14" COLOUR DISPLAY UNIT - CDU 1460MS/HY01

This unit is manufactured by **HYUNDAI** and bears the marking **DSM 28-144MS** on the front and on the rear of the video and on the Progetto di Gestione. The **CDU 1460MS/HY01** confirmation plate is located on the rear of the video.

CHARACTERISTICS

Ergonomic, multiscan, VGA-compatible, analog video, with digital control panel.

- Screen dimensions: 14"
  Horizontal dimension: 250 ± 4 mm
  Vertical dimension: 187.5 ± 4 mm
- Input voltage: 110 V: 90 - 132 V a.c.
  220 V: 180 - 264 V a.c.
  Mains frequency: 50 - 60 Hz ± 5%
  Degauss: At power-on time
- Input signals:
  Video: Analog R, G, B with separated O/V synchronisms
  Analog R, G, B with separated synchronisms
  Level: 0 - 700 mV
  Polarity: Positive
- Power Saving function

Video status	Horizontal sync.	Vertical sync.	Video	Power saving	Dissipat. power	Reset time	Indicators
On	Present	Present	Active	No	80 W	-	Green
Stand-by	Absent	Present	Deactive	Minimum	< 64 W	Immediate	Green/Orange Blinking 0.5 S
Suspend	Present	Absent	Deactive	> 80%	< 15 W	in 5 sec	Orange Blinking 0.1 s
Off	Absent	Absent	Deactive	> 95%	< 5 W	in 30 sec	Orange

- External controls: ON/OFF switch - Switch on LED - Store/recall key - Contrast Brightness - Horizontal width - Vertical width - Horizontal shift Vertical shift - Pincushion distortion
- Presetting timing

Video mode		VGA Standard			VGA Ergo		SVGA			VGA Plus			
Horiz.	Dots	640	640	640	640	640	800	800	800	1024	1024	1024	1024
Freq.	KHz	31.47	31.47	31.47	37.86	37.5	37.88	48.08	46.87	35.52	56.48	58.14	60.02
Vert.	Lines	350	400	480	480	480	600	600	600	768	768	768	768
Freq.	Hz	70.08	70.08	59.95	72.8	75	60.32	72.19	75	87	70.07	72.13	75.03
Inter.	Y/N	N	N	N	N	N	N	N	N	Y	N	N	N
Pol. V/O	+/-	-/+	+/-	-/-	-/-	-/-	+/+	+/+	+/+	+/+	-/-	+/+	+/+

REMOVING THE CASING

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

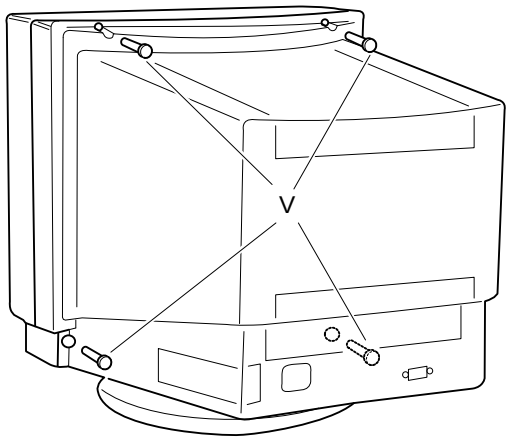


Fig. 28-1 Removal of Monitor Casing

3. Unplug the two pedestal hooks, as illustrated in the figure, to free the casing and remove it.

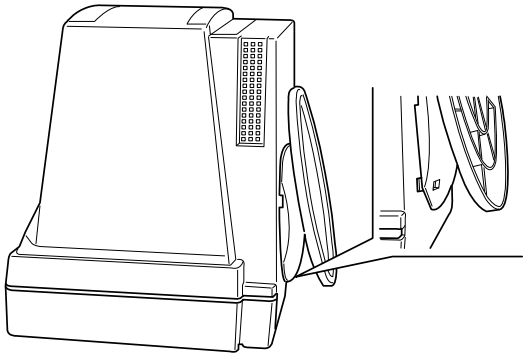


Fig. 28-2 Removal of the pedestal

DISCHARGING THE HIGH VOLTAGE

4. 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.

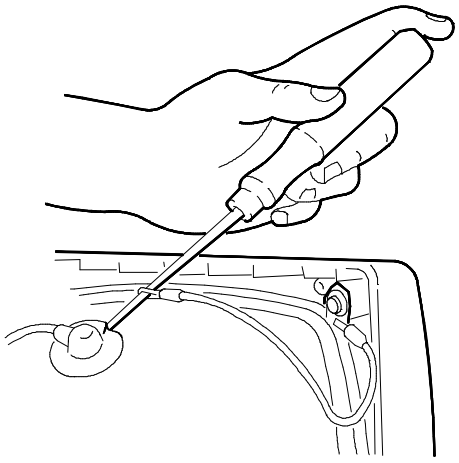


Fig. 28-3 Discharging the EHT

REMOVING THE VIDEO AMPLIFIER BOARD

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

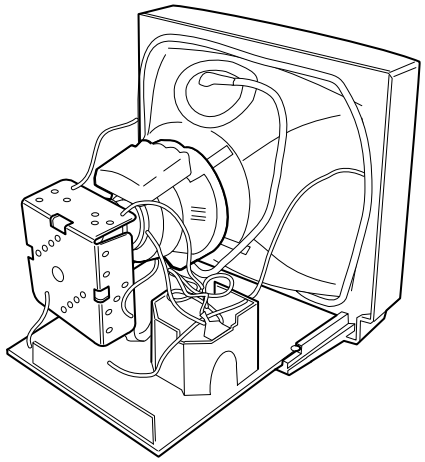


Fig. 28-4 Removing the Video Amplifier Board

6. To free the board, disconnect all cables from the metal cover, from G1, G2 and from W403, W405 and W406 connectors.

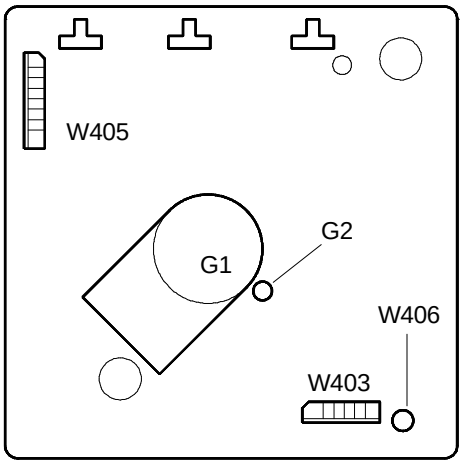


Fig. 28-5 Video Amplifier Board Connectors Location

REMOVING THE MOTHERBOARD

7. Be sure to discharge the EHT (25 KV) before removing the anode.
8. 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.
9. To remove the motherboard, take away the two tabs (T) and take out the board from its guide.

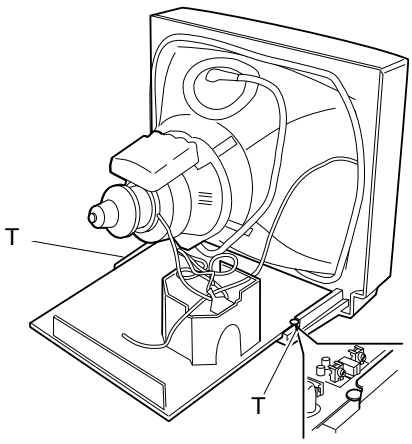


Fig. 28-6 Removing the Motherboard

10. Disconnect all cables from motherboard connectors: W102, W201, W403, W402, W404, W501, W502, W503.

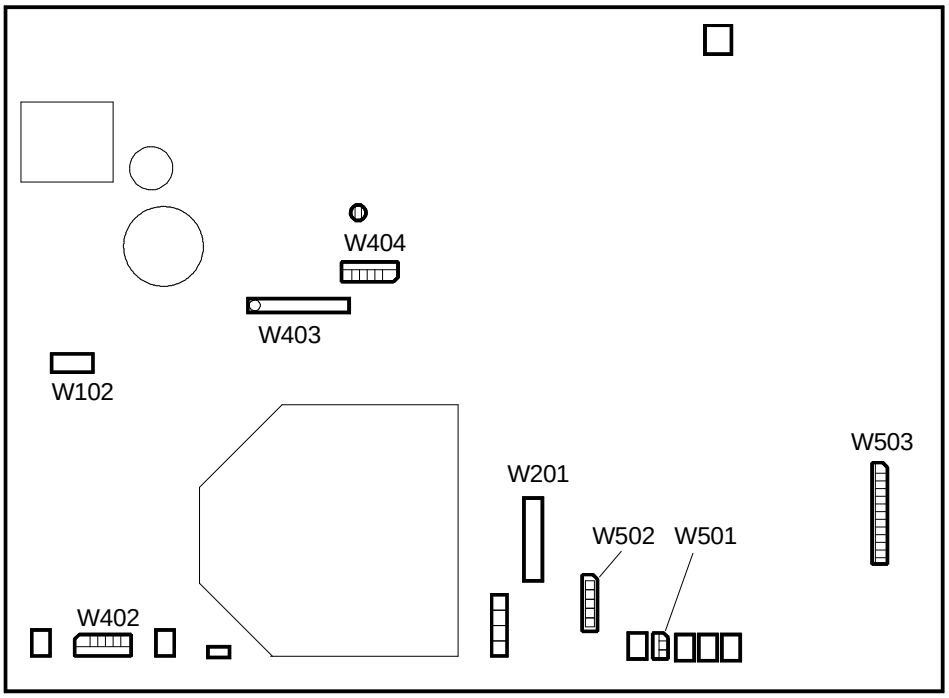


Fig. 28-7 Motherboard Connectors Location

REMOVING THE EXTERNAL CONTROLS BOARD

11. Unscrew the three screws (V), as illustrated in the figure, to remove the external controls board.

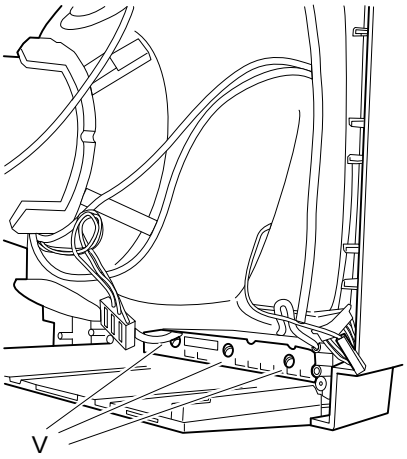


Fig. 28-8 Removing the External Controls Board

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 arrors which are very difficult to correct. Spare tubes come with the yoke already assembled.

12. Unscrew the four screws (A) securing the CRT to the front frame of the monitor.

13. Cut the bands holding the degauss coil (D) and lift the CRT from the front cover.

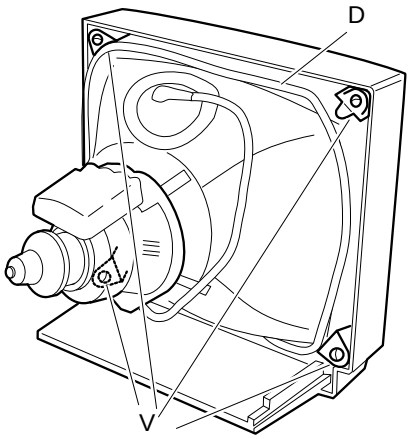


Fig. 28-9 Removing the CRT

14. Remove the catching braid from the CRT by unhooking the earthing braid tensioning spring. The earthing braid should be fixed to the replacement tube.

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.

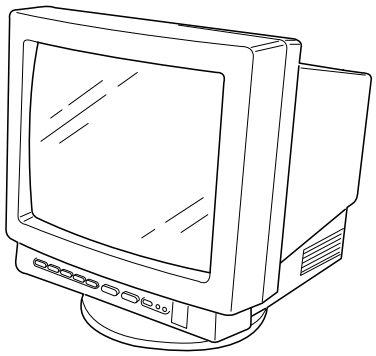


Fig. 28-10 CDU 1460MS/HY01 Front View

EXTERNAL CONTROLS AND ADJUSTMENTS

On the external control panel there are keys, illustrated in the figure, that can be used by the user to carry out external controls and adjustments.

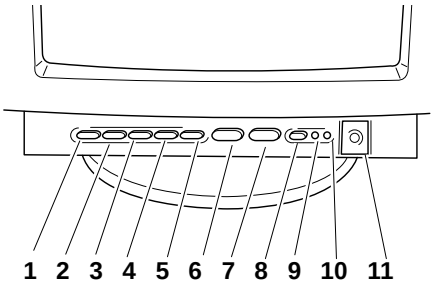
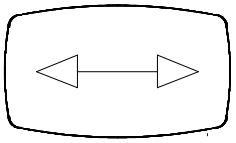
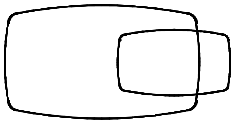


Fig. 28-11 Extrernal Control Panel

1. **HORIZONTAL WIDTH**
   Press this key to adjust the picture horizontal width:
   By pressing to the right the picture will be enlarged
   By pressing to the left the picture will be reduced.

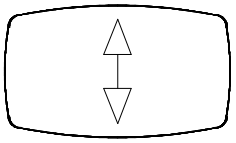


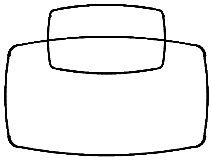
2. **HORIZONTAL SHIFT**
   Press this key to adjust the picture horizontal position:
   By pressing to the right the picture will move to the right
   By pressing to the left the picture will move to the left.



3. **VERTICAL WIDTH**
   Press this key to adjust the picture vertical width:
   By pressing to the right the picture will be enlarged
   By pressing to the left the picture will be reduced.

4. **VERTICAL SHIFT**
   Press this key to adjust the picture vertical position:
   By pressing to the right the picture will move upwards
   By pressing to the left the picture will move downwards.





5. **PINCUSHION DISTORTION**
   Press this key to adjust the pincushion distortion:
   By pressing to the right the picture curvature will vary to external
   By pressing to the left the picture curvature will vary to internal.
6. **BRIGHTNESS**
   Press this key to adjust the picture brightness:
   By pressing to the right the brightness will be enlarged
   By pressing to the left the brightness will be reduced.
7. **CONTRAST**
   Press this key to adjust the picture contrast:
   By pressing to the right the contrast will be enlarged
   By pressing to the left the contrast will be reduced.
8. **STORE/RECALL**
   Press this key to store the picture adjustments see before:
   By pressing for 1 second the new adjustment will store
   By pressing for at least 4 seconds the factory adjustment will recall.
9. **STORE/RECALL INDICATOR LED**
   Operations of store/recall are indicated by the LED blinking.
10. **SWITCH ON LED**
    Normal operation: green colour
    Power saving condition: orange colour.
11. **ON/OFF SWITCH**
    Press this key to switch on or switch off the monitor.

INTERNAL ADJUSTMENTS

Internal adjustments can be carried out by the service engineer.

ADJUSTMENT TRIMMER

The following is a list of the trimmers to use during the video adjustments. The sequence illustrated must be followed in the order shown as some of the adjustments influence those that come later.

Video Amplifier Board

VR402	Blue cutt-off adjustment
VR432	Green cut-off adjustment
VR462	Red cut-off adjustment

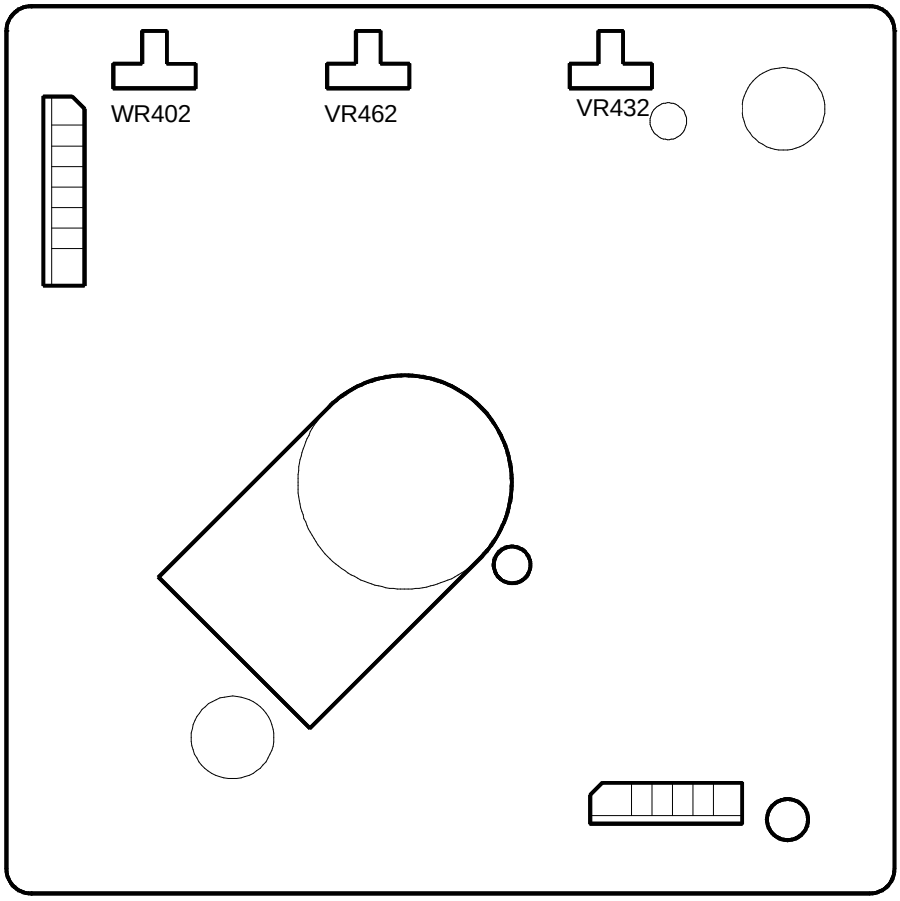


Fig. 28-12 Video Amplifier Board Adjustments

Motherboard

VR431	Sub-brightness adjustment
VR101	PB+ adjustment
VR461	Red gain adjustment
VR401	Blue gain adjustment
VR304	Pin ball adjustment
VR201	Vertical linearity adjustment
VR302	High voltage adjustment
VR301	Horizontal hold adjustment

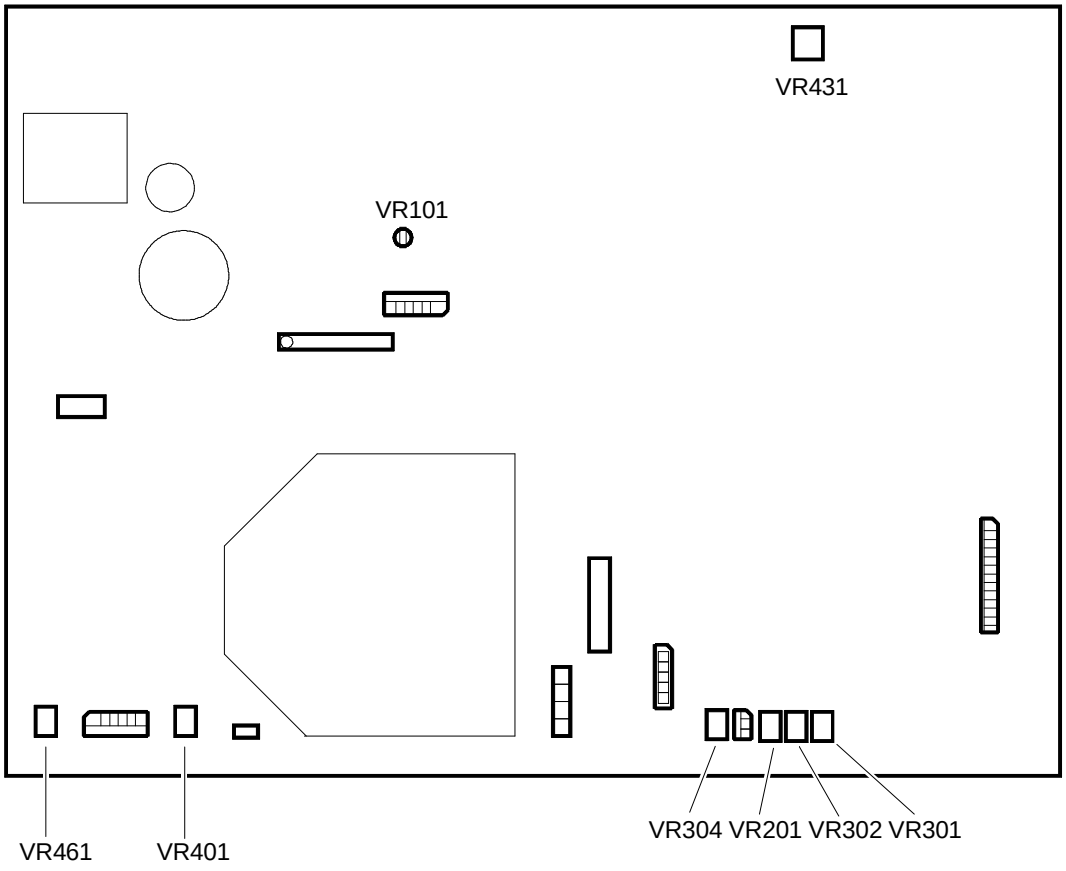


Fig. 28-13 Motherboard Adjustments

ADJUSTMENT OF CONDITIONS AND PRECAUTIONS

- Input voltage must be from 100 to 240 V a.c. (50/60 Hz).
- Switch on the monitor and wait 20 minutes before starting the adjustments.
- Apply 0.7 Vp-p of analog video signal to the 75 Ω termination resistor, with positive/negative TTL level synchronism signal.
- The signal horizontal scanning frequency must be within 30 KHz to 60 KHz.
- The signal vertical scanning frequency must be within 50 to 90 Hz.
- Select the VGA plus, 1024 x 768, mode video with horizontal scanning frequency of 56.476 KHz and vertical scanning frequency of 70 Hz.

ADJUSTMENT OF MOTHERBOARD SETTINGS

- Remove the SW516 jumper.
- Remove the input signal.
- Adjust VR101 trimmer to obtain 138 V ± 1V between the PB+ and ground
- Adjust the high voltage with VR302 trimmer to obtain 23.5 KV ± 0.5 KV.
- Adjust the hold horizontal with VR301 trimmer so that the horizontal scanning frequency is 43.5 KHz ± 0.25 KHz. The hold frequency is carried out by connecting a frequency meter between the red cable of the deflection yoke W201 connector and ground.

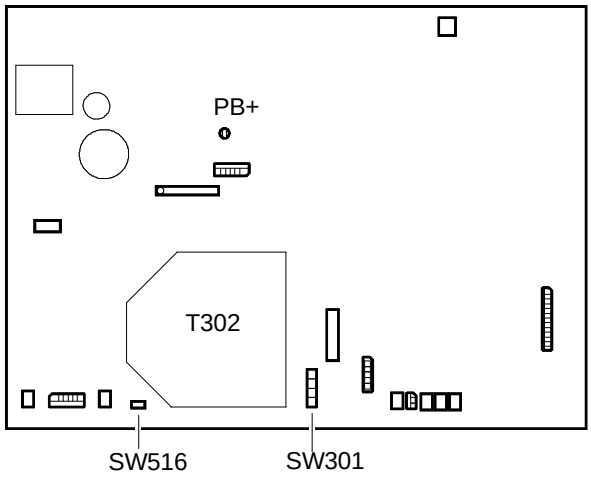


Fig. 28-14 Motherboard Adjustment Points

MOTHERBOARD ADJUSTMENTS

- Insert the SW516 jumper.
- Apply a VGA Plus 1024x768 56 KHz video signal.
- Adjust the horizontal raster centering relative to the screen with the SW301 (three positions) switch.
- Adjust the vertical linearity with the VR201 trimmer.

FOCUS ADJUSTMENT

- Apply a VGA Plus 1024x768 56 KHz video signal.
- With the system test, display a character screen to adjust the focus.
- Set 24 F/L of brightness with the proper external adjustment.
- Adjust the focus potentiometer (FOCUS), located on the row transformer T302, to give the best focus possible.

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