

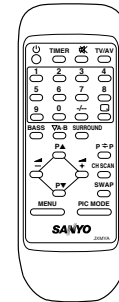
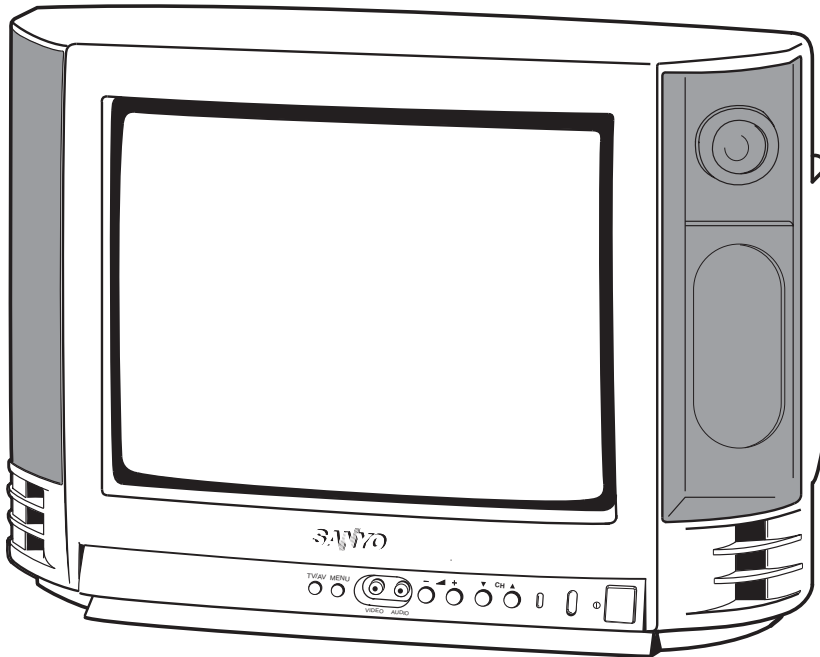
FILE NO.

SERVICE MANUAL Colour Television

Model No. CE14SP4R

(Russia)

Service Ref. No. CE14SP4R-00



Specifications

Power Source AC110-240V, 50Hz/60Hz.
 Colour System PAL/SECAM/NTSC4.43/NTSC/PAL-60Hz
 Sound System B/G, D/K, K', I, M/M
 Channel Coverage VHF: E2-E12, R1-R12, K1-K9, A2-A13, J1-J12
 UHF: 21-69, A14-A69, J13-J62
 CATV: S1-S41, X, Y, Z, Z+1, Z+2
 Video IF 38.0MHz
 Aerial Input Impedance . . 75Ω
 Ext. Terminals
 Video inputs: Phone jack x 2 (1Vp - p, 75Ω)
 Audio inputs: Phone jack x 2 (436mVrms, more than 40KΩ)
 Video monitor outputs: Phone jack x 1 (1Vp - p, 75Ω)
 Audio monitor outputs: Phone jack x 1 (436mVrms, less than 600Ω)
 Speaker 6 cm x 12 cm x 2 pcs.
 Sound Output (RMS) . . . 3W + 3W
 Dimensions 480 (W) x 306 (H) x 392 (D)mm
 Weight approx. 10.3 Kg

Specifications subject to change without notice.

Product Code : 111356544

Original Version

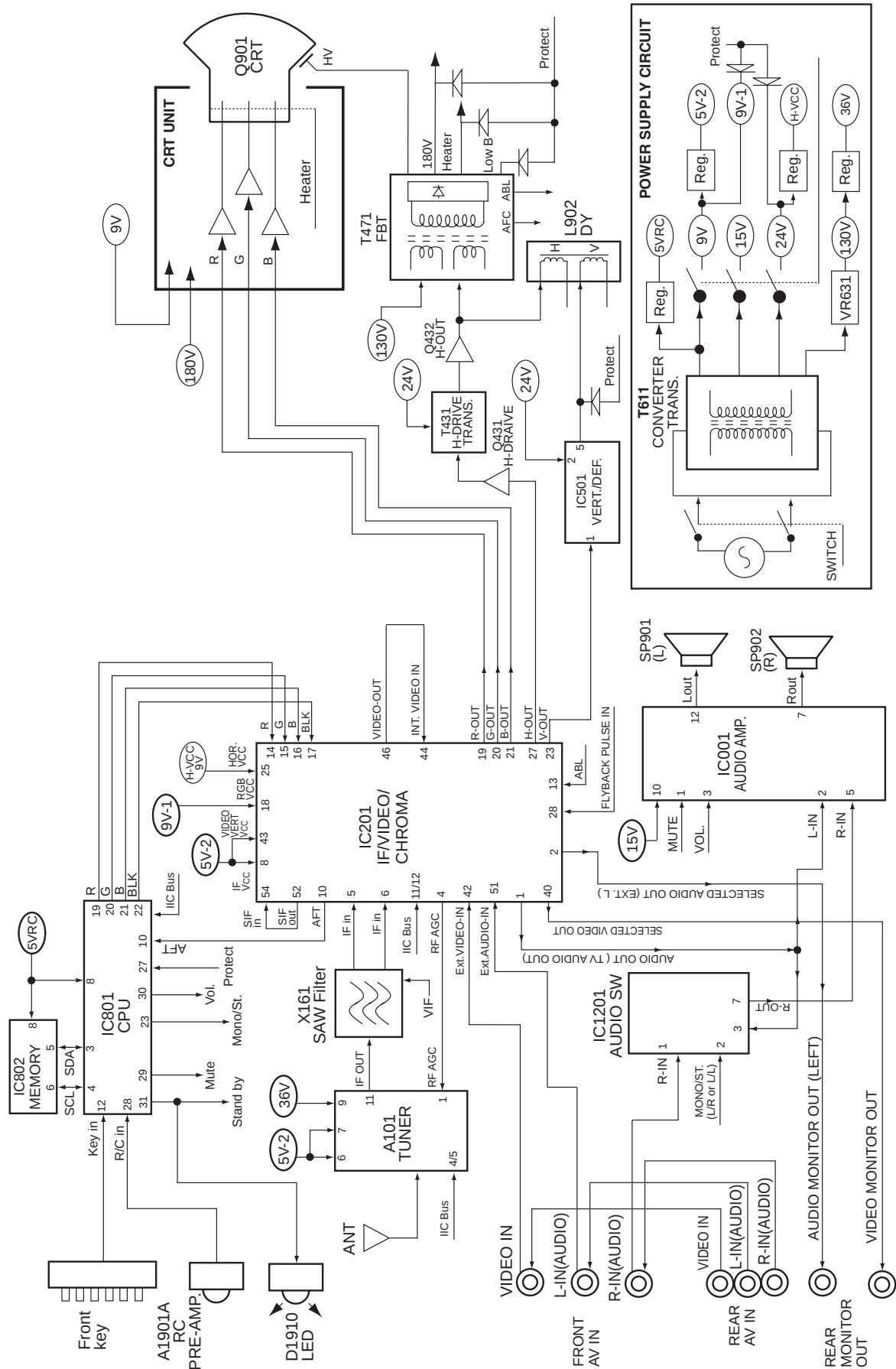
Chassis Series: AC5-C

Give complete "SERVICE REF. NO." for parts order or servicing. It is shown on the rating plate at the cabinet back of the unit.

This T.V. receiver will not work properly in foreign countries where the television transmission system and power source differ from the design specifications. Refer to the specification table.

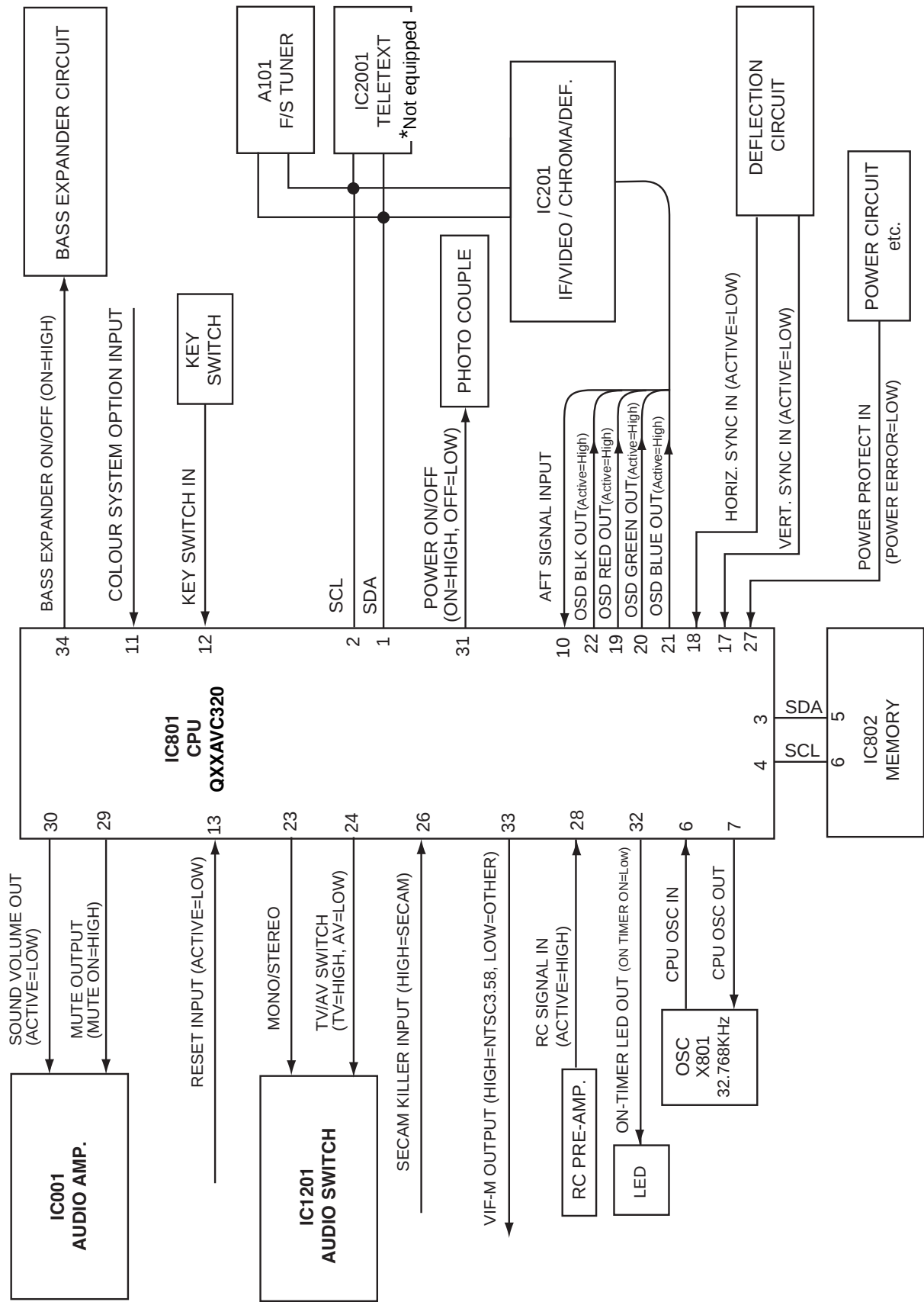
Chassis Block Diagrams

MAIN SIGNAL PROCESSING CIRCUIT



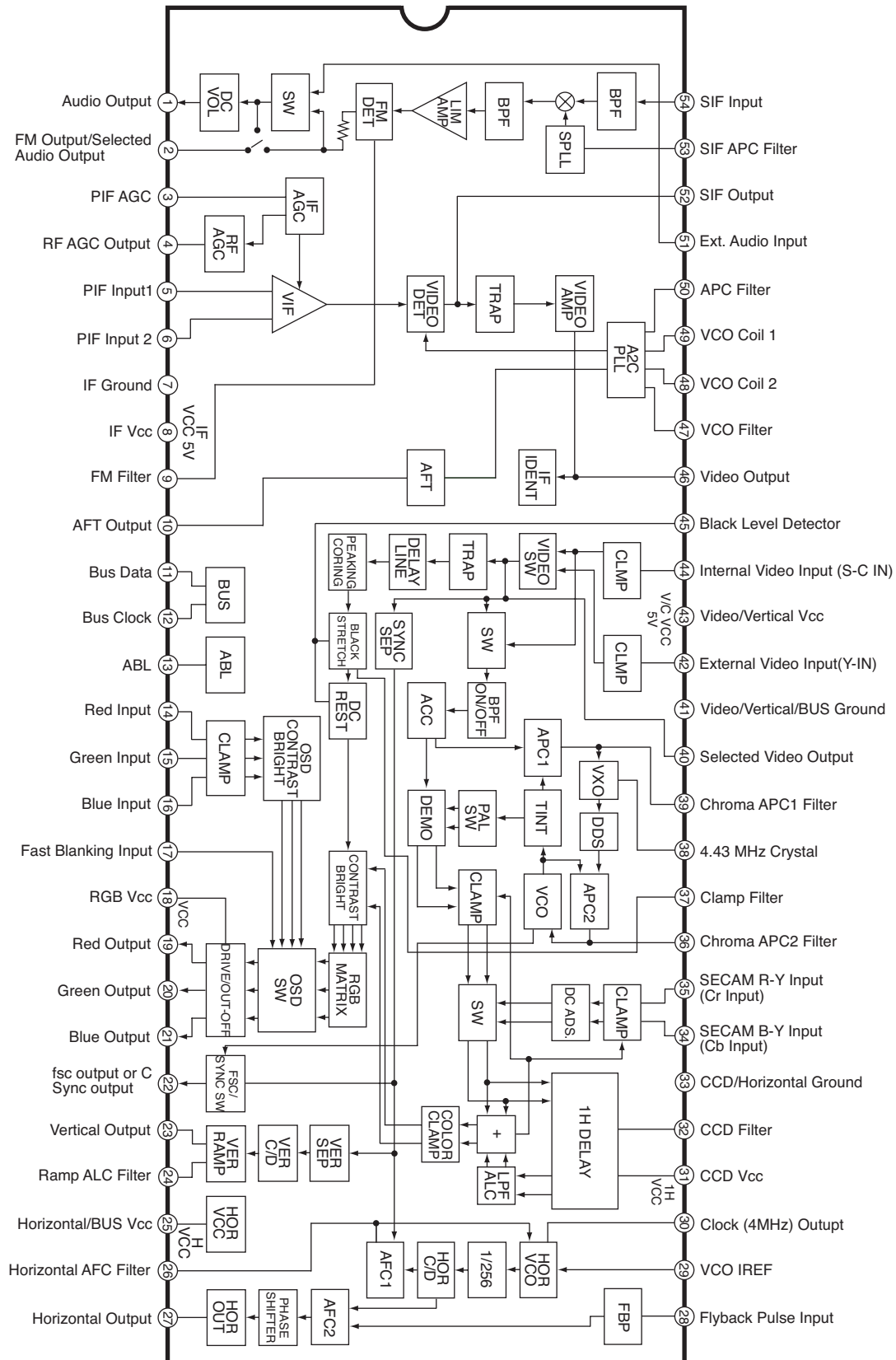
Chassis Block Diagrams

SYSTEM CONTROL



IC Block Diagrams

IC201 < IF/Video/Chroma/Def. > LA76818J-A-E

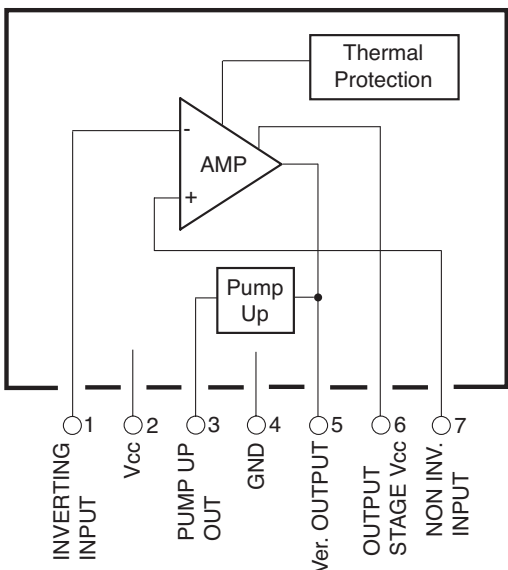


IC201 <IF System Block Diagram> LA76818J-A-E

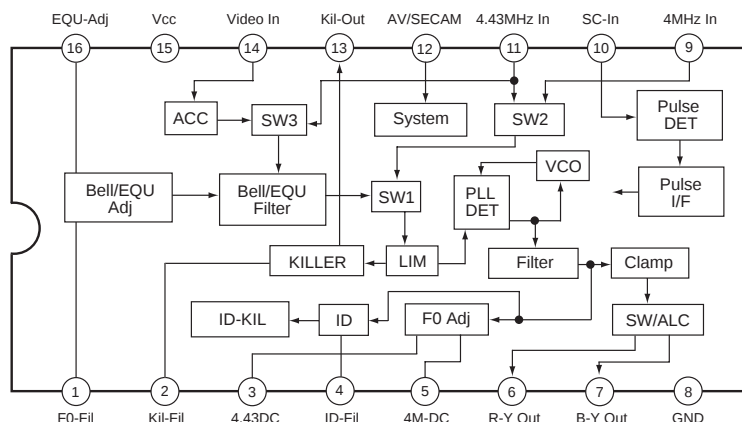


IC Block Diagrams

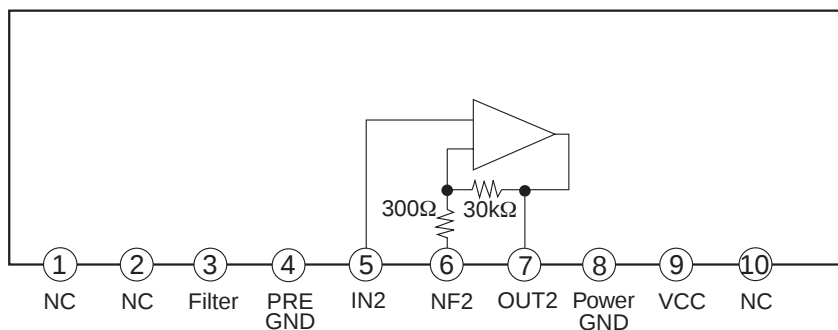
IC501 < Vertical Output > LA78040/TDA9302H



IC281 <SECAM Decoder> LA7642N



IC002 < Audio AMP.> LA4267



Service Information

■ Protection Circuit

This TV set has a built-in power supply protection circuit.

It is provided to protect the TV set in case of a power supply circuit malfunctions. When something abnormality occurs during TV reception, the TV set goes to the stand-by mode.

When an abnormality occurs during TV reception, it causes pin 27 of the CPU to go continually Low (less than 0.75V) for about one second. The CPU detects that this has occurred and outputs the signal from pin 31 to switch off the power supply lines.

Releasing the protective circuit and restoring power supply

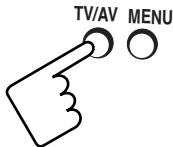
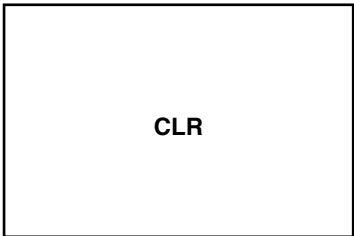
To release the protective circuit and restore power supply, turn the power to the TV set OFF and then ON again via either the main power switch or the ON-OFF button on the remote control. This will work only if the power supply trouble was temporary. If there is permanent trouble such as a damaged circuit, power cannot be restored and the circuit will have to be repaired.

Service Adjustments with Replacing Memory IC (IC802)

Note: The CPU (IC801) and memory IC (IC802) store the service adjustments data and controls data for each circuit. When the Memory IC(IC802) is replaced, some of the service adjustments should be readjusted to obtain the best performance. The necessary service adjustments are carried out by using the RC handset. Please set up the TV set with following steps [1] to [2].

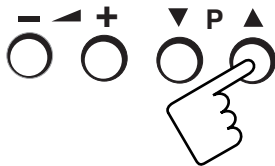
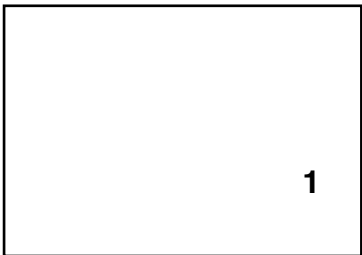
[1] Initializing Procedure

- 1. Put a new memory IC.
- 2. Turn on the TV set.
- 3. Press and hold the **TV/AV Selector** on the TV set for more than 2 seconds. The following picture appears on the screen.



Press and hold for more than 2 seconds

- 4. Press the **PROGRAMME UP** on the TV set while the above On-Screen Display is still on the screen. The following picture appears on the screen.



This completes the initialization of memory IC.

Following shows the initialized contents of memory data by this procedure.

- | | |
|---------------------|----------------|
| - Plug & play | : No executed |
| - Inhibit data | : Cancelled |
| - Ch skip data | : Cancelled |
| - Sound volume data | : 10/63 steps. |
| - Volume Lock | : OFF |
| - Tuning Lock | : OFF |
| - Colour system | : AUTO |

[2] Required Service Adjustments

Readjust the following service adjustments.

Adjustments	Service Mode No. & Item
RF AGC	Item 01, RF AGC
Horizontal centre	Item 02, H-PHA
Vertical size	Item 04, V-SIZ
Vertical-S correction	Item 05, V-SCO
Vertical linearity	Item 06, V-LIN
Gray scale	Item 14-17, 19-21

Further adjustment please refer to page 12 and 13.

Service Adjustments with Replacing Memory IC(IC802)

Following table shows the initial values which have been stored in the CPU ROM, and items for the service adjustments.

Service mode adjustments table in CPU ROM

NO.	ITEM	DATA RANGE	INITIAL SETUP DATA	DESCRIPTION
01	RF AGC	00~63	30	RF AGC Adj.
02	H-PHA	00~31	9	H-Phase (H-Centering) Adj. (50Hz)
03	V-POS	00~63	40	V-Position (V-Centering) Adj. (50Hz) Fixed.
04	V-SIZ	00~127	59	V-Size Adj. (50Hz)
05	V-SCO	00~31	7	V-S Correction (50Hz)
06	V-LIN	00~31	19	V-Linearity Adj. (50Hz)
07	H-P60	-16~+15	+5	H-Centering Adj. (60Hz)
08	V-S60	-64~+32	0	V-Size Adj. (60Hz)
09	OSDHP	00~255	29	OSD H-Position Adj.
10	OSDC	00~127	60	OSD Contrast Adj.
11	V-SCP	00~07	7	Correction of the V-size accompanying brightness change.
12	H-SCP	00~07	7	Correction of the H-size accompanying brightness change.
13	SBIAS	00~127	105	Sub Bias Adj. (Do not change)
14	RBIAS	00~255	0	Red Bias Adj.
15	GBIAS	00~255	0	Green Bias Adj.
16	BBIAS	00~255	0	Blue Bias Adj.
17	RDRIV	00~127	64	Red Drive Adj.
18	GDRIV	00~15	8	Green Drive Adj.
19	BDRIV	00~127	64	Blue Drive Adj.
20	1-LINE APPEAR			
21	DRV			White Balance Adj.
22	B-YD	00~15	10	B-Y DC level Adj.. Colour compensation (PAL)
23	R-YD	00~15	10	R-Y DC level Adj.. Colour compensation (PAL)
24	B-YDN	-16~+15	0	NTSC B-Y DC level Adj. (Difference value over PAL.)
25	R-YDN	-16~+15	0	NTSC R-Y DC level Adj. (Difference value over PAL.)
26	SBDC	-16~+15	-9	SECAM B-Y DC level Adj. (Difference value over PAL.)
27	SRDC	-16~+15	-2	SECAM R-Y DC level Adj. (Difference value over PAL.)
28	G-YA	0,1	0	G-Y angle Adj. (The reproducibility of a colour is changed.)
29	RGBG	00~15	8	R-Y, B-Y Gain Balance Adj. (Do not change.)
30	RBAG	00~15	8	R-Y, B-Y Angle Adj. (Do not change.)
31	G-YAN	0,1	0	NTSC G-Y Angle Adj. (Difference value over PAL.)
32	RGBGN	-16~+15	0	NTSC R-Y, B-Y Gain Balance Adj. (Difference value over PAL.)
33	RBAGN	-16~+15	0	NTSC G-Y, B-Y Angle Adj. (Difference value over PAL.)
34	COGV	00~03	0	Coring Adj.
35	BLKS	00~03	3	Setting of Black stretch start.
36	BLKG	00~03	3	Setting of Black stretch gain.
37	BRTA	0,1	0	On and off of ABL.
38	BRST	0,1	0	Setting of ABL.
39	BRTH	00~07	0	Setting of ABL.
40	WPL	00~03	2	White peak limiter.
41	YGAM	00~03	0	Y Gamma setting.
42	PORW	0,1	0	Switching of Pre-shoot and Over shoot in AV mode.
43	PORS	00~03	2	Pre-shoot/Over shoot Adj. in AV mode.

NO.	ITEM	DATA RANGE	INITIAL SETUP DATA	DESCRIPTION
44	RFCO	00~03	0	RF Coring Gain Adj.
45	PORWN	0,1	0	Switching of RF Pre-shoot and Over shoot.
46	PORSN	00~03	0	RF Pre-shoot/Over shoot Adj.
47	TINT	-16~+15	0	RF Tint Adj.
48	TINT 443	-16~+15	-12	NTSC 4.43 Tint Adj.
49	SHRF	-32~+31	0	RF Sharpness Adj.
50	TEXTC	-128~+127	0	OSD TEXT Contrast.
51	VOLUM	00~255	127	Volume Control Adj.
52	DEEM	00~01	0	De emphasis TC.
53	VIFSW	00~03	0	VIF System Switch.
54	SIFSW	00~03	1	SIF System Switch.
55	V-LVL	00~07	4	Video Level Adj.
56	FMLVL	00~31	16	FM Level Adj.
57	IFOM-S	0,1	0	Over Modulation
58	IFMN-S	0,1	1	Audio Monitor Switch
59	IFTRAPS	0,1	1	SIF TRAP SW, ON/OFF
60	IFMLVL	00~255	136	Video Level & Modulation
61	TRAPT	00~63	4	TRAP TEST
62	H-FRQ	00~63	34	Correction of Horizontal Frequency.
63	FBTS	0,1	0	Switching of H-blanking and Flyback Pulse.
64	COOP	00~07	7	Setting of Colour Killer Level.
65	HBLKL	00~07	7	H-Blanking Control. (Left)
66	HBLKR	00~07	3	H-Blanking Control. (Right)
67	AFCRF	0,1	0	RF AFC Gain & Gate Adj.
68	VSURF	0,1	0	RF V-Sync. Separation Adj.
69	CDMRF	00~07	0	RF V-Countdown Circuit Adj.
70	AFCV	0,1	1	AV AFC Gain & Gate Adj.
71	VSUAV	0,1	0	AV V-Sync. Separation Adj.
72	CDMAV	00~07	0	AV V-Countdown Circuit Adj.
73	HLVDRF	0,1	1	H Lock, V Detect RF mode
74	HLVDAV	0,1	1	H Lock, V Detect AV mode
75	VCO-SW	0,1	0	C-VCO Adj. Switch.
76	VCO-ADJ	00~03	3	C-VCO Adj.
77	CROSS-BW	00~03	0	Pattern Output.
78	AVNCON	00~127	64	Contrast Adj. of the blue back in AV mode.
79	AVNBRI	00~127	64	Brightness Adj. of the blue back in AV mode.
80	POMT	00~127	25	Power Mute Time Adj.
81	CHMT	00~31	10	Channel Change Mute time Adj.
82	SYST	00~15	5	Selection of the number of times of a Colour system judgment.
83	S-STE	0,1	0	Stereo/Mono Option. 0=MONO, 1=AV STEREO
84	VOLTBL	0~3	2	Selection of the change characteristic of volume.
85	MPP	0,1	0	Multi Picture Preference Option
300	R00	00~255	87	CPU Debug Date.
301	R01	00~255	142	CPU Debug Date.
302	R02	00~255	0	CPU Debug Date.
303	R03	00~255	0	CPU Debug Date.
304	R04	00~255	1	CPU Debug Date.
305	R05	00~255	0	CPU Debug Date.
306	R06	00~255	0	CPU Debug Date.

Service Adjustments with Replacing Memory IC (IC802)

NO.	ITEM	DATA RANGE	INITIAL SETUP DATA	DESCRIPTION
307	R07	00~255	0	CPU Debug Date.
308	R08	00~255	2	CPU Debug Date.
309	R09	00~255	195	CPU Debug Date.
310	R10	00~255	49	CPU Debug Date.
311	R11	00~255	8	CPU Debug Date.
312	R12	00~255	2	CPU Debug Date.
313	R13	00~255	1	CPU Debug Date.
314	R14	00~255	6	CPU Debug Date.
315	R15	00~255	34	CPU Debug Date.
316	R16	00~255	197	CPU Debug Date.
317	R17	00~255	61	CPU Debug Date.
318	R18	00~255	34	CPU Debug Date.
319	R19	00~255	196	CPU Debug Date.
320	R20	00~255	9	CPU Debug Date.
321	R21	00~255	33	CPU Debug Date.
322	R22	00~255	87	CPU Debug Date.
323	R23	00~255	107	CPU Debug Date.
324	R24	00~255	0	CPU Debug Date.
325	R25	00~255	0	CPU Debug Date.
326	R26	00~255	0	CPU Debug Date.
327	R27	00~255	0	CPU Debug Date.
328	R28	00~255	0	CPU Debug Date.
329	R29	00~255	0	CPU Debug Date.
330	R30	00~255	0	CPU Debug Date.
331	R31	00~255	0	CPU Debug Date.
332	R32	00~255	0	CPU Debug Date.
333	R33	00~255	0	CPU Debug Date.
334	R34	00~255	0	CPU Debug Date.
335	R35	00~255	0	CPU Debug Date.
336	R36	00~255	0	CPU Debug Date.
337	R37	00~255	0	CPU Debug Date.
338	R38	00~255	0	CPU Debug Date.
339	R39	00~255	0	CPU Debug Date.
340	R40	00~255	0	CPU Debug Date.
341	R41	00~255	0	CPU Debug Date.
342	R42	00~255	0	CPU Debug Date.
343	R43	00~255	0	CPU Debug Date.
344	R44	00~255	0	CPU Debug Date.
345	R45	00~255	0	CPU Debug Date.
346	R46	00~255	0	CPU Debug Date.
347	R47	00~255	0	CPU Debug Date.
348	R48	00~255	0	CPU Debug Date.
349	R49	00~255	0	CPU Debug Date.
350	R50	00~255	0	CPU Debug Date.
351	R51	00~255	0	CPU Debug Date.
352	R52	00~255	0	CPU Debug Date.
353	R53	00~255	0	CPU Debug Date.
354	R54	00~255	0	CPU Debug Date.
355	R55	00~255	0	CPU Debug Date.
356	R56	00~255	0	CPU Debug Date.
357	R57	00~255	0	CPU Debug Date.
358	R58	00~255	0	CPU Debug Date.
359	R59	00~255	0	CPU Debug Date.

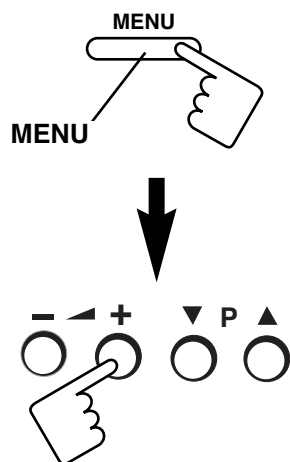
NO.	ITEM	DATA RANGE	INITIAL SETUP DATA	DESCRIPTION
360	R60	00~255	0	CPU Debug Date.
361	R61	00~255	0	CPU Debug Date.
362	R62	00~255	0	CPU Debug Date.
363	R63	00~255	0	CPU Debug Date.
364	R64	00~255	0	CPU Debug Date.
365	R65	00~255	0	CPU Debug Date.
366	R66	00~255	0	CPU Debug Date.
367	R67	00~255	0	CPU Debug Date.
368	R68	00~255	0	CPU Debug Date.
369	R69	00~255	0	CPU Debug Date.
370	R70	00~255	0	CPU Debug Date.
371	R71	00~255	0	CPU Debug Date.
372	R72	00~255	72	CPU Debug Date.

Notes: The initial value that the CPU writes down the CPU ROM data to the memory when replaced the memory IC. TV set may not operate correctly with this initial value. It is required to set up the fine adjustment for service adjustments described in the above.

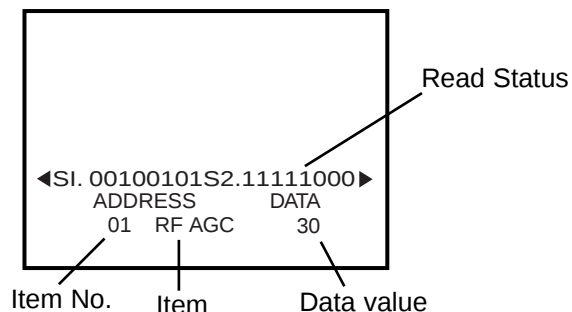
Service Adjustments with Replacing Memory IC(IC802)

[Entering to Service Mode]

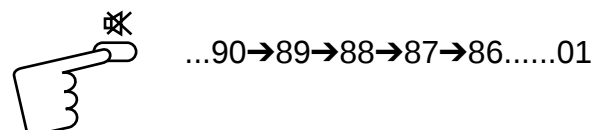
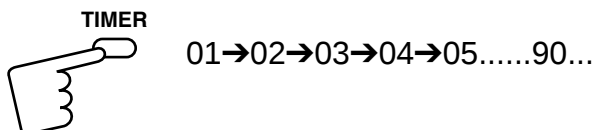
1. Press and hold the **MENU** button on the Remote Control and press the **VOLUME (+)** button on the TV set.
Following setting items appears on the screen.



Display for [RF AGC] RF AGC adjustment

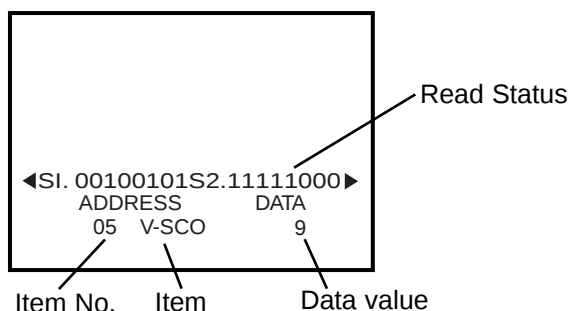


2. Select item by pressing the **TIMER** (Item No. UP) or **SOUND MUTE** (Item No. DOWN) button on the remote control handset.

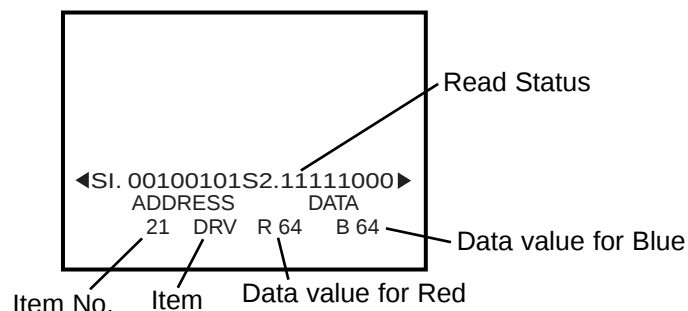


Example

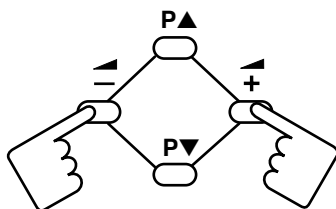
Display for [V-SCO] V-S Correction adjustment



Display for [DRV] White balance adjustment



3. Adjust data value by pressing the **VOLUME +** or **VOLUME -** button on the remote control handset.



To return to normal TV mode, press the **MENU** button on the TV set or the remote control handset.

Service Mode Adjustments

Following adjustments should be carried out when the memory IC is replaced. How to enter the service mode and adjust values, please refer to "Entering to Service mode" on page 11.

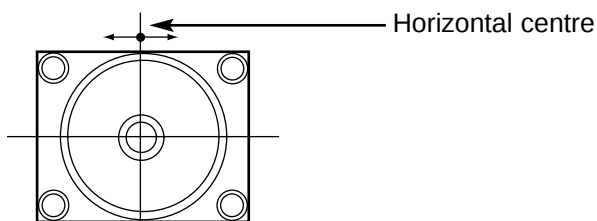
Item 01 [RF AGC] AGC

NOTE: Do not attempt this adjustment with weak signal.

- (1) Tune the receiver to most clearest (or strongest) VHF station in your area. Set the brightness and contrast controls to maximum. Set the colour control to minimum.
- (2) Select [RF AGC] in the service mode.
- (3) Change value until the snow noise just disappears.
- (4) Exit from service mode.

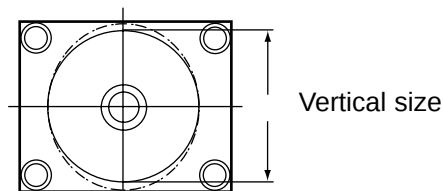
Item 02 [H-PHA] HORIZONTAL CENTRE

- (1) Receive a monochrome circular pattern.
- (2) Set the brightness and contrast to normal.
- (3) Select [H-PHA] in the service mode.
- (4) Change value to be optimum horizontal centre position.
- (5) Exit from service mode.



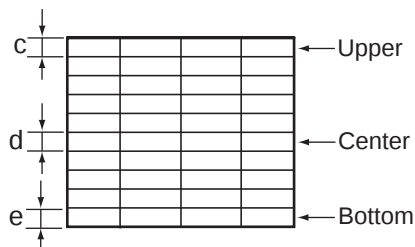
Item 04 [V-SIZ] VERTICAL SIZE

- (1) Receive a monochrome circular pattern.
- (2) Set the brightness and contrast to maximum.
- (3) Select [V-SIZ] in the service mode.
- (4) Change value to be optimum vertical size.
- (5) Exit from service mode.



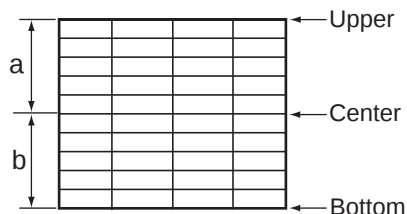
Item 05 [V-SCO] V-S CORRECTION

- (1) Receive a crosshatch pattern.
- (2) Set the lever of SW501 (Vertical Center SW) as the position of a center.
- (3) Select a picture mode of NATURAL by pressing the PICTURE MODE button.
- (4) Select [V-SCO] in the service mode.
- (5) Adjust Vertical S-letter Correction so that the difference of "c", "d" and "e" becomes less than 2 mm by pressing the VOLUME + or - button.
- (6) Confirm Vertical Linearity and adjust Vertical Center then Vertical Size.
- (7) Exit from service mode.



Item 06 [V-LIN] VERTICAL LINEARITY

- (1) Receive a crosshatch pattern.
- (2) Set the lever of SW501 (Vertical Center SW) as the position of a center.
- (3) Select a picture mode of NATURAL by pressing the PICTURE MODE button.
- (4) Select [V-LIN] in the service mode.
- (5) Adjust Vertical Linearity so that the difference of "a" and "b" becomes less than 3mm by pressing VOLUME + or - button.
- (6) Exit from service mode.

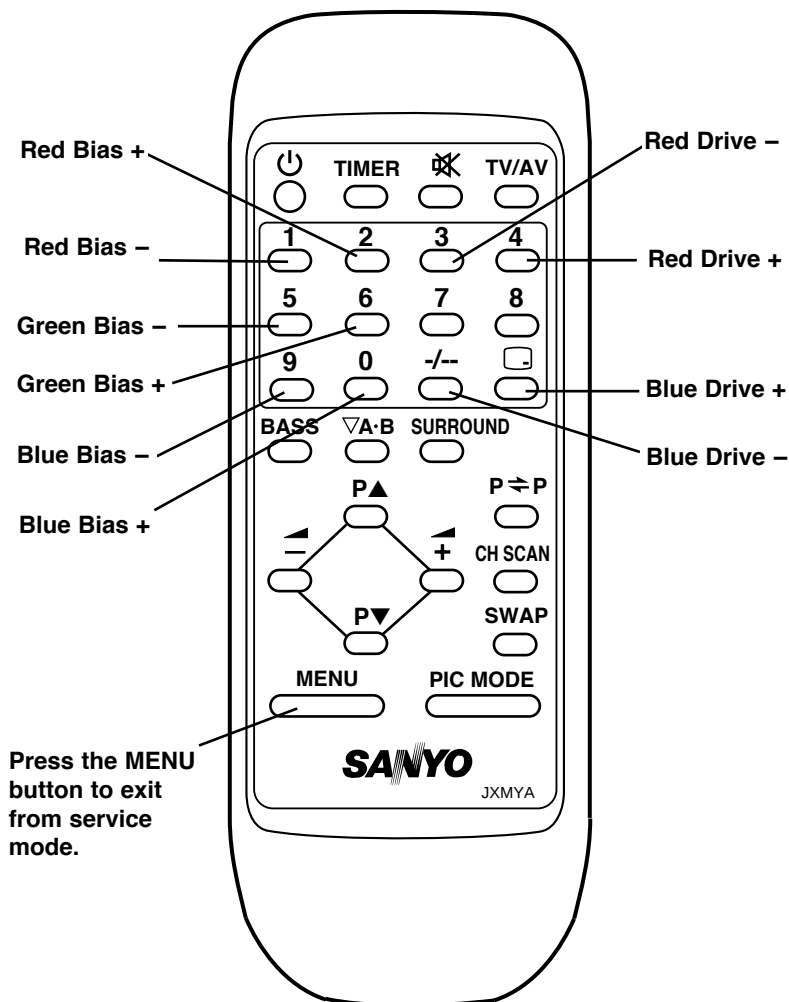


Service Mode Adjustments

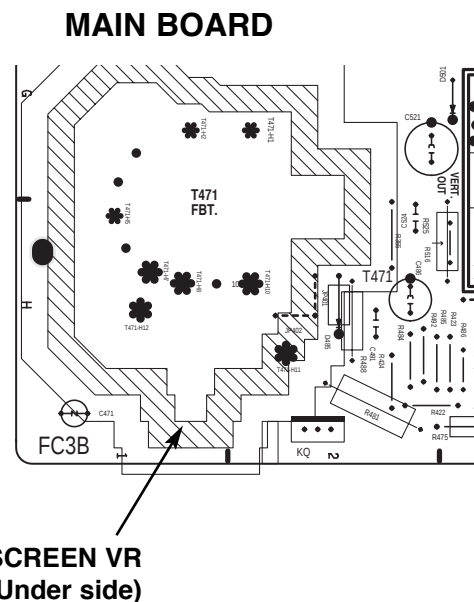
Items 14-17, 19-21 GREY SCALE

- (1) Receive the monochrome circular pattern.
- (2) Set the brightness and colour to normal, contrast to maximum.
- (3) Enter to the service mode.
- (4) Set each value of Item-**14 RBIAS**, **15 GBIAS**, **16 BBIAS** mode to 0, **17 RDRIV** and **19 BDRIV** mode to 64.
- (5) Select Item-**20** mode to be one horizontal scanning line and turn the screen volume on the FBT to obtain just visible one coloured line.
- (6) Press the **1 (Red Bias -)**, **2 (Red Bias +)**, **5 (Green Bias -)**, **6 (Green Bias +)**, **9 (Blue Bias -)** or **0 (Blue Bias +)** button to adjust the brightness of each colour until a dim white line produced. Please see the control button allocations in this mode.
- (7) Select Item-**21 DRV** mode to enter the white balance adjusting mode.
- (8) Press the **3 (Red Drive -)**, **4 (Red Drive +)**, **-/- (Blue Drive -)** or **RECALL (Blue Drive +)** button alternately to produce normal black and white picture.
- (9) Exit from the service mode.
- (10) Check for proper grey scale tracking at all brightness levels.

NOTE: If the grey scale adjustment is made after picture tube replacement, check the high voltage.



Press the MENU button to exit from service mode.



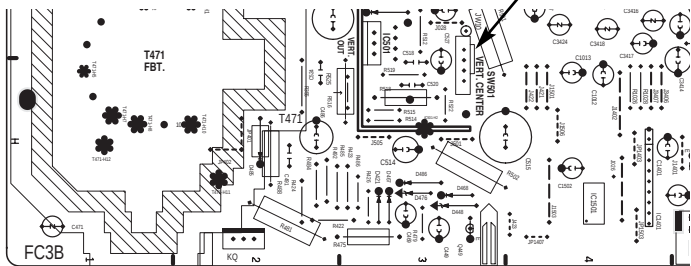
+B VOLTAGE ADJUSTMENT

- ## MAIN BOARD

[illegible]

VERTICAL CENTER ADJUSTMENT

-
- Vertical centre
- SW501**



The drawing is a technical schematic of a mechanical assembly, possibly a transmission or engine component. It features several key parts and labels:

- T471 H-DRIVE TRANS.:** Located in the upper left corner, showing a housing with internal components.
- Q432 H-OUT:** A component labeled at the top center, with a dimension of 1.000" (25.40 mm) indicated.
- KDY:** A central component, possibly a shaft or housing, with a dimension of 1.000" (25.40 mm) indicated.
- T471 FBT.:** A component labeled in the lower left corner, showing a housing with internal components.
- C436:** A large arrow points to this label at the bottom center, indicating a specific part or assembly.
- C430:** A component labeled in the lower right corner, showing a housing with internal components.

Dimensions are provided in inches and millimeters. The drawing includes various mechanical details such as bolts, washers, and housing components. The overall layout is a top-down view of the assembly.

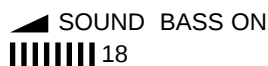
No high-voltage adjustment is provided on this chassis.

Special Function

The following special functions can be set up on this TV set.

(1) Volume Lock setting

With this function, a maximum sound volume limit can be set at any level.



(2) Tuning Lock setting

Once TUNING LOCK is switched on, further channel tuning (Pre-set) is not possible. The Channel Swapping function also is not possible.

TUNING LOCKED

(3) Music Mode setting

When Music Mode is ON, Programme position from "91" to "99" and "0" are set Music Mode. Only sound is provided and any picture is not on the screen under Music Mode.

MUSIC

Turns black screen

(4) AV Start setting

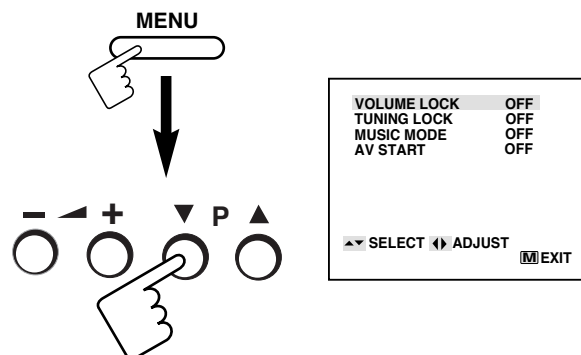
Set AV-START to ON and every time the TV set is switched on, AV position will be the initial programme position.

AV

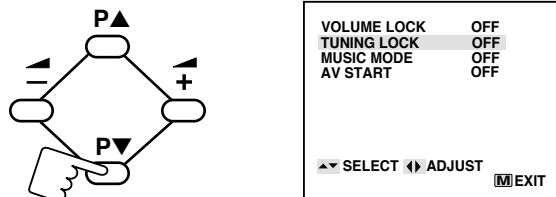
How to set the special function:

Note: When making the VOLUME LOCK setting, set the desired maximum sound volume by pressing the **VOLUME +** or **-** button before entering Special Function setting mode.

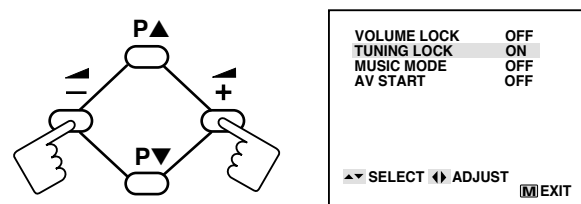
- 1 To enter into the special function setting mode, press and hold the **MENU** button of the remote control, then press the **PROGRAMME DOWN** button on the TV set.



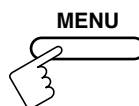
- 2 Select an item of the special functions by pressing the **PROGRAMME UP** or **DOWN** button on the remote control or the TV set.

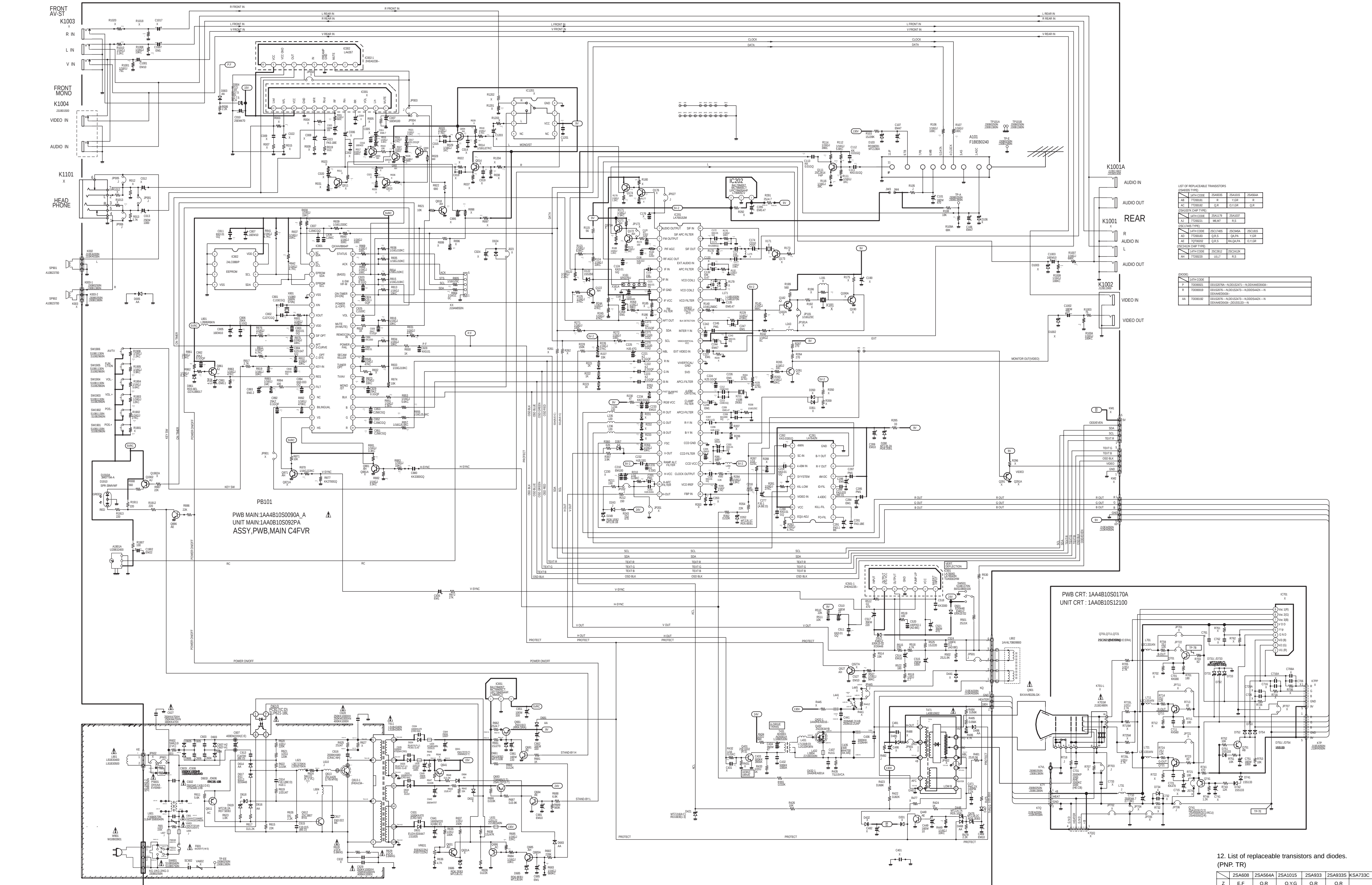


- 3 Set the selected special function "ON" by pressing the **VOLUME +** or **-** button. To cancel, set to "OFF".



- 4 Press the **MENU** button of the remote control to return to the normal TV mode.





THE SERVICE PRECAUTION:
The area enclosed by this line () is directly connected with AC mains voltage.
When servicing the area, connect an isolating transformer between TV receiver and AC line to eliminate hazard of electric shock.

COLOUR TELEVISION

AC5-C CHASSIS SERIES

SERVICE REF. NO. CE14SP4R-00

PRODUCT SAFETY NOTICE:
Product safety should be considered when a component replacement is made in any area of a receiver.
Components indicated by a mark Δ in this circuit diagram show components whose values have special significance to product safety. It is particularly recommended that only parts specified on the part service manual be used for components replacement pointed out by the mark.

- CIRCUIT DIAGRAM NOTICE:**
- All resistance value are in ohms, K=1,000, M=1,000,000.
 - All resistance rated wattages are 1/6W unless otherwise noted.
 - Excepting electrolytic capacitors, all capacitance values of less than 1 are expressed in μ F and more than 1 are pF.
 - All capacitance rated voltages are 50V unless otherwise noted.
 - All inductance values are in μ H.
 - Voltage readings take with a "VTVM" are from point indicated chassis ground. Voltage readings taken by using PAL colour bar signal are with all controls at normal position. Some voltage may vary with signal strength.
 - Waveform were taken with PAL colour bar and controls adjusted for normal picture. Waveforms were taken by using a wide band oscilloscope and a low capacity probe.
 - This circuit diagram covers a basic or representative chassis only. There may be some components or partial circuit differences between the actual chassis and the circuit diagram.
 - Parts specified with "X" are not installed in this model.
 - Parts specified with "J" are just jumper wires.

11. Expression of capacitance and resistance in circuit diagram.
- Capacitance (Example)
- 1000 C M 2000 D
- Resistance (Example)
- 1/2 N J 1.2
- Characteristics
- J= $\pm 5\%$
K= $\pm 10\%$
M= $\pm 20\%$
- T, A, U, D: Electrolytic
C, K, B: Ceramic
F: Mylar film
M, N: Polypropylene
Z: Metalized paper
- D: Carbon
N: Metalized carbon
S: Oxidized metalized
W: Wire winding
C: Solid

TRANSISTOR, DIODE AND INTEGRATED CIRCUIT TERMINAL GUIDE

C: COLLECTOR
B: BASE
E: EMITTER

A: ANODE
K: KATHODE

CHIP COMPONENTS
TRANSISTOR
DIODE
RESISTOR

PARTICULAR PARTS SYMBOL
FUSIBLE RESISTOR
NON POLE ELECTRIC CAPACITOR
POSISTER

12. List of replaceable transistors and diodes. (PNP, TR)

	2SA608	2SA564A	2SA1015	2SA933	2SA933S	KA733C
Z	E.F	Q.R	O.Y.G	Q.R	Q.R	
Y	E.F	Q.R	O.Y.G	Q.R		
W	F	R	O.Y.G	R		
V	E.F	Q.R	O.Y.G	Q.R		Y.G
U	F	R	O.Y.G	R		G

(DIODE)

	DIODE
M	1S5176, 1S5133, 6MA01
P	1S1593, 1S2076A, 1S2471, 1N4148
R	1S1555, 1S2473, 1S2076, DS442, 1N4148

(NPN, TR)

	2SC536	2SC945A	2SC1815	2SC1740	2SC1740S	KSC945C
A	E.F.G	P.Q.R	O.Y.G	Q.R.S	Q.R.S	
B	E.F.G	P.Q.R	O.Y.G	Q.R.S		
D	F.G	P.Q	Y.G	Q.R.S		
F	F.G	P	G	R.S		
H	F.G	P.Q	Y.G	Q.R.S		Y.G
I	E.F.G	P.Q.R	O.Y.G	Q.R.S		Y.G
G	F.G	P	G	R.S		G