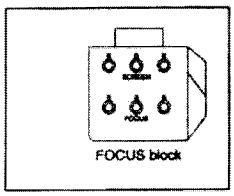
Improved Service Adjustment Procedure for RA-6 Chassis (KP-51HW50-57HW40, 51WS500, 57WS500)

Important Notes:

- **Method on how to Turn Off the CRTs**: To perform some adjustments, it will be necessary to turn off the CRTs, which can be done in the Service mode by doing the following: Select adjustment category "2150P-2", adjustment item #2 labeled "RGBS". Press the 3 and 6 button on the remote until the desired color is viewed on the screen.
- **Accessing the internal generator through the service mode.** Select Category PJE MODE using the 2 or 5 remote button. Repeated pressing of the remote button #6 will allow you to cycle through the crosshatch, dots.



Screen Adjustment G-2/ Sub-bright adjustment:

Equipment required: Darkened Room and/or a heavy blanket to cover the set.
Signal Applied/Input: Select Video 1 input / No signal applied
Adjust points: G2 (Screen Controls) VRs for RGB and Sub-Brightness register
Conditions:

- Darken Room preferred. If not possible, a blanket must cover the front of the screen.
- Pro Picture Mode (push reset to ensure proper settings, then adj. "Picture to max.")
- Turn off ALL the CRT outputs in Service mode.

Confirmation Procedure:

1. To confirm proper setting (with all 3 CRTs OFF), the screen should ALMOST be at cut-off.
2. If not, check Sub-Bright Data in the service mode. Service data Range is usually 29 to 34 in the Service menu, category "2150P-1", adjustment item #4 "SBRT".
3. If the picture is still not at almost cut-off, proceed to the adjustment procedure below.

Adjustment Procedure: Important Note: It is **crucial** that the G2 adjustment be done as accurately as possible. If it is off even slightly, white balance and focus can be greatly affected. Also, if the G2 is set incorrectly, it may cause an intermittent video shutdown condition, due to the affect on the IK circuit. Therefore, the following procedure must be adhered to: The room should be as dark as possible. Also, a **blanket (standard heavy mover's blanket used to protect furniture) is required for this procedure.** The blanket must be placed over the front screen of the TV to minimize the ambient light, so the technician can see the correct cutoff level.

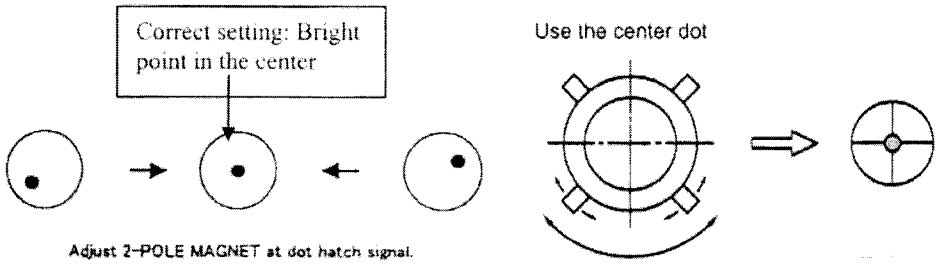
1. Turn the green screen control on the Focus Block until retrace lines appear and gradually turn it back until the point where you can see the retrace line disappears, just before cutoff.
2. Turn the red screen control on the Focus Block until retrace lines appear and gradually turn it back until the point where you can see the retrace line disappears, just before cutoff.
3. Turn the blue screen control on the Focus Block until retrace lines appear and gradually turn it back until the point where you can see the retrace line disappears, just before cutoff.
4. **If the screen still appears too bright after proper G-2 adjustment, please adjust the sub-bright control down until screen cut-off.** *(Service data Range is usually 29 to 34 in the Service menu, category "2150P-1", adjustment item 04 "SBRT").*

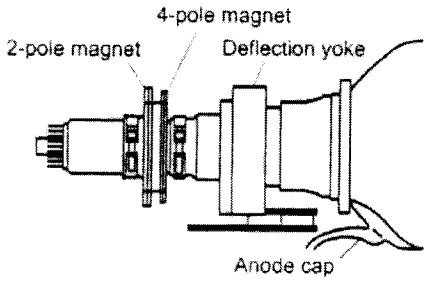
Green, Red & Blue CRT 2 Pole Magnet Confirmation / Adjustment:

Equipment required: Pattern Generator
Signal Applied/Input: Dot Hatch Pattern (100-IRE) / Video 1 input
Adjust points: Confirmation: RGB Focus VRs Adjustment: 2 Pole Magnets on CRTs
Conditions: Pro Picture mode, Brightness to 50%, Picture to 100%, and Color temp. Cool

Confirmation/ Adjustment Procedure for 2 Pole Magnet Adjustment:

1. Turn off Red and Blue CRTs.
2. Turn G VR to the left (over-focus) and view the center luminance point, which must be in the center of the dot. (see diagram below).
3. Rotate the VR back and forth to verify that the luminance point remains in the center. If it does, this adjustment is not required. If the luminance point does not remain in the center, you must perform the 2 Pole Magnet adjustment. Note: In the large majority of cases, this adjustment will not be needed.
4. Adjust the 2-Pole Magnet on the CRT to center the luminance spot.
5. Set the VR for best focus
6. **Perform the same procedures for the Red and Blue CRTs**.



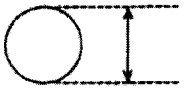


4-Pole Magnet Confirmation / Adjustment for the Green & Red & Blue CRTs:

(Same setup/conditions as for the 2-Pole magnet adjustment)

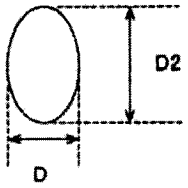
1. Turn off the red and blue CRTs.
2. Turn the green focus control on the Focus Block to the CW and the spot will become larger.
3. The dot should be round. If it is oval, perform the following steps.
4. Adjust the two tabs (the tabs towards the bell of the CRT) until the spot becomes round.
5. **Red Adjustment: Perform the same procedure for the Red CRT 4-Pole Magnet. Adjust if necessary, see following illustration.**
6. **Blue Adjustment: Perform the same procedure as the Green CRT, However the shape should be a slight vertical oval (not round) in the center of the screen. Adjust if necessary, see the following illustration.**

4. RED , GREEN



Red and Green dot should be round

5. BLUE



The Blue dot should be Slightly Oval in shape The vertical should be 1.2 x the horizontal size. *Note: Illustrations are not to scale.*

Blue De-Focus adjustment (The blue focus needs to be slightly defocused so to produce a more pleasing picture). Same setup/conditions as for the previous adjustment, except select the **Vivid mode** (reset the Vivid Mode to ensure proper settings) .

Confirmation / Adjustment:

Correct: blue dot in center of the screen has a vertical oval shape. →

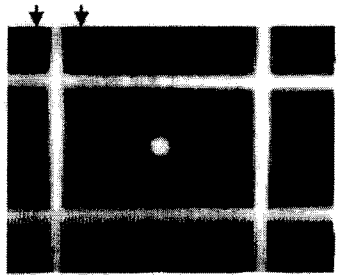
Incorrect: blue dot in center of the screen has a horizontal oval shape →

1. Adjust the blue focus VR to the right (under focus) slightly while looking at the left side of the screen.
2. When the blue horizontal luminance line (not flare) starts to increase in size, stop turning the VR. The Vertical or Horizontal width of the blue luminance line should be no larger than x1.2 the size of the green line.
3. Turn the green CRT back on to confirm the size of blue in reference to green.

NOTE: This adjustment will create a slight blue outline visible on the white lines, however, an additional blue flare may be seen *(halo around the blue luminance lines).* If the additional blue flaring is seen, (see picture below) it may be necessary to adjust the blue mechanical focus. The blue flare should be minimized as much as possible; adjust to best position, which has the least amount of flare.

See photo below: Far left side should have a slight blue edge in Vivid mode with a 100-IRE hatch.

Blue Flaring →



Example:
If too much blue flare is seen, then adjust blue mechanical lens focus

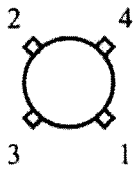
CRT/ Lens Focus adjustment:

Equipment required: Pattern Generator, 1080i cross hatch or monoscope pattern is preferred.
Signal Applied/Input: All white 100-IRE signal for aging & crosshatch for adjustments
Adjust points: Mechanical lens adjust
Conditions: Picture mode Pro, Picture 100% Age the TV set before attempting to adjust focus by one of the recommended amounts below. *Aging Conditions:*

- Apply an all white signal 100-IRE, minimum 30 min to a maximum of 1 hr., ***OR*** TV signal (with moving picture) minimum 2 hrs to a maximum of 4 hrs. If this method of aging is used, be sure to coordinate with the customer beforehand so that the set is ready upon your arrival.
- Use Vivid picture mode setting on TV.

1. Apply a crosshatch pattern to one of the video inputs.
2. Start with the Green CRT, therefore turn off the other two CRTs in the Service mode.
3. Two persons, one to adjust the lens, and one to watch the front of the picture will achieve better overall adjustment results. If a second person is not available, apply a white sheet of paper on the inside of the screen. Then by looking at the paper's reflection in the sets mirror, adjusting the mechanical lens as in the next step.
4. Adjust the mechanical lens of the Green CRT first (loosen the wing nut on the lens. Adjust the lens to achieve proper (equal) balance between left and right sides of the picture, while also achieving good center focus. Focus in the center area of the screen should be better than in the corner areas.
5. If proper balance cannot be achieved, then loosen all lens screws and re-seat the lens (see the drawing below for the locations of the lens screws). Then create a just-snug condition *(each screw's washer is slightly compressed)* with the screws and try to adjust the focus again.

ONLY IF PROPER BALANCE STILL CANNOT BE ACHIEVED, remove lens screws and rotate the lens 90°. Reinstall the lens screws in the new pilot holes. The new pilot holes will not have had screws installed previously, so you should expect to feel some resistance while installing the screws. Tighten the screws by following torque sequence shown in the drawing below, but do not completely seat the screws (over-torque). Perform lens re-adjustment again. With a 100-IRE crosshatch pattern, you may see a slight amount of blue or red halo on the green crosshatch lines. This is caused by the prism effect of the green CRT lens. However, try to minimize the amount of blue or green flare seen on the screen while maintaining sharper more defined lines. If red halo is seen on the green lines re-adjust the focus lens to eliminate reddish colored flare.



←Torque sequence applied to lens. If slight tilt / rocking motion is noticed, lean lens to the # 3 or # 4 position and begin torque sequence. Start at position No.1 and tighten until each screw's washer is slightly compressed.

After the mechanical focus is performed, adjust the electrical focus on the focus block for a final touch-up. Once again, try to achieve proper balance between center and corners while keeping center slightly better.

Red mechanical lens adjustment should apply the same method as described for green, except for the color of the flare, which will be red due to the prism effect of the lens. Try to minimize or eliminate red flare as much as possible.

White balance adjustment:

Equipment required: pattern generator with 100 IRE all white pattern.
Optional: white balance meter.
Signal Applied/Input: 100 IRE all white pattern
Adjust points: Registers accessed in the service mode
Conditions:
This adjustment must be done in Pro picture mode (Picture 100%) with Color Temp set at the Neutral settings, however, please check color tracking to determine if this adjustment is necessary. To do this, apply a B&W signal (5 step ramp pattern) and check it at both high and low brightness settings to verify the grayscale and white levels do not have color tinting. If the set checks good for color tracking, it is not necessary to do this procedure. Please note, if the G2 was adjusted, it is most likely the white balance should also be adjusted.

Provided below are two methods to adjust white balance. One with a white balance meter (preferred) and one without.

Preliminary setup for White Balance Confirmation / Adjustment
In Pro picture mode (Picture 100%).
All other user controls at the reset condition. To reset the user controls, press the rest button on the remote control while Pro picture mode is active, then raise Picture to 100%.
User control "COLORTEMP" set Neutral
Check the white balance in both high (100-IRE) and low (20-IRE) IRE all white signal. If a low IRE signal is not available, then reduce the picture level until an appearance of 20-IRE signal is seen on the screen. This is approx. 3 bars (display dashes that illustrate level) up from minimum picture adjustment on the picture bar-graph display on the screen. Proceed to the adjustment section below if the color temperature (tracking) appears to be incorrect for either the high or low IRE input signal. A white balance meter can be used to confirm the white balance if available. If adjustment is required, perform the white balance adjustments by either method below.

Adjustment with a white balance meter: (Preferred Method)

1. For the *High* IRE all white signal adjust R/G to 1.06 and B/G to 0.9. (Adjust by RDRV, BDRV in 2105P-1). Corresponding X Y values X =.294, Y = .310
2. Adjust picture level to 3 bars up from minimum on the picture bar-graph display if the IRE input signal level cannot be adjusted to 20-IRE. (adjust RCUT, and BCUT in adjustment category "2105P-1" the same as above, i.e. R/G to 1.06 and B/G to 0.9.
3. After low-level white adjustment (cutoff adjustment) repeat the high level adjustment to achieve proper white balance tracking.
4. Confirm the adjustment with COLORTEMP set to WARM mode. Picture should become slightly more reddish; and COOL mode should become slightly more blueish. Additional confirmation of adjustment can be achieved by switching to a black and white broadcast movie if available.

Adjustment without white balance meter:

1. The 100 IRE all-white signal must be adjusted by eye. Adjust RDRV, BDRV in 2150P-1 to make the white as pure as possible.
2. Adjust picture level to 3 bars up from minimum on the picture bar-graph display if the IRE input signal level cannot be adjusted to 20 IRE. Adjust RCUT, and BCUT in adjustment category "2150P-1" by eye to make the gray as pure as possible.

3. After low-level white adjustment (cutoff adjustment) repeat the high level adjustment to achieve proper white balance tracking.
4. Confirm the adjustment with COLORTEMP set to WARM mode. The picture should be slightly more reddish;. and COOL mode should become slightly more blueish. Additional confirmation of adjustment can be achieved by switching to a black and white broadcast movie if available. If a B&W signal is not available, turn the color to minimum using the customer controls. In some sets, the customer controls may not entirely eliminate all color, thus in this case, an external B&W signal needs to be applied.

The following are typical white balance data ranges for each model.

	KP57HW40	**KP57HW40**
RDRIV	21~24	21~25
BDRIV	31~44	29~36
RCUT	21~34	22~34
BCUT	23~34	21~33

Geometry/ Convergence adjustment:

Equipment required: pattern generator (must also have 1080i Y,Pb,Pr capability)
Signal Applied/Input: Crosshatch (for 1080i adjustment, signal must be applied to Video 5 input)
Adjust points: Registers accessed in the service mode
Conditions: Multiple Wide Modes will be required to be checked for mis-convergence and geometry.

1. **Normal/Full**
2. **Wide-Zoom**
3. **Zoom**
4. **1080i mode: (Video 5 input Only)**

IMPORTANT NOTE: For each mode, use the remote to enter the modes above (in the order listed) and check for correct geometry and convergence. If adjustment is required, use the Fine Adjustment Mode to correct the distortion. *Special Copy function*: After adjusting Full wide mode (while still in the Fine Adjust Mode) write the data into memory (Muting, then Enter). Copy adjustment data to other Wide modes using PJED item #1 "COPY" Change data to "1" , then write (Mute + Enter) . This will copy the data to other Wide modes, except for Widezoom which is unique. Then activate the Flash Focus (button on front of set) to calibrate the new adjustment.

Input 480i signal.
Start with the Full Mode (this will also adjust the Normal mode simultaneously. Full and Normal modes share the same adjustment data).

1. Change Wide mode to FULL mode and adjust Geometry as needed, including all four corners to straighten out vertical/horizontal lines at the sides of the screen.
2. Adjust the convergence as needed. Pay special attention to center outside areas.
3. While still in the Fine adjust Mode, write the data into memory and then "Copy " the data to the other Wide modes. Press Flash Focus button in Service mode to caliabate.

Check / Adjust Wide Zoom Mode:

1) Change Wide mode to WIDEZOOM and adjust Geometry as needed, including all four corners to straighten out vertical/horizontal lines at the sides of the screen.
2) Adjust the convergence as needed. Pay special attention to center outside areas.

3) Press Mute + Enter when complete.

Check / Adjust Zoom Mode: If the mode checks OK, continue to other modes, if not, please adjust in Fine Mode and Write the data into memory.

Check / Adjust the 1080i Mode: In the Video 5 input apply 1080i input signal and go into service mode. Turn on internal crosshatch signal and adjust as needed. Please note, a 1080i signal MUST BE APPLIED to the Video 5 input for the internal crosshatch generator to enter the 1080i mode. If this is not done, the pattern displayed will not be 1080i but stay in the NTSC 480i mode.

If a 1080i crosshatch generator is available, use this signal to adjust rather than using the internal pattern (this is a preferable method).If the mode checks OK, continue to the next step, if not, adjust the Convergence in the Fine Mode. If any adjustments are made write data (by pressing "MUTING: then "ENTER").

Exit service mode and press Flash Focus. Verify correct Convergence in each Wide mode.

Final Check:

Now check each mode with a live video signal to verify correct operation. If problems still exist, please readjust. If a 1080i source is available, please check this mode.

SUPPORT DOCUMENTATION SECTION:

The following items are provided as support documentation for adjustments taken from the Service manual:

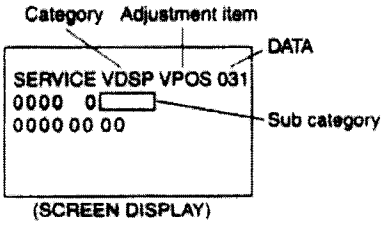
***Setup adjustments**
***Electrical Adjustment by Remote Commander.**

Method of setting the Service Adjustment Mode.

SERVICE MODE PROCEDURE

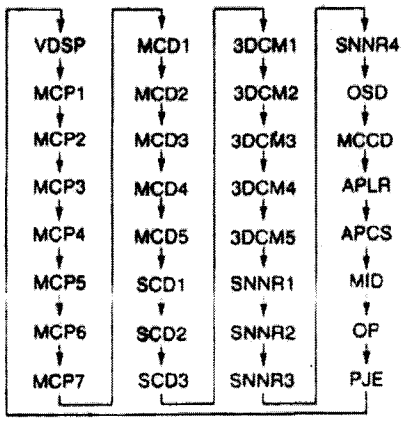
1. Standby mode. (Power off)
2. DISPLAY → 5 → VOL (+) → TV POWER
   on the Remote Commander.
   (Press each button within a second.)

SERVICE MODE ADJUSTMENT



3. The screen displays the item being adjusted.
4. The category is reached by using the remote buttons 2 and 5.
5. The Adjustment item is selected using remote buttons 1 and 4.
6. The Data is changed using remote buttons 3 and 6.

Using the remote 2 or 5 button you will search through the category shown in the chart below.



The acronyms above are the titles of the different adjustment categories. See the Service Mode charts for the definition of the various categories. Example: VDSP (Vertical Deflection Signal Processor).

1. If you want to recover the original data (if you did not save any changes) press the **0** then **Enter** button on the remote.

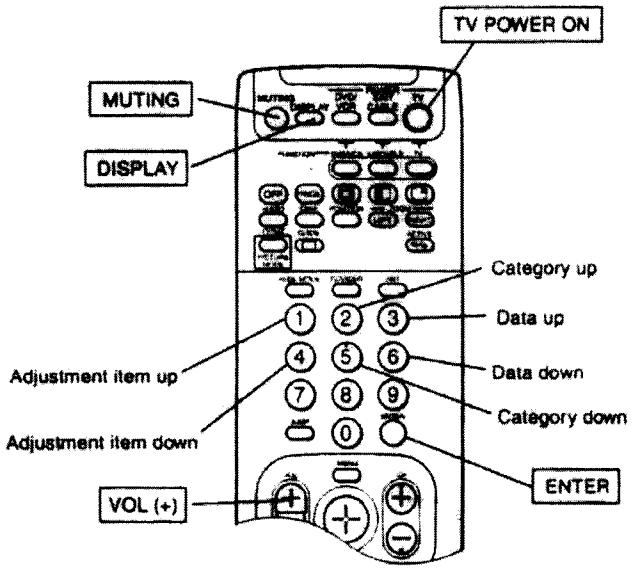
Writing new data into memory.

1. After adjusting the data it must be placed into memory (writing) This is done using the **muting** button (the data turns red) then the **Enter** button. (The data turns green)

Memory confirmation Method:.

1. After finishing all adjustments and saving the data changes, remove the AC plug from the outlet, and then plug in again.
2. Turn unit on to Service Mode.
3. Check the data and confirm it retained the changes you made.

Adjustment buttons on the remote:

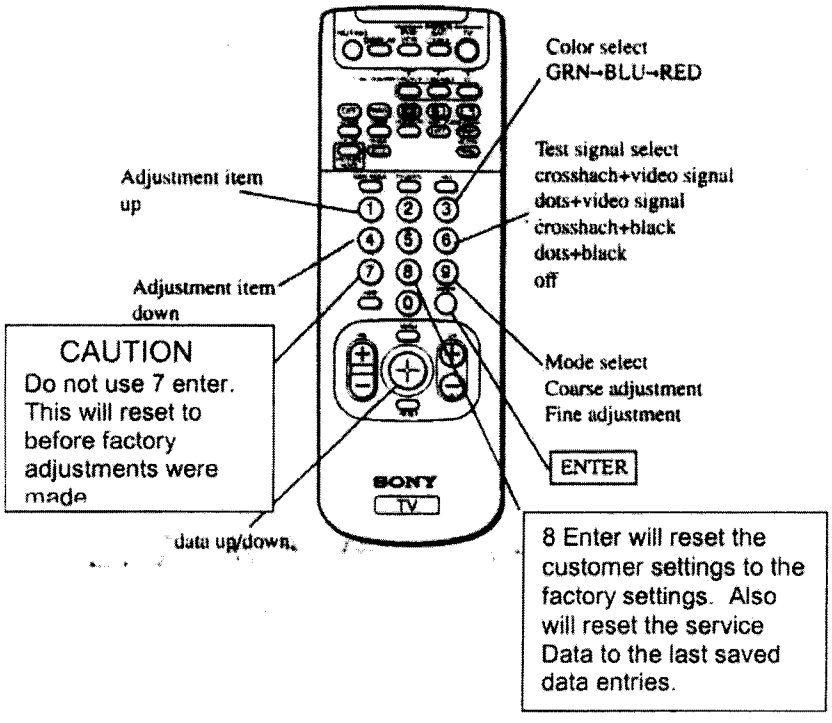


RM-Y907

Note: **When the category PJE is selected, which displays an internally generated signal, several buttons on the remote commander will have different functions then listed above. Therefore, when in the PJE Mode, refer to section** Registration Adjustment (PJE). **Function of buttons of remote commander for PJE mode**

Registration Adjustments (PJE)

Function of the Remote Buttons in PJE Mode



IMPORTANT:

Separate adjustments are required for the multiple modes and MUST be done in the following order. (Each mode will require a separate adjustment.)

Full (Normal) Mode

Wide Zoom Mode
Zoom Mode
1080I (video 5 input mode)

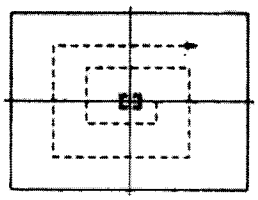
In all these modes, both color and geometry adjustments are required.

In order to do the 1080I (Video 5) mode adjustment, you must follow this procedure.
Connect green component from the 1080 generator to the green video 5 input.

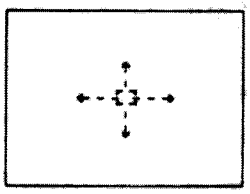
Video 5 forced 1080I mode setting OP 03 1080 to 001 in the
Service Mode.

Fine Adjustment Mode for Green, Red and Blue Convergence and Geometry:

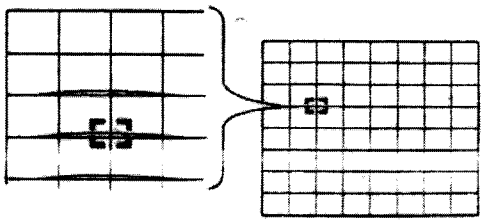
1. Press the 9 button on the remote. This puts you in the fine mode.
   The green cursor (in the green mode) appears on the center of the screen.
   (Pressing the 3 button will change the mode to Red or Blue)
2. Using the remotes 1 or 4 button, or the remote joystick, moves the cursor
   (See below) around the screen in a square-pattern.



Pressing the remote joystick the cursor turns green to white. When it is white the cursor can be moved up and down left or right around the screen.



Press once again the joystick button and the cursor stops and returns green, and you can adjust the miss-convergence in the cursor area.



Press the remote 9 button again to exit the fine mode and revert back to the coarse mode.
Store the new adjustment data values by using the remote buttons **Muting** then **Enter.**

IMPORTANT:

The adjustments above must be repeated for the different modes in the order below.
Full (Normal) Mode
Wide Zoom Mode
Zoom Mode
1080I (video 5 input mode)
In all these modes, both color and geometry adjustments are required.

3-10.ELECTRICAL ADJUSTMENT BY REMOTE COMMANDER

By using Remote Commander (RM-Y909),all circuit adjustments can be made.

NOTE : Test Equipment Required.

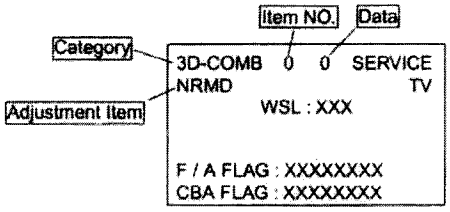
1. Pattern Generator (with component outputs)
2. Frequency counter
3. Digital multimeter
4. Audio oscillator

1. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

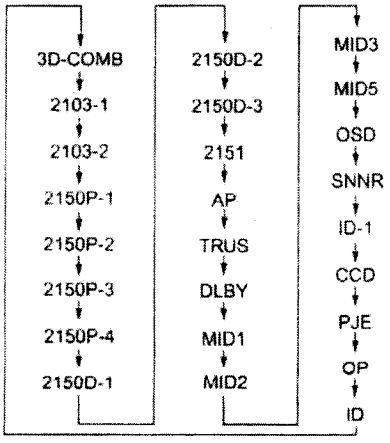
SERVICE MODE PROCEDURE

1. Standby mode. (Power off)
2. [DISPLAY] → [5] → [VOL (+)] → [TV POWER] on the Remote Commander.
   (Press each button within a second.)

SERVICE MODE ADJUSTMENT



3. The SCREEN displays the item being adjusted.
4. Press [1] or [4] on the Remote Commander to select the adjustment item.
5. Press [3] or [6] on the Remote Commander to change the data.
6. Press [2] or [5] on the Remote Commander to select the category.
   Every time you press 2(Category up), Service mode changes in the order as shown below.



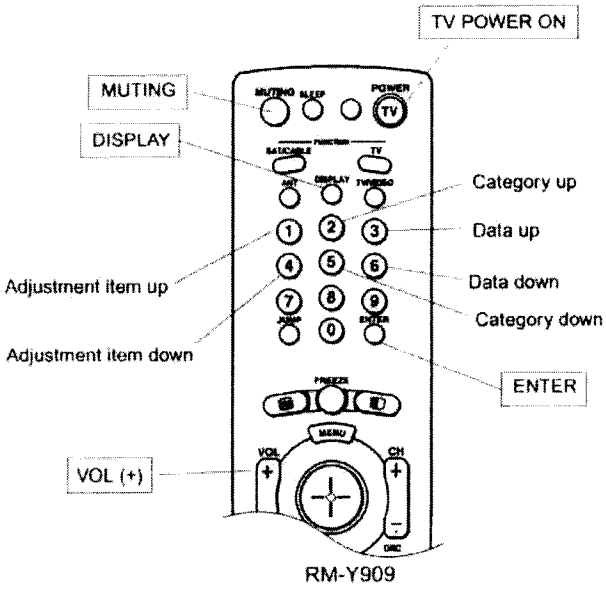
7. If you want to recover the latest values press [0] then [ENTER] to read the memory.
8. Press [MUTING] then [ENTER] to write into memory.
9. Turn power off.

Note: Press [8] then [ENTER] on the Remote Commander to initialize or turn set off and on to exit.

2. MEMORY WRITE CONFIRMATION METHOD

1. After adjustment, turn power off with the remote commander.
2. Turn power on and set to Service Mode.
3. Call the adjusted items again and confirm they were adjusted.

3. ADJUSTING BUTTONS AND INDICATOR



Note : When the PJE mode is activated, which displays an internally generated signal, several buttons on the remote commander will have different functions than listed above. Therefore, when in the PJE mode, refer to page 26 for button functions.

3-5. FOCUS VR ADJUSTMENT

1. Set generator to crosshatch.
2. Cover the both red and blue picture lenses with the lens caps to show only the green color.
3. Turn the green focus VR on the focus block to adjust to the optimum focus point with the crosshatch signal.
4. Cover the both green and blue picture lenses with the lens caps to show only the red color.
5. Turn the red focus VR on the focus block to adjust to the optimum focus point with the crosshatch signal.
6. Cover the both green and red picture lenses with the lens caps to show only the blue color.
7. Turn the blue focus VR on the focus block to adjust to the optimum focus point with the crosshatch signal.
8. After adjusting the items 3-4. Focus Lens Adjustment, 3-6. 2-Pole Magnet Adjustment and 3-7. 4-Pole Magnet Adjustment, adjust again to the optimum focus point.

Note: Instead of items 2, 4 and 6, you can cut off the unnecessary color beams by controlling the service mode 2150P-2 1 RGBS.

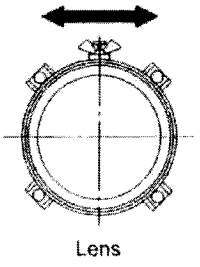


Fig. 3-5

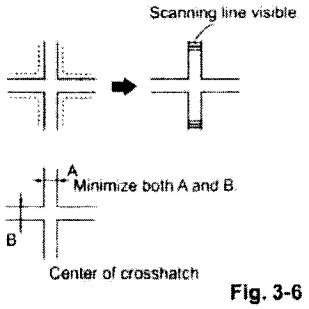


Fig. 3-6

3-6. 2-POLE MAGNET ADJUSTMENT

1. Set the picture mode to"Pro" and picture to MAX.
2. Receive the Dot signal.
3. Cover the both red and blue picture lenses with the lens caps to show only the green color.
4. Turn the green focus VR on the focus block to the left and set to overfocus to enlarge the spot.
5. Adjust 2-pole magnet so that the bright spot should be centered.
6. Align the green focus VR and set for just (precise) focus.
7. Perform the same alignment for red and blue.

Note: Instead of item 2 you can cut off the unnecessary color beams by controlling the service mode 2150P-2 1 RGBS.

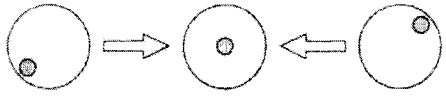


Fig. 3-7

3-7. CENTERING MAGNET ADJUSTMENT

1. Set the picture mode to "Pro".
2. Receive the monoscope signal.
3. Cover the both red and blue picture lenses with the lens caps to show only the green color.
4. Adjust the green centering magnet to put the center of the monoscope signal to the center of the screen.
5. Adjust the red centering magnet in the same way.
6. Adjust the blue centering magnet in the same way.

Note: Instead of item 2 you can cut off the unnecessary color beams by controlling the service mode 2150P-2 1 RGBS.

3-8. 4-POLE MAGNET ADJUSTMENT

1. Set the picture mode to"Pro" and picture to MAX.
2. Receive the Dot signal.
3. Cover the both red and blue picture lenses with the lens caps to show only the green color.
4. Turn the green focus VR on the focus block to the right and set the spot will become smaller.
5. Adjust the 4-Pole Magnet so that the spot becomes round for green and red.
6. Adjust blue spot to an oval shape X:Y=1:1.4 ~ 1.5.

Note: Instead of item 2 you can cut off the unnecessary color beams by controlling the service mode 2150P-2 1 RGBS.

Use the center dot

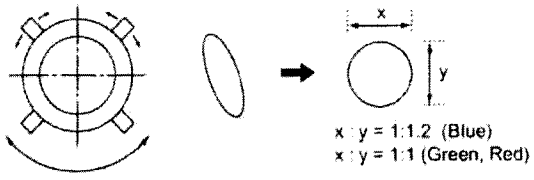


Fig. 3-8

3-9. DEFOCUS ADJUSTMENT (BLUE)

Note: Please adjust the blue dot to be slightly larger than red and green dots. This adjustment provides a more pleasing picture to the customer.

1. Select the picture mode to "Pro".
2. Receive the Dot signal.
3. Cover the both red md green picture lenses with the lens caps to show only the blue color.
4. Turn the blue focus VR on the focus block to right to make the round dot elipical.
5. Check flare with high luminace signal, make sure flare is minimal while dot shape is elipical.
6. Set generdtor to all white signal and check uniformity.

Note: Instead of item 3 you can cut off the unnecessary color beams by controlling the service mode 2150P-2 1 RGBS.