14" CDU 1431/N COLOUR MONITOR UNIT

This monitor is manufactured by **HANTAREX** and there are several models that can be identified by the label on the rear.

- HA22 Mask pitch 0.31
- HA23 Mask pitch 0.28
- HA24 Mask pitch 0.28 Low emission.

CHARACTERISTICS

Colour analogous monitor 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: 198 - 264 V a.c.
  Network frequency: 50 Hz: 47 - 63 Hz
  Degauss: At switch on
- 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:
  Monitor: Control R, G, B (Red, Green, Blue)
  Signal: Linear voltage steps (63 steps of 11 mV)
  Level: 0 - 700 mV
  Polarity: Positive
- Displayed resolutions: 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 plastic cover (A) by pressing in the direction indicated in the figure.

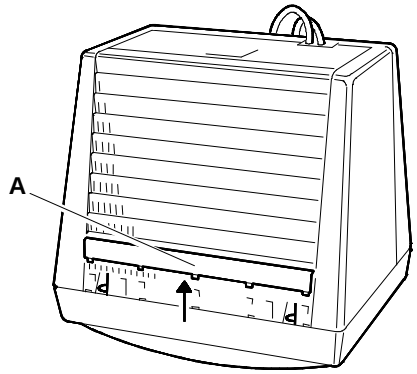

Fig. 3-1 Removal of video casing screws plastic covering

2. Position the monitor as illustrated in the figure (place a cloth between the monitor and the work table to avoid scratching the screen). Remove the 5 securing screws (B e C) from the casing.

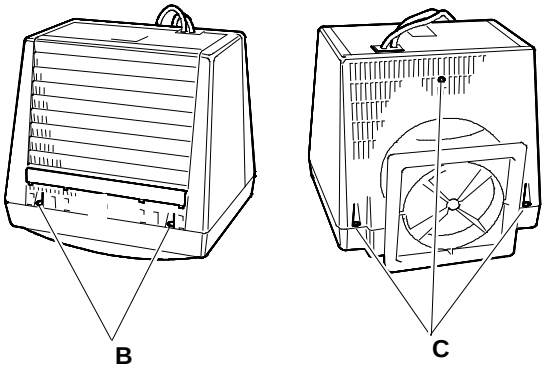

Fig. 3-2 Removal of video casing 5 fixing screws

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.

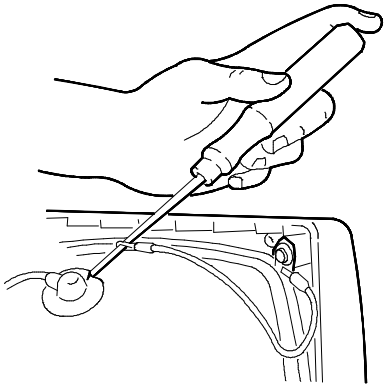

Fig. 3-3 Screwdriver to ground connection

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

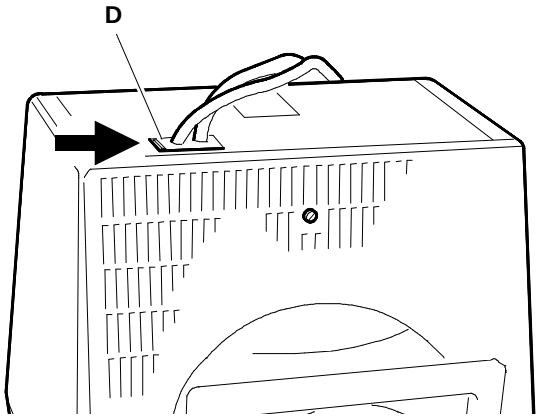

Fig. 3-4 Removing the video cables support

5. Remove the casing, slipping the cables through the passage slot. Take care not to damage the cables or board components.

6. **If it is necessary to change the power or the signal cable** the procedure is as follows:

   - Disconnect the signals cable from connector J3 on the video amplifier board.

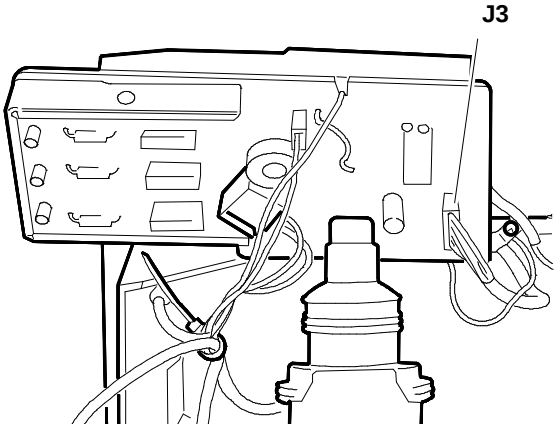

Fig. 3-5 Position of connector J3 on video amplifier board

   - Disconnect the signal cable from connector J105 on the motherboard and remove it.
   - Disconnect the data cable fom connector J102 on the motherboard and remove it.

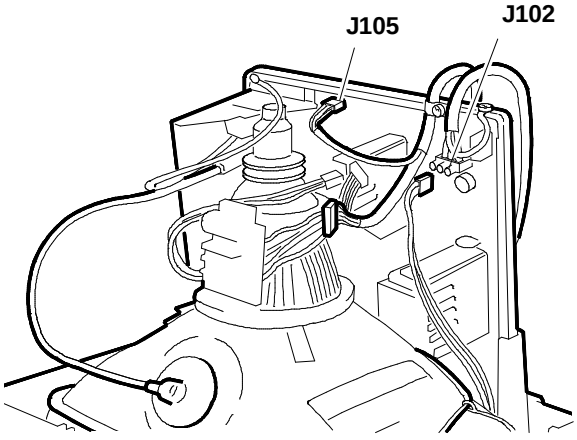

Fig. 3-6 Position of connectors J105 and J102 on the motherboard

REMOVING THE VIDEO AMPLIFIER BOARD

7. Remove the silicone adhesive that secures the CRT to the video amplifier board connector (this is a transport precaution).
8. Cut the cable clamp (A) that secures the video amplifier board and CRT cables.
9. Disconnect the video amplifier board connector cables:
   - Disconnect J3 - monitor signal cable
   - Disconnect J1 - power cable coming from the motherboard
   - Disconnect J2 - board pre-warming cable
   - Remove J4 - monitor earthing ribbon.

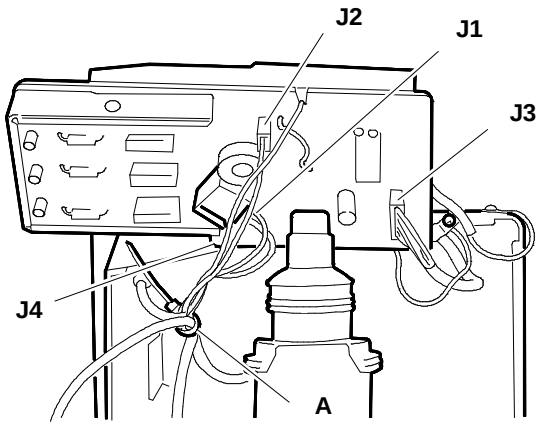

Fig. 3-7 - Position of cable clamp A
- Position of connectors on video amplifier board

10. Slide the video amplifier board off the CRT connector.
11. Unhook and turn over the casing of connection G3 (focus - black cable) on the video amplifier board. To disconnect the cable it must be unsoldered.
12. To have access to connection G2 (shielded cable) the metal protection screen of the video amplifier board must be removed.
    To remove it, unsolder 6 solder spots.
    Once the protection has been removed, connection G2 (red cable) can be reached.
    To disconnect the cable it must be unsoldered.

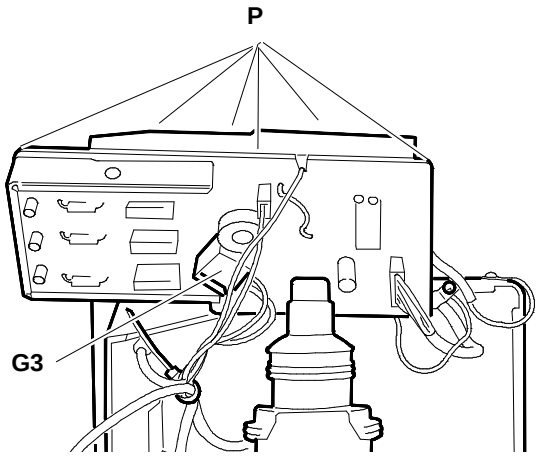

Fig. 3-8 - Position of G2 connection
- Position of 6 solder spots that fix the video amplifier board protection

13. The video amplifier board is now completely free of cables.

REMOVING THE MOTHER BOARD

14. Disconnect the signal cable from connector (A) and remove the cable clamp (B).
15. Disconnect the power cable from connector (C) and ground (T).

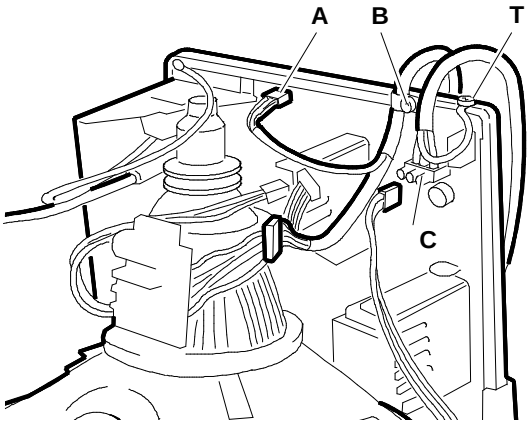

Fig. 3-9 Signals cable and power cable disconnection

16. Disconnect connections J101 (degausser) and J106 (Deflection coil). Disconnect the cable connections for the pre-warming of motherboard W105 and W106.
    The figure alongside illustrates the monitor motherboard.

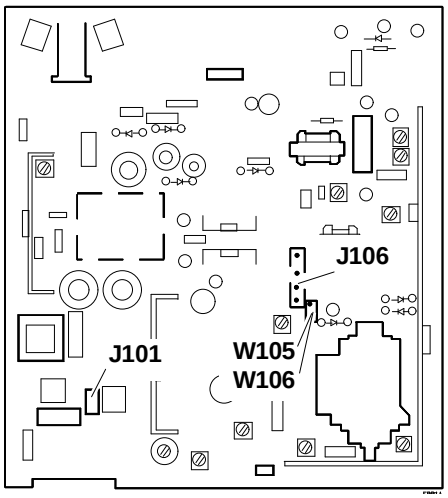

Fig. 3-10 Connector position for connections J101, J106, W105 and W106

17. Before disconnecting the CRT anode, make sure it is completely discharged by inserting the tip of a screwdriver connected to ground through the rubber suction cup of the CRT.
18. To remove the anode, turn the plastic casing upside-down and remove the two contacts.

19. Remove the 2 screws A that secure the potentiometers to adjust contrast (C) and brightness (L).
    Push these potentiometers into the casing.
20. Push securing brackets (B) outwards to free the motherboard.
21. Remove the mother board from the casing. Take care not to damage any components on the motherboard

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

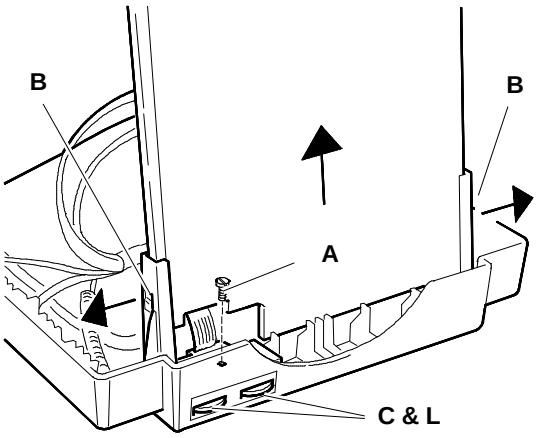

Fig. 3-11 Motherboard removal from video frame

When re-installing the motherboard check that the metal ring (C) on the CRT anode contact is fastened properly under retaining ring (D) of the plastic casing.

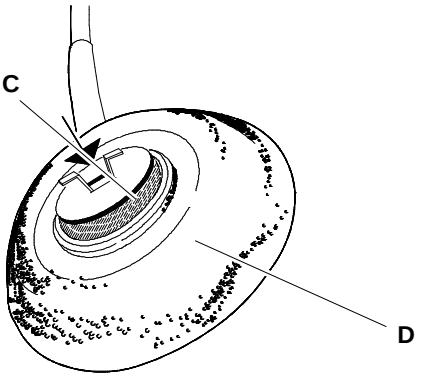

Fig. 3-12 Correct CRT anode fixing

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.

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

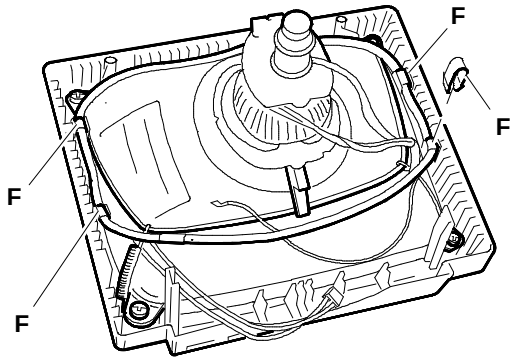

Fig. 3-13 Degaussing coil securing clips removal

23. Loosen the 4 screws (V) that secure the CRT to the monitor casing.

24. Remove the earthing ribbon from the CRT (G) releasing the tensioning spring (M) and unhooking it from the mounting brackets (S).

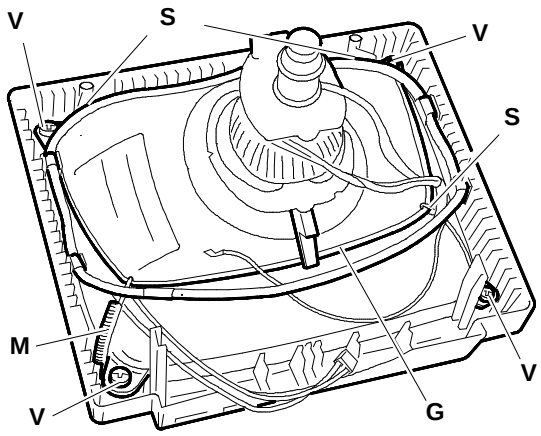

Fig. 3-14 - Position screws securing CRT to video frame
- Earthing ribbon (G) removal

ADJUSTING THE MONITOR

The sequence that is illustrated below must be followed step by step because some adjustments affect the subsequent modifications.

HANTAREX HA22 MONITOR

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 preset.

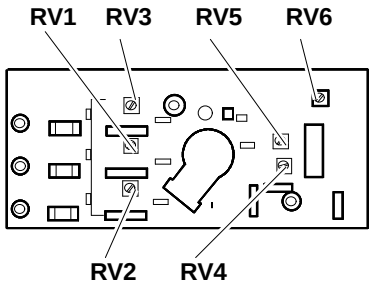

Fig. 3-15 Video amplifier board

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 D110 and ground measures a voltage of 81 V (see figure on previous page for the potentiometer and diode positions).

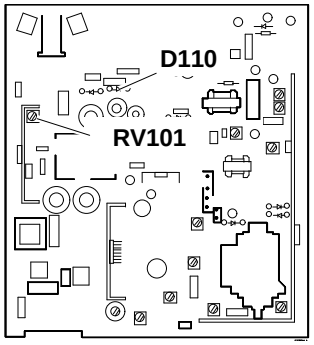

Fig. 3-16 - Voltage adjustment

ADJUSTING THE FREQUENCY

- System Test: *640 BY 400 GRAPHICS.*
- Connect pin 9 on IC 103 (TDA2593) to ground.
- Adjust RV108 (H FREQ) until the picture is as stable as possible.

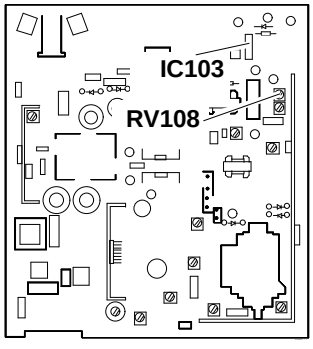

Fig. 3-17 - Frequency adjustment

ADJUSTING THE HORIZONTAL LINEARITY

- System Test: *640 BY 400 GRAPHICS.*
- Adjust the horizontal linearity using coil L104 (H LIN).

ADJUSTING THE HORIZONTAL WIDTH

- System Test: *640 BY 400 GRAPHICS.*
- Adjust RV111 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 RV102.

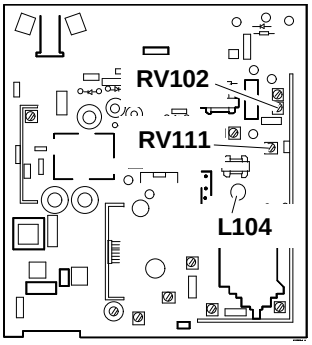

Fig. 3-18 - Horizontal linearity adjustment
- Horizontal width adjustment
- Horizontal centering adjustment

ADJUSTING THE VERTICAL LINEARITY

- System Test: *640 BY 400 GRAPHICS.*
- Adjust the vertical linearity using potentiometer RV107.

ADJUSTING THE VERTICAL CENTERING

- System Test: *CROSS HATCH WITH CIRCLE AT CENTER OF SCREEN.*
- Adjust potentiometer RV109 to vertically centre the picture on the screen.

ADJUSTING THE VERTICAL WIDTH

- System Test: *640 BY 480 GRAPHICS.*
- Adjust RV106 to obtain a vertical width of 180 mm +/- 4 mm.
- System Test: *640 BY 350 GRAPHICS.*
- Adjust RV104 to obtain a vertical width of 180 mm +/- 4 mm.
- System Test: *640 BY 400 GRAPHICS.*
- Adjust RV105 to obtain a vertical width of 180 mm +/- 4 mm.

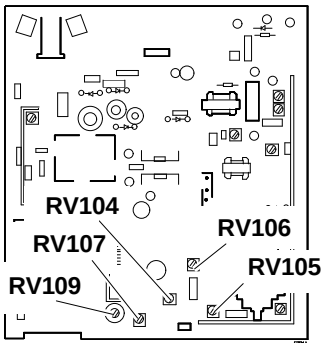

Fig. 3-19 - Vertical linearity adjustment
- Vertical width adjustment
- Vertical centering adjustment

ADJUSTING THE DISTORTION (PINCUSHION)

- System Test: *640 BY 400 GRAPHICS.*
- Adjust the distortion using potentiometer RV110.

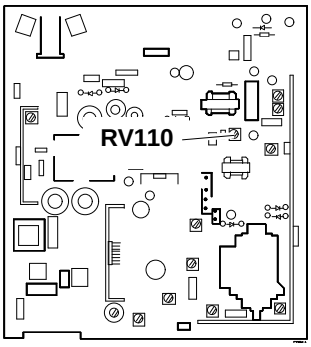

Fig. 3-20 - Distortion (pincushion) adjustment

ADJUSTING THE FOCUS

- System Test: *CHECK LINEARITY.*
- Adjust the “FOCUS” potentiometer on transformer TH103 to obtain the best focus possible.

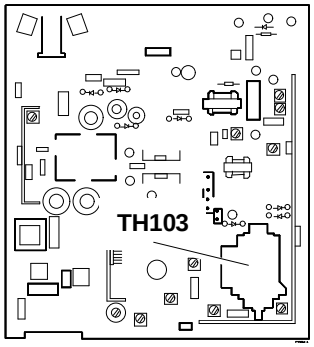

Fig. 3-21 - Focus adjustment

HANTAREX HA23 MONITOR

The adjustments for this type of monitor are identical to those for HANTAREX HA22.

HANTAREX HA24 MONITOR

The adjustments for this type of monitor are identical to those for HANTAREX HA22.

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