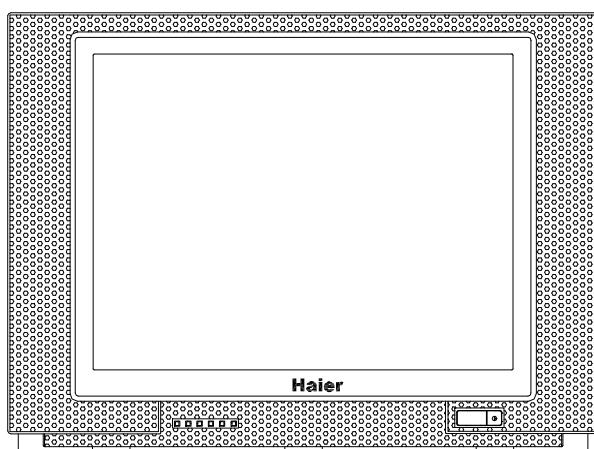


HTX29S31S

COLOR TELEVISION

Service Manual



MODEL: HTX29S31S

■ Features

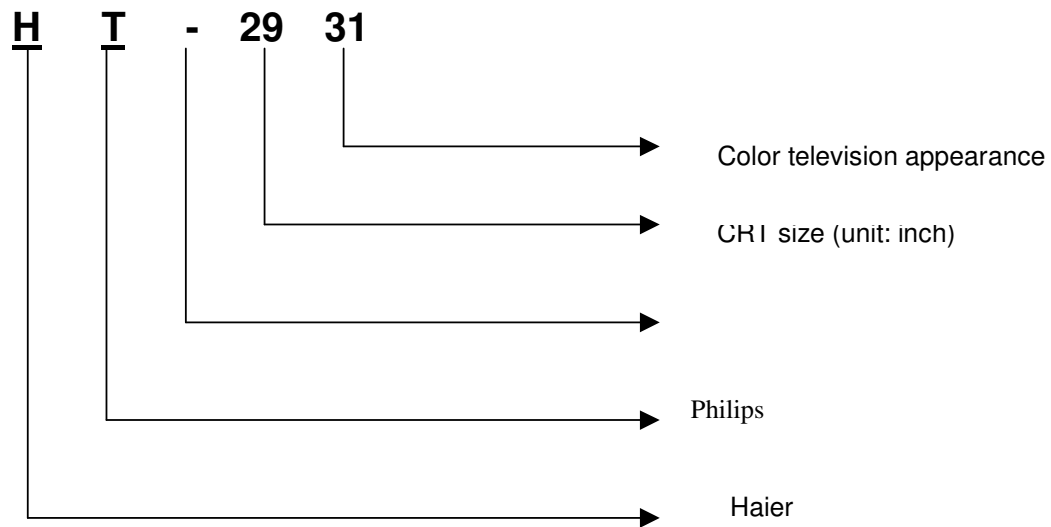
- PAL M/N, NTSC M
- Front Audio/Video input
- V-CHIP, CCD
- 181 Channel

Haier Group

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2.Product Code illumination and Series Introduction



3.Features

NO.	ITEM	FUNCTION	MODEL HS-2190	NO.	ITEM	FUNCTION	MODEL TV-9708
1	PICTURE	Main IC	76814	24	SOFTWARE	Digital curtain	×
2		CRT	Flat square	25		Slow fading on & off	×
3		Color system	NTSC	26		Semitransparent menu	×
4		Audio system	M	27		Non-flashing channel changing	×
5		Number of channels	181	28		ZOOM	×
6		OSD language	E、F、S、P	29		16:9 mode	×
7		Multi-picture modes	√	30		Games	√
8	AUDIO	AV stereo	×	31		Calendar	√
9		Super woofer	×	32		Child-lock	×
10		Surrounding sound	×	33		Multi-functional lock	×
11		Treble/bass boost	×	34		No-picture listening	×
12		Left/right balancer	×	35		Background light	×
13		NICAM	×	36		Auto-timer on	√
14		Multi-audio modes	×	37		CCD	√
15		Tone adjuster	×	38		V-CHIP	√
16		MTS/SAP	×	39	PARAMETER	Number of built-in speakers	2
17		Auto-volume leveling	×	40		Audio output power (W)	2
18	JACK	AV input	Front 1,Side 1	41		Total power input (W)	140
19		AV output	√	42		Voltage range (V)	90VAC-250V AC
20		DVD terminal	×	43		Power frequency (Hz)	60
21		S-video jack	√	44		Time of sleep timer (MINS)	120
22		Headphone socket	×	45		Net weight (KG)	41.5
23		SCART socket	×	46		Gross weight (KG)	50
				47		Net dimension (MM)	770x500x58 0
				48		Packaged dimension (MM)	890x645x64 0
				49		Quantity for 20' container	×
				50		Quantity for 40' container	×
				51		Quantity for 40' high container	×

4. Safety Precautions

SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical identify these parts and mechanical parts in this chassis have special safety-related characteristics! In the Schematic Diagram and Replacement Parts List.

It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.

Do not modify the original design without permission of the manufacturer.

General Guidance

An Isolation Transformer should always be used during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents that might result in personal injury caused by electrical shocks.

It will also protect the receiver and it's components from being damaged by accidental shorts of the circuitry that might be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with a specified one.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Due to the high vacuum and large surface area of the picture tube, extreme care should be taken in handling the Picture Tube. Do not lift the Picture Tube by its Neck.

X-RAY Radiation

Warning:

The source of X-RAY RADIATION in this TV receiver is the High Voltage Section and the Picture Tube.

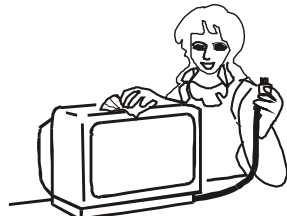
For continued X-RAY RADIATION protection, the replacement tube must be of the same type as specified in the Replacement Parts List.

Before returning the receiver to the customer,

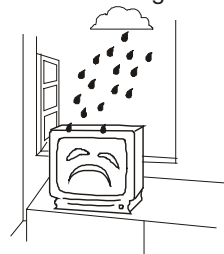
Always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to make sure that the set is safe to operate without any danger of electrical shock.

5.Warning and Cautions

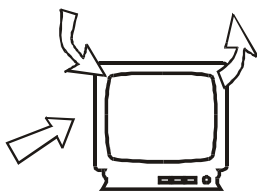
1. When you clean the TV set, please pull out the power plug from AC outlet. Don't clean the cabinet and the screen with benzene, petrol and other chemicals.



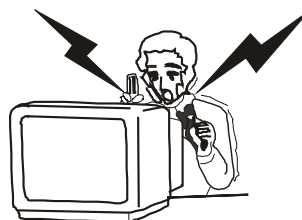
4. To prevent the TV set from firing and electric shock, don't make the TV set rain or moisture.



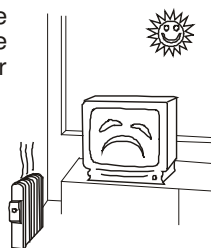
2. In order to prolong the using life of the TV set, please place it on a ventilated place.



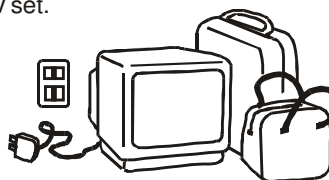
5. Don't open the back cover, otherwise it is possible to damage the components in the TV set and harm you.



3. Don't place the TV set in the sunshine or near heat source.



6. When the TV set isn't going to be used for long time or it is in thunder and lightening, please pull out the plug from AC outlet and the antenna plug from the cover of the TV set.



Explanation on the display tube

Generally, it is not needed to clean the tube surface. However, if necessary, its surface can be cleaned with a dry cotton cloth after cutting off the power. Don't use any cleanser. If using hard cloth, the tube surface will be damaged.

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the **SAFETY PRECAUTIONS**.

Warning and Cautions

NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions. **Remember: Safety First.**

General Servicing Precautions

1). Always unplug the receiver AC power cord from the AC power source before:

- a. Removing or reinstalling any component, circuit board module or any other assembly of the receiver.
- b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
- c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.

CAUTION: A wrong substitution part or incorrect installation polarity of electrolytic capacitors may result in an explosion hazard.

- d. Discharging the picture tube anode.

2). Test high voltage only by measuring it with an appropriate high voltage meter or other voltage-measuring device (DVM, FETVOM, etc.) equipped with a suitable high voltage probe. Do not test high voltage by “drawing an arc”.

3). Discharge the picture tube anode only by (a) first connecting one end of an insulated clip lead to the degaussing or kine aquadag grounding system shield at the point where the picture tube socket ground lead is connected, and then (b) touch the other end of the insulated clip lead to the picture tube anode button, using an insulating handle to avoid personal contact with high voltage.

4). Do not sprays chemicals on or near this receiver or any of its assemblies.

5). Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable nonabrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)

CAUTION: This is a flammable mixture.

Unless specified otherwise in this service manual, lubrication of contacts is not required.

6). Do not defeat any plug / socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.

7). Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.

8). Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.

Always remove the test receiver ground lead last.

9). Use with this receiver only the test fixtures specified in this service manual.

CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatic ally Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such

Warning and Cautions

components are usually called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor “chip” components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

- 1) Immediately before handling any semiconductor component or semiconductor- equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock prior to applying power to the unit under test.
- 2) After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
- 3) Use only a grounded-tip soldering iron to solder or unsolder ES devices.
- 4) Use only an anti-static type solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ES devices.
- 5) Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
- 6) Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
- 7) Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

- 8) Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise even some normally harmless motions such as mutual brushing of your clothes’ fabric or lifting of your foot from a carpeted floor might generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

- 1) Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range of 500 °F to 600 °F.
- 2) Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
- 3) Keep the soldering iron tip clean and well tinned.
- 4) Thoroughly clean the surfaces to be soldered. Use a mall wire bristle (0.5 inch, or 1.25cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
- 5) Use the following unsoldering technique
 - a. Allow the soldering iron tip to reach normal temperature. (500 ° F to 600° F)
 - b. Heating the component lead until the solder melts.
 - c. Quickly draw the melted solder with an anti-static, suction-type solder removal device with solder braid.

Warning and Cautions

CAUTION: Work quickly to avoid overheating the circuit board printed foil.

1) Use the following unsoldering technique

- a. Allow the soldering iron tip to reach normal temperature. (500° F to 600° F)
- b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
- c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.

CAUTION: Work quickly to avoid overheating the circuit board printed foil.

- d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

Remove /Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are of slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined.

Removal

Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.

Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

Carefully insert the replacement IC in the circuit board.

Carefully bend each IC lead against the circuit foil pad and solder it.

Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

“Small-Signal” Discrete Transistor

Removal/Replacement

Remove the defective transistor by clipping its leads as close as possible to the component body.

Bend into a “U” shape the end of each of three leads remaining on the circuit board.

Bend into a “U” shape the replacement transistor leads.

Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the “U” with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device

Removal/Replacement

Heat and remove all solder from around the transistor leads.

Remove the heat sink mounting screw (if so equipped).

Carefully remove the transistor from the heat sink of the circuit board.

Insert new transistor in the circuit board.

Solder each transistor lead, and clip off excess lead.

Replace heat sink.

Diode Removal/Replacement

Remove defective diode by clipping its leads as close as possible to diode body.

Bend the two remaining leads perpendicularly to the circuit board.

Observing diode polarity, wrap each lead of the new diode round the corresponding lead on the circuit board.

Securely crimp each connection and solder it.

Inspect (on the circuit board copper side) the solder joints of the two “original” leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/Replacement

- 1) Clip each fuse or resistor lead at top of the circuit board hollow stake.
- 2) Securely crimp the leads of replacement component around notch at stake top.
- 3) Solder the connections

CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds foil to the circuit board causing the foil to separate from or “lift-off” the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

- 1) Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
- 2) Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
- 3) Bend a small “U” in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
- 4) Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At other connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1) Remove the defective copper pattern with a sharp knife.

Remove at least 1/4 inch of copper, to insure that a hazardous condition will not exist if the jumper wire opens.

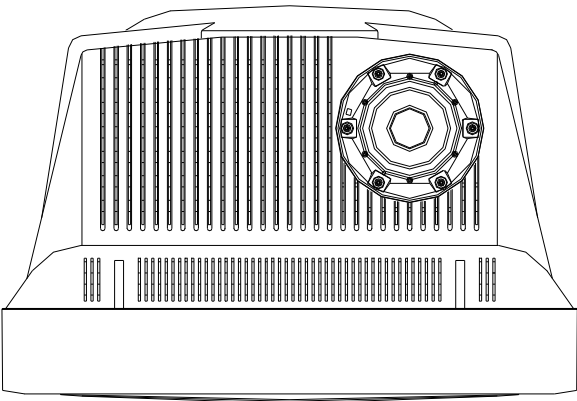
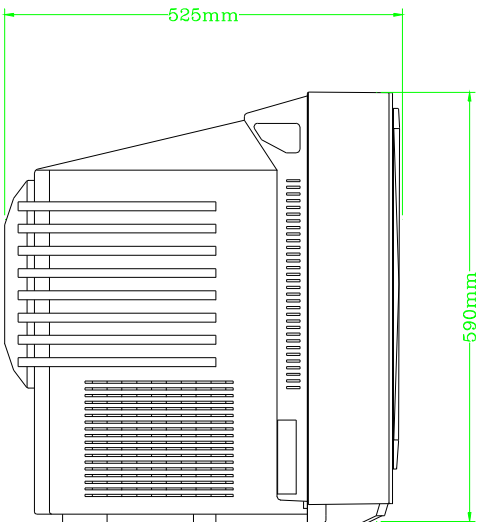
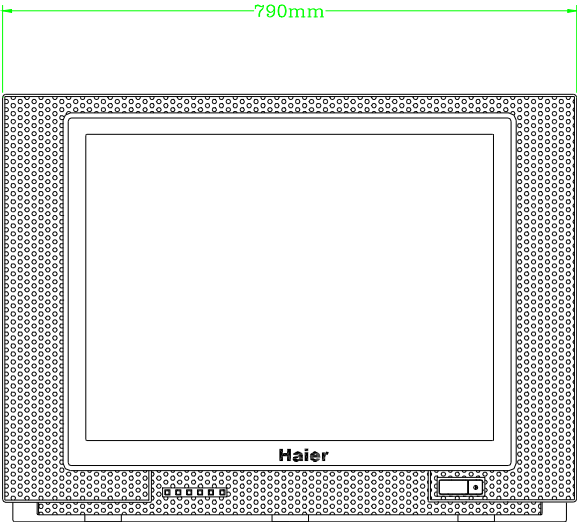
2) Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.

3) Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side.

Carefully crimp and solder the connections.

CAUTION: Be sure the insulated jumper wire is dressed so that it does not touch components or sharp edges.

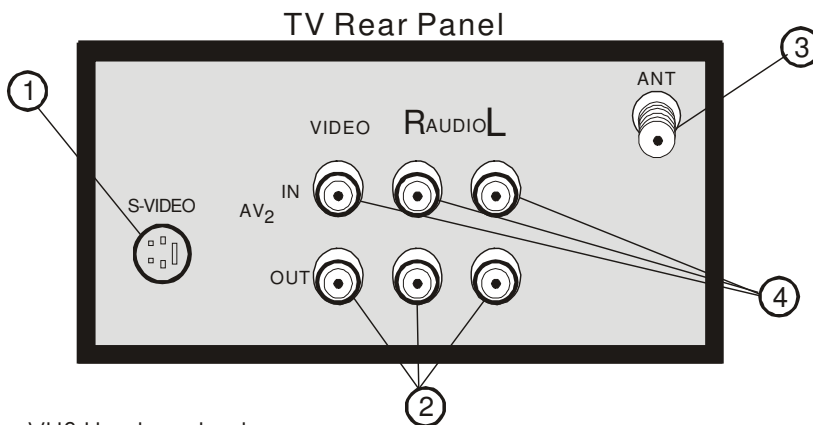
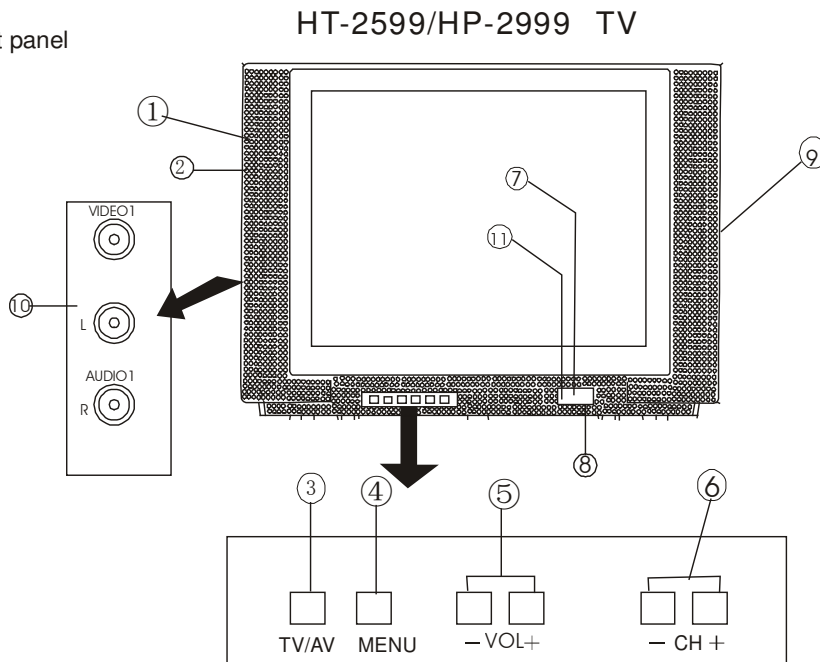
6.Net dimension



7.Parts and Functions

Features and Operation

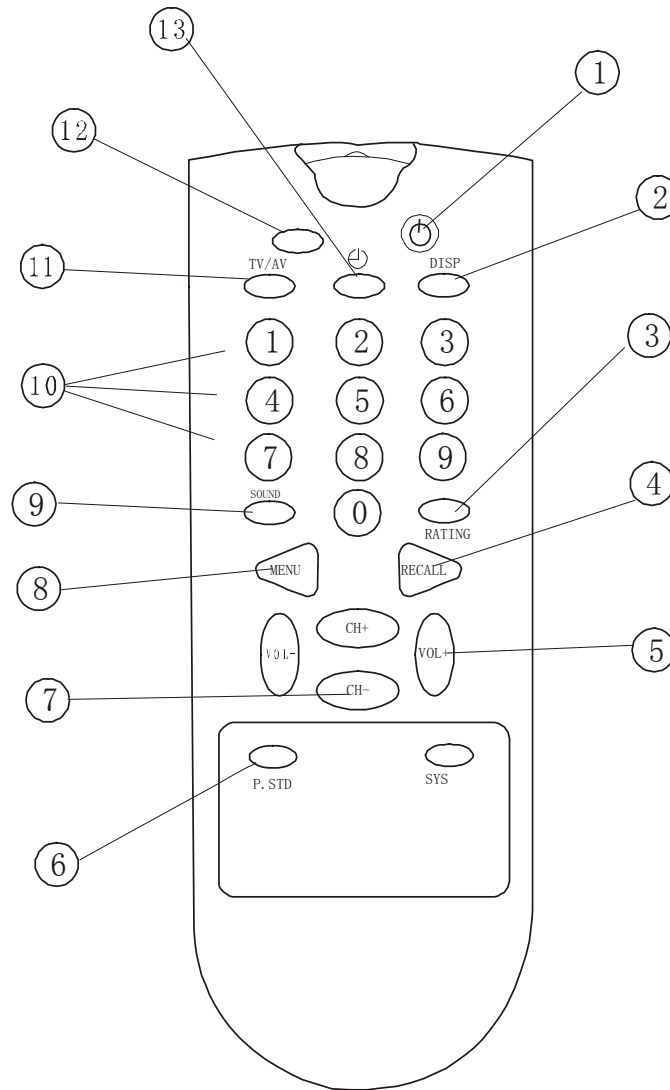
1.Front panel



1. Super VHS Hookup Jack
2. Rear Audio/Video Hookup Jacks
 - V-video output
 - L-left channel output
 - R-right channel output

8.Remote Controller Functions

Remote Features




- | | |
|----------------------------------|----------------------------------|
| 1. Power Button | 8. Menu Select Button |
| 2. Time & Channel Display Button | 9. Audio Select Button |
| 3. Rating Button | 10. Direct Access Channel Select |
| 4. Last Channel Recall Button | 11. TV/AV Input Button |
| 5. Volume(+/-) Select Button | 12. Mute Button |
| 6. Personal Preference Select | 13. Sleep Timer |
| 7. Channel(+/-) Select Button | 14. SYSTEM selection |

9. Program Diagram


Insert the power plug into the power line socket and insert the antenna plug into the antenna socket on the rear panel. Press down the power switch of the TV set. The red indicator light goes on.

Program preset

A. 1). *Auto searching and storing program*

Press MENU button on the remote controller to call up the “PREST” menu on the screen. Use the “

2). *Deleting channel number*

Press channel up/down buttons to select a channel to skip. Press MENU to call up the “PREST” menu on the screen. Then Press the” 

B. Volume tuning

Press VOLUME buttons VOL- to decrease and VOL+ to increase the volume.

C Personal preference settings

Picture modes

Press P.STD repeatedly to change among Personal, Standard, Vivid, Soft to change the Picture Mode.

10.Maintenance service and trouble shooting

1). Adjustment item Explanation:

	OSD	Explanation	Range	Remark
0	H.PHASE	H.PHASE	0~31	
1	NT.H.PHASE	H.PHASE	0~31	No used
2	H.BLK.LEFT		0~7	
3	H.BLK.RIGHT		0~7	
4	V.SIZE	Vertical Size	0~127	
5	V.LINE	Vertical Linearity	0~31	
6	V.POSI	Vertical DC	0~63	
7	V.SC	Vertical S-Correction	0~31	
8	NT.V.SIZE	Vertical Size	-32~+31	
9	NT.V.LINE	Vertical Linearity	-16~+15	
10	NT.V.POSI	Vertical DC	-32~+31	
11	NT.V.SC	Vertical S-Correction	-16~+15	

12	RF.AGC	RF AGC Delay	0~63	
13	VOL.OUT	Volume Control	0~127	
14	OSD H.POSI		0~127	
15	OSD V.POSI		0~31	
16	INPUT LEVEL		0~15	
17	SPECTRAL		0~63	(0~31)PHILIP IC
18	WIDEBAND		0~63	(0~31)PHILIP IC
19	STEREO VCO		0~63	No used
20	FILTER SET		0~63	No used
21	SAP VCO		0~63	No used

2). Setting item explanation:

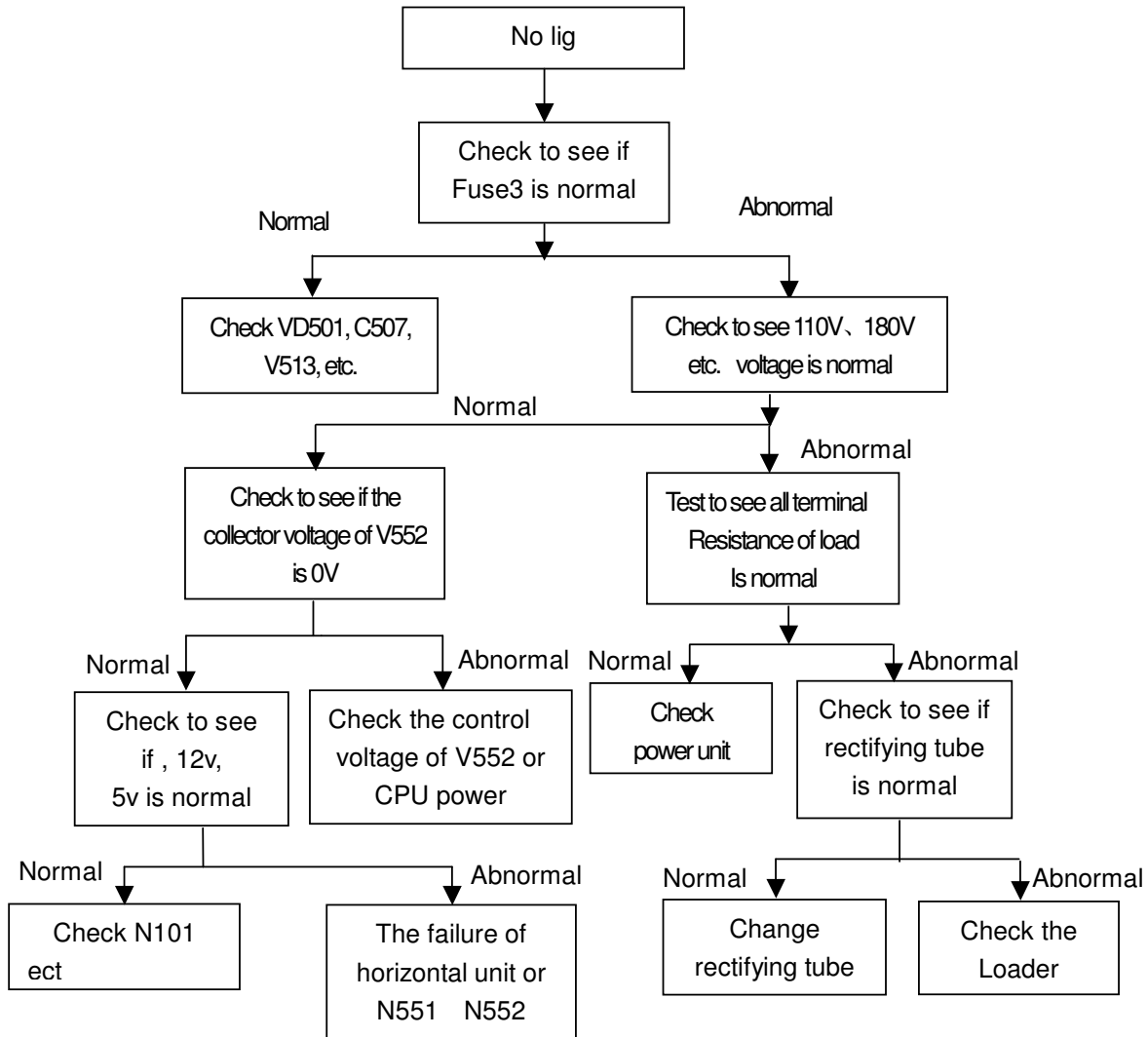
	OSD	Function
0	LA76814/LA76812	0: select LA76814 1:select LA76812
1	SAP IC SELECT	0:TDA9850;1:CXA2104;2:TDA9855;3:UPC1815B
2	SUB. CONT	Sub-contrast(0-31)
3	SUB. COLOR	Sub-color(0-63)
4	SUB. SHARP	Sub-sharpness(0-31)
5	SUB. TINT	Sub-tint(0-63)
6	BLK. STR. DEF	Black level stretch (0:on; 1:off)
7	AFC GAIN	AFC gain (0:low; 1:high)
8	V. SEPUP	Vertical synchronize sensitive (0: low;1:high)
9	CD. MODE	“Count down mode”(LA76814:0/1;LA76812:0-7)
10	DIGITAL OSD	Digital OSD setting (0:anlyos 1:digital)
11	OSD CONT.	OSD contrast (0-127)/LA76814 (0-3)
12	GRAY MOD	Gray mode (0/1)
13	B. GAM. SEL	Blue γ select (0-3)
14	RG. GAM. DEF	Red green γ define (0/1)
15	FBPBLK. SW	FBPBLK. SW (0/1)
16	BRIGHT ABL. TH	“Bright. abl. threshold”(0-7)
17	EMG. ABL. DEF	“Emg. abl. def”

Maintenance service and trouble shooting

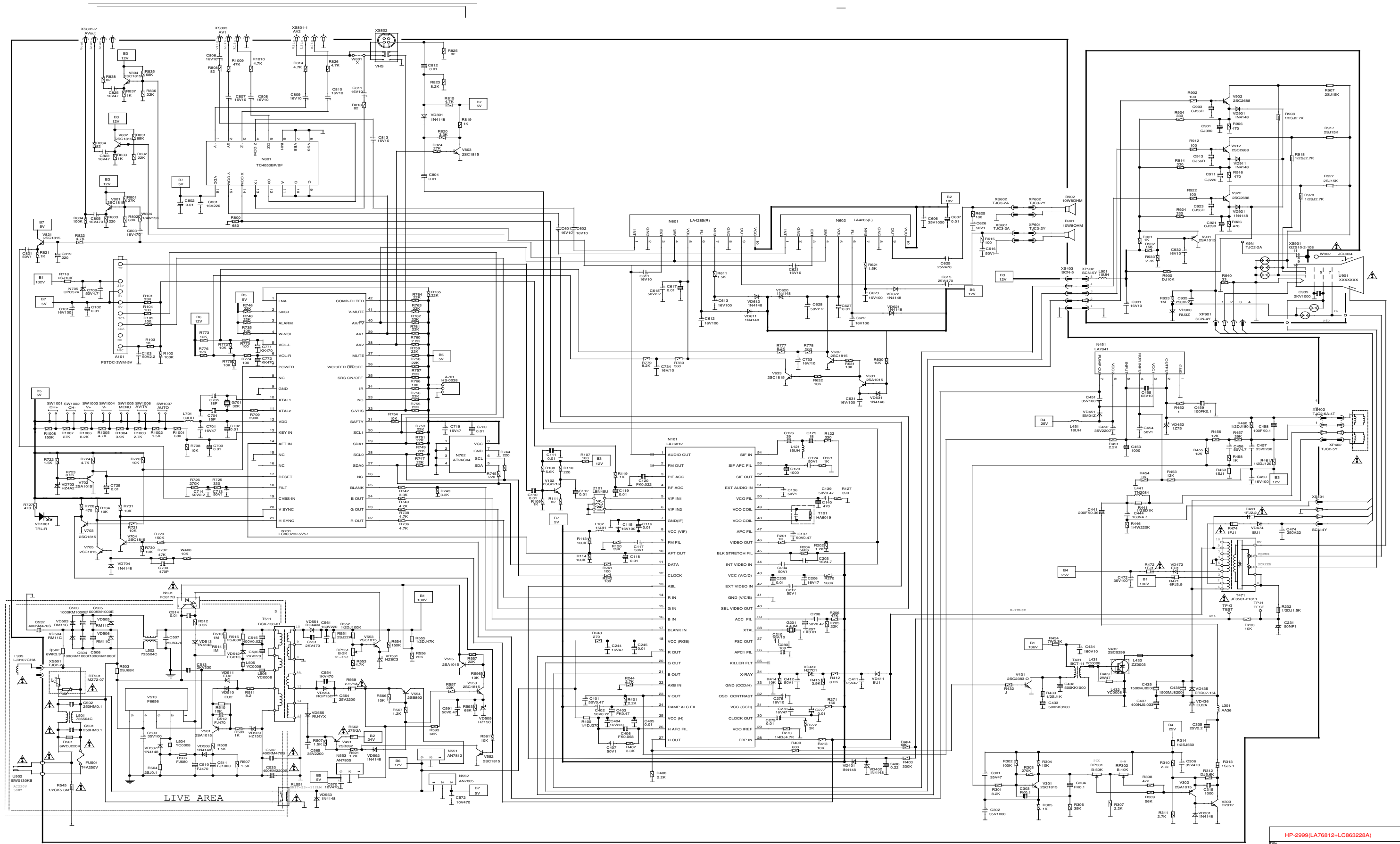
18	BRT. ABL. DEF	“Brт. Abl. Def” (0/1)	
19	MID. STP. DEF	“Mid. Stp. Def” (0/1)	
20	R—Y/B—Y G. BL	“R-Y/B-Y Gain Balance” (0~15) No use (LA76814)	
21	R—Y/B—Y ANG	“R-Y/B-Y Angle” (0~15)	
22	C. KILL. OFF	“C_Kill OFF” (0/1)	
23	SND. TRAP	“Sound Trap” (0~7)	
24	VOL. FIL	“Volume Filter Defeat”	
25	VIF. SYS. SW	Video IF setting (0: 45.75M; 1: 58.75M) For LA76814	
26	VIDEO. LEVEL	“Video Level” (0~7)	
27	FM. LEVEL	“FM Level” (0~31)	
28	POWER OPT	0: turn TV on twice; 1: memory; 2或3: Turn TV on first	
29	POWER FLAG	0: Without OSD power on function	1: With OSD power off function
30	SEARCH CHECK	1: With auto-programmed function turning TV on.	

31	SEARCH SPEED	0: Slow search speed	1: Fast search speed
32	AV OPTION	0: without AV; 1: one AV input; 2: two AV input; 3: Three AV input	
33	POSITION L/R	0: Logo display on left top of screen	1: Logo display on right top of screen
34	BLUE BACK	0: No blue background without signal	1: Blue background without signal
35	BLACK BACK	0: No background changing channel	1: Background changing channel

36	STEREO OPTION	0: No stereo	1: Stereo
37	WOOF/H. PHONE	No used	No used
38	WOOF VOL. OPT	No used	No used
39	SENSITIVITY	No used	No used
40	V. MUTE P. OFF	0: Before POWER OFF, don't cut off video input	1: Before POWER OFF, cut off video input
41	CCD OPTION	0: No CCD	1: CCD
42	V-CHIP OPTION	0: No V-CHIP	1: V-CHIP
43	PASSWORD OPT.	0: No V-CHIP password	1: V-CHIP password
44	COMB. OPTION	0: NOTHING	1: NOTHING
45	TUNER OPTION	0: TDF-3M3 tuner	1: PHILIP UV1336B tuner
46	GAME OPTION	0: No game	1: Game
47	SCREEN OPTION	0:no curtain effect 1: curtain for on effect 2:curtain for effect 3:curtain for on/off effect	

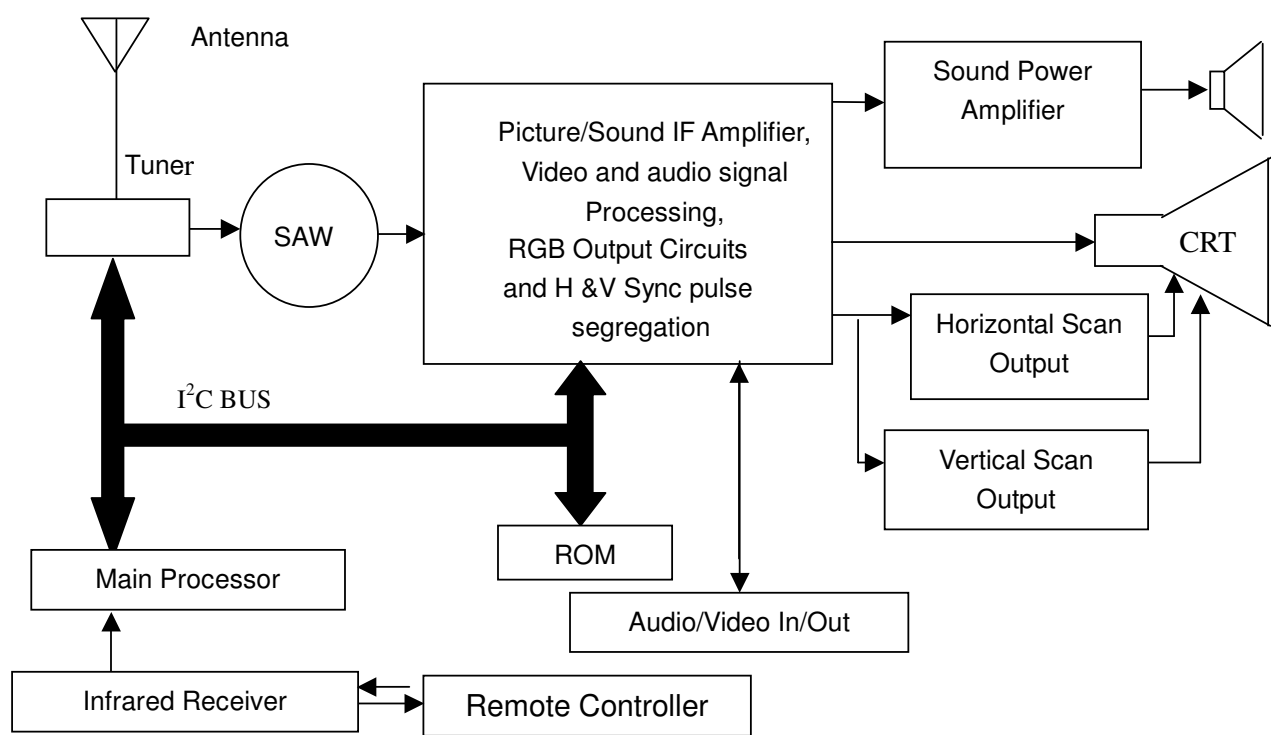


11. Circuit Diagram

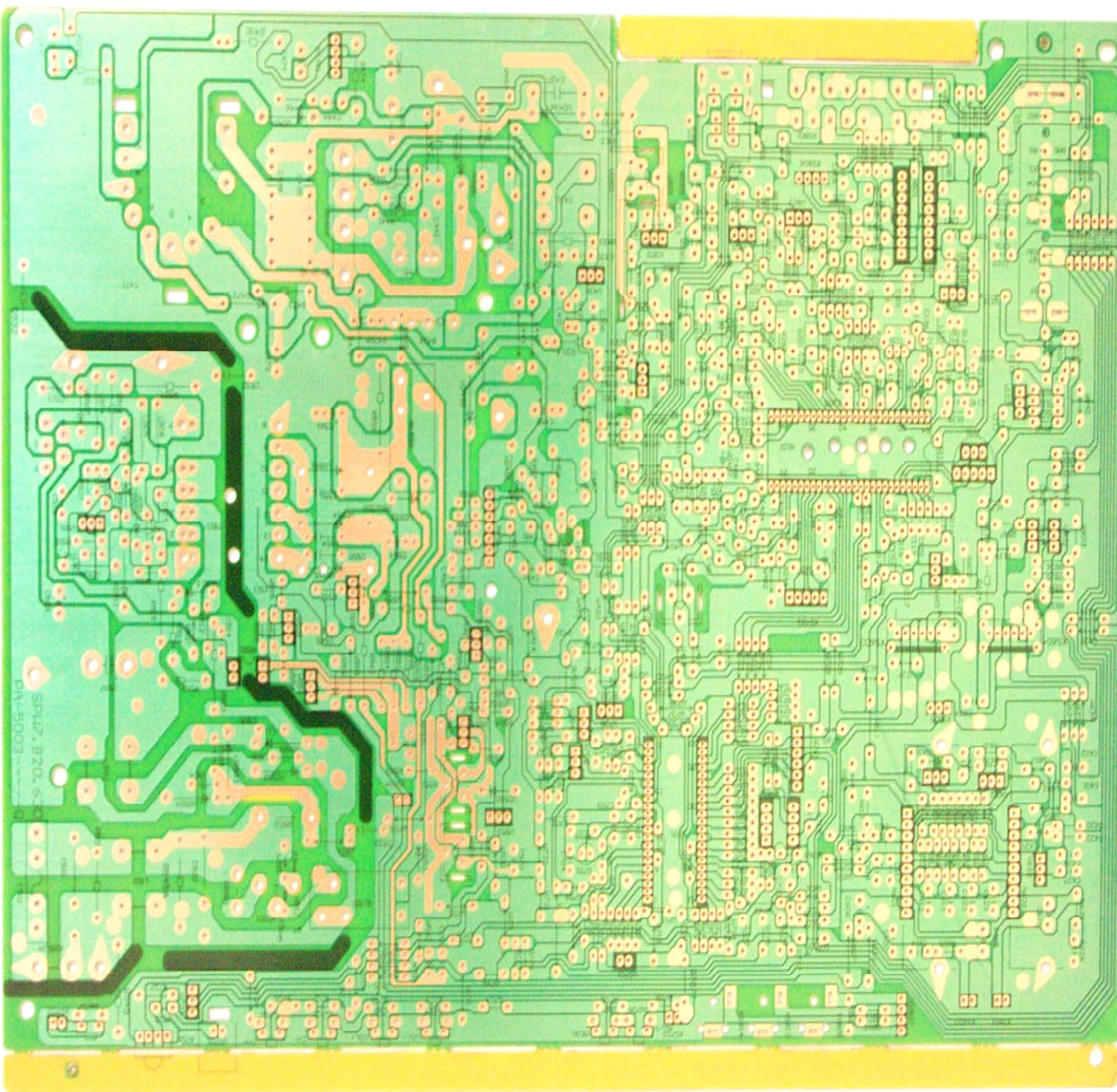


Circuit Block Diagram

Circuit Block Diagram



PCB



Circuit Explanation

12. Circuit Explanation

IC reference data:

1). N701 (LC86F3232A)

Pin No.	function	voltage (V)	Pin No.	function	voltage (V)
1	n.c		22	R-input	0.06
2	Connect to 5V via a resistor	5.03	23	G-input	0.06
3	Connect to 5V via a resistor	5.03	24	B-input	0.07
4	Connect to 5V via a resistor	5.04	25	Blank	0.15
5	Connect to 5V via a	5.03	26	n.c.	0.01
6	Connect to 5V via a resistor	5.03	27	I2C bus control 0	4.85
7	standby	0.03	28	I2C bus control 0	4.79
8	n.c.	0	29	I2C bus control 1	5
9	Ground	0	30	I2C bus control 1	4.99
10	Scl	1.47	31	Connect to 5V via a resistor	5.03
11	sdl	2.2	32	Connect to 5V via a onnect to 5V via a resisto	5.04
12	Power supply	4.99	33	Connect to 5V via a resistor	5.03
13	Key input	0.24	34	遥控接收	0.03
14	AFT in	2.77	35	Connect to 5V via a resistor	5.02
15	AGC in	1.7	36	Connect to 5V via a resistor	5.01
16	n.c.	1.7	37	mute	0.11
17	Reset	4.99	38	AV select	0.02
18	Filter	3.13	39	Connect to 5V via a resistor	5.02
19	CVBS in	3.25	40	Connect to 5V via a resist	5.01
20	V syn input	4.8	41	C resistor	5.01
21	H syn input	4.12	42	Connect to 5V via a resistor	5.02

Circuit Explanation

2). N101 LA76812

Pin No.	function	voltage (V)	Pin No.	function	voltage (V)
1	Audio output	2.23	28	FBT input	1.06
2	FM output	2.23	29	VCO IREF	1.69
3	IF AGC filter	2.22	30	Clock output	0.002
4	RF AGC	2.59	31	VCC	0.002
5	PIF AMP input	1.30	32	OSD gain control	3.05
6	PIF AMP input	2.83	33	Gnd	0
7	IF ground	2.83	34	X-ray pretect	0.06
8	IF VVcc	0	35	ACC killer filter	0.39
9	FM filter	4.94	36	APC2 filter	3.49
10	AFT output	1.90	37	FSCout	0.54
11	Bus data	2.77	38	XTAL	2.87
12	Bus clock	4.85	39	APC1 filter	3.2
13	ABL	4.76	40	Selected video output	2.43
14	R-input	3.92	41	Video chroma deflection	0
15	G-input	0.14	42	Ext video input	2.55
16	B-input	0.15	43	Power	5
17	Fast blanking input	0.08	44	Int . video input	2.77
18	RGB Vcc	7.94	45	Black stretch filter	2.6
19	R-output	2.21	46	Video input	2.12
20	G-output	2.36	47	APC filter	3.5
21	B-output	2.28	48	VCO coil	4.3
22	H-synchronize output	0	49	VCO coil	4.3
23	Vertical output	2.47	50	FLL filter	2.24
24	Vertical ramp ALC filter	2.65	51	Ext audio input	2.12
25	Power	5.10	52	SIF output	1.95
26	AFC filter	2.49	53	APC filter	2.38
27	Horizontal output	0.63	54	SIF input	3.14

Adjustment

13. Adjustment

● IF alignment:

1). Test equipment:

- a. 45.75MHz sweep generator
- b. 15V/3A DC power supply (with short and over current proof)
- c. Digital multi-meter
- d. If alignment tool
- f. User Remote controller
- g. Service remote controller
- h. Video signal generator
- i. Multi-system adjustment tool
- j. 60MHz double trace oscillograph(2 units)
- k. White balance adjustment instrument

2). Signal, power supply connection:

- a. Connect +15V DC power supply to the +15V testing top in the main PCB.
- b. Input sweep signal into IF testing top
- c. Connect multi-meter to PIF-TP testing top in PCB.

3). Alignment

- a. Connect 45.75MHz sweep generator to IF test top in PCB
- b. Adjust T101 and make digital multi-meter display $3.6V \pm 0.05V$.
(PIF-TP top can only connect to multi-meter).

Alignment and check:

- a. Connect main PCB with alignment tool, input factory adjustment signal, and turn TV on. Adjust screen control on FBT and make screen brightness relevant, receive 525-line monoscope, adjust focus control on FBT and make focus relevant.
- b. Pre-adjust power voltage: adjust RP551 and make +B voltage be $109V \pm 0.5V$.
- c. Check brightness, contrast, color, and sharpness: receive color bar signal and adjust contrast, brightness, color, sharpness control, picture will change accordingly.
- d. AV input check: press AV/TV button, screen will display AV mode or TV mode and audio input signal can be observed, picture and sound must be normal.

S optimal.

Adjustment

Main power adjustment:

Adjustment: Connect voltage meter to +B on main PCB, make +B voltage be 148V±0.3V.

Screen voltage adjustment:

Adjustment: Tune TV on, receive a digital test pattern, set brightness and contrast standard mode. Press “FACTORY” button on the service remotecontroller twice,”B/W balance display on the screen, then press“MUTE” button, and make a horizontal bright line display on the screen. Adjust Screen voltage of FBT, make the line just seen. Then press“MUTE” button and exit service mode. Press “P.STD” button and make picture enter standard mode.

AGC ALIGNMENT:

Receive a color bar signal, 60dB,NTSC M color bar pattern, and check if there is noise in the picture, if there is noise, press FACTORY button and enter service mode, adjust RF.AGC value and make the noise just disappear, press FACTORY button and exit service mode.

White balance adjustment:

Turn TV on, receive white field signal, and make the probe of white balance adjustment instrument touch with top and bottom of screen fully. Check if values of R, G, B are standard, if not, press “FACTORY” button, make “B/W BALANCE” menu display on screen, adjust values of R-BIA, G-BIA, B-IA, R-DRV, G-DRV, B-DRV, make them standard. Press FACTORY button, exit service mode.

OSD	I2C bus control (LA76810)	Varied range
S-BRI	Sub brightness	0-127
R-BIA	Red bias	0-255
G-BIA	Green bias	0-255
B-BIA	Blue bias	0-255
R-DRV	Red drive	0-127
G-DRV	Green drive	0-15
B-DRV	Blue drive	0-127
C.B/W	Cross B/W	0-3

FOCUS ALIGNMENT

Receive crosshatch (N system) pattern; Adjust focus-variable resistor on the FBT, make picture is the sharpest.

Adjustment

GEOMETRIC ALIGNMENT:

Receive the monochrome circle pattern (NTSC system);

Check vertical center and horizontal center and H-linearity .if they are not standard, press FACTORY button to enter service mode, and adjust vertical size, vertical linearity, vertical center, horizontal center, make them standard.

Alignment parameter table:

Press FACTORY button on service remote controller and enter service mode: 1.Adjustment mode and2. Setting mode;

Use CH+ or CH- button up/down pages to select items that you need adjust; use VOL+ or VOL- button

Damageable Parts List

16. Damageable Parts List

Location	Material Code	Parts Name	Type	Qt. (unit)	Remark
FU501	0094000150	Fuse	T2.5A/250V	1	
	0094000778	Remote controller	HYF-25E	1	
A101	0094003734	Tuner	ENV56DB4G3	1	
R474, R472	0094101006	Resister	RF10-1W-1Ω±5%-15-C-A	2	
R491	0094101008	Resister	RF10-2W-3.3Ω±5%-20-C-A	1	
N551	0094400357	IC	L7812CV	1	
N801	0094400417	IC	TC4053BP	1	
N552, N553	0094400450	IC	L7805CV	2	
RT501	0094400452	Resister	PTH451A7R0Q21	1	
N101	0094400457	IC	LA76814K	1	
V432	0094400465	Transistor	2SD1651----B-A	1	
N451	0094400470	IC	LA7840	1	
N702	0094400636	IC	CAT24C08P	1	
V102	0094400660	Transistor	2SC2216(O)-----F	1	
N701	0094401090	IC	LC863232A-5V57	1	

17. Information of Resistors and Capacitors

CAPACITORS

RESISTORS & CAPACITORS-PARTS NO.CODE

- Notes: 1.part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2.The unit of resistance is Ω (ohm).K=1000 Ω ,M=1000K Ω
3.The unit of capacitance is μ F(microfarad). 1pF=10⁻⁶ μ F.

Numbering system of Capacitor

Example

<u>CL42</u>	----	<u>17</u>	----	<u>50V</u>	----	<u>2F4</u>	----	<u>104 *</u>	----	<u>Z</u>	----
Type				Voltage		Value (pF)		Tolerance			
<u>CL21X</u>	----	<u>100V</u>	----	<u>223 *</u>	----	<u>J</u>					
Type		Voltage		Value (pF)		Tolerance					
<u>CL110X</u>	----	<u>25V</u>	----	<u>100 μ F</u>		<u>±</u>		<u>20%</u>			
Type		Voltage		Value		Tolerance					
* <u>104</u> =10×10 ⁴ <u>223</u> =22×10 ³											

Numbering system of resistor

Example

<u>RY17S</u>	----	<u>2W</u>	----	<u>390</u>	----	<u>J</u>	----	<u>05-E-A</u>
Type		Wattage		Value(Ω)		Tolerance		
<u>RS11</u>	----	<u>1/2W</u>	----	<u>1.8K</u>	----	<u>K</u>		
Type		Wattage		Value		Tolerance		

ABBREVIATION OF PART NAME AND DESCRIPTION

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
T	Carbon	F	±1%
S	Solid	J	±5%
J	Metal	K	±10%
Y	Oxide	M	±20%
F	Fuse	G	±2%

CAPACITOR

RESISTOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Ceramic	J	±5%
T	Ceramic	K	±10%
L	Film	L	±15%
D	Electrolytic	M	±20%
A	Tantalum	P	+100%-0%
		Z	+80%-0%

Terminal view of transistors

