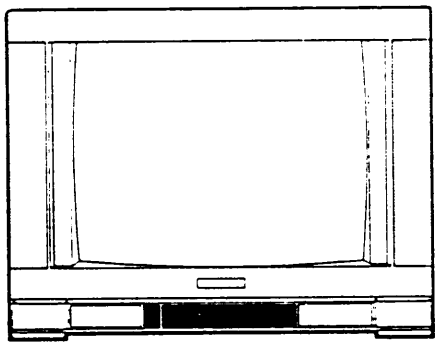
brother

COLOUR TV
SERVICE MANUAL

AUTION

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



CHASSIS : PC-12A(CBT-2871E)

MODEL : BR 7128

PART NO. 483-778D

FEB., 1993

CONTENTS

SPECIFICATIONS

Power Source 180-270V, 50/60Hz
Power Consumption ..... 130 W
Receiving TV System ..... CCIR Standard
Tuning ..... 40 Voltage Synthesizer
Audio Output 12WX2
Antenna Input Impedance ..... 75 ohm IEC Type
(300-ohm using balun supplied)
Picture Tube A66EAK71X01
Dimension ..... 764(W) x 588(D) x 458(H) mm
Weight 43Kg

COLOUR RECEIVING SYSTEM		PAL/SECAM-B/G
Intermediate Frequency	Picture	38.9 MHz
	Sound	33.4 MHz
	Colour	34.47 MHz
Receiving Channel	VHF Low	2-4 CH, S_1
	VHF High	5-12 CH, S_2-S_{25}
	UHF	21-69 CH

SAFETY PRECAUTIONS

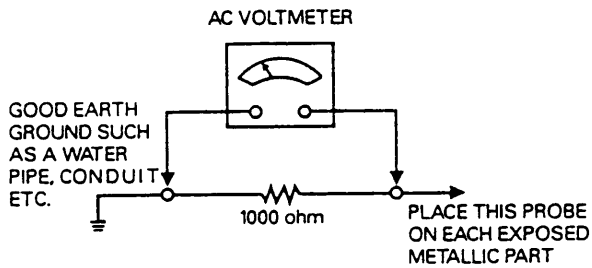
WARNING : BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTIONS", SAFETY INSTRUCTIONS" AND "PRODUCT SAFETY NOTICE" DESCRIBED BELOW.

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 "28.5KV" at Zero beam current (minimum brightness) under specified power source. The high voltage must not, under any circumstances, exceed 28.5KV. 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 24,000-27,000 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 without being noticed by a visual inspection and the X-RAY RADIATION protection afforded by some of 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 polahity 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 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 ieads 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 bruching 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 maintan 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. Thorohly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle.
   Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature. (500 ° F to 600 ° F)
   b. Heat the component lead until the solder 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 circuiboard 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. Qulckly 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 Remove/Replacement
Some chassis circuit boards have slotted holes (oblong) through wiich 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 parapraphs 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 boare.
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 a "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 perpendicula y 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).

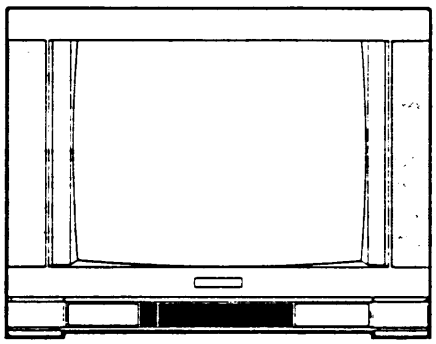
1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire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

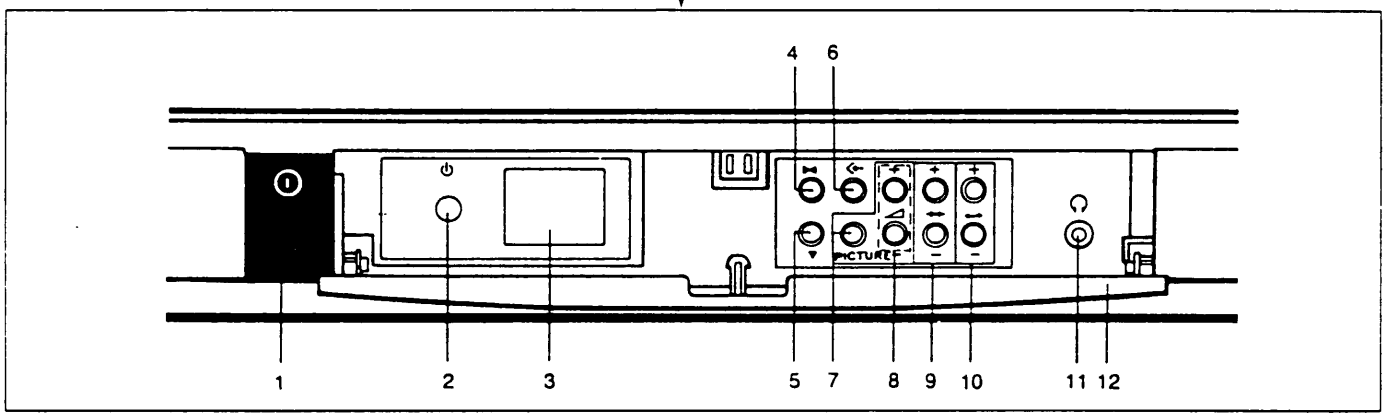
At Other Connections
Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involoves the installation of a jumper wire on the component side of the circuit board.

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 the it does not touch components or sharp edges.

CONTROLS LOCATION

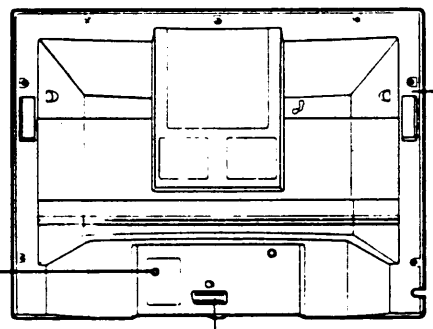
FRONT





1	MAIN POWER SWITCH	7	PICTURE ADJUSTMENT SELECTION BUTTON
2	STAND-BY INDICATOR	8	LEVEL UP(+)/DOWN(-): VOLUME, PICTURE
3	REMOTE CONTROL SENSOR	9	FINE TUNING BUTTONS
4	AUTO SEARCH BUTTON	10	PROGRAM NUMBER UP(+)/DOWN(-) BUTTONS
5	FORCED MONO SOUND SELECTION BUTTON	11	HEADPHONE JACK
6	STORE BUTTON	12	PANEL DOOR

BACK



DISASSEMBLY INSTRUCTIONS

BACK CABINET REMOVAL

Remove 8 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 P603 & P604 connector between the speaker and the main chassis.
2. Remove 8 screws holding SPEAKER to the cabinet.

TXT, IF, E/W BOARD REMOVAL

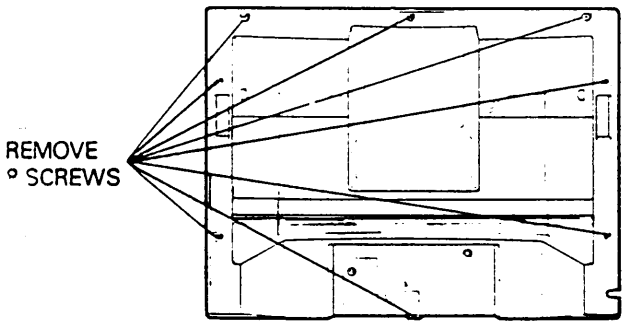
1. Remove the soldering of the TXT, IF BOARD from the main chassis.
2. Release the screw between IF Board and sound heat sink.
3. Release the screw between E.W Board and horizontal output heat sink.
4. Grasp the center area of the TXT, IF, E/W Board and then pull it up.

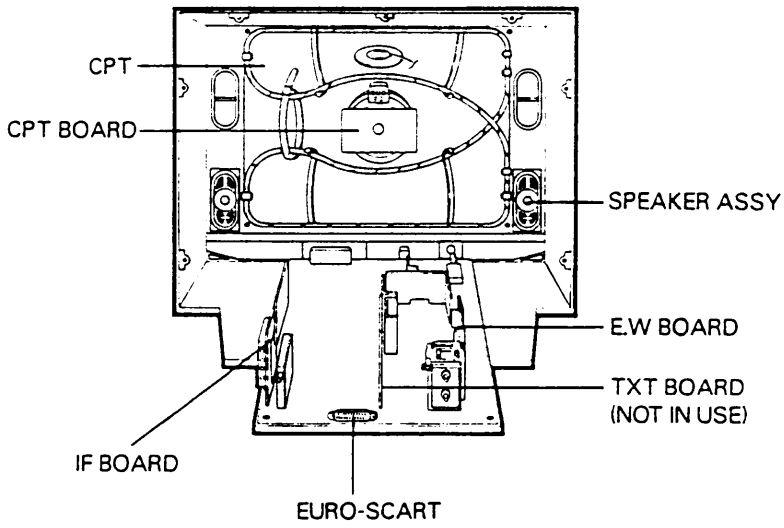
CPT REMOVAL

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 screws securing the picture tube mounting brackets to the front cabinet.
4. Carefully separate CPT from the fron cabinet.

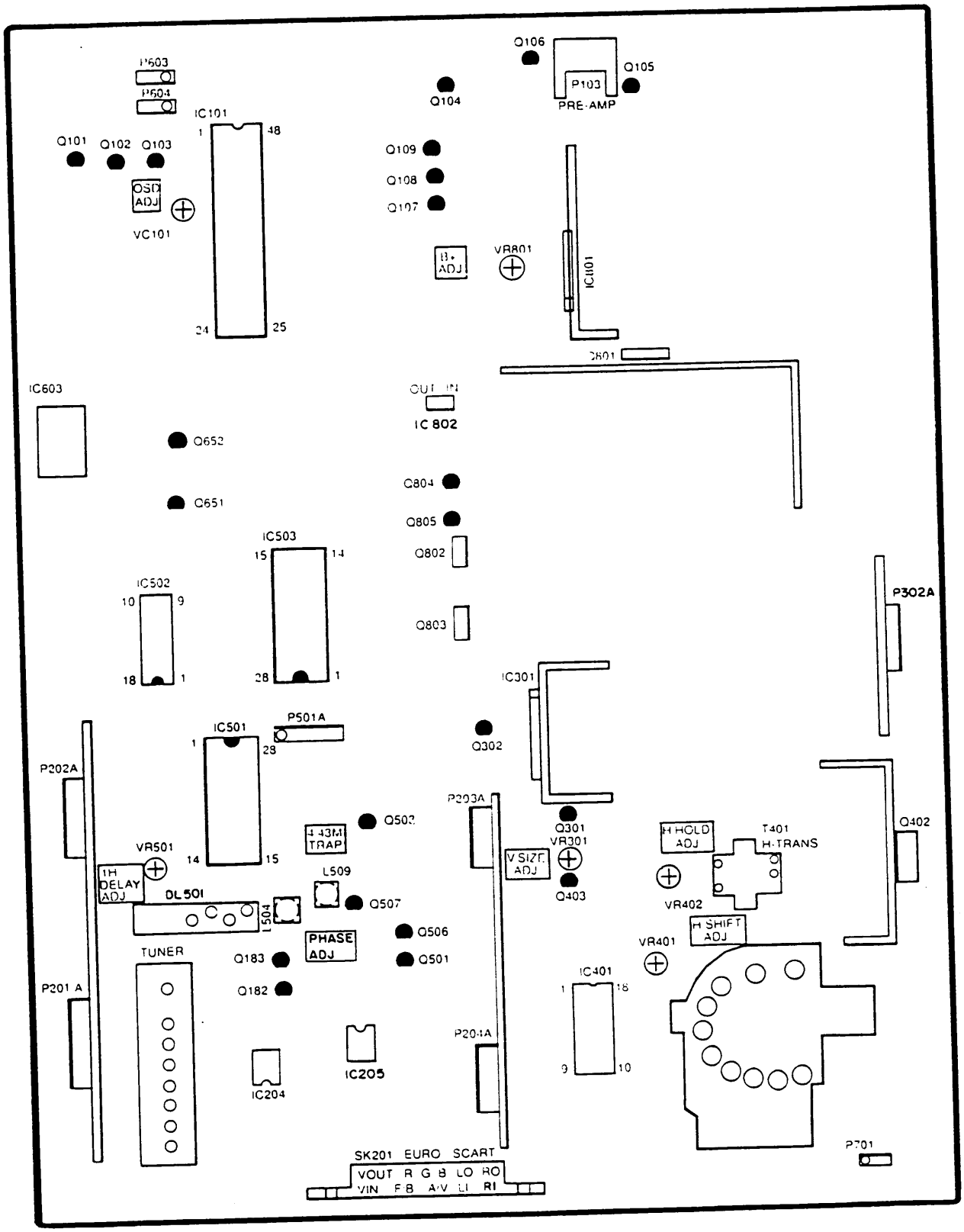
PICTURE TUBE HANDLING CAUTION

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.





PARTS LOCATION OF MAIN CHASSIS



ADJUSTMENT INSTRUCTIONS

- This instruction is applicable for all model using PC-12A CHASSIS.

- TEST EQUIPMENT REQUIRED
  1) Sweep Generator and Maker Unit of each system
  2) Alignment Scope
  3) DC Power Supply (0-20V, 1A) : 2 EA
  4) Oscilloscope
  5) High Impedance Probe (100 : 1 and 1000 : 1)
  6) Digital Multi-meter (Volt-Ohm, Ampere Meter)
  7) Frequency Counter
  8) Pattern Generator (PM5518)

ADJUSTMENT

1. VIF (Video Intermediate Frequency, 38.9MHz) ADJUSTMENT

1) Connect a Sweep Generator RF output through C1 (ceramic 0.01uF) to the pin5 of Z201. (out)
   Connect detector lead (input of Alignment Scope) to the pin of IC201. (Bus VIDEO)
2) Set the output level of Sweep Generator to 60dBuV.
3) Adjust VOLT/DIV of Alignment Scope to be 0.1 VOLT/DIV.
4) With the TV receiver turned off, apply 12 VDC to the left lead of L201 and the AGC Bias voltage to the pin4 of IC201. (Fig. 1).
5) Adjust L203 (VIF Detection Coil) for maximum amplitude at the picture carrier mark (38.9 MHz) (Fig. 2).

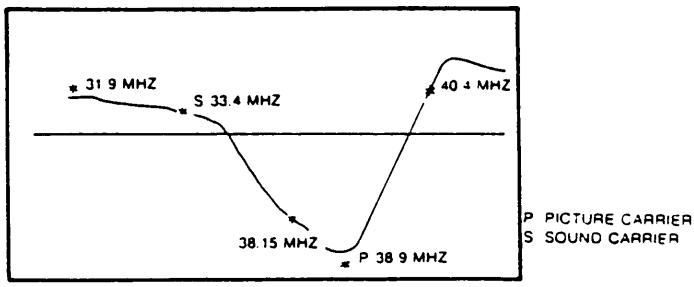


Fig 2. VIF Response Curve

2. AFT (Auto Fine Tuning) ADJUSTMENT

1) Connect a Sweep Generator RF output through C1 (ceramic 0.01uF) to the pin5 of Z201.
   Connect a detector lead (input of Alignment Scope) to the pin12 of IC201.
2) Adjust vertical gain on the Scope for 1Vp-p/DIV and set the output level of Sweep Generator to 60dBuV.
3) With the TV receiver turned off, apply 12VDC to the left lead of L201 and the AGC Bias voltage to the pin4 of IC201. (Fig. 1).
4) Adjust L202 to balance as shown in Fig 3.

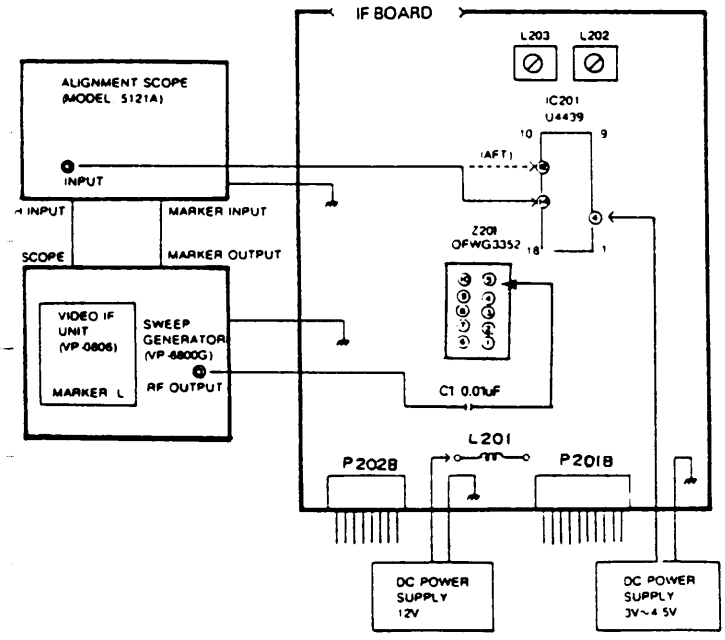


Fig 1. Connection Diagram of the Instruments

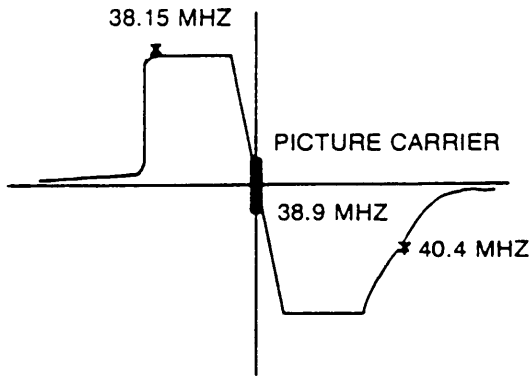


Fig 3. AFT Response Curve

3. 5.5. MHz SIF (Sound Intermediate Frequency) ADJUSTMENT

1) Connect a Sweep Generator RF output to the input of Z602.
   Connect a detector lead (input of Alignment Scope) to the right lead of C605. (Fig. 4)
2) Set output level of Sweep Generator to 80dBuV.
3) Adjust the VOLT/DIV of Alignment Scope to be 1 VOLT/DIV.
4) With the TV receiver turned off, apply 12VDC to the left lead of L201 and the AGC Bias voltage to the pin4 of IC601. (Fig. 4)
5) Adjust L602 to balance as shown Fig 5.

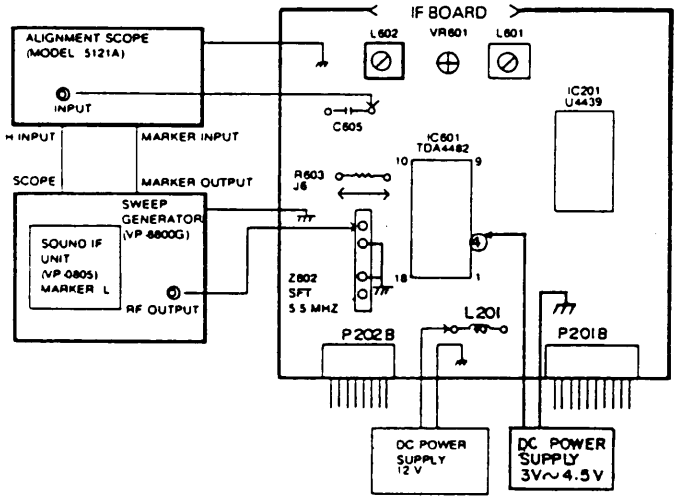


Fig 4. Connection Diagrm of the Instruments

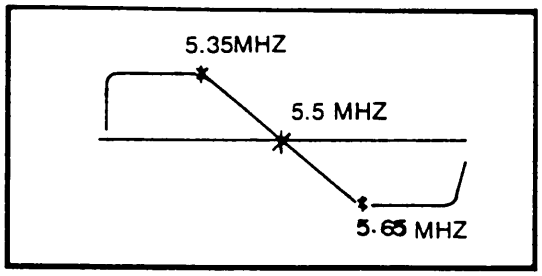


Fig 5. 5.5MHz SIF Response Curve

4. 5.74 MHz SIF (Sound Intermediate Frequency) ADJUSTMENT

1) Connect the Sweep Generator RF output to the input of Z601.
   Connect a detector lead (input of Alignment Scope) to the J15 (tin wire). (Fig. 6)
2) Set the output level of Sweep Generator to 80dBuV.
3) Adjust VOLT/DIV of Alignment Scope to be 1 VOLT/DIV.
4) With the TV receiver turned off, apply 12VDC to the left lead of L201 and the AGC Bias voltage to the pin4 of IC601. (Fig. 6)
5) Adjust L601 to balance as shown in Fig 7.

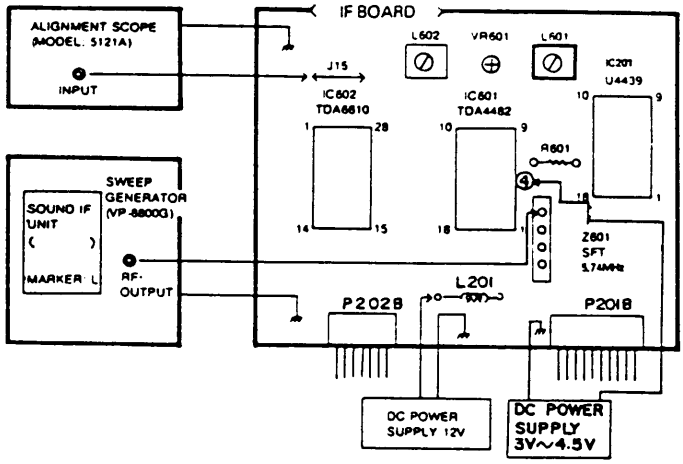


Fig 6. Connection Diagram of the Instruments

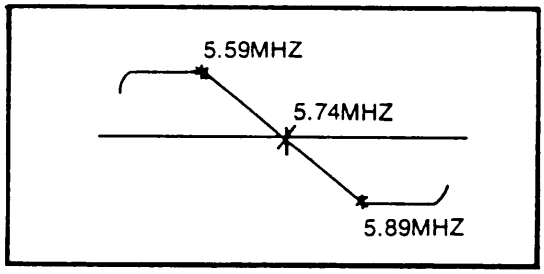


Fig 7. 5.74MHz SIF Response Curve

5. PILOT CARRIER ADJUSTMENT

1) Connect Oscilloscope to the pin5 of IC601 with 10:1 prove.(Fig. 8).
2) Set the SEC/DIV of oscilloscope to 2ms/DIV and the VOLT/DIV to 0.1V/DIV.
3) With the TV receiver turned on, tune the receiver in the modulated Stereo Sound Signal. (main: 3KHz, Sub:1 KHz)
4) Adjust L604 (Pilot Carrier Detection Coil) for maximum amplitude. (Fig. 9)

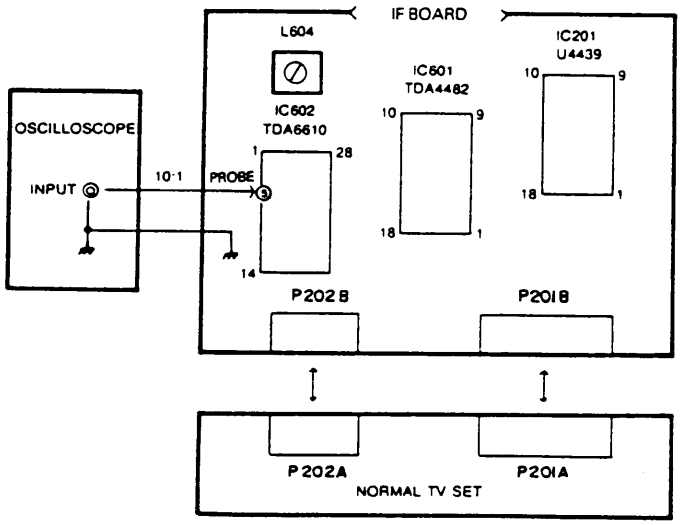


Fig 8. Connection Diagram of the Instruments

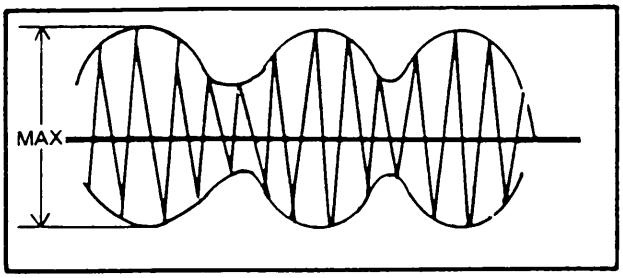


Fig 9. Pilot Carrier Response Waveform.

5. CHANNEL SEPARATION ADJUSTMENT

NOTE: This adjustment must be performed after Pilot Carrier Adjustment.

1) Connect the oscilloscope to the pin16 of IC602. (Fig. 10)
2) Set the SEC/DIV of oscilloscope to 1mv/DIV and the VOLT/DIV to 0.2V/DIV.
3) With the TV receiver turned on, tune the receiver in modulated Stereo Sound Signal. (main:3KHz, Sub:1KHz)
4) Adjust VR601 to be the same of amplitude. (Fig 11. (b))

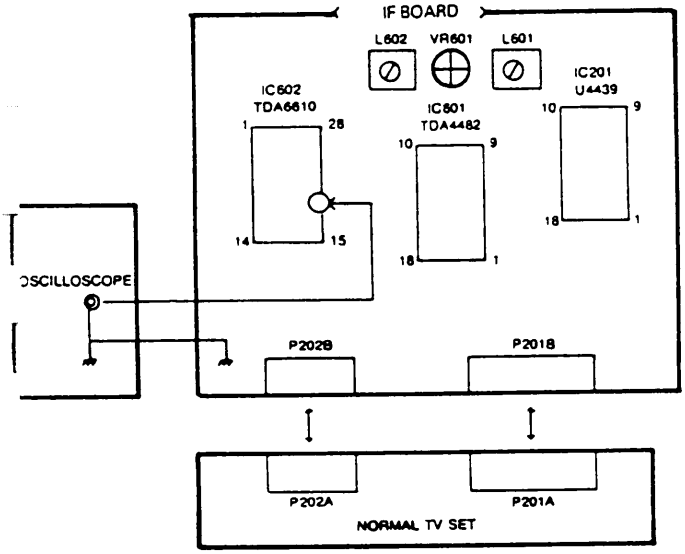


Fig 10. Connection Diagram of the Instruments

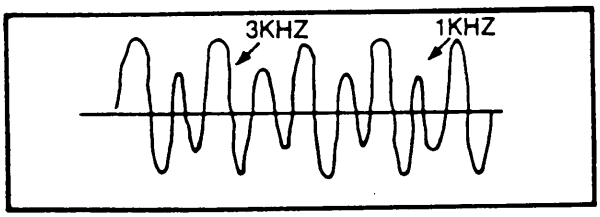


Fig 11-(a). Prealignment Waveform.

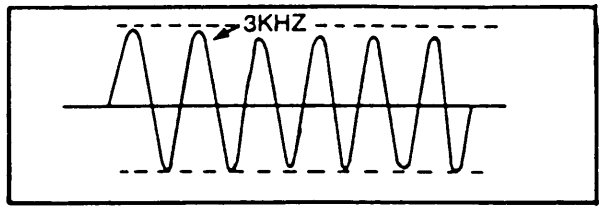


Fig 11-(b). Postalignment Waveform.

7. TELETEXT (TXT) CLOCK (6MHz) ADJUSTMENT (Not in use)

NOTE: This adjustment is available for the TV equipped TXT receiver.

1) Tune the TV to a CH including TXT Signal. (RF:80dBuV)
2) Change the mode from TV to TXT with TXT key.
3) Connect frequency counter to the TP03 on the TXT board and short TP01 and TP02 together. (Fig. 12)
4) Adjust VC1 with Ceramic (non-conductive) driver to be 6,000,050 – 6,000,150 Hz on Frequency Counter.
5) After adjustment, remove the short to return to normal operation.

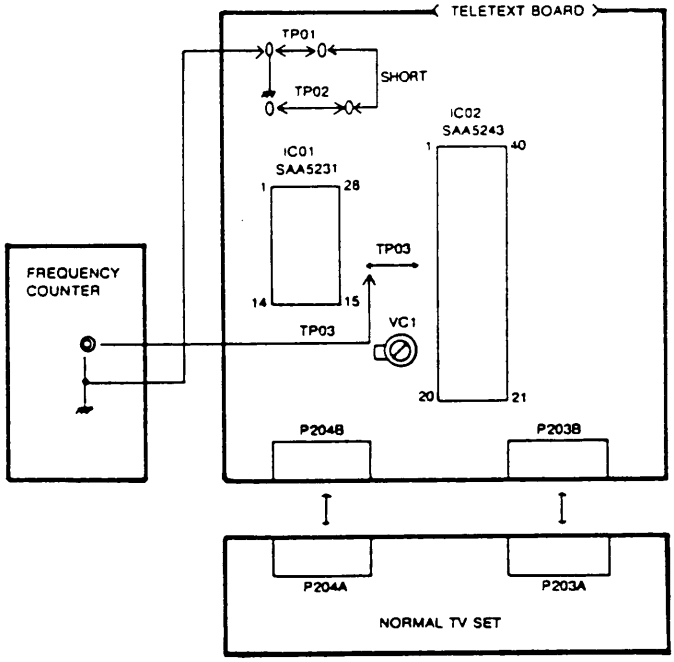


Fig 12. Connection Diagram of the Instruments

8. PAL APC (Auto Phase Control) ADJUSTMENT

1) Tune is Color Bar Signal.
2) Short the pin17 of IC501 (TDA 4555) and GND together.
3) Adjust VC501 (Trimmer capacitor) for the Color Bar not to wave vertically.
4) After adjustment, remove the short to return to normal operation.

9. PAL MATRIX ADJUSTMENT

1) Turn in DEM pattern.
2) Connect the oscilloscope CH1 to the pin1 and CH2 to the pin3 of IC501 with 10:1 prove and set the VOLT/DIV of oscilloscope CH1 to the 10mV/DIV, CH2 to the 20mV/DIV.
3) Set the Horizontal Display of oscilloscope to X-Y mode.
4) Adjust VR501 for the dots off A to concentrate and then adjusting L504, make dots of B to be one overlapped. (Fig 13).

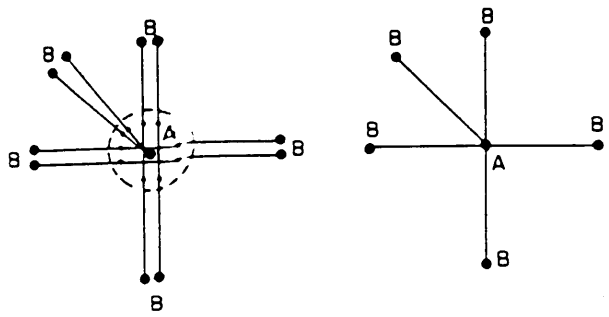
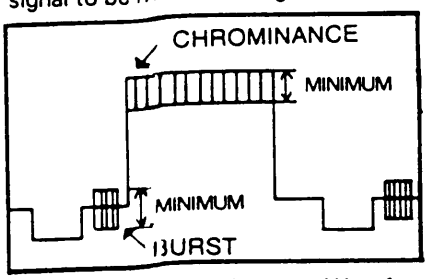


Fig 13.

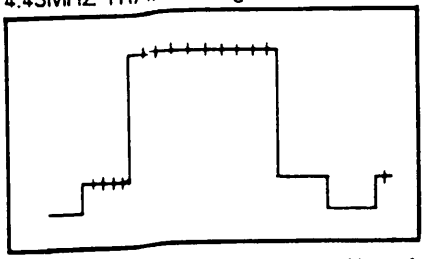
a) Prealignment Waveform b) Postalignment Waveform

10. 4.43MHZ TRAP ADJUSTMENT

1) Turn in DEM Pattern.
2) Connect the oscilloscope to the pin17 of IC502(TDA 4565).
3) Adjust L509 for the Amplitude of burst and chrominance signal to be minimum. (Fig. 14)



a) 4.43MHZ TRAP Prealignemnt Waveform



b) 4.43MHZ TRAP Postalignment Waverform

Fig 14.

11. HORIZONTAL OSCILLATION ADJUSTMENT

1) Tune in Standard Color Signal.
2) Connect the pin5 of IC401 to the GND.
3) Adjust VR402 for the picture not flow horizontally and vertically.

12 B+ ADJUSTMENT

1) Tune in Standard Color Signal.
2) Set analog (Contrast, Brightness, Color) level to 80%, 50%, 70% each.
3) Connect Voltmeter to the TP701.
4) Adjust VR801 the response voltage to be as follows.
   - For 25,28 inch :155 ± 0.2 VDC
   - For 21 inch :115 ± 0.1 VDC

13. RF AGC (Auto Gain Control) ADJUSTMENT

1) Tune in standard color signal whose level is 60 ± 1dBuV.
2) Connector the Voltmeter to the TP181.
3) Adjust VR201 for 4.8.± 0/1VDC.

14. HORIZONTAL CENTER ADJUSTMENT

1) Tune in standard color signal.
2) Adjust VR401 to center the video display.

15. VERTICAL HEIGHT ADJUSTMENT

1) Tune in FUBK Test Pattern.
2) Adjust bright control to minimum.
3) Adjust VR301 so that the upper and lower outline or great circle is coincident with the edge of a effective screen.

16. VERTICAL CENTER ADJUSTMENT

1) Tune in standard color signal.
2) Adjust SW301 (Service Switch) to center the video display vertically.

17. OSD (On Screen Dispaly) POSITION ADJUSTMENT

1) Tune in standard color digital pattern.
2) Reset recall for normal viewing.
3) Adjust VC101 to center the OSD.

18. FOCUS ADJUSTMENT

1) Tune in standard color digital pattern.
2) Adjust slowly the Focus control on the FBT for well defined scan lines and a sharp picture.

19. SCREEN VOLTAGE ADJUSTMENT

For 25,28 inch;

1) Connect the oscilloscope to the TP501 with 10:1 prove. (Fig. 15)
2) Set analog (Contrast, brightness, color) level to 80%, 50%, 70% each.
3) Adjust the screen control on the FBT for 6.5 ± 0.1VDC (25 inch) and 5.0± 0.1 VDC(28 inch).

For 21 inch;

1) Connect the oscilloscope to the P904 on the CPT board with 1000 : 1 prove.
2) Set analog (Contrast, Brightness, Color) level to minimum.
3) Adjust the screen control on the FBT for 7.0 ± 0.1VDC.
   * In case of using PHILIPS CPT for 870 ± 10 VDC

20. WHITE BALANCE ADJUSTMENT

1) Tune in 100% white pattern.
2) Set drive control (VR901, 902) on the CPT board to mid-range.
3) Set analog (Contrast, brightness, Color) level to 80%, 50%, 70% each.
4) Adjust contrast control for luminance at center screen to be 40F.L.
5) Adjust drive control (VR901, 902) to obtain a white display. (X=281 ± 5, Y=288 ± 5 : 10000° K)

21. E/W(East/West) BOARD ADJUSTMENT

NOTE: This is performed after adjustment of 11,12,14,15,16.

1) Tune in standard color digital signal.
2) Set the analog (Contrast, Brightness, Color) level to 80%, 50%, 70% each.
3) Adjust VR502 to eliminate left and right pincushion.
4) Adjust VR451 for approximately 5-10 mm overscan at left and right of dispaly.

22. SECAM IDENTIFICATION ADJUSTMENT

1) Tune in Secam color standard signal.
2) Connect the oscilloscope to the pin21 of IC501 with high impedance probe. (100:1)
3) Adjust L506 for maximum DC Volt. (Fig. 15)

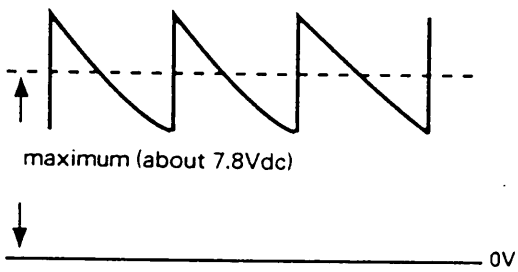
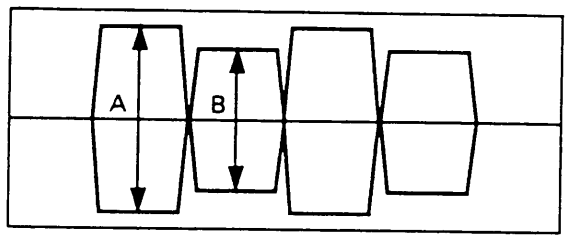


Fig 15. Secam Ident response Waveform

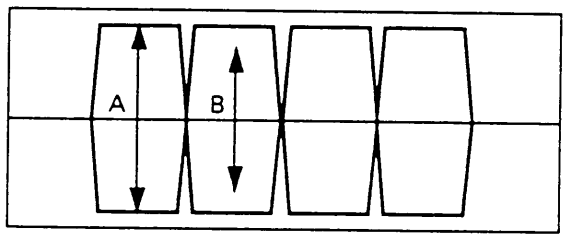
note: In case of using Voltmeter, the Voltage reading is about 8.4 VDC max.

23. SECAM BELL FILTER ADJUSTMENT

1) Tune in secam dot pattern.
2) Connect the oscilloscope to the emitter of Q503 with high impedance prove. (100 : 1)
3) Adjust L508 so that the amplitude of chrominance input waveform to balanced as shown in Fig 16-b.



a) Before adjustment Response Curve



b) After adjustment Response Curve

Fig 16. Chrominance input Waveform

24. SECAM (REFERENCE R-Y, B-Y) DEMODULATOR ADJUSTMENT

1) Tune in secam standard color signal.
2) Connect the oscilloscope to the pin1 of IC501.
3) Adjust L502 (R-Y REFERENCE COIL) so that the white/black level is the same as blanking level. (Fig.17)

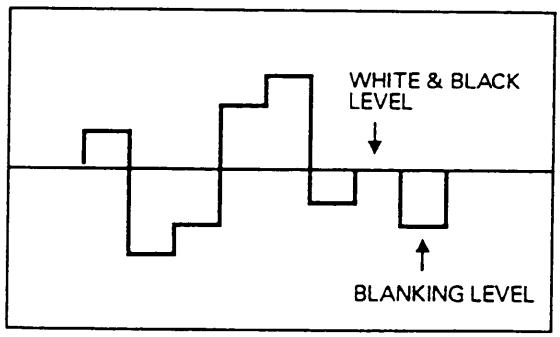


Fig 17. R-Y output Response Waveform

4) Move the connection of oscilloscope from pin1 to pin3 of IC501.
5) Adjust L501 (B-Y REFERENCE COIL) so that the white/black level is the same as blanking level. (Fig. 18)

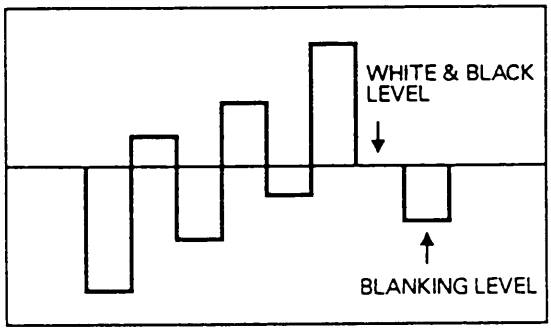


Fig 18. B-Y output Response Waveform.

CIRCUIT DESCRIPTION

I. PRE-AMPLIFIER (IC202, U4744B) & SAW FILTER(Z201, OFWG3352) CIRCUIT

1-1. THE BASIC CONSTRUCTION

U4744B (MAKER: TELEFUNKEN) is pre-amplifier and OFWG3352 (MAKER: SIEMENS) is saw filter.
The schematic diagram is same as figure 22.

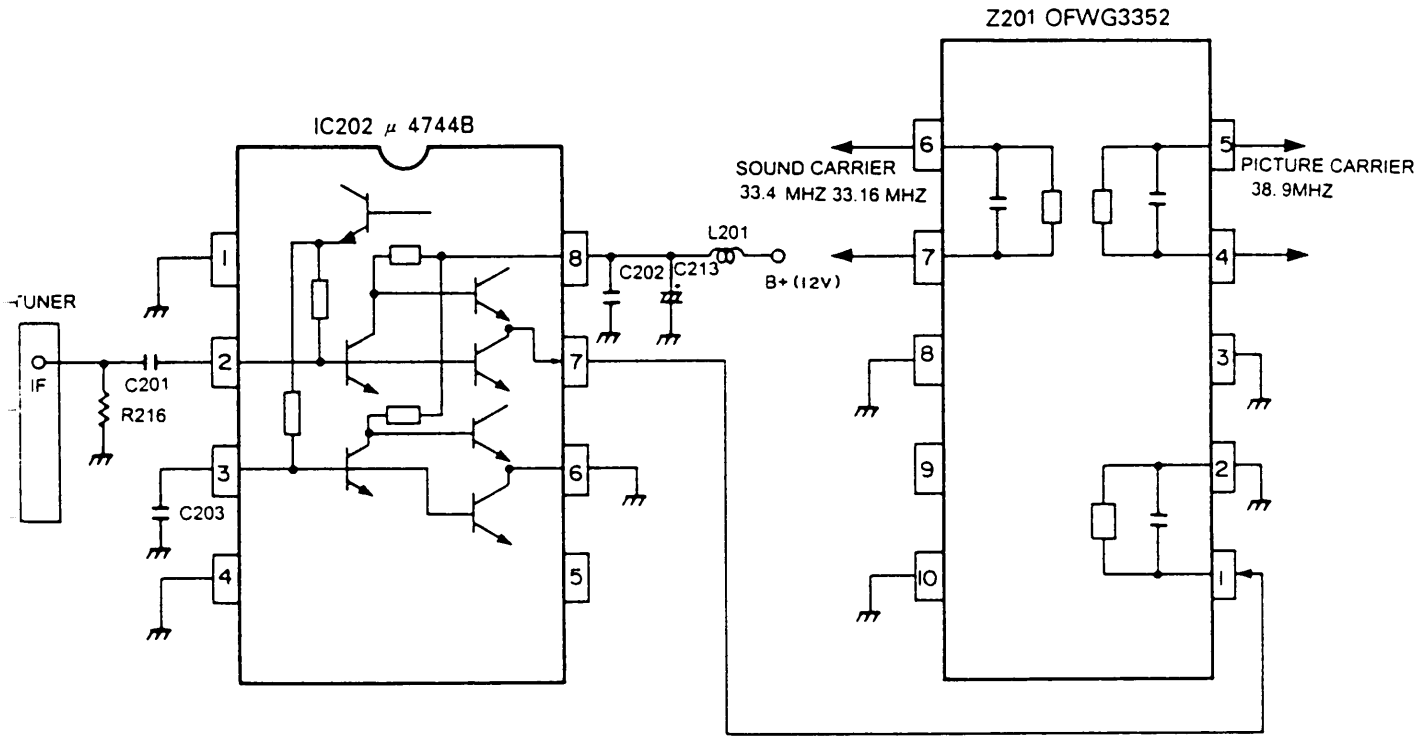


Figure 22. Schematic Diagram of IC202 (μ 4744B) and Z201 (OFWG 3352)

1-2. PIN CONFIGURATION OF IC202

Pin No.	Function
1,4	Ground
2,3	RF input (Internal Biased)
5	Not Connected
6,7	RF Push-Pull Output
8	Supply Voltage

1-3. PIN CONFIGURATION OF Z201

Pin No.	Function
1	Input
2	Input Ground
3,8	Ground
4,5	Vision Output
6,7	Sound Output
9	Free
10	Not Connected (Ground)

1-4. OPERATING DESCRIPTION OF THE CIRCUIT

After the air signal is varied into the IF signal through the tuner of the TV SET, this signal is applied to the PRE-AMPLIFIER (PIN 2). The insertion loss of the saw filter is compensated by this pre-amplifier about 23dB.
The amplified output signal (PIN 7 of the pre-amplifier) is applied to the SAW FILTER (PIN1). This SAW FILTER is TV IF FILTER for parallel sound applications (Separate Vision and Sound Channel)
The output (PIN 4,5) of the saw filter is THE VISION CHANNEL with nyquist slope and sound suppression, the output (PIN 6, 7) of the sawfilter is the SOUND CHANNEL with passband for sound carrier only.

2. VIDEO IF AMPLIFIER CIRCUIT (IC201, U4439BG)

2-1. THE BASIC CONSTRUCTION

VIDEO IF AMPLIFIER CIRCUIT (MAKER : TELEFUNKEN) contains three symmetrics for VIDEO-IF PROCESSING. (VIDEO AMP. & IF DETECTOR, AFT DETECTOR & AMP., and AGC CIRCUIT)
The schematic diagram is same as figure 23.

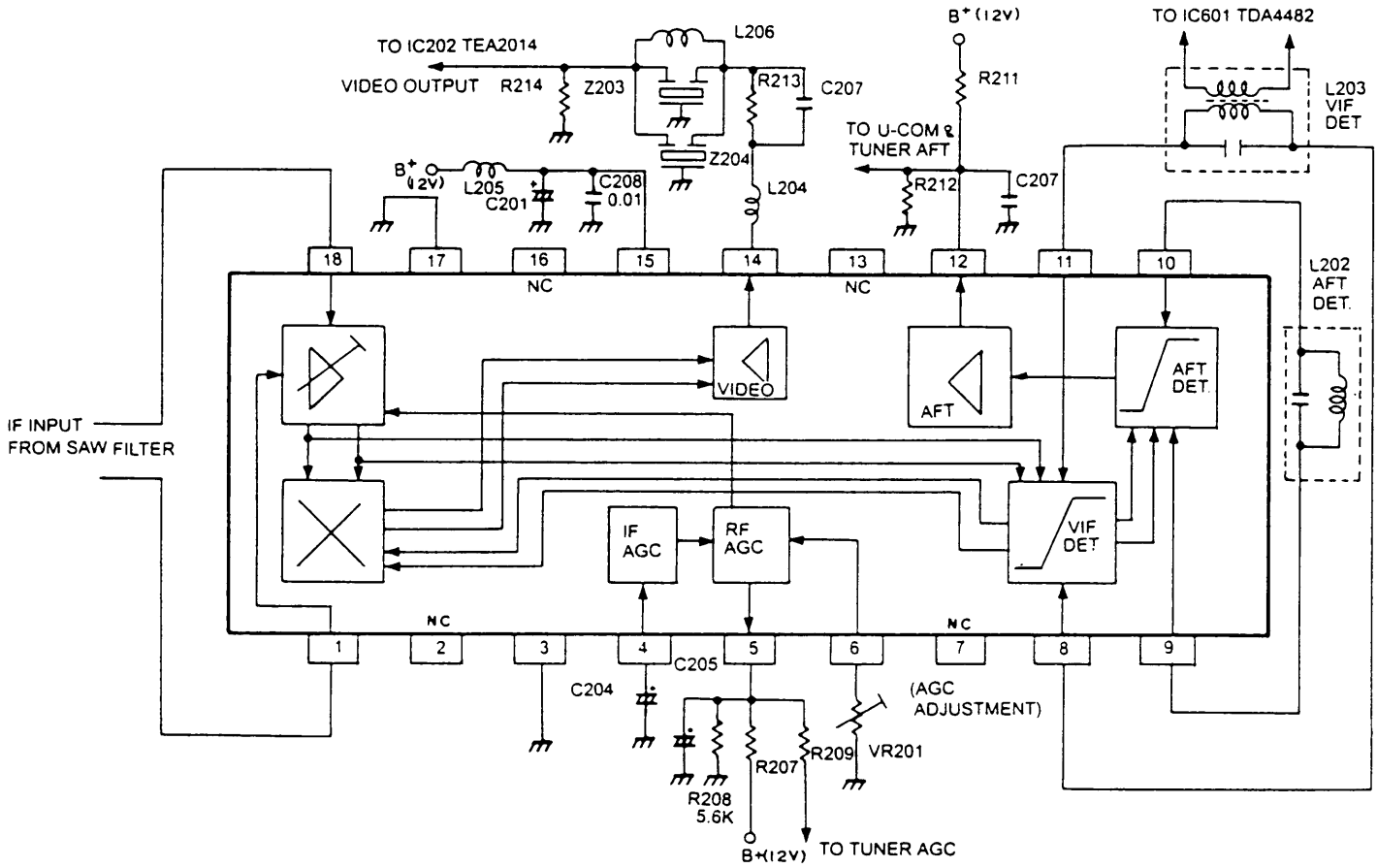


Figure 23. Schematic Diagram of IC201 (U4439BG)

2-2. PIN CONFIGURATION OF IC201

Pin No.	Function
1, 18	IF Input
2,7,13,16	N.C
3,17	Ground
4	IF AGC Storage Capacitor
5	AGC (TUNER CONTORL)
6	Tuner AGC take over
8,11	Video Detector
9,10	AFT Detector
12	AFT Output
14	Video Output, CVBS Level: 3Vp-p
15	Supply Voltage : 12V

2-3. OPERATING DESCRIPTION OF THE CIRCUIT

The IF signal through the SAW filter is applied to pin1. 18 of IC201.
This IF signal is amplified by the three stage AMP. about 87 dB.
And then video signal is detected by the VIF DETECTOR COIL connected to pin 8.11. AFT signal is also detected by the AFT DETECTOR. COIL Connected to pin 9.10.
After the detected Video signal is Amplified by the video amplifier, video output signal comes out about 3Vp-p at pin 14.
Also, the detected AFT signal is amplified by the AFT amplifier , AFT output signal comes out at pin 12.
AGC Voltage comes out at pin5 after adjusting VR201 CONNECTED to pin6 is connected to the AGC terminal of the tuner, so that the AGC voltage is controlled.

3. VIDEO SWITCHING CIRCUIT (IC205, TEA 2014)

3-1. THE BASIC CONSTRUCTION

THE VIDEO SWITCHING CIRCUIT (MAKER : SGS-THOMSON) provides video switching between the video signal from the PERI TV PLUG(SCART) and the video signal from VIF amplifier circuit (IC201)
The schematic diagram is same as figure 24.

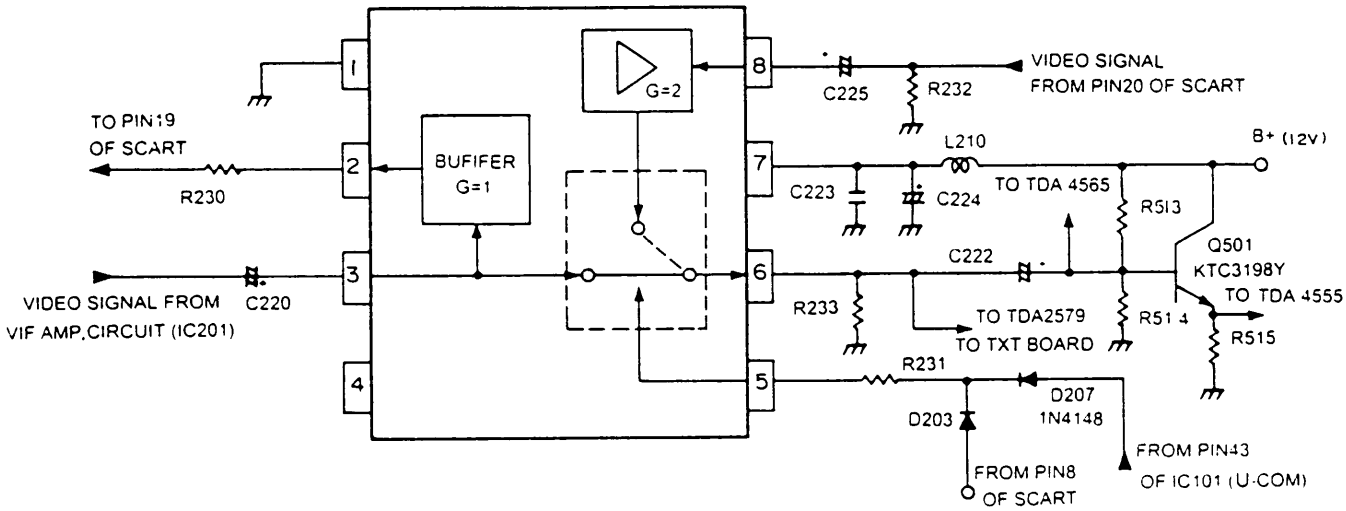


Figure 24. Schematic Diagram of IC205(TEA2014)

3-2. PIN CONFIGURATION OF IC 205.

Pin No.	Function
1	Ground
2	75 ohm Video Output (2Vp-p)
3	Internal Video Input (2Vp-p)
4	Not to be Used
5	Switching Input Voltage
6	Switched Video Output (2Vp-p)
7	Supply Voltage (12V)
8	External Video Input(1Vp-p)

3-3. OPERATING DESCRIPTION OF THE CIRCUIT

Normally, the pin5 is low (0v or not connected), the video signal coming from VIF AMP circuit (IC 201) is output of pin 6. When we choose the A/V mode with transmitter or the external operating equipment is connected to the EURO SCART, The pin 5 is high (OVER 7V), the external video signal coming from SCART is output of pin6.
The output video signal of pin6 is applied to theTXT BOARD, TDA2579 (LINE/FRAME SYNC PROCESSOR), TDA 4565 (CTI), and TDA4555 (MULTI:-CHROMA DECODER) THE TRANSISTOR (Q501) is Buffer.

4. MULTISTANDARD DECODER CIRCUIT (IC 501, TDA 4555)

4-1. THE BASIC CONSTRUCTION

The TDA 4555 is the multistandard color decoder for the PAL, SECAM, NTSC 3.58MHz and NTSC 4.43MHz standards. Normally we use PAL and SECAM standards. But it can be used PAL only STANDARD according to some model type.
The output signals of the TDA 4555 are THE COLOR DIFFERENCE OUTPUT SIGNALS (R-Y) and (B-Y) of constant amplitude.
The schematic diagram is same as figure 25.

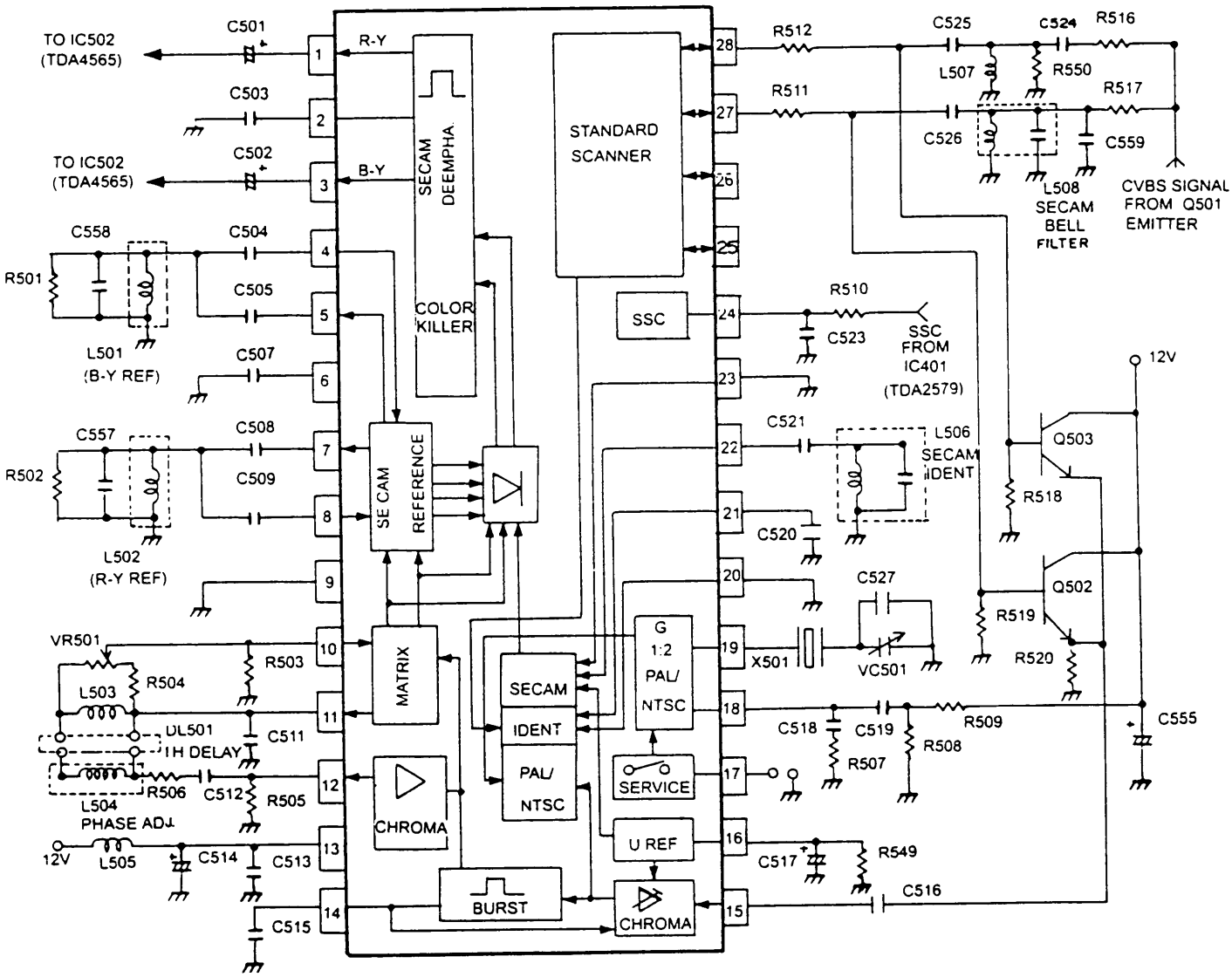


Figure 25. Schematic Diagram of IC501 (TDA4555)

4-2. PIN CONFIGURATION OF IC 501

in No.	Function
1	(R-Y) Output
2	(R-Y) SECAM Deemphasis
3	(B-Y) Output
4	Input From (B-Y) SECAM Reference
5	Output to (B-Y) SECAM Reference
6	(B-Y) SECAM Deemphasis
7	Output to (R-Y) SECAM Reference
8	Input From (R-Y) SECAM Reference
9	Ground
10	Chrominance Signal Input (WITHOUT BURST) From Delay Line
11	DC Output to delay line
12	Chrominanc Signal Output (WITHOUT BURST) to delay line
13	Supply voltage (12V)
14	Chrominance Amplifier DC operation point
15	Chrominance input
16	Acc Filter
17	Service Switch
18	AFC Filter
19	Reference Oscillator Input
20	NTSC IDENT. Storage capacitor
21	PAL/SECAM IDENT. Storage Capacitor
22	SECAM IDENT Reference
23	Selection of SECAM ident.
24	Super Sandcastle input
25	Control voltage NTSC(4.43 MHz)
26	Control voltage NTSC(3.58 MHz)
27	Control voltage SECAM
28	Control voltage PAL

3. OPERATING DESCRIPTION OF THE CIRCUIT

R517, C559, L508, & C526 are Bell Filter for SECAM.

2) R516, C524, L507, R550 & C525 are Band Pass Filter for PAL.

3) Q502 & Q503 are switching & buffer circuit.

4) COLOR TRANSMISSION STANDARD IDENT. CIRCUIT

Consist of an automatic control and scanning sequence with ident. Circuits which identify the transmitted color standard.

The automatic control and scanning sequence sets the mode of the TDA4555 sequentially to PAL-SECAM -NTSC 3.58-NTSC 4.43.

The outputs from the TV standard scanning circuits not only establish the internal mode of the multi-standard color decoder but also select the appropriate external PAL/SECAM FILTER. (via the voltages on pin 27 & 28)

When a transmission conforming to a color transmission standard is identified by the identification circuits, the mode of the TDA 4555 is automatically selected.

5) Control and scanning sequence

The automatic control and scanning sequence determines the mode of the TDA4555 selected by the color transmission standard scanning and system control circuits. These circuits switch the mode sequentially to the PAL, SECAM, NTSC 3.58 and NTSC 4.43 standards.

During the control and scanning sequence, the amplitude of the color transmission standard switching signals on pins 27 and 28 is approximately +2.5V.

When a color transmission standard is identified , the amplitude of the associated switching signal rises to typically +5.8V and the other switching signal is set to less than 0.5V

The TDA 4555 requires a 3-LEVEL super sandcastle pulse (SSC) to generate all the necessary internal timing pulses. The sandcastle pulse auplitudes are > 7.7V for the burst key pulses, 4.5 $\pm$0.4V for the horizontal blanking pulses and 2.5 $\pm$0.5V for the vertical blanking pulses.

6) Color transmission standard Identification circuits.

The identification circuits compare the mode of the multi standard decoder with the input chrominance signal, the result of this comparison determines the color transmission stardard. The identification circuits examine the nature of the signals present during the back porch interval of the chrominance signal. For PAL chrominance signal this is the color burst at the color carrier reference frequency but for SECAM chrominance signals these are the No-Color frequencies (4.250 and 4.40625 MHz)

For PAL identification, the phase of the color burst signal is compared with that of the (R-Y) reference signal, generated by dividing the 8.8MHz crystal oscillator Frequency by two.

The output pulses from the phase discriminator alternate in polarity but, after being fed through an H/2 demodulator, have the same polarity. These pulse are integrated by an external capacitor connected to pin21 to provide a DC signal.

For SECAM identification, the alternating no color carrier frequencies present on the back porches are demodulated. The two No-color carrier frequencies generate pulses of alternate polarity (AS WITH PAL) which are therefore fed to the H/2 demodulator.

The unipolar output pulses are integrated by the external capacitr connected to pin21, again to provide a DC level signal.

The capacitor voltage consists of a fixed component derived from internal biassing at half the supply voltage (6V), plus an extra component δ V_{21} provided by the input chrominance signal.

7) PAL Refence Frequency Generation

To identify and demodulate PAL quadrature amplitude-modulated chrominance signals, the reference signals (R-Y) and (B-Y) are required. These reference signals are generated by a PLL consisting of a voltage-controlled crystal oscillator (VCXO), crystal X501, a 2:1 frequency divider and a phase detector.

The phase detector compares the phase of the color burst signal with the (R-Y) reference signal. The color difference reference signals (R-Y) and (B-Y) are generated at the output of the frequency divider.

The color burst output from the automatic color control (ACC) of pin16 is fed directly to the phase detector for PAL. The PLL time constant is determined by the second order filter of pin18.

Pin 17 is also connected to the service switch. If the voltage on pin 17 is less than 0.5V (e.g. connected to ground), the color burst signal and the color killer switch are inhibited but color decoding remains operational. The PLL is switched OFF and the Vcxo free runs.

8) Chrominance Signal Control

The chrominance signal input is AC-coupled via pin 15 to a gain-controlled chrominance amplifier for which the chrominance signal gain is set by in-phase synchronous Demodulation.

The nominal peak-to-peak amplitude of the chrominance signal input at pin 15 is 100mV with a 75% color bar signal.

Biassing for the chrominance amplifier is stabilized by an independent DC feedback loop, decoupled by the external capacitor at pin 14.

In the case of SECAM, the chromiance signal is fed to a limitter amplifier prior to demodulation.

9) PAL Chrominance Signal Demodulation

The (R-Y) and (B-Y) components of PAL chrominance signal are demodulated by two conventional, balanced, synchronous cross-coupoled differential amplifiers. The chrominance signal from the color burst blanking circuits is fed to the emitters of the differential amplifiers while the (R-Y) and (B-Y) reference signals from the PLL are fed to the bases of the demodulator transistors.

The phase of the chrominance signal to the emitter of the (R-Y) demodulator is inverted line sequentially by a PAL switching circuit, switched by the H/2 signal. The PAL switching circuit provides the necessary phase reversal to demodulate the PAL (R-Y) color difference signal on successive horizontal scan lines with consistent polarity.

10) SECAM Chrominance Signal Demodulation

The SECAM chrominance signal is demodulated by a QUADRATURE DEMODULATOR which follows a limiter amplifier which removes residual amplitude variations after automatic color control.

The QUADRATURE DEMODULATOR is a FOUR-QUADRANT LINEAR MULTIPLIER with two pairs of inputs. One pair is directly connected to the SECAM chrominance signal from the limitter amplifier and the other pair is connected to the external SECAM reference tuned circuits.

In the SECAM mode only, the color difference signals are switched to a SECAM DE-EMPHASIS circuit.

The DE-EMPHASIS time constants are determined by the capacitor on pin 2(R-Y) and pin 6(B-Y). 220PF capacitors and internal resistors set the SECAM DE-EMPHASIS time-constant to 1.85us.

11) Demodulator Output Stages

The output of the PAL and SECAM chrominance signal demodulators are connected in paraller.

The color-diference signals are finally fed to the color-killer switch. When the Color-Killer is operational, the Color-Difference signal outputs are switched to the reference black level.

The (R-Y) and (B-Y) color difference signals are fed through Buffer amplifiers to pin1 and pin 3.

5. COLOR TRANSIENT IMPROVEMENT CIRCUIT (IC 502, TDA 4565)

5-1. THE BASIC CONSTRUCTION

The TDA 4565 is a integrated circuit for color transient improvement (CTI) and luminance delay line
The schematic diagram is same as figure 26.

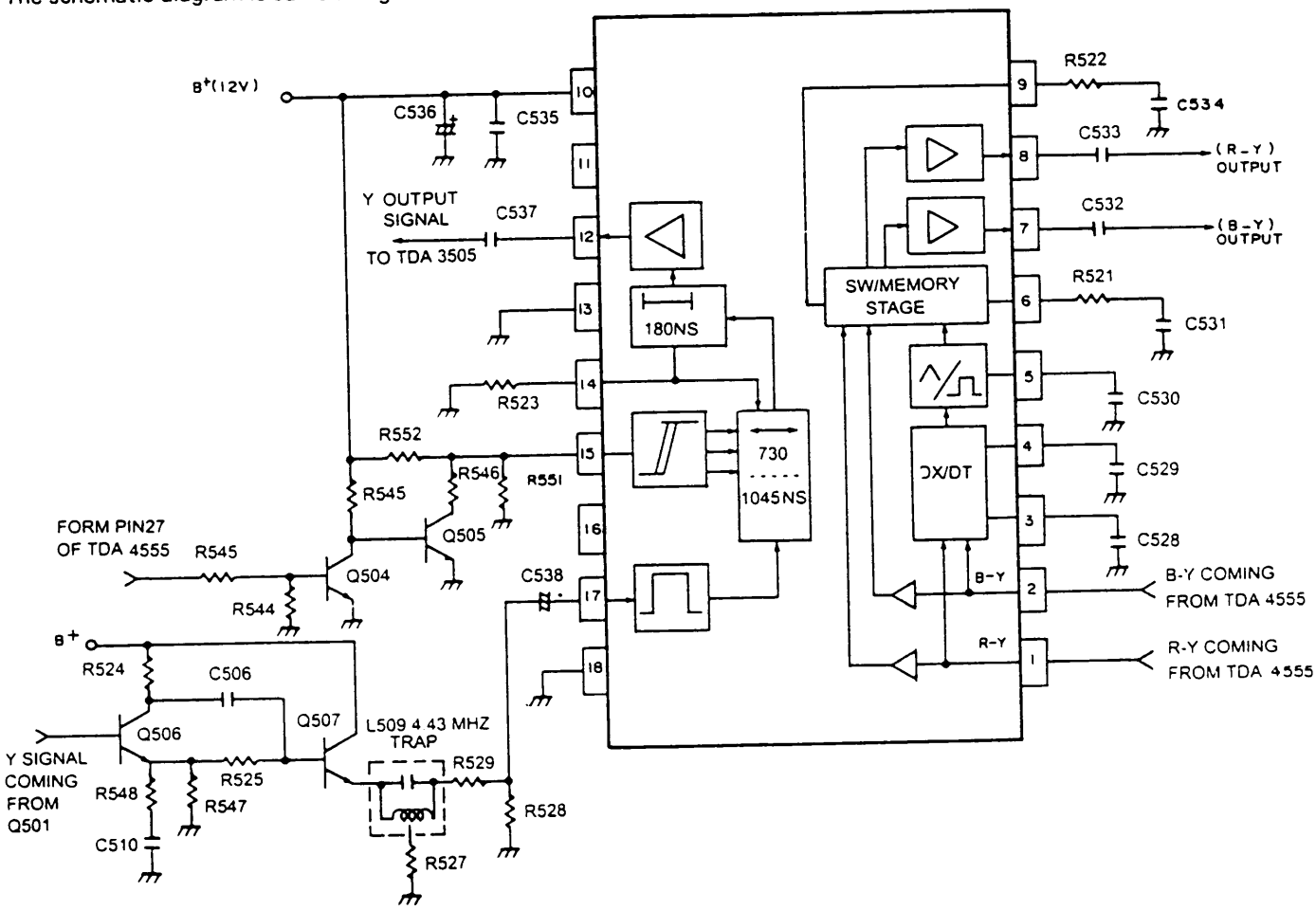


Figure 26. Schematic Diagram of IC 502 (TDA 4565)

5-2. PIN CONFIGURATION OF IC 502

Pin No.	Function
1	R-Y color Difference Input Signal
2	B-Y Color Difference Input Signal
3,4	Differentiating Stage
5	Integrator Stage
6,9	Switching and Storage stage
7	B-Y Output
8	R-Y Output
10	Supply Voltage (12V)
11	Velocity Modulation Output (NOT USED)
12	Y Output Signal
13,18	Ground
14	Reference Delay Time
15	Delay Time Switching Voltage
16	Not Connected
17	Luminance Input Signal (Y)

5-3. OPERATING DESCRIPTION OF THE CIRCUIT

1) Color Difference Channels

The (R-Y) and (B-Y) color difference channels consist of a buffer amplifier at the input, a switching stage and an output amplifier.

The switching stages, which are controlled by transient detecting stages (DIFFERENTIATORS), switch to a value that has been stored at the beginning of the transients.

The differentiating stages get their signal direct from the color difference input signals. (pin1 and 2)

Two parallel storage stages are incorporated in which the color difference signals are stored during the transient time of the signal.

2) Y SIGNAL PATH

The Y-signal input (pin17) is capacitively coupled to an input clamping circuit. Gyrator delay cells provide a maximum delay of 1045ns.

Three delay cells are switched with two interstage switches dependent on the voltage at pin 15. The Y-signal path has a 7dB attenuation as a normal Y-delay coil. The output is fed to pin12 via a buffer amplifier.

3) Q506 and Q507 circuits are to compensate the sharpness.

4) Q504 and Q505 circuits are to adjust the delay time of the luminance signal for SECAM signal.

6. VIDEO CONTROL COMBINATION CIRCUIT (IC 503, TDA 3505)

6-1. THE BASIC CONSTRUCTION

The TDA 3505 is integrated circuit which perform video control functions in a PAL/SECAM decoder
The required input signals are luminance and color difference signals and a 3-LEVEL sandcastle pulse for control purposes.
Linear RGB signals can be inserted from an external source.
RGB output signals are available for driving the video output stages. The circuits provide automatic cut-off control of the picture tube.
The schematic diagram is same as figure 27.

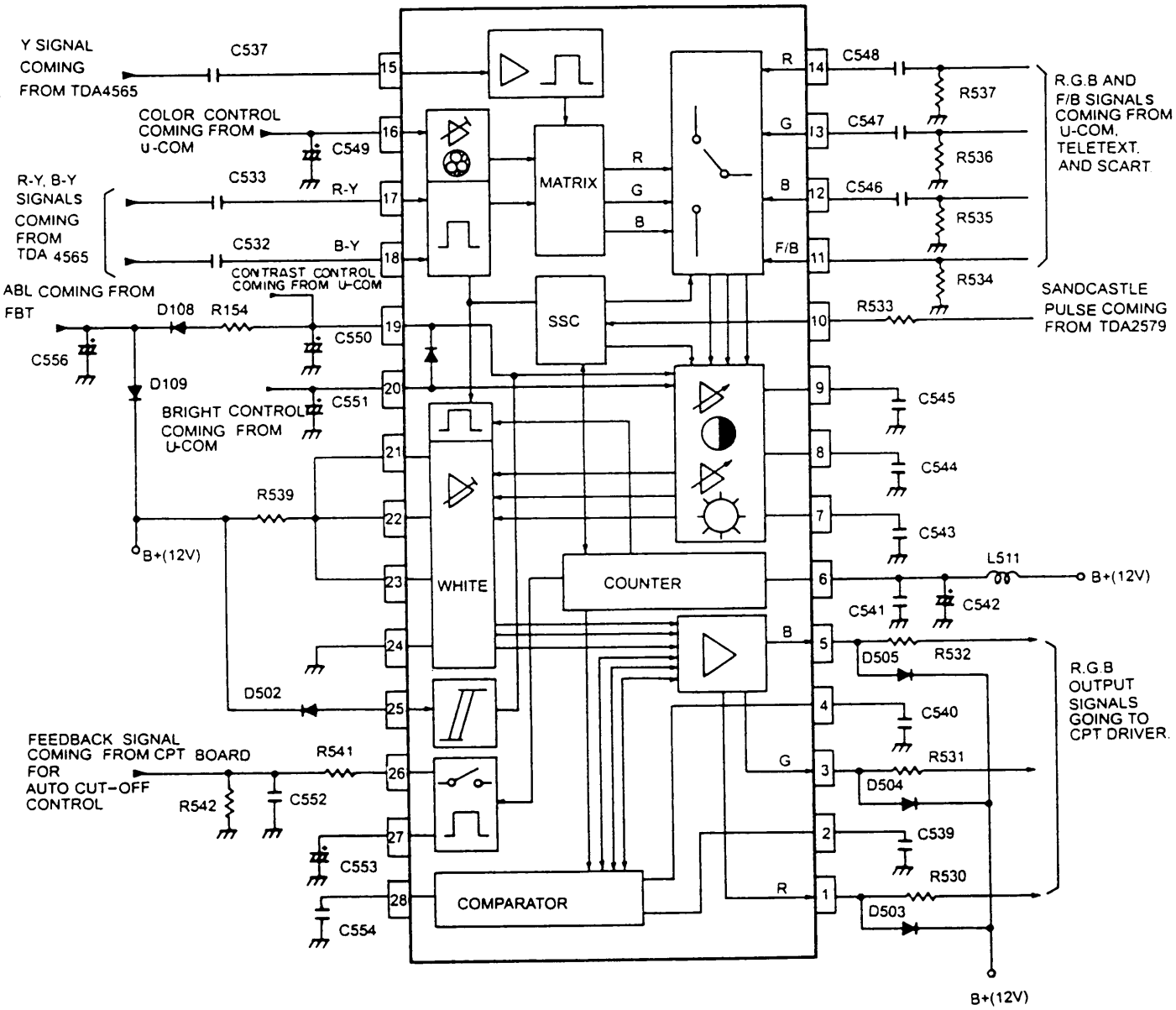


Figure 27. Schematic Diagram of IC503 (TDA3505)

6-2. PIN CONFIGURATION OF IC503

Pin No.	Function
1	RED Output Signal
2	Green Storage Capacitor for CUT-OFF Control
3	Green Output Signal
4	Blue Storage Capacitor for CUT-OFF Control
5	Blue Output Signal
6	Suply Voltage(12V)
7	Blue Storage for Brightness
8	Green Storage for Brightness
9	RED Storage for Brightness
10	Sandcastle Pulse Input
11	Fast Switch for RGB Inputs
12	Blue Input (External Signal)
13	Green Input (External Signal)
14	RED Input (External Signal)
15	Luminance Input Signal
16	Saturation Control Input
17	Color Difference Input (R-Y) Signal
18	Color Difference Input (B-Y) Signal
19	Contrast Control Input
20	Brightness Control Input
21	White Point Adjustment, Blue
22	White Point Adjustment, Green
23	White Point Adjustment, RED
24	Ground
25	Control Input for Peak Beam Current Limitting
26	Automatic CUT-OFF Control Input
27	Storage Capacitor for Leakage Current
28	RED Storage Capacitor for CUT-OFF Control

6-3. OPERATING DESCRIPTION OF THE CIRCUIT

Luminance signal Y and color difference signals (R-Y) and (B-Y) are supplied to the input terminals 15, 17 and 18 via coupling capacitors. The Y signal at terminal 15 must be a nominal level of V_{VBS} = 0.45V.

The color difference signals, which are supplied to input terminals 17 and 18, must be (R-Y)p-p =1.05V and (B-Y)pp =1.33V. The indicated numerical values are valid for a color bar signal with 100% white amplitude and 75% color amplitude.

The color control range acting on the color difference signals is about 2V ~ 4.3V.

The luminance and color difference input signals with black level clamping in the input stages are supplied to the RGB matrix circuit.

When there are no external RGB input signals of pin 12, 13 and 14 via coupling capacitors, the signal switching input voltage of PIN11 is about 0 ~ 0.4V. At this time, RGB signals which are in general supplied by the receiving section of a TV receiver are output of PIN 1.3 and 5.

When the signal switching input voltage of PIN11 is about 0.9V ~ 3V, the external RGB signals of PIN12, 13 and 14 are output of PIN 1.3 and 5.

The contrast control range acting on the RGB signals is about 2V~4.3V.

The brightness control range acting on the RGB signals is about 1V~ 3V.

When the voltage of Pln21,22 and 23 is about 12V, the AC amplifications for RGB signals are 140%. The RGB output signals of PIN 1.3 and 5 are typical black to white 2V.

7. QUASI PARALLEL-SOUND PROCESSOR (IC601, TDA4482-C: TELEFUNKEN)

7-1. THE BASIC CONSTRUCTION

This circuit configuration permits processing of audio carriers for FM-Sound standards, providing separate inputs for the Video and Audio carrier.

The schematic diagram is same as figure 28.

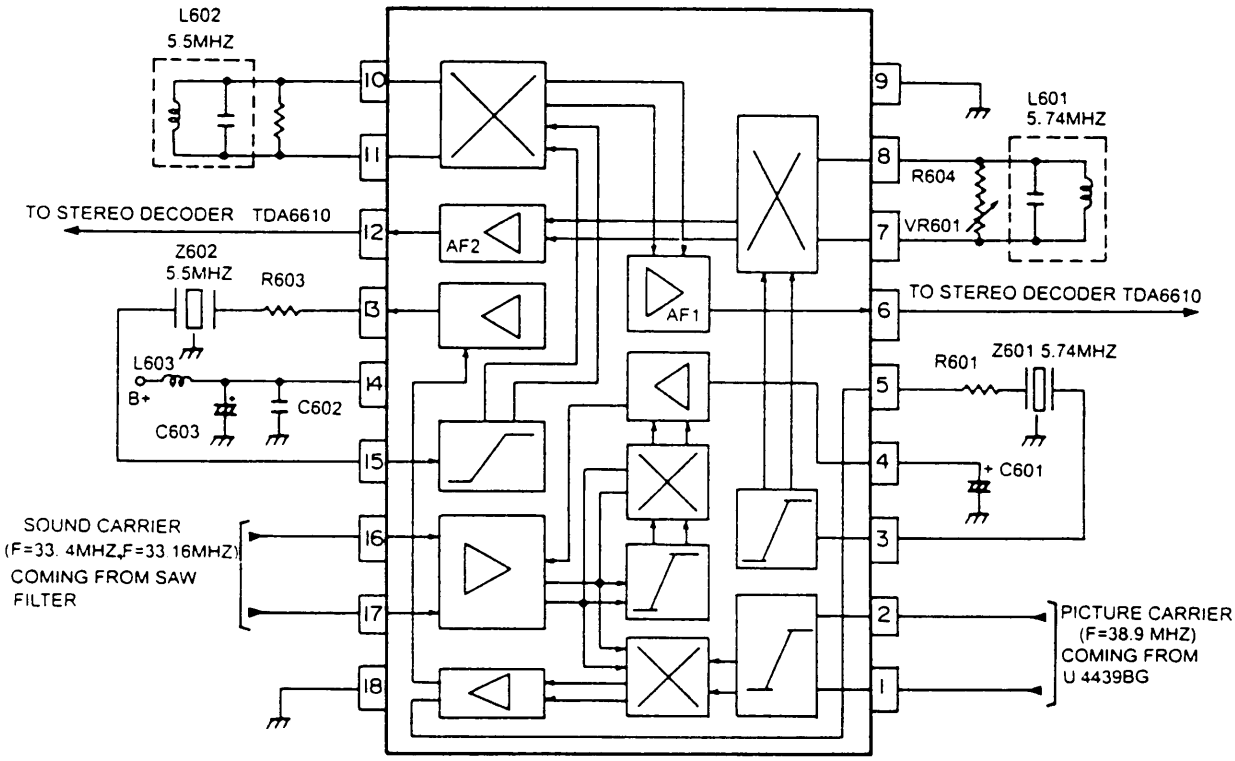


Figure 28. Schematic Diagram of IC601 (TDA4482)

7-2. PIN CONFIGURATION OF IC601

Pin No.	Function
1,2	Vision IF Carrier Input
3	Intercarrier Input 5.74MHz
4	AGC Storage Capacitor
5	Intercarrier Output 5.74MHz
6	AF output 1
7,8	FM Demod. Circuit 5.74MHz
9,18	Ground
10,11	FM Demod. Circuit 5.5MHz
12	AF output 2
13	Intercarrier Output 5.5MHz
14	Supply Voltage (12V)
15	Intercarrier Input 5.5MHz
16,17	Sound IF Carrier Input

7-3. OPERATING DESCRIPTION OF THE CIRCUIT

The Audio carrier signal is passed to two multiplying mixer arrangement via a 3-stage variable wide band amplifier with levelled output signals. One mixer generates the gain control signal. The second mixer operates as an intercarrier demodulator and supplies the intermediate af carrier. The video carrier signal coming from the demodulator tank of μ 4439 BG is decoupled in a prelimited and led to the intercarrier mixer via a limiting amplifier.

The audio FM IF carrier reaches the quadrature demodulators via an interconnected IF filter and subsequent limiting amplifier. The resulting AF signals are led via a Low-Pass amplifier with increased level to the buffered output stages.

8. STEREO PROCESSOR (IC602, TDA6610-2 : SIEMENS)

-1. THE BASIC CONSTRUCTION.

The TDA6610 represents a complete stereo suound processor controlled by the I²C (SDA, SCL) bus. The IC is divided into three functional blocks. (stereo sound processing, sound ident. signal decoder and control section)
The schematic diagram is same as figure 29.

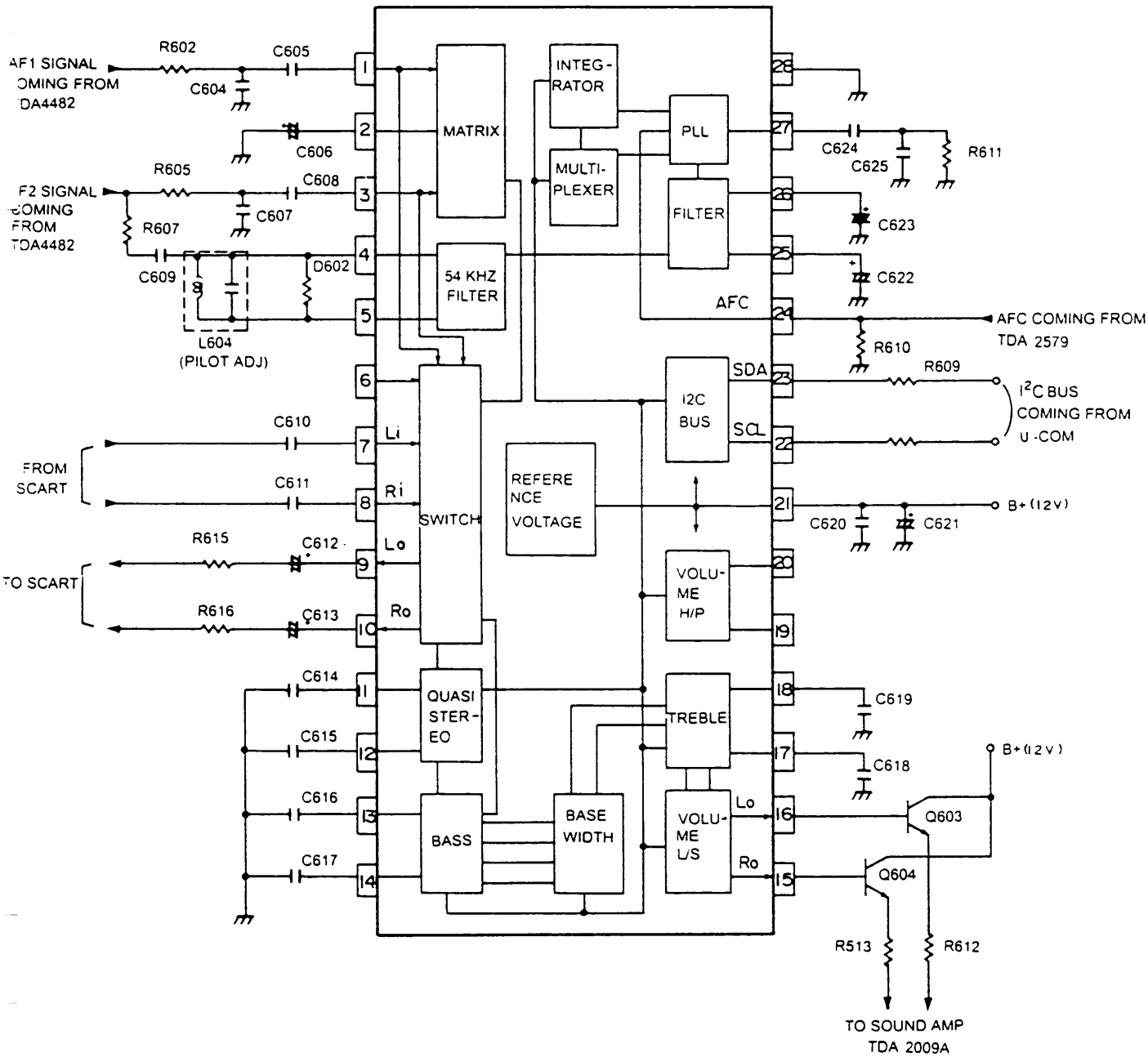


Figure 29. Schematic Diagram of IC602 (TDA6610-2)

8-2. PIN CONFIGURATION IC602

Pin No.	Function
1	AF Input Mono, Left, Sound1
2	Bias for AF Operating Point
3	AF Input Right, Sound 2
4	54 KHz Input
5	54 KHz Filter
6	"L" Standard AF Input(not used)
7	AF Input Scart Left (Sound1)
8	AF Input Scart Right (Sound 2)
9	AF Output Scart (Mono, Sound1, Left)
10	AF Output Scart (Mono, Sound2, Right)
11,12	Phase Shifter Quasi Stereo
13	Cut Off Frequency BASS Left
14	Cut Off Frequency BASS Right
15	AF Output, Loudspeaker Left
16	AF Output, Loudspeaker Right
17	Cut Off Frequency Treble Left
18	Cut Off Frequency Treble Right
19	Headphone Left Output (Not Used)
20	Headphone Right Output (Not Used)
21	Supply Voltage (12V)
22	I²C Bus (SCL)
23	I²C Bus (SDA)
24	Input Horizontal Pulse
25,26	Filter Ident. Signal Decoder
27	PLL Filter Ident. Signal Decoder
28	Ground

8-3. OPERATING DESCRIPTION OF THE CIRCUIT

1. Stereo Sound Processing Section

THE AUDIO SIGNAL PROCESSING and the SWITCH-OVER for sound signals according to the TWO-CARRIER system takes place in the matrix and switching sections. In addition to the two inputs for the demodulated sound carrier, a TWO-CHANNEL scart input is provided. The switching section is terminated with the scart output and an switchable CH1/CH2 switch for the loudspeaker.

In the loudspeaker signal path a switchable QUASI-STEREO section follows the CH1/CH2 switch. This section gives a special audio effect (pseudo) with mono signals due to a 180 ° phase shift at medium frequencies in one channel.

The following bass control exhibits a step of 3dB with a range of +15/-12dB.

A circuit for stereo Base-Width expansion, switchable if stereo signals are recognized, provides a more spatial audio effect due to 50% of frequency dependent crosstalk in opposing phases. Likewise the treble control has a step of 3dB with a range of ±12dB. The volume control can be adjusted left and right independently, and includes also the loudspeaker signal path using 57 steps of 1.25dB each.

Balance function is realized by software (I²C bus)

2. Identification Sound Decoder

The input of the ident. Sound decoder consists of an OP-AMP for the pilot signal with its sidebands. The signal is then passed to a PHASE-INDEPENDENT ACTIVE BAND-PASS FILTER with a very narrow bandwidth. This filter detects whether the lower Side-Band of the pilot caprrier, modulated with the ident signal, is present. The center frequency of the filter is switched between dual and stereo by a multiplexer. The multiplexing frequency is adjustable by software. all required clock signals are derived from a PLL which can be very fast synchronized by a reference frequency. This reference frequency has to be sufficiently close to the horizontal frequency (AFC).

3. Control Section

All functions are controlled VIA I²C bus interface.

9. SOUND(STEREO) AMPLIFIER (IC603, TDA 2009A : SGS-THOMSON)

9-1. THE BASIC CONSTRUCTION

The TDA 2009A is class AB dual Hi-Fi audio power amplifier.
The schematic diagram is same as figure 30.

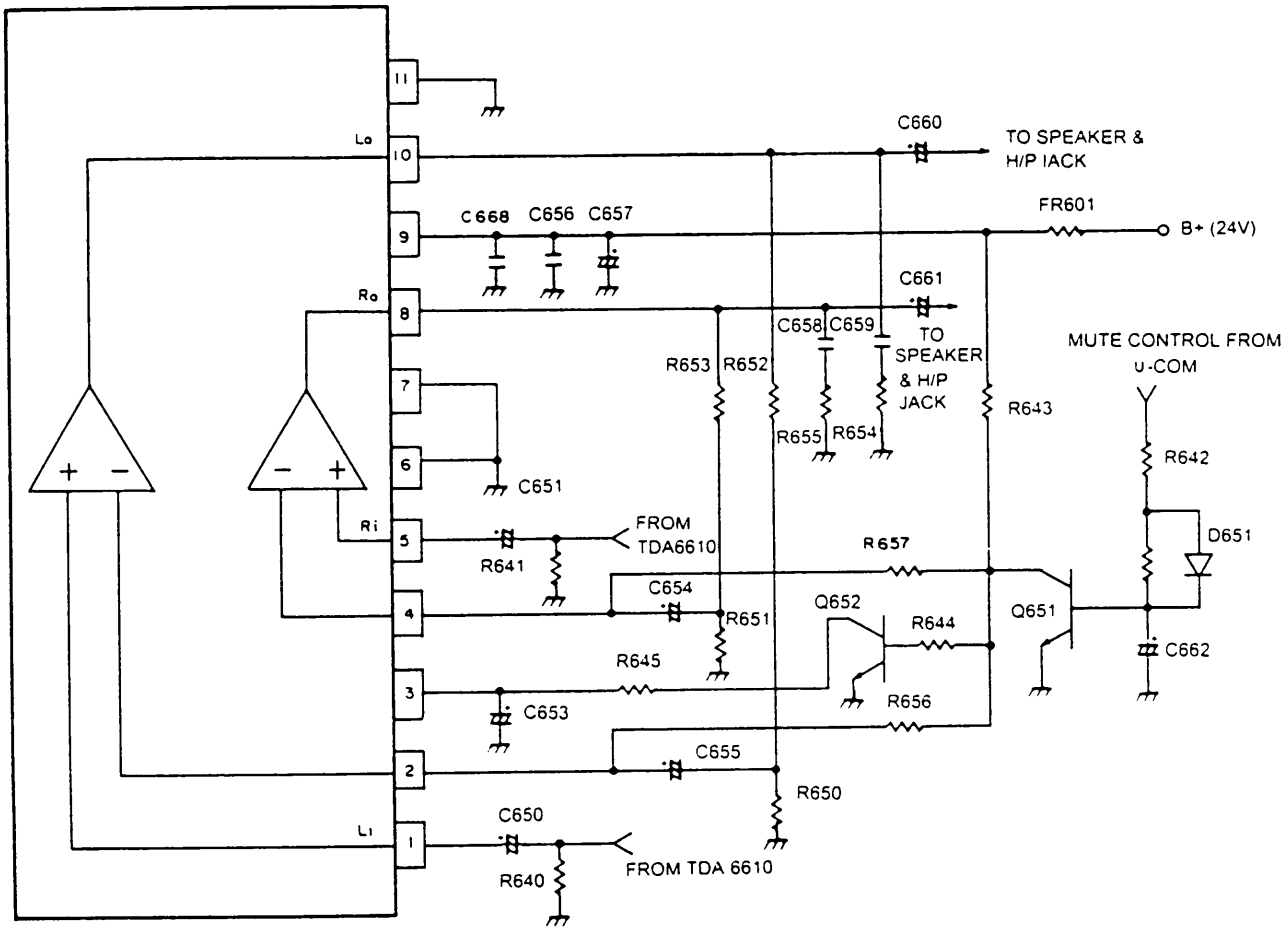


Figure 30. Schematic Diagram of IC603 (TDA 2009A)

9-2. PIN CONFIGURATION OF IC603.

Pin No.	Function
1	Non-Inverting Input (Li)
2	Inverting Input
3	SVRR
4	Iverting Input
5	Non-Inverting Input(Ri)
6	Ground
7	NC (Ground)
8	Output (Right Signal)
9	Voltage Supply (24V)
10	Output (Left Signal)

9-3. OPERATING DESCRIPTION OF THE CIRCUIT.

The demodulated audio signals coming from TDA 6610 are amplified about 36dB at this IC.
The following table is shown the used purpose of the components on application circuit.

Circuit No	Purpose
R640, R641	Divider of the signal level
C650, C651	Input DC Decoupling
C654, C655	Feedback Input DC Decoupling
R650,R651,R652,R653	Close Loop Gain Setting
C653	Ripple Rejection
R654,R655,C658,C659	Frequency Stability
C660, C661	Output DC Decoupling
R642,R643,R644,R656 R657,R658,C662 D651,Q651,Q652	Circuit for Imporving Pop Noise

10. TUNING SECTION : MICOM → ST6358(SGS-THOMSON) ··· GS8014-04C (GOLDSTAR CUSTOM NO.)

10-1. THE BASIC CONSTRUCTION

The GS8014-04C is THE MICOM for voltagage synthesis with OSD. This micom consists of a 14 bit voltage synthesis tuning peripheral, an IR remote control preprocessor, a core (8k x 8 ROM, 256 x 8 RAM), a spi (serial peripheral interface), a 128 x 8 E·prom, an AFT A/D converter, a ON-SCREEN display generator and four PWM D/A converters.
The schematic diagram is same as figure 31.

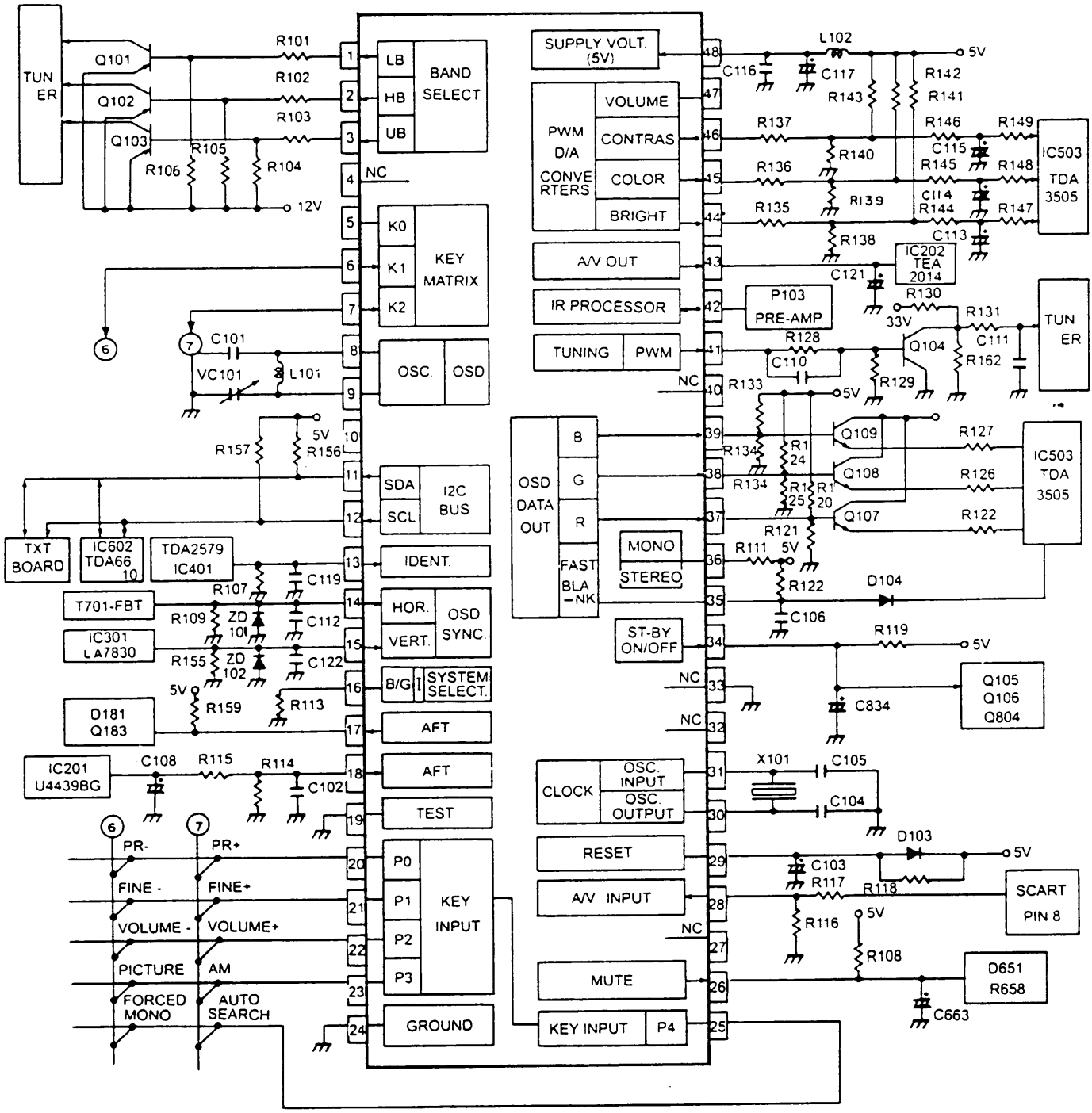


Figure 31. Schematic Diagram of IC101 (GS8014-04C)

10-2. PIN CONFIGURATION OF IC101

Pin No.	Function
1	VHF Low Band Selector
2	VHF High Band Selector
3	UHF Band Selector
4,5, 10,27, 32, 40	NC (Not Used)
6,7	Input Common Lines for Keyboard
8,9	OSD Oscillator Terminal
11	SDA (I·C Bus)
12	SCL (I·C Bus)
13	Identification (Signal Existor Not)
14	Horizontal Sync. Input for OSD
15	Vertical Sync Input for OSD
16	System Select. (High : I, Low: B/G)
17	AFT (On Auto Search or Pr No. Exchage : High, Another Case : Low)
18	AFT Input Terminal
19	Test (Ground)
20,21, 22, 23, 25	Input Port for Keyboard
24	Ground
26	Mute For Sound (Mute : Low, Not Mute :High)
28	A/V Input For Identifying A/V Mode
29	Reset (Active Low)
30	OSC output for Operating MCU
31	OSC input for operating MCU
34	STAND-BY ON/OFF(On:Low, Off :High)
35	OSD Fast Blanking Signal(Active High)
36	Mono/Stereo Select. (Stereo : High)
37	OSD "R" Signal (Active High)
38	OSD "G" Signal (Active High)
39	OSD "B" Signal (Active High)
41	Tuning PWM Signal Output
42	IR(INFRA-RED Signal Input
43	A/V Output (Active High For A/V Mode)
44	Brightness (PWM D/A Converter)
45	Color (PWM D/A Converter)
46	Contrast (PWM D/A Converter)
47	Volume (Not Used)
48	Supply Voltage (5V)

10-3. OPERATING DESCRIPTION OF THE CIRCUIT

If the UHF band is chosen, the PIN3 of the MICOM is low level. Then Q103 conducts to provide high level at UHF band terminal of the tuner. The I·C bus (SDA, SCL) is used to control stereo decoder and Tele-Text. When you remove the VIF/SIF board and teletext board from the main board, before removing modules you have to make main power off.

Because I·C bus line is affected by impulse.

When you have some porblem of On Screen Disply(OSD), you have to check horizontal flyback pulse (typical 5.6Vp-p SQUARE-WAVE), Vertical flyback pulse (typical 5.6Vp-p SQUARE-WAVE) of PIN 14 and 15, and oscillation for OSD of PIN8 and 9. And then check R,G,B and fast blanking signals of PIN 35,37,38 and 39 for OSD.

When you have some problem of auto search, you have to check identification voltage (typical 4.6V ˙) of PIN13 and AFT waveform of PIN18.

11. VERTICAL DEFLECTION OUTPUT CIRCUIT (LA7831 : SANYO)

11-1. THE BASIC CONSTRUCTION

The LA7831 is a linear integrated circuit for vertical deflection output driver. The schematic diagram is same as figure 32.

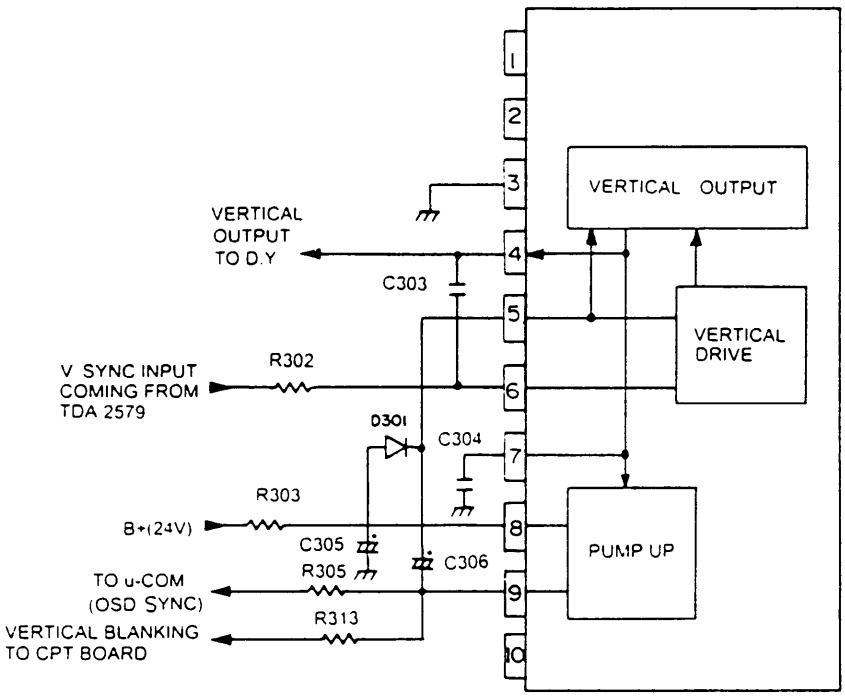


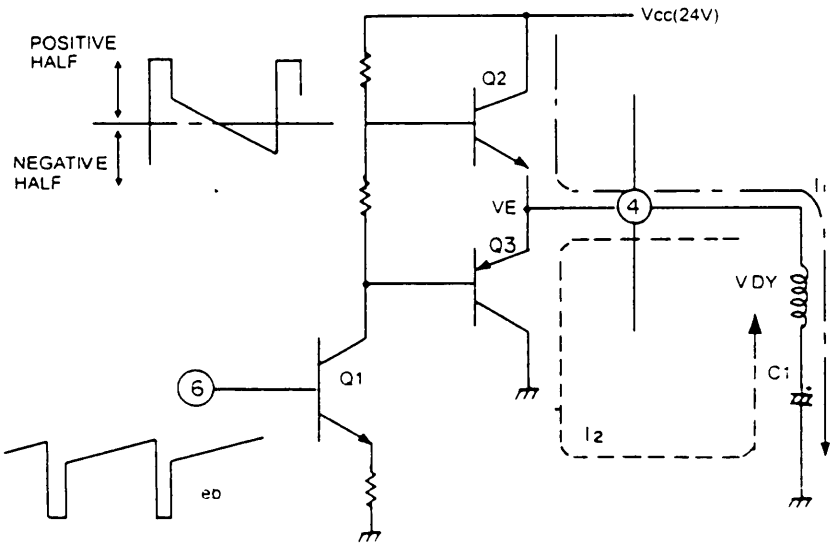
Figure 32. Schematic Diagram of IC301

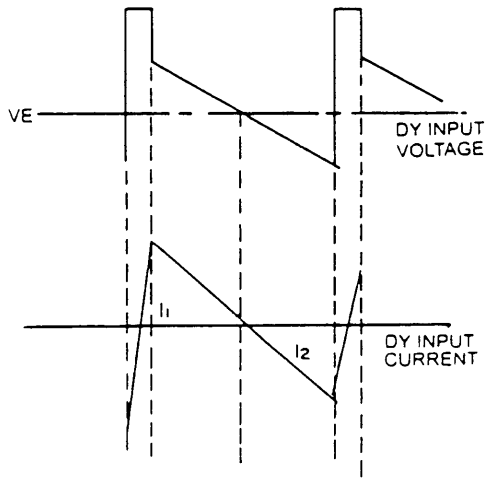
11-2. PIN CONFIGURATION OF IC301

Pin No.	Function
1,2,10	N.C
3	Ground
4	Vertical Output
5	Power Supply for Vertical Output
6	Vertical Sync. Input
7	OSC. Blocking
8	Power Supply (12V)
9	Pump-Up Output

11-3. OPERATING DESCRIPTION OF THE CIRCUIT

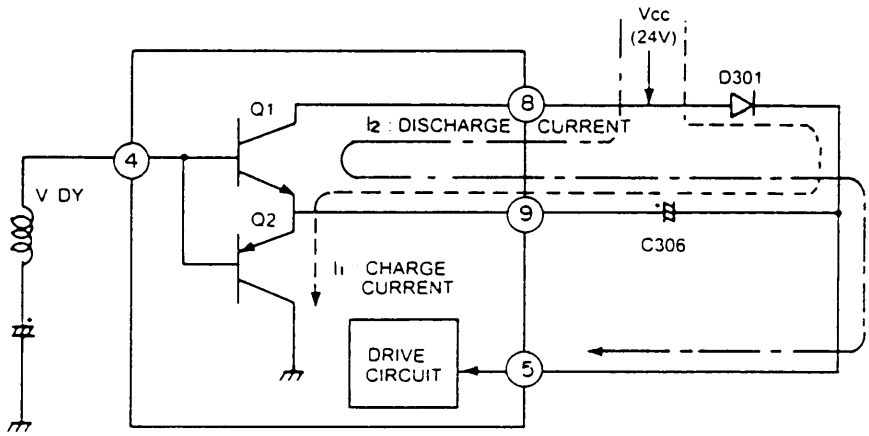
1) Description of V. Drive and V. Out Circuit (LA7830)



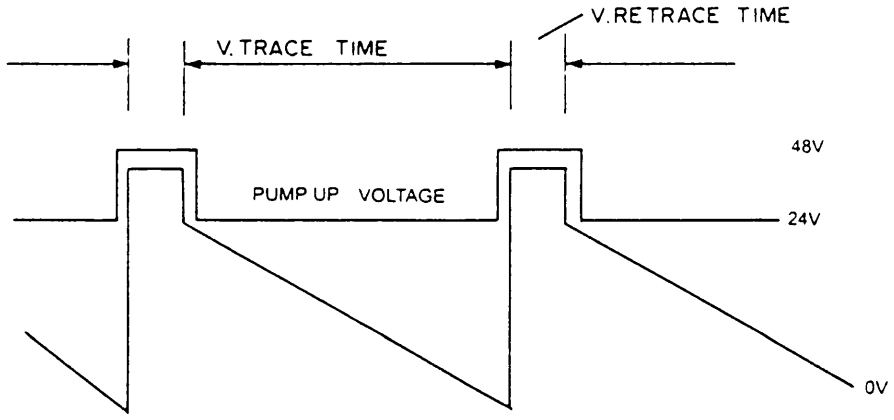


The vertical drive pulse(eb) supplied to the base of Q1 is amplified, turned over the phase by transistor Q1 and supplied to the base of transistor Q2, Q3.
In the period of positive half, the transistor Q2 is switched on(Q3 :OFF).
And then the current I1 charged at capacitor C1 via vertical deflection yoke (V.DY) in the period of negative half, the transistor Q3 is switched on (Q2 : OFF) and then reverse current begins to flow through V. DY.

2) Description of Pump-up Circuit (LA7831)



When the voltage of pin 4 reduces, transistor Q2 is switched on.
When the transistor Q2 is switched ON, the charge current (I1) flows into pin 9 and at C306 is charged about 24 voltage.
During retrace time, the voltage of pin 4 increases to high voltage, transistor Q1 is switched ON.
Vcc (24V) and the voltage charged at C306 is added, and high voltage (about 48V) appears at pin 5.
The voltage charged at C306 discharges during short time, the voltage of pin 5 reduces rapidly, supply voltage (24V) is constantly applied to pin 5 via D301 during trace time.



12. HORIZONTAL/VERTICAL SYNCHRONIZATION CURCUIT (IC 401, TDA2579A: PHILIPS)

12-1. THE BASIC CONSTRUCTION

The TDA2579A generates and synchronizes horizontal and vertical signals.
The schematic diagram is same as figure 33.

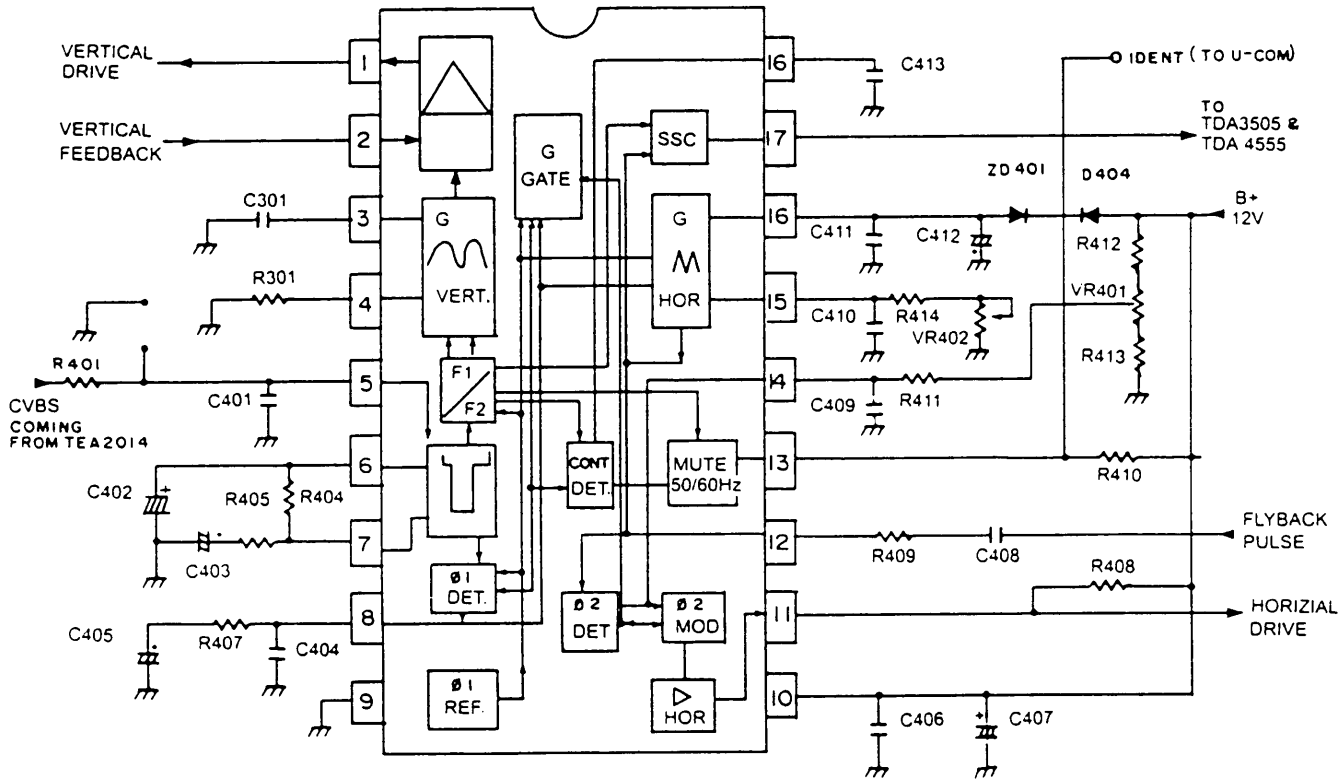


Figure 33. Schematic Diagram of IC401 (TDA2579A)

12-2. PIN CONFIGURATION OF IC401

Pin No.	FUNCTION
1	VERTICAL DRIVE OUTPUT
2	VERTICAL FEED BACK
3	VERTICAL SAWTOOTH GENERATOR
4	CURRENT SOURCE
5	VIDEO SIGNAL INPUT
6, 7	HORIZONTAL/VERTICAL SYNC.SEPARATOR
8	PHASE DETACTOR
9	GROUND
10	SUPPLY VOLTAGE (12V)

Pin No.	FUNCTION
11	HORIZONTAL DRIVE OUTPUT
12	FLYBACK PULSE INPUT
13	MUTE OUTPUT AND 50/60HZ IDENTIFICATION
14	PHASE DETECTOR
15	HORIZONTAL OSCILLATOR
16	POWER SUPPLY FOR STARTING
17	SANDCASTLE OUTPUT
18	COINCIDENCE DETECTOR

12-3.OPERATING DESCRIPTION OF THE CURCUIT

1) Starting ic operation and power supply.

The IC has been designed such that the horizontal oscillator and output stage can start operating by applicaltion of a very low supply current into pin 16.

The horizontal output stage is forced into non-conducting stage until the supply current has typical value of 5mA

The starting circuit has the ability to derive the main (pin10) from horizontal output stage.

When the voltage on pin 10 increase from zero to its final value (12V) a part of the supply current of the starting circuit is taken from 10 via internal diode, and the voltage on pin16 will be stabilize to a typical value of 9.4V.

In a stabilized condition (pin10>10V) the minimum reguired supply carrent to 16 is≈2.5mA.

All other IC functions are switched on via the main supply valtage on pin10.

2) Horizontal Part

The harizartal oscillator is connected to pin 15.

The frequency is set by external RC combination (C410, R414, VR402.)

The open collector horizontal output stage is connected to pin 11.

An internal zener diode configuration limits the open voltage of pin 11 to ≈ 14.5V

The horizontal output transistor at pin 11 is blocked until the current into pin 16 reaches a value of ≈5mA.

A higher current results in a horizontal output signal at pin 11, which starts with a duty factor of ≈ 40% HICH.

The duty factor is set by an internal current source-loaded npn emitter follower stage connected to pin 14 during starting. When pin 16 changes over to voltage stabilization the npn emitter follower and current source load at pin 14 are switched OFF and the second phase detector circuit is activated, provided a horizontal flyback pulse is present at pin 12. When no flyback pulse is detected at pin 12 the duty factor of the horizontal output stage is set to 50%.

The phase detector circuit at pin 14 compensates for storage time in the horizontal deflection output stage. The horizontal output pulse duration is 29μ s HICH for storage times between 1 μ s and 17 μ s (29 μ s flyback pulse of 12 us). A higher storage time increases the HIGH time. Horizontal picture shift is possible by forcing an external charge or discharge current into the capacitor at pin 14.

3) Vertical Part

a. The IC embodies a synchronized divider system for generating the vertical sawtooth at pin 3.
   The divider system has internal frequency doubling circuit, so the horizontal oscilltor is working at its normal line and one line period eqeals 2 clock pules
   Due to the devider system no vertical frequency adjustment is needed. The divider has a discriminator window for automatically switching over from the 60Hz. The devider system operates with 3 different divider reset window for maximum interference/disturbance protection.

b. Drive Output
   The driver output is at pin1, it can deliver current of 1. 5mA at 5V output.
   The internal impedance is approximately 150 ohm. .
   The output pin is also connected to an internal current source with sink current of 0.35mA.

c. Vertical Guard
   Vertical guard circuit monitors the feed back signal on pin 2. When the level on pin2 is below 0.35V on higher than 1.85V, the guard curcuit inserts a continuous level of 2.5V in the sandcastle output of pin17. The results in the blanking of the picture displayed, thus preventing a burnt-in horizontal line. The guard levels specified refer to the zener diode reference voltage source level.

d. Sync separator, phase detector and TV-station identification (pins 5,6,7,8 and 18)
   The video input signal is connected to pin 5. The sync separator is designed such that the slicing level is independent of the amplitude of the sync pulse. The black level is measured and stored in the capacitor at pin 7. The slicing level value is stored in the capacitor at pin 6. The slicing level value can be chosen by the value of the external resistor between pins 6 and 7. The value is given by the formula:

$$P = \frac{R_{404}}{5.3 + R_{404}} \times 100 \ (R_{404} \text{ value in K}\Omega)$$

   When R404 is the resistor between pins 6 and 7 and top sync level equals 100%. The recommended resistor value is 5.6 k Ω.

e. Phase detector
   The phase detector circuit is connected to pin 8. This circuit consists of 3 separate phase detectors which are activated depending on the voltage of pin 18 and the state of the sync pulse noise detection circuit. For normal and fast time constants all three phase detectors are activated during the vertical blanking period, this with the exception of the anti-top-flutter pulse period, and the separated vertical sync-pulse time. As a result, phase jumps in the video signal related to the video head, take over of video recorders are quickly restored within the vertical blanking period. At the end of the blanking period the phase detector time constant is increased by 1.5 times. In this way there is no requirement for external VTR time constant switching, and so all station numbers are suitable for signals from VTR, video games or home computers.
   For quick locking of a new TV station starting from a noise only signal condition (normal time constant) a special circuit is incorporated. A new TV station which is not locked to the horizontal oscillator will result in a voltage decrease below 0.1V at pin 18. This will activate a frame period counter which switches the phase detector to fast for 3 frame periods during the vertical scan period.
   The horizontal oscillator will now lock to the new TV station and as a result, the voltage on pin 18 will increase to approximately 6.5V. When pin 18 reaches a level of 1. 8V the mute output transistor of pin 13 is switched OFF and the divider is set to the large window. In general the mute signal is switched OFF within 5 ms (pin C18 = 47 μ F) after reception of a new TV signal. When the voltage on pin 18 reaches a level of 5V, usually within 15ms, the frame counter is switched OFF and the time constant is switched from fast to normal during the vertical scan period.
   If the new TV station is weak, the sync-noise detector is activated. This will result in a change over of pin 18 voltage from 6.5 V to ≈10V. When pin 18 exceeds the level of 7.8V the phase detector is switched to slow time constant and gated sync pulse condition. The current is also reduced during the vertical blanking period by 1mA. When desired, most conditions of the phase detector can also be set by external means in the following way :

a) Fast time constant TV transmitter identification circuit not active, connect pin 18 to earth (pin 9)
b) Fast time constant TV transmitter identification circuit active, connect a resistor of 220k Ω between pin 18 and ground.
c) Slow time constant, (with exception of frame blanking period), connect pin 18 via a resistor of 10k Ω to + 12V, pin 10. In this condition the transmitter identification circuit is not active.
d) No switching to slow time constant desired (transmitter identification circuit active), connect a 6.8V, zener diode between pin18 and ground.

Figure 33-1. Illustrates the operation of the 3 phase detecor circuits.

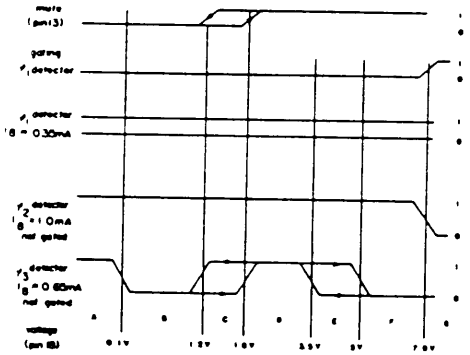


Figure 33-1. Timing Diagram, Phase detectors

4) Mute output and 50/60 Hz identification (pin3)

The collector of an npn transistor is connected to pin 13. When the voltage on pin 18 drops below 1.2V (no TV transmitter) the npn transistor is switched ON.

When the voltage on pin 18 increases to a level of ≈ 1.8V (new TV-transmitter found) the npn transistor is switched OFF.

Pin 13 has also the possibility for 50/60 Hz identification. This function is available when pin 13 is connected to pin 10 (+12V) via an external pull-up resistor of 10 to 20k Ω. When no TV-transmitter is identified the voltage on pin 13 will be LOW (<0.5V). When a TV-transmitter with a divider ratio > 576 (50Hz) is detected the output voltage of pin 13 is HIGH (+12V).

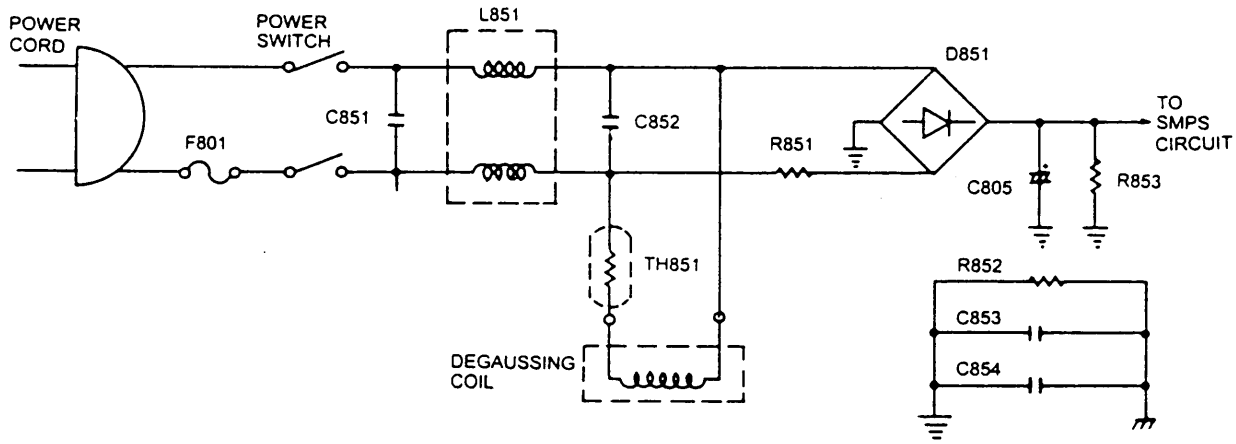
When a TV-transmitter with a divider ratio <576 (60Hz) is found an internal pnp transistor with its emitter connected to pin 13 will force this pin output voltage down to ≈ 7.6V.

5) Sandcastle output (pin 17)

The sandcastle output pulse generated at pin 17, has three different voltage levels. The highest level, (10.4V), can be used for burst gating and black level clamping. The second level (4.5V) is obtained from the horizontal flyback pulse at pin12, and is used for horizontal blanking. The third level (2.5V) is used for vertical blanking and is derived via the vertical divider system. For 50Hz the blanking pulse duration is 42 clock pulses and for 60 Hz it is 34 clock pulses started from the vertical divider reset. For TV-signals which have a divider ratio between 622 and 628 or between 522 and 528 the pulse is started at the first equalizing pulse. With the 50/60 Hz information the burst-key pulse width is switched to improve the behaviour in multi-norm concepts.

13. POWER SUPPLY CIRCUIT

13-1. AC INPUT AND DEGAUSSING CIRCUIT



Ac power is supplied to the instrument through FUSE (F801) and power switch line, and full wave rectifying circuit rectifies the line voltage.

The rectified voltage (about 325VDC) is charged to capacitor C805 and it is also supplied to the switched mode power supply (SMPS) circuit.

F801 is the Fuse (T3.15A, AC250V) of slow blow (time lag) type.

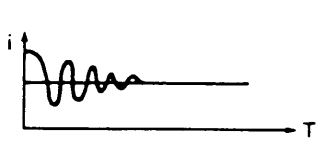
C851, C852 and L851 circuits are to avoid the radiation of hamonic noise caused by several oscillator circuit which are transfered to outside of TV SET through power line and also remove the noise caused by normal mode of several hundred KHz.

C853, C854, and R852 circuits connected with common mass of the first side and second side of power supply part are to avoid the noise caused by common mode of several MHz.

R853 is for discharging when turning the power switch OFF.

TH 851 (PTC) and degaussing coil are degaussing circuit.

When turning the power switch ON, AC current flows through the THERMISTOR (TH851) that has a positive temperature coefficient. And then the resistance value of TH801 increase abruptly (about 18 ohm → about several Mohm) but the AC current is simultaneously decreased as follows.



13-2. SMPS CIRCUIT (IC801, TDA 4601)

13-2-1. The Basic Construction

The TDA4601 has been designed for driving, controlling and protecting the switching transistor in self-oscillating blocking converter power supplies during stort-up, normal, and overload operations as well as during interferences.

In case of interferences, the drive of the switching trancistor is inhibited and a secondary voltage rise is prevented.

The schematic diagram is same as figure 34.

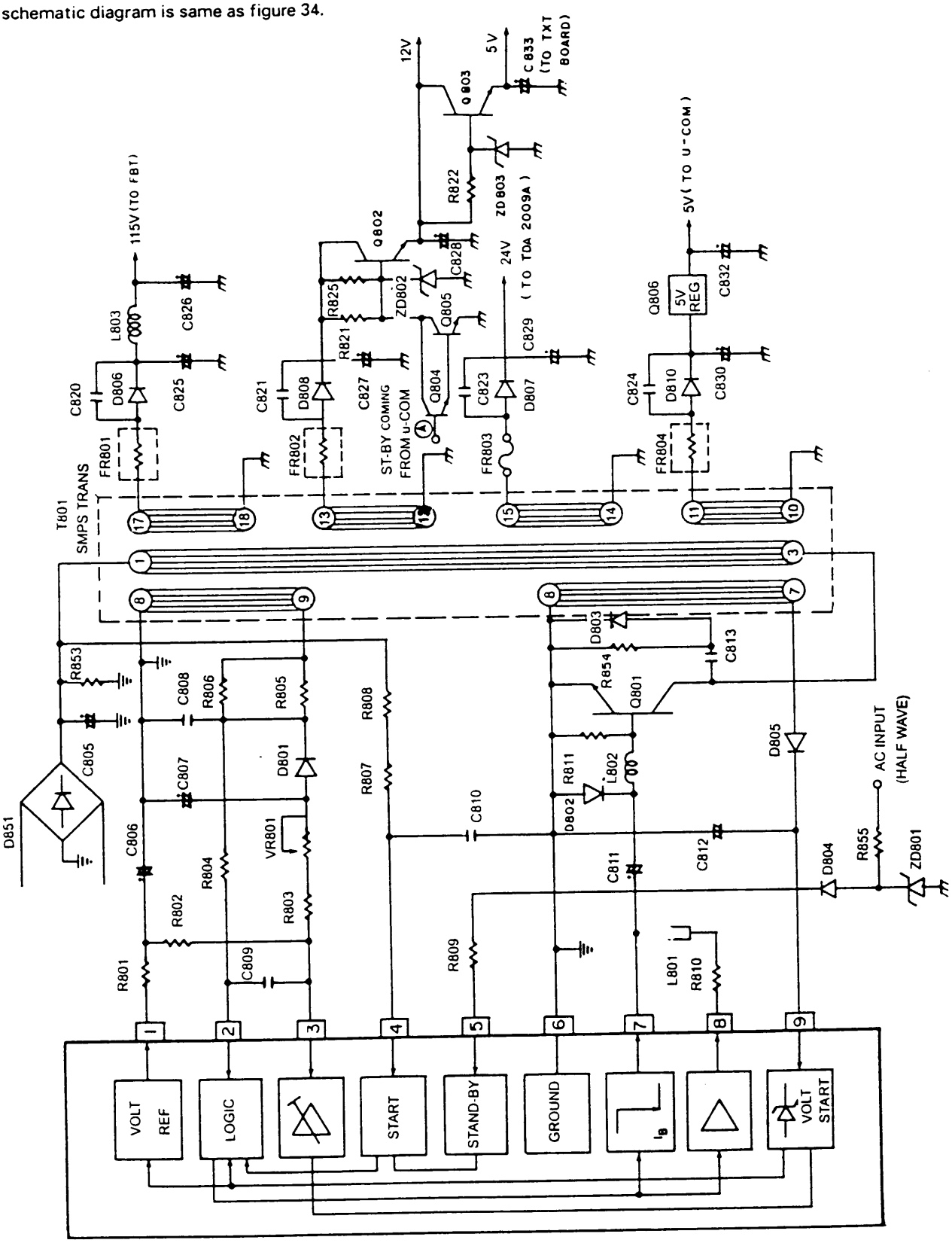


Figure 34. Schematic Diagram of IC801 (TDA4601)

13-2-2. Pin Configuration of IC801

Pin No.	Function
1	$V_{REF.}$ OUTPUT (ABOUT 4.2V)
2	ZERO CROSSING IDENTIFICATION
3	INPUT CONTROLLED AMP. OVERLOAD AMP
4	COLLECTOR CURRENT SIMULATION
5	CONNECTIONS FOR ADDITIONAL PROTECTOR
6	GROUND
7	DC OUTPUT FOR CHARGING THE COUPLING CAPACITOR
8	PULSE OUTPUT-DIRVING OF THE SWITCHING TR
9	SUPPLY VOLTAGE (AROUT 12V)

13-2-3. Operating Description of the Circuit.

1) START UP

If the power switch is ON.

The half-wave AC voltage is rectified by R855, D804 and C812 is applied to pin9 of IC801.

If the voltage of pin9, is above 8.5V, IC801 begins the generation.

The internal reference voltage supplies the voltage regulator and effects the charging of the coupling electorlythic capacitor connected to the switching transistor. Simultaneous with V9 reaching≈12V, an internal voltage becomes available, providing all component elements, with the exception of the control logic, with a thermally stable and overload resistant current supply.

In conjuction with the generation of the reference voltage, the current supply for the control logic is activated. The IC801 is now ready for operation.

The voltage rectified by D851 and C805, which is applied to pin 1 of SMPS TRANSFORMER (T801) and pin4 of IC801.

At this time, PWM signal outputs from pin7 of IC801 and drives Q801.

If Q801 is drived, AC current flows through pin1 and pin 3 of SMPS TRANS (T801) and the voltage is drived by this AC current at another winding line according to the winding turns.

The voltage generanted at pin7 and 8 of SMPS TRANS is rectified at D805 and C812, and supplied about 12V~15V to pin 9 of IC801 continually. At this time D804 is OFF.

2) NORMAL OPERATION

At the input of pin2 the zero crossing of the frequency provided by pin8 and 9 of SMPS TRANS are registered and forwarded to the control logic. Pin3 (control input, overload and "Standby" recognition) receives the rectified amplitude fluctuations of pin 8 and 9 of SMPS TRANS.

The detected variation sources which is communated with the D801 and C807 input the voltage to pin 3.

And VR801 controls the secondary output voltage.

The collector current of Q801 is simulated by an external R807, R808, and C810 combination present at pin4 of IC801 and internally set threshold voltages.

The output levels of the control amplifier as well as those of the overload recognition and the collector current simulator are compared in the trigger and forwarded to the control logic. The output at pin 8 of IC801 will be inhibited when voltages of $\leq$ (V_{ref}/2)-0.1V are present at pin5 of IC801.

Flip flops for controlling the base current amplifier and the base current shut-down are set in the control logic depending on the start-up circuit, the zero crossing identification as well as the release through the trigger. The base current amplifier forwards the sawtooth-scaped V_4 voltage to the output of pin8. A current feedback with an external resistor (R810=0.68 Ω) is present between pin 8 and pin7. The applied value of the resistor determines the max. amplitude of the base driving current for the switching transistor.

The base current shut-down activated by the control logic clamps the output of pin 7 to 1.6V. As a result, the drive of the switching transistor is inhibited. This protective measure is enabled if the supply voltage at pin 9 reaches $\leq$ 6.7V or if voltages of V_{ref}/2-0.1V are present at pin5. In case of short-circuits occuring in the secondary outputs of the switching power supply, the integrated circuit continuously monitors the fault conditions.

During secondary, completely load-free operations, only a small pulse duty factor is set. As a result, the total current consumption of the power supply is held at N=6..10 what during both operating modes. After the output has been inhibited during a voltage supply of $\leq$ 6.7V, the reference voltage (4V) is switched-off, if the voltage supply is further reduced to ΔV_9=0.6V

3) THE SECONDARY SIDE OUTPUT VOLTAGE

The 115V rectified by D806 and C825 is only for FBT and H-TRANS.

The 24V rectified by D807 and C829 is for sound AMP. (IC603).

About 8V rectified by D810 and C830 is regulated by Q806, the output voltage of Q806, is 5V for U-com.

For normal operation condition, Ⓐpoint level coming from U-com is low, and Q802 is on, the output voltage is 12V for ICs except U-com and some teletext devices. At the same time, Q803 is on, the output voltage of Q803 is 5V for some teletext device.

In stand-by condition, Ⓐpoint level coming from U-com is high, and Q804 and 805 are on, Q802 and Q803 are off.

So 12V and 5V is removed.

14. TELETEXT VIDEO PROCESSOR CIRCUIT (IC01, SAA 5231) (Not in use)

14-1. THE BASIC CONSTRUCTION

The SAA 5231 extracts teletext data from the video signal, regenerates teletext clock and synchronizes the text display to the television sync.

The schematic diagram is same as figure 35.

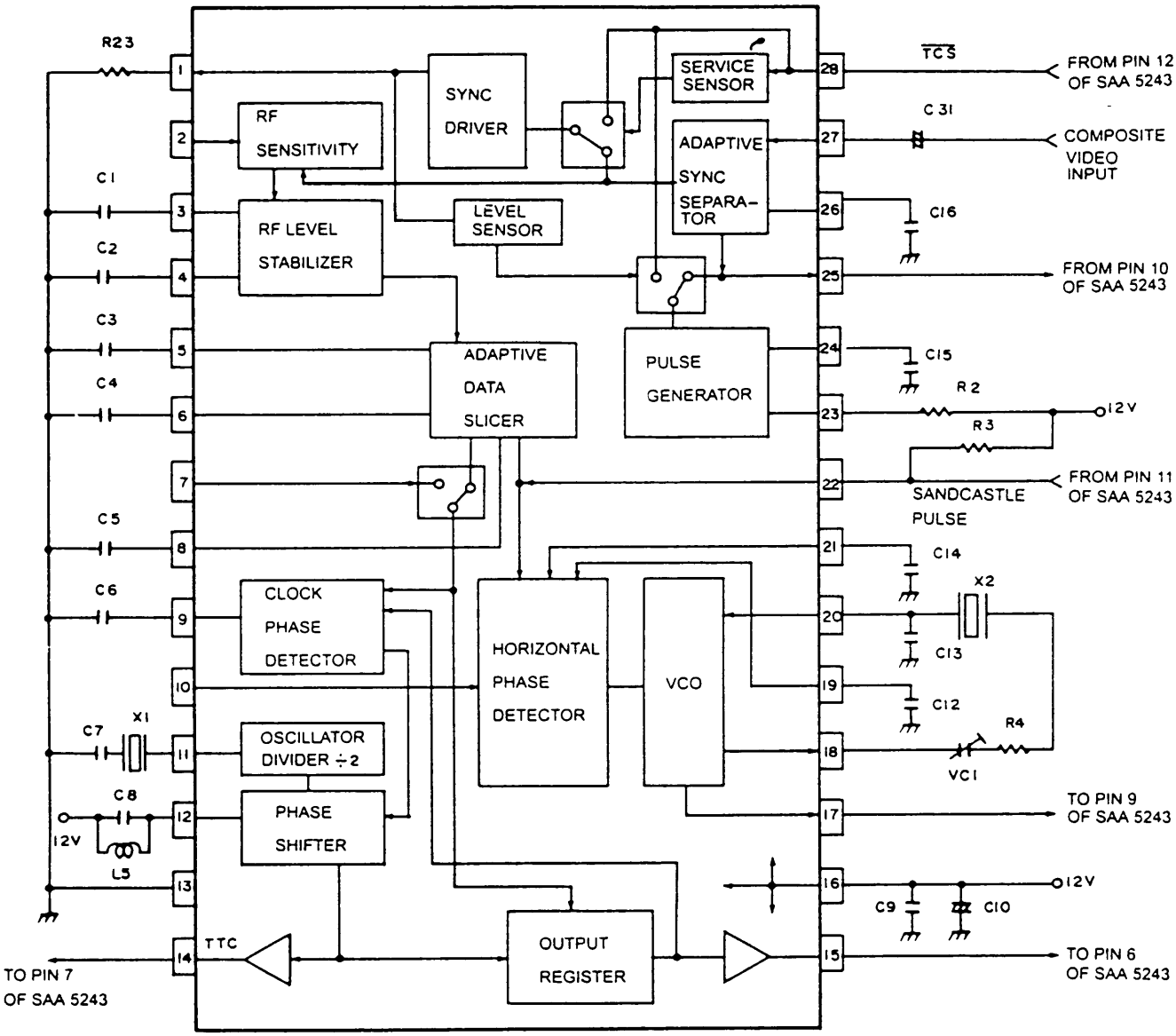


Figure 35. Schematic Diagram of IC01 (SAA 5231)

14-2. PIN CONFIGURATION AND OPERATING DESCRIPTION OF THE CIRCUIT

Pin No.	Function	Operating Description
1	SYNC Output to TV	Output with dual polarity buffer, a load resistor to OV or +12V Selects Positive-Going or Negative-going syncs.
2	Video input level select	When this pin is low, a 1V Video input level is selected. When the pin is not connected it floats high selecting a 2.5V video input level
3	HF Filter	The video signal for the HF-LOSS compensator is filtered by a 15PF capacitor connected to this pin.
4	Store H.F	The HF amplitude is stored by a 1nF capacitor.

Pin No.	Function	Operating Description
5	Store Amplitude	The amplitude for the adaptive data slicer is stored by a 470PF capacitor connected to this pin.
6	Store Zero Level	The zero level for the adaptive data slicer is stored by a 22nF capacitor.
7	External data input	Not Used
8	DATA Timing	A 270PF capacitor is connected to this pin for timing of the adaptive data slicer.
9	Store Phase	The output signal from the clock phase detector is stored by a 100PF capacitor.
10	Video tape recorder mode	Not Used
11	Crystal	A 13.875MHz crystal, 2X DATA RATE, connected in series with a 15pF capacitor is applied via this pin to the oscillator and DIVIDE-BY-TWO to provide the 6.9375 MHz clock signal.
12	Clock Filter	A filter for the 6.9375 MHz clock signal is connected to this pin.
13	Ground	
14	Teletext clock output	Clock output for CCT (COMPUTER CONTROLLED TELETEXT)
15	Teletext data output	Data output for CCT
16	Supply voltage	Vcc (12V)
17	Clock output (F6)	6 MHz clock output for timing and sandcastle generation in CCT
18	Oscillator output (6 MHz)	Control the nominal frequency of the Vco
19	Filter 2	A filter with a short time constant is for the horizontal phase detector.
20	Oscillator input (6 MHz)	Control the nominal frequency of the Vco
21	Filter 1	A filter with a long time constant is for the horizontal phase detector.
22	Sandcastle input pulse	SANDCASTLE WAVEFORM 
23	Pulse timing resistor	The current for the pulse generator is defined by a 56K Ω resistor.
24	Pulse timing capacitor	The timing of the pulse generator is determined by a 220PF capacitor
25	Video composite sync output (VCS)	The output signal is for CCT
26	Black level	The black level for the adaptive sync separator is stored by a 68nF capacitor.
27	Composite video input (CVS)	The composite video signal is input via a 2.2uF clamping capacitor to the adaptive sync separator.
28	Text composite sync input ($\overline{TCS}$)/SCAN composite sync input ($\overline{SCS}$)	$\overline{TCS}$ is input from CCT or $\overline{SCS}$ from external sync circuit. $\overline{SCS}$ is expected when there is no load resistor at pin 1. If pin 28 is not connected the sync output on pin 1 will be the composite video input at pin 27, internally buffered.

15. ENHANCED COMPUTER CONTROLLED TELETEXT CIRCUIT (IC02, SAA 5243) (Not in use)

15-1. THE BASIC CONSTRUCTION

The SAA 5243 performs all the digital logital logic functions of a 625-LINE world system teletext decoder. It operates in conjunction with the teletext video processor SAA 5231, standard static RAMS and is controlled via I²C bus.
The Schematic diagram is same as figure 36.

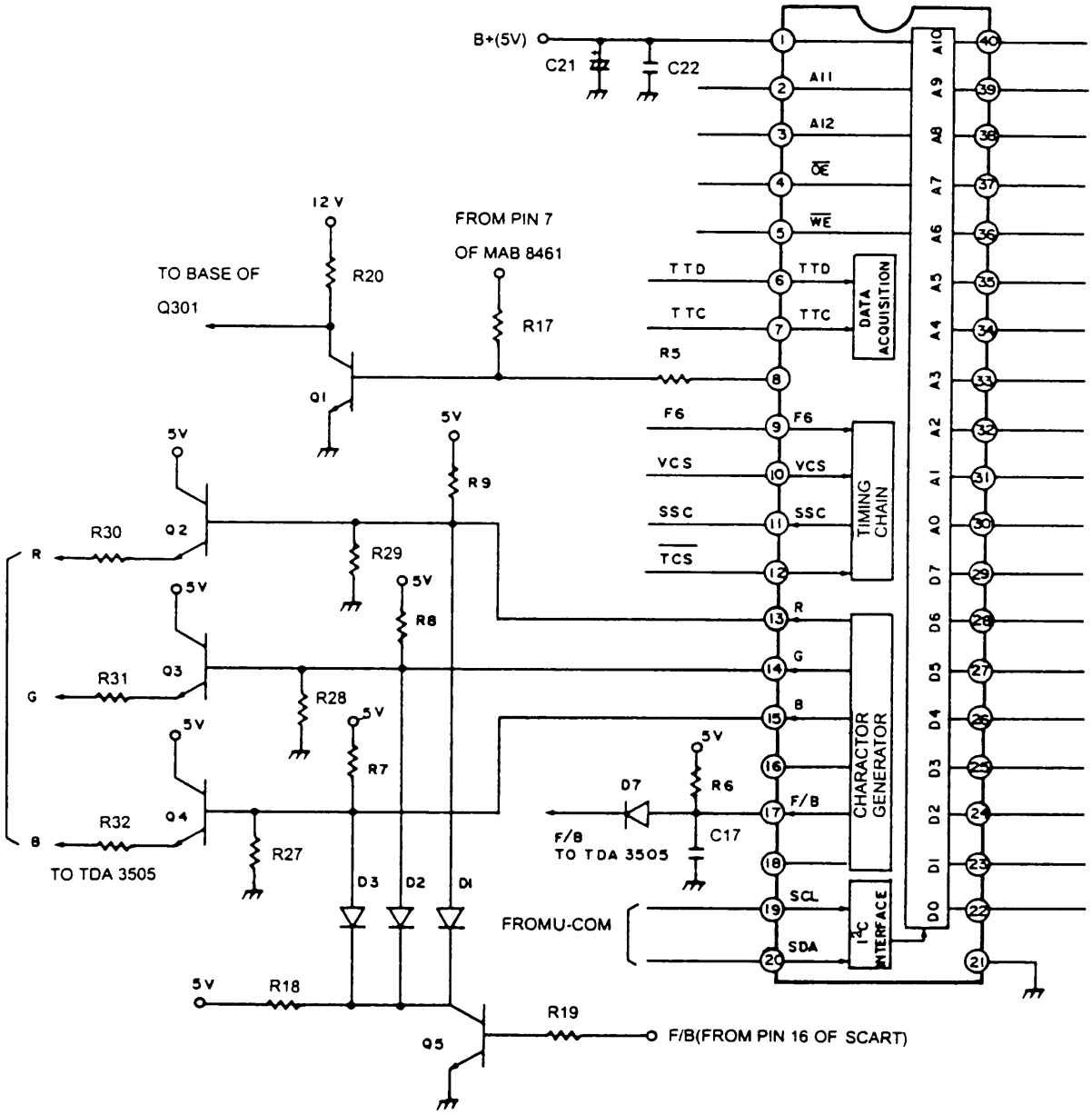


Figure 36. Schematic diagram of IC 02 (SAA 5243)

15-2. PIN CONFIGURATION AND OPERATING DESCRIPTION OF THE CIRCUIT

Pin No.	FUNCTION	OPERATING DESCRIPTION
1	Power supply	+5V
2,3,40	A11, A12, A10	Chapter address : Three outputs that select which 1K byte chapter of external RAM is being accessed for any read or write cycle.
4	$\overline{OE}$	Output enable : Active low output signal used to control the reading of the external RAM. It occurs continuously at a 1 MHz rate
5	$\overline{WE}$	Write enable : Active low output signal used to control the writing of data to the external RAM. It occurs for a valid write cycle only.
6	TTD	Teletext datea : Input from the SAA 5231 video input processor.
7	TTC	Teletext clock : 6.9375 MHz clock input from the SAA 5231.
8	$\overline{ODD}$/EVEN	For interlaced mode, the output changes once per field at.2uS before the end of line 311 (624). The output is high for EVEN fields and low for ODD fields
9	F6	Character display clock : 6 MHz clock input from the SAA 5231
10	VCS	Video composite Sync : Input from the SAA 5231 derived from the incoming video signal. SYNC pulses are active high.
11	Sandcastle	3 Level sandcastle output to the SAA 5231 containing the phase locking and color burst blanking information.
12	$\overline{TCS}/\overline{SCS}$	Text composite SYNC/SCAN composite SYNC : as an output an active low composite SYNC waveform (TCS) with interlaced or NON-INTERLACED format which is fed to the SAA 5231 to drive the display timebases. Alternatively this pin can act as an input for an active low composite SYNC waveform (SCS) to 'SLAVE' the display timing circuits.
13,14,15	R.G.B	RED, GREEN, BLUE : These three open drain outputs are the character video signals to the television display circuits. They are active high and contain character and background information.
16	$\overline{COR}$	Contrast reduction : Not used
17	Blanking	Fast blanking : Open drain, active high output which controls the blanking of the television picture for a normal text display and for a mixed display
18	Y	Character foreground : Not used
19	SCL	Serial clock : Input signal which is the I²C bus clock from u-com
20	SDA	Serial data : Is the I²C bus data line. It is an input/output function with an open drain output
21	Vss	Ground
22-29	D^0-D^7	8 RAM data lines : 3-STATE input/output pins which carry the data bytes to and from the external RAM.
30-39	A^0-A^9	RAM ADDRESS : 10 Output signals that determine which byte location within a 1K byte chapter of external RAM is accessed for any read or write cycle.

When we choose the teletext mode with transmitter, transistor Q2, Q3 and Q4 are ON, they are buffer.
At this time, diode D1, D2 and D3 are OFF.
When we connect the external RGB signals to the scart.
The base of transistor Q5 is high, and diode D1, D2, D3 and transistor Q5 are on, so the external RGB signals connected to scart display on the screen.

16. 8192 x 8 BIT STATIC RAM (IC03, GM 76C 88L) (Not in use)

16-1. DESCRIPTION

The GM 76C 88L is 65,536 bit static random access memory organized as 8.192 words by 8 bits using CMOS technology and operated from a single 5V supply.

16-2. FEATURES

1) 8,192 x 8 Organization
2) Access time : 150nS
3) Completely static RAM : No clock or timing strobe required
4) NON-VOLATILE storage with BACK-UP batteries.
5) 3-STATE output with WIRED-OR capability
6) Directly TTL compatible : All inputs and outputs

16-3. BLOCK DIAGRAM

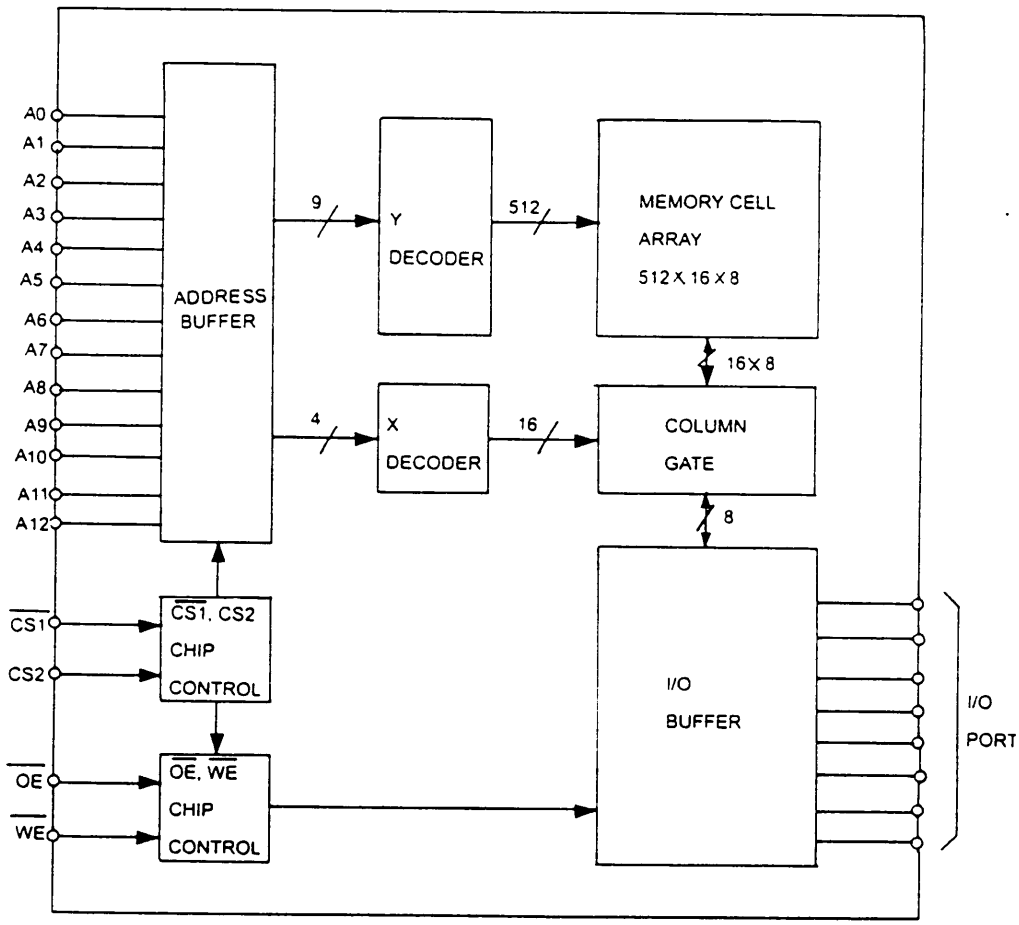


Figure 37. Schematic diagram of IC03 (GM 76C 88)

17. 266 X 8 BIT STATIC CMOS EEPROM WITH I²C BUS INTERFACE. (IC05, PCD 8582) (Not in use)

17-1. THE BASIC CONSTRUCTION.

The PCD 8582 is a 2K-Bit 5V electrically erasable programmable read only memory (EEPROM) organized as 256 x 8 Bits.
The data bytes are received and transmitted via the serial I²C bus
The Schematic diagram is same as figure 38.

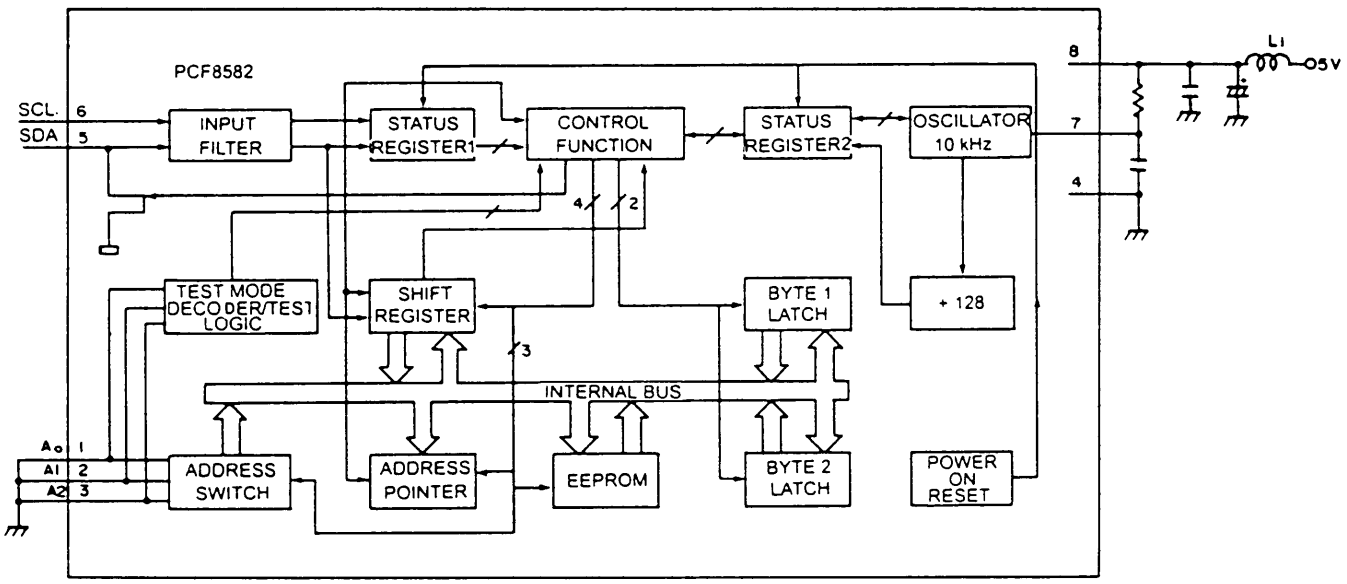


Figure 38. Schematic diagram of IC05 (PCD 8582)

17-2. PIN CONFIGURATION

Pin No.	Function	Description
1	A^0	Ground
2	A^1	Address inputs/TEST : Ground
3	A^2	Mode select : Ground
4	Vss	Ground
5	SDA	I²C bus
6	SCL	I²C bus
7	RC	Input for timer costant
8	V^{DD}	Power Supply (5V)

17-3. FEATURES

1) NON-Volatile storage of 2K-bit organized as 256x8
2) On chip voltage multiplier for erase/write
3) Automatic word address incrementing
4) One point erase/Write timer
5) Power on reset
6) Infinite number of read cycles.

18. MICROCONTROLLER (IC04, MAB 8461) (Not in use)

18-1. THE BASIC CONSTRUCTION

The MAB 8461 is the microcontroller of a range of stand-alone teletext software packages for use with the SAA 5243 ECCT integrated circuit. It comprises a high performance full level one features (FASTEXT) teletext decoder.

The MAB 8461 consists of an 8 bit cpu, 6K (6144 BYTES) program ROM, 128 bytes data RAM, 8 bit timer/event counter and signal level three source interrupt structure.

ON-Chip circuitry is included to perform byte level organized serial I/O which completely fulfills the MULTI-MASTER bidirectional I²C bus specification. The device has up to 20 general purpose bidirectional I/O ports.

The Schematic diagram is same as figure 39.

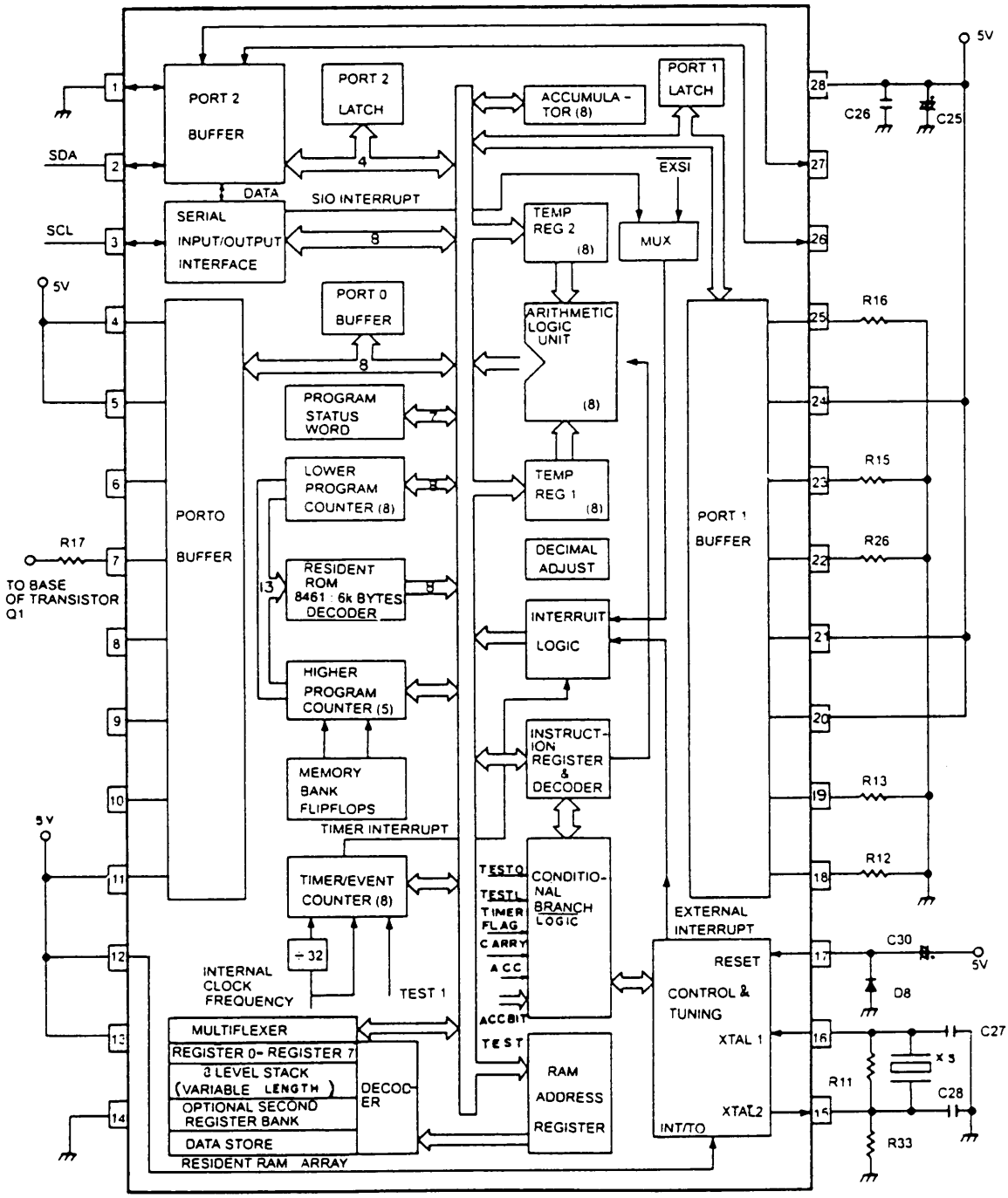
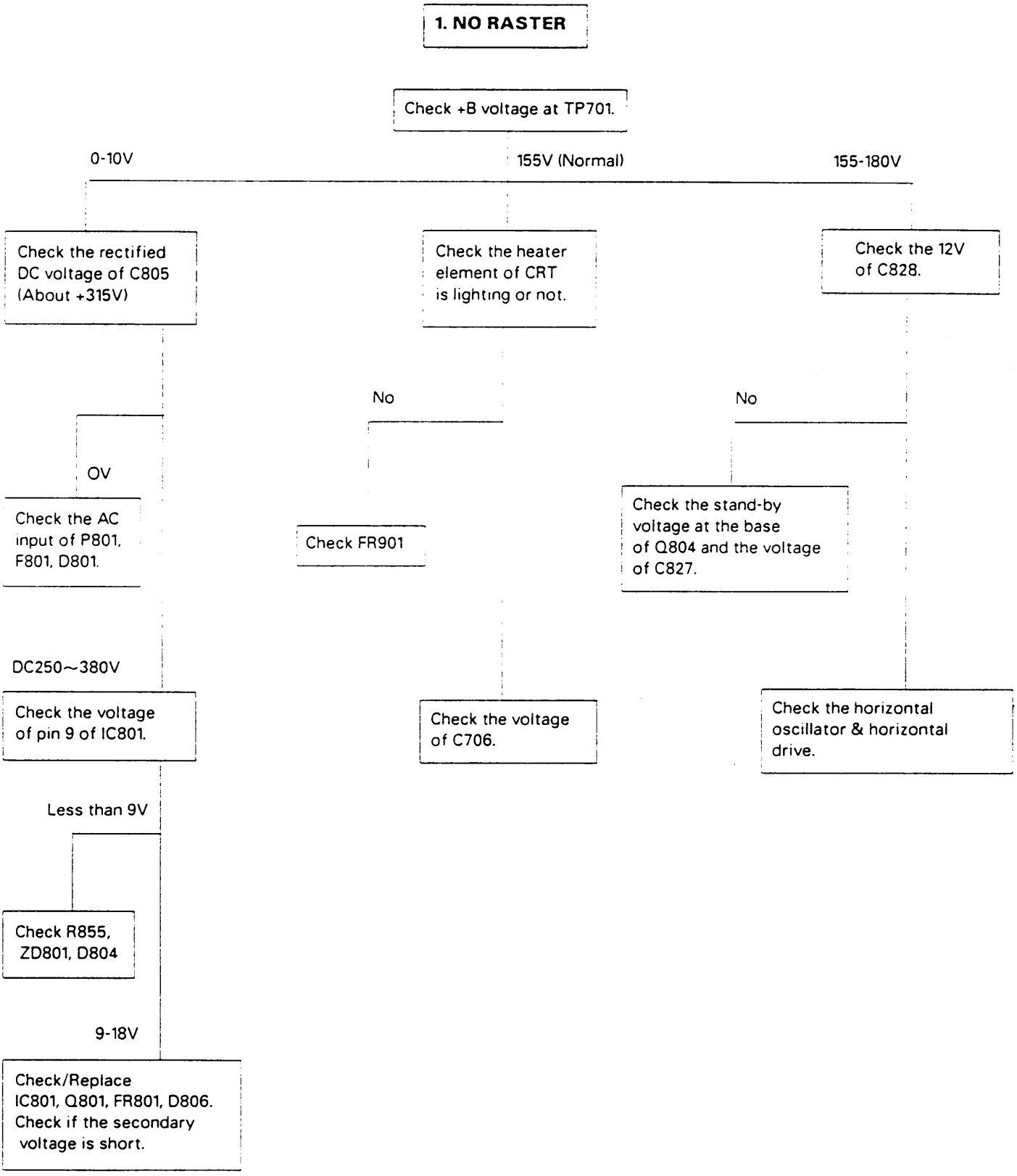


Figure 39. Schematic diagram of IC 04 (MAB 8461)

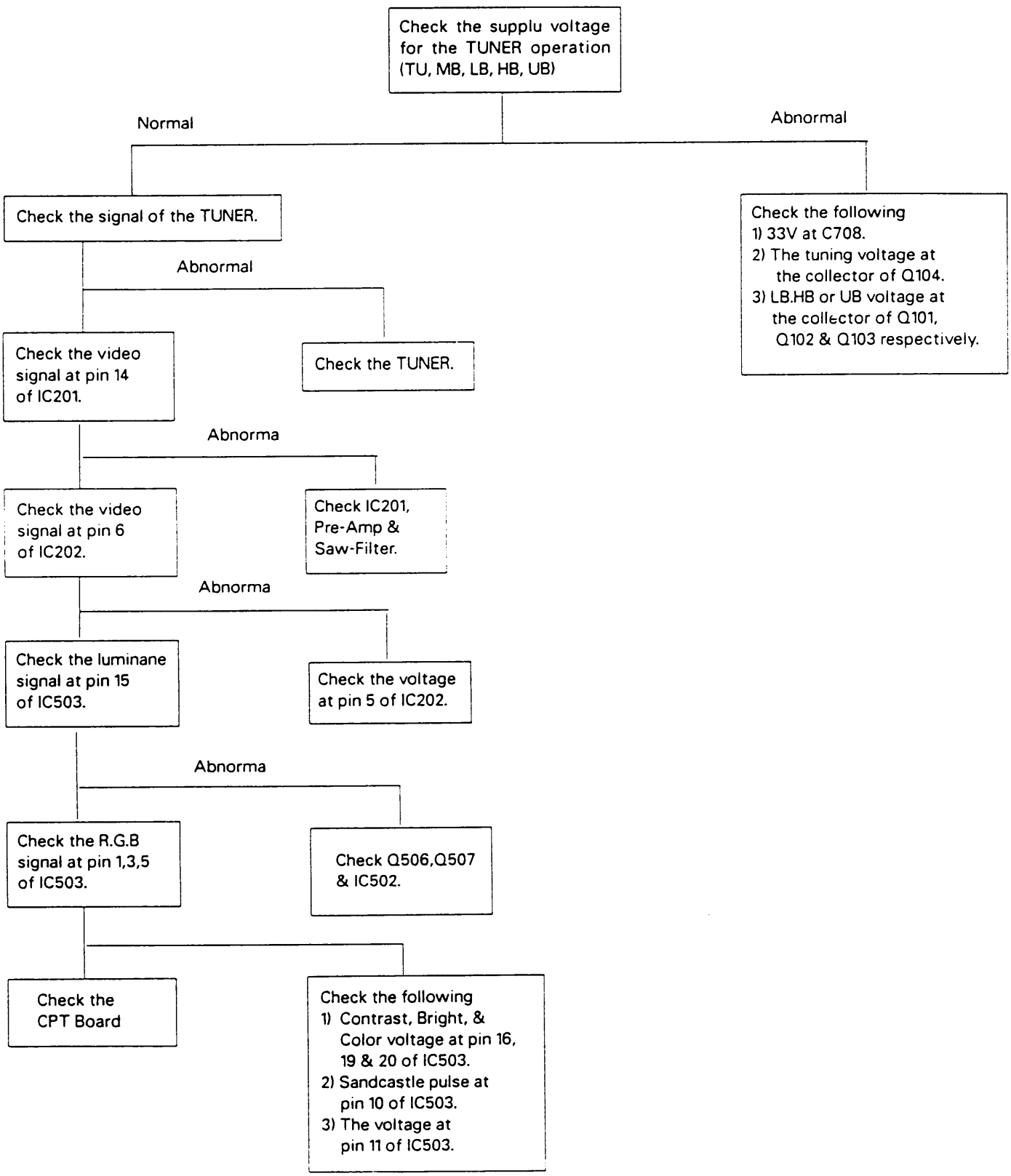
18-2. PIN CONFIGURATION

Pin No.	Name	Function	Remark
1	P22	Not used	Ground
2	SDA	Serial data I'C bus	
3	SCL	Serial clock I'C bus	
4	P00	Link-SelectI'C /MIBUS CONTROL	5V
5	P01	Power down imminent input	5V
6	P02	PL OUT	Not used
7	P03	PON OUT	
8	P04	PROC data output	Not used
9	P05	PROC clock output	Not used
10	P06	Mis data input	Not used
11	P07	Data inhibit output	5V
12	$\overline{INT}$/TO	MIBUS DLEN, NAND, DLIM	5V
13	T1	PL Signal input	5V
14	Vss	Ground	
15	XTAL1	Crystal oscillator connection	
16	XTAL2	Frequency = 6 MHz $\pm$500 Hz	
17	RESET	Reset circuit	
18	P10	Link-Select Fastext/List mode at power up	
19	P11	Link-English/European MIBUS & Screen Symbols	
20	P12	Link-2K8/8K8 static page RAM connected	5V
21	P13	Link-Enable use of NVRAM	5V
22	P14	Link-Enable packet 8/30 identification display	
23	P15	Link-Enable on screen prompts	
24	P16	Link-Enable LCB controlled KETY/STATUS ROW	5V
25	P17	Link-Enable status row used in NON-FASTEXT	
26	P20	Link-Select 128/256 byte NVRAM	Not used
27	P21	Link-Enable display of row 24	Not used
28	Vcc	Power supply (5V)	

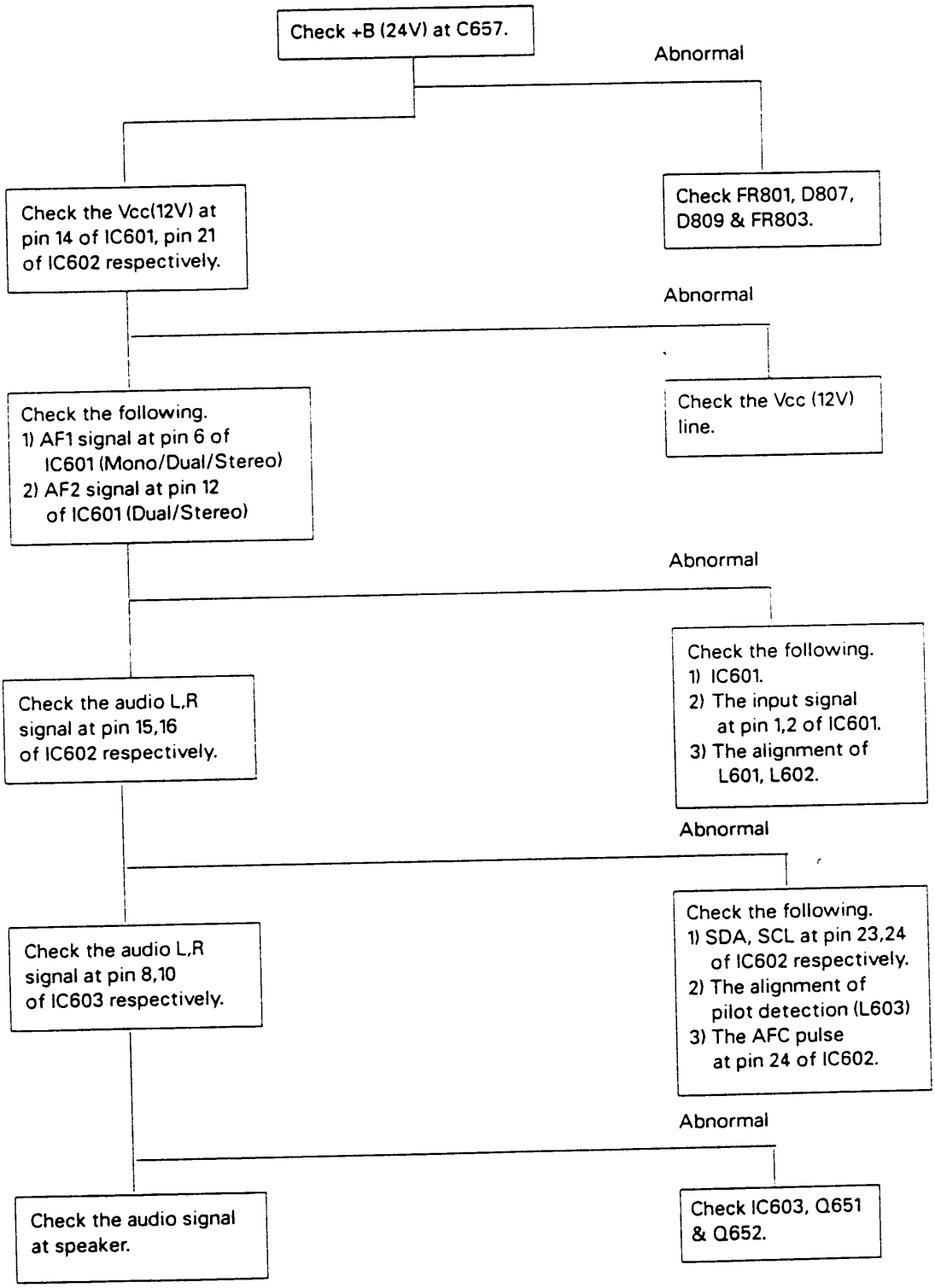
TROUBLESHOOTING GUIDE



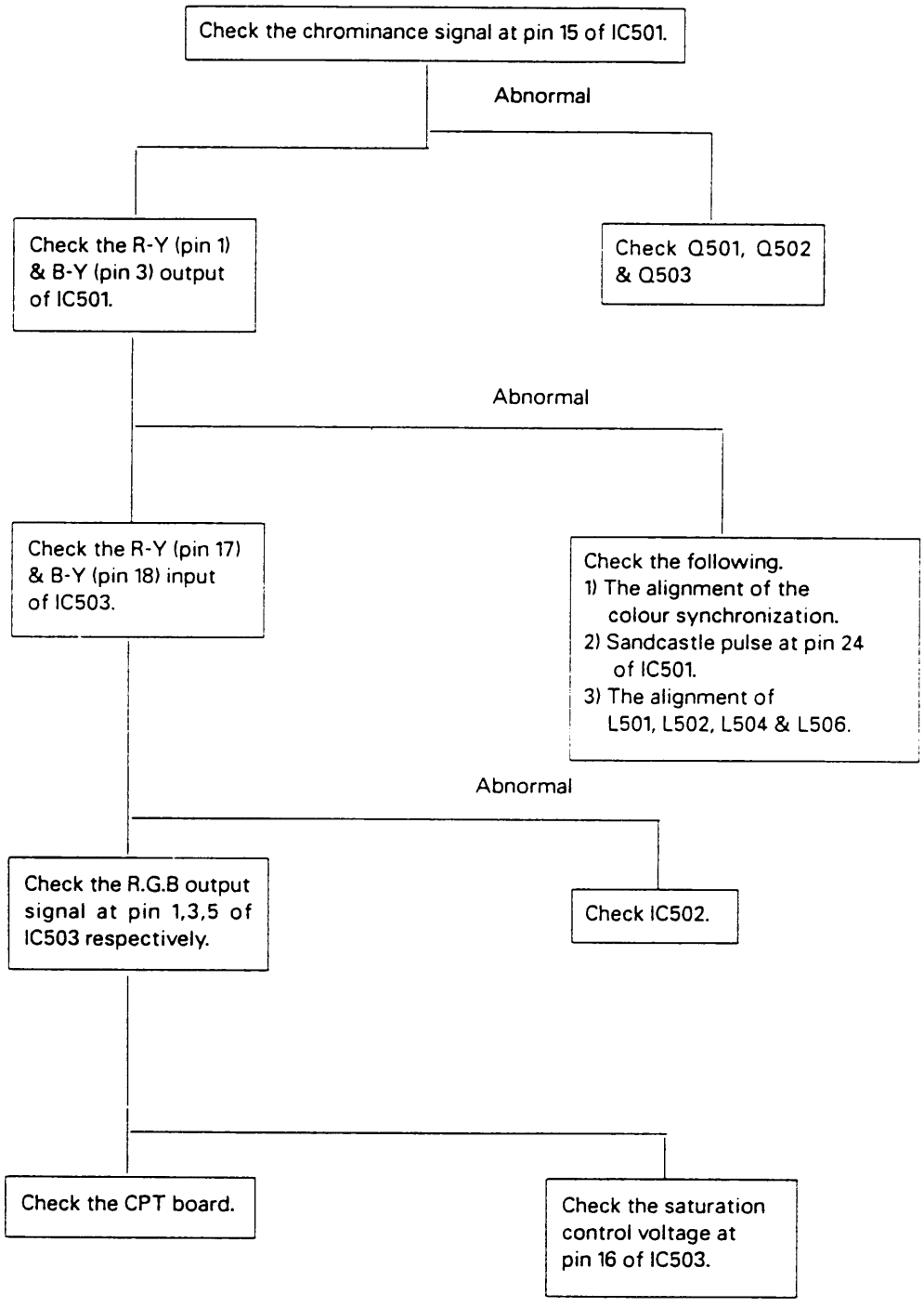
2. NO PICTURE (RASTER & SOUND OK)



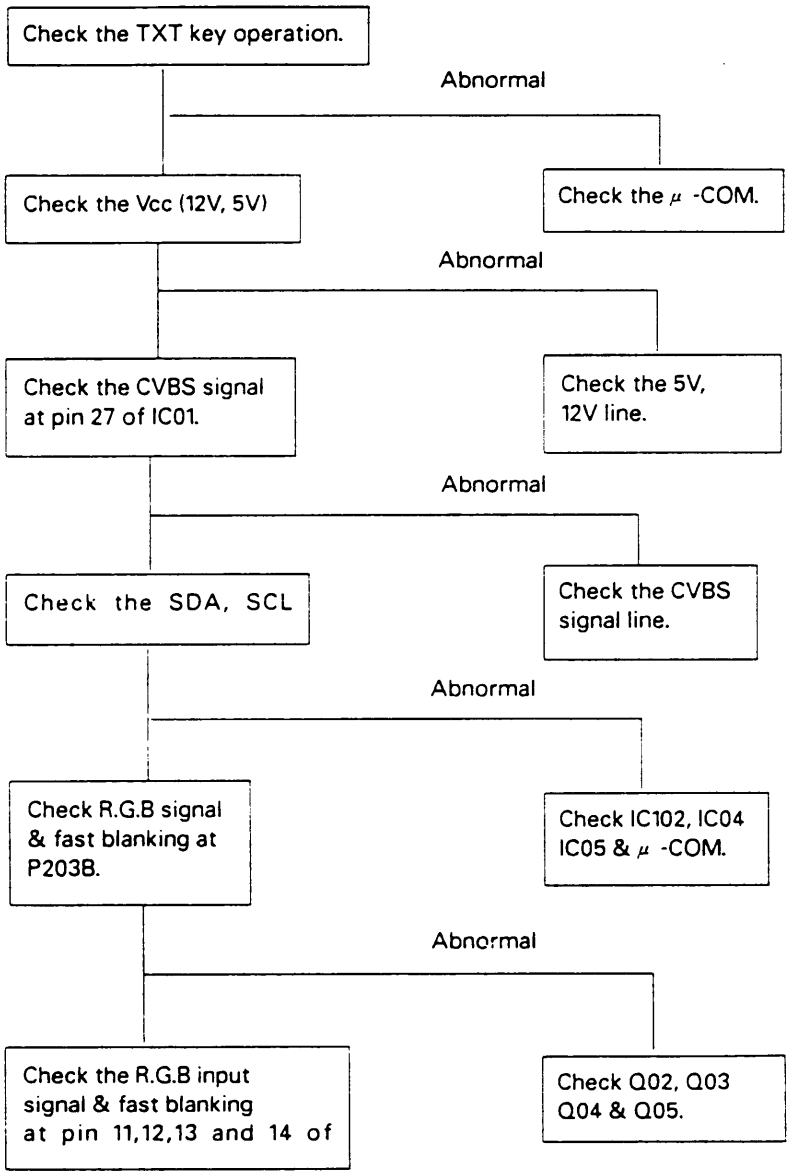
3. NO SOUND (PICTURE OK)



4. NO COLOUR

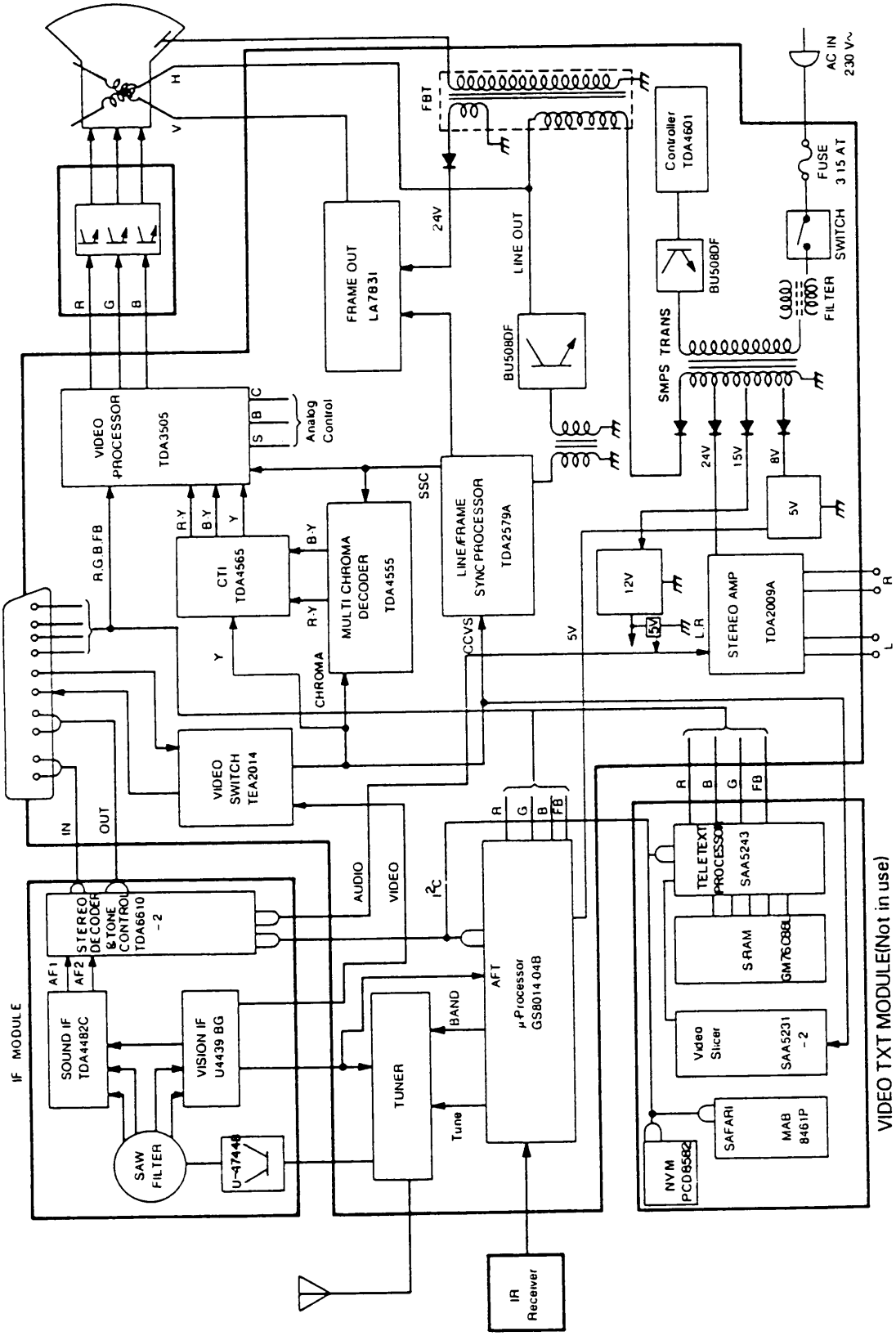

Check the chrominance signal at pin 15 of IC501.
Abnormal
Check the R-Y (pin 1) & B-Y (pin 3) output of IC501.
Check Q501, Q502 & Q503
Abnormal
Check the R-Y (pin 17) & B-Y (pin 18) input of IC503.
Check the following.
1) The alignment of the colour synchronization.
2) Sandcastle pulse at pin 24 of IC501.
3) The alignment of L501, L502, L504 & L506.
Abnormal
Check the R.G.B output signal at pin 1,3,5 of IC503 respectively.
Check IC502.
Check the CPT board.
Check the saturation control voltage at pin 16 of IC503.

5. NO TELETEXT (Not in use)

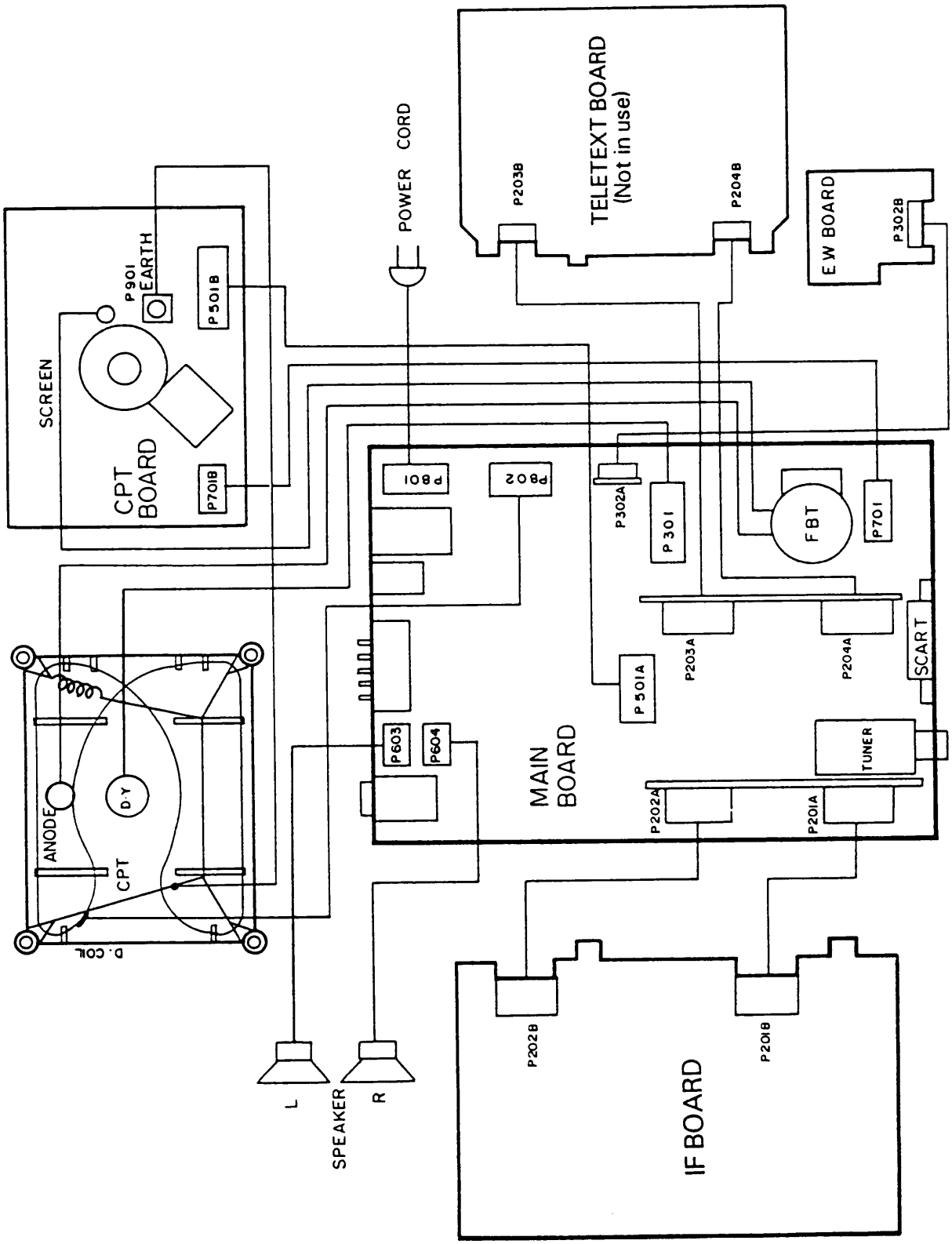


1) If teletext sync is not correct, the teletext picture move to left of right, then readjust VC1 to be 6.0MHz.
2) If teletext data error occurs, readjust channel memory or VIF & AFT alignment.

BLOCK DIAGRAM



WIRING DIAGRAM



COMPONENT LOCATION GUIDE

(Refer to page 53)

R101 1A
R102 1A
R103 1A
R104 1A
R105 1A
R106 1A
R107 1A
R108 2B
R109 1A
R110 2B
R111 3A
R113 1B
R114 1B
R115 1B
R116 2B
R117 2B
R118 2B
R119 3A
R120 3A
R121 3A
R122 3A
R123 2B
R124 3A
R126 2B
R127 2B
R128 3A
R129 3A
R130 3A
R131 3A
R132 1A
R133 3A
R134 3A
R135 2A
R136 2A
R137 2A
R138 2A
R139 2A
R140 2A
R141 2A
R142 2A
R143 2A
R144 2A
R145 2A
R146 2A
R147 2B
R148 2B
R149 2B
R150 4A
R151 4A
R152 4A
R153 3C
R154 3B
R155 1B
R156 2B
R157 2B
R158 3A
R159 2B
R162 3A
R181 2E
R182 1E
R183 2E
R184 1E
R185 2E
R186 2D
R187 1E
R231 3E
R232 2E
R233 3E
R301 3D
R302 3D
R303 4C
R304 4D
R305 3D
R306 3D
R307 3D
R308 4D
R309 4D
R310 4D
R311 4D
R312 4D
R313 3D
R314 4D
R315 4C
R401 3E
R404 3E
R405 3E
R407 3E
R408 4E
R409 4E
R410 4E
R411 4D
R412 4E
R413 4D
R414 4D
R416 2B
R417 5D
R418 4D
R419 5D
R420 4D
R501 1C
R502 1D
R503 1D
R504 1D
R505 1D
R506 2D
R507 2D
R508 2D
R509 2D
R510 2D
R511 2D
R512 2D
R513 3E
R514 3E
R515 2D
R516 3D
R517 2D
R518 2D
R519 2D
R520 2D
R521 1C
R522 1C
R523 1C
R524 3D
R525 3D
R527 2D
R528 1C
R529 1C
R530 2C
R531 2C
R532 2C
R533 2C
R534 2C
R535 2B
R536 2B
R537 2B
R539 2C
R541 2C
R542 1C
R543 1C
R544 1C
R545 1C
R546 1C
R547 3D
R548 3D
R549 2D
R550 3D
R551 1C
R552 1C
R638 1A
R639 1A
R640 1C
R641 1C
R642 2B
R643 1B
R644 1B
R645 1B
R650 1B
R651 1B
R652 1B
R653 1B
R654 1B
R655 1B
R656 1C
R657 1C
R658 1B
R701 4E
R702 4E
R703 5E
R704 3E
R705 3C
R801 4B
R802 4B
R803 3B
R804 4B
R805 3B
R806 3B
R807 4B
R808 4A
R809 3B
R810 4A
R811 4B
R821 3C
R822 3C
R823 3B
R824 3B
R825 3C
R851 4B
R852 5C
R853 5B
R854 5A
R855 4A
FR401 4D
FR402 5D
FR601 2B
FR701 4E
FR702 5E
FR703 4E
FR704 5E
FR801 4C
FR802 4C
FR803 4C
FR804 3C
VR301 3D
VR401 4D
VR402 4D
VR501 1D
VR801 3B

C101 1A
C102 1B
C103 2B
C104 2B
C105 2A
C106 3A
C107 3A
C108 1B
C110 3A
C111 3A
C112 1A
C113 2B
C114 3A
C115 3A
C116 3A
C117 3A
C118 4A
C119 1A
C120 2A
C121 3B
C122 1B
C181 1E
C182 1E
C183 1E
C184 1E
C185 1E
C186 1E
C187 1E
C188 1E
C189 2E
C220 2E
C222 3E
C223 2E
C224 2E
C225 3E
C261 2E
C262 2E
C301 3D
C302 3D
C303 3C
C304 3D
C305 4C
C306 4C
C307 4D
C308 4C
C309 4D
C401 3E
C402 3E
C403 3E
C404 3E
C405 3E
C406 3E
C407 3E
C408 4E
C409 4E
C410 4D
C411 4D
C412 3D
C413 4D
C415 4D
C416 4D
C417 4D
C418 4D
C419 5D
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C422 5D
C423 5C
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C425 5D
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C505 1D
C506 3D
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C834 3B
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C853 4B
C854 4B
VC101 1A
VC501 2D

D103 2B
D104 2B
D108 3B
D109 3C
D110 4A
D181 2D
D182 2E
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D401 5D
D402 5D
D403 2D
D404 4D
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D702 3E
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D808 4C
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ZD803 3C

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Q108 3A
Q109 3A
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Q183 2D
Q301 3D
Q302 3D
Q401 4D
Q402 5D
Q403 3D
Q501 3D
Q502 2D
Q503 2D
Q504 1C
Q505 1C
Q506 3D
Q507 2D
Q651 1C
Q652 1B
Q801 4B
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Q803 3C
Q804 3B
Q805 3C

IC101 2A
IC202 2E
IC204 2E
IC205 2E
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IC501 2D
IC502 1C
IC503 2C
IC603 1B
IC801 4B
IC802 3B

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L803 5C
L851 5B
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P101 2A
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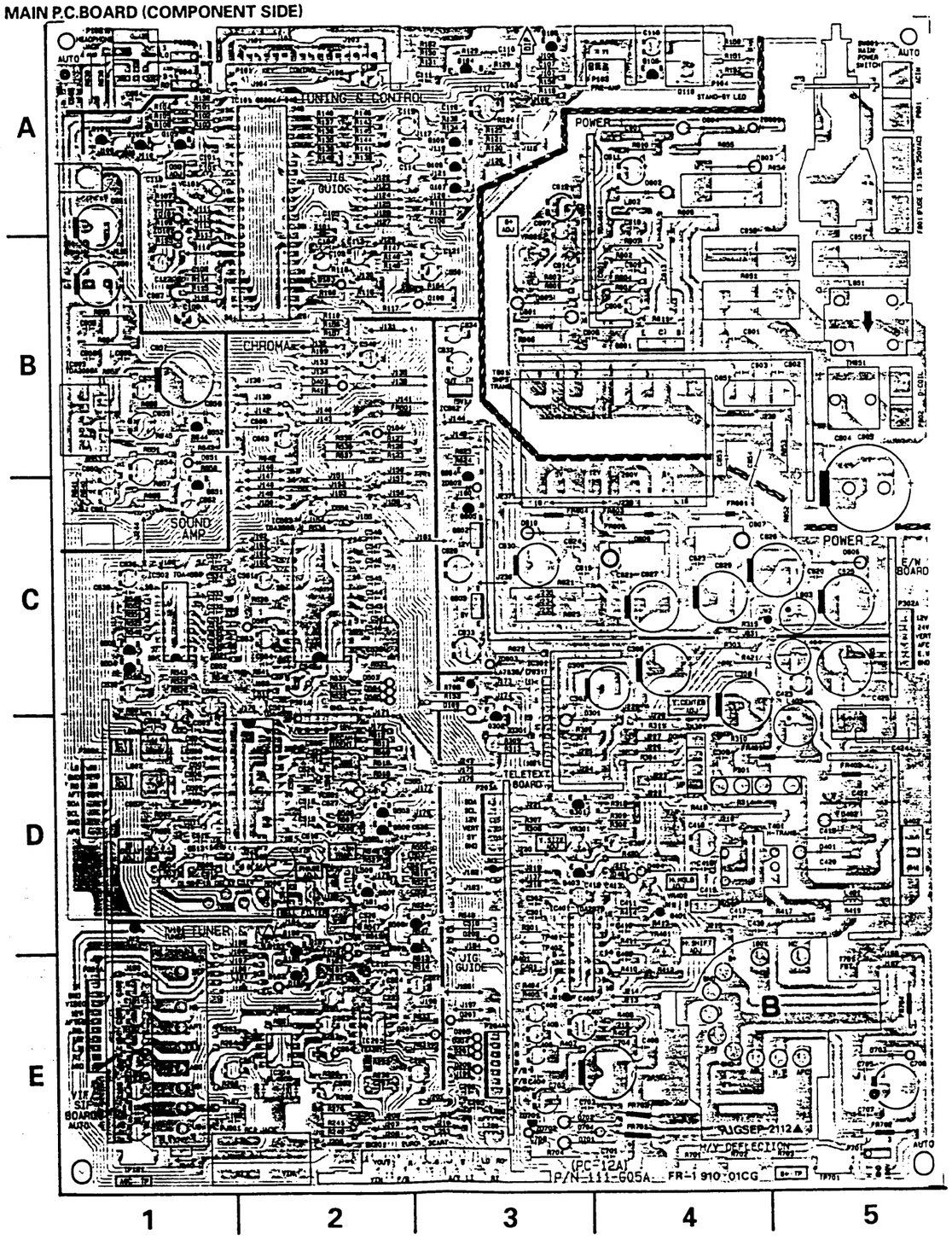
P103 4A
P104 4A
P301 4D
P603 1A
P604 1A
P701 5E
P801 5A
P802 5B
P201A 1E
P202A 1D
P203A 3D
P204A 3E
P302A 5C
P501A 2C

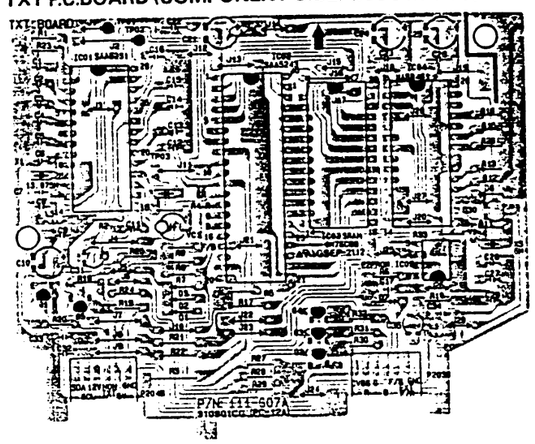
F801 5A
T401 5D
T701 5D
T801 3B
TH851 5B
TP181 1E
TP401 3D
TP402 3E
TP701 5E
TU181 1E
X101 2B
X501 2D
PJ601 2E
SW301 4D
SW801 5A

PRINTED CIRCUIT BOARD

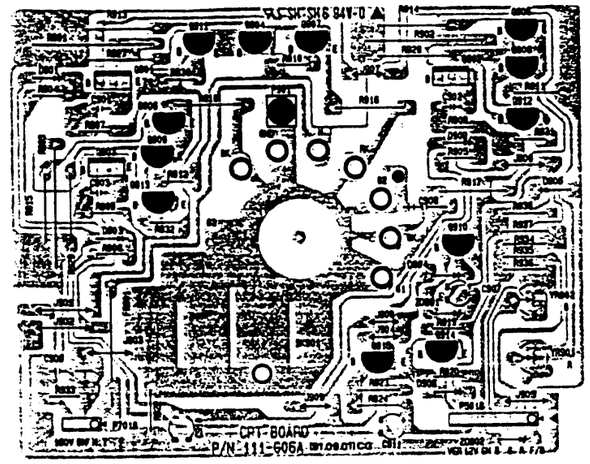
MAIN P.C.BOARD (COMPONENT SIDE)



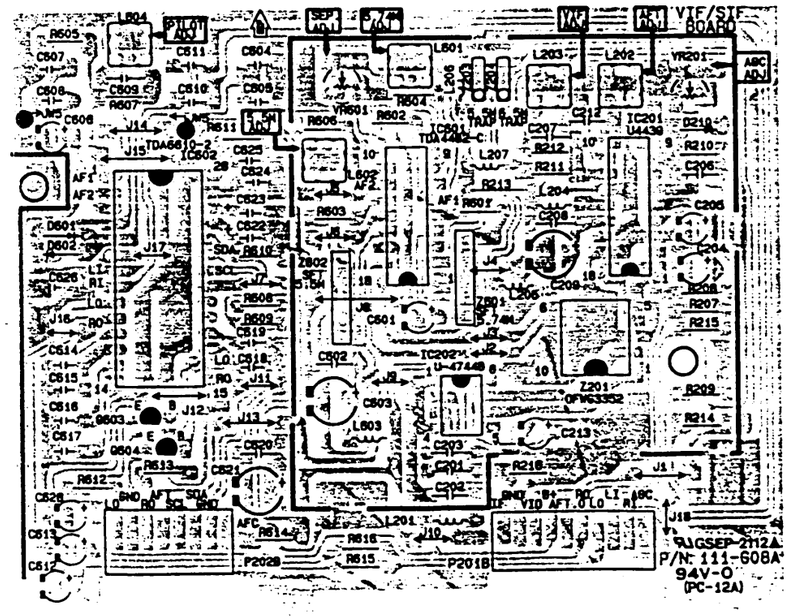
TXT P.C.BOARD (COMPONENT SIDE) (Not in use)



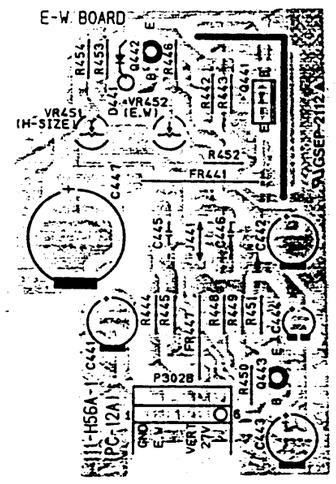
CPT P.C.BOARD (COMPONENT SIDE)



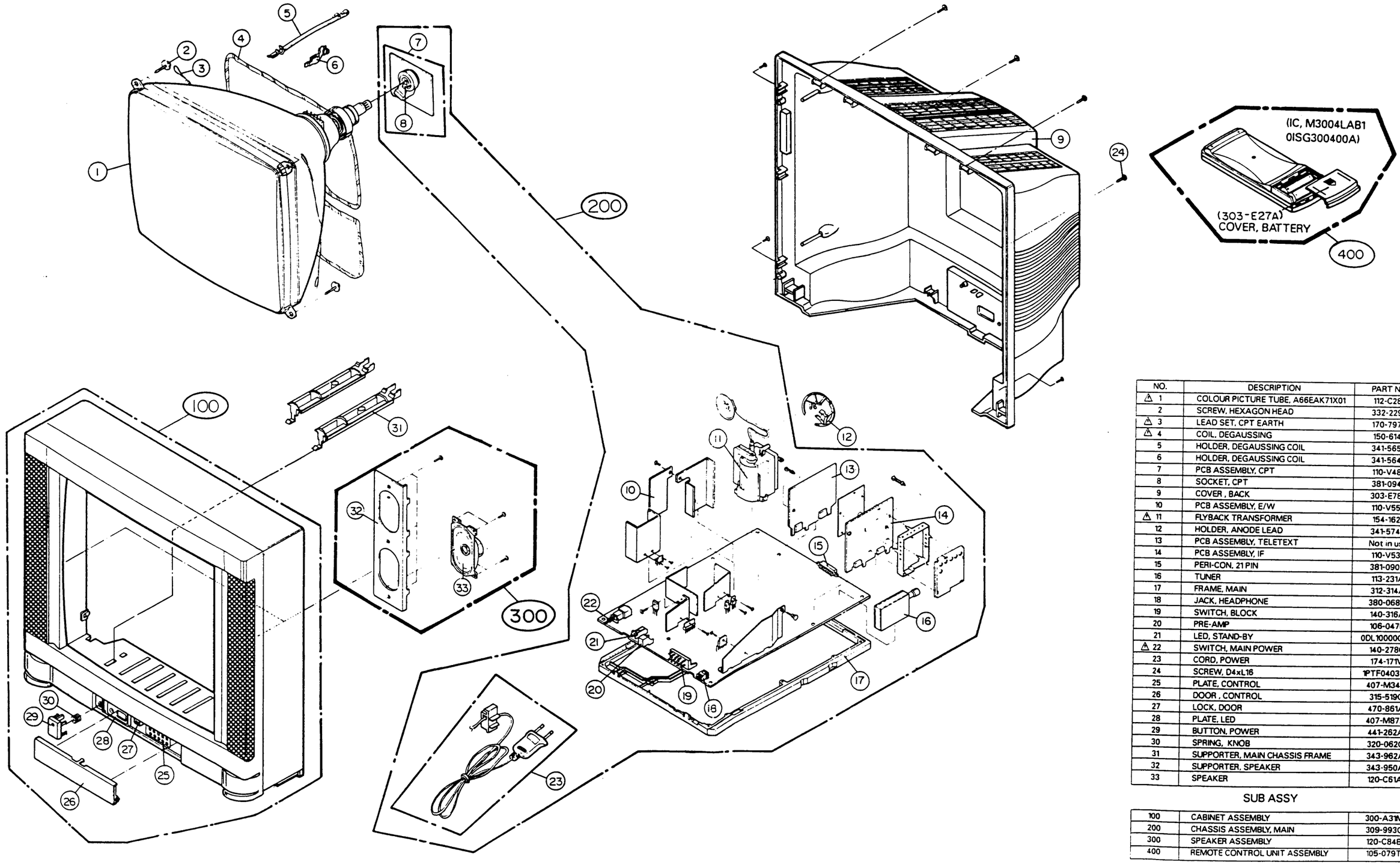
IF P.C.BOARD (COMPONENT SIDE)



E.W P.C.BOARD (COMPONENT SIDE)



EXPLODED VIEW



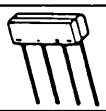
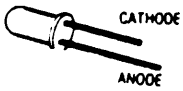
NO.	DESCRIPTION	PART NO.
⚠ 1	COLOUR PICTURE TUBE, A66EAK71X01	112-C28B
2	SCREW, HEXAGON HEAD	332-229G
⚠ 3	LEAD SET, CPT EARTH	170-797G
⚠ 4	COIL, DEGAUSSING	150-614B
5	HOLDER, DEGAUSSING COIL	341-565A
6	HOLDER, DEGAUSSING COIL	341-564A
7	PCB ASSEMBLY, CPT	110-V48E
8	SOCKET, CPT	381-094B
9	COVER , BACK	303-E78U
10	PCB ASSEMBLY, E/W	110-V55H
⚠ 11	FLYBACK TRANSFORMER	154-162F
12	HOLDER, ANODE LEAD	341-574A
13	PCB ASSEMBLY, TELETEXT	Not in use
14	PCB ASSEMBLY, IF	110-V53L
15	PERI-CON, 21 PIN	381-090A
16	TUNER	113-231A
17	FRAME, MAIN	312-314A
18	JACK, HEADPHONE	380-068A
19	SWITCH, BLOCK	140-316A
20	PRE-AMP	106-047B
21	LED, STAND-BY	0DL100000AE
⚠ 22	SWITCH, MAIN POWER	140-278C
23	CORD, POWER	174-171V
24	SCREW, D4xL16	1PTF0403116
25	PLATE, CONTROL	407-M34A
26	DOOR , CONTROL	315-519C
27	LOCK, DOOR	470-861A
28	PLATE, LED	407-M87A
29	BUTTON, POWER	441-262A
30	SPRING, KNOB	320-062G
31	SUPPORTER, MAIN CHASSIS FRAME	343-962A
32	SUPPORTER, SPEAKER	343-950A
33	SPEAKER	120-C61A

SUB ASSY

100	CABINET ASSEMBLY	300-A31M
200	CHASSIS ASSEMBLY, MAIN	309-993C
300	SPEAKER ASSEMBLY	120-C84B
400	REMOTE CONTROL UNIT ASSEMBLY	105-079T

TERMINAL VIEW OF SEMICONDUCTOR

DIODE

FIGURE	DESCRIPTION	REFERENCE NO.
	DS4148TA	D1-3,7,8,103,104 108,109,181,182 201-207, 403,404,440 502-505 651,901 902,903,905,906
	IN4003TA	D301,D804
	RL-4Z	D807,808
	R10J	D701-703,801-803,805
	RGP15J	D806,810
	RB-156	D851
	DL-1LO	D110
	MTZ 5.6B	ZD101,102,181,901
	HZ-12(B) T2	ZD802
	MTZ 18B	ZD801
	HZ33TE	ZD702
	MTZ 2.4A	ZD443
	MTZ 30B	ZD301
	MTZ3.6B	ZD440
	MTZ6.8B	ZD444
	MTZ12B	ZD446
	Z12BM	ZD902
	GU3C	D401,402

TRANSISTOR

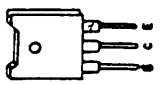
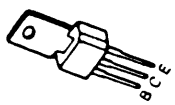
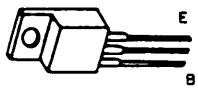
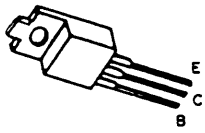
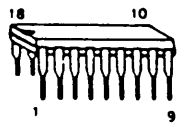
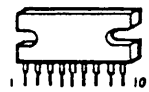
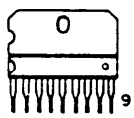
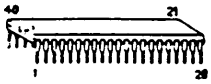
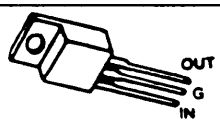
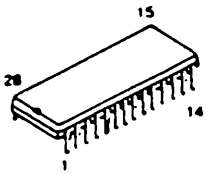
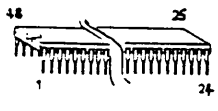
	BU508DF	Q402,Q801
	KTC 3198Y	Q1,2,3,4,5,104-109,182 183,301,302 ,403,441 501,503,506,507,603 604,651,652,804 805,910,914
	KTA 1266Y	Q101,102,103,Q915
	BF422	Q904,905,906
	BF421	Q907-909,911-913
	KTA1270-Y	Q440
	KTC 2068	Q401

FIGURE	DESCRIPTION	REFERENCE NO.
	KTC3229	Q901,902,903
	KTD2058	Q802,Q803

IC

	TDA-2579	IC401
	TDA4565	IC502
	TDA4439	IC201
	TDA 4482C	IC601
	PCD 8582	IC05
	TEA2014	IC205
	GL4558	IC204
	U4744B	IC202
	LA7831	IC301
	TDA2009A	IC603
	TDA4601	IC801
	SAA5243P	IC02
	GL7805	IC802
	MAB8461P/W172	IC04
	TDA4555	IC501
	SAA5231	IC01
	TDA3505	IC503
	TDA6601-2	IC602
	GM76C88L-15	IC03
	GS8014-04C	IC101

SAFETY PARTS LIST OF PC-12A CHASSIS ⚠

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed without being noticed by a visual inspection and the X-RAY RADIATION protection afforded by some of 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 circuit diagram. Before replacing any these components, read the specification of the part carefully. The use of substitute replacement parts which do not have the same characteristics as specified in this parts list may create X-RAY RADIATION.

LOCA.NO	DESCRIPTION
C420	CAPACITOR
C425	CAPACITOR
C805	CAPACITOR
C851	CAPACITOR
C852	CAPACITOR
C853	CAPACITOR
C854	CAPACITOR
D806	DIODE
F801	FUSE
FR401	RESISTOR, FIX METAL FILM OXIDE
FR402	RESISTOR, FIX METAL FILM OXIDE
FR701	RESISTOR, FUSIBLE
FR702	RESISTOR, FUSIBLE
FR703	RESISTOR, FUSIBLE
FR704	RESISTOR, FUSIBLE
FR801	RESISTOR, FUSIBLE
FR802	RESISTOR, FUSIBLE
FR803	FUSE
FR804	RESISTOR, FUSIBLE
L403	COIL
P801	PIN
P802	PIN
Q402	TRANSISTOR
Q801	TRANSISTOR
R851	RESISTOR
R852	RESISTOR
SW801	SWITCH
TH851	THERMISTOR
T401	TRANSFORMER
T701	FBT
T801	TRANSFORMER
	POWER SWITCH
	COIL, DEGAUSSING
	COLOR PICTURE TUBE(CPT)
	DEFLECTION YOKE(DY)

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
			407-M87A	PLATE	LED DECO.	
			410-589F	MARK	BRAND(BROTHER,SILVER)	
			441-262A	BUTTON	POWER(CBT-2871)	
			450-018C	ADAPTER	ANT.(300 TO 75) PAL	
			470-861A	LOCK	ASSY.DOOR A(FCO	
			482-F78G	INSTRUCTIONS(OWNER'S MANUAL)	PC12A,CBT-2871E,BROTHER,ENG	
		C101	0CC3900K415	CAPACITOR CERAMIC(TEMP COMP)	39P 50V J NPO TP	
		C102	0CN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C103	0CE1056K618	CAPACITOR,ELECTROLYTIC	1.0MF SMS 50V M FMS TP5	
		C104	0CX1500K409	CAPACITOR TUBULA(T.C)	15PF 50V J SL TA52	
		C105	0CX1500K409	CAPACITOR TUBULA(T.C)	15PF 50V J SL TA52	
		C106	0CN1510K519	CAPACITOR TUBULA(HIGH DIELE)	150P 50V K B TA52	
		C108	0CE4740J618	CAPACITOR,ELECTROLYTIC	0.47MF SMS 50V M FMS TP5	
		C110	0CC2710K415	CAPACITOR CERAMIC(TEMP COMP)	270P 50V J NPO TP	
		C111	181-444J	C,METALPOLYESTER	0.22MF 50V J	
		C112	0CN2710K519	CAPACITOR TUBULA(HIGH DIELE)	270PF 50V K B TA52	
		C113	0CE2256K618	CAPACITOR,ELECTROLYTIC	2.2MF SMS 50V M FMS TP5	
		C114	0CE2256K618	CAPACITOR,ELECTROLYTIC	2.2MF SMS 50V M FMS TP5	
		C115	0CE2256K618	CAPACITOR,ELECTROLYTIC	2.2MF SMS 50V M FMS TP5	
		C116	0CN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C117	0CE1076F618	CAPACITOR,ELECTROLYTIC	100MF SMS 16V M FMS TP5	
		C118	0CE4766D618	CAPACITOR,ELECTROLYTIC	47MF SMS 16V M FMS TA5	
		C119	0CK104GK945	CAPACITOR,CERAMIC(HIGH DIELE)	0.1M 50V Z F TS	
		C120	0CE475K618	CAPACITOR,ELECTROLYTIC	4.7MF SMS 50V M FMS TP5	
		C121	0CE1056K618	CAPACITOR,ELECTROLYTIC	1.0MF SMS 50V M FMS TP5	
		C122	181-444G	C,METALPOLYESTER	0.15MF 50V (TR)	
		C123	0CN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C181	0CN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C182	0CE476AF618	CAPACITOR,ELECTROLYTIC	47MF SMS 16V M FMS TP5	
		C183	0CE475F618	CAPACITOR,ELECTROLYTIC	4.7MF SMS 50V M FMS TP5	
		C184	0CE106AF618	CAPACITOR,ELECTROLYTIC	10MF SMS 16V M FMS TP5	
		C185	0CE475F618	CAPACITOR,ELECTROLYTIC	4.7MF SMS 50V M FMS TP5	
		C186	0CE106AF618	CAPACITOR,ELECTROLYTIC	10MF SMS 16V M FMS TP5	
		C187	0CE475K618	CAPACITOR,ELECTROLYTIC	4.7MF SMS 50V M FMS TP5	
		C188	0CQ33331N509	CAPACITOR POLYESTER(MYLAR)	0.033U 100V K POLY TP	
		C189	181-444E	C,METALPOLYESTER	0.1MF 50V J	
		C201	0CN1C2D519	CAPACITOR TUBULA(HIGH DIELE)	100CPF 50V K B TA52	
		C202	0CN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C203	0CN102D519	CAPACITOR TUBULA(HIGH DIELE)	1000PF 50V K B TA52	
		C204	0CE225AF618	CAPACITOR,ELECTROLYTIC	2.2MF SMS 50V M FMS TP5	
		C205	0CE105AF618	CAPACITOR,ELECTROLYTIC	1.0MF SMS 50V M FMS TP5	
		C206	0CX1500K419	CAPACITOR TUBULA(T.C)	15P 50V J C TA52	
		C207	0CN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C208	0CN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C209	0CE1076F618	CAPACITOR,ELECTROLYTIC	100MF SMS 16V M FMS TP5	
		C212	0CX1R5CK619	CAPACITOR TUBULA(T.C)	1.5P 50V M C TA52	
		C213	0CE476AF618	CAPACITOR,ELECTROLYTIC	47MF SMS 16V M FMS TP5	
		C220	0CE476AF618	CAPACITOR,ELECTROLYTIC	47MF SMS 16V M FMS TP5	
		C222	0CE475F618	CAPACITOR,ELECTROLYTIC	4.7MF SMS 50V M FMS TP5	
		C223	0CN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	

Two parts which are marked with "R" in the "AL" column of this replacement parts list are in the remote control unit.

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
	R		0IC0300A00A	IC, SGS-THUMSON	M3004,AB1,2DDIP,RGM,REMOCON	
			1PTF0403016	SCREW,TRUSS HEAD TAP TITE +	"P" TYPE 04 L16 MSWR3/8K	
			1PTF0403116	SCREW,TRUSS HEAD TAP TITE +	"P" TYPE 04 L16 MSWR3/8K	
			105-079T	TRANSMITTER	ASSY (PC12A,W/O TXT,NO BRAND)	
			110-048E	PCB ASSY	CPT PC12A 28"	
			110-053L	PCB ASSY	VIF+SIF,PC12A HYPER	
			110-055H	PCB ASSY	E/W CORR,PC12A 28"	
			112-C288	CPT	A66EAC71X01(PHILIPS)	
			120-C61A	SPEAKER	125BF01LC (BUK DOO)	
			120-C84B	SPEAKER	CBT-2871 R&L	
			120-C92A	SPEAKER	CBT-2871 RIGHT	
			120-C92B	SPEAKER	CBT-2871 LEFT	
			150-614B	COIL	DEGASSING 28" FST(PAL)	
	R		166-015U	FILTER	KBR455BKTLR(WASHABLE)	
			170-797G	LEAD SET	CPT EARTH	
			174-171U	CORD	ASSY POWER(CBT-2570)	
			174-179B	CORD	DM-1	
			300-A31M	CABINET ASSY	CBT-2871E (BROTHER)	
			303-E27A	COVER	BATTERY(068TX,"AA")	
			303-678U	COVER	ASSY,BACK(CBT-2871,BROTHER)	
			305-002D	HOUSING	2P AMP 171157-1 (10)	
			305-129A	HOUSING	MKM2806-1-0-600(STOCKO)	
			309-995C	CHASSIS ASSY	MAIN PC12A(28" W/SEC,W/O TXT)	
			312-314A	FRAME	MAIN CHA (PC12A)	
			314-210A	GRILL	SPEAKER (CBT-2870)	
			315-519C	DOOR	CONTROL (CAT-2871)	
			320-062G	SPRING	KNOB	
			327-062E	SEAT	RUBBER	
			332-229G	SCREW	HEXAGON HEAD(L:40.0:22)	
			341-184D	HOLDER	LEAD TWISTER	
			341-213A	HOLDER	CORD	
			341-564A	HOLDER	D.COIL (CBT-2552/55)	
			341-565A	HOLDER	D-COIL	
			341-574A	HOLDER	ANODE LEAD	
			341-685A	HOLDER	D-COIL SPRING TYPE	
			343-445A	SUPPORTER	CPT (CBT-2870/2871)	
			343-447A	SUPPORTER	FBT	
			343-854A	SUPPORTER	PCB (DACH-6N)	
			343-950A	SUPPORTER	SPEAKER (CBT-2870)	
			343-962A	SUPPORTER	FRAME(CBT-2570)	
			347-649A	BAND	CABLE TIES	
			381-058N	SOCKET	4PIN (2.54-15.24PITCH MOLEX)	
			387-572A	CONNECTOR ASSY	FOR DY(PHILIPS 28")	
			387-717B	CONNECTOR ASSY	ASSY,3P	
			387-855R	CONNECTOR ASSY	7P(L=3)	
			407-M54A	PLATE	CONTROL DECO.	

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		C224	0CE476AF618	CAPACITOR,ELECTROLYTIC	47MF SMS 16V M FMS TP5	
		C225	0CE1066F618	CAPACITOR,ELECTROLYTIC	10MF SMS 16V M FMS TP5	
		C259	0CQ1031N509	CAPACITOR POLYESTER(MYLAR)	0.01U 100V K POLY TP	
		C260	0CQ1031N509	CAPACITOR POLYESTER(MYLAR)	0.01U 100V K POLY TP	
		C261	181-064N	CAPACITOR,ELECTROLYTIC	4.7MF 16V TR	
		C262	0CE4756K618	CAPACITOR,ELECTROLYTIC	4.7MF SMS 50V M FMS TP5	
		C263	181-064N	CAPACITOR,ELECTROLYTIC	4.7MF 16V TR	
		C264	0CE475G618	CAPACITOR,ELECTROLYTIC	4.7MF SMS 50V M FMS TP5	
		C265	0CK471CK515	CAPACITOR CERAMIC(HIGH DIELE)	470P 50V K B TS	
		C266	0CK471CK515	CAPACITOR CERAMIC(HIGH DIELE)	470P 50V K B TS	
		C267	0CN102CK519	CAPACITOR TUBULA(HIGH DIELE)	1000PF 50V K B TA52	
		C268	0CN821CK519	CAPACITOR TUBULA(HIGH DIELE)	820P 50V K B TA52	
		C269	0CN821CK519	CAPACITOR TUBULA(HIGH DIELE)	820P 50V K B TA52	
		C270	0CE4766F618	CAPACITOR,ELECTROLYTIC	47MF SMS 16V M FMS TP5	
		C271	0CE4766F618	CAPACITOR,ELECTROLYTIC	47MF SMS 16V M FMS TP5	
		C301	181-444G	C,METALPOLYESTER	0.15MF 50V (TR)	
		C302	0CQ1031N509	CAPACITOR POLYESTER(MYLAR)	0.01U 100V K POLY TP	
		C303	0CC4700K415	CAPACITOR CERAMIC(TEMP COMP)	47P 50V J NPO TP	
		C304	0CQ1021N509	CAPACITOR POLYESTER(MYLAR)	0.001U 100V K POLY TP	
		C305	0CE1086J618	CAPACITOR,ELECTROLYTIC	1000M SMS 35V M FL	
		C306	0CE2276K618	CAPACITOR,ELECTROLYTIC	220M SMS 50V M FMS TP(S)	
		C307	0CE2256K618	CAPACITOR,ELECTROLYTIC	2.2MF SMS 50V M FMS TP5	
		C308	0CE1086H618	CAPACITOR,ELECTROLYTIC	1000U SMS 25V M FL TP5	
		C309	181-444E	C,METALPOLYESTER	0.1MF 50V J	
		C401	0CN121CK519	CAPACITOR TUBULA(HIGH DIELE)	120P 50V K B TA52	
		C402	0CE1056K618	CAPACITOR,ELECTROLYTIC	1.0MF SMS 50V M FMS TP5	
		C403	0CE2266F618	CAPACITOR,ELECTROLYTIC	22MF SMS 16V M FMS TA5	
		C404	181-444G	C,METALPOLYESTER	0.15MF 50V (TR)	
		C405	0CE1066F618	CAPACITOR,ELECTROLYTIC	10MF SMS 16V M FMS TP5	
		C406	0CN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C407	0CE3376F618	CAPACITOR,ELECTROLYTIC	330M SMS 16V M FMS TP5	
		C408	0CK2710M515	CAPACITOR CERAMIC(HIGH DIELE)	270P 500V K B TS	
		C409	181-444E	C,METALPOLYESTER	0.1MF 50V J	
		C410	181-074Q	CAPACITOR	PSR 272G	
		C411	0CN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C412	0CE4766F618	CAPACITOR,ELECTROLYTIC	47MF SMS 16V M FMS TP5	
		C413	181-444E	C,METALPOLYESTER	0.1MF 50V J	
		C415	0CN391CK519	CAPACITOR TUBULA(HIGH DIELE)	390P 50V K B TA52	
		C416	0CK2710M515	CAPACITOR CERAMIC(HIGH DIELE)	270P 500V K B TS	
		C417	0CQ1031N419	CAPACITOR POLYESTER(MYLAR)	0.01U 100V J POLY NI TP	
		C418	0CE105BR618	CAPACITOR,ELECTROLYTIC	1UF NME 250V M FL TP5	
		C419	181-131D	CAPACITOR	MPP 1.6KV 103J	
		C420	181-083K	C,POLYPROPYLENE	0.0022MF 1500V J	
		C422	181-095F	CAPACITOR PE	0.033MF 400V K	
		C423	0CE105BR618	CAPACITOR,ELECTROLYTIC	1UF NME 250V M FL TP5	
		C425	181-451B	C,METAL POLYPROPYLENE	0.247MF 400V	
		C441	0CE477AD618	CAPACITOR,ELECTROLYTIC	470U SMS 10V M FMS TP5	
		C442	0CE227AJ618	CAPACITOR,ELECTROLYTIC	220M SMS 35V M FL TP(S)	
		C444	0CE476AF618	CAPACITOR,ELECTROLYTIC	47M SMS 50V M FMS TP(S)	
		C445	181-444E	C,METALPOLYESTER	0.1MF 50V J	

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		C446	181-444U	CAPACITOR	MPE.ECQ-U1H683JZ3(TR)	
		C447	QCE1066M618	CAPACITOR.ELECTROLYTIC	10MF SMS 100V M FS TP5	
		C448	QCX1200K409	CAPACITOR TUBULA(T.C)	12PF 50V J SL TA52	
		C501	QCE1056K618	CAPACITOR.ELECTROLYTIC	1.0MF SMS 50V M FM5 TP5	
		C502	QCE1056K618	CAPACITOR.ELECTROLYTIC	1.0MF SMS 50V M FM5 TP5	
		C503	QCN2210L519	CAPACITOR TUBULA(HIGH DIELE)	220PF 50V K B TA52	
		C504	QCC6800K435	CAPACITOR CERAMIC(TEMP COMP)	68P 50V J N150 TP	
		C505	QCC2200K415	CAPACITOR CERAMIC(TEMP COMP)	22P 50V J NPO TS	
		C506	QCN2710K519	CAPACITOR TUBULA(HIGH DIELE)	270PF 50V K B TA52	
		C507	QCN2210K519	CAPACITOR TUBULA(HIGH DIELE)	220PF 50V K B TA52	
		C508	QCC2200K415	CAPACITOR CERAMIC(TEMP COMP)	22P 50V J NPO TS	
		C509	QCC6800K435	CAPACITOR CERAMIC(TEMP COMP)	68P 50V J N150 TP	
		C510	QCN2710K519	CAPACITOR TUBULA(HIGH DIELE)	270PF 50V K B TA52	
		C511	QCN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C512	QC01031N509	CAPACITOR POLYESTER(MYLAR)	0.01U 100V K POLY TP	
		C513	QCN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C514	QCE1076F618	CAPACITOR.ELECTROLYTIC	100MF SMS 16V M FM5 TP5	
		C515	QC02231N509	CAPACITOR POLYESTER(MYLAR)	0.022MF 100V K POLY TP	
		C516	QCN2220F569	CAPACITOR TUBULA(HIGH DIELE)	2200P 16V K X TA52	
		C517	QCE1056K618	CAPACITOR.ELECTROLYTIC	1.0MF SMS 50V M FM5 TP5	
		C518	QC04731N509	CAPACITOR POLYESTER(MYLAR)	0.047U 100V K POLY TP	
		C519	181-444L	CAPACITOR	MPE.ECQ-U1H334JZ3(TR)	
		C520	QC02231N509	CAPACITOR POLYESTER(MYLAR)	0.022MF 100V K POLY TP	
		C521	QCN1020K519	CAPACITOR TUBULA(HIGH DIELE)	1000PF 50V K B TA52	
		C523	QCX6800K409	CAPACITOR TUBULA(T.C)	68P 50V J SL TA52	
		C524	QCX2700K409	CAPACITOR TUBULA(T.C)	27PF 50V J SL TA52	
		C525	QC04721N509	CAPACITOR POLYESTER(MYLAR)	0.0047U 100V K POLY TP	
		C526	QC04721N509	CAPACITOR POLYESTER(MYLAR)	0.0047U 100V K POLY TP	
		C527	QCC0800K115	CAPACITOR CERAMIC(TEMP COMP)	8P 50V D NPO TS	
		C528	QCN1010K519	CAPACITOR TUBULA(HIGH DIELE)	100PF 50V K B TA52	
		C529	QCC2210K415	CAPACITOR CERAMIC(TEMP COMP)	220P 50V J NPO TP	
		C530	QCN3310K519	CAPACITOR TUBULA(HIGH DIELE)	330P 50V K B TA52	
		C531	QCC2210K415	CAPACITOR CERAMIC(TEMP COMP)	220P 50V J NPO TP	
		C532	QC02231N509	CAPACITOR POLYESTER(MYLAR)	0.022MF 100V K POLY TP	
		C533	QC02231N509	CAPACITOR POLYESTER(MYLAR)	0.022MF 100V K POLY TP	
		C534	QCC2210K415	CAPACITOR CERAMIC(TEMP COMP)	220P 50V J NPO TP	
		C535	QCN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C536	QCE3376F618	CAPACITOR.ELECTROLYTIC	330M SMS 16V M FM5 TP5	
		C537	181-066R	CAPACITOR.ELECTROLYTIC	1MF 50V M TR	
		C538	QCE4756K618	CAPACITOR.ELECTROLYTIC	4.7MF SMS 50V M FM5 TP5	
		C539	181-444L	CAPACITOR	MPE.ECQ-U1H334JZ3(TR)	
		C540	181-444L	CAPACITOR	MPE.ECQ-U1H334JZ3(TR)	
		C541	QCN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C542	QCE1076F618	CAPACITOR.ELECTROLYTIC	100MF SMS 16V M FM5 TP5	
		C543	QC02231N509	CAPACITOR POLYESTER(MYLAR)	0.022MF 100V K POLY TP	
		C544	QC02231N509	CAPACITOR POLYESTER(MYLAR)	0.022MF 100V K POLY TP	
		C545	QC02231N509	CAPACITOR POLYESTER(MYLAR)	0.022MF 100V K POLY TP	
		C546	QC02231N509	CAPACITOR POLYESTER(MYLAR)	0.022MF 100V K POLY TP	
		C547	QC02231N509	CAPACITOR POLYESTER(MYLAR)	0.022MF 100V K POLY TP	
		C548	QC02231N509	CAPACITOR POLYESTER(MYLAR)	0.022MF 100V K POLY TP	

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		C663	QCE2260A618	CAPACITOR.ELECTROLYTIC	22M SMS 10V M FM5 TP(5)	
		C666	QCN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C667	QCN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C668	QCC3900K415	CAPACITOR CERAMIC(TEMP COMP)	39P 50V J NPO TP	
		C701	QCX5610M515	CAPACITOR CERAMIC(HIGH DIELE)	560PF 500V K B TS	
		C702	QCE1066M618	CAPACITOR.ELECTROLYTIC	10MF SMS 100V M FS TP5	
		C703	QCX5610M515	CAPACITOR CERAMIC(HIGH DIELE)	560PF 500V K B TS	
		C704	QCE1086J618	CAPACITOR.ELECTROLYTIC	1000M SMS 35V M FL	
		C705	QCX5610M515	CAPACITOR CERAMIC(HIGH DIELE)	560PF 500V K B TS	
		C706	QCE2261R618	CAPACITOR.ELECTROLYTIC	22M SM 250V M TP5	
		C707	QC04731N511	CAPACITOR POLYESTER(MYLAR)	0.047U 100V K POLY MI FS	
		C708	181-444E	C.METALPOLYESTER	0.1MF 50V J	
		C801	QCC10211545	CAPACITOR.CERAMIC(TEMP COMP)	1000PF 105C 1KV K N220 TR	
		C802	QCC10211545	CAPACITOR.CERAMIC(TEMP COMP)	1000PF 105C 1KV K N220 TR	
		C803	QCC10211545	CAPACITOR.CERAMIC(TEMP COMP)	1000PF 105C 1KV K N220 TR	
		C804	QCC10211545	CAPACITOR.CERAMIC(TEMP COMP)	1000PF 105C 1KV K N220 TR	
		C805	181-126A	CAPACITOR	CE (400V/120UF)	
		C806	QCE2266M618	CAPACITOR.ELECTROLYTIC	22M SMS 25V M FM5 TP(5)	
		C807	QCE1056K618	CAPACITOR.ELECTROLYTIC	1.0MF SMS 50V M FM5 TP5	
		C808	QC04721N519	CAPACITOR POLYESTER(MYLAR)	0.0047U 100V K POLY MI TP	
		C809	QCC1010K415	CAPACITOR CERAMIC(TEMP COMP)	100P 50V J NPO TS	
		C810	QC01031N419	CAPACITOR POLYESTER(MYLAR)	0.01U 100V J POLY MI TP	
		C811	QCE1076F618	CAPACITOR.ELECTROLYTIC	100MF SMS 16V M FM5 TP5	
		C812	QCE2266K618	CAPACITOR.ELECTROLYTIC	22M SMS 50V M FM5 TP(5)	
		C813	181-083B	C.POLYPROPYLENE	0.0033MF 1600V J	
		C814	181-444E	C.METALPOLYESTER	0.1MF 50V J	
		C819	QCC10211545	CAPACITOR.CERAMIC(TEMP COMP)	1000PF 105C 1KV K N220 TR	
		C820	QCC27111405	CAPACITOR.CERAMIC(TEMP COMP)	270PF 105C 1KV J SL TR	
		C821	QCC27111405	CAPACITOR.CERAMIC(TEMP COMP)	270PF 105C 1KV J SL TR	
		C823	QCC27111405	CAPACITOR.CERAMIC(TEMP COMP)	270PF 105C 1KV J SL TR	
		C824	QCC27111405	CAPACITOR.CERAMIC(TEMP COMP)	270PF 105C 1KV J SL TR	
		C825	QCE10710650	CAPACITOR.ELECTROLYTIC	100M SM 200V M FM7.5	
		C826	QCE4761R650	CAPACITOR.ELECTROLYTIC	47M SM 250V M FM7.5	
		C827	QCE1086M618	CAPACITOR.ELECTROLYTIC	1000U SMS 25V M FL TP5	
		C828	QCE1076F618	CAPACITOR.ELECTROLYTIC	100MF SMS 16V M FM5 TP5	
		C829	QCE4771K61A	CAPACITOR.ELECTROLYTIC	470UF SM 50V M FL TP7.5	
		C830	QCE4776D618	CAPACITOR.ELECTROLYTIC	470U SMS 10V M FM5 TP5	
		C832	QCE2266F618	CAPACITOR.ELECTROLYTIC	22MF SMS 16V M FM5 TA5	
		C834	QCE1066F618	CAPACITOR.ELECTROLYTIC	10MF SMS 16V M FM5 TP5	
		C851	181-408C	CAPACITOR	250V 0.47UF(ISKRA)	
		C852	181-408C	CAPACITOR	250V 0.47UF(ISKRA)	
		C853	181-410B	CAPACITOR	DE1910E 472M	
		C855	181-410A	CAPACITOR.CERAMIC	4700PF A.C 125V M UL/CSA	
		C901	QCC1510K415	CAPACITOR.CERAMIC(TEMP COMP)	15P 50V J NPO TS	
		C902	QCC1210A415	CAPACITOR.CERAMIC(TEMP COMP)	120P 50V J NPO TP	
		C903	QCC1510K415	CAPACITOR.CERAMIC(TEMP COMP)	15P 50V J NPO TS	
		C907	QCE4766F618	CAPACITOR.ELECTROLYTIC	47MF SMS 16V M FM5 TP5	
		C908	QCK10202510	CAPACITOR.CERAMIC(HIGH DIELE)	1000P 3KV K B S	
		C909	QCK1020W515	CAPACITOR.CERAMIC(HIGH DIELE)	1000PF 500V K B TS	
		C911	QCE1066F618	CAPACITOR.ELECTROLYTIC	10MF SMS 16V M FM5 TP5	

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		C549	QCE1056K618	CAPACITOR.ELECTROLYTIC	1.0MF SMS 50V M FM5 TP5	
		C550	QCE4756K618	CAPACITOR.ELECTROLYTIC	4.7MF SMS 50V M FM5 TP5	
		C551	QCE4756K618	CAPACITOR.ELECTROLYTIC	4.7MF SMS 50V M FM5 TP5	
		C552	QCX3900K409	CAPACITOR TUBULA(T.C)	39PF 50V J SL TA52	
		C553	QCE2266F618	CAPACITOR.ELECTROLYTIC	22MF SMS 16V M FM5 TA5	
		C554	181-444L	CAPACITOR	MPE.ECQ-U1H334JZ3(TR)	
		C555	QCE4766F618	CAPACITOR.ELECTROLYTIC	47MF SMS 16V M FM5 TP5	
		C556	QCE4740K618	CAPACITOR.ELECTROLYTIC	0.47MF SMS 50V M FM5 TP5	
		C557	QCC1810K445	CAPACITOR.CERAMIC(TEMP COMP)	180P 50V J N220 TS	
		C558	QCC1810K445	CAPACITOR.CERAMIC(TEMP COMP)	180P 50V J N220 TS	
		C559	QCX1200K409	CAPACITOR TUBULA(T.C)	12PF 50V J SL TA52	
		C601	QCE1066F618	CAPACITOR.ELECTROLYTIC	10MF SMS 16V M FM5 TP5	
		C602	QCN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C603	QCE1076F618	CAPACITOR.ELECTROLYTIC	100MF SMS 16V M FM5 TP5	
		C604	QC32231N509	CAPACITOR POLYESTER(MYLAR)	0.022MF 100V K POLY TP	
		C605	181-444E	C.METALPOLYESTER	0.1MF 50V J	
		C606	QCE1056K618	CAPACITOR.ELECTROLYTIC	1.0MF SMS 50V M FM5 TP5	
		C607	QC02231N509	CAPACITOR POLYESTER(MYLAR)	0.022MF 100V K POLY TP	
		C608	181-444E	C.METALPOLYESTER	0.1MF 50V J	
		C609	QCN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C610	181-444E	C.METALPOLYESTER	0.1MF 50V J	
		C611	181-444E	C.METALPOLYESTER	0.1MF 50V J	
		C612	QCE4746K618	CAPACITOR.ELECTROLYTIC	0.47MF SMS 50V M FM5 TP5	
		C613	QCE4746K618	CAPACITOR.ELECTROLYTIC	0.47MF SMS 50V M FM5 TP5	
		C614	QC06821N509	CAPACITOR POLYESTER(MYLAR)	0.0068U 100V K POLY TP	
		C615	QC06821N509	CAPACITOR POLYESTER(MYLAR)	0.0068U 100V K POLY TP	
		C616	QC04731N509	CAPACITOR POLYESTER(MYLAR)	0.047U 100V K POLY TP	
		C617	QC04731N509	CAPACITOR POLYESTER(MYLAR)	0.047U 100V K POLY TP	
		C618	QC01021N509	CAPACITOR POLYESTER(MYLAR)	0.001U 100V K POLY TP	
		C619	QC01021N509	CAPACITOR POLYESTER(MYLAR)	0.001U 100V K POLY TP	
		C620	QCN1030F679	CAPACITOR TUBULA(HIGH DIELE)	0.01MF 16V M Y TA52	
		C621	QCE1074F618	CAPACITOR.ELECTROLYTIC	100MF SMS 16V M FM5 TP5	
		C622	181-0321	CAPACITOR.TANTAL	1.0MF 25V K TAPING	
		C623	181-0321	CAPACITOR.TANTAL	1.0MF 25V K TAPING	
		C624	QC03321N509	CAPACITOR POLYESTER(MYLAR)	0.0033U 100V K POLY TP	
		C625	QCC6810K400	CAPACITOR CERAMIC(TEMP COMP)	680P 50V J SL S	
		C626	QCK1050K945	CAPACITOR.CERAMIC(HIGH DIELE)	0.01MF 50V Z F TS	
		C637	QCC2710K405	CAPACITOR CERAMIC(TEMP COMP)	270P 50V J SL TP	
		C650	181-064M	CAPACITOR.ELECTROLYTIC	4.7MF 16V TR	
		C651	181-064M	CAPACITOR.ELECTROLYTIC	4.7MF 16V TR	
		C653	QCE2256F618	CAPACITOR.ELECTROLYTIC	22MF SMS 16V M FM5 TA5	
		C654	QCE2276F618	CAPACITOR.ELECTROLYTIC	220MF SMS 16V M FM5 TP5	
		C655	QCE2276F618	CAPACITOR.ELECTROLYTIC	220MF SMS 16V M FM5 TP5	
		C656	QCK1050K945	CAPACITOR.CERAMIC(HIGH DIELE)	0.01MF 50V Z F TS	
		C657	QCE1086J618	CAPACITOR.ELECTROLYTIC	1000M SMS 35V M FL	
		C658	181-444E	C.METALPOLYESTER	0.1MF 50V J	
		C659	181-444E	C.METALPOLYESTER	0.1MF 50V J	
		C660	QCE1086F618	CAPACITOR.ELECTROLYTIC	1000M SMS 16V M FM(5) TP(5)	
		C661	QCE1086F618	CAPACITOR.ELECTROLYTIC	1000M SMS 16V M FM(5) TP(5)	
		C662	QCE2274D618	CAPACITOR.ELECTROLYTIC	220MF SMS 10V M FM5 TP5	

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		DL501	175-001C	DELAY LINE	1H ADL-CP144E(VE)	
		D103	000414809ED	DIODE	(DS4148) TA	
		D104	000414809ED	DIODE	(DS4148) TA	
		D108	000414809ED	DIODE	(DS4148) TA	
		D109	000414809ED	DIODE	(DS4148) TA	
		D110	00L100000AE	DIODE.LED	DL-1L0 (DIFFUSION TYPE)	
		D181	000414809ED	DIODE	(DS4148) TA	
		D182	000414809ED	DIODE	(DS4148) TA	
		D201	000414809ED	DIODE	(DS4148) TA	
		D202	000414809ED	DIODE	(DS4148) TA	
		D203	000414809ED	DIODE	(DS4148) TA	
		D204	000414809ED	DIODE	(DS4148) TA	
		D205	000414809ED	DIODE	(DS4148) TA	
		D206	000414809ED	DIODE	(DS4148) TA	
		D207	000414809ED	DIODE	(DS4148) TA	
		D301	000400509AA	DIODE	1N4005 GP TA	
		D401	000400000AF	DIODE	RU4C	
		D402	000400000AF	DIODE	RU4C	
		D403	000414809ED	DIODE	(DS4148) TA	
		D404	000414809ED	DIODE	(DS4148) TA	
		D441	000414809ED	DIODE	(DS4148) TA	
		D502	000414809ED	DIODE	(DS4148) TA	
		D503	000414809ED	DIODE	(DS4148) TA	
		D504	000414809ED	DIODE	(DS4148) TA	
		D505	000414809ED	DIODE	(DS4148) TA	
		D601	000410009AA	DIODE	SCHOTTKY.BAT 41 TP	
		D602	000410009AA	DIODE	SCHOTTKY.BAT 41 TP	
		D651	000414809ED	DIODE	(DS4148) TA	
		D701	000150009CA	DIODE	RGP15J.TP(52MM).GI	
		D702	000150009CA	DIODE	RGP15J.TP(52MM).GI	
		D703	000150009CA	DIODE	RGP15J.TP(52MM).GI	
		D801	000060009AC	DIODE	TVR06J 0.6A/600V 250NS TP G.I	
		D802	000060009AC	DIODE	TVR06J 0.6A/600V 250NS TP G.I	
		D803	000060009AC	DIODE	TVR06J 0.6A/600V 250NS TP G.I	
		D804	000400509AA	DIODE	1N4005 GP TA	
		D805	000060009AC	DIODE	TVR06J 0.6A/600V 250NS TP G.I	
		D806	000400000AF	DIODE	RU4C	
		D807	000400000AA	DIODE	RL4Z.SANKEN	
		D808	000400000AA	DIODE	RL4Z.SANKEN	
		D810	000150009CA	DIODE	RGP15J.TP(52MM).GI	
		D851	162-045A	DIODE	BRIDGE.RB-156	
		D901	000414809ED	DIODE	(DS4148) TA	
		D902	000414809ED	DIODE	(DS4148) TA	
		D903	000414809ED	DIODE	(DS4148) TA	
		D905	000414809ED	DIODE	(DS4148) TA	
		D906	000414809ED	DIODE	(DS4148) TA	
		FR401	QRS1201J607	RESISTOR.FIX METAL FILM OXIDE	1.2K 1W SZ TA62	
		FR402	QRS1000J607	RESISTOR.FIX METAL FILM OXIDE	100 1W SZ TA62	
		FR441	QRF0102J607	RESISTOR.FUSIBLE	10 1W SZ TA62	
		FR442	QRF0102H609	RESISTOR.FUSIBLE	10 1/2W S TA52	

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MODEL : CBT-2871E MMBRD SET PART NO : 100-C73N RUN-DATE : 93.01.18

S	ALL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		FR601	131-095C	FUSE	MICRO CERAMIC TUBE 125V 2A	
		FR701	ORF0470M609	RESISTOR FUSIBLE	0.47 1/2W S TA52	
		FR702	ORF0470M609	RESISTOR FUSIBLE	0.47 1/2W S TA52	
		FR703	ORF0470M609	RESISTOR FUSIBLE	0.47 1/2W S TA52	
		FR704	ORF0470M609	RESISTOR FUSIBLE	0.47 1/2W S TA52	
		FR801	ORF0470J607	RESISTOR.FUSIBLE	0.47 1W 5% TA62	
		FR802	131-093F	FUSE	MICRO CERAMIC TUBE 125V 2.5A	
		FR804	131-095C	FUSE	MICRO CERAMIC TUBE 125V 2A	
		FR805	131-095C	FUSE	MICRO CERAMIC TUBE 125V 2A	
		FR901	ORF0511J607	RESISTOR.FUSIBLE	5.10 1W 5% TA62	
		F801	131-085A	FUSE	BSI APPROVED(KITE MARK)	
		IC101	OISG8014040	IC.SGS-THOMSON	ST-6358P(GS8014-040)480	
		IC201	OITF463900A	IC. TELEFUNKEN	TDA4439(TFK)	
		IC202	OITF474400A	IC. TELEFUNKEN	U4744B.80.PRE-AMP	
		IC204	OIGS455800A	IC. GOLDSTAR ELECTRON	GL4558 OP AMP	
		IC205	OISG201400A	IC. SGS-THOMSON	TEA2014	
		IC301	OISA783300A	IC.SANYO	LA7833 7SIP V/OUT 2.2A(P-P)	
		IC401	OIPH2579008	IC. PHILIPS	TDA2579 A/N8	
		IC501	OIPH455500A	IC. PHILIPS	TDA4555.28DIP.LIN.MULTI-CHROMA	
		IC502	OIPH4565A0A	IC. PHILIPS	TDA4565	
		IC503	OIPH3505A0A	IC. PHILIPS	TDA3505(PHILIPS)	
		IC601	OITF448200B	IC.TELEFUNKEN	TDA4482-0 180 MULTI SIF	
		IC602	OISM661000A	IC. SIEMENS	TDA4610-2.28D.STEREO DECODER	
		IC603	OISG200900A	IC. SGS-THOMSON	TDA2009A.11SIP.LIN SOUND AMP	
		IC801	OISM460100A	IC. SIEMENS	TDA4601	
		IC802	OIGS780500A	IC. GOLDSTAR ELECTRON	GL7805 REGULATOR	
		J168	ORD82025D9	RESISTOR.FIXED CARBON FILM	82K 1/4W 2 TA52	
		L101	OLA0392K119	INDUCTOR AXIAL LEAD	39UH K 2.3x3.4 TP	
		L102	OLA0472K119	INDUCTOR AXIAL LEAD	47UH K 2.3x3.4 TP	
		L181	OLA0152K119	INDUCTOR AXIAL LEAD	15UH K 2.3x3.4 TP	
		L201	OLA0472K119	INDUCTOR AXIAL LEAD	47UH K 2.3x3.4 TP	
		L202	150-327A	COIL	AFT(PC04X)	
		L203	150-540M	COIL	VIF DEMO (38.9MHZ)	
		L204	OLA0221K119	INDUCTOR AXIAL LEAD	2.2UH K 2.3x3.4 TP	
		L205	OLA0472K119	INDUCTOR AXIAL LEAD	47UH K 2.3x3.4 TP	
		L206	OLA0471K119	INDUCTOR AXIAL LEAD	4.7UH K 2.3x3.4 TP	
		L207	OCN181GK519	CAPACITOR TUBULAR(HIGH DIELE)	180PF 50V K B TA52	
		L210	OLA0472K119	INDUCTOR AXIAL LEAD	47UH K 2.3x3.4 TP	
		L252	OLA1000K119	INDUCTOR AXIAL LEAD	100UH K 2.3x3.4 TP	
		L253	OLA1000K119	INDUCTOR AXIAL LEAD	100UH K 2.3x3.4 TP	
		L265	OLR1000K520	INDUCTOR RADIAL LEAD	100M K 4X5 F BULK	
		L266	OLA1000K119	INDUCTOR AXIAL LEAD	100UH K 2.3x3.4 TP	
		L401	125-022K	CORE	FERRITE 1UH TAPING	
		L403	150-159G	COIL	LINEARITY	
		L404	150-692A	COIL	CHOKE 8.2MH	
		L405	150-717G	COIL	CHOKE 600MH	
		L501	150-214Q	COIL	SECAM OEM(4.43)	
		L502	150-214Q	COIL	SECAM OEM(4.43)	

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MODEL : CBT-2871E MMBRD SET PART NO : 100-C73N RUN-DATE : 93.01.18

S	ALL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		Q801	OTR508000EA	TRANSISTOR	BU508AOF (PHILIPS)	
		Q802	OTR20580088	TRANSISTOR	KTD2058-GR(2SD2058).KEC	
		Q803	OTR20580EB	TRANSISTOR	KTD2058-GR(2SD2058).KEC	
		Q804	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q805	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q901	OTR322900AA	TRANSISTOR	KTC3229 (KTC2068).KEC	
		Q902	OTR322900AA	TRANSISTOR	KTC3229 (KTC2068).KEC	
		Q903	OTR322900AA	TRANSISTOR	KTC3229 (KTC2068).KEC	
		Q904	OTR422000AA	TRANSISTOR	BF422	
		Q905	OTR422000AA	TRANSISTOR	BF422	
		Q906	OTR422000AA	TRANSISTOR	BF422	
		Q907	OTR421000AA	TRANSISTOR	BF421	
		Q908	OTR421000AA	TRANSISTOR	BF421	
		Q909	OTR421000AA	TRANSISTOR	BF421	
		Q910	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q911	OTR421000AA	TRANSISTOR	BF421	
		Q912	OTR421000AA	TRANSISTOR	BF421	
		Q913	OTR421000AA	TRANSISTOR	BF421	
		Q914	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q915	OTR126609AA	TRANSISTOR	KTA1266-TP-Y (KTA1015) KEC	
		R101	ORD6801F609	RESISTOR.FIXED CARBON FILM	6.8K 1/6W S TA52	
		R102	ORD6801F609	RESISTOR.FIXED CARBON FILM	6.8K 1/6W S TA52	
		R103	ORD6801F609	RESISTOR.FIXED CARBON FILM	6.8K 1/6W S TA52	
		R104	ORD2202F609	RESISTOR.FIXED CARBON FILM	22K 1/6W S TA52	
		R105	ORD2202F609	RESISTOR.FIXED CARBON FILM	22K 1/6W S TA52	
		R106	ORD2202F609	RESISTOR.FIXED CARBON FILM	22K 1/6W S TA52	
		R107	ORD1003F609	RESISTOR.FIXED CARBON FILM	100K 1/6W S TA52	
		R108	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W S TA52	
		R109	ORD6800F609	RESISTOR.FIXED CARBON FILM	680 1/6W S TA52	
		R111	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W S TA52	
		R113	ORD1201F609	RESISTOR.FIXED CARBON FILM	1.2K 1/6W S TA52	
		R114	ORD1003F609	RESISTOR.FIXED CARBON FILM	100K 1/6W S TA52	
		R115	ORD1203F609	RESISTOR.FIXED CARBON FILM	120K 1/6W S TA52	
		R116	ORD6802F609	RESISTOR.FIXED CARBON FILM	68K 1/6W S TA52	
		R117	ORD1003F609	RESISTOR.FIXED CARBON FILM	100K 1/6W S TA52	
		R118	ORD2703F609	RESISTOR.FIXED CARBON FILM	270K 1/6W S TA52	
		R119	ORD2201F609	RESISTOR.FIXED CARBON FILM	2.2K 1/6W S TA52	
		R120	ORD5601F609	RESISTOR.FIXED CARBON FILM	5.6K 1/6W S TA52	
		R121	ORD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W S TA52	
		R122	ORD2201F609	RESISTOR.FIXED CARBON FILM	2.2K 1/6W S TA52	
		R123	OPD0822F609	RESISTOR.FIXED CARBON FILM	82 1/6W S TA52	
		R124	ORD5601F609	RESISTOR.FIXED CARBON FILM	5.6K 1/6W S TA52	
		R125	OPD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W S TA52	
		R126	ORD0822F609	RESISTOR.FIXED CARBON FILM	82 1/6W S TA52	
		R127	ORD0822F609	RESISTOR.FIXED CARBON FILM	82 1/6W S TA52	
		R128	ORD3902F609	RESISTOR.FIXED CARBON FILM	39K 1/6W S TA52	
		R129	ORD4702F609	RESISTOR.FIXED CARBON FILM	47K 1/6W S TA52	
		R130	OPD1202F609	RESISTOR.FIXED CARBON FILM	12K 1/6W S TA52	
		R131	ORD1202F609	RESISTOR.FIXED CARBON FILM	12K 1/6W S TA52	
		R132	OPD1003F609	RESISTOR.FIXED CARBON FILM	100K 1/6W S TA52	

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MODEL : CBT-2871E MMBRD SET PART NO : 100-C73N RUN-DATE : 93.01.18

S	ALL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		L503	OLA0681K119	INDUCTOR AXIAL LEAD	6.8UH K 2.3x3.4 TP	
		L504	150-489Y	COIL	DL PHASE	
		L505	150-679D	COIL	CHOKE 100UH(SANYANG)	
		L506	150-689X	COIL	SECAM 1D	
		L507	OLR0122K520	INDUCTOR RADIAL LEAD	12M K 4X5 F BULK	
		L508	150-689B	COIL	SECAM BELL FILTER	
		L509	150-540J	COIL	IFT 4.43TRAP (L3Z-2162M)	
		L511	OLA0152K119	INDUCTOR AXIAL LEAD	15UH K 2.3x3.4 TP	
		L601	150-540K	COIL	SIF DEMO.(5.5/5.74MHZ)	
		L602	150-540K	COIL	SIF DEMO.(5.5/5.74MHZ)	
		L603	OLA0472K119	INDUCTOR AXIAL LEAD	47UH K 2.3x3.4 TP	
		L604	150-214S	COIL	TUNING	
		L801	125-022K	CORE	FERRITE 1UH TAPING	
		L802	OLR0221K520	INDUCTOR RADIAL LEAD	2.2M K 4X5 F BULK	
		L803	150-235A	COIL	H-CHOKE (TLN-3006)	
		L851	150-670B	COIL	LINE FILTER(7CMH)	
		P101	140-316A	SWITCH	BLOCK.RK09V0020-SW#10	
		P102	380-068A	JACK	HEADPHONE.MSJ0914-01-110	
		P103	106-047B	PRE-AMP	SBX1620-72(SONY)	
		P3020	387-604E	CONNECTOR	HOUSING.5244-06AMPB	
		P5018	387-461L	CONNECTOR	ASSY.7P(BOARD IN)	
		P7018	387-457L	CONNECTOR	ASSY.3P (IL-G)	
		Q101	OTR126609AA	TRANSISTOR	KTA1266-TP-Y (KTA1015) KEC	
		Q102	OTR126609AA	TRANSISTOR	KTA1266-TP-Y (KTA1015) KEC	
		Q103	OTR126609AA	TRANSISTOR	KTA1266-TP-Y (KTA1015) KEC	
		Q104	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q105	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q106	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q107	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q108	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q109	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q182	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q183	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q302	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q401	OTR206800A	TRANSISTOR	KTC2068.KEC	
		Q402	OTR508000EA	TRANSISTOR	BU508OF (PHILIPS)	
		Q403	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q442	OTR126609AA	TRANSISTOR	KTA1266-TP-Y (KTA1015) KEC	
		Q443	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q452	OTR135100AB	TRANSISTOR	KTD1351-Y(KTD880).KEC	
		Q501	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q502	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q503	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q504	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q505	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q506	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q507	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q603	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		Q604	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		J651	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	
		J652	OTR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	

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MODEL : CBT-2871E MMBRD SET PART NO : 100-C73N RUN-DATE : 93.01.18

S	ALL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		R133	ORD5601F609	RESISTOR.FIXED CARBON FILM	5.6K 1/6W S TA52	
		R134	ORD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W S TA52	
		R135	ORD1201F609	RESISTOR.FIXED CARBON FILM	1.2K 1/6W S TA52	
		R136	ORD1201F609	RESISTOR.FIXED CARBON FILM	1.2K 1/6W S TA52	
		R137	ORD2201F609	RESISTOR.FIXED CARBON FILM	2.2K 1/6W S TA52	
		R138	OPD8201F609	RESISTOR.FIXED CARBON FILM	8.2K 1/6W S TA52	
		R139	ORD7501F609	RESISTOR.FIXED CARBON FILM	7.5K 1/6W S TA52	
		R140	OPD1502F609	RESISTOR.FIXED CARBON FILM	15K 1/6W S TA52	
		R141	OPD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W S TA52	
		R142	OPD2201F609	RESISTOR.FIXED CARBON FILM	2.2K 1/6W S TA52	
		R143	ORD2701F609	RESISTOR.FIXED CARBON FILM	2.7K 1/6W S TA52	
		R144	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W S TA52	
		R145	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W S TA52	
		R146	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W S TA52	
		R147	OPD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W S TA52	
		R148	OPD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W S TA52	
		R149	OPD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W S TA52	
		R150	ORD2202F609	RESISTOR.FIXED CARBON FILM	22K 1/6W S TA52	
		R151	OPD1000F609	RESISTOR.FIXED CARBON FILM	100 1/6W S TA52	
		R152	OPD1502F609	RESISTOR.FIXED CARBON FILM	15K 1/6W S TA52	
		R153	OPD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W S TA52	
		R154	ORD4702F609	RESISTOR.FIXED CARBON FILM	47K 1/6W S TA52	
		R155	OPD1001F609	RESISTOR.FIXED CARBON FILM	1.0K 1/6W S TA52	
		R156	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W S TA52	
		R157	OPD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W S TA52	
		R159	ORD5601F609	RESISTOR.FIXED CARBON FILM	5.6K 1/6W S TA52	
		R162	OPD1003F609	RESISTOR.FIXED CARBON FILM	100K 1/6W S TA52	
		R181	ORD4702F609	RESISTOR.FIXED CARBON FILM	47K 1/6W S TA52	
		R182	ORD2203F609	RESISTOR.FIXED CARBON FILM	220K 1/6W S TA52	
		R183	OPD3902F609	RESISTOR.FIXED CARBON FILM	39K 1/6W S TA52	
		R184	ORD5601F609	RESISTOR.FIXED CARBON FILM	5.6K 1/6W S TA52	
		R185	ORD1802F609	RESISTOR.FIXED CARBON FILM	18K 1/6W S TA52	
		R186	OPD1003F609	RESISTOR.FIXED CARBON FILM	100K 1/6W S TA52	
		R187	OPD1502F609	RESISTOR.FIXED CARBON FILM	15K 1/6W S TA52	
		R207	OPD3301F609	RESISTOR.FIXED CARBON FILM	3.3K 1/6W S TA52	
		R208	OPD5601F609	RESISTOR.FIXED CARBON FILM	5.6K 1/6W S TA52	
		R209	OPD1000F609	RESISTOR.FIXED CARBON FILM	100 1/6W S TA52	
		R210	OPD8200F609	RESISTOR.FIXED CARBON FILM	820 1/6W S TA52	
		R211	OPD3302F609	RESISTOR.FIXED CARBON FILM	33K 1/6W S TA52	
		R212	OPD3902F609	RESISTOR.FIXED CARBON FILM	39K 1/6W S TA52	
		R213	OPD3300F609	RESISTOR.FIXED CARBON FILM	330 1/6W S TA52	
		R214	OPD9100F609	RESISTOR.FIXED CARBON FILM	910 1/6W S TA52	
		R230	OPD0752F609	RESISTOR.FIXED CARBON FILM	75 1/6W S TA52	
		R231	OPD1201F609	RESISTOR.FIXED CARBON FILM	1.2K 1/6W S TA52	
		R232	OPD0752F609	RESISTOR.FIXED CARBON FILM	75 1/6W S TA52	
		R233	OPD1201F609	RESISTOR.FIXED CARBON FILM	1.2K 1/6W S TA52	
		R240	ORD4702F609	RESISTOR.FIXED CARBON FILM	47K 1/6W S TA52	
		R241	ORD4702F609	RESISTOR.FIXED CARBON FILM	47K 1/6W S TA52	
		R261	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W S TA52	
		R262	OPD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W S TA52	

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S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		R264	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W 5 TA52	
		R265	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W 5 TA52	
		R266	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W 5 TA52	
		R267	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W 5 TA52	
		R268	ORD7501F609	RESISTOR.FIXED CARBON FILM	7.5K 1/6W 5 TA52	
		R269	ORD7501F609	RESISTOR.FIXED CARBON FILM	7.5K 1/6W 5 TA52	
		R301	ORD3303F609	RESISTOR.FIXED CARBON FILM	330K 1/6W 5 TA52	
		R302	ORD1003F609	RESISTOR.FIXED CARBON FILM	100K 1/6W 5 TA52	
		R303	ORF0331M609	RESISTOR FUSIBLE	3.3 1/2W 5 TA52	
		R304	ORD1001M609	RESISTOR.FIXED CARBON FILM	1.0K 1/2W 5 TA52	
		R305	ORD3302F609	RESISTOR.FIXED CARBON FILM	33K 1/6W 5 TA52	
		R306	ORD6201F609	RESISTOR.FIXED CARBON FILM	6.2K 1/6W 5 TA52	
		R307	ORD7501F609	RESISTOR.FIXED CARBON FILM	7.5K 1/6W 5 TA52	
		R308	ORD1301F609	RESISTOR.FIXED CARBON FILM	1.3K 1/6W 5 TA52	
		R309	ORD6802F609	RESISTOR.FIXED CARBON FILM	68K 1/6W 5 TA52	
		R310	ORD3900M609	RESISTOR.FIXED CARBON FILM	390 1/2W 5 TA52	
		R311	ORM0820M609	RESISTOR FIX METAL FILM	0.82 1/2W 5 TA52	
		R313	ORD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W 5 TA52	
		R314	ORD1001M609	RESISTOR.FIXED CARBON FILM	1.0K 1/2W 5 TA52	
		R401	ORD1001F609	RESISTOR.FIXED CARBON FILM	1.0K 1/6W 5 TA52	
		R404	ORD5601F609	RESISTOR.FIXED CARBON FILM	5.6K 1/6W 5 TA52	
		R405	ORD0220F609	RESISTOR.FIXED CARBON FILM	22 1/6W 5 TA52	
		R407	ORD8200F609	RESISTOR.FIXED CARBON FILM	820 1/6W 5 TA52	
		R408	ORD1201G509	RESISTOR.FIXED CARBON FILM	1.2K 1/4W 2 TA52	
		R409	ORD8202F609	RESISTOR.FIXED CARBON FILM	82K 1/6W 5 TA52	
		R410	ORD1202F609	RESISTOR.FIXED CARBON FILM	12K 1/6W 5 TA52	
		R411	ORD4702F609	RESISTOR.FIXED CARBON FILM	47K 1/6W 5 TA52	
		R412	ORD6802F609	RESISTOR.FIXED CARBON FILM	68K 1/6W 5 TA52	
		R413	ORD1001F609	RESISTOR.FIXED CARBON FILM	1.0K 1/6W 5 TA52	
		R414	ORD3302F609	RESISTOR.FIXED CARBON FILM	33K 1/6W 5 TA52	
		R416	ORD1503F609	RESISTOR.FIXED CARBON FILM	150K 1/6W 5 TA52	
		R417	ORD3301M609	RESISTOR.FIXED CARBON FILM	3.3K 1/2W 5 TA52	
		R418	ORS6801L667	RESISTOR.FIX METAL FILM OXIDE	6.8K 3W S SF30	
		R419	OPD0390M609	RESISTOR.FIXED CARBON FILM	39 1/2W 5 TA52	
		R420	ORD4702F609	RESISTOR.FIXED CARBON FILM	47K 1/6W 5 TA52	
		R442	OPD2701F609	RESISTOR.FIXED CARBON FILM	2.7K 1/6W 5 TA52	
		R443	OPD3902F609	RESISTOR.FIXED CARBON FILM	39K 1/6W 5 TA52	
		R444	ORD8202F609	RESISTOR.FIXED CARBON FILM	8.2K 1/6W 5 TA52	
		R445	ORD3902F609	RESISTOR.FIXED CARBON FILM	39K 1/6W 5 TA52	
		R446	ORD3901F609	RESISTOR.FIXED CARBON FILM	3.9K 1/6W 5 TA52	
		R448	ORD1003F609	RESISTOR.FIXED CARBON FILM	100K 1/6W 5 TA52	
		R449	ORD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W 5 TA52	
		R450	ORD2703F609	RESISTOR.FIXED CARBON FILM	270K 1/6W 5 TA52	
		R451	ORD1001F609	RESISTOR.FIXED CARBON FILM	1.0K 1/6W 5 TA52	
		R452	OPD3902F609	RESISTOR.FIXED CARBON FILM	39K 1/6W 5 TA52	
		R453	ORD4700F609	RESISTOR.FIXED CARBON FILM	470 1/6W 5 TA52	
		R454	ORD2202F609	RESISTOR.FIXED CARBON FILM	22K 1/6W 5 TA52	
		R501	OPD1201F609	RESISTOR.FIXED CARBON FILM	1.2K 1/6W 5 TA52	
		R502	ORD6806F609	RESISTOR.FIXED CARBON FILM	680 1/6W 5 TA52	
		R503	ORD1203F609	RESISTOR.FIXED CARBON FILM	120K 1/6W 5 TA52	

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S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		R504	ORD1800F609	RESISTOR.FIXED CARBON FILM	180 1/6W 5 TA52	
		R505	ORD1201F609	RESISTOR.FIXED CARBON FILM	1.2K 1/6W 5 TA52	
		R506	ORD3900F609	RESISTOR.FIXED CARBON FILM	390 1/6W 5 TA52	
		R507	ORD4700F609	RESISTOR.FIXED CARBON FILM	470 1/6W 5 TA52	
		R508	ORD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W 5 TA52	
		R509	ORD5101F609	RESISTOR.FIXED CARBON FILM	5.1K 1/6W 5 TA52	
		R510	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W 5 TA52	
		R511	ORD1502F609	RESISTOR.FIXED CARBON FILM	15K 1/6W 5 TA52	
		R512	ORD1502F609	RESISTOR.FIXED CARBON FILM	15K 1/6W 5 TA52	
		R513	ORD3302F609	RESISTOR.FIXED CARBON FILM	33K 1/6W 5 TA52	
		R514	ORD2702F609	RESISTOR.FIXED CARBON FILM	27K 1/6W 5 TA52	
		R515	ORD1001F609	RESISTOR.FIXED CARBON FILM	1.0K 1/6W 5 TA52	
		R516	ORD2701F609	RESISTOR.FIXED CARBON FILM	2.7K 1/6W 5 TA52	
		R517	ORD2201F609	RESISTOR.FIXED CARBON FILM	2.2K 1/6W 5 TA52	
		R518	ORD3302F609	RESISTOR.FIXED CARBON FILM	33K 1/6W 5 TA52	
		R519	ORD3302F609	RESISTOR.FIXED CARBON FILM	33K 1/6W 5 TA52	
		R520	ORD2201F609	RESISTOR.FIXED CARBON FILM	2.2K 1/6W 5 TA52	
		R521	ORD1000F609	RESISTOR.FIXED CARBON FILM	100 1/6W 5 TA52	
		R522	ORD1000F609	RESISTOR.FIXED CARBON FILM	100 1/6W 5 TA52	
		R523	ORD1201F609	RESISTOR.FIXED CARBON FILM	1.2K 1/6W 5 TA52	
		R524	ORD3900F609	RESISTOR.FIXED CARBON FILM	390 1/6W 5 TA52	
		R525	ORD1500F609	RESISTOR.FIXED CARBON FILM	150 1/6W 5 TA52	
		R527	ORD2701F609	RESISTOR.FIXED CARBON FILM	2.7K 1/6W 5 TA52	
		R528	ORD1500F609	RESISTOR.FIXED CARBON FILM	150 1/6W 5 TA52	
		R529	ORD1500F609	RESISTOR.FIXED CARBON FILM	150 1/6W 5 TA52	
		R530	ORD1000F609	RESISTOR.FIXED CARBON FILM	100 1/6W 5 TA52	
		R531	ORD3900F609	RESISTOR.FIXED CARBON FILM	390 1/6W 5 TA52	
		R532	ORD1000F609	RESISTOR.FIXED CARBON FILM	100 1/6W 5 TA52	
		R533	ORD1001F609	RESISTOR.FIXED CARBON FILM	1.0K 1/6W 5 TA52	
		R534	ORD1501F609	RESISTOR.FIXED CARBON FILM	1.5K 1/6W 5 TA52	
		R535	ORD0752F609	RESISTOR.FIXED CARBON FILM	75 1/6W 5 TA52	
		R536	ORD0752F609	RESISTOR.FIXED CARBON FILM	75 1/6W 5 TA52	
		R537	ORD0752F609	RESISTOR.FIXED CARBON FILM	75 1/6W 5 TA52	
		R539	ORD5600F609	RESISTOR.FIXED CARBON FILM	560 1/6W 5 TA52	
		R541	ORD2201F609	RESISTOR.FIXED CARBON FILM	2.2K 1/6W 5 TA52	
		R542	ORD1803F609	RESISTOR.FIXED CARBON FILM	180K 1/6W 5 TA52	
		R543	ORD3302F609	RESISTOR.FIXED CARBON FILM	33K 1/6W 5 TA52	
		R544	ORD5601F609	RESISTOR.FIXED CARBON FILM	5.6K 1/6W 5 TA52	
		R545	ORD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W 5 TA52	
		R546	ORD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W 5 TA52	
		R547	ORD3300F609	RESISTOR.FIXED CARBON FILM	330 1/6W 5 TA52	
		R548	ORD4700F609	RESISTOR.FIXED CARBON FILM	470 1/6W 5 TA52	
		R549	ORD6804F609	RESISTOR.FIXED CARBON FILM	6.8M 1/6W 5 TA52	
		R550	ORD2201F609	RESISTOR.FIXED CARBON FILM	2.2K 1/6W 5 TA52	
		R551	ORD1802F609	RESISTOR.FIXED CARBON FILM	18K 1/6W 5 TA52	
		R552	ORD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W 5 TA52	
		R553	ORD5601F609	RESISTOR.FIXED CARBON FILM	5.6K 1/6W 5 TA52	
		R601	ORD5600F609	RESISTOR.FIXED CARBON FILM	560 1/6W 5 TA52	
		R602	ORD3601F609	RESISTOR.FIXED CARBON FILM	3.6K 1/6W 5 TA52	
		R603	ORD5600F609	RESISTOR.FIXED CARBON FILM	560 1/6W 5 TA52	

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S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		R604	ORD3300F609	RESISTOR.FIXED CARBON FILM	330 1/6W 5 TA52	
		R605	ORD3601F609	RESISTOR.FIXED CARBON FILM	3.6K 1/6W 5 TA52	
		R606	ORD5600F609	RESISTOR.FIXED CARBON FILM	560 1/6W 5 TA52	
		R607	ORD2701F609	RESISTOR.FIXED CARBON FILM	2.7K 1/6W 5 TA52	
		R608	ORD1000F609	RESISTOR.FIXED CARBON FILM	100 1/6W 5 TA52	
		R609	ORD1000F609	RESISTOR.FIXED CARBON FILM	100 1/6W 5 TA52	
		R610	ORD2002F609	RESISTOR.FIXED CARBON FILM	20K 1/6W 5 TA52	
		R611	ORD5602F609	RESISTOR.FIXED CARBON FILM	56K 1/6W 5 TA52	
		R612	ORD1201F609	RESISTOR.FIXED CARBON FILM	1.2K 1/6W 5 TA52	
		R613	ORD1201F609	RESISTOR.FIXED CARBON FILM	1.2K 1/6W 5 TA52	
		R615	ORD2200F609	RESISTOR.FIXED CARBON FILM	220 1/6W 5 TA52	
		R616	ORD2200F609	RESISTOR.FIXED CARBON FILM	220 1/6W 5 TA52	
		R638	ORD2200M609	RESISTOR.FIXED CARBON FILM	220 1/2W 5 TA52	
		R639	ORD2200M609	RESISTOR.FIXED CARBON FILM	220 1/2W 5 TA52	
		R640	ORD3900F609	RESISTOR.FIXED CARBON FILM	390 1/6W 5 TA52	
		R641	ORD3900F609	RESISTOR.FIXED CARBON FILM	390 1/6W 5 TA52	
		R642	ORD2202F609	RESISTOR.FIXED CARBON FILM	22K 1/6W 5 TA52	
		R643	ORD2201M609	RESISTOR.FIXED CARBON FILM	2.2K 1/2W 5 TA52	
		R644	ORD6801F609	RESISTOR.FIXED CARBON FILM	6.8K 1/6W 5 TA52	
		R645	ORD1201F609	RESISTOR.FIXED CARBON FILM	1.2K 1/6W 5 TA52	
		R650	ORD0182F609	RESISTOR.FIXED CARBON FILM	18 1/6W 5 TA52	
		R651	ORD0182F609	RESISTOR.FIXED CARBON FILM	18 1/6W 5 TA52	
		R652	ORD1301F609	RESISTOR.FIXED CARBON FILM	1.3K 1/6W 5 TA52	
		R653	ORD1301F609	RESISTOR.FIXED CARBON FILM	1.3K 1/6W 5 TA52	
		R654	ORD0102M609	RESISTOR.FIXED CARBON FILM	10 1/2W 5 TA52	
		R655	ORD0102M609	RESISTOR.FIXED CARBON FILM	10 1/2W 5 TA52	
		R656	ORD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W 5 TA52	
		R657	ORD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W 5 TA52	
		R658	ORD2701F609	RESISTOR.FIXED CARBON FILM	2.7K 1/6W 5 TA52	
		R701	ORD1001G509	RESISTOR.FIXED CARBON FILM	1.0K 1/4W 2 TA52	
		R704	ORD3301M609	RESISTOR.FIXED CARBON FILM	3.3K 1/2W 5 TA52	
		R801	ORD2200F609	RESISTOR.FIXED CARBON FILM	220 1/6W 5 TA52	
		R802	ORD1201F609	RESISTOR.FIXED CARBON FILM	1.2K 1/6W 5 TA52	
		R803	ORD2002F609	RESISTOR.FIXED CARBON FILM	20K 1/6W 5 TA52	
		R804	ORD1002F609	RESISTOR.FIXED CARBON FILM	10K 1/6W 5 TA52	
		R805	ORD2200M609	RESISTOR.FIXED CARBON FILM	220 1/2W 5 TA52	
		R806	ORD2200M609	RESISTOR.FIXED CARBON FILM	220 1/2W 5 TA52	
		R807	ORD1503M609	RESISTOR.FIXED CARBON FILM	150K 1/2W 5 TA52	
		R808	ORD1203M609	RESISTOR.FIXED CARBON FILM	120K 1/2W 5 TA52	
		R809	ORD1003F609	RESISTOR.FIXED CARBON FILM	100K 1/6W 5 TA52	
		R810	ORM0680G609	RESISTOR FIX METAL FILM	0.68 1/4W 5 TA52	
		R811	ORD0272G509	RESISTOR.FIXED CARBON FILM	27 1/4W 2 TA52	
		R821	ORS2700K666	RESISTOR.FIX METAL FILM OXIDE	270 2W S SF25	
		R823	ORD3302F609	RESISTOR.FIXED CARBON FILM	33K 1/6W 5 TA52	
		R824	ORD3302F609	RESISTOR.FIXED CARBON FILM	33K 1/6W 5 TA52	
		R825	ORS3900K666	RESISTOR.FIX METAL FILM OXIDE	390 2W S SF25	
		R851	180-142F	RESISTOR	CEMENT RWR 5W 2.2J	
		R852	180-783F	RESISTOR.RC	4700K 2W K TAPING	
		R853	ORD3303G609	RESISTOR.FIXED CARBON FILM	330K 1/4W 5 TA52	
		R854	180-1420	RESISTOR.CEMENT RWR	47 5W J	

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S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		R855	ORS1502L667	RESISTOR.FIX METAL FILM OXIDE	15K 3W S SF30	
		R856	ORD3303G409	RESISTOR.FIXED CARBON FILM	330K 1/4W 5 TA52	
		R901	ORS1502K666	RESISTOR.FIX METAL FILM OXIDE	15K 2W 5 SF25	
		R902	ORS1502K666	RESISTOR.FIX METAL FILM OXIDE	15K 2W 5 SF25	
		R903	ORS1502K666	RESISTOR.FIX METAL FILM OXIDE	15K 2W 5 SF25	
		R904	OPD5100F609	RESISTOR.FIXED CARBON FILM	510 1/6W 5 TA52	
		R905	ORD5100F609	RESISTOR.FIXED CARBON FILM	510 1/6W 5 TA52	
		R906	ORD5100F609	RESISTOR.FIXED CARBON FILM	510 1/6W 5 TA52	
		R907	ORD1800F609	RESISTOR.FIXED CARBON FILM	180 1/6W 5 TA52	
		R908	ORD1800F609	RESISTOR.FIXED CARBON FILM	180 1/6W 5 TA52	
		R909	ORD1800F609	RESISTOR.FIXED CARBON FILM	180 1/6W 5 TA52	
		R910	ORD3302F609	RESISTOR.FIXED CARBON FILM	33K 1/6W 5 TA52	
		R911	ORD3302F609	RESISTOR.FIXED CARBON FILM	33K 1/6W 5 TA52	
		R912	ORD3302F609	RESISTOR.FIXED CARBON FILM	33K 1/6W 5 TA52	
		R913	ORD1001M609	RESISTOR.FIXED CARBON FILM	1.0K 1/2W 5 TA52	
		R914	ORD1001M609	RESISTOR.FIXED CARBON FILM	1.0K 1/2W 5 TA52	
		R915	ORD1001M609	RESISTOR.FIXED CARBON FILM	1.0K 1/2W 5 TA52	
		R916	ORD1001M609	RESISTOR.FIXED CARBON FILM	1.0K 1/2W 5 TA52	
		R917	ORD1001M609	RESISTOR.FIXED CARBON FILM	1.0K 1/2W 5 TA52	
		R918	ORD1001M609	RESISTOR.FIXED CARBON FILM	1.0K 1/2W 5 TA52	
		R919	ORD5601F609	RESISTOR.FIXED CARBON FILM	5.6K 1/6W 5 TA52	
		R920	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W 5 TA52	
		R922	ORD1000F609	RESISTOR.FIXED CARBON FILM	100 1/6W 5 TA52	
		R923	ORD4700F609	RESISTOR.FIXED CARBON FILM	470 1/6W 5 TA52	
		R924	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W 5 TA52	
		R927	ORD3902M609	RESISTOR.FIXED CARBON FILM	39K 1/2W 5 TA52	
		R928	ORD3902M609	RESISTOR.FIXED CARBON FILM	39K 1/2W 5 TA52	
		R929	ORD3902M609	RESISTOR.FIXED CARBON FILM	39K 1/2W 5 TA52	
		R930	ORD6201F609	RESISTOR.FIXED CARBON FILM	6.2K 1/6W 5 TA52	
		R931	ORD6201F609	RESISTOR.FIXED CARBON FILM	6.2K 1/6W 5 TA52	
		R932	ORD6201F609	RESISTOR.FIXED CARBON FILM	6.2K 1/6W 5 TA52	
		R933	ORD3303F609	RESISTOR.FIXED CARBON FILM	330K 1/6W 5 TA52	
		R934	ORD1001F609	RESISTOR.FIXED CARBON FILM	1.0K 1/6W 5 TA52	
		R935	ORD1001F609	RESISTOR.FIXED CARBON FILM	1.0K 1/6W 5 TA52	
		R936	ORD1001F609	RESISTOR.FIXED CARBON FILM	1.0K 1/6W 5 TA52	
		R937	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W 5 TA52	
		R938	ORD4701F609	RESISTOR.FIXED CARBON FILM	4.7K 1/6W 5 TA52	
		SK201	381-090A	PERI-CON	ASSY.21PIN PERI-SOCKET	
		SK901	381-0948	CRT SOCKET	CPT MPS0360-01-020	
		SW301	140-111A	SWITCH	SVC P12T21	
		SW801	140-278C	SWITCH	MAIN.MESC(TV-S)	
		TH851	163-012A	THERMISTOR	PTC,PTH451A102BG180M290	
		TP701	ORD6802G509	RESISTOR.FIXED CARBON FILM	68K 1/4W 2 TA52	
		TU181	113-231A	TUNER	TEKE4-033A	
		T401	151-386A	TRANSFORMER	H.DRIVE 19Y4BT	
		T701	154-162F	FBT	FCH=162F-25ST5	
		T801	151-395B	TRANSFORMER	SMPS.PC12A 25INCH	
		VC101	181-169A	CAPACITOR	CAPACITOR TRIMMER 4.5P-20P	
		VC501	181-169A	CAPACITOR	CAPACITOR TRIMMER 4.5P-20P	
		VR201	180-451G	RESISTOR	EVN-DJAA03 B502 HORIZONTAL(TA)	

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S	AL	LOCA.NO.	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		VR501	180-451A	RESISTOR	EVM-DJAA03 B221 HORIZONTAL(TA)	
		VR401	180-451L	RESISTOR	EVM-DJAA03 B104 HORIZONTAL(TA)	
		VR402	180-451G	RESISTOR	EVM-DJAA03 B502 HORIZONTAL(TA)	
		VR451	180-451H	RESISTOR	EVM-DJAA03 B103 HORIZONTAL(TA)	
		VR452	180-451K	RESISTOR	EVM-DJAA03 B473 HORIZONTAL(TA)	
		VR501	180-451A	RESISTOR	EVM-DJAA03 B221 HORIZONTAL(TA)	
		VR601	180-451D	RESISTOR	EVM-DJAA03 B102 HORIZONTAL(TA)	
		VR801	180-451F	RESISTOR	EVM-DJAA03 B332 HORIZONTAL(TA)	
		VR901	180-451D	RESISTOR	EVM-DJAA03 B102 HORIZONTAL(TA)	
		VR902	180-451D	RESISTOR	EVM-DJAA03 B102 HORIZONTAL(TA)	
		X101	156-025A	OSCILLATOR	8 MHZ	
		X501	156-007A	OSCILLATOR	X-TAL 8.86 MHZ	
		ZD101	0DZ560009AA	DIODE ZENER	MTZ5.6B.TP(52MM).ROHM	
		ZD102	0DZ560009AA	DIODE ZENER	MTZ5.6B.TP(52MM).ROHM	
		ZD181	0DZ560009AA	DIODE ZENER	MTZ5.6B.TP(52MM).ROHM	
		ZD301	0DZ300009BA	DIODE ZENER	MTZ30B.TP(52MM).ROHM	
		ZD401	0RD3000F609	RESISTOR.FIXED CARBON FILM	300 1/6W 5 TA52	
		ZD702	0DZ330009BA	DIODE ZENER	ZENER HZT33 TAPING	
		ZD801	0DZ180009AA	DIODE ZENER	MTZ18B.TP(52MM).ROHM	
		ZD802	0DZ122009BA	DIODE ZENER	HZ-12(B)T2	
		ZD901	0DZ560009AA	DIODE ZENER	MTZ5.6B.TP(52MM).ROHM	
		ZD902	0DZ120009AA	DIODE ZENER	Z12BM TA	
		Z201	166-199B	FILTER	SAW OFWG3352(PAL-B/G)SIEMENS	
		Z203	166-031L	FILTER	TPS 5.5MB-TF21(TA)	
		Z204	166-031N	FILTER	TPS 6.5MB-TF21(TA)	
		Z601	166-248B	FILTER	SFT5.74MA	
		Z602	166-243A	FILTER	SFT5.5MA	
				*** END OF DATA ***		

CIRCUIT DIAGRAM (PC-12A-MAIN BOARD)

MODEL : CBT-2871E

NOTICE

Since this is a basic circuit diagram, the value of components and some partial 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.

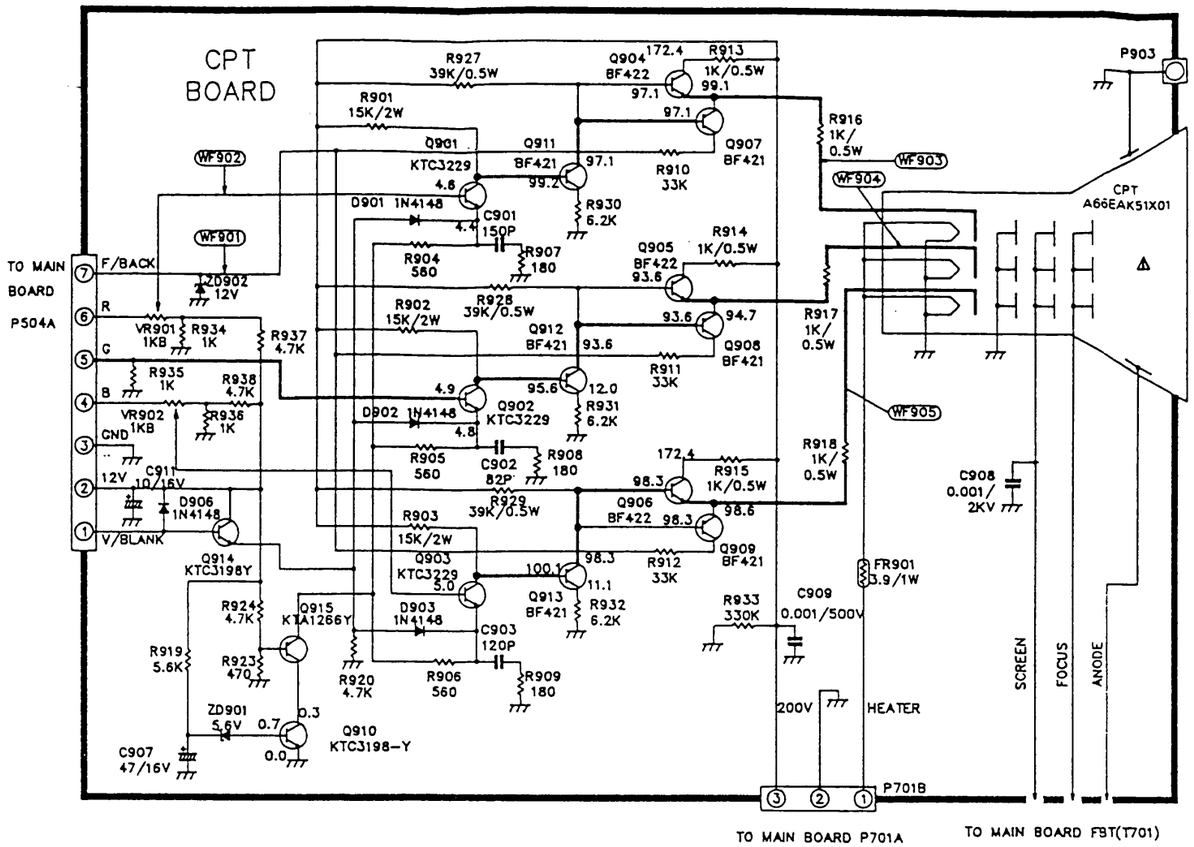
VALUE OF RESISTOR, CAPACITOR and INDUCTOR

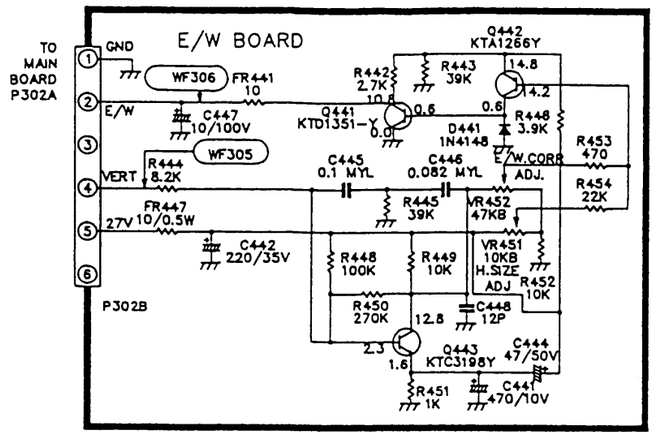
1. Resistance is shown in ohm, k=1,000, M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in uF and the values more than 1 in pF. The sign of (M) in schematic means MYLAR CAPACITOR.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in uH.

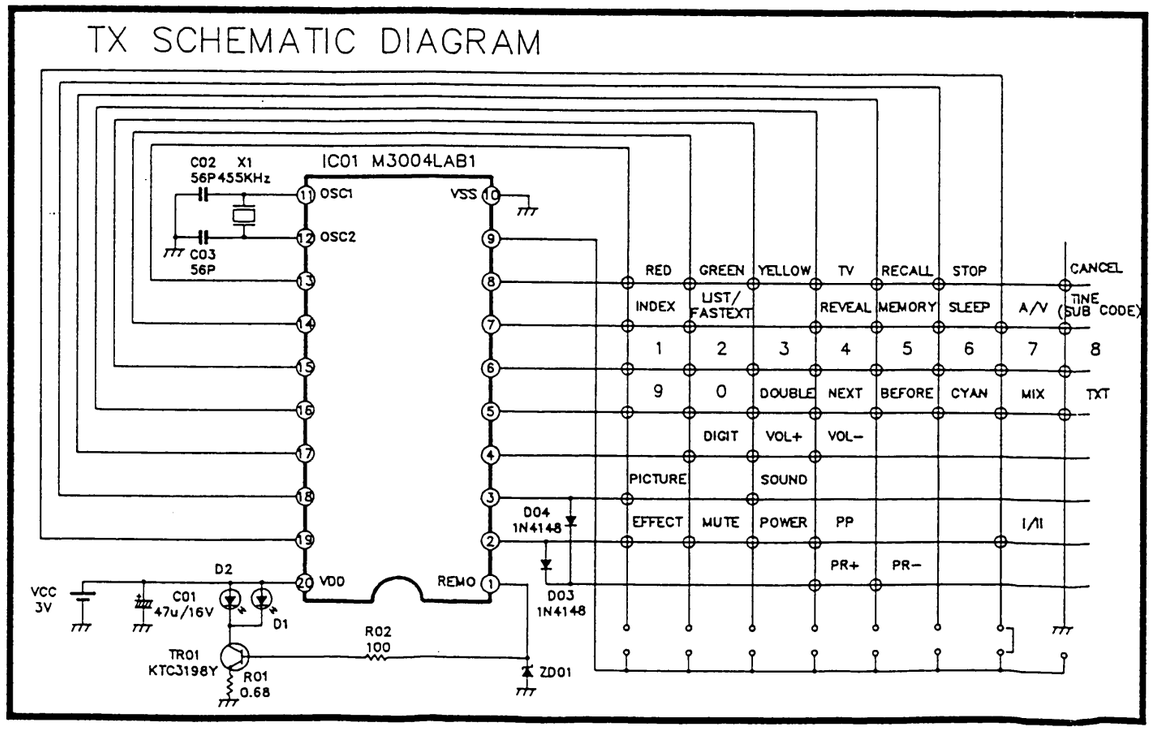
OBSERVATION of VOLTAGES AND WAVEFORMS

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 BRIGHTNESS and COLOUR controls are in mid position and CONTRAST controls is almost in maximum position.
6. Waveforms are taken using a standard colour bar signal.

P/N : 484-799P(1/2)







WF201 2.0Vp-p	WF305 1.9Vp-p	WF306 13.0Vp-p		
WF603 550mVp-p	WF604 1.5Vp-p	WF605 1.5Vp-p		
WF901 4.0Vp-p F/B	WF902 4.0Vp-p R	WF903 80Vp-p RK	WF904 80Vp-p GK	WF905 80Vp-p BK

WHEN WE RELEIVE THE SIGNAL OF LEFT(3KHZ) AND RIGHT(1KHZ)

	STEREO	DUAL	MONO
WF601	AF1= (L+R)/2, 1.5Vp-p	3KHZ, 1.5Vp-p	3KHZ, 1.5Vp-p
WF602	AF2=2R 1KHZ, 1.5Vp-p	1KHZ, 1.5Vp-p	

PC-12A SUB-BOARD

MODEL : CBT-2871E