Electrical Adjustments

0. General

When carry-out the electrical settings in many cases a video signal must be applied to the monitor. A computer with :

- ATI GPT-1600 (4822 397 10065), Mach 64 (up to 107kHz)

are used as the video signal source. The signal patterns are selected from the "service test software" package, see user guide 4822 727 21046 (GPT-1600).

0.1 This monitor has 8 factory-preset modes as below.

720 x 400 31.5 kHz/70 Hz	1024 x 768 68.7 kHz/85 Hz
640 x 480 31.5 kHz/60 Hz	
640 x 480 43.0 kHz/85 Hz	
800 x 600 46.9 kHz/75 Hz	
800 x 600 53.6 kHz/85 Hz	
1024x768 60.0 kHz/75 Hz	
1280 x 1024 64.0kHz/60Hz	

14 factory-preload modes as below

640 x 350 31.5 kHz/70 Hz	800 x 600	48.0 kHz/72 Hz
640 x 350 37.8 kHz/85 Hz	800 x 600	64.0 kHz/100 Hz
640 x 480 37.5 kHz/75 Hz	832 x 624	49.7 kHz/75 Hz
640 x 480 37.8 kHz/72 Hz	1024 x 768	48.3 kHz/60 Hz
640 x 480 50.5 kHz/100 Hz	1024 x 768	56.5 kHz/70 Hz
720 x 400 38.0 kHz/85 Hz	1152 x 864	67.5 kHz/75 Hz
800 x 600 37.90kHz/60Hz	1280 x 960	60.0 kHz/60 Hz

0.2 With normal VGA card:
If not using the ATI card during repair or alignment, The service engineer also can use this service test software adapting with normal standard VGA adaptor and using standard VGA mode 640 x 480, 31.5 kHz/60 Hz (only) as signal source.

0.3 AC/DC Measurement:
The measurements for AC waveform and DC figure is based on 640 x 480 31.5 kHz/60 Hz resolution mode with test pattern "gray scale". Power input: 110V AC

1. B+ supply voltage (3145) 83Vdc

- Apply a video signal in the 640 x 480 with 31.5 kHz/60Hz mode.
- Select the "cross-hatch" pattern.
- Set the brightness control and the contrast control to the minimum position.
- Pre-set trimming potentiometer 3145(+) and 3561(EHT) in mid-position.
- Set Vg2 (screen) to fully Counter-clockwise (zero beamcurrent).
- Connect a dc voltmeter between the joint of capacitor 2151 and ground (common ground).
- Set the B+ trimming potentiometer 3145 so that the reading on the dc voltmeter is 83 V +/- 0.2 Vdc.

2. High-voltage EHT (3561)

- Apply a video signal in the 640 x 480 with 31.5 kHz/60Hz mode.
- Select the "cross-hatch" pattern.
- Set the brightness control and the contrast control to the minimum position.
- Turn off the power.
- Connect a dc voltmeter between the joint of capacitor c2601 and ground (common ground).
- Turn on the power.
- Set the EHT trimming potentiometer 3561 so that the reading on the dc voltmeter is 66.0V+/-0.2V(for PHL tube) or 67.0V+/- 0.2V (for CPT tube)

3.Monitor the following auxiliary voltages.

SOURCE ACROSS 7114 Pin and GRN	+5 V +/- 0.25 VDC
SOURCE ACROSS C2155	-6.1 V +/- 0.3 VDC.
SOURCE ACROSS C2141	+8.0 V +/- 0.4 VDC.
SOURCE ACROSS C2153	+13.1V +/- 1.0 VDC.
SOURCE ACROSS C2154	- 13.1V +/- 1.0 VDC.
SOURCE ACROSS C2151	+83.0V +/- 1.0 VDC.
SOURCE ACROSS C2609	- 170 V +/- 15.0 VDC.
SOURCE ACROSS C2152(+ to Gnd)	+180.0V +/-2.0 VDC.

4. General conditions for alignment

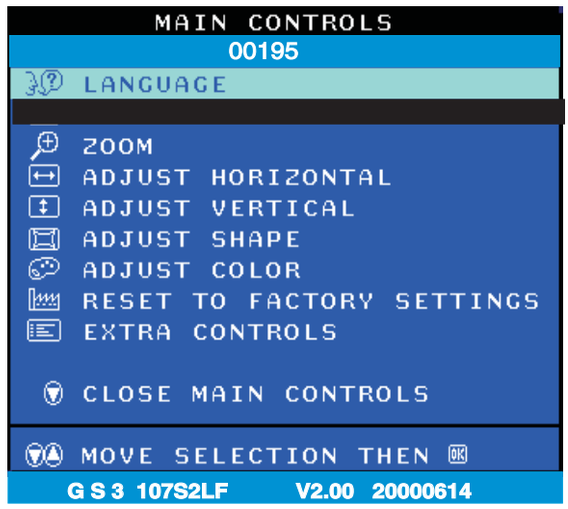
4.1 During all alignments, supply a distortion free AC mains voltage to set via an isolating transformer with low internal impedance.
4.2 Align in pre-warmed condition, at least 30 minutes warm-up with nominal picture brightness.
4.3 Purity, geometry and subsequent alignments should be carried out in magnetic cage with correct magnetic field.

Northern hemisphere : H=0, V=450 mG, Z=0
Southern hemisphere : H=0, V=-500 mG, Z=0
Equatorial Support : H=0, V=0 mG, Z=0

4.4 All voltages are to be measured or applied with respect to ground.
Note: Do not use heatsink as ground.
4.5 Adjust brightness controls to center position except for contrast control which should be set to MAX.

5. To access factory mode:

- Turn off monitor (don't turn off PC)
- Press " ◀▶ " and " ⏻ " simultaneously on the front control panel ,then press " ⊠ ",wait till the OSD menu with characters " factory mode (below OSD menu)" come on the screen of monitor.



- If OSD menu disappears on the screen of monitor, press " ⊠ " again (anytime), then the OSD menu comes on the screen again.
- using " ▲▼ " : to select OSD menu.
- using " ◀▶ " : to increase or decrease the setting.

(Please also refer to page 8 to page 15 for OSD adjustment)

- Using " ⊠ " to confirm the selection.

5.1. To leave factory mode

* After alignment of factory mode, turn off monitor (if you do not turn off monitor, the OSD menu is always at the factory mode), then turn on monitor again (at this moment, the OSD menu goes back to user mode).

Electrical Adjustments (Continued)

Go to cover page

6. Picture geometry setting

- Apply a video signal with cross-hatch pattern.
- Apply a video signal in the 1024 x 768 with 68.7 kHz/85 Hz mode.
- Set contrast control at Max. position, and brightness control in the mid-point.

6.4 Alignment of horizontal geometry and vertical geometry
6.4.1 Adjust the H-width to 306 mm
6.4.2 Adjust the H-phase to center position.
6.4.3 Adjust V-size to 230mm.
6.4.4 Adjust V-Position to center.
Adjust/Trapezium/pincushion
6.4.5 Adjust picture tilt via I²C BUS for correct top/bottom lines.
6.4.6 Adjust the top and bottom corner by I²C to straight vertical lines of the left and right edge.
6.4.7 Adjust the parallelogram by I²CBUS to get optimum vertical line.
6.4.8 Adjust the unbalance pin by I²C BUS to get optimum vertical line.
6.4.9 Adjust the unbalance Vertical linearity balance by I²C BUS to get optimum vertical linearity balance.
6.4.10Adjust the unbalance Vertical linearity by I²C to get optimum vertical linearity.
6.5 Adjust size/centering/trapezium/pincushion/parallelogram of all other preset modes (TABLE1-TABLE8) via I²C bus.
6.6 Preset factory preload timin TABLE9-TABLEE22 according to step 6.5 values.

7. Alignment of Vg2 cut-off point, white tracking

Equipment : 1. Video Test Generator-801GC (Quantum Data)
2. Color-analyzer (Minolta CA-100)
VG2 [(screen), at the bottom of the L.O.T.].
* Apply a video signal in the 1024 x 768 with 68.7 kHz/85 Hz mode, select the "full white pattern" (sizes 306 x 230 mm).
* Use color-analyzer (Minolta CA-100) to adjust cutoff and white uniformity.

OSD R/G/B cut-off and R/G/B gain can be accessed, with initial data:
9300 °K
R cutoff = 25%, R gain = 65% (I² C)
G cutoff = 25%, G gain = 65% (I² C)
B cutoff = 25%, B gain = 65% (I² C)
6500 °K
R cutoff = 25%, R gain = 55% (I² C)
G cutoff = 25%, G gain = 55% (I² C)
B cutoff = 25%, B gain = 55% (I² C)

Brightness = 50%, Sub-Contrast = 85%, ABL = 50% (I² C)

Step 1: To press power button switch and left & right simulaneously to entert the character "FACTORY MODE" as shown in Fig.2.1, press " " to access the OSD menu for R/G/B gain & cutoff as shown in Fig. 2.2.
Step 2: Press " " for function selection as shown in Fig. 2.2.

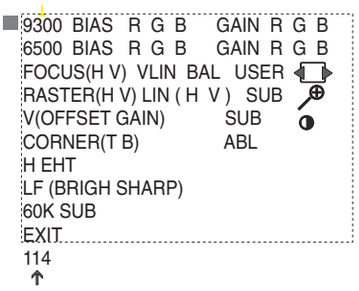


Fig. 2.2

BIAS R G B : R(red) G(green) B(blue) cutoff
GAIN R G B : R(red) G(green) B(blue) gain
V FOCUS : Vertical Focus
VLIN BAL : Vertical Linearity Balance
USER : Horizontal size range
RASTER H: Horizontal DC (raster) Shift
RASTER V: Vertical DC (raster) Shift
HLIN : Horizontal Linearity
V LIN : Vertical Linearity
SUB : Zoom range
SUB : Sub Contrast
V OFFSET : Vertical offset
V GAIN : Vertical Gain
ABL : Auto Beam Limit
T CORNER: Corner Correctionof TOP
B CORNER: Corner Correctionof BOTTOM
H EHT : Horizontal Extensive High Tension
LF : Light Frame
60K SUB : H-Size limit

7.2 Connect the video input, set brightness control at center, and contrast control at maximum
7.3
set R,G,B cut-off at 127 9300k and 6500K(EEPROM preload value)
R,G,B gain at 180 9300k and 6500K(EEPROM preload value)
ABL at 127 9300k and 6500K(EEPROM preload value)
SUB-CON at 218 (EEPROM preload value)
7.4 Adjust 9300K color:
With the help of a factory calibrated color analyzer CA 100
set low R,G,B scale 100=0.12FL,x=283,y=297
Adjust Vg1 until brightest gun at 100 on low brightness scale.
7.5 Adjust R,G,B cut-off for all gun reading to get 100 on low brightness scale.

7.5 Adjust R,G,B cut-off for all gun reading to get 100 on low brightness scale.
7.6 Set Ca100 high R,G,B scale 100 = 41+/- 1FL,X=283,y=297
Adjust G gain at 100 scale on high brightness scale.
7.7 Adjust R,B gain so that blue and green havng as red on the high brightness scale
7.8 Set contrast at minimum and repeat 7.5,7.6,7.7,until RGB three guns get same readings on low and high brightness scale.
7.9 Adjust 6500K color:
With the help of a factory calibrated color analyzer CA 100
set low R,G,B scale 100=0.12FL,x=313,y=329
Adjust Vg1 until brightest gun at 100 on low brightness scale.
7.10 Adjust R,G,B cut-off for all gun reading to get 100 on low brightness scale.
7.11 Set CA100 high R,G,B scale 100 = 41+/- 1FL,X=313,y=329
Adjust G gain at 100 scale on high brightness scale.
7.12 Adjust R,B gain so that blue and green have the same reading as red on the high brightness scale
7.13 Set contrast at minimum and repeat 7.10,7.11,7.12,until RGB three guns get same readings on low and high brightness scale.
7.14 Adjust SUB-CON to get Y=41+/-1FL.
7.15 Apply full white pattern, adjust ABL to reach 30 +/- 1FL(C MAX.)
7.16 Check full white at contrast and brightness at minimum, the foreground shall be extinguished.

Back Forward

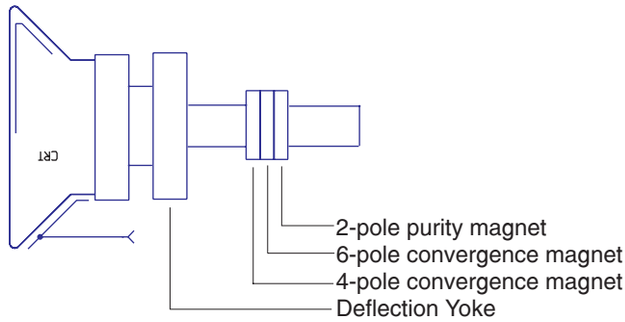
Electrical Adjustments (Continued)

8. Focus adjustment

Apply a signal of " @ " character. at 68.7 kHz/85 Hz mode set the brightness to mid-position , contrast to max - position and adjust the focus for optimal sharpness in the area within 2/3 from the screen center.

9. Loading DDC code

The DDC HEX data should be written into the EEPROM (7803,7804) by EDID301.EXE Program(3138 106 10103) and software DDC Alignment kits (4822 310 11184).



10. Purity adjustment

- Make sure the monitor is not exposed to any external magnetic field.
- Produce a full red pattern on the screen, adjust the purity magnet rings on the PCM assy (on CRT) to obtain a complete field of the color red. This is done by moving the two tabs (2-pole) in such a manner that they advance in an opposite direction but at the same time to obtain the same angle between the two tabs, which should be approximately 180 degree.
- Check by full green pattern and full blue pattern again to observe their respective color purity.

11. Static convergence

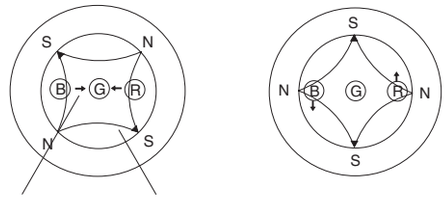
Introduction

Slight deviation in the static convergence can be corrected by using two permanent pairs of magnets which are fitted around the neck of the CRT. These are the 4-pole magnet and the 6-pole magnet.
The 4-pole magnet move the outermost electron beams (R and B) parallel in the opposite direction from the other. The 6-pole magnet moves the outermost electron beam (R, B and G) parallel in the opposite direction from the other.
The magnetic field of the above magnets do not affect the center of the CRT neck.

Setting

- Before the static convergence setting can be made, the monitor must be switched on for 30 minutes.
- The focus setting must be made correctly.
- Signal: 640 * 480, 31.5 kHz/60 Hz mode.
- Set the tabs of the 4-pole magnet in the neutral position. This is when the tabs are opposite one another. In this position the magnets do not affect the deflection of the R and B electron beams.
- Set the tabs of the 6-pole magnet in the neutral position. This is when the tabs are opposite one another. In this position the magnets do not affect the deflection of the R, B, and G electron beams.
- First set the 4-pole magnet optimally.
- Then set the 6-pole magnet optimally.
- If the convergence is not now optimal, then adjust to the optimal setting with the 4-pole magnet and then with the 6- Pole magnet again.
- Set the tabs of the 6-pole magnet in the neutral position. This is when the tabs are opposite one another. In this position the magnets do not affect the deflection of the R, B, and G electron beams.
- First set the 4-pole magnet optimally.
- Then set the 6-pole magnet optimally.
- If the convergence is not now optimal, then adjust to the optimal setting with the 4-pole magnet and then with the 6- pole magnet again.

4-pole — Beam motion producced by the 4-pole convergence magnet



Beam displacement direction — Magnetic flux lines

6-pole — Beam motion producced by the 6- pole convergence magnet