

## 9" MONOCHROME DISPLAY UNIT MDU1035 (DSM 40-091)

Manufactured by **ACTION**, this monitor is identified as **DSM 40-091** on the front and rear of the casing and in the Progetto di Gestione; the homologation label on the rear of the monitor bears the writing **MDU 1035**.

### CHARACTERISTICS

VGA-compatible analog monitor

- Diagonal screen size: 9"  
Horizontal size: 160 ± 4 mm  
Vertical size: 120 ± 4 mm
- Input voltage: 100 - 240 V (universal power supply)  
Line voltage frequency: 50 - 60 Hz  
Power dissipation: < 30 W (maximum absolute value)
- Input signals:
  - 1 - Video (Analog monitor)
  - 2 - HSYNC (Horizontal sync)
  - 3 - VSYNC (Vertical sync)
  - 4 - ST (Self Test enable/disable)
  - Level: 0 - 700 mV
  - Polarity: Positive
- Preset timings:

Video Mode	Standard VGA			SVGA	XGA
Horizontal (Dots)	640			800	1024
Frequency (KHz)	31.469			35.2	35.524
Vertical (Lines)	350	400	480	600	768
Frequency (Hz)	70.08	70.08	59.95	56.3	87
Interlaced (Y/N)	N	N	N	N	Y
Polarity (V/H)	-/+	+/-	-/-	+/+	+/+

- External adjustments: Contrast  
Brightness  
Vertical amplitude  
Horizontal shift  
ON/OFF button

**REMOVING THE BASE**

1. Turn the monitor up-side down so that its base is facing upwards.
2. Raise the two catches (A) from their slots and slide the base off.

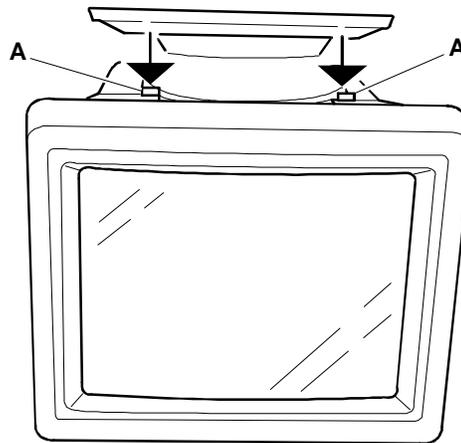


Fig. 35-1 Removing the Base

**REMOVING THE CASE**

3. Loosen the two screws (V) which secure cable holder (B) and remove the holder.
4. Loosen the two screws (V) which secure the case of the monitor.

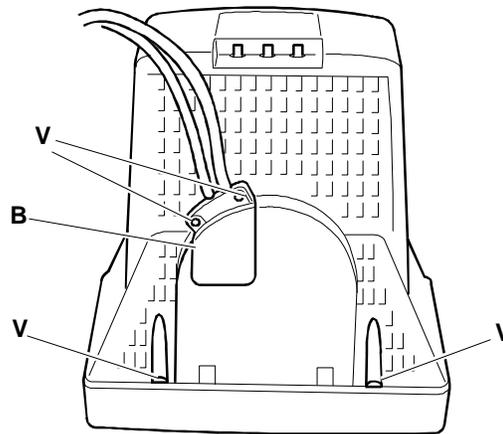


Fig. 35-2 Removing the Case of the Monitor

5. Insert a flat blade screwdriver where indicated by the letters p in the figure and remove the case by threading the power supply and signals cables through the appropriate slot.

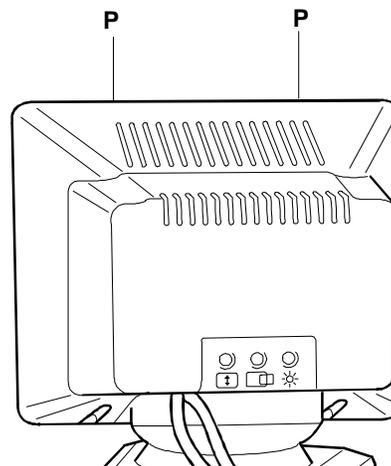


Fig. 35-3 Removing the Case of the Monitor - Locating Points P

**DISCHARGING THE HIGH VOLTAGE**

- After removing the case of the monitor and before working with the cables and boards you must first discharge the high voltages. Discharge the CRT anode using a screwdriver with a wire conductor to the monitor frame ground.

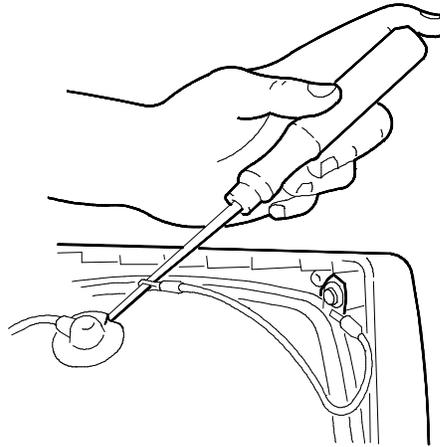


Fig. 35-4 Discharging the CRT Anode

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**REMOVING THE POWER SUPPLY BOARD**

- Remove screw (V) and slide off pin (P), shown in figure 35-5.

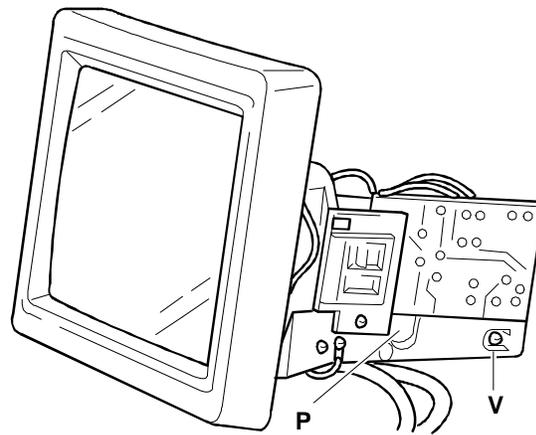


Fig. 35-5 Removing the Power Supply Board

- Disconnect the cables from connectors P101, P102, P103.

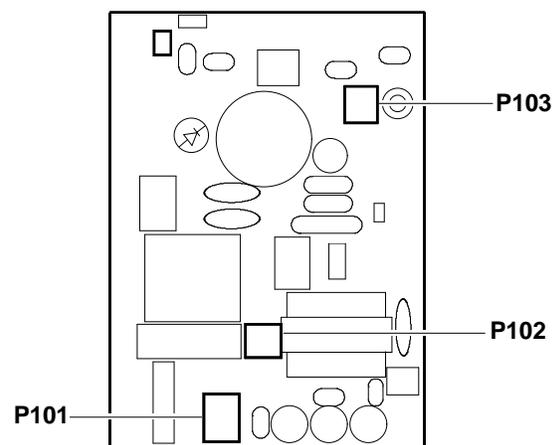


Fig. 35-6 Locating the Connectors on the Power Supply Board

9. Remove the screw shown in figure 35-7 to free the black degaussing cable.

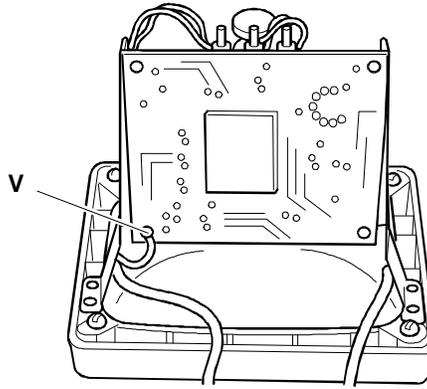


Fig. 35-7 Removing the Degaussing Cable Screw

**REMOVING THE ON/OFF SWITCH AND CONTRAST ASSEMBLY**

10. Remove screw (V) shown in figure 35-8.
11. Disconnect the cable from motherboard connector P501. Figure 35-10 shows the location of this connector.
12. Disconnect the power supply cable connector.
13. Cut retaining strap (T) so as to free the power supply cable which connects the assembly to the power supply board.

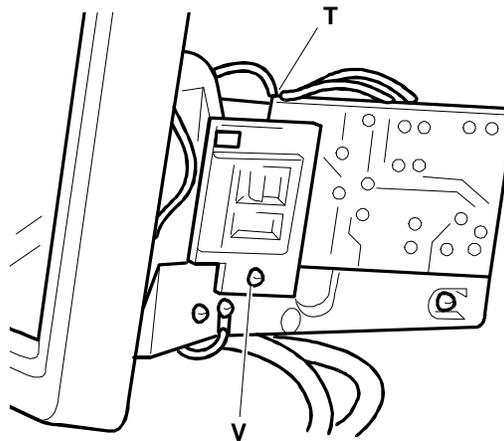


Fig. 35-8 Removing the ON/OFF Switch and Contrast Assembly

**REMOVING THE MAIN BOARD**

14. Remove the four screws which secure the main board.

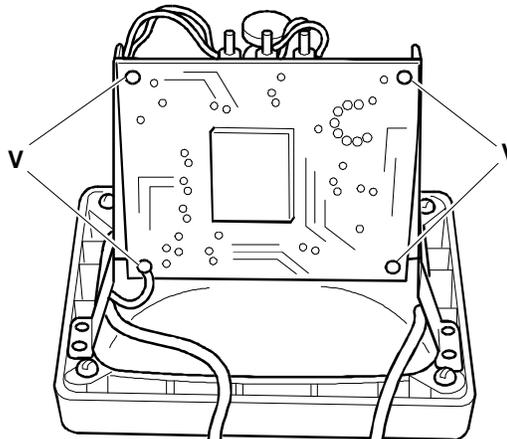
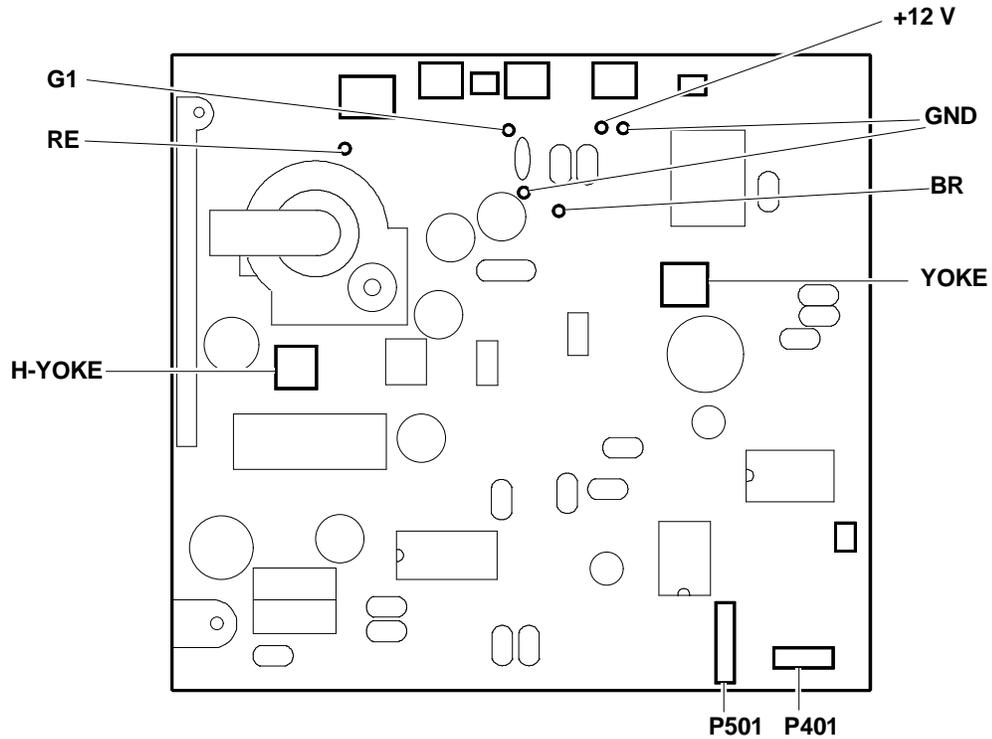


Fig. 35-9 Removing the Main Board

15. Disconnect the cables from connectors GND, YOKE, H-YOKE, P501, P401, RE, G1, G2, BR, GND, GND to free the main board from all of its connections.



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Fig. 35-10 Locating the Connectors on the Main Board

#### REMOVING THE CRT

16. Remove the four screws shown in the figure to free the CRT from its frame.

#### REASSEMBLY PROCEDURES

17. To reassemble the display unit follow its disassembly procedures in reverse order.

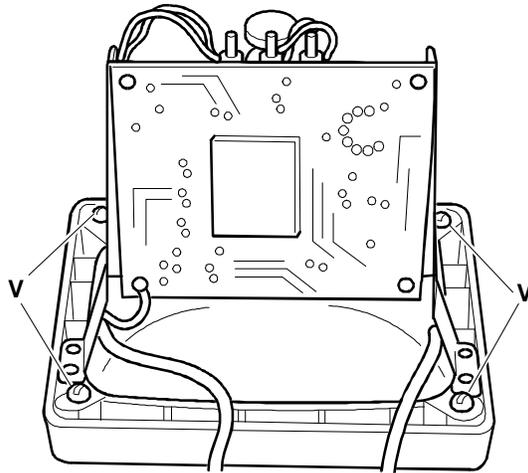


Fig. 35-11 Removing the CRT

## VIDEO ADJUSTMENTS

This monitor has two types of adjustments:

- External adjustments performed by the user.
- Internal adjustments performed by the field engineering service.

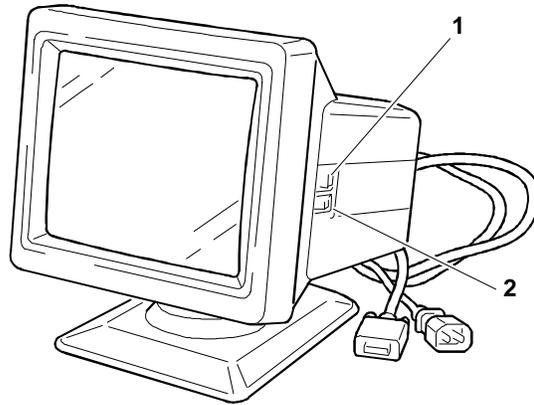


Fig. 35-12 Display Unit Front View

## EXTERNAL CONTROLS AND ADJUSTMENTS

To carry out external adjustments, the user will have to use the buttons and potentiometers located externally on the side and rear of the monitor case.

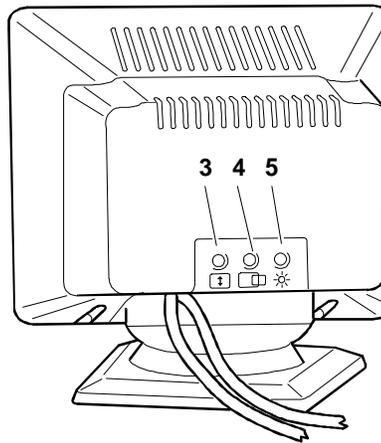


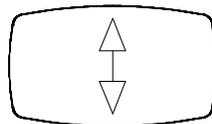
Fig. 35-13 External Rear Control Panel

### 1 - ON/OFF

This button powers the monitor ON and OFF.

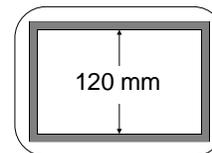
### 2 - CONTRAST

This potentiometer allows picture contrast adjustments.



### 3 - VERTICAL AMPLITUDE

This potentiometer allows vertical amplitude adjustments.



### 4 - HORIZONTAL SHIFT

This potentiometer allows horizontal shift adjustments.  
 $|a-b| < 4 \text{ mm}$



### 5 - BRIGHTNESS

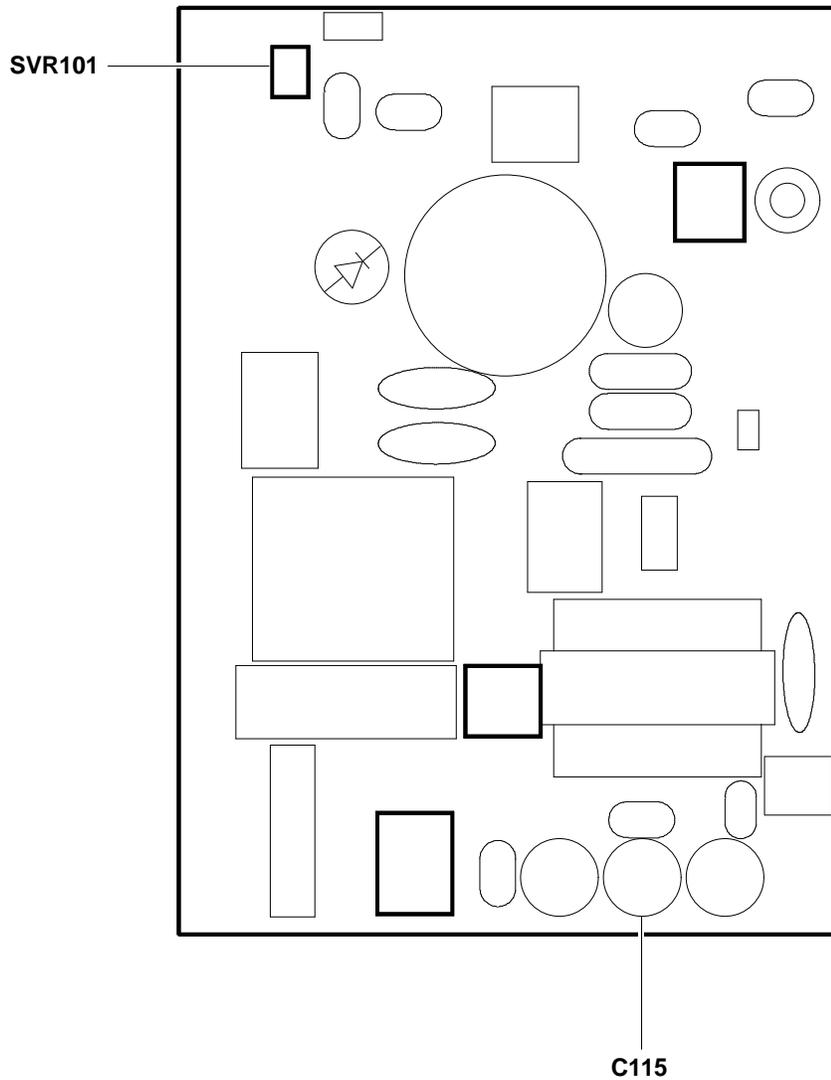
This potentiometer allows brightness adjustments.

**INTERNAL ADJUSTMENTS**

Internal adjustments can only be carried out by the field engineering service. Follow these adjustments step-by-step as certain adjustments affect others.

**POWER SUPPLY BOARD**

SVR101                    +12 V adjustment



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Fig. 35-14 Power Supply Board Adjustments

**MAIN BOARD ADJUSTMENTS**

VR202	Vertical amplitude external adjustment
VR301	Horizontal shift external adjustment
VR302	Brightness external adjustment
SVR201	Vertical linearity internal adjustment
SVR303	Brightness sub-adjustment
SVR302	Focus adjustment
SVR501	Contrast sub-adjustment

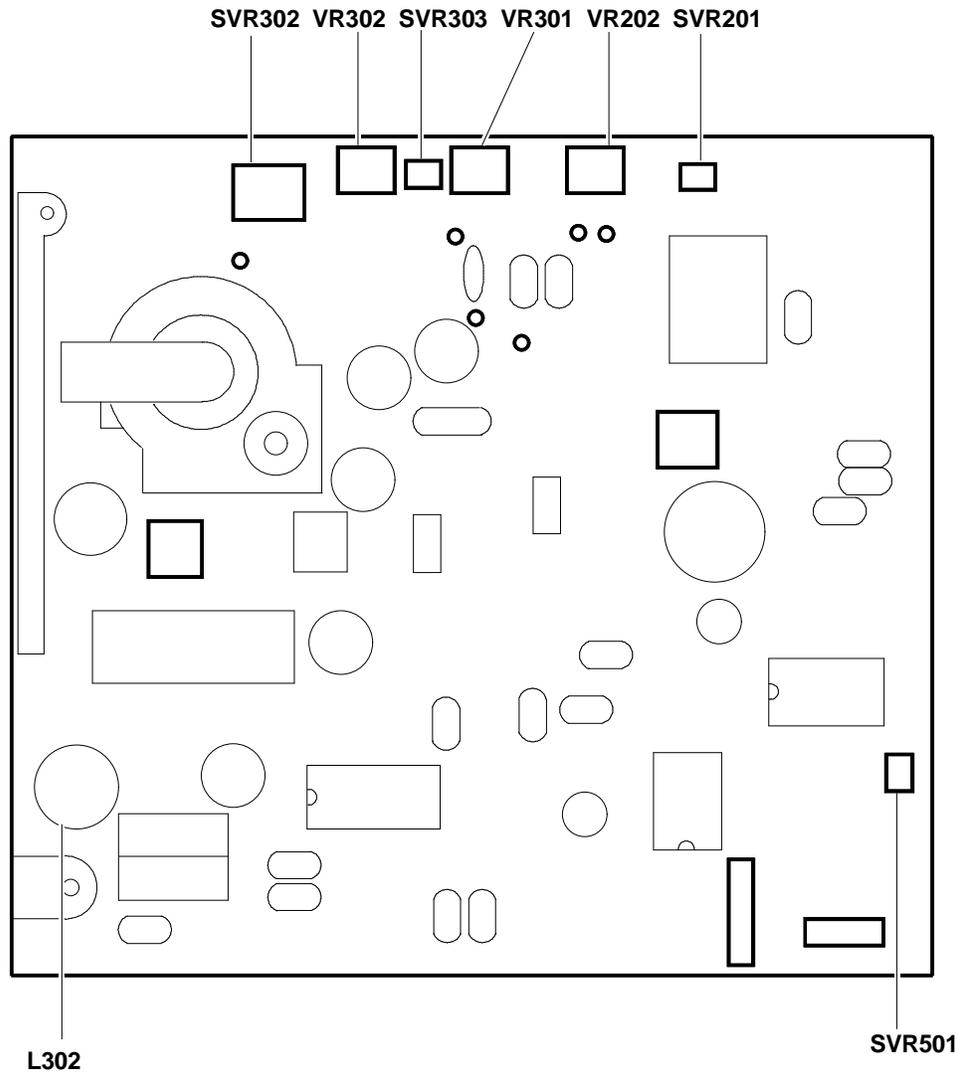


Fig. 35-15 Main Board Adjustments

## PRELIMINARY OPERATIONS

- Make sure that all of the monitor's components, connectors and frame parts are in their correct position.
- Connect to the line voltage and make sure it is within the 100 or 240 V range as indicated in the specifications.
- Attach the signals cable to the monitor and Personal Computer or signal source.
- Adjust the external brightness (VR302) and contrast (VR502) controls to their maximum position.
- Adjust the horizontal shift (VR301) and vertical amplitude (VR202) controls to their intermediate position.
- Set the display with the CRT facing East.
- Set the contrast sub-adjustment trimmer SVR501 to its intermediate position.
- Set the brightness sub-adjustment trimmer SVR303 until the back-raster disappears.
- Leave the monitor on for at least 30 minutes.

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## B+ (12 V) VOLTAGE ADJUSTMENTS

**NOTE:** This adjustment requires a voltmeter.

- Display a cross hatch pattern in the 640x480 video mode.
- Adjust trimmer SVR101 until a  $+12\text{ V} \pm 0.1\text{ V}$  voltage on the positive armor of capacitor C115 is obtained.

## HORIZONTAL SIZE ADJUSTMENTS

- Display a cross hatch pattern in the 640x480 video mode.
- Adjust coil L302 until a  $160 \pm 2\text{ mm}$  horizontal width is obtained.

## VERTICAL LINEARITY ADJUSTMENTS

- Display a cross hatch pattern in the 640x480 video mode.
- Adjust trimmer SVR201 until an equivalent vertical linearity between the upper and lower segments is obtained.

## FOCUS ADJUSTMENTS

- Display a screen page of letters H in the 640x480 video mode.
- Adjust trimmer SVR302 (FOCUS) until the best picture focus is obtained.

## OUTPUT BRIGHTNESS ADJUSTMENTS

**NOTE:** A brightness detector is required for this adjustment.

- Display a raster pattern signal in the 640x480.
- Set brightness sub-adjustment trimmer SVR303 until a 1 FL (Foot/Lambert) output brightness.
- Display a block pattern of 3" per side in the 640x480 video mode.
- Set trimmer SVR502 (external contrast) until a  $70 \pm 10\text{ FL}$  output brightness is obtained.

