

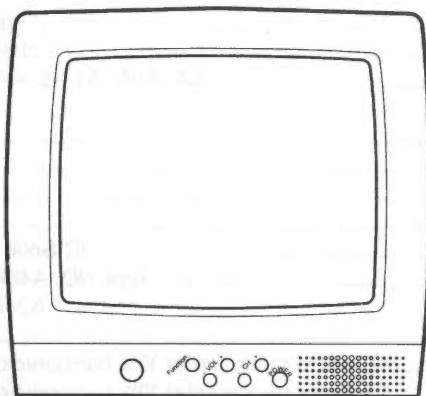
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GoldStar

COLOR TV SERVICE MANUAL

CAUTION

BEFORE SERVICING THE CHASSIS, READ THE "SAFETY PRECAUTIONS"
IN THIS MANUAL.



CHASSIS : NC-4JA

MODEL : GCT1356M(CN-14B90)
GCT1956M(CN-20B90)

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SPECIFICATIONS

POWER INPUT	AC 120 Volts, 60Hz
POWER CONSUMPTION	95 watts (19")
	85 watts (13")
ANTENNA INPUT IMPEDANCES	75 ohm unbalanced (VHF/UHF)
CHANNEL RANGE (181 CHANNEL)	
12 VHF channels	channels 2 to 13
56 UHF channels	channels 14 to 69
113 CATV channels	5A, A-W, A1-A5, AA-CCC, 66-125
INTERMEDIATE FREQUENCIES	
Picture I-F carrier frequency	45.75 MHz
Sound I-F carrier frequency	41.25 MHz
Color sub-carrier frequency	42.17 MHz
Center frequency	44 MHz
CHASSIS CONSTRUCTION	IC-Solid state chassis
PICTURE TUBE	Type NO. A48KUV02XX(19")
	A34KPU02XX(13")
RESOLUTION(CENTER)	280 LINES
SOUND OUTPUT	1.5 watts minimum(at 10% harmonic distortion)-19"
	1.2 watts minimum(at 10% harmonic distortion)-13"
CABINET	Plastic
WEIGHT	13": 9.1Kg
	19": 17.7Kg
DIMENSIONS	13": 376 x 378 x 362 (W x D x H)
	19": 500 x 478 x 466 (W x D x H)

ABBREVIATIONS : Used in this book

ADJ	Adjustment or Adjust	V.I.F	Video Intermediate Frequency
AFC	Automatic Frequency Control	H	Horizontal
AGC	Automatic Gain Control	V	Vertical
AMP	Amplifier	IC	Integrated Circuit
CRT	Cathode Ray Tube	OSD	On-Screen Display
DEF	Deflection	BPF	Band Pass Filter
DET	Detector	LPF	Low Pass Filter
FBT	Flyback Transformer	DP	Delay Phase
H.V	High Voltage	DG	Delay Group
OSC	Oscillator	PLL	Phase Locked Loop
SEP	Separator	APC	Automatic Picture Control
SYNC	Synchronization	BM	B+ Main
S.I.F	Sound Intermediate Frequency	BT	B+ Tuning

SAFETY PRECAUTIONS

1. Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

a. Be sure that no built-in protective devices are defective and/or have been defeated during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer.

Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. **Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.**

b. Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, (1) spacing between the picture tube and the cabinet mask, (2) excessively wide cabinet ventilation slots, and (3) an improperly fitted and/or incorrectly secured cabinet back cover.

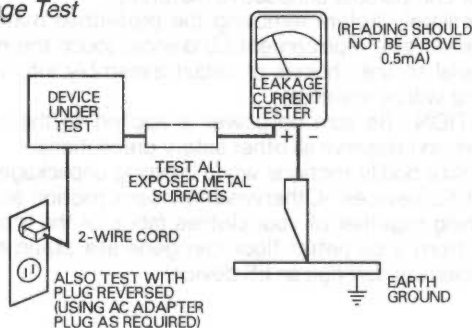
c. **Antenna Cold Check**-With the instrument AC plug removed from any AC source, connect an electrical jumper across the two AC plug prongs. Place the instrument AC switch in the on position. Connect one lead of an ohmmeter to the AC plug prongs tied together and touch the other ohmmeter lead in turn to each tuner antenna input exposed terminal screw and, if applicable, to the coaxial connector. If the measured resistance is less than 1.0 megohm or greater than 5.2 megohm, an abnormality exists that must be corrected before the instrument is returned to the customer. Repeat this test with the instrument AC switch in the off position.

d. **Leakage Current Hot Check**-With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American

National Standards Institute (ANSI) C101.1 *Leakage Current for Appliances* and Underwriters Laboratories (UL) 1410, (59.7). With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle bracket, metal cabinet, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milliamp. Reverse the instrument power cord plug in the outlet and repeat test.

ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER.

AC Leakage Test



e. **X-Radiation and High Voltage Limits**-Because the picture tube is the primary potential source of X-radiation in solid-state TV receivers, it is specially constructed to prohibit X-radiation emissions. For continued X-radiation protection, the replacement picture tube must be the same type as the original. Also, because the picture tube shields and mounting hardware perform an X-radiation protection function, they must be correctly in place.

High voltage must be measured each time servicing is preformed that involves B+, horizontal deflection or high voltage. Correct operation of the X-radiation protection circuits also must be reconfirmed each time they are serviced. (X-radiation protection circuits also may be called

"horizontal disable" or "hold-down.") Read and apply the high voltage limits and if the chassis is so equipped, the X-radiation protection circuit specifications given on instrument labels and in the *Product Safety & X-radiation Warning* note on the service data chassis schematic.

High voltage is maintained within specified limits by close-tolerance safety-related components/adjustments in the high-voltage circuit.

If high voltage exceeds specified limits, check each component specified on the chassis schematic and take corrective action.

2. Read and comply with all caution and safety-related notes on or inside the receiver cabinet, on the receiver chassis, or on the picture tube.

3. **Design Alteration Warning**- Do *not* alter or add to the mechanical or electrical design of this TV receiver. Design alterations and additions, including, but not limited to, circuit modifications and the addition of items such as auxiliary audio and/or video output connections, might alter the safety characteristics of this receiver and create a hazard to the user. Any design alterations or additions will void the manufacturer's warranty and will make you, the servicer responsible for personal injury or property damage resulting therefrom.

4. **Picture Tube Implosion Protection Warning**-The picture tube in this receiver employs integral implosion protection. For continued implosion protection, replace the picture tube only with one of the same type number. Do *not* remove, install, or otherwise handle the picture tube in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while picture tubes are handled. Keep the picture tube away from your body. Do not handle the picture tube by its neck. Some "in-line" picture tubes are equipped with a permanently attached deflection yoke; because of potential hazard, do *not* try to remove such "permanently attached" yokes from the picture tube.

5. **Hot Chassis Warning** -a. Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord and may be safely serviced without an isolation transformer only if the AC power plug is inserted so that the chassis is connected to the *ground* side of the AC power source. To confirm that the AC power plug is inserted correctly, with an AC voltmeter measure between the chassis and a known earth ground. If a voltage reading in excess of 10V is obtained, remove and reinsert the AC power plug in the opposite polarity and again measure the voltage potential between the chassis and a known earth ground. b. Some TV receiver chassis normally have 85V AC (RMS) between chassis and earth ground regardless of the AC plug polarity. These chassis can be safely serviced only with an isolation transformer inserted in the power line between the receiver and the AC power source, for both personnel and test equipment protection. c. Some TV receiver chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is *isolated* from the AC power line. The two ground systems are electrically separated by insulating material that must not be defeated or altered.

6. Observe original lead dress. Take extra care to assure correct lead dress in the following areas : a. near sharp edges, b. near thermally hot parts- be sure that leads and components do not touch thermally hot parts, c. the AC supply, d. high voltage, and e. antenna wiring. Always inspect in all areas for pinched, out-of-place, or frayed wiring. Do not change spacing between components, and between components and the printed-circuit board. Check AC power cord for damage.

7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

8. PRODUCT SAFETY NOTICE

Some electrical and mechanical parts have special safety related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by shading, by a (★) or (Δ) on schematics and parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement parts might create shock, fire, and/or other hazard. Product Safety is under review continuously and new instructions are issued whenever appropriate.

SERVICING PRECAUTIONS

CAUTION: Before servicing instruments covered by this service manual and its supplements, read and follow the **SAFETY PRECAUTIONS** section of this manual. **NOTE:** If unforeseen circumstances created conflict between the following servicing precautions and any of the safety precautions, **always follow the safety precautions.** Remember: Safety First.

General Servicing Precautions

1. a. Always unplug the instrument AC power cord from the AC power source before: (1) removing or reinstalling any component, circuit board, module or any other instrument assembly. (2) disconnecting or reconnecting any instrument electrical plug or other electrical connections. (3) connecting a test substitute in parallel with an electrolytic capacitor in the instrument.

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

- b. Do not defeat any plug/socket B+ voltage interlocks which instruments covered by this service manual might be equipped.
- c. 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.
- d. Always connect a test instrument's ground lead to the instrument chassis ground **before** connecting the test instrument positive lead.
Always remove the test instrument ground lead last.

NOTE: Refer to Safety Precautions Section of this manual.

2. The service precautions are indicated or printed on the cabinet, chassis or components. When servicing, follow the printed or indicated service precautions and service materials.
3. The Components used in the unit have a specified flame resistance and dielectric strength. When replacing any components, use components which have the same ratings. Components identified by shading, by (*) or (Δ) in the circuit diagram are important for safety or for the characteristics of the unit. Always replace with the exact replacement components.
4. An insulation tube or tape is sometimes used and some components are raised above the printed wiring board for safety. The internal wiring is sometimes clamped to prevent contact with heating components. Install them as they were.
5. After servicing, always check that the removed screws, components and wiring have been installed correctly and that the portion around the service part have not been damaged and so on. Further check the insulation between the blades of attachment plug and accessible conductive parts.

INSULATION CHECKING PROCEDURE

Disconnect the attachment plug from the AC outlet and turn the power on. Connect the insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1M-ohm.

NOTE: Accessible Conductive Parts including metal panels, input terminals, earphone jacks, etc.

ELECTROSTATICALLY SENSITIVE (ES) DEVICES

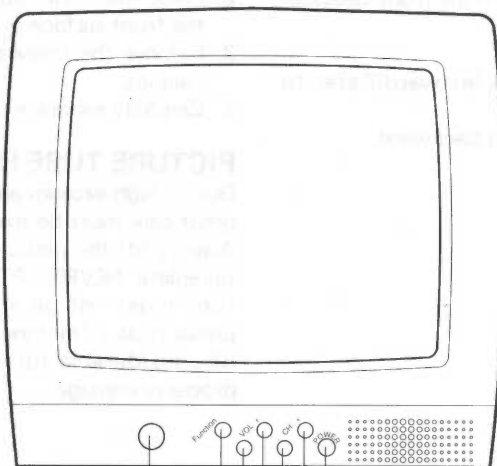
Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following 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 body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons 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 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 harmless motion such as the brushing together of your clothes fabric or the lifting of you foot from a carpeted floor can generate static electricity sufficient to damage an ES device)

CONTROLS LOCATIONS

FRONT



REMOTE CONTROL
SENSOR

FUNCTION BUTTON

POWER BUTTON

CHANNEL +(UP)/-(DOWN) BUTTONS

VOLUME +(UP)/-(DOWN) BUTTONS

REMOTE CONTROLLER

POWER BUTTON

CHANNEL SELECTION
BUTTONS

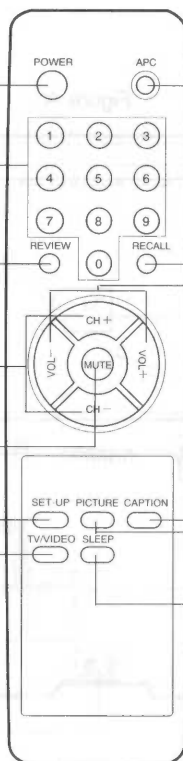
REVIEW BUTTON

CHANNEL +(UP)/-(DOWN)
BUTTONS

MUTE BUTTON

SET UP BUTTON

TV/VIDEO BUTTON
(for CN-14B90 only)



APC BUTTON

RECALL BUTTON

VOLUME +(UP)/(DOWN)
BUTTONS

CAPTION BUTTON

PICTURE BUTTON

SLEEP BUTTON

DISASSEMBLY INSTRUCTIONS

BACK CABINET REMOVAL

1. Remove the screws residing on the back cabinet and carefully separate the back cabinet from the front cabinet.

MAIN CHASSIS REMOVAL

1. Hold the bracket and push the latch leftward (Refer to figure B.)
2. Grasp both sides of main chassis, pull it backward.

SPEAKER ASSY REMOVAL

1. Remove the speaker connector.
2. Remove the 4 screws.

CRT REMOVAL

1. Pull out the CRT board from CRT neck.
2. Place the front cabinet on soft material so as not to mar the front surface or damage of control knobs.
3. Remove the screws securing the picture tube to the front cabinet.
4. Carefully separate the CRT from the front cabinet.

PICTURE TUBE HANDLING CAUTION

Due to high vacuum and large surface area of the picture tube great care must be exercised when handling the picture tube. Always lift the picture tube by grasping it firmly around the faceplate. NEVER LIFT THE TUBE BY ITS NECK. The picture tube must not be scratched or subjected to excessive pressure as a fracture of the glass may result in an implosion of considerable force which can cause personal injury or property damage.

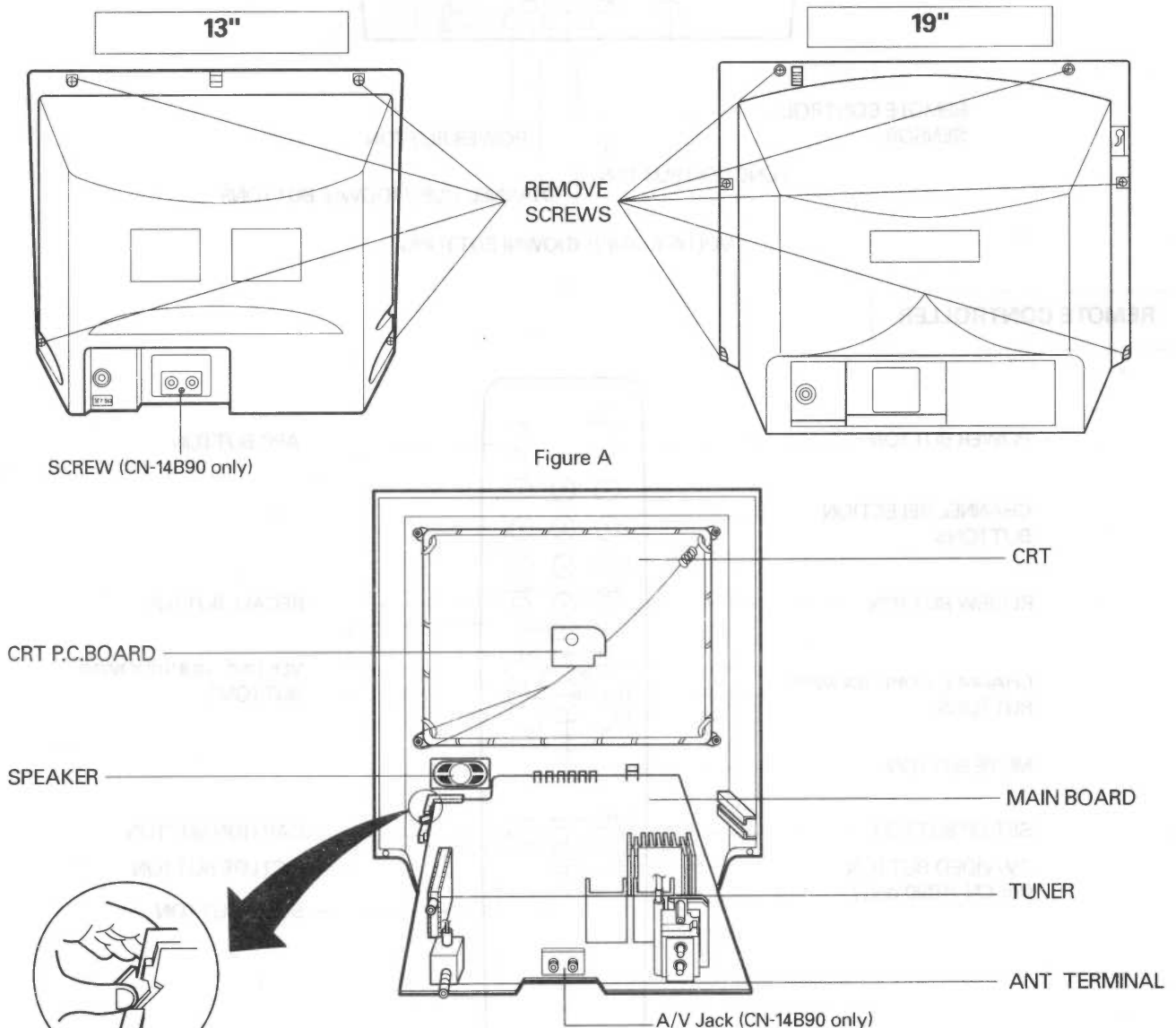
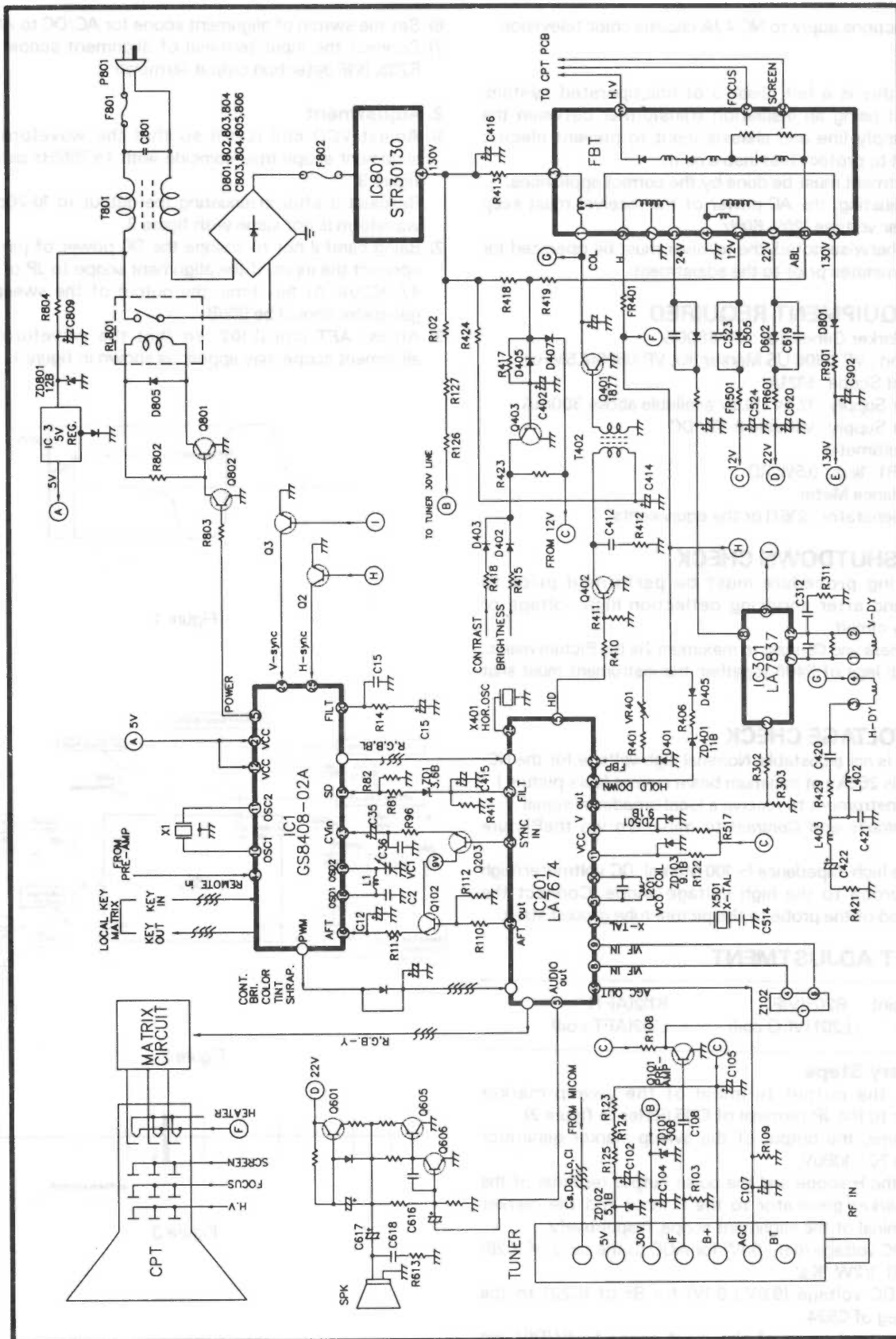


Figure B

BLOCK DIAGRAM



ADJUSTMENT INSTRUCTIONS

These instructions apply to NC-4JA chassis color television.

NOTES

1. Because this is a hot chassis of line-operated system, operate it using an insulation transformer between the power supply line and chassis input to prevent electric shock and to protect test instrument.
2. The adjustment must be done by the correct appliances.
3. During adjusting, the AC power of the receiver must keep the Regular voltage 120V, 60Hz.
4. Unless otherwise noted, the receiver must be operated for about 30 minutes prior to the adjustment.

1. TEST EQUIPMENT REQUIRED

- 1) Sweep-Marker Generator : VP-8800G
- 2) Plug In Unit : VP-0806 US Marker (K), VP-0805(4.5MHz)
- 3) Alignment Scope : 5121A
- 4) DC Power Supply : $12.4V \pm 0.5V$ available above 300mA
- 5) DC Power Supply : Variable 0-15V DC
- 6) Digital Multimeter
- 7) Resistor R1: $1k\Omega$, 0.5W RD
- 8) White Balance Meter
- 9) Pattern Generator : 216/1 or the equivalents.

2. X-RAY SHUTDOWN CHECK

The following procedure must be performed prior to servicing, and after servicing deflection high voltage or regulated B+ circuit.

- 1) Set *Brightness* and *Contrast* to maximum via the Picture menu.
- 2) Short both legs of R405 together, the instrument must shut down.

3. HIGH VOLTAGE CHECK

High voltage is *not* adjustable. Nominal high voltage for the NC-4JA chassis is 26.5kv at minimum beam current (dark picture)

- 1) Tune the instrument to receive a local broadcast signal.
- 2) Set *Brightness* and *Contrast* to minimum via the Picture menu.
- 3) Connect a high impedance (> 100 Mohm) DC voltmeter/high voltage probe to the high voltage anode. Connect the ground lead of the probe to the picture tube ground strap.

4. VIF, AFT ADJUSTMENT

Test Point : R205(VIF)	R112(AFT)
Adjust : L201(VCO coil)	L102(AFT coil)

1. Preliminary Steps

- 1) Connect the output terminal of the sweep-marker generator to the JP terminal of C116.(Refer to figure 2)
At this time, the output of the sweep-marker generator should be 70 ± 1 dBuV.
- 2) Connect the H-scope and the pulse output terminal of the sweep-marker generator to the H-input and the marker input terminal of the alignment scope, respectively.
- 3) Apply a DC voltage ($6.8 \pm 0.1V$) for AGC to the pin 2 of IC201 through R1, $1/2W$ $1k\Omega$.
- 4) Apply a DC voltage ($9.0V \pm 0.1V$) for B+ of IC201 to the positive leg of C524.
- 5) Set the vertical range of alignment scope to 1V/DIV and CAL position.

- 6) Set the switch of alignment scope for AC/DC to AC.
- 7) Connect the input terminal of alignment scope to JP of R205. (VIF detection output terminal)

2. Adjustment

- 1) Adjust VCO coil (L201) so that the waveform on the alignment scope may coincide with 45.75MHz as shown in figure 3.
Readjust it after attenuating the output to 10-20dB, if the waveform is not same with figure 3.
- 2) Being careful not to change the DC power of pin 2, IC201, connect the input of the alignment scope to JP of R112 (Pin 47, IC201). At this time, the output of the sweep-marker generator should be 90dB.
- 3) Adjust AFT coil (L102) so that the waveform on the alignment scope may appear as shown in figure 1.

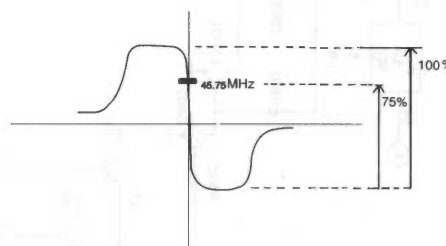


Figure 1

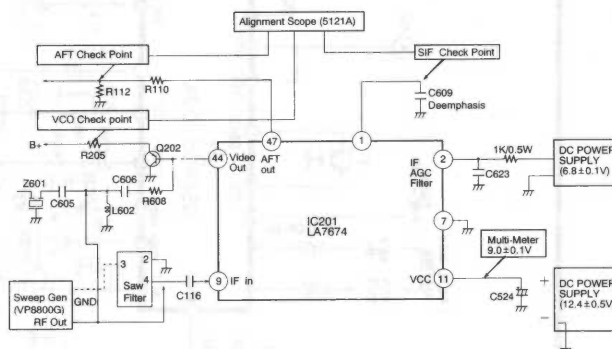


Figure 2

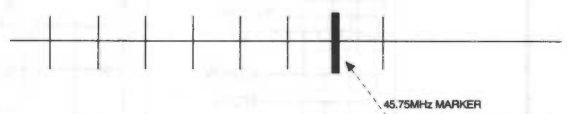


Figure 3

5. SIF ADJUSTMENT

Test Point : C605
Adjust : L601 (SIF coil)

- 1) Connect the output of the sweep-marker generator as shown in figure 4.
(The ip of C605)
- 2) The connection of sweep-marker generator and alignment scope is the same as VIF adjustment procedure.
- 3) Apply a DC voltage ($6.8 \pm 0.1V$) for AGC to the pin 2, IC201 through R1, 1/2W 1.0K Ω .
- 4) Apply a DC voltage ($12.4 \pm 0.5V$) for B⁺ of IC201 to the positive leg of C524 through R2, 1/2W 5.6 Ω .
- 5) Adjust SIF coil (L601) so that the "S" curve on the alignment scope becomes as shown in figure 5, and the distance of "A" and "B" may be equal.
Readjust it so that the "a" marker may be located at the center of "b" and "c", if 4.5MHz marker is not coincided with horizontal line.

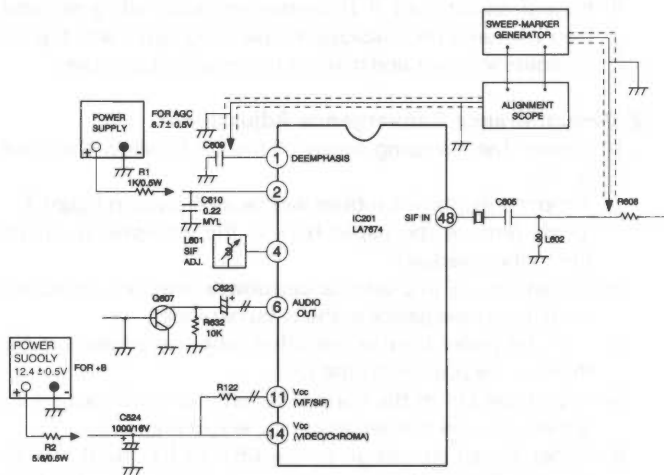


Figure 4

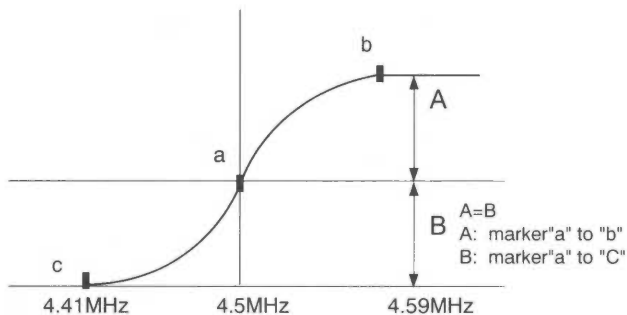


Figure 5

6. AGC ADJUSTMENT

Test Point : J127
Adjust : VR101 (AGC)

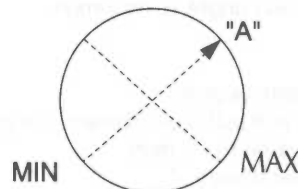
- 1) Operate the receiver and apply the Pattern Generator's output of $60 \pm 1dBu$ to the 75 Ω antenna terminal.
- 2) Connect the Digital Voltmeter to the AGC CHECK point of J127 on the board.
- 3) Turn VR101 fully clockwise so that the digital voltmeter may read maximum.
- 4) Turn AGC control (VR101) counterclockwise until the voltage becomes $1.2 \pm 0.1V$ less than maximum.

7. WHITE BALANCE ADJUSTMENT

Test Point : Video Display
Adjust : Screen Control
VR501 (Blue Drive) VR502 (Red Drive)
VR503 (Blue Bias) VR504 (Red Bias)
VR505 (Green Bias)

2. Preliminary Steps

- 1) Receive the standard white signal.
- 2) Turn the SCREEN control fully counterclockwise (screen MIN).
- 3) Set the DRIVE controls to the mid-range.
- 4) Turn the BIAS controls fully clockwise and return counterclockwise about one-third position (A).
- 5) Set the SW 501 to the SVC position from normal position to obtain the horizontal line.



2. Adjustment

- 1) Turn the SCREEN volume knob clockwise slowly until the first horizontal line appears on the picture screen.
- 2) Adjust Two Color Bias controls which have not appeared in step 1) to obtain white horizontal line.
- 3) Turn SCREEN control to obtain a dim horizontal line. (from cut off point to distinguishable point)
- 4) Set the SW501 to the NORMAL position from SVC position.
- 5) Receive an adjustment signal, upper in white and lower in black.
- 6) Adjust the DRIVE controls to obtain proper white in bright area.
- 7) Readjust the BIAS and the DRIVE controls to maintain a good white balance in both bright and dark areas.
- 8) Check for adjusted condition with the memorized white balance meter.
color temperature (Unless buyer's noted, MPCD is "0")
9,300° K \pm 1,000° K X: 0.282
Y: 0.300

Noted : This adjustment should be done after warming up for 10 minutes and be operated only in Picture Reset ON mode.

8. SUB BRIGHT ADJUSTMENT

Test Point : Video Display
Adjust : VR508(Sub Bright)

- 1) Receive the Digital Pattern.
- 2) Press the APC button on the Remote control until the on screen display shows PICTURE RESET ON mode.
- 3) Press the picture button until the on screen display shows CONTRAST mode.
- 4) Press the VOLUME DOWN button for the minimum contrast.
- 5) Adjust *Sub Bright* control (VR508) so that the 3rd step and the 4th step from the right side becomes dark of 90% under the condition of Contrast 0%, Bright 50%.

Noted: Perform this adjustment under the circumstance of 30-50LUX.

This adjustment should be done after warming up for 10 minutes.

9. PURITY AND CONVERGENCE ADJUSTMENT

CAUTION:

Apply this adjustment only in case of needed and use the ITC adjusted CRT.

Though the adjustment is not necessary, the convergence magnetic material and the rubber wedge must be positioned as shown in figure 7.

9-1. PURITY ADJUSTMENT

1. Preliminary Steps

- 1) Degauss the CRT and cabinet with the degaussing coil.
- 2) Set the contrast and bright to maximum.

2. Adjustment

- 1) Obtain a green raster signal.
- 2) Loosen the yoke and pull it out toward you gradually until a green belt appears on the screen.
- 3) Remove the rubber wedge.
- 4) Turn the purity magnet so that the green raster is positioned in the center vertically. (Refer to figure 6.)
- 5) Move the yoke toward slowly for a uniform green color in the picture screen and tighten the screw holding the yoke.
- 6) Obtain a blue raster and a red raster and check the color purity.

9-2. CONVERGENCE ADJUSTMENT

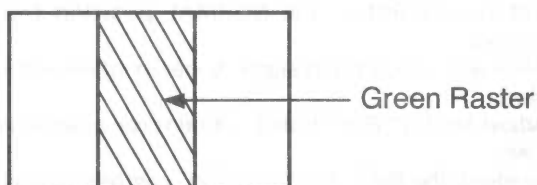


Figure 6

1. Preliminary Steps

Noted: This adjustment should be done after warming up for 10 minutes.

- 1) Degauss the CRT and cabinet with the degaussing coil.
- 2) Receive the Cross Hatch pattern.
- 3) Adjust the contrast and bright controls for the best picture screen.

2. Adjustment

1. Center Convergence Adjustment

- 1) Adjust two tabs of 4-pole magnets to change the angle between them and superimpose the red and blue vertical lines in the center area of the picture screen.
- 2) Turn both tabs at the same time keeping their angles constant to superimpose red and blue horizontal lines at the center of screen.
- 3) Adjust two tabs of the 6-pole magnets to superimpose a red/blue lines with a green one.
- 4) Turn both tabs at the same time keeping their angles constant to superimpose a red/blue lines with a green one.
- 5) Repeat adjustment 1) 2) keeping in mind red, green and blue movements, because 4-pole magnets and 6-pole magnets interact and make dot movement complex.

2. Circumference Convergence Adjustment

- 1) Loosen the clamping screw of the DY to allow the yoke to tilt.
- 2) Temporarily place a rubber wedge as shown in figure 7. (Don't remove the paper bark in the adhesive point of the rubber wedge.)
- 3) Adjust the DY in a vertical (up/down) direction to obtain a better convergence in the circumstance.
- 4) Peel the paper bark in the other rubber wedges and fix them in the bottom of the CRT.
- 5) Adjust the DY in the horizontal (left to right) motion to obtain a better convergence in the circumstance.
- 6) Adher the other wedge to the CRT to fix the DY after positioning the DY correctly, inserting other wedge into the upper part, and getting rid of the paper bark.
- 7) Check the position of 3 wedges and convergence and then tighten the screws holding DY up.

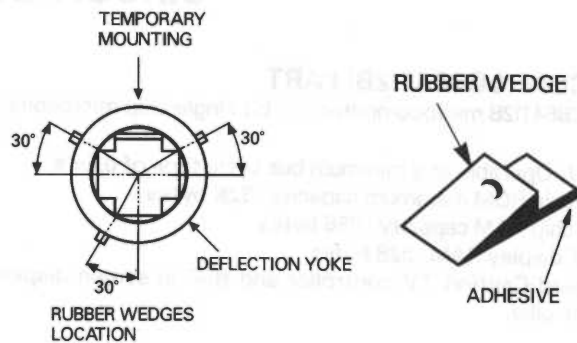
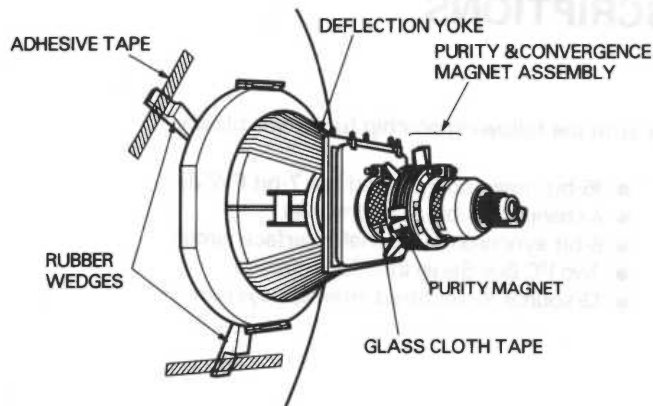


Figure 7

10. EXTERNAL COMPOSITE VIDEO SIGNAL ADJUSTMENT

This adjustment is applied only to the model with an external video input terminal.

Test Point : Q206-E
Adjust : VR201

- 1) Connect the output of VCR's RF to the TV's VHF/UHF 75 Ω terminal.
- 2) Connect the output of VCR's VIDEO to the input terminal of TV's VIDEO.
- 3) Apply power for both VCR and TV.
- 4) Tune the TV to receive a still picture of VCR from R terminal(TV mode).
- 5) Check the level of composite video signal at Q208-E.
- 6) Set the TV to VIDEO mode.
- 7) Adjust *Video Gain* control (VR201) for the level of both signal may be equal.

11. FOCUS ADJUSTMENT

- 1) Receive a broadcasting signal.
 - 2) Set to the Picture Reset ON condition with APC button.
 - 3) Adjust the *Focus* control for best overall focus.
- Noted :** This adjustment should be done after warming up for 10 minutes.

12. VERTICAL SIZE ADJUSTMENT

Test Point : Video Display
Adjust : VR301

- 1) Receive the crosshatch signal.
- 2) Set to the Picture Reset ON condition.
- 3) Adjust the *Vertical Size* control (VR301) for approximately 1/2" overscan at the top and bottom of the display.

13. ON-SCREEN DISPLAY VOLTAGE ADJUSTMENT

Test Point : Pin20 of IC1
Adjust : VC1

- 1) Receive a Broadcasting signal.
- 2) Press the APC button for PICTURE RESET ON mode.
- 3) Adjust VC1 until the voltage of IC1, Pin 20 is 2.5 ± 0.1 V DC.

CIRCUIT DESCRIPTIONS

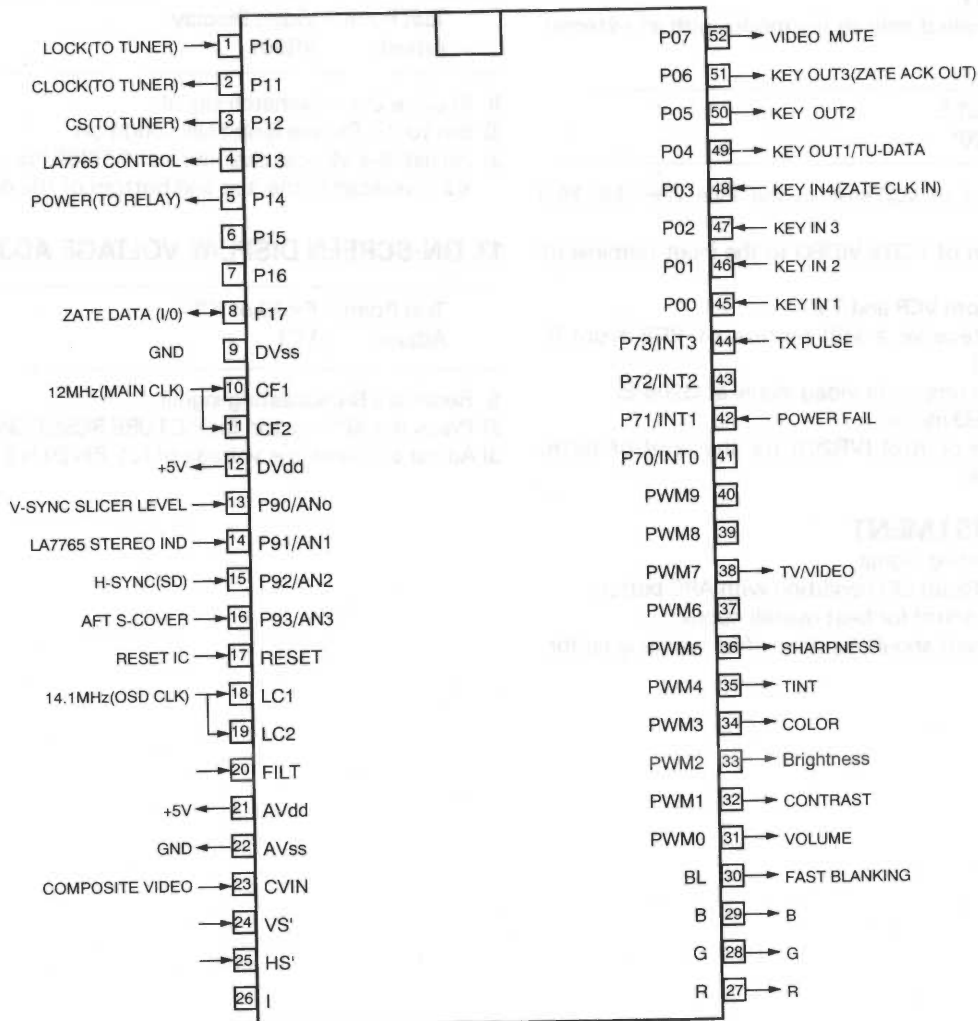
1. μ -COM (LC864112B) PART

The LC864112B microcomputer is 8-bit single chip microcomputer with the following on-chip functional blocks:

- CPU : Operable at a minimum bus cycle time of $0.5\mu s$
- On-chip ROM maximum capacity : 32K bytes
- On-chip RAM capacity : 256 bytes
- CRT display RAM : 528 bytes
- Closed-Caption TV controller and the on-screen display controller.
- 16-bit timer/counter and ten 7-bit PWMs
- 4 channel x 4-bit AD Converter
- 8-bit synchronous serial-interface circuit
- Two I²C Bus Serial Interface circuits
- 12-source 10-vectored interrupt system

All of the above functions are fabricated on a single chip.

1-3. Pin Assignment



2.VIF/SIF,VIDEO,CHROMA,DEFLECTION CIRCUIT

2-1.Description

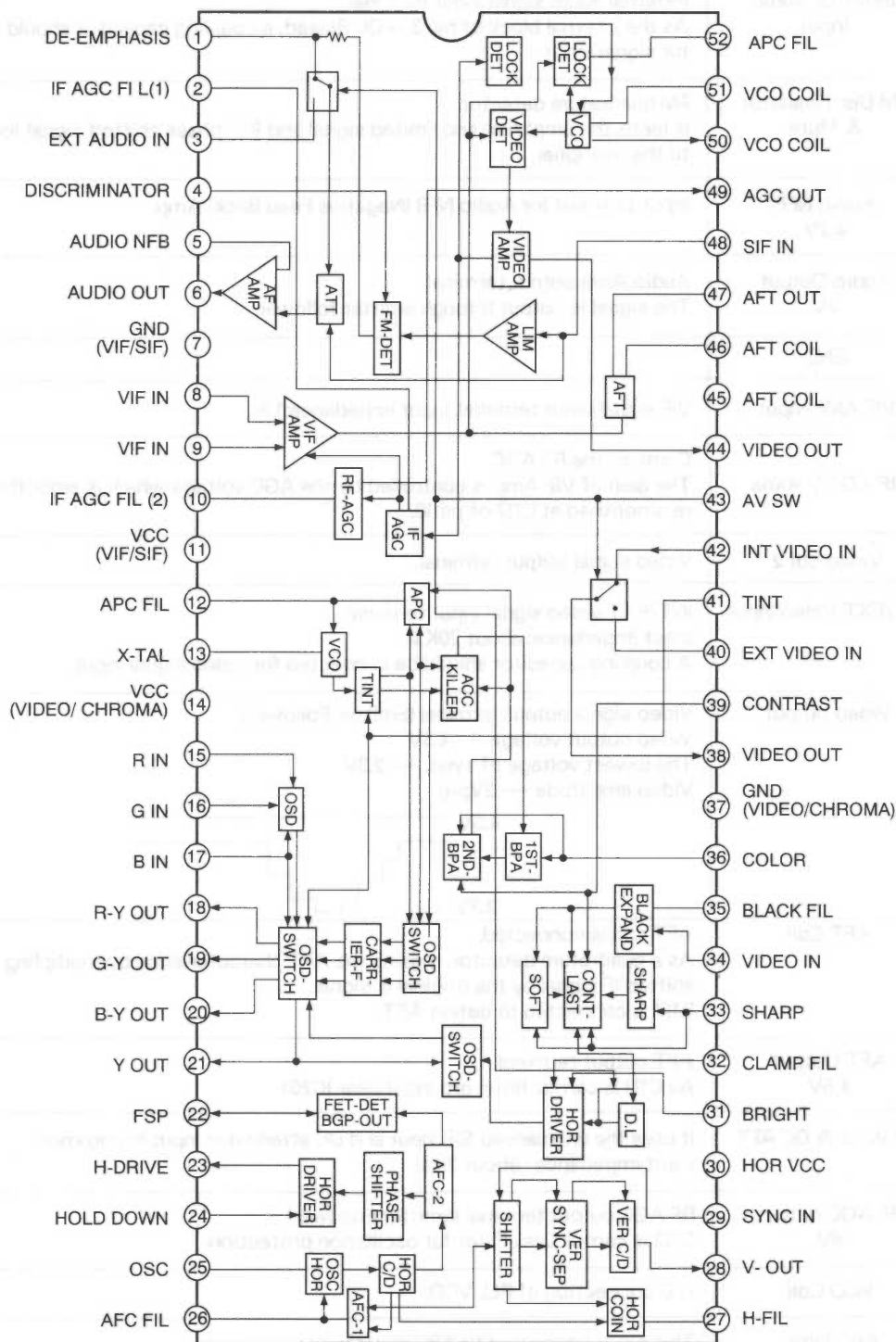
LA7674 has PLL,Black-Expansion Circuit and On-Screen Display Function.

1. PIF/SIF Circuit is PLL system as Detection Circuit for a good sharpness and a good sound. By controlling Pulse interruption and getting a non-control Pulse Cancel Circuit, it get a good sound system.

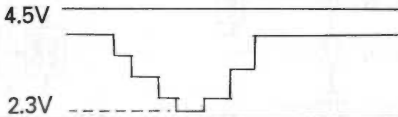
2. In Video Circuit, expands Black signal for a good sharpness. And, Bright Circuit Corrects the current-transmission ratio by comparing with APL.

3. Chroma Circuit has a On-screen Display function, with R.G and B of the first blanking, to indicate all color display.

2-2.Block Diagram of IC201(LA7674)



2-3. VIF/SIF Circuit

NO.	Name and Voltage	Function
1	FM Detector output	Sound FM detector As the deemphasis time constant is decided by internal impedance 7.5K Ω and capacitor connected pin 1(0.01 μ F), use a Mylar capacitor for good Temperature characteristics.
2	AGC Filter	IF AGC filter terminal. This pin makes AGC voltage by smoothing the peak detected signal from AGC detector through the external capacitor C610.
3	External Audio Input	External audio signal input terminal. As the internal block of pin 3 is DC Biased, a coupling capacitor should be connected for signal input.
4	FM Discriminator & Mute	FM quadrature detector. It feeds the amplified and limited signal and 90° phase shifted signal for FM detection to the multiplier.
5	Audio NFB 4.2V	Input terminal for Audio NFB (Negative Feed Back) Amp.
6	Audio Output 4V	Audio Amp output terminal. The signal is output through emitter follower.
7	GND	
8, 9	VIF AMP Input	VIF signal input terminal. Input impedance:1.8K
10	RF AGC Volume	Controls the RF AGC. The gain of VIF Amp is controlled by the AGC voltage which is smoothed at pin 2 and re-smoothed at C117 of pin10.
38	Video out 2	Video signal output terminal.
40 42	INT/EXT Video Input	INT/EXT video signal input terminal. Input impedance: about 20K Ω A coupling capacitor should be connected for video signal input.
44	Video output	Video signal output terminal (Emitter Follower). Video output voltage ---- 4.5V The lowest voltage of sync. ---- 2.3V Video amplitude ---- 2Vp-p 
45 46	AFT Coil	AFT coil is connected. As a quadrature detector, it gains the AFT characteristics by multiplying the 90° phase shifted IF signal by the original IF signal. R117 is connected to defeat AFT.
47	AFT Output 4.5V	AFT output terminal. As C111 is carrier filter, ground it near IC201.
48	SIF input & DC ATT	It uses the unbalanced SIF input and DC attenuator input in common. Input impedance : about 3K Ω
49	RF AGC output 8V	RF AGC output terminal (Emitter Follower) C113 is carrier Leak Filter for oscillation protection.
50 51	VCO Coil	L, C connection of PLL VCO.
52	APC Filter	This pin is connected to APC switch.

2-4. Video Circuit

NO.	Name and Voltage	Function
31	Bright Control & D.C Restoration Control 4.5V	Bright control voltage is determined by VR508.
32	Clamp Filter 3.3V	Pedestal Clamp Filter terminal.
33	Video Tone in & control	Secondary differentiation input and video tone control terminal.
34	Video Input	Video signal input terminal. Connect the pedestal clamp to the input coupling capacitor and input the video signal (0.5Vp-p).
35	Black Stretch Time Constant	If the pedestal clamped video signal is input, black signal is detected through H, V blanking circuit.
39	Contrast Control	Contrast control terminal.
21	Video out & FBP input	The video output signal becomes horizontal blanking signal by applying the F.B.P through D503, R529. The FBP is input to IC by the threshold voltage and becomes horizontal blanking pulse.
43	Audio, Video Select SW	A/V switch and Delay Line ON/OFF switch.

2-5. Chroma Circuit

16 15	OSD input G OSD input R	OSD(On Screen Display) Signal input terminal.
17	OSD input B & High Speed Blanking	Performs both Blue input and High Speed Blanking function
12	APC Filter 6V	APC Filter circuit is connected.
13	3.58 X-tal	3.58MHz X-tal is connected for chroma oscillation.
18 19 20	R-Y output G-Y output B-Y output	Color difference signal output terminals.
36	Chroma Input & Color Control	Chroma signal input and color control terminal. C510, L502 and C509 are Band Pass Filter for chroma input. Color control voltage is derived by removing chroma signal from the voltage of Pin 36 through internal Low Pass Filter.
41	Tint Control & Service SW	It controls the tint by applying a DC voltage to this pin. When the service switch(SW501) is in SVC position, vertical output stops and the killer becomes on for white Balance adjustment.

2-6. Deflection Circuit

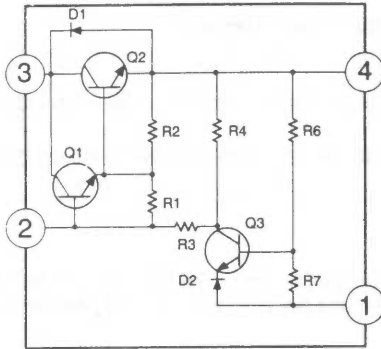
29	Sync. Separation Input	Sync separation input terminal
22	FBP input, BGP output & VCR SW	It performs three functions which is Fly Back pulse input, Burst Gate Pulse input and VCR switching.
23	H. output	Horizontal output push-pull circuit.
25	H. X-TAL	The ceramic resonator for horizontal oscillation is connected.
26	AFC Filter	To improve the stability against fluctuation of power supply, connect the AFC filter to the power supply.
27	H. Coincidence Filter	H. sync detection filter terminal.
28	V. output	It performs vertical output, sensitivity selection of V.sync sep., external trigger input, auto trigger mode cancel SW, and V-hold function.
30	H. VCC	VCC for Horizontal Deflection.

3. POWER SUPPLY CIRCUIT

3-1. Description

STR30130 is used as the power supply circuit. This is a regulator IC for DC 130V.

Equivalent Internal Circuit of IC801

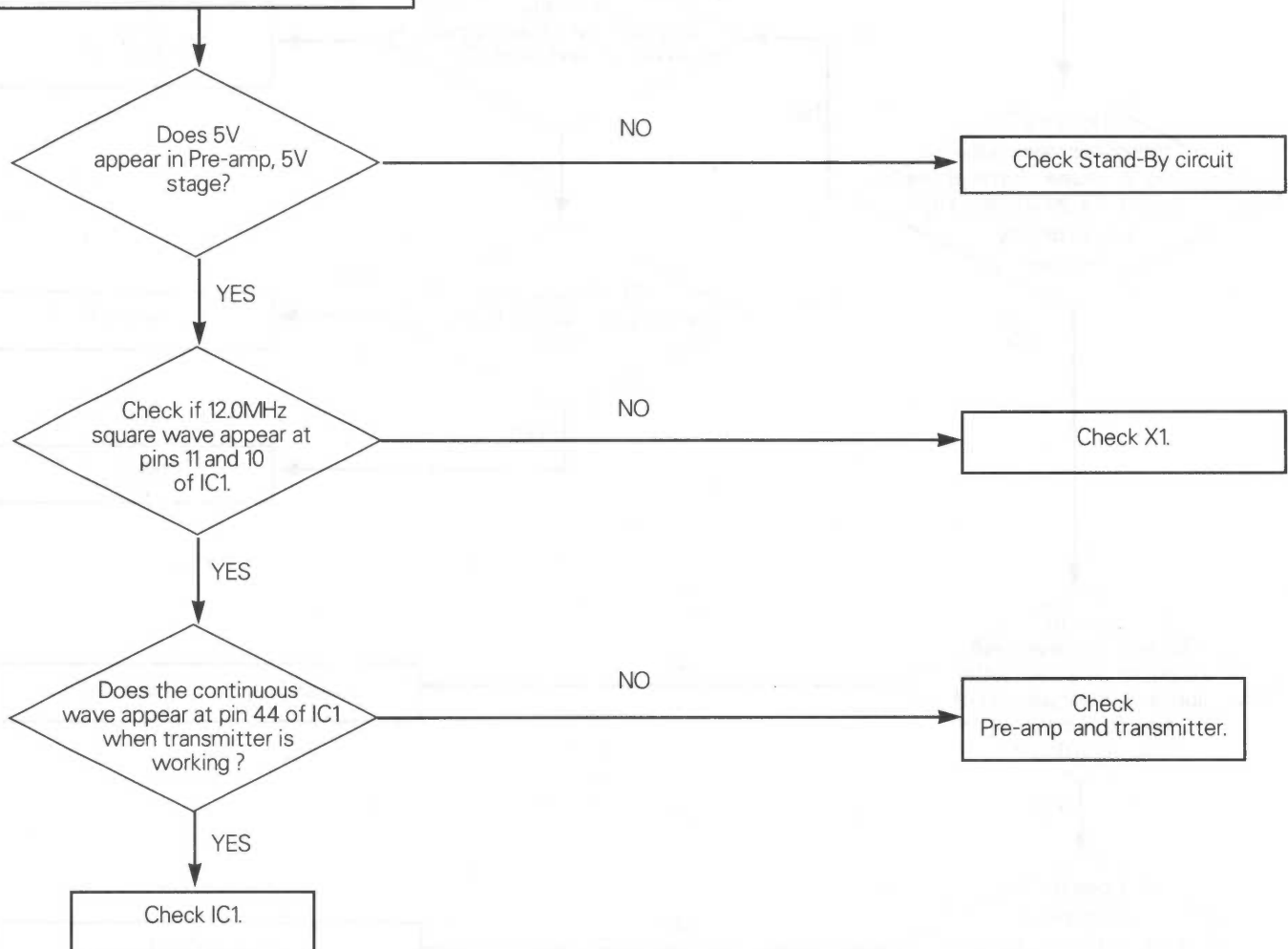


3-2. Pin Function Chart of IC801 (STR30130)

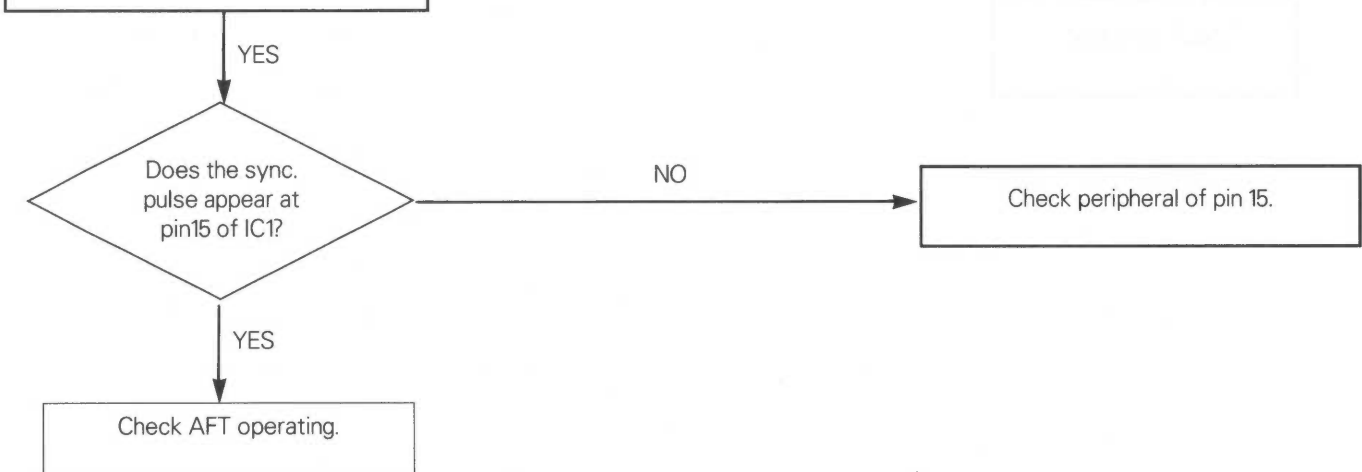
Pin No.	Description
1	Ground
2,3	The input pin of DC voltage by Bridge-Diode.
4	Output pin of DC 130V.
5	NC

TROUBLESHOOTING CHARTS

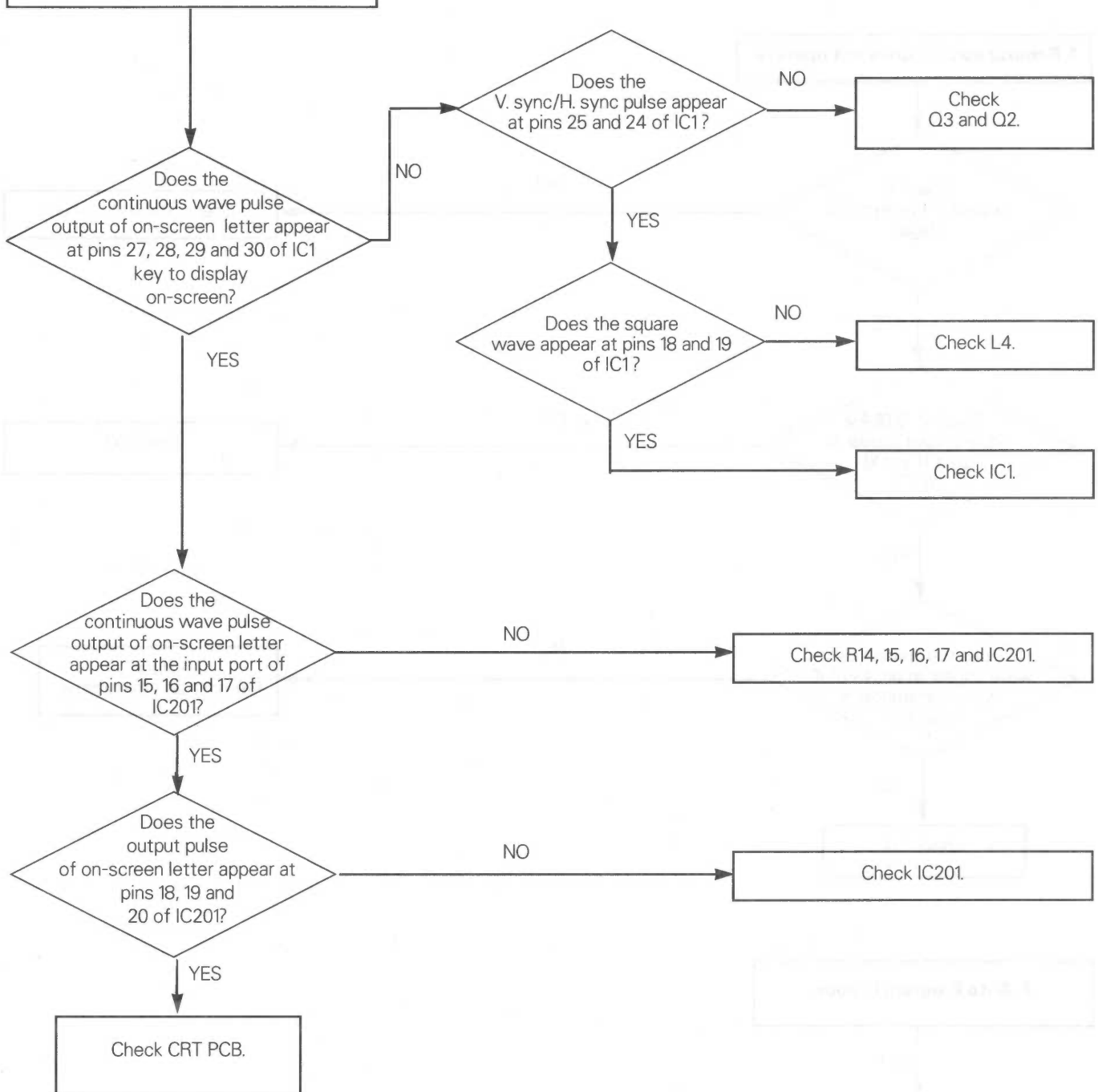
1. Remote control does not operate.

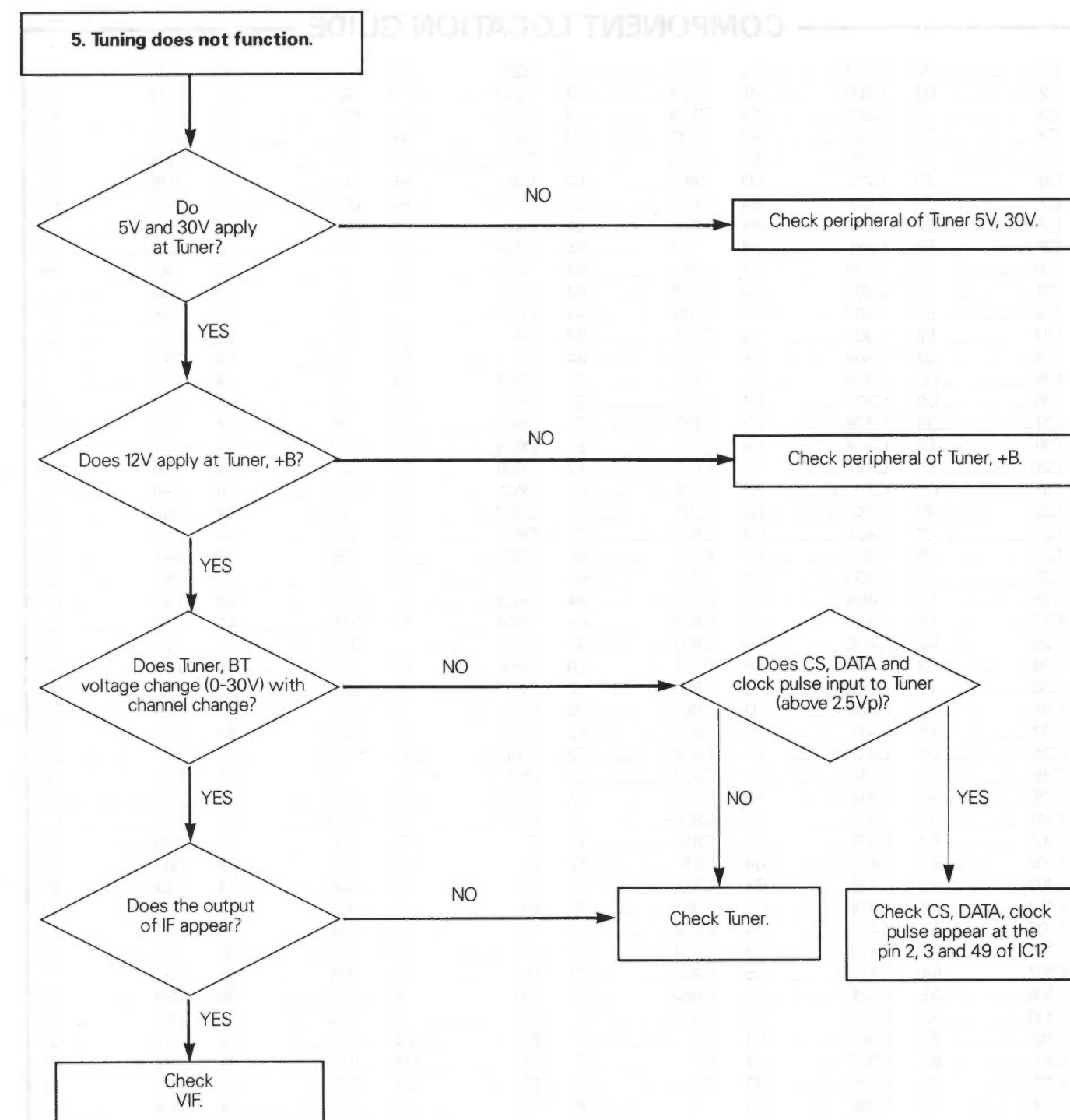
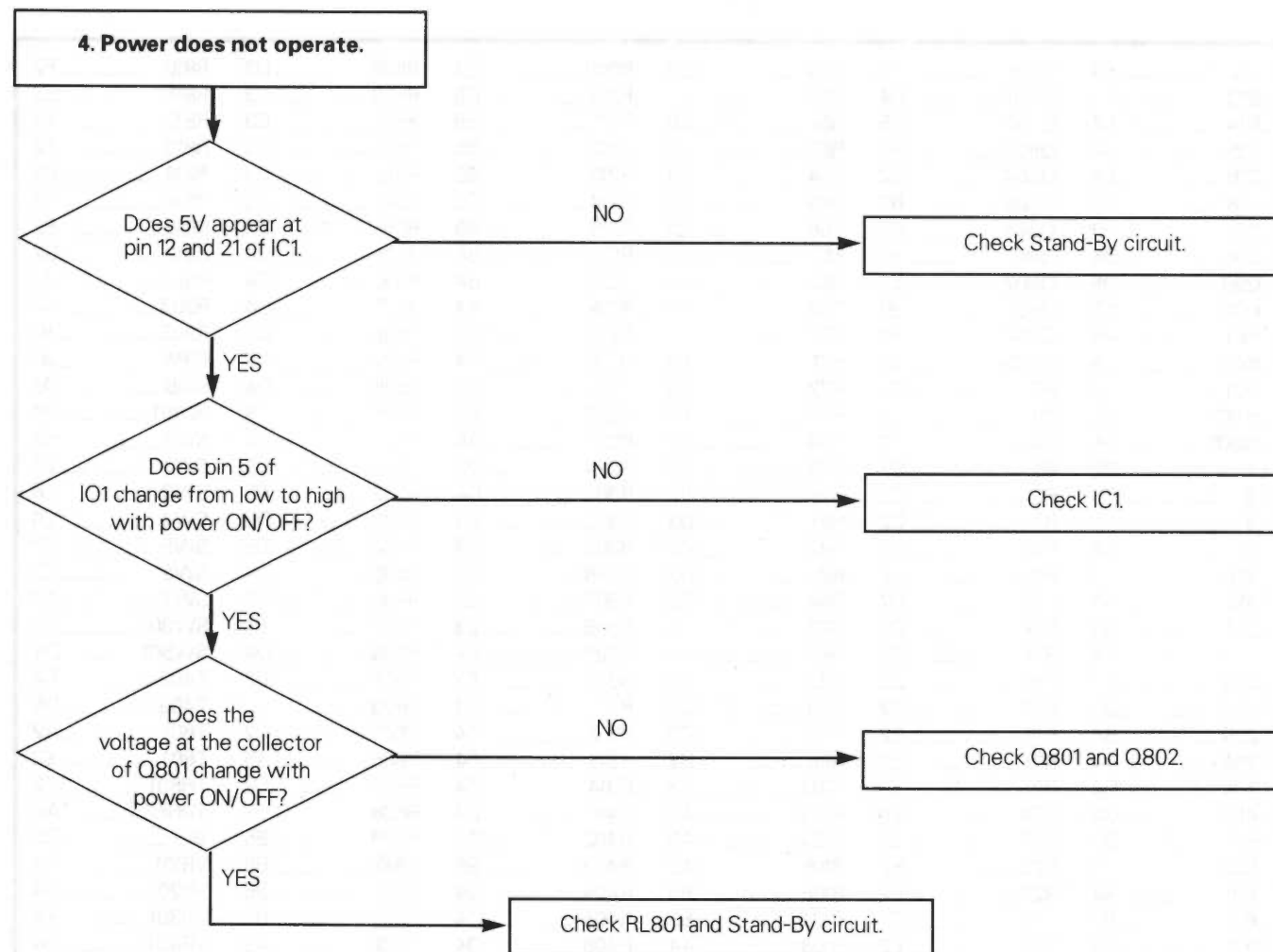


2. Auto Program is poor.



3. On-Screen not Displayed.





COMPONENT LOCATION GUIDE

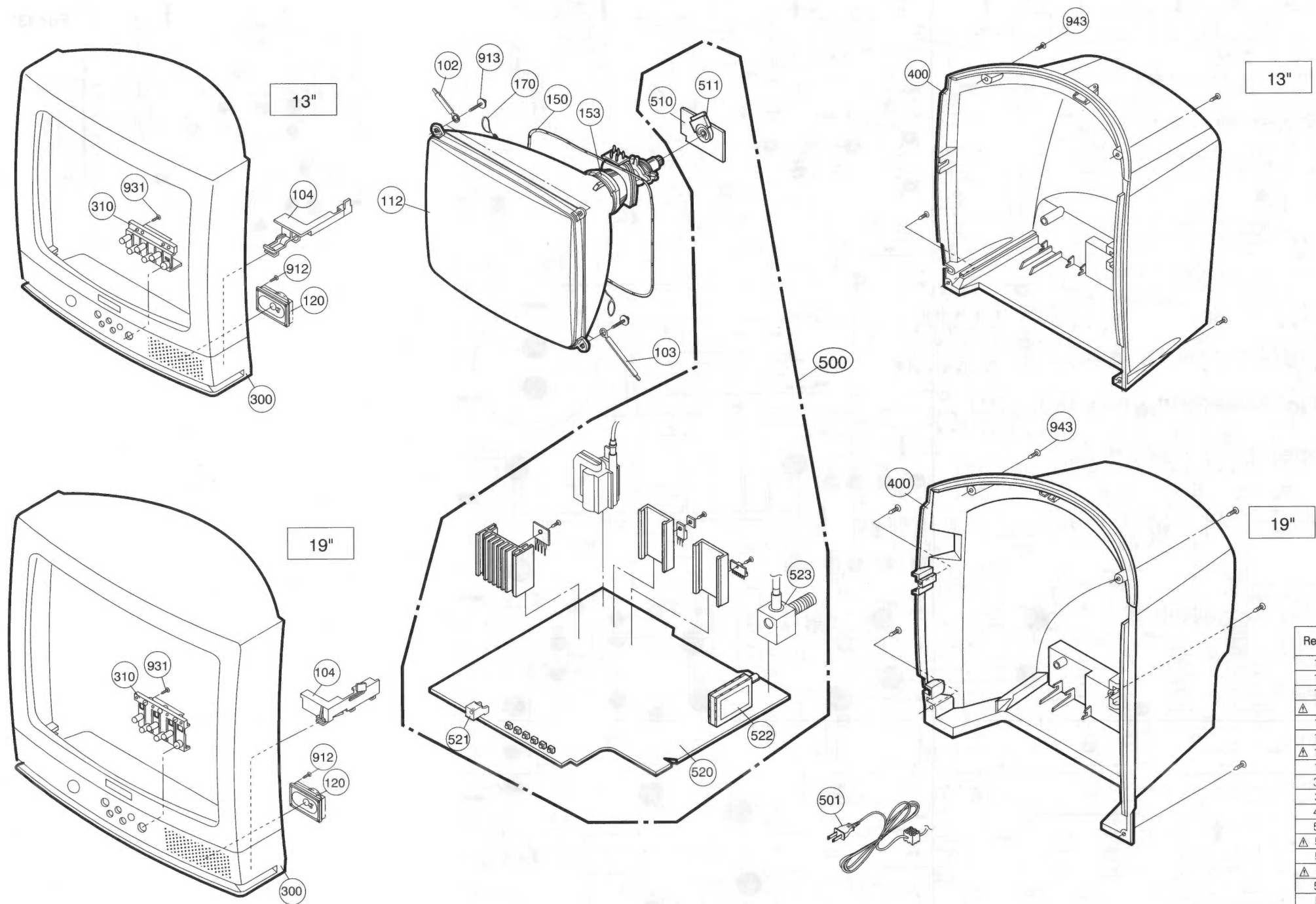
C1	D2	C207	C2	C527	C4	D201	B5	G1	E1	J133	B3
C2	D2	C208	B5	C528	C4	D202	C5	G2	F1	J134	B3
C3	D2	C209	A4	C529	C3	D203	A4	G3	G4	J135	A3
C4	C2	C210	A3	C532	D3	D204	A5	G4	E5	J137	B3
C5	E1	C211	B5	C603	C2	D301	E4	G5	F5	J138	B3
C6	E1	C212	D3	C604	B2	D302	E5	G6	E3	J139	C3
C7	E1	C214	B4	C605	B3	D303	E4	G7	E3	J140	B3
C8	E2	C215	B4	C606	B2	D401	C4	G8	E3	J141	C4
C9	E2	C216	B4	C607	B5	D402	E4	G9	E3	J142	C4
C10	E2	C299	B4	C608	B4	D403	E4	G10	E3	J143	D4
C11	E2	C301	E4	C609	B4	D405	D4	G11	E3	J144	C3
C12	E3	C302	E4	C610	B4	D406	E5	G12	E3	J145	D3
C13	E2	C303	E4	C611	B4	D407	E5	G13	E3	J146	C3
C14	D2	C304	E4	C612	B4	D501	E3	G16	F4	J147	C3
C15	D2	C306	E4	C613	B2	D502	D4	G17	F4	J148	C3
C16	D2	C307	E4	C614	B2	D503	D4	G18	G4	J149	D3
C17	E1	C308	E3	C615	B2	D504	C4	G19	G4	J152	E3
C19	D1	C309	E4	C616	B2	D505	E5	G20	G4	J154	E3
C20	D1	C310	F5	C617	A2	D506	D4	G21	G4	J155	E3
C21	C2	C311	E5	C618	A3	D601	B2	G22	G4	J156	D3
C22	E1	C312	G3	C619	G5	D602	G5	G23	G4	J158	D3
C23	C1	C401	D4	C620	G5	D603	C2	G24	G4	J159	C3
C24	D1	C402	E4	C621	B5	D801	F2	G25	F2	J161	A3
C25	C1	C403	D3	C622	B5	D802	G2	G26	A1	J162	A3
C26	C1	C404	G4	C623	B4	D803	F2	G27	A2	J163	B2
C27	D1	C405	D3	C624	A3	D804	F2	G28	A2	J164	C2
C28	B2	C406	D3	C632	B2	D805	G1	G29	A5	J166	D2
C29	E3	C407	F4	C801	G1	D806	E2	G30	A5	J167	D2
C30	B1	C408	D3	C803	F2	D807	F1	IC1	C2	J168	D2
C31	C2	C409	D3	C804	G2	D808	F3	IC3	E1	J169	D2
C32	D1	C410	D4	C805	F2	D809	E1	IC201	B4	J170	C2
C35	D2	C412	F4	C806	F2	D810	E1	IC202	B5	J171	C2
C36	D2	C413	D4	C807	G2	D811	F2	IC301	D4	J172	C2
C39	F1	C414	F3	C808	E3	D812	F2	IC601	B5	J173	C2
C40	E1	C415	D3	C809	F1	D901	E5	IC801	F3	J179	E2
C101	A3	C416	F4	C810	G2	E1	G2	J53	E3	J180	E2
C102	A3	C417	G4	C811	F2	E2	G3	J75	D2	J181	E2
C103	A3	C418	G4	C812	F1	E3	G3	J101	A4	J182	E1
C104	A4	C420	G4	C901	A1	E4	G3	J103	B5	J183	E1
C105	A4	C421	G4	C902	E5	E5	F3	J104	B5	J185	E1
C106	A4	C422	G3	CA01	D1	E8	F4	J105	B5	J186	E1
C107	A4	C425	D5	CA02	C2	E9	E4	J106	B5	J187	F1
C108	A3	C426	A5	CA03	C1	E10	E4	J107	B5	J189	E1
C109	A3	C429	E5	D5	C1	E11	E4	J108	A4	J190	E1
C110	B3	C501	D3	D6	C1	E12	E4	J109	A4	J191	D1
C111	B3	C502	C4	D7	E1	E13	D4	J111	B4	J192	D1
C112	C2	C505	D3	D8	E1	E14	D4	J112	B4	J193	C1
C113	B3	C506	D3	D9	E1	E15	F5	J113	B4	J194	C2
C114	B3	C509	C3	D10	E1	E16	F5	J114	C4	J195	B2
C117	C4	C510	C3	D11	E2	E17	F5	J117	D4	J196	C1
C118	C4	C512	C4	D12	E2	E18	F5	J118	D4	J197	D5
C119	C4	C513	C4	D13	E2	F801	G1	J119	D4	J199	E4
C120	D2	C514	C4	D14	E2	F802	G3	J120	D4	J201	D4
C121	C4	C519	D4	D15	E3	FBT	F5	J121	D4	J202	D4
C122	C2	C520	D5	D16	D2	FR301	E4	J122	A4	J203	E4
C201	C3	C521	D5	D17	E2	FR401	E5	J123	C4	J204	E5
C202	D3	C522	D5	D19	C2	FR402	E5	J124	B4	J205	E5
C203	C3	C523	F5	D20	D1	FR501	E5	J126	A4	J206	F5
C204	C5	C524	E5	D21	C1	FR601	G5	J127	A4	J209	E3
C205	C5	C525	D3	D22	C1	FR602	G5	J128	A4	J210	E3
C206	C5	C526	D3	D23	C2	FR901	E5	J130	A3	J211	D3

J212	E4	Q501	C3	R58	D3	R209	C3	R508	D3	R810	F2
J213	D4	Q502	D4	R60	D1	R210	C5	R509	C3	R811	E3
J214	E4	Q602	A5	R61	D1	R211	B5	R510	C3	R812	F2
J215	E4	Q603	B5	R63	C1	R212	B5	R511	C3	R813	F2
J216	E4	Q604	C2	R64	C1	R213	B5	R512	C3	R814	F3
J218	F2	Q605	B3	R65	C1	R214	C5	R513	C3	R815	F2
J219	F3	Q606	B3	R66	C1	R215	B5	R514	E3	R816	E2
J230	D5	Q801	F1	R67	C1	R216	B4	R515	C4	R818	G2
J299	D5	Q802	E2	R68	C1	R217	B4	R516	C4	R901	A1
J600	A5	Q901	B1	R69	C1	R218	A4	R517	C4	R902	A1
J601	A5	Q902	B1	R70	C1	R219	C5	R519	D3	R903	B1
J602	A5	Q903	B1	R71	C1	R220	A4	R522	C2	R914	A1
J901	B1	R2	C2	R72	C1	R221	C5	R525	D4	R915	A1
JA001	C5	R3	C2	R73	C1	R222	A5	R526	D4	RL801	F1
JA601	A5	R4	C2	R74	C1	R223	A5	R527	D4	SW1	G1
L1	D2	R5	C2	R76	C1	R224	D3	R531	D5	SW2	D1
L3	E1	R6	C2	R78	E2	R301	D4	R532	D5	SW3	D1
L8	E2	R7	C2	R81	D3	R302	E4	R533	D5	SW4	D1
L9	D1	R10	C2	R82	D2	R303	E3	R534	D5	SW5	D1
L101	B3	R11	C2	R83	D2	R306	E3	R535	D5	SW6	C1
L102	B3	R12	D2	R84	D2	R307	E3	R536	D5	SW7	C1
L201	B3	R13	D2	R87	A3	R308	E3	R537	E5	SW301	E4
L202	A4	R14	D2	R88	A3	R309	E4	R538	D4	SW501	D4
L203	C3	R15	D2	R92	D3	R310	F3	R601	C2	T402	F4
L204	D3	R17	E2	R93	C3	R311	G3	R603	C2	T403	D5
L205	B4	R18	E2	R94	C3	R312	E4	R605	C2	T601	A2
L206	A4	R19	E2	R96	D2	R313	F4	R606	A5	T801	G1
L402	G4	R21	D1	R102	E3	R314	E4	R607	C2	TH801	F2
L403	G4	R24	D1	R103	A3	R401	D4	R608	C3	TUNER	A4
L501	D3	R25	D1	R104	A3	R402	D4	R609	B5	VC1	D2
L502	C3	R26	E2	R105	A3	R403	G5	R610	B5	VR101	B4
L601	B4	R27	E2	R106	B3	R404	D4	R611	B5	VR201	B4
L602	B2	R28	E2	R107	B3	R405	D4	R612	B5	VR301	E4
L901	B1	R29	E2	R108	A4	R406	D4	R613	A3	VR401	D4
P401	G4	R30	E3	R109	A4	R407	D3	R614	A5	VR501	D5
P503	D5	R31	E2	R110	B3	R408	D3	R615	B5	VR502	D5
P601	A2	R32	E2	R111	B3	R410	E4	R616	A5	VR503	E5
P603	A5	R33	E2	R112	B3	R411	F4	R617	B4	VR504	D5
P801	G2	R34	E2	R113	B3	R412	F4	R618	B4	VR505	D5
P802	F2	R35	E3	R114	B3	R413	G5	R619	A4	VR508	C4
P904	B1	R36	D3	R115	B3	R414	C3	R620	C4	X1	C2
P905	A1	R37	E2	R116	A3	R415	D3	R621	B2	X401	C4
PRE-AMP	F1	R38	D1	R117	B3	R416	E3	R622	B2	X501	C4
Q1	E1	R39	D2	R118	B3	R417	E5	R623	B2	Z101	B4
Q2	D2	R40	E3	R119	B4	R418	G5	R624	B2	Z201	C3
Q3	E2	R41	E1	R120	B4	R419	E5	R625	B2	Z601	B3
Q5	D1	R42	E2	R121	B4	R420	F3	R626	B2	ZD1	D3
Q6	E2	R43	D2	R122	C4	R421	F3	R628	A2	ZD101	A4
Q7	D2	R44	D2	R123	A4	R422	F4	R629	A2	ZD102	A3
Q101	B3	R45	E3	R124	A4	R423	D4	R631	B5	ZD103	C4
Q102	B3	R46	E2	R125	A4	R424	E3	R632	A3	ZD201	C5
Q201	D3	R47	E2	R126	C4	R425	C5	R633	B5	ZD202	C2
Q202	C3	R48	E2	R127	C5	R426	D4	R634	B5	ZD301	D4
Q203	C2	R49	C2	R128	B3	R427	E3	R635	A4	ZD401	D4
Q204	A5	R50	D1	R201	D3	R428	E3	R660	A5	ZD501	C4
Q205	A5	R51	D1	R202	D3	R429	G4	R801	F2	ZD502	C4
Q206	A4	R52	D1	R203	C3	R430	E3	R802	E1	ZD503	C4
Q207	A4	R53	D1	R204	B3	R501	D3	R803	E2	ZD504	C4
Q208	B5	R54	D1	R205	C3	R502	D3	R804	F1	ZD505	C4
Q401	E4	R55	C2	R206	C2	R503	C4	R807	E1	ZD507	D4
Q402	F4	R56	B2	R207	B3	R505	C4	R808	E1	ZD801	F1
Q403	E5	R57	D2	R208	C3	R506	C4	R809	F3		

1. Main P.C. Board (component side)



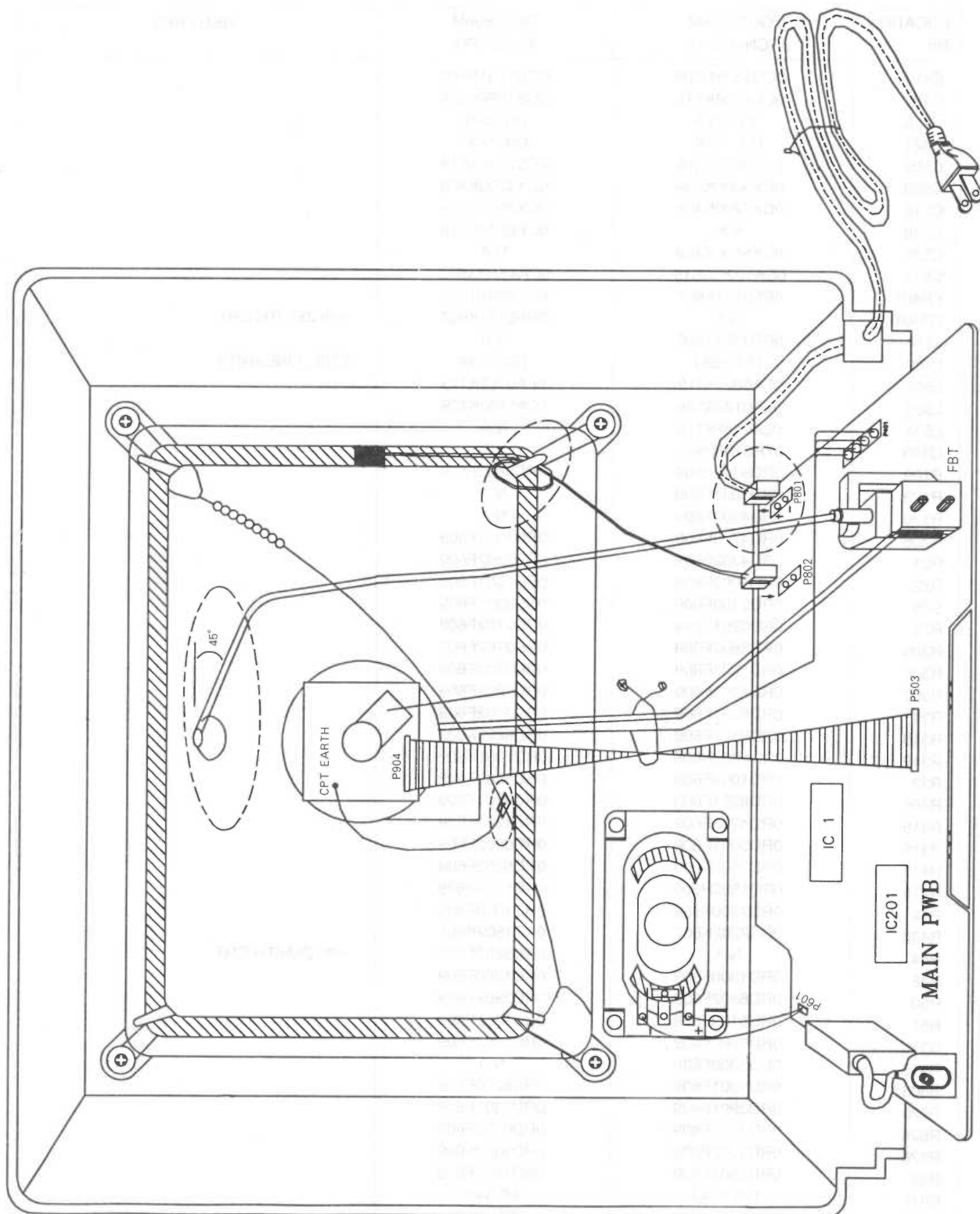
EXPLODED VIEW



Ref. No.	Description	PART NO.			
		GCT1356M	CN-14B90	19"(Z.CRT)	19"(G/S CRT)
102	HOLDER, D-COIL (L=65)	341-721A	341-721A	341-721A	341-721A
103	HOLDER, D-COIL (L=130)	341-721B	341-721B	341-721B	341-721B
104	HOLDER, PCB RAIL	341-745A	341-745A	340-369B	340-369B
▲ 112	CRT	2055-00744L	2055-00744K	★ 112-A09A	2055-00721K
120	SPEAKER	120-D04B	120-D04B	120-C93A	120-C93A
150	COIL, DEGAUSSING	150-276F	150-276F	150-276C	150-276C
▲ 153	DY	★ 851-036A	★ 851-036A	★ 153-310A	153-176E
170	LEAD SET, CPT EARTH	170-851A	170-851A	170-851B	170-851B
300 ★	CABINET ASSY	300-C20C	300-C20G	300-C34A	300-C34A
310	BUTTON, CONTROL	441-506A	441-506A	441-499A	441-499A
400 ★	COVER ASSY, BACK	303-J80C	303-J80E	303-K92D	303-K92C
500	CHASSIS ASSY, MAIN	310-H30F	310-H30A	310-H10M	310-H10K
▲ 501	CORD, POWER	174-019Q	174-019Q	174-019C	174-019C
510	PCB ASSY, CRT	109-372A	109-372A	109-362A	109-362A
▲ 511	SOCKET, CRT	381-100C	381-100C	381-226D	381-226D
520	PCB ASSY, MAIN	109-356F	109-356A	109-264P	109-264M
521	PRE-AMP	106-054B	106-054B	106-054B	106-054B
522	TUNER	★ 113-202U	★ 113-202U	113-241A	113-241A
523	BOARD, SHIELD BOX	401-589D	401-589D	401-589D	401-589D
912	SCREW	1PRF0302616	1PRF0302616	1PRF0302816	1PRF0302816
913	SCREW, HEXAGON HEAD	332-057B	332-057B	332-057B	332-057B
931	SCREW	1PWG0302816	1PWG0302816	1PWG0302816	1PWG0302816
943	SCREW	1PPF0403116	1PPF0403116	1PPF0403116	1PPF0403116

★ Marked Parts are from LGEUS SVC DIV. only.
Do not order them to Korea.

WIRING DIAGRAM



COMPARISON TABLE

LOCATION No.	GCT1356M (CN-14B90)	GCT1956M (CN-20B90)	REMARKS
C401	0CQ1531N509	0CQ1031N509	with ZENITH CRT COIL, LINEARITY
C402	0CE4756K618	0CE1066K618	
C416	181-452A	181-452E	
C421	181-059K	181-128C	
C505	0CE1066F618	0CE2256K618	
C509	0CX3000K409	0CX4700K409	
C510	0CX6200K409	0CX3900K409	
C526	N/A	0CE6846K618	
C530	0CX5100K409	N/A	
C619	0CK1020W515	0CK4710W515	
FR401	0RF0141K607	0RF0201K607	
FR401	N/A	0RF0181K607	
J214	0RD1001F609	N/A	
L402	150-159J	150-159A	
L502	0LA0821K119	0LA0152K119	
L503	0LA0122K139	0LA1200K139	
L504	0LA0182K119	N/A	
Q103	0TR319809AA	N/A	
R109	0RD9102F609	0RD5602F609	
R129	0RD1001F609	N/A	
R130	0RD4302F609	N/A	
R206	0RD4700F609	0RD1001F609	
R21	0RD4302F609	0RD1302F609	
R22	0RD1002F609	0RD7501F609	
R26	0RD5102F609	0RD3302F609	
R27	0RD6201F609	0RD2702F609	
R305	0RD3602F609	0RD2702F609	
R306	0RD1203F609	0RD3302F609	
R307	0RD1203F609	0RD1002F609	
R31	0RD6201F609	0RD3302F609	
R310	0RD9102F609	0RD6802F609	
R312,313	0RD1201H609	0RD1001H609	
R32	0RD1002F609	0RD5602F609	
R405	0RD8201F609	0RD9101F609	
R415	0RD4702F609	0RD1202F609	
R416	0RD3901F609	0RD6802F609	
R417	0RD7502F609	0RD6802F609	
R418	0RD1503H609	0RD1103H609	
R42	0RD1300F609	0RD1000F609	
R430	0RS2202K607	0RS1502K607	with ZENITH CRT
R44	N/A	0RD3602F609	
R48	0RD1300F609	0RD1000F609	
R50	0RD6802F609	0RD3902F609	
R51	0RD5102F609	0RD1002F609	
R510	0RD1000F609	0RD1001F609	
R518	0RD3302F609	N/A	
R603	0RD1001F609	0RD8200F609	
R620	0RD3901F609	0RD3301F609	
R626	0RD1500F609	0RD0752F609	
R628	0RD3302F609	0RD3002F609	FLYBACK TRANSFORMER
R93	0RD3903F609	0RD1803F609	
R811	180-344J	180-344Q	
T401	154-064C	154-375B	
VR301	0RV1503D230	0RV1203D230	

REPLACEMENT PARTS LIST

Caution: The Δ or \star marks on the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE in this manual. Do not risk the safety of the receiver through improper servicing.

LOCA NO	PART NO	DESCRIPTION
IC		
IC1	0ISA840819A	IC,GS8408-19A(LC864116K-5705) 52S
IC201	0ISA767400A	IC,LA7674 52SD NTSC 1 CHIP
IC202	0IT0651000A	IC,TLP6518D 5KVRMS PHOTO COUPLER
IC3	0IKE780500P	IC,KIA78L05BP(TA)3P 5V,150MA
IC301	0ISA783700A	IC,GL7837(LA7837) 13SIP V/O.
IC601	0IT0631000A	IC,TLP6316D 5KVRMS PHOTO COUPLER
Δ IC801	0IGL301300A	IC,STR30130,W/MICA SHEET
DIODES		
D10	0DD247109AA	1S2471DETECT SW
D11	0DD247109AA	1S2471DETECT SW
D12	0DD247109AA	1S2471DETECT SW
D13	0DD247109AA	1S2471DETECT SW
D14	0DD247109AA	1S2471DETECT SW
D15	0DD247109AA	1S2471DETECT SW
D16	0DD247109AA	1S2471DETECT SW
D17	0DD247109AA	1S2471DETECT SW
D19	0DD247109AA	1S2471DETECT SW
D20	0DD247109AA	1S2471DETECT SW
D201	0DD247109AA	1S2471DETECT SW
D202	0DD060009AC	TVR06J 0.6A/600V 250NS
D21	0DD247109AA	1S2471DETECT SW
D22	0DD247109AA	1S2471DETECT SW
D23	0DD247109AA	1S2471DETECT SW
D3	0DD247109AA	1S2471DETECT SW
D301	0DD400509AA	1N4005 GP
Δ D302	0DD060009AC	TVR06J 0.6A/600V 250NS
D303	0DD247109AA	1S2471DETECT SW
D4	0DD247109AA	1S2471DETECT SW
D401	0DD247109AA	1S2471DETECT SW
D402	0DD247109AA	1S2471DETECT SW
D403	0DD247109AA	1S2471DETECT SW
D405	0DD400509AA	1N4005 GP
D406	0DD247109AA	1S2471DETECT SW
D407	0DD247109AA	1S2471DETECT SW
D501	0DD247109AA	1S2471DETECT SW
D502	0DD247109AA	1S2471DETECT SW
D503	0DD247109AA	1S2471DETECT SW
D504	0DD247109AA	1S2471DETECT SW
Δ D505	0DD150009CA	RGP15J
D506	0DD247109AA	1S2471DETECT SW
D601	0DD247109AA	1S2471DETECT SW
Δ D602	0DD060009AC	TVR06J 0.6A/600V 250NS
D603	0DD247109AA	1S2471DETECT SW
D7	0DD247109AA	1S2471DETECT SW
D8	0DD247109AA	1S2471DETECT SW
Δ D801	0DD150009CE	GP15J TP (1.5A/600V) GI
Δ D802	0DD150009CE	GP15J TP (1.5A/600V) GI
Δ D803	0DD150009CE	GP15J TP (1.5A/600V) GI
Δ D804	0DD150009CE	GP15J TP (1.5A/600V) GI
D805	0DD247109AA	1S2471DETECT SW
D806	0DD400509AA	1N4005 GP
D807	0DD400509AA	1N4005 GP
Δ D808	0DD247109AA	1S2471DETECT SW

LOCA NO	PART NO	DESCRIPTION
D809	0DD247109AA	1S2471DETECT SW
D810	0DD247109AA	1S2471DETECT SW
D811	0DD247109AA	1S2471DETECT SW
D9	0DD247109AA	1S2471DETECT SW
Δ D901	0DD060009AC	TVR06J 0.6A/600V 250NS
ZD1	0DZ360009DA	ZENER MTZ3.6B
ZD101	0DZ300009BA	ZENER MTZ30B
ZD102	0DZ510009AB	ZENER MTZ5.1B
ZD103	0DZ910009BA	ZENER MTZ9.1B
ZD201	0DZ110009AA	ZENER MTZ 11B
ZD301	0DZ820009AA	ZENER MTZ8.2B
ZD401	0DZ110009AA	ZENER MTZ 11B
ZD501	0DZ910009BA	ZENER MTZ9.1B
ZD502	0DZ120009AA	ZENER Z12BM TA
ZD507	0DZ240009BC	ZENER MTZ2.4B 2.4V
ZD801	0DZ120009AC	ZENER TZP12A

TRANSISTORS

Q1	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q101	0TR319709AB	KTC3197,TP(KTC388A),KEC
Q102	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q2	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q201	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q202	0TR126609AA	KTA1266-TP-Y (KTA1015) KEC
Q203	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q204	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q206	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q207	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q208	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q3	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Δ Q401	0TR187700AA	2SD1877 SANYO
Q402	0TR320709AA	KTC3207,TP(KTC2482),KEC
Δ Q403	0TR126609AA	KTA1266-TP-Y (KTA1015) KEC
Q5	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q501	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q502	0TR127009AA	KTA1270-TP-Y (KTA562TM)KEC
Q602	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q603	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q604	0TR205800AB	KTD2058-Y KEC
Q605	0TR136600AB	KT81366-Y,KEC
Q606	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q801	0TR322709AA	KTC3227-Y,TP(KTC1627A),KEC
Q802	0TR319809AA	KTC3198-TP-Y (KTC1815)KEC
Q901	0TR378900AB	2SC3789-E SANYO
Q902	0TR378900AB	2SC3789-E SANYO
Q903	0TR378900AB	2SC3789-E SANYO

CAPACITORS

C10	0CE4756K618	C,ELECTROLYTIC	4.7MF SMS 50V M
C101	0CN1030F679	C,TUBULA(HIGH DIELE)	0.01MF 16V M
C102	0CE1056K618	C,ELECTROLYTIC	1.0MF SMS 50V M
C103	0CK1030K945	C,CERAMIC(HIGH DIELE)	0.01MF 50V Z
C104	0CE1056K618	C,ELECTROLYTIC	1.0MF SMS 50V M
C105	0CN1030F679	C,TUBULA(HIGH DIELE)	0.01MF 16V M
C106	0CE1086F618	C,ELECTROLYTIC	1000M SMS 16V M

LOCA NO	PART NO	DESCRIPTION
C107	OCE2256K618	C,ELECTROLYTIC 2.2MF SMS 50V M
C108	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C109	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C11	OCE4756K618	C,ELECTROLYTIC 4.7MF SMS 50V M
C110	OCC2000K415	C,CERAMIC(TEMP COMP) 20P 50V J
C111	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C112	OCE4756K618	C,ELECTROLYTIC 4.7MF SMS 50V M
C113	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C114	OCE4746K618	C,ELECTROLYTIC 0.47MF SMS 50V M
C115	OCX2700K409	C,TUBULA(T.C) 27PF 50V J
C116	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C117	OCC1031N509	C,POLYESTER(MYLAR) 0.01U 100V K
C118	OCE2276F618	C,ELECTROLYTIC 220MF SMS 16V M
C119	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C12	OCE4756K618	C,ELECTROLYTIC 4.7MF SMS 50V M
C120	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C121	OCE2276F618	C,ELECTROLYTIC 220MF SMS 16V M
C14	OCN1010K519	C,TUBULA(HIGH DIELE) 100PF 50V K
C15	OCE2256K618	C,ELECTROLYTIC 2.2MF SMS 50V M
C16	OCN1020K519	C,TUBULA(HIGH DIELE) 1000PF 50V K
C17	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C19	OCN1020K519	C,TUBULA(HIGH DIELE) 1000PF 50V K
C2	OCC2700K415	C,CERAMIC(TEMP COMP) 27P 50V J
C20	OCN4710K519	C,TUBULA(HIGH DIELE) 470PF 50V K
C201	OCE1056K618	C,ELECTROLYTIC 1.0MF SMS 50V M
C202	OCN1510K519	C,TUBULA(HIGH DIELE) 150P 50V K
C203	OCE1066F618	C,ELECTROLYTIC 10MF SMS 16V M
C204	OCE4766F618	C,ELECTROLYTIC 47MF SMS 16V M
C205	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C206	OCE4776F618	C,ELECTROLYTIC 470UF SMS 16V M
C208	OCX3R90K509	C,TUBULA(T.C) 3.9P 50V K
C209	OCX1500K409	C,TUBULA(T.C) 15P 50V J
C210	OCE1066F618	C,ELECTROLYTIC 10MF SMS 16V M
C211	OCE2276F618	C,ELECTROLYTIC 220MF SMS 16V M
C214	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C215	OCE4766F618	C,ELECTROLYTIC 47MF SMS 16V M
C21	OCN1020K519	C,TUBULA(HIGH DIELE) 1000PF 50V K
C212	OCC5100K415	C,CERAMIC(TEMP COMP) 51P 50V J
C216	OCE2286F618	C,ELECTROLYTIC 2200U SMS 16V M
C22	OCE1086D618	C,ELECTROLYTIC 1000U SMS 10V M
C23	OCN1020K519	C,TUBULA(HIGH DIELE) 1000PF 50V K
C24	OCN1020K519	C,TUBULA(HIGH DIELE) 1000PF 50V K
C25	OCN1020K519	C,TUBULA(HIGH DIELE) 1000PF 50V K
C26	OCN1020K519	C,TUBULA(HIGH DIELE) 1000PF 50V K
C27	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C29	OCX5600K409	C,TUBULA(T.C) 56P 50V J
C3	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C301	OCE4766F618	C,ELECTROLYTIC 47MF SMS 16V M
C302	OCN3910K519	C,TUBULA(HIGH DIELE) 390P 50V K
C303	OCC1031N509	C,POLYESTER(MYLAR) 0.01U 100V K
C304	181-112F	C,ELECTROLYTIC 50V/1UF K
C306	OCE4766K618	C,ELECTROLYTIC 47M SMS 50V M
C307	OCC5610K515	C,CERAMIC(HIGH DIELE) 560P 50V K
C308	OCE1056K618	C,ELECTROLYTIC 1.0MF SMS 50V M
C309	OCE1086J618	C,ELECTROLYTIC 1000M SMS 35V M
△ C310	OCC4710W515	C,CERAMIC(HIGH DIELE) 470PF 500V K
△ C311	OCE4776J618	C,ELECTROLYTIC 470UF SMS 35V M
C312	OCC1041N509	C,POLYESTER(MYLAR) 0.1MF 100V L
C32	OCE2276D618	C,ELECTROLYTIC 220MF SMS 10V M
C35	OCE1056K618	C,ELECTROLYTIC 1.0MF SMS 50V M
C36	OCN3310K519	C,TUBULA(HIGH DIELE) 330P 50V K
C39	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C40	OCE1076D618	C,ELECTROLYTIC 100MF SMS 10V M
C401	OCC1031N509	C,POLYESTER(MYLAR) 0.01U 100V K

LOCA NO	PART NO	DESCRIPTION
C402	OCE1066K618	C,ELECTROLYTIC 10MF SMS 50V M
C403	OCE1076F618	C,ELECTROLYTIC 100MF SMS 16V M
C405	OCC3331N509	C,POLYESTER(MYLAR) 0.033U 100V K
C406	OCE2256K618	C,ELECTROLYTIC 2.2MF SMS 50V M
C408	OCN5610K519	C,TUBULA(HIGH DIELE) 560P 50V K
C409	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C410	OCE3366H618	C,ELECTROLYTIC 33M SMS 25V M
△ C412	OCC3910W515	C,CERAMIC(HIGH DIELE) 390P 500V K
C413	OCE4756K618	C,ELECTROLYTIC 4.7MF SMS 50V M
△ C414	OCE2251R618	C,ELECTROLYTIC 2.2M SM 250V M
C415	OCE1056K618	C,ELECTROLYTIC 1.0MF SMS 50V M
△ C416	181-452E	C,MPP 1.6KV 0.0073MF
△ C417	181-087D	C,DE1010R 680PF 2KV K
△ C418	181-102P	C,HR 160V 33UF TP
△ C420	OCC8210W515	C,CERAMIC(HIGH DIELE) 820PF 500V K
△ C421	181-128C	C,METALPOLYPROPYLENE 0.39MF 200V J
△ C422	OCE1051R618	C,ELECTROLYTIC 1.0M SM 250V M
C425	181-093A	C,DE 7090B 102KVA 1MKC4-14
C429	OCC2231N509	C,POLYESTER(MYLAR) 0.022MF 100V K
C5	OCE1086D618	C,ELECTROLYTIC 1000U SMS 10V M
C501	OCE1056K618	C,ELECTROLYTIC 1.0MF SMS 50V M
C502	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C503	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C504	OCE4746K618	C,ELECTROLYTIC 0.47MF SMS 50V M
C505	OCE2256K618	C,ELECTROLYTIC 2.2MF SMS 50V M
C506	OCN3910K519	C,TUBULA(HIGH DIELE) 390P 50V K
C509	OCX4700K409	C,TUBULA(T.C) 47PF 50V J
C510	OCX3900K409	C,TUBULA(T.C) 39PF 50V J
C512	OCE4746K618	C,ELECTROLYTIC 0.47MF SMS 50V M
C513	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C514	OCX1300K409	C,TUBULA(T.C) 13P 50V J
C519	OCE4756K618	C,ELECTROLYTIC 4.7MF SMS 50V M
C520	OCN8210K519	C,TUBULA(HIGH DIELE) 820P 50V K
C521	OCN1020K519	C,TUBULA(HIGH DIELE) 1000PF 50V K
C522	OCN1020K519	C,TUBULA(HIGH DIELE) 1000PF 50V K
△ C523	OCC4710W515	C,CERAMIC(HIGH DIELE) 470PF 500V K
△ C524	OCE1086F618	C,ELECTROLYTIC 1000M SMS 16V M
C525	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C526	OCE6846K618	C,ELECTROLYTIC 0.68U SMS 50V M
C527	OCX1200K409	C,TUBULA(T.C) 12PF 50V J
C528	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C529	OCE1066F618	C,ELECTROLYTIC 10MF SMS 16V M
C532	OCE1076F618	C,ELECTROLYTIC 100MF SMS 16V M
C6	OCE1056K618	C,ELECTROLYTIC 1.0MF SMS 50V M
C603	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C604	OCE4766K618	C,ELECTROLYTIC 47M SMS 50V M
C605	OCX1800K409	C,TUBULA(T.C) 18PF 50V J
C606	OCX3900K409	C,TUBULA(T.C) 39PF 50V J
C609	OCC1031N509	C,POLYESTER(MYLAR) 0.01U 100V K
C607	OCE1066F618	C,ELECTROLYTIC 10MF SMS 16V M
C608	OCE1066F618	C,ELECTROLYTIC 10MF SMS 16V M
C611	OCN1030F679	C,TUBULA(HIGH DIELE) 0.01MF 16V M
C612	OCE1056K618	C,ELECTROLYTIC 1.0MF SMS 50V M
C613	OCE4776J618	C,ELECTROLYTIC 470UF SMS 35V M
C614	OCE4766F618	C,ELECTROLYTIC 47MF SMS 16V M
C615	OCN3310K519	C,TUBULA(HIGH DIELE) 330P 50V K
C616	OCE4756K618	C,ELECTROLYTIC 4.7MF SMS 50V M
C617	OCE1076J618	C,ELECTROLYTIC 100M SMS 35V M

LOCA NO	PART NO	DESCRIPTION
C618	OCN1020K519	C,TUBULA(HIGH DIELE) 1000PF 50V K
△ C619	OCK4710W515	C,CERAMIC(HIGH DIELE) 470PF 500V K
△ C620	OCE1076J618	C,ELECTROLYTIC 100M SMS 35V M
C621	OCE4766F618	C,ELECTROLYTIC 47MF SMS 16V M
C622	OCE4766F618	C,ELECTROLYTIC 47MF SMS 16V M
C623	181-444J	C,METALPOLYESTER 0.22MF 50V J
C624	OCQ6821N509	C,POLYESTER(MYLAR) 0.0068U 100V K
C7	OCE2256K618	C,ELECTROLYTIC 2.2MF SMS 50V M
C8	OCE4756K618	C,ELECTROLYTIC 4.7MF SMS 50V M
C801	181-017D	CAPACITOR MPP(BOX) AC250V 0.22UF K
△ C803	OCK2220W515	C,CERAMIC(HIGH DIELE) 2200PF 500V K
△ C804	OCK2220W515	C,CERAMIC(HIGH DIELE) 2200PF 500V K
△ C805	OCK2220W515	C,CERAMIC(HIGH DIELE) 2200PF 500V K
△ C806	OCK2220W515	C,CERAMIC(HIGH DIELE) 2200PF 500V K
△ C807	181-075E	C,ELECTROLYTIC 470MF 200V
C808	OCE475BP618	C,ELECTROLYTIC 4.7U KME(RG) 160V
C809	OCE3376F618	C,ELECTROLYTIC 330M SMS 16V M
C810	OCE1086F618	C,ELECTROLYTIC 1000M SMS 16V M
C811	OCE4766F618	C,ELECTROLYTIC 47MF SMS 16V M
C812	OCK1030K945	C,CERAMIC(HIGH DIELE) 0.01MF 50V Z
C9	OCE4756K618	C,ELECTROLYTIC 4.7MF SMS 50V M
C901	181-434K	C,CERAMIC(HI-K) 2200PF 2KV
C902	OCE4751F618	C,ELECTROLYTIC 4.7M SM 250V M

COILS & TRANSFORMERS

L1	OLA0561K119	INDUCTOR 5.6UH K
L101	OLA0680K119	INDUCTOR 0.68UH K
L102	150-540Y	COIL AFT
L201	150-540T	COIL VIF
L202	OLA0562K119	INDUCTOR 56UH K
L203	OLA0152K119	INDUCTOR 15UH K
L204	OLA0392K119	INDUCTOR 39UH K
L205	OLA1000K139	INDUCTOR 100UH K
L206	OLA1200K139	INDUCTOR 120UH K
L3	OLA1000K119	INDUCTOR 100UH K
△ L402	150-159A	COIL LINEARITY
△ L403	150-1091	COIL PL 6800 UHJ
L501	OLA0472K119	INDUCTOR 47UH K
L502	OLA0152K119	INDUCTOR 15UH K
L503	OLA1200K139	INDUCTOR 120UH K
L601	150-540Z	COIL SIF
L602	OLA0152K119	INDUCTOR 15UH K
L8	OLA0102K119	INDUCTOR 10UH K
L9	OLA0122K119	INDUCTOR 12UH K
L901	OLA1200K139	INDUCTOR 120UH K
△ T401	154-375B	FBT DNF-FA2105(SECTION,154-177C)
△ T402	151-386A	TRANSFORMER H.DRIVE 19Y4BY
△ T403	150-F02B	COIL LINE FILTER UU1116 1.5MH
T801	150-F02B	COIL LINE FILTER UU1116 1.5MH

RESISTORS

△ FR301	ORF0201J607	R,FUSIBLE RC 1/2W 3.3M K TA52
△ FR401	ORF0201K607	R,FUSIBLE 2 1W 5%
△ FR402	ORF0102J607	R,FUSIBLE 2 2W 5%
△ FR501	ORF0101J607	R,FUSIBLE 10 1W 5%
△ FR601	ORF0511J607	R,FUSIBLE 1 1W 5%
△ FR602	ORF0102J607	R,FUSIBLE 5.10 1W 5%
△ FR901	ORF0101J607	R,FUSIBLE 10 1W 5%
R102	ORS4701H609	R,METAL FILM OXIDE 4.7K 1/2W 5
R103	ORD0752F609	R,CARBON FILM 75 1/6W 5
R104	ORD5601F609	R,CARBON FILM 5.6K 1/6W 5
R105	ORD1001F609	R,CARBON FILM 10K 1/6W 5
R106	ORD1001F609	R,CARBON FILM 10K 1/6W 5

LOCA NO	PART NO	DESCRIPTION
R107	ORD0222F609	R,CARBON FILM 22 1/6W 5
R108	ORD1500F609	R,CARBON FILM 150 1/6W 5
R109	ORD5602F609	R,CARBON FILM 56K 1/6W 5
R110	ORD1001F609	R,CARBON FILM 1.0K 1/6W 5
R111	ORD5102F609	R,CARBON FILM 51K 1/6W 5
R112	ORD5102F609	R,CARBON FILM 51K 1/6W 5
R113	ORD2701F609	R,CARBON FILM 2.7K 1/6W 5
R114	ORD3601F609	R,CARBON FILM 3.6K 1/6W 5
R115	ORD1002F609	R,CARBON FILM 10K 1/6W 5
R116	ORD7501F609	R,CARBON FILM 7.5K 1/6W 5
R117	ORD3301F609	R,CARBON FILM 3.3K 1/6W 5
R118	ORD1500F609	R,CARBON FILM 150 1/6W 5
R119	ORD6802F609	R,CARBON FILM 68K 1/6W 5
R12	ORD1002F609	R,CARBON FILM 10K 1/6W 5
R120	ORD3001F609	R,CARBON FILM 3.0K 1/6W 5
R121	ORD2700F609	R,CARBON FILM 270 1/6W 5
R122	ORS0332J607	R,METAL FILM OXIDE 33 1W 5%
R123	ORD0512H609	R,CARBON FILM 51 1/2W 5
R124	ORD0512H609	R,CARBON FILM 51 1/2W 5
R125	ORD0512H609	R,CARBON FILM 51 1/2W 5
R126	ORS1202J607	R,METAL FILM OXIDE 12K 1W 5%
R127	ORS4701H609	R,METAL FILM OXIDE 4.7K 1/2W 5
R13	ORD1502F609	R,CARBON FILM 15K 1/6W 5
R14	ORD2402F609	R,CARBON FILM 24K 1/6W 5
R17	ORD3300F609	R,CARBON FILM 330 1/6W 5
R18	ORD1000F609	R,CARBON FILM 100 1/6W 5
R19	ORD1000F609	R,CARBON FILM 100 1/6W 5
R2	ORD4702F609	R,CARBON FILM 47K 1/6W 5
R201	ORD3900F609	R,CARBON FILM 390 1/6W 5
R202	ORD1201F609	R,CARBON FILM 1.2K 1/6W 5
R203	ORD2700F609	R,CARBON FILM 270 1/6W 5
R204	ORD1000F609	R,CARBON FILM 100 1/6W 5
R205	ORD4700F609	R,CARBON FILM 470 1/6W 5
R206	ORD1001F609	R,CARBON FILM 1.0K 1/6W 5
R207	ORD4702F609	R,CARBON FILM 47K 1/6W 5
R208	ORD1001F609	R,CARBON FILM 1.0K 1/6W 5
R209	ORD1001F609	R,CARBON FILM 1.0K 1/6W 5
R21	ORD1302F609	R,CARBON FILM 13K 1/6W 5
R210	ORD0752F609	R,CARBON FILM 75 1/6W 5
R211	ORD9101F609	R,CARBON FILM 9.1K 1/6W 5
R212	ORD2001F609	R,CARBON FILM 2.0K 1/6W 5
R213	ORD1200F609	R,CARBON FILM 120 1/6W 5
R214	ORD5601H609	R,CARBON FILM 5.6K 1/2W 5
R215	ORD4701F609	R,CARBON FILM 4.7K 1/6W 5
R216	ORD1002F609	R,CARBON FILM 10K 1/6W 5
R217	ORD2400F609	R,CARBON FILM 240 1/6W 5
R218	ORD0912F609	R,CARBON FILM 91 1/6W 5
R219	ORS0101J607	R,METAL FILM OXIDE 11W 5%
R22	ORD7501F609	R,CARBON FILM 7.5K 1/6W 5
R220	ORD1001F609	R,CARBON FILM 1.0K 1/6W 5
R221	ORD0472H609	R,CARBON FILM 47 1/2W 5
R223	ORD4702F609	R,CARBON FILM 47K 1/6W 5
R224	ORD3900F609	R,CARBON FILM 390 1/6W 5
R23	ORD9101F609	R,CARBON FILM 9.1K 1/6W 5
R24	ORD1302F609	R,CARBON FILM 13K 1/6W 5
R25	ORD4701F609	R,CARBON FILM 4.7K 1/6W 5
R26	ORD3302F609	R,CARBON FILM 33K 1/6W 5
R27	ORD2702F609	R,CARBON FILM 27K 1/6W 5
R28	ORD1502F609	R,CARBON FILM 15K 1/6W 5
R29	ORD1502F609	R,CARBON FILM 15K 1/6W 5
R3	ORD4702F609	R,CARBON FILM 47K 1/6W 5
R30	ORD1502F609	R,CARBON FILM 15K 1/6W 5
R301	ORD1500H609	R,CARBON FILM 150 1/2W 5
R302	ORD6801F609	R,CARBON FILM 6.8K 1/6W 5
R303	ORD2402F609	R,CARBON FILM 24K 1/6W 5

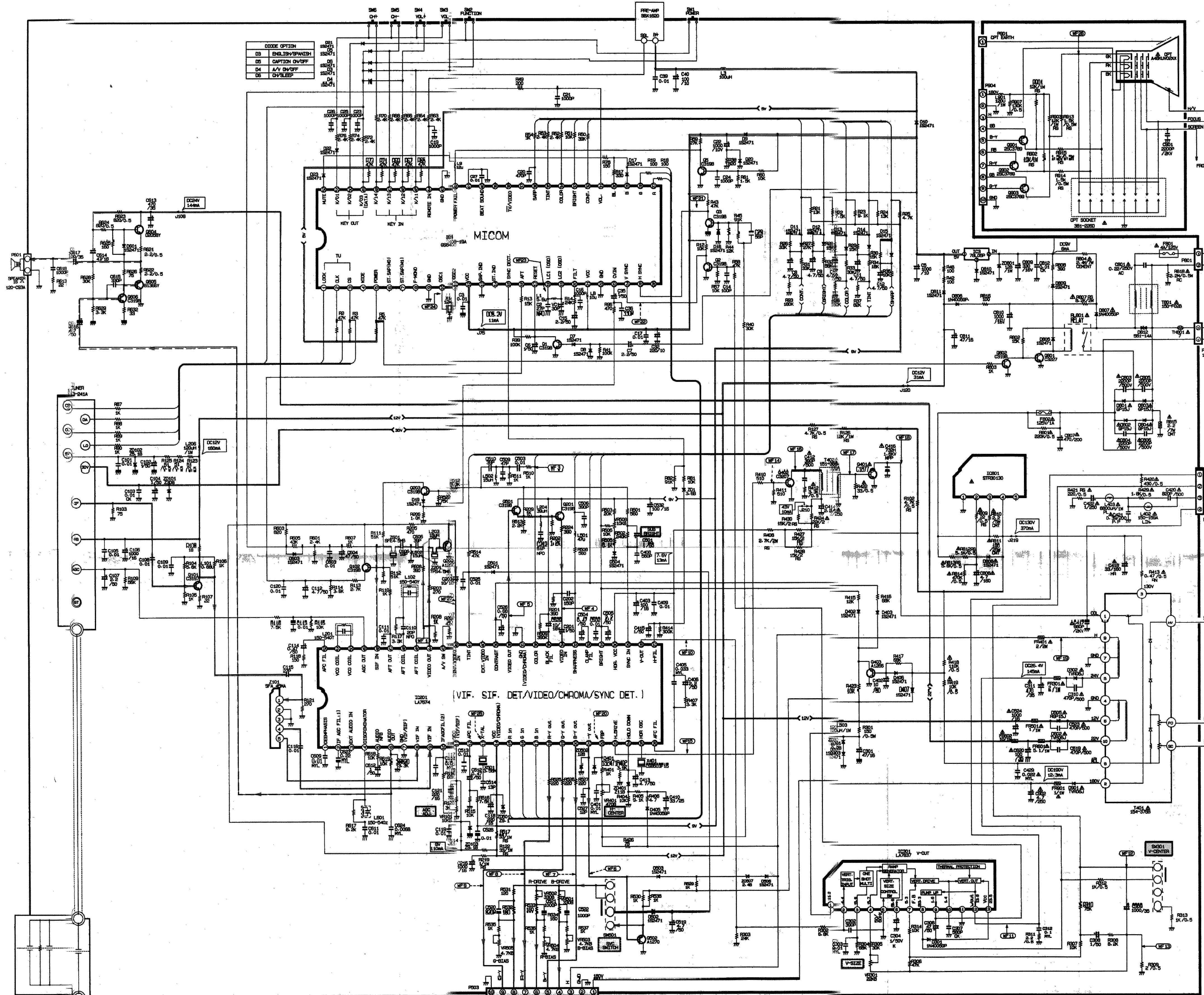
LOCA NO	PART NO	DESCRIPTION		LOCA NO	PART NO	DESCRIPTION	
R304	ORD6802F609	R,CARBON FILM	68K 1/6W 5	R5	ORD4702F609	R,CARBON FILM	47K 1/6W 5
R305	ORD3002F609	R,CARBON FILM	30K 1/6W 5	R50	ORD3902F609	R,CARBON FILM	39K 1/6W 5
R306	ORD3302F609	R,CARBON FILM	33K 1/6W 5	R501	ORD5600F609	R,CARBON FILM	560 1/6W 5
R307	ORD1002F609	R,CARBON FILM	10K 1/6W 5	R502	ORD2403F609	R,CARBON FILM	240K 1/6W 5
R308	ORD8201F609	R,CARBON FILM	8.2K 1/6W 5	R503	ORD2002F609	R,CARBON FILM	20K 1/6W 5
R309	ORD0201H609	R,CARBON FILM	2.0 1/2W 5	R505	ORD9101F609	R,CARBON FILM	9.1K 1/6W 5
R31	ORD3302F609	R,CARBON FILM	33K 1/6W 5	R506	ORD1002F609	R,CARBON FILM	10K 1/6W 5
R310	ORD7502F609	R,CARBON FILM	75K 1/6W 5	R508	ORD5600F609	R,CARBON FILM	560 1/6W 5
R311	ORD0221H609	R,CARBON FILM	2.2 1/2W 5	R509	ORD3903F609	R,CARBON FILM	390K 1/6W 5
R312	ORD1001H609	R,CARBON FILM	1.0K 1/2W 5	R51	ORD1002F609	R,CARBON FILM	10K 1/6W 5
R313	ORD1001H609	R,CARBON FILM	1.0K 1/2W 5	R510	ORD1001F609	R,CARBON FILM	1.0K 1/6W 5
R314	ORD1002F609	R,CARBON FILM	10K 1/6W 5	R511	ORD1001F609	R,CARBON FILM	1.0K 1/6W 5
R32	ORD5602F609	R,CARBON FILM	56K 1/6W 5	R512	ORD3301F609	R,CARBON FILM	3.3K 1/6W 5
R33	ORD3002F609	R,CARBON FILM	30K 1/6W 5	R513	ORD2201F609	R,CARBON FILM	2.2K 1/6W 5
R34	ORD1802F609	R,CARBON FILM	18K 1/6W 5	R514	ORD4702F609	R,CARBON FILM	47K 1/6W 5
R35	ORD5601F609	R,CARBON FILM	5.6K 1/6W 5	R515	ORD1002F609	R,CARBON FILM	10K 1/6W 5
R36	ORD1603F609	R,CARBON FILM	160K 1/6W 5	R516	ORD7501F609	R,CARBON FILM	7.5K 1/6W 5
R37	ORD8202F609	R,CARBON FILM	82K 1/6W 5	R517	ORS0332J607	R,METAL FILM OXIDE	33 1W 5%
R38	ORD8200F609	R,CARBON FILM	820 1/6W 5	R52	ORD2401F609	R,CARBON FILM	2.4K 1/6W 5
R39	ORD1003F609	R,CARBON FILM	100K 1/6W 5	R522	ORD7502F609	R,CARBON FILM	75K 1/6W 5
R40	ORD3002F609	R,CARBON FILM	30K 1/6W 5	R525	ORD2200F609	R,CARBON FILM	220 1/6W 5
R401	ORD1001F609	R,CARBON FILM	1.0K 1/6W 5	R526	ORD2200F609	R,CARBON FILM	220 1/6W 5
R402	ORD3901F609	R,CARBON FILM	3.9K 1/6W 5	R527	ORD2200F609	R,CARBON FILM	220 1/6W 5
R404	ORD1002F609	R,CARBON FILM	10K 1/6W 5	R529	ORD1001F609	R,CARBON FILM	1.0K 1/6W 5
R405	ORD9101F609	R,CARBON FILM	9.1K 1/6W 5	R53	ORD2401F609	R,CARBON FILM	2.4K 1/6W 5
R406	ORD0471F609	R,CARBON FILM	4.7 1/6W 5	R530	ORD1001F609	R,CARBON FILM	1.0K 1/6W 5
R407	ORD3301F609	R,CARBON FILM	3.3K 1/6W 5	R531	ORD1200F609	R,CARBON FILM	120 1/6W 5
R408	ORS2701K607	R,METAL FILM OXIDE	2.70K 2W 5%	R532	ORD1600F609	R,CARBON FILM	160 1/6W 5
R41	ORD1003F609	R,CARBON FILM	100K 1/6W 5	R533	ORD1600F609	R,CARBON FILM	160 1/6W 5
R410	ORD5100F609	R,CARBON FILM	510 1/6W 5	R534	ORD1600F609	R,CARBON FILM	160 1/6W 5
R411	ORD5100F609	R,CARBON FILM	510 1/6W 5	R535	ORD1001F609	R,CARBON FILM	1.0K 1/6W 5
△ R412	ORD3301H609	R,CARBON FILM	3.3K 1/2W 5	R536	ORD1001F609	R,CARBON FILM	1.0K 1/6W 5
△ R413	ORN0470H609	R,METAL FILM	0.47 1/2W 5	R537	ORD1001F609	R,CARBON FILM	1.0K 1/6W 5
R414	ORD3003F609	R,CARBON FILM	300K 1/6W 5	R538	ORD1001F609	R,CARBON FILM	1.0K 1/6W 5
R415	ORD1202F609	R,CARBON FILM	12K 1/6W 5	R54	ORD3001F609	R,CARBON FILM	3.0K 1/6W 5
R416	ORD6802F609	R,CARBON FILM	68K 1/6W 5	R55	ORD2202F609	R,CARBON FILM	22K 1/6W 5
R417	ORD6802F609	R,CARBON FILM	68K 1/6W 5	R56	ORD2401F609	R,CARBON FILM	2.4K 1/6W 5
△ R418	ORD1103H609	R,CARBON FILM	110K 1/2W 5	R57	ORD1002F609	R,CARBON FILM	10K 1/6W 5
△ R419	ORD1002H609	R,CARBON FILM	10K 1/2W 5	R58	ORD4702F609	R,CARBON FILM	47K 1/6W 5
R42	ORD1000F609	R,CARBON FILM	100 1/6W 5	R59	ORD2702F609	R,CARBON FILM	27K 1/6W 5
△ R420	ORD4300H609	R,CARBON FILM	430 1/2W 5	R60	ORD1002F609	R,CARBON FILM	10K 1/6W 5
△ R421	ORS2200H609	R,METAL FILM OXIDE	220 1/2W 5	R601	ORD2401F609	R,CARBON FILM	2.4K 1/6W 5
△ R422	ORD0332H609	R,CARBON FILM	33 1/2W 5	R603	ORD8200F609	R,CARBON FILM	820 1/6W 5
R423	ORD1002F609	R,CARBON FILM	10K 1/6W 5	R605	ORD4302F609	R,CARBON FILM	43K 1/6W 5
△ R424	ORS2202K607	R,METAL FILM OXIDE	22K 2W 5%	R606	ORD1000F609	R,CARBON FILM	100 1/6W 5
R426	ORD0752F609	R,CARBON FILM	75 1/6W 5	R607	ORD1001F609	R,CARBON FILM	1.0K 1/6W 5
R427	ORS1502K607	R,METAL FILM OXIDE	15K 2W 5%	R608	ORD3900F609	R,CARBON FILM	390 1/6W 5
R428	ORS1502K607	R,METAL FILM OXIDE	15K 2W 5%	R61	ORD1501F609	R,CARBON FILM	15K 1/6W 5
△ R429	ORD1801H609	R,CARBON FILM	1.8K 1/2W 5	R609	ORD2203F609	R,CARBON FILM	220K 1/6W 5
R43	ORD4702F609	R,CARBON FILM	47K 1/6W 5	R610	ORD1502F609	R,CARBON FILM	15K 1/6W 5
R430	ORS1502K607	R,METAL FILM OXIDE	15K 2W 5%	R611	ORD5601F609	R,CARBON FILM	5.6K 1/6W 5
R44	ORD1202F609	R,CARBON FILM	12K 1/6W 5	R612	ORD2000F609	R,CARBON FILM	200 1/6W 5
R45	ORD9102F609	R,CARBON FILM	91K 1/6W 5	R614	ORD1302F609	R,CARBON FILM	13K 1/6W 5
R48	ORD1000F609	R,CARBON FILM	100 1/6W 5	R615	ORD0912F609	R,CARBON FILM	91 1/6W 5
R49	ORD2000F609	R,CARBON FILM	200 1/6W 5	R616	ORD1501F609	R,CARBON FILM	15K 1/6W 5
				R613	ORD0222F609	R,CARBON FILM	22 1/6W 5
				R617	ORD8201F609	R,CARBON FILM	8.2K 1/6W 5
				R618	ORD1002F609	R,CARBON FILM	10K 1/6W 5
				R619	ORD1002F609	R,CARBON FILM	10K 1/6W 5
				R620	ORD3301F609	R,CARBON FILM	3.3K 1/6W 5
				R621	ORD0221H609	R,CARBON FILM	2.2 1/2W 5
				R622	ORD0221H609	R,CARBON FILM	2.2 1/2W 5
				R623	ORD8200H609	R,CARBON FILM	820 1/2W 5
				R624	ORD8200H609	R,CARBON FILM	820 1/2W 5
				R625	ORD1600F609	R,CARBON FILM	160 1/6W 5

LOCA NO	PART NO	DESCRIPTION
R626	ORD0752F609	R,CARBON FILM 75 1/6W 5
R628	ORD3002F609	R,CARBON FILM 30K 1/6W 5
R629	ORD3301F609	R,CARBON FILM 3.3K 1/6W 5
R63	ORD2401F609	R,CARBON FILM 2.4K 1/6W 5
R631	ORD3901F609	R,CARBON FILM 3.9K 1/6W 5
R632	ORD0332F609	R,CARBON FILM 33 1/6W 5
R633	ORD3300F609	R,CARBON FILM 330 1/6W 5
R634	ORD0752F609	R,CARBON FILM 75 1/6W 5
R635	ORD2000F609	R,CARBON FILM 200 1/6W 5
R64	ORD2401F609	R,CARBON FILM 2.4K 1/6W 5
R65	ORD4702F609	R,CARBON FILM 47K 1/6W 5
R66	ORD2401F609	R,CARBON FILM 2.4K 1/6W 5
R67	ORD4702F609	R,CARBON FILM 47K 1/6W 5
R68	ORD2401F609	R,CARBON FILM 2.4K 1/6W 5
R69	ORD4702F609	R,CARBON FILM 47K 1/6W 5
R70	ORD2401F609	R,CARBON FILM 2.4K 1/6W 5
R71	ORD4702F609	R,CARBON FILM 47K 1/6W 5
R72	ORD2401F609	R,CARBON FILM 2.4K 1/6W 5
R73	ORD4702F609	R,CARBON FILM 47K 1/6W 5
R74	ORD2401F609	R,CARBON FILM 2.4K 1/6W 5
R76	ORD2401F609	R,CARBON FILM 2.4K 1/6W 5
R78	ORD1500F609	R,CARBON FILM 150 1/6W 5
△ R801	ORD2203H609	R,CARBON FILM 220K 1/2W 5
R802	ORD1502F609	R,CARBON FILM 15K 1/6W 5
R803	ORD1001F609	R,CARBON FILM 10K 1/6W 5
R804	180-830N	R,RSR 7W 2.4K JPD
R807	ORS8201K607	R,METAL FILM OXIDE 8.20K 2W 5%
R808	ORD3900F609	R,CARBON FILM 390 1/6W 5
R809	ORS0222H609	R,METAL FILM OXIDE 22 1/2W 5
R81	ORD1002F609	R,CARBON FILM 10K 1/6W 5
R810	180-142F	R,CEMENT RWR 5W 2.2J
R811	180-344Q	R,CEMENT RWR 180 OHM 25W
R812	ORS5101H609	R,METAL FILM OXIDE 5.1K 1/2W 5
R813	ORS5601H609	R,METAL FILM OXIDE 5.6K 1/2W 5
R814	ORD4703H609	R,CARBON FILM 470K 1/2W 5
R815	180-344M	R,CEMENT PWR 2.2J 7W
R816	ORD1000F609	R,CARBON FILM 100 1/6W 5
R818	180-783E	RESISTOR RC 2200K 1/2W K
R82	ORD9102F609	R,CARBON FILM 91K 1/6W 5
R87	ORD1001F609	R,CARBON FILM 10K 1/6W 5
R88	ORD1001F609	R,CARBON FILM 10K 1/6W 5
R89	ORD1001F609	R,CARBON FILM 10K 1/6W 5
R90	ORD1001F609	R,CARBON FILM 10K 1/6W 5
R901	ORS1202J607	R,METAL FILM OXIDE 12K 1W 5%
R902	ORS1202J607	R,METAL FILM OXIDE 12K 1W 5%
R903	ORS1202J607	R,METAL FILM OXIDE 12K 1W 5%
R907	ORD1303H609	R,CARBON FILM 130K 1/2W 5
R913	ORS1501H609	R,METAL FILM OXIDE 15K 1/2W 5
R914	ORS1501H609	R,METAL FILM OXIDE 15K 1/2W 5
R915	ORS1501H609	R,METAL FILM OXIDE 15K 1/2W 5
R93	ORD1803F609	R,CARBON FILM 180K 1/6W 5
R96	ORD4700F609	R,CARBON FILM 470 1/6W 5
VR101	ORV1103D330	VARIABLE,CARBON FILM 10K 6 ST
VR201	ORV1222D330	VARIABLE,CARBON FILM 2.2K 6 ST
VR301	ORV1223D330	VARIABLE,CARBON FILM 22K 6 ST
VR401	ORV1471D330	VARIABLE,CARBON FILM 470 6 ST
VR501	ORV1331D330	VARIABLE,CARBON FILM 330 6 ST
VR502	ORV1331D330	VARIABLE,CARBON FILM 330 6 ST
VR503	ORV1472D330	VARIABLE,CARBON FILM 4.7K 6 ST
VR504	ORV1472D330	VARIABLE,CARBON FILM 4.7K 6 ST

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LOCA NO	PART NO	DESCRIPTION
VR505	ORV1472D330	VARIABLE,CARBON FILM 4.7K 6 ST
VR508	ORV1103D330	VARIABLE,CARBON FILM 10K 6 ST
SWITCHES		
SW2	140-333A	SWITCH TACT.2PDC12V 50MA
SW3	140-333A	SWITCH TACT.2PDC12V 50MA
SW301	140-111A	SWITCH SVC P12T21
SW4	140-333A	SWITCH TACT.2PDC12V 50MA
SW5	140-333A	SWITCH TACT.2PDC12V 50MA
SW501	140-111A	SWITCH SVC P12T21
SW6	140-333A	SWITCH TACT.2PDC12V 50MA
SW7	140-333A	SWITCH TACT.2PDC12V 50MA
FILTER		
X1	166-235B	FILTER CST12.0MTW-TF01
X401	166-015V	FILTER RESONATOR CSB503F15
Z101	166-234A	FILTER SAF 45 MA 80Z
Z201	166-031K	FILTER TPS 4.5MB-TF21
Z601	166-B01C	FILTER SFSH4.5MCB-TF21
MISCELLANEOUS		
D812	164-003D	VARISTOR,SVC 561D-14A
△ F801	131-033X	FUSE,125V 4A TIME LAG
△ F802	OFF1001A512	FUSE,FAST BLOW 1.0A 125V
JA001	380-362B	JACK,VIDEO:YL, AUDIO:VH
△ P801	174-019C	CORD,POWER(W/HOLDER,HOUSING L=120)
RL801	141-028A	RELAY,SZR-G5-AP 12VDC
△ TH801	163-007A	THERMISTOR,PTH631D01BF7ROM140
VC1	181-503A	CAPACITOR,VCT56G521A 7.5P-50P N600-N1200
X501	156-001C	OSCILLATOR,CRYSTAL 3.58MHZ
ACCESSORIES		
A1	482-G44U	OWNER'S MANUAL
A1	482-H59A	OWNER'S MANUAL(CANADA)
A2	105-207C	TRANSMITTER ASSY(CN-14B90)
A2	105-207D	TRANSMITTER ASSY
A2-1	303-H35B	COVER BATTERY(105-207 TX)
A3	132-204H	ANTENNA ASSY ROD(STS,3SEC,F/L 650,BK)
A4	450-003A	ADAPTER ANT (75/300)

NC-4JA CHASSIS SCHEMATIC DIAGRAM (19")



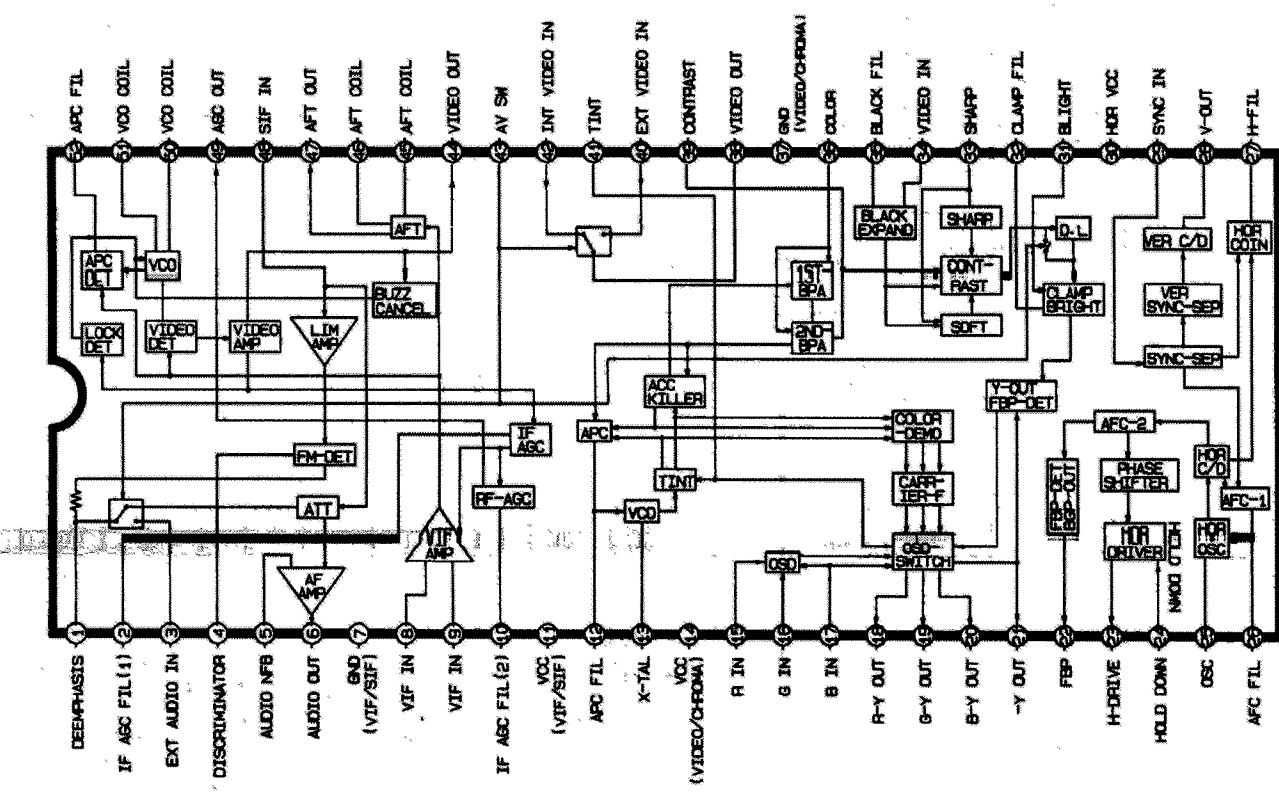
WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND PRODUCT SAFETY NOTICE IN THIS MANUAL.

CAUTION: The Δ marks in the schematic diagram and the parts list designate components which have special characteristics for safety, and should be replaced only with types identical to those in the original circuit or specified in the parts list. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE in this manual. Do not degrade the safety of the receiver through improper servicing.

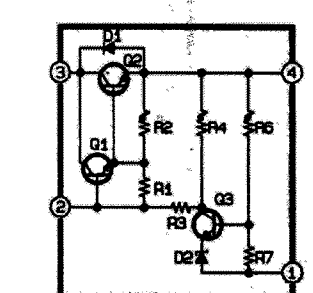
AVIS SUR LA SECURITE DU PRODUIT
Les pièces de la partie ombrée possèdent d'importantes caractéristiques spéciales par rapport à la sécurité et avant de les remplacer, il est recommandé de lire le manuel de service. Ne remplacez pas le récepteur car vous pourriez en endommager le système sécuritaire.

- NOTE
- 1. Resistance is shown in ohm. K=1,000 M=1,000,000
 - 2. Capacitors are shown in μF otherwise noted. P = μF
 - 3. Unless otherwise listed, all inductor values more than 1 are expressed in μH , and the values less than 1 in H.
 - 4. Voltages are measured DVM from point indicated to chassis ground, using color bar signal with all controls at normal.
 - 5. Waveforms are measured with synchroscope from point indicated to chassis ground, using color bar with all controls at normal.
 - 6. May choose anyone since listed following semiconductors have same characteristics

EQUIVALENT CIRCUIT BLOCK DIAGRAM



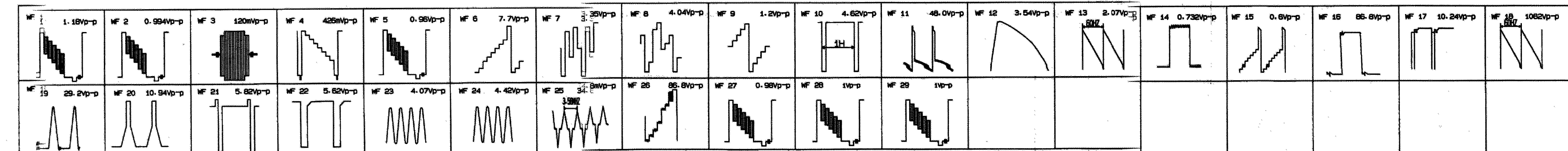
IC201
LA7674
(VIF/SIF DET. VIDEO, CHROMA, H/V SYNC)



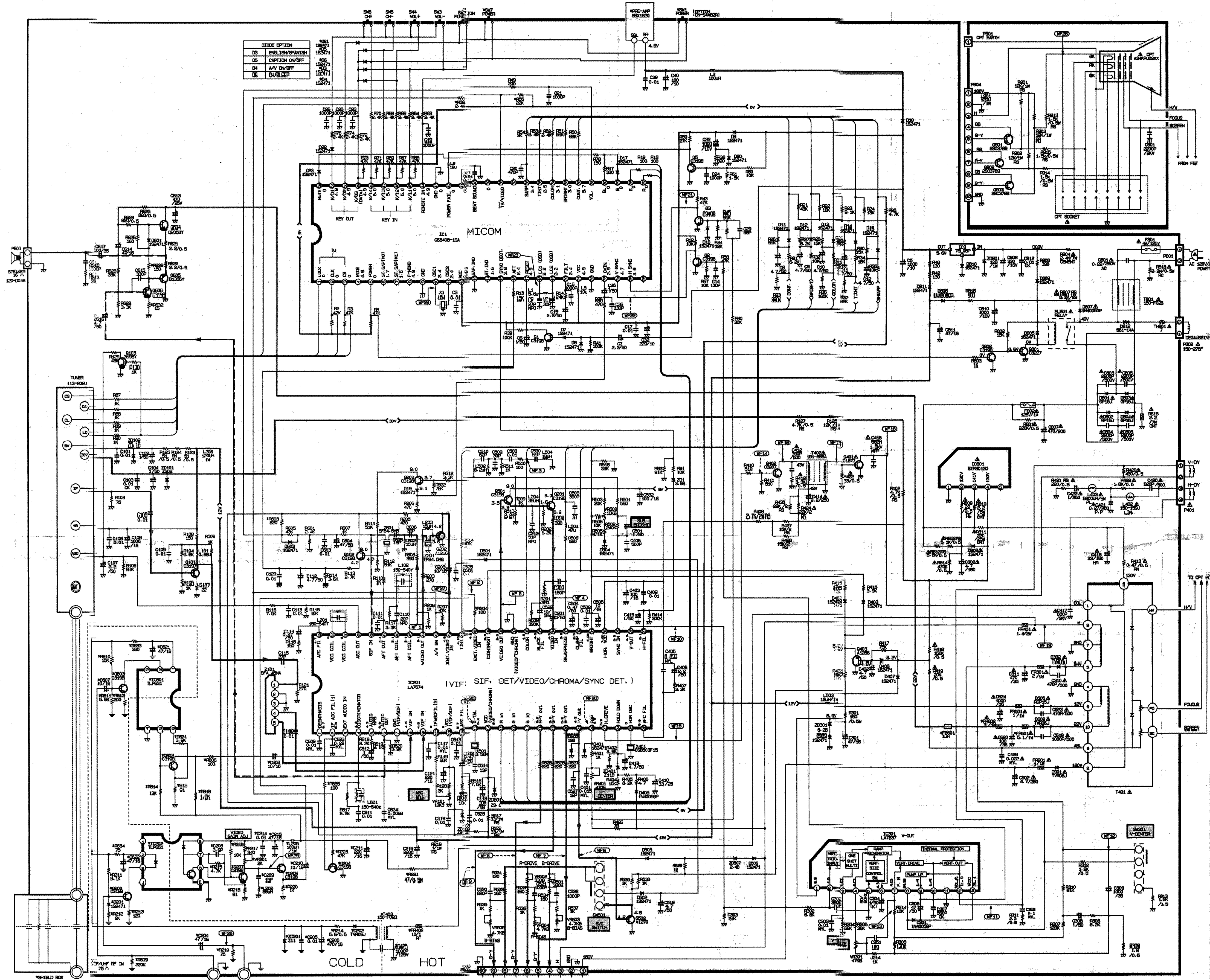
PIN NO.	DESCRIPTION
1	GROUND
2,3	THE INPUT PIN OF DC VOLTAGE BY BRIDGE-CIRCUIT
4	OUTPUT PIN OF DC 130V

IC801
STR30130
(POWER REGULATOR)

- POWER
- VIDEO
- SOUND
- ADJUST



NC-4JA CHASSIS SCHEMATIC DIAGRAM (13")



OPTION OPTION

02	ENCLOSURE
03	OPTION ON/OFF
04	A/V ON/OFF
05	BUILT

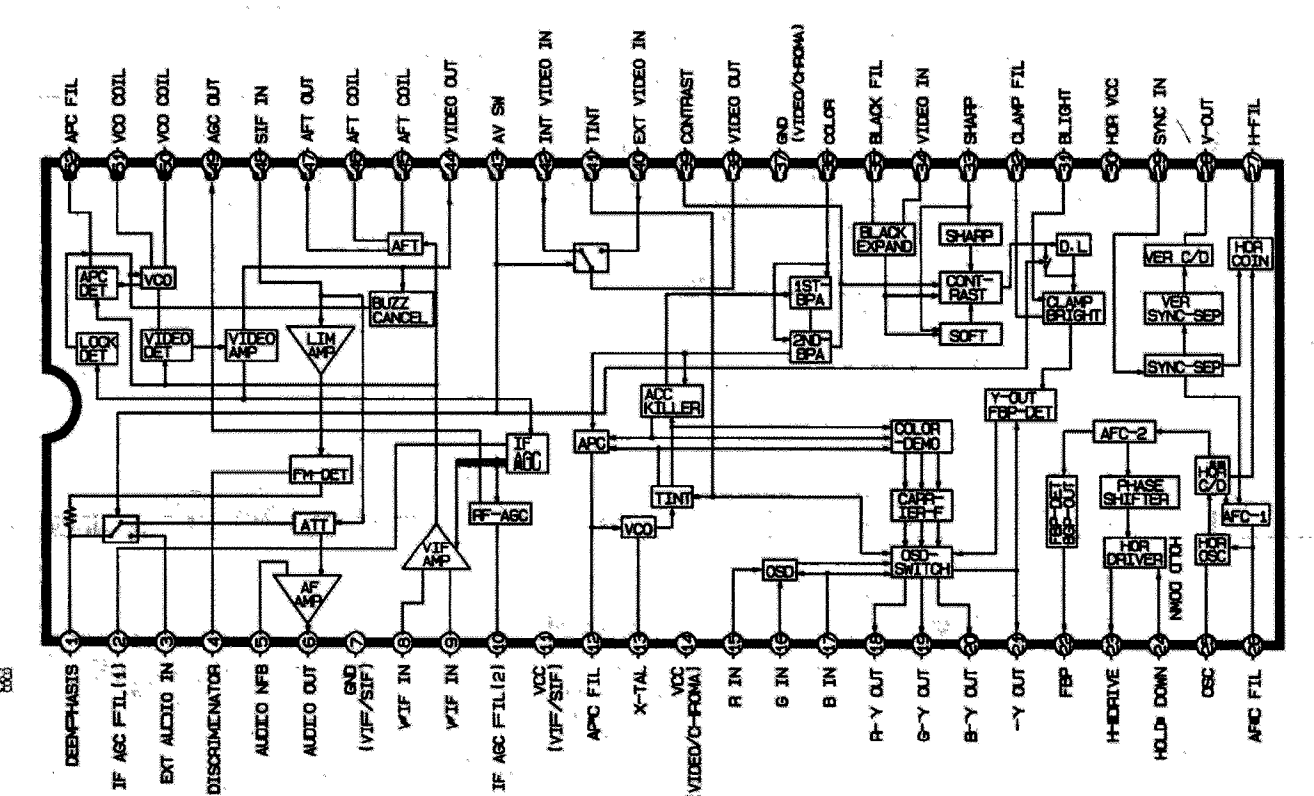
WARNING: BEFORE SERVICING THIS CHASSIS, READ THE 'X-RAY RADIATION PRECAUTION', 'SAFETY PRECAUTION' AND PRODUCT SAFETY NOTICE' IN THIS MANUAL.

CAUTION: The Δ marks in the schematic diagram and the parts list designate components which have special characteristics for safety, and should be replaced only with types identical to those in the original circuit or specified in the parts list. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE in this manual. Do not degrade the safety of the receiver through improper servicing.

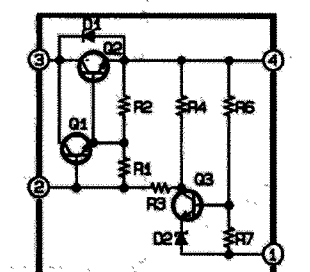
AVIS SUR LA SECURITE DU PRODUIT
Les pièces de la partie ombrée possèdent d'importantes caractéristiques spéciales par rapport à la sécurité et avant de les remplacer, il est recommandé de lire le manuel de service. Ne traitez pas le récepteur car vous pourriez en endommager le système sécuritaire.

- NOTE**
1. Resistance is shown in ohm. K=1,000 M=1,000,000
 2. Capacitors are shown in μ otherwise noted: P = uu
 3. Unless otherwise listed, all inductor values more than 1 are expressed in μ H, and the values less than 1 in mH.
 4. Voltages are measured DVM from point indicated to chassis ground, using color bar signal with all controls at normal.
 5. Waveforms are measured with synchroscope from point indicated to chassis ground, using color bar with all controls at normal.
 6. May choose anyone, since listed following semiconductors have same characteristics
 7. * IS DIFFERENTIATED BY WEATHER EAR PHONE & A/V FUNCTION IS INCLUDED OR NOT.

EQUIVALENT CIRCUIT BLOCK DIAGRAM



IC201
LA7674
(VIF/SIF DET. VIDEO/CHROMA. H/V SYNC)



PIN NO	DESCRIPTION
1	GROUND
2,3	THE INPUT PIN OF DC VOLTAGE BY BRIDGE-DIODE
4	OUTPUT PIN OF DC 130V

IC202
STR50130
(POWER REGULATOR)

EAR PHONE				VIDEO				AUDIO				REMARK			
RESISTANCE	WATT	MATERIAL	REMARK	RESISTANCE	WATT	MATERIAL	REMARK	RESISTANCE	WATT	MATERIAL	REMARK	RESISTANCE	WATT	MATERIAL	REMARK
R201	50K	40K	X	R202	10K	X	C204 47/16	X	R203	47K	X				
R203	10K	10K	X	R204	10K	X	C206 47/16	X	R205	47K	X				
R206	50/1W	10/1W	X	R207	240	X	C209 318BY	X	R208	2.4K	X				
R209	10K	10K	X	R210	40K	X	C212 318BY	X	R211	25K	X				
R212	10K	10K	X	R213	10K	X	C216 318BY	X	R214	10K	X				
R215	0.1	X		R216	31	X	C219 318BY	X	R217	10K	X				
R219	100/0.5	X		R220	4.7K	X	J201 10K	X	R221	13K	X				
R223	3P	X		R224	47/0.5	X	L202 50H	X	R225	5.0K	X				
R227	X	3P		R228	75	X	L205 100H	X	R229	1.0K	X				
R229	5-1K	10K		R230	11K	X	Z201 11K	X	R231	10K	X				
R233	500	1.0K		R234	75	X	C201 247/1	X	R235	51	X				
R237	10K	JUMP		R238	120	X	T403 100K	X	R239	3.5K	X				
R240	500	X		R241	5	X	F402 10/1W	X	R242	220K	X				
R243	240	X		R244	10K	X	TLP201	X	R245	15K	X				
R246	10/16	X		R247	10K	X	T20 20K	X	R248	200	X				
R249	15P	X		R250	10K	X	D4 247/1	X	R251	330	X				
R254	103	X		R255	10K	X			R256	10/16	X				
R258	3-8P	X		R259	10K	X			R260	10/16	X				
R261	47/16	X		R262	10K	X			R263	47/16	X				
R211	10K	X		R264	10K	X			R265	318BY	X				
R268	103	X		R269	10K	X			R270	318BY	X				
R270	10K	X		R271	10K	X			R272	318BY	X				
R273	10K	X		R274	10K	X			R275	318BY	X				
R276	10K	X		R277	10K	X			R278	318BY	X				
R279	10K	X		R280	10K	X			R281	318BY	X				
R282	10K	X		R283	10K	X			R284	318BY	X				
R285	10K	X		R286	10K	X			R287	318BY	X				
R288	10K	X		R289	10K	X			R290	318BY	X				
R291	10K	X		R292	10K	X			R293	318BY	X				
R294	10K	X		R295	10K	X			R296	318BY	X				
R297	10K	X		R298	10K	X			R299	318BY	X				
R300	10K	X		R301	10K	X			R302	318BY	X				
R303	10K	X		R304	10K	X			R305	318BY	X				
R306	10K	X		R307	10K	X			R308	318BY	X				
R309	10K	X		R310	10K	X			R311	318BY	X				
R312	10K	X		R313	10K	X			R314	318BY	X				
R315	10K	X		R316	10K	X			R317	318BY	X				
R318	10K	X		R319	10K	X			R320	318BY	X				
R321	10K	X		R322	10K	X			R323	318BY	X				
R324	10K	X		R325	10K	X			R326	318BY	X				
R327	10K	X		R328	10K	X			R329	318BY	X				
R330	10K	X		R331	10K	X			R332	318BY	X				
R333	10K	X		R334	10K	X			R335	318BY	X				
R336	10K	X		R337	10K	X			R338	318BY	X				
R339	10K	X		R340	10K	X			R341	318BY	X				
R342	10K	X		R343	10K	X			R344	318BY	X				
R345	10K	X		R346	10K	X			R347	318BY	X				
R348	10K	X		R349	10K	X			R350	318BY	X				
R351	10K	X		R352	10K	X			R353	318BY	X				
R354	10K	X		R355	10K	X			R356	318BY	X				
R357	10K	X		R358	10K	X			R359	318BY	X				
R360	10K	X		R361	10K	X			R362	318BY	X				
R363	10K	X		R364	10K	X			R365	318BY	X				
R366	10K	X		R367	10K	X			R368	318BY	X				
R369	10K	X		R370	10K	X			R371	318BY	X				
R372	10K	X		R373	10K	X			R374	318BY	X				
R375	10K	X		R376	10K	X			R377	318BY	X				
R378	10K	X		R379	10K	X			R380	318BY	X				
R381	10K	X		R382	10K	X			R383	318BY	X				
R384	10K	X		R385	10K	X			R386	318BY	X				
R387	10K	X		R388	10K	X			R389	318BY	X				
R390	10K	X		R391	10K	X			R392	318BY	X				
R393	10K	X		R394	10K	X			R395	318BY	X				
R396	10K	X		R397	10K	X			R398	318BY	X				
R399	10K	X		R400	10K	X			R399	318BY	X				
R402	10K	X		R403	10K	X			R400	318BY	X				
R405	10K	X		R406	10K	X			R401	318BY	X				
R408	10K	X		R409	10K	X			R402	318BY	X				
R411	10K	X		R410	10K	X			R403	318BY	X				
R414	10K	X		R411	10K	X			R404	318BY	X				
R417	10K	X		R412	10K	X			R405	318BY	X				
R420	10K	X		R413	10K	X			R406	318BY	X				
R423	10K	X		R414	10K	X			R407	318BY	X				
R426	10K	X		R415	10K	X			R408	318BY	X				
R429	10K	X		R416	10K	X			R409	318BY	X				
R432	10K	X		R417	10K	X			R410	318BY	X				
R435	10K	X		R418	10K	X			R411	318BY	X				
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R441	10K	X		R420	10K	X			R413	318BY	X				
R444	10K	X		R421	10K	X			R414	318BY	X				
R447	10K	X		R422	10K	X			R415	318BY	X				
R450	10K	X		R423	10K	X			R416	318BY	X				
R453	10K	X		R424	10K	X			R417	318BY	X				
R456	10K	X		R425	10K	X			R418	318BY	X				
R459	10K	X		R426	10K	X			R419	318BY	X				
R462	10K	X		R427	10K	X			R420	318BY	X				
R465	10K	X		R428	10K	X			R421	318BY	X				
R468	10K	X		R429	10K	X			R422	318BY	X				
R471	10K	X		R430	10K	X			R423	318BY	X				
R474	10K	X		R431	10K	X			R424	318BY	X				
R477	10K	X		R432	10K	X			R425	318BY	X				
R480	10K	X		R433	10K	X			R426	318BY	X				
R483	10K	X		R434	10K	X			R427	318BY	X				
R486	10K	X		R435	10K	X			R428	318BY	X				
R489	10K	X		R436	10K	X			R429	318BY	X				
R492	10K	X		R437	10K	X			R430	318BY	X				
R495	10K	X		R438	10K	X			R431	318BY	X				
R498	10K	X		R439	10K	X			R432	318BY	X				
R501	10K	X		R440	10K	X			R433	318BY	X				
R504	10K	X		R441	10K	X			R434	318BY	X				
R507	10K	X		R442	10K	X			R435	318BY	X				
R510	10K	X		R443	10K	X			R436	318BY	X				
R513	10K	X		R444	10K	X			R437	318BY	X				
R516	10K	X		R445	10K	X			R438	318BY	X				
R519	10K	X		R446	10K	X			R439	318BY	X				
R522	10K	X		R447	10K	X			R440	318BY	X				
R525	10K	X		R448	10K	X			R441	318BY	X				
R528	10K	X		R449	10K	X			R442	318BY	X				
R531	10K	X		R450	10K	X			R443	318BY	X				
R534	10K	X		R451	10K	X			R444	318BY	X				
R537	10K	X		R452	10K	X			R445	318BY	X				
R540	10K	X		R453	10K	X			R446	318BY	X				
R543	10K	X		R454	10K	X			R447	318BY	X				
R546	10K	X		R455	10K	X			R448	318BY	X				
R549	10K	X		R456	10K	X			R449	318BY	X				
R552	10K	X		R457	10K	X			R450	318BY	X				
R555	10K	X		R458	10K	X			R451	318BY	X				
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R579	10K	X		R466	10K	X			R459	318BY	X				
R582	10K	X		R467	10K										

