COLOUR VIDEO UNIT CDU 1438SE/LO01

This unit is manufactured by **LITE-ON** and bears the marking **DSM 28-039PS** on the front and on the rear of the video on the Progetto di Gestione. The **CDU 1438SE/LO01** confirmation plate is located on the rear of the video.

CHARACTERISTICS

Ergonomic, power saving, VGA-compatible, analog video.

- Screen dimensions: 14"
  Horizontal dimension: 247 ± 8 mm
  Vertical dimension: 188 ± 6 mm
- Input voltage: 90-264 V (universal power supply)
  Mains frequency: 50 - 60 Hz ± 3 %
  Degauss: At power-on time
- Presetting timing:

VIDEO MODE	UNIT OF MEASURE	VGA STANDARD			VGA ERGO	SUPER VGA		XGA
HORIZONTAL RESOLUTION	DOTS	640			640	800	800	1024
FREQUENCY	KHz	31.469			37.86	35.156	37.879	35.524
VERTICAL RESOLUTION	LINES	350	400	480	480	600	600	768
FREQUENCY	Hz	70.08	70.08	59.95	72.8	56.25	60.316	87
V/O POLARITY		-/+	+/-	-/-	-/-	+/+	+/+	+/+
LEVEL		TTL	TTL	TTL	TTL	TTL	TTL	TTL
INTERLACED		NO	NO	NO	NO	NO	NO	YES

- Input signals:
  Video: R, G, B (Red, Green, Blue) Driving
  Signal: Depend on video controller (i.e.: voltage steps)
  Level: 0 - 700 mV
  Polarity: Positive
- External controls: Brightness - Contrast - Horizontal width - Vertical width
  Horizontal shift - Vertical shift
- Power Saving function

VIDEO STATUS	HORIZ. SYNC.	VERT. SYNC.	VIDEO	POWER. SAV.	CONSUMPTION
On	Present	Present	Active	No	< 80 W
Stand-by	Absent	Present	Dark	Minimum	< 15 W
Suspend	Present	Absent	Dark	Considerable	< 15 W
Off	Absent	Absent	Dark	Maximum	< 8 W

REMOVING THE CASING

1. Disconnect the power cord (C) on the rear of the monitor.
2. Unscrew the four screws (V) as shown in the figure, using a cross screwdrivder.

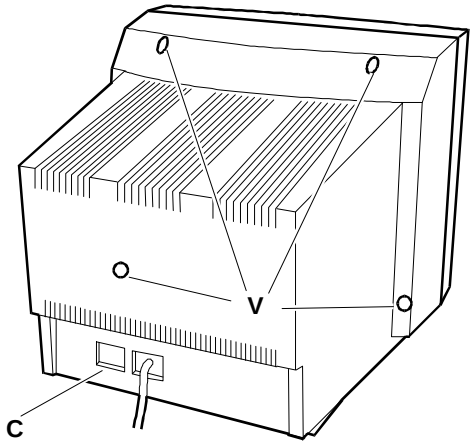


Fig. 31-1 Video Casing Screws Location

3. Pushing on the apposite hook, remove the pedestal.
4. Remove the casing.

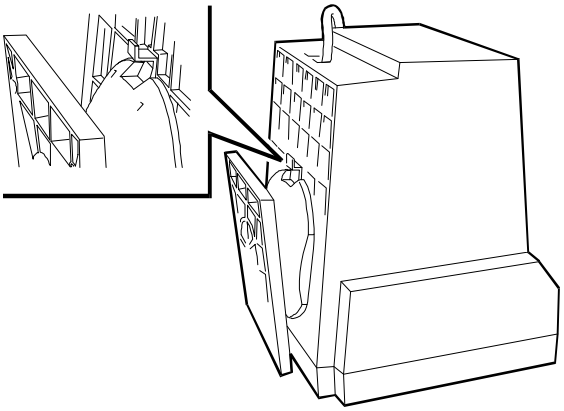


Fig. 31-2 Removal of the Pedestal

DISCHARGING THE ANODE

5. After removing the casing and before performing any work on the unit boards and cables, the extra high voltage (25 KV anode voltage) must be discharged. Use a screwdriver to discharge the CRT anode through a cable to the display chassis ground.

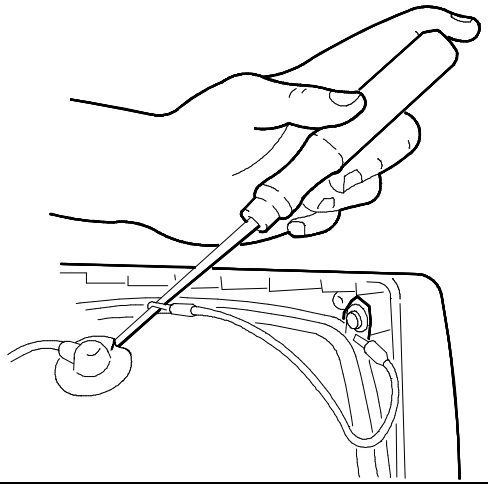


Fig. 31-3 Discharging the EHT

REMOVING THE VIDEO AMPLIFIER BOARD

6. Remove the layer of adhesive silicon on the connection between the CRT connector and the connector of the video amplifier board, used for video protection during transport. Then turn over the video amplifier board.

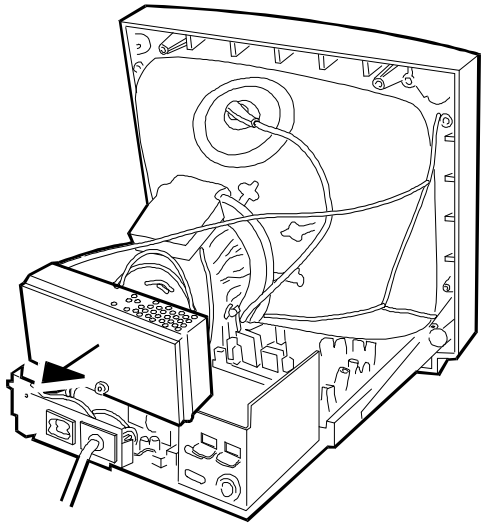


Fig. 31-4 Removing the Video Amplifier Board

7. To free the video amplifier board, disconnect all cables from the metal cover and from connectors: P501, P502, P503, P504, P505, P902, G1, G2, FV and HV.

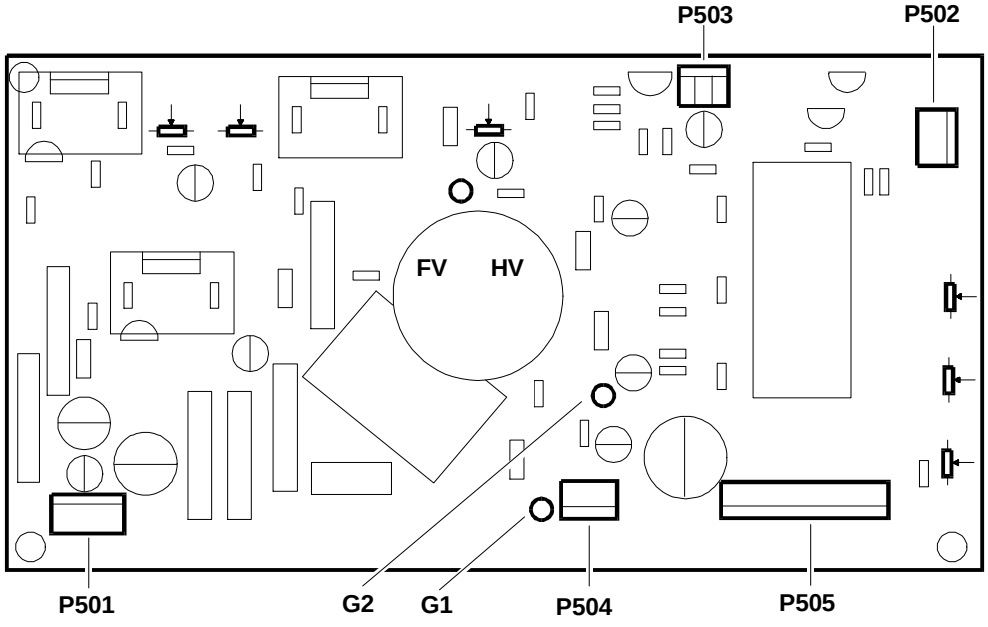


Fig. 31-5 Video Amplifier Board Connectors Location

REMOVING THE MOTHERBOARD

8. Be sure to discharge the EHT (25 KV) before removing the anode.
9. To remove the anode, lift up the rubber cap, squeeze the metal contacts with a pair of pliers and remove them from the hole in the CRT.

10. Disconnect all cables from motherboard connectors: P402, P404, P405, P401A, P001, P803, P804, P101, P002, P301, GND4 and GND5.

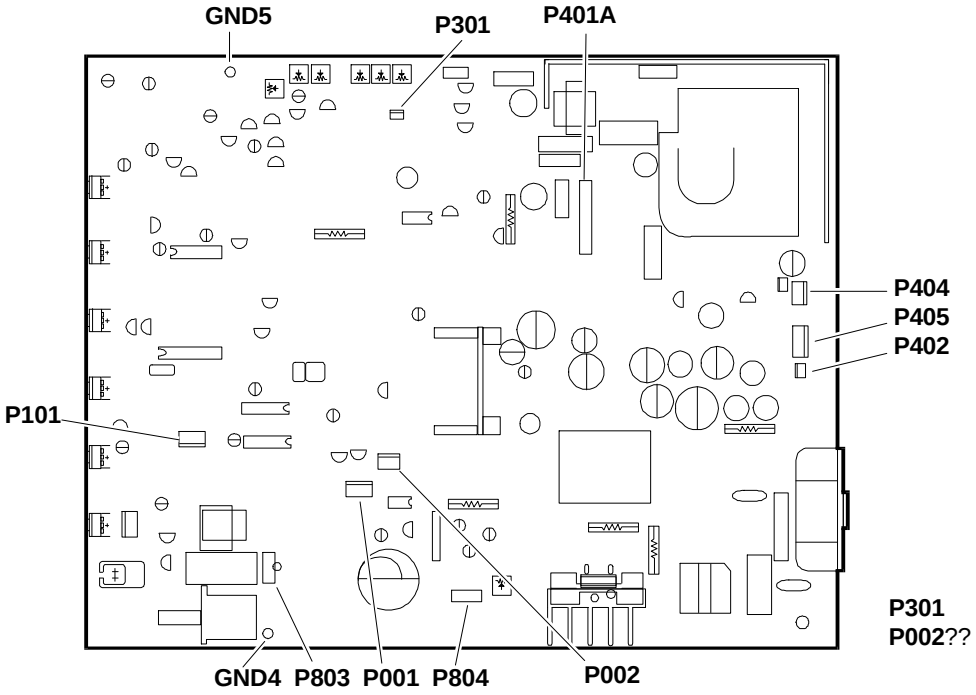


Fig. 31-6 Motherboard Connectors Location

11. To remove the motherboard, position the display as shown in the figure, take away the two tabs (G) and take out the board from its guide.

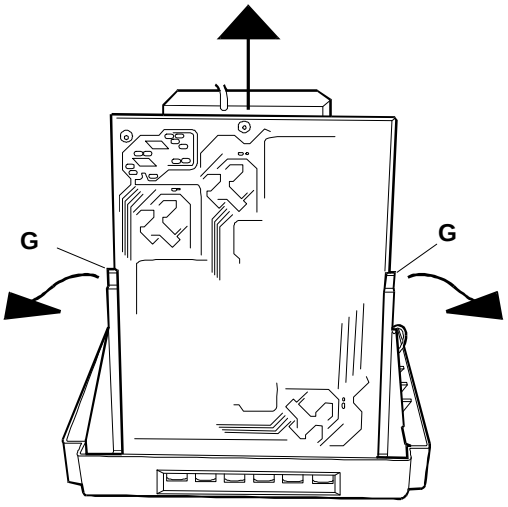


Fig. 31-7 Removing the Motherboard

REMOVING THE CRT

NOTE: The CRT forms a whole with the yoke on which the deflection windings and convergency magnets are mounted. The magnets are laid on the yoke by the CRT manufacturer and must not be moved, otherwise there may be mis-convergency errors which are very difficult to correct. Spare tubes come with the yoke already assembled.

12. Unscrew the four screws (V) securing the CRT to the front frame of the monitor.
13. Lift the CRT from the front casing of the video and free the degauss winding (D).
14. Remove the CRT ground cable (M) releasing the spring that tensions it and release it from the fixing brackets.

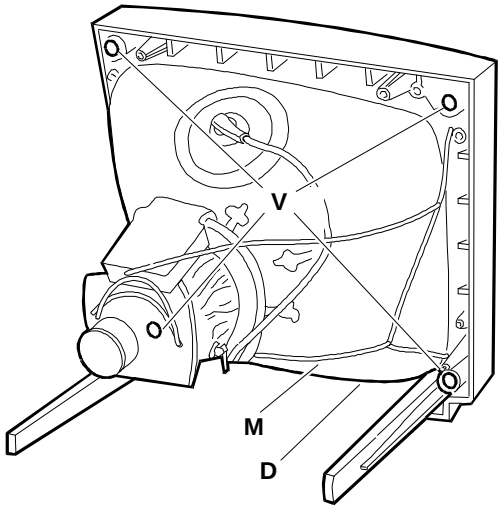


Fig. 31-8 Removing the CRT

REASSEMBLY PROCEDURES

15. To remount the video, follow the disassembly procedures in reverse order.
16. The video casing must be reassembled by sliding it along the work surface.

VIDEO ADJUSTMENTS

Two types of video adjustments are available:

- External controls and adjustments that can be carried out by the user.
- Internal adjustments that can be carried out by the service engineer.

EXTERNAL CONTROLS AND ADJUSTMENTS

On the video unit front panel there are trimmers that can be used by the user or service engineer to adjust:

- Contrast
- Brightness
- Width
- Height
- Horizontal shift
- Vertical shift

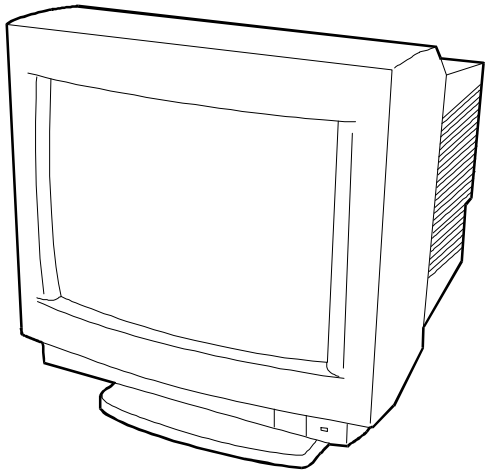


Fig. 31-9 CDU 1438SE/LO01 Video Unit

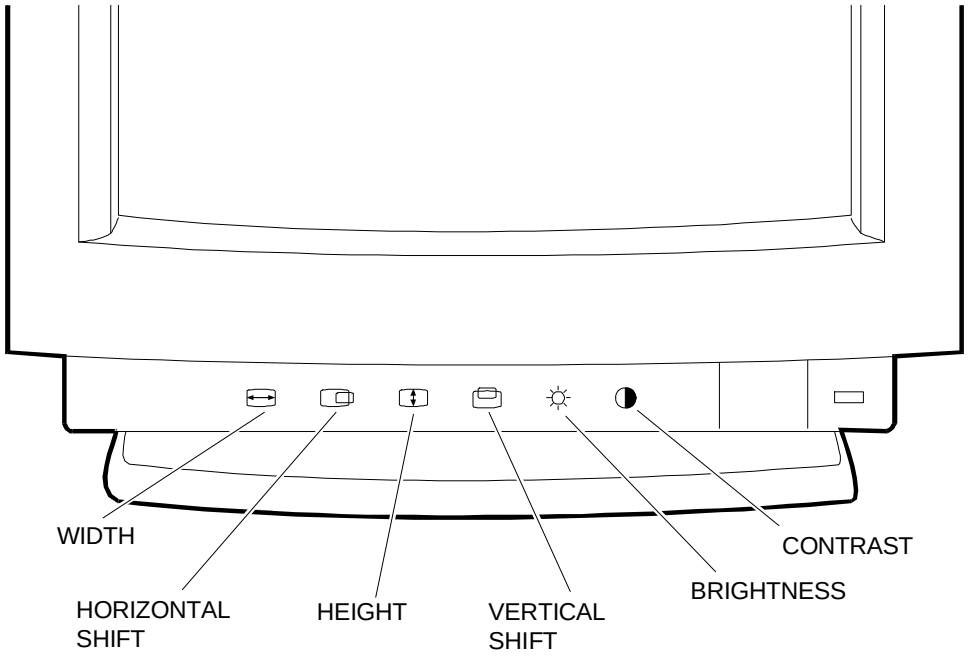
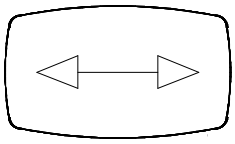


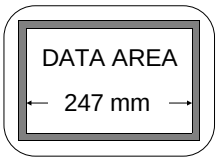
Fig. 31-10 External Video Adjustments

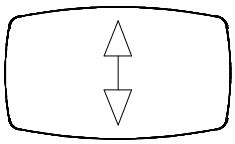
CONTRAST - When the trimmer knob is turned left or right, picture intensity is increased or decreased.

BRIGHTNESS - By turning the trimmer knob to the right or the left, the picture brightness is increased or decreased. When turning a "click" will be heard that indicates that the best position has been obtained (click point), il desired this point can be changed.

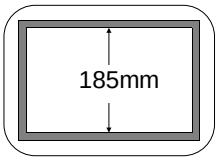


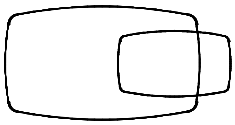
WIDTH
Use the trimmer to obtain a picture width of 247 ± 6 mm.



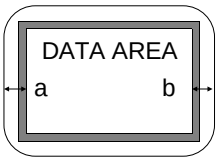


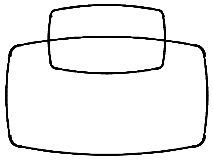
HEIGHT
Use the trimmer to obtain a picture height of 185 ± 6 mm.



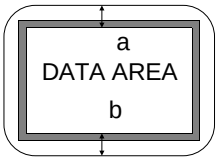


HORIZONTAL SHIFT
Use the trimmer to centre the picture hortizontally.
|a-b|< 4 mm.





VERTICAL SHIFT
Use the trimmer to centre the picture vertically.
|a-b|< 4mm



INTERNAL ADJUSTMENTS

ADJUSTMENT TRIMMERS

The following is a list of the trimmers to use during the video adjustments. The sequence illustrated must be followed in order because some of the adjustments influence those coming afterwards.

VIDEO AMPLIFIER BOARD

R502	Rer drive
R532	Green drive
R562	Blue drive
R910	Red bias
R940	Green bias
R970	Blue bias

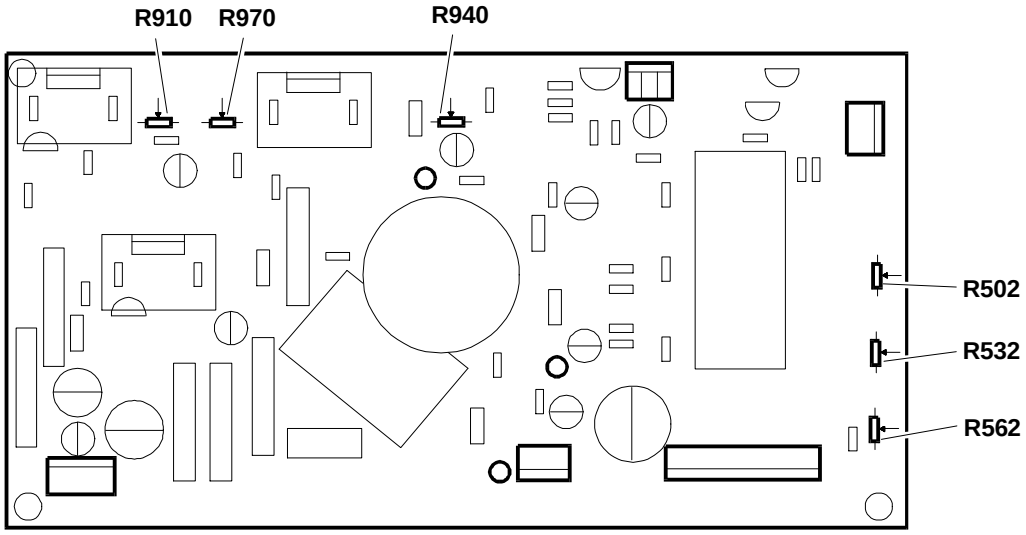


Fig. 31-11 Video Amplifier Board Adjustments

MOTHERBOARD

R596	Contrast adjustment (external access)
R458	Brightness adjustment (external access)
R343	Vertical shift adjustment (external access)
R325	Height adjustment (external access)
R423	Horizontal shift adjustment (external access)
R450	Width adjustment (external access)
R373	Trapezoidal distortion adjustment
R352	Pincushion distortion adjustment
R408	Horizontal synchronization frequency adjustment
R311	Vertical linearity adjustment
R811	B+ voltage adjustment
FOCUS	Focus adjustment
SCREEN	Screen adjustment

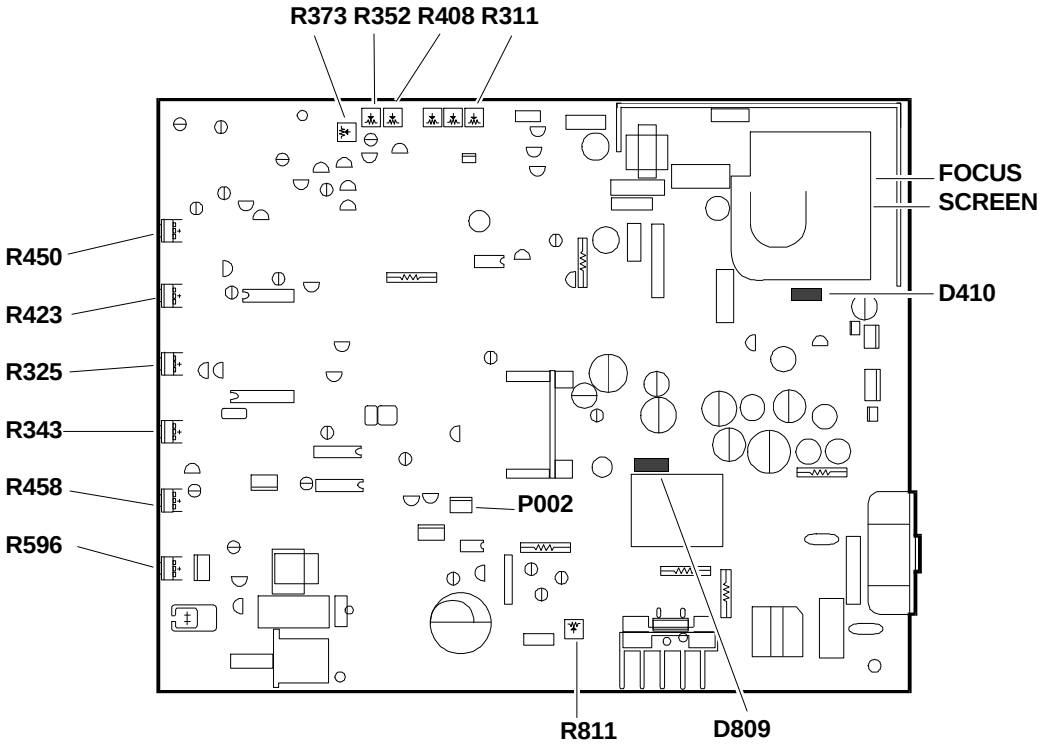


Fig. 31-12 Motherboard Adjustments

B+ VOLTAGE ADJUSTMENT

- Turn on the video at least 15 minutes before adjusting.
- Display a pattern test in VGA (31.468 KHz) video mode.
- On the motherboard connect a voltmeter to the cathode of the D809 diode and adjust, with VR811 trimmer, the voltage to 18.6 ± 0.1 V.

SYNCHRONISM ADJUSTMENTS

- Turn on the video to activate the signals synchronism transmission in the Motherboard.
- Shortcircuit pins 1 and 2 of P002 to ignore the Power Saving function.
- On the motherboard, connect a frequency meter to the anode of the D410 diode and adjust the trimmer R408 to obtain a horizontal frequency od 30.6 KHz ± 100 Hz.

NOTE: At the end of adjustment remove the shortcircuit from pins 1 and 2 of P002.

IMAGE SIZE ADJUSTMENT

- Display a pattern test (CROSS-HATCH PATTERN) in 640x480 (60 Hz) video mode.
- Adjust the width of the image to 247 mm with the R450 external trimmer.
- Adjust the height of the image to 185 mm with the R325 external trimmer.

VERTICAL LINEARITY ADJUSTMENT

- Display a pattern test (CROSS-HATCH PATTERN) in 640x480 (60 Hz) video mode.
- Adjust the vertical linearity with the VR311 trimmer

WHITE BALANCE AND SCREEN ADJUSTEMENT

NOTE: To perform this adjustment correctly a **brightness meter** and a **color analyzer** are needed.

- Display a pattern test (CROSS-HATCH PATTERN) in 640x480 (60 Hz) video mode.
- Adjust the pincushion distortion, with the R352 motherboard trimmer.
- Display a white video page (700 mV) in 640x480 (60 Hz) video mode.
- Set the external brightness and cotrast controls to maximum and adjust the G2 grid trimmer to obtain 1 FL of luminance.
- Set the R490 trimmer of the video amplifier board to center position.
- Adjust the R970 trimmer of the video amplifier board to obtain the chromati co-ordinate Y = 0.280 ± 0.020.
- Adjust the R910 trimmer of the video amplifier board to obtain the chromati co-ordinate Y = 0.290 ± 0.020.
- Adjust the G2 grid trimmer to obtain 0.5 FL of luminance.
- Display a white pattern size 50 x 50 mm in 640x480 (60 Hz) video mode.
- Set the external contrast control to maximum and external brightness control to center position in the "click" point.
- Adjust the R532 trimmer of the video amplifier board to obtain 53 FL of luminance.
- Adjust the external contrast control to obtain 8 FL of luminance.
- Adjust the R562 trimmer of the video amplifier board to obtain the chromatic co-ordinate Y = 0.280 ± 0.020.
- Adjust the R502 trimmer of the video amplifier board to obtain the chromatic co-ordinate Y = 0.290 ± 0.020.

FOCUS ADJUSTMENT

- Display a "H" video page in 640x480 (60 Hz) video mode.
- Adjust the external contrast and brightness controls to maximum.
- Adjust the FOCUS trimmer on the FBT transformer to obtain the best focus of the image.

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