

17" COLOUR VIDEO UNIT - CDU1764GE/GS01

This unit is manufactured by **GOLDSTAR** and bears the marking **DSM 28-172 EY** on the front and on the rear of the video on the Progetto di Gestione. The **CDU 1764GE/GS01** confirmation plate is located on the rear of the video.

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CHARACTERISTICS

Ergonomic, multiscan, high resolution, VGA-compatible, analog video, low emission, with digital control panel.

- Screen dimensions: 17"
Horizontal dimension: 300 ± 6 mm (290 ± 6 mm only for 1280 x 1024)
Vertical dimension: 225 ± 6 mm (232 ± 6 mm only for 1280 x 1024)
- Input voltage: 94 - 264 V a.c. (universal power supply)
Mains frequency: 50 - 60 Hz ± 5 %
Degauss: At power-on time
- Presetting timing:

VIDEO MODE		VGA STANDARD		VGA ERGO	SVGA		VGA PLUS	HIGH RESOLUTION
HORIZ.	DOTS	640		640	800	800	1024	1280
FREQ.	KHz	31.469		37.86	37.879	48.077	56.476	64.252
VERT.	LINES	400	480	480	600	600	768	1024
FREQ.	Hz	70.08	59.95	72.8	60.316	72.18	70.07	60.049
V/O POL.		+/-	-/-	-/-	+/+	+/+	-/-	-/-
INTER.		N	N	N	N	N	N	N

- Input signals:
Video: R, G, B (Red, Green, Blue) analog with separated O/V synchronisms
R, G, B (Red, Green, Blue) analog with composite O/V synchronisms
Level: 0 - 700 mV p.p.
Polarity: Positive
- Power Saving function

VIDEO STATUS	HORIZ. SYNC.	VERTICAL SYNC.	VIDEO	POWER SAVING	CONSUMPTION
ON	PRESENT	PRESENT	ACTIVE	NO	< 100 W
STAND-BY	ABSENT	PRESENT	DARK	MINIMUM	< 15 W
SUSPEND	PRESENT	ABSENT	DARK	CONSIDERABLE	< 15 W
OFF	ABSENT	ABSENT	DARK	MAXIMUM	< 8 W

- External controls: ON/OFF - Degauss - Contrast - Brightness - Select - Recall Up/Down
Width - Height - Horizontal position - Vertical position
Pincushion distortion - Trapezoidal distortion

REMOVING THE CASING

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

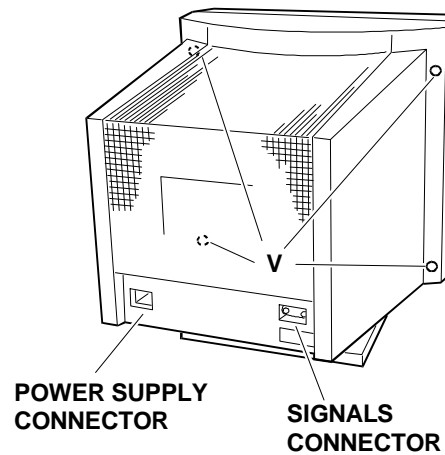


Fig. 29-1 Removal of Monitor Casing

3. Unscrew the 6 screws (V) illustrated in the figure, free the tabs of the casing from the holes and remove the metal internal casing.

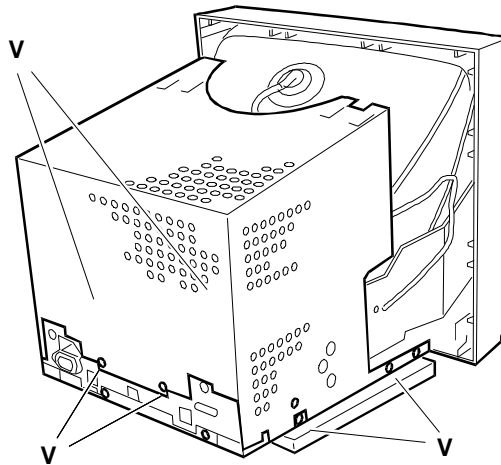


Fig. 29-2 Removal of Internal Casing

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.

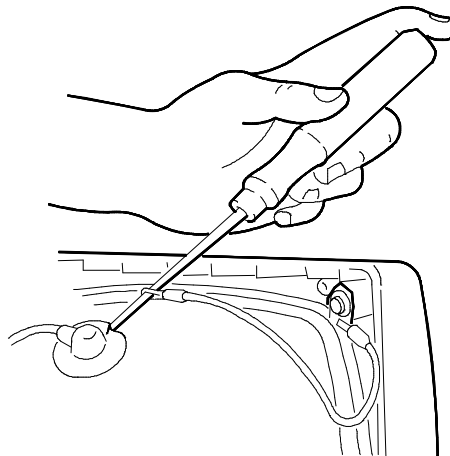
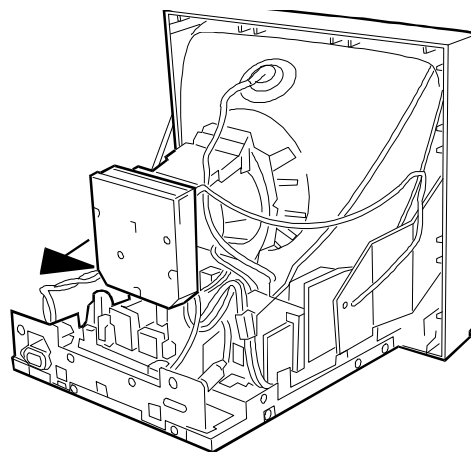


Fig. 29-3 Discharging the EHT

REMOVING THE VIDEO AMPLIFIER BOARD

- 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.



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Fig. 29-4 Removing the Video Amplifier Board

- Disconnect or desolder the cables from the connectors as shown in the figure to disconnect the board from the video. The connectors involved are: **P301**, **P302**, **P304**, **G2 (Green)**, **G3 (Focus)**, **2** ground connectors on the metal casing, **1** degauss connector on the metal casing, **1** ground cable connected to the motherboard metal support.
- To remove the cover of the video amplifier board, free the tabs from the holes.

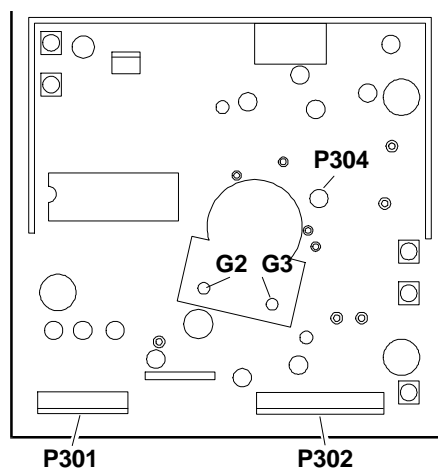


Fig. 29-5 Video Amplifier Board Connectors Location

REMOVING THE MOTHERBOARD

- Be sure to discharge the EHT (25 KV) before removing the anode.
- 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.
- To separate the motherboard support from the video, unscrew the 8 screws (V) and remove all as shown in the figure.

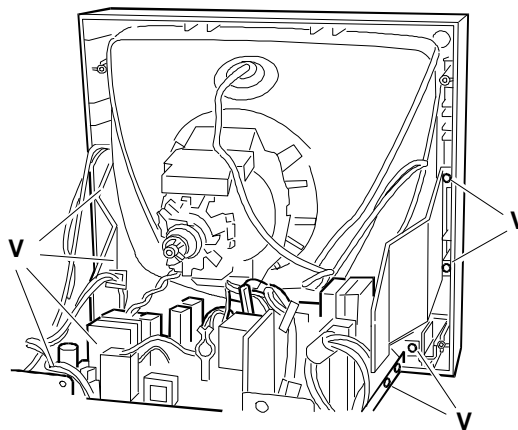


Fig. 29-6 Removing the Motherboard

11. Remove all the cables from the motherboard connectors to free them. The connectors involved are: **P701, P702, P703, P704, P601, P901, P902.**

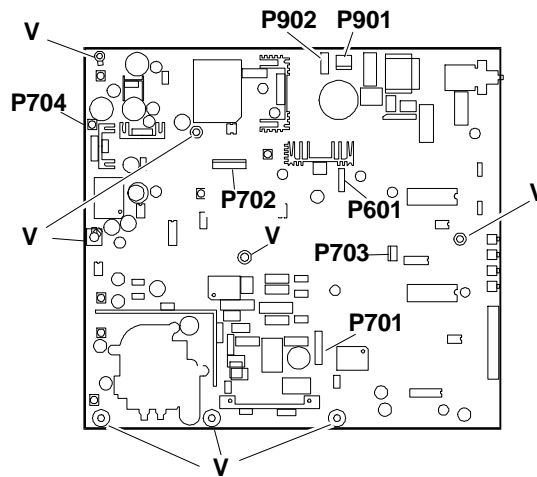


Fig. 29-7 Motherboard Connectors and Screws Position

12. To separate the plastic support from the motherboard metal support, unscrew the 7 screws (V) as shown in the figure.

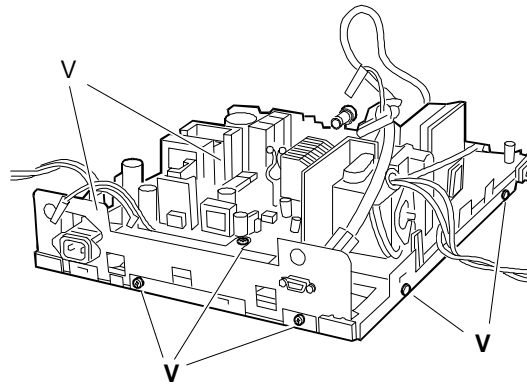


Fig. 29-8 Removing the Plastic Support from the Metal Support

13. To separate the motherboard from the plastic support, unscrew the screws indicated in figure 29-7; then turn over it and unscrew the 3 screws located under the FBT transformer. Turn over the motherboard again and remove it from the plastic support by pushing on the hooks (G).

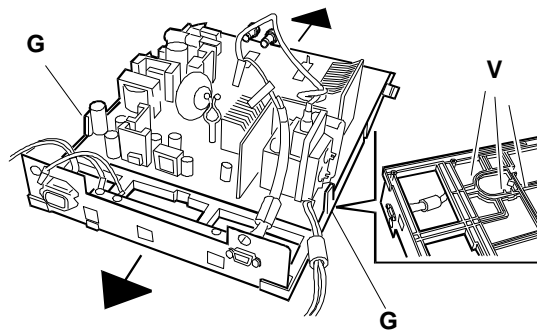
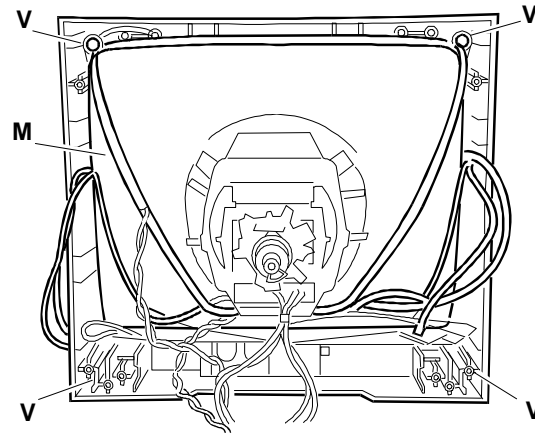


Fig. 29-9 Removing the Motherboard from the Plastic Support

REMOVING THE CRT

NOTE: The CRT forms a whole with the yoke on which the deflection windings and convergence 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.

14. Unscrew the four screws (A) securing the CRT to the front frame of the monitor.
15. Cut the bands holding the degauss coil and lift the CRT from the front cover.



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Fig. 29-10 Removing the CRT

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

REASSEMBLY PROCEDURES

To remount the video unit, follow the disassembly procedures in reverse order.

VIDEO ADJUSTMENTS

Two types of video adjustment 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

1. Contrast

According to the environmental light, adjust the contrast to obtain the best image quality with the trimmer knob.

2. Brightness

According to the environmental light, adjust the brightness to obtain the best image quality with the trimmer knob.

3. Degauss

Press this key to run the degauss function.

Image geometry, positioning

The adjustment switches are positioned in the external control panel illustrated in the relative figure. To select the parameter to adjust press the **SELECT** (10) key until the symbol of the adjustment is indicated by the lighting of the relative **LED**. Adjust each parameter with the **UP/DOWN** (11) keys; the adjustments are stored automatically. The **RECALL** (12) function is achieved by pressing the UP and DOWN keys together; in this way the default settings for VGA (640x400), VGA Ergo (640x480) and VGA Plus (1024x768 70 Hz) are available.

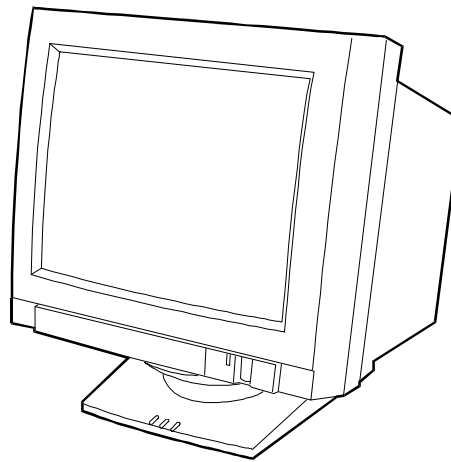


Fig. 29-11 Video Unit Front View

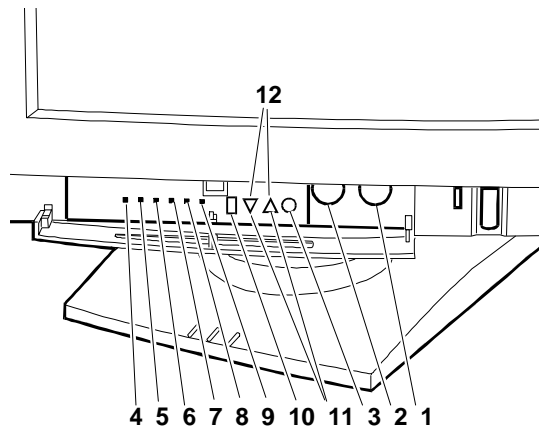


Fig. 29-12 External Control Panel

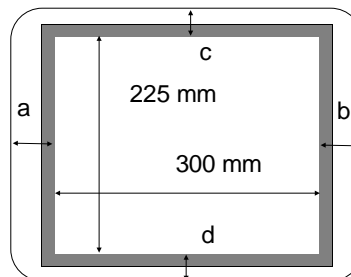
The following is a list of the adjustments which can be made by the users on the following image characteristics:

Width: 300 ± 6 mm (290 ± 6 mm)

Height: 225 ± 6 mm (232 ± 6 mm)

$|a - b| \leq 4$ mm

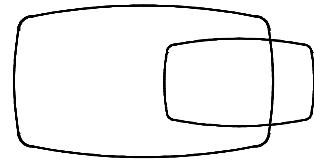
$|c - d| \leq 4$ mm



NOTE: The 1280 x 1024 resolution dimensions are indicated in brackets.

4. Horizontal Position

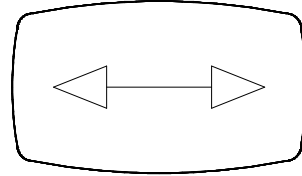
To adjust the horizontal position of the image, use the SELECT key to choose the adjustment and center the image horizontally with the UP/DOWN keys.



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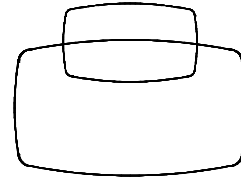
5. Width

To adjust the width of the image, use the SELECT key to choose the adjustment and adjust the width of the image with the UP/DOWN keys.



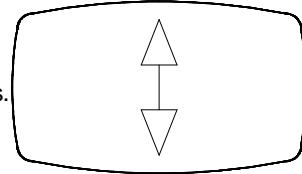
6. Vertical Position

To adjust the vertical position of the image, use the SELECT key to choose the adjustment and center the image vertically with the UP/DOWN keys.



7. Height

To adjust the height of the image, use the SELECT key to choose the adjustment and adjust the height of the image with the UP/DOWN keys.



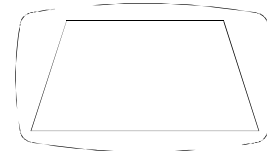
8. Pincushion Distortion

To adjust the pincushion distortion, use the SELECT key to choose the adjustment and correct the distortion with the UP/DOWN keys.



9. Trapezoidal Distortion

To adjust the trapezoidal distortion, use the SELECT key to choose the adjustment and correct the distortion with the UP/DOWN keys.



INTERNAL ADJUSTMENTS

ADJUSTMENT TRIMMERS

The following is a list of the trimmers to use during the video adjustments.

Video Amplifier Board

VR301	Green drive
VR302	Red drive
VR303	Red bias
VR304	Green bias
VR305	Sub-brightness adjustment

NOTE: Bias is the electronic gun gain.

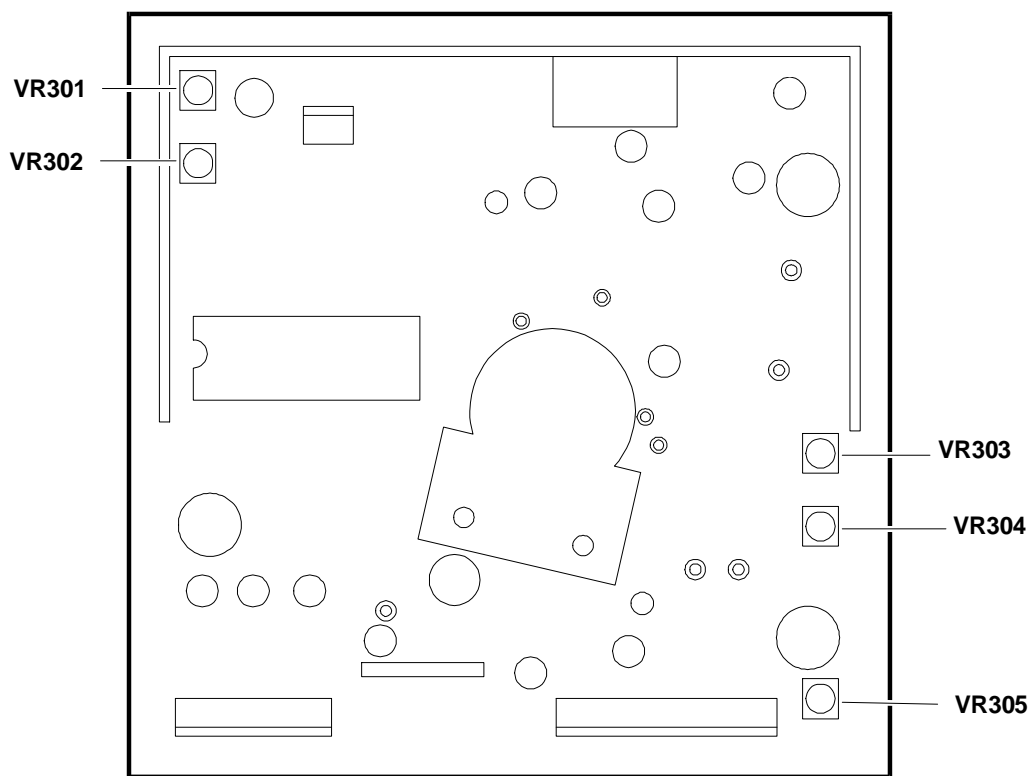


Fig. 29-13 Video Amplifier Board Adjustments

Motherboard

VR501	High voltage adjustment
VR701	Horizontal raster centering
VR901	B+ voltage adjustment
VR704	Sub-contrast adjustment
VR703	ABL (Automatic Beam Limiter) adjustment
VR702	Contrast adjustment (external access)
VR201	Brightness adjustment (external access)
SW804	Degauss adjustment key (external access)
SW802	Recall/up adjustment key (external access)
SW803	Recall/down adjustment key (external access)
SW801	Select adjustment key (external access)
FOCUS1	Focus adjustment
FOCUS2	Focus adjustment
SCREEN	Screen adjustment

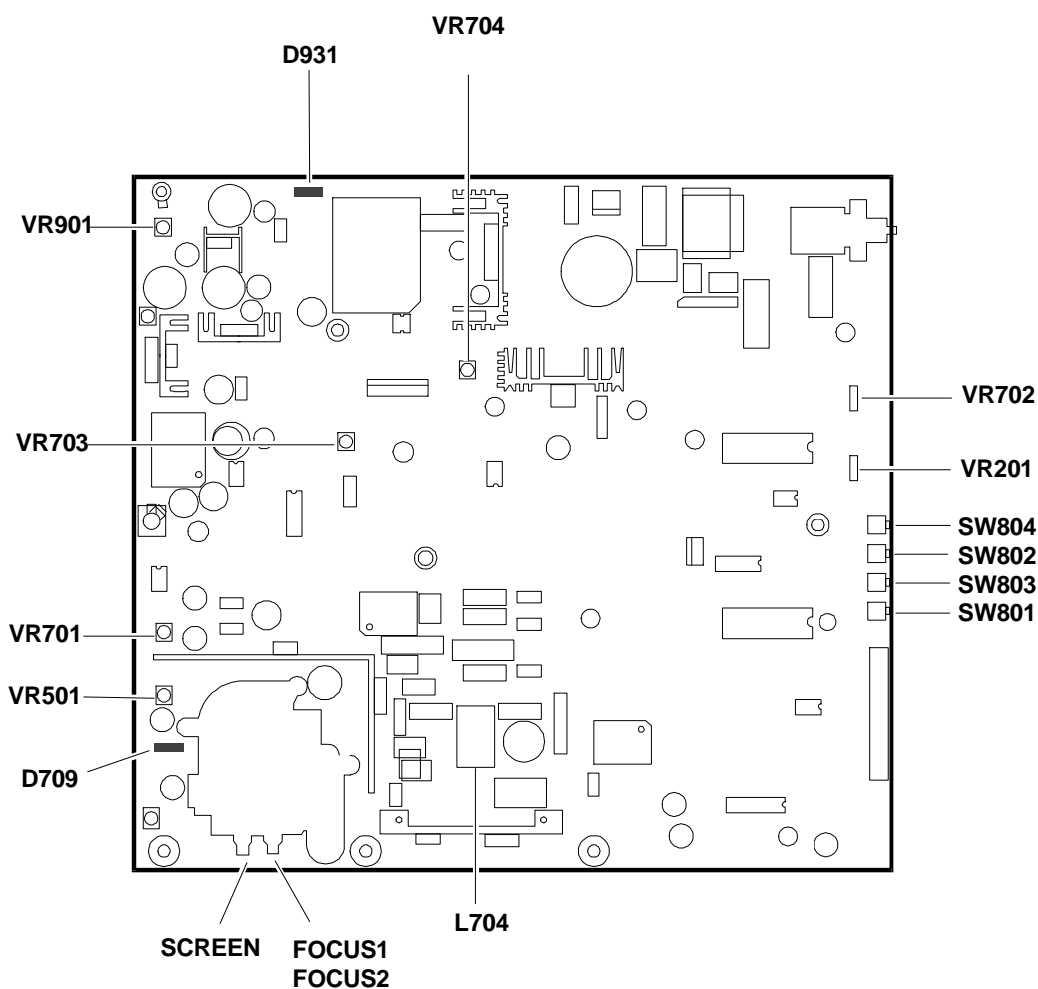


Fig. 29-14 Motherboard Adjustments

MOTHERBOARD ADJUSTMENTS

The motherboard 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: Make sure that the video is on for at least 30 minutes.

RASTER CENTERING ADJUSTMENT

- Display the test raster (CROSS-HATCH PATTERN) in 1280x1024 video mode.
- Adjust the brightness trimmer to maximum to see the raster.
- Adjust the VR701 trimmer to center the raster in the screen.

FOCUS ADJUSTMENT

- Adjust the contrast and brightness trimmers to maximum.
- Display a "H" video page in 1280x1024 video mode.
- Adjust the two FOCUS potentiometers on the FBT transformer, to give the best focus possible.

B+ VOLTAGE ADJUSTMENT

NOTE: For this adjustment is necessary use a **voltmeter**.

- Adjust the external contrast and brightness trimmers to maximum.
- Display the pattern test (CROSS-HATCH PATTERN) in 640x400 video mode.
- Adjust the voltage on the cathode of D931 diode to $170\text{ V} \pm 0.5\text{ V}$ with the VR901 trimmer.

HORIZONTAL LINEARITY TRIMMER

- Adjust the external contrast and brightness trimmers to maximum.
- Display the pattern test (CROSS-HATCH PATTERN) in 640x480 (72 Hz) video mode.
- Adjust the horizontal linearity coil L704, to obtain the best linearity conditions.

HIGH VOLTAGE ADJUSTMENT

NOTE: For this adjustment is necessary use a **voltmeter**.

- Display the pattern test (CROSS-HATCH PATTERN) in 800x600 (72 Hz) video mode.
- Adjust the width and the height of the image data area respectively to 300 and 225 mm.
- Adjust the voltage on the cathode of the D709 diode to $29.5\text{ V} \pm 0.1\text{ V}$ with the VR501 trimmer.

IMAGE CHARACTERISTICS:

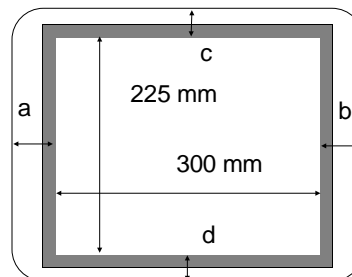
Width: $300 \pm 6\text{ mm}$ ($290 \pm 6\text{ mm}$)

Height: $225 \pm 6\text{ mm}$ ($232 \pm 6\text{ mm}$)

$|a - b| \leq 4\text{ mm}$

$|c - d| \leq 4\text{ mm}$

NOTE: The 1280 x 1024 resolution dimensions are indicated in brackets.



ADJUSTMENT PROCEDURES

PRE-SETTING

- Carry out the adjustment with the video on for at least 30 minutes.
- Effect the degauss of the video with button on the control panel.
- Set the controls in the following way:

At max: External brightness (VR201)
External contrast (VR702)
Sub-brightness (VR305)

In central position : Sub-contrast (VR704)
Red drive (VR302)
Green drive (VR301)

At min.: Red bias (VR303)
Green bias (VR304)

CUT-OFF ADJUSTMENT

NOTE: To effect these adjustments correctly a **brightness meter** and a **color analyzer** are needed.

- Display a black video page (0 mV) in 1280x1024 video mode.
- Check that the colour of the raster is blue and then adjust the brightness to 0.3-0.4 FL (Foot Lambert) with the SCREEN trimmer of the motherboard FBT transformer.
- On the video amplifier board adjust the VR303 trimmer (red bias) to obtain the chromatic coordinate $X=0.290 \pm 0.020$ at the center of the screen.
- On the video amplifier board adjust the VR304 trimmer (green bias) to obtain the chromatic coordinate $X=0.280 \pm 0.020$ at the center of the screen.
- Adjust the luminance to 0.9 ± 0.1 FL with the VR305 trimmer (Sub-brightness) on the video amplifier board.

BRIGHTNESS ADJUSTMENT AND WHITE BALANCE NOTE

NOTE: To effect these adjustments correctly a **brightness meter** and a **color analyzer** are needed.

- Display a white patten (700 mV) size 70 mm x 70 mm in 1280x1024 video mode.
- Set the external contrast and brightness to maximum.
- Adjust the white balance to the chromatic co-ordinates $X=0.290 \pm 0.020$ and $Y=0.280 \pm 0.020$ with the VR301 trimmer (green drive) and VR302 (red drive) of the video amplifier board.
- Adjust the luminance to 50 ± 1 FL with the VR704 (Sub-contrast) trimmer of the motherboard.

ABL (AUTOMATIC BEAM LIMITER) ADJUSTMENT

NOTE: To effect these adjustments correctly a **brightness meter** is needed.

- Display a white video page (700 mV) in 1280 x 1024 video mode.
- Adjust the luminance to 23 ± 1 FL with the VR703 (ABL adjustments) trimmer of the motherboard.

ADJUSTMENTS FOR THE DEFAULT VIDEO MODES

NOTE 1: These adjustments must be carried out in the case of replacement of the video's EEPROM memory or of the video motherboard.

NOTE 2: To effect these adjustments the use of an interface cable and the "1725 Monitor Adjustment Program" are needed.

- The manufacturer of the video unit has pre-set three video modes:
VGA Standard - 640x400 (70 Hz)
VGA Ergo - 640x480 (72 Hz)
VGA Plus - 1024x768 (70 Hz)
which are stored in the motherboard EEPROM.
- Connect the interface cable to the video unit to adjust, a signal generator (or Personal Computer) and another Personal Computer.

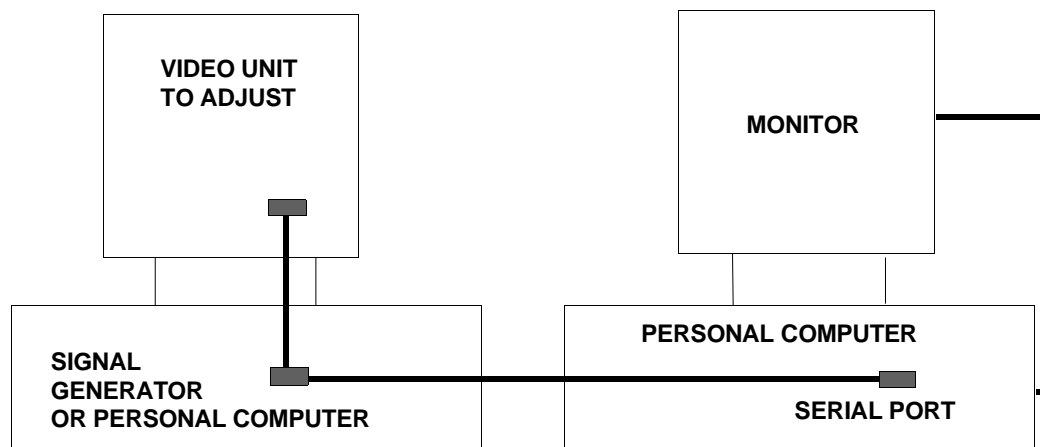


Fig. 29-15 Adjustment Cabling

NOTE: The following figure shows the interface cable.

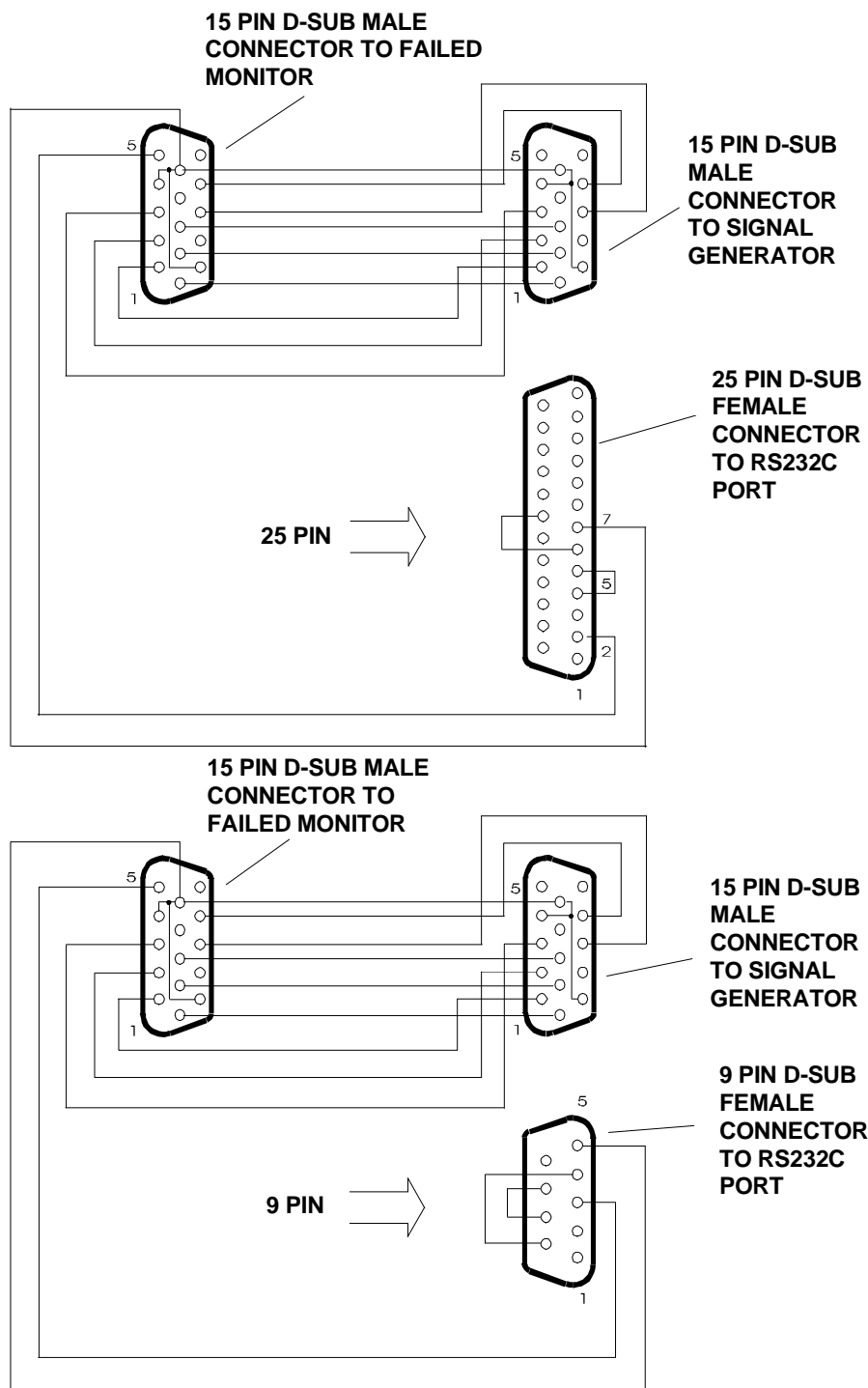


Fig. 29-16 Interface Cable

- Insert the diskette with the "1725 Monitor Adjustment Program" in the Personal Computer and type **CS767.EXE** to activate it. This program allows the adjustment of the video mode pre-set by the manufacturer.
- Select the serial port (COM1 or COM2) with the **COM PORT SELECT** command.
- Display the **640x400 (70 Hz)** video mode.
- Select the **FACTORY MODE ON** command to access the adjustment of the factory video mode selected.
- Adjust the image characteristics with the "1725 Monitor Adjustment Program" commands:
H-ADJUST for Width and Horizontal position
V-ADJUST for Height and Vertical position
S-PCC ADJUST for Pincushion distortion
TRAP ADJUST for Trapezoidal distortion
- Repeat these operations for **640x480 (72 Hz)** and **1024x768 (70 Hz)** video modes.
- Select the **FACTORY MODE OFF** command to exit the factory mode adjustments and the **EXIT** command to quit the program.
- To pre-set the other video modes:
640x480 (60 Hz)
800x600 (60 Hz)
800x600 (72 Hz)
1280x1024 (60 Hz)
effect the adjustments with the external video commands, as described in the "EXTERNAL CONTROLS AND ADJUSTMENTS" section.

