

General Information

Chassis: C5S

Safety Instructions

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 27.8 kV at zero beam current (minimum brightness) operating at 240V a.c. The maximum E.H.T. voltage permissible in any operating circumstances must not exceed 29.0 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 24.5 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

Recommended Safety Parts

Item	Part No.	Description
C440	24082476	PF, 6600pF, ±3%, 1500V
C463	24212152	CD, 1500pF, ±10%
C801	24082363	PF, 0.22uF, ±20%, AC250V
C813	24094656	CD,2200pF,±20%, AC400V
C814	24094656	CD,2200pF,±20%, AC400V
R327	24339569	MF, 5.6 ohm, 2W
R448	24338338	MF, 0.33 ohm, 1W
R801	24009954	Metal-Glazed Resistor, 2.2M ohm, 1/2W
R808	24019340	PTC Thermistor, 290V, 18 ohm
R890	24381333	OME, 33k ohm, 1/2W
R899	24005007	Metal-Glazed Resistor, 8.2M ohm, 1W
R920	24000940	FR, 2 ohm, 2W
R920	24000568	FR, 4.7 ohm, 1W
L462	-----	DY, Supplied with V901
L901	23200205	Coil, Degaussing, TSB-2333AR
T401	23224983	Transformer, Horiz. Drive, TLN1039
T461	23236464	Transformer, Flyback, TFB41 23AR
T801	23211858	Line Filter, TRF3139
T862	23217287	Transformer, Converter, TPW3331AR
Q404	23314375	Transistor, ON4409(508D)
Q862	A8643108	Photo Coupler, TLP621(GR-LF
F470	23144875	Fuse, 0.63A
F801	23144507	Fuse, 3.15A
P801	23372012	Power Cord
S801	23145434	Switch, Power, 2C2P
V901A	23902067	Socket, CRT, 10P
V901	23312642	Picture Tube, A51EF543X69
V901	23312571	Picture Tube, A51EAL55X01

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 240 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 29.0 kV (2152DB), 32.0 kV (2857DB).

HEIGHT ADJUSTMENT

1. Receive the UK PHILIPS pattern, and set the contrast to max, colour and brightness to centre.
2. Adjust HEIGHT Control (R350) so that white blocks at top and bottom of the picture are just masked.

HORIZONTAL CENTRE ADJUSTMENT

1. Receive the UK PHILIPS pattern.
2. Adjust HPOS (Bus control) so the pattern centre can be located at the screen centre.

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:

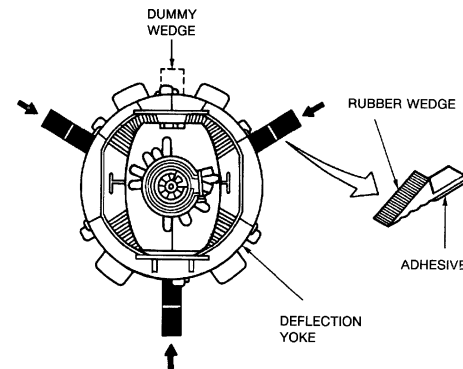
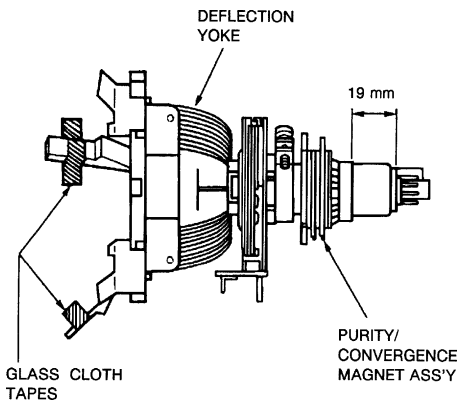
1. Color Purity
2. Convergence
3. White Balance

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

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.
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 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.



CONVERGENCE ADJUSTMENTS

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

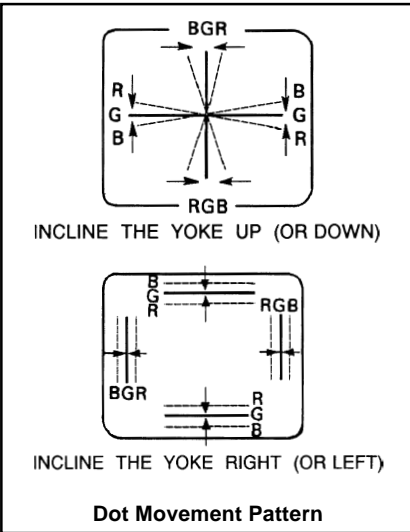
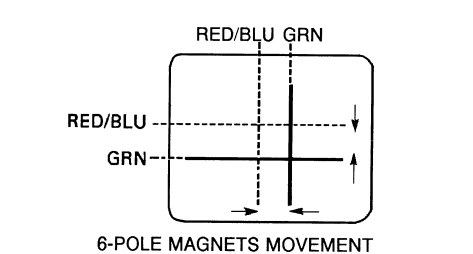
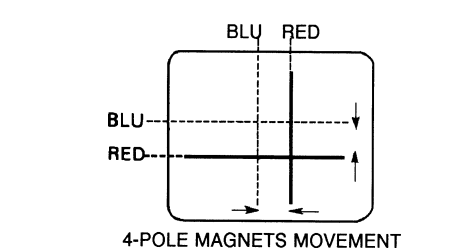
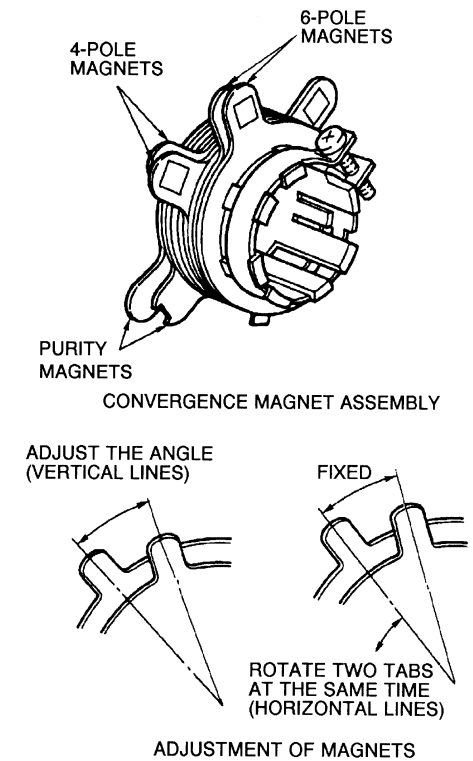
CENTRE CONVERGENCE ADJUSTMENT

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 and superimpose red and blue vertical lines in the center 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

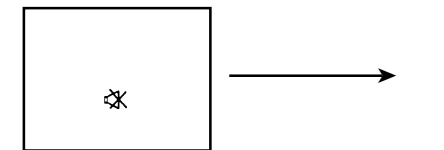
1. Loosen the clamping screw of deflection yoke slightly to allow the yoke to tilt.
2. Temporarily put a wedge as shown. (Do not remove cover paper on adhesive part of the wedge.)
3. Tilt front of the deflection yoke up or down to obtain better convergence in circumference. Push the mounted wedge into 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.
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.



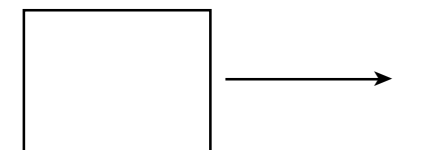
Service Mode General Instructions

1. ENTERING TO SERVICE MODE

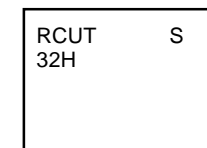
- 1) Press button once on Remote Control.



- 2) Press button again to keep pressing.



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



(Service mode display)

2. SELECTING THE ADJUSTING ITEMS

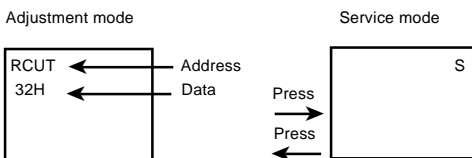
Every pressing of CHANNEL button changes the adjustment items in the following order. (button for reverse order.)

3. 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.

4. NORMAL OPERATION ON THE SERVICE MODE

Press MENU button on TV.



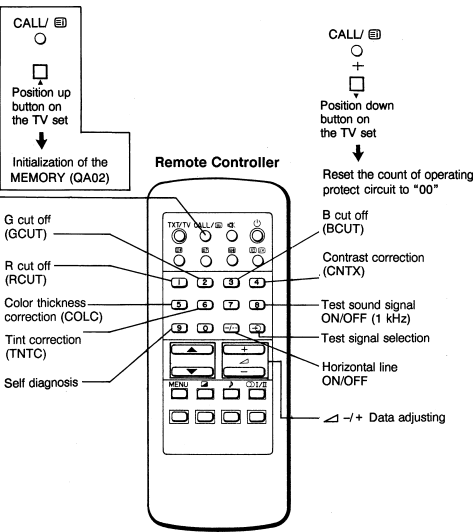
5. EXIT FROM SERVICE MODE

Press POWER button on the remote control to turn off the TV once.

Service Mode 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)

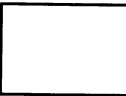
↑
PAL signals (14 patterns)
↓

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

- Red single colour
- Green single colour
- Blue single colour
- Black single colour
- White single colour

Picture



Using method

Purity and White uniformity of CRT
Red single colour.
Stopping G and B output of Q501
Green single colour.
Stopping R and B output of Q501
Blue single colour.
Stopping R and G output of Q501
Black single colour.
Making black signal of approx. 1Vp-p in QA01
White single colour.
Making white signal of approx. 1Vp-p in QA01

Signals

W/B adjustment

Picture



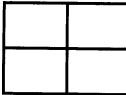
Using method

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



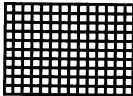
Using method

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



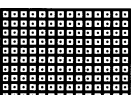
Using method

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

Signals

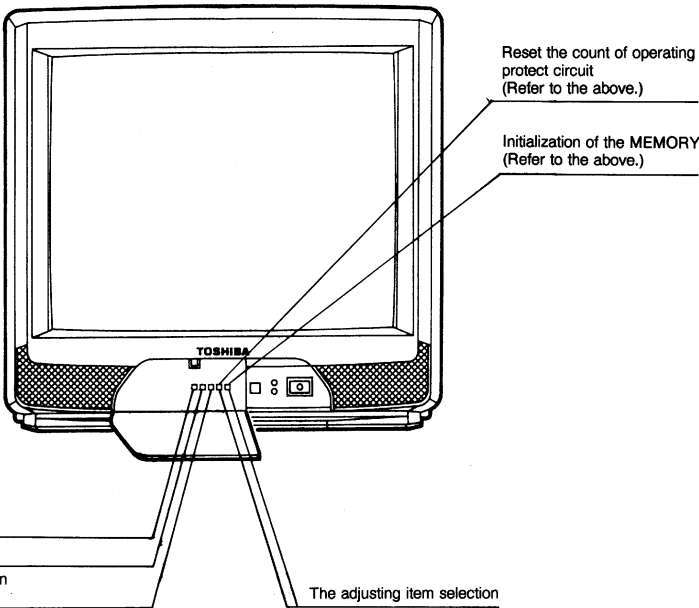
Black cross-dot
White cross-dot

Picture

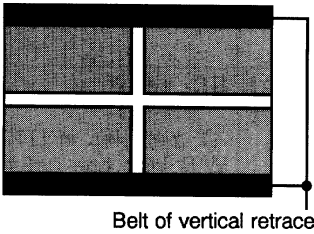


Using method

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



4. Rotate R350 to show the belt of vertical retrace. See next figure.
5. 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.

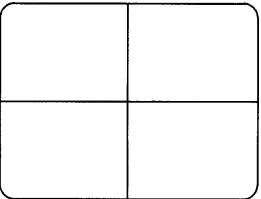


ITEMS:
HORIZONTAL POSITION ADJUSTMENT (HPOS)

VERTICAL POSITION ADJUSTMENT (VPOS)

ADJUSTMENT PROCEDURE:

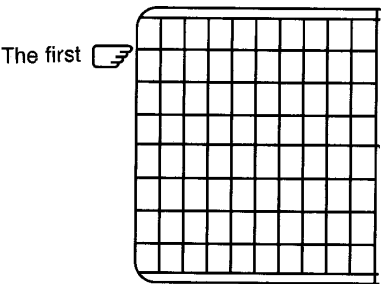
1. Set the TV in service mode, and get black or white cross-bar signal with VIDEO button on remote hand unit.
2. Select either HPOS (Horizontal picture phase) or VPOS (Vertical picture phase) with CHANNEL , buttons, and adjust horizontal or vertical picture position in the center of screen with VOLUME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



ITEM:
VERTICAL AMPLITUDE ADJUSTMENT (HIT)

ADJUSTMENT PROCEDURE:

1. Set the TV in service mode, and get black or white cross-hatch signal with VIDEO button on remote hand unit.
2. Select HIT (Vertical amplitude) with CHANNEL , buttons, and adjust vertical amplitude with VOLUME - / + buttons so that vertical amplitude lacks a little.
3. 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)

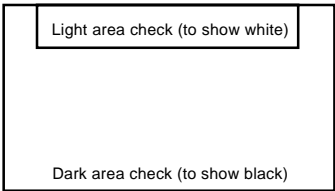
DRIVE ADJUSTMENT (GDRV) (BDRV)

1. Set Contrast to 40, and brightness to +20 by

- picture control.
2. Set the TV in service mode, and get the inside W/B adjusting signal with VIDEO button.
 3. 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.
 4. 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.
 5. Press button to release horizontal line picture, and select the two other colours which did not light in the above step with CHANNEL , buttons. Then tap VOLUME - / + buttons so that three colours 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

- 1) 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.
- 2) During diagnosis, the following displays are

shown.

(SELF CHECK)			
(1)	23904981		
(2)	POWER	:	00
(3)	BUS LINE	:	OK
(4)	Bus CONT	:	OK
(5)	BLOCK	:	UV V1 V2 QV01

- 1) Part number of microcomputer (QA01)
- 2) 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.
- 3) 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.
- 4) BUS CONT----"OK" is normal. When indication shows "Q 000 NG", the device with the number may possibly be damaged.
- 5) 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.

MULTI BUS E2PROM ADDRESS, ADJUSTING ADDRESS TABLE

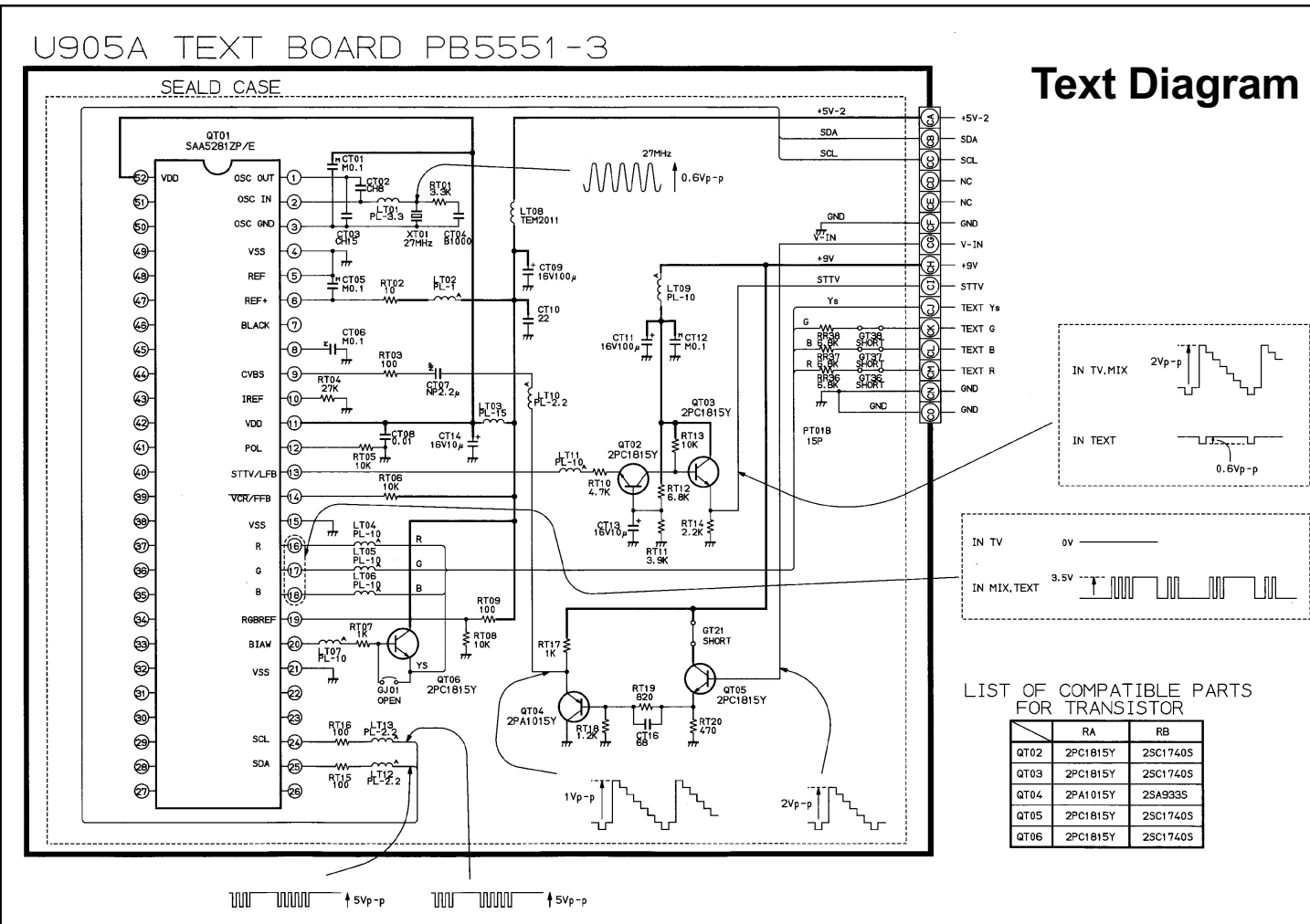
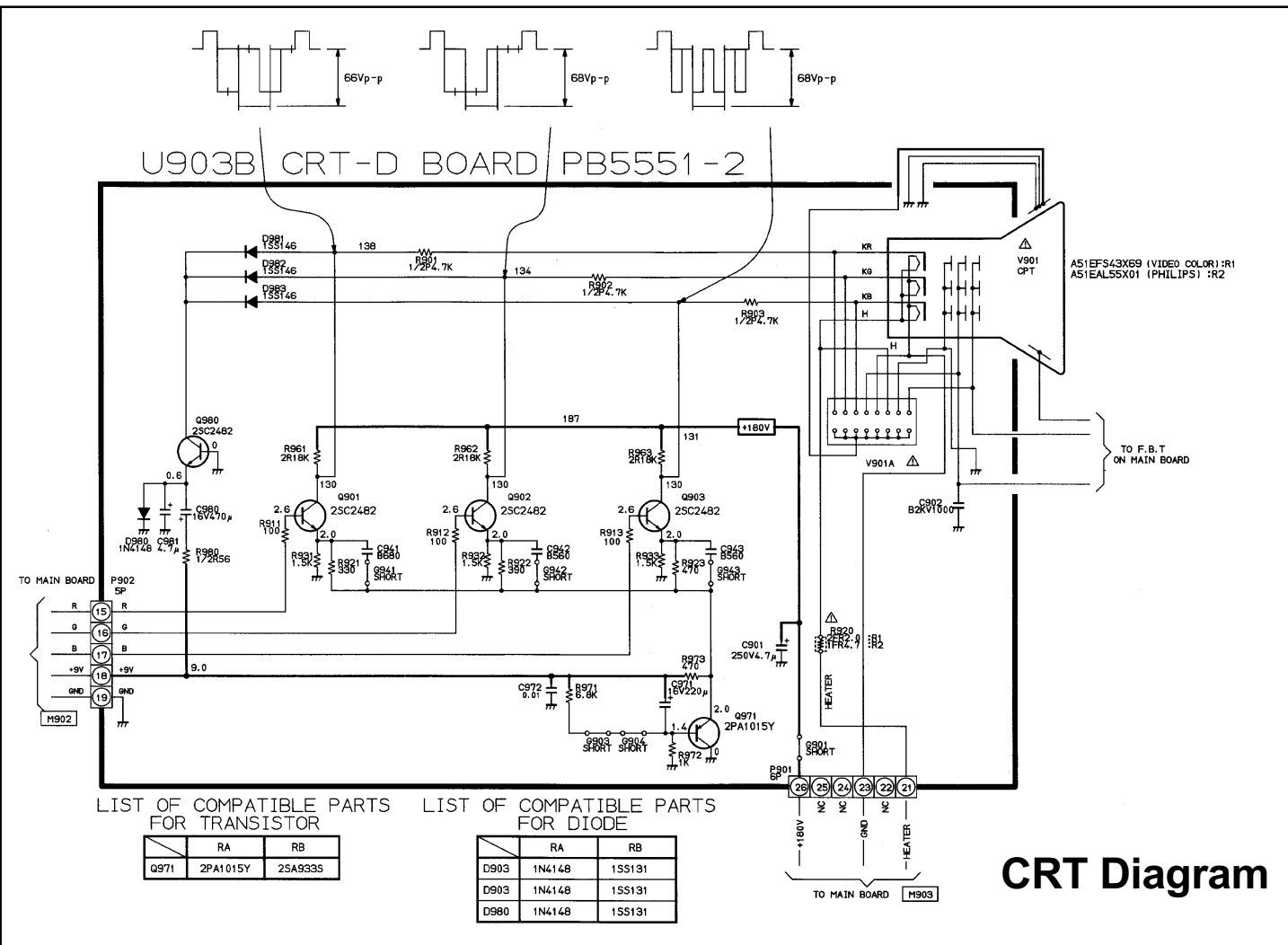
Adjusting method	QA02 memory address	Name of item	Value of initializing QA02 (Hexa-decimal)	Adjustments
S	06B	OSD	60	OSD POSITION
	06C	OPT	07	OPTION
F	06D	RCUT	32	R CUT OFF
	06E	GCUT	32	G CUT OFF
	06F	BCUT	32	B CUT OFF
	070	GDRV	20	G DRIVE
F	071	BDRV	20	B DRIVE
S	072	CNTX	39	SUB CONTRAST MAX
F	073	BRTC	40	SUB BRIGHT CEN
	076	COLP	32	SUB COLOUR CEN PAL
	077	COLS	32	SUB COLOUR CEN SECAM
S	078	CNTC	2D	SUB CONTRAST CEN
	079	CNTN	20	SUB CONTRAST MIN
	07A	BRTX	12	SUB BRIGHT MAX (DIFFERENCE)
	07B	BRTN	10	SUB BRIGHT MIN (DIFFERENCE)
	070	COLX	40	SUB COLOUR MAX
	07D	COLN	10	SUB COLOUR MIN
	082	5T4	19	SUB SHARP CEN OTHER (TV)
	083	5V4	19	SUB SHARP CEN OTHER (VIDEO)
	084	TXCL	4A	TEXT CONTRAST LEVEL
	086	VM0	05	VCD MODE DATA
	087	WCTL	00	APRO MODE DATA
	08E	WON	2D	WOOFER AUTO LOUDNESS
	097	EMX	FC	NICAM ON LEVEL
	098	EMN	64	NICAM OFF LEVEL
	099	FMA	00	FM ATTENUATOR LEVEL
S	09A	STS	00	STEREO SEPARATION
F	09B	HPOS	08	50Hz H-POSITION
S	09E	HPS	04	60Hz/50Hz H-POSITION (DIFFERENCE)
F	0AF	PID	11	PAL IDENT LEVEL
	0B0	TRP	01	CROMA TRAP I0
	0B1	DLY0	07	Y DELAY TV SECAM (BG)
	0B2	DLY1	07	Y DELAY TV SECAM (OTHER)
	0B3	DLY2	07	Y DELAY VIDEO SECAM
	0B4	DLY3	04	Y DELAY TV OTHER (BG)
	0B5	DLY4	04	Y DELAY TV OTHER (DK, I)
	0B6	DLY5	05	Y DELAY TV OTHER (M,N)
	0B7	DLY6	05	Y DELAY TV OTHER (VIDEO)

S ... semi-fixed data area which is fixed by model. (Do not adjust in field service.) F ... This item may require adjustments by models after initialization, when QA02 is replaced.

ADJUSTMENT OF VIDEO-CHROMA SYSTEM
(Factory Adjustment)

Model Name: S5E

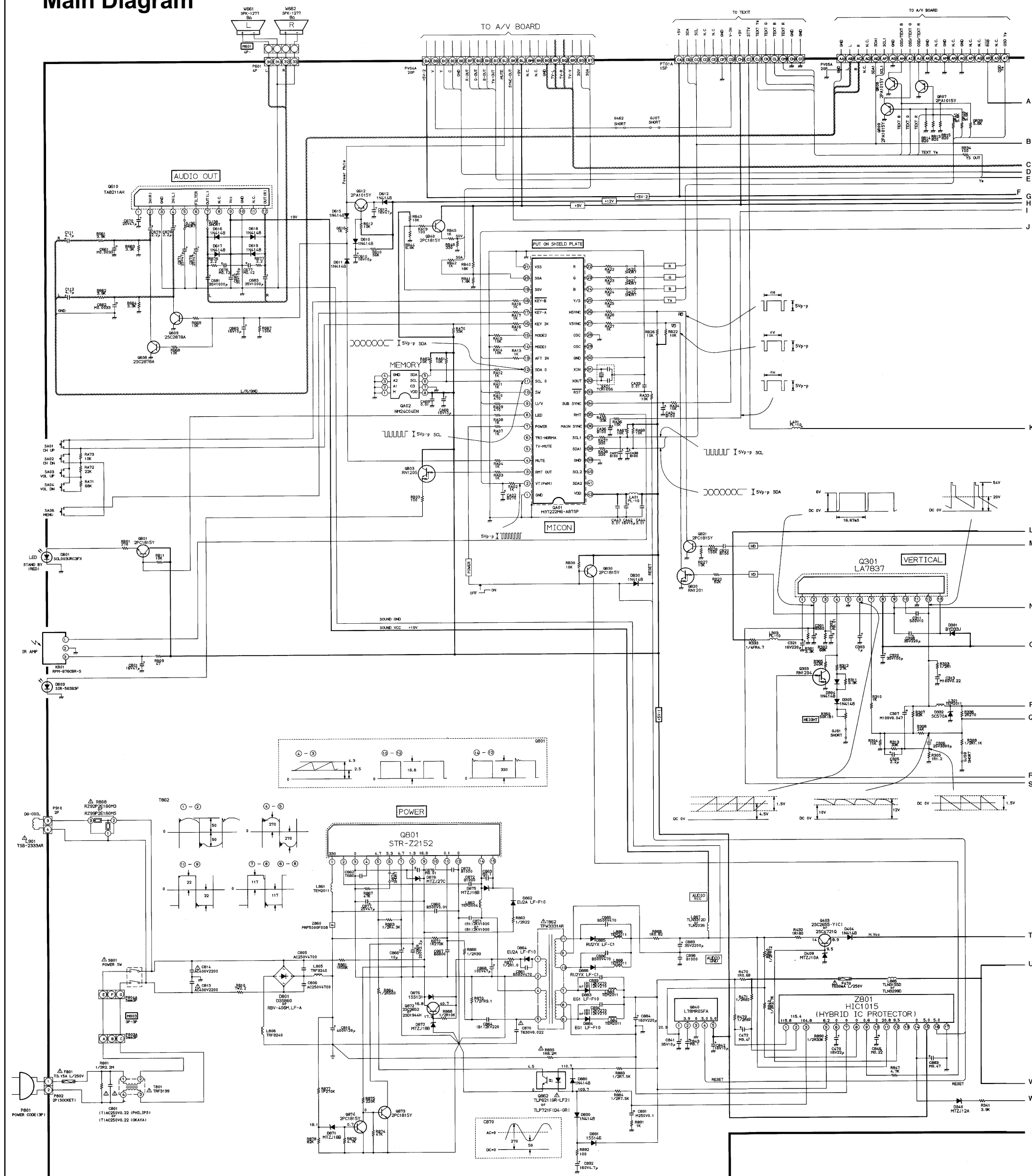
Item	Name	Setting(User control)	Input signal	Measurement point	Adjustment procedure	Adjustment standard
Slave address 36 [BRTC]	SUB BRIGHT CENTRE	Contrast: MAX Bright: CENTER Color: MIN	Sub-bright signal	Screen adjustment	1. This adjustment must be done after [BRTC], screen VR and white balance adjustments have been completed. 2. Adjust number of black collapse lines of sub-bright signal.	5 ± 1.5
Slave address 39 [COLP]	SUB COLOUR PAL	Contrast: MAX Bright: CENTER Color: CENTER	Sub-bright signal (PAL)	IC501 #23... (B-OUT)	1. Select slave address 39 [COLP]. 2. When [COLP] is selected, Y-signal is muted and only color signals are outputted. 3. Adjust amplitude of the upper half of the colour bar output.	$1.4V(p-p)$ $\pm 0.2V(p-p)$
Slave address 20[RCUT] 31[GCUT] 32[BCUT] Screen VR	R cut-off G cut-off B cut-off Screen	RCUT 32 Hexa-decimal GCUT 32 Hexa-decimal BCUT 32 Hexa-decimal GDRV 20 Hexa-decimal BDRV 20 Hexa-decimal Select horizontal line mode by pressing -/- button on the remote control in service mode.		Screen adjustment	1. Set the controls as shown in the left column. 2. Gradually increase the screen VR (T461) until one of R, G or B line begins to brighten slightly. 3. Determine the position of the screen VR here. 4. Adjust RCUT, GCUT and BCUT, brighten other lines until they begin to light slightly. (Adjust DATA so that the line becomes almost white.) 5. Press -/- button on the remote control to escape from the horizontal line mode.	
30[RCUT] 31[GCUT] 32[BCUT] 33[GDRV] 34[BDRV]	R cut-off G cut-off B cut-off G drive B drive (White balance)	Contrast: MAX Bright : CENTER Color : CENTER	White, etc.	Screen adjustment	1. This adjustment must be done after adjustment of the above- mentioned cut-off and screen VR's have been completed. 2. Adjust cut-off and drive DATA alternately. 3. Use a checker to adjust brightness by changing modulation factor.	HIGH LIGHT; (103cd/m ³) 7195K -0.005uv [BDRV] DARK; (17cd/m ³) 7695K $\pm 0uv$
Slave address F0 PID	ID ref		VIDEO No input	Pin 52 of IC501	1. Connect a resistor 220k ohm across pin 52 of IC501 and GND and connect digital voltmeter. 2.Select slave address F0 PID. 3.Adjust DC voltage.	2.0V DC $\pm 0.1V$ DC
Slave address F1 TRP	Chroma trap f ₀ adjusting	Contrast: MAX Bright : MIN Colour: MIN	PAL colour bar	Pin 23 of IC501 (B-OUT)	1.Select slave address F1 TRP 2. Adjust chroma trap so that chroma level at pin 23 of IC501 becomes minimum.	Chroma level: MIN



U903A AV BOARD PB5551-1



Main Diagram



U902 MAIN BOARD PB5550

