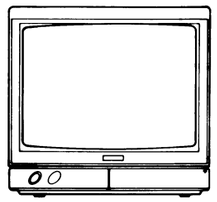
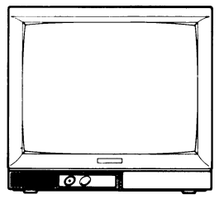
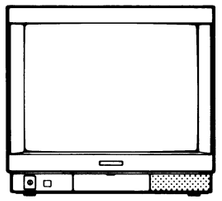
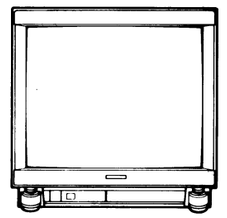
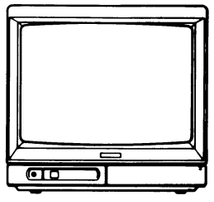
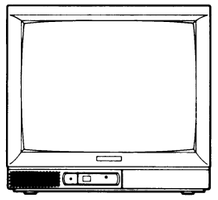
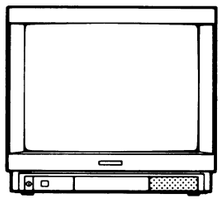
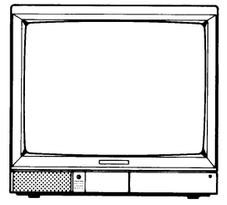
COLOUR TV
SERVICE MANUAL

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

PC04A CHASSIS COMMON

 **CBT-4902 CIT-4902 CKT-4902**	 **CBT-9902 CIT-9902 CKT-9902**	 **CBT-2190 CIT-2190 CKT-2190**	 **CIT-2168**
 **CBT-4905 CIT-4905 CKT-4905**	 **CBT-9905 CIT-9905 CKT-9905**	 **CBT-2191 CIT-2191 CKT-2191**	 **CBZ-9822**

12

PART NO. 483-662Z

JULY, 1990

CONTENTS

SPECIFICATIONS

Power Consumption ..... 14″: 70W
19″: 80W
21″: 85W
Receiving TV System ..... CCIR Standard
Tuning ..... 40 Voltage Synthesizer
Audio Output ..... 3W (2168: 7.5W + 7.5W)
Antenna Input Impedance ..... 75 ohm IEC Type
(300-ohm using balun supplied)

COLOUR RECEIVING SYSTEM		PAL/SECAM-B/G	PAL B/G-SECAM D/K	PAL-I	PAL-H
Intermediate Frequency	Picture	38.9 MHz	38.9 MHz	39.5 MHz	38.9 MHz
	Sound	33.4 MHz	33.4 MHz	33.5 MHz	33.4 MHz
	Colour	34.47 MHz	34.47 MHz	35.07 MHz	34.47 MHz
Receiving Channel	VHF Low	2–4 CH, S_1	1–5 CH	NONE	0–5 CH
	VHF High	5–12 CH, S_2-S_{25}	6–12 CH	NONE	5A–11 CH
	UHF	21–69 CH	21–69 CH	21–69 CH	21–69 CH
Power Source		220V/50Hz (SMPS)		240V/50Hz (SMPS)	

	4902/4905	**9902/9905**	**9822/9825**	**2190/2191**	**2168**
PICTURE TUBE	A34KCQ12XX	A48KCS12XX	A48KCS12XX	A51JFC61X	A51JFC61X
DIMENSION(W×D×H)	360×373×349	492×465×458	492×462×458	512×474.4×475	516×470×480
WEIGHT (Kg)	10	18.4	18.4	22	22.3

The picture tube for 21″ is described on the pages 41 and 42 in detail.

SAFETY PRECAUTIONS

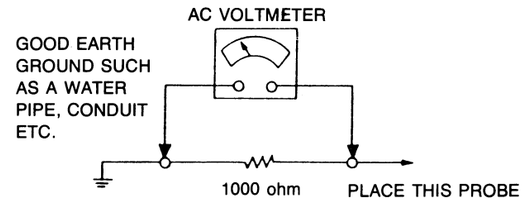
WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTIONS", "SAFETY INSTRUCTIONS" AND "PRODUCT SAFETY NOTICE" DESCRIBED BELOW.

X-RAY RADIATION PRECAUTIONS

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not be above the specified limit. The nominal value of the high voltage of this receiver is 24 ± 1.5 kV at High beam current (maximun brightness) under specified power source. The high voltage must not, under any circumstances, exceed 27.5 KV. Each time a receiver requires servicing, the high voltage should be checked. It is recommended the reading of the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.
2. The only source of X-RAY RADIATION in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.
3. Some parts in this receiver have special safety-related characteristics for X-RAY RADIATION protection. For continued safety, parts replacement should be undertaken only after referring to the PRODUCT SAFETY NOTICE below.

SAFETY INSTRUCTIONS

1. Potential as high as 25,000—27,000 volts is present when this receiver is operating. Operation of the receiver outside the cabinet or with the back cover removed involves a shock hazard from the receiver.
   (1) Servicing should not be attempted by anyone who don't know the precautions necessary through and through when working on high-voltage equipment.
   (2) Always discharge the picture tube anode to the CHASSIS GROUND to reduce the shock hazard before removing the anode cap.
   (3) Perfectly discharge the high potentical of the picture tube before handling.
   (WARNING: Risk of implosion. Handle with care.)
2. If any Fuse in this TV receiver is blown, replace it with the FUSE specified in the chassis parts list only.
3. When replacing parts or circuit boards, wind the lead wires around terminals before soldering.
4. When replacing a high wattage resistor (oxide metal film resistor) in circuit board, keep the resistor 10 mm. away from circuit board.
5. Keep wires away from high voltage or high temperature components.
6. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, screwheads, metal overlays, control shafts, etc., to be sure the set is safe to operate without danger of electrical shock. Since this TV has AVC (Automatic Voltage Control) circuit, it may be operated nonadjustably within the voltage-area indicated in the label attached at back cover. (Do not use a line isolation transformer during this check.) Use an AC voltmeter having 1000 ohms per volt or more sensitivity in the following manner.
   Connect a 1000 ohm resistor between a known good earth ground, (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1000 ohm resistor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 1 volt RMS. This corresponds to 1 mA. AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-RAY RADIATION protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified by ⚠ marks on the schematic diagram and the replacement parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create X-RAY RADIATION.

SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the *SAFETY PRECAUTIONS* on page 3 of this publication. *NOTE:* If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. *Remember:Safety First.*

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   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 part substitution or incorrect polarity installation 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 in not required.
6. Don *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 heatsink in this receiver.

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 semicounductor "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 electostatic 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 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* type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficent to demage ES devices.
5. Do *not* use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do *not* remove a repalcement 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 your foot from a carpeted floor can 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 small 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. Heat the component lead until the sodler melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500°F to 600°F).
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.

   c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
   d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Removal/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 the 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 in paragraphs 5 and 6 above.

Removal

1. 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.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. 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

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. 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

1. Heat and remove all solder from around the transistor leads.
2. Remove the heatsink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heatsink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicularly to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/ Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board, to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the 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 cut-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 ensure 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.

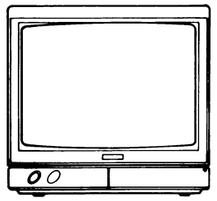
IMPORTANT

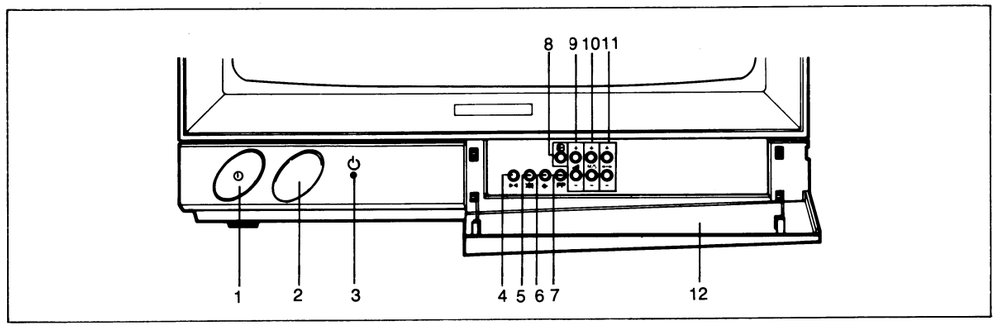
The wires in this mains lead are coloured in accordance with the following code:
BLUE: NEUTRAL BROWN : LIVE
As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.
If a 13 Amp (BS1363) Plug or any other type of Plug is used a 5 Amp Fuse must be fitted, either in the Plug or Adapter, or on the Distribution board.

CONTROLS LOCATION

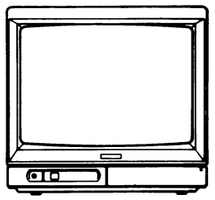
FRONT

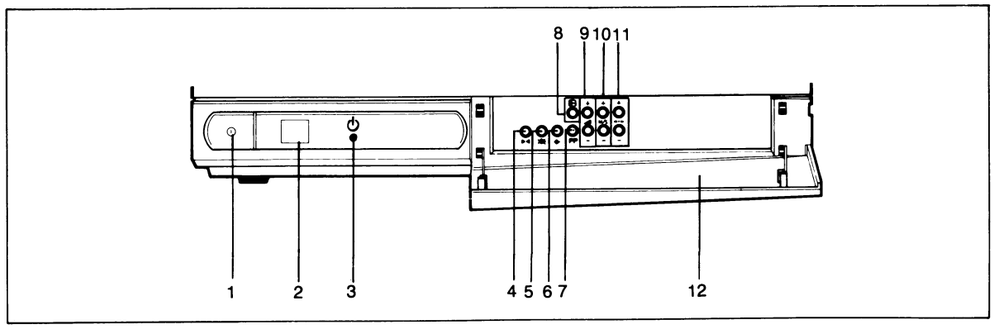
CBT-4902
CIT-4902
CKT-4902





CBT-4905
CIT-4905
CKT-4905

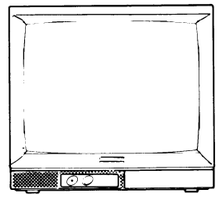


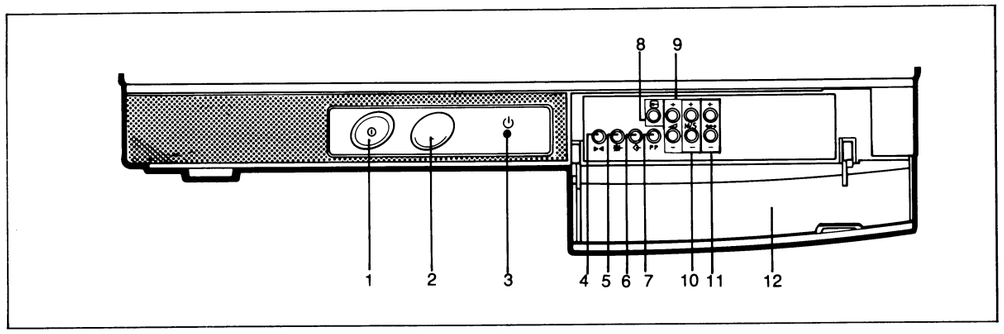


1.	MAIN POWER SWITCH	7.	PERSONAL PREFERENCE SETTING KEY
2.	REMOTE CONTROL SENSOR	8.	NORMAL KEY
3.	STAND-BY LED	9.	VOLUME UP(+)/DOWN(–) KEYS
4.	SEARCH KEY	10.	MANUAL SEARCH UP(+)/DOWN(–) KEYS
5.	CLEAR KEY	11.	PROGRAM UP(+)/DOWN(–) KEYS
6.	STORE KEY	12.	PANEL DOOR

FRONT

CBT-9902
CIT-9902
CKT-9902





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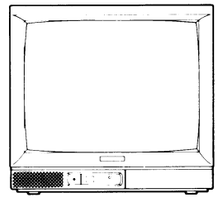
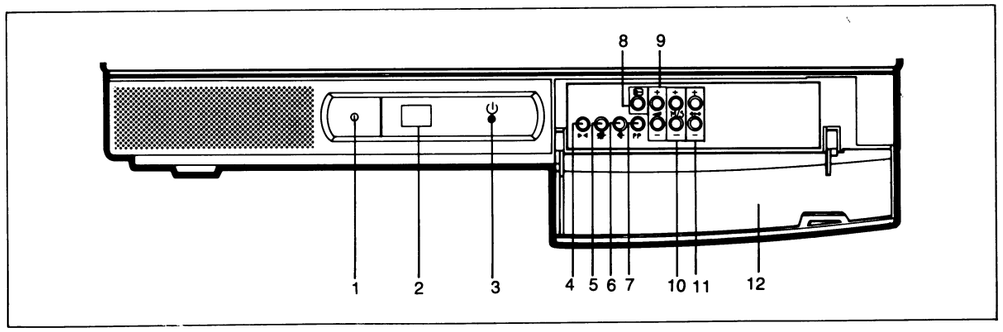
CIT-9905
CKT-9905





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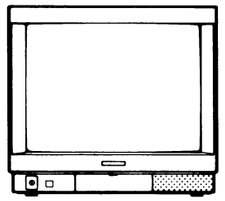
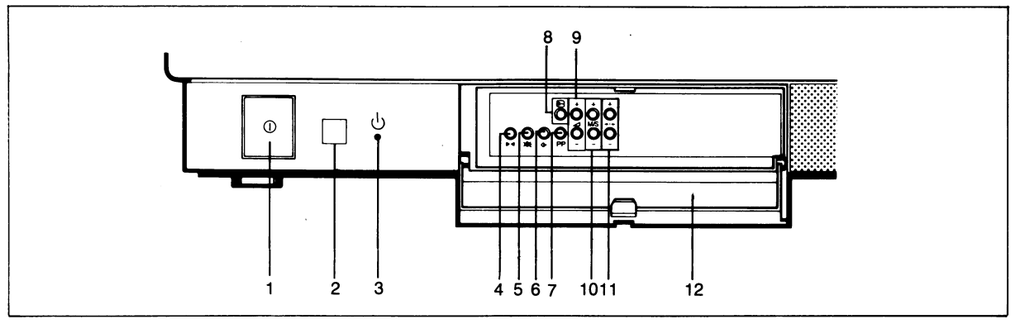
6.	STORE KEY	12.	PANEL DOOR

FRONT

CBT-2190
CIT-2190
CKT-2190





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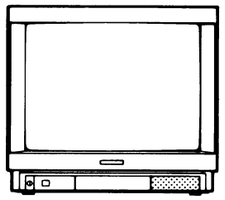
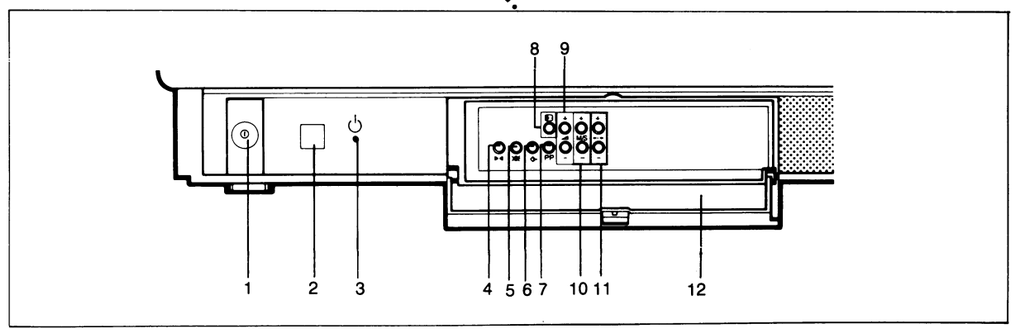
CIT-2191
CKT-2191





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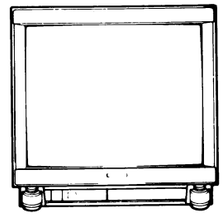
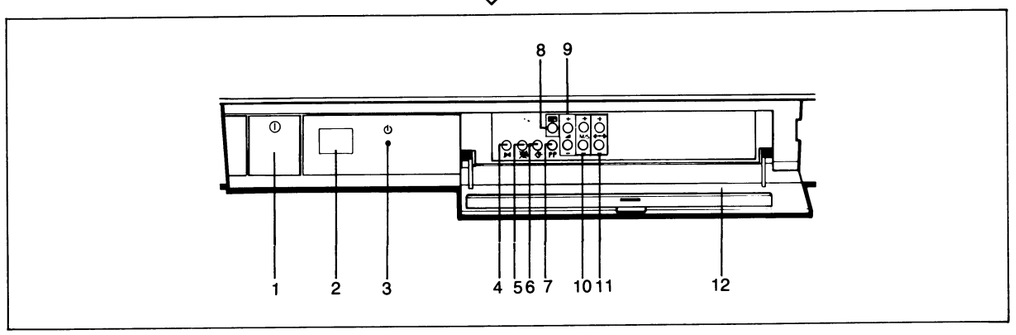
6.	STORE KEY	12.	PANEL DOOR

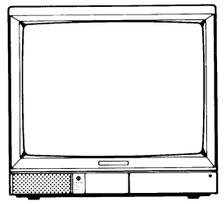
FRONT

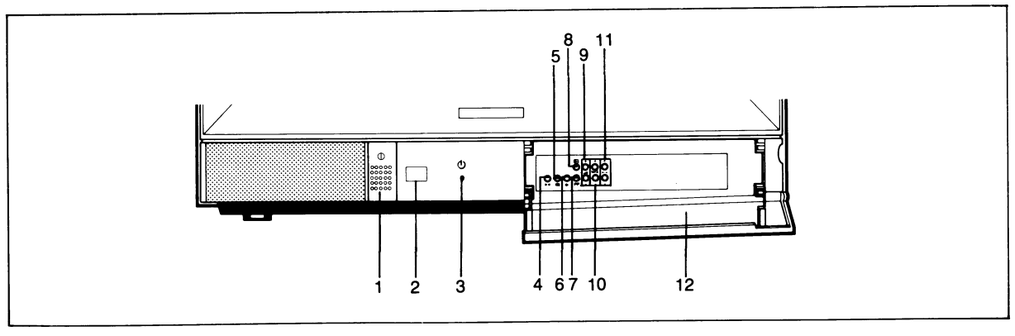
CIT-2168





CBZ-9822





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2.	REMOTE CONTROL SENSOR	8.	NORMAL KEY
3.	STAND-BY LED	9.	VOLUME UP(+)/DOWN(–) KEYS
4.	SEARCH KEY	10.	MANUAL SEARCH UP(+)/DOWN(–) KEYS
5.	CLEAR KEY	11.	PROGRAM UP(+)/DOWN(–) KEYS
6.	STORE KEY	12.	PANEL DOOR

DISASSEMBLY INSTRUCTIONS
(CBT-4902/5, CIT-4902/5, CKT-4902/5)

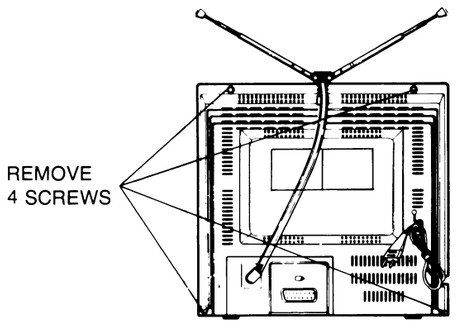
BACK CABINET REMOVAL
Remove 4 screws residing on the back cabinet and carefully separate the back cabinet from the front cabinet.

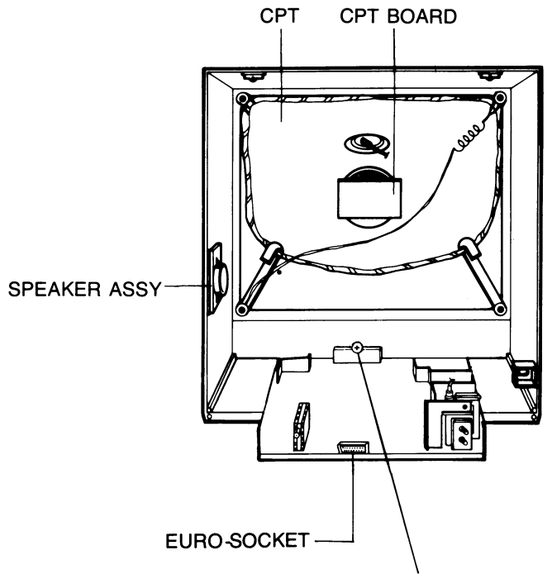
MAIN CHASSIS REMOVAL
Grasp both sides of the main chassis, pull it backward smoothly.

SPEAKER ASSY REMOVAL
1. Remove P602 connector between the speaker and the main chassis.
2. Pull the speaker from the front cabinet.

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

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





(CBT-9902/5, CIT-9902/5, CKT-9902/5)

BACK CABINET REMOVAL
Remove 6 screws residing on the back cabinet and carefully separate the back cabinet from the front cabinet.

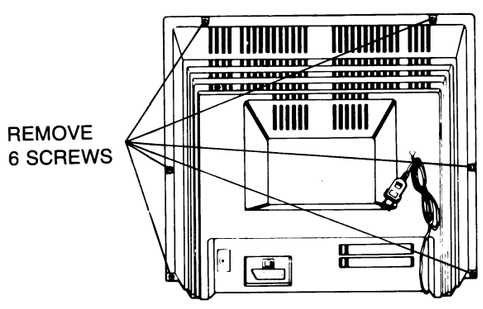
MAIN CHASSIS REMOVAL
Grasp both sides of the main chassis, pull it backward smoothly.

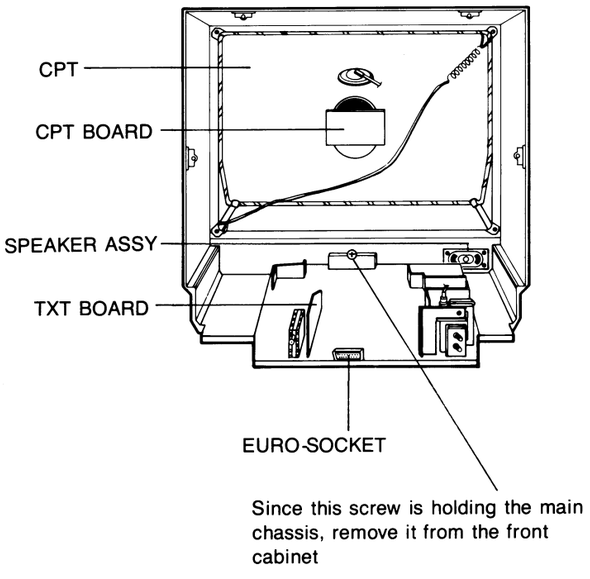
SPEAKER ASSY REMOVAL
1. Remove P602 connector between the speaker and the main chassis.
2. Remove 4 screws holding SPEAKER to the front cabinet.

TXT BOARD REMOVAL
Grasp the center area of the TXT Board and then pull it up.

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

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





(CBT-2190/1, CIT-2190/1, CKT-2190/1)

BACK CABINET REMOVAL
Remove 6 screws residing on the back cabinet and carefully separate the back cabinet from the front cabinet.

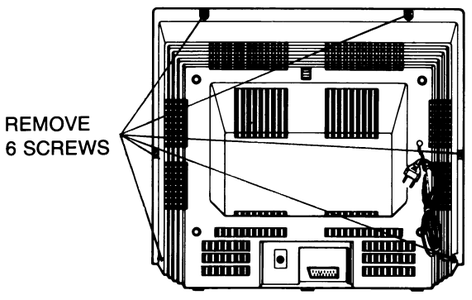
MAIN CHASSIS REMOVAL
Grasp both sides of the main chassis, pull it backward smoothly.

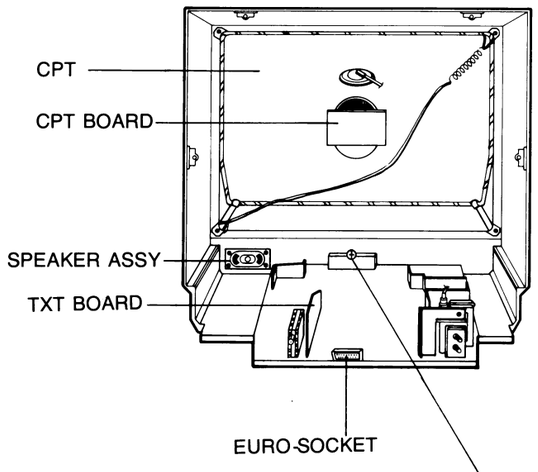
SPEAKER ASSY REMOVAL
1. Remove P602 connector between the speaker and the main chassis.
2. Remove 4 screws holding SPEAKER to the front cabinet.

TXT BOARD REMOVAL
Grasp the center area of the TXT Board and then pull it up.

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

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





Since this screw is holding the main chassis, remove it from the front cabinet

(CBZ-9822, CIT-2168)

BACK CABINET REMOVAL
Remove 6 screws residing on the back cabinet and carefully separate the back cabinet from the front cabinet.

MAIN CHASSIS REMOVAL
Grasp both sides of the main chassis, pull it backward smoothly.

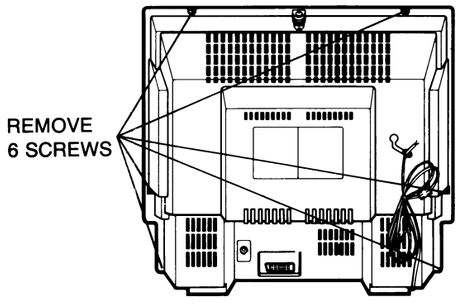
SPEAKER ASSY REMOVAL
1. Remove P602 connector between the speaker and the main chassis.
2. In case of the MODEL CBZ-9822, remove 4 screws holding SPEAKER to the front cabinet.
   In case of the MODEL CIT-2168, push protuberance out of the BACK COVER and then pull the speaker bracket.

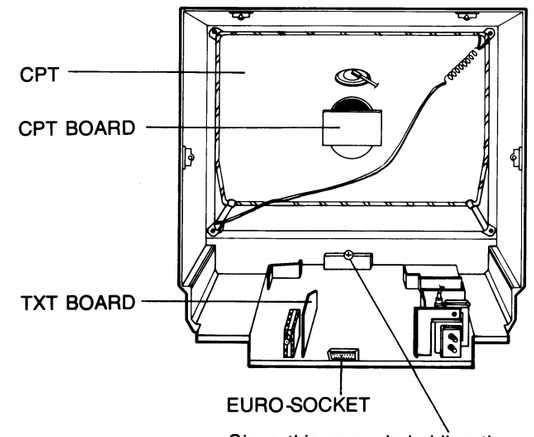
TXT BOARD REMOVAL
Grasp the center area of the TXT Board and then pull it up.

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

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

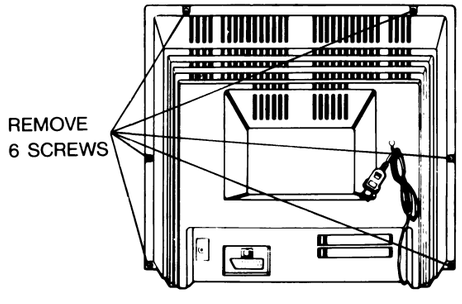
CIT-2168

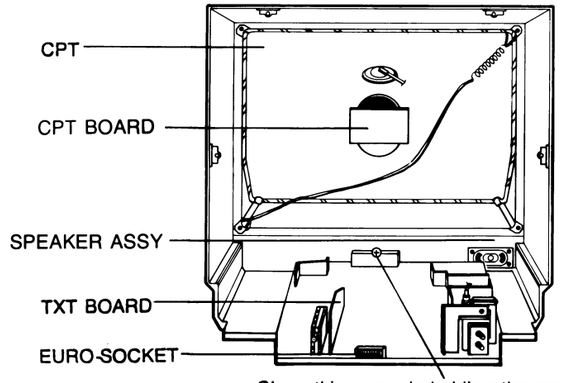




Since this screw is holding the main chassis, remove it from the front cabinet

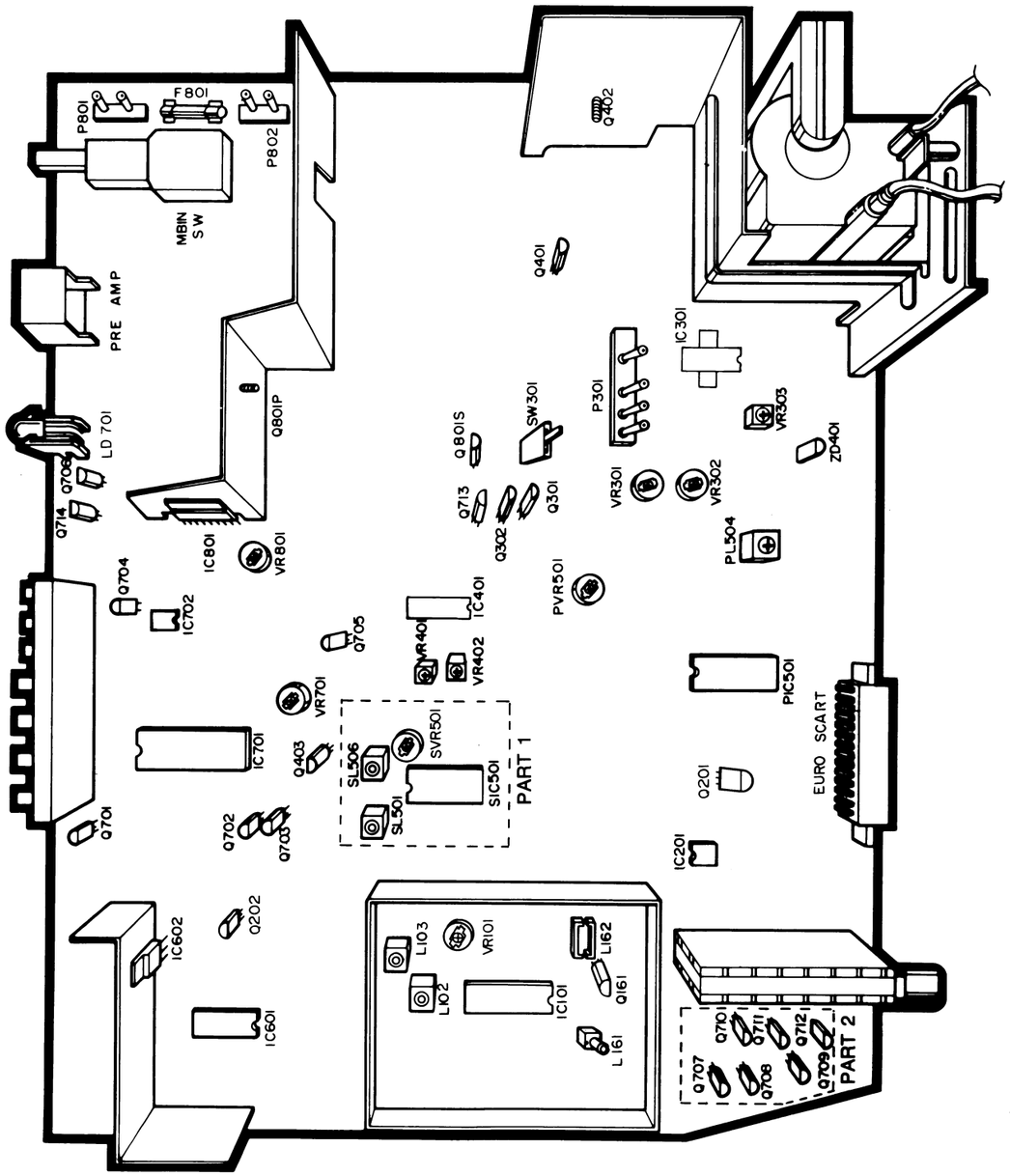
CBZ-9822





Since this screw is holding the main chassis, remove it from the front cabinet

PARTS LOCATION OF MAIN CHASSIS



***NOTICE:**

In case of the model without teletext, get rid of Q301, Q302.
In case of the model without SECAM system, get rid of PART 1.
In case of the model with PAL-I system, get rid of PART 1, PART 2 and L162.

ALIGNMENT INSTRUCTIONS

1. APPLIANCE

This instruction is applicable for all models using the PC04A CHASSIS.

2. SPECIFICATION

2-1 CIRCUMFERENCE CONDITION

If there is no particular guidance, adjust under the following condition.
1) Circumference Temperature: 20°C ±5°C
2) Relative Humidity: 65% ±5%

2-2 NECESSARY INSTRUMENTS

1) DC Power Supplier (0-20V, 1A): 2EA
2) Sweep Generator and Marker unit of Each System
3) Alignment Scope
4) DC Voltmeter (High Impedance)
5) PAL/SECAM Colour Bar, Signal Generator
6) Frequency Counter

2-3 SIGNAL

Standard colour signal which is out from Goldstar standard digital signal Generator (PM5544).

2-4 POWER SOURCE (In Case of Receiver Operation)

AC 180V-270V, 50/60Hz.

3. ALIGNMENT

3-1 VIF ALIGNMENT

1) Connection Diagram of Equipments

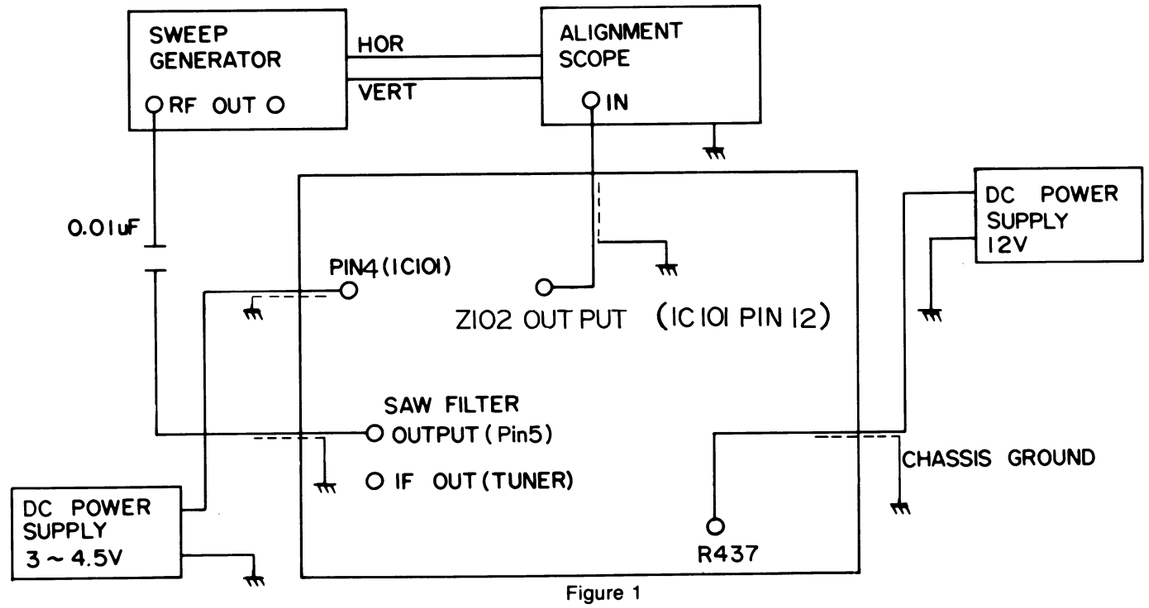


Figure 1

* Connect the ceramic condenser (0.01uF) between RF-OUT terminal of the SWEEP GENERATOR and SAW FILTER OUT terminal.

2) VIF Detection Coil Alignment
   a) Do the connection as shown in figure 1 and then DC power suppliers on.

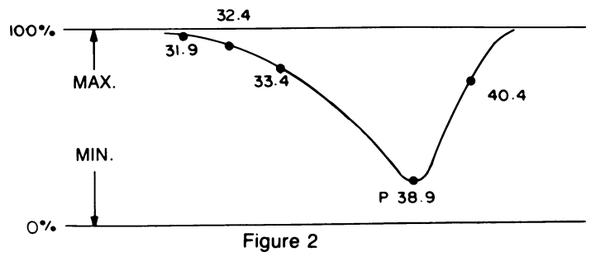


Figure 2

   b) Adjust L103(Detection Special Quality Adjustment Coil) in order to minimize the PICTURE CARRIER MARK as shown in figure 2.
   (For Mark Frequency of Each System, refer to the below note (*)).

* Each frequency carrier of system.

PAL B/G: 38.9 MHz
PAL I: 39.5 MHz
PAL I/I: 39.5 MHz
PAL D/K: 38.9 MHz
PAL/SECAM B/G: 38.9 MHz
PAL/SECAM B/G, D/K: 38.9 MHz

3) ASC (40.4 MHz) Alignment (L161)
   a) This alignment is only applicable to the model with ASC TRAP for FTZ.
   b) The connection of alignment is the same as figure 1 but connect RF OUT of the SWEEP GENERATOR to TURNER IF OUTPUT terminal of Main PCB.
   c) Turn L161 counterclockwise so that CORE may be appeared to maximum and then adjust it clockwise.
   d) After setting output of SWEEP GENERATOR to maximum, in crease IF AGC voltage of pin 4 (IC101) about 5V so that waveform may be distinguished the variation of L161 in the saturated state.
   e) Adjust L161 so that 40.4MHz POINT may be maximum.

3-2 AFT ALIGNMENT (L102)

NOTE) Cut the SLIT part of the C106(+) before adjusting.
1) The connecting of equipments is the same procedure as that above b) item. but the connection position of Alignment Scope must be changed from output terminal of Z102 to pin 12 of IC101.
2) Set VERTICAL GAIN of SCOPE to 1Vp-p/dIV and set the SWEEP GENERATOR output to a low state possibly.
3) Adjust L102 so that it may be the same as shown in figure 3.

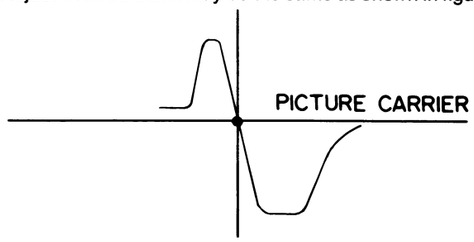


Figure 3 (AFT Alignment Waveform)

4) After finishing the adjustment, connect SLIT of the C106(+).

3-3 MAIN B+(112V or 118V DC) ALIGNMENT

1) Turn on the TV set.
2) Receive the standard colour signal. (digital pattern)
3) Set the portion of colour, Bright, Contrast to the maximum.
4) Adjust VR801 so that the voltage of J122(TP6) may be 112V for the model smaller than 21″ and 118V for 21″ model.

3-4 HORIZONTAL SYNCHRONIZATION ALIGNMENT

1) Receive the standard color signal on the TUNER ANTENNA.
2) Connect SYNC. SEPARATOR INPUT SIGNAL to the Ground.
   (Connect pin 11 of IC401 to the GND... J110, J111, TP3 part)
3) Adjust VR401 so that the screen may be maintained the synchronization in a horizontal and vertical direction.
4) Remove the connection of pin 11 of IC401 from GROUND.

3-5 HORIZONTAL CENTER ALIGNMENT (HOR.SHIFT ALIGNMENT)

1) Receive the standard colour signal.
2) Adjust the VR402 so that the screen may be the Geometric center.

3-6 VERTICAL OSCILLATOR FREQUENCY ALIGNMENT

1) Adjust the set in no signal condition.
2) Connect the frequency COUNTER to the CONNECTOR part (R304) which is connected with vertical DY.
   (Connect the (−) side of the connector to the heat sink of the chassis)
3) Adjust VR302 so that FREE-RUN frequency may be 46.00 ± 0.5Hz.

3-7 VERTICAL AMPLITUDE AND LINEARITY ALIGNMENT (VERT. HEIGHT AND LINEARITY ALIGNMENT)

1) When brightness of a screen is minimum as receiving the FuBK TEST PATTERN, adjust VR301 so that the outline signal of the upper and lower parts of the great circle on screen may be coincide with the edge of a effective screen.
2) After changing the signal to Digital, adjust VR303 so that the length of upper and lower of the great circle may be equal.

3-8 VERTIICAL CENTER ALIGNMENT

Adjust SW301 (Vertical Center SVC.S/W) so that CENTER of PATTERN may coincide with the Geometric center of an effective CPT screen.

3-9 COLOUR SYNCHRONIZATION ALIGNMENT

1) Receive the standard colour signal.
2) Set the Contrast, Brightness, Colour VR to maximum.
3) Connect the COLOUR SATURATION terminal to 12V.
4) Short the INPUT pin 21 (B-Y), PIN 22 (R-Y) of the IC501.
5) Adjust the PTC501 (TRIMMER CAPACITOR) so that COLOUR BAR should not flow down.
6) After finishing adjustment, remove the connection of item 3) and 4).

3-10 PAL MATRIX ALIGNMENT

1) Set the Contrast, Brightness, Colour Control VR to the maximum.
2) Receive the DEM. PATTERN (Colourless Pattern).
3) Connect the SCOPE to the B-OUT (Pin 16 of PIC501).
4) Adjust PVR501 to obtain a minimum fluctuation (A straight line) in figure 4-1.

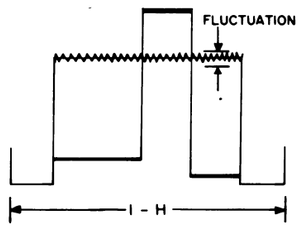


Figure 4-1. PVR501 Alignment

5) After changing the PATTERN into the PAL COLOUR BAR signal, adjust PL504 so that the fluctuation may be minimum and a straight line as shown in figure 4-2.

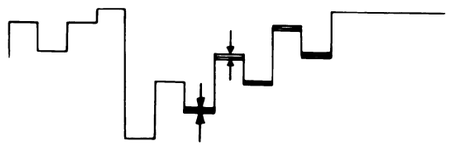


Figure 4-2. PL504 Alignment

6) Repeat the adjustment of the above items 4), 5) again by varing the pattern and then confirm.

3-11 RF AGC ALIGNMENT

1) Receive the standard colour signal (60dB ± 1dB), but in case of PAL-I, receive 70dB ± 1dB.
2) Connect DIGITAL MULTIMETER to AGC terminal of the TUNER (J20, TP1).
3) Refer to below diagram and then adjust VR101.

Tuner System	B/G	I	B-H	D/K
ALPS	4.8 ± 0.1dc	4.9 ± 0.1dc	4.8 ± 0.1dc	4.8 ± 0.1dc

* Select the best point in accordance with the TUNER, SYSTEM or per production LOT.

3-12 SCREEN AND WHITE BALANCE ALIGNMENT

1) Set the Colour, Brightness, Contrast alignment VR to the minimum.
2) Set the BIAS ALIGNMENT VR(VR901-903) and DRIVE ALIGNMENT VR(VR904-905) of CPT BOARD to the mechanical center position.
3) Tune in channel No. 05CH.
4) Vary SCREEN VR of FBT until the screen will be cut off.
5) As using Color Analyze White Balance checker, adjust it to be X equal to 281 ± 8 and Y equal to 288 ± 8 in the Low light(4-5ft.L) and High Light(40-50ft.L).

3-13 FOCUS ALIGNMENT

1) Receive the standard Digital signal and adjust the Contrast, Brightness, Colour to be maximum.
2) Adjust it so that HALO situation should not appear on the portions as follows. (Center, edges and logo portion)

4. SECAM ALIGNMENT

4-1 SECAM BELL FILTER ALIGNMENT

1) Receive the SECAM BAR PATTERN.
2) Connect the LOW CAPACITANCE PROBE to pin 4 of SIC501. (Using FET PROBE)
3) Adjust SL501 to maximize and flatten the waveform.
4) In case of not using FET PROBE, precede the above adjustments (1 to 3).
   And then adjust the GS standard SECAM SIGNAL so that the COLOUR of 3.8MHz portion may be red and minimize the MAGENTA COLOUR of the COLOUR BAR and the shadows of the BLACK LEVEL BAR boundary.
5) In accordance with necessary, adjust the DIGITAL PATTERN signal with the maked scale.

4-2 SECAM REFERENCE COIL ALIGNMENT

1) Connect OSCILLOSCOPE PROBE to pin 24 of SIC501.
2) Ground pin 11 and pin 16 of SIC501. (Only SECAM MODE)
3) Turn out SVR501 clockwise to the maximum.
4) Adjust SL506 so that the DC LEVEL of the parts A,B (figure 6) may coincide.

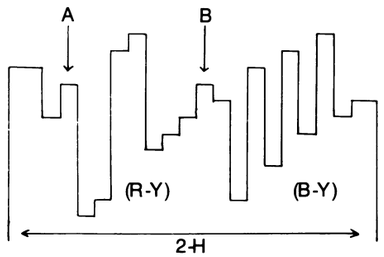


Figure 6. Pin 24 Waveform

5) Move the OSCILLOSCOPE PROBE to pin 10 of the SIC 501.
6) Adjust SVR501 so that the right and left LEVEL of R-Y and B-Y part may be equal and the waveform of part A may be coincide to be one.

To be equaled the whole size

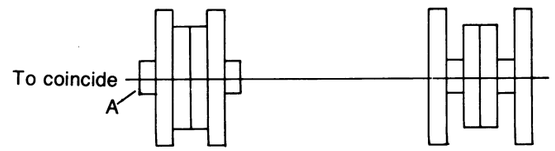


Figure 6. Pin 10 Waveform

7) If the field color differs from that of the pal signal, leaving SL506, adjust SVR501 in full detail.

5. OSD POSITION ALIGNMENT

1) Turn on the set and adjust it to be non-signal condition.
2) Push the SEARCH KEY.
3) Adjust VR701 so that the size of Analogue TUNING BAR may be coincide with the right and left side of the screen.

6. TELETEXT(F6) ALIGNMENT

This alignment is applied only to the TV that contains the TXT receiver (111-D67A).

TXT BOARD

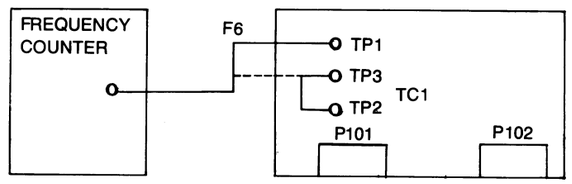


Figure 7. Connection Diagram of the Instruments

2) PREPARATION OF ALIGNMENT
   (a) Connect with the Instrument shown as in figure 7. (TP2, TP3 are GND).
   b) Receive the TV signal including the TXT signal on the TV Antenna. (Input=RF signal LEVEL must be 80 ±10dBuV.)
   c) Change the TV to the TXT MODE.

3) ALIGNMENT
   Adjust TCI so that TP1(F6) Frequency being shown with the Frequency Counter may be between 6,000,050 Hz and 6,000,150 Hz.

PURITY AND CONVERGENCE ADJUSTMENT

CAUTION: Convergence and Purity have been factory aligned. Do not attempt to tamper with these alignments. However, the effects of adjacent receiver components, or replacement of picture tube or deflection yoke may require the need to readjust purity and convergence. Convergence magnet assembly and rubber wedges need mechanical positioning following the figure 8. Before attempting any convergence adjustments this receiver should be operated for at least fifteen minutes. If adjustment is required the adjustments should be made in the following sequence.

COLOUR PURITY ADJUSTMENT

1. Demagnetize the picture tube and cabinet using a degaussing coil.
2. Turn the CONTRAST and BRIGHTNESS controls to maximum.
3. Select the purity pattern consisted of green only on the pattern generator.
4. Loosen the clamp screw holding the yoke, and slide the yoke backward to provide vertical green belt (zone) in the picture screen.
5. Remove the Rubber Wedges.
6. Rotate and spread the tabs of the purity magnet (See figure 9) around the neck of the picture tube until the green belt is in the center of the screen. At the same time, center the raster vertically.
7. Move the yoke slowly forward or backward until a uniform green screen is obtained. Tighten the clamp screw of the yoke temporarily.
8. Check purity of the red and blue rasters by selecting the purity pattern of pattern generator.
9. Obtain a white raster, refering to "WHITE BALANCE ADJUSTMENT".
10. Proceed with convergence adjustment.

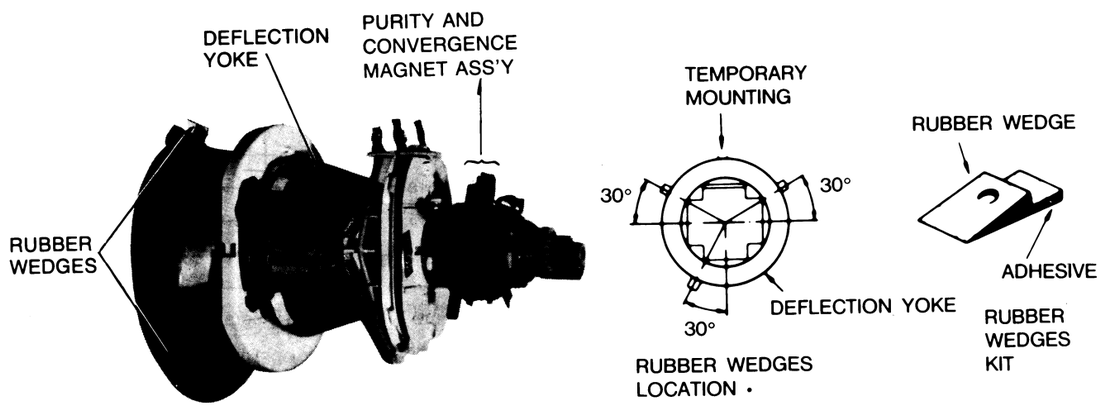


Figure 8

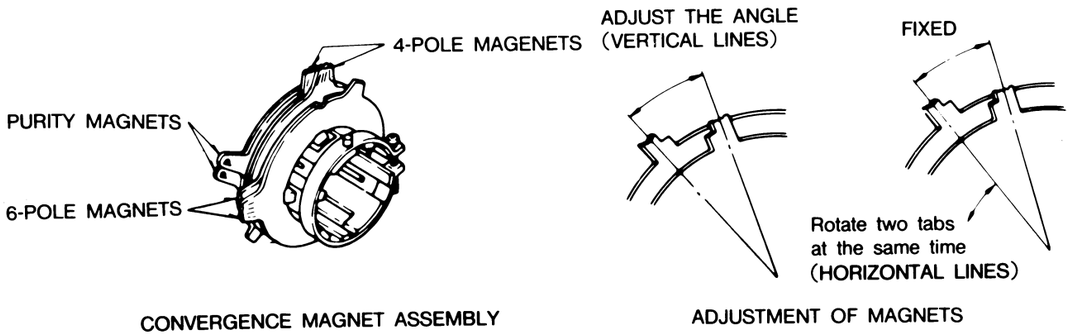


Figure 9

CENTER CONVERGENCE ADJUSTMENT

1. Receive crosshatch pattern with a colour bar signal generator.
2. Adjust the BRIGHTNESS and CONTRAST controls for well defined pattern.
3. Adjust two tabs of the 4-pole magnets to change the angle between them (See figure 9) and superimpose the red and blue vertical lines in the center area of the picture screen. (See figure 9.)
4. Turn both tabs at the same time keeping their angles constant to superimpose red and blue horizontal lines at the center of the screen. (See figure 10)
5. Adjust two tabs of 6-pole magnets to superimpose red/blue line with green one. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
6. Repeat adjustments 1,2,3, keeping in mind red, green and blue movements, because 4-Pole magnets and 6-Pole magnets interact and make dot movement complex.

CIRCUMFERENCE CONVERGENCE ADJUSTMENT

1. Loosen the clamping screw of DY to allow the yoke to tilt.
2. Adjust DY to obtain a better convergence in the circumference by orbital movement of the front of the yoke, then secure the DY in appropriate position by placing the wedges as illustrates in figure 8. Tighten screw holding the DY. Stick 3 adhesive tapes on wedges as shown in figure 8.

4-Pole Magnets Movement

6-Pole Magntes Movement

Center Convergence by Convergence Magnets

Incline the Yoke up (or down)

Incline the Yoke right(or left)

Circumference convergence by Deflection Yoke

Figure 10 DOT MOVEMENT PATTERN

CIRCUIT DESCRIPTION

1. VIDEO IF AMPLIFIER CIRCUIT (IC101, μ4439BG)

1-1 The Basic Construction

Video IF Amplifier Circuit contains three symmetrics of IF AMP (Video IF Dtector & AMP, AFT circuit & AMP and AGC circuit).
All of above functions are performed in IC101 (μ4439BG).
The schematic diagram is same as figure 11.

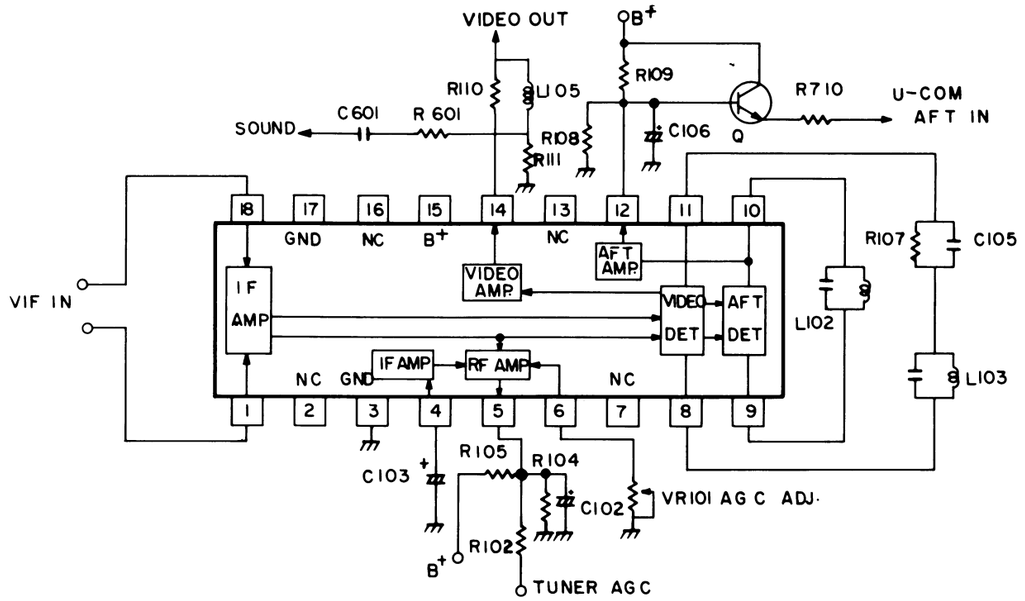


Figure 11. Schematic Diagram of IC101 (μ4439BG)

1-2 Pin Configuration of IC101

Pin No.	Description
1, 18	IF IN
2, 7, 16	NC
3, 17	Ground
4	IF AGC storage capacitor
5	The output terminal of RF out
6	RF AGC control terminal
8, 11	Video detector
9, 10	AFT detector
12	AFT output
14	Video output • Composite video output level: 3Vp-p • White level: 5.2V • Black clamping level: 1.9 V
15	Supply voltage terminal • voltage: about 12 V_{DC} • current: 75 mA

1-3 Operating Description of the Circuit

After the air signal is varied into the IF signal through the TUNER of the TV set, this signal which is passed via PRE-AMP and SAW FILTER input into pins1, 18 of IC101 via. This IF signal passes into the three stage AMP. and then video signal is detected by the detector coil connected to pins8, 11. AFT signal is also detected by the dector coil connected to pins9, 10.
They are output each video signal in pin14, AFT signal in pin12 through the AMP.
Also, AGC voltage passes pin5 after adjusting VR101 (AGC adjustment variable rasistor) connected pin6 and this voltage is connected to the AGC terminal of the TUNER, so that the AGC voltage is controlled.

2. SOUND IF AMPLIFIER CIRCUIT (IC601, TBA120T)

2-1 The Basic Construction

SIF AMP as FM IF AMP & Demodulator is composed of SIF AMP, SIF Detector, sound output, volume control and external audio in/out.
These circuits are operated within IC601.
The schematic diagram is same as figure 12.

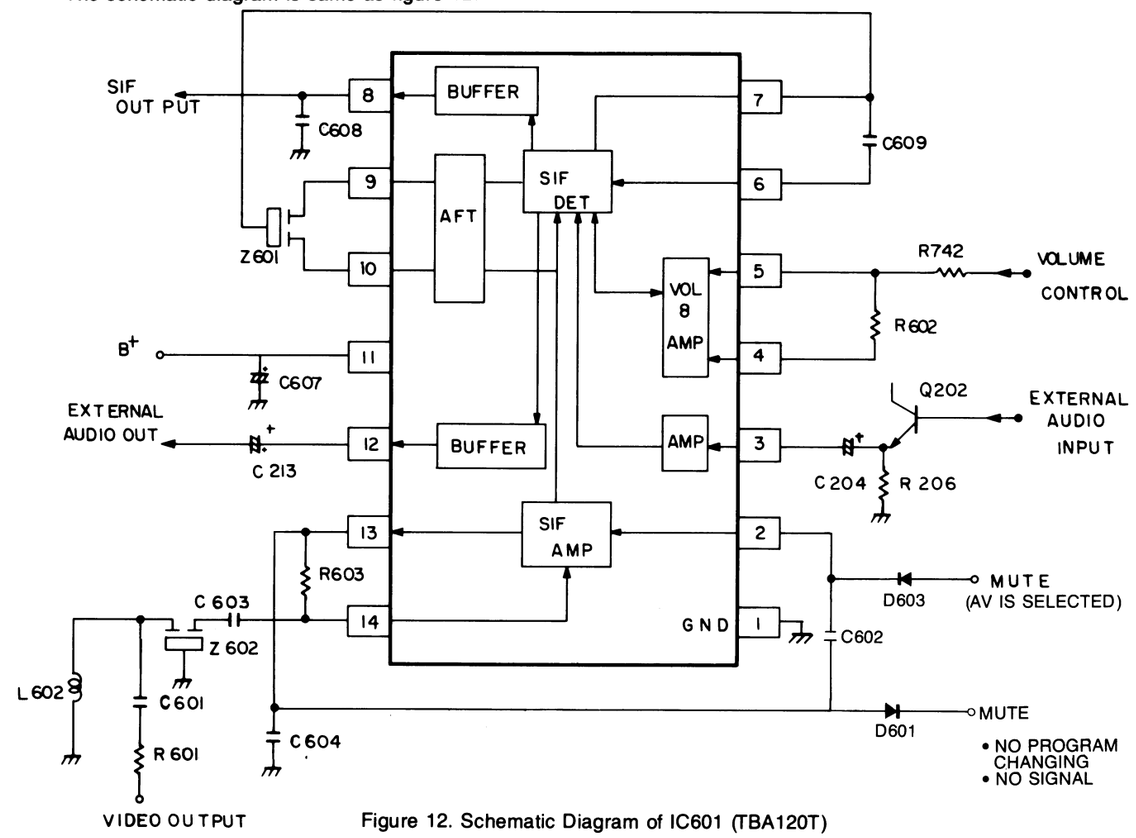


Figure 12. Schematic Diagram of IC601 (TBA120T)

2-2 Pin Configuration of IC601

Pin No.	Description
1	Ground
2, 13	Sound Amp. Negative feed back terminal
3	External audio input terminal
4	Volume control reference terminal Reference voltage: 4.8V
5	Volume control terminal
6, 7	SIF detector.
8	SIF output Output voltage: 4V
9, 10	FM detector
11	Supply voltage terminal; 12V
12	External audio output

2-3 Operating Description of the Circuit

Sound carrier is detected by the composite video signal gone through band pass filter(BPF), (which is composed of R601, C601, L601) and ceramic descriminator (Z602), and it is applied to SIF AMP. (pin13).
The amplified signal is applied to the SIF Detector Terminal.
And, after detection, this signal outputs into pin8 through the Buffer Circuit.
This output signal is controlled, by inputting to pin5 volume level which is controlled by the μ-com (IC701).
The detected Audio Signal outputs into pin12 through the Buffer Circuit and this signal is the Audio output signal.
The Audio signal input from the external is input into pin3 and is detected through AMP and is output at pin8 through the Buffer Circuit.

3. HORIZONTAL DEFLECTION CIRCUIT (IC401, TDA1940)

3-1 The Basic Construction

Horizontal Deflection Circuit consists of Sync. Seperator Circuit 01 & 02, Phase Comparator, Super Sandcastle(SSC) Pulse Generator, Horizontal Sync. output circuit, Vertical pulse Generator, burst gating Generator. Schematic Diagram of IC401 is same as figure 13.

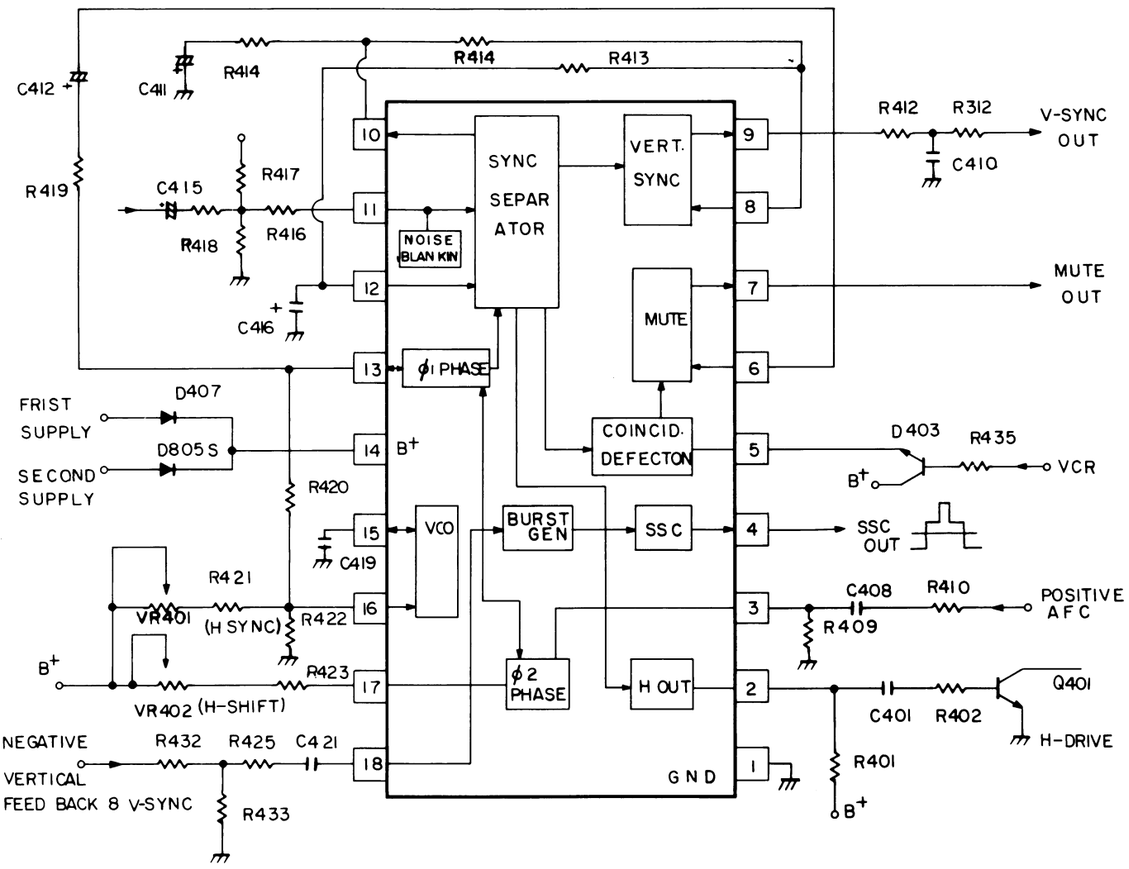


Figure 13. Schematic Diagram of IC401

3-2 Pin Configuration of IC401

Pin No.	Description
1	GND
2	Horizontal Sync output
3	Positive flyback pulse(AFC) input
4	Super sandcastle pulse(ssc) out
5	Output of coincidence detector : In case of the external VCR Mode, used as the auto time constant switching terminal.
6	Input time-constant switching stage
7	If there is the broadcast signal, as the muting circuit output stage, it is high. In case of non-signal condition, keeps the low condition.
8	The reference stage for the vertical sync pulse
9	Vertical sync pulse output
10	Horizontal pulse separator H/V clamping stage
11	Video signal input stage
12	Reference input stage for line pulse seperation
13	• First phase comparator • Used as H-sync of ON-SCREEN.
14	• Supply voltage stage • Supply voltage: 12V • Supply current: 40mA
15	Horizontal oscillator frequency control is selected with the time constant of R422 and C419.
16	• Horizontal oscillation frequency control stage. • Contols horizontal sync. with VR401
17	Second phase comparator stage (0, phase DET.)
18	• Vertical flyback pulse feedback input stage • Requires the negative vertical pulse. • Used as V-sync. of ON-SCREEN.

3-3 Operating Description of the Circuit

3-3-1. START-UP

If the power switch is ON, the supply voltage (12V) of SMPS transformer is applied to pin14 through D407. At that time IC401 begeins to oscillate with the starting voltage, and the horizontal sync. pulse outputs through pin2. And then the horizontal sync. pulse is applied to Q401 (Horizontal Drive Transistor) through C401 and C402 to drive Q401, which cause that the second supply voltage supplied from FBT is applied to pin14 through D805S by loading the horizontal output circuit.

3-3-2. HORIZONTAL OSCILLATION AND PHASE SHIFT

The oscillation signal controled by R422, C419 and VR401 makes the horizontal synchronizing signal which is divided by pins10, 11 and 12.
And then, by comparing with a part of compared-waveform vertical signal at the first phase and the second phase, the horizontal synchronizing signal makes the final output signal, and the phase shift is made by VR402.

3-3-3. SYNC. SEPARATOR

R417 and R418 connected to pin11 select the input level which IC401 of the sync. separator circuit demands and the slicing level for the sync. separator.
And it is the important factor of selecting the level which checks whether the broadcasting signal is or not.

3-3-4. SUPER SANDCASTLE PULSE

The super sandcastle pulse output from pin4 is composed of three levels, and it is applied to pin8 of PIC501 (PAL chroma IC) and pin23 of SIC501. (SECAM decoder IC).

3-3-5. VCR MODE SECTION

If the high voltage is supplied to pin5 of IC401 from tuning μ-com, the second phase detector is changed to the fast mode, this mode is selected to operate by the VCR or A/V signal which is input from the external.

3-3-6. VERTICAL SECTION

Video signal is received through pin11.
The vertical sync. signal is output from 9.
By dividing the vertical sync. signal at the vertical sync. signal separator circuit which is connected to pins8, 9.

4. VERTICAL DEFLECTION CIRCUIT (IC301, TDA1170N)

4-1 Basic Construction

The Vertical Deflection Circuit consists of the vertical Sync. Input terminal, Ramp Generator, Vertical Sync. Circuit, Flyback Generator (Vertical output stapge) Power Amplifier Circuit, Preamplifier Circuit.
The Schematic diagram of IC301 is same as figure 14.

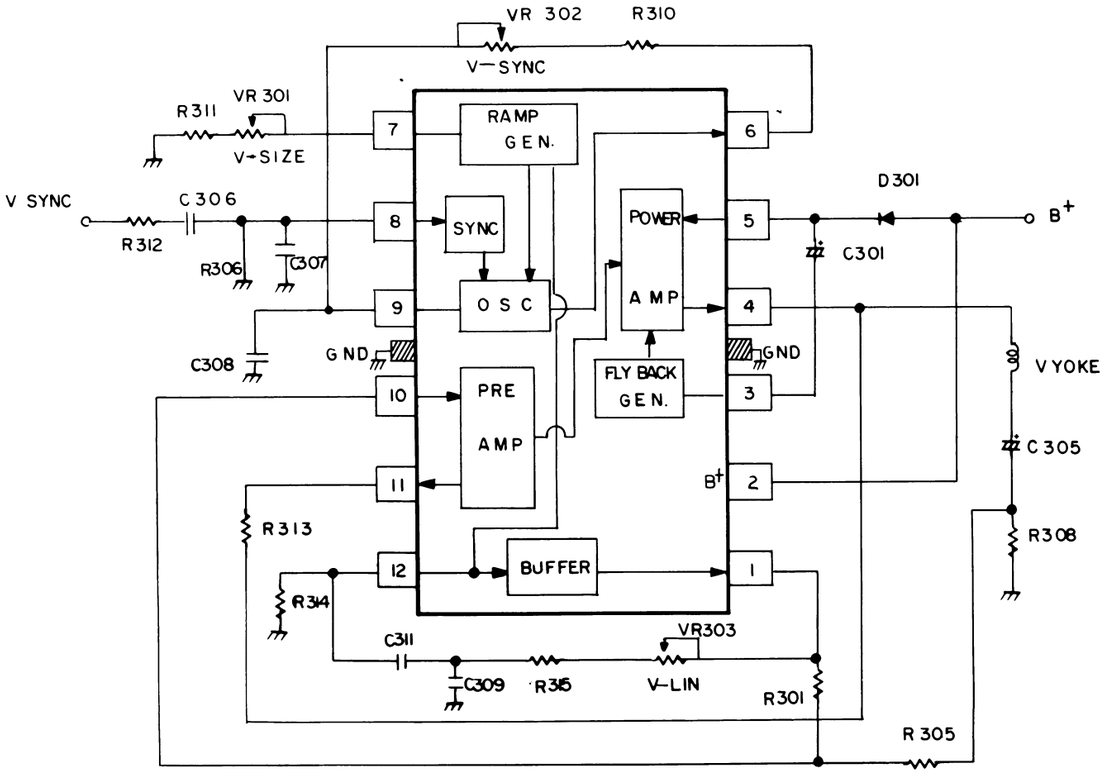


Figure 14. Schematic Diagram of IC301.

4-2 Pin Configuration of IC301

Pin No.	Description
1	Buffer stage
2	Voltage supply stage Supply voltage: 25V Supply current: 140mA
3	Flyback generator
4	Vertical output
5	The supply terminal of the vertical output circuit
6, 9	Vertical sync control stage. (Adjusts the frequency of V-sync. by VR302.)
7	• Ramp generator stage • Adjusts V-size by adjusting VR301.
8	Vertical sync. input & sync. amplifier
10, 11	Preamplifier reference input and vertical feedback
12	Adjusts the vertical linearity by adjusting reference current of the Ramp Generator.

4-3 Operating Description of the Circuit

The vertical sync. signal output through pin9 of IC401 enters the vertical sync. input circuit and AMP. circuit and makes the saw-form signal by the time constant of C308 connected to pin9 and R310 connected to pin6.
And then VR302 controls the vertical sync.
Also, this signal controls the vertical size by being supplied to the Ramp Generator circuit connected to pin7.
The signal phase generated from the oscillator and the Ramp Generator is compared with the phase of the vertical feedback signal, so that this signal may be obtain through the vertical amplifier, is output-through pin4 and supplied to the deflection yoke.

5. CHROMA & LUMINANCE CIRCUIT (PIC501, TDA3560A)

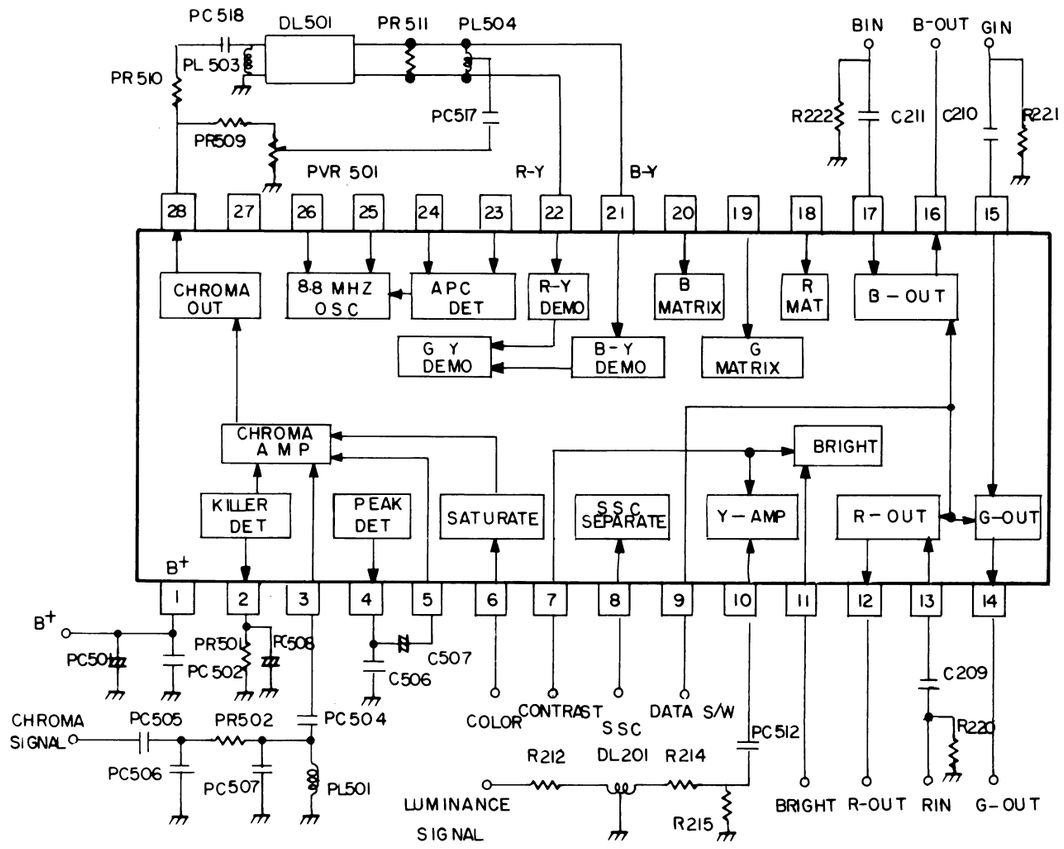


Figure 15. Schematic Diagram of PIC501 (TDA3560A)

5-1 Chroma Path

First, the chroma signal flows from B.P.F circuit into pin3 to be amplified, and then it flows into the second amplifier to be about 4Vp-p.
The amplifier signal output from pin28 is separated into two ways.
One flows through PR510, PC518 into 1H-Delay Line(DL501), the other flows through PR509, PVR501 and PC517 into mid-tap of PL504.
At PL504 two kinds of signal are vectored and adjusted, so that R-Y(u) signal is separated into B-Y(u) and B-Y(v). Each of the signals is demodulated inside pins21, 22, so that G-Y is generated by R-Y and B-Y.
In the course of demodulation, colour system is a carrier wave suppressed. Therefore pins25,26 oscillate to 8.86MHz to reconstitute a carrier wave.
The DC voltage the colour Burst of pins23,24 generates flows into oscillator for 8.86MHz and adjust the oscillating frequency and the false image so that they may concide with original signal.
After 8.86MHz generated in this way decrease by half, R-Y and B-Y flow into G-Y demodulator in order to generate a complete demodulation.
On the other hand, pin2 discharges its duty of controlling the first amplifier of an outcome so that colour killer should not generate colour noise during receiving black and white signal or electric field less than 35dBm.
That is to say, pin4 detects the colour Burst and makes it generate DC voltage, which is supplied and controlled on pin2, and kills the DC voltage of pin2 less than 3V.
Pin6 is a saturation control circuit.

5-2 Luminance Path

As much as chroma path needs to perform chroma signal, DL201 delays Luminance signal about 600nS, and then this flows into pin10 through PC512 and control contrast, brightness with pin7 and pin11 to be supplied for each of R.G.B matrix circuit luminance signal supplied on pin10 is commonly 0.5Vp-p.

5-3 R.G.B Data Input

When the DC voltage of pin9 is 1-3V, PIC501 is converted into it in data input and when each of R.G.B signals flows into pins 13,15,17 each signal is in output at pins 12,14,16.
In case that DC voltage of pin9 remains less than 0.4V, normal state remains.

6. POWER SUPPLY (IC801, TDA4601)

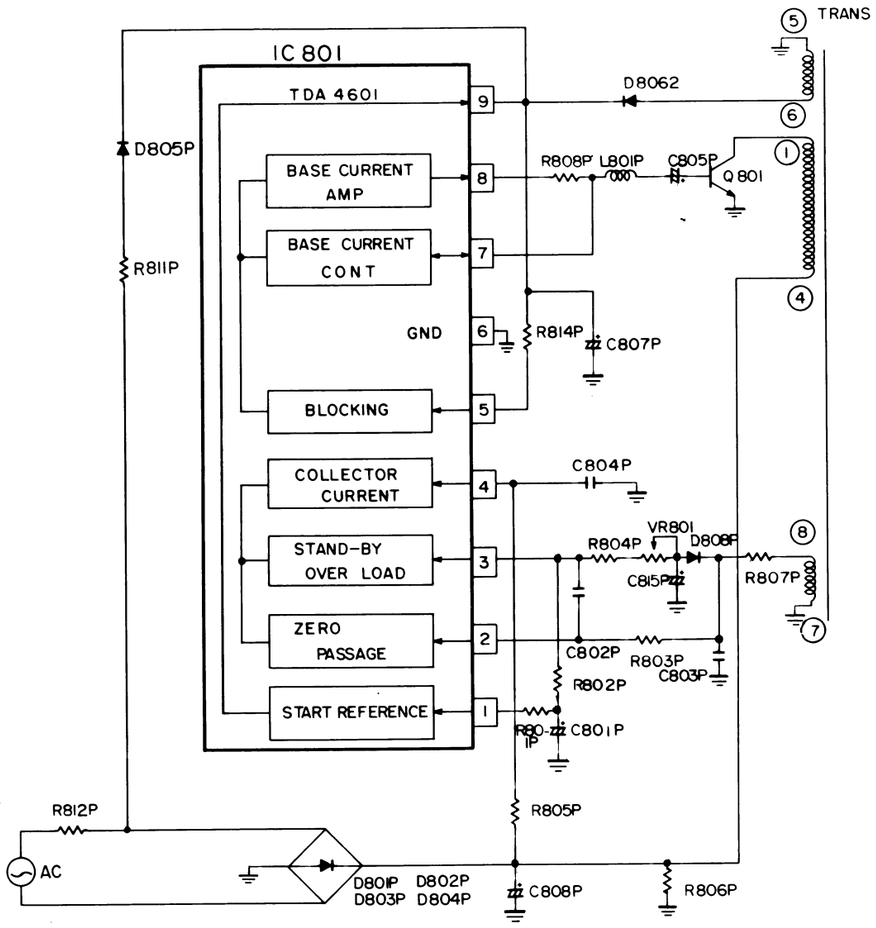


Figure 16. Schematic Diagram of IC801 (TDA4601)

6-1 Operating Description of the Circuit

START UP

If the power switch is ON, the voltage made by R811P, D805P and C807P, which is applied to pin9 of IC801.
If the voltage of pin9 is above 8.5V, IC801 begins the generation.
The voltage rectified by D801P, D802P, D803P, D804P and C808P, which is applied to pin4 of SMPS transformer (T801).
At this time, PWM signal outputs from pin7 of IC801 and drives Q801.
If Q801 is drived, the voltage generated at pins5,6 of SMPS TRANS is rectified at D806P and C807P, and supplieds about 13V to pin9 of IC801 continually.

NORMAL OPERATION

The square wave output which make Q801 on and off flows out of pin8, and its extend is adjusted by pin7.
Also the sources generated by the load variation are detected from the wire wound pins7,8 of T801.
The detected variation sources which is communated with the D808P and C815P input the voltage to pin3.
Pin2 and pin3 have the function assisting the control operation.
And VR801 controls the secondary output voltage.

OVER LOAD OPERATION

The maximum collector current is decided by R805P and C804P connected to the pin4. When this identified value is exceed over load operation, fix R805P for 270K ohm and change the value of C804P to adjust the maximum over load.
If you use a big capacitor of C804P, the maximum load electric power will increase.

HIGH VOLTAGE PROTECTION

This is decided by R814P connected at pin5 if the voltage of pin5 increase above the fixed voltage, the switching motion will stop.

TROUBLESHOOTING GUIDE

PRESET CONTROL
Brightness–Fully Up
Contrast–Fully Up
Colour–Fully Up
Volume–Mid range or adjust as need

Apply the colour bar signal to the RF input terminal.
Set channel on TV to match the signal.

- Dead set (No Raster/ No Sound) → Go to trouble-shooting guide #1.
- No raster (Sound OK) → Go to trouble-shooting guide #2.
- No picture/ No sound (Raster OK) → Go to trouble-shooting guide#3.
- No sound (Picture OK) → Go to trouble-shooting guide #4.
- No colour → Go to trouble-shooting guide #5.
- No vertical sweep → Go to trouble-shooting guide #6.
- No TELETEXT → Go to trouble-shooting guide #7.

#1. DEAD SET (NO RASTER/NO SOUND)

Check +B voltage at TP6. (J122)

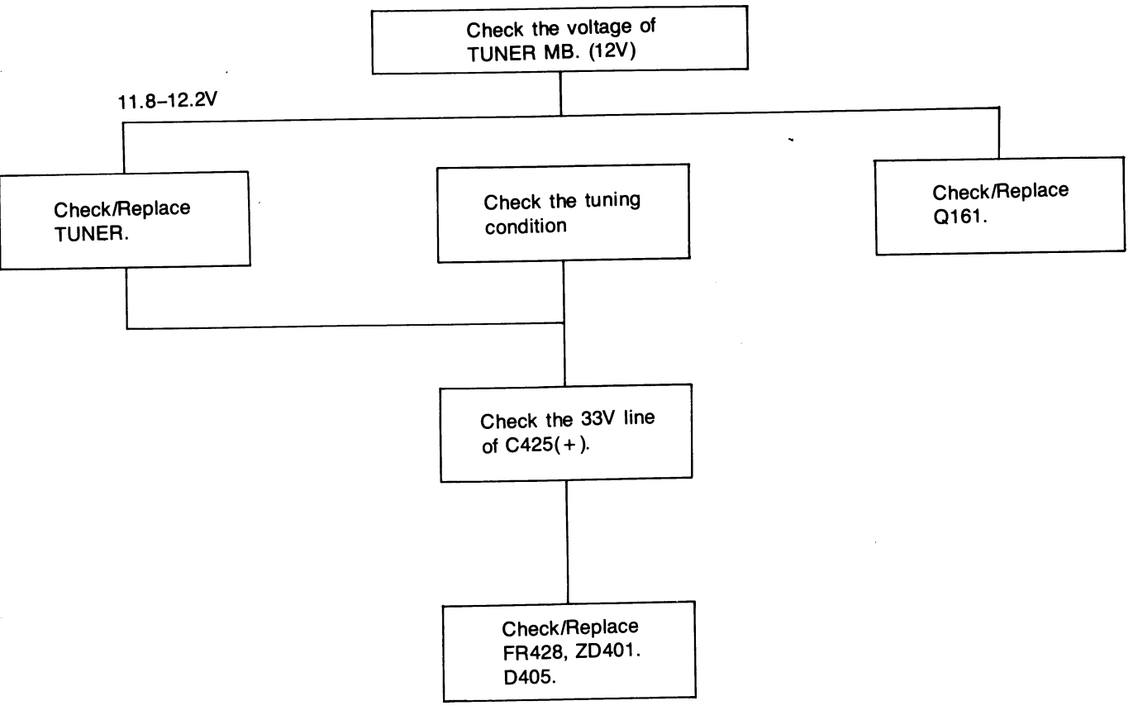
- 130–140V
  - Check stand-by 12V of C804S(+).
    - 0V → Check/Replace D801S, FR801.
    - 12V → Check the voltage of pin5 of IC201.
      - 4V–5V → Check/Replace Q801S, Q704 IC701.
      - 0V → Check the voltage of SMPS 19V.
        - Abnormal → Check/Replace FR802S, D802S.
        - Normal → Check/Replace Q401, Q402 D401, IC401.
- 120V (Normal)
  - Check/heater elements of CRT are lighting or not.
    - No → Check/Replace FR404.
    - Yes → Check the voltage of C429(+).
      - 0V → Check/Replace FR403, D403 R427.
      - 12V → Check the voltage of pin5 of IC201.
        - 0V → Check/Replace IC201.
        - 10–12V → Check/Replace Q801S, Q704.
- 0V
  - Check the rectified voltage of main supply power of C808P(+).
    - 0V → Check/Replace D801P–D804P F851, Q801.
    - 250–380V → Check the voltage of pin9 of IC801.
      - Less than 8V → Check/Replace R811P, D805P.
      - 8V–18V → Check/Replace FR803S, D806P D801S–803S Check the secondary voltages are short.

#2. NO RASTER (SOUND OK)

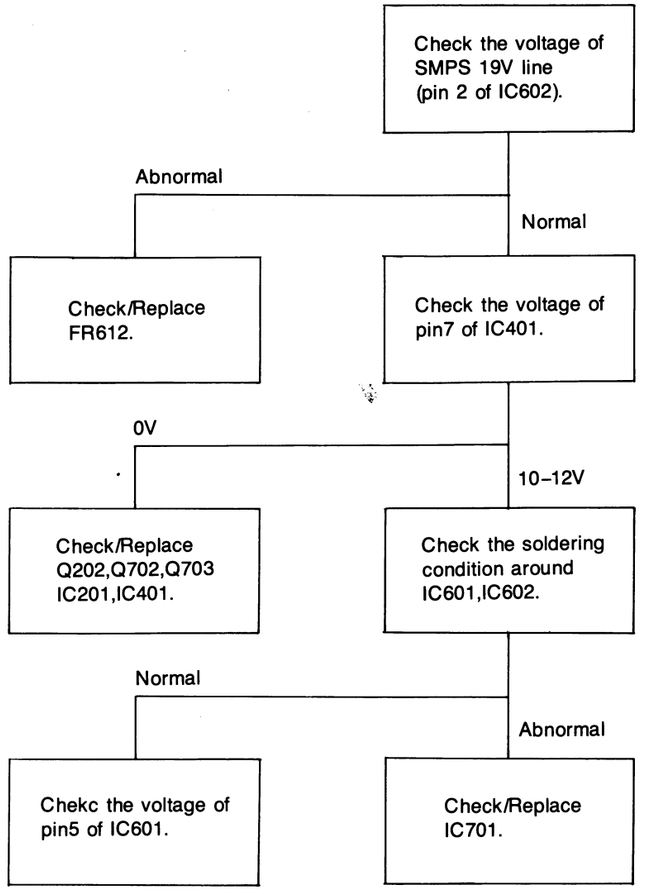
Check/heater elements of CRT are lighting.

- No → Check the connecting condition from connector 3P on CPT board to main P401.
- Yes
  - The screen is blinking. → Check/Replace PIC501.
  - Retrace line is visible. → Check the screen voltage(G2) alignment is correct or not.
    - Abnormal → Realign White Balance.
    - Normal → Check the screen colour.
      - White
        - Check the 180V line of C431(+).
          - Abnormal → Check/Replace FR404, D406.
          - 12V → Check/Replace D501–D503.
        - R/G/B → Check the base voltage of Q901–Q903.
          - 4–5V → Check/Replace R904–R906 or soldering condition. on CPT board

#3. NO PICTURE/NO SOUND (RASTER OK)

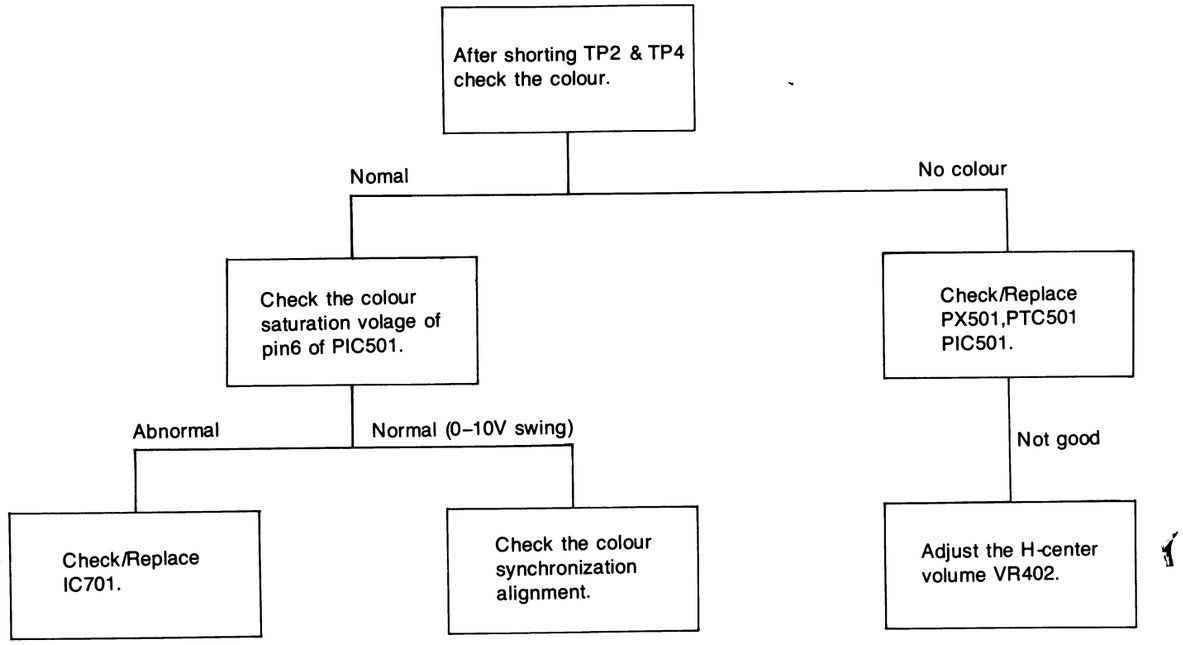


#4. NO SOUND (PICTURE OK)



NOTE:
Sound is muted whenever the screen is noise condition, that is, broadcasting signal is not found.

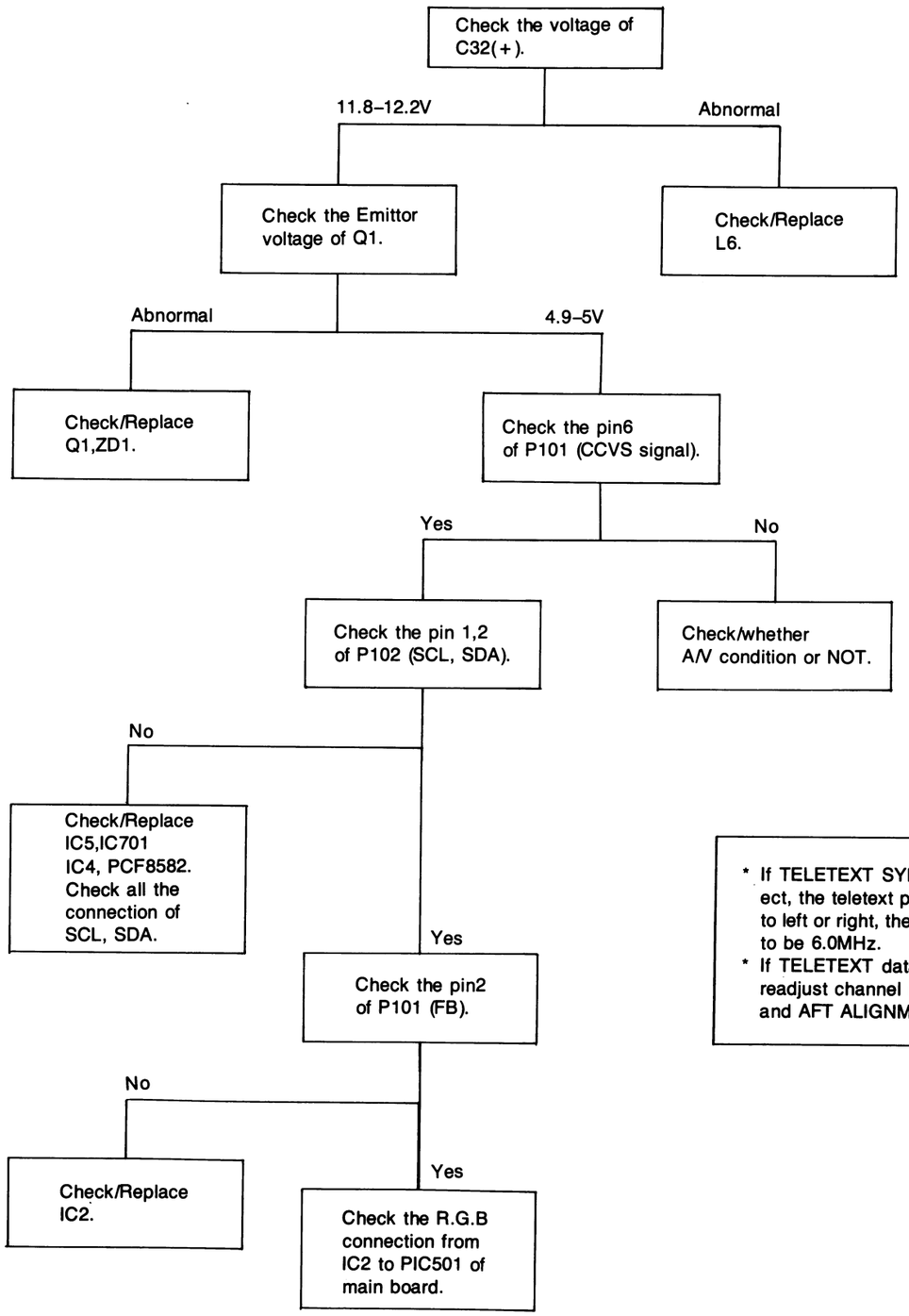
#5. NO COLOUR



#6. NO VERTICAL SWEEP

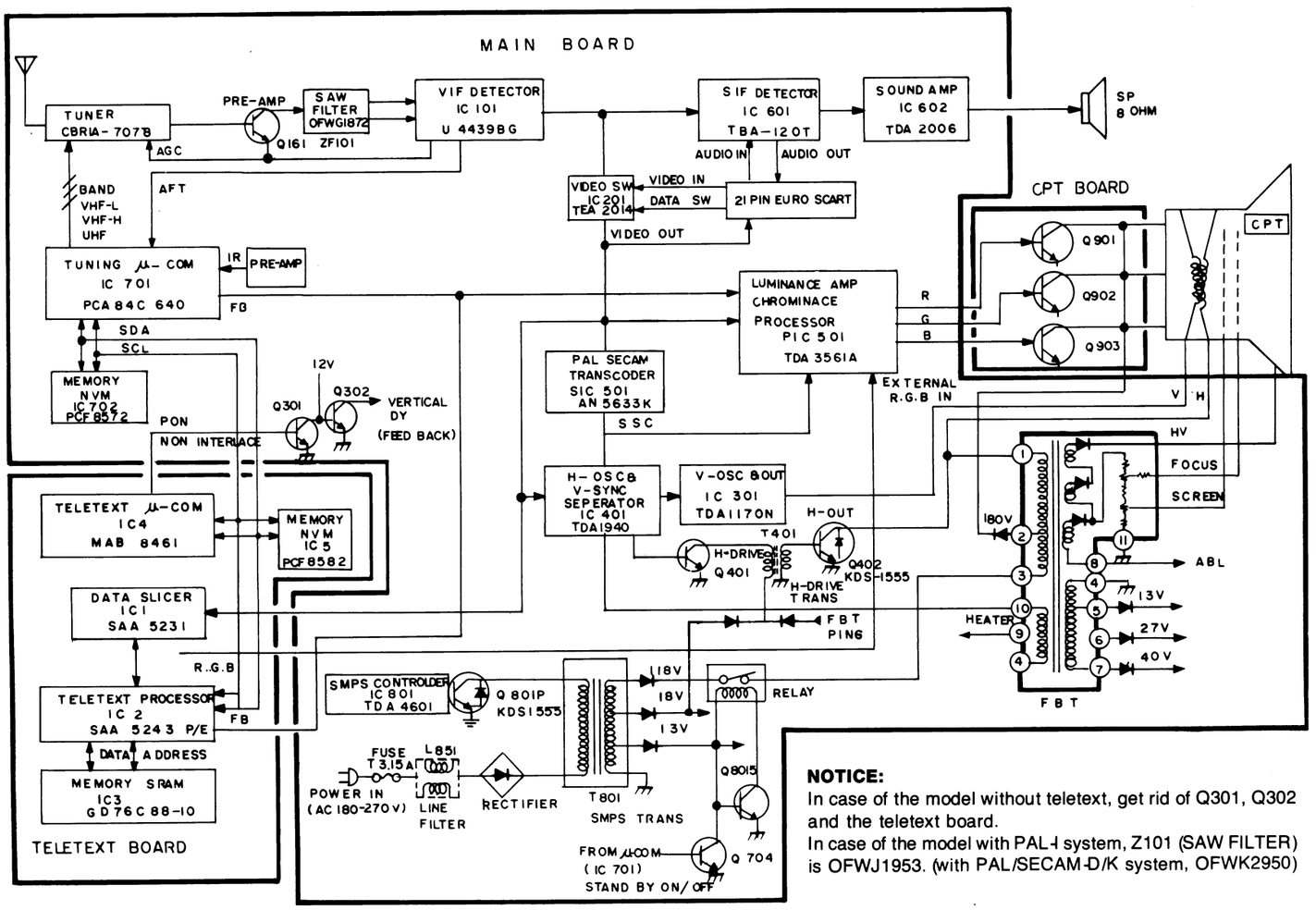
Check the around IC301 soldering condition check/Replace IC301.

#7. NO TELETEXT



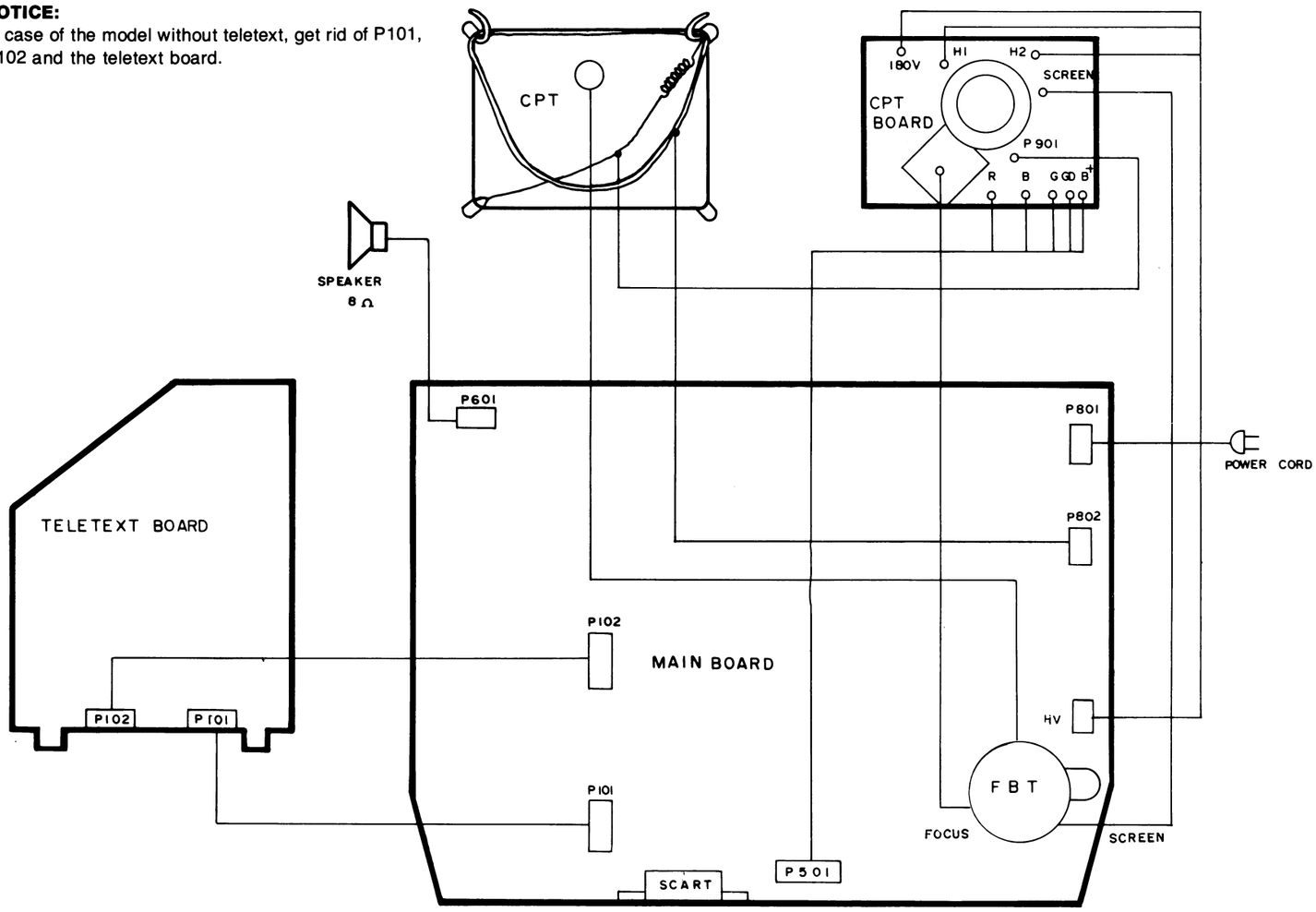
* If TELETEXT SYNC is not correct, the teletext picture be move to left or right, then readjust TC1 to be 6.0MHz.
* If TELETEXT data error occurs, readjust channel memory or VIF and AFT ALIGNMENT.

BLOCK DIAGRAM



NOTICE:
In case of the model without teletext, get rid of Q301, Q302 and the teletext board.
In case of the model with PAL-I system, Z101 (SAW FILTER) is OFWJ1953. (with PAL/SECAM-D/K system, OFWK2950)

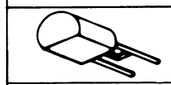
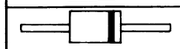
WIRING DIAGRAM



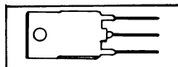
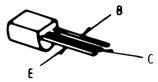
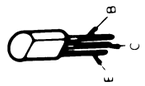
NOTICE:
In case of the model without teletext, get rid of P101, P102 and the teletext board.

TERMINAL VIEW OF SEMICONDUCTOR

DIODE

FIGURE	DESCRIPTION	REFERENCE NO.
	1N4148TA	D1-D8,D201,D203 D205,D206,D207 D208,D210,D601 D602,D603,D604 D701,D703 D704-D709 D901-D903,D804S PD502,503,SD501
	1N4003TA	D301,D401,D402
	R10J	D404-D407,D801S D802S,D805S D805P-D808P
	RGP15J	D403,D408
	1N4005TA	D801P-D804P
	GU3C	D803S
	KA33V	ZD401
	HZ33T	
	Z5.6BM	ZD1,ZD701
	Z7.5BM	ZD402

TRANSISTOR

FIGURE	DESCRIPTION	REFERENCE NO.
	2SD1555	Q402,Q801
	KTC1815-GR	Q403
	KTC1815-O/Y	Q201,Q202,Q301 Q302 Q701-Q709
	KTC388A	Q161
	KTA1015-O/Y	Q710,Q711,Q712 Q714
	KTC2230A	Q401
	KTC1959-Y	Q713,Q801S
	KTC2236A-O	Q1
	KTC2068	Q901-Q903

IC

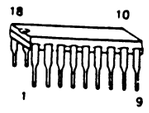
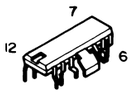
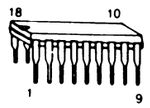
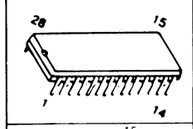
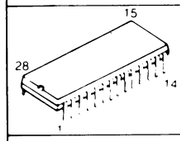
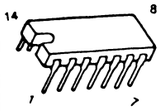
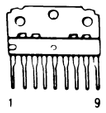
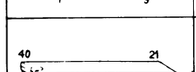
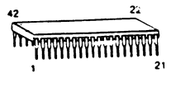
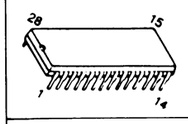
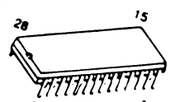
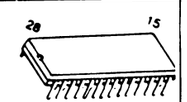
FIGURE	DESCRIPTION	REFERENCE NO.
	TDA4439 u4439BG	IC101
	TEA1014	IC201
	TDA1170N	IC301

FIGURE	DESCRIPTION	REFERENCE NO.
	TDA1940	IC401
	GD76C88-10 GD76C88-15	IC3
	TDA-3560A	PIC501
	TBA120T	IC601
	TDA4601	IC801
	SAA5243P/E	IC2
	PCF84C640/030	IC701
	AN5633K	SIC501
	PCF8582 PCD8582	IC5
	PCD85C72 PCD8572	IC702
	MAB8461P/W172	IC4
	SAA5231-2 SAA5231	IC1

COMPONENT LOCATION GUIDE

(Refer to page 39)

R101	2A	R319	2D	R702	1A	R761	5D	PR502	2B		
R102	3A	R320	1D	R703	1A	R762	5D	PR503	2B		
R104	2A	R401	2C	R704	1A	R763	4C	PR504	2C		
R105	3A	R402	3E	R705	1A	R764	4C	PR505	1C		
R106	2A	R403	2E	R706	1A	R765	4C	PR506	1C		
R107	3A	R404	3E	R707	4B	R766	4C	PR507	1C		
R108	3A	R405	2E	R708	4B	R767	4C	PR508	1D		
R109	3A	R406	2D	R709	4B	R768	5D	PR509	2C		
R110	3A	R408	4C	R710	3A	R769	4C	PR510	2C		
R111	3A	R409	3C	R711	4B	R770	1B	PR511	1C		
R112	1B	R410	1D	R712	5B	R771	4C	PR512	2C		
R161	1A	R411	3C	R713	5B	R801S	3D	PVR501	2C		
R162	2A	R412	3C	R714	5B	R802S	3D				
R163	2A	R413	3C	R715	5B	R804S	3D	C101	2A		
R164	2A	R414	3C	R716	5B	R811S	3D	C102	3A		
R165	2A	R415	3C	R717	5B	R801P	4D	C103	2A		
R166	2A	R416	3C	R718	5C	R802P	4D	C104	2A		
R167	2A	R417	3C	R719	5C	R803P	4D	C105	3A		
R168	1A	R418	3C	R720	5C	R804P	4C	C106	3A		
R169	1A	R419	3C	R721	5C	R805P	4D	C108	2A		
R171	1A	R420	3C	R722	5C	R806P	5D	C109	2A		
R172	2A	R421	3C	R723	5C	R807P	4D	C161	2A		
R201	1B	R422	3C	R724	4C	R808P	5D	C162	2A		
R202	1B	R423	3C	R725	5C	R809P	4E	C163	2A		
R203	1B	R424	3C	R726	4C	R810P	4D	C164	2A		
R205	4A	R425	3C	R727	4C	R811P	5D	C165	1A		
R207	4A	R426	1E	R728	4B	R812P	4E	C166	1A		
R208	3A	R427	1D	R729	4C	R813P	3E	C167	1A		
R209	4A	R429	1E	R729	4C	R814P	5C	C168	1A		
R210	1C	R430	1E	R730	4C	VR101	3A	C169	1A		
R211	1C	R432	3C	R731	4C	VR301	2C	C170	1A		
R212	1B	R433	3C	R732	4C	VR302	2C	C171	2A		
R214	1B	R434	2C	R733	4B	VR303	1D	C201	1B		
R215	1B	R435	4B	R734	4C	VR401	3C	C202	2B		
R218	1B	R436	3C	R735	4C	VR701	4B	C203	2B		
R219	1B	R437	1D	R736	4C	VR801	4C	C204	4A		
R220	1B	R601	3A	R737	4B	FR401	1D	C206	4A		
R221	1C	R602	4A	R738	5B	FR402	1D	C209	1C		
R222	1C	R603	4A	R739	5B	FR403	1D	C210	1C		
R225	1B	R604	4A	R740	5B	FR404	1E	C211	1C		
R226	1B	R605	5A	R741	5B	FR405	2E	C212	1C		
R227	1B	R606	5A	R742	5B	FR406	2E	C213	4A		
R229	3B	R607	5A	R743	5B	FR407	2D	C214	3A		
R301	1D	R608	5A	R744	5B	FR428	1D	C215	1B		
R302	2D	R609	5A	R745	5B	FR801S	3D	C301	1D		
R303	2D	R610	5A	R746	4B	FR802S	3D	C302	2D		
R304	2D	R611	5A	R747	5B	FR803S	3D	C303	2D		
R305	2D	R612	5B	R748	5B	SR501	3B	C304	2D		
R306	2C	R613	4A	R749	5B	SR502	3B	C305	3D		
R307	2D	R614	4A	R750	4B	SR503	3B	C306	2D		
R308	2D	R615	5A	R751	4B	SR504	2B	C307	2D		
R309	2D	R616	4A	R752	4B	SR505	2C	C308	2D		
R310	2D	R617	5A	R753	4B	SR506	3B	C309	1D		
R311	2D	R618	3A	R754	4C	SR507	3B	C310	1D		
R312	3C	R619	3A	R755	5C	SR508	3B	C311	1D		
R313	1D	R620	3A	R756	5C	SR509	3B	C401	3E		
R314	1D	R621	4A	R757	5C	SR510	2B	C403	3E		
R315	1D	R622	5A	R758	4B	SR513	2B	C404	3E		
R316	2D	R623	5A	R759	4C	SVR501	3B	C405	2E		
R318	2D	R701	1A	R760	4C	PR501	3C	C406	2D		

C407	2D	C705	4C	PC521	2C	D805P	5D	L102	3A		
C408	3C	C706	5C	PC522	1D	D806P	4D	L103	3A		
C409	3C	C707	4C	SC501	3B	D807P	4D	L104	2A		
C410	3C	C708	4B	SC502	3B	D808P	4C	L105	3A		
C411	3C	C709	4B	SC504	3B	D801S	3D	L161	2A		
C412	3C	C710	4B	SC505	3B	D802S	3D	L162	2A		
C413	3C	C711	5B	SC506	3B	D803S	3D	L201	2B		
C414	3C	C712	5B	SC507	3B	D804S	3D	L401	2D		
C415	3C	C713	4B	SC508	3B	D805S	2C	L402	2E		
C416	3C	C714	5B	SC509	2B	SD501	2C	L602	3A		
C417	3C	C715	5D	SC510	2B	PD502	1C	L622	4A		
C418	3C	C716	4C	SC511	2B	PD503	1D	L701	4C		
C419	3C	C717	1B	SC512	2B	ZD401	1D	L801P	5D		
C420	2C	C801P	4D	SC513	2B	ZD701	4C	L804S	3E		
C421	2C	C802P	4C	SC514	2B	ZD702	4C	L851	5E		
C422	1D	C803P	4D	SC515	3B	LD701	5D	PL501	2C		
C423	2D	C804P	4D	SC516	3B			PL502	1B		
C424	1E	C805P	4D	SC517	2B	T401	2E	PL503	2C		
C425	1D	C806P	4D	SC518	3B	T801	4C	PL504	1C		
C426	2D	C807P	5C	SC519	3B			SL501	3B		
C427	1D	C808P	3E	SC520	3B	Q161	2A	SL503	3B		
C428	1D	C809P	4E	SC521	3B	Q201	1B	SL504	3C		
C429	1D	C810P	4E	SC523	3C	Q202	4A	SL505	3B		
C430	1E	C811P	4E	SC524	3B	Q301	2D	SL506	3B		
C431	2E	C812P	3E	SC525	3B	Q302	2D	DL201	1B		
C432	2E	C814P	3E	SC526	2B	Q402	2E				
C522	3C	C815P	4C	PTC501	2C	Q403	4B	PA1	5E		
C528	1C	C816P	3E			Q601	4A	P101	1B		
C601	3A	C801S	3D	D201	1B	Q602	4A	P102	3B		
C602	4A	C802S	3D	D203	1B	Q701	5B	P201	1B		
C603	4A	C803S	3D	D204	1B	Q702	4B	P301	2D		
C604	4A	C804S	3D	D205	4B	Q703	4B	P401	2E		
C605	4A	C805S	3D	D206	4B	Q704	5C	P501	1C		
C606	4A	C806S	3E	D207	2C	Q705	4C	P601	5A		
C607	4A	C807S	3E	D210	3B	Q706	5D	P701	5C		
C608	5A	C851	4E	D301	2D	Q707	1A	P702	5C		
C609	4A	C852	4D	D401	3D	Q708	1A	P801	5E		
C610	4A	C853	4E	D402	2E	Q709	1A	P802	4E		
C611	5A	C854	5E	D403	1D	Q710	1A	PX501	2C		
C612	5A	C855	5D	D404	2D	Q711	1A	X501	5A		
C613	5A	PC501	2C	D405	1E	Q712	1A	X701	4C		
C614	5A	PC502	2B	D406	2E	Q713	3D	F851	4E		
C615	5A	PC503	2B	D407	4C	Q714	5D	SW301	2D		
C616	5A	PC504	2B	D601	4A	Q715	4C	SW851	5E		
C617	5A	PC505	2B	D602	5A	Q801S	3D	Z101	2A		
C618	4A	PC506	1B	D603	4A	Q801P	4D	Z102	2A		
C619	3A	PC507	1B	D604	4A			Z601	5A		
C620	4A	PC508	2B	D701	5C	IC101	3A	Z602	4A		
C621	4A	PC509	2C	D702	5C	IC201	2B	Z603	3A		
C622	5A	PC510	2C	D703	5C	IC301	2D	Z604	3A		
C623	4A	PC511	1C	D704	5C	IC401	3C	ZF101	2A		
C624	4A	PC512	1C	D705	5C	IC601	4A	TH851	4E		
C625	4A	PC513	1C	D706	5B	IC602	5A	RL801	3D		
C626	4A	PC514	1C	D707	4B	IC701	5B	TP1	2A		
C627	5A	PC515	1C	D708	5B	IC702	5C	TP2	2C		
C628	3A	PC516	1C	D709	5B	IC801	4D	TP3	3C		
C701	5B	PC517	2C	D801P	4E	SIC501	2B	TP4	2C		
C702	5B	PC518	2C	D802P	4E	PIC501	1C	TP5	1C		
C703	5B	PC519	2C	D803P	4E			TP6	1E		
C704	4C	PC520	2C	D804P	4E	L101	2A				

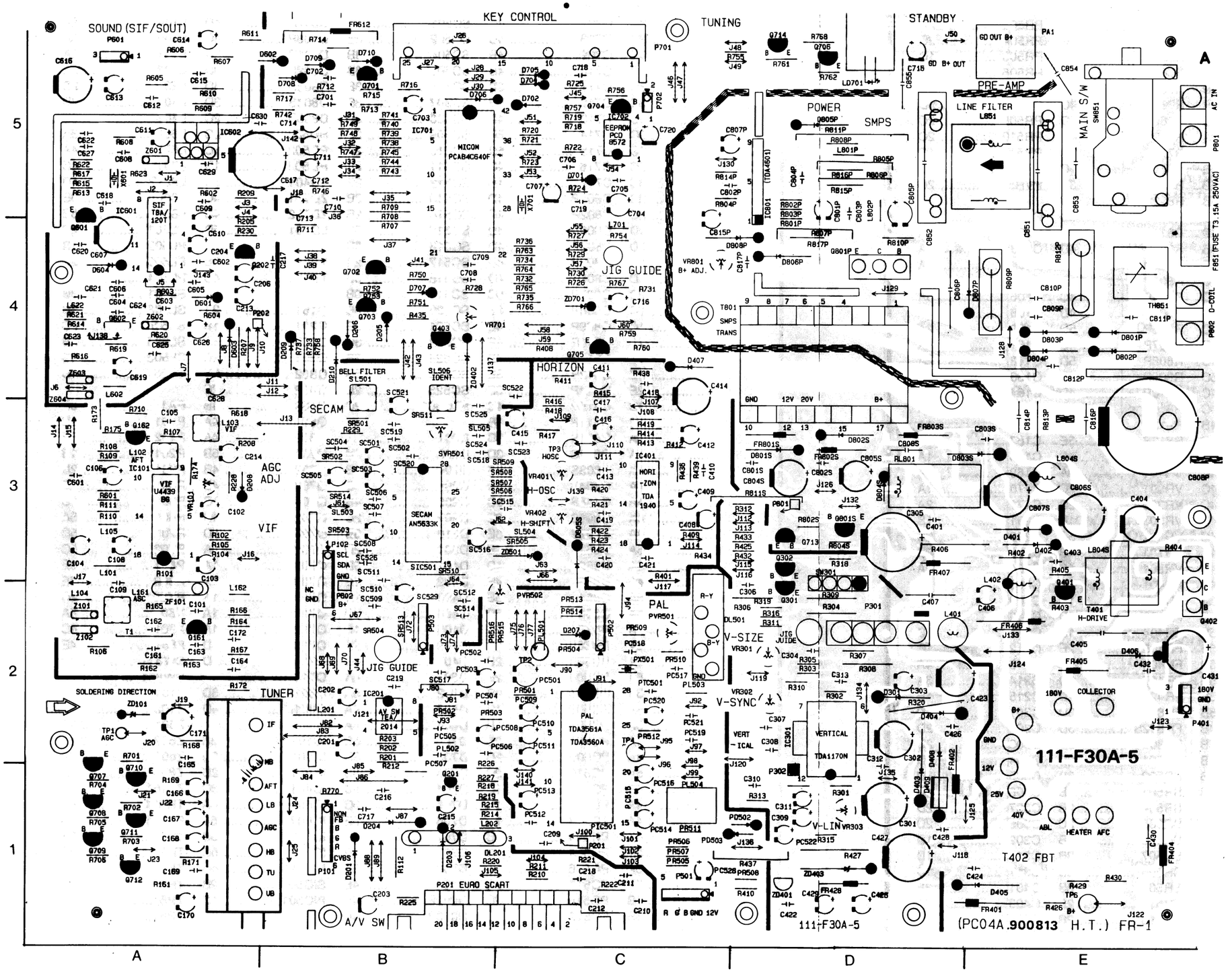
COMPONENTS CONVERSION LIST VS. CPT CHANGING (21 INCH)

NO	CIRCUIT NO.	HITACHI (A51JFC60X)	GOLD STAR (A51KAK 12XX)	PHILIPS (A51EAL 30X01) (A51EAL 30X02)	NOKIA (A51ECQ 00X01)	VIDEO–COLOR (A51EBV 90X02) (A51EBV 13X01)	REMARKS
1	DY	153–110D (GS)	153–110F (GS)	PHILIPS	NOKIA	VIDEO–COLOR	DY
2	T402	154–194B	154–194B	154–194B	154–177K	154–194B	FBT
3	C405	181–131G (MPP912/1.6KV)	181–131G (MPP862/1.6KV)	181–131G (MPP912/1.6KV)	181–131H (MPP822/1.6KV)	181–131F (MPP732/1.6KV)	TUNING
4	C407	181–128B (MPP474/200V)	181–128B (MPP474/200V)	181–128C (MPP394/200V)	181–128C (MPP394/200V)	181–128B (MPP474/200V)	SIZE
5	FR404	180–305G (FUSING 1W1.5 Ω)	180–305G (FUSING 1W1.5Ω)	ORF 0301 J665 (FUSING 1W 3 Ω)	ORF 0391 J665 (FUSING 1W3.9 Ω)	180–305G (FUSING 1W1.5 Ω)	HEATER
6	R429	ORD 7502 F609 (RD 1/6W 75K)	ORD 7502 F609 (RD 1/6W 75K	ORD 7502 F609 (RD 1/6W 75K)	ORD 8202 F609 (RD 1/6W 82K)	ORD 7502 F609 RD 1/6W 75K)	ABL
	R430	ORD 6802 F609 (RD 1/6W 68K)	ORD 6802 F609 (RD 1/6W 68K)	ORD 6802 F609 (RD 1/6W 68K)	ORD 8202 F609 (RD 1/6W 82K)	ORD 6802 F609 (RD 1/6W 68K)	
7	R754	ORD 1202 F609 (RD 1/6W 12K)	ORD 1202 F609 (RD 1/6W 12K)	ORD 1202 F609 (RD 1/6W 12K)	ORD 3902 F609 (RD 1/6W 39K)	ORD 1202 F609 (RD 1/6W 12K)	OSD POSITION
	R767	ORD 4702 F609 (RD 1/6W 47K)	ORD 4702 F609 (RD 1/6W 47K)	ORD 4702 F609 (RD 1/6W 47K)	ORD 3902 F609 (RD 1/6W 39K)	ORD 4702 F609 (RD 1/6W 47K)	
8	J112	971–0016 (TIN WIRE)	971–0016 (TIN WIRE)	971–0016 (TIN WIRE)	ORD 1001 F609 (RD 1/6W 1K)	971–0016 (TIN WIRE)	
9	REAR SIDE	X	X	X	X	ODD 4148 09ED (1N414888)	C408 ⊣⊢ J112 GND
10	R427 (B+ 12V)	ORS 0121 J665 (RS 1W 1.2Ω)	ORS 0121 J665 (RS 1W 1.2Ω)	ORS 0121 J665 (RS 1W 1.2Ω)	ORS 0101 J665 (RS 1W 1Ω)	ORS 0101 J665 (RS 1W 1Ω)	WITH TEXT WITH SECAM
		ORS 0151 J665 (RS 1W 1.5Ω)	ORS 0151 J665 (RS 1W 1.5Ω)	ORS 0151 J665 (RS 1W 1.5Ω)	ORS 0101 J665 (RS 1W 1Ω)	ORS 0151 J665 (RS 1W 1.5Ω)	WITH TEXT WITHOUT SECAM
		ORS 0221 J665 (RS 1W 2.2Ω)	ORS 0221 J665 (RS 1W 2.2Ω)	ORS 0221 J665 (RS 1W 2.2Ω)	ORS 0221 J665 (RS 1W 2.2Ω)	ORS 0221 J665 (RS 1W 2.2Ω)	WITHOUT TEXT WITH SECAM
		ORS 0303 J665 (RS 1W 3.0Ω)	ORS 0303 J665 (RS 1W 3.0Ω)	ORS 0303 J665 (RS 1W 3.0Ω)	ORS 0271 J665 (RS 1W 2.7Ω)	ORS 0331 J665 (RS 1W 3.3Ω)	WITHOUT TEXT WITHOUT SECAM
	R437 (B+ 12V)	ORS 0151 J665 (RS 1W 1.5Ω)	ORS 0151 J665 (RS 1W 1.5Ω)	ORS 0151 J665 (RS 1W 1.5Ω)	ORS 0271 J665 (RS 1W 2.7Ω)	ORS 0181 J665 (RS 1W 1.8Ω)	WITH TEXT WITH SECAM
		ORS 0151 J665 (RS 1W 1.5Ω)	ORS 0151 J665 (RS 1W 1.5Ω)	ORS 0151 J665 (RS 1W 1.5Ω)	ORS 0151 J665 (RS 1W 1.5Ω)	ORS 0221 J665 (RS 1W 2.2Ω)	WITH TEXT WITHOUT SECAM
		ORS 0271 J665 (RS 1W 2.7Ω)	ORS 0271 J665 (RS 1W 2.7Ω)	ORS 0271 J665 (RS 1W 2.7Ω)	ORS 0271 J665 (RS 1W 2.7Ω)	ORS 0331 J665 (RS 1W 3.3Ω)	WITHOUT TEXT WITH SECAM
		ORS 0331 J665 (RS 1W 3.3Ω)	ORS 0331 J665 (RS 1W 3.3Ω)	ORS 0331 J665 (RS 1W 3.3Ω)	ORS 0331 J665 (RS 1W 3.3Ω)	ORS 0331 J665 (RS 1W 3.3Ω)	WITHOUT TEXT WITHOUT SECAM

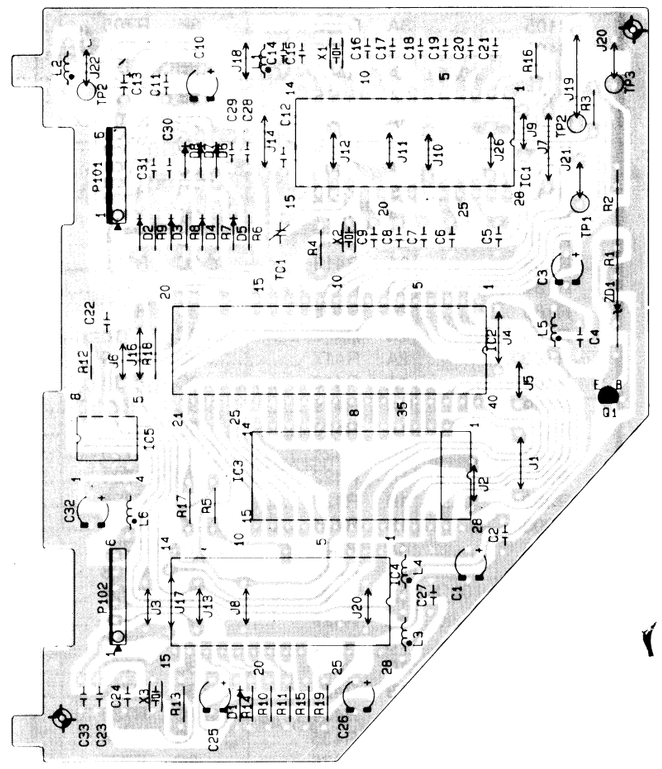
NO	CIRCUIT NO.	HITACHI (A51JFC60X)	GOLD STAR (A51KAK 12XX)	PHILIPS (A51EAL 30X01) (A51EAL 30X02)	NOKIA (A51ECQ 00X01)	VIDEO-COLOR (A51EBV 90X02) (A51EBV 13X01)	REMARKS
11	R302	ORD 5602 F609 (RD 1/6W 56K)	ORD 5602 F609 (RD 1/6W 56K)	ORD 5602 F609 (RD 1/6W 56K)	ORD 5602 F609 (RD 1/6W 56K)	ORD 4702 F609 (RD 1/6W 47K)	
	R315	ORD 5102 F609 (RD 1/6W 51K)	ORD 5102 F609 (RD 1/6W 51K)	ORD 5102 F609 (RD 1/6W 51K)	ORD 5102 F609 (RD 1/6W 51K)	ORD 3302 F609 (RD 1/6W 33K)	
12	C305	181-221H CE 1000u/35V (MINI)	181-221H CE 1000u/35V (MINI)	181-221H CE 1000u/35V (MINI)	181-221H CE 1000u/35V (MINI)	OCE 4776H 630 (CE 470u/25V)	
13	DY CONNEC.	WITH DY	WITH DY	387-574D(30X01) 387-574C(30X02)	387-574D	387-574D	
14	R433	ORD 1202 F609 (RD 1/6W 12K)	ORD 1202 F609 (RD 1/6W 12K)	ORD 1202 F609 (RD 1/6W 12K)	ORD 4302 F609 (RD 1/6W 43K)	ORD 4302 F609 (RD 1/6W 43K)	
15	REAR SIDE (SECAM ONLY)	X	X	X	OCQ 333 1N501 (MYLAR 2A 333)	X	PARALLEL WITH R361
		X	X	X	OCQ 223 1N500 (MYLAR 2A 223)	X	PARALLEL WITH R432
		X	X	X	OCQ 473 1N501 (MYLAR 2A 473)	X	R432 B+12V R433 E of Q713
16	DY LEAD ATTACH	X	X	X	X	961-0027 (90 X 02)	ABESTOS TAPE (0.08MZ/SET)
17	CPT BOARD	110-N03B	110-N03B	110-N03B	110-N03B	110-N03H(90X02) 110-N03B(13X01)	
18	R431	OCE 4751 R630 (CE 4.7u/250V)	OCE 2251 R630 (CE 2.2u/250V)	OCE 4751 R630 (CE 4.7u/250V)	OCE 4751 R630 (CE 4.7u/250V)	OCE 4751 R630 (CE 4.7u/250V)	180 LINE
19	R311	ORD 6202 F609 (RS 1/6W 68K)	ORD 6202 F609 (RS 1/6W 68K)	ORD 6202 F609 (RS 1/6W 68K)	ORD 6202 F609 (RS 1/6W 68K)	ORD 8202 F609 (RS 1/6W 82K)	V-SIZE
20	CPT FIX	332-057E	332-057M	332-057E	332-057E	332-057E	SCREW HEXAGON FOR CPT FIX
21	VDE LABEL	891-112A	891-112A	X	891-112A	891-112A	ATTACH TO CPT

PRINTED CIRCUIT BOARD

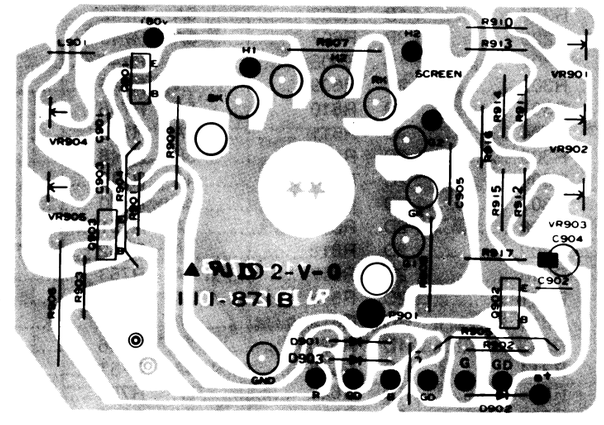
MAIN P.C.BOARD (COMPONENT SIDE)



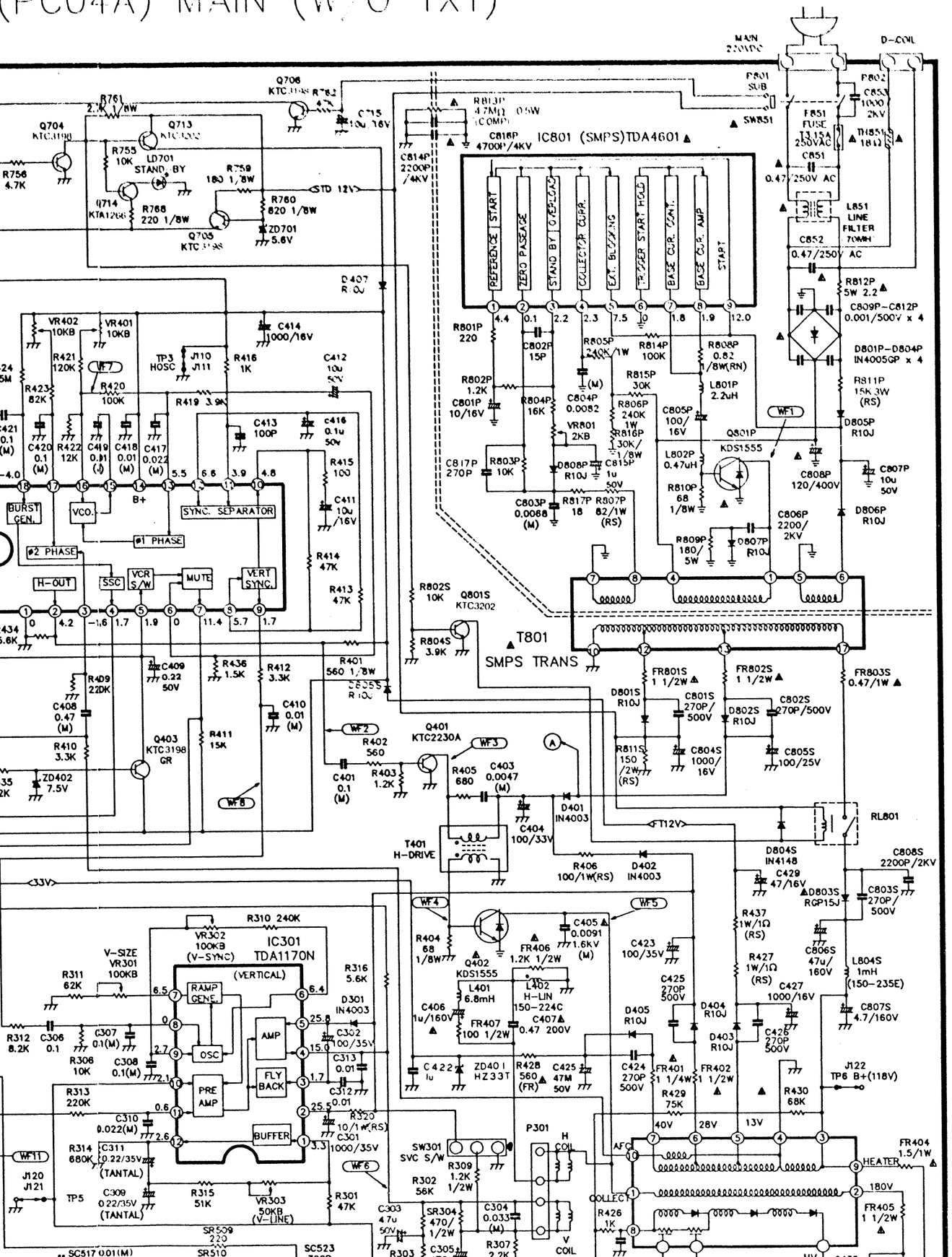
TXT P.C.BOARD (COMPONENT SIDE)



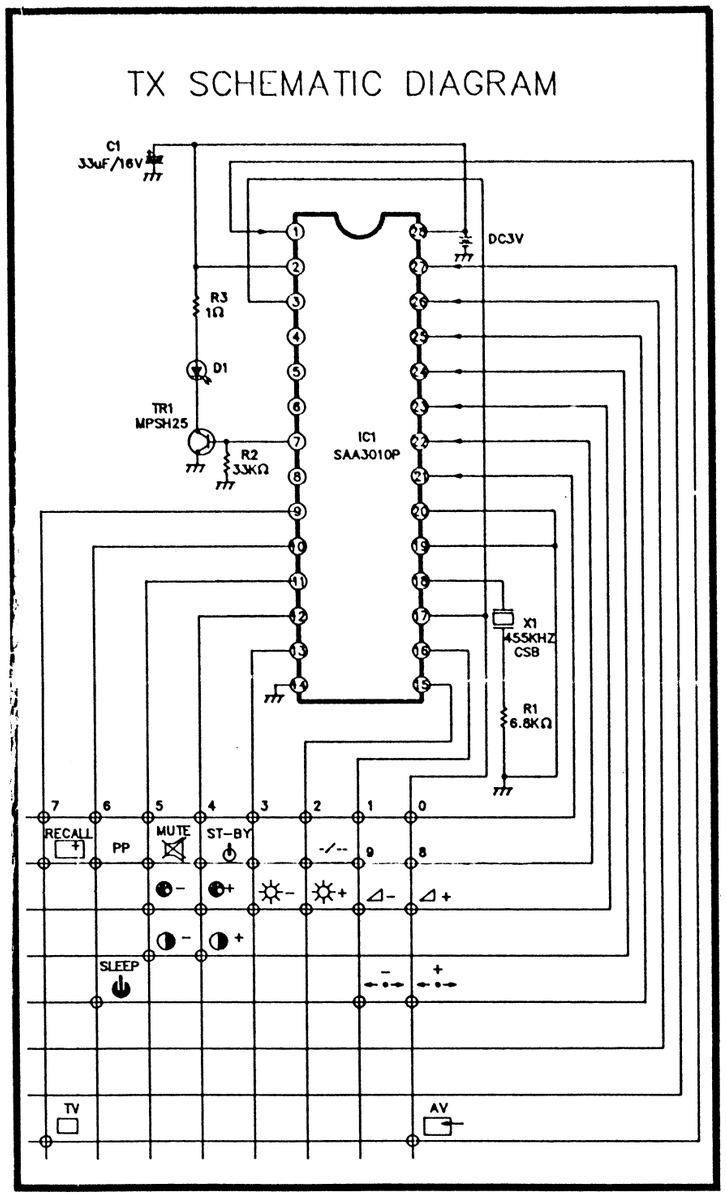
CPT P.C.BOARD (COMPONENT SIDE)



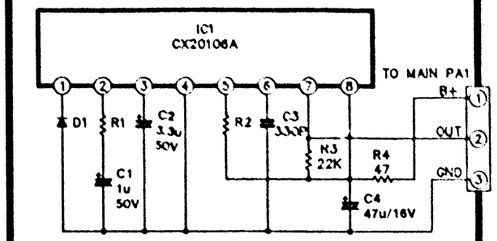
(PC04A) MAIN (W/O TXT)



TX SCHEMATIC DIAGRAM



PRE-AMP



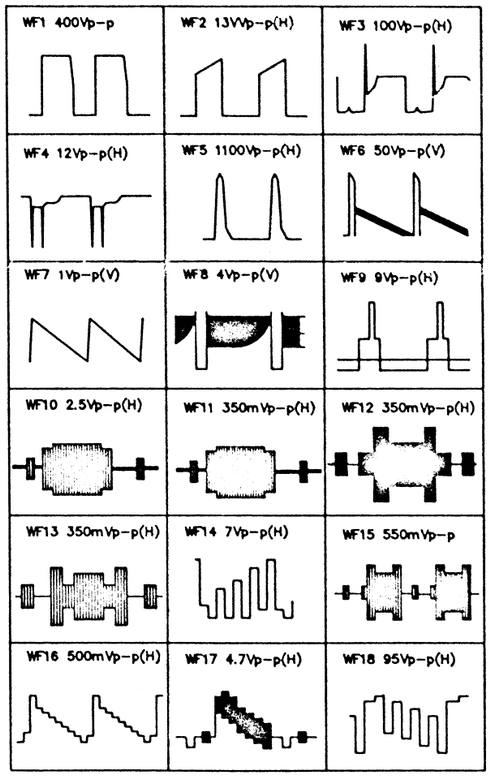


TABLE OF INCH CONVERSION (TABLE 1)

CIRCUIT NO.	INCH 14"	INCH 20"	INCH 21"	REMARK
R302	47KΩ	56KΩ	56KΩ	CARBON FILM RESISTOR
R311	91KΩ	91KΩ	62KΩ	"
R315	27KΩ	39KΩ	39KΩ	"
R427	1Ω 1W	1 Ω1W	1 1W	METAL OXIDE FILM RESISTOR
R437	1Ω 1W	0.47Ω 1W	1 1W	"
R429	10KΩ	56KΩ	75KΩ	CARBON FILM RESISTOR
FR404	1.2 Ω	1.5 Ω	1.5Ω	FUSIBLE RESISTOR
FR428	390 Ω	390Ω	560Ω	"
C303	3.3uF	4.7uF	4.7uF	CE CAPACITOR
C405	0.0073/1.6KV	0.0091/1.6KV	0.0091/1.6KV	MPP CAPACITOR

NOTICE:
Since this is a basic circuit diagram.
The value of components and some partical connection are subject to be changed for improvement.

The components marked ⚠ conform to VDE or IEC guidelines and are essential for safe operation of the set, while those marked ▲ are required for correct operation. Use specified parts only when replacing.

VALUE OF RESISTOR, CAPACITOR and INDUCTOR

1. Resistances is shown in ohm, k=1,000, M=1,000,000.
2. Unless other wise noted in schematic, all capacitor values less than 1 are expresses in mfd and the values more than 1 in pf
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in uH, and the values less than 1 in H.

CIRCUIT DIAGRAM (PC04A) M

IC602
TDA2006
(SOUT)

SOUND CONVERTER

IC601(SIF)
TBA-120T

IC101(VF)
U4439BG

IC701 (u-COM)
PCA84C640P/030

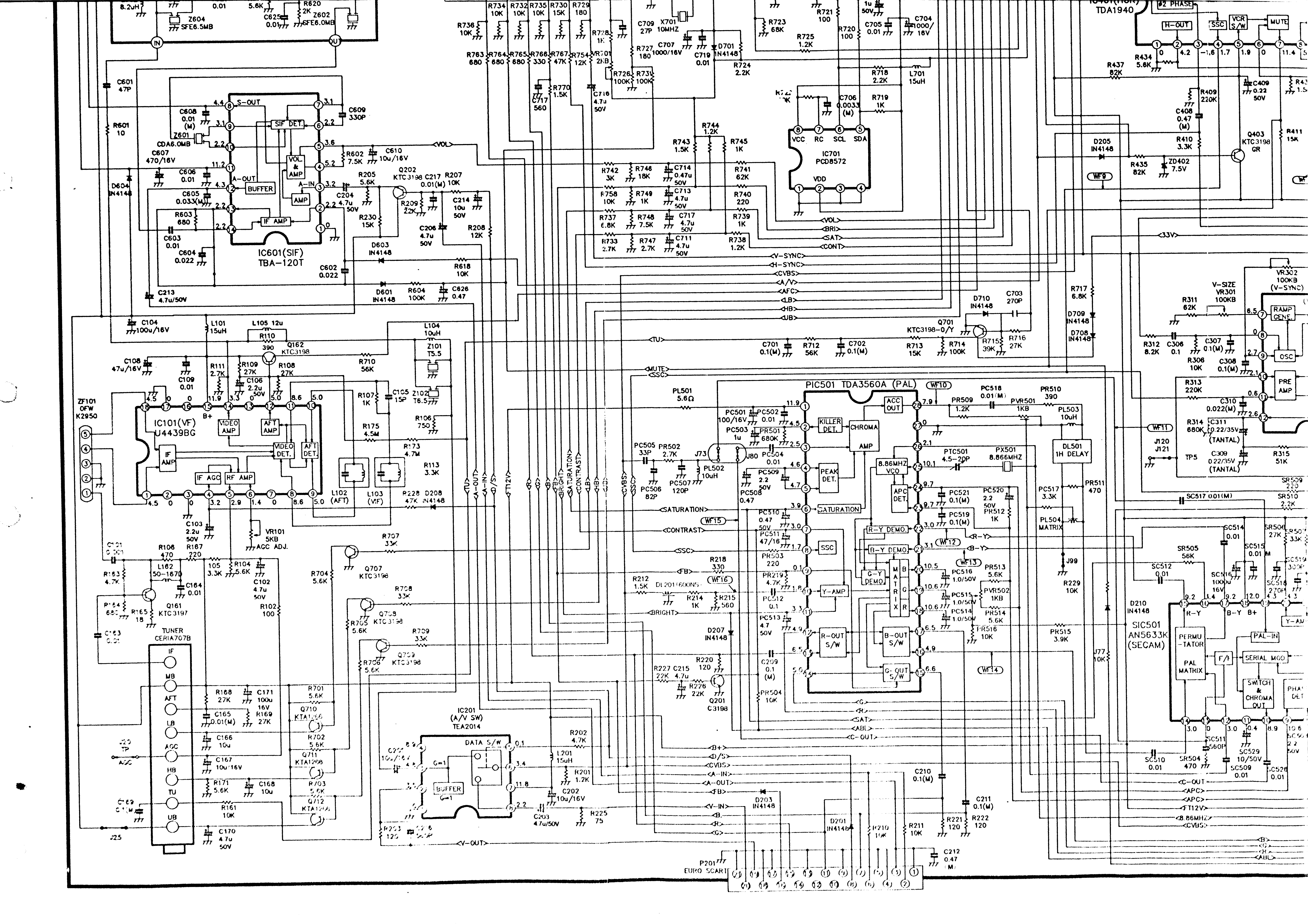
IC701
PCD8572

PIC501 TDA3560A (PAL)

IC401(HOR)
TDA1940

P701(SWITCH BLOCK)

PRE AMP


IC601(SIF)
TBA-120T
S-OUT
SIF DET.
VOL. & AMP
A-OUT
BUFFER
AMP
A-IN
IF AMP
IC101(VF)
U4439BG
VIDEO AMP
AFT AMP
VIDEO DET.
AFT DET.
IF AGC
RF AMP
IF AMP
ZF101
OFW
K2950
TUNER
CERIA707B
IF
MB
AFT
LB
AGC
HB
TU
UB
VR101
5KB
AGC ADJ.
IC701
PCD8572
VCC
RC
SCL
SDA
VDD
X701
10MHZ
PIC501 TDA3560A (PAL)
KILLER DET.
CHROMA AMP
ACC OUT
PEAK DET.
8.86MHZ VCO
APC DET.
SATURATION
R-Y DEMO.
B-Y DEMO
G-Y DEMO
MATRIX
SSC
Y-AMP
R-OUT S/W
B-OUT S/W
G-OUT S/W
DL501
1H DELAY
PL504
MATRIX
SIC501
AN5633K
(SECAM)
PERMU-TATOR
PAL MATRIX
F/I
SERIAL MOD
SWITCH & CHROMA OUT
PAL-IN
R-Y
B-Y
IC201
(A/V SW)
TEA2014
DATA S/W
BUFFER
P201
EURO SCART
TDA1940
H-OUT
SSC
VCR S/W
MUTE
V-SIZE
VR301
100KB
VR302
100KB
(V-SYNC)
RAMP GENE.
OSC
PRE AMP
Q403
KTC3198
GR
Q701
KTC3198-O/Y
Q202
KTC3198
Q162
KTC3198
Q161
KTC3197
Q707
KTC3198
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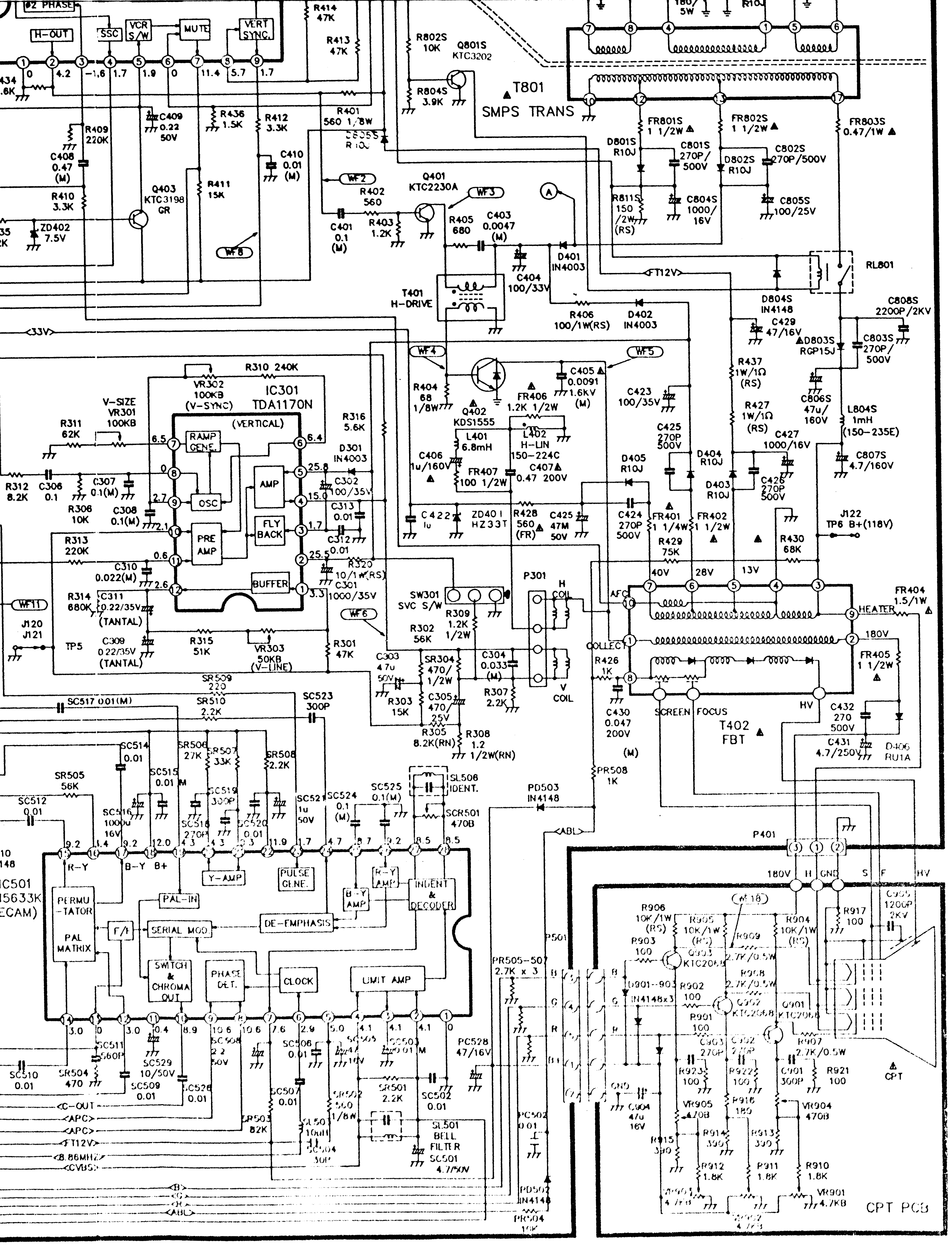
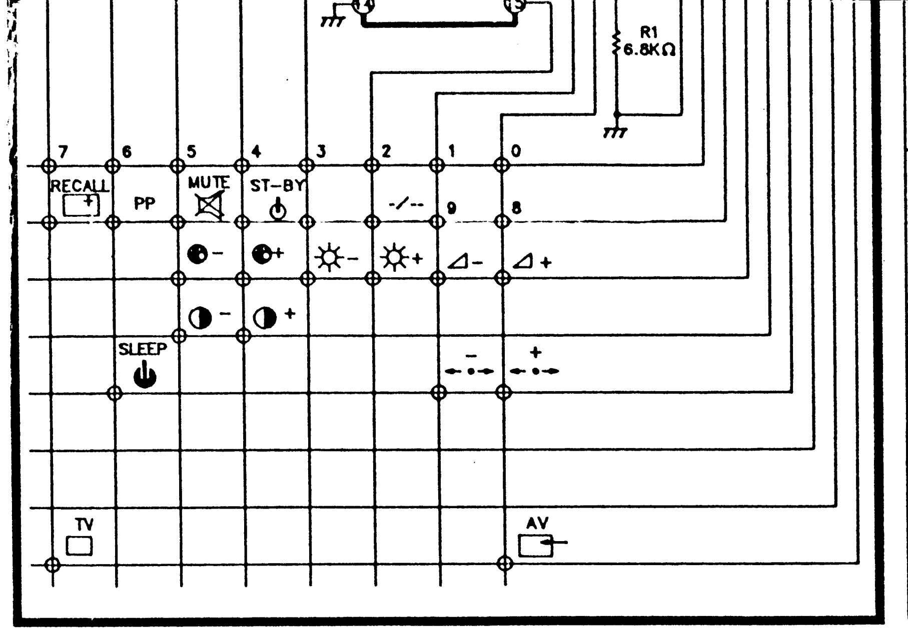
Q711
KTA1266
Q712
KTA1266
Q201
C3198





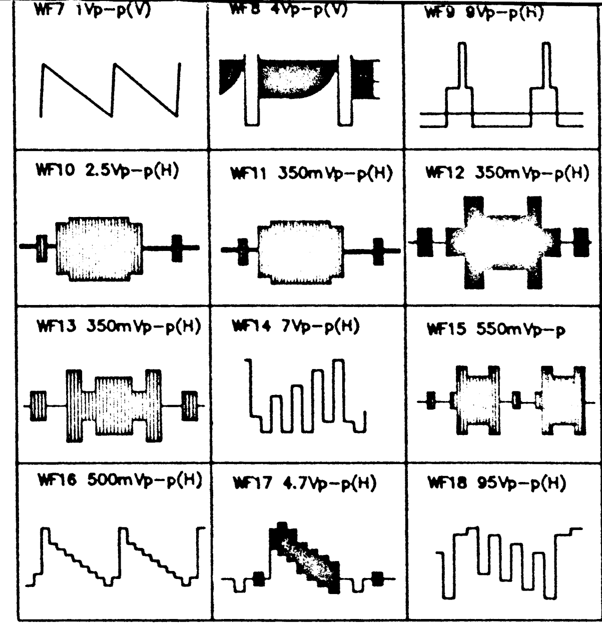


TABLE OF INCH CONVERSION (TABLE 1)

CIRCUIT NO.	INCH			REMARK
	14"	20"	21"	
R302	47KΩ	56KΩ	56KΩ	CARBON FILM RESISTOR
R311	91KΩ	91KΩ	62KΩ	•
R315	27KΩ	39KΩ	39KΩ	•
R427	1Ω 1W	1Ω1W	1 1W	METAL OXIDE FILM RESISTOR
R437	1Ω 1W	0.47Ω 1W	1 1W	•
R429	10KΩ	56KΩ	75KΩ	CARBON FILM RESISTOR
FR404	1.2Ω	1.5 Ω	1.5Ω	FUSIBLE RESISTOR
FR428	390Ω	390Ω	560Ω	•
C303	3.3uF	4.7uF	4.7uF	CE CAPACITOR
C405	0.0073/1.6KV	0.0091/1.6KV	0.0091/1.6KV	MPP CAPACITOR
C407	0.39/200V	0.39/200V	0.47/200V	•
L401	3.3uH	6.8uH	6.8uH	PEAKING COIL
L402	150-224L	150-224C	150-224C	LINEARITY COIL
T402	154-064F	154-177J	154-1948	FBT

NOTICE:
Since this is a basic circuit diagram.
The value of components and some partical connection are subject to be changed for improvement.

The components marked ▲ conform to VDE or IEC guidelines and are essential for safe operation of the set, while those marked ▲ are required for correct operation. Use specified parts only when replacing.

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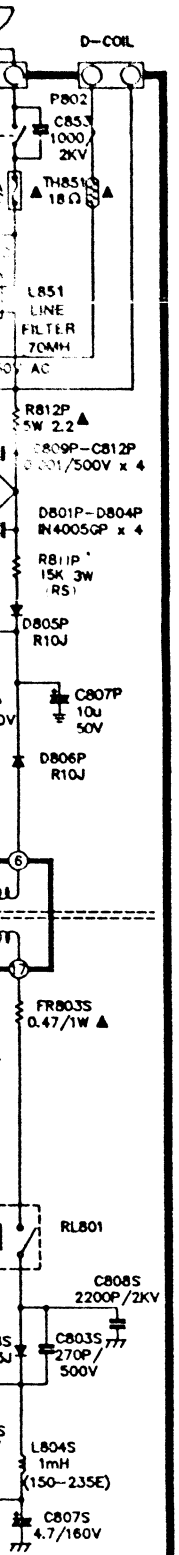
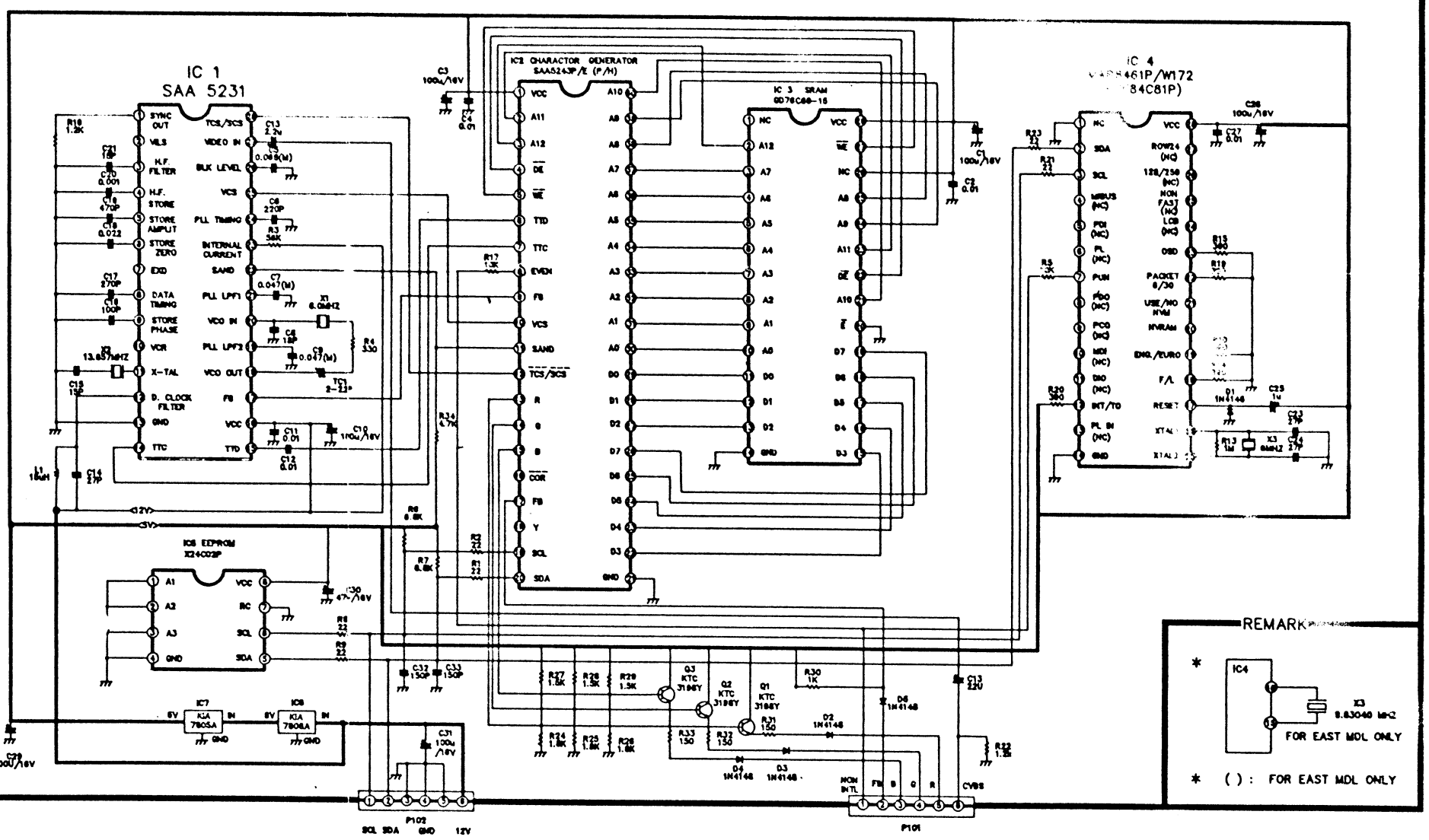
OBSERVATION OF VOLTAGES AND WAVEFORMS

1. Voltages read with VTVM from point shown to chassis ground, line voltages 180~270V volts, colour bar signal.
2. Voltages reading may vary ±20%.
3. The schematic shown is representative only.
4. All waveforms are taken using a wide band oscilloscope and a low capacity probe.
5. Check FINE TUNING, AGC, BRIGHTNESS, CONTRAST and COLOUR controls for best picture, make sure that CONTRAST and COLOUR controls are in mid position and BRIGHTNESS controls is almost in maximum position.
6. waveforms are taken using a standard colour bar signal.

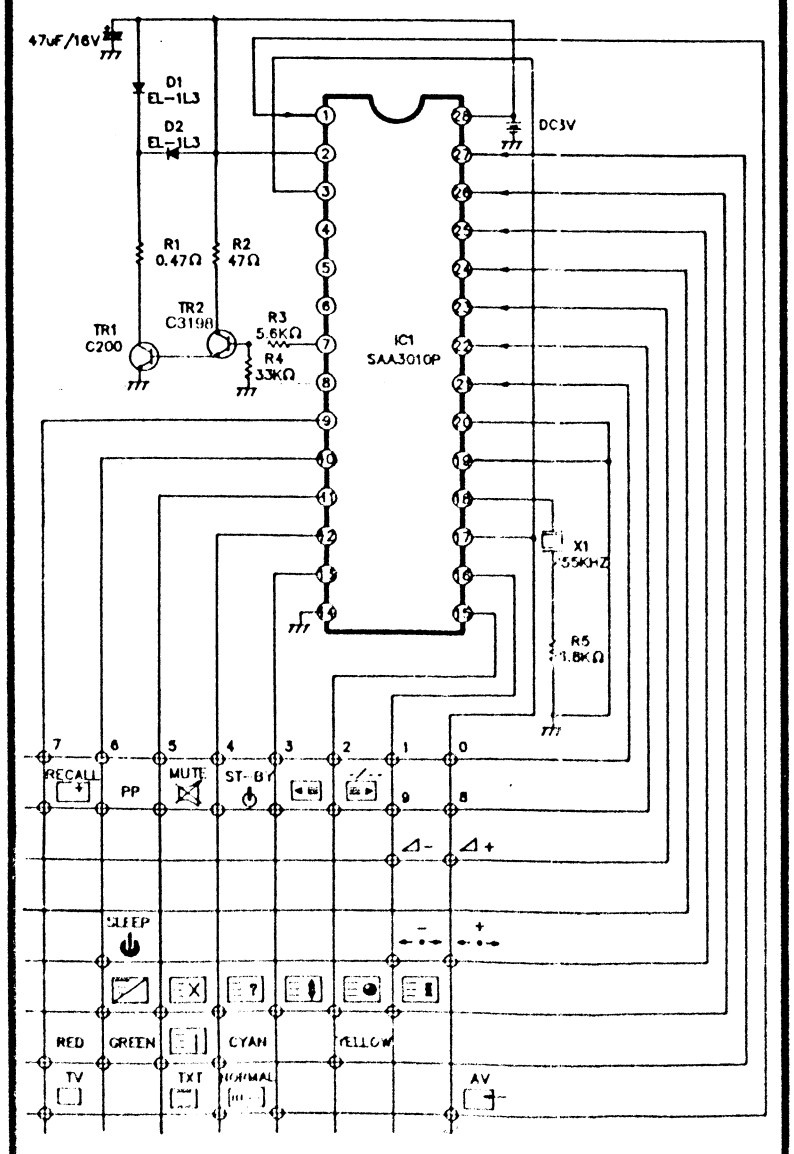
P / N : 484-761J



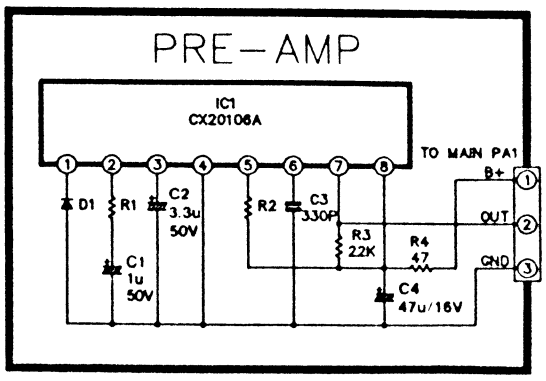
TELETEXT PCB BOARD CIRCUIT DIAGRAM

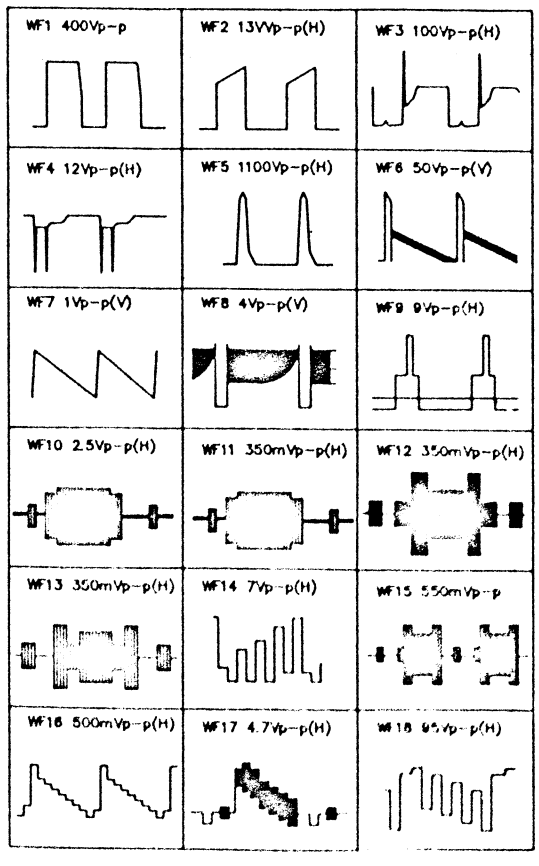


TX SCHEMATIC DIAGRAM



PRE-AMP





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R427	1Ω 1W	1 Ω1W	1 1W	METAL OXIDE FILM RESISTOR
R437	1Ω 1W	0.47Ω 1W	1 1W	"
R429	10KΩ	56KΩ	75KΩ	CARBON FILM RESISTOR
FR404	1.2 Ω	1.5 Ω	1.5Ω	FUSIBLE RESISTOR
FR428	390 Ω	390Ω	560Ω	"
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C405	0.0073/1.6KV	0.0091/1.6KV	0.0091/1.6KV	MPP CAPACITOR
C407	0.39/200V	0.39/200V	0.47/200V	"
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L402	150-224L	150-224C	150-224C	LINEARITY COIL
T402	154-064F	154-177J	154-194B	FBT

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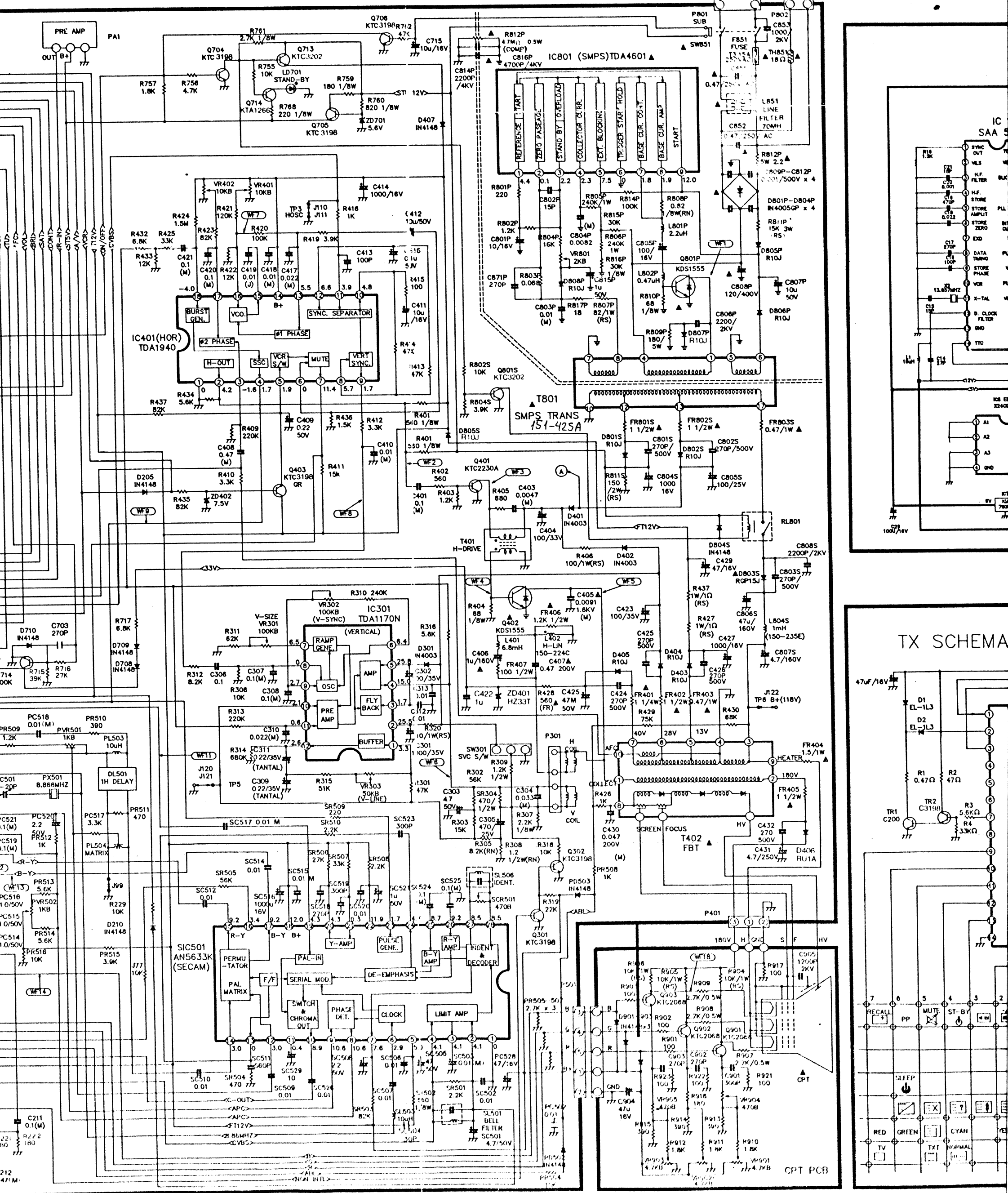
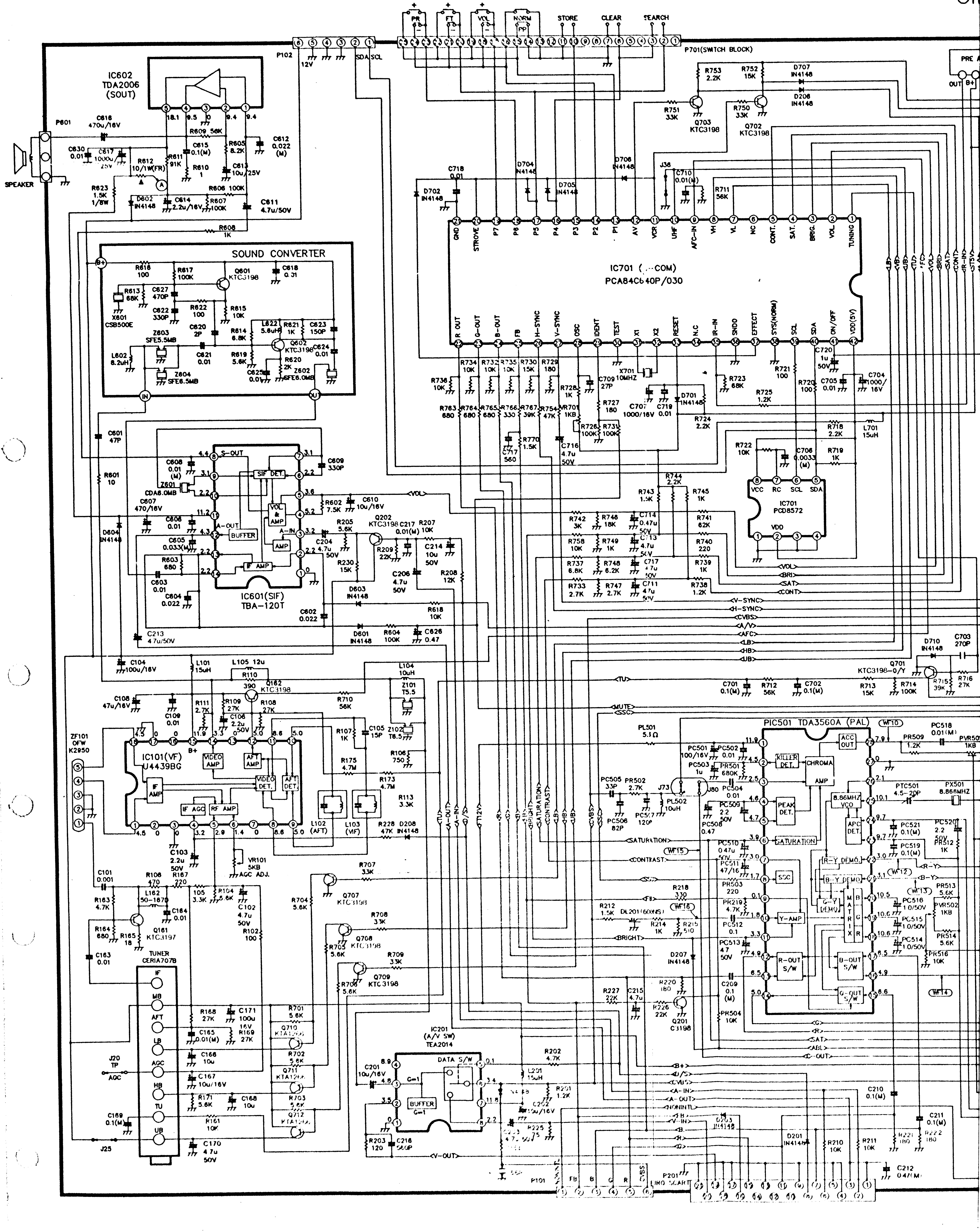
P / N : 484-761D

CIRCUIT DIAGRAM (PC04A) MAIN



CI



IC602
TDA2006
(SOUT)
P601
SPEAKER
P102
12V
SDA SCL
PR
FT
VOL
NORM
PP
STORE
CLEAR
SEARCH
P701(SWITCH BLOCK)
PRE A
OUT B+
R753 2.2K
R752 15K
D707 IN4148
D206 IN4148
R751 33K
Q703 KTC3198
R750 33K
Q702 KTC3198
C616 470u/16V
C630 0.01
C617 1000u 25V
R612 10/1W(FR)
R623 1.5K 1/8W
D602 IN4148
C614 2.2u/16V
R607 100K
R609 56K
C615 0.1(M)
R611 91K
R610 1
R605 8.2K
C613 10u/25V
R606 100K
C612 0.022 (M)
C611 4.7u/50V
R608 1K
SOUND CONVERTER
R616 100
R617 100K
Q601 KTC3198
C618 0.01
R613 68K
C627 470P
C622 330P
X601 CSB500E
R622 100
R615 10K
C620 2P
R614 6.8K
L622 5.6uH
R621 1K
C623 150P
Z603 SFE5.5MB
L602 8.2uH
C621 0.01
R619 5.6K
Q602 KTC3198
C624 0.01
R620 2K
Z604 SFE6.5MB
C625 0.01
Z602 SFE6.0MB
IN
OUT
C601 47P
R601 10
C608 0.01 (M)
Z601 CDA6.0MB
C607 470/16V
C606 0.01
C605 0.033(M)
R603 680
C603 0.01
C604 0.022
D604 IN4148
C213 4.7u/50V
S-OUT
SIF DET.
VOL & AMP
A-OUT
BUFFER
A-IN
AMP
IF AMP
IC601(SIF)
TBA-120T
C609 330P
R602 7.5K
C610 10u/16V
VOL
R205 5.6K
Q202 KTC3198
C217 0.01(M)
R207 10K
C204 4.7u 50V
R209 22K
C214 10u 50V
R230 15K
C206 4.7u 50V
R208 12K
D603 IN4148
R618 10K
C602 0.022
D601 IN4148
R604 100K
C626 0.47
C104 100u/16V
L101 15uH
L105 12u
R110 390
Q162 KTC3198
L104 10uH
Z101 T5.5
C108 47u/16V
C109 0.01
R111 2.7K
R109 27K
C106 2.2u 50V
R108 27K
R710 56K
R107 1K
C105 15P
Z102 T8.5
R106 750
R175 4.7M
R173 4.7M
R113 3.3K
ZF101 OFW K2950
IC101(VF)
U4439BG
VIDEO AMP
AFT AMP
IF AMP
VIDEO DET.
AFT DET.
IF AGC
RF AMP
L102 (AFT)
L103 (VIF)
R228 47K
D208 IN4148
C103 2.2u 50V
VR101 5KB AGC ADJ.
C101 0.001
R106 470
R167 220
L162 50-1870
R105 3.3K
R104 5.6K
C102 4.7u 50V
R102 100
R163 4.7K
C164 0.01
R164 680
R165 18
Q161 KTC3197
C163 0.01
TUNER CERIA707B
IF MB AFT LB AGC HB TU UB
R168 27K
C171 100u 16V
C165 0.01(M)
R169 27K
C166 10u
J20 TP AGC
C167 10u/16V
R171 5.6K
C168 10u
C169 0.1(M)
R161 10K
C170 4.7u 50V
J25
R707 3.3K
Q707 KTC3198
R704 5.6K
R708 3.3K
Q708 KTC3198
R705 5.6K
R709 3.3K
Q709 KTC3198
R706 5.6K
R701 5.6K
Q710 KTA1266
R702 5.6K
Q711 KTA1266
R703 5.6K
Q712 KTA1266
IC201 (A/V SW) TEA2014
DATA S/W
C201 10u/16V
G=1
BUFFER G=1
R203 120
C216 560P
V-OUT
R202 4.7K
L201 15uH
R201 1.2K
C202 10u/16V
R225 75
P101
FB B G R CVBS
P201 EURO SCART
C718 0.01
D702 IN4148
D704 IN4148
D705 IN4148
D706 IN4148
J36
C710 0.01(M)
R711 56K
GND STROVE P7 P6 P5 P4 P3 P2 P1 AV VCR UHF AFC-IN VH VL NC CONT. SAT. BRIG. VOL TUNING
IC701 (μ-COM)
PCA84C640P/030
R OUT G-OUT B-OUT FB H-SYNC V-SYNC OSC IDENT TEST X1 X2 RESET N.C IR-IN SNDO EFFECT SYS(NORM) SCL SDA ON/OFF VDD(5V)
R734 10K
R732 10K
R735 10K
R730 15K
R729 180
R736 10K
R763 680
R764 680
R765 680
R766 330
R767 39K
R754 47K
VR701 1KB
R728 1K
C709 27P
X701 10MHZ
R727 180
C707 1000/16V
C719 0.01
D701 IN4148
R724 2.2K
R726 100K
R731 100K
R770 1.5K
C717 560
C716 4.7u 50V
R723 68K
R721 100
C720 1u 50V
R720 100
C705 0.01
C704 1000/16V
R725 1.2K
R718 2.2K
L701 15uH
R722 10K
C706 0.0033 (M)
R719 1K
VCC RC SCL SDA
IC701 PCD8572
VDD
R744 2.2K
R743 1.5K
R745 1K
R742 3K
R746 18K
C714 0.47u 50V
R741 62K
R758 10K
R749 1K
C713 4.7u 50V
R740 220
R737 6.8K
R748 6.2K
C717 4.7u 50V
R739 1K
R733 2.7K
R747 2.7K
C711 4.7u 50V
R738 1.2K
VOL BRI SAT CONT V-SYNC H-SYNC CVBS A/V AFC LB HB UB
D710 IN4148
C703 270P
Q701 KTC3198-O/Y
R716 27K
R715 39K
TU
C701 0.1(M)
R712 56K
C702 0.1(M)
R713 15K
R714 100K
MUTE
SSC
PIC501 TDA3560A (PAL)
WF10
PL501 5.3Ω
PC501 100/16V
PC502 0.01
PC503 1u
PR501 680K
KILLER DET.
CHROMA AMP
ACC OUT
PC518 0.01(M)
PR509 1.2K
PVR501 1KB
PC505 33P
PR502 2.7K
J73
J80
PC504 0.01
PL502 10uH
PC506 82P
PC507 120P
PC509 2.2 50V
PC508 0.47
PEAK DET.
8.86MHZ VCO
PTC501 4.5-20P
PX501 8.866MHZ
APC DET.
PC521 0.1(M)
PC520 2.2 50V
PR512 1K
PC519 0.1(M)
SATURATION
WF15
CONTRAST
PC510 0.47u 50V
PC511 47/16
R-Y DEMO.
R-Y
WF12
B-Y DEMO.
B-Y
SSC
PR503 220
WF13
PR513 5.6K
G-Y DEMO.
MATRIX
PC516 1.0/50V
PVR502 1KB
R218 330
FB
PR219 4.7K
R212 1.5K
DL201(60NS)
WF16
R214 1K
R215 510
PC512 0.1
Y-AMP
PC515 1.0/50V
PR514 5.6K
BRIGHT
PC513 47 50V
PC514 1.0/50V
D207 IN4148
R-OUT S/W
B-OUT S/W
PR516 10K
C209 0.1 (M)
R220 180
WF14
R227 22K
C215 4.7u
R226 22K
Q201 C3198
PR504 10K
G-OUT S/W
G R SAT ABL C-OUT
B+ U/S CVBS A-IN A-OUT NONINTL FB V-IN B R G
C210 0.1(M)
D203 IN4148
C211 0.1(M)
D201 IN4148
R210 10K
R211 10K
R221 180
R222 180
C212 0.47(M)