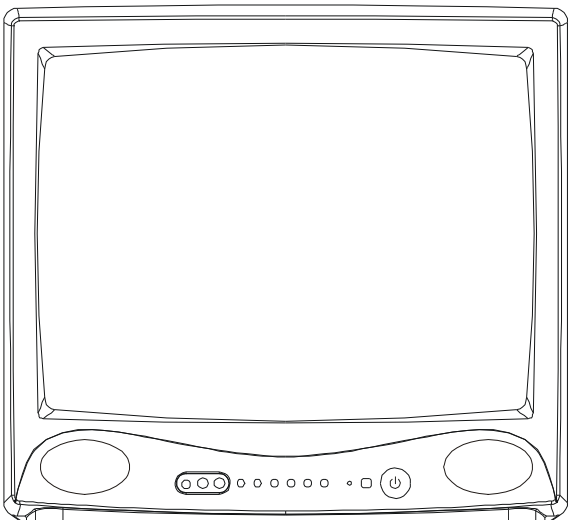
HTN19R12/HTN19R12S

COLOUR TELEVISION

Service Manual



MODEL :

HTN19R12/HTN19R12S

(America)

■ Features

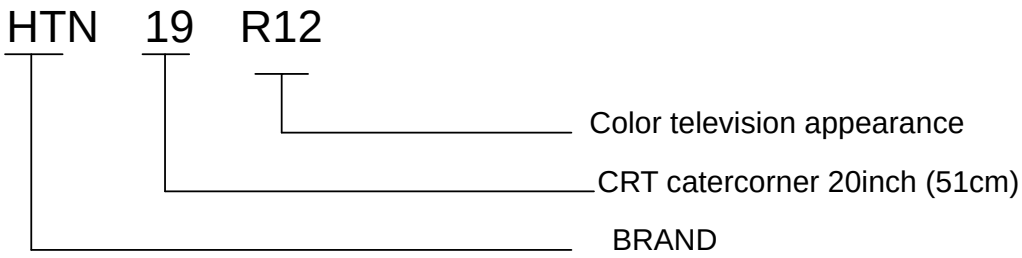
- 48cm super flat picture tube
- Auto search 181 program presetting and memory
- CCD & V-CHIP

Haier Group

NO:M-MR-AE-HTN19R12-76814 **Edition:2004/4/17**

CONTENT

2. Product code illumination and series introduction



3. FEATURES

序号	FUNCTION		
1	PIC	Main IC	76814
2		CRT	flat picture
3		Color system	NTSC3.58
4		Audio system	M
5		NO.of channels	181
6		OSD language	ENGLISH、FRENCH SPANISH
7		Multi-picture modes	
8	AUDIO	AV stereo	
9		Super woofer	
10		Surrounding sound	
11		Treble/bass boost	
12		Left/right balancer	
13		NICAM	
14		Multi-audio modes	
15		Tone adjuster	
16		MTS/SAP	
17		Auto-volume leveling	
18	JIC	AV input	Y
19		AV output	
20		DVD terminal	
21		S-video jack	
22		Headphone socket	Y
23		SCART socket	
24	SOFTWARE	Digital curtain	
25		Slow fading on & off	
26		Semitransparent menu	
27		Non-flshing channel changing	
28		ZOOM	
29		16:9 mode	
30		Games	
31		Calendar	
32		Child-lock	
33		Multi-functional lock	Y
34		No-picture listening	
35		Background light	
36		Auto-timer on	
37		CCD	Y
38		V-CHIP	Y

序号	FUNCTION		
39	PARAMETER	NO. of built-in speakers	1
40		Audio output power(W)	2W
41		Total power input（W）	70W
42		Voltage range（V）	120V
43		Power frequency（Hz）	60HZ
44		Time of sleep timer(MINS)	120MIN
45		Net weight(KG)	21
46		Gross weight(KG)	23
47		Net dimension(MM)	
48		Packaged dimension(MM)	
49		Quantity for 20' container	
50		Quantity for 40' container	
51		Quantiry for 40' high container	
52	APPROVAL	Acquired certificate	
53		Suitable market	

4. SAFETY PRECAUTIONS

INPORTANT SAFETY NOTICE

These parts are identified by many electrical and mechanical parts in this chassis have special safety-related characteristics.

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.

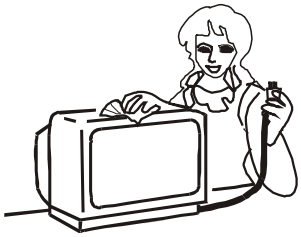
For continued X-RAY RADIATION protection, the replacement tube must be of the same type as specified in the Replacement Parts List.

Before returning the receiver to the customer,

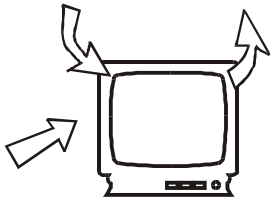
Always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to make sure that the set is safe to operate without any danger of electrical shock.

5. Warning and Cautions

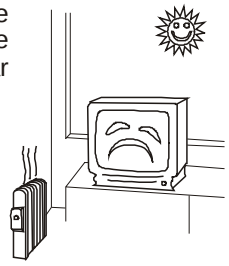
1. When you clean the TV set, please pull out the power plug from AC outlet. Don't clean the cabinet and the screen with benzene, petrol and other chemicals.



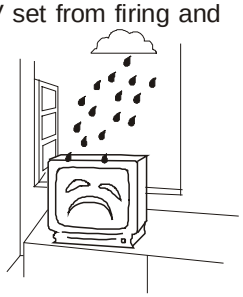
2. In order to prolong the using life of the TV set, please place it on a ventilated place.



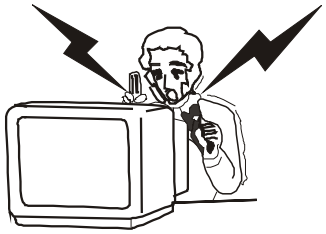
3. Don't place the TV set in the sunshine or near heat source.



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



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



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.

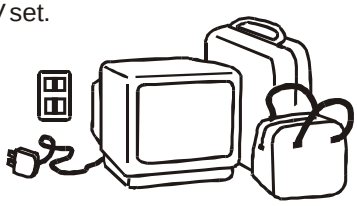


Figure 1

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**.

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 spray 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.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such 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 folder 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 ^{o}F to 600 ^{o}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 spay-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature.(500 ^{o} F to 600^{o} 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.

      CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature.(500 ^{o} F to 600^{o} 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

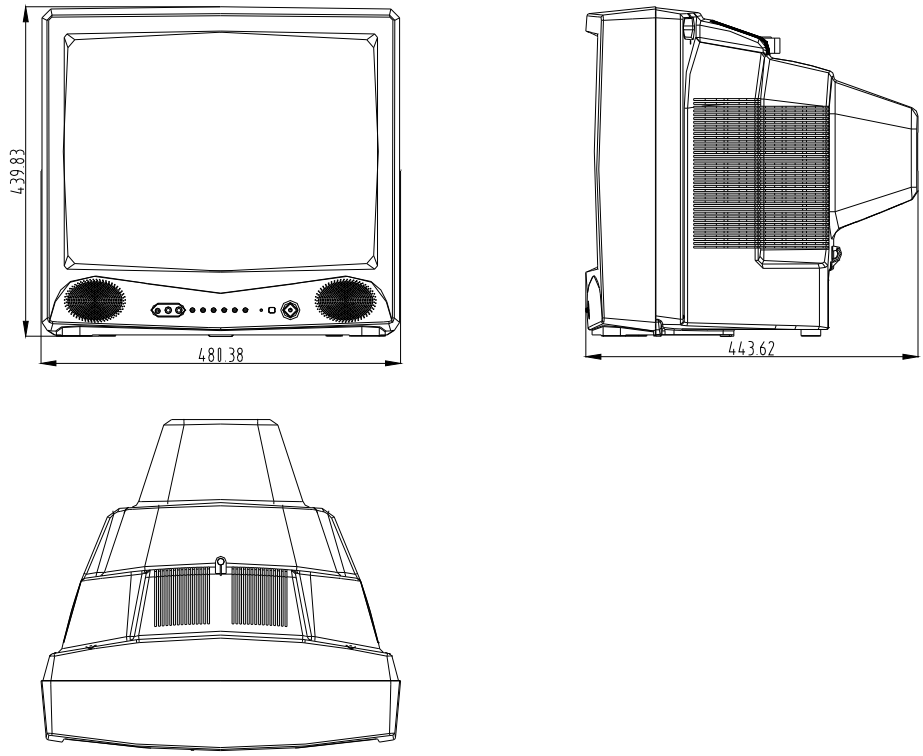


Figure 2

7. Parts and Funcitions

Front and side panel of the TV set

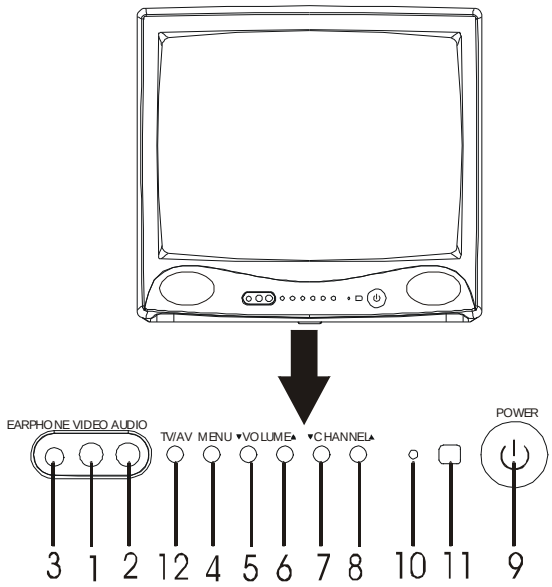
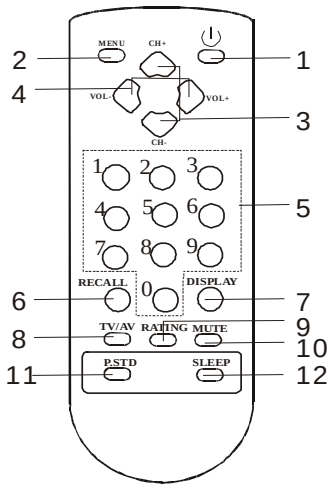


Figure 3

When using S terminal, please pull out video 1 input terminal

8. Remote Controller Functions



1. (⏻) : Mise en marche/Arrêt
2. Accès /Sortie du M (Menu) principal
3. CH+/- : Choisit la chaîne supérieure ou inférieure
4. VOL+/- : Augmente ou diminue le volume sonore
5. Touche Numéro de chaîne : Réglage directe de la chaîne (chaîne TV 02-69, chaîne câble 01-125).
6. RECALL : Retour à la chaîne précédente
7. DISPLAY : Affiche la chaîne reçue
8. TV/AV : Sélecteur TV/AV
9. RATING : Programmation du V-chip
10. MUTE : Appuyez sur la touche pour activer/désactiver a fonction silence
11. P.STD : Choisit Personnalisé, Vivant, Claire, Standard, Doux
12. SLEEP : Chronodéclencheur de mise en veille

Figure 4

9. Program Diagram

I. Features

HTN19R12 color TV sets (designed for the US market) incorporate the monolithic integrated circuit LA76814K developed by SANYO in 1999 and the CPU LC863432B-535A designed for LA76814K control.

LA76814K intergrates the sound accompany filter and trap filter in the chip, resulting in minimized application of peripheric components, maximized integtration and reliable performance. The chip functions for picture intermediate frequency amplification, picture detection, sound intermediate frequency amplification, sound frequency discrimination, video amplification, choma decoding, line and field synchronized scanning wave formation and output. The circuits of picture detection, sound frequency discrimination and chroma decoding incorporate PLL demodulation which is noted for significant stability and reliability. In addition, this chip integrates the brightness and chroma retarding lines and additional functions of black level extension, bus geometric figure adjustment, I^2C bu control on the basis of the 7687, resulting in test point free assembly, reduced components of test point and peripheric components and improved picture quality.

The CPU LC863424 uses SANYO LC863432B-535A series for reprogramming. In the design, functions of CCD and V-CHIP as well as various function extensions are added for the North American market. This chip also uses low frequency 32.7KHZ crystal oscillator to reduce interferences to pictures and medium frequency signals.

II. Technical properties and requirements

1. Main performance index

1. Screen diagonal:	51cm
2. Receiving system:	NTSC-M
3. Receiving channel:	VHF-channel 2~13
	UHF-channel 14~49
	CATV-channel 1~125
4. Antenna input:	75Ω F plug
5. Picture limit noise sensibility:	VHF≤51dB（μV）
	UHF≤54dB（μV）
6. Color sensitivity:	≤40dB（μV）
7. Two signal selectivity:	-1.5MHZ≥45dB
	+6MHZ≥50dB

8. Sound noise limit sensitivity: VHF≤39dB（μV）
   UHF≤42dB（μV）
9. Sound output power: ≥2W
10. X-ray radiation value: <0.1mR/Hr
11. Voltage: AC 100～130V
12. Energy consumption: ≤70W
13. Net dimensions: 472mmX445mmX432mm
14. Net weight: 17.5Kg

2. User's instructions

Note: This TV set has been installed a caption decoder and control to US Federal Communications Commission.

Customized Power On setup

This TV set is designed for customized initiation. (For detailed information, see the User's Manual.) The TV set has been preset before delivery and can be reset by the user.

Power on

1. When the TV set is connected with the power supply, the power indicator illuminates. When the Power On/Off button on the TV set or the remote controller is pressed, the TV set is started.

2. When the MENU button on the remote controller is pressed, the menu will appear on the screen. The CH and VOL buttons are used for setup.

3. Press of CH+ or CH- button will result in moving the icon up or down for function options. The designated item will turn green.

4. Pressing the VOL+ or VOL- button can change the designated item.

VIDEO setup

1. Press MENU button for VIDEO option.
2. Press CH+ or CH- button to designate desired item. (Move the icon to designated item and the submenu will appear.)
3. The menu item under the icon will turn bright green. Press VOL+ or VOL- button for options.

Options	VOL+	VOL-

CONTRAST	Contrast increase	Contrast decrease
BRIGHT	Brightness increase	Brightness decrease
COLOR	Color increase	Color decrease
SHARP	Sharpness increase	Sharpness decrease
TINT	Tint increase	Tint decrease

4. Press MENU button again to quit the main MENU.

SETUP

1. Press SETUP button, the main menu will appear on the screen.
2. Press CH+ or CH- for LANGUAGE options. The designated LANGUAGE will turn bright green.
3. Press VOL+ or VOL- for LANGUAGE options (such as English, Spanish and French)
4. Receiving: Press VOL- button to move the icon to RECEPTION. The TV set is preset AIR state before delivery (indicating that unlimited receiving of 0~63 channel signals). If the TV set is connected with the cable TV system, press VOL+ button for CABLE option.
5. Automatic search: Press CH+ or CH- button for AUTO PROGRAM. When VOL or +VOL- is pressed, the function of automatic channel search will be activated (if signals are available, the channel will be fixed. If VOL+ button is pressed again, the search can be resumed.)
6. Add/delete: Press CH+ or CH- button for option of ADD/DELETE. Press VOL+ or VOL- button to add or delete some channel.
7. Input: Press CH+ or CH- button for option of INPUT. Press VOL+ or VOL- button, or press AV/TV button on the remote controller for option of AV/TV.
8. Press MENU button again to quit the main menu.

TIME setup

1. Press MENU button and the main menu appear on the screen.
2. Press CH+ or CH- button to move the icon for TIME setup. The designated CLOCK under the icon will turn bright green.
3. Press VOL+ or VOL- button for options of hour, minute and am/pm on the CLOCK.
4. Press CH+ or CH- to adjust the figure until designed time value is reached. Set ON TIME/OFF TIME with the same way.
5. Press CH+ or CH- for option of SLEEP. Press VOL+ or VOL- for option of set clock. The clock display will turn bright green while SLEEP icon turns blue. Press CH+ or CH- for sleep period adjustment.
   0：15 / 0：30 / 0：45 / 1：00 / 1：15 / 1：30 / 1：45 / 2：00
6. When CHANNEL in TIME setup is designated, this option will be the preset [illegible] turned on or off.
7. Press MENU button again to quit the main menu.

SPECAIL

1. Press MENU button Press MENU button Press MENU button and the main menu appear on the screen.
2. Press CH+ or CH- button to move the icon to SPECIAL, and designate C.CAPTION. Then icon of C.CAPTION turns to bright green. When OFF is displayed, C.CAPTION is inactivated while when ON is displayed, C.CAPTION is activated.
3. Press CH- to move the icon to CC ON MUTE and the icon will turn bright green. Press VOL+ or VOL- button for adjustment of this function. When OFF is displayed, the item cannot display its function regardless of the indication of C.CAPTION. When this item displays C1 while C.CAPTION displays OFF, the system will activate C.CAPTION function automatically.
4. Press CH- button to move the icon to POWER RESTORE. Press VOL+ or VOL- to adjust power on and off.
5. When icon designates MENU OFFSET, the digital value of the designated item can be adjusted by pressing VOL+ or VOL-. Function of this item is to change the location of the menu.
6. Press MENU button again to quit the main menu.

V—CHIP setup

This function is designed for television program limitation. The TV set user is allowed to control the usage of the TV set in accordance with the regulations of US Federal Communications Commission. This function is also destined to prevent children from watching the TV programs which are improper for juvenile.

1. Press MENU button, the menu will appear on the screen. Press RATING button, V-CHIP displays the menu.
2. Press CH+ or CH- button to move the icon to another option, then the designated item will turn bright red.
3. When an item is selected, press MENU button and the submenu of the designated item will appear on the screen.
4. Press MENU button and return to V-CHIP.
5. Press RATING button to the main menu.
6. Press RATING button again to quit the main menu.

OPTION MENU

1. Press RATING button, and the RATING main menu will appear on the screen.
2. Designate OPTION MENU and then press MENU button, OPTION MENU will appear on the screen.
3. Press CH+ or CH- button for item option, and the color of designated item will change from yellow to bright green.
4. When HELP is selected, press MENU button and HELP menu will appear on the screen. Press CH+ or

CH- to search up and down for relative items. If MENU button is pressed again, OPTION MENU will appear.

5. When NO-INFO RATING is selected, press MENU button for option of UNBLOCK or BLOCK state.
6. When NO RATED is selected, press MENU button for option of UNBLOCK or BLOCK state.
7. When ENTER PASSWARD is selected, press MENU button, then a dialog box will appear at bottom left corner of the screen and then a 4 digit password can be input. Press RATING button again to return to the main menu.（The password must be input when entering the V-CHIP submenu.）

TV RATING

1. Press RATING button.
2. When TV RATING is selected, press MENU button and the submenu will appear on the screen as follows:
3. TV RATING

TV-Y					
TV-Y7	√				
TV-G					
TV-PG		√	√	√	√
TV-14		√	√	√	√
TV-MA		√	√	√	
RATING	FV	V	S	L	D

In the table, the blocks marked "√" indicates the restrictive items. If all restrictive items are to be selected, move the icon to the top left corner of the table and then press MENU button.

（1） If all restrictive items are to be released, move the icon to the bottom left corner and press MENU button twice.

（2） If one of the restrictive items is to be selected, press CH+ or CH- button in an alternate way and press MENU button (for some line) and then VOL+ or VOL- for option of desired line. Finally press MENU button.

（3） Some item can be deleted by following the same process above.

4. Press RATING button again to quit V-CHIP menu.

MPAA RATING

1. Press RATING button, and the RATING main menu will appear on the screen.
2. When MPAA RATING turns bright red, press MENU button and MPAA RATING submenu will appear on the screen.
3. If all items are to be selected, press CH+ or CH- button to move the icon to the top left corner, and then press MENU button.
4. If all selective items are to be deleted, press CH+ or CH- button to move the icon to the bottom left corner, and then press MENU button twice.

5. Items under or above the designated icon in the submenu can be selected.
6. Press RATING button again to quit V-CHIP menu.

BLOCK OFF

1. Press RATING button, and the RATING main menu will appear on the screen.
2. When BLOCK turns bright red and MENU button is pressed, BLOCK will display BLOCK OFF and BLOCK ON.

Caution:

BLOCK OFF: Indicating lock on status. Regardless setup of TV RATING and MPAA RATING, even V-CHIP signals are received during TV programs, this TV set dos not have the V-CHIP function.

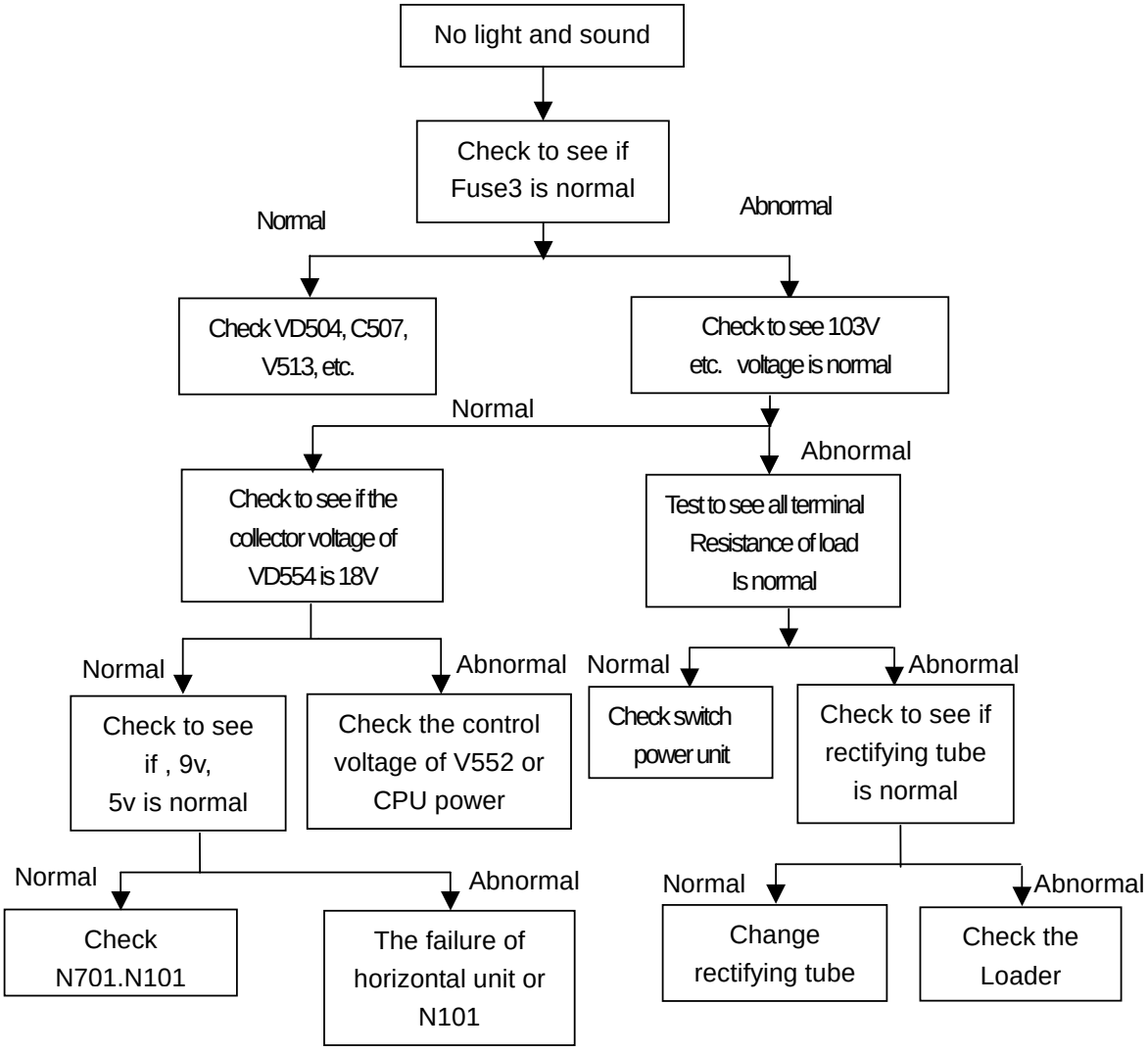
BLOCK ON: Indicating lock off status. When TV RATING and MPAA RATING are selected, the TV set will have the V-CHIP function when V-CHIP signals are received in the TV program.

Precausions:

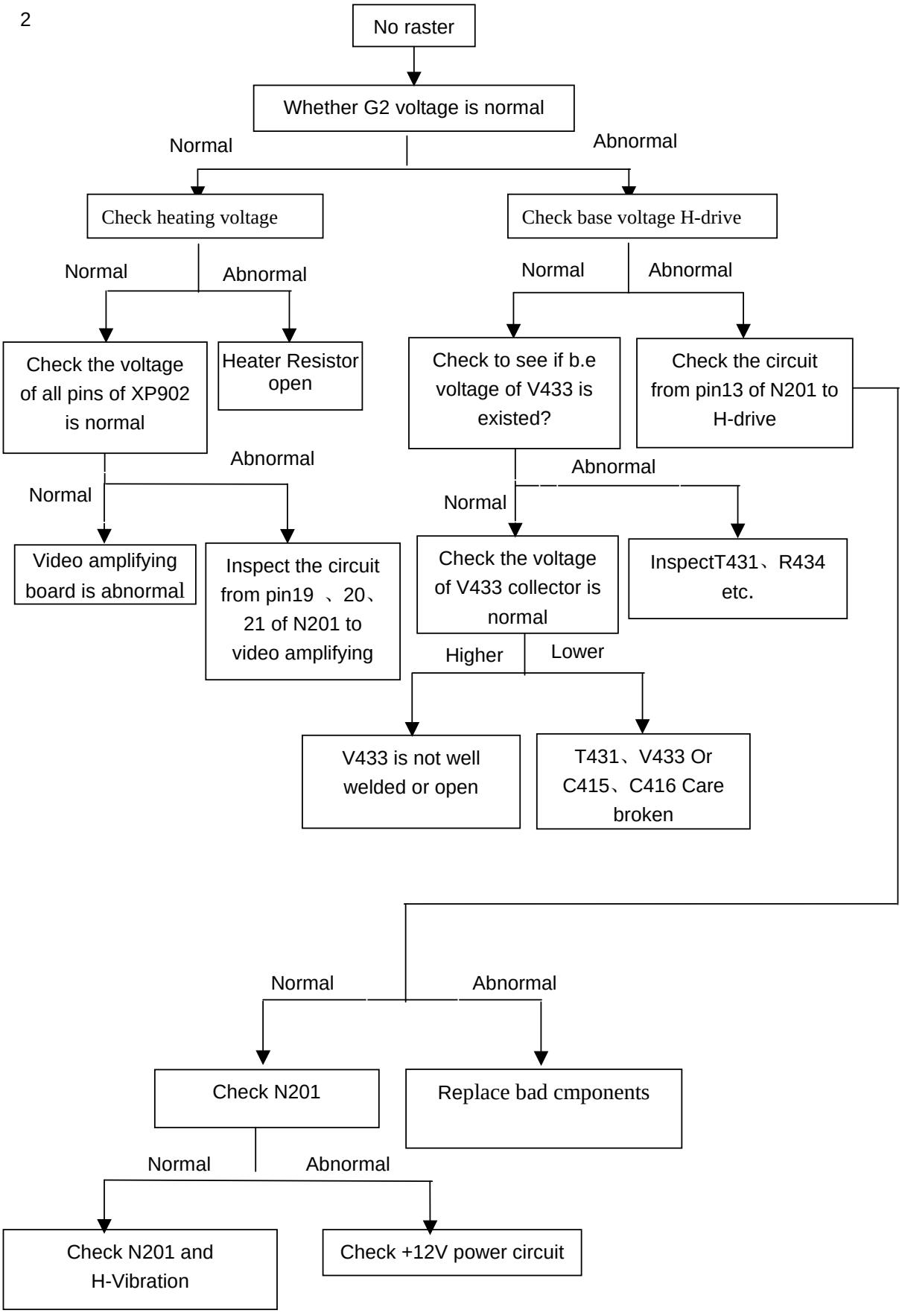
1. Keep the TV set away from heat resources, such as stoves and radiators;
2. Place the TV set in a well ventilated area;
3. Place the TV set in an area free from dusts and corrosive gas;
4. Prevent the TV set from waterdrops, moisture and humidity;
5. Do not place magnetic materials on the TV set;
6. Disconnect the TV set when moving the TV set.
7. When the TV set is turn on during a rainy weather, disconnect the outdoor antenna and use the indoor antenna attached to the TV set.
8. Disconnect the TV set from power supply source during a power interruption or vacation.

10. Maintenance Service and Trouble Shooting

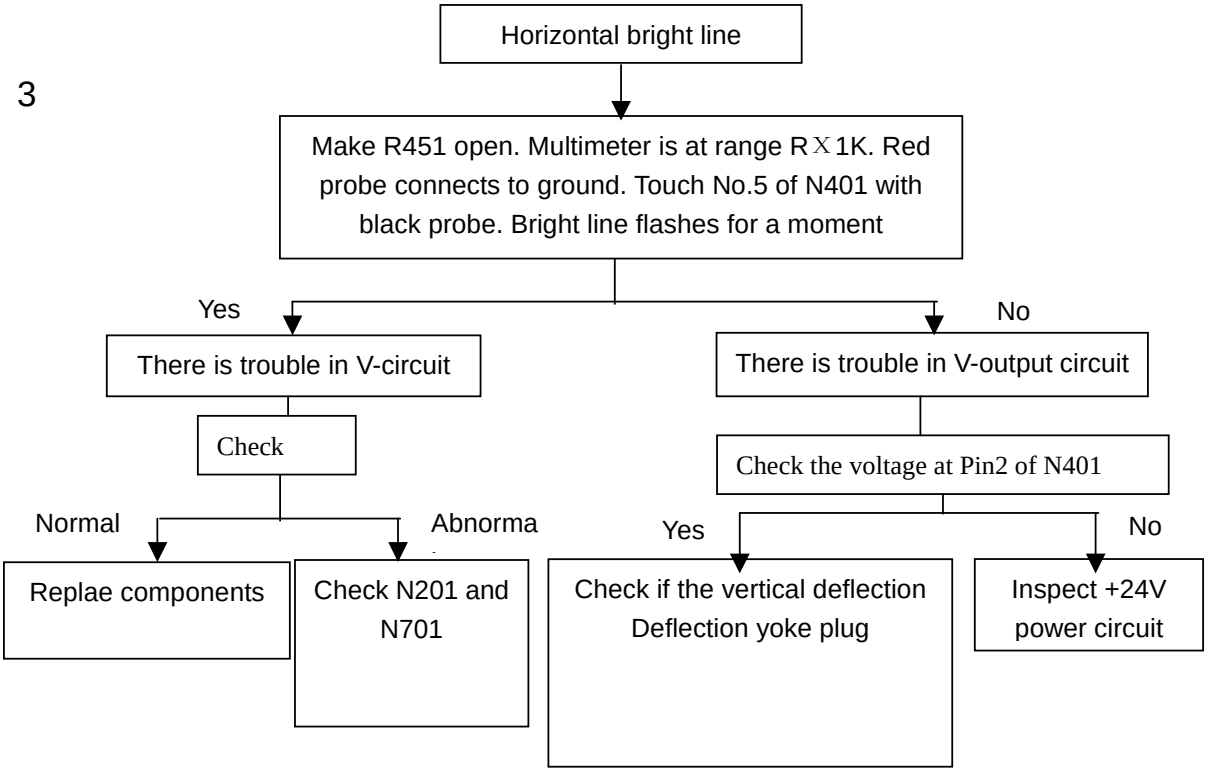
1 TROUBLESHOOTING PROCESS



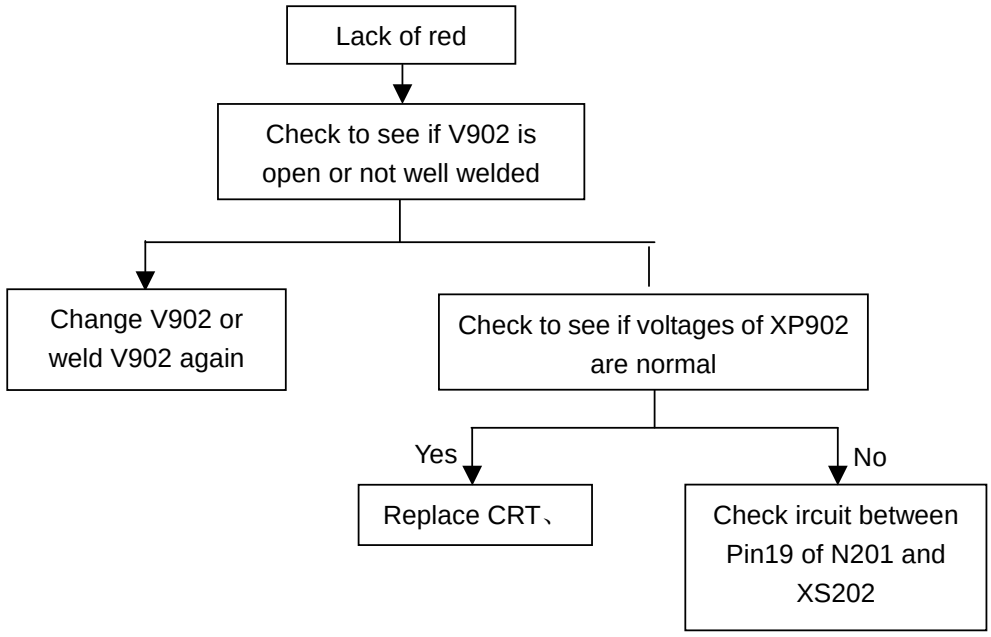
2


No raster
Whether G2 voltage is normal
Normal
Abnormal
Check heating voltage
Check base voltage H-drive
Normal
Abnormal
Normal
Abnormal
Check the voltage of all pins of XP902 is normal
Heater Resistor open
Check to see if b.e voltage of V433 is existed?
Check the circuit from pin13 of N201 to H-drive
Abnormal
Abnormal
Normal
Normal
Video amplifying board is abnormal
Inspect the circuit from pin19 、20、21 of N201 to video amplifying
Check the voltage of V433 collector is normal
InspectT431、R434 etc.
Higher
Lower
V433 is not well welded or open
T431、V433 Or C415、C416 Care broken
Normal
Abnormal
Check N201
Replace bad cmponents
Normal
Abnormal
Check N201 and H-Vibration
Check +12V power circuit

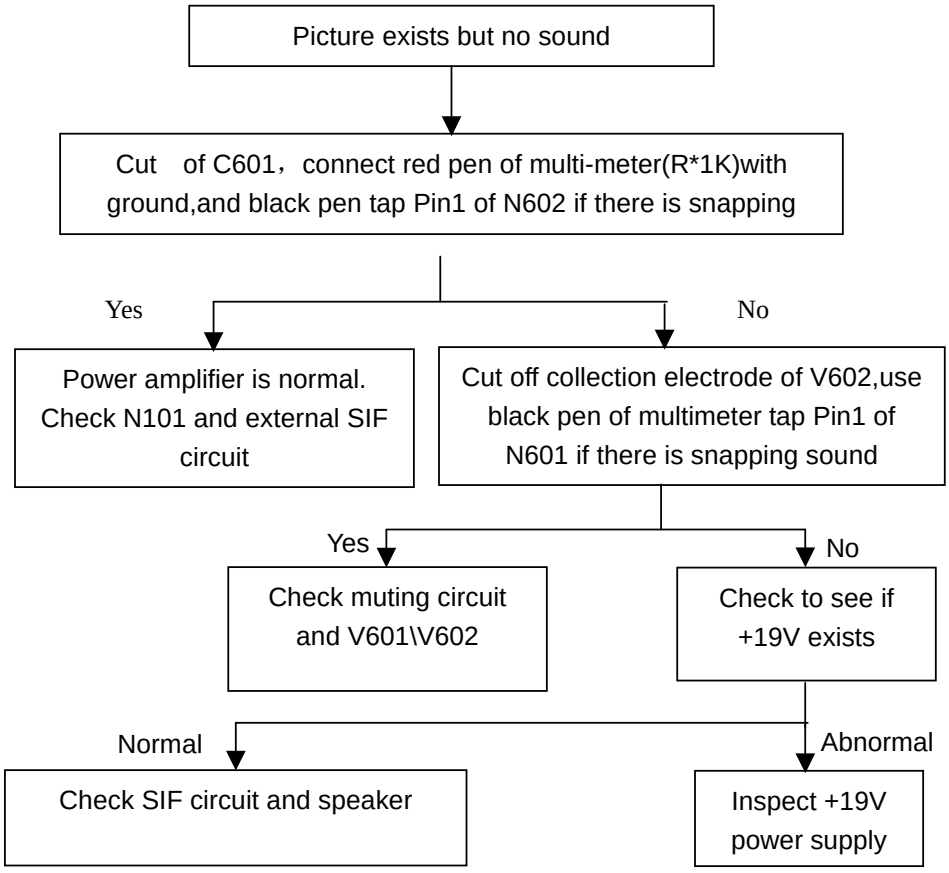
3


Horizontal bright line
Make R451 open. Multimeter is at range R X 1K. Red probe connects to ground. Touch No.5 of N401 with black probe. Bright line flashes for a moment
Yes
No
There is trouble in V-circuit
There is trouble in V-output circuit
Check
Check the voltage at Pin2 of N401
Normal
Abnorma
Yes
No
Replae components
Check N201 and N701
Check if the vertical deflection Deflection yoke plug
Inspect +24V power circuit

4


Lack of red
Check to see if V902 is open or not well welded
Change V902 or weld V902 again
Check to see if voltages of XP902 are normal
Yes
No
Replace CRT、
Check ircuit between Pin19 of N201 and XS202

5


Picture exists but no sound
Cut of C601，connect red pen of multi-meter(R*1K)with ground,and black pen tap Pin1 of N602 if there is snapping
Yes
No
Power amplifier is normal. Check N101 and external SIF circuit
Cut off collection electrode of V602,use black pen of multimeter tap Pin1 of N601 if there is snapping sound
Yes
No
Check muting circuit and V601\V602
Check to see if +19V exists
Normal
Abnormal
Check SIF circuit and speaker
Inspect +19V power supply

11. Circuit Diagram

1. Pane hint picture

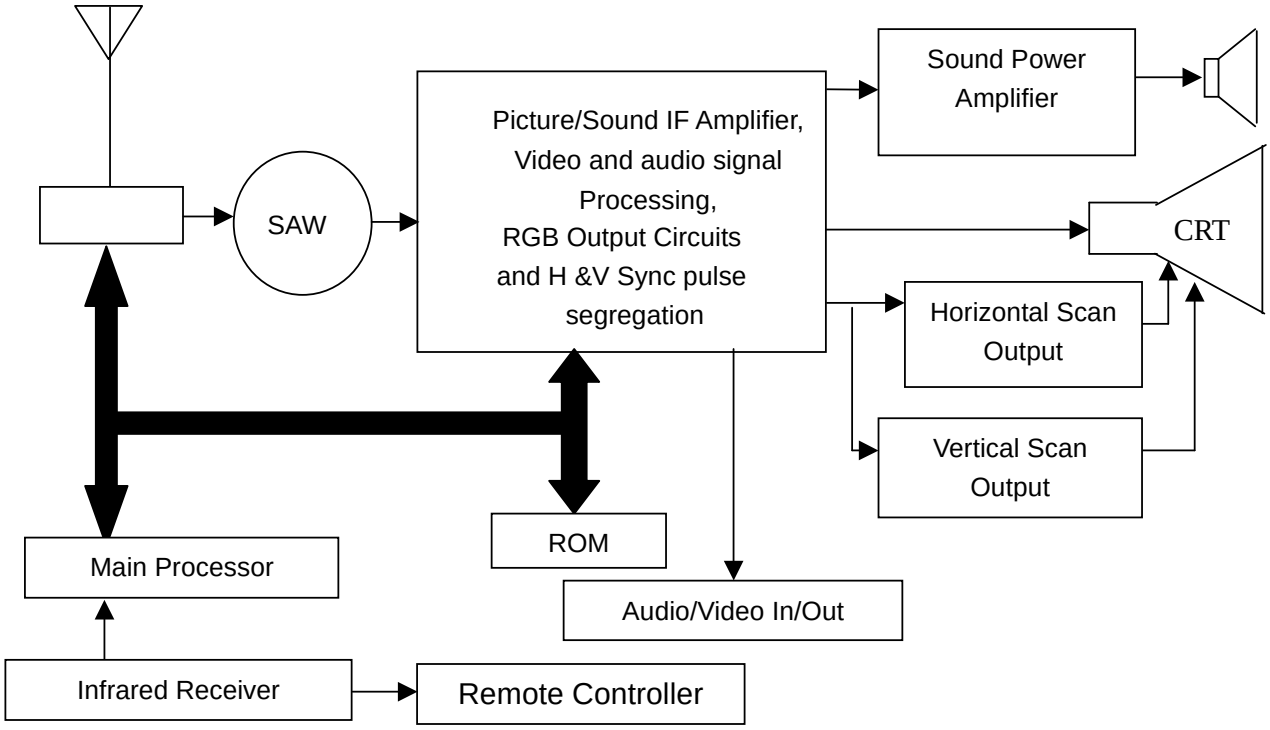
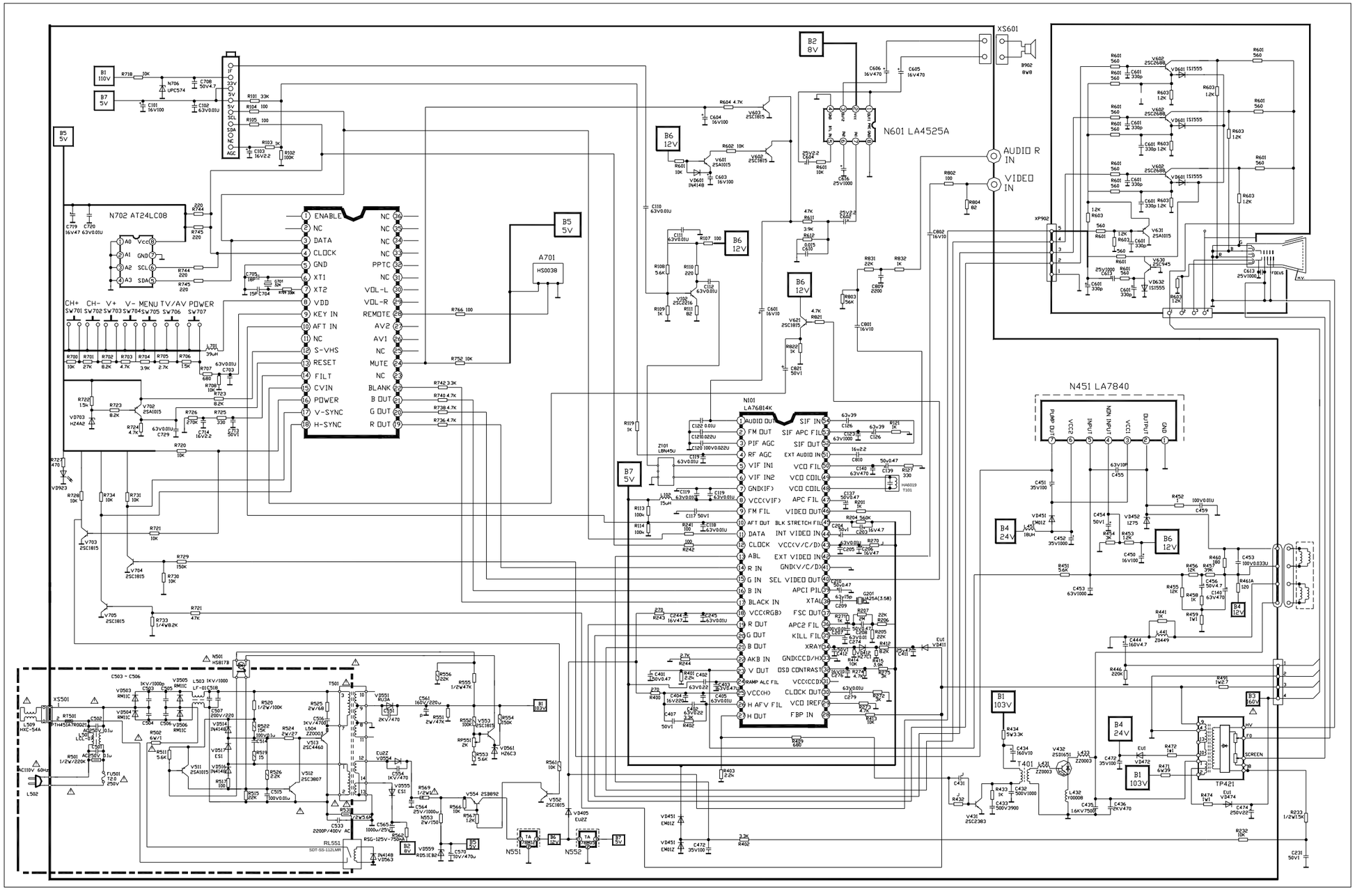


Figure 5

2


N702 AT24LC08
CH+ CH- V+ V- MENU TV/AV POWER
SW701 SW702 SW703 SW704 SW705 SW706 SW707
ENABLE
NC
DATA
CLOCK
GND
XT1
XT2
VDD
KEY IN
AFT IN
NC
S-VHS
RESET
FILT
CVIN
POWER
V-SYNC
H-SYNC
PPTC
VOL-L
VOL-R
REMOTE
AV2
AV1
MUTE
BLANK
B OUT
G OUT
R OUT
A701
HS0038
N601 LA4525A
AUDIO R IN
VIDEO IN
XS601
N451 LA7840
N101 LA76814K
AUDIO OUT
FM OUT
PIF AGC
RF AGC
VIF IN1
VIF IN2
GNDK(IF)
VCC(VIF)
FM FIL
AFT OUT
DATA
CLOCK
ABL
R IN
G IN
B IN
BLACK IN
VCC(RGB)
R OUT
G OUT
B OUT
AKB IN
V OUT
RAMP ALC FIL
VCC(H)
H AFV FIL
H OUT
SIF IN
SIF APC FIL
SIF OUT
EXT AUDIO IN
VCO FIL
VCO COIL
VCO COIL
APC FIL
VIDEO OUT
BLK STRETCH FIL
INT VIDEO IN
VCC(V/C/D)
EXT VIDEO IN
GNDK(V/C/D)
SEL VIDEO OUT
APCI PIL
XTAL
FSC OUT
APC2 FIL
KILL FIL
XRAY
GNDK(CCD/H)
OSD CONTRAST
VCC(CCD)
CLOCK OUT
VCO IREF
FBP IN
T501
T401
TP421
RL551
N551
N552
B1 110V
B7 5V
B5 5V
B6 12V
B2 8V
B4 24V
B1 103V
B3 160V

3. PCB Diagram

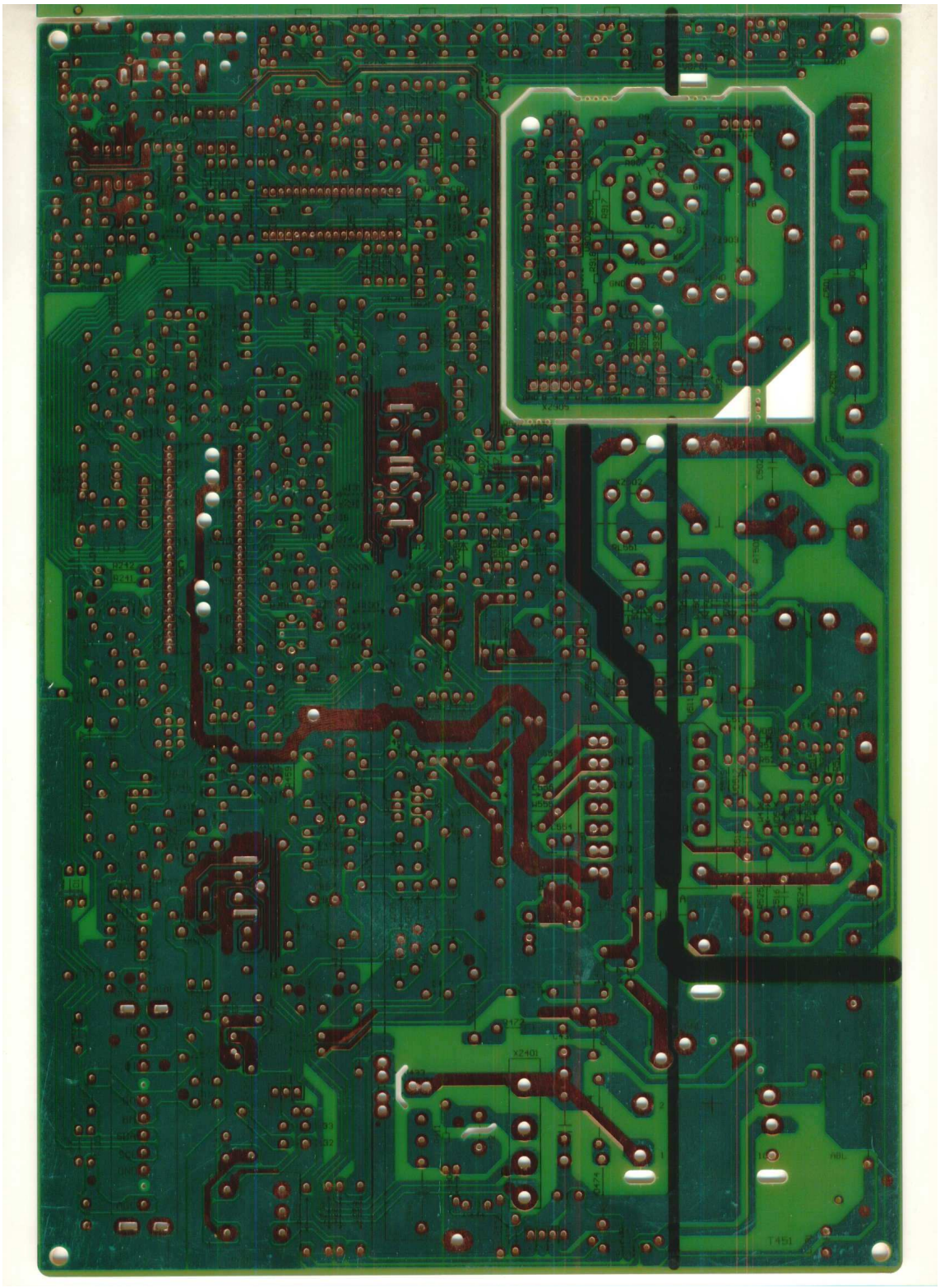


Figure 8

12. Circuit Explanation

1. Principle integrated circuits

A1. HTN19R12 color TV set composed of the following sections

(1) Small signal processing: super monolithic integrated circuits N204(LA76814A). and memory N901 (AT24C08).
(2) Sound power amplifying: integrated circuits N701 (LA4525).
(3) Horizontal and Vertical scan output circuits: Vertical output integrated circuits N402 (LA78040), Horizontal output transistor V411 (TT2140), Horizontal flying back transformer T402 (JF0501-19810).
(4) Switch power supply: switch transformer T501 (BCK-01-90II), power transistor V503 (2SD4460).

A2. Main integrated circuits:

(1) LA76814A	Microprocessor Picture IF/sound IF/video processing/H and V Scan/color decoding
(2) LA78040	Vertical output integrated circuits
(3) LA4525	Sound power amplifying integrated circuits

A3. Electrical circuit analysis

1、Microprocessor and Small signal processing: super monolithic integrated circuits ：LA76814A

LA76814A is super large integrated circuit decoder, containing intermediate image amplifying, intermediate sound amplifying, horizontal and vertical scan, small signal processing, color decoding, hi-pressure tracing and over-load protection, I^2C bus control.

Information introducing functions and testing data for maintenance is listed in Table 1.

1. N701 LC863424B

PIN	Leads Function	Voltage (V)	PIN	Leads Function	Voltage (V)
1	Auto adjust Enable Pin	5.1	19	OSD red signal output	0.09
2	Blank		20	OSD greem signal output	0.09
3	IIC data	4.6	21	OSD blue signal output	0.09
4	IIC clock	4.5	22	OSD blank signal output	0.01

5	Earth	0	23	Blank	5.1
6	CPU Crystal oscillation port	2.2	24	MUTE control	0.02
7	CPU Crystal oscillation port	2.75	25	Blank	5.07
8	Power (+5V)	5.1	26	AV option control 2	0.01
9	Plate control input	0.25	27	Av option control 1	0.01
10	AFT signal input	0.3	28	Control signal input	5.1
11	Blank		29	Right channel sound volume PWM output port	0.01
12	S terminal input test	5.1	30	Left channel sound volume PWM output port	0.01
13	CPU reset port	5.1	31	Blank	
14	OSD filter	3.55	32	Demagnetize	0.007
15	Video signal input	3.2	33	Blank	
16	POWER ON/OFF control signal output	0.03	34	Blank	
17	Field pulse input	4.8	35	Blank	
18	Line pulse input	4.3	36	Blank	

2. N101 LA76814K

PIN	Leads Function	Working Voltage (V)	PIN	Leads Function	Working Voltage (V)
1	Video output	2.23	28	Reciprocal pulse input	1.06
2	FM filter output	2.23	29	Reference current	1.69
3	AGC filter	2.22	30	Clock output	0.002
4	Hi AGC output	2.59	31	N.C.	0.002
5	MF input	1.30	32	OSD gain control	3.05
6	MF input	2.83	33	GND	0
7	GND	2.83	34	X ray protection	0.06
8	Power	0	35	ACC KILLER FILTER	0.39

9	FM filter	4.94	36	CHROMA AFC-F	3.49
10	AFT output	1.90	37	CW：3.58MHz OUT	0.54
11	Data bus	2.77	38		
12	Clock bus	4.85	39	Auto color filter	3.2
13	Beam input	4.76	40	Video output option	2.43
14	R input	3.92	41	GND	0
15	G input	0.14	42	Outside video input	2.55
16	B input	0.15	43	Power	5
17	Beam limit	0.08	44	Inside video input	2.77
18	RGB Power	7.94	45	lack strech delay filter	2.6
19	R input	2.21	46	Video output	2.12
20	G input	2.36	47	Auto phase control filter	3.5
21	B input	2.28	48	VCO COLL	4.3
22	Line synchronized output	0	49	VCO COLL	4.3
23	Field sawtooth wave output	2.47	50	FILL FILTER	2.24
24	Field incline gain	2.65	51	Outer sound input	2.12
25	Power	5.10	52	SIF output	1.95
26	AFC filter	2.49	53	SIF auto phase control filter	2.38
27	Line output	0.63	54	SIF input	3.14

Circuit Explanation

2. Service mode and adjusting items and data

1. Method

a. Press PRO button to enter the adjustment or setup mode.

b. Press CH+ or CH- button to turn page up or down for desired item options. If a special remote controller is used for options, part of adjustment items can be selected directly by pressing buttons on the remote controller.

c. Press VOL+ or VOL- button to alter the value of selected adjustment items.

d. In the factory production process, the factory adjuster is sued for accelerated adjustment.

2. Notices for adjustment

OSD		Range	Ref.
B/W BALANCE			
S-BRI		0-127	80
R-BIA		0-255	82
G-BIA		0-255	180
B-BIA		0-255	144
R-DRV		0-127	58
G-DRV		0-15	7
B-DRV		0-127	63
C. B/W		0-3	0
ADJUST			
H. PHASE		0-31	17
H.BLK.LEFT		0-7	7
H.BLK.RIGHT		0-7	0
V. SIZE		0-127	39
V. LINE		0-31	10
V. POSE		0-63	56
V. SC		0-31	0
RF. AGC		0-63	20
OSD H.POSI		0-127	10
OSD V.POSI		0-31	3
VOLUME OUT		0-127	100
SETUP			
STEREO OPTION		0-1	0
SUB.CONT		0-31	20
SUB.COLOR		0-63	25
SUB.SHARP		0-31	10
SUB.TINT		0-63	32
BLK.STR.DEF	(0：On; 1: Off)	0-1	0
AFC GAIN	(0: Low; 1: Hi)	0-1	1
V.SEPUP	(0: Low; 1: Hi)	0-1	1
CD.MODE	(LA76814: 0/1; LA76812: 0~7)	0-1	0
DIGITAL OSD	(0: Simulation OSD input; 1: Digit OSD input)	0-1	0
OSD CONT.	(0~127) / LA76814 (0~3)	0-3	2

GRAY MOD	(0/1)	0-1	0
OSD	Description	Range	Ref.
B.GAM.SEL	(0~3)	0-3	3
RG.GAM.DEF	(0/1)	0-1	0
FBPBLK.SW	(0/1)	0-1	0
BRIGHT ABL.TH	Bright. Abl. Threshold (0~7)	0-7	4
EMG.ABL.DEF	Emg. Abl. Def (0/1)	0-1	1
BRT.ABL.DEF	Brt. Abl. Def (0/1)	0-1	1
MID.STP.DEF	Mid. Stp.Def (0/1)	0-1	1
R-Y/B-Y G.BL	R-Y/B-Y Gain Balance (0~15) LA76814, no this function	0-15	8
R-Y/B-Y ANG	R-Y/B-Y Angle (0~15)	0-15	8
C.KILL.OFF	C_Kill OFF (0/1)	0-1	0
SND.TRAP	Sound Trap (0~7)	0-7	4
VOL.FIL	“Volume Filter Defeat”	0-1	0
VIF.SYS.SW	(0:45.75M; 1:58.75M) LA76814	0-1	0
VIDEO.LEVEL	Video Level (0~7)	0-7	7
FM.LEVEL	FM Level (0~31)	0-31	16
POWER OPTION	0: 2 starts; 1: memory; 2 or 3: 1 start	0-3	0
SEARCH CHECK	0: w/out start auto search; 1: w/ start auto search	0-1	0
SEARCH SPEED	0: search slow; 1: search fast	0-1	1
AV OPTION	0: w/out AV; 1: 1-way AV input; 2: 2-way AV input; 3: 3-way AV input	0-3	1
POSITION L/R	0: top left corner; 1: top right corner	0-1	1
BLACK BACK	0: No black back; 1: Black back	0-1	1
BLACK TRANS		0-1	1
V.MUTE P.OFF	0: video output not cut before POWER OFF; 1: video output cut before POWER OFF	0-1	0
CCD OPTION	0: CCD not used; 1: CCD used	0-1	1
V-CHIP OPTION	0: V-CHIP not used; 1: V-CHIP used	0-1	1
PASSWORD OPT.	0: V-CHIP not used; 1: V-CHIP used	0-1	1
TUNER OPTION	0:TDF-3M3 not used; 1: PHILIP UV1336B used	0-1	1
SCREEN OPTION	0:w/out curtain; 1: w/ at start; 2: w/ at close; 3: w/ at start/close	0-3	0
SCREEN TIME		0-7	6
SCREEN HDC		0-63	0

BAND SELECT		0-1	0

3.Circuit signals processing

(1) MF amplifying circuit

Received by antanna and processed by the high frequency tuner, the television signals will be transmitted by the tunner as 45.75MHZ signals to sound surface filter through C112 coupling after being amplified by V102, and then the MF signals of trapped wave in sound carrier wave from sound surface filter F45U will be sent to pin 5 and 6 of LA76814. The MF demodulation circuit of this TV set is completed through PLL carrier wave generator and outside pressure control oscillator (T101) in LA76814. The MF frequency is adjusted by T101 adjustment, and output of AFC is generated by a numerical control IF-PLL circuit, and read and sent to CPU by I^2C bus for correction of MF signals frequency deviation. The external capacitor of pin 3 decides the time constant of AGC， and high frequency amplication AGC will be transmitted by I^2C bus through pin 4 for control of high frequency tuner gain.

(2) Sound signals processing

The secondary sound MF signals are input via pin 54 of LA76814, and then demodulated in PLL tuner through lowpass and limit inside LA76814. After demodulation, the sound signals will be amplified through inside lowpass and transmitted via pin1. Pin 2 is FM output, C121 is deaccentuation capacitor, pin 9 is FM detector’s DC filter connector and C117 is filter capacitor. The external AUDIO signals are input via LA76814 pin 51, controlled by CPU. A swith inside I2C bus control LA76814 can be used for options of internal and external signals. The sound signals are transmitted via LA76814 pin 1 to LA4225A pin 1 via C601 coupling and transmitted from its pin 4, after being amplified by LA4225A, to the speaker. The mute circuit 1 is comprised of V601, V602 and other components for Power On and Off mute. Circuit 2 is comprised of CPU mute pin V603 and other components.

(3) Line sync processing circut

The line oscillation circuit of the TV set is fully comprised of LA76814 internal integrated components. The brightness signals containing compound sync signals are transmitted to the internal sync seperation circuit for line and field sync pulse.

(4) Line output circuit

Standard line oscilation pulse is output via pin 27 to V431 for line drive. T431 is H (L) drive used to convert the low current and high pressure pulse signals from line tube into low voltage and large current signals for line export needs. V432 is line output, C435 and C436 are reciprocal capacitor, C441 is S calibration capacitor, L441 is line linear indutance and T471 is line output transformer. 240V voltage needed for field scanning is transmitted via winding 10 of the transformer and gained after being rectified by VD472. In addition to anode

high pressure, screen grid and focus voltages, the transformer provides 180V video amplifier voltage by winding 2. VD411, C411, R412, VD412, R414 and C412 form the X ray protection circuit. R233, C231, R232, R403 and C408 form the beam restriction circuit. The winding 9 of the transformer provides CRT filament voltage.

(5) Field sync and output circuit

Field sync seperator produces field sync signals from compound sync signals and activates the field frequency splitting system. When a certain number field sync pulse is detected, the field frequency spliting system will start operation for frequency spliting of the muliple line frequency signals generated by the line frequency oscilator. The field pulse gained from frequency spliting will be sent to field sawtooth generator for sawtooth waves, and then transmitted by pin 23. The output circuit of this TV set is mainly comprised of LA7840 and other components.

(6) CRT output circuit

The tricolor signals produced by LA76814 will be transmitted to CRT board and then to the cathode of the TV tube after being amplified by videoamplifier which is comprised of V902, V912 and V922.

(7) CCD performance

The CVBS signals produced by LA76814 pin 40 will be amplified and sent to N701 pin 19 via V821 and then processed by software and hardware inside CPU. The decoded CCD signales will be transmitted to LA76814 pin 14, 15 and 16 via CPU pin 22, 23 and 24.

(8) V-CHIP performance

Performance of V-CHIP is mainly completed by CPU. The CPU receives grade signals from the IC bus and executes relative performances and shields those programs of relative grade.

4. Electric diagram (see attached page)

IV. Integrated circuit reference

1. All integrated circuit voltages

Following voltage data is achieved while the TV set is turned on, and the electric resistance is achieved when the TV set is turned off. When the status changes, the data should also be changed. So these data are used as references.

1. N701 LC863424B

PIN	Leads Function	Voltage (V)	PIN	Leads Function	Voltage (V)
1	Auto adjust Enable Pin	5.1	19	OSD red signal output	0.09
2	Blank		20	OSD greem signal output	0.09
3	IIC data	4.6	21	OSD blue signal output	0.09
4	IIC clock	4.5	22	OSD blank signal output	0.01
5	Earth	0	23	Blank	5.1
6	CPU Crystal oscillation port	2.2	24	MUTE control	0.02
7	CPU Crystal oscillation port	2.75	25	Blank	5.07
8	Power (+5V)	5.1	26	AV 选通控制端 2	0.01
9	Plate control input	0.25	27	Av option control 1	0.01
10	AFT signal input	0.3	28	Control signal input	5.1
11	Blank		29	Right channel sound volume PWM output port	0.01
12	S terminal input test	5.1	30	Left channel sound volume PWM output port	0.01
13	CPU reset port	5.1	31	Blank	
14	OSD filter	3.55	32	Demagnetize	0.007
15	Video signal input	3.2	33	Blank	
16	POWER ON/OFF control signal output	0.03	34	Blank	
17	Field pulse input	4.8	35	Blank	
18	Line pulse input	4.3	36	Blank	

2. N101 LA76814K

PIN	Leads Function	Voltage (V)	PIN	Leads Function	Voltage (V)
1	Video output	2.23	28	Reciprocal pulse input	1.06

2	FM filter output	2.23	29	Reference current	1.69
3	AGC filter	2.22	30	Clock output	0.002
4	Hi AGC output	2.59	31	N.C.	0.002
5	MF input	1.30	32	OSD gain control	3.05
6	MF input	2.83	33	Earth	0
7	Earth	2.83	34	X ray protection	0.06
8	Power	0	35	ACC KILLER FILTER	0.39
9	FM filter	4.94	36	CHROMA AFC-F	3.49
10	AFT output	1.90	37	CW：3.58MHz OUT	0.54
11	Data bus	2.77	38		2.87
12	Clock bus	4.85	39	Auto color filter	3.2
13	Beam input	4.76	40	Video output option	2.43
14	R input	3.92	41	Earth	0
15	G input	0.14	42	Outside video input	2.55
16	B input	0.15	43	Power	5
17	Beam limit	0.08	44	Inside video input	2.77
18	RGB power	7.94	45	Black strech delay filter	2.6
19	R output	2.21	46	Video output	2.12
20	G output	2.36	47	Auto phase control filter	3.5
21	B output	2.28	48		4.3
22	Line synchronized output	0	49	VCO COLL	4.3
23	Field sawtooth wave output	2.47	50	FILL FILTER	2.24
24	Field incline gain	2.65	51	Outer sound input	2.12
25	Power	5.10	52	SIF output	1.95
26	AFC filter	2.49	53	SIF auto phase control filter	2.38
27	Line output	0.63	54	SIF input	3.14

Circuit Explanation

13. Adjustment

1. Safety precautions

1. It is safe to adjust after using insulating transformer between the power supply and chassis input to prevent the risk of electric shock and protect the instrument.
2. Never disconnect leads while the TV receiver is on.
3. Don't short any portion of circuits while power is on.
4. The adjustment must be done by the correct appliances. But this is changeable in view of productivity.

2. Adjustment procedure

The chassis of this TV set uses sanyo IC with the latest digital bus processing technology. The adjustment points are fewer and the adjustment is simpler. The adjustment method is as follows:

1. +B: 104±1V adjustment.

1) Switch on the power and connect NTSC circular signals to the tuner.

2) Adjust variable resistor RP551 until the voltage of the main power is 104±1V.

2. Screen voltage adjustment.

1) Switch on the power and receive NTSC system circular signal. Warm up the TV set for 15 min.

2) Enter the adjustment state. Press the “MUTE” button, then a bright horizontal line appears. Adjust screen potentiometer to let the horizontal line just appears.

3. Focus adjustment.

1) Receive electronic circular signal.

2) Set picture mode on standard mode.

3) Adjust focus potentiometer until the optimum picture is achieved.

4. White balance adjustment.

1) Set the picture mode on standard mode.

2) Enter the D state and adjust RCUT, GCUT, BCUT, GDRV and BDRV.

3) Coordinate of reference white color: (X=0.281, Y=0.311).

6. Adjustment of horizontal and vertical position and size.

1) Switch on the power and connect the signals to the tuner to receive NTSC system circular signal.

2) Enter the D state. Adjust HPOS to change the horizontal position and V. POSE to change the vertical position. Adjust V.SIZE to change the vertical size until the vertical size is 90-92%. Horizontal size is related to the capacitor C436. Hold the horizontal size is 90-92%.

17. Information of Resistors and 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=1000Ω,M=1000KΩ
3.The unit of capacitance is μF(microfarad). P=10^{-6}μF.

Numbering system of Capacitor

Example

CL42 ----- 17 ---- 50V ---- 2F4 ---- 104 * ---- Z
Type Voltage Value(PF) Toleance

CL21X ---- 100V ---- 223 * ---- J
Type Voltage Value(PF) Toleance

CL110X ---- 25V ---- 100μF ± 20%
Type Voltage Value Toleance * 10<u>4</u> =10×10^4 22<u>3</u>=22×10^3

Numbering system of Capacitor

Eaxmple

RY17S ---- 2W ---- 390 ---- J ---- 05-E-A
Type Wattage Value(Ω) Toleance

RS11 ---- 1/2W ---- 1.8K ---- K
Type Wattage Value Toleance

ABBREVIATION OF PART NAME AND DESCRIPTION

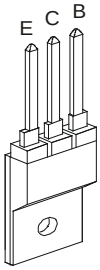
RESISTOR

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

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

Terminal view of transistors



2SD18887YD

2SC4544----B-A
2SB1569A-E----B-A EXPORT
2SP2400A-E----B-A EXPORT
2SC3853(2SC3852)----E-A
3DD2553----B-A
3CA688----E-A
2SC3853(2SC3852)----B-A

KSR1010TA
KSR2010TA

2SC1815-Y------F
2SA1015-Y------F
2SC752GTM-Y------F EXPORT
2SC2878-A(TEM)------F EXPORT
RN1204(DTC144ESATP) EXPORT
2SA562TM-Y------F
2SC3355------F EXPORT

Figure 11

Sincere Forever

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