14" CDU 1431/HA01 COLOUR MONITOR UNIT

This monitor is manufactured by **HANTAREX** and can be identified by **HA01** written on the label at the rear of the monitor.

CHARACTERISTICS

Colour analogous compatible VGA

- Screen dimensions: 14"
  Horizontal dimensions: 240 mm +/- 4 mm
  Vertical dimensions: 180 mm +/- 4 mm
- Input voltage: 110 V: 90 - 132 V a.c.
  220 V: 170 - 264 V a.c.
  Network frequency: 50 Hz: 47 - 63 Hz
  Degauss: At start
- Horizontal synchronism:
  Frequency: 31.469 KHz
  Polarity: Negative or positive
  Level: TTL
- Vertical synchronism:
  Frequency: 50 - 70 Hz
  Polarity: Negative or positive
  Level: TTL
- Input signals:
  Video: Control R, G, B (Red, Green, Blue)
  Signal: Linear voltage steps (63 steps of 11 mV)
  Level: 0 - 700 mV
  Polarity: Positive
- Displayed resolution: 640 x 350 lines by columns
  640 x 400 lines by columns
  640 x 480 lines by columns
- External controls: Brightness
  Contrast

REMOVING THE CASING AND DISASSEMBLY

1. To have access to the two casing fixing screws, remove the plastic casing (A) pressing in the direction indicated in the figure.

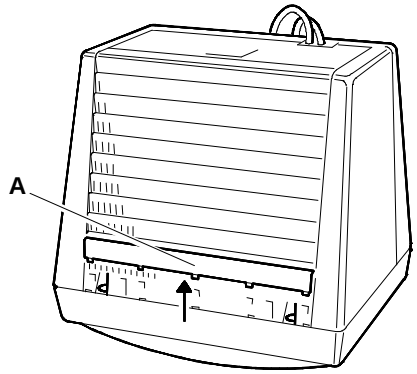

Fig. 4-1 Removal of video casing screws plastic covering

2. Position the monitor as indicated in the figure (place a cloth between the monitor and the work table to avoid scratching the screen). Remove the 6 securing screws on the casing (B, C and D).

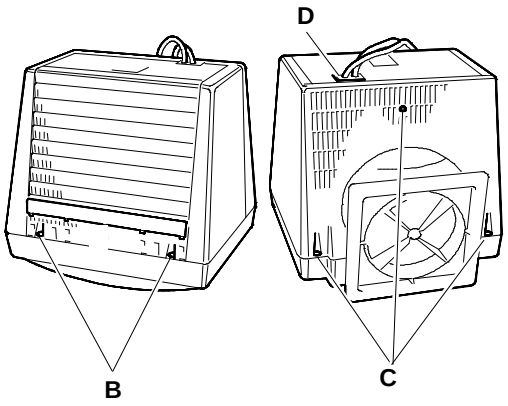

Fig. 4-2 Removal of video casing 6 fixing screws

HIGH VOLTAGE DISCHARGE

3. Discharge the high voltage (25 KV CRT anode voltage) before removing any board.
   To discharge the CRT anode, connect a screwdriver to a grounder cable on the monitor frame.

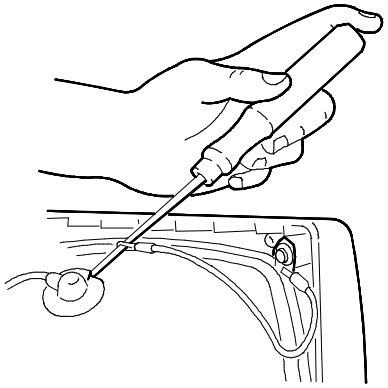

Fig. 4-3 Screwdriver to ground connection

4. Press on the cable holder (P) in the direction illustrated in the figure to free the cables. Push the holder inside the casing.

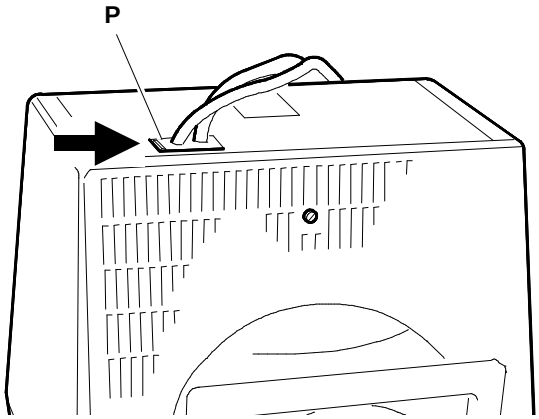

Fig. 4-4 Video cable support removal

5. Remove the casing slipping the cables through the passage slot. Take care not to damage the cables or the board components.
6. If it is necessary to **change the power or signals cable** the procedure is as follows:
   - Remove screw (E) from the cable holder (P) to separate the two cables.

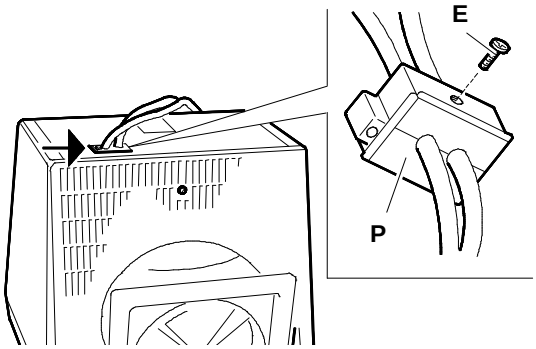

Fig. 4-5 Cable support (P) removal

   - To remove the power cable (A), loosen screw (F) that connects the cable to the motherboard metal support (ground) and disconnect the connector J101 from the motherboard.
   - To remove the monitor signals cable (S), slide the video amplifier board from the CRT, loosen screw (G) that secures the cable to the motherboard metal support, disconnect connector J103 from the mother board and disconnect connector J2 from the video amplifier board.

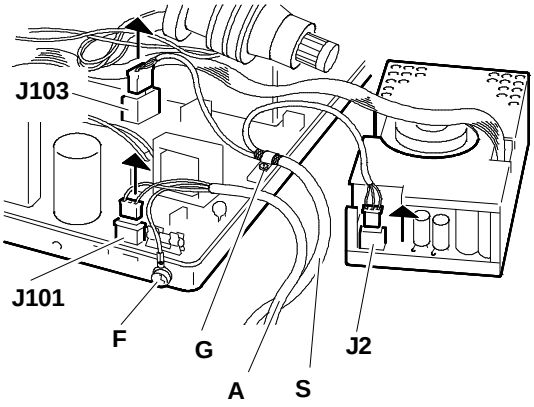

Fig. 4-6 Removal of video signal cable (S) and power cable (A)

REMOVING THE VIDEO AMPLIFIER BOARD

7. Remove the silicone adhesive which secures the CRT to the video amplifier board connector (this is a transport precaution).
8. Loosen screw (A) on the earthing bar (M) that connects the video amplifier board frame to the motherboard frame.
9. Disconnect the video amplifier board (V) from the CRT.

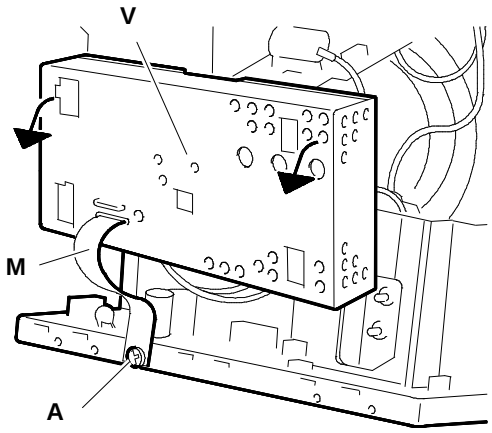

Fig. 4-7 Earthing bar (M) disconnection

10. Disconnect from the video amplifier board:
    - Interface cable connector J1 with the motherboard
    - Interface connector J2 with monitor signals cable
    - CRT ground cable connector J3.
11. Using pliers turn the four securing tabs (B) of the video amplifier board casing and remove the casing.

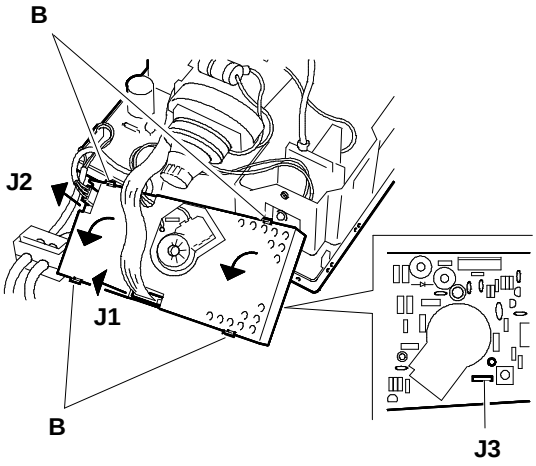

Fig. 4-8 Video amplifier board cables disconnection

12. Unhook and turn the casing of connection G3 (focus) on the video amplifier board. Unsolder the cable to disconnect it.
13. To have access to connection G2 (screen cable) remove the video amplifier board grid.
    To remove the grid, unsolder 6 solder spots.
    After the grid has been removed it is possible to have access to connection G2. Unsolder the cable to disconnect it.
14. The video amplifier board is now free of all cables.

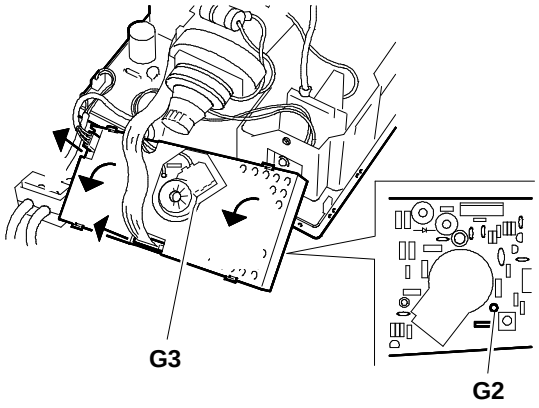

Fig. 4-9 G3 and G2 disconnection from video amplifier board

REMOVING THE MOTHER BOARD

15. Disconnect the signals cable from connettore (A) and remove the cable clamp (B).
16. Disconnect the power cable from connector (C) and the earthing (T).

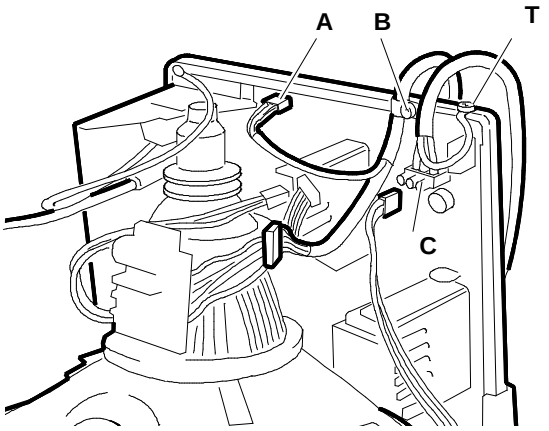

Fig. 4-10 Signals cable and power cable disconnection

17. Disconnect connections J102 (degausser) and J104 (Deflection coil).

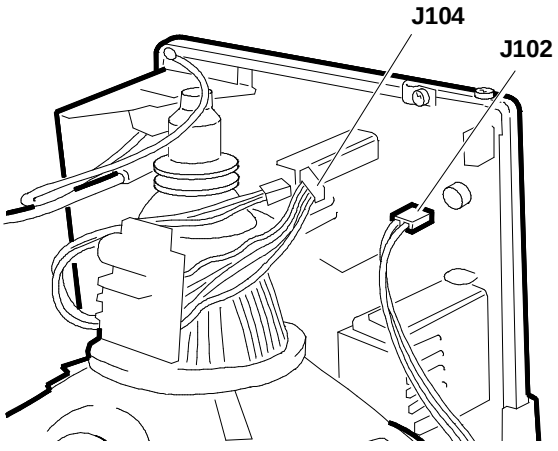

Fig. 4-11 Disconnection of cable from motherboard

18. Before disconnecting the CRT anode, make sure that it is completely discharged by inserting the tip of a screwdriver connected to ground by the CRT earthing ribbon.

19. To remove the anode, turn the plastic casing upside-down and remove the two contacts.

20. Remove the 2 screws A that secure the potentiometers for contrast and brightness adjustment (C & L).
    Push the potentiometers inside the casing.

21. Disconnect the two cables that connect the potentiometers to the motherboard connectors J306 and J106.

22. Push the retaining clips (B) outwards to free the motherboard frame. Remove the motherboard from the casing.
    Take care not to damage the board or its components.

NOTE: The mother board is fixed to a support plate and should not be separated from it.

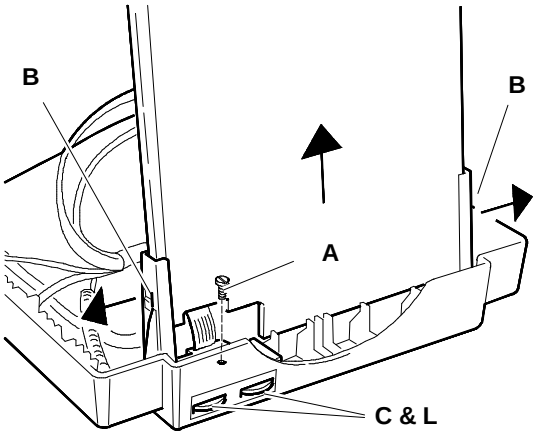

Fig. 4-12 Motherboard structure removal from video casing

23. To remove the metal panel covering the motherboard solder side, slide it until the securing tabs are free, then remove it.

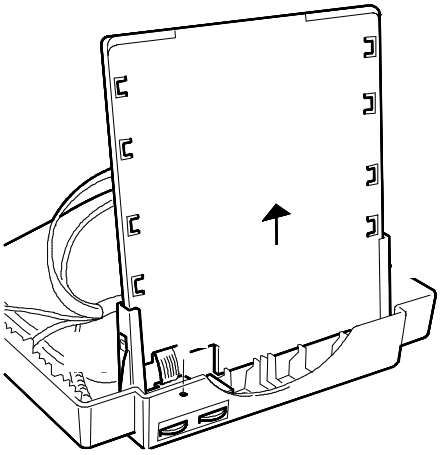

Fig. 4-13 Motherboard solder side metal protection panel removal

24. When re-installing the mother board check that the metal ring (C) on the CRT anode is securely fastened under retaining ring (D) of the plastic casing.

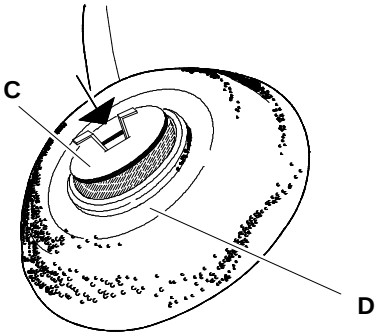

Fig. 4-14 CRT anode correct mounting

REMOVING THE CRT

NOTE: In addition to the cathode-ray tube, the CRT also integrates the deflection yoke and the adjustment magnets for geometric distortion. These magnets should not require adjustment.

25. Remove the 4 securing clips (F) of the degaussing coil.

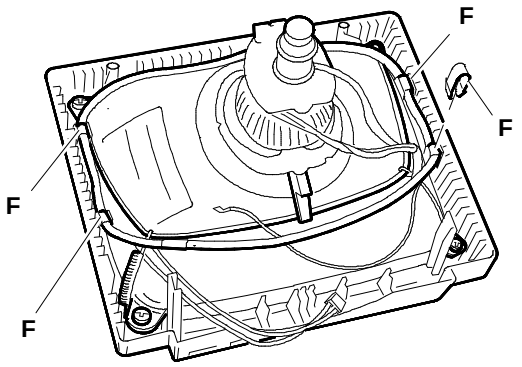

Fig. 4-15 Degaussing coil securing clips removal

26. Loosen the 4 screws (V) that secure the CRT to the monitor frame.
27. Remove the earthing ribbon from the CRT (G) unhooking the ribbon tensioning spring (M) releasing it from the mounting brackets (S).

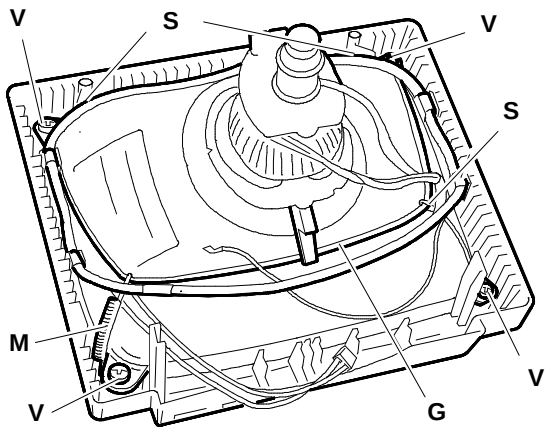

Fig. 4-16 - Position of screws fixing CRT to video frame
- Earthing ribbon removal (G)

ADJUSTING THE MONITOR

Adjustment potentiometers

This sequence must be followed step by step because some adjustments affect the subsequent modifications.

Video amplifier board adjustment points

RV1	Red cut-off
RV2	Green cut-off
RV3	Blue cut-off
RV4	Red adjustment
RV5	Blue adjustment
RV6	Contrast pre-set.

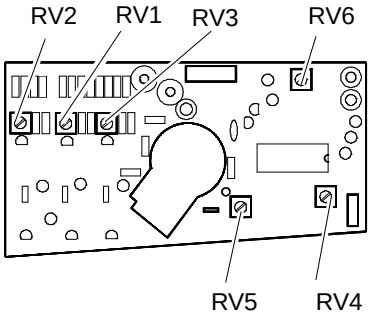

Fig. 4-17 Video amplifier board

Motherboard adjustment points

ADJUSTING THE VOLTAGE

- Set the contrast and brightness controls half-way.
- Switch on the system.
- Adjust RV101 until the voltmeter connected between diode D114 and ground measures a voltage of 83 V (see the figure on the previous page for the positions of the potentiometer and diode).

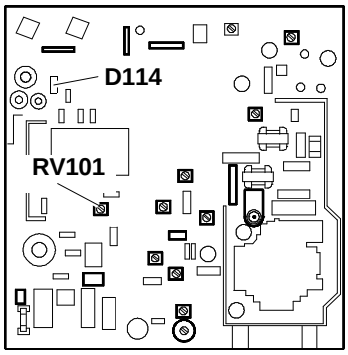

Fig. 4-18 Voltage adjustment

ADJUSTING THE FREQUENCY

- Disconnect the signals cable to stop horizontal synchronism.
- Connect a frequency meter to PIN 4 of IC104 (4048).
- Adjust trimmer RV117 until the signal frequency measures 29.5 KHz.

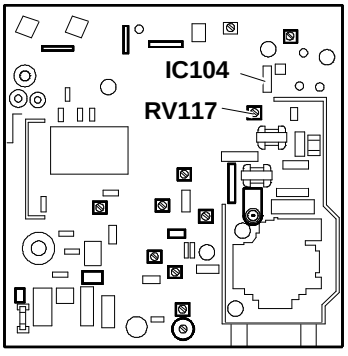

Fig. 4-19 Frequency adjustment

ADJUSTING THE HORIZONTAL LINEARITY

- System Test: *640 BY 400 GRAPHICS.*
- Use coil L105 (H LIN) to adjust the horizontal linearity.

ADJUSTING THE HORIZONTAL WIDTH

- System Test: *640 BY 400 GRAPHICS.*
- Adjust RV120 to obtain a horizontal width of 240 mm +/- 4 mm.

ADJUSTING THE HORIZONTAL CENTERING

- System Test: *640 BY 400 GRAPHICS.*
- Centre the picture on the screen using potentiometer RV121.

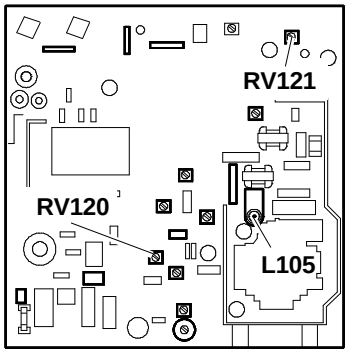

Fig. 4-20 - Horizontal linearity adjustment
- Horizontal width adjustment
- Horizontal centering adjustment

ADJUSTING THE VERTICAL LINEARITY

- System Test: *640 BY 400 GRAPHICS.*
- Adjust the vertical linearity through potentiometer RV115.

ADJUSTING THE VERTICAL CENTERING

- System Test: *CROSS HATCH WITH CIRCLE AT CENTER OF SCREEN.*
- Adjust potentiometer RV116 until the picture is centered vertically on the screen.

ADJUSTING THE VERTICAL WIDTH

- System Test: *640 BY 480 GRAPHICS.*
- Adjust RV114 to obtain a vertical width of 180 mm +/- 4 mm.
- System Test: *640 BY 350 GRAPHICS.*
- Adjust RV102 to obtain a vertical width of 180 mm +/- 4 mm.
- System Test: *640 BY 400 GRAPHICS.*
- Adjust RV103 to obtain a vertical width of 180 mm +/- 4 mm.

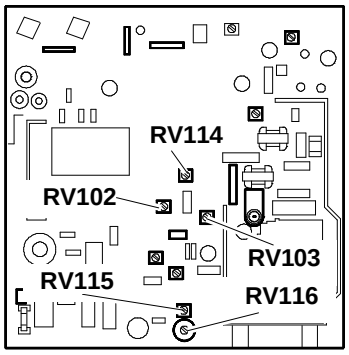

Fig. 4-21 - Vertical linearity adjustment
- Vertical width adjustment
- Vertical centering adjustment

ADJUSTING THE FOCUS

- System Test: *CHECK LINEARITY.*
- Adjust the “FOCUS” potentiometer on transformer TH102 to obtain the best focussed picture.

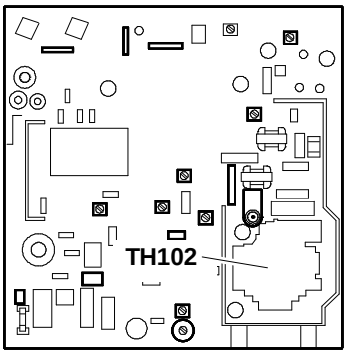

Fig. 4-22 Focus adjustment

ADJUSTING THE DISTORTION (PINCUSHION)

- System Test: *640 BY 400 GRAPHICS.*
- Adjust the distortion through potentiometer RV119.

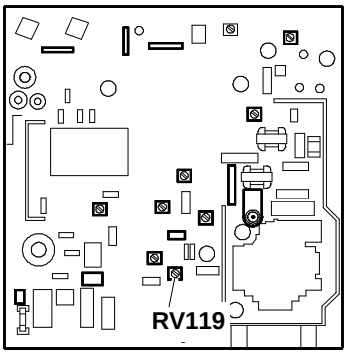

Fig. 4-23 Distortion (pincushion) adjustment

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