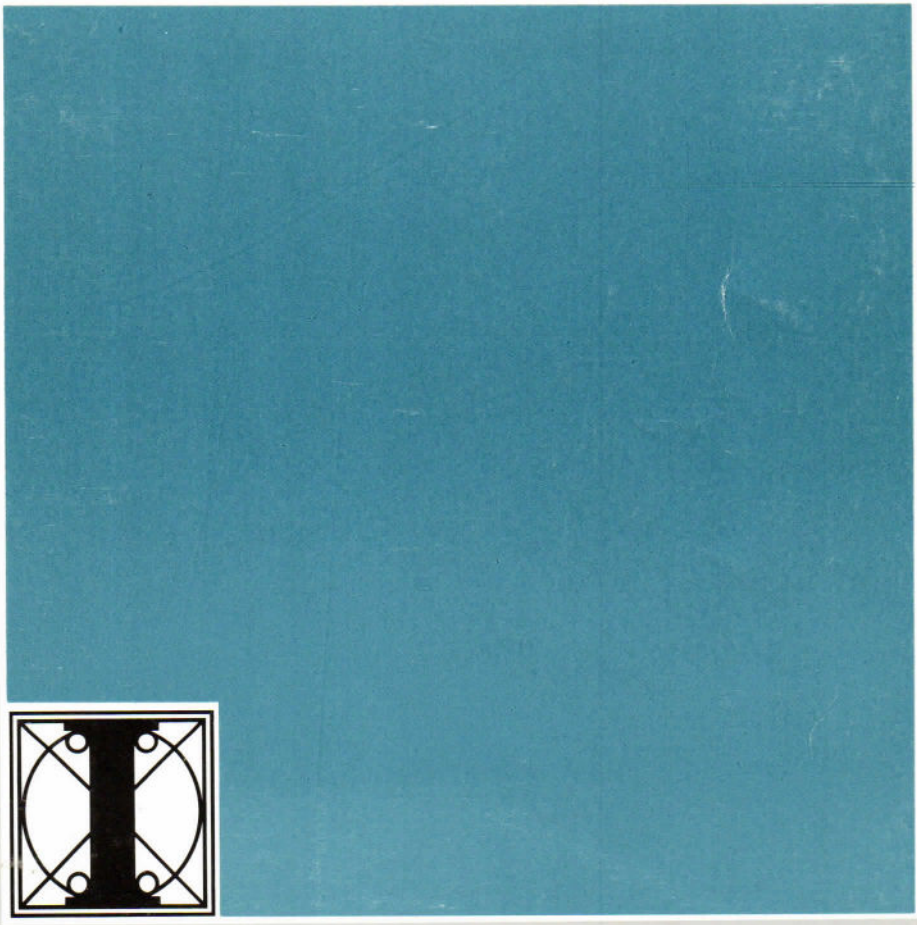
L1 - L2

ELB 3684

General Service Manual



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Information from Olivetti Documentation

L1 - L2

ELB 3684

General Service Manual

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PREFACE

This manual is intended for technicians who service the ELB 3684 work station in field.

SECTOR/RANGE: B1

PRODUCTS: M54, M64

SECTOR/RANGE: B2

PRODUCTS: M70, M80

SUMMARY

The manual is divided into five chapters as follows:

Chapter one sets out the peripherals which can be connected to the ELB 3684 work station.

Chapter two describes the work station based on the ELB 3684.

Chapter three describes the ELB 3684 diagnostics and set-up.

Chapter four describes the installation, assembly and disassembly of the parts making up the ELB 3684.

Chapter five contains the mechanical spare parts catalogue.

REFERENCES:

M34-M44-M54: Service Manual	Code 4105740 T (0)
M64-M70/2/3: Service Manual	Code 4111190 Q (0)
M80: Service Manual	Code 4114030 N (0)
L1: Hardware Architecture	Code 4102210 Z (0)

DISTRIBUTION: Internal (Z)

FIRST EDITION: August 1987

CONTENTS

1. INTRODUCTION

1.1 OVERVIEW

Work stations based on the electronic box ELB 3684, comprising display, keyboard and options (pin pad, badge reader, printer, etc.) have been defined for L1 and L2 systems with MOS operating system. The following figure shows a work station based on the ELB 3684.

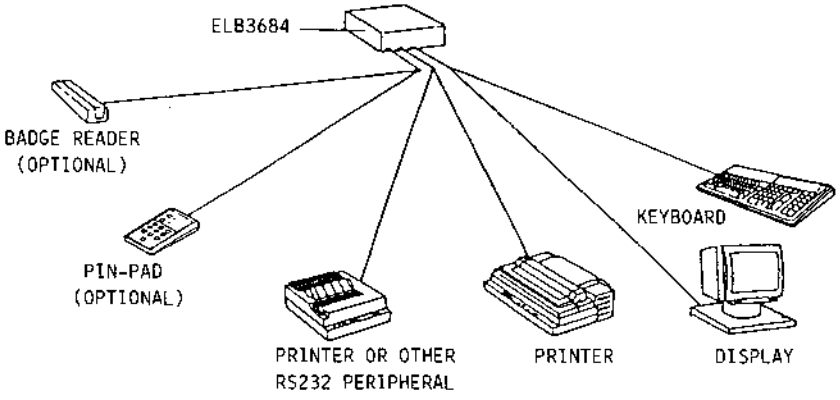


Fig. 1-1 Work Station Based on ELB 3684

The WS based on the ELB 3684 conforms to the interface requirements of L1 and L2 systems (in MOS environment only).

This manual describes the various modules making up the ELB 3684 and the system set-up and also contains the procedures for installing the work station in accordance with its distance from the host system.

The work station is housed in a self-standing box (dimensions 364x100x284), and contains a power supply, control circuits on a multilayer board and an optional expansion board for optional banking peripherals.

The following figure shows a front view of the ELB 3684 electronic box.

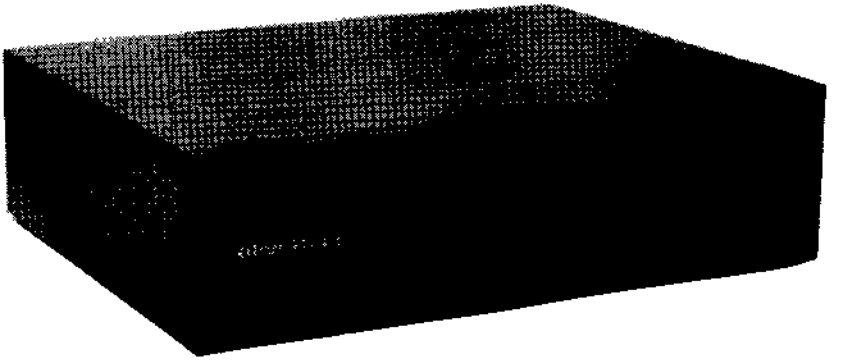


Fig. 1-2 ELB 3684 Electronic Box

The box has the following structure:

- A sheet metal base, with a back panel and two side panels to support the motherboard and the power supply
- The power supply box in sheet metal with cover
- A front panel in resin which is secured to the cover
- Metal cover over the whole system

The ELB 3684 circuitry consists of a motherboard and an optional peripherals expansion board. The motherboard is a multilayer printed circuit board of 770 cmq (22.86 by 33.655) with the following features:

- **PROCESSOR :** Uses an 8-bit Z80A CPU with an operating frequency of 3.6864 MHz (machine cycle 271 ns)

- **MEMORY :** The memory is made up of ROM, NOVRAM and RAM and contains the WS control programs and display data

- **MAIN LINE:** WS/host computer asynchronous serial communication line (V24 - RS232C for remote connections via modem and Current Loop for 4-wire direct connection for distances of up to 1 Km)

- **AUX1/AUX2 LINES:** Two identical auxiliary RS232C asynchronous serial lines for connection with peripherals such as printers, endorsers, etc.

- **KEYBOARD INTERFACE:** The keyboard interface is of the asynchronous serial type and is handled by the other channel of the main line.
  The electrical interface is TTL and the connection is full duplex with a fixed frequency of 1200 baud.
  The output is on the same terminal strip as the display.

- **DISPLAY CONTROLLER:** Only handles alphanumeric monochrome monitors.

The functions implemented are the same as for a standard TTY (VT 100) extended to handle the connection of peripherals.

1.2 PERIPHERALS WHICH CAN BE CONNECTED TO THE ELB 3684

This section lists the peripherals which can be connected to the work station based on the ELB 3684; refer to the specific manuals for information on the technical characteristics of the individual peripherals.

1.2.1 KEYBOARDS

The following unified multifunctional keyboards are compatible with the WS based on the ELB 3684:

- ANK 1401 alphanumeric + functions
- ANK 1402 alphanumeric + functions + switch keys
- NBK 1405 numeric + functions
- NBK 1406 alphanumeric + functions + switch keys

1.2.2 DISPLAYS

The following displays are compatible with the work station:

- DSM 3605 5" alphanumeric monochrome
- DSM 3619 9" alphanumeric monochrome
- DSM 3605 15" alphanumeric monochrome

1.2.3 PERIPHERALS

The following peripherals can be used with the work station:

- ML 700
- CA 2000
- Other peripherals with RS232 interface conforming to the work station specifications

2. WORK STATION BASED ON THE ELB 3684

Work stations with the following components have been defined for L1 systems:

- Multiplexer (MUX) controller
- D-BOX distribution box
- ELB 3684 electronic box
- Current loop/RS232 connection line
- T-BOX galvanic isolation box (TBX 9020)

This chapter contains a description of the work stations based on the ELB 3684 as a function of their distance from the host system. Particular attention will be paid to the cables used to connect the ELB with the host and with the peripherals supported.

2.1 SYSTEM/ELB 3684 CONNECTING CABLES

The WS (ELB 3684) is connected to the system controller (MUX) by a series of cables which depend on the system and type of connection used. The following figure shows the various ways of connecting a MUX controller and a work station via ELB.

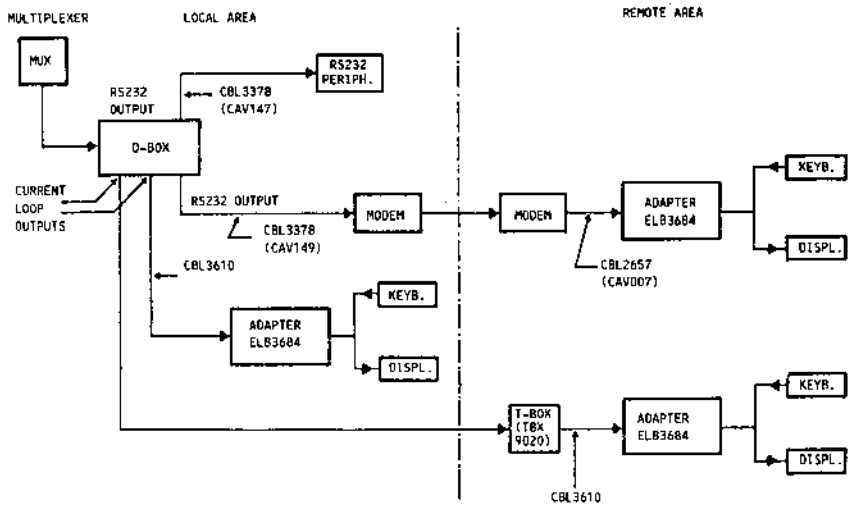


Fig. 2-1 Ways of Connecting MUX Controller and ELB

2.1.1 D-BOX FOR L1 SYSTEMS

The D-BOX is used to connect four L1 system I/O channels numbered from 1 to 4 in the following way:

- 2 and 4 always used for Current Loop type connections
- 1 and 3 can be configured on the MUX board for Current Loop or RS232 operation

There are two versions of the D-BOX for L1 systems:

- D-BOX (Code no. DBX3389) for M54 systems and old lines (M30/34, M40/44 and M60)
- New D-box for M64 and M70 systems

The two versions of the D-BOX are shown in the following figure.

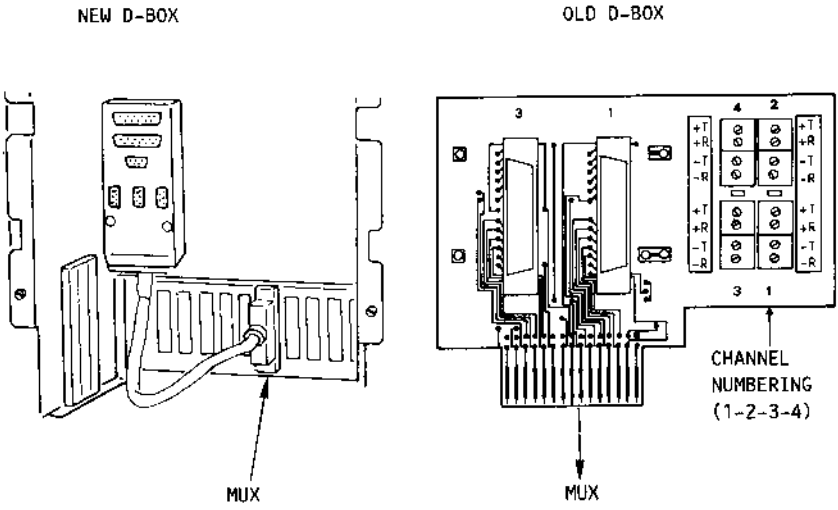
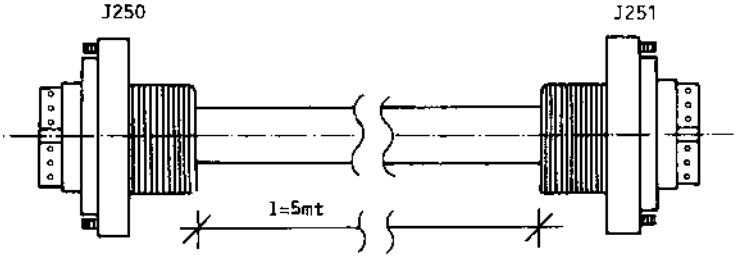


Fig. 2-2 View of the Two D-BOXes Used in L1 Systems

2.1.2 MUX BOARD AND D-BOX CONNECTION FOR M54 SYSTEMS

The MUX is connected to the D-BOX for M54 systems and systems with old lines via a Y-cable (max. length 5 m) code no. 963225 Y, and two TWIN LEAF connectors. The cable is attached symmetrically to the two connectors; the following figure shows the MUX signals connection, the cable and the way it is inserted in the connector.



(CABLE WITH SYMMETRICAL SIGNALS)

2	RXD1B	VE/AZ	BI/NE	RXD1A	1
4	COM10	GI	VI/RS	TXD1A	3
6	RTS12	GR	BI/BL	RXR11	5
8	DSR13	NE	MA	CTS13	7
10	DCD13	RS/MA	AZ	DTR12	9
12	RXD2B	GI/NE	GI/BI	RXD2A	11
14	TXD2B	GR/NE	RS/BL	TXD2A	13
16	M	VE/NE, RS/NE	GR/BL, GI/RS	M	15
18	RXD3B	BI/VE	BL/NE	RXD3A	17
20	COM20	RA	VE/RS	TXD3A	19
22	RTS32	RS	BI/VI	RXR31	21
24	DSR33	BL	VE	CTS33	23
26	DCD33	BI	AR	DTR32	25
28	RXD4B	BI/RS	AR/NE	RXD4A	27
30	TXD4B	VI	GI/VE	TXD4A	29

Ⓐ REFERENCE

LOWER PLATE

J250-J251 TWIN LEAF CONNECTORS (CONNECTION TO BOARD)

Fig. 2-3 MUX Board/D-BOX Connection for M54 System

2.1.3 MUX BOARD AND D-BOX CONNECTION FOR M64 AND M70 SYSTEMS

The MUX is connected to the D-BOX by a cable approx. 30 cm long which is prepared with the D-BOX. It is connected in the same way as the D-BOX for M54.

2.1.4 D-BOX AND ELB 3684 CONNECTION

To connect the D-BOX and ELB via current loop at a distance of less than 10 m using the cable CBL 3610, code no. 111176 R, the following conditions must be respected:

```
 -------          CABLE CBL 3610          -------
| D-BOX |<------------------------------>|  ELB  |
 -------                                 -------
```

D-BOX	ELB	COLOUR OF WIRE
+T	R+	WHITE/BROWN
+R	T+	WHITE
-T	R-	RED/WHITE
-R	T-	BLACK/WHITE

The following figure shows the cable and the connections to be performed on the TWIN LEAF connector (ELB side).

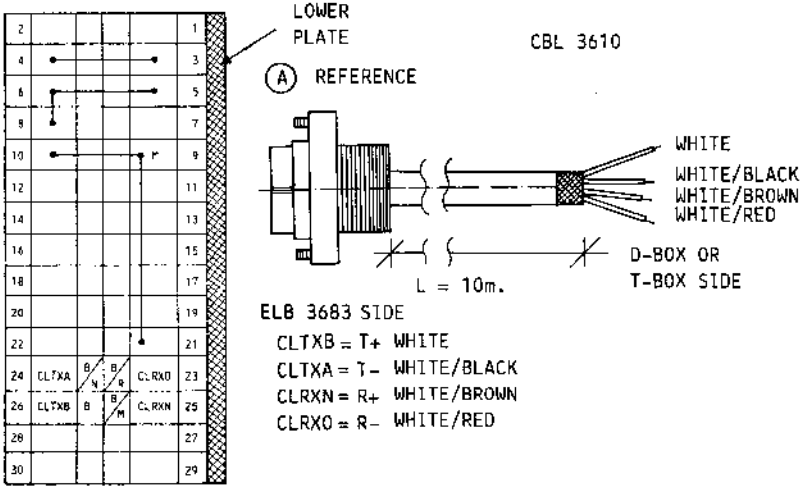


Fig. 2-4 Cable and Connector for Current Loop Connection

On the D-BOX side, the connection is performed according to the system used, as explained below.

For M54 systems and systems with old lines (M30/34, M40/44 and M60), the D-BOX cable wires are connected directly to the D-BOX terminal strip (in the relevant channel of the four present), using the previous table as reference.

For M64 and M70 systems, the D-BOX cable is connected via the 9-way D-shell connector according to the procedures shown in the following figure, and inserted in one of the four Current Loop connectors present on the D-BOX depending on the channel concerned.

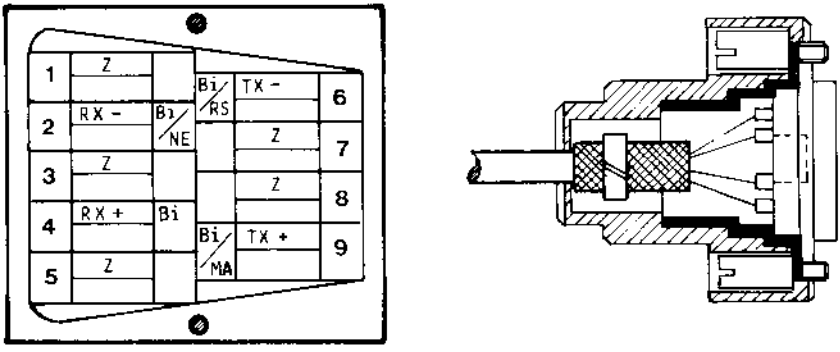


Fig. 2-5 9-way D-shell Connector and Relative Cable Connections

2.1.5 CURRENT LOOP CONNECTION BETWEEN D-BOX AND ELB VIA T-BOX

A T-BOX is inserted in remote connections of more than 10 m and in places where there is no potential difference between the ELB 3684 and the D-BOX grounds.
The T-BOX has the double function of galvanic isolator of the grounds of the two devices and of line junction between cable CBL 3610 (code no. 111176 R) and the 4-pole shielded cable AWG 24 (code no. 5731315 Q), for connection with the D-BOX.
The cable used to connect the D-BOX and the T-BOX can be up to 1 Km long, and is available from 'Gestione ricambi' in 500 m coils.
The interconnections of the four wires from the ELB 3684 to the T-BOX are shown in the following table.

T-BOX TERMINAL	CABLE CBL 3610
+T	R+ WHITE/BROWN
+R	T+ WHITE
-T	R- WHITE/RED
-R	T- WHITE/BLACK

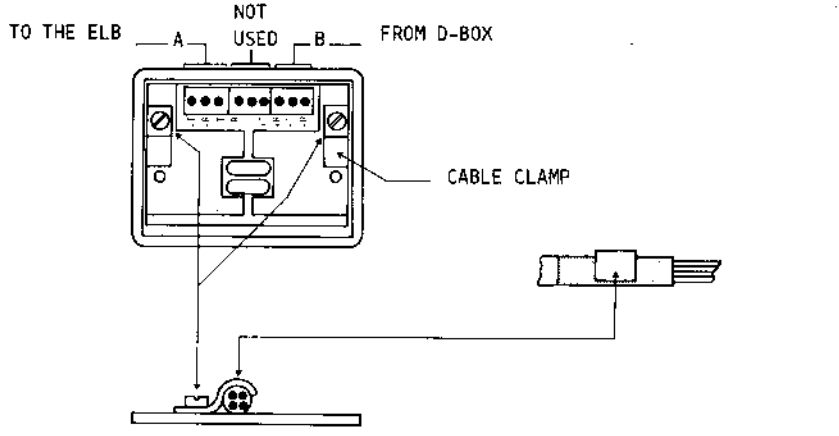
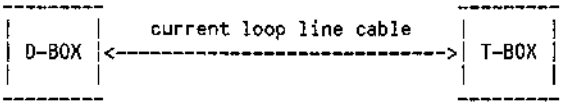


Fig. 2-6 Mounting the T-BOX

It should be noted that the T-BOX has two groups of four terminals each, for connection to ELB and D-BOX: the choice of group is irrelevant, as the T-BOX is perfectly symmetrical.
The interconnection between D-BOX and T-BOX requires the same conditions as with the ELB, which are summed up in the figure overleaf.



T+	WHITE/BROWN	connected to	R+
R+	WHITE	connected to	T+
T-	WHITE/RED	connected to	R-
R-	WHITE/BLACK	connected to	T-

2.1.6 RS232C CONNECTION BETWEEN D-BOX AND ELB VIA MODEM

For connections greater than 1 Km, the system MUX is connected to the ELB 3684 via RS232 with modem. The following figure shows the connection between D-BOX and ELB 3684 via modem.

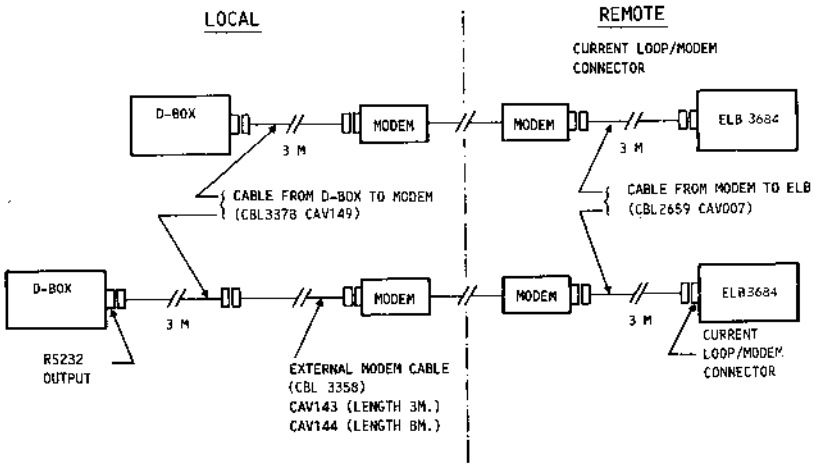


Fig. 2-7 D-BOX and ELB 3684 Connection via Modem

The cable connecting the local modem to the D-BOX is the CBL 3378 cav 149 (code no. 337011 R), which is 3 m long. The distance between D-BOX and modem can be increased by means of cable extensions available in two lengths: the CBL 3358 cav 143 (code no. 336520 X) which is 3 m long and the CBL 3358 cav 144 (code no. 336520 X) which is 8 m long. It should be remembered that the maximum distance between the modem and modules handling the RS232C interface, in this case the MUX board G0322 and the ELB 3684, is 15 m.

The connecting cable from the ELB 3684 to the remote modem is the CBL 2659 cav 007 (code no. 335132 M) which is 3 m long.

Connections with the RS232C interface are effected in conformity with the EIA standard with the following signals:

Description	EIA symbol	CCITT symbol	Signal name	Direction
Protective ground	AA	101	-	-
Transmitted Data Tx	BA	103	LITXD	OUTPUT
Received Data Rx	BB	104	LIRXD	INPUT
Request to send RTS	CA	105	RTS1N	OUTPUT
Clear to sent CTS	CB	106	CTS1N	INPUT
Data set ready DSR	CC	107	RI11N	OUTPUT
Signal ground	AB	102	M	-
Rec.line sign. detec. DCD	CF	109	DCD1N	INPUT
Data terminal ready DTR	CD	108	DTR1N	OUTPUT

2.2 INSTALLATION OF SIGNAL CABLES FOR WORK STATION

The signal cables must not be installed near to high voltage electrical equipment which may cause damage.

The most common sources of interference are:

- Lighting installations
- Power and distribution generators such as transformers, alternators and motors (air conditioners, lifts, fans)
- Radio and TV transmitters
- Signal generators, intercommunication and alarm devices

Interference on the cables can also be caused by the length of the lines which run parallel to the source of interference.

The following table shows the minimum distance between the cable and the source of interference.

MAINS DISTRIBUTION	MINIMUM DISTANCE BETWEEN CABLE AND SOURCE OF INTERFERENCE
Less than 2KVA	0.10 m
From 2KVA to 5KVA	0.30 m
More than 5KVA	0.50 m

When the cross-over is 90°, the minimum distance must not exceed 0.10 m, and the cable must be protected from mechanical stress. If the cable is installed vertically, it must be anchored to supports, at a maximum of 1 m apart.

Important Notes:

1. In order to make servicing easier, one work station must be installed within sight of the box or cabinet. This work station is used as system console; information on the operation of the entire system will be sent to it during the diagnostic phase.
2. If a work station without ELB is connected, the alternating power is supplied to the display directly by the box or cabinet. In other cases it is supplied by the ELB.

2.2.1 EXTERNAL STRETCHES OF CABLE BETWEEN BUILDINGS

The ELB line is only internal. There is no provision for external cables, but some installations may require small stretches of cable outside the building. If this is the case, the following measures must be taken to protect the cables from atmospheric discharges.

1. Cable ducts at least 30 cm underground.

2. Overhead lines in shielded metal tubes connected to ground at both ends.

   The metallic section of the tube must be at least 50 mmq (tube with diameter greater than or equal to 19 mm) and it should be connected to ground with a cable of diameter 35 mm (as for lightning rods). This ensures good ohmic continuity at low impedance for all sections of the tube.

The normal procedures for waterproof electrical installations should be carried out for both underground and overhead lines.

2.2.2 CURRENT LOOP CABLE

This is a 4-pole flexible shielded cable, composed of four wires in electrolytic tinned annealed copper, insulated and inserted in copper shielding and covered in a grey insulating sheath.

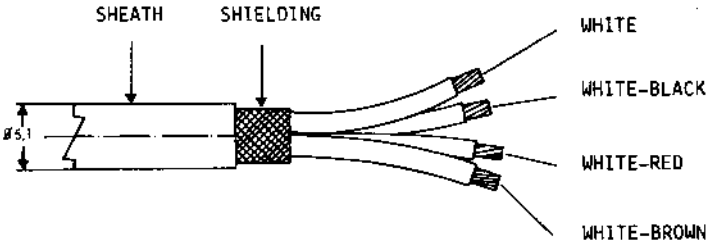
CHARACTERISTICS

Electrolytic copper : Cu - ETP UNI 5649

Resistance : 0.017094 ohm x mm /m

Style : 2448

Approval : UL



Impedance 20 KHz	110 Ω
Attenuation 20 KHz	0,5 dB/100m
Capacity 20 KHz	95 pF/m
Resistance	84Ω/Km
Percenting of shielding	≥80%

Fig. 2-8 Current Loop Cable AGW 24

If the Current Loop cable is to have junctions, use of 4-way shielded male-female cylindrical connectors of the AMPHENOLDI type (code no.: Female 141857 S - Male 5783212 N) is recommended.

The cable wires should be soldered to the respective pins of the connector and the ground shield connected to the shielding.

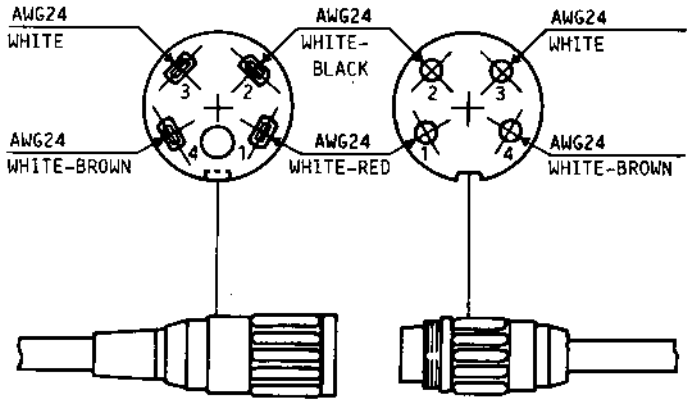


Fig. 2-9 Current Loop Cable AGW 24 Junction

Note: The Current Loop cable can have a maximum of 10 junctions.

2.3 ASSEMBLY AND DISASSEMBLY OF THE D-BOX

For M64 and M70 systems the D-BOX is mounted with two screws on the specific frame at the back of the basic system cabinet.

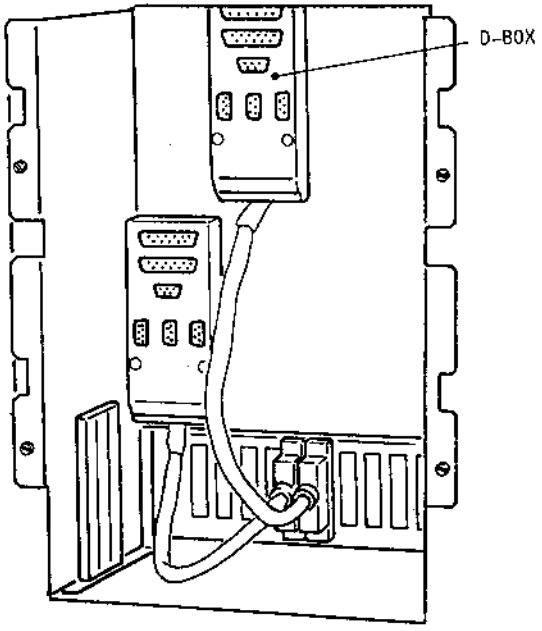


Fig. 2-10 D-BOX Frame on M64 and M70 Systems Basic Cabinet

For M54 M30/34, M40/44 and M60 systems, the D-BOX must be placed near the L1 system and should be secured to a wall or the floor at a maximum of 4 m.
Two slots are accessed by lifting the D-BOX cover, which is held in place by interlocking tabs. It is not necessary to remove the interference shielding, but the connector covers protecting the male Cannon connectors must be removed.

To secure the D-BOX, make two holes with 102 mm between centres and a diameter appropriate to the type of washer used. The diameter of the mounting screws should be 3.2 mm.

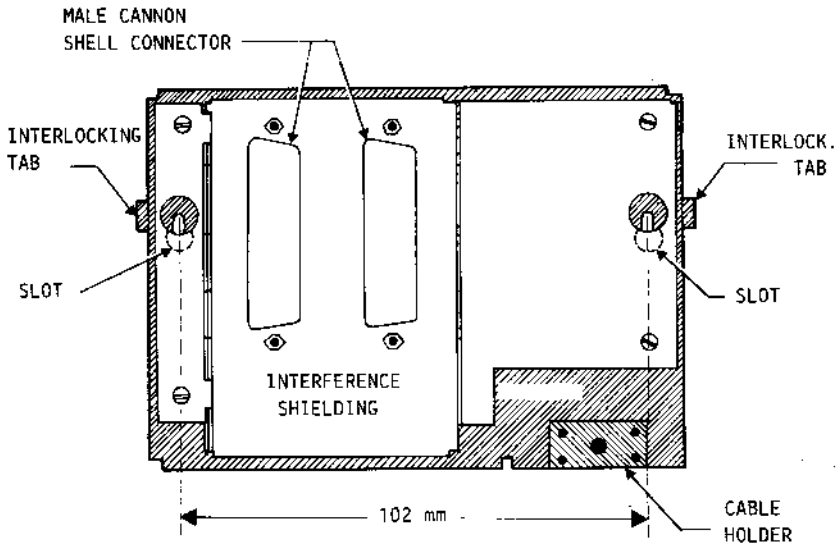


Fig. 2-11 D-BOX for M54, M30/34 M40/44 and M60

2.3.1 ASSEMBLY AND DISASSEMBLY OF THE T-BOX

The T-BOX should be placed at a maximum of 10 m from the ELB 3684 and secured to the wall or floor with twist-lock screws.
The diameter of the holes for the screws is 4.5 mm and the distance between the centres is 49 mm.
The T-BOX can only be secured by removing the cover and then removing the printed circuit as shown in the following figures.

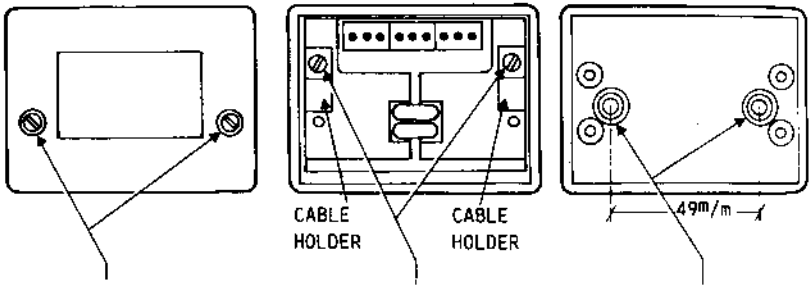


Fig. 2-12 Disassembling the T-BOX

2.4 REMOTE ELB 3684 WITH ERROR CONTROLLERS OR STATIC MULTIPLEXERS

Due to the high number of errors on the connection lines between the L1 system and ELB 3684 WS connected asynchronously via MUX-MODEM, it has been necessary to introduce devices to check and recover these errors.

These devices, the ERROR CONTROLLERS and STATIC MULTIPLEXERS, greatly reduce the number of errors by using the appropriate line protocols.

It should be noted that the introduction of these devices to the line does not create any restrictions on the type of line or modems for remote L1 work stations, as shown in the following table:

TYPE OF LINE	NO. OF WIRES	TYPE OF MODEM	BAUD RATE (bps)
LEASED/PRIVATE	4	V 23	600/1200
LEAS/SWTCH/PRIV	2	V 22	1200
LEAS/SWTCH/PRIV	2	V 26 bis	2400
LEAS/SWTCH/PRIV	2	V 26 ter	2400
PRIVATE	4	B. BASE	UP TO 19200

Note: The modems used must be of the controlled carrier type so that the system can be switched off and on via the remote device or remote DCE line.

The following Olivetti products allow "error free" connection:

MUX: MUX 3688 (for old type L1 systems and M54) with new firmware
MUX 7089 (for new type L1/L2 systems) with new firmware

ELB 3684: for L1 and L2 systems.

The introduction of the new firmware on the MUX controller has created the following limitations on lines 0 and 2:

1. The WS cannot support Current Loop connection as this feature has been eliminated to make space in EPROM for the relative coding of the modifications required for connection in remote mode;

2. The WS cannot be connected in remote mode via the MODEM alone.

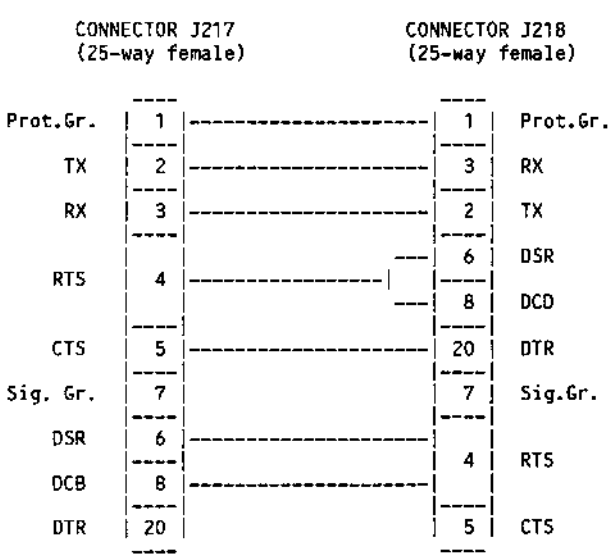
The modifications on the new MUX controller boards allow the following connections:

	NEW MUX BOARD	EXISTING MUX BOARD
LINE 0	Local WS via RS232 C Remote WS controlled	Local WS via RS232 C Local WS in Current Loop
LINE 1	Local WS in Current Loop	Local WS in Current Loop
LINE 2	Local WS via RS232 C Remote controlled WS	Local WS via RS232 C Local WS in Current Loop
LINE 1	Local WS in Current Loop	Local WS in Current Loop

In order to connect the WS and the MUX, the WS should be set via SET-UP (MPLEX YY) as remote in controlled mode. The WS and MUX can be connected in direct mode, i.e., local without MODEM, or in remote controlled mode.

2.4.1 DIRECT MODE CONNECTION

Direct mode connection between MUX and WS is effected by using preformed cable CBL 339 as shown below:



- J127 is connected to the D-BOX
- J128 is connected directly to the WS cable connector

The cable used to connect the WS to the adapter (CBL 3349) is CBL 2657 cav 007.

2.4.2 REMOTE CONTROLLED MODE CONNECTION

The MUX/WS connection in remote mode using an error controller or static multiplexer is shown below:

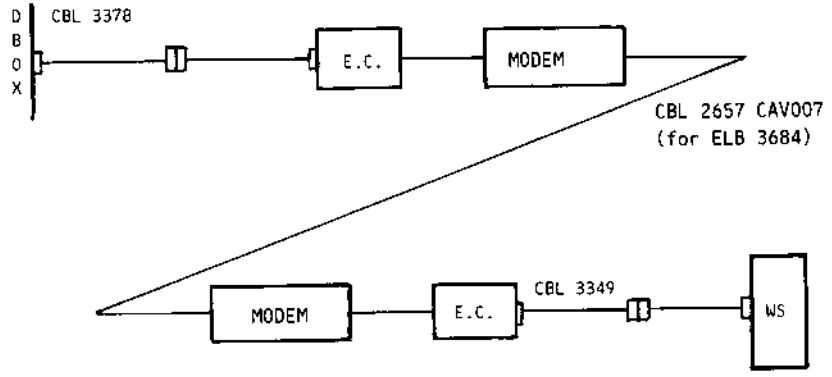


Fig. 2-13 MUX/WS Connection Diagram

2.4.2.1 Characteristics Required by the Static Multiplexers and Error Controllers

The devices selected to connect the WS in remote mode via MUX with error controllers must satisfy the following characteristics:

Data Flow Control

Data Flow Control is handled by signals CTS/DTR, where:

- Signal CTS controls the state of the device receive buffer.
  CTS OFF (logic level 0) signifies request to stop DTE data transmission.
  CTS ON (logic level 1) signifies request to restart DTE data transmission.

- Signal DTR controls the state of the DTE receive buffer.
  DTR OFF (logic level 0) signifies request to stop local device data transmission.
  DTR ON (logic level 1) signifies request to restart local device data transmission.

Signal DTR Handling

Signal DTR OFF/ON is driven by the local DTE, and the signal status is sent by the devices on channel CTS of the remote DTE, so that as well as stopping/starting local device transmission, transmission of the remote DTE to the remote device can also be stopped/started.

Signal RTS Handling

The status of signal RTS is driven by the local DTE, and sent via the line carrier signal DCD of the remote DTE.

This causes the following:

- DCD off (logic level 0) signifies DCEs on, devices on and remote DTE on.
  If one of the two DTEs, devices or DCEs is switched off, the data buffers of both devices must be cleared.

- DCD ON (logic level 1) signifies DCEs on, devices on and remote DTE on.
  The devices must only transmit the data received from when the DTEs/devices/DCEs are switched on again.

Signal DSR Handling

Signal DSR carries information on the condition of the device, as follows:

- DSR OFF (logic level 0), signifies local device off.

- DSR ON (logic level 1), signifies local device on.

BREAK Status Handling

The status of BREAKs, if present on the data line, following specific handling by the protocol between the two DTEs (MUX and WS), must be completely transparent to the devices in question.

Character Format

The character must be made up of 8 bits plus one parity bit.

NOTE: If the error controller or static multiplexer device satisfies the interface characteristics described, the connection can be effected without the adapter cable CBL 3349.

3. DIAGNOSTICS AND SET-UP

This chapter describes the operations of the WS ELB 3684: at power on (autodiagnostics), or on request by the user in LOCAL mode, the ELB 3684 tests the following:

- Correct operation of the WS itself
- Correct operation of the peripheral devices connected. It also defines the operating parameters (SET UP).

This chapter also describes how the diagnostic results are indicated, on the display and keyboard (LEDs)

3.1 OPERATING MODES

The WS has a switch (see figure 3-1) at the back of the box, which the operator can use to select the operating state:

1. LOCAL: the operator can access LOCAL TEST and SET UP procedures
2. ON LINE: once the autodiagnostics tests have completed, the WS is available for communication with the host.

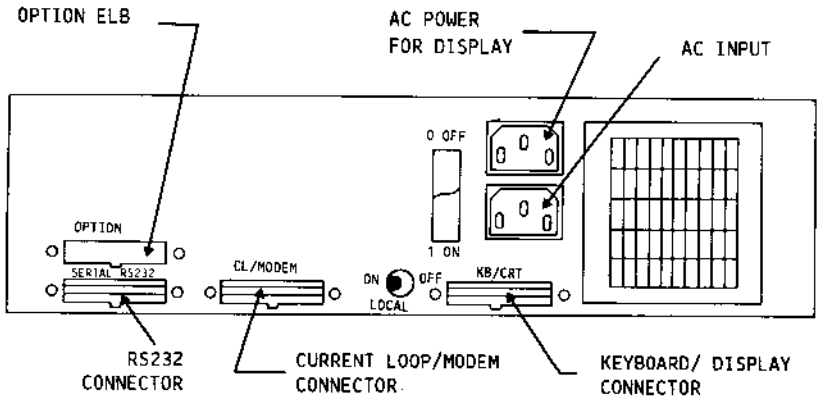


Fig. 3-1 Back View of the ELB 3684

3.1.1 LOCAL MODE

When the ELB 3684 is powered up, the status of the switch is sampled. If it is in LOCAL, the operator can select the following from the menu:

- To execute local tests of the peripherals connected, to test internal operation (diagnostic loopback on serial lines) and to display the contents of the memories. The results are displayed on the screen or indicated on the keyboard LEDs.

- To execute the SET UP procedures. A menu is provided, and the user can modify the variable parameters (such as the serial line parameters) previously set and stored in NOVRAM. This operation may be followed by a STORE in NOVRAM if required. In this case, the new parameters are stored in non-volatile memory and are valid each time the WS is powered up. If the operation is not stored, the parameters are only valid for the current session.

At the end of these operations, the user can then turn the switch to ON LINE. The machine carries out the necessary modifications, reinitializes the channels, recompiles the diagnostic string and is then ready ON LINE.

3.1.2 ON LINE MODE

When in ON LINE mode, the system executes the autodiagnostics off line, initializes the channels according to the contents of the NOVRAM, compiles the diagnostic string and then connects to the line and is ready for communication.

The WS cannot pass from this state to LOCAL unless it is switched off and then on again.

3.2 AUTODIAGNOSTICS

When the WS is switched on, an autodiagnostic program is started up. The following tests are executed:

- ROM test
- RAM test
- NOVRAM read in RAM area
- Diagnostic string initialization
- Keyboard serial controller test
- CTC timer_counter test
- NOVRAM RAM test
- Display RAM test

- Display logic test
- SIO serial controllers test, with local loopback for pairs of lines
- Keyboard and PIN PAD initialization and diagnostic results
- End of diagnostic string compilation

A red LED can be seen on the front of the W5 box. This LED comes on at power up and goes off when the autodiagnostics have completed successfully, otherwise it remains lit.

As the display remains off during test execution, the sequence of tests is indicated by the keyboard LEDs, which follow a pattern starting with all LEDs on.

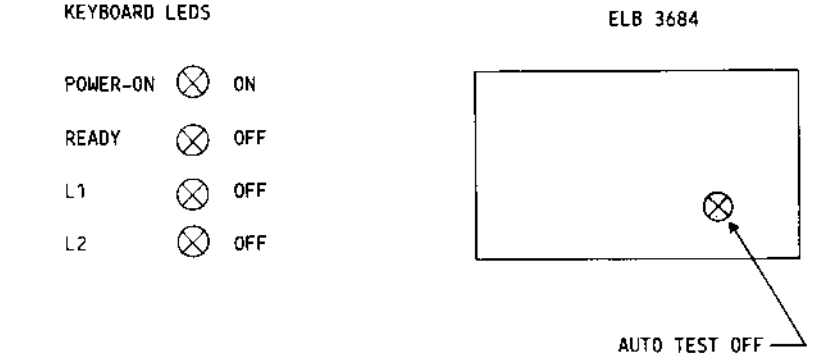


Fig. 3-2 LEDs Indicating State of Autodiagnostics

The table below shows the status of the LEDs according to the diagnostic test being executed.

TEST NO.	TYPE OF TEST	LEDS READY	L1	L2
1	ROM test	1	1	1
2	RAM test	1	1	0
3	Keyboard serial line test	1	0	1
4	Timer-counter CTC test	1	0	0
5	NOVRAM RAM test	0	1	1
6	Video RAM test	0	1	0
7	Video logic test	0	0	1
8	Serial lines test	0	0	0

The end of the test is indicated by a beep, and one of the following situations is then verified:

- The result of the test is positive, thus the diagnostic string is compiled; the Host can request this with a specific command to service channel #0 or it can be displayed in local mode.

- The result of the WS diagnostic tests go automatically into a loop and the error is indicated on an available output device.

- The result of the test gives a non-blocking error, thus the machine can either work ON LINE or in LOCAL mode, and the error is reported in the diagnostic string.

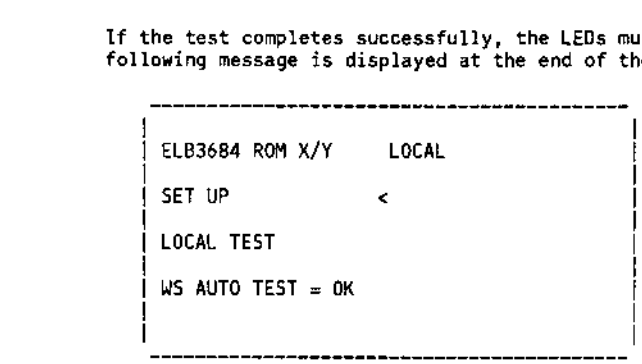
In all cases, the sequence of the tests is scanned by the keyboard LEDs with rotating configurations until the first error is detected: from this point the configuration of the LEDs remains the same even if there is an automatic recycle due to a blocking error.

In this case a beep is emitted at the end of each test cycle.

If the WS is in LOCAL, the results, positive or negative, are summed up on the display in the following way:

The result is: OK

If the test completes successfully, the LEDs must all be off and the following message is displayed at the end of the test:



The message "WS AUTO TEST = OK" is displayed in reverse video.

After this test it is possible to go on directly to SET UP or to LOCAL TEST by pressing the SKIP key. The selected environment is activated by pressing the ENTER key.

The result is :FAULT

If an error is detected during the test, one of the following situations occur:

If the error is of the blocking type, the test remains in the diagnostic phase, recycling indefinitely with the emission of a BEEP at the end of each cycle: the configuration of the keyboard LEDs (if present) remains the same.

If an error is detected in the display sync logic, which compromises monitor operation, the display signal is not enabled and thus the system cannot function in LOCAL mode; the switch must be turned to ON LINE in order to use the system, but the display cannot be used. The configuration of the keyboard LEDs informs the operator of this.

If the tests continue and the WS functions normally:

- The first error detected is indicated by the keyboard LEDs, the configuration of these LEDs shows which test has generated the error

- The test continues and terminates with the message FAULT on the display and the list of errors:

```
 ----------------------------------------
|                                        |
| ELB3683 ROM X/Y     LOCAL              |
|                                        |
| SET UP              <                  |
|                                        |
| LOCAL TEST                             |
|                                        |
| WS AUTO TEST = FAULT                   |
|                                        |
| XX  XX  XX  XX  XX  XX  XX  XX  XX  XX |
|                                        |
|                                        |
 ----------------------------------------
```

Row 5 contains the data on 10 bytes on the status of the autodiagnostics. Bytes 2 to 11 are released to the host on channel zero after the autodiagnostics, by means of the relevant command.

The following information is contained in each byte:

BYTE	TEST
1	GO-NO-GO
2	ROM
3	System RAM
4	Display RAM
5	Not assigned
6	NOVRAM
7	Display and type of display
8	CTC
9	Serial I/O controller and options present
10	Keyboard and presence of serial devices

Note: The bytes which contain an error are displayed blinking.

3.3 SET UP

The SET UP operation is performed in LOCAL mode, and is used to define the WS operating parameters.

It is an interactive operation whereby the operator uses a menu to introduce the new parameters via the keyboard. The operation is in two phases:

1. Introduction of new parameters

2. Validation of parameters

The SET UP operation writes the information provided by the operator into a non-volatile memory device (electrically modifiable). This component, known as NOVRAM, is composed of two memory planes, the first non-volatile, the second made up of the normal RAM. At power_on, the non-volatile part is automatically transferred onto the RAM part which can be read and written to by the WS program. The contents of the RAM can be transferred into the non-volatile NOVRAM by a STORE command. The NOVRAM is typically used instead of the traditional hardware jumpers due to its greater flexibility.

The NOVRAM has a capacity of 64 nibbles, equal to 256 bits.

NOTE: Particular attention should be paid to the STORE procedure, as the number of writes that can be made in the non-volatile part of the NOVRAM is limited to 1000.

3.3.1 STORE

The STORE operation is used to make modifications permanent. It is made up of two distinct phases (see SET UP operating procedures):

- STORE request

- Execution

If the NOVRAM is OK, the store request gives a Warning on the display with the number of STOREs which can still be executed. The request is refused if STORE NUMBER = 000.

Execution of the STORE procedure writes the modification permanently; the STORE NUMBER is decreased and the SET UP session is closed.

When a STORE is executed on a virgin NOVRAM, it has the following characteristics:

- It can be effected at the end of the autodiagnostic test in production (before packing), or in field when the NOVRAM is replaced.

- All the parameters are programmed (some by the program itself).

- It always terminates with an unconditional STORE.

The WS program must be able to tell that the NOVRAM is virgin, thus two bytes of the NOVRAM are reserved for a non-accessible signature. By probing this signature, the program can sense if the NOVRAM is to be written to for the first time, and can thus present a SET UP menu complete with the static information to be written.

3.3.2 NOVRAM CONTENTS

The following is a definition of the information/parameters contained in the NOVRAM.

byte 0 = NOVRAM STORE NUMBER (least significant digit in BCD)

byte 1 = NOVRAM STORE NUMBER (most significant digit in BCD)

byte 2 = identifies type of WS (in Hex)
ELB 3683 = 01H
ELB 3684 = 02H

byte 3 = WS hardware release number (in Hex)

The next 10 bytes are relative to the SET UP of the serial lines:

- HOST serial line

- AUX A serial line

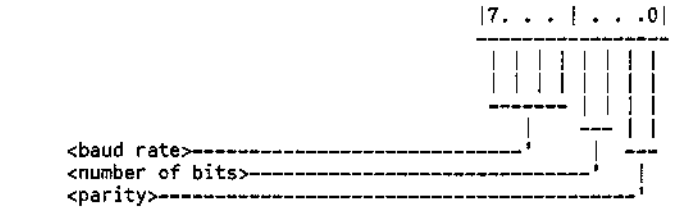
- AUX B serial line

- AUX C serial line (the two bytes 10 and 11 are only significant if the option is present)

- AUX D serial line (as for AUX C)

byte 4 ::= byte 6 ::= byte 8 ::= byte 10 ::= byte 12

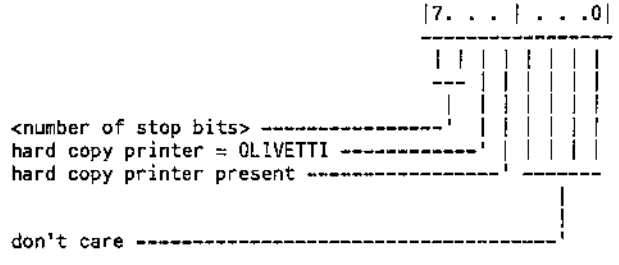
The format of a byte is shown below:



<baud rate>	0000 = synchronous mode 0001 = 50 bps 0010 = 75 0011 = 110 0100 = 134.5 0101 = 150 0110 = 200 0111 = 300 1000 = 600 1001 = 1200 1010 = 1800 1011 = 2400 1100 = 4800 1101 = 9600 1110 = 19200
<number of bits>	00 = 5 bits 01 = 6 10 = 7 11 = 8
<parity>	00 = no parity 01 = odd parity 10 = no parity 11 = even parity

byte 5 ::= byte 7 ::= byte 9 ::= byte 11 ::= byte 13

The format of a byte is shown below:

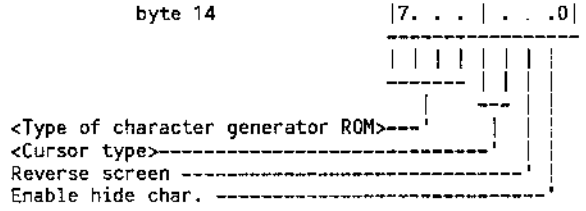


<number of stop bits> 00 = synchronous mode
01 = 1 stop bit
10 = 1.5
11 = 2

The next byte contains information on the type of character generator mounted in the WS and the programming of the visual attributes at screen level, selected by the SET UP.

byte 14 ::= <contents displayed>

The format of the byte is:



<Type of character generator ROM> ::= 0000 PK3Z (multifunctional)
0001 PK3Y (multif. extended)

<Cursor type> ::= 00 = underscore not blinking
01 = underscore blinking (default)
10 = reverse display block not blinking
11 = reverse display block blinking

The next byte is expressed in BCD and is used to program (in minutes) the display switch-off time, after which the display is automatically switched off when not in use.

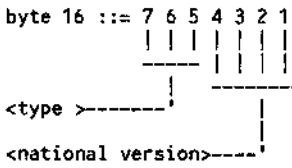
This time can be programmed from 00 to 99 minutes. The default is zero minutes, i.e., the option is not selected.

This timer is reset at the next operation displayed.

byte 15 ::= display OFF time code (in BCD)

byte 16 ::= type of keyboard and national version

byte 16 ::= 7 6 5 4 3 2 1 0



<type> ::= 000 ANK 1401, ANK 1402, ANK 1405, ANK 1406
unified multifunctional (default)
001 All other types

<national version> ::= 00000 Germany
00001 Portugal
00010 Spain
00011 Denmark
00100 France
00101 Italy
00110 Norway
00111 Sweden Finland
01000 Great Britain
01001 USA ASCII (default)
01010 Swiss German
01011 Swiss French

Bytes 17 to 29 are reserved for future use.

bytes 17 - 29 ::= (reserved for future use)

The final two bytes contain the NOVRAM signature.

byte 30 ::= NOVRAM signature lower byte (C3H)

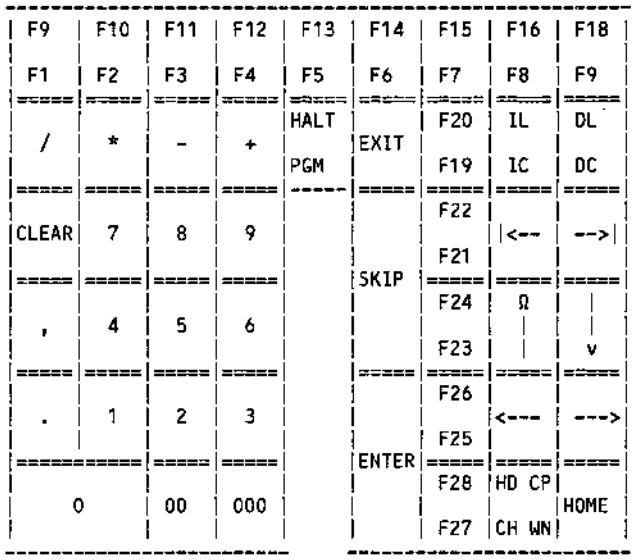
byte 31 ::= NOVRAM signature upper byte (A5H)

3.3.3 SET UP OPERATING PROCEDURES

As described previously, the SET UP feature used in LOCAL mode allows the variable WS operating parameters to be initialized/modified.

Interactive use of the WS in LOCAL mode only concerns a portion of the display equal to 7 rows of 40 characters (the first 40 characters of rows 1 to 7 for the 15" display; the odd rows for the 5" and 9" displays) and to the "numeric + functions" section of the keyboard, which is assumed to always present.

The part of the keyboard to use is shown in the following figure.



Layout of the Part of Keyboard to be Used

The STORE procedure differs according to whether the NOVRAM has been written to at least once, or whether it is virgin (the program knows the NOVRAM is virgin when there is no signature).

3.3.4 STORE PROCEDURE ON VIRGIN NOVRAM

If the program detects that there is no signature, the NOVRAM must be completely and unconditionally written at the end of the SET_UP operations.

The contents which can be written by the operator are displayed on the screen in two phases; the first presents the static or private WS information, the second provides information relative to the variable parameters which affect physical operation of the channels.

Phase 1

The menu of phase 1 is accessed in the following way:

- Turn the LOCAL operating mode selection switch to ON
- Turn the power switch to ON
- Wait for the results of the autodiagnostics (the following step can only be performed if the auto test gives the OK result)
- Press the ENTER key to select the SET UP (from the autodiagnostics menu)
- Wait for the phase 1 menu to be displayed

The phase 1 menu has the following format:

```
column  12345678901234567890123456789012345678901234567890
        ------------------------------------------------
        |                                              |
        | ELB 3684 ROM X/Y   LOCAL     SET UP A        |
        |                                              |
        | 02 XXXXXXXX        <                         |
        |                                              |
        | 03 XXXXXXXX                                  |
        |                                              |
        | 16 XXXXXXXX                                  |
        |                                              |
        | 17 XXXXXXXX                                  |
        |                                              |
        | 18 XXXXXXXX                                  |
        |                                              |
        | 19 XXXXXXXX                                  |
        |                                              |
        ------------------------------------------------
```

The menu is interpreted as follows:

- Columns 1 and 2 show the number of the NOVRAM byte to be initialized (refer to the section "CONTENTS OF THE NOVRAM" for the function of the byte)
- Columns 4 to 11 show the field to be initialized, with reference to the bytes indicated in columns 1 and 2, decoded into bits (refer to the section "CONTENTS OF THE NOVRAM" for the interpretation of the contents)

Press the SKIP key to go from one field to the next

At the end of phase 1, the menu to compile the functional parameters is then displayed (phase 2).

Phase 2

The display has the following format:

```
column 12345678901234567890123456789012345678901234567890
       ------------------------------------------------
       |                                              |
   1   | SERIAL H A B        LOCAL     SET UP B       |  1
       |                                              |
   2   | SPEED = XXXXX       <                        |  3
       |                                              |
   3   | BIT   = X                                    |  5
       |                                              |
   4   | PAR   = X                                    |  7
       |                                              |
   5   | STOP  = X.X                                  |  9
       |                                              |
   6   | MPLEX = XX                                   | 11
       |                                              |
   7   | VIDEO = XXXXX XX                             | 13
       |                                              |
       ------------------------------------------------
```

The menu is interpreted as follows:

- Row 1 shows the list of the RS232 serial lines to be programmed (H = common line for host)
- The selected line is shown in reverse video
- Lines C and D only appear in the menu if the double RS232 option (not currently available) is present
- Fields SPEED, BIT, PAR, STOP and MPLEX are shown with their default values if the NOVRAM is virgin, or with the current NOVRAM values
- When the up cursor key (Ω) is pressed, the values are incremented. Once the required value has been selected, press the SKIP key to go on to the next parameter of the same line
- When the selected line has been programmed, the right cursor key (-->) selects the next serial line to be programmed (the index in row 1 is shown in reverse video) and the cycle is repeated
- Once the lines have been programmed, when the SKIP key is next pressed the cursor goes to row 7, where the display parameters and the display switch-off time are programmed
- Another SKIP causes a return to the start of phase 1
- Pressing the EXIT key completes programming, recalls an unconditional STORE and displays the start menu (LOCAL) again.

NOTE: The recall of an unconditional STORE causes bytes 0 and 1 of the NOVRAM to be compiled with value 999 (decimal); these bytes indicate the residual number of STOREs which can be effected on the NOVRAM. The first time the NOVRAM is used, the signature is compiled by the two bytes 30 and 31 with values A5 and C3 (hex).

The current NOVRAM parameters are shown below as they are presented in the menus of the two phases; in phase 1 they are defined as private WS parameters and in phase 2 as variable parameters.

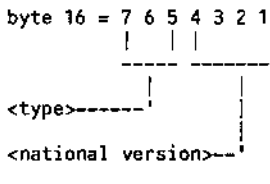
Private WS Parameters

3 fixed parameters are currently defined:

1. byte 02 = Identifies type of WS (02H for the ELB 3684)

2. byte 03 = WS hardware release number (binary)

3. byte 16 = type of keyboard and national version (binary)



<type> ::= 000 ANK 1401, ANK 1402, ANK 1405, ANK 1406
unified multifunctional (default)
001 All others types

<national version>::= 00000 Germany
00001 Portugal
00010 Spain
00011 Denmark
00100 France
00101 Italy
00110 Norway
00111 Sweden Finland
01000 Great Britain
01001 USA ASCII (default)
01010 Swiss German
01011 Swiss French

The parameters of bytes 17, 18 and 19 are not assigned, but are available for other information which will then be included in the diagnostic string.

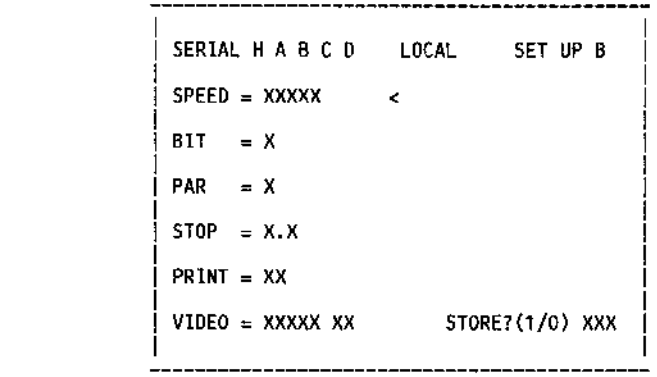
WS Variable Parameters

```
1  SPEED = XXXXX   baud rate (in decimal) from 50 to 19200 baud

2  BIT   = X       number of character bits (in decimal)
                   from 5 to 8

3  PAR   = X       parity bit (in ASCII)
                   N = no, E = even parity, O = odd parity

4  STOP  = X.X     number of stop bits (in decimal)
                   1.0, 1.5, 2.0

5  MPLEX = XX      type of connection with or without controllers

                   XX = NN Current Loop or RS232 connection
                   XX = YY connection with error controllers or
                          static multiplexers

6  VIDEO = XXXXX XX display attributes (in 5 bit binary) and
                    display switch-off time (in two digit BCD)

 display attributes and cursor format       XXXXX  00100 default
                                             |||||
<type of character generator ROM>------------'||||
 0 = PK3Z (multifunctional)                  ||||
 1 = PK3Y (multif. extended)                 ||||
                                             ||||
<type of cursor>-----------------------------'|||
 1= reverse video block                      |||
 0= underscore                               |||
                                             |||
<Blinking Cursor>----------------------------'||
                                              ||
<Reverse screen>-----------------------------'|
                                               |
<Enable hide char>-----------------------------'

Number in BCD of minutes for display switch-off time XX  default 00
```

3.3.5 NORMAL SET UP

This is the normal operation to modify parameters when the NOVRAM has already been initialized. It can be terminated with a STORE operation, that is, the parameters are made permanent and are valid each time the WS is power up, or with a NON STORE; in this case the parameters are only valid for the current session.

The menus and operation are identical to those described in the previous section (STORE PROCEDURE ON VIRGIN NOVRAM) except that in phase 2 of SET UP B, the store request is displayed on the screen.



- At the end of programming, the EXIT key activates the store request
- The message STORE is displayed blinking when the request is activated
- Pressing 1 executes the STORE, pressing 0 means the STORE is not executed
- The operation is followed by a numeric field indicating how many STOREs can still be performed
- If the number is 000 the store request is refused
- Pressing SKIP recycles SET UP B, EXIT returns to the start menu LOCAL

3.4 LOCAL TEST

If the WS is accessed in LOCAL, the operator has a set of keyboard commands with which to test the internal functions, in recycling mode if necessary, and also tests the operation of the main peripherals connected:

- Keyboard_display
- PIN PAD
- Card reader
- Auxiliary Devices

It is assumed that the results of all the tests have been displayed on the screen. The menu in LOCAL is shown below.

```
   ------------------------------------------
   |                                        |
1  | ELB3683 ROM X/Y     LOCAL              |  1
   |                                        |
2  | SET UP                                 |  3
   |                                        |
3  | LOCAL TEST          <                  |  5
   |                                        |
4  | WS AUTO TEST = OK                      |  7
   |                                        |
5  |                                        |  9
   |                                        |
6  |                                        | 11
   |                                        |
7  |                                        | 13
   |                                        |
   ------------------------------------------
```

Press the SKIP key to move the cursor from the SET UP line to the LOCAL TEST line.

Press the ENTER key to go on to the LOCAL TEST, and thus to the following menu:

```
   ------------------------------------------
   |                                        |
   | ELB3683 ROM X/Y     LOCAL     TEST     |
   |                                        |
   | EXTL                <                  |
   |                                        |
   | LOOP                                   |
   |                                        |
   | DVCS                                   |
   |                                        |
   | INFO                                   |
   |                                        |
   |                                        |
   ------------------------------------------
```

A test (and thus the subsequent menu) is normally selected by using the SKIP key to move the cursor and the ENTER key to select the required test. As can be seen from the menu, the following tests can be executed:

- **EXTL:** The tests are accessed and recycled indefinitely with serial line loopback via loopback plugs on the external connectors
- **LOOP:** The same tests as EXTL with internal serial line loopback
- **DVCS:** Tests the connected peripherals
- **INFO:** The operator can request the contents of areas of the system memory to be displayed on the screen

3.4.1 EXTL

Once the test is selected, the following menu is displayed:

```
+-----------------------------------------+
|                                         |
| ELB3683 ROM X/Y     LOCAL     TEST  EXTL |
|                                         |
|                                         |
| TEST = X                                |
|                                         |
|                                         |
+-----------------------------------------+
```

- the message EXTL is displayed in reverse video
- the cursor appears on the field X to be compiled
- the number of tests to be run is entered
- the CLEAR key returns to the previous step
- the ENTER key starts test execution, and the test recycles indefinitely
- the HALT PGM key stops the test and recalls the LOCAL TEST EXTL menu
- the EXIT key returns to the previous menu (LOCAL TEST)

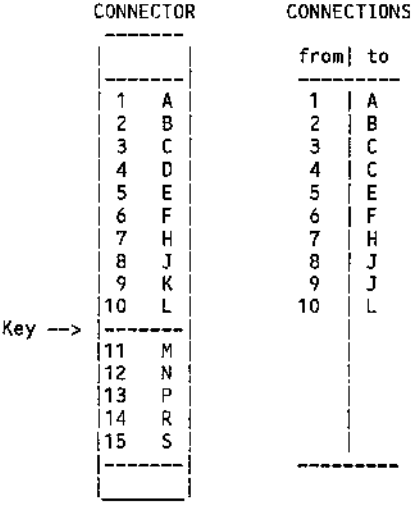
The list of tests which can be executed in recycling mode is shown below:

X = 0 : ROM test
1 : RAM test
2 : NOVRAM test
3 : Display RAM test
4 : Timer_counter CTC test
5 : Test of serial line dedicated to the Host (with external loopback)
6 : Test of RS 232 serial line (with external loopback)
7 : Test of serial line dedicated to the PIN PAD TTL (with external loopback)
8 : Test of serial line dedicated to the CARD READER (with external loopback)
9 : All the tests (from test 0 to test 8 with return to test 0)

Tests 5, 6, 7 and 8 require an external loopback plug. The loopback plugs used in the tests are shown in the following tables.

LOOPBACK CONNECTOR FOR HOST IN CURRENT LOOP

The loopback plug is prepared by performing the following connections:



NOTE: The following components are required for the loopback connector:

- AAMP TWIN 15 x 2 connector (1)
  Olivetti code no. 5784851 Y

- Contacts (14), Olivetti code no. 5784860 Y

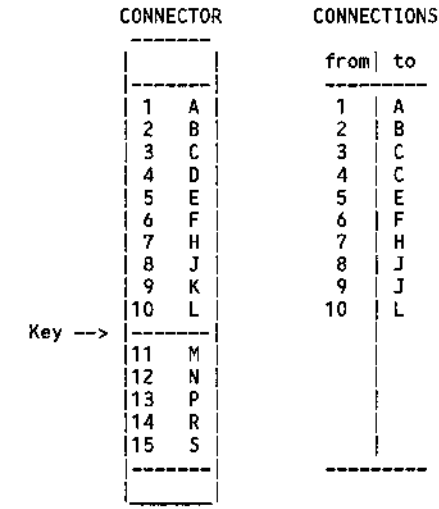
- AWG 24/28 cable
  Length: 8 connections (0.4 m)

- Key (1), code no. 334267 B

The cable must be cut with the relevant tool
AMP code no. 90277-1

LOOPBACK CONNECTOR CHANNELS A AND B IN RS232

The loopback plug is prepared by performing the following connections:



Note: The following components are required for the loopback connector:

- AAMP TWIN 15 x 2 connector (1)
  Olivetti code no. 5784851 Y

- Contacts (18), Olivetti code no. 5784860 Y

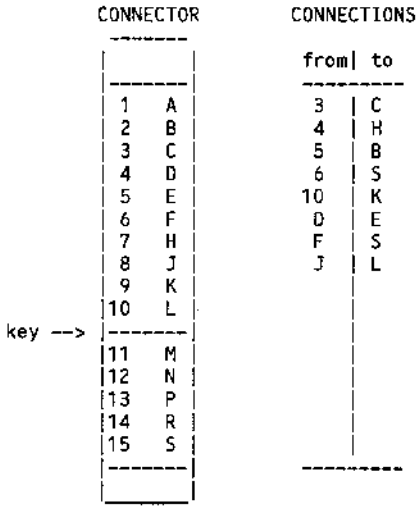
- AWG 24/28 stranded cable
  Length: 8 connections (0.4 m)

- Key (1), code no. 334267 B

The cable must be cut with the relevant tool
AMP, code no. 90277-1

LOOPBACK CONNECTOR FOR PIN PAD AND BADGE READER

The loopback plug is prepared by performing the following connections:

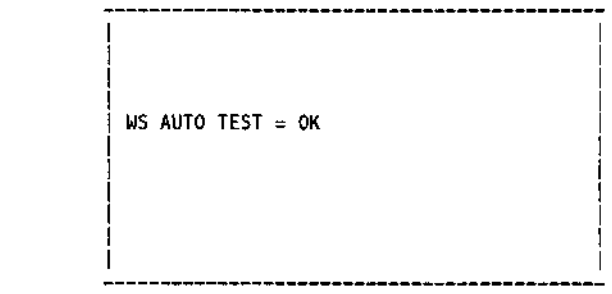


Note: The following components are required for the loopback connector:

- AAMP TWIN 15 x 2 connector (1)
  Olivetti code no. 5784851 Y
- Contacts (18), Olivetti code no. 5784860 Y
- AWG 24/28 stranded cable
  Length: 8 connections (0.4 m)
- Key (1), code no. 334267 B

The cable must be cut with the relevant tool.
AMP code no. 90277-1.

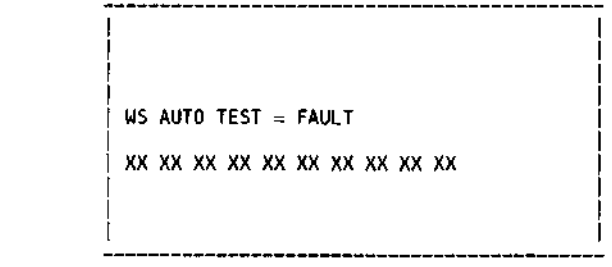
The following message is displayed on the screen during the test:



The message WS AUTO TEST is in highlight and is displayed in a square. The message OK is in reverse video. The space between the 'T' and the '=' contains the character '?' with the hide attribute; as hide is enabled at screen level, this character is not visible.

This message appears on the screen at the end of each test loop selected by the operator and remains for a fraction of a second before being cancelled at the beginning of the next loop.

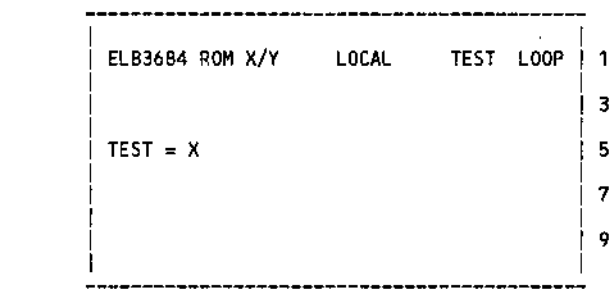
If an error is detected during the test, the following message is displayed:



where the sequence XX represents the display of the 10 bytes indicating the result of the diagnostic tests; the tests that have failed are displayed blinking.

3.4.2 LOOP

The following menu is displayed:

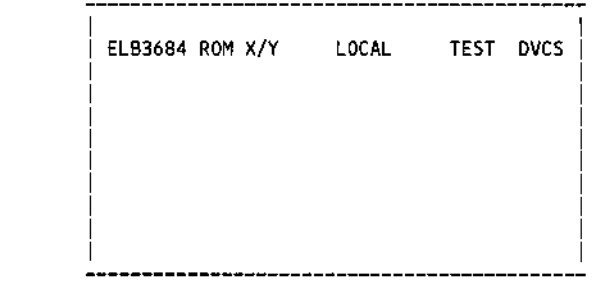


Operator intervention and the messages are the same as for the EXTL tests.

The tests are also the same as EXTL, with the difference that the serial lines are looped back internally. The lines can thus be tested with the cables connected.

3.4.3 DVCS

This environment activates the tests of the peripheral devices connected. The tests are of the simple type and are not repetitive.
The following menu is displayed with the message DVCS in reverse video:



Function keys F1, F2, F3 and F4 select on which peripheral channel to send the string of characters entered via the keyboard, as follows: (F1 -> AUX_A), (F2 -> AUX_B), (F3 -> AUX_C/BADGE), (F4 -> AUX_D/PIN_PAD).

The SKIP key handles the ASCII string as a channel command, while the ENTER key handles the string as DATA for the peripheral.

A control operation is performed on the maximum length of the data string introduced (displayed on the screen except for the function key which selects the target channel): commands longer than 10 are refused, and data strings longer than 64 are truncated.

Data strings received from the peripherals are displayed in full, including the part of the MUX/WS protocol, without any control of length, and so are the responses to commands received in loop from the channel handling driver to which the peripheral is connected.

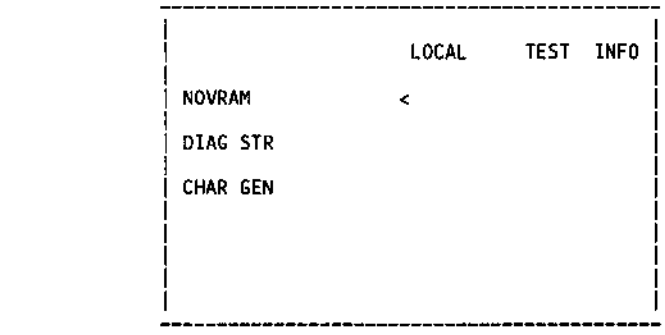
As the coding of commands of the MUX/WS protocol requires codes greater than '9', the WS requires a full keyboard (not reduced) in order to be able to use all the features of the DVCS option.

The keyboard can be used to test the display, by sending sequences of data or commands according to the specifications of commands for the keyboard/display terminal.

The EXIT key causes the end of the test and the return to LOCAL TEST DVCS.

3.4.4 INFO

Press ENTER to activate the following menu:



This test allows specific memory contents to be displayed.

The SKIP key selects the option, and the ENTER key activates the option.

- NOVRAM: the whole contents of the NOVRAM (32 bytes) are displayed.

  The EXIT key recalls the LOCAL TEST INFO menu.

- DIAG STR: the whole diagnostic string is displayed as it was compiled when the WS was powered up or after modifications using the SET UP procedure.

  The EXIT key recalls the LOCAL TEST INFO menu.

- CHAR GEN: the contents of the character generator ROM are displayed. There can be two types of ROM: with 256 or 512 characters. With 256 characters, the single page is displayed on the whole of the available screen, and pressing key WN repeats the same page. With extended ROM, the key WN causes the ALTERNATIVE SET of characters to be displayed.

  The EXIT key recalls the LOCAL TEST INFO menu.

- A further EXIT returns to LOCAL TEST. A third EXIT causes a return to LOCAL.

To exit from local environment, the external switch must be turned to the ON LINE position.

4. INSTALLATION, ASSEMBLY AND DISASSEMBLY OF THE ELB 3684

This chapter is subdivided into four sections, each dedicated to a specific aspect of installation of the work station.

The first part consists in a brief introduction to preparing the site for system installation.

The second part deals with assembling and disassembling the ELB 3684.

The third section deals with the ELB 3684 power supply, while the last part is dedicated to the installation of the optional modules.

4.1 SITE PREPARATION

The conditions set out below should be followed to prepare the site for the WS and its peripherals.

Main Power Supply

Cables and switches must be of suitable dimensions to support the expected work load.
The ohmic resistance of the ground device must meet the requirements of the National Standard. A value of 50 Ohms is sufficient to protect from interference. The Italian standard ENPI requires not more than 20 Ohms for the protection of the operator.

Electrical Noise

The work station should be isolated from sourced of electrical noise and from equipment which may cause excessive variations in the voltage levels or which introduce heavy inductive or capacitive loads into the circuit.

However, some of the normal small office machines are allowed on the same line as an L1/L2 system work station, and it is also possible to connect several work stations to the same power mains, as long as each work station is plugged in separately.

Dust

Work stations based on the ELB 3684 can be installed in a normal office with a maximum of 0.25 mg/mc of dust.
A high percentage of dust affects above all the badge reader, by reducing the useful life of the head.

Air Flow and Temperature

The ELB 3684 can be mounted on a table or on any surface which allows free circulation of air for the power supply. If there are limitations in air circulation due to the proximity of other units, the air flow through the ELB 3684 must not be less than 8 litres per minute, and the temperature must be within 10^{o} C and 40^{o} C.

Operating Area

All parts of the work station must be accessible for servicing and when several work stations are installed, the slots must not be obstructed or facing each other. The following figure shows the air flow slots on the ELB 3684.

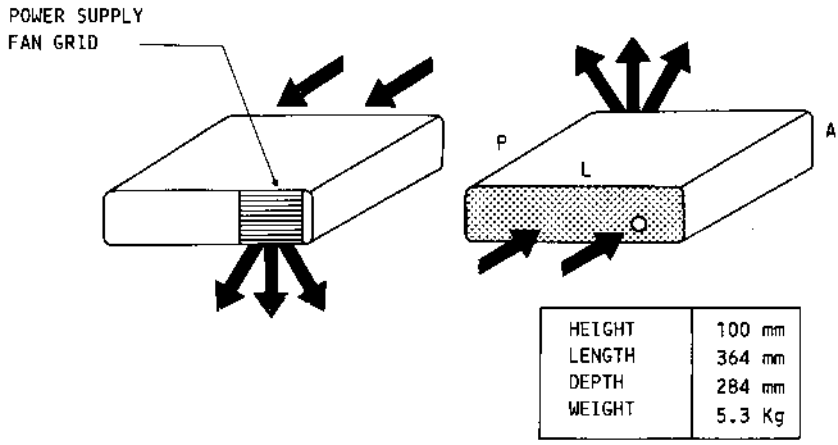


Fig. 4-1 ELB 3684 Ventilation

4.2 ASSEMBLY AND DISASSEMBLY

4.2.1 REMOVING AND REMOUNTING THE ELB 3684 COVER

The cover of the ELB 3684 is removed in the following way (refer to figure 4-2):

- Switch the system off
- Undo the two screws of the cover (ELB connector panel) and leave them in the panel
- Remove the cover by pulling it in the direction indicated by arrow A and then lift it up as shown by arrow B.

Replacing the Cover

- Insert the tabs on both sides of the ELB 3684 (front) in the corresponding grooves on the cover and push the cover into place
- Replace and tighten the cover screws

Note: Before replacing the cover, ensure that the cover and chassis grounds are in place.

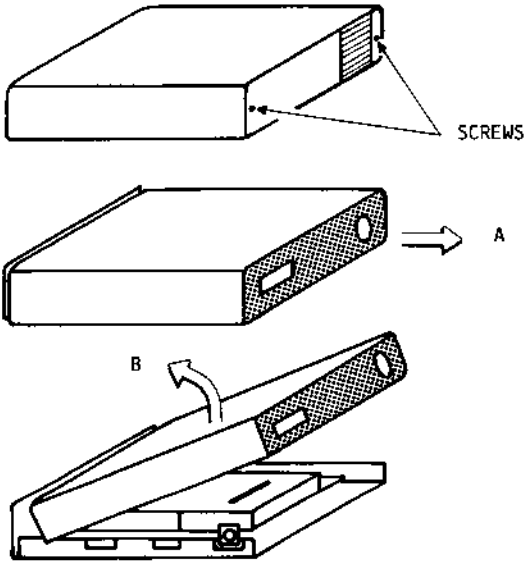


Fig. 4-2 Removing the ELB 3684 Cover

4.2.2 REPLACING THE FUSE

There is a current limiting fuse mounted in the power supply at the AC current input of the ELB 3684. This section describes the procedure to replace this fuse.

- Switch the system off.
- Remove the cover of the ELB 3684 (see section 4.2.1).
- Remove the cover of the power supply; figure 4-3 shows how it is secured
- Remove the fuse (see figure 4-4) and replace it with a new fuse (1.6 A for the 220 Volt version and 2.5 A for the 110 Volt version).

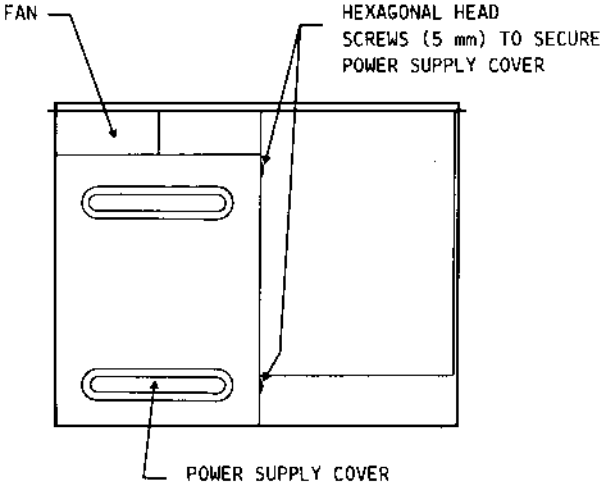


Fig. 4-3 Internal View of the ELB 3684

4.3 ELB 3684 POWER SUPPLY

The power supply group is made up of a metal structure containing the electronic board (power supply-mains filter) and the AC mains distribution.

The power supply is of the switching type, and is known as the ALI LG03 (see figure 4.5). It is available in the following versions:

1. With power voltage 110 V: in this case the power supply must have a 2.5 A slow fuse (6 x 32 mm), jumper A should be open, jumper B closed and the cooling fan operating at 110 V

2. With power voltage 220 V: in this case the power supply must have a 1.6 A slow fuse (5 x 20 mm), jumper A should be closed, jumper B open and the cooling fan operating at 220 V

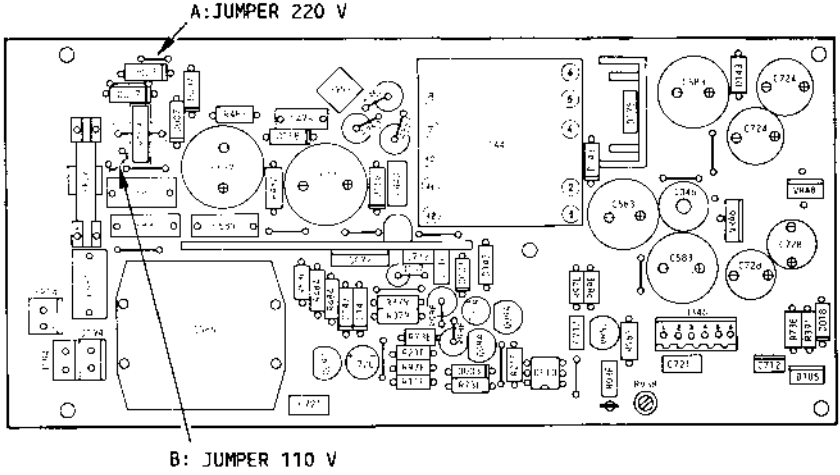


Fig. 4-4 Power Supply Board ALI LG03

4.3.1 ALI LG03 INPUT CHARACTERISTICS

The electrical input characteristics for the LG03 power supply for the work station based on the ELB 3684 are listed below:

110 V Version: AC input 100 V nominal (+10%, -15%); 110 V nominal (+10%, -15%); 115 V nominal (+10%, -15%); or 120 V nominal (+10%, -15%).
The voltage variability field is thus 85 -132 V, and its insensitivity to mains failures is 100% for 0.5 cycles and 30% for 25 cycles with reference to the minimum nominal voltage.
Frequency 50/60 Hz normal (from 47.5 to 63 Hz).

220 V Version: AC input 220 V nominal (+10%, -15%) or 240 V nominal (+10%, -15%).
The voltage variability field is thus 187 -264 V, and its insensitivity to mains failures is 100% for 0.5 cycles and 30% for 25 cycles with reference to the minimum nominal voltage.
Frequency 50/60 Hz normal (from 47.5 to 63 Hz).

Power absorbed by the mains in the two versions is 50 VA.

4.3.2 ALI LG03 OUTPUT CHARACTERISTICS

The electrical output characteristics of the LG03 power supply are shown below with the load limits:

VOLTAGE [V]	TOLERANCE	Imin. [A]	Imax [A]
+ 5	+/- 2.5	3.0	4.5
+12	+/-10.0	0.085	0.3
-12	+/-10.0	0.0	0.3

4.3.3 CONTROL OF POWER VOLTAGES

The following figure shows the points at which to measure the output voltage (+5 V, +12 V and -12 V).

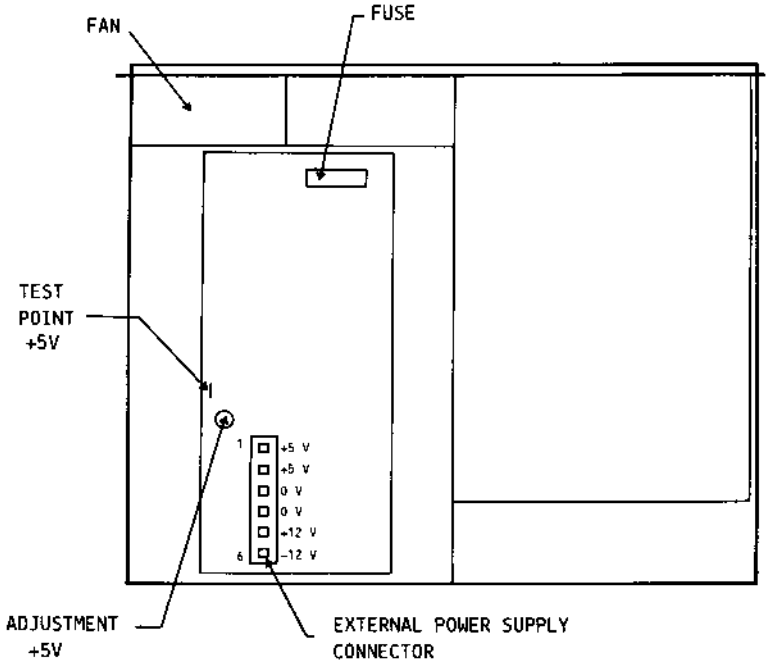


Fig. 4-5 Power Supply LG03 - Output Voltage Test Points

The output voltages are regulated in production and thus should not need to be adjusted. However, if the voltage values are out of tolerance, they should be adjusted using the potentiometer shown in the previous figure (figure 4-5).

4.3.4 MAINS GROUP

The following figure shows the AC distribution for the work station based on the ELB 3684.

Note: The mains distribution requires an input plug, a switch and an output socket for display power supply.

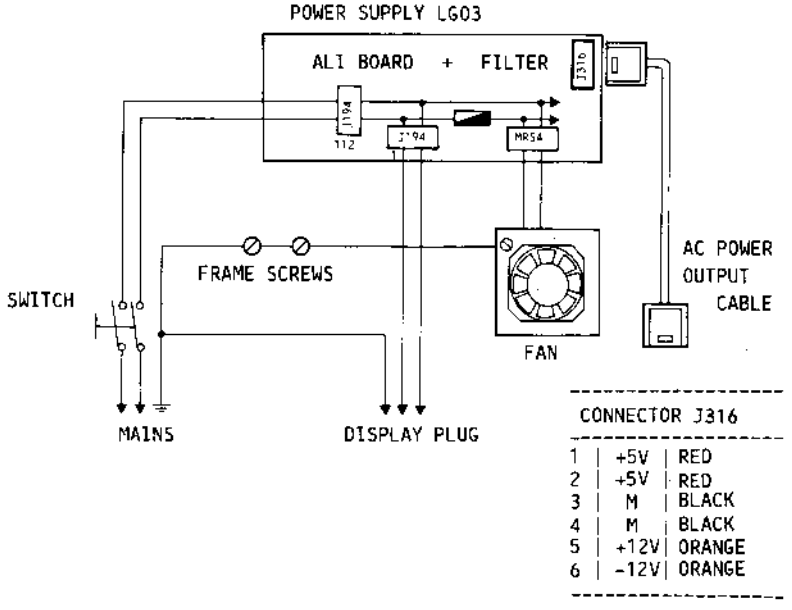


Fig. 4-6 AC Distribution for the ELB 3684

4.4 OPTION INSTALLATION

An optional board (GO 329) can be mounted to handle banking peripherals of the bichannel type (one for the pin-pad and one for the badge).

The board is supported by the motherboard with columns and connection to the Z80 bus is via a cable with insulating perforations.

The two electrical interfaces for pin-pad and badge are both of the TTL type, the output to the two units is on the same terminal strip.

Communication of the pin-pad is of the asynchronous serial half duplex type at 2400 bauds, and the following model can be connected: the PIN 1440

Communication with the badge unit is of the synchronous type with peripheral clock, and the following models can be connected:

- Badge reader/writer MRW 1810
- Badge reader MBR 1932

4.4.1 OPTIONAL BOARD INSTALLATION PROCEDURE

The optional board for Pin Pad and Badge Reader is installed in the following way (refer to figure 4-7):

- Switch the work station off
- Remove the cover of the ELB (see section 4.2.1)
- Remove the plastic cover from the options connector, located on the back panel of the ELB
- Place the two plastic spacers on the ELB logic board (they must both be facing upwards)
- Place the optional board on the two plastic spacers
- Secure the optional board with 5 mm hexagonal screws
- Insert the optional cable, ensuring that the connectors on the optional board and on the ELB logic board are paired correctly
- Replace the cover of the ELB
- Insert the cable in the pin pad or badge reader and in the WS adapter (connector labelled "OPTION" located on the back panel of the ELB) and secure the relative connectors
- Switch the work station on and run the DVCS tests (local operating mode), described in section 3.4.3 to control that the pin pad or badge reader and the work station are operating correctly

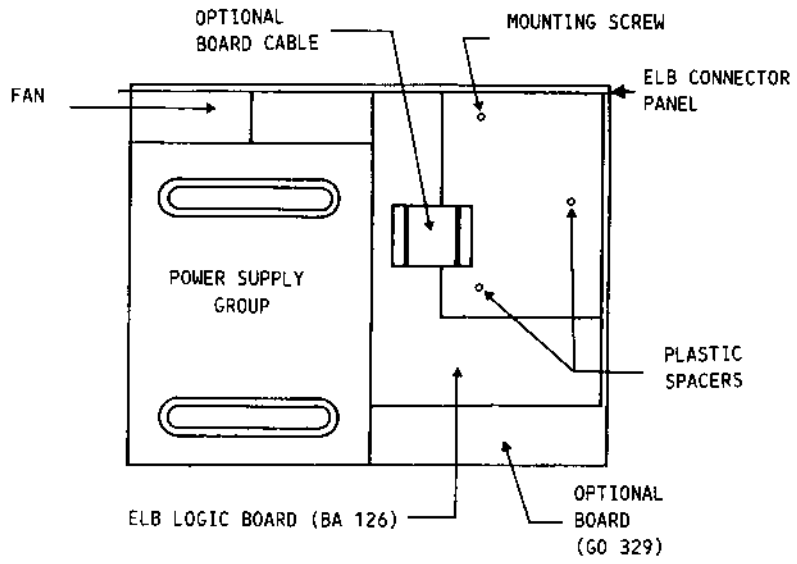


Fig. 4-7 Installing the Optional Board for Pin Pad and Badge Reader

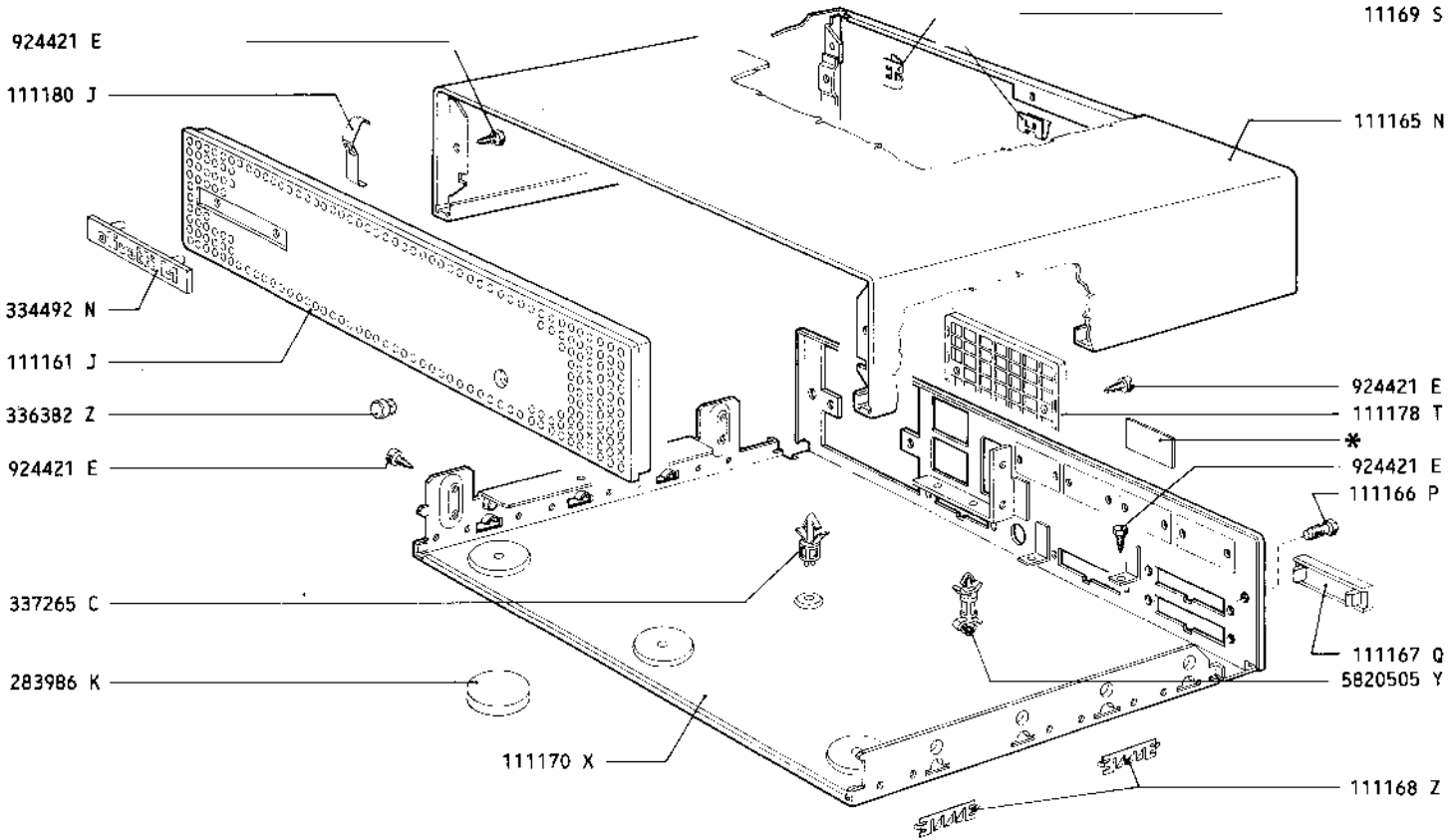
NOTA
Il CATALOGO PARTI DI RICAMBIO é l'unico documento al quale fare riferimento per ordinare le parti alla GESTIONE RICAMBI.
Codici indicati su altre documentazioni non sono fornibili.

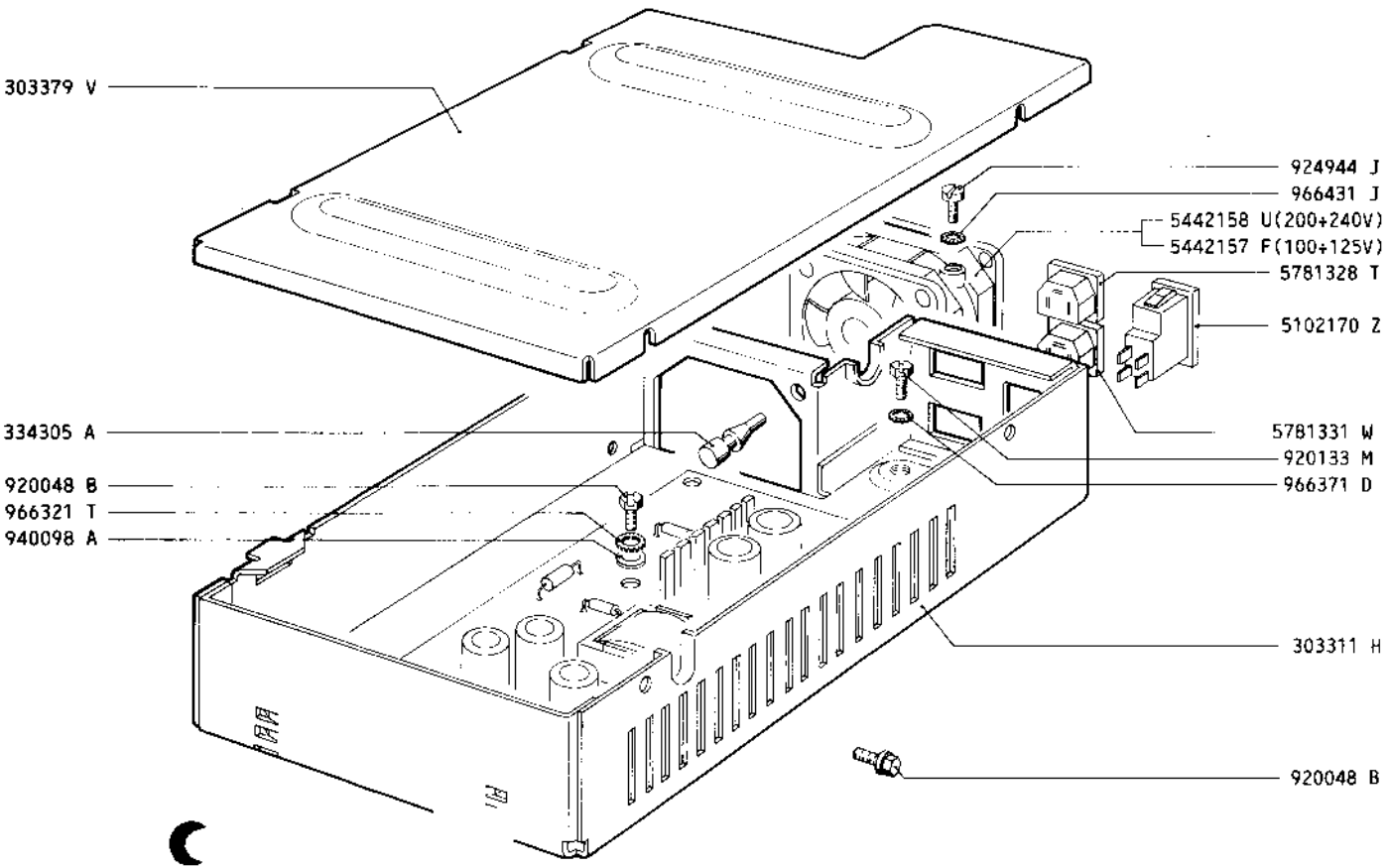
NOTE
The SPARE PARTS CATALOGUE is the sole reference document for ordering the spare parts from GESTIONE RICAMBI.
Other part numbers reported in different documentation are not delivered.

ELB 3684

*

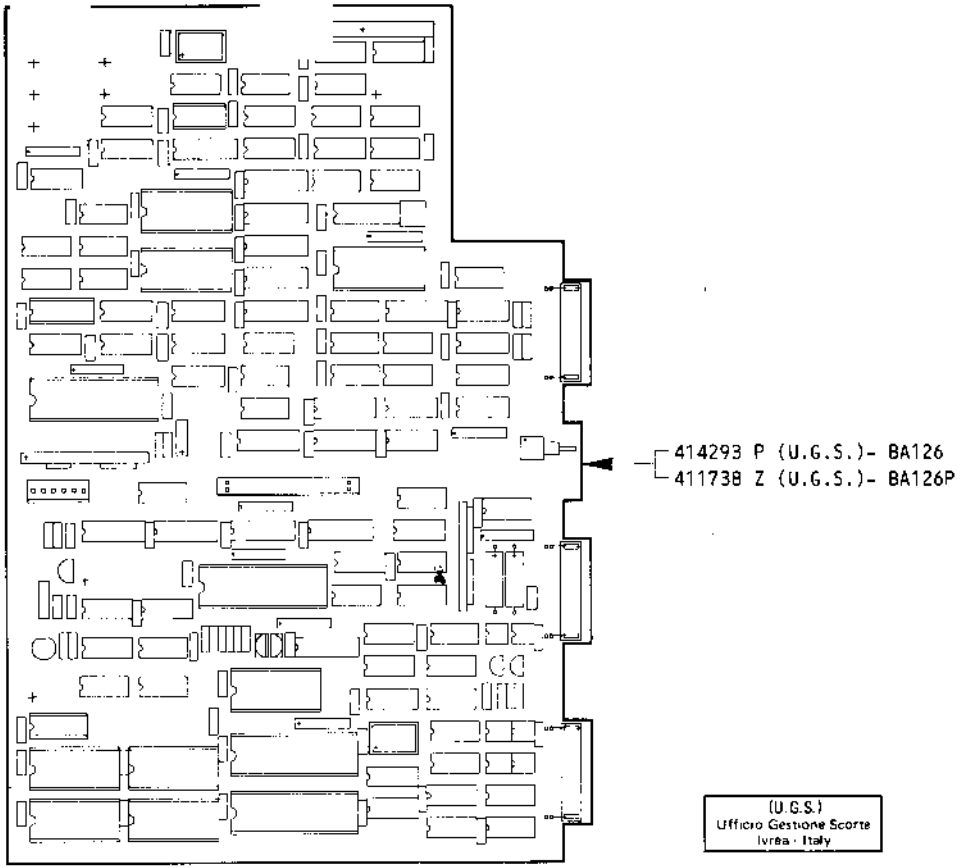
TARGHETTE TENSIONI Voltage Labels	
CODICE Code	NOME TARGHETTA Label Name
026538 J	120V 50W 50Hz
026540 Y	120V 50W 50Hz
026537 H	220V 50W 50Hz
026535 F	240V 50W 50Hz
026539 K	100V 50W 60Hz
125131 A	115V 50W 60Hz
125032 A	220V 50W 60Hz


924421 E
111180 J
334492 N
111161 J
336382 Z
924421 E
337265 C
283986 K
111170 X
11169 S
111165 N
924421 E
111178 T
*
924421 E
111166 P
111167 Q
5820505 Y
111168 Z

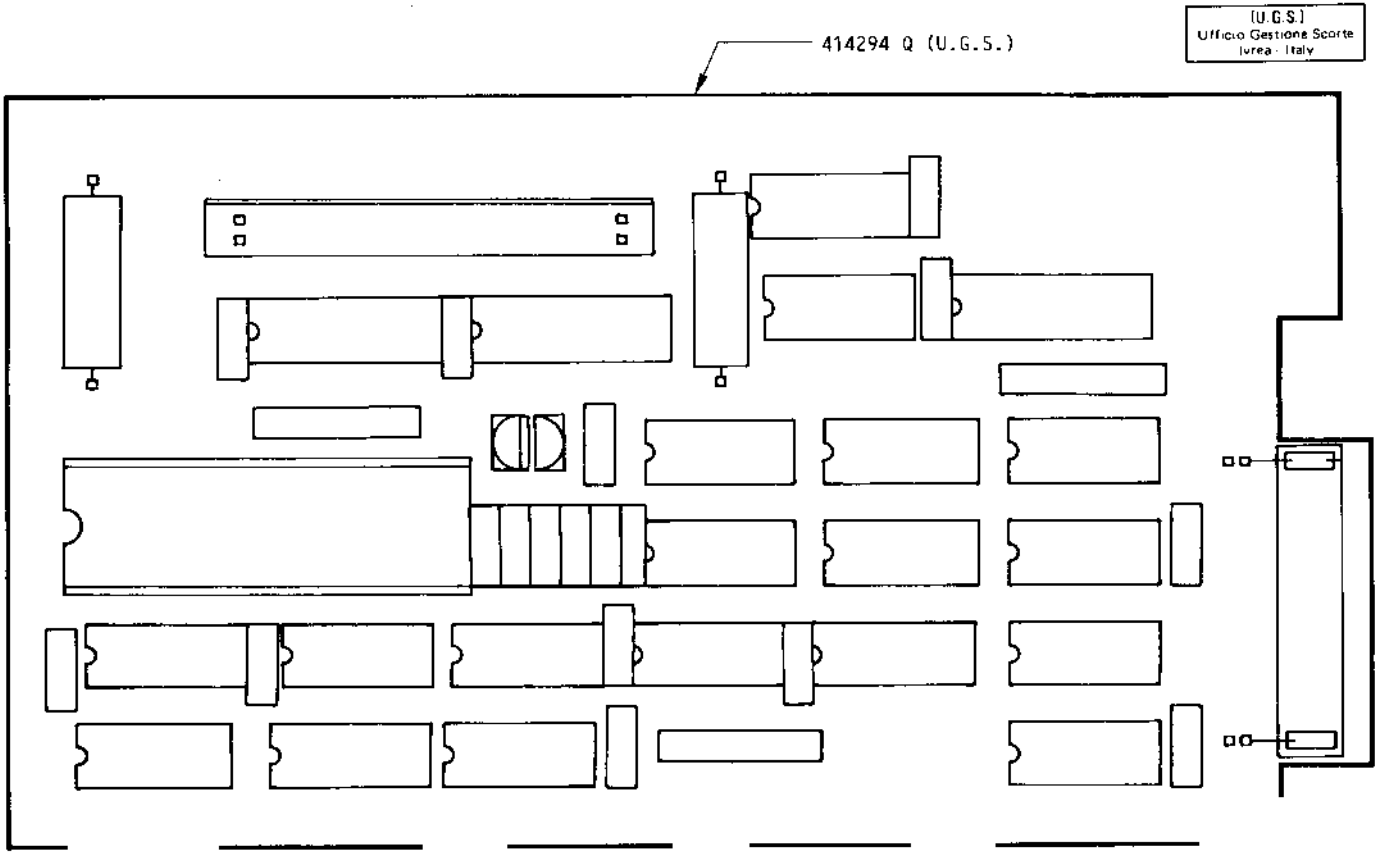

303379 V
924944 J
966431 J
5442158 U(200÷240V)
5442157 F(100÷125V)
5781328 T
5102170 Z
334305 A
5781331 W
920133 M
920048 B
966371 D
966321 T
940098 A
303311 H
920048 B

PIASTRE BOARDS

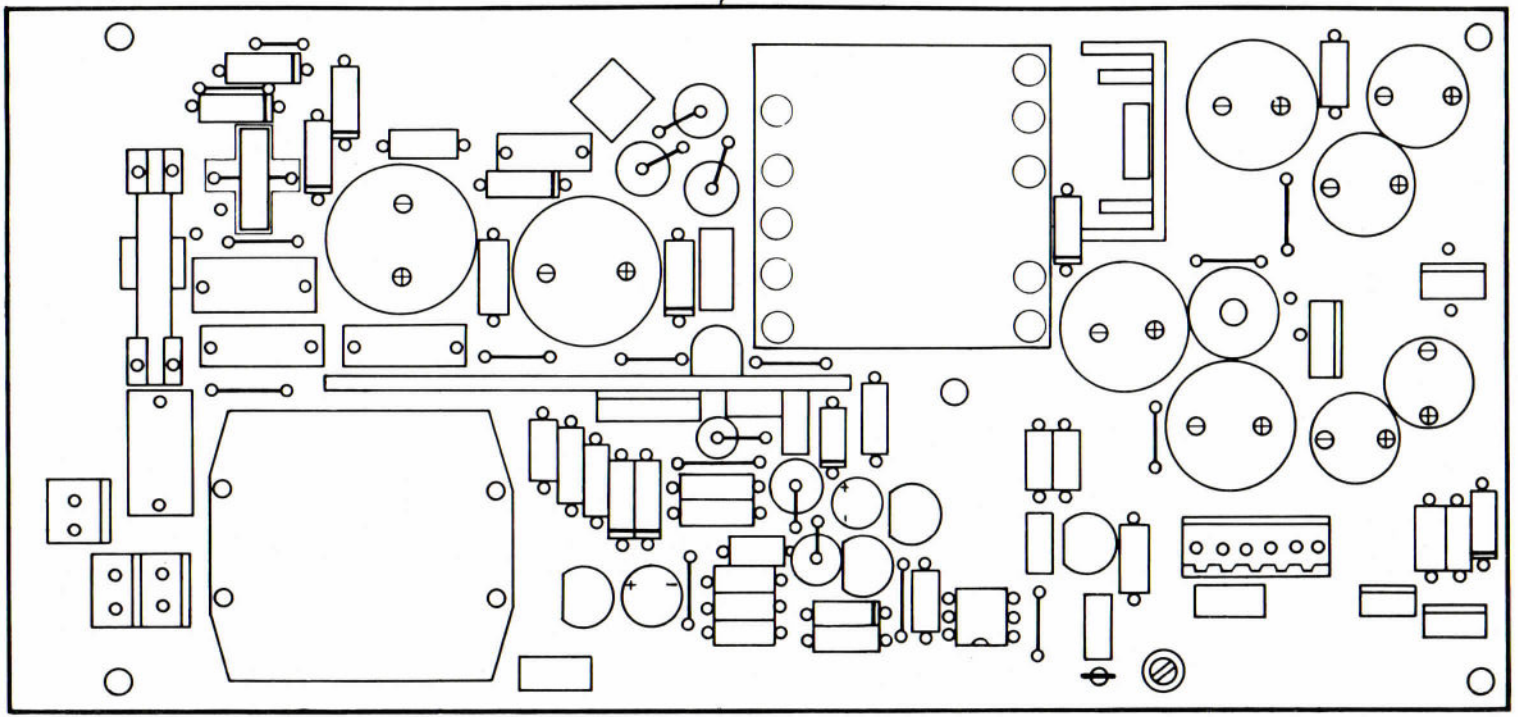
CODICE CODE	NOME FUNZIONE NAME FUNCTION	DESCRIZIONE DESCRIPTION	
963921 J	PK3G	EPROM 4K8	SPEC. PER GRECIA E JUGOSLAVIA GREECE AND JUGOSLAVIA SPECIFIC
4873533 G	MK3Z	ROM 4K x 8	CARATTERI LATINO CON FINCATURE LATIN CHARACTERS WITH MARGINS
965386 U	PBPW	EPROM 16 x 8	FIRMWARE WSTO.S. WSTO.S. FIRMWARE
965387 V	PBPX	EPROM 16 x 8	FIRMWARE WSTO.S. WSTO.S. FIRMWARE
963986 L	PK3S	ROM 4K x 8	SPEC. PER SPAGNA 2 SPAIN 2 SPECIFIC


414293 P (U.G.S.)- BA126
411738 Z (U.G.S.)- BA126P
(U.G.S.)
Ufficio Gestione Scorte
Ivrea - Italy

[U.G.S.]
Ufficio Gestione Scorte
Ivrea - Italy

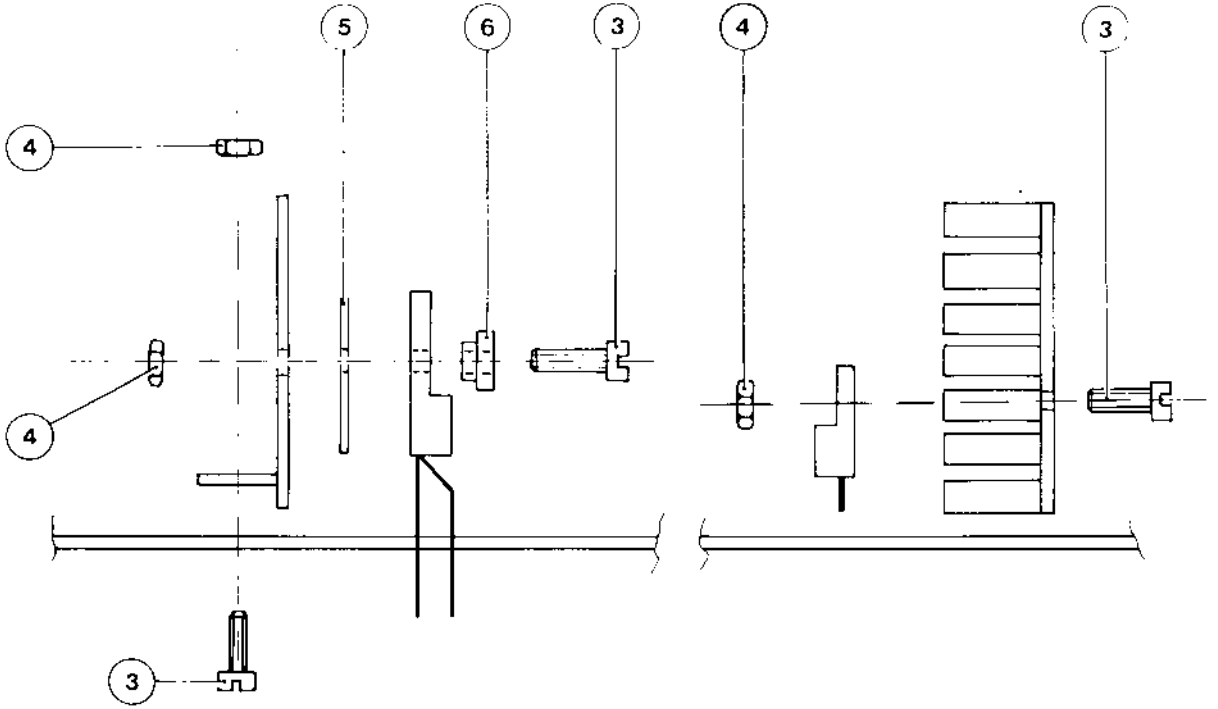


- 414295 R (U.G

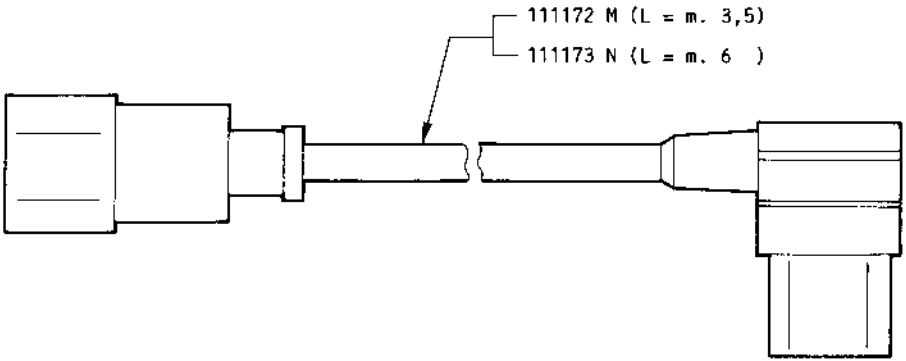


4114250 B | PIASTRA ALI LG03 | ALI LG03 BOARD | 5-9

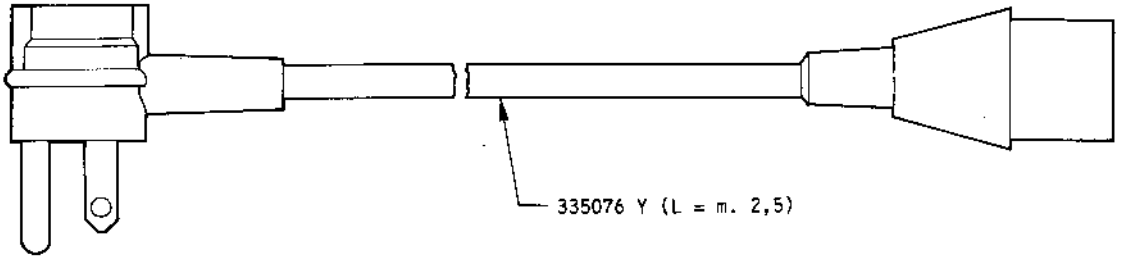
Codice *Code number*	Rifer. *Ref.*	Descrizione *Description*
126569 S	6	BOCCOLA ISOLANTE PER TO220
126850 Y	5	ISOLANTE
938210 C	4	DADO M2,5
920025 L	3	VITE M2,5 x 8


5
6
3
4
3
4
4
3

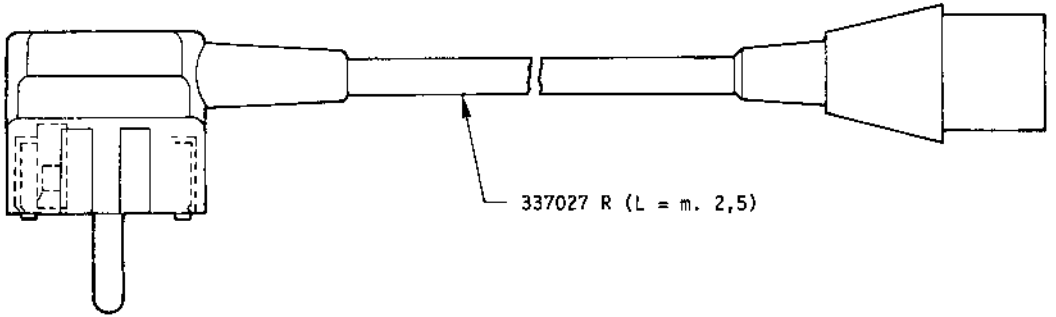
CAVI
CABLES


111172 M (L = m. 3,5)
111173 N (L = m. 6)

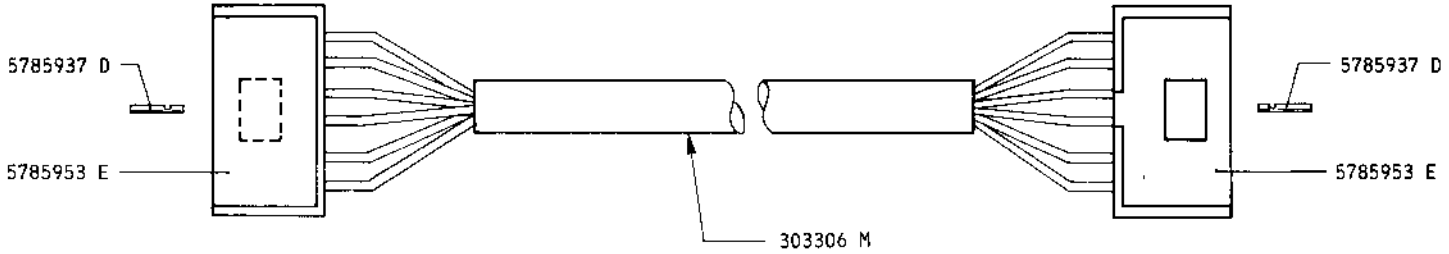
SPINA AMERICA



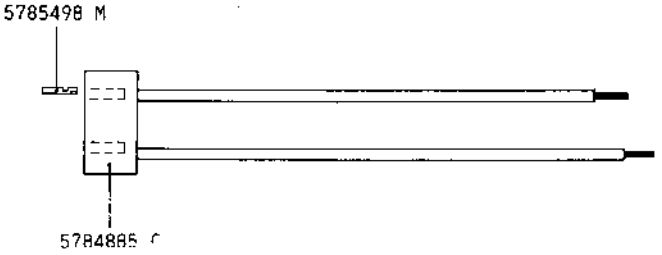
SPINA EUROPA



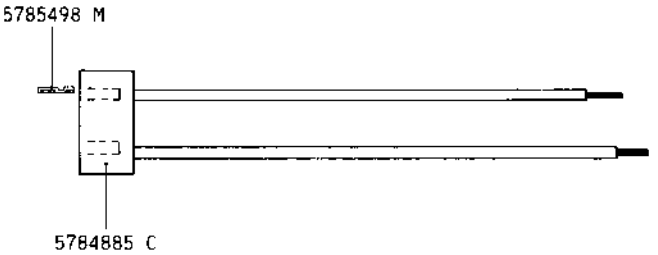
CAVO USCITA CONTINUE

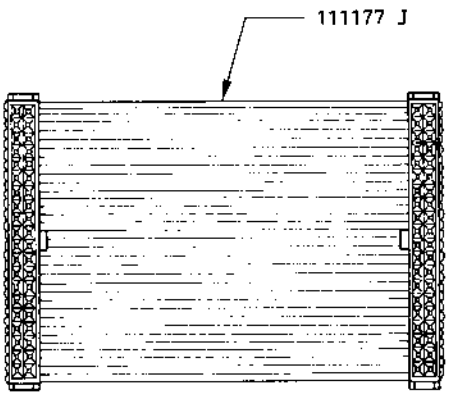


CAVO PIASTRA INTERRUTTORE



CAVO PIASTRA PRESA




111177 J

CODICE CODE	PAGINA PAGE	CODICE CODE	PAGINA PAGE	CODICE CODE	PAGINA PAGE	CODICE CODE	PAGINA PAGE
026535F	2	337265C	3				
026537H	2	411738Z	7				
026538J	2	414293P	7				
026539K	2	414294Q	8				
026540Y	2	414295R	9				
111161J	3	920025L	10				
111165N	3	920048B	4				
111166P	3	920133M	4				
111167Q	3	924421E	3				
111168Z	3	924944J	4				
111169S	3	938210C	10				
111170X	3	940098A	4				
111172M	14	963921J	6				
111173N	14	963986L	6				
111177J	17	965386U	6				
111178T	3	965387V	6				
111180J	3	966321T	4				
125032A	2	966371D	4				
125131A	2	966431J	4				
126569S	10	4873533G	6				
126850Y	10	5102170Z	4				
283986K	3	5442157F	4				
303306M	16	5442158U	4				
303311H	4	5781328T	4				
303379V	4	5781331W	4				
334305A	4	5784885C	16				
334492N	3	5785498M	16				
335076Y	15	5785937D	16				
336382Z	3	5785953E	16				
337027R	15	5820505Y	3				

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