

# 14" COLOUR DISPLAY UNIT - CDU 1435SE/GS11

This unit is manufactured by **GOLDSTAR** and bears the marking **CDU 1435S/GS11** on the rear and **DSM 27-039** on the Progetto di Gestione.

It can display 5 different vertical resolution: 350, 400, 480 lines (VGA standard mode); 600 lines (Super VGA mode) and 768 lines (1024 x 768 interlaced mode). Vertical scan frequency varies from 56 to 87 Hz. (Interlacing frequency).

The horizontal scan frequency may be of: 31.5 KHz (VGA standard mode); 35.2 KHz (Super VGA mode) or 35.5 KHz (1024 x 768 interlaced mode).

## CHARACTERISTICS

Ergonomic, high resolution, VGA-compatible, analog video.

- Screen dimensions: 14"  
Horizontal dimension: 240 mm  $\pm$  6 mm  
Vertical dimension: 180 mm  $\pm$  3 mm
- Input voltage: 110 V: 98 - 132 Vac for CDU 1435SE/GS11 - 110 V  
220 V: 198 - 264 Vac for CDU 1435SE/GS11 - 220 V  
Mains frequency: 50  $\pm$  3 Hz - 60  $\pm$  3 Hz  
Degauss: On powering up
- Horizontal Synchronism:  
Frequency: 31.5 - 35.2 - 35.5 KHz  
Polarity: Negative or positive  
Level: TTL  
Pull-in range: more than  $\pm$  250 Hz  
Hold-in range: more than  $\pm$  350 Hz  
Retrace period: 5.0  $\mu$ s max.
- Vertical Synchronism:  
Frequency: 56 - 60 - 70 - 87 (Interlaced) Hz  
Polarity: Negative or positive  
Level: TTL  
Pull-in range: 50 - 87 Hz  
Hold-in range: 50 - 87 Hz  
Retrace period: < 800  $\mu$ s
- Input signals:  
Video: R, G, B (Red, Green, Blue) driving  
Signal: Linear voltage steps (63 steps of 11 mV)  
Level: 0 - 700 mV  
Polarity: Positive
- Resolutions displayed: 640 x 350 rows x columns (VGA standard mode)  
640 x 400 rows x columns (VGA standard mode)  
640 x 480 rows x columns (VGA standard mode)  
800 x 600 rows x columns (Super VGA mode)  
1024 x 768 rows x columns (1024 x 768 int. mode)
- External Controls: Brightness - Contrast  
Horizontal size - Vertical size  
Horizontal phase - Vertical center

## REMOVING THE COVER

1. Position the display as shown in the figure; put a cloth on the table under the unit so as not to scratch the CRT glass screen. Remove the 4 cover securing screws V1, V2, V3 and V4.
2. Take the cover off; take care not to damage the cables or board components.

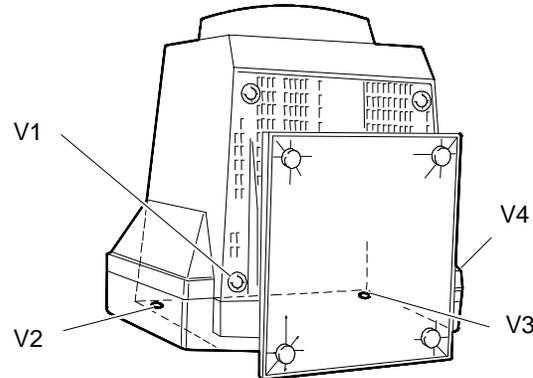


Fig. 20-1 Removal Screws Securing the Video Cover

## DISCHARGING THE HIGH VOLTAGE

3. Before removing any board, you must first discharge the high voltages (25 KV CRT anode voltage). To discharge the CRT anode, use a screwdriver, connecting it with a wire conductor to the monitor chassis ground. Put the point of the screwdriver under the rubber suction cap of the anode until it touches the two contacts of the CRT anode. Hold the screwdriver in contact with the anode for a few seconds until the high voltage is fully discharged.

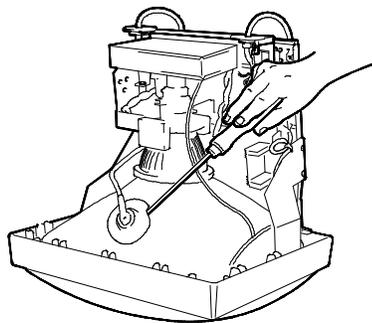
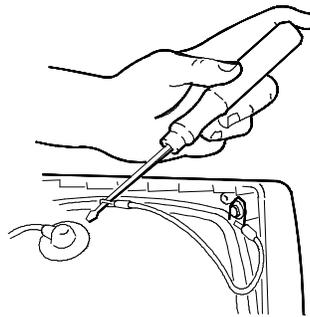


Fig. 20-2 Discharging the High Voltage

## REMOVING THE VIDEO AMPLIFIER BOARD

4. Remove the monitor cover as described in the paragraph "REMOVING THE COVER".
5. Remove the silicon solution attaching the CRT to the connector of the video amplifier board (used for security of transport).
6. Unscrew screw A attaching the ground cable, that connects the video amplifier board structure to the main board structure.
7. Disconnect the video amplifier board from CRT. Disconnect connector B interfacing the main board, connector C connected to the video ground.
8. Disconnect (desolder) connectors D interfacing the video signal cable.
9. Raise the grid of the G3 (focus) grid input at the CRT connector on the video board. Desolder the connection.
10. Disconnect the G2 grid cable.
11. The video board is now free of all connection.

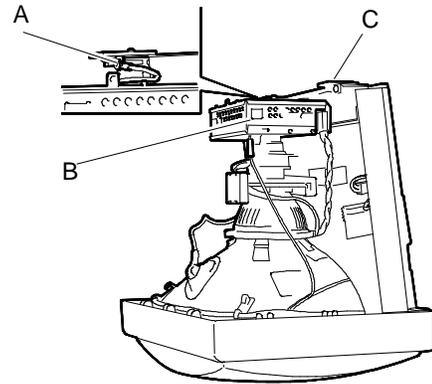


Fig. 20-3 Removing the Video Amplifier Board

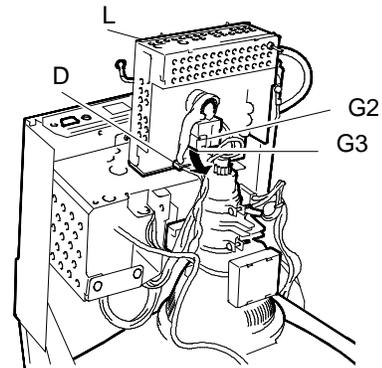


Fig. 20-4 Video Amplifier Board

## REMOVING THE MAIN BOARD

12. Discharge the anode, as described in the paragraph "DISCHARGING THE HIGH VOLTAGE", before starting to work on the monitor.

13. Remove the video amplifier board as described in the paragraph "REMOVING THE VIDEO AMPLIFIER BOARD".

**NOTE:** Disconnect the anode suction cap. Turn the plastic top of the anode upside down and draw the two catches of the anode contact closer together.

14. Lift off the anode suction cap.

15. Disconnect connectors A, unscrew the screws and raise the slots that fixing the main board at the support.

16. Press catches and raise the board from side A.

17. Disconnect deflection yoke D and potentiometers P connectors, than press catch B and remove board.

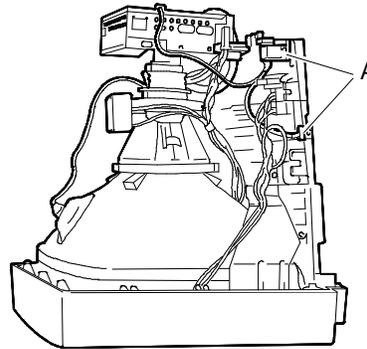


Fig. 20-5 Removing the main board

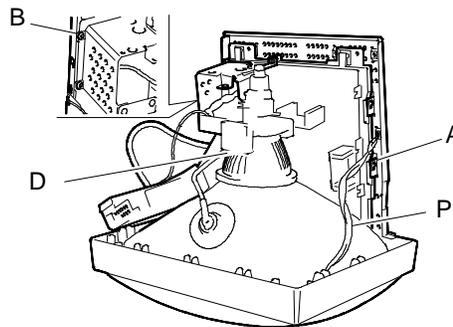


Fig. 20-6 Removing the main board

## REPLACING THE VIDEO SIGNALS CABLE

18. If the signals cable needs replacing, disconnect the cable and unscrew the screws A fixing it.

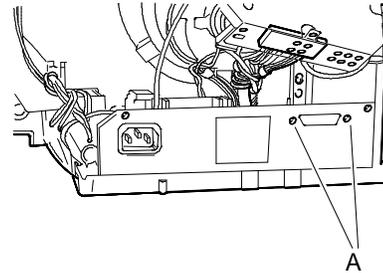


Fig. 20-7 Replacing the Video Signals Cable

## REMOVING THE CRT

**NOTE:** In addition to the cathode ray tube, the CRT also comprises the deflection yoke and the geometric distortion regulation magnets. These magnets should not need to be adjusted.

19. Remove the video amplifier board and main board as described previously.
20. Remove the 4 screws V securing the CRT to the front casing of the monitor, and release it from the casing.
21. Remove the CRT aquadag D, after releasing the spring keeping it taut.

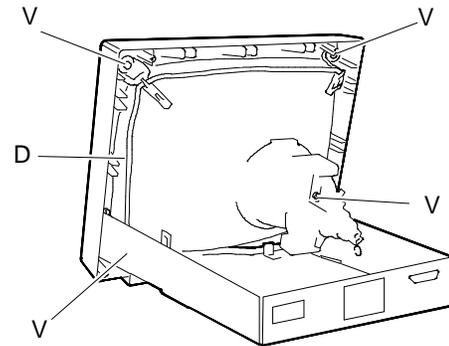


Fig. 20-8 Removing the CRT

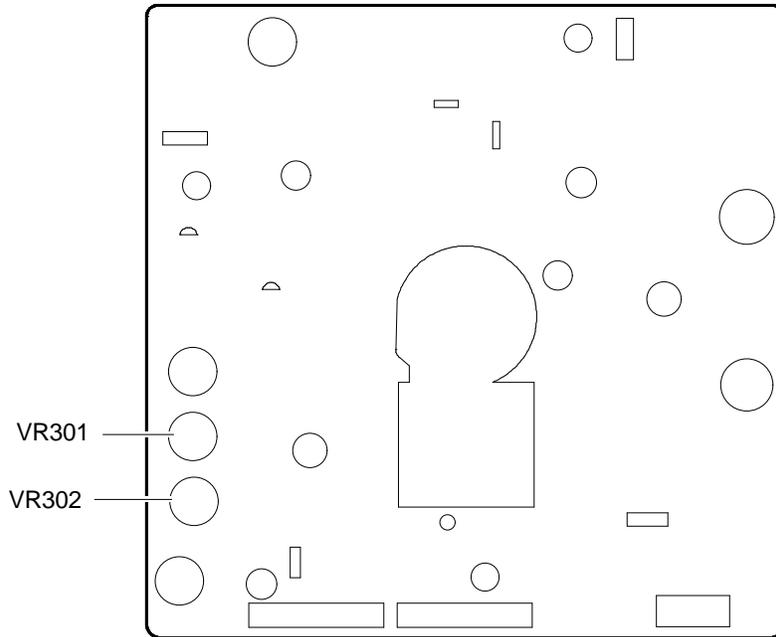
## VIDEO ADJUSTMENTS

### ADJUSTMENT TRIMMERS

The following list illustrates the trimmers to be used in making video adjustments. The sequence illustrated below should be performed step by step as some of the adjustments influence those that follow.

#### Video amplifier board

- VR301      Blue cut-off
- VR302      Green cut-off

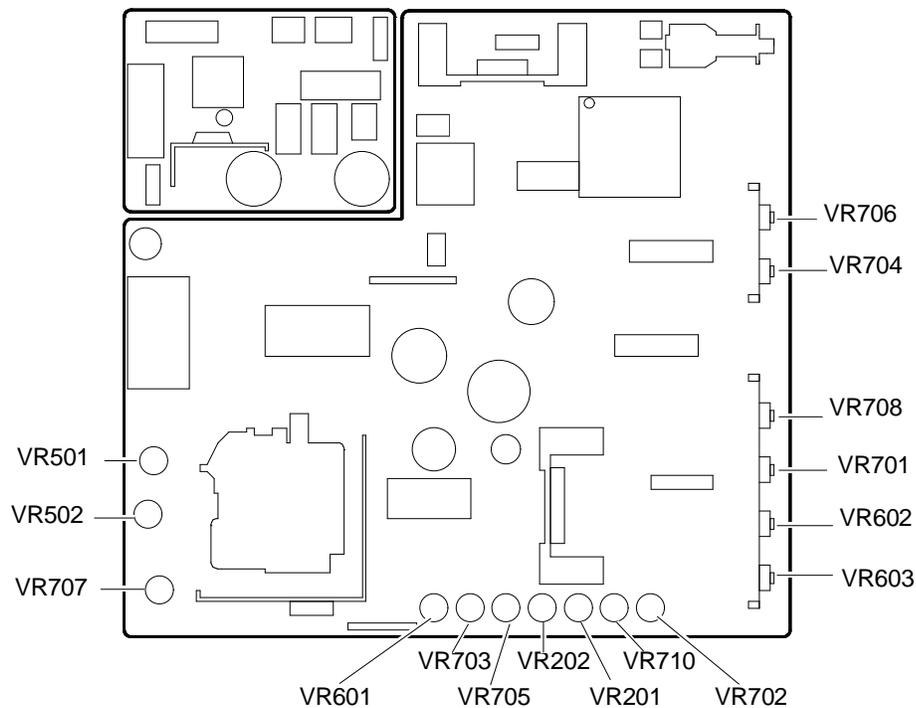


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Fig. 20-9 Video Amplifier Board Adjustments

**Main board**

VR201	Horizontal phase 123 adjustment
VR202	Horizontal phase adjustment
VR501	Green drive adjustment
VR502	Blue drive adjustment
VR602	Vertical size adjustment (external access)
VR601	Vertical linearity adjustment
VR603	Vertical center adjustment (external access)
VR702	Horizontal hold adjustment
VR701	Horizontal phase adjustment (external access)
VR703	Sub-contrast adjustment
VR708	Horizontal size adjustment (external access)
VR705	Sub-brightness adjustment
VR704	Contrast adjustment (external access)
VR707	Horizontal center adjustment
VR706	Brightness adjustment (external access)
VR710	Side pincushion adjustment



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Fig. 20-10 Main Board Adjustments

## MAIN BOARD ADJUSTMENTS

The main board setting procedures described in this section guarantee correct setting of the video unit. It is important to respect the order in which the procedures are listed for best results.

**NOTE:** In performing these setting an **electrostatic voltmeter** and an **electronic voltmeter** must be used. In view of the high voltages being measured, proceed with extreme caution and take care at all times.

### HORIZONTAL HOLD ADJUSTMENT

- Set PC or signal generator to VGA mode.
- Connect the TP2 pin on main board to GND with short clip.
- Connect the frequency counter between GND and R776 lead which is adjacent to pulse trans (T901).
- Adjust the frequency to  $31.45 \text{ KHz} \pm 100 \text{ Hz}$ .

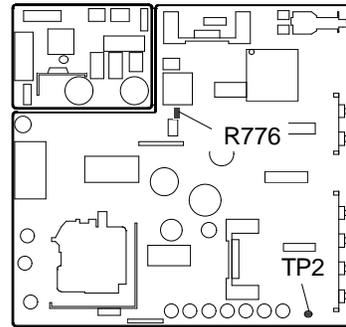


Fig. 20-11 Locating of R776

### VERTICAL LINEARITY ADJUSTMENT

- System Test: 640 BY 480 GRAPHICS, CROSS HATCH PATTERN.
- Adjust VR601, so that the vertically linearity should be best condition.

### VERTICAL SIZE ADJUSTMENT

- System Test: 640 BY 480 GRAPHICS.
- Set the external V-SIZE VR602 (external VR) at Center Position.
- Adjust the V-SIZE VR602 and then the vertical size should be within  $180 \pm 2 \text{ mm}$ .

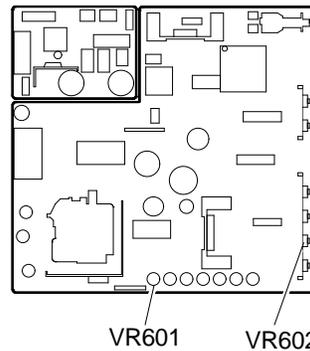
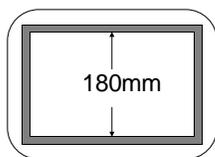


Fig. 20-12 Vertical Linearity and Vertical Size Adjustment

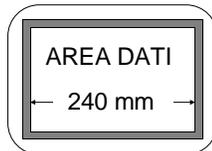


**SIDE PINCUSHION ADJUSTMENT**

- System Test: CROSS HATCH PATTERN.
- Adjust the VR710 so as to minimize the pincushion distortion.

**HORIZONTAL SIZE ADJUSTMENT**

- System Test: CROSS HATCH PATTERN.
- Adjust VR708 (external VR) for the Horizontal Size as to be within  $240 \pm 2$  mm.



- Then the Bright control should be set at the center, and the Contrast control should be set at the Max.

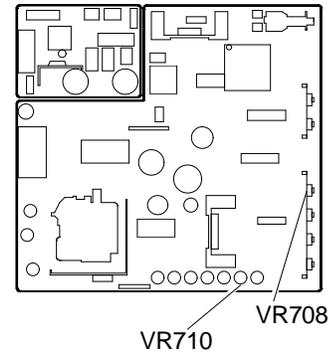


Fig. 20-13 Side Pincushion and Horizontal Size Adjustment

**BRIGHTNESS ADJUSTMENT**

- Set the external bright VR706 at center and the external contrast VR704 at Min.
- Display the Cut-Off Level (Color 0.0)
- Adjust the Sub-Bright VR705 until the back raster disappears.
- Confirm that back raster appears when the Bright VR706 is at Max.

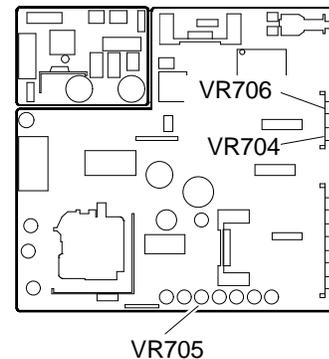


Fig. 20-14 Brightness Adjustment

**CONTRAST ADJUSTMENT**

- Set the external bright VR706 at center and the external contrast VR704 at Max.
- Display White Pattern (700 mV input voltage), of which the size is 90 x 90, on the monitor.
- At the center of the screen, adjust the Sub-Contrast VR (VR703), so that the brightness should be  $\geq 95$  NIT.

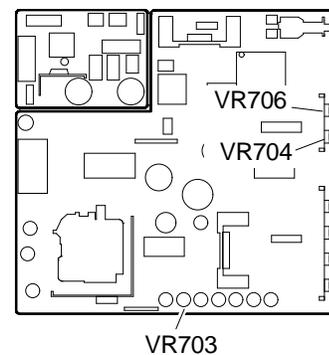
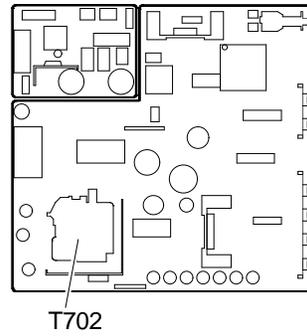


Fig. 20-15 Contrast Adjustment

## FOCUS ADJUSTMENT

- System Test: CHECK LINEARITY, that display the "H" character in full screen.
- Set the bright VR at the center and the contrast VR at Max.
- Adjust Focus VR, on T702 transformer, so that the focus should be best condition



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Fig. 20-16 Focus Adjustment