

Safety Instructions

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" INSTRUCTIONS BELOW.

X-RAY RADIATION PRECAUTION

1. The E.H.T. must be checked every time the receiver is serviced to ensure that the C.R.T. does not emit X-ray radiation as result of excessive E.H.T. voltage. The nominal E.H.T. for this receiver is 28.1 kV at zero beam current (minimum brightness) operating at 220V a.c. The maximum E.H.T. voltage permissible in any operating circumstances must not exceed 29.5 kV. When checking the E.H.T., use the 'High Voltage Check' procedure in this manual using an accurate E.H.T. voltmeter.
2. The only source of X-RAY radiation in this receiver is the C.R.T. To prevent X-ray radiation, the replacement C.R.T. must be identical to the original fitted as specified in the Parts List.
3. Some components used in this receiver have safety related characteristics preventing the C.R.T. from emitting X-ray radiation. For continued safety, replacement component should only be made after referring the Product Safety Notice below.

SAFETY PRECAUTION

1. This receiver has a nominal working E.H.T. voltage of 26.0 kV. Extreme caution should be exercised when working on the receiver with the back removed. Do not attempt to service this receiver if you are not conversant with the precautions and procedures for working on high voltage equipment. When handling or working on the C.R.T., always discharge the anode to the receiver chassis before removing the anode cap. The C.R.T., if broken, will violently expel glass fragments. Use shatter proof goggles and take extreme care while handling. Do not hold the C.R.T. by the neck as this is a very dangerous practice.
2. It is essential that to maintain the safety of the customer all cable forms be replaced exactly as supplied from factory.
3. A small part of the chassis used in this receiver is, when operating, at approximately half mains potential at all times. It is therefore essential in the interest of safety that when serving or connecting any test equipment the

receiver should be supplied via a suitable isolating transformer of adequate rating.

4. Replace blown fuses within the receiver with the fuse specified in the parts list.
5. When replacing wires or components to terminals or tags, wind the leads around the terminal before soldering. When replacing safety components identified by the international hazard symbols on the circuit diagram and parts list, it must be a Toshiba approved type and must be mounted as the original.
6. Keep wires away from high temperature components.

PRODUCT SAFETY NOTICE

Many electrical and mechanical components in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-ray radiation protection afforded by them cannot necessarily be obtained by using replacements rated at higher voltages or wattage, etc. Components which have these special safety characteristics in this manual and its supplements are identified by the international hazard symbols on the schematic diagram and parts list. Before replacing any of these components read the parts list in this manual carefully. Substitute replacement components which do not have the same safety characteristics as specified in the parts list may create X-ray radiation.

Installation and Service Adjustments

GENERAL INFORMATION

All adjustments are thoroughly checked and corrected when the receiver leaves the factory. Therefore the receiver should operate normally and produce proper colour and B/W pictures upon installation. However, several minor adjustments may be required depending on the particular location in which the receiver is operated. This receiver is shipped completely in cardboard carton. Carefully draw out the receiver from the carton and remove all packing materials. Plug the power cord into a convenient 220 volts 50 Hz AC two pin power outlet. Turn the receiver ON. Check and adjust all the customer controls such as BRIGHTNESS, CONTRAST and COLOUR Controls to obtain natural colour or B/W picture.

AUTOMATIC DEGAUSSING

A degaussing coil is mounted around the picture tube so that external degaussing after moving the receiver is normally unnecessary, providing the receiver is properly degaussed upon installation. The degaussing coil operates for about 1 second after the power to the receiver is switched ON. If the set is moved or faced in a different direction, the power switch must be switched off at least 30 minutes in order that the automatic degaussing circuit operates properly. Should the chassis or parts of the cabinet become magnetized to cause poor colour purity, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube, the sides and front of the receiver and slowly withdraw the coil to a distance of about 2 m before disconnecting it from AC source. If colour shading still persists, perform the COLOUR PURITY ADJUSTMENT and CONVERGENCE ADJUSTMENTS procedures.

HIGH VOLTAGE CHECK

CAUTION: There is no HIGH VOLTAGE ADJUSTMENT on this chassis.

1. Connect an accurate high voltage meter to the second anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST Controls to minimum (zero beam current).
3. High voltage will be measured below 29.5 kV.
4. Rotate the BRIGHTNESS Control to both extremes to be sure the high voltage does not exceed the limit of 29.5 kV under any conditions.

FOCUS ADJUSTMENT

Adjust FOCUS Control on FLYBACK TRANS. (T461) for well defined scanning lines in the centre area on the screen.

Set-up Adjustment

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

Perform the adjustments in order as follows

1. Color Purity
2. Convergence
3. White Balance

Note: The PURITY/CONVERGENCE MAGNET assembly and rubber wedges need mechanical positioning. Refer to figure 1.

COLOR PURITY ADJUSTMENT

NOTE: Before attempting any purity adjustments, the receiver should be operated for at least fifteen minutes.

1. Demagnetize the picture tube and cabinet using a degaussing coil.
2. Set the brightness and contrast to maximum.
3. Use a green raster from among the built-in test signals. See page 12.
4. Loosen the clamp screw holding the yoke and slide the yoke backward or forward to provide vertical green belt (zone) in the picture screen.
5. Remove the Rubber Wedges.
6. Rotate and spread the tabs of the purity magnet (See figure 2.) around the neck of the picture tube until the green belt is in the center of the screen. At the same time, enter the raster vertically.
7. Slowly move the yoke forward or backward until a uniform green screen is obtained. Tighten the clamp screw of the yoke temporarily.

8. Check the purity of the red and blue raster.

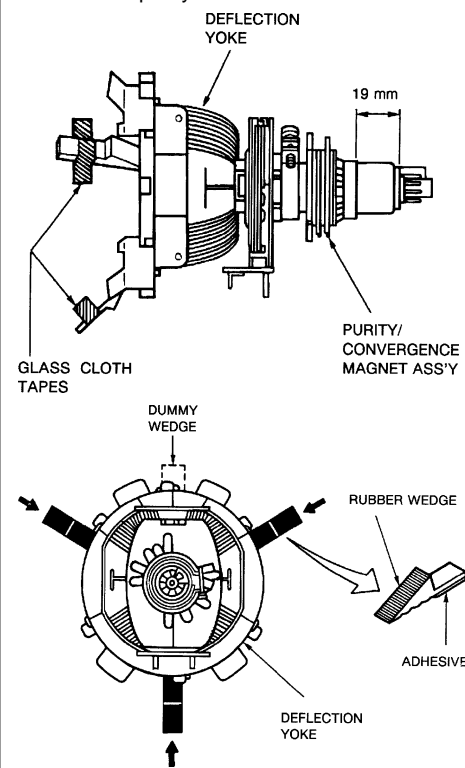


Fig. 1

CONVERGENCE ADJUSTMENTS

NOTE: Before attempting any convergence adjustments, the receiver should be operated for at least fifteen minutes.

CENTRE CONVERGENCE ADJUSTMENT

1. Use the cross-dot pattern from among the built-in test signals.
2. Set the brightness and contrast for well defined pattern.
3. Adjust two tabs of the 4-Pole Magnets to change the angle between them (See figure 2.) and superimpose red and blue vertical lines in the centre area of the picture screen.
4. Turn the both tabs at the same time keeping the angle constant to superimpose red and blue horizontal lines at the center of the screen.
5. Adjust two tabs of 6-Pole Magnets to superimpose red/blue line and green one. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
6. Repeat adjustments 3, 4, 5 keeping in mind red, green and blue movement, because 4-Pole Magnets and 6-Pole Magnets have mutual interaction and make dot movement complex.

CIRCUMFERENCE CONVERGENCE ADJUSTMENT

1. Loosen the clamping screw of deflection yoke slightly to allow the yoke to tilt.
2. Temporarily put a wedge as shown in figure 1. (Do not remove cover paper on adhesive part of the wedge.)
3. Tilt front of the deflection yoke up or down to obtain better convergence in circumference. (See figure 3.) Push the mounted wedge into the space between picture tube and the yoke to fix the yoke temporarily.
4. Put other wedge into bottom space and remove the cover paper to stick.
5. Tilt front of the yoke right or left to obtain better convergence in circumference. (See figure 3.)
6. Keep the yoke position and put another

wedge in either upper space. Remove cover paper and stick the wedge on picture tube to fix the yoke.

7. Detach the temporarily mounted wedge and put it in another upper space. Stick it on picture tube to fix the yoke.
8. After fixing three wedges, recheck overall convergence. Tighten the screw firmly to fix the yoke and check the yoke is firm.
9. Stick three adhesive tapes on wedges as shown in figure 1.

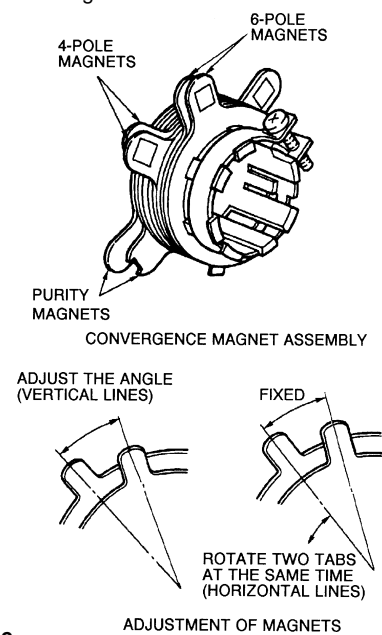


Fig. 2

Centre Convergence by Convergence Magnets

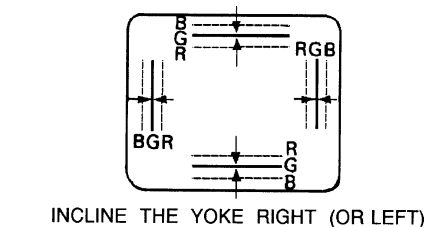
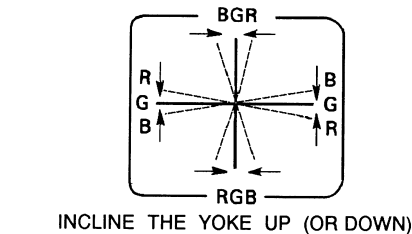
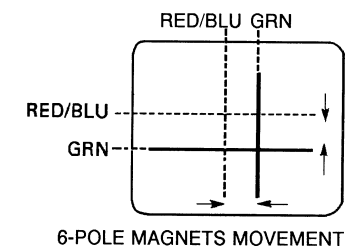
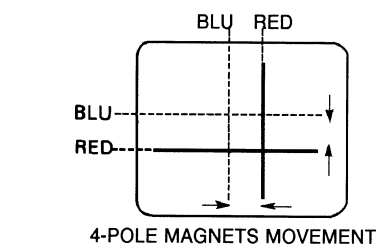
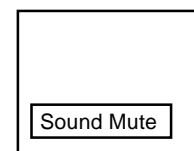


Fig. 3. Dot Movement Pattern

Service Mode

1. ENTERING TO SERVICE MODE

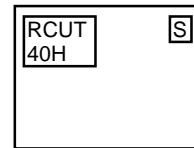
- 1) Press button once on Remote Control.



- 2) Press button again to keep pressing.

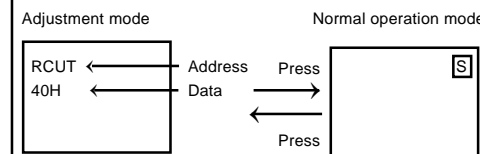


- 3) Keep pressing the button, press MENU button on TV set.



2. DISPLAYING THE ADJUSTMENT MENU

Press MENU button on TV.



3. SELECTING THE ADJUSTING ITEMS

Every pressing of CHANNEL button changes the adjustment items in the following order. (button for reverse order.)

4. ADJUSTING THE DATA

Pressing of VOLUME or button will change the value of data in the range from 00 to FF. The variable range depends on the adjusting item.

5. EXIT FROM SERVICE MODE

Press POWER button to turn off the TV once.

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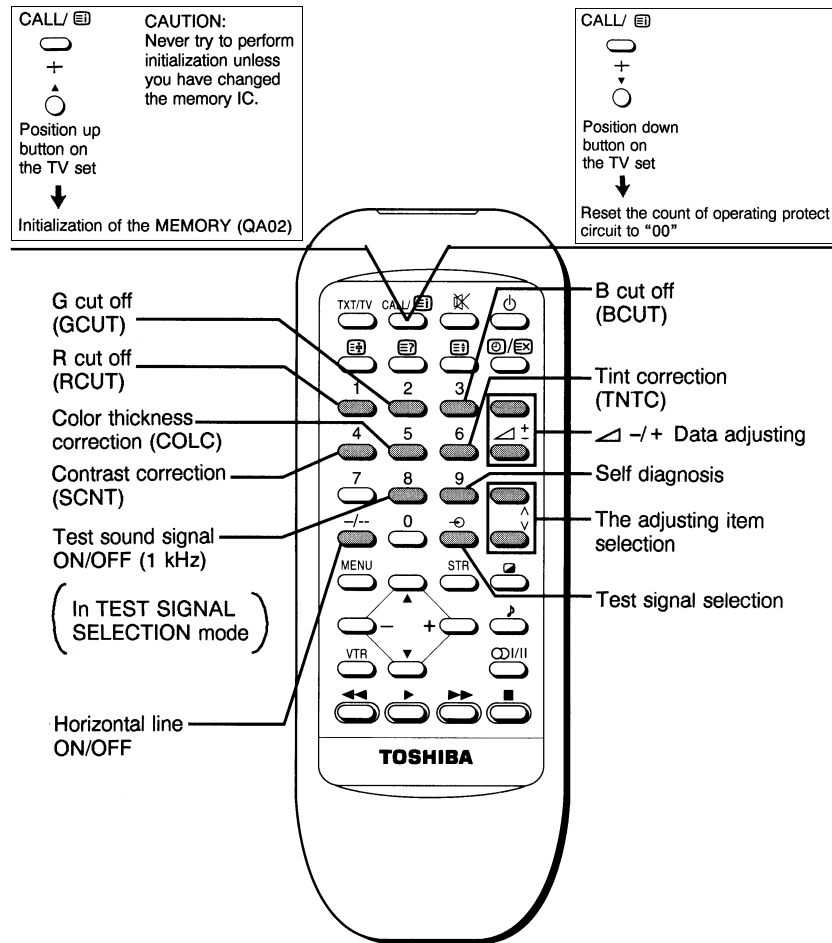
Recommended Safety Parts

Item	Part No.	Description
L462		DY, Supplied with V901
L901	23200205	Coil, Degaussing, TSB-2333AR
T401	23224983	Transformer, Horiz. Drive, TLN1039
T461	23236510	Transformer, Flyback, TFB4123BE
T801	23211858	Line Filter, TRF3139
T862	23217346	Transformer, Converter, TPW3365AR
Q404	23314375	Transistor, 0N4409(508D)
Q862	A8643108	Photo Coupler, TLP621(GR-LF)
F470	23144501	Fuse, 0.8A
F801	23144507	Fuse, 3.15A
P801	23372012	Power Cord
F801	23344395	Switch, Power
V901A	23902067	Socket, CRT, 10P
V901	23312670	Picture Tube, A51EAL155X01

Adjustments Cont'd

OTHER SERVICE FUNCTION

The following key entry during display of adjustment menu provides special functions.



TEST SIGNAL SELECTION

Every pressing of button changes the test patterns on screen as described below in SERVICE MODE.

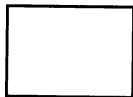
Signal off → NTSC signals (14 patterns)
↑
PAL signals (14 patterns)
↓

- About inside signal: The inside signal is output at video input terminal from QA01, and is not output with the pin inserted into terminal. (Single color signal can be output.)

Signals:

- Black single color
- White single color
- Picture
- Using method

Picture:



Using method:

Purity and White uniformity of CRT

Black single color....
Making black signal of approx. 1Vp-p in QA01
White single color....
Making white signal of approx. 1Vp-p in QA01

Signals:

- W/B adjustment

Picture:



Using method:

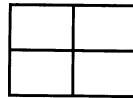
White balance adjustment
White part....
White balance adjustment/check in light area
Black part....
White balance adjustment/check in dark area

Making. approx. 1Vp-p signal in QA01.

Signals:

- Black cross-bar
- White cross-bar

Picture:



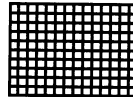
Using method:

Picture position (horizontal, vertical and slant) in CRT adjustment. Making approx. 1 Vp-p signal in QA01.

Signals:

- Black cross-hatch
- White cross-hatch

Picture:



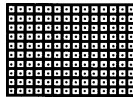
Using method:

Convergence and vertical amplitude adjustment.
Making approx. 1 Vp-p signal in QA01.

Signals:

- Black cross-dot
- White cross-dot

Picture:



Using method:

Convergence adjustment.
Making approx. 1Vp-p signal in QA01.

Signals:

- H signal (Left, right, white)
- H signal (Left, right, black)

Picture:



Using method:

For checking (of purity drift) of white uniformity of CRT.
H signal (Left, right, white)....Check in light area.
H signal (Left, right, black)....Check in dark area
The adjustment will be the best, if the time when unevenness of color in light area occurs, is a little longer than that in dark area. Making approx. 1Vp-p signal in QA01.

Electrical Adjustments

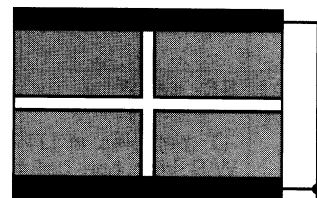
ITEM:

SUB-BRIGHTNESS (Address: BRTC)

Note: Constrict the picture height until the vertical retrace line appears adjusting the address HIT (HEIGHT).

ADJUSTMENT PROCEDURE:

- Set CONTRAST to "00", and BRIGHTNESS to "50" by adjusting user controls.
- Set the TV in service mode to get white cross-bar of inside pattern.
- Select BRTC (brightness correction), and adjust the - / + button to reduce the value so that white portion of inside pattern slightly light.
- Adjust - / + button to increase the data value of BRTC, and set it just before the difference between the belt of vertical retrace and the border of black portion of inside pattern is visible. After that, return vertical height and contrast.



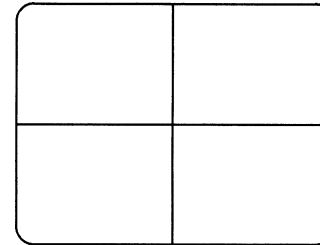
Belt of vertical retrace

ITEM:

HORIZONTAL POSITION ADJUSTMENT (HPOS)

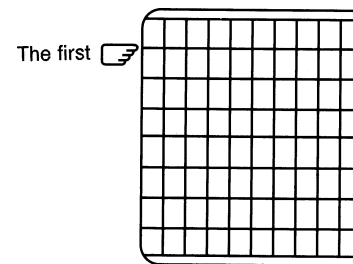
VERTICAL POSITION ADJUSTMENT (VPOS)

- Set the TV in service mode, and get black or white cross-bar signal with VIDEO button on remote hand unit.
- Select either HPOS (Horizontal picture phase) or VPOS (Vertical picture phase) with CHANNEL , buttons, and adjust horizontal or vertical picture position in the center of screen with VOLUME - / + buttons.



VERTICAL AMPLITUDE ADJUSTMENT (HIT)

- Set the TV in service mode, and get black or white cross-hatch signal with VIDEO button on remote hand unit.
- Select HIT (Vertical amplitude) with CHANNEL , buttons, and adjust vertical amplitude with VOLUME - / + buttons so that vertical amplitude lacks a little.
- Adjust vertical amplitude with VOLUME - / + buttons so that the first bar on cross-hatch signal touches edge of screen.



WHITE BALANCE ADJUSTMENT

CUTOFF ADJUSTMENT

(RCUT)
(GCUT)
(BCUT)

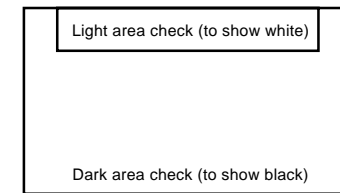
DRIVE ADJUSTMENT

(GDRV)
(BDRV)

- Set Contrast to 40, and brightness to +20 by picture control.
- Set the TV in service mode, and get the inside W/B adjusting signal with VIDEO button.
- Select RCUT, GCUT and BCUT with CHANNEL , buttons, to set individual values to 32, and to set GDRV and BDRV to 20 with VOLUME - / + buttons.
- Press button on the remote control and rotate Screen VR to get one slight horizontal line on screen.
Note: Every pressing of button provides Horizontal line picture and Normal picture alternately.
- Press button to release horizontal line picture, and select the two other colors which did not light in the above step with CHANNEL , buttons. Then tap VOLUME - / + buttons so that three colors slightly light in the same level.

To correct white balance in light area, select GDRV and BDRV with CHANNEL , buttons to adjust.

To correct white balance in dark area, perform fine adjustment of RCUT, GCUT and BCUT.



SELF DIAGNOSTIC FUNCTION

- Press "9" button on Remote Control during display of adjustment menu. The diagnosis will begin to check if interface among IC's are executed properly.
- During diagnosis, the following displays are shown.

(SELF CHECK)	
(1)	2390XXXX
(2)	POWER : 00
(3)	BUS LINE : OK
(4)	Bus CONT : OK
(5)	BLOCK : UV V1 V2 QV01

- Part number of microcomputer (QA01)
- Operation number of protecting circuit ----"00" is normal. When indication is other than "00", overcurrent appts to flow, and circuit parts may possibly be damaged.
- BUS LINE CHECK ---- "OK" is normal.
"SDA1-GND" means that SDA line is shorted to ground.
"SCL1-GND" means that SCL line is shorted to ground.
"SCL1-SDA1" means that SDA line is shorted to SCL line.
- BUS CONT----"OK" is normal.
When indication shows "Q 000 NG", the device with the number may possibly be damaged.
- BLOCK
UV : TV reception mode
V1: VIDEO 1 input mode (~ ~1)
V2 : VIDEO 2 input mode (~ ~2)
Indicated color of mode now selected: Green and Red Indicated color of other modes : White

Green: Normal

Red: The microcomputer operates to provide judgement of no video signal. The red color is still indicated though the signal is input, failure may exist in input signal line including QV01.
QV01: In case of indication green --- Normal
In case of indication red with input signal --- Failure may exist in output line including QV01.

NOTE: Component which controls character display on screen is QT01 (TELETEXT IC). If this display function fails to operate due to damage in QT01, self diagnosis procedure is as follows.

- In case that power indicator is blinking with interval of 0.5 seconds; it means protecting circuit (Current limiter) is operating, and circuit components may possibly be damaged. Check related components.
- In case that power indicator is blinking with interval of 1 second; Protecting circuit does not operate, but a part of Bus line does not operate normally. Check Bus line.

Item: Slave address 36 [BRTC]

Name: SUB BRIGHT CENTER

Setting: (User control)

Contrast: MAX
Bright : CENTER
Color : MIN

Input signal: Sub-bright signal

Measurement point: Screen adjustment

Adjustment procedure:

- This adjustment must be done after [BRTC], screen VR and white balance adjustments have been completed.
- Adjust number of black collapse lines of sub-bright signal.

Adjustment standard: 4±1.5

Item: Slave address 3B [SCNT]

Name: SUB CONTRAST

Setting: (User control)

Contrast: MAX
Bright : CENTER
Color : MIN

Input signal: Sub-bright signal (PAL)

Measurement point: IC501 #12... (B-OUT)

Adjustment procedure:

- Select slave address 3B [SCNT].
- When [SCNT] is selected, 0-signal is muted and only B,W signals are outputted.
- Adjust amplitude of white level from pedestal level of Y-signal.

Adjustment standard: 1.25V(p-p) ± 0.15V(p-p)

Item: Slave address

20 [RCUT]

31 [GCUT]

32 [BCUT]

Screen VR

Name:

R cut-off
G cut-off
B cut-off
Screen

Setting: (User control)

RCUT
GCUT
BCUT) 40 Hexa-decimal

GDRV
BDRV) 80 Hexa-decimal

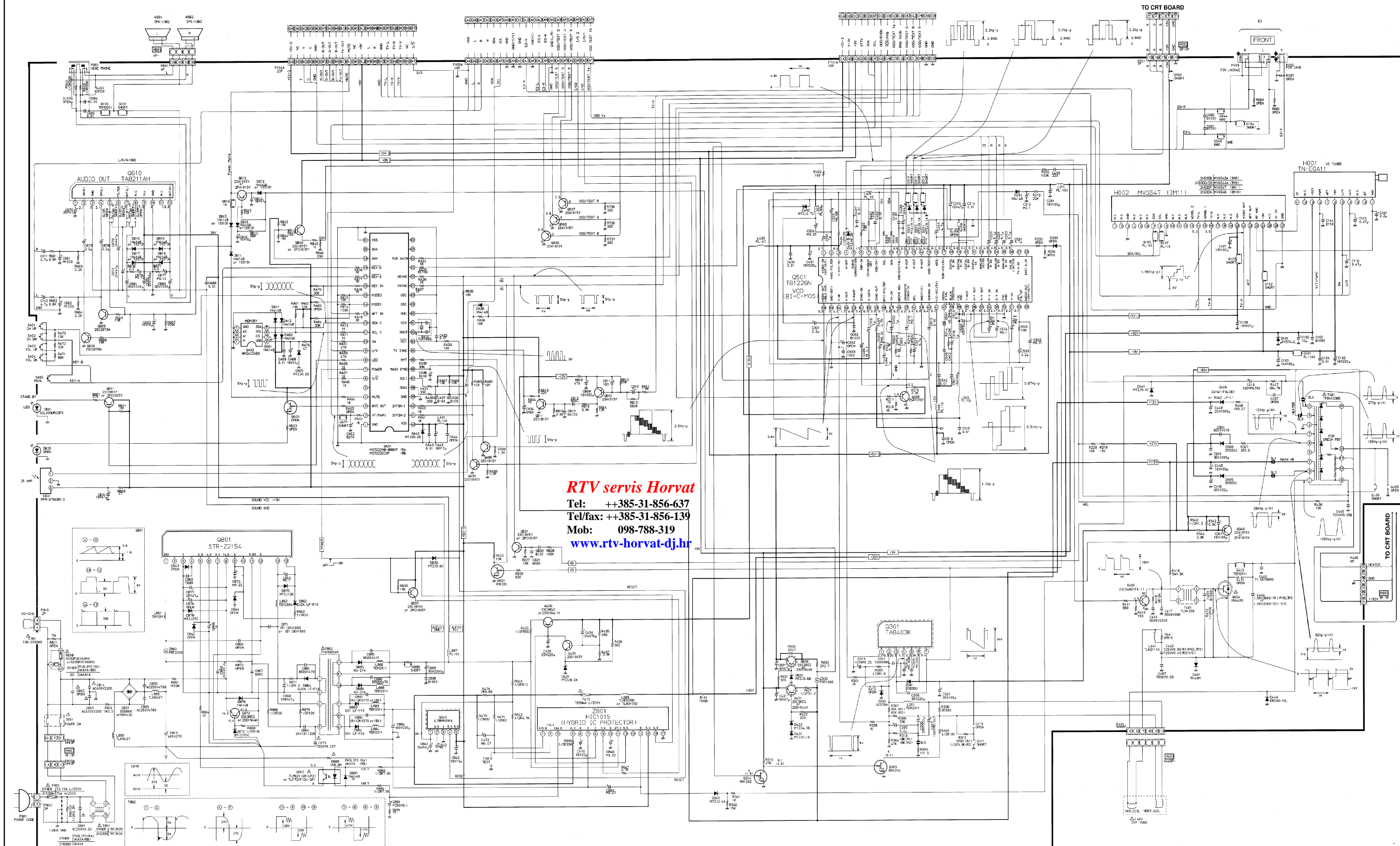
Select horizontal line mode by pressing button on the remote control in service mode.

Measurement point: Screen adjustment

Adjustment procedure:

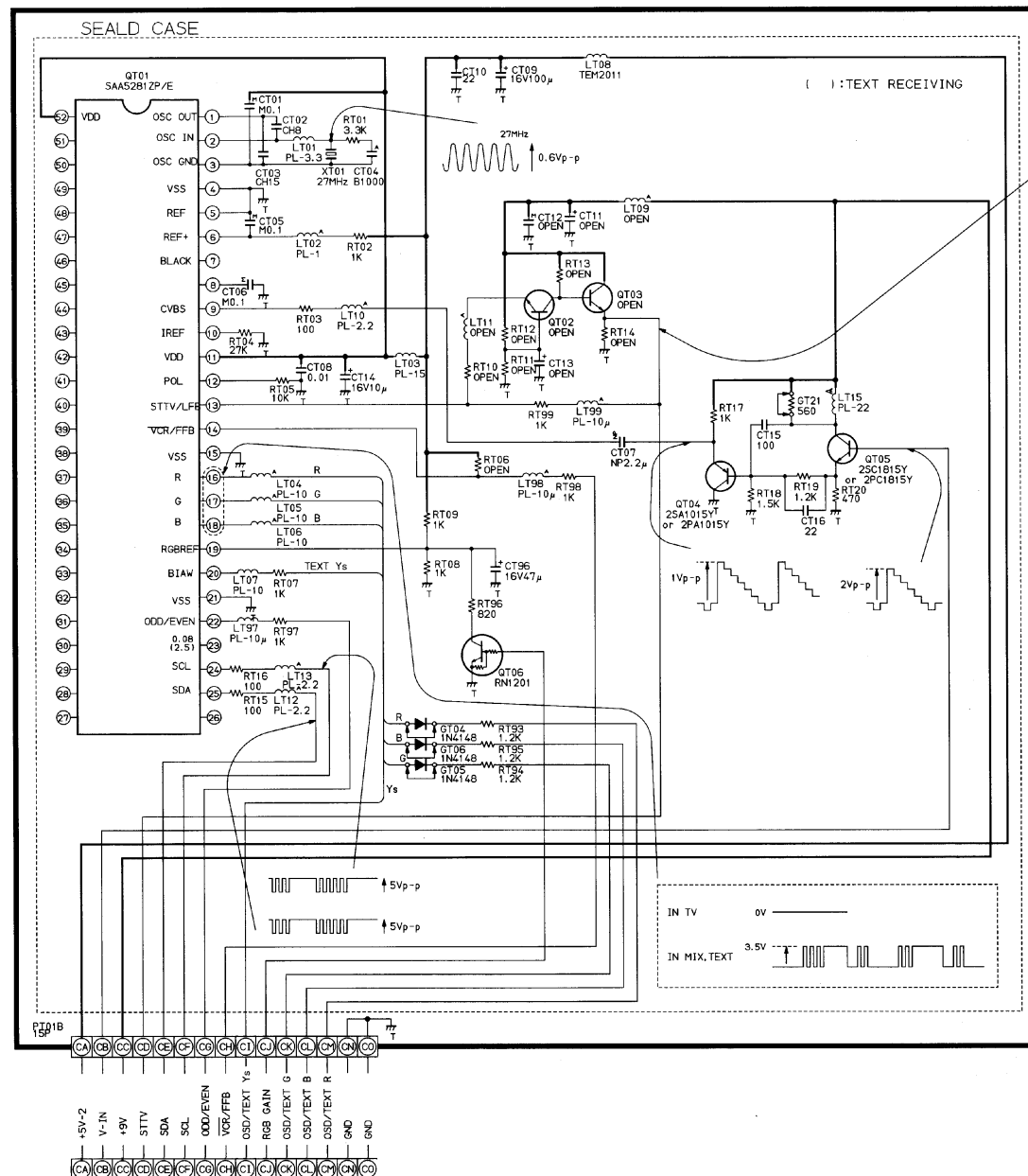
- Set the controls as shown in the left column.
- Gradually increase the screen VR (T461) until one of R, G or B line begins to brighten slightly.
- Determine the position of the screen VR here.
- Adjust RCUT, GCUT and BCUT, brighten other lines until they begin to light slightly. (Adjust DATA so that the line becomes almost white.)
- Press button on the remote control to escape from the horizontal line mode.

Main Diagram



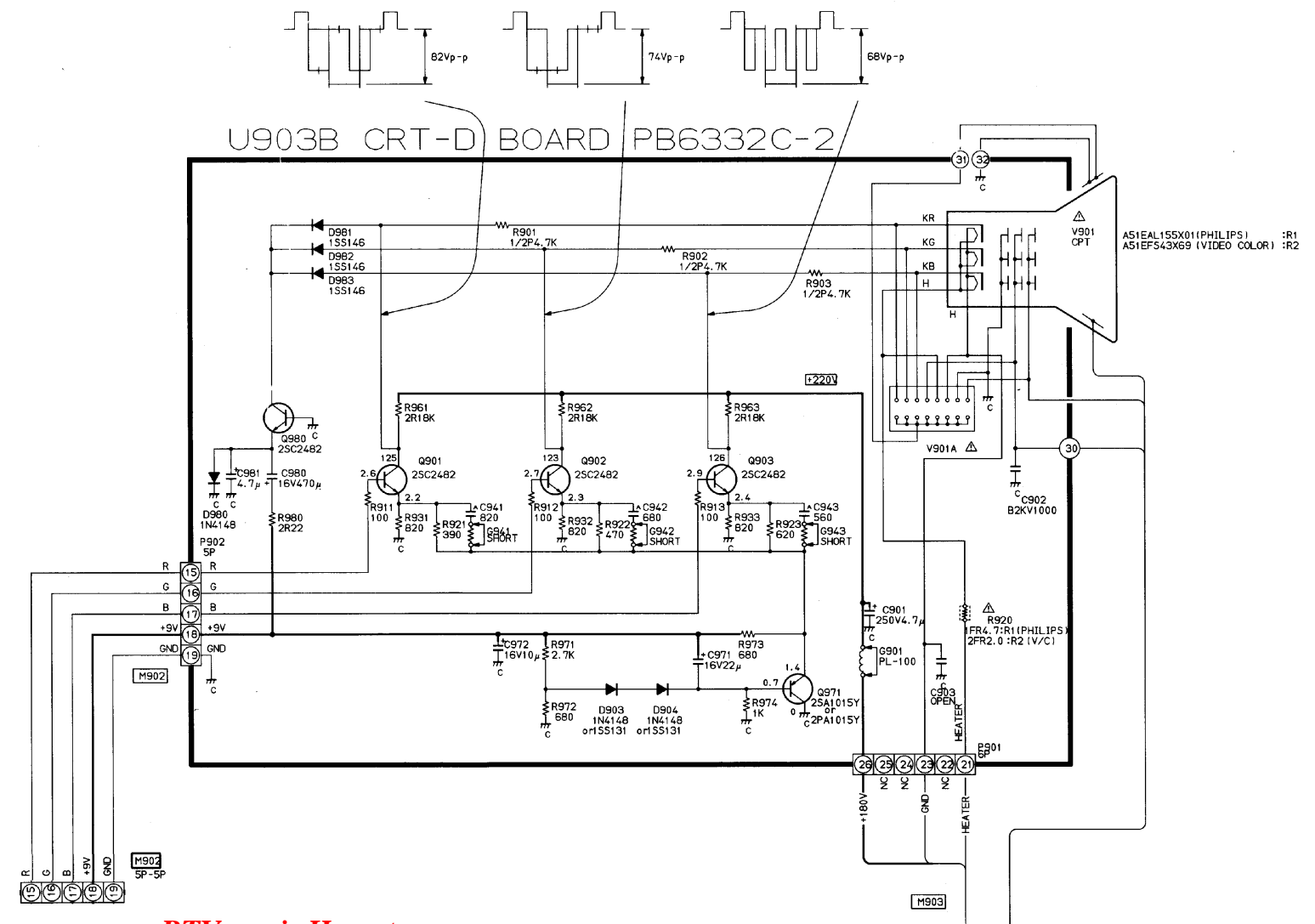
Text Diagram

U903C TEXT BOARD PB6332C-3



CRT Diagram

U903B CRT-D BOARD PB6332C-2



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