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# 15" CDU 1548 COLOUR MONITOR UNIT

This monitor is manufactured by **HANTAREX** and is available in two models identified by the plate on the rear of the monitor.

- **HA01**
- **HA02**

## CHARACTERISTICS

Colour analogous monitor, compatible VGA

- Screen dimensions: 15"  
Horizontal dimension: 260 mm +/- 3 mm High Resolution  
Vertical dimension: 195 mm +/- 3 mm  
VGA horizontal dimensions: 293.5 mm +/-3 mm  
VGA vertical dimensions: 189 mm +/-3 mm

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- Input voltage: 110 V: 85 - 132 V a.c.  
220 V: 170 - 264 V a.c.  
Network frequency: 50 Hz: 47 - 63 Hz

- Operation resolutions and frequencies:

<u>Resolution</u>	<u>Horizontal frequency</u>	<u>Vertical frequency</u>
640 x 350	31.469 KHz	70.08 Hz
640 x 400	31.469 KHz	70.08 Hz
640 x 480	31.469 KHz	59.64 Hz
1024 x 768	48.363 KHz	60.08 Hz

- Synchronism signals:  
Horizontal synchronism signal: H. SYNC  
Vertical synchronism signal: V. SYNC

Polarity:

<u>Resolution</u>	<u>Horizontal synchronism</u>	<u>Vertical synchronism</u>
640 x 350	positive	negative
640 x 400	negative	positive
640 x 480	negative	negative
1024 x 768	positive	positive

Level: TTL

- Video signal: Control R, G, B (Red, Green, Blue)  
Level: 0 - 700 mV (impedance 75 Ohm 1%)  
Polarity: Positive
- Displayed resolutions: 640 x 350 lines by columns  
640 x 400 lines by columns  
640 x 480 lines by columns  
1024 x 768 lines by columns
- Absorbed power: < 90 W
- External controls: Brightness  
Contrast

## REMOVING THE COVER AND DISASSEMBLY

1. Switch off the system and disconnect the power and monitor signals cables.
2. Remove the monitor casing fixing screws as illustrated in the figure.
3. Remove the monitor casing.

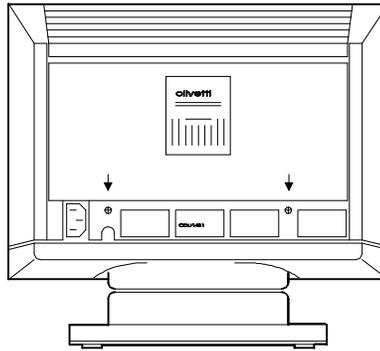


Fig. 7-1 Video casing screws removal

4. Loosen the screws indicated in the figure and remove the monitor metal casing.

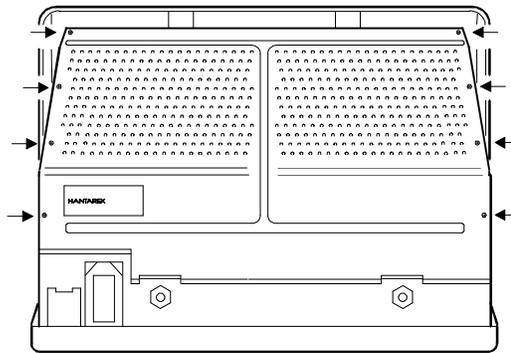


Fig. 7-2 Position of screws fixing video metal grid

5. Locate the board positions inside the monitor:
  - Monitor preamplifier board (F)
  - Motherboard (B)
  - Interface board (I).

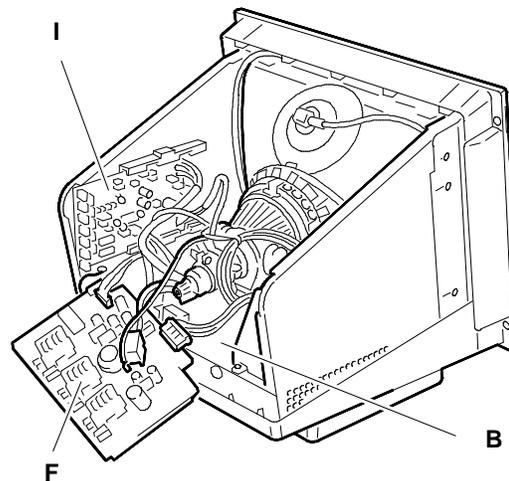


Fig. 7-3 Video board position

## ADJUSTING THE MONITOR

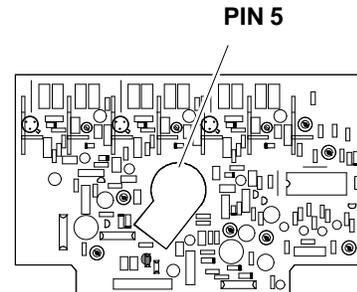
The adjustment sequence must be followed step by step because some adjustments affect the subsequent modifications.

### HANTAREX MONITOR HA01

#### Motherboard adjusting points

#### ADJUSTING THE SOCKET VOLTAGE ON THE PREAMPLIFIER BOARD

- System Test: *MAIN MENU*.
- Position one voltmeter probe on pin 5 of the preamplifier board socket and the other on ground.



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Fig. 7-4 Position of pin 5 on pre-amplifier board socket

- Adjust RV1 on the mother board until the voltage measured is 135 V dc +/- 10%.

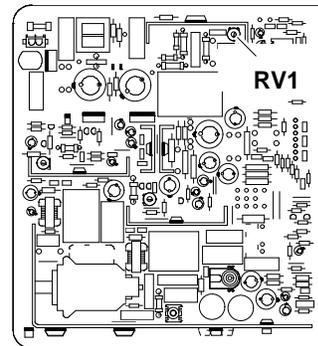


Fig. 7-5 Voltage adjustment on pre-amplifier board socket

#### ADJUSTING THE HIGH VOLTAGE

- System Test: *MAIN MENU*.
- Position the voltmeter *probe* on the CRT anode, and the other on ground.
- Adjust RV6 (motherboard) until the voltage measured is 23 KV +/- 500 V.

**WARNING:** This is a very dangerous operation.

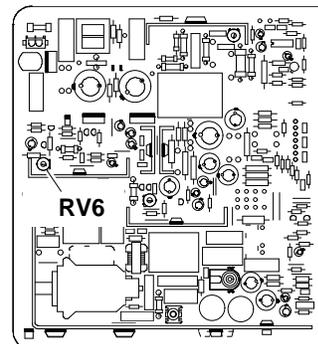


Fig. 7-6 High voltage adjustment

### ADJUSTING THE HORIZONTAL AND VERTICAL (GREY FIELD) RASTER CENTERING

- System Test: *MAIN MENU*.
- Increase the brightness with the external control until the surrounding area (grey field) is visible.
- Adjust trimmers RV2 (vertical control) and RV4 (horizontal control) to centre the screen surrounding area.

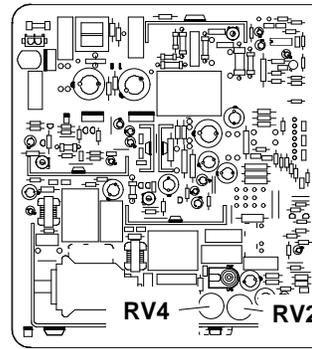


Fig. 7-7 Horizontal and vertical raster centering adjustment

### ADJUSTING THE HORIZONTAL LINEARITY

- System Test: *CROSS HATCH WITH CIRCLE AT CENTER OF SCREEN*.
- Adjust B10 (mother board) so that the right and left sections of the grid are symmetrical.

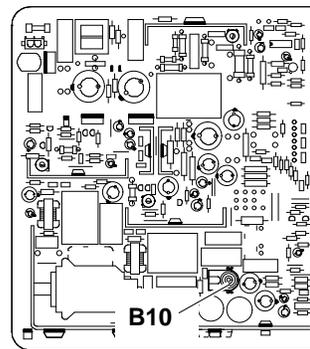
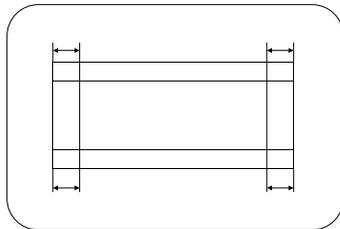


Fig. 7-8 Horizontal linearity adjustment

### Interface board adjusting points

#### ADJUSTING THE HORIZONTAL WIDTH

- System Test: *1024x768 GRAPHICS*.
- Adjust trimmer RV13 to obtain a picture with a width of 260 mm.

**NOTE:** The horizontal linearity and width are interactive adjustments, therefore adjust them alternately until both are correct.

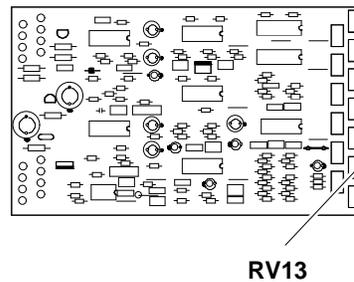


Fig. 7-9 Horizontal width adjustment

### ADJUSTING THE PICTURE CENTERING

- System Test: *1024x768 GRAPHICS*.
- Adjust trimmer RV10 to have the picture centered horizontally.
- System Test: *640x480 GRAPHICS*.
- Check that the horizontal width of the picture is 253.5 mm +/- 3 mm.
- Adjust trimmer RV12 to have the picture centered horizontally with this working frequency also.

**NOTE:** On the older circuit board versions, trimmer RV10, has been mistakenly written twice. In this case use the figure as a reference to find the correct one.

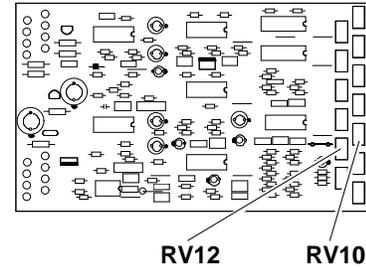


Fig. 7-10 Picture centering adjustment

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### ADJUSTING THE VERTICAL HEIGHT (350/400/480 /1024 LINES)

- System Test: *640 BY 350 GRAPHICS*.
- Adjust trimmer RV1 to obtain a picture with a height of 189 mm.
- System Test: *640 BY 400 GRAPHICS*.
- Adjust trimmer RV4 to obtain a picture with a height of 189 mm.
- System Test: *640 BY 480 GRAPHICS*.
- Adjust trimmer RV2 to obtain a picture with a height of 189 mm.
- System Test: *1024 BY 768 GRAPHICS*.
- Adjust trimmer RV7 to obtain a picture with a height of 195 mm.

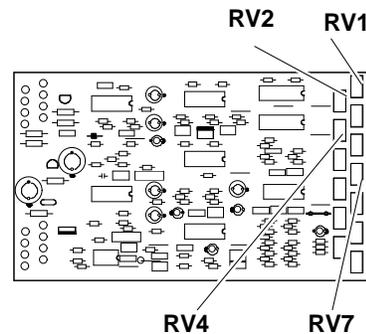


Fig. 7-11 Vertical height adjustment

### ADJUSTING THE GEOMETRIC DISTORTION

- System Test: *1024x768 GRAPHICS*.
- Adjust trimmer RV14 to obtain the most regular picture possible.
- System Test: *640x480 GRAPHICS*.
- Adjust trimmer RV15 to have the most regular picture possible with this working frequency also.

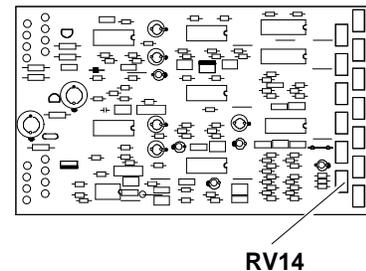


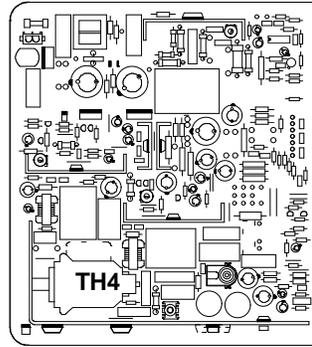
Fig. 7-12 Geometric distortion adjustment

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## Preamplification board adjustment points

### ADJUSTING THE FOCUS

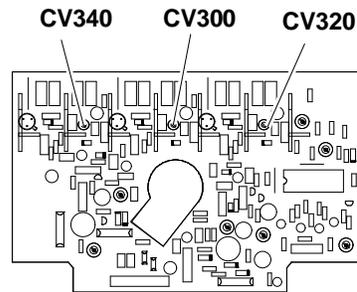
- System Test: *TEST LINEARITY*.
- Adjust the focus through the control on transformer TH4.



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Fig. 7-13 Focus adjustment position on transformer TH4

- Adjust components CV300, CV320 e CV340 to have a picture with the correct offsets.



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Fig. 7-14 Focus adjustment on video pre-amplifier board

## HANTAREX MONITOR HA02

The adjustments for this type of monitor are identical to those for HANTAREX HA01.