

HAIER

COLOR TELEVISION

SERVICE MANUAL

PART # TV-8888-36

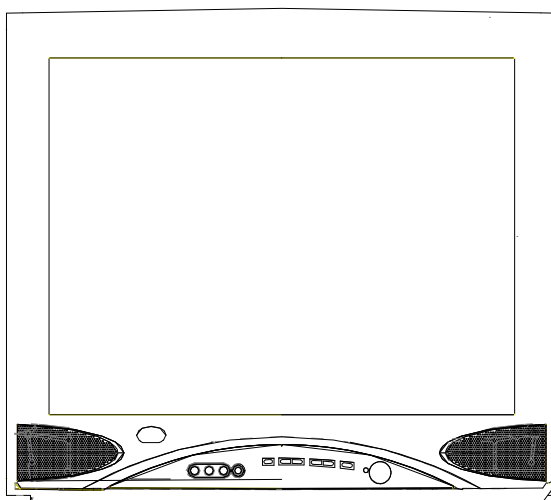
HAIER AMERICA TRADING, LLC
www.haieramerica.com



BH2404D

COLOUR TELEVISION

Service Manual



MODEL :
BH2404D
USA

Features

- 218 programs present
- Multiple picture modes
- On/off timer
- Child-lock、V-CHIP
- CCD、BTSC

Haier Group

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1. Features

- 1) 218 programs present
- 2) Multiple picture & volume modes
- 3) On/off timer
- 4) Child-lock、 Program scan
- 5) Slide curtain power on/off display

2. Specifications

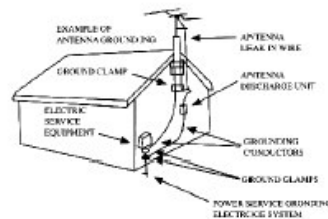
NO	FUNCTION		
1	PIC	Main IC	UOC
2		CRT	SF
3		Color system	NTSC
4		Audio system	M
5		NO.of channels	218
6		OSD language	ENGLISH
7		Multi-picture modes	YES
8	AUDIO	AV stereo	YES
9		Super woofer	
10		Surrounding sound	
11		Treble/bass boost	
12		Left/right balancer	
13		NICAM	
14		Multi-audio modes	
15		Tone adjuster	
16		MTS/SAP	YES
17		Auto-volume leveling	
18	JIC	AV input	YES
19		AV output	
20		DVD terminal	
21		S-video jack	YES
22		Headphone socket	YES
23	SOFTWARE	SCART socket	
24		Digital curtain	
25		Slow fading on & off	
26		Semitransparent menu	YES
27		Non-flashing channel changing	
28		ZOOM	
29		16:9 mode	
30		Games	
31		Calendar	YES
32		Child-lock	YES
33		Multi-functional lock	YES
34		No-picture listening	
35		Background light	
36		Auto-timer on	YES
37		CCD	YES
38		V-CHIP	YES

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

3. SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

- 1) Save these Instructions — the safety and operating instructions should be retained for future reference.
- 2) All warnings on the appliance and in the operating instructions should be followed.
- 3) Cleaning — Unplug TV from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use only a damp cloth for cleaning.
Exceptions: Some products are designed for uninterrupted service, eg. Cable TV converters, unplugging such accessories may result in loss of authorization codes. In such cases, please follow instructions for unplugging such devices as provided by the accessories manufacturer.
- 4) Attachments — do not use attachments not recommended by the TV manufacturer as they may cause hazards.
- 5) Water and moisture — do not place this TV near water, for example, near a bathtub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.
- 6) Accessories — do not place this TV on an unstable cart, stand, tripod, bracket, or table. The TV may fall, causing serious injury to someone, and serious damage to the appliance. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the TV. Any mounting of the appliance should follow the manufacturer's instructions and should use a mounting accessory recommended by the manufacturer. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.
- 7) Ventilation — Slots and openings in the cabinet and the back or bottom are provided for ventilation and to ensure overheating. These openings must not be blocked in a built in installation such a bookcase or rack unless proper ventilation is provided or the manufacturer instructions have been adhered to.
- 8) POWER Sources — this TV should be operated only from the type of power sources indicated on the electrical nameplate. If you are not sure of the type of power supply to your home, consult your appliance dealer or local power company. For TV's intended to operate from battery power or other source, refer to the operation instructions.
- 9) Grounding or polarization — This TV is equipped with a polarized alternating current line plug (a plug having one blade wider than the other is). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to inset the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your outlet. Don't defeat the safety purpose of the polarized plug.
- 10) Power cord protection — Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords or plugs, convenience receptacle, and the point where they exit from the appliance.
- 11) Outdoor antenna grounding — If an outside antenna or cable system is grounded so as to provide some protection against voltage surges and built up static charges. Article 810 of the National Electrical Code, ANSI/NFPA No.70, provided information with respect to proper grounding of the mast and supporting structure, grounding of the lead in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirement for the grounding electrode. (Fig. A)



(Fig. A)

-
- 12) Lighting precaution — for added protection for this TV receiver during a lighting storm or when it is left unattended for long period of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the TV due to lighting and power line surges.
 - 13) Object and liquid entry — never push objects of any kind into this TV through openings as they may touch dangerous voltage point or short out parts that could result in a fire or electric shock. Avoid spilling liquid of any kind on the TV.
 - 14) Servicing — do not attempt to service the TV by yourself, as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
 - 15) Damage Requiring Service — Unplug this TV from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - a. When the power supply cord or plug is damaged or frayed.
 - b. If liquid has been spilled, or objects have been fallen into the TV.
 - c. If the TV has been exposed to rain or water.
 - d. If the TV does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the TV to its normal operation.
 - e. If the TV has been dropped or damaged in any way.
 - f. When the TV exhibits a distinct change in performance; this indicates a need for service.
 - 16) Replacement parts — when replacement parts are required, be sure the service technician uses replacement parts specified by the manufacturer that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, injury to persons or other hazards.
 - 17) Safety check — Upon completion of any service or repairs to this TV, ask the service technician to perform routine safety checks to determine that the TV is in proper operation condition.
 - 18) Heat — This TV product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.
 - 19) Modifications — Any changes or modifications not expressly approved by the Federal Communications Commission are prohibited.
 - 20) Read these instructions.
 - 21) Keep these instructions.
 - 22) Heed all warnings.
 - 23) Follow all instructions.
 - 24) Do not use this apparatus near water.
 - 25) Clean only with a dry cloth.
 - 26) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
 - 27) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
 - 28) Do not defeat the safety purposes of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
 - 29) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
 - 30) Only use the attachments/accessories specified by the manufacturer.
 - 31) Unplug this apparatus during lightning storms or when unused for long periods of time.
 - 32) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- (Please save these instructions for future reference.)

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.

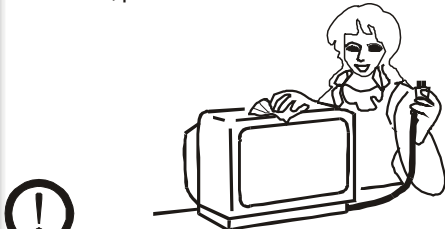
Before returning the receiver to the customer,

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.

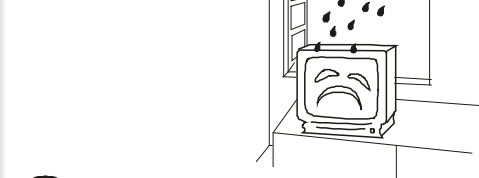
Warning and Cautions

4. 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.



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, circuitboard 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 antistatic 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.

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. (500F to 600F)
 - 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.

Warning and Cautions

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

Warning and Cautions

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.

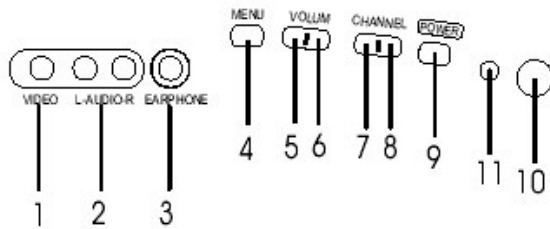
Carefully crimp and solder the connections.

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

5. Parts and Functions

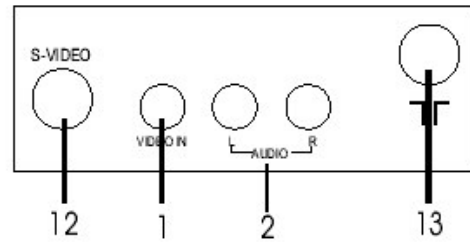
Front and rear panel of the TV set

Front



- 1. V-IN: Video Input
- 2. A-IN(L/R): Audio Input
- 3. Earphone
- 4. Menu: Access/Exit Main M (Menu)
- 5. VOL-: Decrease sound
- 6. VOL+: Increase sound
- 7. CH-: Select next lower channel
- 8. CH+: Select next higher channel
- 9. Power: Power on/off
- 10. Power Indicator
- 11. Sensor Windows

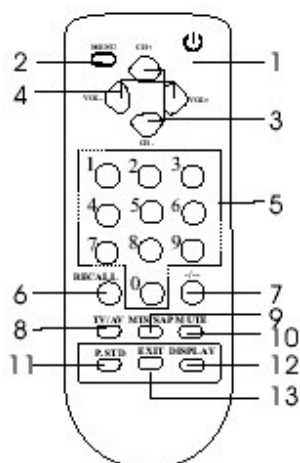
Rear



- 12. S-VIDEO: S-Video Input
- 13. ANT. IN: Antenna In

6. Remote Controller Functions

Remote Control Functions



1. : Power on/off
2. MENU: Access/Exit Main M
3. CH+/-: Select next higher or lower channel
4. VOL+/-: Increase or decrease sound
5. CHANNEL NUMBER BUTTON: Direct channel tuning (TV channel 02-69, CATV channel 01-125.)
6. RECALL: Return to previous channel
7. ./-: Digital Selector
8. TV/AV: TV/AV selection
9. MTS/SAP: MTS/SAP selection
10. MUTE: Press key to Activate/deactivate Mute Function
11. P.STD: Picture Preference Select Button
12. DISPLAY: Display receiving channel
- 13.EXIT: Exit TV Menu

7. Program Diagram

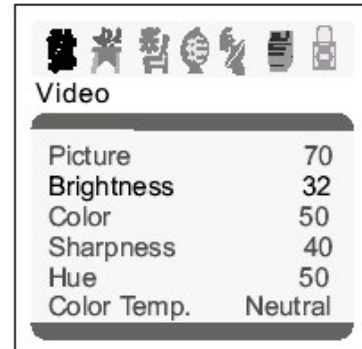
Video Set Up:

Pressing MENU button once will bring the Video Set Up menu on the TV

The following is shown on your TV screen:

Follow the procedure below to adjust the picture quality of your choice:

1. Press the CH(+) and CH(-) button to go up and down the menu.
2. Press the VOL(+) and VOL(-) button to increase and decrease the level to your preference for each item.



Adjustment of Picture Quality:

To adjust the picture quality from the factory preset read the following:

Picture: By increasing the level. It will adjust white areas of picture and by decreasing the level, it will adjust black areas of picture.

Brightness: By increasing the level, it will add more light to dark parts of the picture and by decreasing the level, it will add more dark to light parts of the picture.

Color: By increasing the level. It will adjust the low and the high level of the picture.

Sharpness: By increasing the level, it will show cleaner and clearer images and by decreasing the level, it will make picture smoother.

Hue: You can adjust the tint of the picture by going into picture set up menu. By decreasing the level, it will give red tint to skin color and by increasing the color it will give green tint to skin color.

Color Temp : By pressing the VOL(+/-) buttons to select the three setting A) Neutral, B) Warm, C) Cool.

Audio Set Up:

By pressing MENU button, and then pressing VOL(-/+) button it will bring you to Audio Set Up display. You will see the following menu on your TV screen:

Follow the procedure below to adjust the sound quality:

Press VOL(+) button to increase and VOL (-) button to decrease the level to your preference.



Timer Set Up:

By pressing MENU button ,and then pressing VOL(-/+) button it will bring you to Timer Set Up display. You will see the following menu on your TV screen:

Follow the procedure below to select one of the above options:

1. Press the CH(+) and CH(-) button to go up and down the menu.
2. Press VOL(+) button or VOL (-) button to select your preference.



Timer	
Clock	17:18
Time-On	18:00
Ch. Select	1
Time-Off	--:--
Sleep Time	0
Remind Time	--:--
Ch. Switch	1

Clock: Press CH(+/ -) buttons to scroll to Clock, then press VOL (-/ +) buttons to set the hour after setting the hour press CH(+/ -) buttons to go to minute mode and set by using VOL(+/ -) buttons.

Time-On: Press CH(+/ -) buttons to scroll to Clock, then press VOL (-/ +) buttons to set the hour after setting the hour press CH(+/ -) buttons to go to minute mode and set by using VOL(+/ -) buttons.

Ch. Select: This exclusive feature switches you to your favorite channel at the appropriate set time. Press VOL(+) and VOL(-) buttons to select the channel.

Time-Off : Press CH(+/ -) buttons to scroll to Clock, then press VOL (-/ +) buttons to set the hour after setting the hour press CH(+/ -) buttons to go to minute mode and set by using VOL(+/ -) buttons.

Sleep Time: This feature allows you to turn off television in pre-selected minutes (180, 170, 160,, 10 and 0).

Remind time: Press CH(+/ -) buttons to scroll to Clock, then press VOL (-/ +) buttons to set the hour after setting the hour press CH(+/ -) buttons to go to minute mode and set by using VOL(+/ -) buttons.


Ch. Switch: This feature lets you store your favorite channel. Once you store the channel number in this function, when the set time is up, it will switch over to the set channel. This feature is used with the Exchange feature. Press VOL(+) or VOL(-) button to select the channel.

Function Set Up:

By pressing the MENU button , and then pressing VOL-/+ button will bring you to Function Set Up menu. You will see the following menu on your screen:

Follow the procedure below to select one of the above options:

1. Press the CH(+) and CH(-) button to go up and down the menu.
2. Press the VOL(+) and VOL(-) button to increase and decrease the level to your preference for each item.



Setup	
Language	English
Background	on
Black Stretch	on
VNR	on
C. Caption	off
Demo Mode	

Language: Use VOL(+/-) to select the OSD in either English, French or Spanish.

Background: Press the VOL(+/-) buttons to select between Background ON or Background OFF. When the Background ON function is chosen, a moving "NO SIGNAL" sign will be displayed if there is no input signal to the set.

Black Stretch: Press VOL(+/-) buttons to turn the Black Stretch feature on or off. When the Black Stretch function is on the screen automatically increases the contrast range.

VNR: Press VOL(+/-) buttons to turn the VNR function on or off. VNR is a term for Video Noise Reduction, a built-in device on the set that reduces video noise interference so the viewer is assured a clear picture.

C.Caption: Press VOL(+/-) buttons to select the Closed Caption options. Closed Captioning helps the hearing impaired with the broadcast program, as well as helping children learn how to read. A built-in decoder displays the audio portion of a program as text on the screen when this option is selected.

OFF: When OFF is displayed on TV means C.Caption is turned off.

CC1: When CC1 displays on TV means C.Caption is turned on.

CC2 to CC4: For other modes of video related broadcast information.

T1: For program guide and other information displayed by broadcasters.
(This blocks a large portion of the picture on your screen).

T2 to T4: For other modes of information displayed by broadcasters.
(This blocks a large portion of the picture on your screen).

Note: Select CC1 for full translation of the primary language such as English in your area. Select CC2 for secondary language translation such as Spanish or any other language that maybe broadcast in your area.

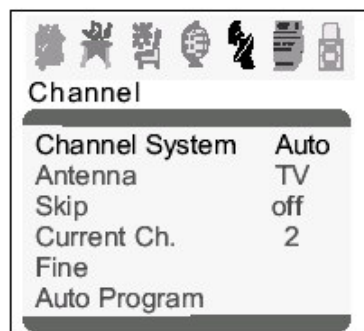
Demo mode: This will display the main functions of the TV set.

Channel set up:

By pressing MENU button, and then pressing VOL-/ + button it will bring you to Channel Set Up. You will see the following display on TV screen.

Follow the procedure below to select above options:

1. Press the CH(+) and CH(-) button to go up and down the menu.
2. Press VOL(+) button or VOL(-) button to select your preference.



Channel System: Press the VOL(-/+) buttons to select the correct channel system.

In general, you can set it as "AUTO" (AUTO, NTSC and NTSC443 will display in turn)

Antenna: Press VOL(+) button or VOL(-) button to select TV or CATV.

Channel Coverage by Antenna:

Antenna Type	Channel Range
VHF	2-13
UHF	14-69
CATV	1-125

Skip : Press VOL(+) button or VOL(-) button to add or delete the channel from the stored memory.

Current Ch. : Press VOL(+) button to go up and VOL (-) button to go down to set the channel position. The display will show the current playing channel.

Fine: If the picture and/or sound are poor, try using the FINE TUNE feature.

Do not use this feature unless reception is poor. Press VOL (+/-) to start the Fine Tune function.

Auto Program: Press VOL(+) button or VOL (-) button to auto program in channels.

This search automatically adds only the active channels in your area to the TV's memory. It deletes any channels on which there is no broadcast or a poor signal.

Note: The Auto Search function will scan the channels on the selected antenna input. If the TV is connected to cable, please select Cable under Antenna.

Calendar:

Your TV has been designed with a calendar. By pressing MENU button, and then pressing VOL-/ + button it will bring you to Calendar. You will see the following display on TV screen.

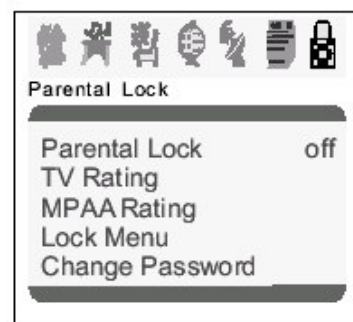
Follow the procedure below to adjust the Calendar :

1. Press the CH +/- buttons to select the year item, the month item or the date item.
2. Press the VOL -/+ buttons to change calendar setup (1901.1.1-2099.12.31).
3. Press EXIT button to exit the calendar mode.



V-CHIP SetUP:

Press the MENU Button on your remote control to go to Password menu, then input the password (0000). It will bring Parental Lock set up display on the screen. You will see the following menu on your screen:



This function enables you to block certain TV channels in accordance to the V-CHIP requirement established by the FCC.

To set the V-CHIP function:

Select the TV Rating option. You will see the TV Rating menu on your TV screen:

1. Press CH(+/-) button to go up and down the menu.
 2. Press VOL(+/-) button to go into TV Rating and Movie Rating menus.
 3. Press MENU button to set the Parent lock ON and Parent lock OFF.
- When TV rating is selected, you will see the following rating table on your TV screen.

Rating	FV	D	L	S	V
TV-Y	>U				
TV-Y7	U	U			
TV-G	U				
TV-PG	U	U	U	U	U
TV-14	U	U	U	U	U
TV-MA	U		U	U	U

Note: You can press CH(+/-) buttons to go up and down the menu, then press VOL(+) button to select "B" or "U".

When Movie rating is selected, you will see the following rating table on your TV screen.

MPAA Rating	
G	U
P G	U
P G - B	U
R	U
NC-17	U
X	U

Note: You can press CH(+/-) buttons to go up and down the menu, then press VOL(+) button to select "B" or "U".

- PARENT LOCK OFF means the lock function is turned off. If the PARENT LOCK is in "OFF" mode then V-CHIP function will not be active to accept the V-CHIP signal.
- PARENT LOCK ON means the lock function is turned on. If the lock is in the "ON" mode then V-CHIP function is activated to accept the V-CHIP signal.

Password

The "Default Password" preset by the manufacturer is "0000". If you want to change the preset password to your own password, just choose any four digits that can be easily remembered and set. Once you set password for a particular channel, that channel will be blocked. This channel can only be accessed with the password.

LOCK Menu

AV LOCK: When it is set ON, you cannot use the AV.

PROGRAM LOCK: When it is set ON, the current channel is locked, you can not see the program of this channel.

V-Chip Technology:

The "V-Chip Technology" allow you to use U.S. And Canada Movies and TV PROGRAMS Guide ratings to block certain types of TV programs and movies. To understand clearly about TV programs rating codes, read the following list:

U.S. TV Program Ratings

NR: Not Rated-this means that programs are not rated or rating does not apply.

TV-Y: For all children-this type of rated programs are designed for a very young audience, including children from ages 2-6.

TV-Y7: Directed for older children - this type of rated programs may include comedic violence of mild physical, or may frighten children under the age of 7.

TV-G: General Audience-this type of rated programs contains little or no violence, no strong language, and little or no sexual dialogue and situations.

TV-PG: Parental Guidance Suggested-this type of rated programs may contain limited violence, some suggestive sexual dialogue and situations, and rare language.

TV-14: Parents strongly cautioned-this type of rated programs may contain sexual content, strong language and more intense violence.

TV-MA: Mature audience only-this type of rated programs may contain sexual violence, explicit sexual content and profane language.

FV: This type of rated programs contain Fantasy and cartoon violence.

Violence: This type of rated programs contain violence.

S: This type of rated programs contain sex.

L: This type of rated programs contain offensive language.

D: This type of rated programs contain dialogue with sexual content.

To understand clearly about movies rating codes, read the following list:

U.S. Movies Rating Chart

NR: This means movie is not rated yet. It is pending government rating approval.

G: General Audience-this type of movie rating means all ages admitted to see the movie.

PG-13: Parents Strongly Cautioned - this type of movie rating means some material may not be appropriate for children under 13.

R: Restricted- This type of movie rating means children under 17 of age requires to be with parent or guardian.

NC-17: This type of movie rating means no one 17 and under admitted.

X: This type of movie rating means adults only.

To understand clearly about Canadian programs rating codes, read the following list:

Canadian English Rating Chart

E: Exempt - this type of rated programs contain news, sports, documentaries, talk shows, music videos, and variety of other programs.

C: This type of rated programs are intended for children under age 8. There is no offensive language, nudity or sexual content.

C8+: This type of rated programs generally considered acceptable for children 8 years and over. There is no profanity, nudity or sexual content.

G: This type of rated programs generally suitable for all audiences.

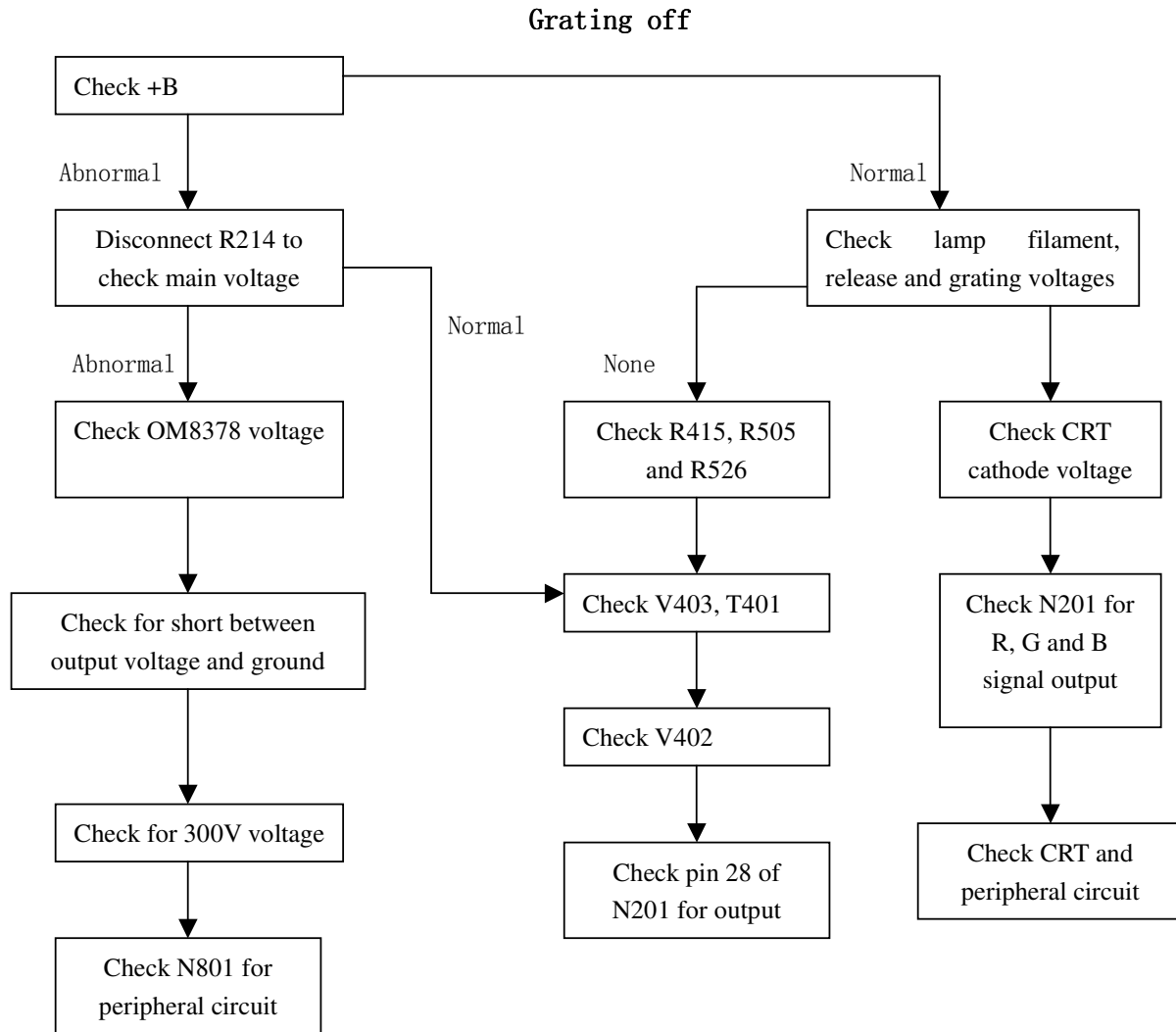
PG: Parental Guidance Suggested - in this type of rated programs, some material may not be suitable for children.

14+: In this type of rated programs, some content may not be suitable for viewers under the age of 14. Parents are strongly cautioned not to have their children view 14+ rated programs by pre-teens and early teens.

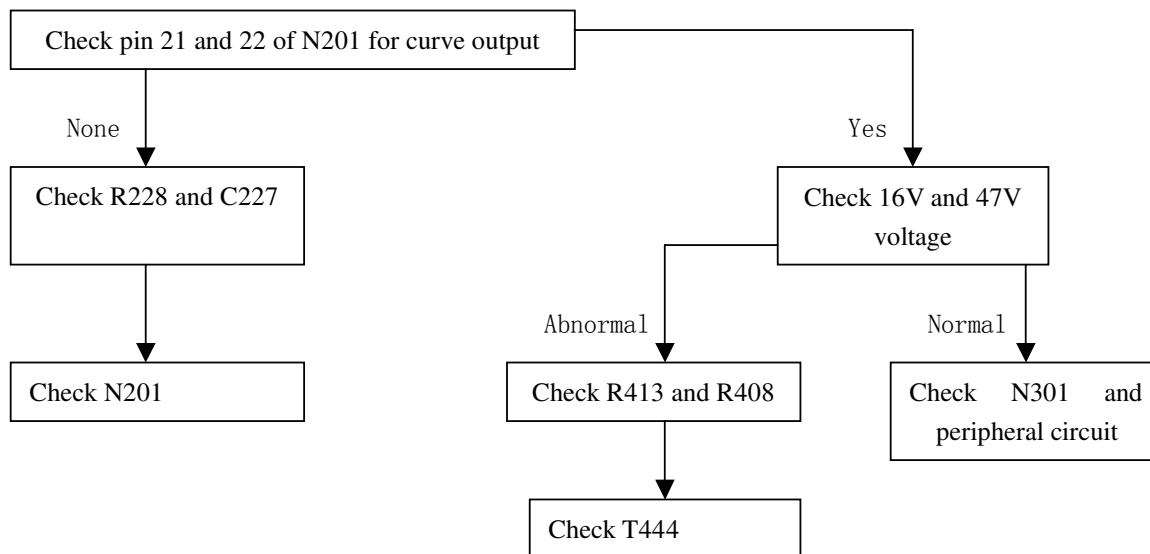
18: Adults Only-this type of rated programs are only for adult viewers only.

8. Maintenance Service and Trouble Shooting

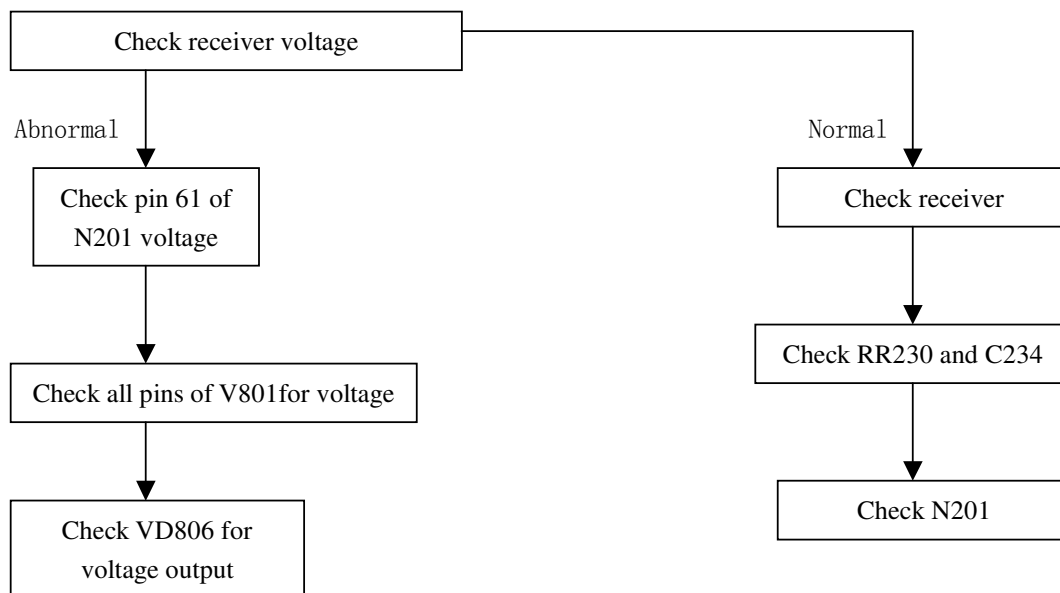
a. TROUBLESHOOTING PROCESS



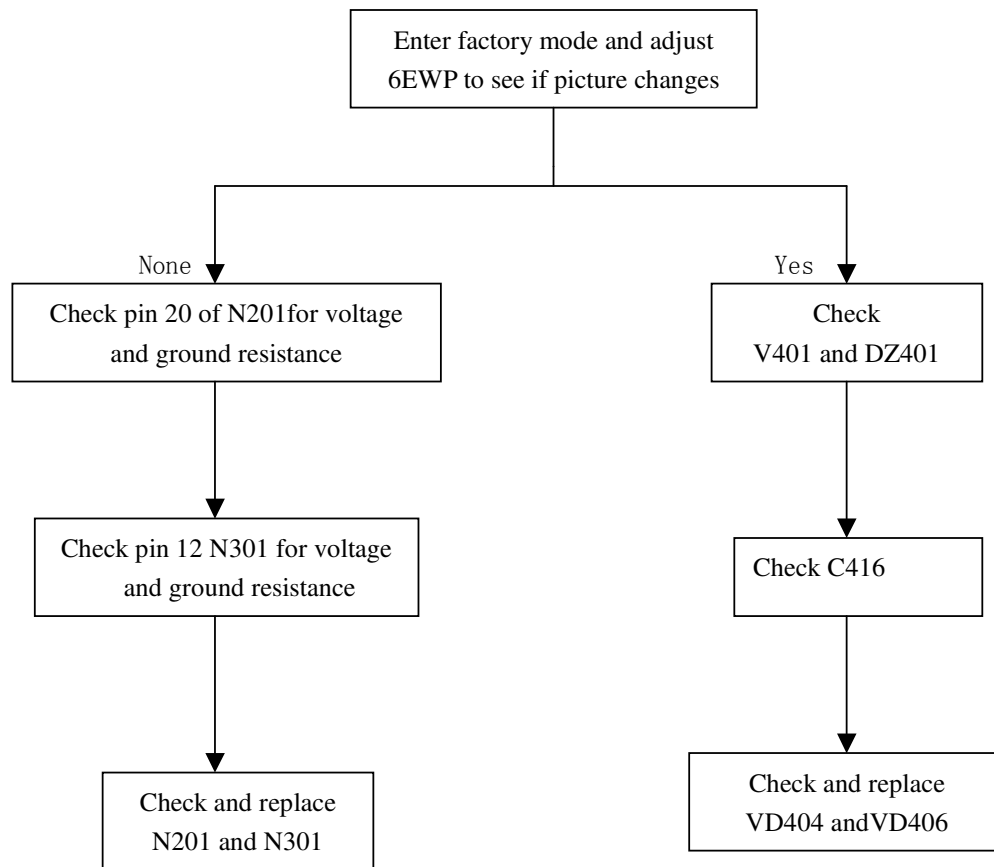
Horizontal bright line



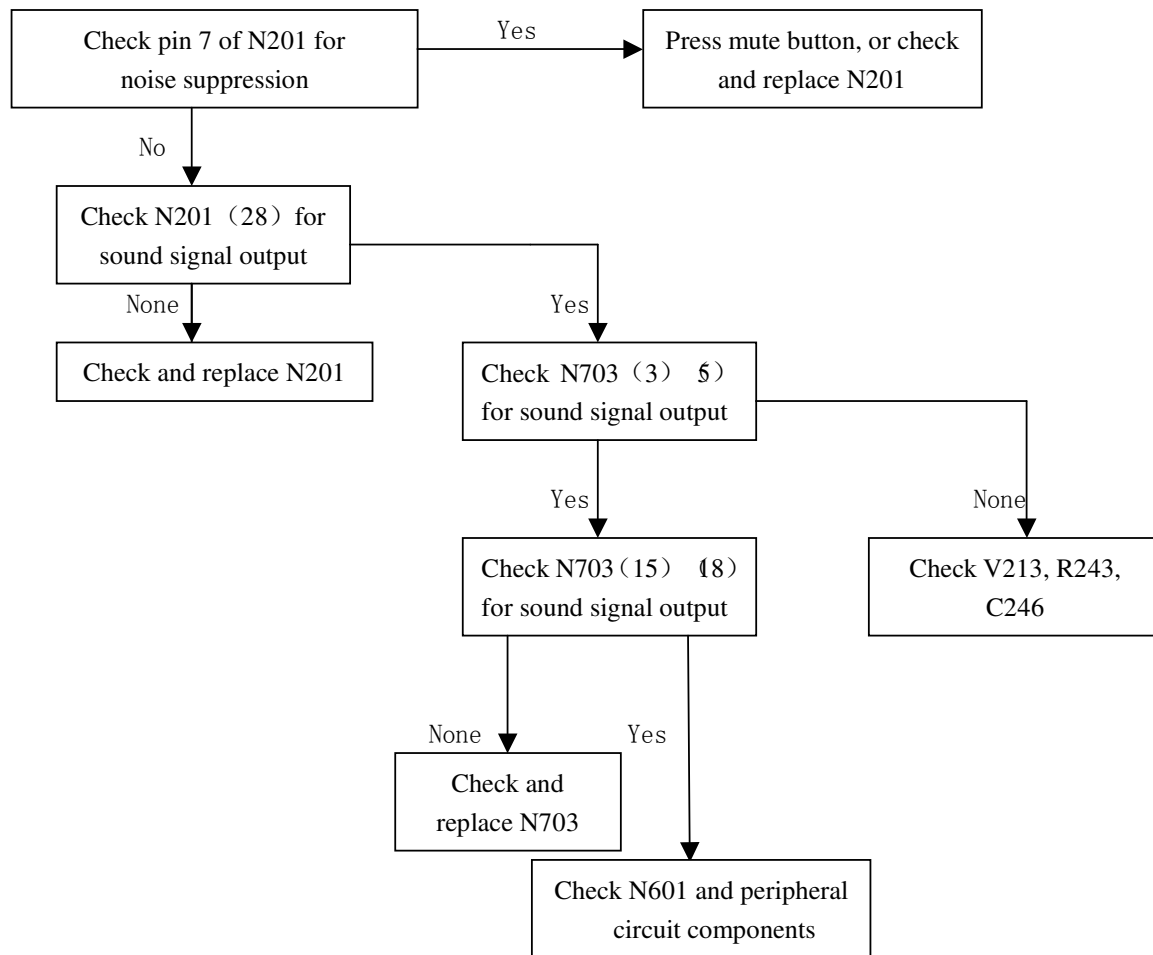
Disabled remote control



Pincushion distortion



















TV program sound off



b. Troubleshooting guide

- To assist in location possible faults use help guide below.

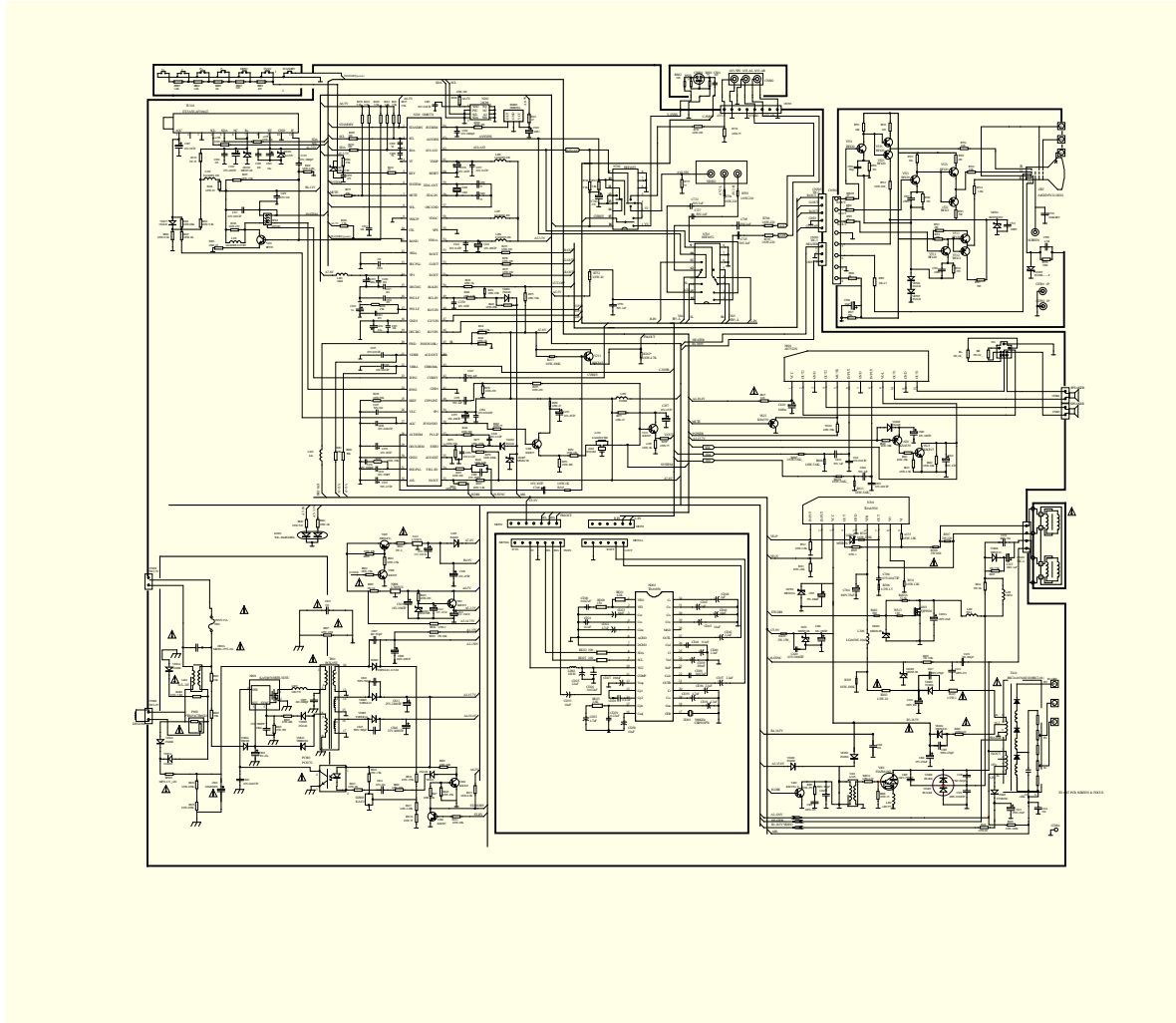
BREAKDOWN PHENOMENON		CHECKING
PICTURE	SOUND	
 Picture with snow	 Noise	The aerial direction and connection
 Double or Triple Image	 Normal	This is called ghosting which can be minimized with an outside aerial, and good quality cable and terminations. Altering the aerial direction can also minimize this effect.
 Disturb	 Noise	Electrical interference which can be caused by cars, motorbikes etc, Fluorescent lamps and dirty insulators on overhead power cables.
 Normal	 No sound	Volume Sound mute
 No Picture	 No sound	Ensure that the power supply is connected to the TV set and turned on. Also ensure that the TV set is not in "Listen Mode" or that the brightness and contrast are not turned down.
 No colour	 Normal volume	Adjust colour control
 Scramble	 Normal or Weak Volume	Adjust channel again
 Colour Spot	 Normal volume	Colour Purity fault which can be caused by moving the TV set, placing magnets near the TV screen or turning on/off house hold appliances such as vacuum cleaners near the TV set. Turn the TV off with the mains power switch for 15 minutes. When the power is turn on again the TV set will automatically degauss the picture. In server cases leave the TV set turned off over night.

Note:

- 1.If the fault can not be repaired using the above guide consult with your local authorized service center.
- 2.The TV set must only be repaired by a qualified registered service person. Never attempt to remove the back cover as the TV set has dangerous voltages in side that may cause a fatality or fire.
3. The cabinet may produce the occasional "snapping sound" This is normal and caused by the materials in the cabinet expanding with room temperature changes.

9. Circuit Diagram

A. Circuit Diagram



B. PCB Diagram

10. Circuit Explanation

The UOC module comprised of Philip super advanced CMOS OM8378 is used for mode BH2404D color TV pictures. This product has I²C bus-mastering digital control system and S VEDIO terminals for auto sound identification, image mode for individual preference, ccd, v-chip, btsc, and 218 channel storage.

I. Electrical circuits and integrated circuits of BH2404D TV receiver

1.1 Electrical circuits

Electric circuits of the BH2404D TV receiver are comprised of the following sections:

- 1.1.1 Microprocessor and signal processor: comprised of super single chip integrated circuit N201 (OM8378), storage N202 (KS24C08).
- 1.1.2 Sound processing and amplifying: comprised of integrated circuit NN02 (TDA9850) for sound tone processing and integrated circuits N601 and N610 (TDA7522) for sound amplifying.
- 1.1.3 Integrated circuit for line and field scan output: comprised of integrated circuit N301 (TDA8359J) for field output, V403 (FQPF630---A-A) for line output tube and T444 (BSC24-01N4021D) line output transformer.
- 1.1.4 Power supply control: comprised of switch transformer T801 (BCK-05E), power integrated circuit N801 (KA5Q0765RTH-YDTU).

1.2 Main integrated circuits:

- 1.2.1 OM8378 Microprocessor / picture intermediate frequency / sound intermediate frequency / video processing / line field scanning / color decoding / text
- 1.2.2 TDA9850 Multi- function TV stereo sound tone processing integrated circuit
- 1.2.3 TDA8359J Field output integrated circuit
- 1.2.4 TDA7522 Sound amplifying integrated circuit
- 1.2.5 KA5Q0765RF-YDTU Power integrated circuit

2 Electric circuit analyses

2.1 Super single chip integrated circuit OM8378

As a super large-scale decoding and microprocessing integrated circuit, OM8378 is comprised of a microprocessor, picture image intermediate frequency amplification, sound intermediate frequency amplification, line and field scanning, dwarf signal processing, color decoding, sound filtering and auto identification, luminance separation, high voltage tracking and over voltage protection. It functions for I²C bus -mastering and automatic adjustment for transmeridional correction and dark balance.

Table 1 lists the pin function and test data of OM8378 as the reference for maintenance.

The data is to be tested under the mode 40.75MHz, NTSC M and cylindrical color card muting, using a model FLUKE 79III instrument.

Table 1

Pin	Function	Working voltage (V)	Resistance to Ground R	
			Forward Test (Ω)	Back Test (Ω)
1.	STANDBY	0	36K	29K
2.	SCL	3.5	15K	15K
3.	SDA	3.2	15K	15K
4.	VT	3.0	20K	20K
5.	KEY	3.4	36K	30K
6.	SYSTEM	4.4	15K	15K
7.	MUTE	5.1	15K	15K
8.	GND. MAG	0	Infinity	2.9M
9.	VSS C/P	0	0	0
10.	BAND	3.3	14.5K	14K
11.	BAND	0	14.5K	14K
12.	VSSA	0	0	0
13.	SEC. PLL	2.3	6.4M	4.3M
14.	VP2	7.8	18K	18K
15.	DECD/G	5.0	31.9K	32K
16.	PH2. LF	2.9	6.4M	4.2M
17.	PH1. LF	3.9	6.4M	4.2M
18.	GND3	0	0	0
19.	DEC. BG	4.0	39.8K	40K
20.	EWD	0.7	63K	63K
21.	V. DRB	2.4	6.0M	4.0M
22.	V. BRA	2.4	6.0M	4.0M
23.	IF. IN1	1.9	37.5K	38K
24.	IF. IN2	1.9	37.5K	38K
25.	I. REF	3.85	38.8K	38.8K
26.	V. S. C.	3.8	6.3M	4.6M
27.	TUNER. AGC	1.7	4.9K	4.9K
28.	AU. DEEM	3.2	6.1M	3.6M
29.	DECS. DEM	2.4	5.9M	3.6M
30.	GND2	0	0	0
31.	SND. PLL	2.4	6.3M	4.7M
32.	AVL	0	6.2M	3.8M

33.	H. OUT	0.6	21K	21K
34.	F. B. L. SO	0.3	6.4M	4.4M
35.	AUO. EXT	0	0	0
36.	EHTO	1.7	21.8K	22K
37.	PLL. IF	2.4	6.4M	4.6M
38.	IF. VO/SVO	3.3	4.3M	4.6M
39.	VP1	7.8	18K	18K
40.	CVPS. INT	3.9	5.4M	4.1M
41.	GND1	0	0	0
42.	CVBS/Y	3.3	6.2M	4.0M
43.	CHROMA	1.5	83K	83K
44.	AUD. OUT	3.4	6.4M	4.8M
45.	INSS. W2 (BL)	2.1	0.86K	0.86K
46.	R2/V. IN	2.5	6.3M	4.5M
47.	G2/Y. IN	2.5	6.3M	4.5M
48.	B2/U. IN	2.5	6.3M	4.5M
49.	BCL. IN	1.5	216K	239K
50.	BLK. IN	4.9	28K	28K
51.	R. OUT	2.8	7.46K	7.5K
52.	G. OUT	2.8	7.48K	7.5K
53.	B. OUT	2.9	7.5K	7.5K
54.	VDD. A	3.3	32K	26K
55.	VPE	0	0	0
56.	VDD. C	3.3	32K	26.5K
57.	OSC. GND	0	14	13
58.	XTAL. IN	1.8	3.0M	2.7M
59.	XTAL. OUT	1.7	0.5M	0.54M
60.	RESET	0	0	0
61.	VDDP	3.4	32K	26.6K
62.	AV1/AV2	5.1	15K	15K
63.	AV/SVHS	5.1	15K	15K
64.	INT. REM	5.0	41K	40.6K

2.3 Analysis of common passage circuits

Having been received by antenna or fed by cable TV into the antenna input terminal of HF tuner TU101 (ET-5A5E-AF108AT), HF TV signals pass through tuning for station selection, HF amplification and frequency mixing inside the HF tuner and then, 45.75MHz IF picture signal and 41.25MHz IF sound signal will be transmitted from the IF terminal of TU 101 and be fed directly into (1) of the preIF amplification the signals will be amplified to compensate for the insertion loss of the sound surface filter.

The sound surface filter SF101 (D1510C) adopts single-terminal or double-terminal input according to different system choices. The single-terminal or double-terminal input are controlled by the (6) of N201 with N101 (BC548C): M signals in double channels. The sound surface filter K6264K is a wide range filter for single channel input, and is a narrow range filter for double-channel input, suitable for M sound signal. The IF signals which have passed through

sound carrier deep trap by sound surface filter will be sent to the (23) and (24) of N201 (OM8378). HF amplification AGC will be sent out from the (27) of N201 (OM8378) under the control of I²C bus for the gain control of HF tuner.

2.4 Analysis of signal trap option switch circuit

Video color signals will be sent out from (38) of N201 (OM8378) and emit and followed by triodes V208 and

, and then, divided into sub-flows which are fed into the wave traps Z201 respectively. All TV signals will be selected and pass through V209 and V212, which are rejector triodes and serve the function of switches here. When the 6 pins of N201 (OM8378) export high level with sound below 4.5M, V212 will break over and the signals will pass through the wave traps Z201; and when the 6 pins send out low level with sound of 4.5M, V212 will stop and V209 break over, and the signals will go through the wave trap Z201. Video signals will be produced after all TV signals are trapped by the wave trap, and then, one sub-flow will go through R255 (430 Ω) and R256 (470 Ω) for signal adjustment amplitude and enter into (40) of N201 (TDA9373), and another sub-flow will, after emit and followed by a triode V212, serve as AV output.

Both the video signal in AV signals and the Y signal in S terminal signals will be selected and passed through V202 (HEF4053BP), and will then be fed into the (42) of N201 (OM8378); and the C signal of S terminal will be fed into the (43) of N201 (OM8378). Both the AV1 and AV2 video signals and the Y signal of S terminal will be selected and passed through V202 (HEF4053BP) under the control of the (62) and (63) of N201 (OM8378).

2.5 Analysis of sound tone processing circuit

The sound tone processing circuit is comprised of an integrated circuit NN02 (TDA9850) and peripheral components. TDA9850 is a multifunction TV sound tone processing integrated circuit of Hi-Fi grade inside which treble and bass frequency division processing, stereo processing and encircling sound processing are made.

The audio signals sent out by the (44) of N201, after emit and followed by V213, will be divided into two subflows which enter into the (3) and (5) of NN02 (TDA9850) respectively. Meanwhile, the audio signals from the left and right channels of AV1 terminal will be put into the (1) and (32) of NN02 (TDA9850). The audio signals of S terminal and AV1 share the same subflow.

2.6 Analysis of sound amplifying circuit

The sound amplifying circuit is comprised of an integrated circuit TDA7522 and peripheral components. TDA7522 is a double-channel stereo sound amplifying circuit featuring MUTE and POWER functions, with power output 2*1W. TDA7522 has a BTL sound output manner with no coupling capacitor in its output circuit, which has a wide range of power supply (6V~18V) and the functions of short circuit protection and over-load protection.

2.7 Analysis of field output circuit

Field sync signals separated from the mixed sync signals trigger the field frequency division system. Once a certain sum of field sync pulse signals have been detected, the field frequency division system will start in action. Of the field sync pulse signals which are obtained from frequency division, one sub-flow will be fed into a sample pulse generator to, together with line feedback signal, produce sample pulses necessary for the circuit.

Another sub-flow will be sent to field sawtooth wave generator. The field frequency sawtooth wave that has undergone geometric processing will be sent from the (21) and (22) of N201 to the (1) and (2) of the field output N301. The external resistor R228 ($39K\Omega$) of the (25) of N201 will supply reference current to field sawtooth wave generator, and the external capacitor C227 (104) of the (26) serves as the capacitor for field saw-tooth wave.

Field output integrated circuit N301 is a full bridge type current driving output circuit of with a bridge type output manner, and field deflection coil is directly connected to the middle of output amplifier. The positive and negative sawtooth signals sent out from the (21) and (22) of N201 will enter into the (1) and (2) of N301 symmetrically, which, after being rectified and amplified by TDA8359J, will be sent out from the (9) and (5).

2.8 Analysis of line sync and scan output circuit

As the line oscillation circuit is inside N201 (OM8378), no external line oscillation components is needed and the oscillation frequency is under the control of PH-1 detector. A flow of luminance signals including mixed sync signals is sent to a sync separation circuit therein, which separate line and field sync pulse signals, among them, the line sync pulse signals are sent to PH1 detector. The PH1 detector functions to synchronize the line oscillation frequency with the frequency of input signals.

C221 (472), R226 ($15K\Omega$) and C222 (1u) connected to N201 (17) are PH-1 phase-locked loop filters. The line oscillation signals that have been corrected by PH1 detector will be sent to PH2 detector, which functions to stabilize and control the phase of line drive pulse output for ensuring that the line linearity and center remain unchanged.

The external capacitor C218 (222) of (16) is a filter capacitor for PH2 detector. Line pumping signals are sent out by the (33) of N201 and fed into a line driving triode V402 (KSC2331), and then, after being amplified by a triode V403 (FQPF630) switch, drive line deflection coil to produce magnetic field to control an electronic beam for horizontal scanning.

C414, C415 and C427 are the capacitors for line return stroke, C406 is the line correction capacitor, and L402 is the linear inductance for line. EW geometric correction signals are sent out by the (20) of N201 and fed into the (12) of N301, which, after being rectified, will be sent out from the (11) of N301 and, after being amplified by a triode V401 (FJAF6810D) and waveshaped by C403 and L401, put into line scanning circuit for a geometric correction in transmeridional direction.

Both VD404A and VD404B are modulating damper diodes, and T444 is a line output transformer. VD202, R275, R276, R259 and C256 constitute a HV tracking circuit to compensate HV variation caused by variation of luminance, hence an automatic correction of change of picture geometric sizes along with HV variation. R419, R249, VD201, R248 and C250 constitute a beam limit circuit.

Line return stroke pulses sent out by the (9) and (8) of line output transformer T444 will be rectified and filtered to produce DC voltage +16.5V and +46V, which are then fed into the (4) and (8) of N301 for supply power to the forward and return strokes of field output integrated circuit, and, the voltage +16.5V will then be regulated

(7) sends out a heater voltage of 6.3Vrms ; (1) provides line sync signal to N201 (TDA9373) ; and the line return stroke pulse sent out by the (5) is rectified and filtered to obtain a DC voltage +180V for power supply to video amplification circuit.

2.9 Analysis of video amplification circuit

Video amplification circuit is peripheral components. R, G and B signals coming from the (51), (52) and (53) of N201 (OM8378) are sent to the (2), (3) and (1) , an integrated video amplification output circuit , contains three independent video amplifiers which amplify the input R, G and B, three basic color signals, which are fed into the cathode of picture tube by (7), (8) and (9).

2.10 Analysis of power switch circuit

A typical self-excited pulse power switch has been chosen for this TV receiver. When the power switch is in the ON position, the voltage from AC 120 V power grid will be rectified by a rectifying tube VD810 to produce a pulse voltage , which will be filtered by a capacitor C806 (220u) to form a DC voltage of about +300V, and the said DC voltage will be fed into the (1) of the power integrated circuit N801 (KA500765RF-YDTU entry) by the (1)~(4) windings of switch transformer T801 (BCK-05E) ;

At start-up, the voltage from an AC single-phase power supply will be divided by starting resistors R803 and R802 to provide starting voltage to N801. After start, an impulse voltage produced by (6)~(7) windings of T801 will be rectified and provided. Photo coupler PC801 (PC817C entry) serves the function of voltage regulation. The error message about the voltage exported by the switch transformer will be transmitted to the (4) of PC801 by the photo coupler PC801, hence adjusting the oscillation parameters of N801.

During stand-by time, POWER signals will be at a lower level, which causes the triode V803 (KSC815) to stop. So a voltage +12V will be put into the photo coupler PC801 (PC817C entry) by resistor R849 and diode VD816, which feeds a special parameter to the (4) of N801 and makes the N801 enter a quasiresonance working state, with the power supply voltage (3) being 11V~12V. In this way, the output voltage of the switch transformer T801 will drop a great deal,

resulting in a great reduction of stand-by power consumption.

The impulse voltage sent out by the (8) of the secondary of switch transformer can be rectified and filtered by VD805 (D5L60) and C816 (100u) to produce a DC voltage +25V for power supply to line output electrode;

The DC voltage +8V sent out by the (8) of N804 after a voltage regulation of secondary power supply will supply power to N2 decoding circuit, the DC voltage +3.3V obtained by the voltage regulation of 12V by the resistor R843 (2K) , triode V801 (KSC815) and diode DZ808 (MTZ3.9B) will supply power to N201 micro-processing circuit, and the DC voltage +5V sent out by the (9) will supply power to a storage block N202 (KS24C08) circuit.

11. Adjustment

Operating method: After a normal start-up, successively push the combination keys of mute, screen display, -/—, screen display and mute on the workshop remote controller to enter a maintenance menu.

Push numeric 0~7 keys for a rapid choice in the maintenance menu.

Push P+/- (CH+/-) key to choose items to be adjusted;

Push VOL+/- key to adjust the size of the present item;

Push MUTE key for mute/no mute switchover

Push the key for screen display retreat to retreat from the maintenance menu

Push the numeric 0 key Screen voltage adjustment

VG2: INSIDE HIGH/LOW

Adjust acceleration electrode to change the screen display from VG2: OUTSIDE HIGH/LOW to VG2: INSIDE HIGH/LOW

Maintenance menu 1 Geometric distortion (Table 8)

Table 8

Item	Description	Adjusting range	Default	Remarks
6PAR	Correction of four corners	0~63		
6BOW	Bow-shape correction	0~63		
6HSH	Correction of line center	0~63		
6EWW	Correction of line width	0~63		
6EWP	Correction of pillow-shaped distortion	0~63		
6UCR	Correction of upper corners	0~63		
6LCR	Correction of lower corners	0~63		

Correction of geometric distortion will automatically fall into categories according to the present identifiable 60hz systems.

Push numeric 2 key:

Maintenance menu 2 Geometric distortion (Table 9)

Table 9

Item	Description	Adjusting range	Default	Remarks
6EWT	Keystone correction	0~63		
6VSL	Field inclination correction	0~63		
6VAM	Field amplitude correction	0~63		
6SCL	Field S correction	0~63		
6VSH	Field center correction	0~63		
6VOF	OSD vertical position	0~63	39	
HOF	OSD horizontal position		25	
VX	Vertical zoom	0~63	25	Unadjustable

S correction will be adjusted according to the curvature of a picture tube, and the picture tubes of the same type possess the same S correction value.

Correction of geometric distortion will automatically fall into categories according to the present identifiable 50/60hz systems.

Push numeric 3 key:

Maintenance menu 3 Picture adjustment (Table 10)

Table 10

Item	Description	Adjusting range	Default	Remarks
RED	Mild color (Red)	0~63	32	
GRN	Mild color (Green)	0~63	32	
WPR	White neutralizing red	0~63		
WPG	White neutralizing green	0~63		
WPB	White neutralizing blue	0~63		
YDFN	Luminance delay NTSC			
YDAV	Luminance delay AV			

White balance: Fully degauss the picture tube, consolidate R excitation, and adjust B and G excitation.

Push numeric 4 key:

Maintenance menu 4 (Table 11)

Table 11

Item	Description	Adjusting range	Default	Remarks
TOP	AGC control starting point	0~63		
VOL	UOC Volume output	0~63	44	Unadjustable
9860	TDA9860 Secondary volume control	0~100	59	Unadjustable
HDOL	Cathode voltage	0~15	5	Unadjustable
AGC	AGC Velocity	0~3	1	Unadjustable

VG2B	VG2 Luminance	0~100	42	Unadjustable
IF0	Off-set IF demodulator	0~63	30	Unadjustable
LCT	OSD BRITGHTNESS	0~3	0	Unadjustable

Push numeric 5 key:

Maintenance menu 5 Analogue of picture mode (Table 12)

Table 12

Item	Description	Adjusting range	Default	Remarks
OCON	Leisurely-listening mode contrast	0~100	0	Unadjustable
OBRI	Leisurely-listening mode luminance	0~100	0	Unadjustable
OCOL	Leisurely-listening mode color	0~100	50	Unadjustable
OSHP	Leisurely-listening mode definition	0~100	50	Unadjustable
1CON	Soft mode contrast	0~100	45	Unadjustable
1BRI	Soft mode luminance	0~100	45	Unadjustable
1COL	Soft mode color	0~100	50	Unadjustable
1SHP	Soft mode definition	0~100	50	Unadjustable

Push numeric 6 key Analogue of picture mode (Table 13)

Table 13

Item	Description	Adjusting range	Default	Remarks
2CON	Standard mode contrast	0~100	65	Unadjustable
2BRI	Standard mode luminance	0~100	50	Unadjustable
2COL	Standard mode color	0~100	70	Unadjustable
2SHP	Standard mode definition	0~100	70	Unadjustable
3CON	Brilliant mode contrast	0~100	80	Unadjustable
3BRI	Brilliant mode luminance	0~100	50	Unadjustable
3COL	Brilliant mode color	0~100	70	Unadjustable
3SHP	Brilliant mode definition	0~100	70	Unadjustable

Push numeric 7 key

Maintenance menu 7 Function choice (Table 14)

Table 14

Item	Description	Adjusting range	Default	Remarks
OPTION1	Function choice	0~255	99	Unadjustable
OPTION2	Function choice	0~255	40	Unadjustable
OPTION3	Function choice	0~255	8	Unadjustable
OPTION4	Function choice	0~255	64	Unadjustable
OPTION5	Function choice	0~255	199	Unadjustable
OPTION6	Function choice	0~255	1	Unadjustable
OPTION7	Function choice	0~255	0	Unadjustable

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=1000 Ω , M=1000K Ω

3. The unit of capacitance is μ F (microfarad). P=10⁻⁶ μ F.

Numbering system of Capacitor

Example

CL42	-----	17	-----	50V	-----	2F4	-----	104 *	-----	Z
Type				Voltage				Value (PF)		Tolerance
CL21X	-----	100V	-----	223 *	-----	J				
Type		Voltage		Value (PF)		Tolerance				
CL110X	-----	25V	-----	100 μ F		\pm		20%		
Type		Voltage		Value		Tolerance			* 104 = 10 \times 10 ⁴	223 = 22 \times 10 ³

Numbering system of Capacitor

Example

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

ABBREVIATION OF PART NAME AND DESCRIPTION

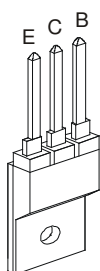
RESISTOR

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

CAPACITOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Ceramic	J	$\pm 5\%$
T	Ceramic	K	$\pm 10\%$
L	Film	L	$\pm 15\%$
D	Electroanalysis	M	$\pm 20\%$
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

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