ELECTRICAL ADJUSTMENT INSTRUCTIONS

General Note:

"CBA" is abbreviation for "Circuit Board Assembly."

NOTE:

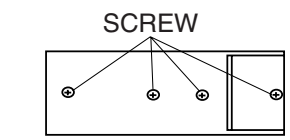
Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed.
Also, do not attempt these adjustments unless the proper equipment is available.

Test Equipment Required

1. NTSC Pattern Generator (Color Bar W/White Window, Red Color, Dot Pattern, Gray Scale, Monoscope, Multi-Burst)
2. AC Milli Voltmeter (RMS)
3. DC Voltmeter
4. Oscilloscope: Dual-trace with 10:1 probe,
   V-Range: 0.001~50V/Div,
   F-Range: DC~AC-60MHz
5. Frequency Counter
6. Plastic Tip Driver
7. Color Analyzer

How to make the service remote control unit:

1. Prepare the remote control unit (Part No. NE241UD). Remove 4 screws from the back lid. (Fig. 1)



Remote control unit (Bottom) **Fig. 1**

2. Cut off pin 10 of the remote control microprocessor and short circuit pins 10 and 17 of the microprocessor with a jumper wire.

How to enter the Service mode:

Service mode:

1. Use the service remote control unit.
2. Turn the power on.
3. To change TV/VIDEO mode or DTV mode, press [SELECT] button on the remote control unit.
4. Press [DISC MENU] button on the service remote control unit. Version of micro computer will be displayed on the CRT. (Ex: A14-0.34)

1. DC 114V (+B) Adjustment

Purpose: To obtain correct operation.

Symptom of Misadjustment: The picture is dark and the unit does not operate correctly.

Test point	Adj. Point	Mode	Input
J1558(+B) GND	VR1601	---	-----
Tape	**M. EQ.**	**Spec.**	
---	DC Voltmeter Plastic Tip Driver	+114±0.5V DC	

Note:
J1558 (+B), VR1601 --- Main CBA

1. Connect the unit to AC Power Outlet.
2. Connect DC Volt Meter to J1558 (+B) and GND.
3. Adjust VR1601 so that the voltage of J1558 (+B) becomes +114±0.5V DC.

2. Setting for BRIGHT, CONTRAST, COLOR, TINT, V-TINT and SHARP Data Values

<TV/VIDEO mode>

1. Enter the Service mode in TV/VIDEO mode.
2. Press [PICTURE] button on the service remote control unit. Display changes “BRT,” “CNT,” “CLR,” “TNT,” “V-TNT,” and “SHP” cyclically when [PICTURE] button is pressed.

BRIGHT (BRT)

1. Press [PICTURE] button on the service remote control unit. Then select "BRIGHT" (BRT) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "BRIGHT" (BRT) becomes 90.

CONTRAST (CNT)

1. Press [PICTURE] button on the service remote control unit. Then select "CONTRAST" (CNT) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "CONTRAST" (CNT) becomes 80.

COLOR (CLR)

1. Press [PICTURE] button on the service remote control unit. Then select "COLOR" (CLR) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "COLOR" (CLR) becomes 58.

TINT (TNT)

1. Press [PICTURE] button on the service remote control unit. Then select "TINT" (TNT) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "TINT" (TNT) becomes 56.

V-TINT (V-TNT)

1. Press [PICTURE] button on the service remote control unit. Then select "V-TINT" (V-TNT) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "V-TINT" (V-TNT) becomes 56.

SHARP (SHP)

1. Press [PICTURE] button on the service remote control unit. Then select "SHARP" (SHP) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "SHARP" (SHP) becomes 40.

<DTV mode>

1. Enter the Service mode in DTV mode.
2. Press [PICTURE] button on the service remote control unit. Display changes “C-CNT,” “C-CLR,” “C-TNT,” and “C-SHP” cyclically when [PICTURE] button is pressed.

CONTRAST (C-CNT)

1. Press [PICTURE] button on the service remote control unit. Then select "CONTRAST" (C-CNT) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "CONTRAST" (C-CNT) becomes 80.

COLOR (C-CLR)

1. Press [PICTURE] button on the service remote control unit. Then select "COLOR" (C-CLR) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "COLOR" (C-CLR) becomes 62.

TINT (C-TNT)

1. Press [PICTURE] button on the service remote control unit. Then select "TINT" (C-TNT) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "TINT" (C-TNT) becomes 56.

SHARP (C-SHP)

1. Press [PICTURE] button on the service remote control unit. Then select "SHARP" (C-SHP) display.
2. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the value of "SHARP" (C-SHP) becomes 40.

3. C-Trap Adjustment

Purpose: To get minimum leakage of the color signal carrier.

Symptom of Misadjustment: If C-Trap Adjustment is incorrect, stripes will appear on the screen.

Test point	Adj. Point	Mode	Input
TP1503 (BLUE)	[CH. ▲ / ▼] buttons	---	Color Bar
Tape	**M. EQ.**	**Spec.**	
---	Oscilloscope Pattern Generator	---	

Figure

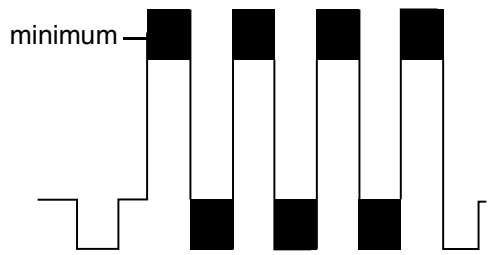


Fig. 2

Note: TP1503 (BLUE)--- Main CBA

1. Connect oscilloscope to TP1503.
2. Input a color bar signal from RF input.
3. Enter the Service mode in TV/VIDEO mode.
4. Press [0] button on the service remote control unit and select "C-TRAP" mode. (Display changes "C-TRP," "D-T TV," "D-T EXT," "D-T DVD," "B-S," and "B-S2" cyclically when [0] button is pressed.)
5. Press [CH. ▲ / ▼] buttons on the remote control unit so that the carrier leakage B-Out (3.58MHz) value becomes minimum on the oscilloscope.
6. Turn the power off and on again.

4. V. Size Adjustment

Purpose: To obtain correct vertical height of screen image.

Symptom of Misadjustment: If V. Size is incorrect, vertical height of image on the screen may not be properly displayed.

Test point	Adj. Point	Mode	Input
---	[CH. ▲ / ▼] buttons	---	Monoscope
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	90±5%	

1. Operate the unit for at least 20 minutes.
2. Enter the Service mode in TV/VIDEO mode.
3. Press [9] button on the service remote control unit and select V-S mode. (Display changes "V-S" and "V-P" cyclically when [9] button is pressed.)
4. Input monoscope pattern.
5. Press [CH. ▲ / ▼] buttons on the remote control unit so that the monoscope pattern is 90±5% of display size and the circle is round.

5. V. Position Adjustment

Purpose: To obtain correct vertical position of screen image.

Symptom of misadjustment: If V. Position is incorrect, vertical position of image on the screen may not be properly displayed.

Test point	Adj. Point	Mode	Input
---	[CH. ▲ / ▼] buttons	---	Monoscope
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	---	

1. Operate the unit for at least 20 minutes.
2. Enter the Service mode in TV/VIDEO mode.
3. Press [9] button on the service remote control unit and select "V-P" mode. (Display changes "V-S" and "V-P" cyclically when [9] button is pressed.)
4. Input monoscope pattern.
5. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the top and bottom of the monoscope pattern are equal each other.

6. H. Position Adjustment

Purpose: To obtain correct horizontal position of screen image.

Symptom of Misadjustment: If H. Position is incorrect, horizontal position of image on the screen may not be properly displayed.

Test point	Adj. Point	Mode	Input
---	[CH. ▲ / ▼] buttons	---	Mono-scope
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	---	

1. Operate the unit for at least 20 minutes.
2. Enter the Service mode in TV/VIDEO mode.
3. Press [8] button on the service remote control unit and select "H-P" mode.
4. Input monoscope pattern.
5. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the left and right side of the monoscope pattern are equal to each other.

7. White Balance Adjustment

Purpose: To mix red, green and blue beams correctly for pure white.

Symptom of Misadjustment: White becomes bluish or reddish.

Test Point	Adj. Point	Mode	Input
Screen	[CH. ▲ / ▼] buttons	RF	White Raster (APL 100%)
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator, Color Analyzer	See below	
Figure			

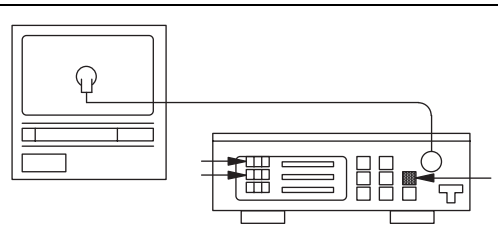


Fig. 3

Note: Use the service remote control unit

1. Operate the unit more than 20 minutes.
2. Face the unit to the east. Degauss the CRT using a degaussing coil.
3. Input the White Raster (APL 100%).
4. Set the color analyzer to the CHROMA mode and after zero point calibration, bring the optical receptor to the center on the tube surface (CRT).
5. Enter the Service mode in TV/VIDEO mode.
6. Press [VOL ▽] button on the service remote control to enter "C/D" mode. (Display changes "C/D," "YUV MEMORY," "TUNER," "QAM," "DTV-H," "D-SOUND," "DL V-CHIP," and "RC5" cyclically when [VOL ▽] button is pressed.)
7. Press [4] button on the service remote control unit for Red adjustment. Press [5] button on the service remote control unit for Blue adjustment.
8. In each color mode, press [CH. ▲ / ▼] buttons to adjust values of color.
9. Adjust Red and Blue color so that the temperature becomes 9200K (x: 286 / y: 294) ±3%.
10. At this time, check if horizontal line is white. If not, adjust Cut-off Adjustment until the horizontal line becomes pure white.
11. Turn off and on again to return to the normal mode. Receive APL 100% white signal and confirm that Chroma temperatures become 9200K (x: 286 / y: 294) ±3%.

Note: Confirm that Cut Off Adj. is correct after this adjustment, and attempt Cut Off Adj, if needed.

8. Sub-Brightness Adjustment

Purpose: To get proper brightness.

Symptom of Misadjustment: If Sub-Brightness is incorrect, proper brightness cannot be obtained by adjusting the Brightness Control.

Test Point	Adj. Point	Mode	Input
---	[CH. ▲ / ▼] buttons	RF	SMPTE 7.5IRE
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below	
Figure			

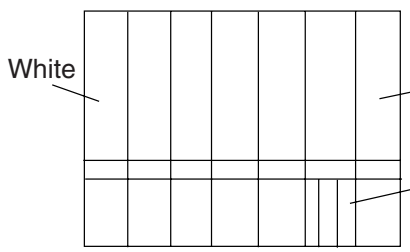


Fig. 4

Note: SMPTE Setup level --- 7.5 IRE

1. Enter the Service mode.
   Then input SMPTE signal from RF Input.
2. Press [PICTURE] button on the service remote control unit and select "BRT" mode. (Display changes "BRT," "CNT," "CLR," "TNT," "V-TNT," and "SHP" cyclically when [PICTURE] button is pressed.) Press [CH. ▲ / ▼] buttons so that the bar is just visible (See above figure).

9. Focus Adjustment

Purpose: Set the optimum Focus.

Symptom of Misadjustment: If Focus Adjustment is incorrect, blurred images are shown on the display.

Test Point	Adj. Point	Mode	Input
---	Focus VR	---	Mono-scope
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below	

Note: Focus VR (FBT) --- Main CBA,
FBT= Fly Back Transformer

1. Operate the unit more than 30 minutes
2. Face the unit to the East and degauss the CRT using a degaussing coil.
3. Input monoscope pattern.
4. Adjust the Focus VR on the FBT to obtain a clear picture.

10. H f_0 Adjustment

Purpose: To get correct horizontal frequency.

Symptom of Misadjustment: If H f_0 adjustment is incorrect, skew distortion will appear on the screen.

Test Point	Adj. Point	Mode	Input
R1583	[CH. ▲ / ▼] buttons	Video	---
Tape	**M. EQ.**	**Spec.**	
---	Frequency Counter	15.734kHz±300Hz	

Note: R1583 --- Main CBA

1. Connect frequency counter to R1583 and ground.
2. Set the unit to the VIDEO mode which is located before CH2 and no input is necessary.
3. Operate the unit for at least 20 minutes.
4. Enter the Service mode in TV/VIDEO mode.
5. Press [2] button on the service remote control unit and select H-ADJ mode.
6. Press [CH. ▲ / ▼] buttons on the service remote control unit so that the display will change "0" ~ "7."
7. At this moment, choose display "0" ~ "7" when the frequency counter display is closest to 15.734 kHz±300Hz.

11. Cut-off Adjustment

Purpose: To adjust the beam current of R, G, B, and screen voltage.

Symptom of Misadjustment: White color may be reddish, greenish or bluish.

Test Point	Adj. Point	Mode	Input
---	Screen VR [CH. ▲ / ▼] buttons	RF	Black Raster
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See Reference Notes below.	

Figure

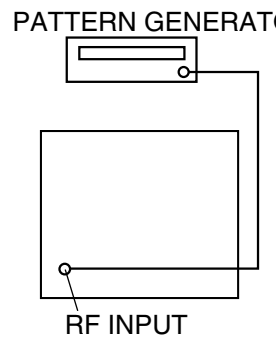


Fig. 5

Note: Screen VR FBT --- Main CBA
FBT= Fly Back Transformer
Use the service remote control unit

1. Degauss the CRT and allow the unit to operate for 20 minutes before starting the alignment.
2. Input the Black Raster Signal from RF Input.
3. Enter the Service mode in TV/VIDEO mode.
4. Press [VOL ▽] button on the service remote control to enter "C/D" mode. (Display changes "C/D," "YUV MEMORY," "TUNER," "QAM," "DTV-H," "D-SOUND," "DL V-CHIP," and "RC5" cyclically when [VOL ▽] button is pressed.)
5. Press [1] button on the service remote control unit and select "COR" mode.The display will momentarily show "COR". Now there should be a horizontal line across the center of the picture tube. If needed, gradually turn the screen control on the flyback clockwise until the horizontal line appears. Adjust the Red Cut off by pressing the "[CH. ▲ / ▼]" buttons. Proceed to Step 6 when the Red Cut off adjustment is done.
6. Press [2] button on the service remote control unit and select "COG" mode. The display will momentarily show "COG". Adjust the Green Cut off by pressing the "[CH. ▲ / ▼]" buttons. Proceed to step 7 when the Green Cut off adjustment is done.
7. Press [3] button on the service remote control unit and select "COB" mode. The display will momentarily show "COB". Adjust the Blue cut off by pressing the "[CH. ▲ / ▼]" buttons. When done with steps 5, 6 and 7 the horizontal line should be pure white. If not, then attempt the Cut off adjustment again.

The following 2 adjustments normally are not attempted in the field. They should be done only when replacing the CRT then adjust as a preparation.

12. Purity Adjustment

Purpose: To obtain pure color.

Symptom of Misadjustment: If Color Purity Adjustment is incorrect, large areas of color may not be properly displayed.

Test point	Adj. Point	Mode	Input
---	Deflection Yoke Purity Magnet	---	*Red Color
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below.	

Figure

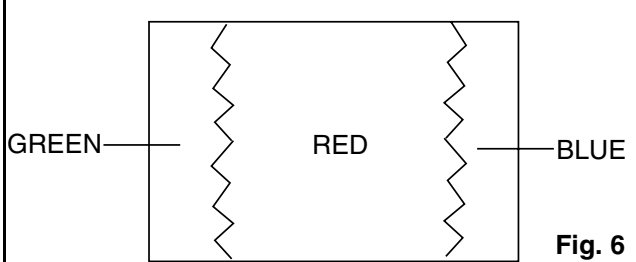


Fig. 6

* This becomes RED COLOR if the [7] button is pressed while in service mode.

1. Set the unit facing east.
2. Operate the unit for over 30 minutes before adjusting.
3. Fully degauss the unit using an external degaussing coil.
4. Set the unit to the AUX mode which is located before CH2, then input a red raster from video in.
5. Loosen the screw on the Deflection Yoke Clamper and pull the Deflection Yoke back away from the screen. (See Fig. 7.)
6. Loosen the Ring Lock and adjust the Purity Magnets so that a red field is obtained at the center of the screen. Tighten Ring Lock. (See Fig. 6,7.)
7. Slowly push the Deflection Yoke toward the bell of the CRT and set it where a uniform red field is obtained.
8. Tighten the clamp screw on the Deflection Yoke.

13. Convergence Adjustment

Purpose: To obtain proper convergence of red, green and blue beams.

Symptom of Misadjustment: If Convergence Adjustment is incorrect, the edge of white letters may have color edges.

Test point	Adj. Point	Mode	Input
---	C.P. Magnet (RB), C.P. Magnet (RB-G), Deflection Yoke	---	Dot Pattern or Crosshatch
Tape	**M. EQ.**	**Spec.**	
---	Pattern Generator	See below.	

Figure

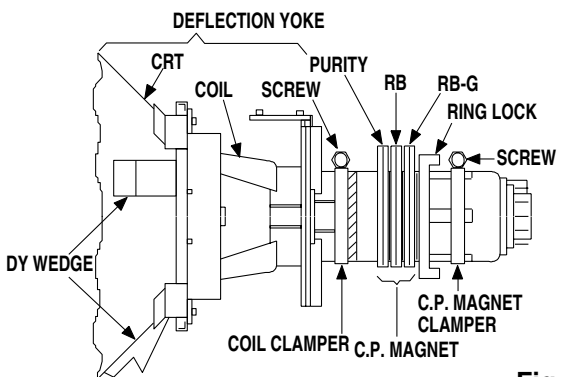


Fig. 7

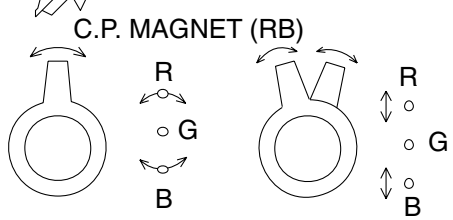


Fig. 8

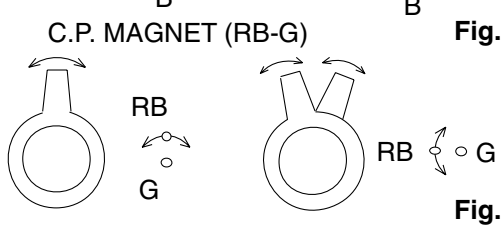


Fig. 9

1. Set the unit to the AUX mode which is located before CH2, then input a dot or crosshatch pattern.
2. Loosen the Ring Lock and align red with blue dots or crosshatch at the center of the screen by rotating (RB) C.P. Magnets. (See Fig. 8.)
3. Align red / blue with green dots at the center of the screen by rotating (RB-G) C.P. Magnet. (See Fig. 9.)
4. Fix the C.P. Magnets by tightening the Ring Lock.
5. Remove the DY Wedges and slightly tilt the Deflection Yoke horizontally and vertically to obtain the best overall convergence.
6. Fix the Deflection Yoke by carefully inserting the DY Wedges between CRT and Deflection Yoke.

HOW TO INITIALIZE THE TV/DVD

To put the program back at the factory-default, initialize the TV/DVD using the following procedure.

< DVD Section >

1. Press [1], [2], [3], [4], and [DISPLAY] buttons on the remote control unit in that order.
   Fig. g appears on the screen.

"*******" differs depending on the models.

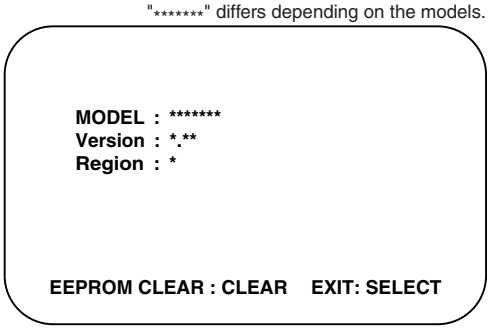


Fig. g

2. Press [CLEAR] button on the remote control unit.
   Fig. h appears on the screen.

"*******" differs depending on the models.

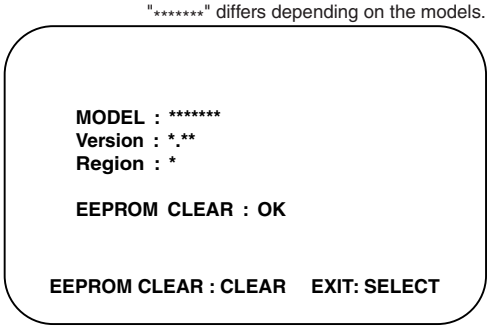


Fig. h

   When “OK” appears on the screen, the factory default will be set.
3. To exit this mode, press [CH. ▲ / ▼] or [SELECT] button to go to TV mode, or press [POWER] button to turn the power off.

< TV Section >

1. Use the service remote control unit.
2. Turn the power on. (Use main power on the TV unit.)
3. Press [DISC MENU] button on the service remote control unit to enter the Service mode. (Refer to “How to enter the Service mode” on page 6-1.)
4. Confirm that OSD indication on the four corners on TV screen changes from on and off light indication to red by pressing a [DISPLAY] button. (It is necessary for one or two seconds.)
5. Turn the power off by pressing main power button on the TV unit, and unplug the AC cord from the AC outlet.