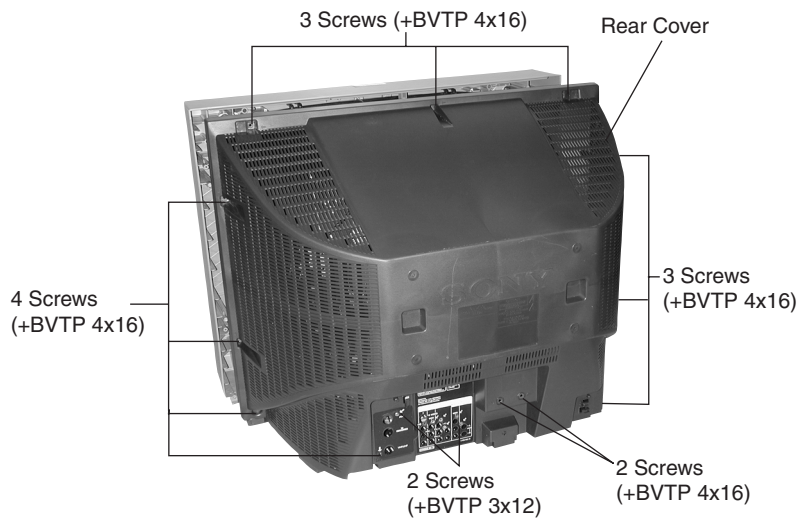


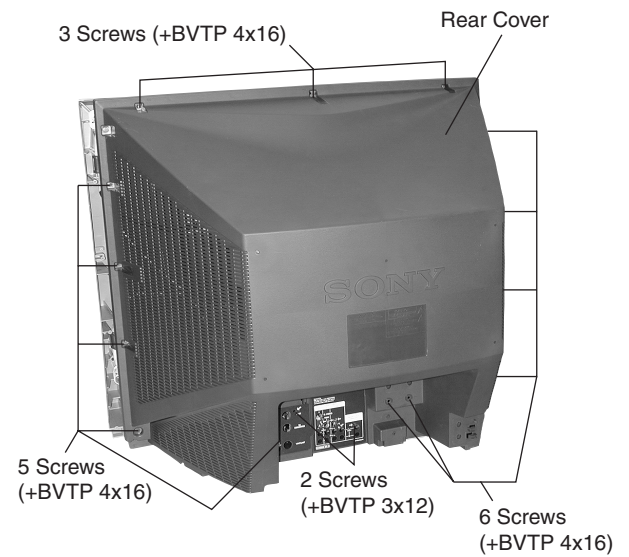
## SECTION 1: DISASSEMBLY

### 1-1. REAR COVER REMOVAL

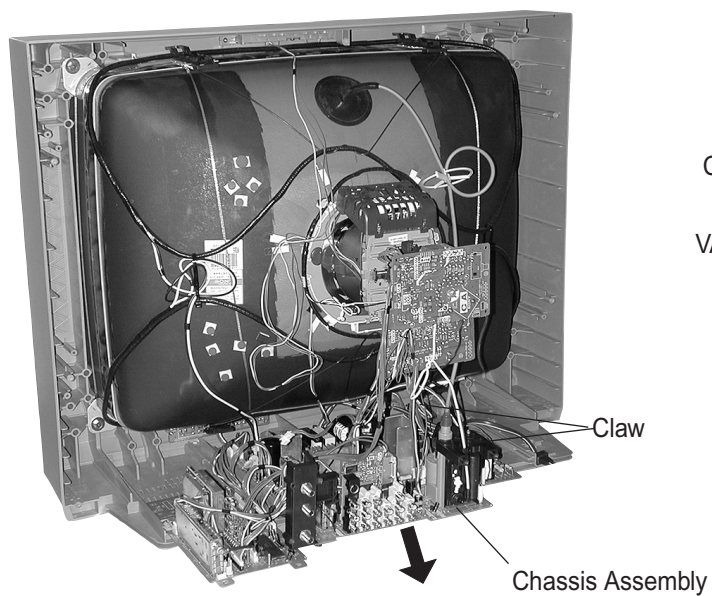
#### KV-27FS13/27FS17/27FV17/29FV17/29FV17C



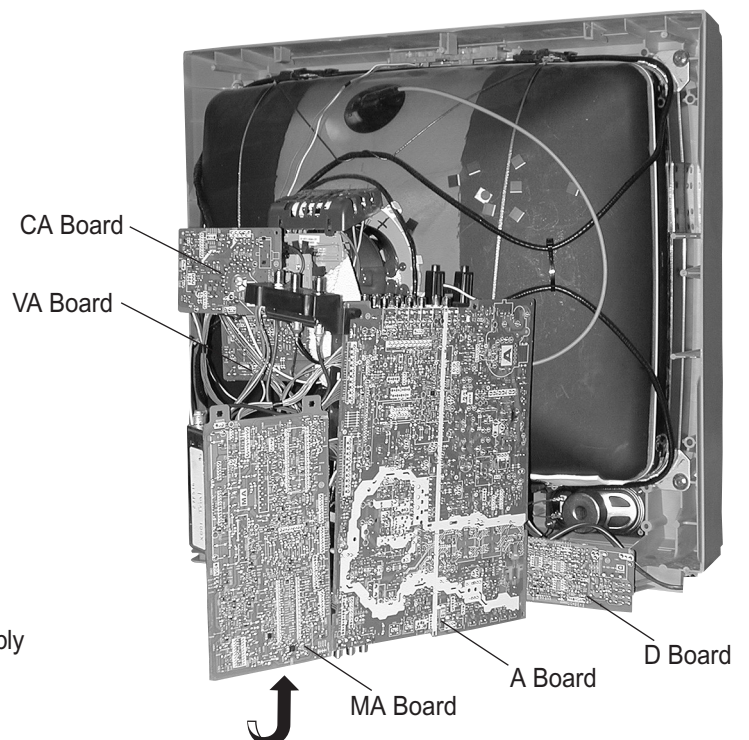
#### KV-32FS13/32FS17/34FS13C/34FS17 ONLY



### 1-2. CHASSIS ASSEMBLY REMOVAL



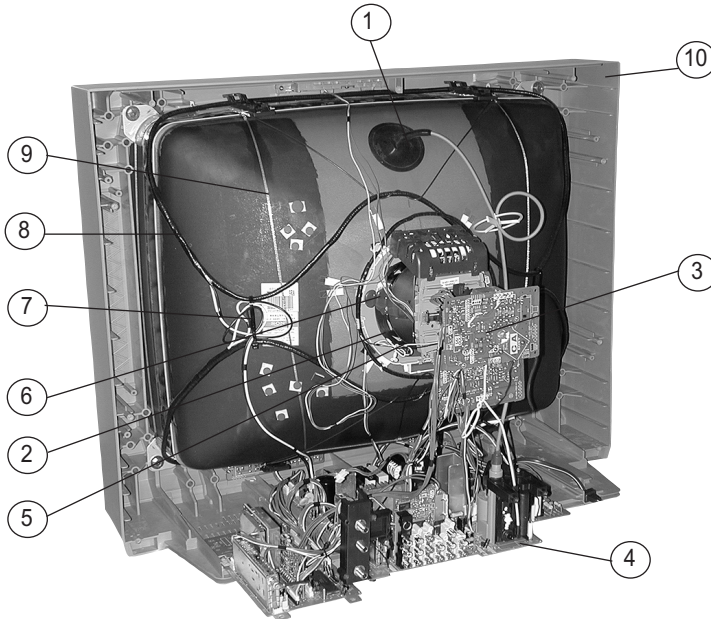
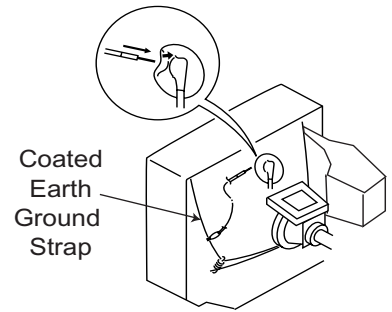
### 1-3. SERVICE POSITION



## 1-4. PICTURE TUBE REMOVAL

### WARNING: BEFORE REMOVING THE ANODE CAP

High voltage remains in the CRT even after the power is disconnected. To avoid electric shock, discharge CRT before attempting to remove the anode cap. Short between anode and CRT coated earth ground strap.

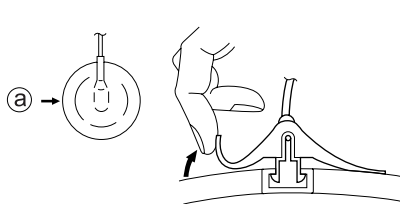


1. Discharge the anode of the CRT and remove the anode cap.
2. Unplug all interconnecting leads from the deflection yoke, neck assembly, degaussing coils and CRT grounding strap.
3. Remove the CA and VA Board from the CRT.
4. Remove the chassis assembly.
5. Loosen the neck assembly fixing screw and remove.
6. Loosen the deflection yoke fixing screw and remove.
7. Place the set with the CRT face down on a cushion and remove the degaussing coil holders.
8. Remove the degaussing coils.
9. Remove the CRT grounding strap and spring tension devices.
10. Unscrew the four CRT fixing screws [located on each CRT corner] and remove the CRT [Take care not to handle the CRT by the neck].

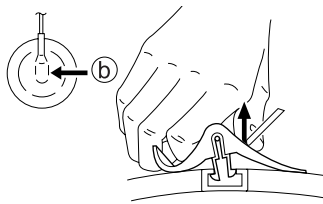
## ANODE CAP REMOVAL PROCEDURE

**WARNING:** High voltage remains in the CRT even after the power is disconnected. To avoid electric shock, discharge CRT **before** attempting to remove the anode cap. Short between anode and coated earth ground strap of CRT.

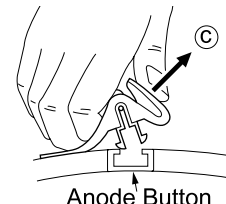
**NOTE:** After removing the anode cap, short circuit the anode of the picture tube and the anode cap to either the metal chassis, CRT shield, or carbon painted on the CRT.



- ① Turn up one side of the rubber cap in the direction indicated by arrow (a) .



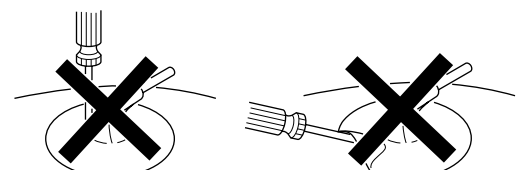
- ② Use your thumb to pull the rubber cap firmly in the direction indicated by arrow (b) .



- ③ When one side of the rubber cap separates from the anode button, the anode cap can be removed by turning the rubber cap and pulling it in the direction of arrow (c) .

## HOW TO HANDLE AN ANODE CAP

1. Do not use sharp objects which may cause damage to the surface of the anode cap.
2. To avoid damaging the anode cap, do not squeeze the rubber covering too hard. A material fitting called a shatter-hook terminal is built into the rubber.
3. Do not force turn the foot of the rubber cover. This may cause the shatter-hook terminal to protrude and damage the rubber.



## SECTION 2: SET-UP ADJUSTMENTS

The following adjustments should be made when a complete realignment is required or a new picture tube is installed.

These adjustments should be performed with rated power supply voltage unless otherwise noted.

Set the controls as follows unless otherwise noted:

VIDEO MODE: Standard

PICTURE CONTROL: Normal

BRIGHTNESS CONTROL: Normal

**Perform the adjustments in order as follows:**

1. Beam Landing
2. Convergence
3. Focus
4. Screen (G2)
5. White Balance

**Note Test Equipment Required:**

1. Color Bar Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital Multimeter

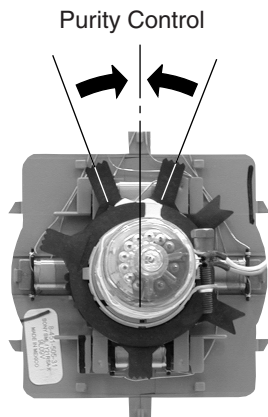
### 2-1. BEAM LANDING

Before beginning adjustment procedure:

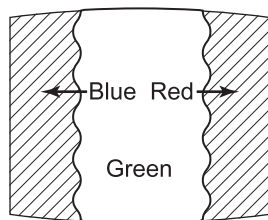
1. Degauss the entire screen.
2. Feed in the white pattern signal.

#### ADJUSTMENT PROCEDURE

1. Input a raster signal with the pattern generator.
2. Loosen the deflection yoke mounting screw, and set the purity control to the center as shown below:

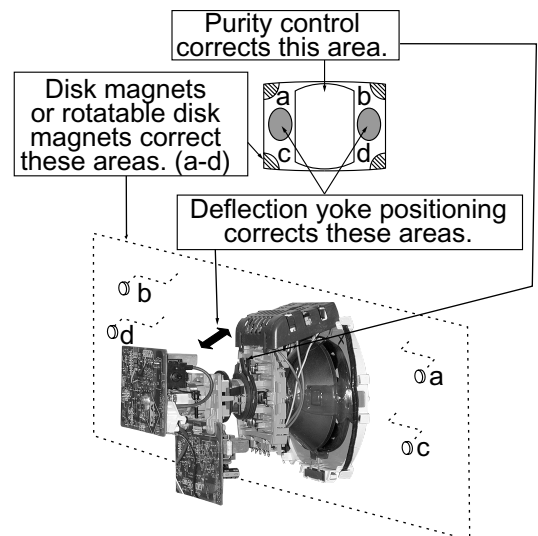
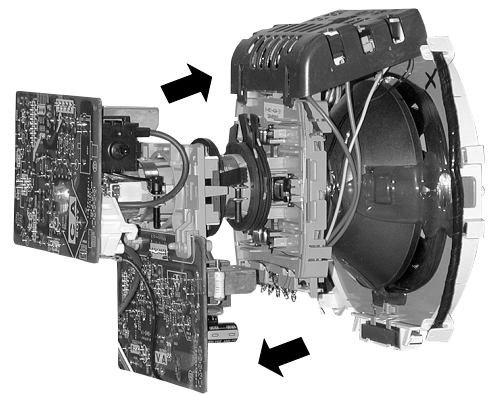


3. Turn the raster signal of the pattern generator to green.
4. Move the deflection yoke backward, and adjust with the purity control so that green is in the center and red and blue are even on both sides.



5. Move the deflection yoke forward, and adjust so that the entire screen becomes green.

6. Switch over the raster signal to red and blue and confirm the condition.
7. When the position of the deflection yoke is determined, tighten it with the deflection yoke mounting screw.
8. If landing at the corner is not right, adjust by using the disk magnets.





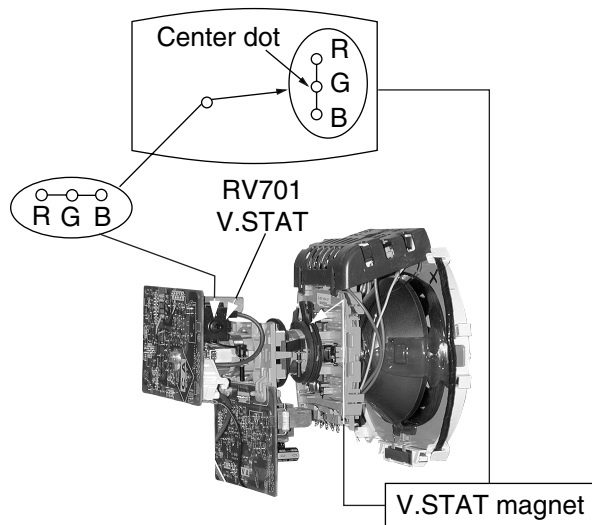
## 2-2. CONVERGENCE

Before starting convergence adjustments:

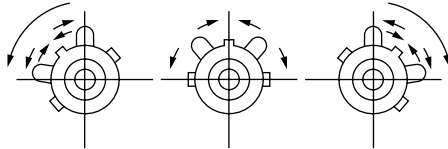
1. Perform FOCUS, VLIN and VSIZE adjustments.
2. Set BRIGHTNESS control to minimum.
3. Feed in dot pattern.

### VERTICAL STATIC CONVERGENCE

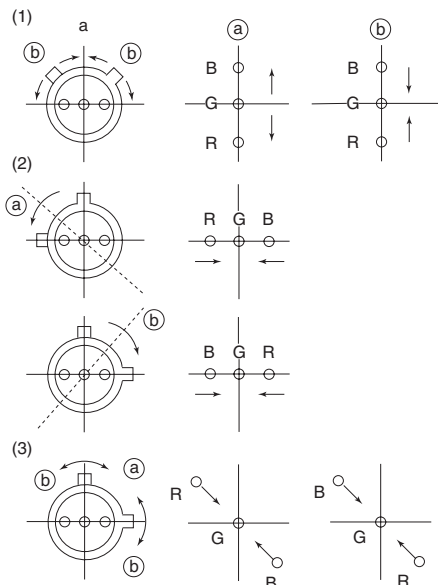
1. Adjust V. STAT magnet to converge red, green and blue dots in the center of the screen (Vertical movement adjusts V.STAT RV701 to converge).



2. Tilt the V. STAT magnet and adjust static convergence to open or close the V. STAT magnet.



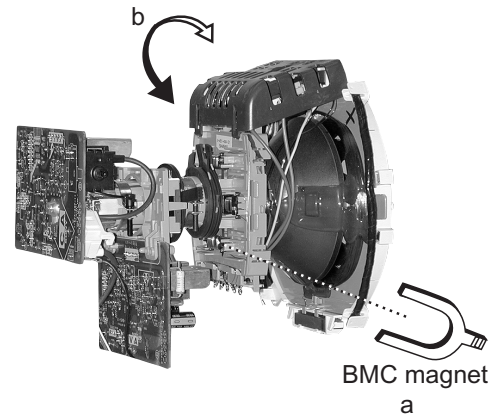
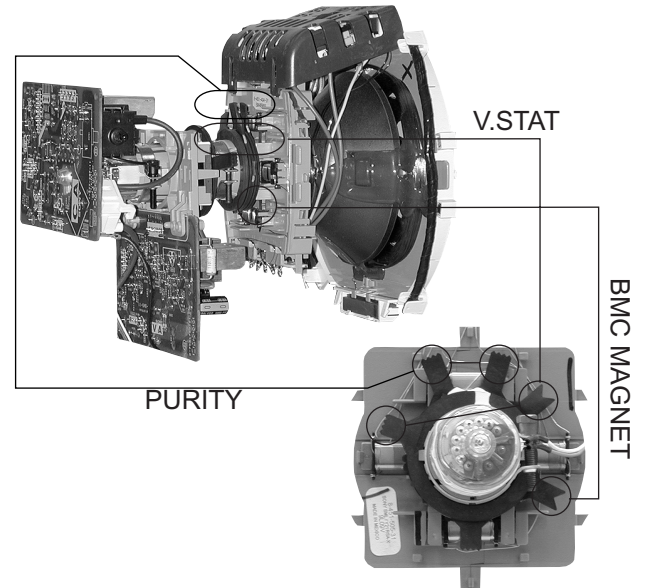
When the V. STAT magnet is moved in the direction of arrow a and b, red, green, and blue dots move as shown below:



### HORIZONTAL STATIC CONVERGENCE

If the blue dot does not converge with the red and green dots, perform the following:

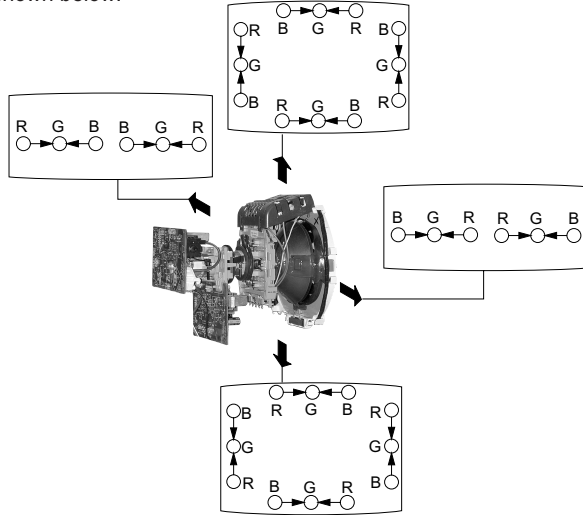
1. Move BMC magnet (a) to correct insufficient H.Static convergence.
2. Rotate BMC magnet (b) to correct insufficient V.Static convergence.
3. After adjusting the BMC magnet, repeat Beam Landing Adjustment.



## DYNAMIC CONVERGENCE ADJUSTMENT

Before performing this adjustment, perform Horizontal and Vertical Static Convergence Adjustment.

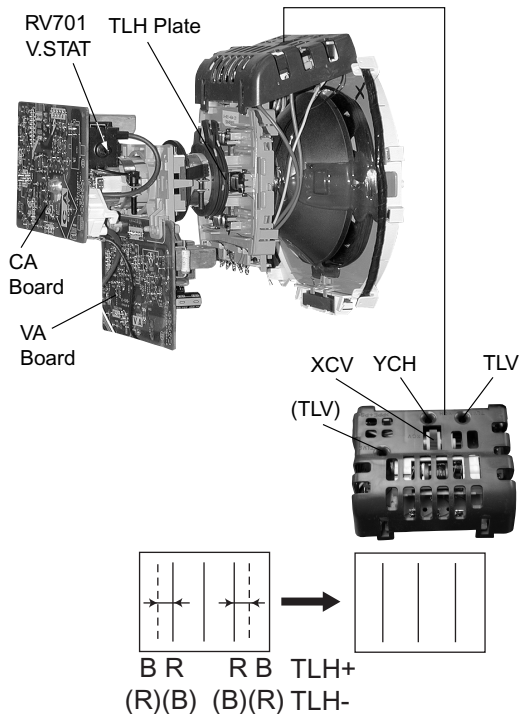
1. Slightly loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below:



4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.

## TLH PLATE ADJUSTMENT

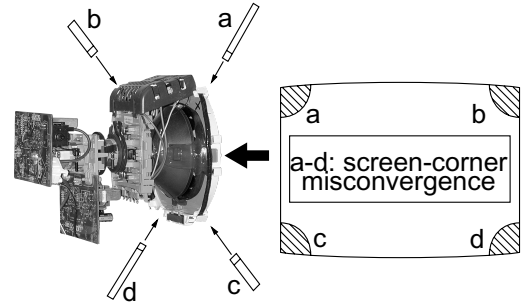
1. Input crosshatch pattern.
2. Adjust PICTURE QUALITY to standard, PICTURE and BRIGHTNESS to 50%, and OTHER to standard.
3. Adjust the Horizontal Convergence of red and blue dots by tilting the TLH plate on the deflection yoke.



4. Adjust XCV core to balance X axis.
  5. Adjust YCH VR to balance Y axis.
  6. Adjust vertical red and blue convergence with V.TILT (TLV VR).
- Note: Perform adjustment 3-6 while tracking items 1 and 2.

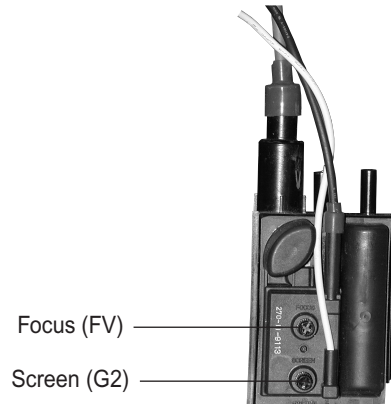
## SCREEN-CORNER CONVERGENCE

1. Affix a permalloy assembly corresponding to the misconverged areas:



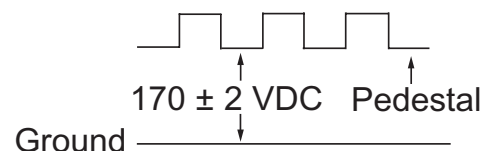
## 2-3. FOCUS

1. Adjust FOCUS control for best pictures.



## 2-4. SCREEN (G2)

1. Input a dot pattern.
2. Set the PICTURE and BRIGHTNESS controls at minimum and COLOR control at normal.
3. Adjust SBRT, GCUT, BCUT in service mode with an oscilloscope as shown below so that voltages on the red, green, and blue cathodes are  $170 \pm 2$  VDC.



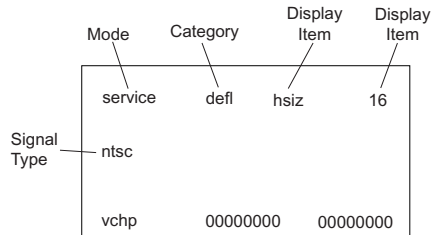
## 2-5. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

### SERVICE MODE PROCEDURE

1. Standby mode (power off).
2. Press **[Display]** → Channel **[5]** → Sound Volume **[+]** → Power on the Remote Commander (press each button within a second).

### SERVICE ADJUSTMENT MODE ON

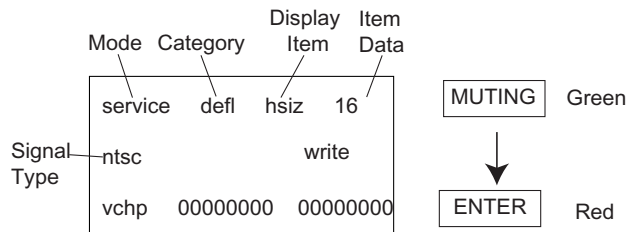
1. The CRT displays the time being adjusted.



2. Press **[1]** or **[4]** on the Remote Commander to select the time.
3. Press **[3]** or **[6]** on the Remote Commander to change the data.
4. Press **[MUTING]** then **[ENTER]** to save into the memory.

### SERVICE ADJUSTMENT MODE MEMORY

Turn the set off then on to exit Service Adjustment Mode.






## 2-6. WHITE BALANCE ADJUSTMENTS

1. Input an entire white signal with burst.
2. Set to Service Adjustment Mode.
3. Set the PICTURE and BRIGHTNESS to minimum.
4. Adjust with SBRT if necessary.
5. Select GCUT and BCUT with **[1]** and **[4]**.
6. Adjust with **[3]** and **[6]** for the best white balance.
7. Set the PICTURE and BRIGHTNESS to maximum.
8. Select GDRV and BDRV with **[1]** and **[4]**.
9. Adjust with **[3]** and **[6]** for the best white balance.
10. To write into memory, press **[MUTING]** then **[ENTER]**.

## SECTION 3: SAFETY RELATED ADJUSTMENTS

### 3-1. R564 CONFIRMATION METHOD (HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components which are marked with  on the schematic diagram:

Part Replaced (  )	Adjustment (  )
DY, T505, CRT, IC501 C507, C520, C505, C509, C515, T504, T503, C551, L510, C546, C537, C547, D517, D518, D519, R560, R561, R562, R563, R565, R566, R567, R525.....A Board  IC301.....MA Board	HV HOLD-DOWN R564


### PREPARATION BEFORE CONFIRMATION

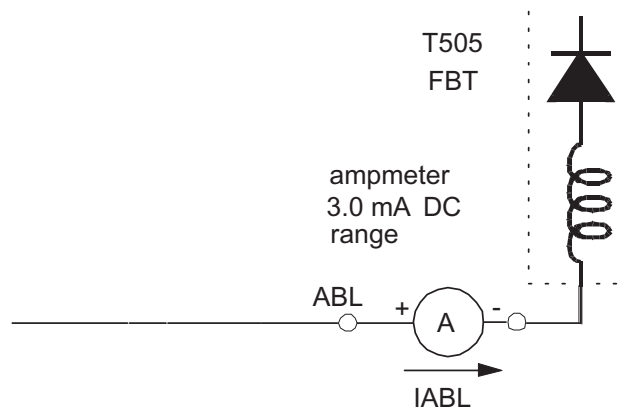
- Using a Variac, apply AC input voltage:  $120 \pm 2$  VAC.
- Turn the POWER switch ON.
- Input a white signal and set the PICTURE and BRIGHTNESS controls to maximum.
- Confirm that the voltage between C546 (+) or TP503 and ground is more than 21.0 VDC (27/29 inch) or 23.0 VDC (32/34 inch).

### HOLD-DOWN OPERATION CONFIRMATION


- Connect the current meter between Pin 11 of the FBT (T505) and the PWB land where Pin 11 would normally attach (See Figure 1 on the next page).
- Input a dot signal and set PICTURE and BRIGHTNESS to minimum: IABL =  $1730 \pm 100\mu\text{A}$  (27/29 inch) or  $2175 +100 - 325\mu\text{A}$  (32/34inch).
- Confirm the voltage of A Board TP-600 is  $135 \pm 1.5$  VDC.
- Connect the digital voltmeter and the DC power supply via Diode 1SS119 to C546 (+) and ground (See Figure 1 on next page).
- Increase the DC power voltage gradually until the picture blanks out.
- Turn DC power source off immediately.
- Read the digital voltmeter indication (standard  $24.78 +0/-0.1$  VDC [27/29 inch] or  $27.24 +0/-0.1$  VDC [32/34 inch]).
- Input a white signal and set PICTURE and BRIGHTNESS to maximum: IABL =  $1730 \pm 100\mu\text{A}$  (27/29 inch) or  $2175 +100/-325 \mu\text{A}$  (32/34 inch).
- Repeat steps 4 to 7.

### HOLD-DOWN READJUSTMENT

If the setting indicated in Step 2 of Hold-Down Operation Confirmation cannot be met, readjustment should be performed by altering the resistance value of R564 component marked with .



### 3-2. B+ VOLTAGE CONFIRMATION AND ADJUSTMENT

Note: The following adjustments should always be performed when replacing the following components, which are marked with  on the schematic diagram on the A Board:

<b>A BOARD:</b>	IC601, PH601
-----------------	--------------

- Using a Variac, apply AC input voltage:  $130 + 2.0/-0.0$  VAC
- Input a monoscope pattern.
- Set the PICTURE and the BRIGHTNESS controls to minimum.
- Confirm the voltage of A Board TP-600 is  $<136.5$  VDC.
- If step 4 is not satisfied, replace the components listed above, then repeat Steps 1 – 3.

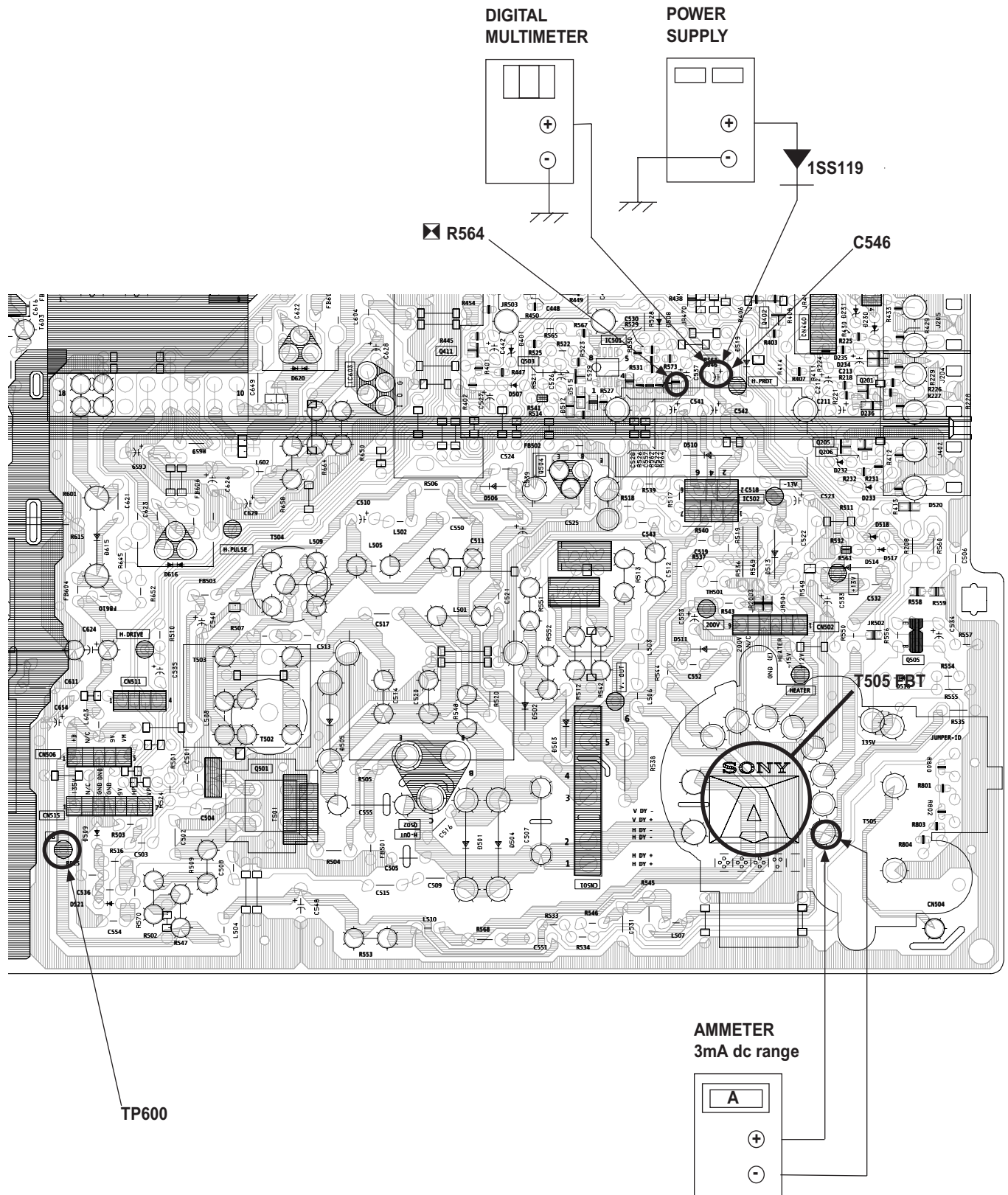


Figure 1