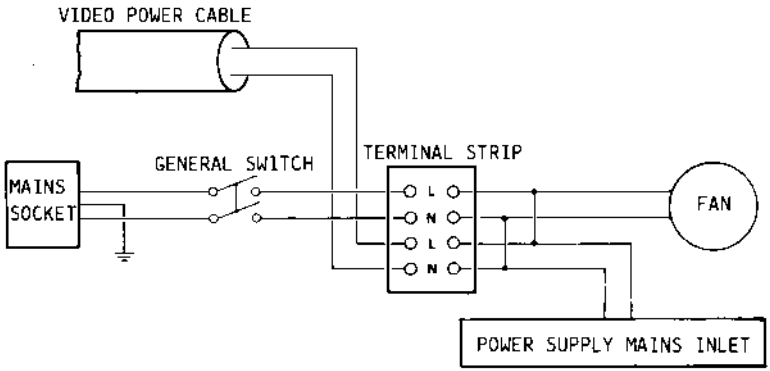


Fig. 3-1 A.c. distribution in the M34/M54

If a self-supplying peripheral is to be powered, the wires must be connected to terminals "L" and "N".

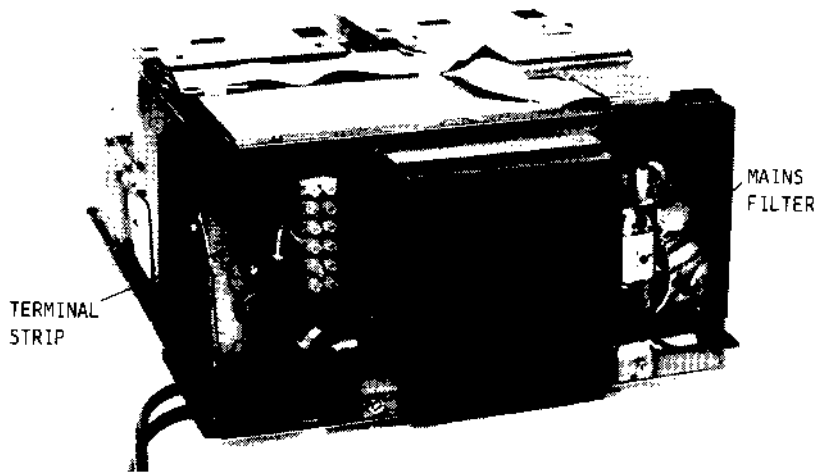


Fig. 3-2 M34/M54 terminal strip

3.2.2 M34/M54 BACK PLANE IN062 VOLTAGES

The figure below shows the M34/M54 back plane and the voltages on the connectors.

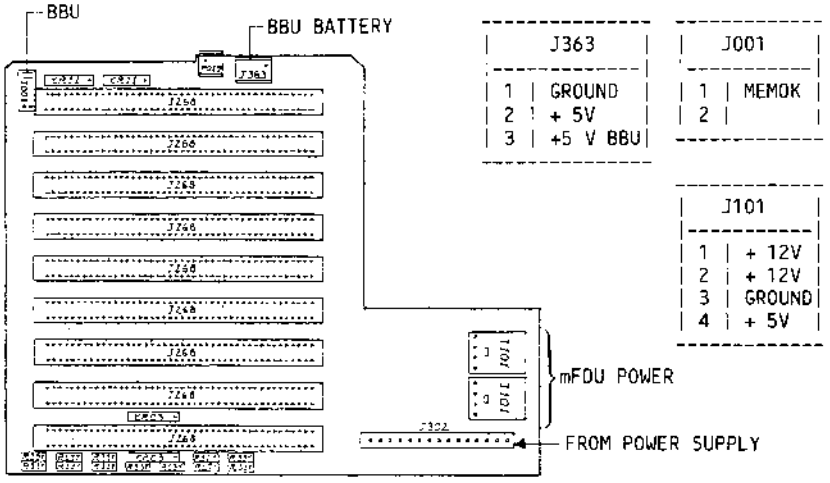


Fig. 3-3 Back plane IN062

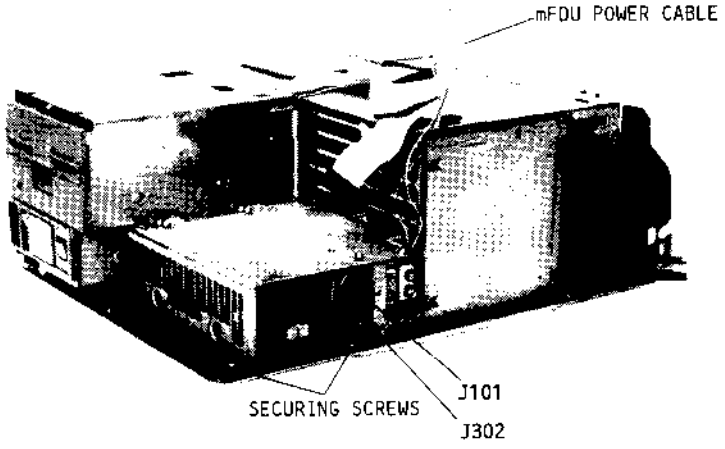
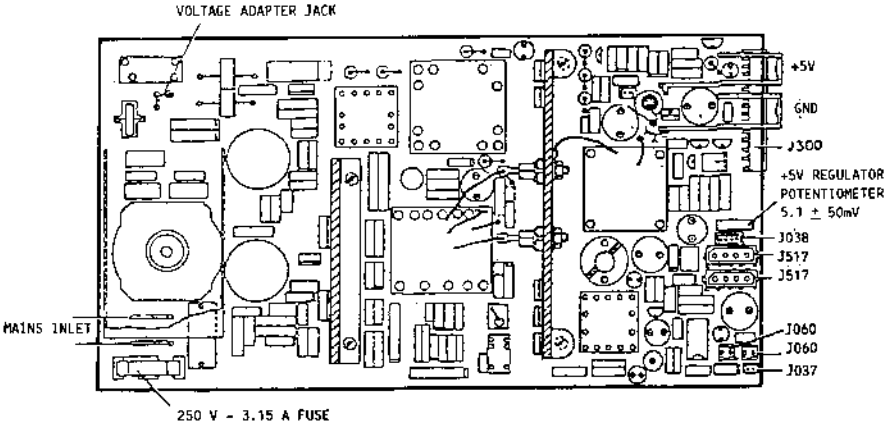


Fig. 3-4 M34/M54 side view

3.2.3 M34/M54 POWER SUPPLY UNIT LA17



J037	
1	+ 5V
2	CLICK

CLICKSON

J060	
1	- 12V
2	RESET

NOT USED

J517	
1	+ 5V
2	GROUND
3	GROUND
4	+ 12V

MFD UNIT POWER SUPPLY

J038	
1	MASSA
2	RESET
3	CATE
4	+ 5V

BBU

J300	
1	RESET
2	CATE
3	- 12V
4	+ 12V
5	Z
6	Z
7	Z
9	Z
10	Z
11	Z
12	Z
13	Z
14	Z
15	Z

TERMINAL STRIP CONNECTOR

VOLTAGE ADAPTER JACK:

(A) (B) A-B = 110 V
A-C = 220 V
(C)

Fig. 3-5 Picture of LA17 power supply board and connectors

N.B.:

- The +5V voltage has a tolerance of ±2%.
- The +12V and -12V voltages should not require regulation, but may be measured, if necessary, on the power supply unit connectors.
- The heat sensor is supplied via the Clickson connector.
- The LA17 is not compatible with the IN052 back plane.

3.2.4 LA17 INSTALLATION

Ensure that the voltage adapter plug position corresponds to the local mains.
Remove the power supply unit securing bracket from the base of the box and fix box to the power supply unit.
Insert the power supply unit in its position below the minifloppy units and secure the bracket to the base of the box.
Fasten the power (N,L) and ground cables.

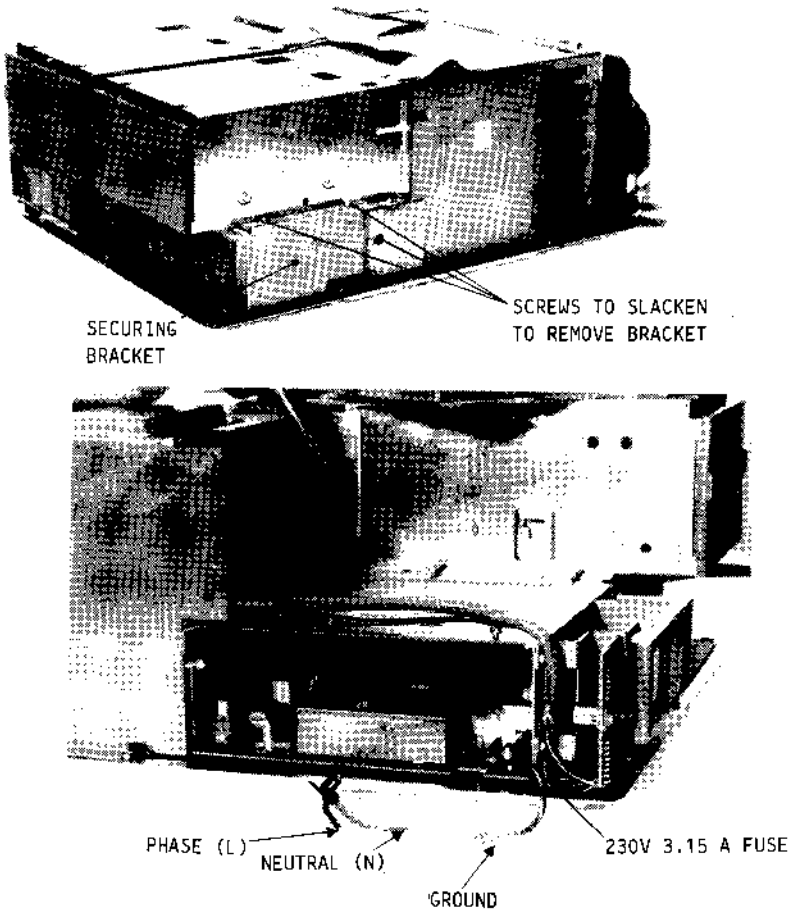


Fig. 3-6 Securing the LA17 power supply unit in the M34/M54

3.3 POWER SUPPLY FOR M44 SYSTEM

3.3.1 A.C. POWER DISTRIBUTION

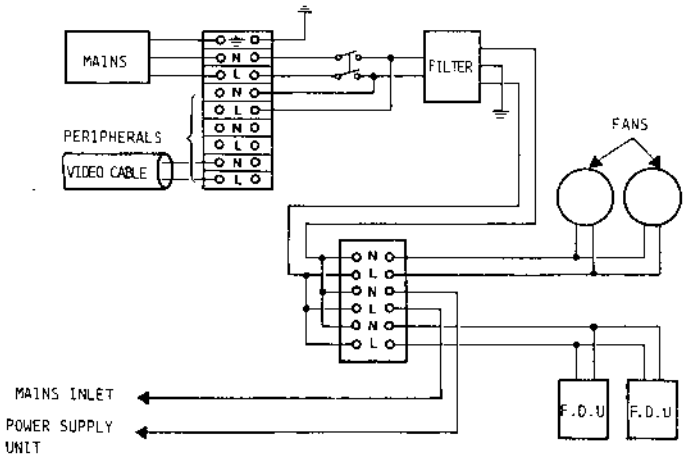


Fig. 3-7 A.c. distribution in the M44

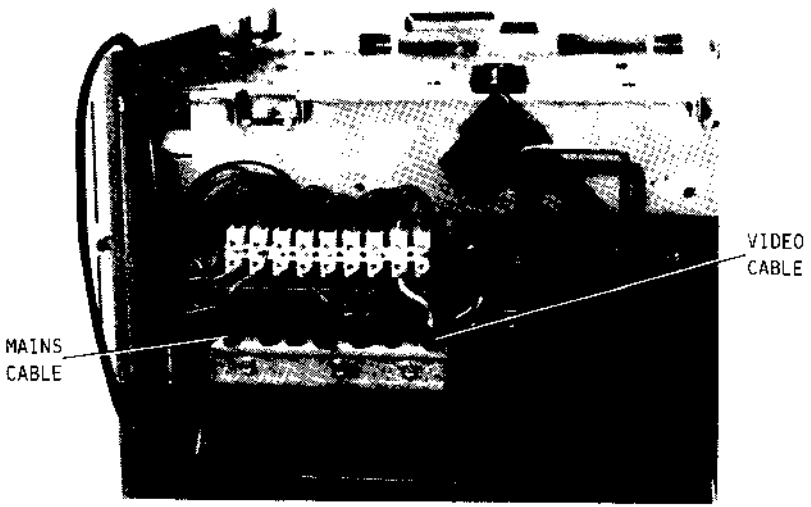


Fig. 3-8 M44 power supply cables and terminal strip

3.3.2 M44 BACK PLANE IN074 VOLTAGES

A rear view of the M44 is shown in the photo below.

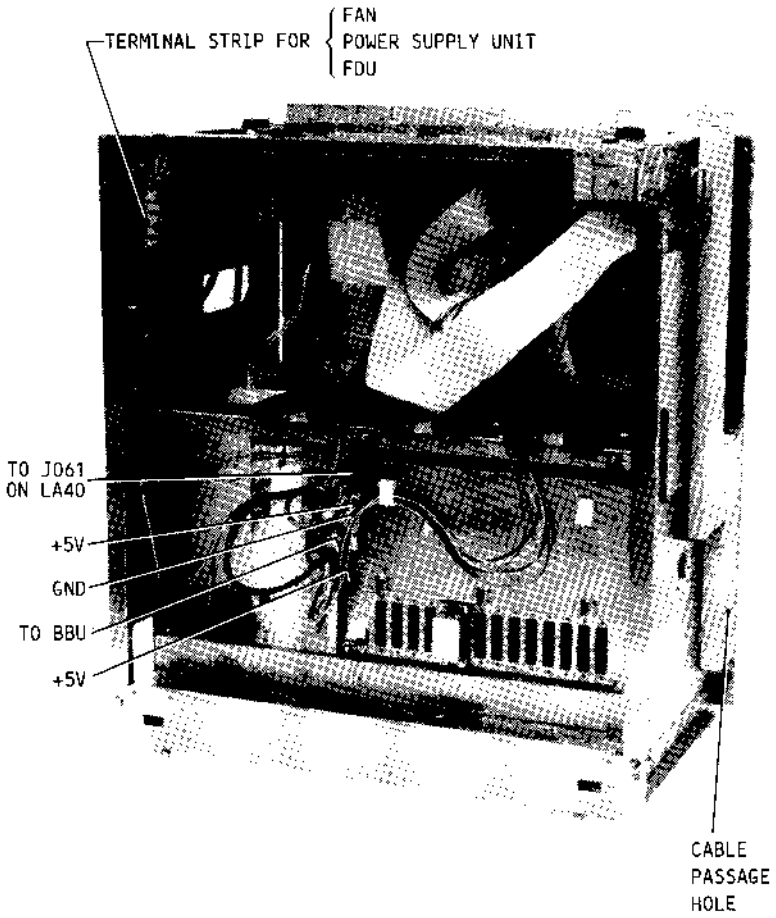
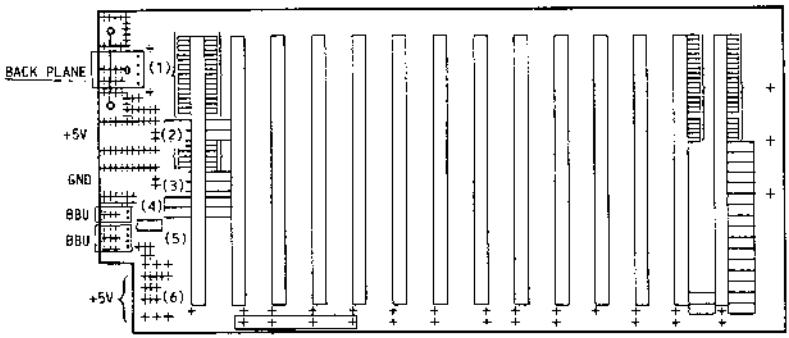


Fig. 3-9 M44 rear view

M44 back plane IN074 and power supply unit interconnection




```
-------
|      |-  + 12V
|IN074 |-  - 12V   connected to LA40 connector J061
| (1)  |-  RESET
|      |-  CATE
--------

-------
|IN074 |-  + 5V    connected to LA40 + 5V strip
| (2)  |
-------

-------
|IN074 |-  GROUND  connected to LA40 + 5V strip
| (3)  |
-------

-------
|IN074 |-  Z       connected to BBU connector J040
| (4)  |-  MEMOK
-------

-------
|      |-  GND
|IN074 |-  RESET   connected to BBU connector J040
| (5)  |-  CATE
|      |-  + 5V
-------

-------
|      |-  + 5V
|IN074 |-  + 5V    connected to LA40 + 5V strip
| (6)  |-  + 5V
|      |-  + 5V
-------
```

Fig. 3-10 Back Plane IN074

3.3.3 LA40 POWER SUPPLY UNIT

The figure below is a picture of the LA40 power supply unit board.

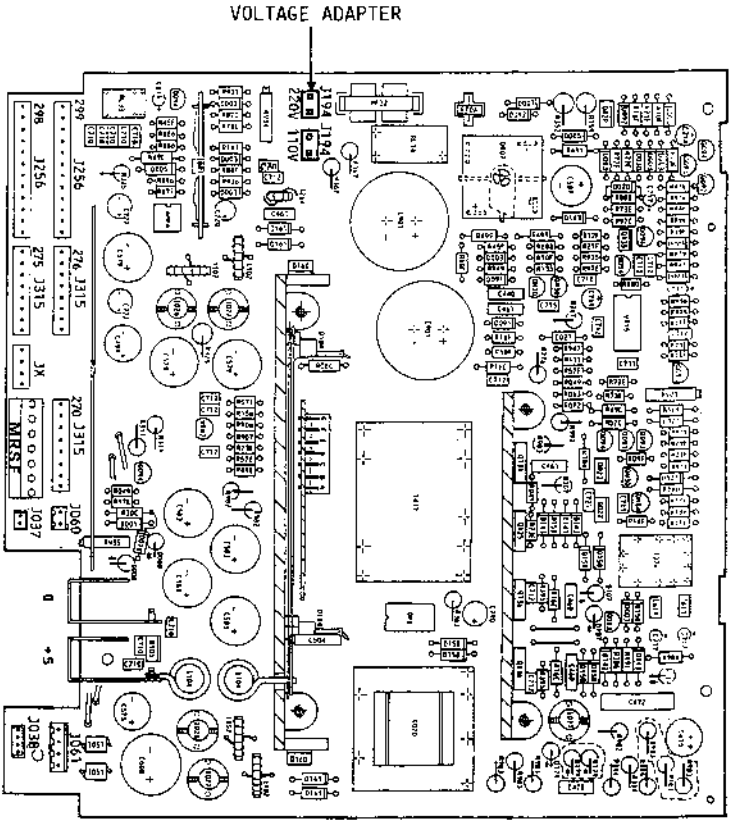


Fig. 3-11 LA40 power supply unit board picture

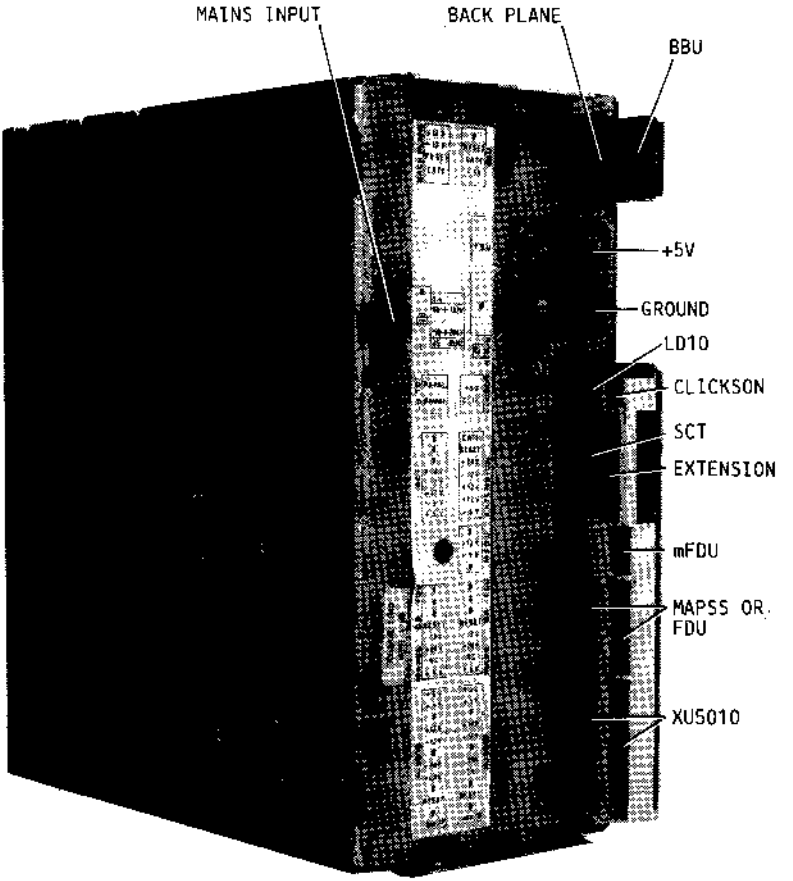


Fig. 3-12 Rear view of LA40 power supply unit

3.3.4 LA40 INSTALLATION

First check that the power supply unit board voltage adapter is set for the correct local mains voltage.

Set the power supply unit in position through the front of the M44 system.
Secure it to the bottom of the M44 lower structure, using the two plates, one at the front, the other at the rear. The power unit is definitively fixed in position by way of a third plate, screwed to the top of the structure.

Fasten the d.c. power cables to the connectors of the back plane 1N074.

Check the + 5V voltage is in tolerance.

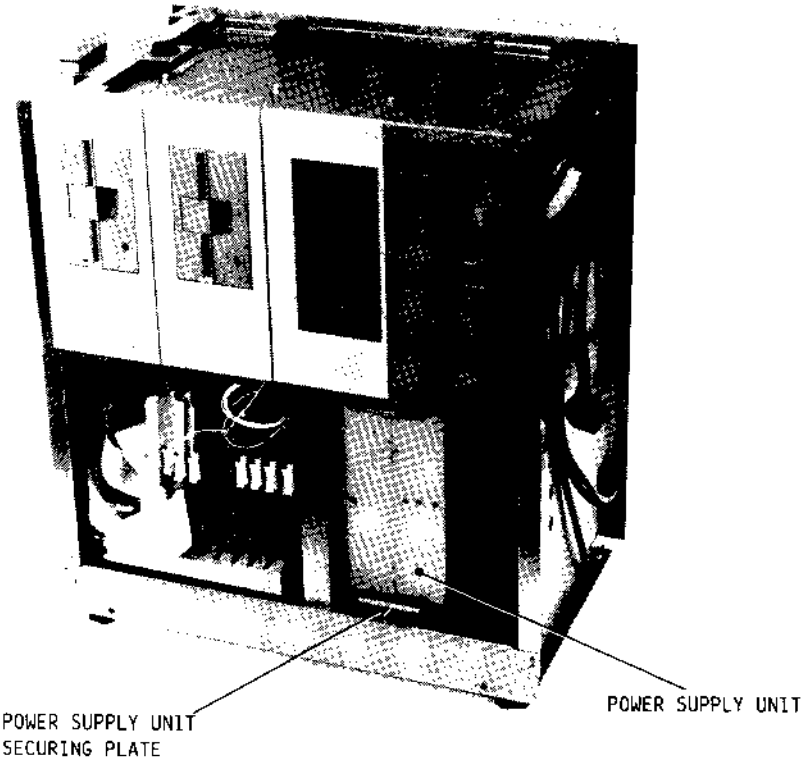


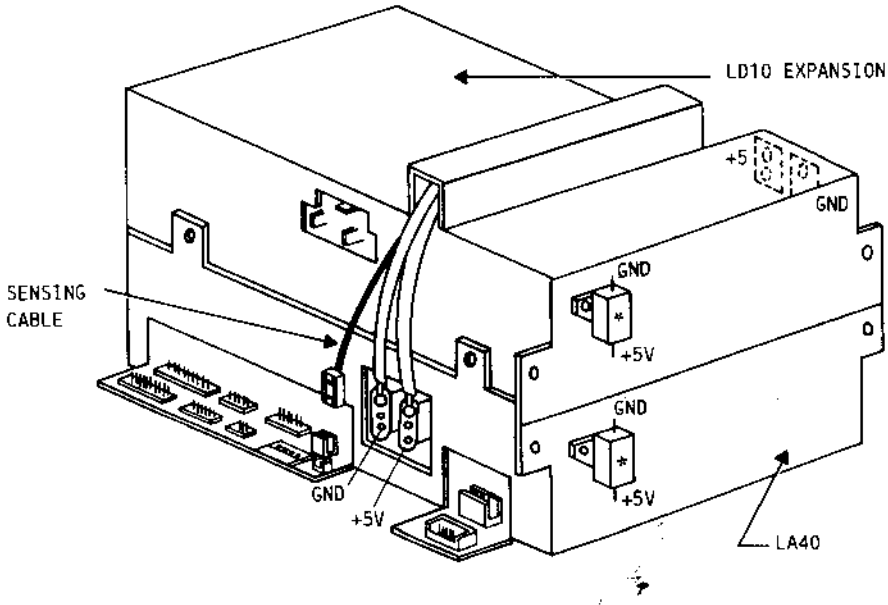
Fig. 3-13 Installation of the LA40 power supply unit in the M44

3.3.5 INSTALLATION OF THE LD10 EXPANSION UNIT

Remove the LA40 unit from the M44, reversing the procedure described above for its installation.

Slacken the 4 screws securing the power supply unit rear screen.
Insert the LD10 module, sliding the edge of the board along the 6 guides (3 upper, 3 lower).
Tighten the 4 screws to secure the LD10 module to the power unit; the screen is no longer required.

Connect the ground and + 5V cables to their respective front and rear connectors, marked "+" for the +5V and "-" for ground. The cables are correctly connected when they cross over on the side of the expansion unit.
Connect the sensing cable to the LA40, as shown in the following figure.
Fit the cable duct to the rear of the unit, pressing it down slightly, taking care, however, not to pinch the cables, and pushing it forward.



(*) Resistors to be fitted when installing the LA40 in the SB3.

Fig. 3-14 Connecting the LD10 expansion unit to the LA40 power supply unit

3.4 BBU: BATTERY BACKUP UNIT

Installation of the BBU in the M34

Remove the system casing, as described in chapter two.
Cut the jumper on the side of the 4-pin connector on the M34 back plane.
Clamp the forked cable to the casing and connect the two 4- and 2-way connectors on the back plane.
Slacken the screws securing the LA17 power supply unit to the casing.
Secure the anti-noise plate M1309 to the power unit in the position shown in the figure.
Tighten the screws securing the power supply unit to the M34, after setting the cable stop on the signal cable from the BBU. Connect the connector to the power supply unit board.
Replace the casing, tucking the cables away in the appropriate housing along the base of the M34.

Take out the main M34 power supply cable and replace it with the cable coming from the BBU.
Connect the BBU to the mains and switch on at the key.

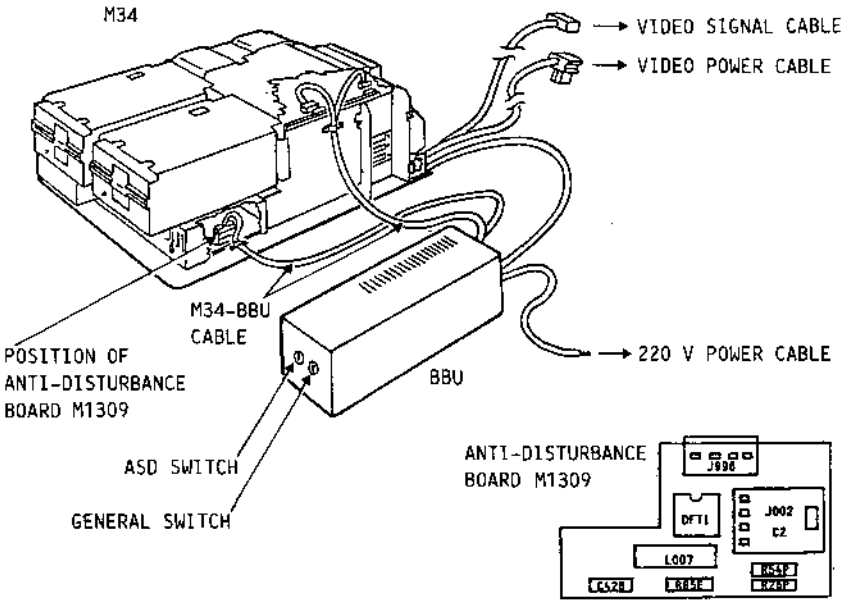


Fig. 3-15 Connection of the BBU to the M34

Installation of the BBU on the M44

Remove the console front panel.
Remove the rear and right side panels from the M44 casing.
Set the BBU module on the two traverse bars inside the M44 and secure with the 4 screws, two under the bars, two on the side of the BBU.

Connect the BBU cables to the respective back plane terminals.
Remove the brass jumper on the back plane.

Power the M44 system with mains voltage from the BBU by connecting the BBU terminal strip (on the right side) to the system terminal strip.
Conect the BBU to the mains and switch on at the key (general switch).

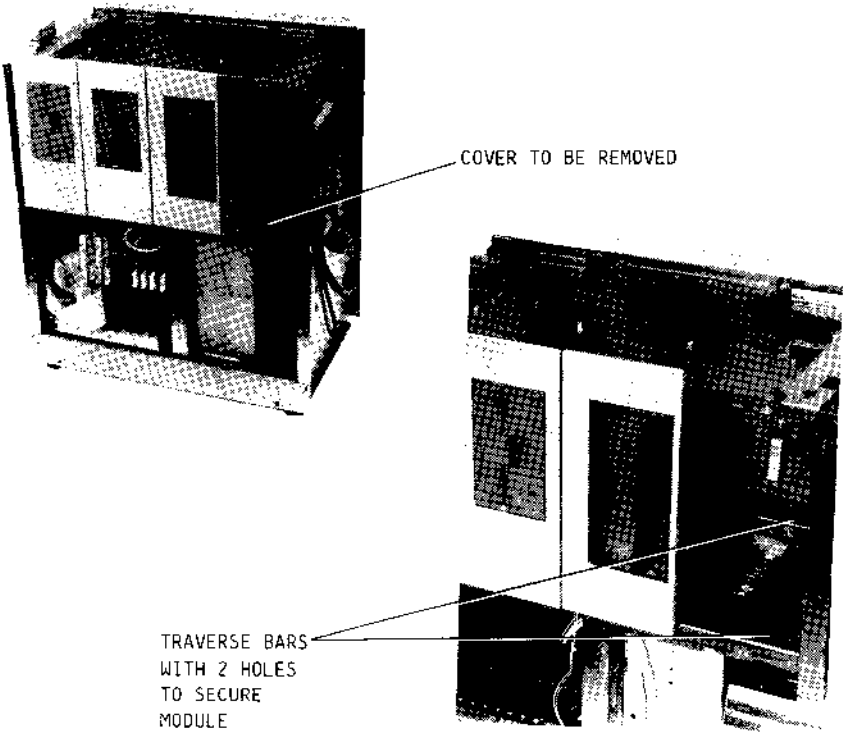


Fig. 3-16 Installation of the BBU module in the M44

3.5 DISTRIBUTION OF A.C. POWER IN THE CAB 3558 (SB3)

Correct distribution of the a.c. power in the SB3 cabinet is illustrated in the figure below.

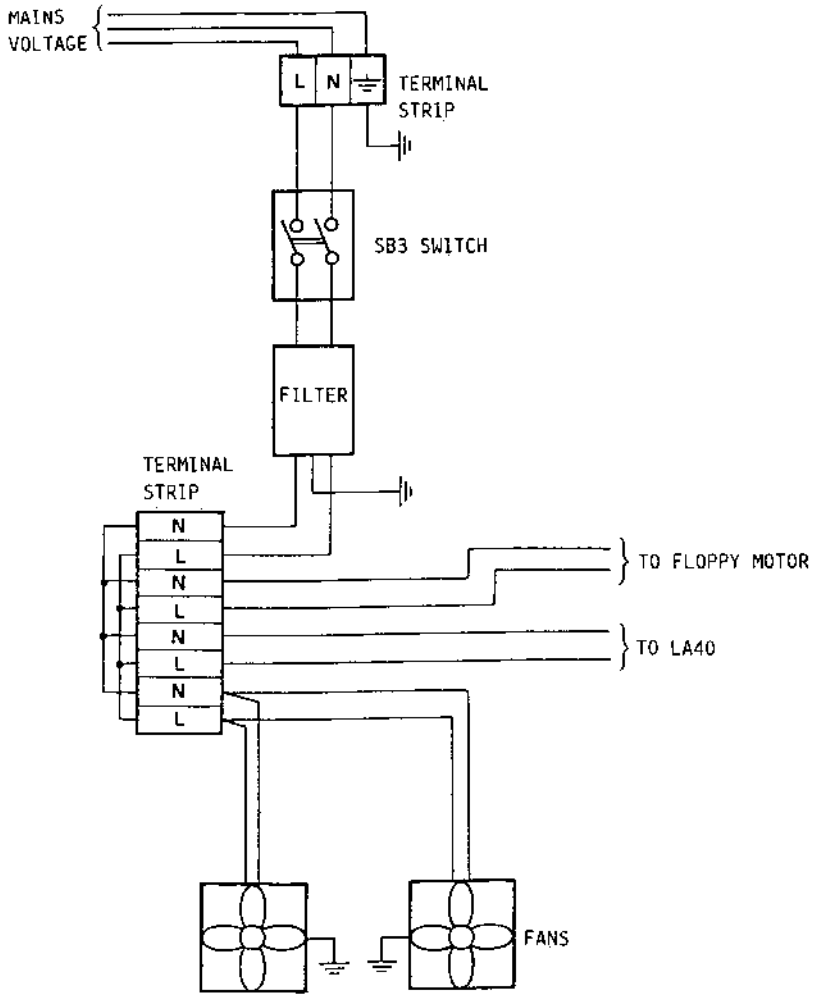


Fig. 3-17 Diagram of a.c. distribution in the SB3

3.5.1 SB3 REMOTE SWITCH-ON DEVICE NOP 17

This is a device allowing one or two M44 systems to switch on the SB3 from a distance.
It consists of a single plate, situated inside the SB3 mains box. Where the SB3 is not shared, there is one cable only to connect the plate to the M44 mains terminal strip.
If the cabinet is shared by two systems, a second cable is needed to connect the plate to the mains strip of the second system. This cable, code no. 338627, is part of Dual Port SET 3569.

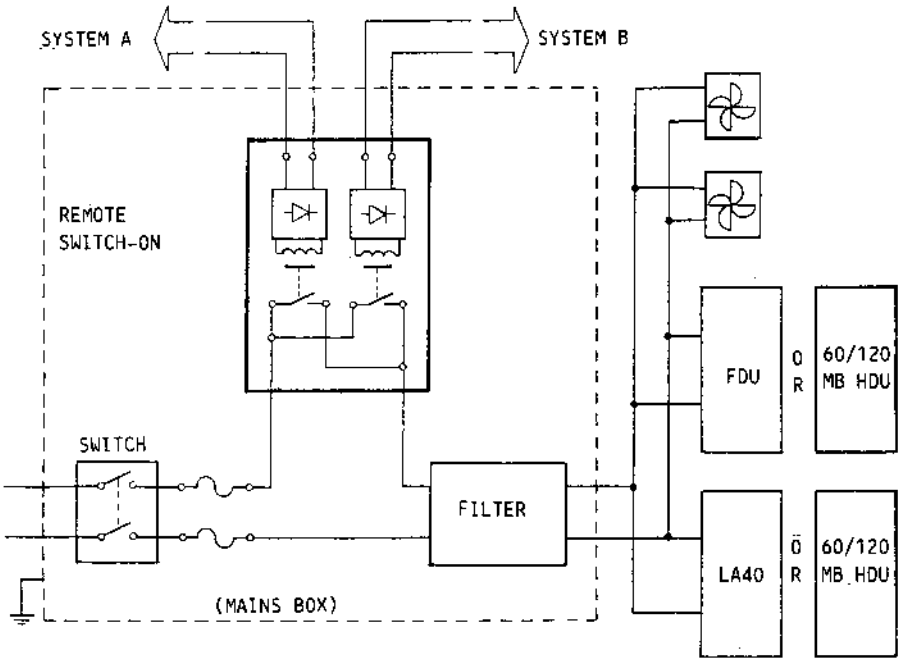


Fig. 3-18 Diagram of remote switch-on device in SB3 cabinet

3.5.2 SB2 REMOTE SWITCH-ON DEVICE

This is a device enabling one or two systems to switch on the SB2 from a distance.
It consists of two plates, situated inside the SB2 mains box.
Where the SB2 is not shared, there is one cable only connecting the first EEC plug of the mains box terminal strip to the M44 terminal strip.
If the cabinet is shared by two systems, a second cable is needed to connect the second EEC plug to the mains strip of the second M44. This cable, code no. 338627, is part of the Dual Port SET 3569.

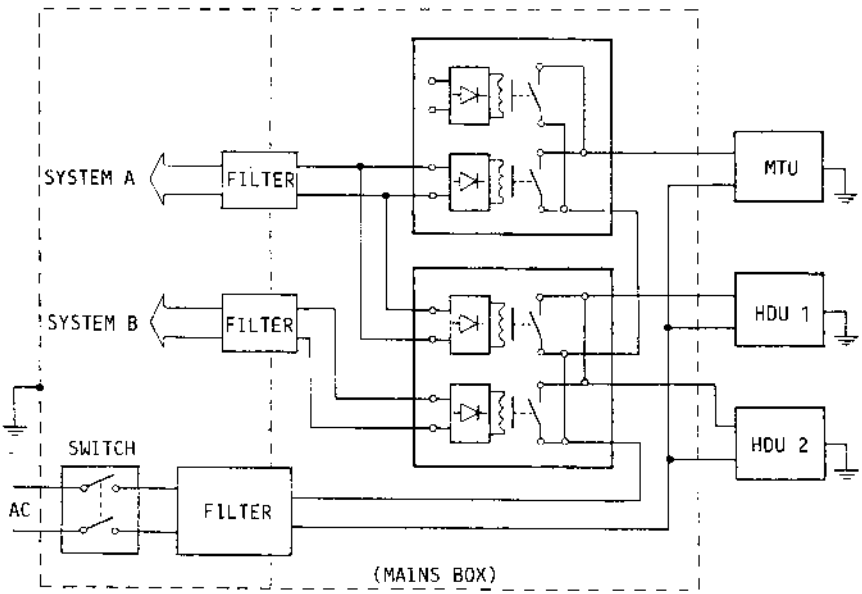


Fig. 3-19 Diagram of remote switch-on device in SB2 cabinet

3.6 ABSORPTION OF THE HARDWARE MODULES

Absorption of the hardware modules used in M34/M54 and M44 systems is illustrated in the table below.

MODULE DESCRIPTION	ABSORPTION (amps) + 5V	+12V	−12V	+24V	POWER (watt)	NOTES
Central Unit UC048	3.40	0.026	0.020		17.56	
Central Unit UC070	3.70	0.026	0.020		19.10	
512 KB memory RA57/E	1.85 1.38				9.25 6.9	selected stand-by
512 KB Memory RA57/A	1.99 1.46				9.95 7.3	selected stand-by
1.0 MB Memory RA57/C	1.72 1.18				8.60 5.9	selected stand-by
1.5 MB Memory RA57/B	1.86 1.33				9.25 6.65	selected stand-by
2.0 MB Memory RA 65	2.50 1.20				12.50 6.00	selected stand-by
1.0 MB Memory RA 65/B	2.50 1.20				12.50 6.00	selected stand-by
Encryption control G0257	1.85	0.10			10.45	
Real Time clock G0257/A	1.51	0.10			8.75	
1 MB FDU/mFDU Con. G0280/B	3.05	1.25			32.50	
Bus adapter G0299	2.50				12.50	
14MB HDU Control, DTC 510	3.80	1.80			40.60	
18MB HDU Con. G0230-231/A	5.00		0.30		28.60	
ST506 Int. Control, G0363	3.30				16.50	
MAPSS board, G0306	1.30		0.35		10.70	
HDU Control (SMD) G0301/A G0302/A	2.60 3.50		0.23 0.32		15.76 21.34	Tot. power = 37.10 W
HDU Control (ESDI) G0404 G0405	2.70 2.50				13.50 12.50	
STC Con. (QIC-36) G0417 G0418	3.20 1.20				16.00 7.00	

>>>

>>>

MODULE DESCRIPTION	ABSORPTION (amps) + 5V	+12V	-12V	+24V	POWER (watt)	NOTES
STC Con. G0201/B-G0202/B	4.30				21.50	
40MB MTU Control G0278/B	2.85				14.25	
V24 line Control G0300	1.80	0.060	0.060		10.44	
LION 9.6 Control G0333	2.20				11.00	
X21 line Control G0303	1.86				9.30	
Integ. Modem MOIN 5.2	0.55	0.20	0.20		7.55	
V24+V24 line Cont. G0236	2.74	0.12	0.1		16.34	
V24+LION line Cont. G0256	2.79	0.17	0.05		16.59	
Twin Control G0327	1.73	0.12	0.06		10.81	
Ethernet Control G0212/A	2.10	0.50			16.50	
Omninet Control G0308	2.30				11.00	
Triv. VDU Control G0252	2.30				11.50	
Graphic Expansion G0255/A	3.70	0.04	0.05		23.90	
Colour Vid. Control G0224	3.20				16.00	
Grap. Col. co.G0259/60/61	10.77	0.037	0.017		54.14	
Multiplexer Control G0322	2.32	0.15	0.05		14.00	
320 KB mFDU (drive)	0.55	0.85			12.95	
1 MB mFDU (drive)	0.55	1.25			17.75	
1 MB FDU (drive)	0.70			1.0	17.75	

>>>

>>>

MODULE DESCRIPTION	ABSORPTION (amps) + 5V	+12V	-12V	+24V	POWER (watt)	NOTES
18 MB HDU (drive)	3.00	0.40	0.70	1.03	63.72	-24V:0.45
14 MB HDU (drive)	3.80	1.80			40.60	+ control.
20 MB STC (drive)	1.00			1.00	29.00	
Multifunctional keyboard	0.40	0.05			2.60	
Pin pad PIN 1440	0.35	0.05			2.35	
Badge reader MBR 1932	0.10				0.50	
Badge reader MRW 1810	0.10				0.50	

N.B.: - Current figures shown allow for a tolerance of ±20 %

- Power figures given are for d.c. voltages

- A.c. power can be obtained by multiplying the corresponding d.c. figure by 1.42

4. SYSTEM HARDWARE AND SETTINGS

4.1 HARDWARE MODULES

The hardware modules discussed in this chapter are listed below:

HARDWARE MODULE DESCRIPTION	MODULE NAME
Central unit	UC048/A
Central unit	UC070
RAM: 0.5 - 1.0 - 1.5 - 2.0 MByte	RA57/E-C-B-A
RAM: with ECC 1 - 2 MByte	RA65/B-RA65
Encryption controller and Real time clock	G0257-257/B-257/A
Trivalent video/keyboard controller	G0252-252/A-252/B
Graphic video expansion module (together with G0252)	G0255/A
Alphanum. colour video/keyboard controller	G0224
Graphic colour video/keyboard controller (3 boards)	G0259,G0260,G0261
Multiplexer controller	G0322
mFDU/FDU controller	G0280/B-C-D-E
14 MB HDU controller (XU 5006)	DTC 510B0
Bus adapter board (SASI) and terminal strip plate	G0299 - G0298
ST506 interface controller for HDU 30/65 MB	G0363
ESDI interface controller for 140 MB HDU	G0404 - G0405
18 MB HDU controller (XU 5010)	G0230, G0231/A
SMD interface cont. for HDU 60/120 MB (XU1700-1703)	G0302/A, G0301/A
20 MB SCT controller (XU 1120)	G0200/B, G0201/B
20 MB SCT controller (XU 1130)	G0200/B, G0342
45/60 MB SCT controller	G0417 - G0418
40 MB MTU controller	G0278/B
Remote V24 internal/external line controller	G0300
LION 9.6 internal line controller	G0333
X24 external line controller	G0303
V24 + V24 intelligent line controller	G0331
V24 intelligent line + LION 200/ controller	G0340
V24 intelligent line + LION 9.6 controller	G0340/A
Omninet local network controller	G0308
Ethernet internal line controller	G0212/A
RS 232 - Current Loop serial interface interface	G0327
Integrated modem MOIN 5.2	IF192

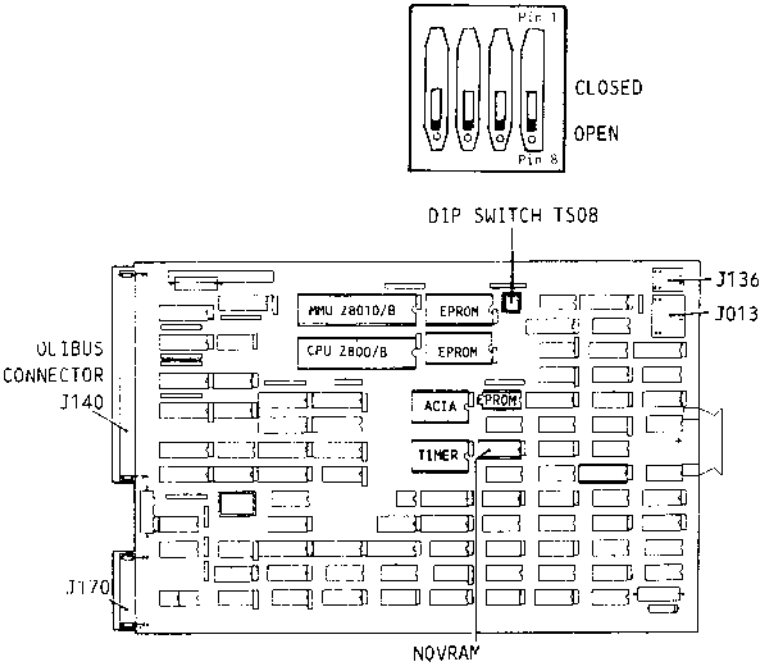
N.B.: Unless specified otherwise, the following conventions are adopted for DIP-switch settings in the remainder of the manual:

0 = OPEN = 1 = OFF X = DON'T CARE

C = CLOSED = 0 = ON - = NOT USED

4.1.1 CENTRAL UNITS UC048/A AND UC070

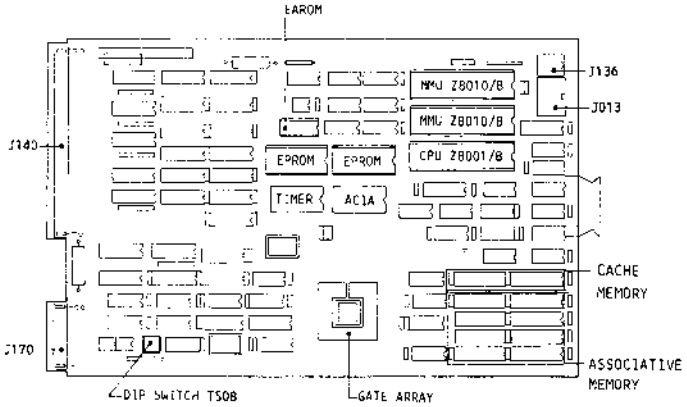
Central Unit UC048/A (for M34/M44)

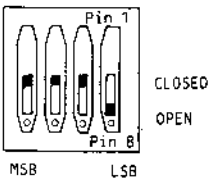


Characteristics:

- Z8001B microprocessor operating with 8 MHz clock
- Z8010B MMU for memory handling
- Two EPROMs (16 or 32 KB) containing the autodiagnostic and IPL
- EAROM (32 or 128 byte, in NOVRAM) for the unbundling feature and installation of the line parameters
- MC 6850 ACIA to handle the RS 232 serial interface
- 8253 TIMER for the RS 232 serial interface and OLIBUS timer timing
- Connectors : J103 to be connected to the diagnostic console
  : J170 for connection to the RS 232

Central Unit UC070 (for M54)



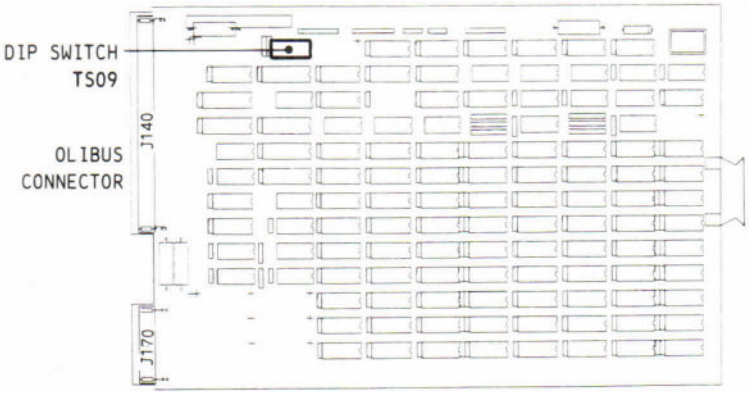


Characteristics:

- Z8001B microprocessor operating with 8 MHz clock
- Z8010B MMU for memory management
- Two EPROM (16 or 32 KB) containing the autodiagnostic and IPL
- EAROM (32 or 128 byte, in NOVRAM) for unbundling feature and line parameter installation
- MC 6850 ACIA for RS 232 serial interface handling
- 8253 TIMER for RS 232 serial interface timing and OLIBUS timeout timing
- 4 KB Cache memory with associative memory
- Connectors : J013 for connection to diagnostic console
  : J136 (not used) for connection to other consoles
  : J170 for connection to RS 232 interface

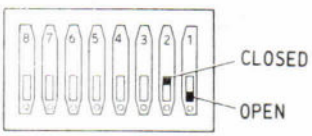
4.1.2 RAM BOARDS

512 Kbyte memory, 64 Kbit chips: RA57/E + RA57H 256 chips



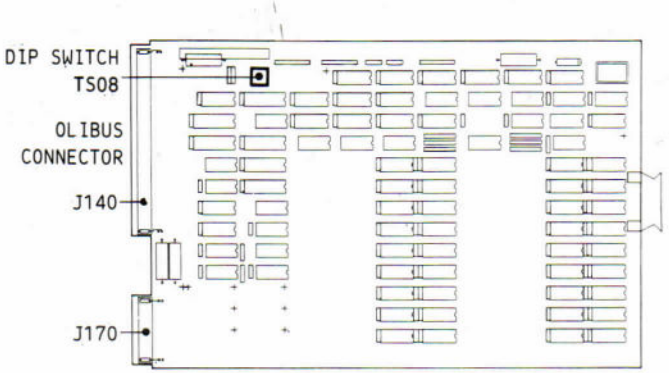
Position of DIP-switch TS09 on the board and addressing table:

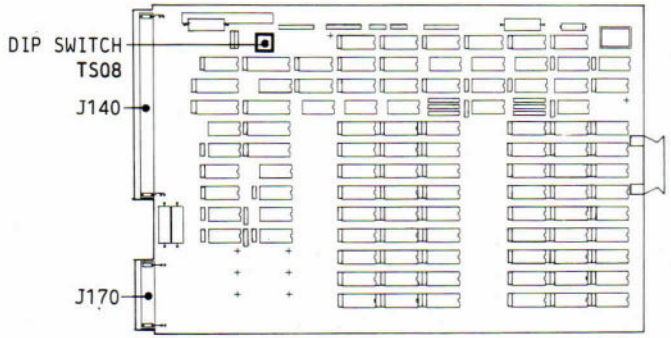
SETTING 8 7 6 5 4 3 2 1	ADDRESSING FIELD BYTE (HEX)	SETTING 8 7 6 5 4 3 2 1	ADDRESSING FIELD BYTE (HEX)
C C C C 0 0 0 0	08 00 00-0F FF FF	0 C C C 0 0 0 0	88 00 00-8F FF FF
C C C 0 C 0 0 0	10 00 00-17 FF FF	0 C C 0 C 0 0 0	90 00 00-97 FF FF
C C C 0 0 0 0 0	18 00 00-1F FF FF	0 C C 0 0 0 0 0	98 00 00-9F FF FF
C C 0 C C 0 0 0	20 00 00-27 FF FF	0 C 0 C C 0 0 0	A0 00 00-A7 FF FF
C C 0 C 0 0 0 0	28 00 00-2F FF FF	0 C 0 C 0 0 0 0	A8 00 00-AF FF FF
C C 0 0 C 0 0 0	30 00 00-37 FF FF	0 C 0 0 C 0 0 0	B0 00 00-B7 FF FF
C C 0 0 0 0 0 0	38 00 00-3F FF FF	0 C 0 0 0 0 0 0	B8 00 00-BF FF FF
C 0 C C C 0 0 0	40 00 00-47 FF FF	0 0 C C C 0 0 0	C0 00 00-C7 FF FF
C 0 C C C 0 0 0	48 00 00-4F FF FF	0 0 C C 0 0 0 0	C8 00 00-CF FF FF
C 0 C 0 C 0 0 0	50 00 00-57 FF FF	0 0 C 0 C 0 0 0	D0 00 00-D7 FF FF
C 0 C 0 0 0 0 0	58 00 00-5F FF FF	0 0 C 0 0 0 0 0	D8 00 00-DF FF FF
C 0 0 C C 0 0 0	60 00 00-67 FF FF	0 0 0 C C 0 0 0	E0 00 00-E7 FF FF
C 0 0 C 0 0 0 0	68 00 00-6F FF FF	0 0 0 C 0 0 0 0	E8 00 00-EF FF FF
C 0 0 0 C 0 0 0	70 00 00-77 FF FF	0 0 0 0 C 0 0 0	F0 00 00-F7 FF FF
C 0 0 0 0 0 0 0	78 00 00-7F FF FF	0 0 0 0 0 0 0 0	F8 00 00-FF FF FF
0 C C C C 0 0 0	80 00 00-87 FF FF		



1.0 MByte memory, 256 Kbit chips: RA57/C

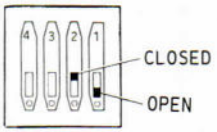
1.5 MByte memory, 256 Kbit chips: RA57/B





Position of DIP-switch TS08 on board and addressing table:

SETTING				ADDRESSING FIELD BYTE (HEX) START END RA57/C	RA57/B
4	3	2	1		
C	C	C	X	00 00 00 - 0F FF FF	/ 17 FF FF
C	C	0	X	20 00 00 - 2F FF FF	/ 37 FF FF
C	0	C	X	40 00 00 - 4F FF FF	/ 57 FF FF
C	0	0	X	60 00 00 - 6F FF FF	/ 77 00 00
0	C	C	X	80 00 00 - 8F FF FF	/ 97 00 00
0	C	0	X	A0 00 00 - AF FF FF	/ B7 00 00
0	0	C	X	C0 00 00 - CF FF FF	/ D7 00 00
0	0	0	X	E0 00 00 - EF FF FF	/ F7 00 00



4.1.3 ENCRYPTION CONTROLLER

Encryption controller and real time clock: G0257

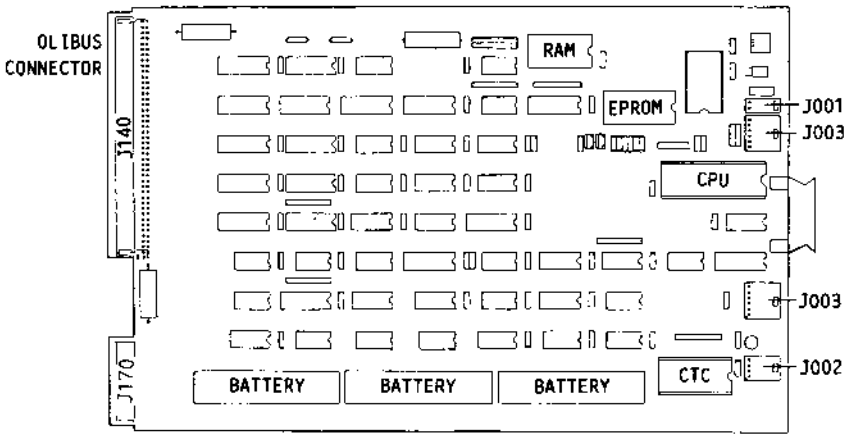
Encryption controller (pin check): G0257/B

Real time clock module (RTC): G0257/A

Encryption controller (pin check) with CAT algorithm:G0257/C

There are no major differences between the four board versions: the G0257 and G0257/B and the G0257/C are practically identical, while the G0257/A does not mount some of the components. The figure below shows the most complete version of the board.

Board G0257 picture



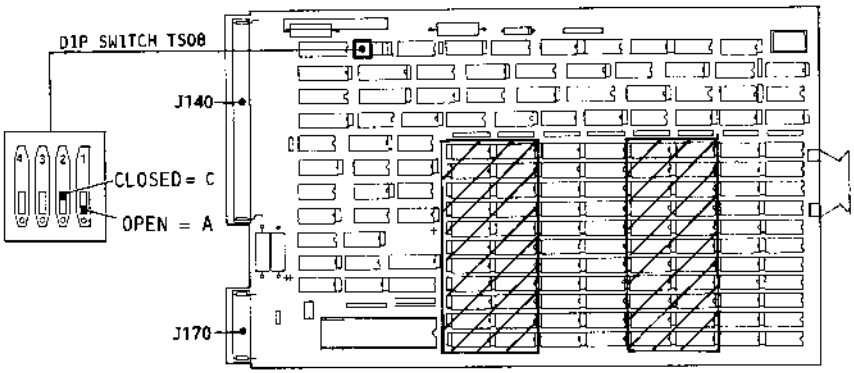
N.B.: - J01: +5V power supply connector for ASD module connection
- J02: Customer safety jumper
- J03: Connector for line and ASD module connection

Characteristics

- Z80/0 microprocessor
- Z80/0 Counter Timer Controller (CTC)
- 2K x 8 Dual-Port RAM
- 2K x 8 battery-powered RAM
- 8K x 8 ROM

1.0/2.0 MByte Memory with ECC, 256 Kbit chips: RA65/RA65B

The two storage memory boards RA65 and RA65B differ only in the number of RAM chips mounted. The figure below is of the RA65. The RA65B does not have the chips in the shaded lines.



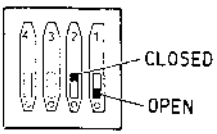
Memory board RA65

Position of DIP-switches TS08 on board RA65B

SETTING				ADDRESSING FIELD BYTE (HEX)
4	3	2	1	
C	C	C	C	00 00 00 - 0F FF FF
C	C	C	0	10 00 00 - 1F FF FF
C	C	0	C	20 00 00 - 2F FF FF
C	C	0	0	30 00 00 - 3F FF FF
C	0	C	C	40 00 00 - 4F FF FF
C	0	C	0	50 00 00 - 5F FF FF
C	0	0	C	60 00 00 - 6F FF FF
C	0	0	0	70 00 00 - 7F FF FF
0	C	C	C	80 00 00 - 8F FF FF
0	C	C	0	90 00 00 - 9F FF FF
0	C	0	C	A0 00 00 - AF FF FF
0	C	0	0	B0 00 00 - BF FF FF
0	0	C	C	C0 00 00 - CF FF FF
0	0	C	0	D0 00 00 - DF FF FF
0	0	0	C	E0 00 00 - EF FF FF

Position of DIP-switches TS08 on board RA65

SETTING				ADDRESSING FIELD BYTE (HEX)
4	3	2	1	
X	C	C	C	00 00 00 - 1F FF FF
X	C	C	0	20 00 00 - 3F FF FF
X	C	0	C	40 00 00 - 5F FF FF
X	C	0	0	60 00 00 - 7F FF FF
X	0	C	C	80 00 00 - 9F FF FF
X	0	C	0	A0 00 00 - BF FF FF
X	0	0	C	C0 00 00 - DF FF FF
X	0	0	0	E0 00 00 - FF FF FF



4.1.3 ENCRYPTION CONTROLLER

Encryption controller and real time clock: G0257

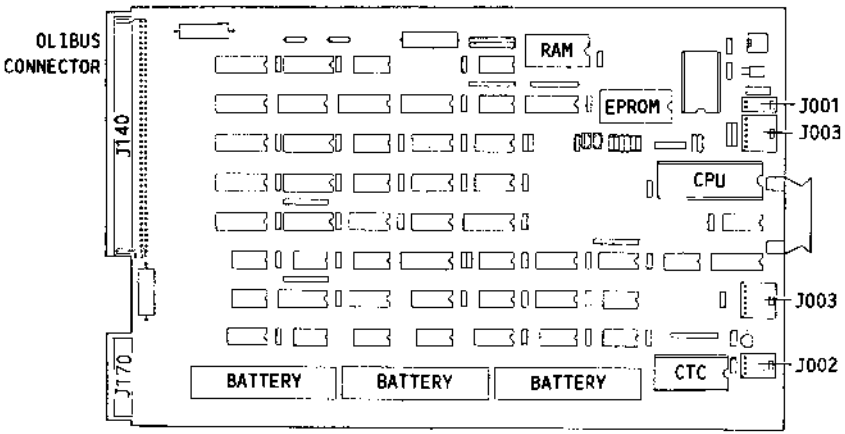
Encryption controller (pin check): G0257/B

Real time clock module (RTC): G0257/A

Encryption controller (pin check) with CAT algorithm:G0257/C

There are no major differences between the four board versions: the G0257 and G0257/B and the G0257/C are practically identical, while the G0257/A does not mount some of the components. The figure below shows the most complete version of the board.

Board G0257 picture



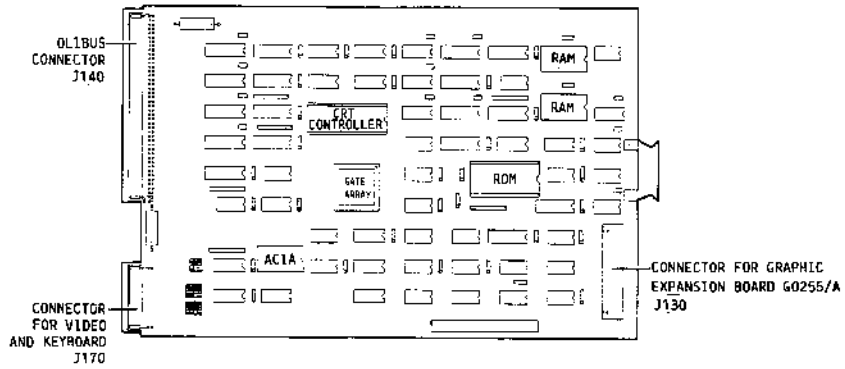
N.B.: - J01: +5V power supply connector for ASD module connection
- J02: Customer safety jumper
- J03: Connector for line and ASD module connection

Characteristics

- Z80/0 microprocessor
- Z80/0 Counter Timer Controller (CTC)
- 2K x 8 Dual-Port RAM
- 2K x 8 battery-powered RAM
- 8K x 8 ROM

4.1.4 VIDEO/KEYBOARD CONTROLLERS

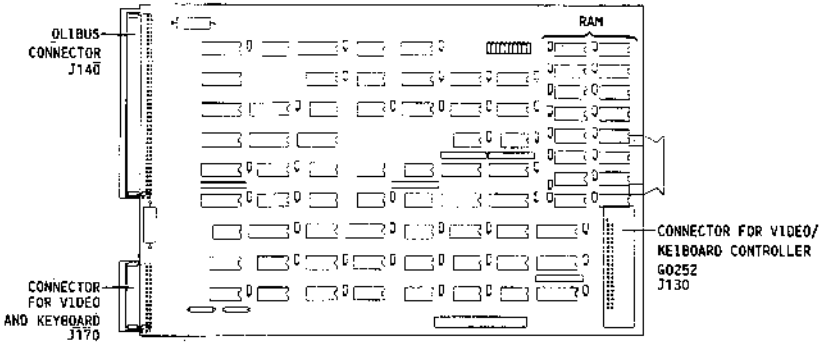
Trivalent video controller G0252



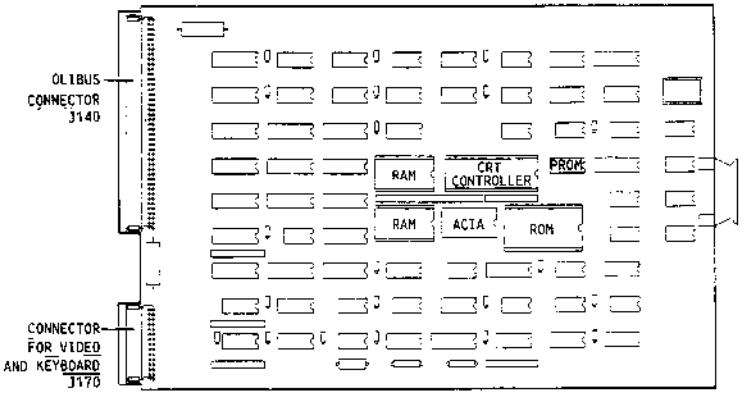
Characteristics:

- 6845 CRT controller 6845 for 5", 9" and 15" videos
- 8 KB refresh RAM (data and attributes)
- 4 KB character generator ROM
- Asynchronous serial interface for exchanges for keyboard or ELB 1381/1382 (for workstations between 5 and 100 metres from system).
- Can be connected to monochrome graphic expansion
- Grid handling for G0252/A
- Conformity with UL/CSO regulations (for G0252/B)

Graphic video expansion module: G0255/A



Alphanumeric colour video: G0224



Characteristics:

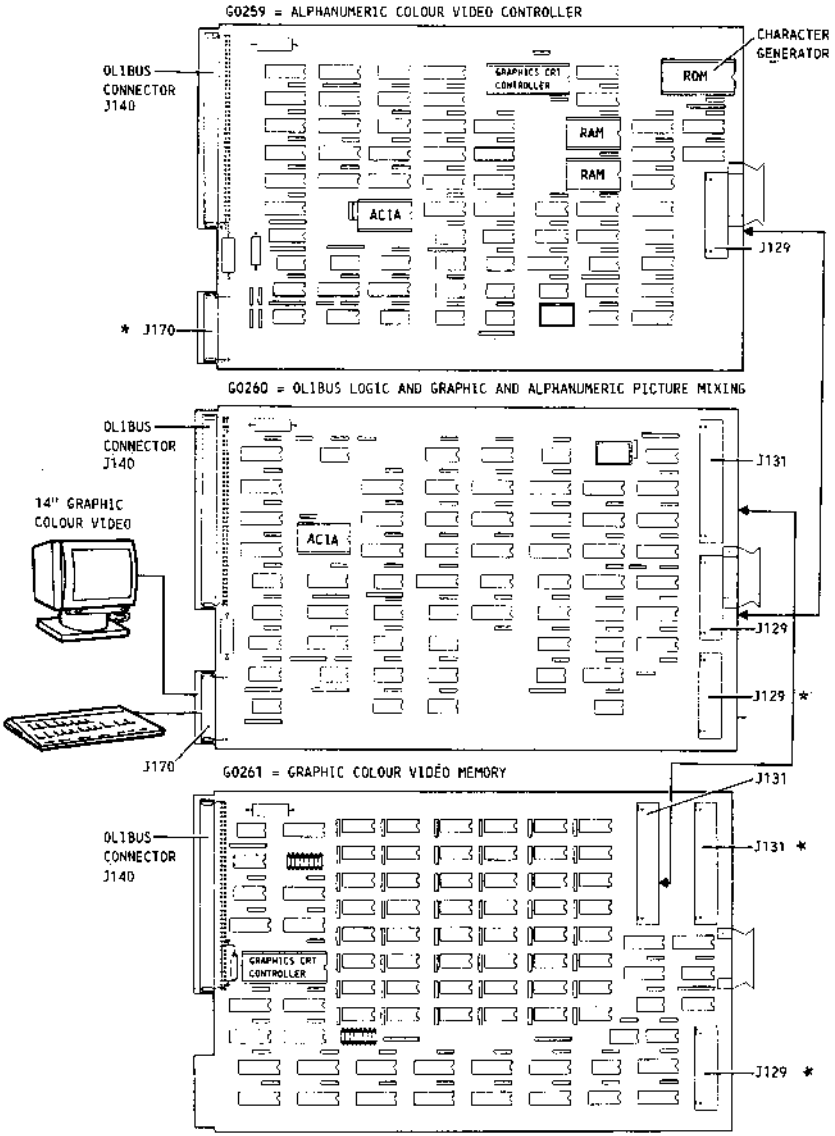
- 6845 CRT controller for 14" colour video
- 8 KB refresh RAM (data and attributes): addressed in memory segment between FF0000 and FFFFFF.
- 4KB character generator ROM
- Asynchronous serial interface for exchanges with keyboard and ELB 1381 or 1382

Graphic colour video controller: G0259/G0260/G0261

Characteristics

- Two graphic display controllers NEC 7220: one on G0259 for the alphanumeric memory, the other on G0261 for the graphic memory
- Asynchronous serial interface for exchange with keyboard or with ELB 1381 or 1382.
- Character generator ROM

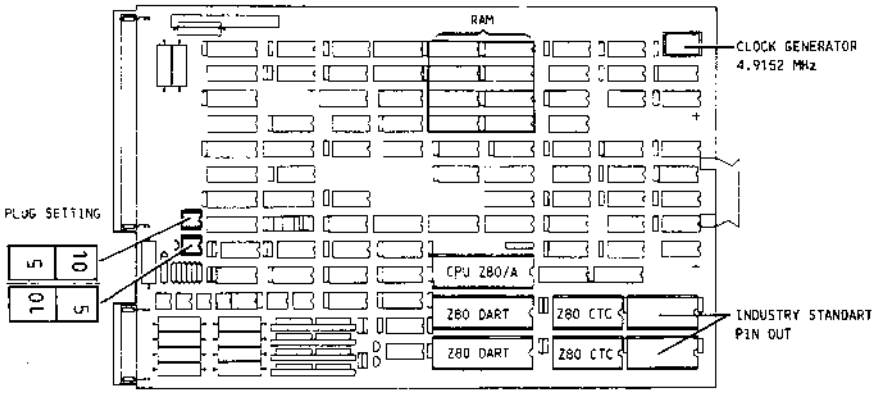
Picture showing boards and interconnections



N.B.: Connectors marked (*) are not used. A keyboard may be connected to G0259 connector J170 instead of the one connected to G0260/J170

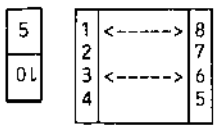
4.1.5 MULTIPLEXER CONTROLLER: G0322

The G0322 is an intelligent controller, used as interface between the system and workstation, and based on the ELB 3683. The 4 board channels are not connected directly to the ELB but via a distribution box D-BOX.

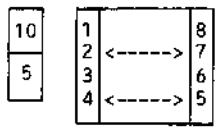


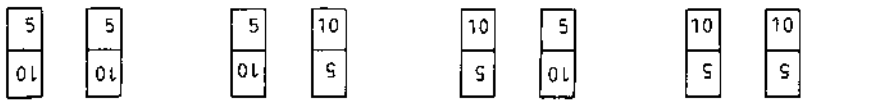
The G0 322 jumper connections made by way of 5|10 plugs and illustrated below must be taken into account in connecting peripherals or the ELB 3683 to the D-BOX:

Position 5 for RS 232 select



Position 10 for Current Loop select

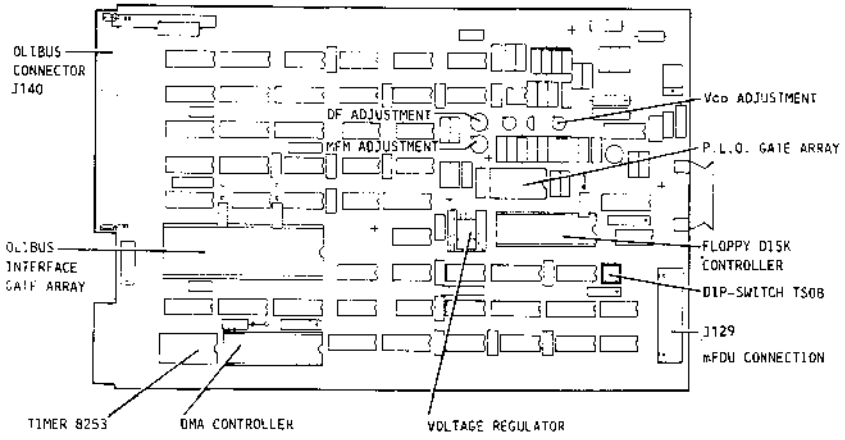




Channel 1 = RS 232 Channel 1 = RS 232 Channel 1 = C.L. Channel 1 = C.L.
Channel 2 = C.L. Channel 2 = C.L. Channel 2 = C.L. Channel 2 = C.L.
Channel 3 = RS 232 Channel 3 = C.L. Channel 3 = RS 232 Channel 3 = C.L.
Channel 4 = C.L. Channel 4 = C.L. Channel 4 = C.L. Channel 4 = C.L.

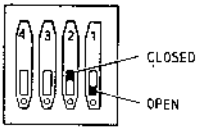
4.1.6 320 KB mFDU CONTROLLER: GD280/C-E

This controller can handle up to four 320 or 640 Kbyte mini-floppy disk units. The board structure is based on the NEC Floppy Disk Controller component PD765. The type of unit connected is defined through DIP-switch TS08 (in board position G10).



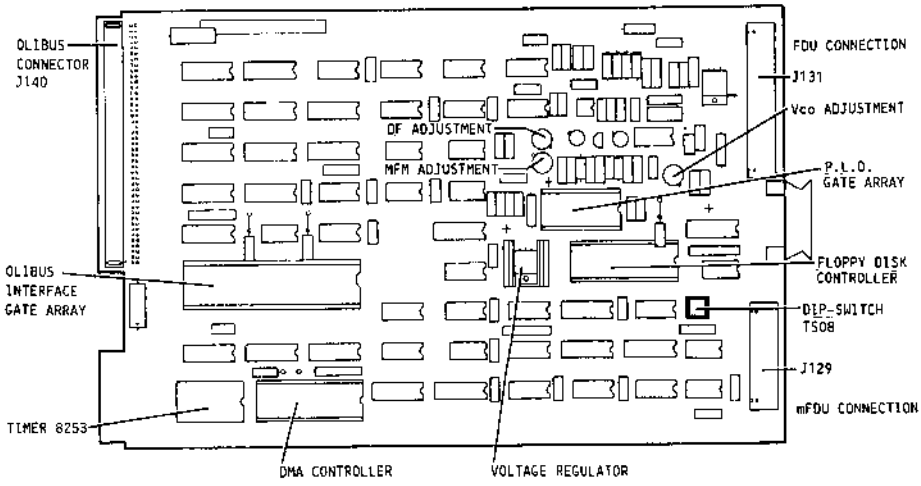
DIP-switch TS08 jumper connections

SETTING				SIGNIFICANCE
4	3	2	1	
C	O	O	O	320 Kbyte Minifloppy
C	O	C	C	640 Kbyte Minifloppy
O	C	O	O	Diagnostic test operation



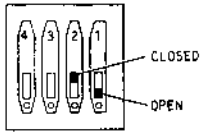
4.1.7 1 MB mFDU/FDU CONTROLLER: G0280/B-D

This controller can handle up to four 1 MB floppy or minifloppy disk units. The board structure is based on the NEC Floppy Disk Controller PD765. The type of unit connected is defined through the DIP-switch TS08 (in board position G10).

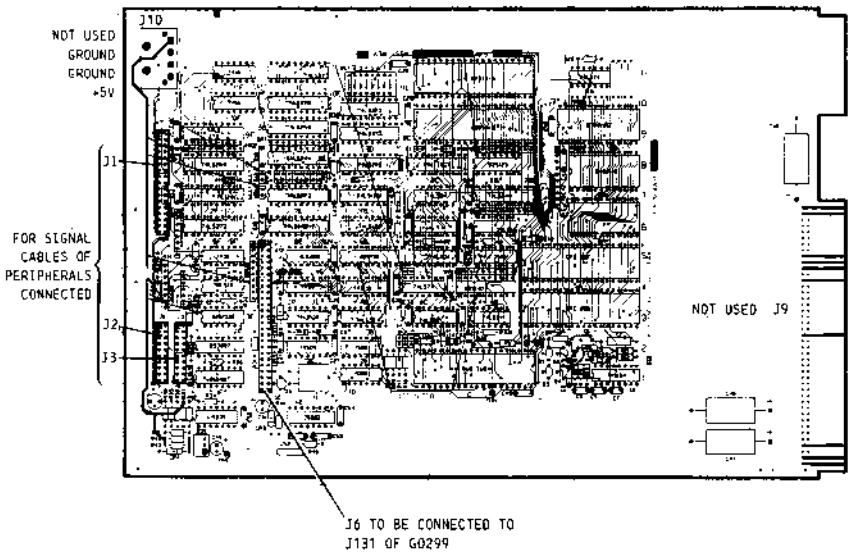


DIP-switch TS08 jump connections

SETTING				SIGNIFICANCE
4	3	2	1	
0	0	0	C	1 Mbyte Floppy
0	0	C	C	1 Mbyte Minifloppy



4.1.8 14 MB HDU CONTROLLER CONTROL UNIT: DTC 510 B0



To prevent data being lost due to undesired switching in the power down phase, voltage on the test point of the piggy back board must read 4.75 V.
Whereas the piggy back board (IF284A or 1F284BU) was externally mounted in the previous versions of the controller DTC 510A and 510 BP, in the present DTC 510 B0 it is integrated on the board.

The test points and potentiometer for the different versions are shown in the table below:

CONTROL	TEST POINT	POTENTIOMETER
DTC 510 A	D01DD (on IF284A)	E011U
DTC 510 BP	B0210 (on IF284BU)	B02FY
DTC 510 B0	TP4 (on 510 B0)	R35

The table below gives the significance of the control unit diagnostic LEDs:

ERROR CODE	DIAGNOSTIC LEDS 7 6 5 4 3 2 1 0	DESCRIPTION
00	0 0 0 0 0 0 0 0	Operation OK
01	0 0 0 0 0 0 0 1	No index pulse from drive
02	0 0 0 0 0 0 1 0	No track 00 after restore
03	0 0 0 0 0 0 1 1	Sector address greater than max. allowed
04	0 0 0 0 0 1 0 0	Winchester drive not selected
05	0 0 0 0 0 1 0 1	A complete seek has not been made
06	0 0 0 0 0 1 1 0	No ID address mark
07	0 0 0 0 0 1 1 1	No data address mark
08	0 0 0 0 1 0 0 0	Cylinder or head seek error
09	0 0 0 0 1 0 0 1	Sector not found
0A	0 0 0 0 1 0 1 0	Ecc error on ID field
0C	0 0 0 0 1 1 0 0	Inexact command received
0D	0 0 0 0 1 1 0 1	Data mark not correct
0E	0 0 0 0 1 1 1 0	ID mark not correct
0F	0 0 0 0 1 1 1 1	Cylinder addressing not correct
10	0 0 0 1 0 0 0 0	Sector addressing not correct
11	0 0 0 1 0 0 0 1	Head addressing not correct
12	0 0 0 1 0 0 1 0	Data errors cannot be corrected
13	0 0 0 1 0 0 1 1	Data errors acn be corrected
14	0 0 0 1 0 1 0 0	Drive not ready
15	0 0 0 1 0 1 0 1	Incorrect write condition
17	0 0 0 1 0 1 1 1	Drive write protected
18	0 0 0 1 1 0 0 0	RAM diagnostic errors
1F	0 0 0 1 1 1 1 1	Alternative track read not enabled
20	0 0 1 0 0 0 0 0	Host adapter parity circuit fault
21	0 0 1 0 0 0 0 1	Faulty data block found
22	0 0 1 0 0 0 1 0	Function not valid for drive
32	0 0 1 1 0 0 1 0	Seek in progress
33	0 0 1 1 0 0 1 1	Volume overflow
40	0 1 0 0 0 0 0 0	Drive not active
81	1 0 0 0 0 0 0 1	Several units selected
82	1 0 0 0 0 0 1 0	Time out during transfer
C0	1 1 0 0 0 0 0 0	Controller selected

N.B.:

1 = LED on
0 = LED off

4.1.9 BUS ADAPTER AND TERMINAL STRIP BOARD: G0299-G0298

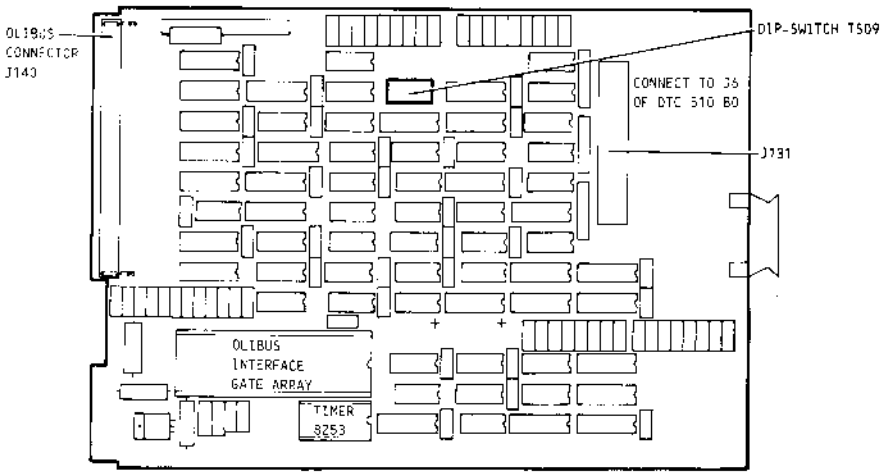
Board G0299 connects the system bus (OLIBUS) to the SASI interface of the DTC 510 controller.
The G0298, on the other hand, is used to mount the DTC 510A or 510BP control unit, thus forming a board with the standard dimensions of the other system boards. The DTC 510 B0 control is directly integrated on the G0298.

The two G0299 and G0298 boards are attached by way of 4 mounting columns and screws.
Control and bus adapter are connected by the SASI cable, connected to J6 on DTC 510 and J131 on G0299.
The peripheral unit signal cables are connected to J1 and J2 on DTC 510.

DIP-switch TS09, position B05 on G0299, can be set as illustrated below:

SETTING 8 7 6 5 4 3 2 1	SIGNIFICANCE
C C C C C C C C	No DTC 510 Control unit
C C C C C C C O	Control DTC 510 + peripheral '0'
C C C C C C O C	Control DTC 510 + peripheral '1'
C C C C C C O O	Control DTC 510 + peripheral '0' and '1'

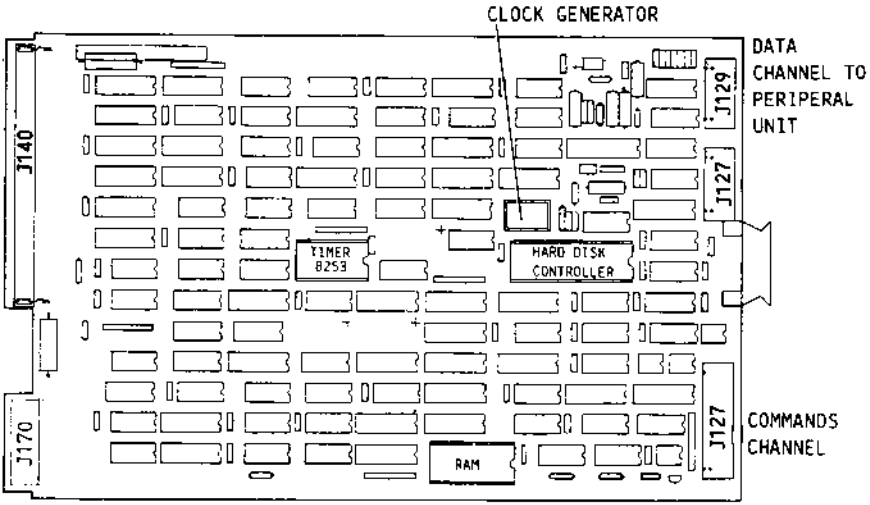
G0299



4.1.10 ST506 INTERFACE HDU CONTROLLER: G0363

Unlike other hard disk unit controllers, this is a single board controller. It can control two peripherals with ST506 interface.
It requires no settings as it recognises the type of peripheral connected by reading the relative data on the disk track 0.

If the G0363 is in an M44 system, then a DC/DC converter must be used to give the + 12V voltage required for operation of the magnetic peripherals.
This plate is mounted to the rear of the magnetic unit.
The DC/DC converter is not necessary in an M34/M54 system, as the power supply unit mounted (LA17) can supply all the voltages the peripheral unit needs.

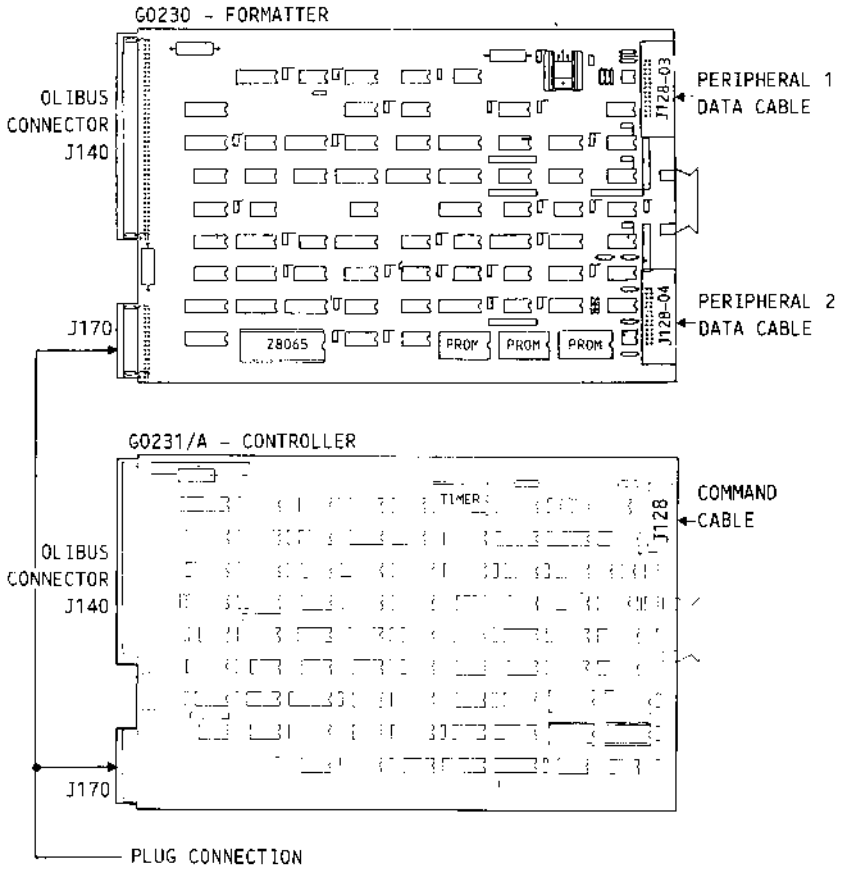


Characteristics:

- Hard disk controller PD 7261
- Programmable timer 8253
- 8K x 8 CMOS RAM
- Clock generator: 20 MHz quartz.

4.1.11 18 MB HDU CONTROLLER: G0230 - G0231/A

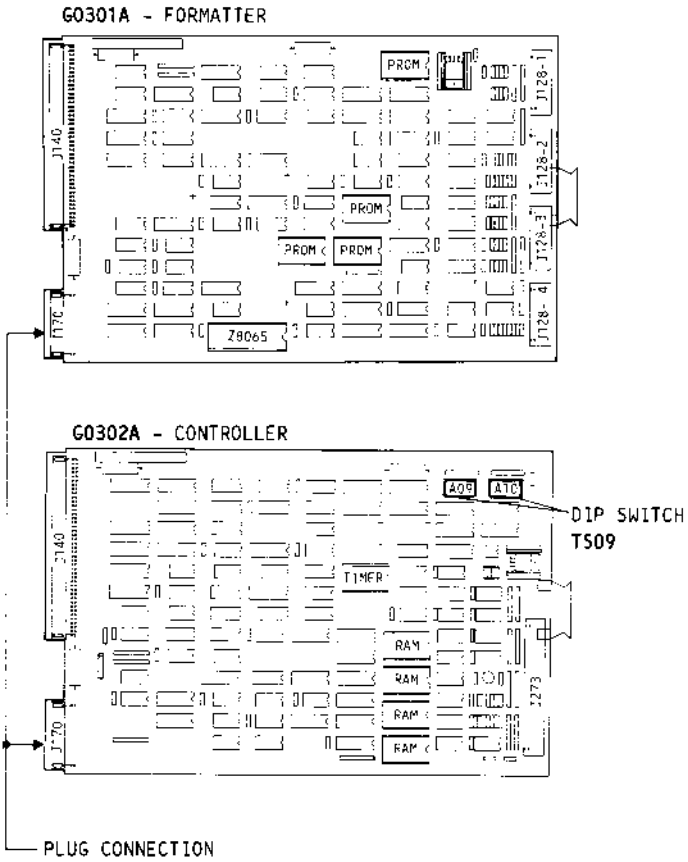
Interconnection between controller and XU 5010 peripherals



Characteristics:

- Z8065 for ECC
- TIMER 8253 to determine length of DMA transfer
- PROM to handle data/command channels to and from peripheral
- RAM for DMA data exchange to and from OLIBUS and peripheral

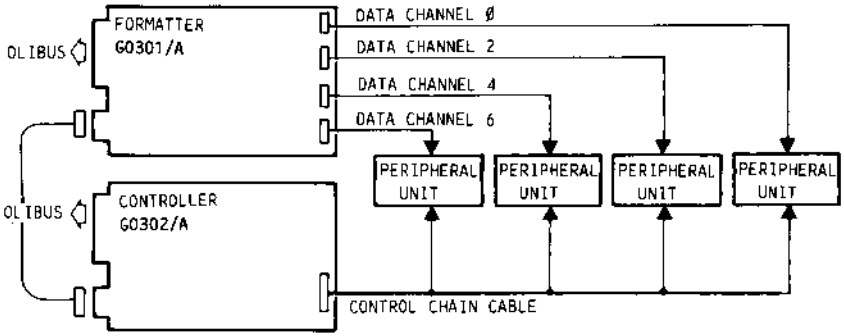
4.1.12 SMD INTERFACE HDU CONTROLLER: G0301/A - G0302/A



Characteristics:

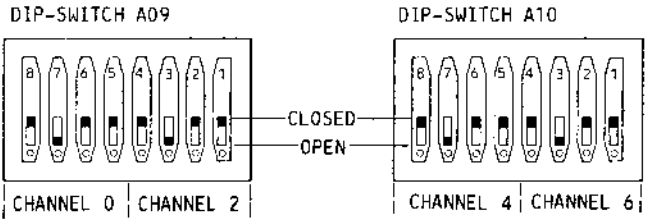
- Z8065 component for ECC
- TIMER 8253 to determine length of DMA transfer
- 3 PROMs to handle the data channels and command channel to and from the peripheral
- 4 RAMs for DMA data exchanges with OLIBUS and with the peripheral unit

Interconnection of controller and XU 1700/1703 peripherals



Setting of DIP-switches A09 and A10 on board G0302/A

These two DIP-switches are used to identify the type of peripherals. For example, if 4 60 MB units were connected, the jump connections would be:



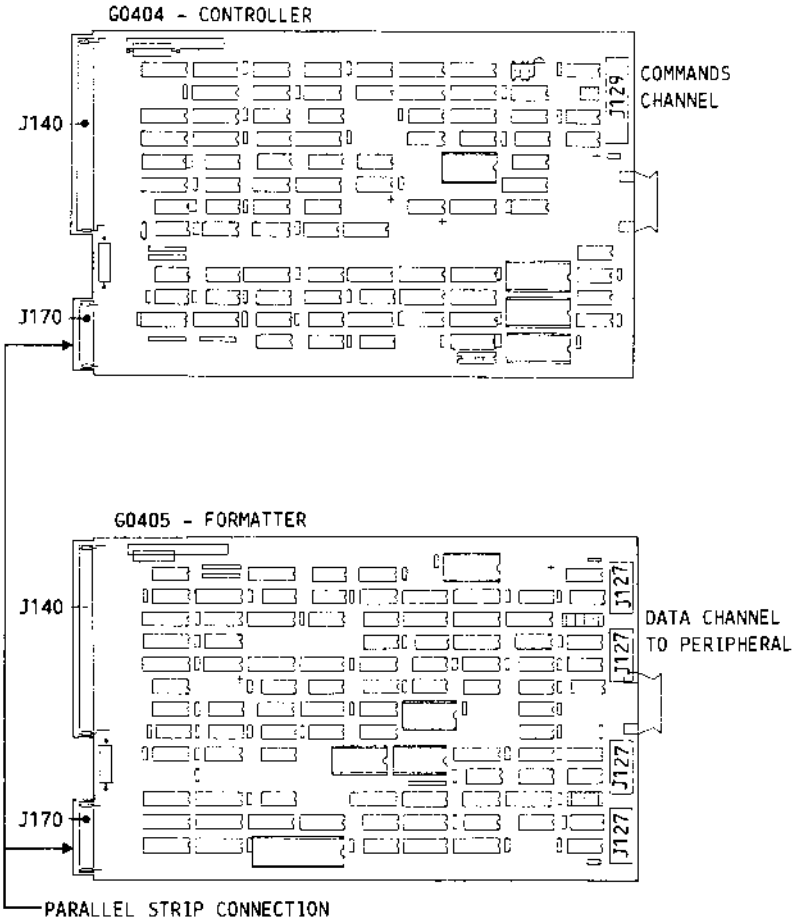
In general, though, settings possible **for each channel** are as follows:

SETTING				SIGNIFICANCE
8 4	7 3	6 2	5 1	
C	C	C	C	No peripheral connected
C	O	C	C	60 MB HDU without Dual-Port board
C	O	C	O	60 MB HDU with Dual-Port board
C	O	O	C	120 MB HDU without Dual-Port board
C	O	O	O	120 MB HDU with Dual-Port board

4.1.13 140 MB HDU ESDI INTERFACE CONTROLLER: G0404 - G0405

The ESDI interface controller does not require any jumper settings; all that is needed is to connect connector J170 of the controller (board G0404) to connector J170 of the formatter (board G0405) through the connection plate (on the rear of the BACK-PLANE).

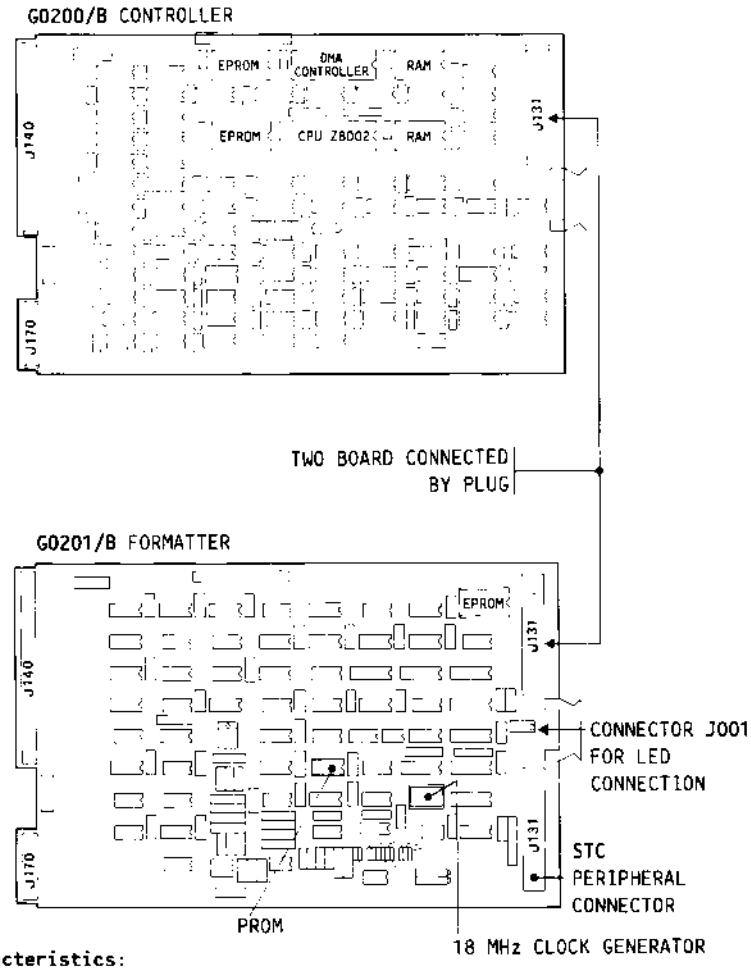
Interconnection between controller and peripherals



4.1.14 STREAMING TAPE UNIT CONTROLLERS

20 MB STC (DEI) Controller: G0200/B - G0201/B

Interconnection between controller and XU 1120 peripherals

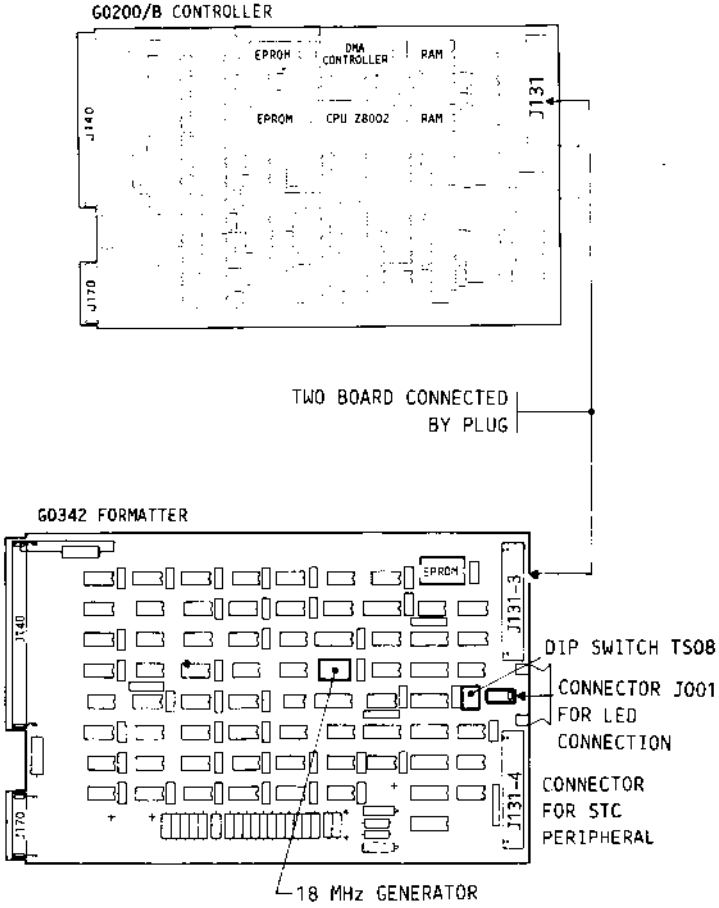


Characteristics:

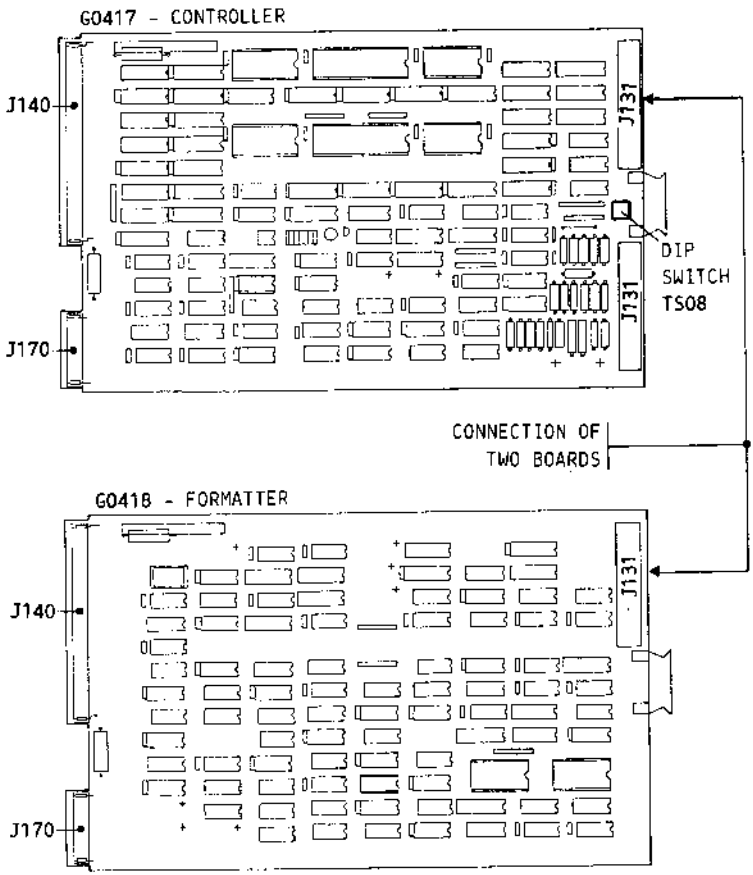
- Z8002 microprocessor
- 4 KB RAM
- DMA controller 9517

20 MB STC (CIPHER) Controller: G0200/B - G0342

Interconnection between controller and XU 1130 peripherals

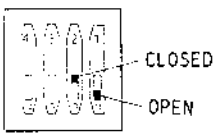


45/60 MB STC Controller: G0417 - G0418

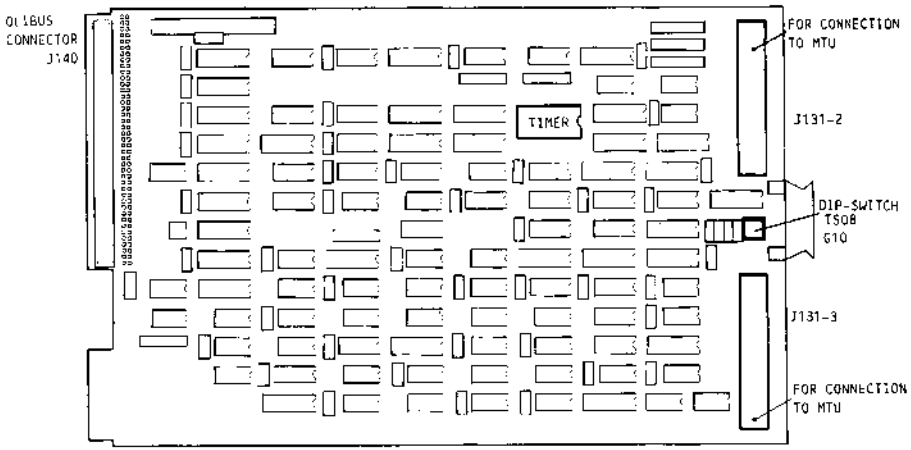


DIP-switches TS08 in position G10 on the G0417 board must be set as follows:

SETTING				SIGNIFICANCE
4	3	2	1	
0	C	C	C	Peripheral connected STC 45-60
X	X	X	X	For future use



4.1.15 40 MTU CONTROLLER: G0278/B



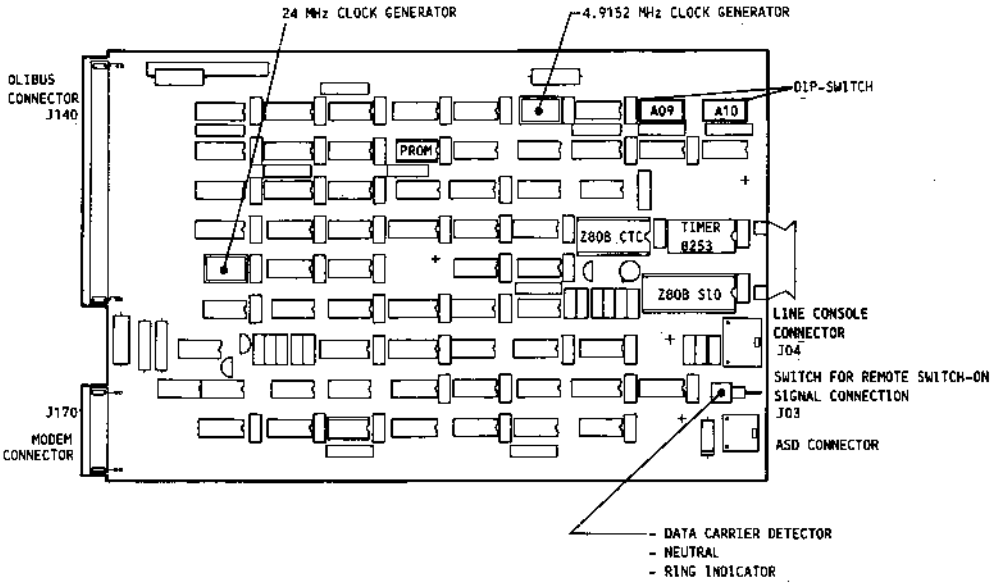
Characteristics:

- 8253 TIMER to determine length of DMA transfer
- FIFO buffer for DMA data exchanges with OLIBUS and peripherals
- Pertec industry standard interface

A DIP-switch in position G10 is used to select the number of peripherals connected:

SETTING				SIGNIFICANCE
4	3	2	1	
C	C	C	C	No peripheral connected
C	C	C	0	First peripheral connected
C	C	0	C	Second peripheral connected
C	C	0	0	First and second peripherals connected

4.1.16 V24 REMOTE INTERNAL/EXTERNAL LINE CONTROLLER: G0300



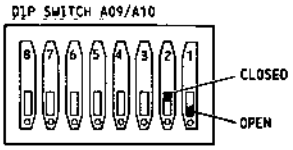
Jump connections for terminal name selection

DIP-switch A09 = First character (POLLING)

DIP-switch A10 = Second character (SELECTING)

An example of terminal name selection is shown below; in the example, the characters "P" and "7" have been chosen for polling and selecting, respectively (see also table overleaf).

SELECTION	SYMB-OL	HEX	PRESETTINGS 8 7 6 5	4 3 2 1
DIP-switch A09 for polling	P	50	0 1 0 1	0 0 0 0
			---v---	---v---
			5	0
DIP-switch A10 for selecting	7	37	0 0 1 1	0 1 1 1
			---v---	---v---
			3	7



Terminal name selection

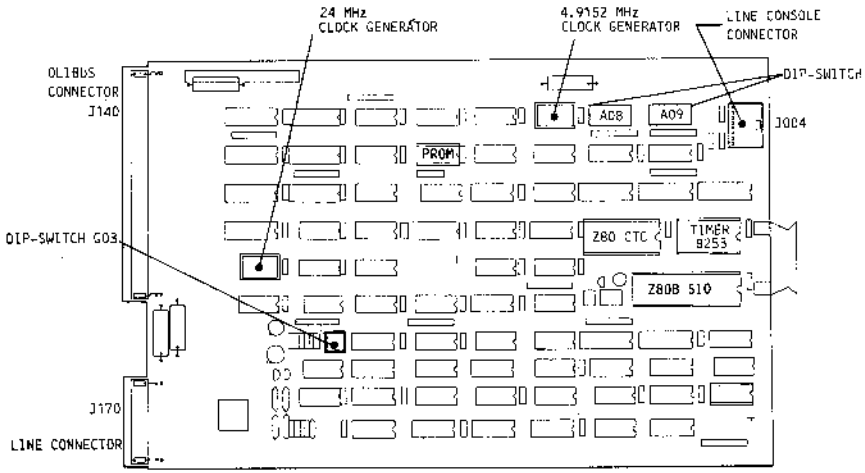
The table below is a decoder table showing the names of the terminals, using polling and selecting addresses.

SYSTEM No.	POLLING ADDRESS Master or Stand Alone				SELECTING ADDRESS Master or Stand Alone			
	EBCDIC symb.	hex	ISO ccitt 5 symb.	hex	EBCDIC symb.	hex	ISO ccitt 5 symb.	hex
0	SP	40	SP	20	-	60	-	20
1	A	C1	A	41	/	61	/	2F
2	B	C2	B	42	S	E2	S	53
3	C	C3	C	43	T	E3	T	54
4	D	C4	D	44	U	E4	U	55
5	E	C5	E	45	V	E5	V	56
6	F	C6	F	46	W	E6	W	57
7	G	C7	G	47	X	E7	X	58
8	H	C8	H	48	Y	E8	Y	59
9	I	C9	I	49	Z	E9	Z	5A
1	¢	4A	[	5B (*)		6A ($)		7C (*)
1	.	4B ($)	.	2E	,	6B	,	2C
1	<	4C	<	3C	%	6C	%	25
1	(	4D	(	28	_	6D	_	5F
1	+	4E	+	2B	>	6E	>	3E
1	|	4F	!	21	?	6F	?	3F
1	&	50	&	26	0	F0	0	30
1	J	D1	J	4A	1	F1	1	31
1	K	D2	K	4B	2	F2	2	32
1	L	D3	L	4C	3	F3	3	33
2	M	D4	M	4D	4	F4	4	34
2	N	D5	N	4E	5	F5	5	35
2	O	D6	O	4F	6	F6	6	36
2	P	D7	P	50	7	F7	7	37
2	Q	D8	Q	51	8	F8	8	38
2	R	D9	R	52	9	F9	9	39
2	!	5A	]	5D (*)	:	7A	:	3A
2	$	5B	$	24 (*)	#	7B	£	23 (*)
2	*	5C	*	2A	@	7C	@	40 (*)
2	)	5D	)	29	'	7D	'	27
3	;	5E	;	3B	=	7E	=	3D
3	¬	5F	Ω	5E (*)	"	7F	"	22

NOTE: (*) Specific national symbol

($) Non-existent symbol

4.1.17 LION 9.6 INTERNAL LINE CONTROLLER: G0333



Terminal name select jump connections

DIP-switch A08 = POLLING (most significant byte)

DIP-switch A09 = SELECTING (least significant byte)

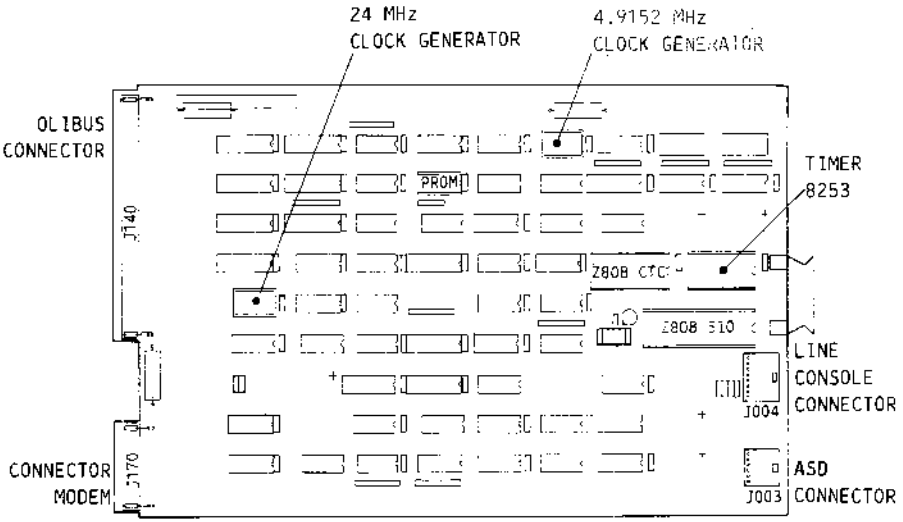
These two DIP-switches are used in the same way as described earlier for the G0300 controller.

DIP-switch G03 for interval timing

The following table illustrates DIP-switch G03 settings relative to delays in releasing the line carrier.

SETTING				SIGNIFICANCE
4	3	2	1	
C	C	C	C	16 clock pulses
C	C	C	O	14 clock pulses
C	C	O	C	12 clock pulses
C	C	O	O	10 clock pulses
C	O	C	C	8 clock pulses
C	O	C	O	6 clock pulses
C	O	O	C	4 clock pulses
C	O	O	O	2 (not possible)

4.1.17 X21 EXTERNAL LINE CONTROLLER: G0303



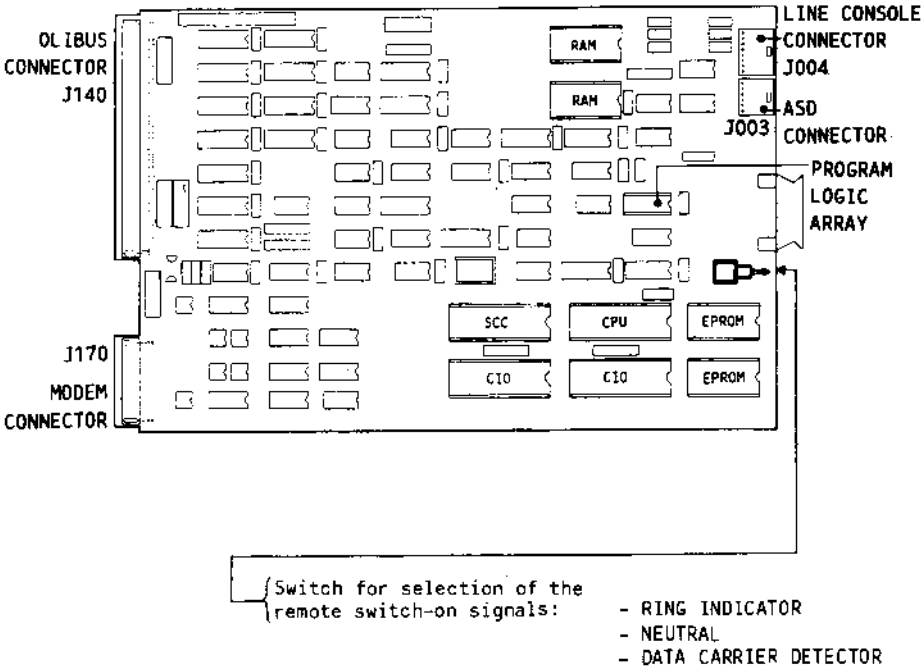
Terminal name select jump connections

DIP-switch A09 = POLLING (most signifiacnt byte)

DIP-switch A10 = SELECTING (least significant byte)

These two DIP-switches are used in the same way as for the G0300 board with the V24 line controller (see section 4.1.16).

4.1.18 V24 + V24 INTELLIGENT LINE CONTROLLER: G0331

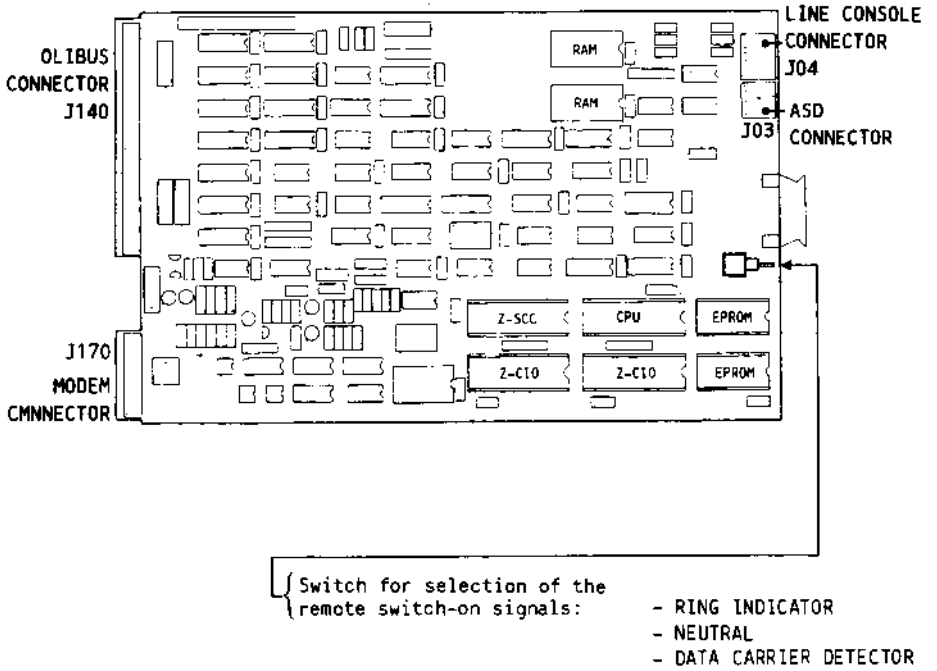


Connector J170 is connected to the modem.

Characteristics:

- Two RS232 channels, V24 interface, for remote internal or external lines
- Z8002 microprocessor
- Self-diagnostic feature
- 32 KB ROM to handle lines
- 16 KB RAM to exchange data and parameters
- Character oriented, SDLC, HDLC protocols

4.1.19 V24 + LION 200/9.6 INTELLIGENT LINE CONTROLLER: G0340-G0340/A



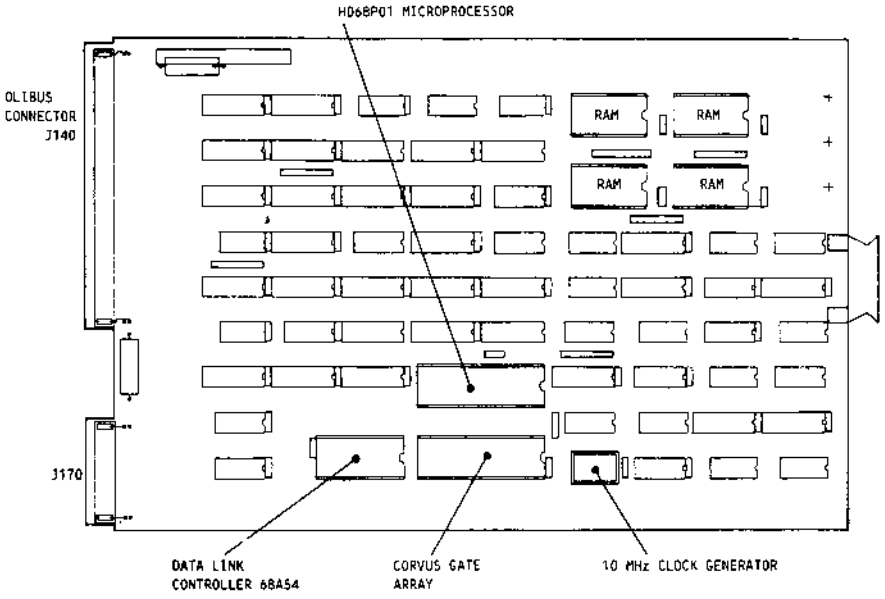
Connector J170 is connected to the modem.

Characteristics:

- Control for external (V24 channel) and internal (LION 200 channel) lines
- Z8002 microprocessor
- Self-diagnostic feature
- 32 KB ROM to handle the lines
- 16 KB RAM to exchange data and parameters
- Character oriented, SDLC and HDLC protocols.

NOTE: There are no major differences between the two line controllers G0256 (V24 + Lion 200) and G0340/A (V24 + Lion 9.6) and separate descriptions are therefore not required.

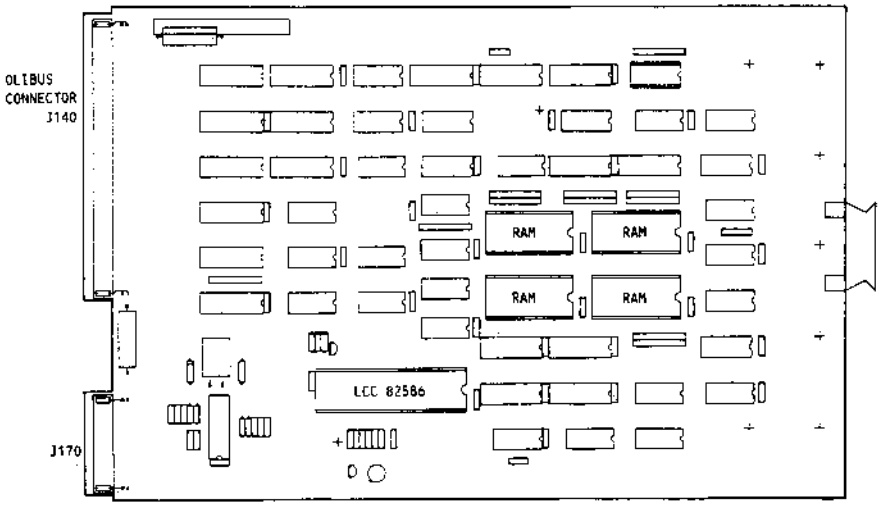
4.1.21 OMNINET LOCAL NETWORK CONTROLLER: G0308



Characteristics:

- CORVUS Omninet kit
- 8 KB Dual-Port memory
- Internal line protocol based on OMNINET specifications
- Transfer speed: 1M bps
- CSMA Channel control
- NRZI code

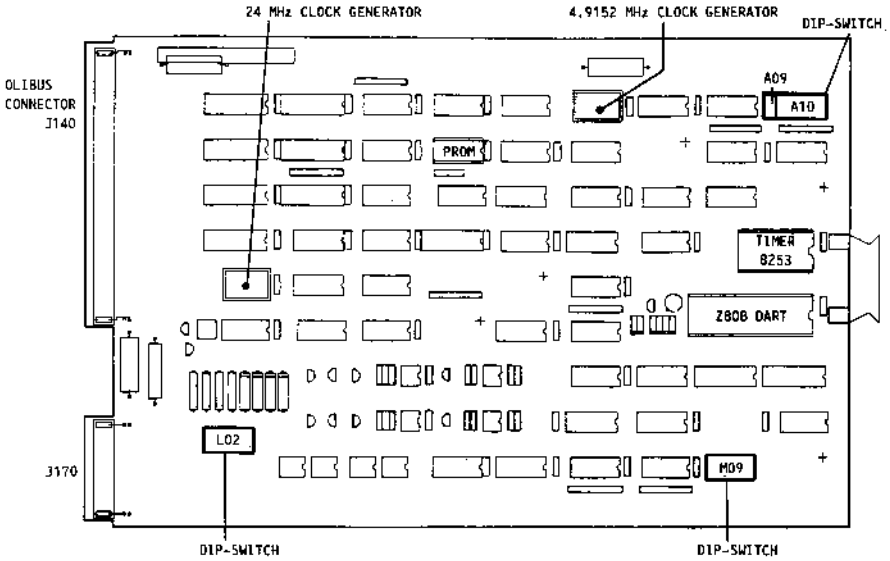
4.1.22 ETHERNET INTERNAL LINE CONTROLLER: G0212/A



Characteristics:

- INTEL kit: 82585 and 82501
- 32 KB Dual-Port memory
- Internal line protocol based on ETHERNET recommendations
- Transfer speed: 10M bps
- CSMA/CD channel control
- Manchester code

4.1.23 RS232 - CURRENT LOOP SERIAL INTERFACE CONTROLLER: G0327



This board has three DIP-switches.

The first, in position L02, is for channel selection, both in parallel current loop and in serial current loop.
DIP-switch settings in both types of operation are illustrated in the tables below:
In an RS232 connection, all the switches must be in the Open position.

Dip switch L02

PARALLEL CURRENT LOOP

SETTING 8 7 6 5 4 3 2 1	SIGNIFICANCE
X X X X X X C C	TX Channel A active
X X X X C C X X	RX Channel A active
X X C C X X X X	TX Channel B active
C C X X X X X X	RX Channel B active

channel B → channel A

SERIAL CURRENT LOOP

SETTING 8 7 6 5 4 3 2 1	SIGNIFICANCE
X X X X X X 0 0	TX Channel A
X X X X 0 0 X X	RX Channel A
X X 0 0 X X X X	TX Channel B
0 0 X X X X X X	RX Channel B

channel B → channel A

Dip switch M09

The second DIP-switch, in position M09, establishes whether or not the DCD is busy in RS232, and whether the current is direct or negated in Current Loop connections.

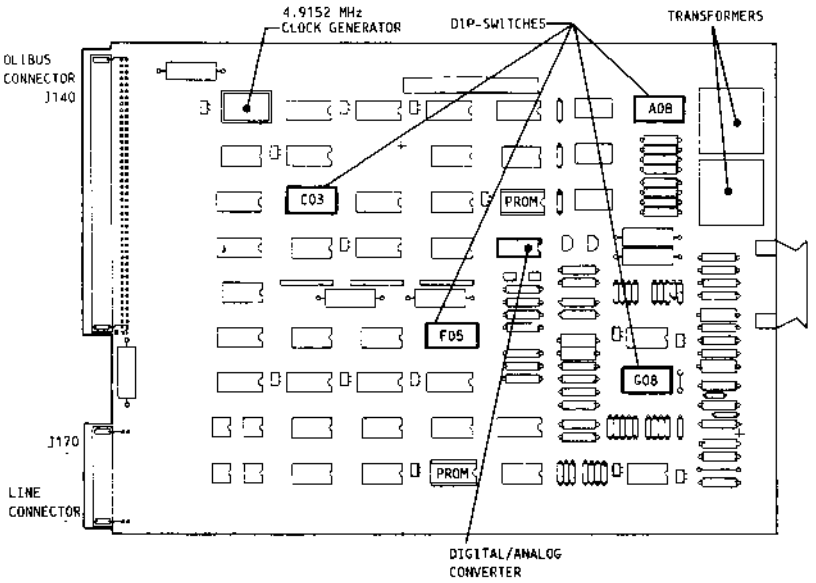
SETTING 8 7 6 5 4 3 2 1	SIGNIFICANCE
X X X X - - X C	Channel A DCD BUSY
X X X X - - C X	Channel B DCD BUSY
X X X 0 - - X X	RX Channel A direct
X X 0 X - - X X	TX Channel A direct
X 0 X X - - X X	RX Channel B direct
0 X X X - - X X	TX Channel B direct

current loop / RS232

Dip switch L02

The third DIP-switch, in position A09/A10, is not used at the moment.

4.1.24 INTEGRATED MODEM MOIN 5.2: IF192



Characteristics:

- Synchronous transmission
- Differential and non-differential twin-phase moduation
- Half duplex or full duplex 4-wire operation
- Point-to-point, multi-point and ring configuration

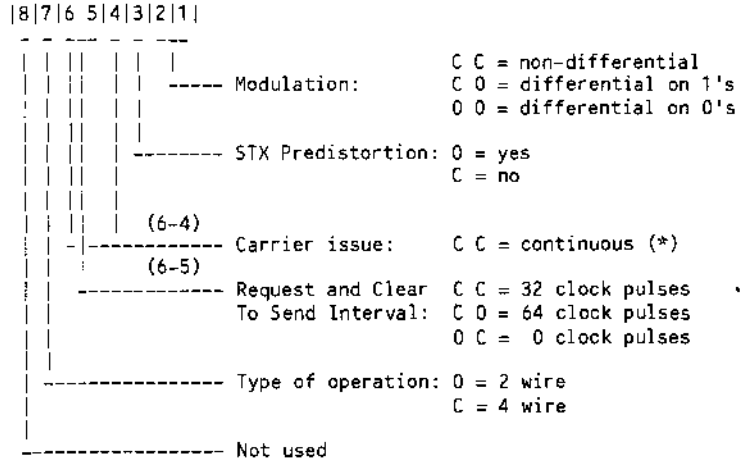
DIP-switch A08

Sets line impedance value:

SETTING	SIGNIFICANCE
8 7 6 5 4 3 2 1	
C 0 C - - C C 0	150 ohm point-to-point
0 C C - - C 0 C	600 ohm point-to-point
C 0 0 - - 0 C 0	150 ohm multi-point
0 C 0 - - 0 0 C	600 ohm multi-point

Dip switch F05

Significance of the settings is shown below:



Notes:

- C = Closed
  O = Open

- TX predistortion (F05-3): sets distortion on the output signal and should be used on long lines with high attenuation.

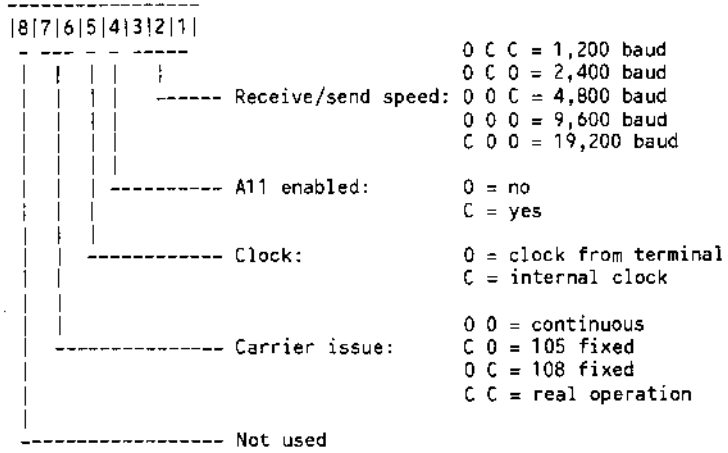
- Carrier issue (F05-4/6): in normal operation, the DIP-switch (F05-4) is set at 1.

- Request To Send and Clear To Send Interval (F05-5/6): inversely proportional to velocity, i.e. at a rate of 9,600 baud, an interval of 32 clock pulses is required.

- (*) Setting valid only in conjunction with DIP-switch C03-6/7 setting.

Dip switch C03

Significance of the settings is illustrated below:



Notes:

- C = Closed
  0 = Open

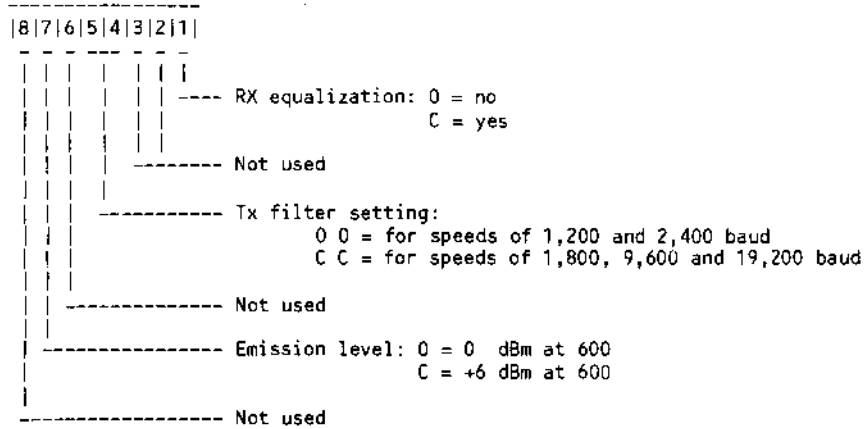
- A111 enable (C03-4): used to modify terminal speed, normally set at 1.

- Carrier issue (C03-6/7): must be jumpered for real operation, as the other features are used only in diagnostics.

- Clock (C03-5): may be sent to the modem by the terminal, or generated on the board (internal clock); in connections to Olivetti equipment, must always be set for internal clock operation (C03-5=0).

DIP-switch G08

Significance of the settings is shown below:



Notes:

- C = Closed
  O = Open

- RX equalization (G08-1): in which the incoming signal is equalized or made clearer; used on long lines with a lot of disturbance.

- TX filter setting (G08-4/5): depends on velocity selected

- Emission level (G08-7): increases the output level on lines with high disturbance.

5. MAGNETIC PERIPHERALS

5.1 LIST OF PERIPHERAL UNITS

The following is a complete list of the magnetic peripheral units which can be used on M34, M44 and M54 systems; the list also specifies whether the units are housed inside the system or in an external cabinet, or if both are possible.

DESCRIPTION OF PERIPHERAL	UNIT NAME	INTEGRATED M34	INTEGRATED M44	INTEGRATED M54	EXTERNAL SB3	EXTERNAL SB2
320 KByte minifloppy	XU 4301	yes	yes	no	no	no
320 KByte slim minifloppy	XU 4350	yes	no	yes	no	no
1 MByte minifloppy	XU 4305	yes	yes	no	yes	no
1 Mbyte slim minifloppy	ND08-DE	yes	yes	yes	yes	no
1 MByte floppy	XG 6030	no	yes	no	yes	no
14 MByte HDU (SASI interface)	XU 5006	yes	no	no	no	no
18 MByte HDU (OPE)	XU 5010	no	yes	no	yes	no
20 MByte HDU (ST506 interface)	XM5221/2	yes	no	yes	no	no
27 MByte HDU (ST506 interface)	XU 1707	yes	yes	no	no	no
40 MByte HDU (ST506 interface)		yes	yes	yes	no	no
65 MByte HDU (ST506 interface)	XU 1709	yes	yes	yes	yes	no
60 MByte HDU (SMD interface)	XU 1700	no	no	no	yes	yes
120 MByte HDU (SMD interface)	XU 1703	no	no	no	yes	yes
140 MByte HDU (ESDI interface)		no	no	yes	no	no
20 MB Streaming Tape Cartridge (DEI)	XU 1120	no	yes	no	yes	no
20MB Streaming Tape Cartridge (CIPHER)	XU 1130	no	yes	no	yes	no
45/60 MB Streaming Tape Cartridge	XU 4950	no	no	yes	no	no
40 MByte MTU (CIPHER)	XU 1705	no	no	no	no	yes

The following modules may be integrated on some of the above units:

- MAPSS board (G0306) for 18 MB HDU
- Dual-Port board (XU 1702) for 60/120 MB HDU

5.2 CONFIGURATION RESTRICTIONS AND LIMITATIONS

A maximum of two peripherals, 5 and 1/4" floppy or 14 MB, 20 MB and 40/65 MB hard disk units are allowed on M34 systems. No external magnetic peripherals are allowed.

In M44 systems, up to three peripherals, 5 and 1/4" or 8" floppy, STC or 18 MB or 27/65 MB Hard Disk units can be accepted. However, one at least of the peripherals must be of the removable medium type. The two hard disk units (18 and 27/65 MB) cannot co-exist on the same system.

M54 systems can house up to three magnetic peripherals chosen from 5 and 1/4" (slim) mFDU, 20/40/65/120 MB HDU and 45/60 MB STC.

A maximum of three peripherals, 5 and 1/4" or 8" floppy, STC or 65 MB Hard Disk units, can be accomodated in an SB3 cabinet (CAB 3558). A further possibility is a configuration with a 60/120 MB peripheral plus one other unit with removable medium, or two 60/120 MB units.
While the 60/120 MB Hard Disk Unit has its own power supply unit (XU 1701), all other peripherals require the LA40 power supply unit.

The 18 MB HDU on the M44 and in the SB3 is being phased out.

The SB2 cabinet is specific for MTU, and, in addition to the tape, may also have one or two 60/120 MB Hard Disk Units.

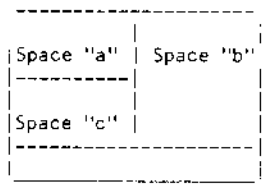
Limitations on configurations

- A 5 and 1/4" floppy and an 8" floppy may not be combined and a maximum of two such units is allowed
- A system may have one STC unit only
- There may only be two 18 MB HDUs; Hard Disk Units with ST506 interface and SMD interface may not be combined
- The 27 MB HDU replaces the 18 MB HDU and may not be combined with 60/120 MB HDUs
- The maximum number of 60/120 MB HDUs is two, configurations without STC or MTU are not possible
- Systems cannot have both STC and MTU.

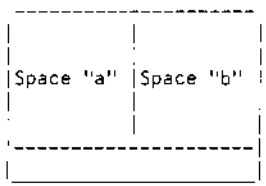
5.2.1 MAGNETIC PERIPHERAL CONFIGURATIONS POSSIBLE

Differences between M54 and M34 configurations

The tables below illustrate the spaces for the magnetic peripherals on the M34 and M54 systems, all configurations possible and the upgrading possibilities of both systems.



M54 spaces



M34 spaces

M54 configurations

CONFIG.	Space "a"	Space "b"	Space "c"	UPGRADING
1	1 mFD	-	-	2; 3; 5
2	1 mFD	1 mFD	-	-
3	1 mFD	1 HDU	-	5
4	-	1 HDU	1 STC	5
5	1 mFD	1 HDU	1 STC	

M34 configurations

CONFIG.	Space "a"	Space "b"	UPGRADING
1	1 mFD	-	2; 3;
2	1 mFD	1 mFD	-
3	1 mFD	1 HDU	-

Note: Configurations with two mFD units with different factors are not possible.

Magnetic peripheral configurations in SB3 and SB2 The tables given below show the magnetic peripheral combinations possible in the SB3 and SB2 cabinets; upgrading possibilities are also given.

Peripherals in the SB3

CONFIG. NO.	18 MB HDU	60/120 MB HDU	65 MB HDU	1 MB FDU	1 MB mFD	20 MB STC	UPGRADING
1	1	0	0	0	0	0	2-5-6
2	1	0	0	0	0	1	6
3	0	1	0	0	0	0	4-7
4	0	1	0	0	0	1	None
5	2	0	0	0	0	0	6
6	2	0	0	0	0	1	None
7	0	2	0	0	0	0	None
8	0	0	0	0	0	1	2-4-6
9	0	0	0	0	1	0	11-13-16-17-19
10	0	0	0	1	0	0	12-14-15-18-20
11	0	0	0	0	2	0	None
12	0	0	0	2	0	0	None
13	0	0	0	0	1	1	9
14	0	0	0	1	0	1	18
15	1	0	0	1	0	0	20
16	1	0	0	0	1	0	19
17	1	0	0	0	1	1	None
18	1	0	0	1	0	1	None
19	2	0	0	0	1	0	None
20	2	0	0	1	0	0	None
21	0	1	0	0	1	0	None
22	0	1	0	0	0	0	None
23	0	0	1	0	0	1	24
24	0	0	2	0	0	1	None
25	0	0	2	0	0	0	None
26	0	0	1	0	1	1	None
27	0	0	1	0	0	0	25
28	0	0	1	0	1	0	None

Peripherals in SB2

CONFIG. NO.	40 MB MTU	60 MB HDU	120 MB HDU	UPGRADING
1	1	0	0	2 - 3 - 4 - 5 - 6
2	1	1	0	3 - 6
3	1	2	0	None
4	1	0	1	5 - 6
5	1	0	2	None
6	1	1	1	None

The peripheral units will be described one by one in the next section, with the information required for installation and service of each. As a rule, there are no differences between installing a peripheral in an M44 and installing it in an external SB3 cabinet; any differences will be pointed out.

5.2.2 MINIFLOPPY AND FLOPPY DISK UNITS

Assembly/disassembly of full size minifloppy units in M34 systems

To dismount the minifloppy drive, the machine casing must first be removed, as described in chapter 2. The screws shown in figure 5-1 must then be slackened (4 screws per drive). Then, before removing the unit, the signal and power cables should be disconnected.

To replace a unit, the operations described should be reversed.

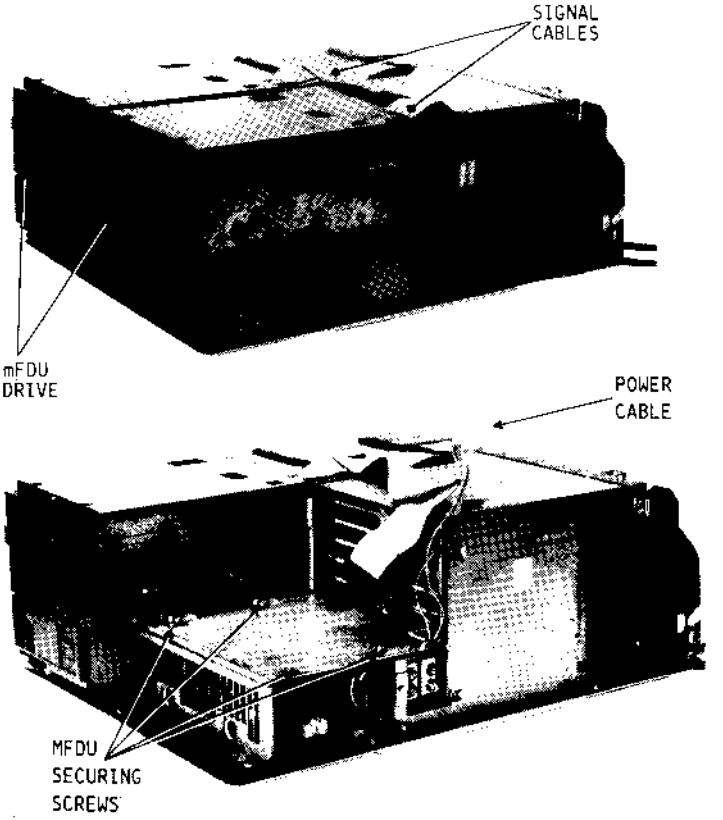


Fig. 5-1 Disassembly of the minifloppy drive in M34 systems

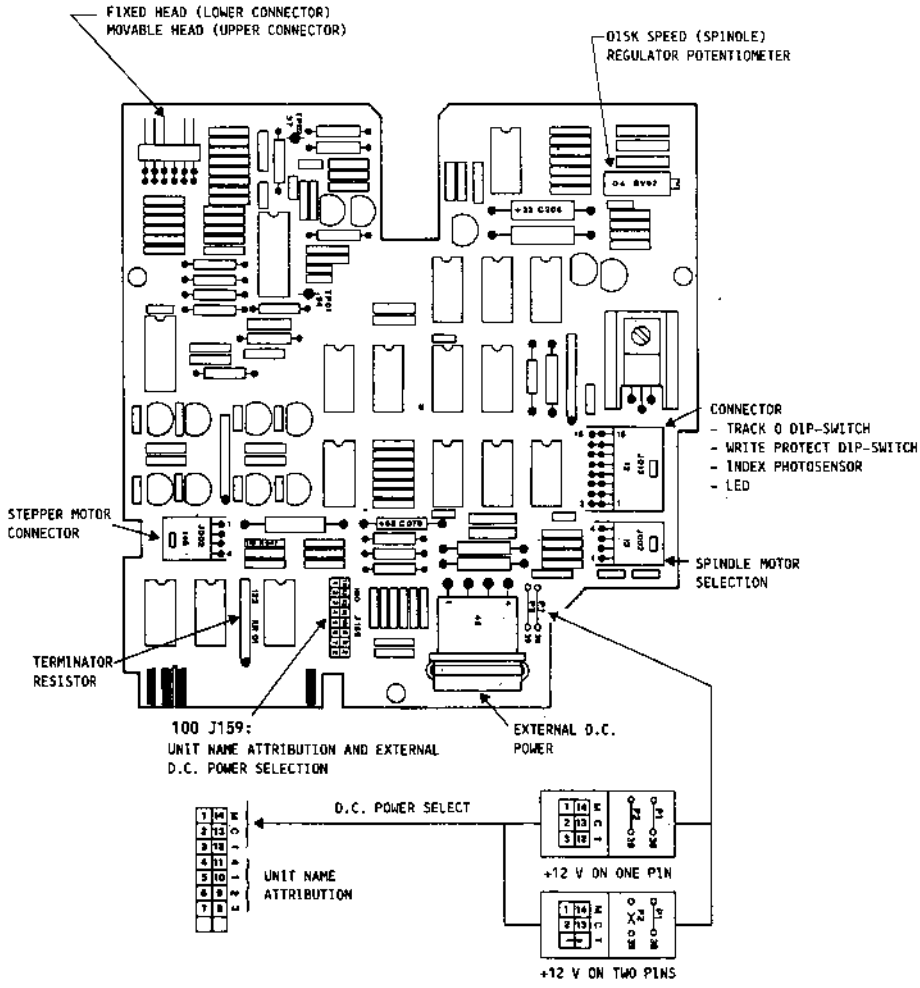
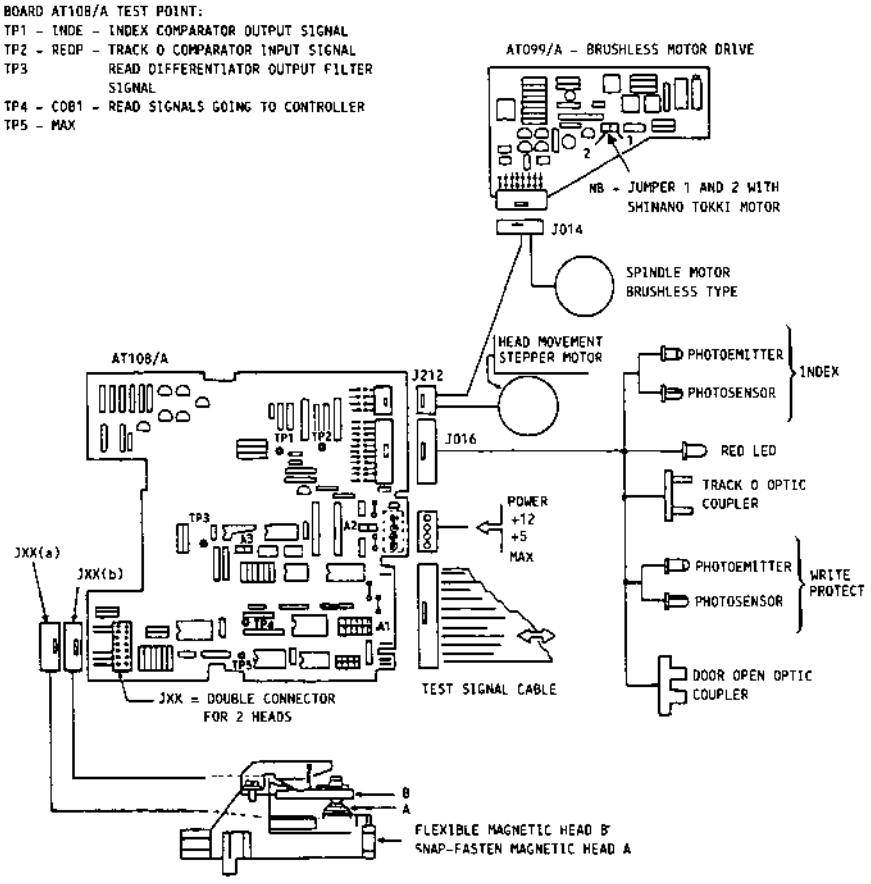


Fig. 5-2 Drive board AT109



N.B.: Jxx(a) Red connector to be fitted low down on board.

Fig. 5-3 Drive boards AT108/A and AT099/A

Installation of floppy and minifloppy units in M44 systems

With reference to figures 5-4 and 5-5, proceed as follows:

- Remove the lower front panel, the rear panel and the upper shelf of the cabinet; remove the panel from the housing intended for the drive - for these operations, see chapter 2.
- Mount the lower slide support C, and secure with the 4 self-threading screws
- Ensure that extension D is facing the rear
- Mount the nut screw A on the slide support and secure with the elastic ring
- Assemble the three floppy upper guide collars on the cabinet frame and secure in holes E using the screws and nuts provided
- Mount floppy stop spring B and secure to frame with two self-threading screws
- Attach the mains cable to terminal strip O and secure the cable to the unit by way of the band and screw P
- Set the drive on the slide support Q and push fully into position, secure with nut screw R
- Assemble the 3 cable holders S and set the mains cable inside unit
- Connect the mains cable to the cabinet AC distribution strip
- Connect the DC power cable to the power supply unit and to the floppy unit
- Fold the power cable and insert in guide T
- Connect the signal cable connector to the floppy unit
- Secure the unit lower section at point U using an Allen screw.

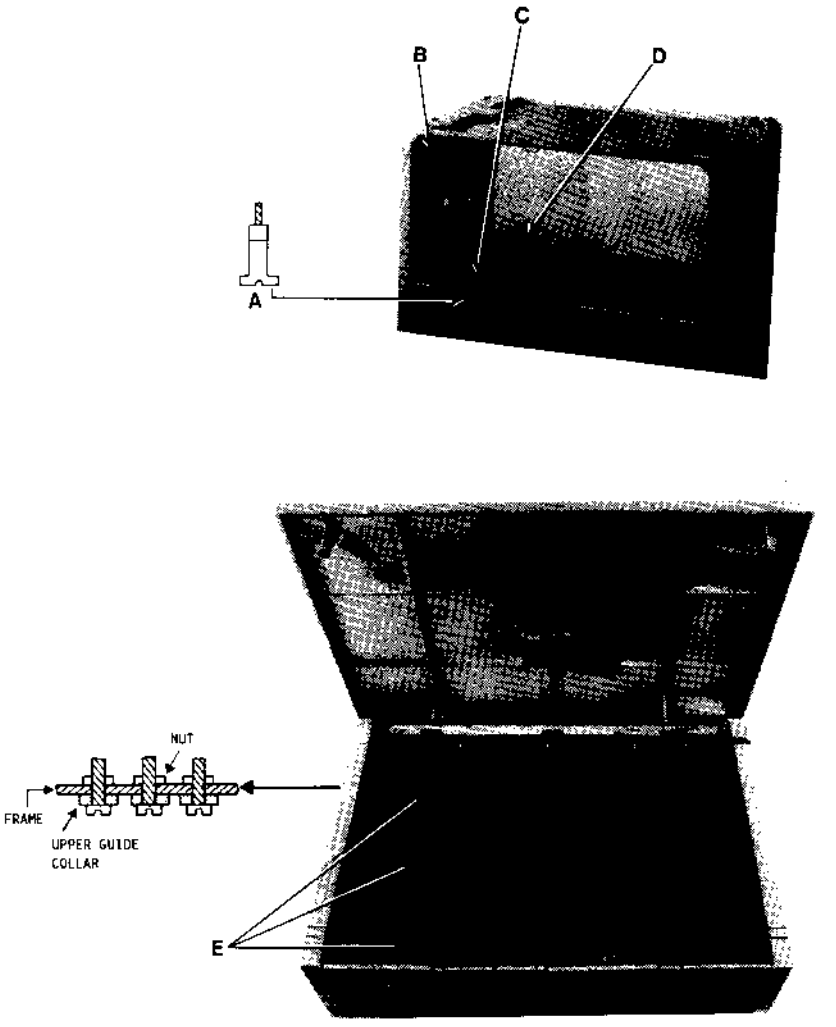


Fig. 5-4 Floppy disk unit assembly in M44 systems

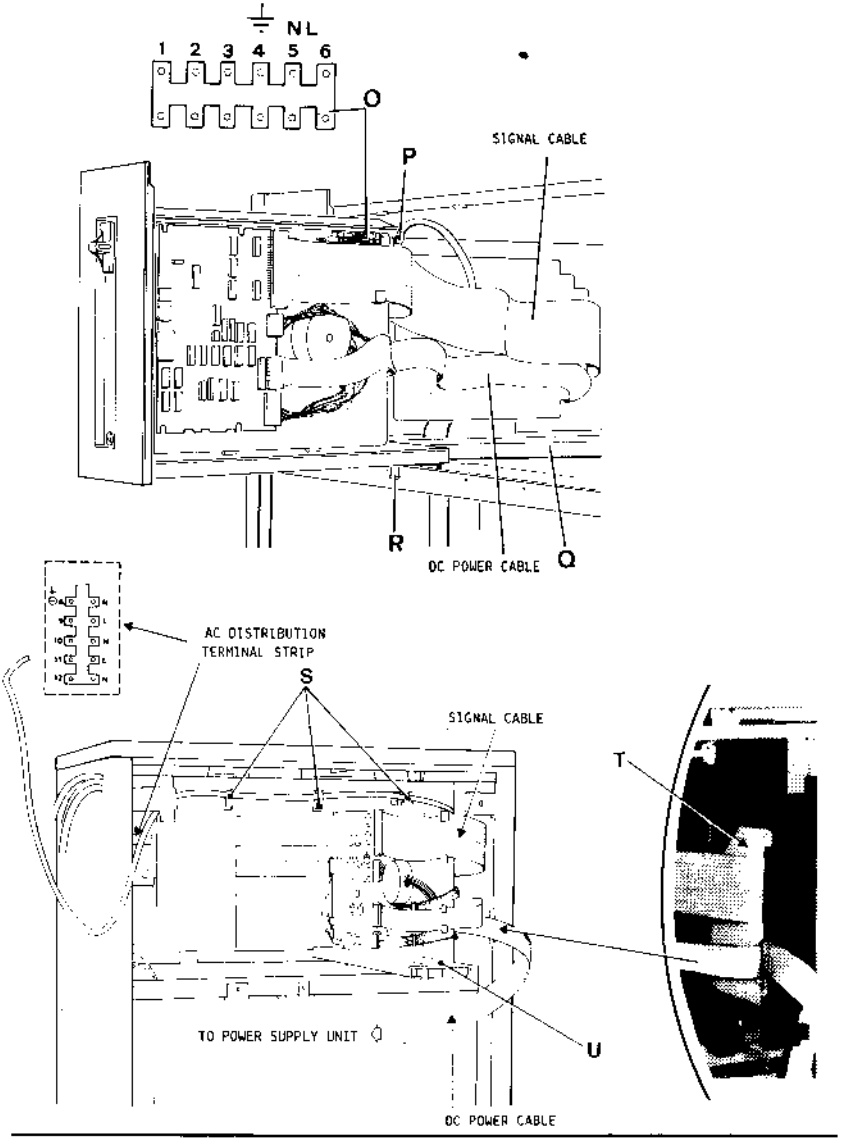


Fig. 5-5 Connection of cables

Installation of the second floppy drive in an M44

In addition to the details on installing the first drive, proceed as follows, with reference to figure 5-6:

- Instal the second drive in the position shown in the figure
- Mount the support bar A for the signal and power cables and secure with the screw B and bracket C
- Fit the cable clips D and E, each of which is on an elastic band to be attached to the support bar
- Use twin channel signal and DC power cables
- Use the new improved type of mains cable guide, supplied in the upgrading set

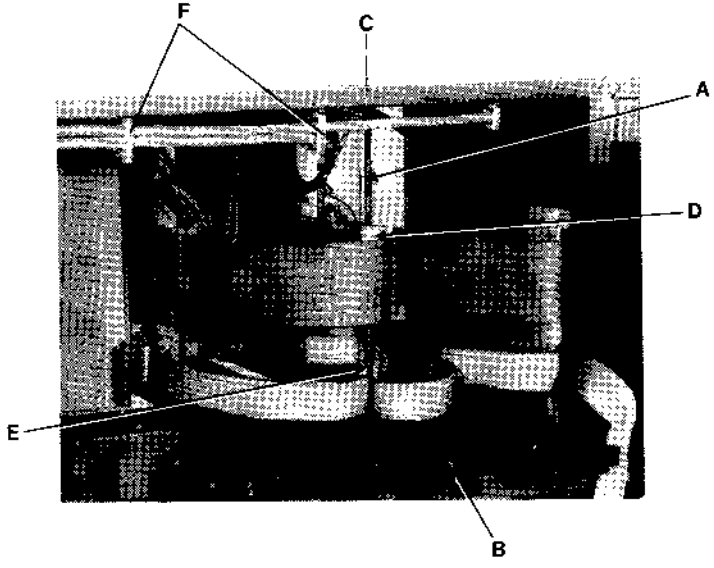


Fig. 5-6 Installation of the second floppy drive in an M44

5.2.3 14 MB HARD DISK UNITS: XU 5006

Installation of a 14 MB Hard Disk unit in an M34

This description deals with the latest versions of the G0298/DTC 510, i.e.:

1. DTC 510 BP with piggy back board (1F284/BU) and terminal strip board G0298, consisting of a frame for the 510 and the terminal strip itself G0328

2. DTC 510 BO now an integral part of the G0298, with the piggy back directly incorporated on the board

With reference to figure 5-7, proceed as follows:

- Connect connector J6 of the 510/BP or BO to G0299 connector J131 with the SASI cable

- Fix the G0299 to the metal support of the 510 BP controller with the 4 screws or to the 510 BO with the 4 spacers and then set the boards thus assembled into the rack

- Set the drive into the system, taking care with the signal cables A and the power cable B. The signal cables are connected to connectors J1 and J2 of the DTC 510

- Tighten the 4 screws securing the drive to the system

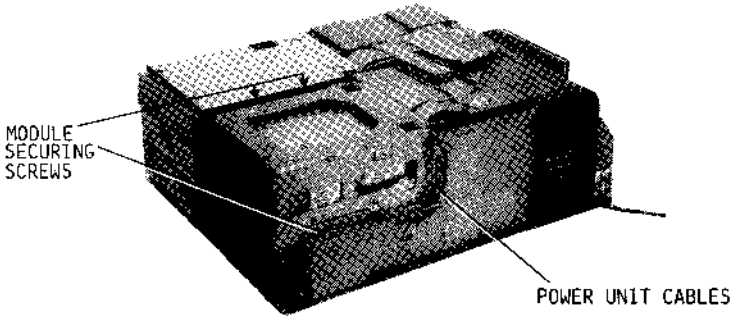


Fig. 5-7 Installation of the XU 5006

5.2.4 18 MB HARD DISK UNITS: XU 5010

With reference to figures 5-8 and 5-9 (also figurse 5-4 and 5-5), proceed as described below:

- Remove the lower front panel, the rear panel and the upper shelf of the cabinet; remove the panel from the housing intended for the drive - for these operations, see chapter 2.

- Mount the lower slide support C and secure with the 4 self-threading screws

- Ensure that extension D is facing the rear

- Fit the nut screw A on the slide support and secure with the elastic ring

- Attach the 3 floppy upper guide collars to the frame of the cabinet and secure at holes E with screws and nuts

- Mount the floppy stop spring B and secure to the frame with 2 self-threading screws

- Release the drive heads with the locking lever (*)

- Push the drive all the way into its housing and secure with nut screw A and with another screw so it corresponds to the rear extension D

- Connect the power supply cable, passing it through one of the 3 cable clips S on the structure of the M44

- Connect the data and command cables to their controller board connectors, taking them above the drive and down towards the controller between the drive and the front panel

If a second drive is to be installed, in addition to the operations outlined above, the second power cable should be attached, the two units multi-point connected on the command channel with the relative cable, star-connected on the data channel using the second connector of the controller of the controller board. The cable path is similar to the one drive cable path.

(*) N.B.:

Some XU 5010 units have automatic head locking devices, others manual locking devices. The automatic locks have a yellow locking lever, the manual locks a white lever. The manual lock is always used when the unit is being moved since the automatic lock does not guarantee its safe transport.

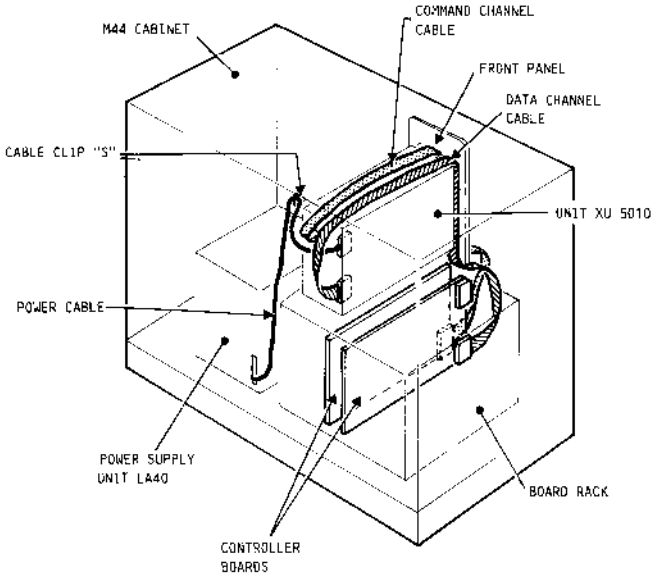
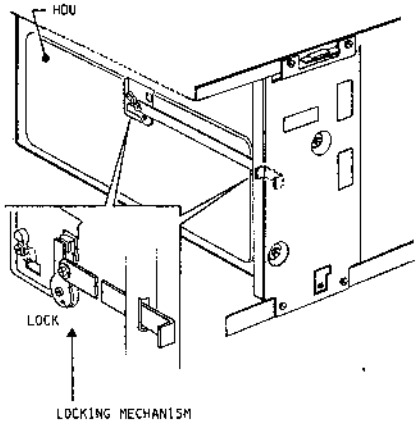


Fig. 5-8 XU 5010 Installation



- WHITE on peripherals without automatic lock
- YELLOW on peripherals with automatic lock

Fig. 5-9 Head blocking/release

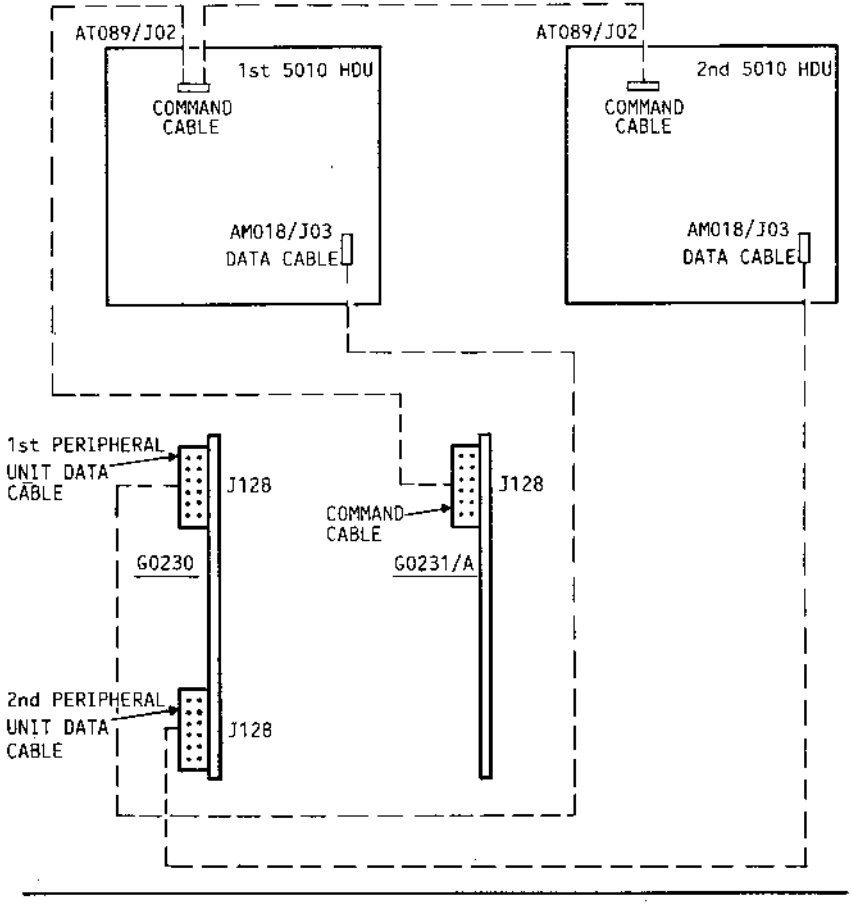


Fig. 5-10 Interconnection between HD controller and two XU5010 units

5.2.5 HARD DISK UNITS IN SB3

Procedures for assembly of the drive in the SB3 are similar to its assembly in the M44. However, before it can be inserted in its chosen housing, the two upper screws securing its panel should be loosened.
The rubber covers of the slides the unit is inserted on and the rubber pads on the rear of the unit should be fitted together by way of the pins on the module casing.

If there is no MAPSS board, the signal cable is connected to one end of the controller terminal strip in the board rack, taken along the M44 left side (the cable duct should be removed, the new cable installed and the duct set back in position), then passes through the washer on the base of the SB3, goes up to the upper shelf, arriving finally at the drive as shown in the figure.

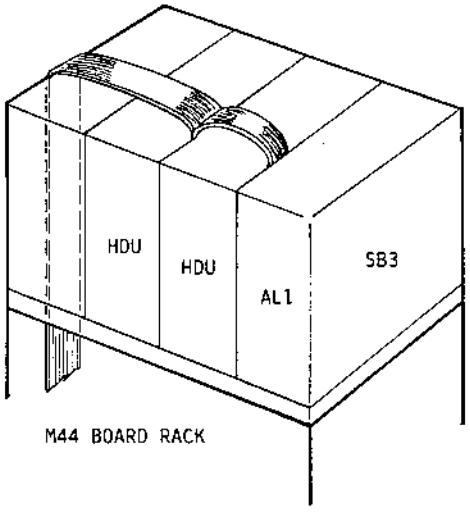


Fig. 5-11 Signal cable path

The path of the power cable coming from the LA40 is shown in the figure below.

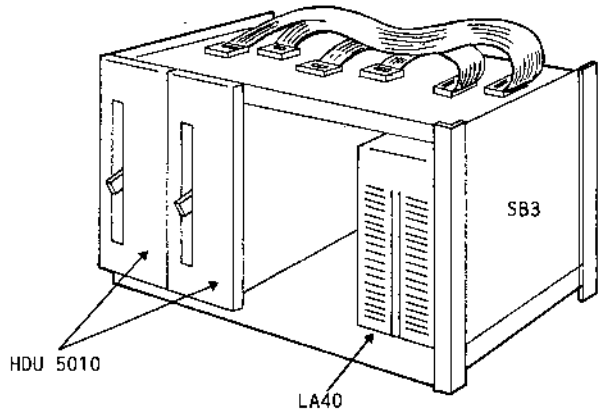


Fig. 5-12 Power cable path

The MAPSS board, when present, is to be fixed to the side of the power supply unit with the 2 screws in the lower corners; in this case, the signal cable folows the entire cable duct path and connects to the MAPSS board. From here, another cable (multi-point, if there are 2 units) goes to the drives, passing between the module upper shelf and the units.

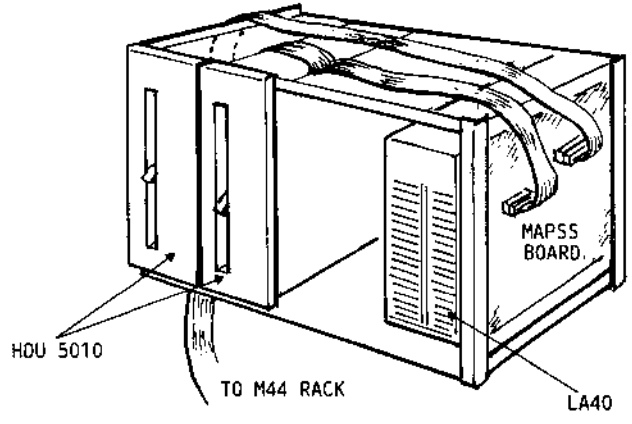
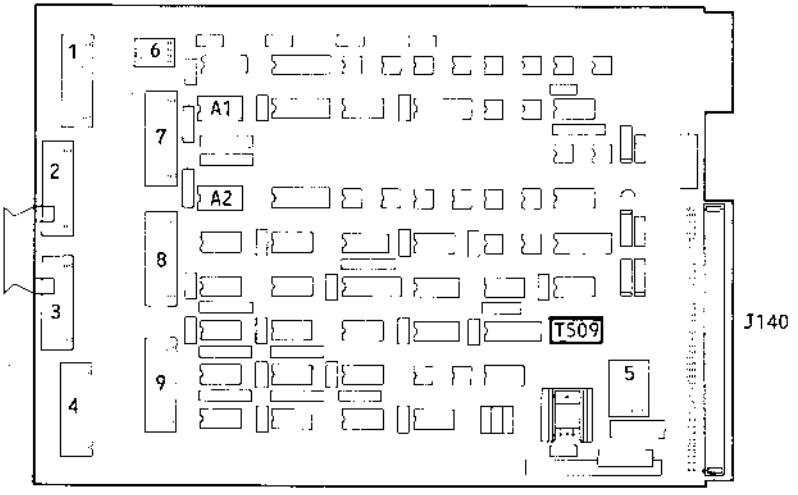


Fig. 5-13 Signal cable path if MAPSS board present

5.2.6 MAPSS BOARD: G0306

The G0306 is a module which can be used to connect more than two XU 5010 peripherals (maximum of 4) to one integrated controller (G0230/231A). The channel for communication with the HDUs is selected automatically on the MAPSS board.
As the G0306 is connected to a controller channel in the same way as a magnetic peripheral, the two HD units connected to the MAPSS are seen by the controller as if they were connected to it directly.

A second use of the MAPSS board is in connecting XU 5010 peripherals to two controllers resident in two different systems. By way of a key on the SB3 front console, the disk units in the SB3 can be connected to either one of the two controllers.
There are always two shared hard disk units.
The cable coming from the switch (SET 3563) on the SB3 console is connected to connector "6" on the MAPSS board.



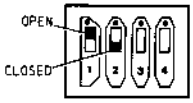
N.B.: 1 = Command cable channel 2
2 = Command cable channel 1
3 = Data cable channel 2
4 = Data cable channel 1
5 = Power unit connector
6 = Connector for switch
7 = Peripheral channel cable
8 = Data cable, peripheral 2 (or 3)
9 = Data cable, peripheral 4 (or 1)
A1-A2 = Terminators

Fig. 5-14 G0306 board picture

DIP-switch TS09 on G0306

The first four switches allow cables of different lengths to be used:

1	2	3	4	DATA CHANNEL CABLE LENGTH	INTERVAL
ON	OFF	OFF	OFF	0 - 3 metres	20 ns
OFF	ON	OFF	OFF	3 - 6 metres	40 ns
OFF	OFF	ON	OFF	6 - 9 metres	60 ns



Selection via the key can be limited through the other switches:

5	6	7	8	KEY FUNCTION
OFF	OFF	ON	OFF	Enable with key at all times
OFF	OFF	OFF	ON	Enable only with machine off

Terminator resistors

Position F07/L07 (A1/A2 of Fig. 5-14); in a multi-point connection, between two MAPSS boards, they are on the board closing the connection.

Peripheral names

The XU 5010 peripherals are connected to connectors "8" and "9" (fig. 5-14). The DIP-switches determining board name are on the XU5010 board AT089 in position TS09 (see figure 5-15).

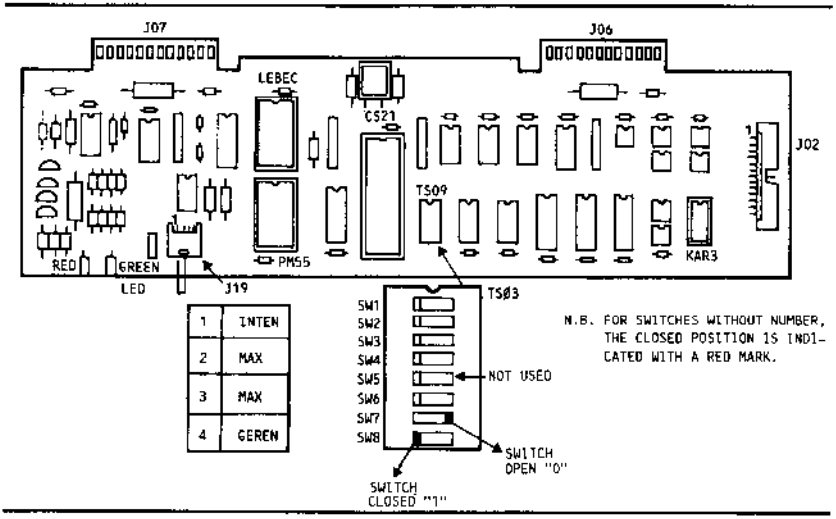


Fig. 5-15 XU 5010 Drive board AT089

Configurations

Some typical XU 5010 peripherals, connected via MAPSS boards, are shown below.

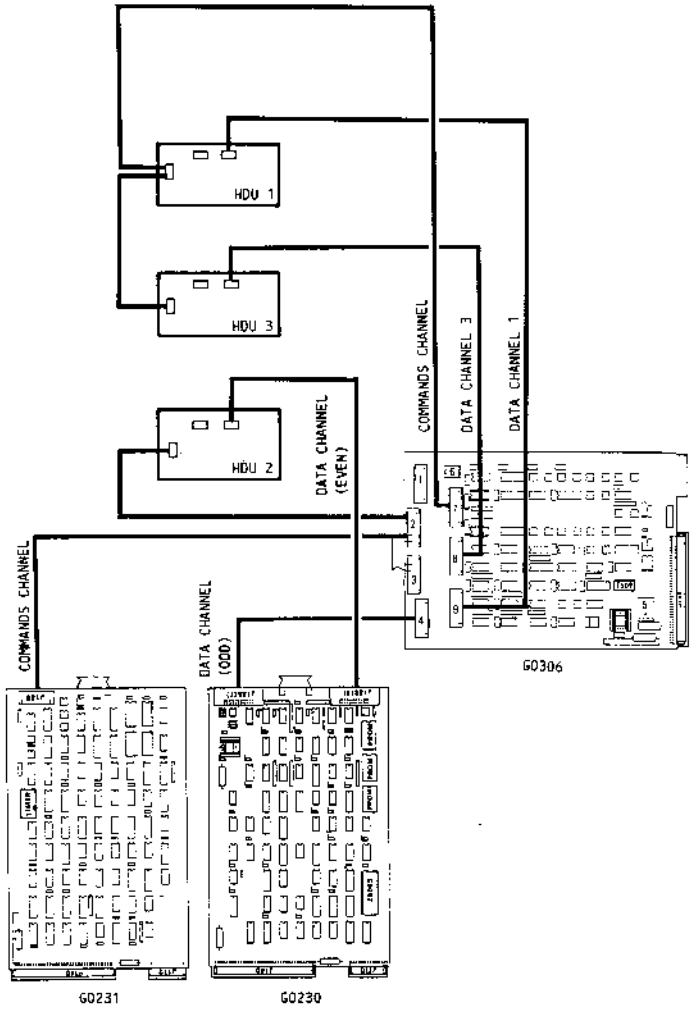


Fig. 5-16 Connection of 3 HDUs and 1 MAPSS board

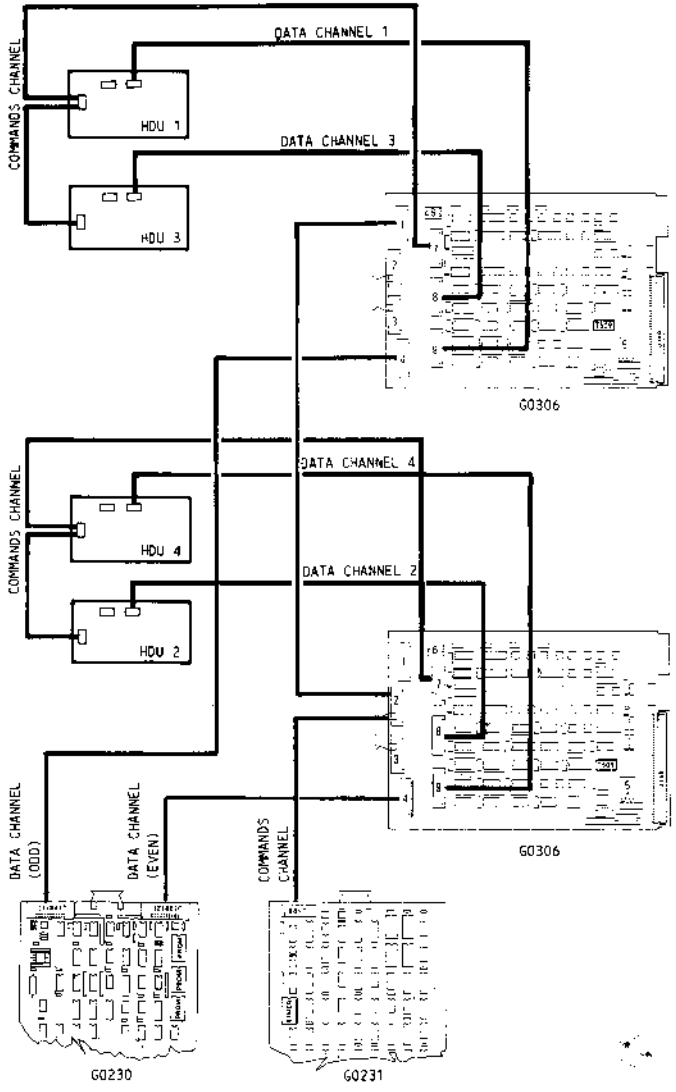


Fig. 5-17 Connection of 4 HDUs and 2 MAPSS boards

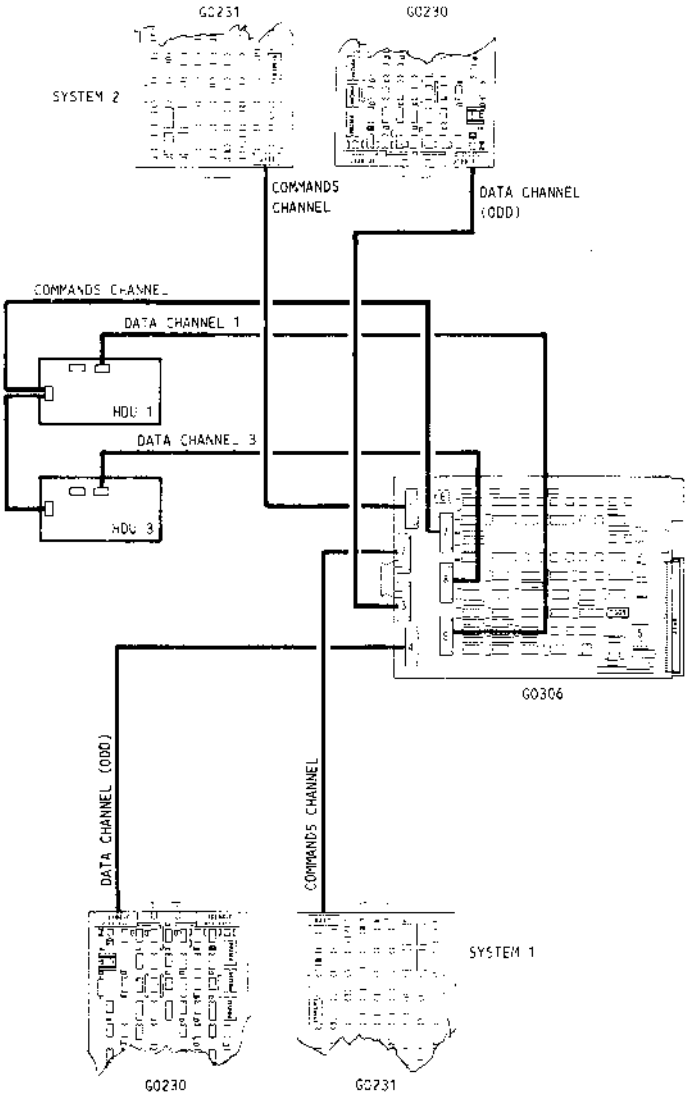


Fig. 5-18 HDU shared between 2 systems via a MAPSS board

5.2.7 ST506 INTERFACE HARD DISK UNITS

Assembly/disassembly in M34/M54

Remembering that the unit is mounted horizontally, with the lower LED on the left, proceed as follows:

- Attach the unit to the structure with 4 screws (Fig. 5-19)
- Screw the head release lever to the structure and the release plate protruding at the rear of the unit
- Attach the resulting structure to the M34/M54 with 4 screws, as done previously for other peripherals in the M34/M54
- Connect the power cable, the data cable and the command cable
- Release the heads by pushing lever towards inside of unit, where unit is the 27 MB HDU (XU1707)

To disassemble unit, the operations described above should be reversed.

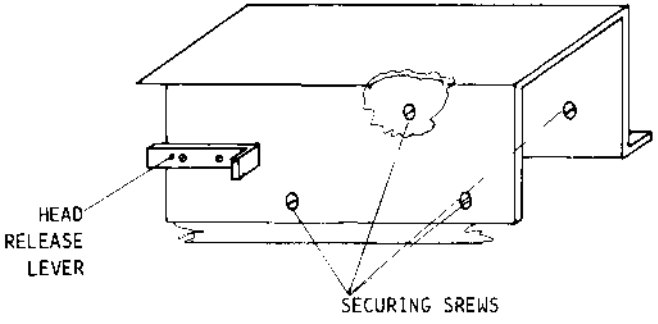


Fig. 5-19 Structure housing the XU 1707 in the M34

Assembly/disassembly in an M44

In the M44, the unit is mounted vertically with the LED facing upwards. With reference to figure 5-17, proceed as follows:

- Attach the HD unit to the support bracket with the screws A
- Assemble bracket and peripheral units to structure by way of the 6 screws (four screws B for the bracket and two screws C for the peripheral)
- Attach to the slide with two screws D
- Screw the head release lever to the structure and release plate protruding from the rear of the unit
- Fit the ground spring support bracket to the lower guideway and insert spring
- Mount the DC/DC converter strip on the rear of the unit via the 4 rods and 4 screws
- Screw the rubber support securing bracket to the M44 frame; this bracket is used to prevent oscillation of the rear of the peripheral
- Fit the 4-way cable between the DC/DC plate and the peripheral and the 8-way cable between the plate and the LA40 power supply; now connect the data cable (20-way) and the command cable (34-way)
- Release the heads by pushing the lever towards the inside of the unit (only for 27 MB HDU).

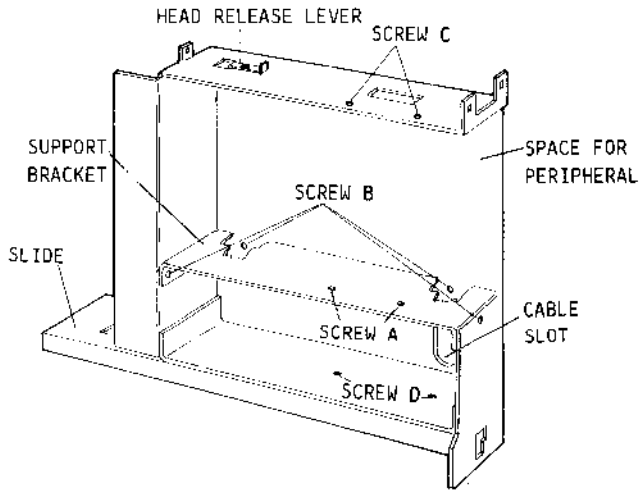


Fig. 5-20 Installation of the XU 1707/1709 in the M44

5.2.8 60/120 MB HARD DISK UNITS: XU 1700/1703

When the unit is being installed, loosen screws A, B and C (see figure below), remove the yellow brackets and tighten the 3 screws again.
At the rear of the unit, remove the yellow-coloured screws D
This type of peripheral has its own specific power supplier, the XU 1701.

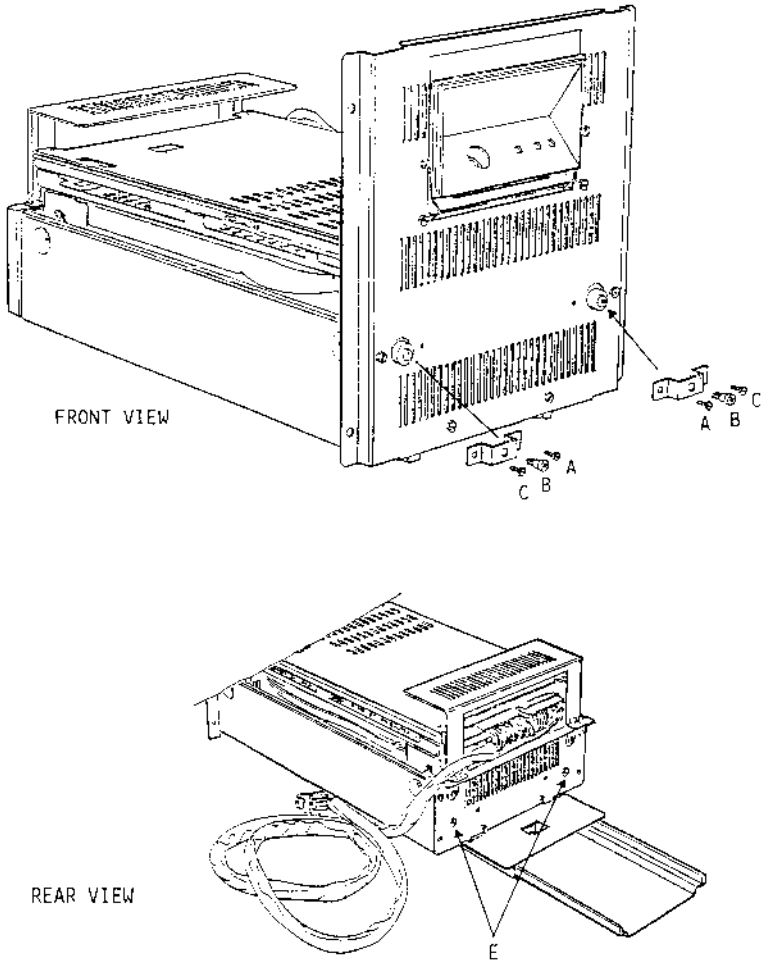


Fig. 5-21 Front and rear views of XU 1700/1703

Before inserting an XU 1700 (60MB HD) in its housing, remember to release the unit heads by turning the knob in the clockwise direction towards OFF, using a screwdriver.

N.B.: It should be remembered that, with the XU 1703 (120MB HD), the heads are released automatically when the unit receives power supply current.

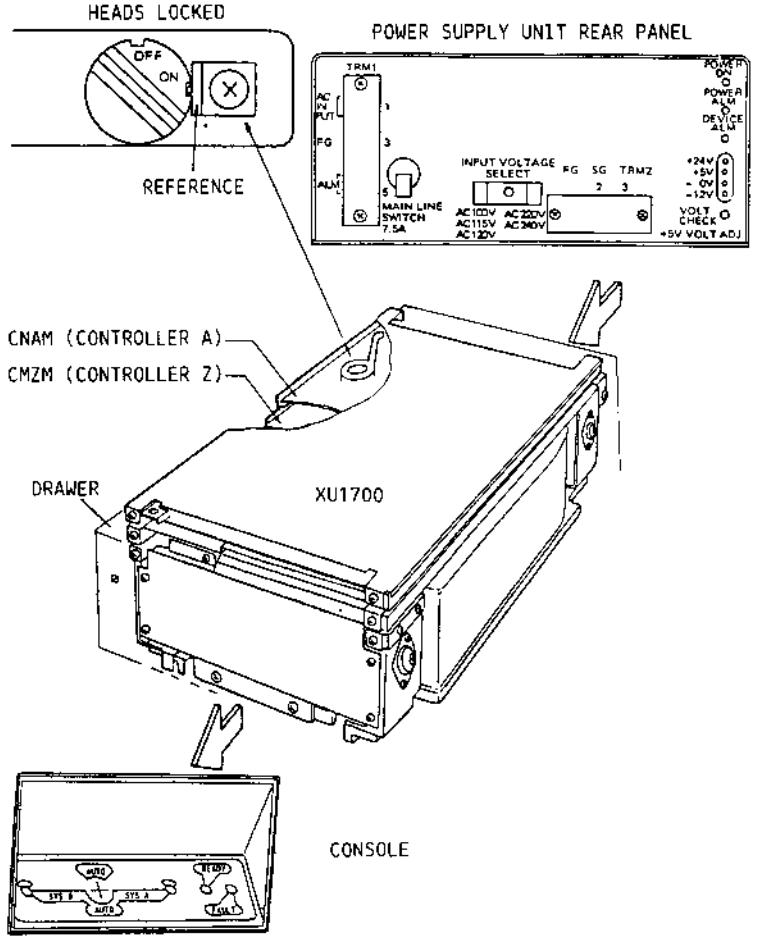


Fig. 5-22 XU 1700 and head blocking system

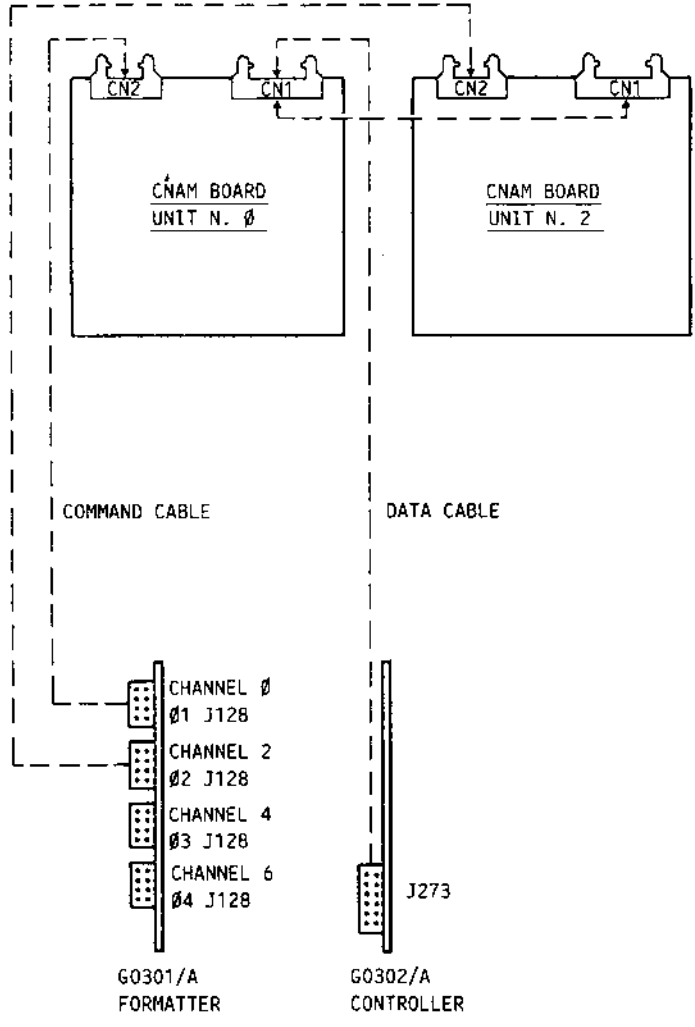


Fig. 5-23 Interconnection of HD controller and 2 XU 1700 units

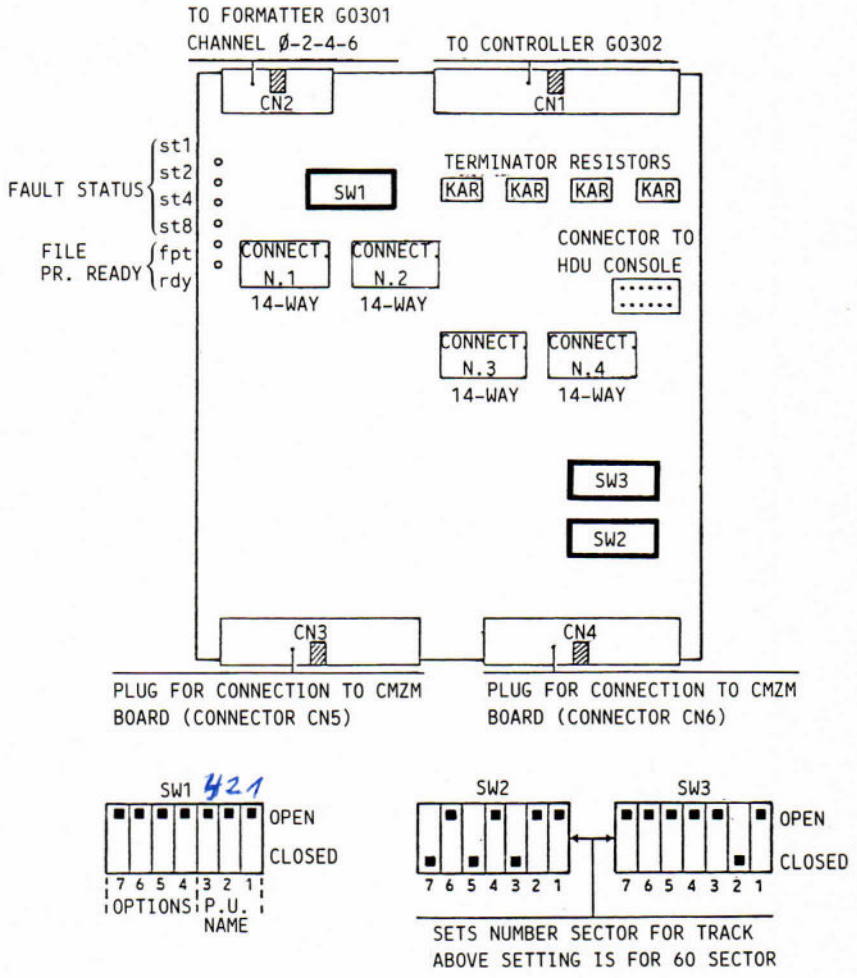


Fig. 5-24 Diagram of CNAM board and settings

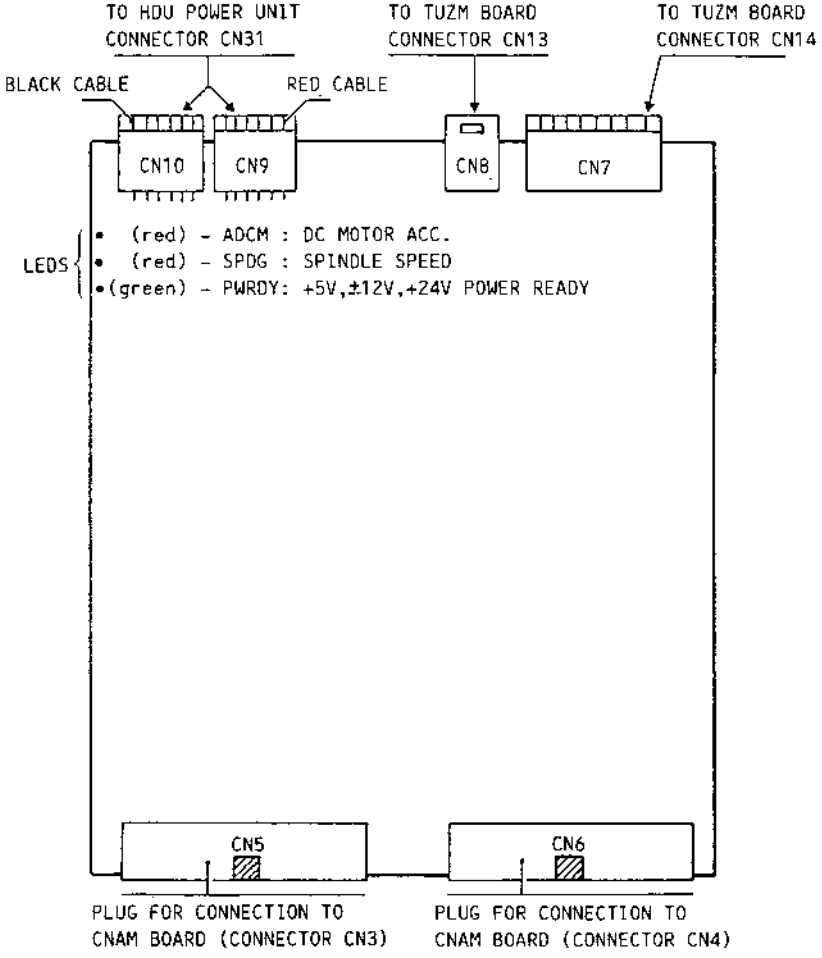
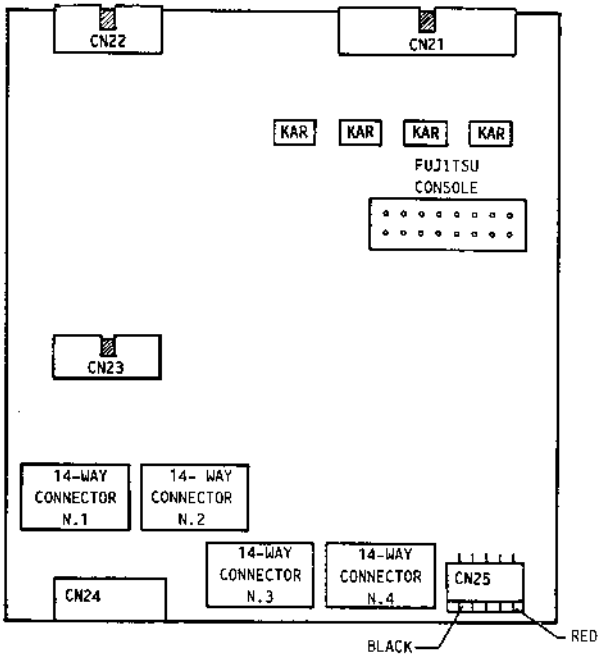


Fig. 5-25 Diagram of CMZM board and settings

5.2.9 DUAL PORT BOARD: XU 1702

This module allows a 60/120 MB HDU to be shared between systems. A diagram is shown below:



KEY:

CN21 = System B command cable connector

CN22 = System B data cable connector

CN23 = System A data cable connector

CN24 = Connector to be connected to connector CN2 of board CNAM

CN25 = Power connector to be connected to connector CN33 of power supply unit XU 1701

14-way The 14-way connectors are connected to the respective connectors on the CNAM board

KAR = The name KAR denotes the terminator resistors

Fig. 5-26 Dual-Port board

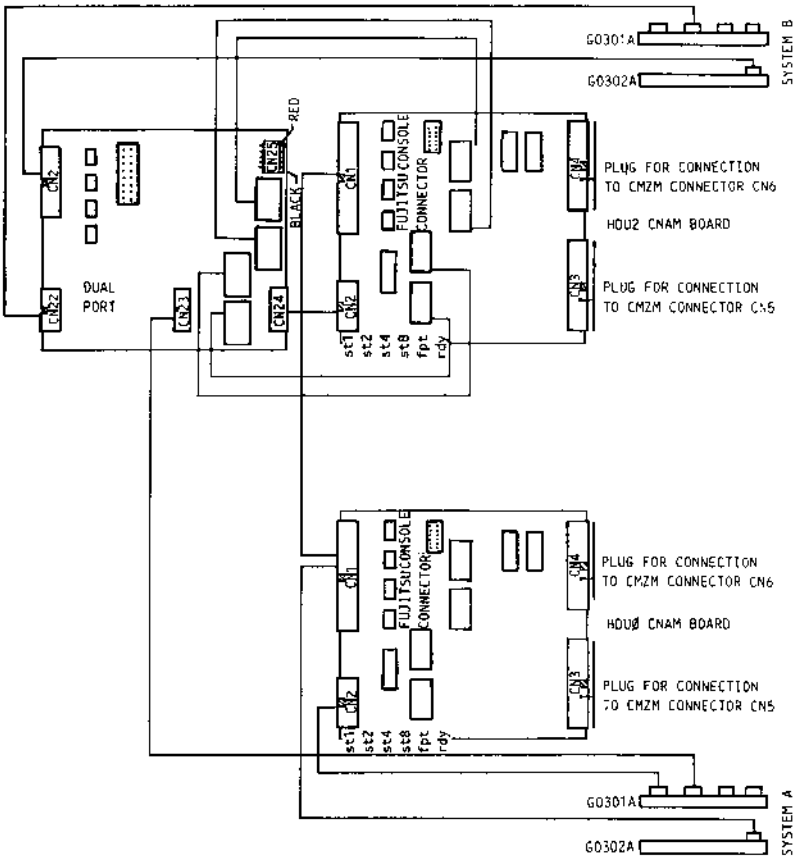


Fig. 5-27 Connection of a HDU to 2 systems (A and B)

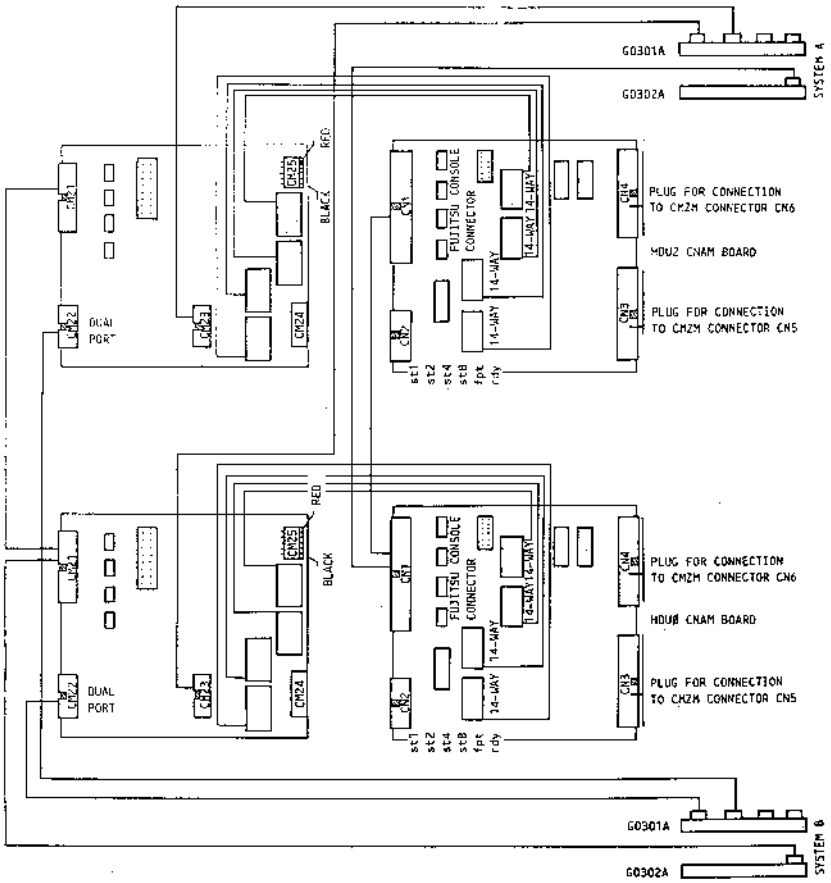


Fig. 5-28 Connection of 2 HDUs to 2 systems (A and B)

N.B.: Remove the KAR resistor package from the Dual-Port board and the HDU 0 CNAM board

5.2.10 20 MB STREAMING TAPE UNITS (DE1): XU 1120

As installation of an STC unit in its position in the M44 is to all intents and purposes similar to floppy disk unit installation; reference should therefore be made to this section.
Before switching the unit on, remember to remove the metal head protector.

The figure below is a diagram showing interconnection of the STC controller, XU 1120 peripheral and the system power supply unit LA 40.

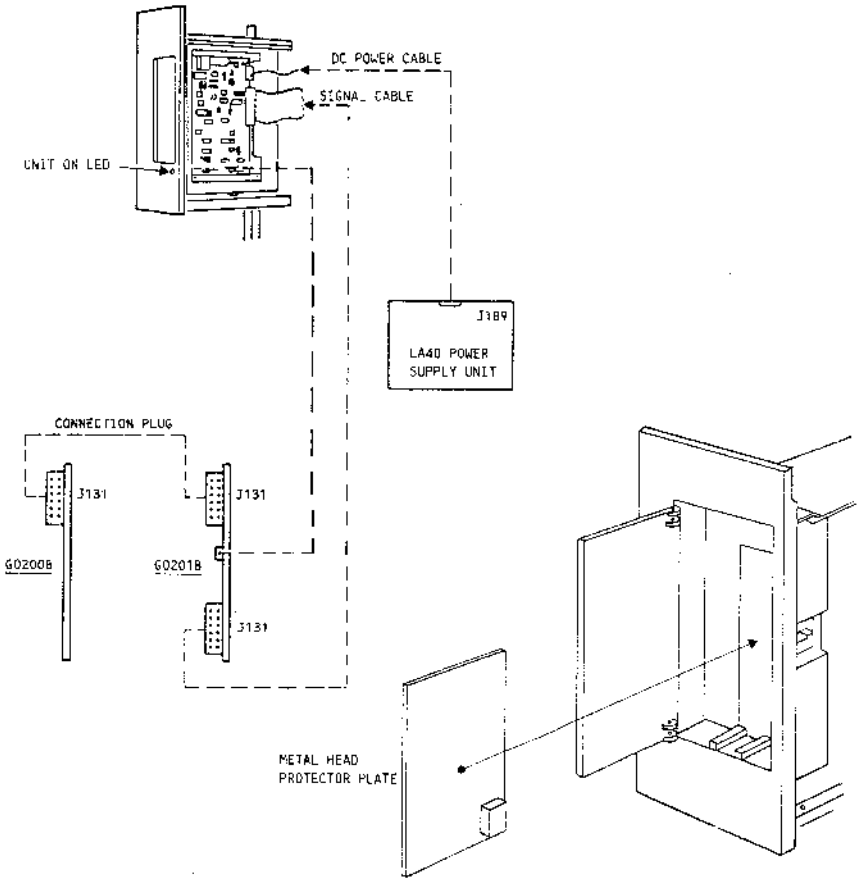


Fig. 5-29 Connection of STC controller and XU 1120

5.2.11 20 MB STREAMING TAPE UNIT (CIPHER): XU 1130

The 8" Streaming Tape unit XU 1130 is mounted in the same way as the XU 1120. The difference between the units lies in their control boards, which, in this case, are the GO 200B (controller) and the GO 342 (formatter).

Before switching the peripheral on, remember to remove the metal head protector cover.

The figure below illustrates interconnection of the STC controller, the peripheral unit and LA 40 power supply.

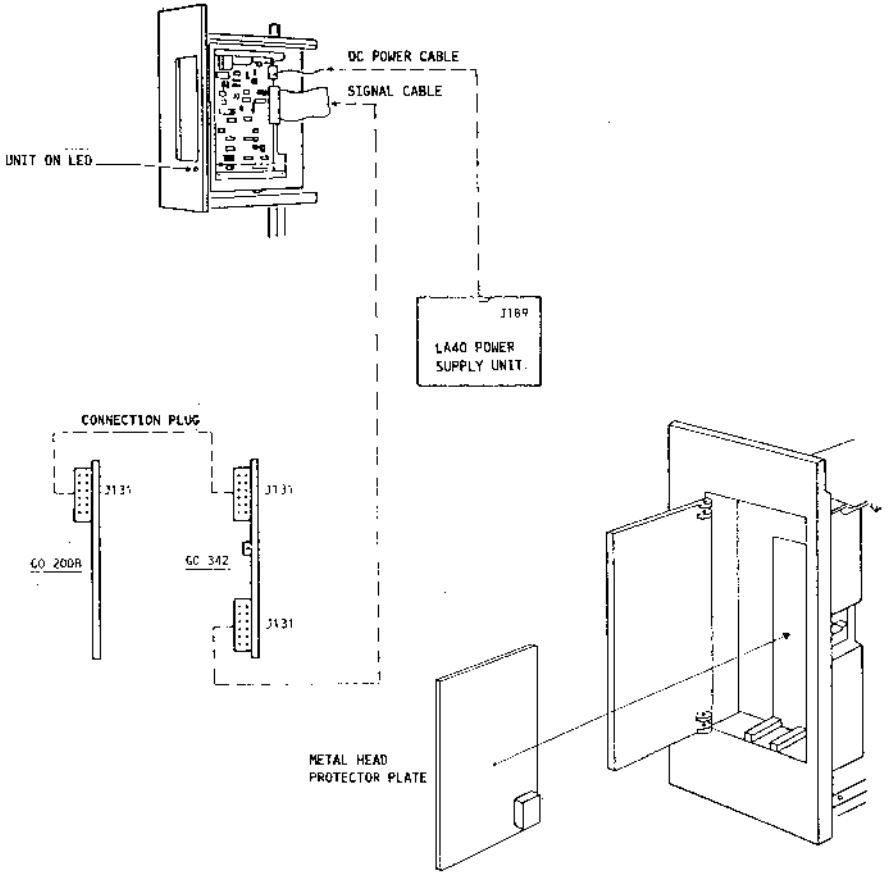


Fig. 5-30 Diagram of connection between STC controller and peripheral

Assembly of an STC in SB3

This unit is to be set in position beside the power supply unit.
After removing the shutter from the unit housing, install the unit in the same way as seen earlier for installation in the M44.
The upper shelf and lower shelf of the SB3 have 2 holes to the left of the slot on the side of the power supply unit; these holes are for the two rubber pads which hold the cable support column in position. The upper pad has two elastic rings, one on top and one on the bottom; there are another two rings in the grooves carved out on the cable support column.
This gives 2 possibilities for the signal cable path: the lower one is for the streaming cartridge cable, the upper one for a floppy (or mini-floppy) cable.

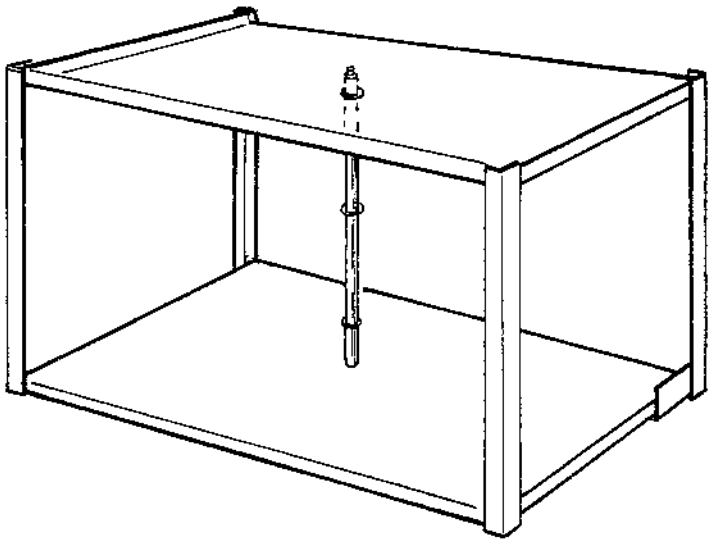


Fig. 5-31 Cable support column

The STC signal cable, coming from the centre of the upper cable duct, will be taken round the support column before being connected to the unit. The cable path from this point to the terminal strip of the STC controller is as shown in the figure.
Screw the stop plate on to the upper shelf with the 2 hex screws. This plate also bears the two screws needed to secure the rear panel of the unit to the casing.

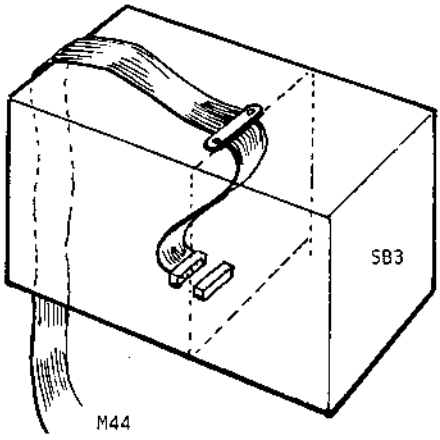


Fig. 5-32 Streaming Cartridge signal cable path

The power supply unit output power cable path is as shown in the figure.

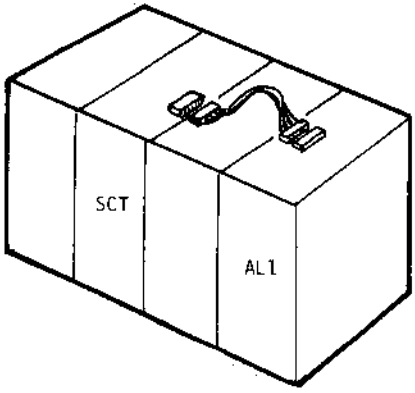


Fig. 5-33 Power cable path

5.2.12 40 MB MAGNETIC TAPE UNIT (CIPHER): XU 1705

Peripheral unit settings

Remove the protector wedges marked 1 in the figure below.

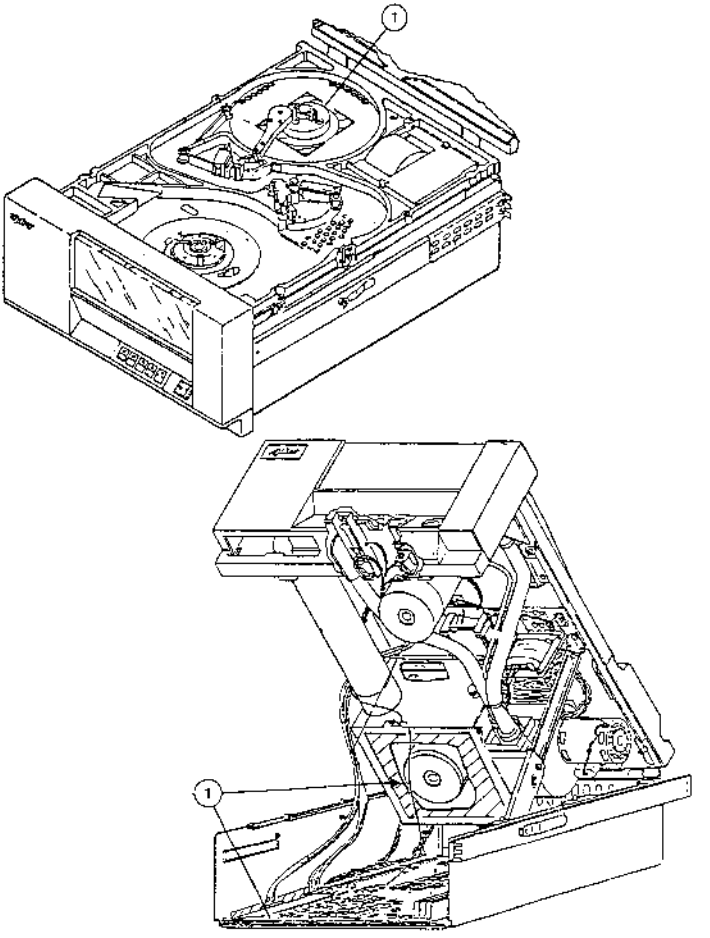


Fig. 5-34 Removing the peripheral protectors

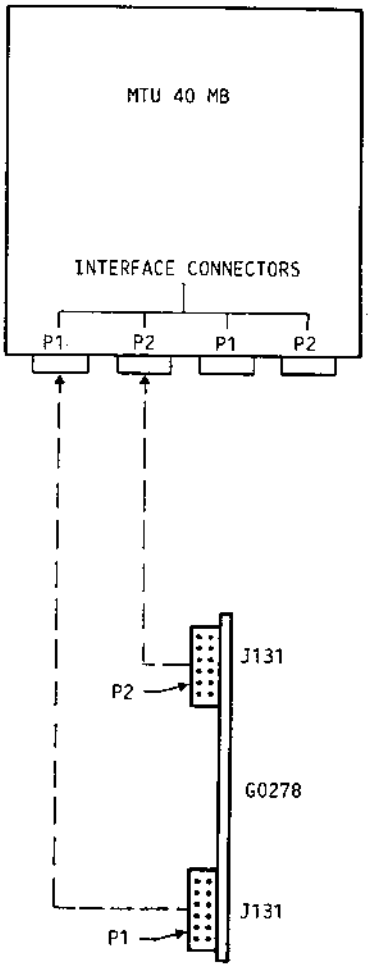
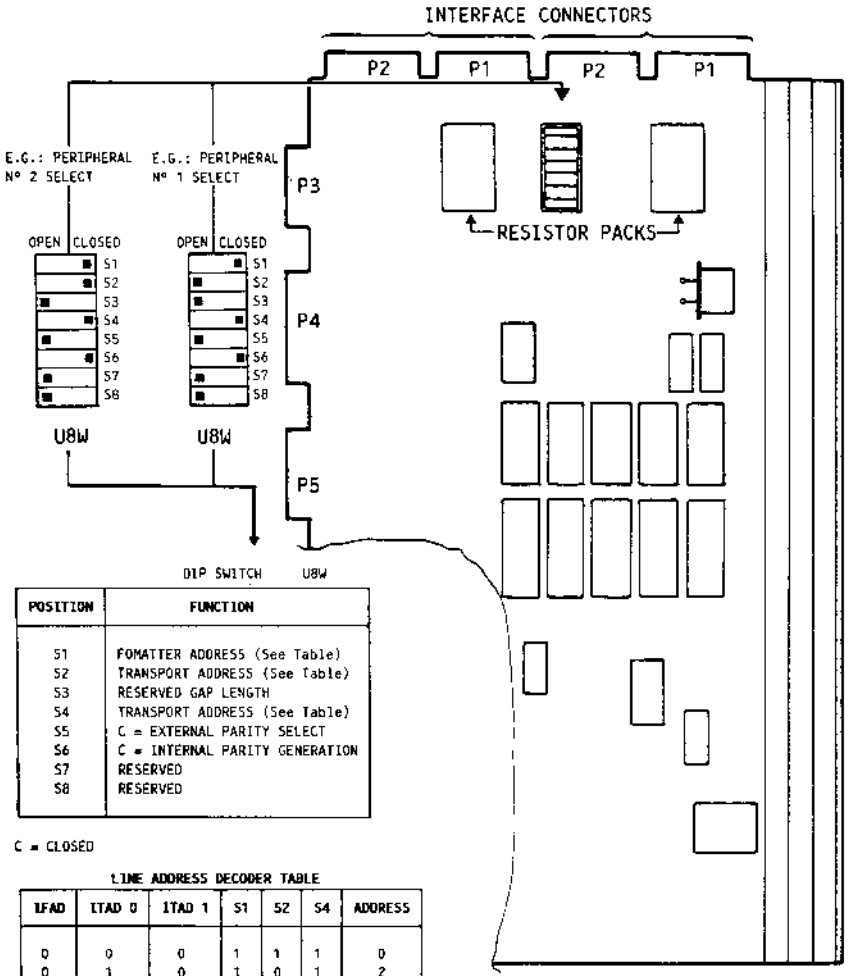


Fig. 5-35 Connection of controller to MTU peripheral

DIP-switch U8W settings



DIP SWITCH U8W

POSITION	FUNCTION
S1	FOMATTER ADDRESS (See Table)
S2	TRANSPORT ADDRESS (See Table)
S3	RESERVED GAP LENGTH
S4	TRANSPORT ADDRESS (See Table)
S5	C = EXTERNAL PARITY SELECT
S6	C = INTERNAL PARITY GENERATION
S7	RESERVED
S8	RESERVED

C = CLOSED

LINE ADDRESS DECODER TABLE

LFAD	ITAD 0	ITAD 1	S1	S2	S4	ADDRESS
0	0	0	1	1	1	0
0	1	0	1	0	1	2

0 = FALSE INTERFACE LEVEL 0 = OPEN
1 = TRUE INTERFACE LEVEL 1 = CLOSED

Fig. 5-36 DIP-switch U8W position

5.2.13 XU4350 AND NND08-DE SLIM MINIFLOPPY UNITS

Assembly/disassembly in M54/M34

The mFD magnetic units in M54/M34 systems are mounted in the top part of the support structure for peripheral units (figure 5-37). This structure can house slim size and full size peripherals as its sides have all the holes required for both types of unit. If only one removable peripheral is to be housed in the unit, there is a front cover to disguise the vacant space.

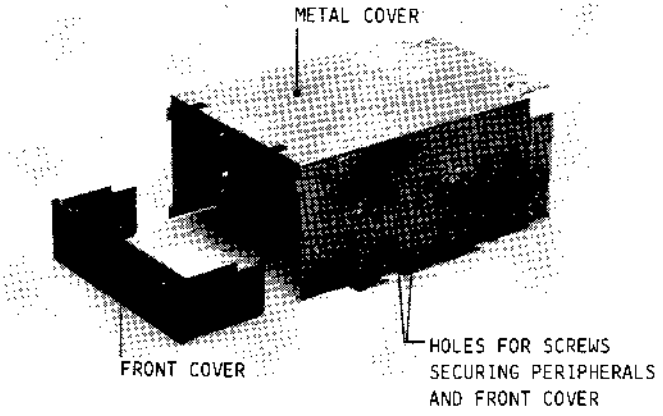


Fig. 5-37 Peripherals support structure and front cover

Referring to figure 5-37, disassemble the drive using the following procedures:

1. Remove the machine casing in the way described in chapter two.
2. Remove the peripherals support structure by loosening the four screws "A" and pulling forwards.
3. Disconnect the signal and power connectors of peripherals installed in the structure.
4. Loosen the four screws "B" securing the peripheral to the support structure.

To reassemble the unit, reverse the procedure described above.

5.2.14 45/60 MB STREAMING TAPE UNITS

Assembly/disassembly in M54

The procedure for assembly/disassembly of STC units is similar to the procedure for the mFD units. To locate the screws securing the peripheral to the structure, see figures 5-37 and 5-38.

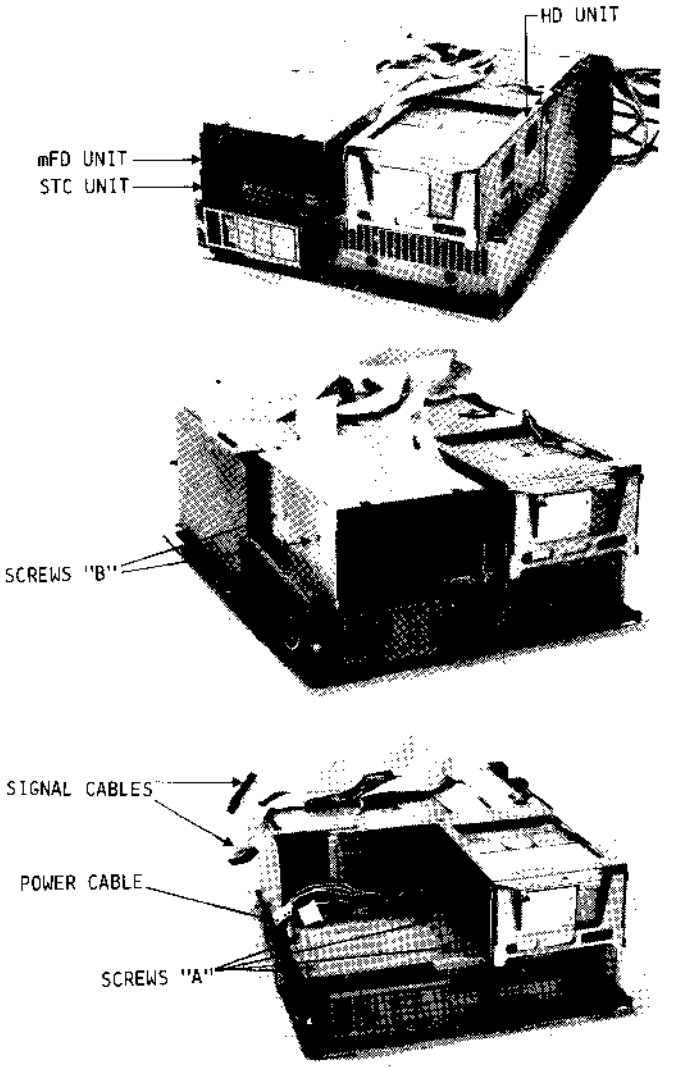


Fig. 5-38 Disassembly of magnetic peripherals in M54

6. AUTODIAGNOSTIC AND DIAGNOSTIC

6.1 RESIDENT AUTODIAGNOSTIC

The ROM resident autodiagnostic relates only to the part of the machine involved in program loading. It starts up automatically when the machine is powered on and is in a number of steps.

6.1.1 RESIDENT AUTODIAGNOSTIC ORGANIZATION

The resident autodiagnostic performs the following tests:

- Central unit board test
- RAM storage module test
- Search for and test of loading controller
- Program loading

6.1.2 LOADING CHANNEL

The channel used to load (IPL) the operating system or the diagnostic monitor (for stand alone diagnostics) is selected in an order established by the position of the ISL switch on the console.

Primary sequence (switch in position 1)

The operating system or diagnostic monitor (DCOS) in this case is loaded from a fixed peripheral unit. If there are several fixed peripherals, a search is made for the program starting from the peripheral with the lowest logic name; if the program is not found, the search continues in the peripherals with higher logic names.

Secondary sequence (switch in position 2)

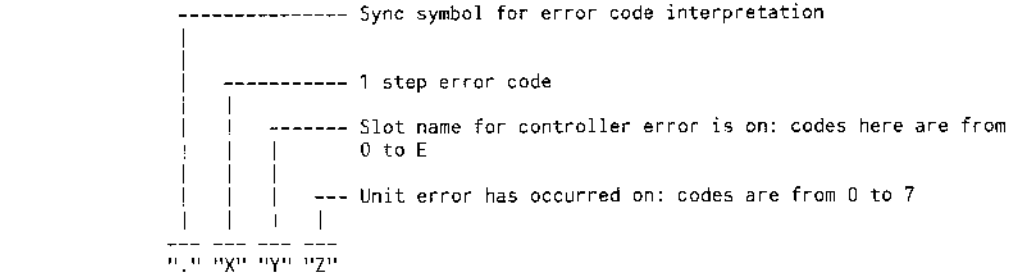
In this case, loading takes place from one of the removable peripherals in the system. On M54 systems, the procedure starts from the mFD unit.

6.1.3 AUTODIAGNOSTIC MESSAGES

Any errors occurring are displayed through display of an error code on the diagnostic console or on the console and video.
There are two types of message - "blinking" and "non blinking".
A list of non blinking messages with a 1-figure code number is given in the table below:

CODE	CAUSE	RECOMMENDED FORM OF ACTION
1	Fault on central unit board	Replace the Central Unit board
2	Fault on RAM storage boards	Check addressing: if OK, replace memory modules
3	Vector obtained in interrupt time not as expected	Replace all the boards one by one, issuing the autodiagnostic each time until the faulty controller is discovered
4	ROM DEBUGGER activation	If the system does not start up when the ROM DEBUGGER GO is entered, remove ROM DEBUGGER
5	Delay for outcome of 1st IPL effort	Appears during the IPL attempt; bootstrap is activated; for subsequent errors, see table below
6	Segment trap after bootstrap activation	
7	Non-maskable interrupt after bootstrap activation	
9	Instruction not implemented after bootstrap activation	
A	Privileged instruction after bootstrap activation	
B	System Call after bootstrap activation	
C	Non-vectored interrupt after bootstrap activation	
D	Delay before IPL switch switches (approx. 3 secs.) when operator wants to activate the Total Memory Dump procedure	If the IPL switch does not switch or the module responsible for the Total Memory Dump (resident in RAM) is not accessible, normal IPL activity starts up again.

Blinking error codes refer to exchanges between the CU and the IPL controllers and consist of 4 figures, issued one second after each other. Their significance is as follows:



The blinking messages are listed in the table below:

CODE "X"	DESCRIPTION OF ERROR	CODE Y	CODE Z	FAULT TYPE AND FORM OF ACTION RECOMMENDED
1	Controller fault	Name of slot error found in and, thus, the faulty board is displayed	Not valid	Fault on controller performing the IPL: replace board. Possible controllers are: floppy/mini-floppy, HDU, STC controller
2	Peripheral unit fault	Indicates slot name of board to which the faulty peripheral is connected	Indicates unit with fault and displays its code	For all peripheral unit faults, see specific manual

CODE X	DESCRIPTION OF ERROR	CODE Y	CODE Z	TYPE OF FAULT AND FORM OF ACTION RECOMMENDED
4	Fault on medium (disk, tape) in read	Indicates name of slot containing board to which peripheral which gave rise to error is connected	Indicates driver whose medium has given rise to fault & displays code no.	If there is a read error (SO loading), replace magnetic medium: if unit is floppy/mini-floppy, service action may be required; for procedures, see specific manuals.
8	Medium (cassette, disk) not inserted or does not have operating system	See points above	See points above	When this type of error arises, proceed as described below: a) if there is an ISL switch, see that it is in the correct position b) when loading from a removable medium, ensure it is a system disk - if it is, it is faulty and should be changed; if it is not, then insert system disk and start again. If the error signal is repeated, see the service procedures in the specific manuals. c) when loading from a fixed medium, see the service procedures in the relative manuals.

In addition to the code on the console, the following message is displayed on the video:

```
X  Y  Z      REL. N
-  -  -      ------
|  |  |         |
|  |  |         --------- ROM LOADER Release
|  |  |
-------------------------- Error code (same as on console)
```

6.2 STAND ALONE DIAGNOSTIC PROGRAMS

With the stand alone diagnostic programs, all the modules in the system can be tested.

Errors occurring will give rise to error messages; these messages may be found in the Functional Checks manual where they are explained.

The above manual should be consulted for all details of these programs; a list of all the programs available as of diagnostic release 8.3.3 is given below.

1. MONIT L1 Diagnostic Monitor
2. UTILY4 Utility program
3. LDHSE2 HDU Environment Activator (WS connected via KDC)
4. LDHMU4 HDU Environment Activator (WS connected via MUX)
5. LDHS33 HDU Environment Activator (WS ETS 20xx type)
6. SYSIN7 Transfer of Programs from MTU/SCT/FDU to HDU
7. HDSCT5 Transfer of Programs from HDU to SCT
8. HDMTU3 Transfer of Programs from HDU to MTU
9. HDUFD3 Transfer of Programs from HDU to FDU
10. UC3003 CU Test (UC036 without gate array) for M30/M40
11. UCG304 CU Test (UC042 with gate array) for M30/M40
12. UCV303 UC048 for M34/M44 and UC070 for M54/M64 test
13. UCY800 UC071 for M70 test
14. 51CAC1 UC070 Cache with XU 5010 test
15. FJCAC1 UC070 Cache with XU 1700/1703 test
16. WRCAC1 UC070 Cache with XU 1707/1709 test
17. MEM811 RAM Boards test
18. EARUT3 Line Parameters on EAROM Installation
19. PRT.UC Printer test
20. PRTWIN Printer test via twin
21. PRTELB Printer test via ELB 1381/1382
22. PINBDG Pinpad/Badge Reader test

23. PINELB Pinpad/Badge Reader test via ELB 1381/1382

24. CA2TS1 CA2000 Test via twin

25. FEEDER Printer Front Feeder test

26. SOVRA7 Overlapping Program

27. ENCDE5 Encryption/Real Time Clock Controller test

28. ENCSE0 Encryption Module (shared segment) test

29. PINCK1 Encryption Module (pin check) test

30. CESTE0 Extended Console for M64/M70 test

31. UCM804 M60-2/3 CPU test (UC040)

32. CACH84 Cache Memory test (UC041)

33. TCB805 TCB Board test

34. MEM811 RAM Boards test

35. MREDA3 REDAC Board test

36. CAC603 60 MB HDU Cache test

37. CAC123 120 MB HDU Cache test

38. TMULT0 Multiprocessor in MOS Operation test

39. RAMVID Display RAM test

40. CRTAN5 Alphanumeric Monochrome Display test

41. CRTGR2 Graphic Monochrome Display test

42. KEYTE1 Keyboard test

43. GRAPH3 Graphic/Colour Display Controller test

44. T31103 Graphic/Colour Display test

45. TKEY04 Keyboard connected to Graphic/Colour Controller test

46. MULT13 Multiplexer Controller Serial Channel test

47. MULT22 Multiplexer Controller test

48. WSVID4 Display for WS connected via ELB 3683 test

49. WSKEY4 Keyboard for WS connected via ELB 3683 test

50. WSPCR2 Pinpad/Badge Reader connected via ELB 3683 test

51. WSLIN1 WS in Multiplexer/D-BOX/ELB 3683 test

52. PRMUX0 Printers connected via Multiplexer/ELB 3683 test

53. GLAV28 LCU V24 test

54. LCUX26 LCU X24 test

55. LCUTT4 LCU TTL test

56. LCUM04 MOIN.5 Line Controller test

57. MOINV2 Modem MOIN 5.2 connected to G0300 or G0156 test

58. TWIN05 Twin Controller (G0327 or G0151) test

59. TW1005 RS 422 Twin Controller test (for ETS 20xx)

60. W24D08 V24 + V24 LCU (dedicated segment) test

61. LIONV4 LION 9.6 LCU test

62. 96ERM5 LION 9.6 Master Error Rate

63. 96ERS5 LION 9.6 Slave Error Rate

64. ER2005 LION 200 (dedicated segment) Error Rate

65. ERS203 LION 200 (shared segment) Error Rate

66. L2V248 LION 200 + V24 (dedicated segment) LPU test

67. V24L27 LION 200 + V24 (shared segment) LPU test

68. W24S07 V24 + V24 (shared segment) LPU test

69. L9V244 LION 9.6 + V24 LPU test

70. MOW240 MOIN 5.2 + LPU V24 + V24 test

71. ETHER1 Ethernet Controller Error Rate

72. OMNIN4 Omninet Controller (dedicated segment) test

73. OMNSH0 Omninet Controller (shared segment) test

74. REPTR0 Omninet Repeater (shared segment) test

75. 7032E3 MFDU and FDU Error Rate

76. MFDMA1 MFDU Alignment and Eccentricity test

77. FDUMA2 FDU Alignment and Eccentricity test

78. 4301T4 320 KB MFDU test

79. 4305T5 1 MB MFDU test

80. 6030T6 1 MB FDU test

81. 50SCT9 Save-Restore from STC to XU 5010

82. HDSCPH Dump-Restore from XU5010 to SCT (on ETS 20xx)

83. SCT303 G0200/B + G0201/B Controller with 20 MB STC (XU 1120) test

84. STC402 G0200/B + G0342 Controller with 20 MB STC (XU 1130) test

85. SCTER7 20 MB STC Error Rate

86. EPC0V3 20 MB STC Error Rate (XU 1120: FW Rel. 7.0 and subseq.)

87. CPC0V1 20 MB STC Error Rate (XU 1130: FW Rel. 8.0 and subseq.)

88. STC5E2 45/60 MB STC Error-Rate

89. STC5T1 45/60 MB STC Control G0417 + G0418 test

90. MTUER6 40 MB MTU Error Rate

91. MTC304 40 MB MTU Controller (G0278) test

92. FJMTU5 60 MB MTU/HDU Dump-Restore

93. 120FC3 120 MB MTU/HDU Dump-Restore

94. TS50I6 18 MB HDU Subsystem XU 5010 test

95. S24I51 Cylinder 0 Initialization for XU 5010

96. DI5011 XU 5010 Registration

97. ER50I3 XU 5010 Error Rate

98. VC50I2 XU 5010 Verify and Correction

99. 50ITM1 XU 5010 Rotation Time Measurement

100. SAS1T5 14 MB HDU Test (SASI3 interface): XU 5006

101. C50062 XU 5006 Certification

102. 5006F3 XU 5006 Formatting

103. ES3563 XU 5006 Error Rate

104. SAS243 Std 24 Write on XU 5006

105. DRSMF4 1 MB MFDU/XU5006 Dump-Restore

106. 5006V1 XU 5006 Verify and Correction

107. S24X62 Std 24 Installation on XU 5006 (ST506 interface, G0363)

108. SM23F6 60 MB HDU Disk Formatting: XU 1700 (SMD interface)

109. ST24S5 Track 0 Initialization on XU 1700 (Std 24)

110. 2312E8 XU 1700 Error Rate

111. 23SCT3 Save-Restore between XU 1700 and STC

112. SM0609 SMD Controller for XU 1700 Test

113. F60TM3 XU 1700 Rotation Time Measurement

114. SM12V4 XU 1700 Verify & Correction

115. 2322F5 120 MB HDU Disk Formatting: XU 1703 (SMD interface)

116. 120ST1 Track 0 Initialization on XU 1703 (Std 24)

117. 2322E3 XU 1703 Error Rate

118. FJSCT3 Save-Restore between XU 1703 and STC

119. SM1209 SMD Controller for XU 1703 Test

120. F12TM3 XU 1703 Rotation Time Measurement

121. SM22V2 XU 1703 Verify & Correction

122. HDC5F5 27/65 MB HDU Disk Formatting: XU 1707/09 (Wren1/Wren2)

123. HDC5E7 Wren1/Wren2 Error Rate

124. HD5ST3 Save Restore between Wren1/Wren2 and STC

125. HDC5V6 Verify & Correction for Wren1/Wren2

126. HDC503 ST506 Interface Controller test (G0363)

127. HDC5X3 HDU ERMAP Read/Write Program ST506 interface

128. S24W16 Std 24 Installation on Wren1 (27 MB HDU)

129. S24W25 Std 24 Installation on Wren2 (65 MB HDU)

130. S24M54 Std 24 Installation on Micropolis 1325 (65 MB HDU)

131. S24X11 Std 24 Installation on on XM 5221 (20 MB HDU)

132. S24WD0 Std 24 Installation on Wren2 (40 MB HDU Depopulated)

133. S24MA1 Std 24 Installation on Micropolis 1325/A (40 MB HDU)

134. ESDIF1 140 MB HDU Disk Formatting, ESDI interface

135. ESDIE1 140 MB HDU Error Rate

136. ESDIV0 HDU Verify & Correction program, ESDI interface

137. ESDIT1 ESDI Interface Controller test

138. EIW3S3 Std 24 Installation on 140 MB HDU: CDC Wren3

139. EIM5S3 Std 24 Installation on 140 MB: Micropolis 1355

140. EIF6S3 Std 24 Installation on 140 MB HDU: Fujitsu M2246E

A. APPENDIX

A.1 HARDWARE MODULES LISTED IN THE 'PROGETTO DI GESTIONE'

A.1.1 BASIC UNIT AND OTHER MODULES

MODULE DESCRIPTION	COMPOSITION	'PROGETTO GESTIONE'
M34 BASIC UNIT	Box and 9-slot rack, CPU UC048, Diagnostic console, 170 W PSU 3470, ISL switch	BU 3417
M44 BASIC UNIT	Box and 14-slot rack, CPU UC048, Diagnostic console, 170 W PSU 3567, ISL switch	BU 3517
M54 BASIC UNIT	Box and 9-slot rack, CPU UC070, Diagnostic console, 170 W PSU 3470, ISL switch	BU 5425
M34/M44 UPGRADING to M34SP/M44SP	UC070 board System nameplate	SET 3444
POWER SUPPLY EXPANSION (for M44)	20 A expansion for + 5V	PSE 3519
KIT to join two M44's (upgrading)	Sheet plates	KIT 3500
AUTOMATIC START DEVICE	Device and cable - AT112	ASD 3384
DATA ENCRYPTION module with real time clock for line/disks	Board GO 257 Lock	DEM 3330
DATA ENCRYPTION CONTROL with CAT	Board GO 257/C	DEM 3477
REAL TIME CLOCK MODULE	Board GO 257/A	RTC 3311
512 KB STORAGE 1.0 MB STORAGE 1.5 MB STORAGE 2.0 MB STORAGE 1.0 MB STORAGE with ECC 2.0 MB STORAGE with ECC	RA57/E: 64/256 Kbit chips RA57/C: 256 Kbit chips RA57/B: " " " RA57/A: " " " RA65/B: " " " RA65: " " "	MEM 3374 MEM 3361 MEM 3362 MEM 3363 MEM 7022 MEM 7024
BATTERY BACK UP	Device with 5A/h battery	BBU 3343

A.1.2 MAGNETIC PERIPHERALS MOUNTED IN M34/M54

MODULE DESCRIPTION	COMPOSITION	'PROGETTO GESTIONE'
320 KB MINIFLOPPY DISK SUBSYSTEM first drive (only for M34)	Board GO 280/C Drive XU 4301 - Cables	MFU 3420
320 KB MINIFLOPPY DISK 2nd drive (only for M34)	Drive XU 4301 - Cables	MFE 3423
1 MB MINIFLOPPY DISK SUBSYSTEM 1st drive (only for M34)	Board GO 280/B Drive XU 4305 - Cables	MFU 3410
1 MB MINIFLOPPY DISK (2nd drive) (only for M34)	Drive XU 4305 - Cables	MFE 3411
320 KB MINIFLOPPY DISK SUBSYSTEM slim (1st drive)	Board GO 280/E Drive 4350 - Cables	MFU 3432
320 KB MINIFLOPPY DISK slim (2nd drive)	Drive 4350 -Cables	MFE 3433
1 MB MINIFLOPPY SUBSYSTEM slim (1st drive)	Board 280/D - Cables Drive ND08-DE	MFU 3426
1 MB MINIFLOPPY DISK slim (2 drive)	Drive ND08-DE - Cables	MFE 3427
45/60 MB STC SUBSYSTEM slim (only for M54)	Boards GO 417 & GO 418 Drive - Cables	STS 5437
ST506 INTERFACE CONTROLLER	Board GO 363	HDC 3544
20 MB HDU slim ST506 interface	Drive XM 5221/2 - Cables	HDU 3425
40 MB HDU ST506 interface	40 MB Drive - Cables	HDU 3449
65 MB HDU ST506 interface	Drive XU 1709 - Cables	HDU 3465
ESDI INTERFACE CONTROLLER (only for M54)	Boards GO 404 & GO 405	HDC 7050
140 MB HDU ESDI interface	140 MB Drive - Cables	HDU 5451
SASI interface (only for M34)	Boards GO298 & GO299	HDA 3319
14 MB HDU SUBSYSTEM SASI interface (only for M34)	Drive XU 5006 Control DTC 510BO - Cables	HDU 3416

A.1.3 MAGNETIC PERIPHERALS MOUNTED IN M44

MODULE DESCRIPTION	COMPOSITION	'PROGETTO GESTIONE'
1MB MINIFLOPPY DISK SUBSYSTEM (1st drive)	Board GO 280/B Drive XU 4305 - Cables	MFU 3551
1 MB MINIFLOPPY DISK (2nd drive)	Drive XU 4305 - Cables	MFE 3562
1 MB MINIFLOPPY SUBSYSTEM slim (1st drive)	Piastra GO 280/B/D - Cables Drive ND08-DE	MFU 3570
1 MB MINIFLOPPY DISK (2nd drive)	Drive ND08-DE - Cables	MFE 3580
1 MB FLOPPY DISK SUBSYSTEM (1st drive)	Board GO 280/B Drive XG 6030 - Cables	FDU 3531
1 MB FLOPPY DISK (2nd drive)	Drive XG 6030 - Cables	FDE 3533
20 MB STREAMING TAPE SUBSYSTEM	Boards GO 200/B - GO 201/B Drive XU 1120 - Cables	STS 3592
20 MB STREAMING TAPE SUBSYSTEM	Boards GO 342 - GO200B Drive XU 1130	STS 3554
18 MB HDU CONTROLLER	Boards GO 230 - GO 231/A	HDC 3555
18 MB HDU (OPE)	Drive XU 5010	HDE 3511
CABLE to connect 1 or 2 HDE 3511	Cable	CBL 3556
HDU CONTROL, ST506 interface	Board GO 363	HDC 3544
30 MB HDU (1st drive)	Drive XU 1707 Convertitore DC - Cables	HDU 3546
30 MB HDU (2nd drive)	Drive XU 1707 DC Converter - Cables	HDE 3549
40 MB HDU ST506 interface (1st drive)	Drive DC Converter - Cables	HDU 3639
40 MB HDU ST506 interface (2nd drive)	Drive DC Converter - Cables	HDE 3640
65 MB HDU ST506 interface (1st drive)	Drive XU 1709 DC Converter - Cables	HDU 3666
65 MB HDU ST506 interface (2nd drive)	Drive XU 1709 DC Converter - Cables	HDE 3667

A.1.4 MAGNETIC PERIPHERALS MOUNTED IN CABINET 3558 (SB3)

MODULE DESCRIPTION	COMPOSITION	'PROGETTO GESTIONE'
SB3 CABINET for magnetic peripherals	Cabinet with remote switch-on device	CAB 3558
SUPPORT for CAB 3558	As with CAB 3558, but empty	KIT 3553
POWER SUPPLY for CAB 3558	345 W power supply (LA40)	PSU 3545
1 MB MFU/FDU (M44) CONTROL	Board GO 280/B	FDC 3593
1 MB MINIFLOPPY DISK (1st drive)	Drive XU 4305 Signals cables	MFU 3594
1 MB MINIFLOPPY DISK (2nd drive)	Drive XU 4305 Signals cables	MFE 3577
1 MB MINIFLOPPY DISK slim 1 drive essential requirement: FDC 3593	Drive ND08-DE - Cables	MFU 3672
1 MB MINIFLOPPY DISK slim 2 drive essential requirement: FDC 3593	Drive ND08-DE - Cables	MFE 3673
1 MB FLOPPY DISK (1st drive)	Drive XG 6030 Signals cables	FDU 3595
1 MB FLOPPY DISK 1MB (2nd drive)	Drive XG 6030 Signals cables	FDE 3582
18 MB HDU (OPE) (1st drive)	Drive XU 5010 MAPSS Board GO306 - Cables	HDU 3572
18 MB HDU (2nd drive)	Drive XU 5010 Cables	HDU 3573
SWITCH for HDU 3572/3573	Switch	SET 3563
CONTROL for 60/120 MB HDU (in M44)	Boards GO 302/A & GO301/A	HDC 3527
DUAL PORT for 60/120 MB HDU	Board - Keys - Cables	SET 3569
60 MB HDU (interfaccia SMD) (1st drive)	Drive XU 1700 Power supply XU 1701/Cables	HDU 3560
HDU 60 MB (SMD) (2nd drive)	Drive XU 1700 Power supply - Cables	HDE 3578

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MODULE DESCRIPTION	COMPOSITION	'PROGETTO GESTIONE'
120 MB HDU (SMD interface) (1st drive)	Drive XU 1703 Power supply - Cables	HDU 3516
HDU 120 MB (SMD) (2nd drive)	Drive XU 1703 Power supply - Cables	HDE 3579
HDU 65 MB ST506 interface (1st drive)	Drive 1709 DC Converter - Cables	HDU 3668
65 MB HDU ST506 interface (2nd drive)	Drive 1709 DC Converter - Cables	HDE 3669
20 MB STC CONTROL (in M44)	Boards GO 200/B & GO 201/B	STC 3598
20 MB STC UNIT (STC 3598 es. req.)	Drive 1120 - Cables	STU 3599

A.1.5 MAGNETIC PERIPHERALS MOUNTED IN 'SB2' CABINET

MODULE DESCRIPTION	COMPOSITION	'PROGETTO GESTIONE'
40 MB MTU TAPE UNIT	Cabinet (SB2) with remote switch-on device Tape unit XU 1705 Power supply Signals cable	MTU 3541
CONTROL for 40 MB MTU (in M44)	Board GO 278/B	MTC 3543
CONTROL for 60/120 MB HDU (in M44)	Boards GO 302/A & GO301/A	HDC 3527
60 MB HDU (SMD) - (1st drive) (essential req. MTU 3541)	Drive XU 1700 Power supply XU 1701 Cassette Cables	HDU 3565
60 MB HDU (SMD) - (2nd drive) (essential req. HDU 3565)	Drive XU 1700 Power supply XU 1701 Cables	HDE 3566
120 MB HDU (SMD) - (1st drive) (essential req. MTU 3541)	Drive XU 1703 Power supply XU 1701 Cassette Cables	HDU 3523
120 MB HDU (SMD) - (2nd drive) (essential req. HDU 3523)	Drive XU 1703 Power supply XU 1701 Cables	HDE 3524
DUAL PORT for 60/120 MB HDU	Frame - Keys - Cables Board	SET 3569

A.1.6 LINE CONTROLLERS

MODULE DESCRIPTION	COMPOSITION	'PROGETTO GESTIONE'
LINE CONSOLE (only for M34/M44)	Console	CDL 3313
REMOTE INTERNAL/EXTERNAL V24 LINE CONTROL	Board GO 300 3 metre modem cable	LCU 3376
MOIN 5.2 INTEGR. MODEM (LCU 3376)	Board IF192 and cable	LTU 3339
LION 9.6 INTERNAL LINE CONTROL	Board GO 333 and cable	LCU 3397
X21 EXTERNAL LINE CONTROL	Board GO 303 Console and cable	LCU 3326
V24 LINE + V24 WITH CPU CONTROL	Board GO 236 and cables	LPU 3348
MOIN 5.2 INTEGRATED MODEM(LPU 3348)	Board IF192 and cable	LTU 3395
V24 + LION 200 LINE CONTROL (with microprocessor)	Board GO 256 Cables	LPU 3390
V24 + LION 9.6 LINE CONTROL (with microprocessor)	Board GO 340/A Cable	LPU 3398
OMNINET LOCAL NETWORK CONTROL	Board GO 308, 2.5 m. cable	LCU 3345
ETHERNET INTERNAL LINE CONTROL	Board GO 212/A	LCU 3323
TWIN CONTROL (RS 232C and C.L. interfaces) (only for M34/M44)	Board GO 327	SIC 3367
CONNECTORS FOR M64/M70 C.L. CONNECTION (only for M54)	Packs of 50 units	SET 9010
JUNCTION BOX (for current loop)	Tap-box	TBX 9020
JUNCTION BOX (LION and Omninet networks)	Tap-box	TAP 1070
LINE DISCHARGER (LION and Omninet networks)	Discharger	LSS 9021
OMNINET REPEATER	Repeater	RPT 9022
TRANSCEIVER BOX (Ethernet line)	Box	SET 3364
DROP CABLE (Ethernet line)	5 m. cable 10 m. cable 20 m. cable 30 m. extension cable	CBL 3391 CBL 3392 CBL 3393 CBL 3394

A.1.7 MODULES FOR WORKSTATIONS

MODULE DESCRIPTION	COMPOSITION	'PROGETTO GESTIONE'
KEYBOARD DISPLAY CONTROL for mono/trivalent DSM 605/19/15/16	Board GO 252 Cable	KDC 3341
GRAPHIC EXPANSION MODULE	Board GO 255/A	MEG 3354
5" DISPLAY alphanumeric/monovalent (only for M34/M44)	Display - Filter Tilting support	DSM 3605
9" DISPLAY alphanumeric/trivalent	Display - Filter Tilting support	DSM 3619
15" DISPLAY alpanumeric B/W, tilting	Display with tilting base - Filter	DSM 3615
15" DISPLAY alphanumeric and graphic green monochrome, tilting	Display with tilting base Non-glare screen	DSM 3616
SPACING/SECURING RING 15" display	Ring	SET 1245
KEYBOARD/DISPLAY CONTROL 14" colour alphanumeric (only for M34/M44)	Board GO 224 Cable	KDC 3335
KEYBOARD/DISPLAY CONTROL 14" colour alphanum. & graphic (only for M34/M44)	Boards GO 259/260/261 Cable	KDC 3336
14" DISPLAY colour alphanum. (M34/M44)	Display	DSM 1214
14" DISPLAY colour alphanum. & graphic (only for M34/M44)	Display	DSM 1244
ADAPTER UNIT (connecting display and keyboard)	Adapter box with: - Board IF141 - Power supply	ELB 1381
ADAPTER UNIT (can connect: display, keyboard, badge reader, pin pad, two serial peripherals)	Adapter box with: - Board GO269 - Power supply	ELB 1382
CONNECTION CABLE between Adapter Unit and Central Unit	15 m. cable	CBL 2614
	25 m. cable	CBL 2624
	50 m. cable	CBL 2649
	100 m. cable	CBL 2698

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MODULE DESCRIPTION	COMPOSITION	'PROGETTO GESTIONE'
MULTIPLEXER CONTROL 4-way	Board GO 322	MUX 3388
MULTIPLEXER CONTROL FOR REMOTE CONTROL	Board GO 322	MUX 3688
Signal Distribution BOX for MUX 3388/3688	Box 5 m. cable	DBX 3389
WORKSTATION alphanum., monochrome, can connect: display, multifunction keyboard, two serial peripherals, options board	Box Board BA 126 Power supply Display-keyboard cable ELB mains cable Display mains cable	ELB 3683
WORKSTATION alphanum., monochrome, remote control, can be set for virtual displays. Can connect keyboard, display, 2 serial peripherals, Pin Pad and Badge Reader options through EXF 3688	Box Basic board Power supply Display-keyboard cable Mains-display cable	ELB 3684
OPTIONS BOARD pin pad and badge reader (mount only on ELB 3683)	Board GO 329	EXF 3686
C.L. BRANCH CABLE for ELB 3683/3684	10 m. cable	CBL 3610
SERIAL INTERFACE CABLE for DBX 3389	Cable	CBL 3378
SERIAL INTERFACE CABLE with male connector on peripheral side to be connected to DBX	3 m. cable	CBL 3679
REMOTE WORKSTATION graphic, monochrome using M31 (BU 3111) (only for M34/M44)	BU 3111 512 KB RAM MEG 3354 (graphic expan.) SIC 3367 (serial interf.) DSM 3616 (graphic displ.) ANK 1401 (keyboard)	WSG 3622
REMOTE WORKSTATION graphic colour using M30 (BU 3415) (only for M34/M44)	BU 3415 MEM 3352 (512 KB RAM) MFU 3420 (minifloppy) SIC 3367 (serial interf.) KDC 3336 (display contr.) DSM 1244 (graphic displ.) ANK 1401 (keyboard)	WSG 3623

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STATIC SWITCH for RS 232 interface	Switch 2 male-male adapter cables Screws for modem extension cable adapter	MSW 3369
DYNAMIC MULTIPLEXER for V24 interf. (M34/M44 only)	Electronics box Cables	DIM 3379

KEYBOARDS DESCRIPTION	'PROGETTO GESTIONE'
Alphanumeric + functions (S.T. with BASIC verbs)	ANK 1426
Alphanumeric + functions (a/c., business, data entry, D.P.)	ANK 1427
Alphanumeric + functions + 3 keys (D.P. terminals)	ANK 1428
Numeric + functions (D.P. terminals)	NKB 1435
Numeric + functions + 3 keys (D.P. terminals)	NKB 1436
Numeric + functions (M34/M44 only)	NKB 1411
Numeric + functions (M34/M44 only)	NKB 1412
Alphabetic (M34/M44 only)	AKB 1413
Alphanumeric + functions, unified multifunction	ANK 1401
Alphanumeric + functions + keys (unified multifunction)	ANK 1402
Numeric + functions, unified multifunction	NKB 1405
Numeric + functions + keys (unified multifunction)	NKB 1406
Pin Pad	PIN 1440

A.1.8 CABLES FOR AUXILIARY PERIPHERAL UNITS

MODULE DESCRIPTION	'PROGETTO GESTIONE'
CABLE, single channel, EIA for serial peripherals with female connector on periph. side	CBL 2657
CABLE, twin channel, EIA for STD 13 serial peripherals with female connector on peripheral side	CBL 2658
CABLE, adapter for PR3300 and read/write modules (50 cm.)	CBL 2661
CABLE, single channel, RS 232 for serial pripherals with male connector on peripheral side	CBL 3657
CABLE, twin channel, for serial peripherals with male connector on peripheral side	CBL 3658
CABLE, adapter for non-STD 13 peripherals (10 cm.)	CBL 3349
CABLE, MODEM extension	CBL 3558
CABLE, single channel, TTL	CBL 2659
CABLE, twin channel, TTL	CBL 2660

A.2 SYSTEM DOCUMENTATION

A complete list of the service manuals of the modules used on the M34/44/54 systems is given below.

- Functional Checks Manual : stand alone (*) .....4111930 B
- Functional Checks Manual - concise : stand alone (*) .....4102230 T
- Functional Checks Manual - I/O routines .....4102070 C
- Site Preparation Guide .....3932800 C
- Hardware Configuration Guide .....3986230 C
- DIM V24 - General Service Manual .....4107970 T
- Omninet repeater - General Service Manual .....4107990 D
- Self-powered displays - Service Manual .....3963460 C
- Low profile keyboards - Service Manual .....3963480 N
- ELB 1381/1382 - General Service Manual .....3963780 L
- ELB 3683 - General Service Manual .....4105690 E

(*): Manuals to be released shortly, updated to Rel. 8.3.3

MAGNETIC PERIPHERALS

- XU 4301 (320KB mFDU) - General Service Manual .....3961630 V
- XU 4305 (1MB mFLOPPY) - Service Manual .....4262670 Z
- ND 08DE (1MB mFDU Slim) - Service Manual .....4107830 V
- XG 6030 (1MB FDU) - Service Manual .....3961670 U
- XU 5006 (14MB HDU) - Service Manual .....4162620 T
- XU 5010 (18MB HDU) - Service Manual .....3964440 X
- XU 5221/2 (20MB HDU) - General Service Manual .....4109750 V
- XU 1707 (HDU 30MB) - General Service Manual .....4107180 B
- XU 1700 (60MB HDU) - General Service Manual .....4102510 F
- XU 1709 (65MB HDU) - General Service Manual .....4107590 L
- XU 1703 (120MB HDU) - General Service Manual .....4102530 N
- XU 1120 (20MB SCT DEI) - General Service Manual .....3964630 S

- XU 1130 (20MB SCT CIPHER) - General Service Manual .....4105920 N
- XU 1705 (40MB MTU) - General Service Manual ...supplied by m'facturer

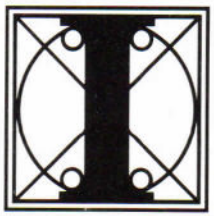
PRINTERS

- PR 15 - General Service Manual .....4101200 S
- PR 17 - General Service Manual .....4101350 K
- PR 19 - General Service Manual .....4101300 C
- PR 340 - General Service Manual .....4103550 V
- PR 1470 - Service Manual .....3930470 Z
- PR 1480 - General Service Manual .....3964010 V
- PR 1580 - General Service Manual .....4101380 W
- PR 2835 - Service Manual .....3964070 T
- PR 2840 - Service Manual .....3960670 Y
- PR 2845 - Service Manual .....4101910 L
- PR 2850 - Service Manual .....3956170 T
- PR 2880 - General Service Manual .....4151580 T
- PR 2890 - Service Manual .....4101000 D
- PR 3300/3600 - General Service Manual .....3963500 L

DATE	UPDATED PAGES	PAGES	CODE
30-05-85	1st EDITION	165	4105740 T (0)
30-12-86	Pages to be replaced: Cover; Preface; v ÷ viii; 1-1 ÷ 1-10; 2-1 ÷ 2-3, 2-5, 2-11, 2-28, 2-31 ÷ 2-33, 2-36; 3-1 ÷ 3-5, 3-18; 4-1 ÷ 4-6, 4-16, 4-17 ÷ 4-19, 4-20, 4-21, 4-26 ÷ 4-28; 5-1 ÷ 5-4, 5-22, 5-23, 5-38, 5-39; Chapter six and Appendix completed. Pages to be added: 2-38; 4-5/1, 4-5/2, 4-21/1, 4-21/2; 5-3/1, 5-3/2.	97	4105741 U
15-05-87	Pages to be replaced: viii, 1-8, 1-9, 2-2, 2-17, 2-18, 2-19, 2-29, 3-18, 3-19, 3-20, 4-2, 4-3, 4-5, 5-1, 5-32 to 5-40	24	4105742 G

Pages marked * must be suppressed

Code 4105740 T (0)
Printed in Italy



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