



# GoldStar

## COLOUR TV SERVICE MANUAL

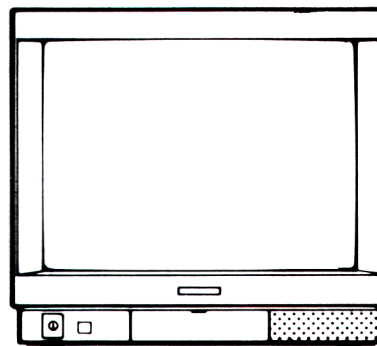
### CAUTION

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

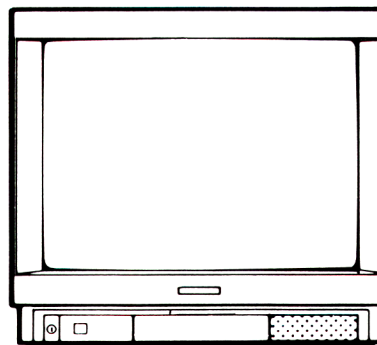
This service manual contains only the replacement parts information of the Model CKT-2190 and CKT-2191.

For the PC04A chassis common information, refer to the service manual of part No. 483-662Z.

**CKT-2190X**  
**CKT-2190**



**CKT-2191X**  
**CKT-2191**



**CHASSIS: PC-04A**

**MODEL: CKT-2190/X**  
**CKT-2191/X**



# GoldStar

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## SPECIFICATIONS

|                               |                          |
|-------------------------------|--------------------------|
| Power Consumption .....       | 80W                      |
| Receiving TV System .....     | CCIR Standard            |
| Tuning .....                  | 40 Voltage Synthesizer   |
| Audio Output .....            | 3W                       |
| Antenna Input Impedance ..... | 75 ohm IEC Type          |
| Picture Tube .....            | A48KM12XX 25N7KD         |
| Dimension .....               | 492(W) × 465(D) × 458(H) |
| Weight .....                  | 18.4 Kg                  |

| COLOUR RECEIVING SYSTEM   |          | PAL/SECAM-B/G                            | PAL B/G-<br>SECAM D/K | PAL-I            | PAL-H     |
|---------------------------|----------|------------------------------------------|-----------------------|------------------|-----------|
| Intermediate<br>Frequency | Picture  | 38.9 MHz                                 | 38.9 MHz              | 39.5 MHz         | 38.9 MHz  |
|                           | Sound    | 33.4 MHz                                 | 32.4 MHz              | 33.5 MHz         | 33.4 MHz  |
|                           | Colour   | 34.47 MHz                                | 34.47 MHz             | 35.07 MHz        | 34.47 MHz |
| Receiving<br>Channel      | VHF Low  | 2-4 CH, S <sub>1</sub>                   | 1-5 CH                | NONE             | 0-5 CH    |
|                           | VHF High | 5-12 CH, S <sub>2</sub> -S <sub>25</sub> | 6-12 CH               | NONE             | 5A-11 CH  |
|                           | UHF      | 21-69 CH                                 | 21-69 CH              | 21-69 CH         | 21-69 CH  |
| Power Source              |          | 220V/50Hz (SMPS)                         |                       | 240V/50Hz (SMPS) |           |

## 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

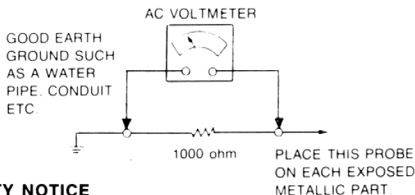
- Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not be above the specified limit. The nominal value of the high voltage of this receiver is  $24 \pm 1.5$  kV at High beam current (maximum brightness) under specified power source. The high voltage must not, under any circumstances, exceed 27.5 KV. Each time a receiver requires servicing, the high voltage should be checked. It is recommended the reading of the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.
- 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.
- 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

- Potential as high as 25,000—27,000 volts is present when this receiver is operating. Operation of the receiver outside the cabinet or with the back cover removed involves a shock hazard from the receiver.
  - Servicing should not be attempted by anyone who don't know the precautions necessary through and through when working on high-voltage equipment.
  - Always discharge the picture tube anode to the CHASSIS GROUND to reduce the shock hazard before removing the anode cap.
  - Perfectly discharge the high potential of the picture tube before handling.  
(WARNING: Risk of implosion. Handle with care.)
- If any Fuse in this TV receiver is blown, replace it with the FUSE specified in the chassis parts list only.
- When replacing parts or circuit boards, wind the lead wires around terminals before soldering.
- When replacing a high wattage resistor (oxide metal film resistor) in circuit board, keep the resistor 10 mm. away from circuit board.
- Keep wires away from high voltage or high temperature components.
- Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts

of the cabinet, such as antennas, terminals, screwheads, metal overlays, control shafts, etc., to be sure the set is safe to operate without danger of electrical shock. Since this TV has AVC (Automatic Voltage Control) circuit, it may be operated nonadjustably within the voltage-area indicated in the label attached at back cover. (Do not use a line isolation transformer during this check.) Use an AC voltmeter having 1000 ohms per volt or more sensitivity in the following manner.

Connect a 1000 ohm resistor between a known good earth ground, (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1000 ohm resistor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 1 volt RMS. This corresponds to 1 mA AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



### PRODUCT SAFETY NOTICE

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

## SERVICING PRECAUTIONS

**CAUTION:** Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the **SAFETY PRECAUTIONS** on page 3 of this publication.

**NOTE:** If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. *Remember: Safety First.*

### General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before:
  - a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
  - b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
  - c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
- CAUTION:** A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
- d. Discharging the picture tube anode.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc.) equipped with a suitable high voltage probe. *Do not test high voltage by "drawing an arc".*
3. Discharge the picture tube anode only by (a) first connecting one end of an insulated clip lead to the degaussing or kine aquadag grounding system shield at the point where the picture tube socket ground lead is connected, and then (b) touch the other end of the insulated clip lead to the picture tube anode button, using an insulating handle to avoid personal contact with high voltage.
4. *Do not* spray chemicals on or near this receiver or any of its assemblies.
5. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable nonabrasive applicator: 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength).

**CAUTION:** *This is a flammable mixture.*

Unless specified otherwise in this service manual, lubrication of contacts is not required.

6. *Do not* defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
7. *Do not* apply AC power to this receiver 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.
  - a. 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 semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock prior to applying power to the unit under test.
  2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
  3. Use only a *grounded-tip* soldering iron to solder or unsolder ES devices.
  4. Use only an *anti-static* type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
  5. *Do not* use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
  6. *Do not* remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material.)
  7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
- CAUTION:** Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

### General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range of 500°F to 600°F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a small wire-bristle (0.5 inch, or 1.25 cm) 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 circuit board printed foil.
6. Use the following soldering technique.
  - a. Allow the soldering iron tip to reach a normal temperature (500°F to 600°F).
  - b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.

- c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.

**CAUTION:** Work quickly to avoid overheating the circuit board printed foil.

- d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

### IC Removal/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

#### Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

#### Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

### "Small-Signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

### Power Output Transistor Devices 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 and heat sink from the circuit board.
4. Insert new transistor in circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heatsink.

### Diode Removal/Replacement

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

### Fuse and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of circuit board hollow stake.
2. Securely crimp 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 defective copper pattern at IC connections, use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

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

#### At Other Connections

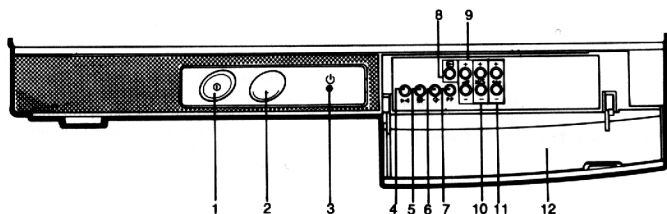
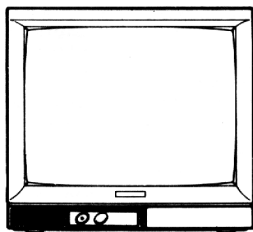
Use the following technique to repair defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.

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

## CONTROLS LOCATION

FRONT



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

## DISASSEMBLY INSTRUCTIONS

### BACK CABINET REMOVAL

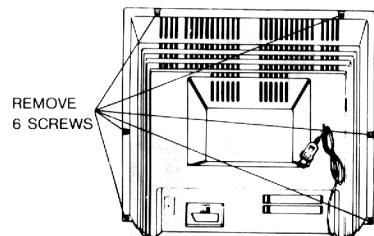
Remove 6 screws residing on the back cabinet and carefully separate the back cabinet from the front cabinet.

### MAIN CHASSIS REMOVAL

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

### SPEAKER ASSY REMOVAL

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

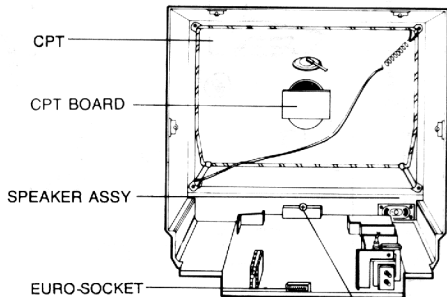


### CPT REMOVAL

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

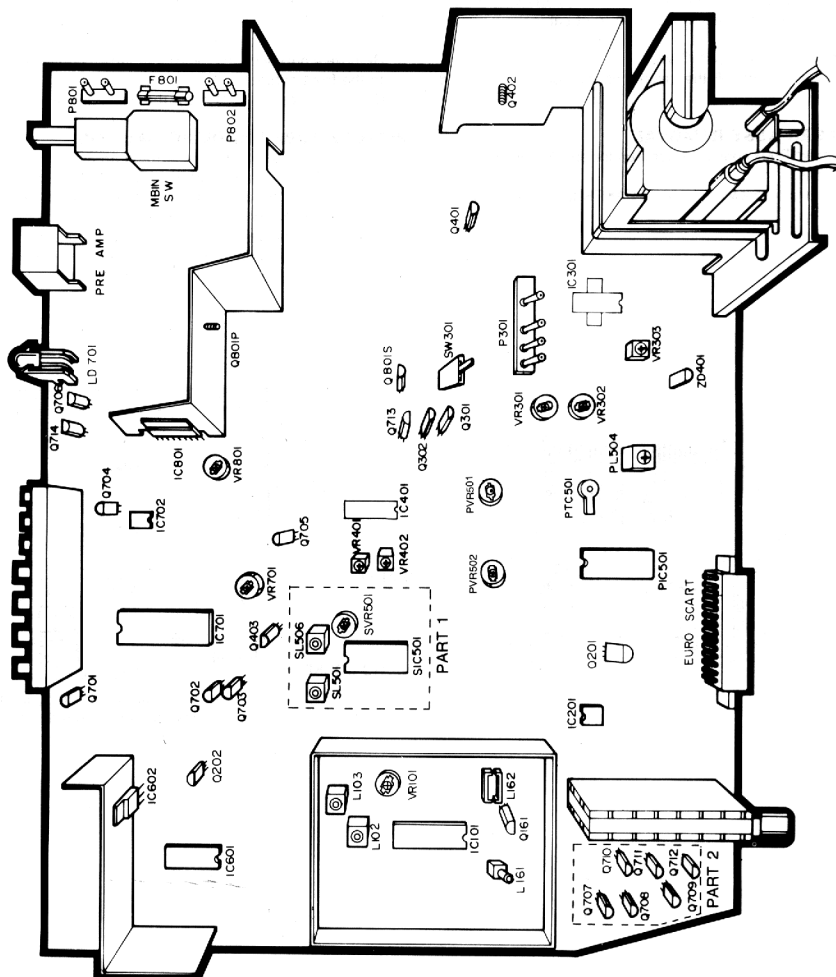
### PICTURE TUBE HANDLING CAUTION

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



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

# PARTS LOCATION OF MAIN CHASSIS



## • NOTICE:

In case of the model without teletext, get rid of Q301, Q302.

In case of the model without SECAM system, get rid of PART 1.

In case of the model with PAL-I system, get rid of PART 1, 2 and L161.

# PC-04A ALIGNMENT INSTRUCTIONS

## 1. APPLIANCE

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

## 2. SPECIFICATION

### 2-1 CIRCUMFERENCE CONDITION

If there is no particular guidance, adjust under the following condition.

- 1) Circumference Temperature:  $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$
- 2) Relative Humidity:  $65\% \pm 5\%$

### 2-2 NECESSARY INSTRUMENTS

## 3. ALIGNMENT

### 3-1 VIF ALIGNMENT

- 1) Connection Diagram of Equipments

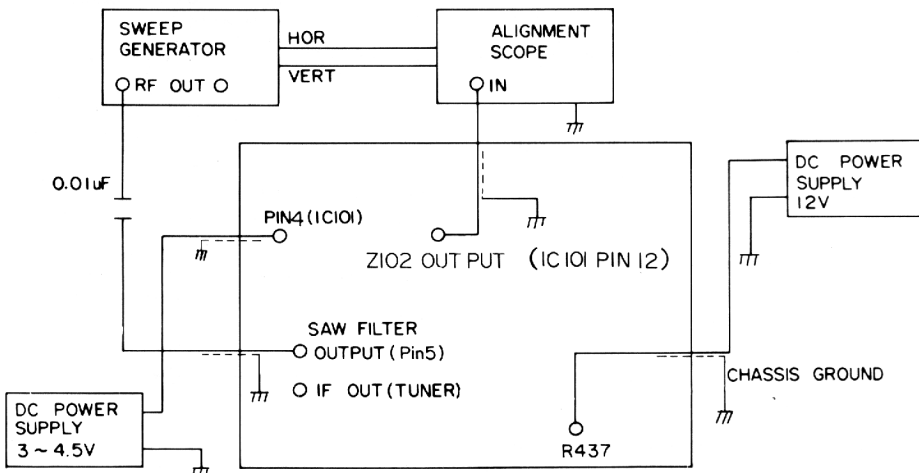


Figure 1

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

- 2) VIF Detection Coil Alignment

- a) Do the connection as shown in figure 1 and then DC power suppliers on.

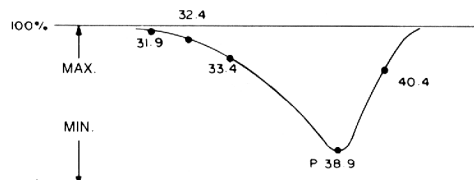


Figure 2

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

### 2-3 SIGNAL

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

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

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

- b) Adjust L103 (Detection Special Quality Adjustment Coil) in order to minimize the PICTURE CARRIER MARK as shown in figure 2.

(For Mark Frequency of Each System, refer to the below note (\*)).

\* Each frequency carrier of system.

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

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

### 3-2 AFT ALIGNMENT (L102)

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

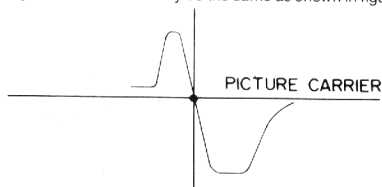


Figure 3 (AFT Alignment Waveform)

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

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

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

### 3-4 HORIZONTAL SYNCHRONIZATION ALIGNMENT

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

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

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

### 3-6 VERTICAL OSCILLATOR FREQUENCY ALIGNMENT

- 1) Adjust the set in no signal condition.
- 2) Connect the frequency COUNTER to the CONNECTOR part (R304) which is connected with vertical DY.

(Connect the (-) side of the connector to the heat sink of the chassis)

- 3) Adjust VR302 so that FREE-RUN frequency may be  $46.00 \pm 0.5\text{Hz}$ .

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

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

### 3-8 VERTICAL CENTER ALIGNMENT

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

### 3-9 COLOUR SYNCHRONIZATION ALIGNMENT

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

### 3-10 PAL MATRIX ALIGNMENT

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

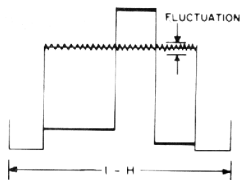


Figure 4-1: PVR501 Alignment

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

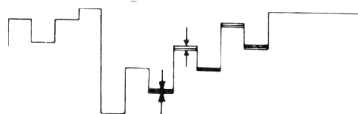


Figure 4-2: PL504 Alignment

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

### 3-11 RF AGC ALIGNMENT

- 1) Receive the standard colour signal ( $60\text{dB} \pm 1\text{dB}$ ), but in case of PAL 4, receive  $70\text{dB} \pm 1\text{dB}$ .
- 2) Connect DIGITAL MULTIMETER to AGC terminal of the TUNER (J20, TP1).
- 3) Refer to below diagram and then adjust VR101.

| Tuner System | B/G                    | I                      | B/H                    | D/K                    |
|--------------|------------------------|------------------------|------------------------|------------------------|
| ALPS         | $4.8 \pm 0.1\text{dc}$ | $4.9 \pm 0.1\text{dc}$ | $4.8 \pm 0.1\text{dc}$ | $4.8 \pm 0.1\text{dc}$ |

- Select the best point in alignment with the TUNER SYSTEM or per production LOT.

### 3-12 SCREEN AND WHITE BALANCE ALIGNMENT

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

### 3-13 FOCUS ALIGNMENT

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

## 4. SECAM ALIGNMENT

### 4-1 SECAM BELL FILTER ALIGNMENT

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

### 4-2 SECAM REFERENCE COIL ALIGNMENT

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

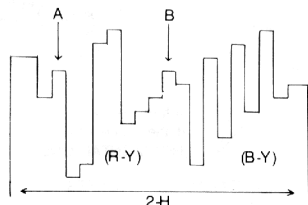


Figure 6. Pin 24 Waveform

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

To be equaled the whole size

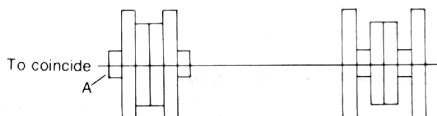


Figure 6. Pin 10 Waveform

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

## 5. OSD POSITION ALIGNMENT

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

## PURITY AND CONVERGENCE ADJUSTMENT

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

### COLOUR PURITY ADJUSTMENT

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

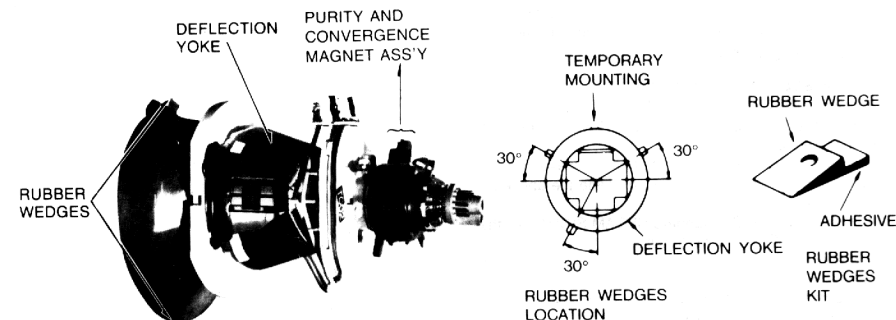


Figure 8

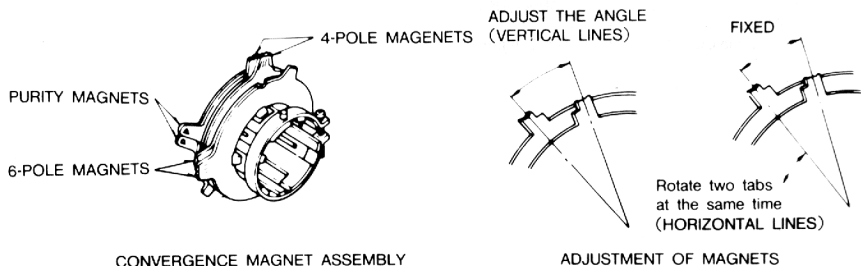


Figure 9

## CENTER CONVERGENCE ADJUSTMENT

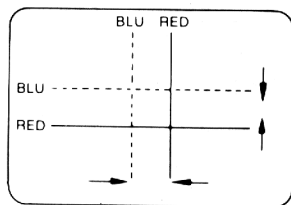
1. Receive crosshatch pattern with a colour bar signal generator.
2. Adjust the BRIGHTNESS and CONTRAST controls for well defined pattern.
3. Adjust two tabs of the 4-pole magnets to change the angle between them (See figure 9) and superimpose the red and blue vertical lines in the center area of the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

lines and rotating both magnets affects the horizontal lines.

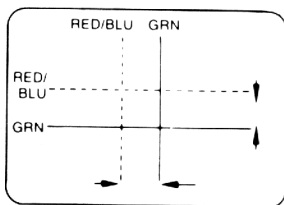
6. Repeat adjustments 1,2,3, keeping in mind red, green and blue movements, because 4-Pole magnets and 6-Pole magnets interact and make dot movement complex.

## CIRCUMFERENCE CONVERGENCE ADJUSTMENT

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

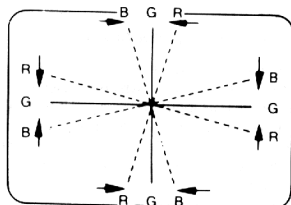


4-Pole Magnets Movement

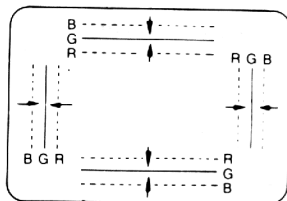


6-Pole Magnets Movement

Center Convergence by Convergence Magnets



Incline the Yoke up (or down)



Incline the Yoke right(or left)

Circumference convergence by Deflection Yoke

Figure 10 DOT MOVEMENT PATTERN

# CIRCUIT DESCRIPTION

## 1. VIDEO IF AMPLIFIER CIRCUIT (IC101, $\mu 4439\text{BG}$ )

### 1-1 The Basic Construction

Video IF Amplifier Circuit contains three symmetrics of IF AMP (Video IF Dtdetor & AMP, AFT circuit & AMP and AGC circuit). All of above functions are performed in IC101 ( $\mu 4439\text{BG}$ ). The schematic diagram is same as figure 11.

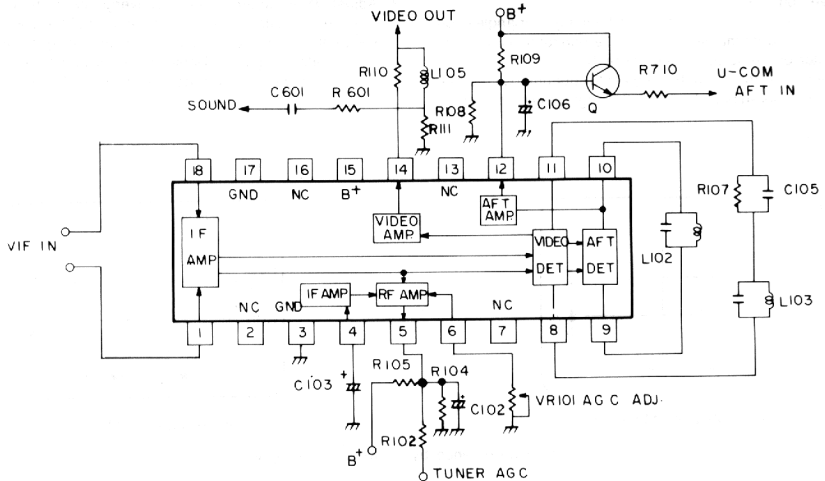


Figure 11. Schematic Diagram of IC101 ( $\mu 4439\text{BG}$ )

### 1-2 Pin Configuration of IC101

| Pin No.  | Description                                                                                                                                                              |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1, 18    | IF IN                                                                                                                                                                    |
| 2, 7, 16 | NC                                                                                                                                                                       |
| 3, 17    | Ground                                                                                                                                                                   |
| 4        | IF AGC storage capacitor                                                                                                                                                 |
| 5        | The output terminal of RF out                                                                                                                                            |
| 6        | RF AGC control terminal                                                                                                                                                  |
| 8, 11    | Video detector                                                                                                                                                           |
| 9, 10    | AFT detector                                                                                                                                                             |
| 12       | AFT output                                                                                                                                                               |
| 14       | Video output <ul style="list-style-type: none"> <li>• Composite video output level: 3Vp-p</li> <li>• White level: 5.2V</li> <li>• Black clamping level: 1.9 V</li> </ul> |
| 15       | Supply voltage terminal <ul style="list-style-type: none"> <li>• voltage: about 12 V<sub>DC</sub></li> <li>• current: 75 mA</li> </ul>                                   |

### 1-3 Operating Description of the Circuit

After the air signal is varied into the IF signal through the TUNER of the TV set, this signal which is passed via PRE-AMP and SAW FILTER input into pins1, 18 of IC101 via. This IF signal passes into the three stage AMP, and then video signal is detected by the detector coil connected to pins8, 11. AFT signal is also detected by the detector coil connected to pins9, 10.

They are output each video signal in pin14, AFT signal in pin12 through the AMP.

Also, AGC voltage passes pin5 after adjusting VR101 (AGC adjustment variable resistor) connected pin6 and this voltage is connected to the AGC terminal of the TUNER, so that the AGC voltage is controlled.

## 2. SOUND IF AMPLIFIER CIRCUIT (IC601, TBA120T)

### 2-1 The Basic Construction

SIF AMP as FM IF AMP & Demodulator is composed of SIF AMP, SIF Detector, sound output, volume control and external audio in/out.

These circuits are operated within IC601.

The schematic diagram is same as figure 12.

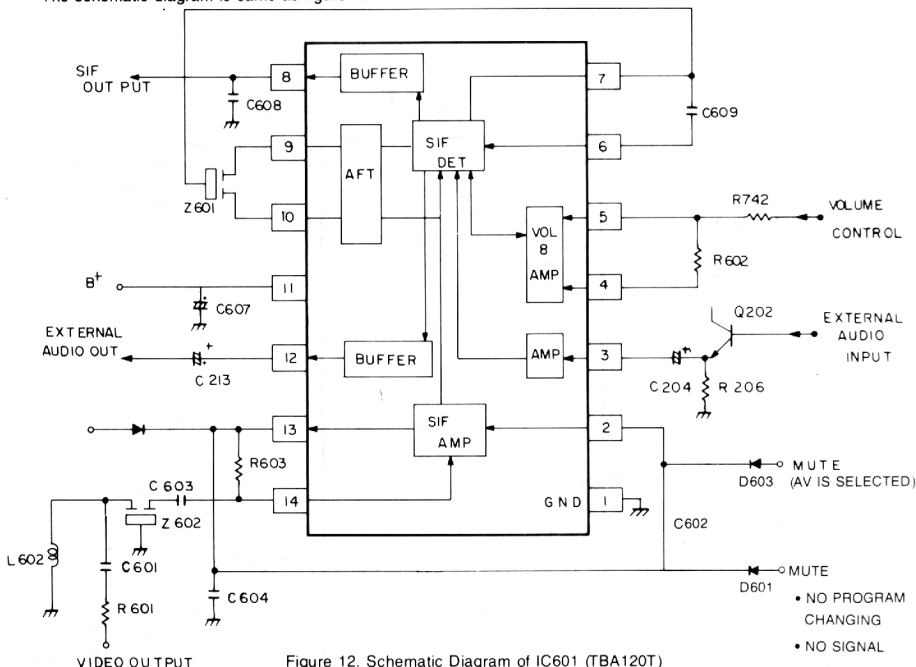


Figure 12. Schematic Diagram of IC601 (TBA120T)

### 2-2 Pin Configuration of IC601

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

### 2-3 Operating Description of the Circuit

Sound carrier is detected by the composite video signal gone through band pass filter(BPF), (which is composed of R601, C601, L601) and ceramic discriminator (Z602).

and it is applied to SIF AMP. (pin13).

The amplified signal is applied to the SIF Detector Terminal.

And, after detection, this signal outputs into pin8 through the Buffer Circuit.

This output signal is controlled, by inputting to pin5 volume level which is controlled by the  $\mu$ -com (IC701).

The detected Audio Signal outputs into pin12 through the Buffer Circuit and this signal is the Audio output signal.

The Audio signal input from the external is input into pin3 and is detected through AMP and is output at pin8 through the Buffer Circuit.

### 3. HORIZONTAL DEFLECTION CIRCUIT (IC401, TDA1940)

#### 3-1 The Basic Construction

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

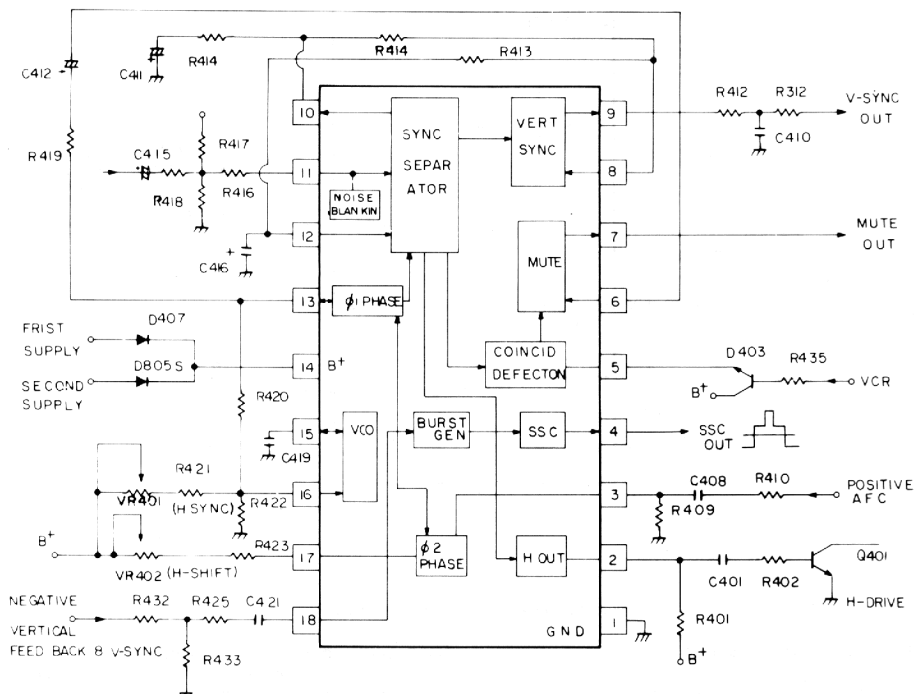


Figure 13. Schematic Diagram of IC401

### 3-2 Pin Configuration of IC401

| Pin No. | Description                                                                                                                                                                               |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | GND                                                                                                                                                                                       |
| 2       | Horizontal Sync output                                                                                                                                                                    |
| 3       | Positive flyback pulse(AFC) input                                                                                                                                                         |
| 4       | Super sandcastle pulse(ssc) out                                                                                                                                                           |
| 5       | Output of coincidence detector<br>: In case of the external VCR Mode, used as the auto time constant switching terminal.                                                                  |
| 6       | Input time-constant switching stage                                                                                                                                                       |
| 7       | If there is the broadcast signal, as the muting circuit output stage, it is high.<br>In case of non-signal condition, keeps the low condition.                                            |
| 8       | The reference stage for the vertical sync pulse                                                                                                                                           |
| 9       | Vertical sync pulse output                                                                                                                                                                |
| 10      | Horizontal pulse separator H/V clamping stage                                                                                                                                             |
| 11      | Video signal input stage                                                                                                                                                                  |
| 12      | Reference input stage for line pulse separation                                                                                                                                           |
| 13      | <ul style="list-style-type: none"> <li>• First phase comparator</li> <li>• Used as H-sync of ON-SCREEN.</li> </ul>                                                                        |
| 14      | <ul style="list-style-type: none"> <li>• Supply voltage stage</li> <li>• Supply voltage: 12V</li> <li>• Supply current: 40mA</li> </ul>                                                   |
| 15      | Horizontal oscillator frequency control is selected with the time constant of R422 and C419.                                                                                              |
| 16      | <ul style="list-style-type: none"> <li>• Horizontal oscillation frequency control stage.</li> <li>• Controls horizontal sync. with VR401</li> </ul>                                       |
| 17      | Second phase comparator stage (0, phase DET.)                                                                                                                                             |
| 18      | <ul style="list-style-type: none"> <li>• Vertical flyback pulse feedback input stage</li> <li>• Requires the negative vertical pulse.</li> <li>• Used as V-sync. of ON-SCREEN.</li> </ul> |

### 3-3 Operating Description of the Circuit

#### 3-3-1. START-UP

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

#### 3-3-2. HORIZONTAL OSCILLATION AND PHASE SHIFT

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

#### 3-3-3. SYNC. SEPARATOR

R417 and R418 connected to pin11 select the input level

which IC401 of the sync. separator circuit demands and the slicing level for the sync. separator. And it is the important factor of selecting the level which checks whether the broadcasting signal is or not.

#### 3-3-4. SUPER SANDCASTLE PULSE

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

#### 3-3-5. VCR MODE SECTION

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

#### 3-3-6. VERTICAL SECTION

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

## 4. VERTICAL DEFLECTION CIRCUIT (IC301, TDA1170N)

### 4-1 Basic Construction

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

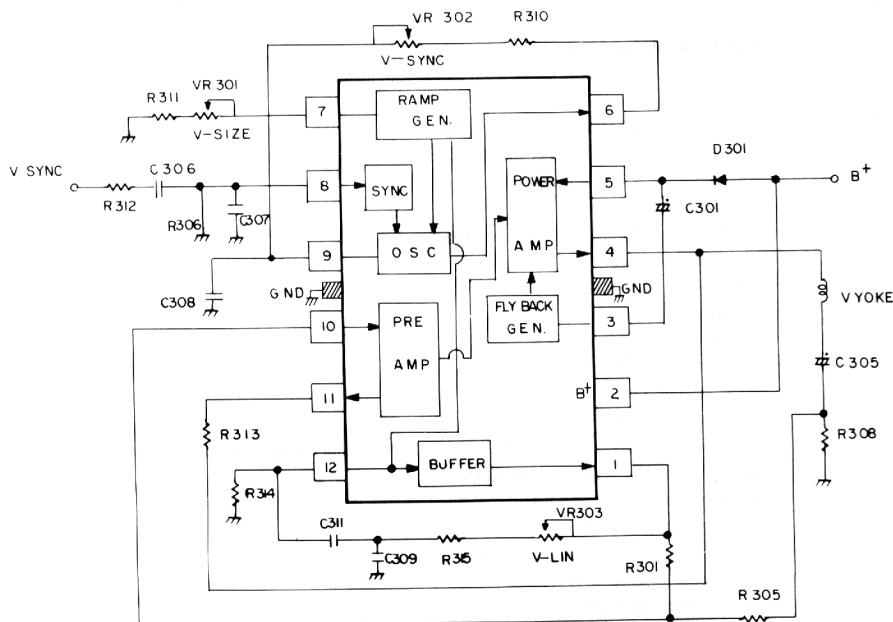


Figure 14. Schematic Diagram of IC301.

### 4-2 Pin Configuration of IC301

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

### 4-3 Operating Description of the Circuit

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

## 5. CHROMA & LUMINANCE CIRCUIT (PIC501, TDA3560A)

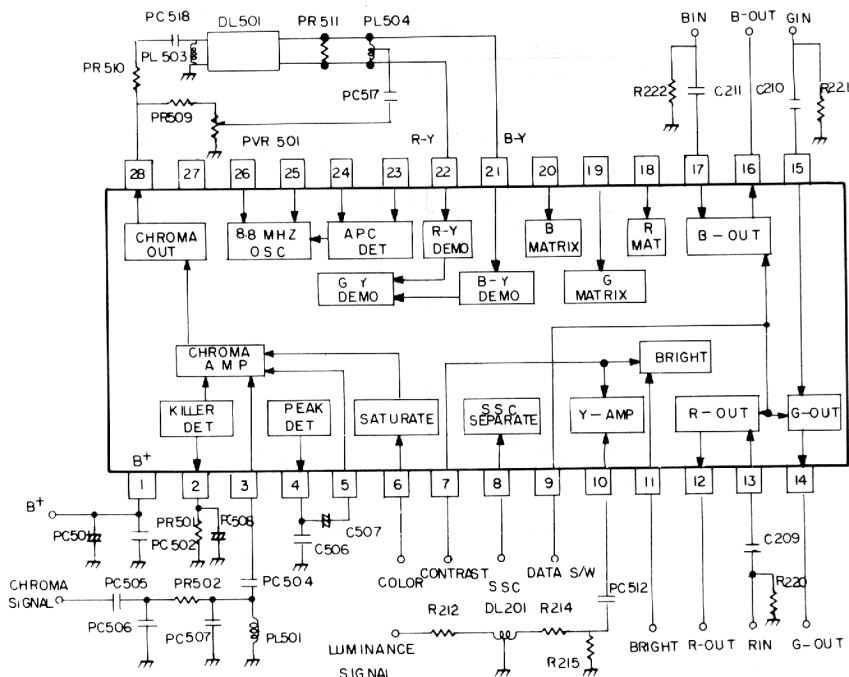


Figure 15. Schematic Diagram of PIC501 (TDA3560A)

### 5-1 Chroma Path

First, the chroma signal flows from B.P.F circuit into pin3 to be amplified, and then it flows into the second amplifier to be about 4Vp-p.

The amplifier signal output from pin28 is separated into two ways.

One flows through PR510, PC518 into 1H-Delay Line(DL501), the other flows through PR509, PVR501 and PC517 into mid-tap of PL504.

At PL504 two kinds of signal are vectored and adjusted, so that R-Y(u) signal is separated into B-Y(u) and B-Y(v). Each of the signals is demodulated inside pins21, 22, so that G-Y is generated by R-Y and B-Y.

In the course of demodulation, colour system is a carrier wave suppressed. Therefore pins25,26 oscillate to 8.86MHz to reconstitute a carrier wave.

The DC voltage the colour Burst of pins23,24 generates flows into oscillator for 8.86MHz and adjust the oscillating frequency and the false image so that they may coincide with original signal.

After 8.86MHz generated in this way decrease by half, R-Y and B-Y flow into G-Y demodulator in order to generate a complete demodulation.

On the other hand, pin2 discharges its duty of controlling the first amplifier of an outcome so that colour killer should not generate colour noise during receiving black and white signal or electric field less than 35dBm.

That is to say, pin4 detects the colour Burst and makes it generate DC voltage, which is supplied and controlled on pin2, and kills the DC voltage of pin2 less than 3V. Pin6 is a saturation control circuit.

### 5-2 Luminance Path

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

### 5-3 R.G.B Data Input

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

## 6. POWER SUPPLY (IC801, TDA4601)

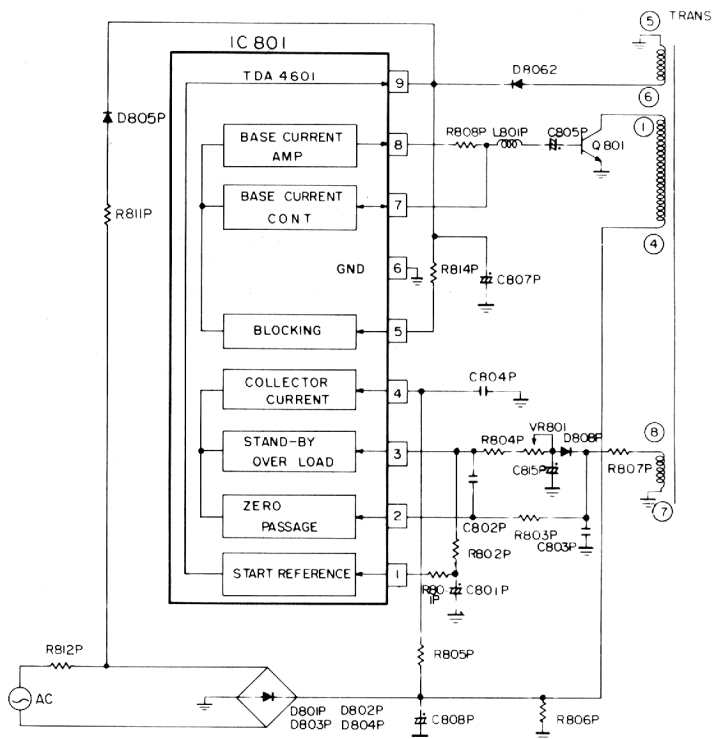


Figure 16. Schematic Diagram of IC801 (TDA4601)

### 6-1 Operating Description of the Circuit

#### START UP

If the power switch is ON, the voltage made by R811P, D805P and C807P, which is applied to pin9 of IC801. If the voltage of pin9 is above 8.5V, IC801 begins the generation.

The voltage rectified by D801P, D802P, D803P, D804P and C808P, which is applied to pin4 of SMPS transformer (T801).

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

If Q801 is driven, the voltage generated at pins5,6 of SMPS TRANS is rectified at D806P and C807P, and supplied about 13V to pin9 of IC801 continually.

#### NORMAL OPERATION

The square wave output which make Q801 on and off flows out of pin8, and its extend is adjusted by pin7. Also the sources generated by the load variation are detected from the wire wound pins7,8 of T801.

The detected variation sources which is commuted with the D808P and C815P input the voltage to pin3. Pin2 and pin3 have the function assisting the control operation.

And VR801 controls the secondary output voltage.

#### OVER LOAD OPERATION

The maximum collector current is decided by R805P and C804P connected to the pin4. When this identified value is exceed over load operation, fix R805P for 270K ohm and change the value of C804P to adjust the maximum over load.

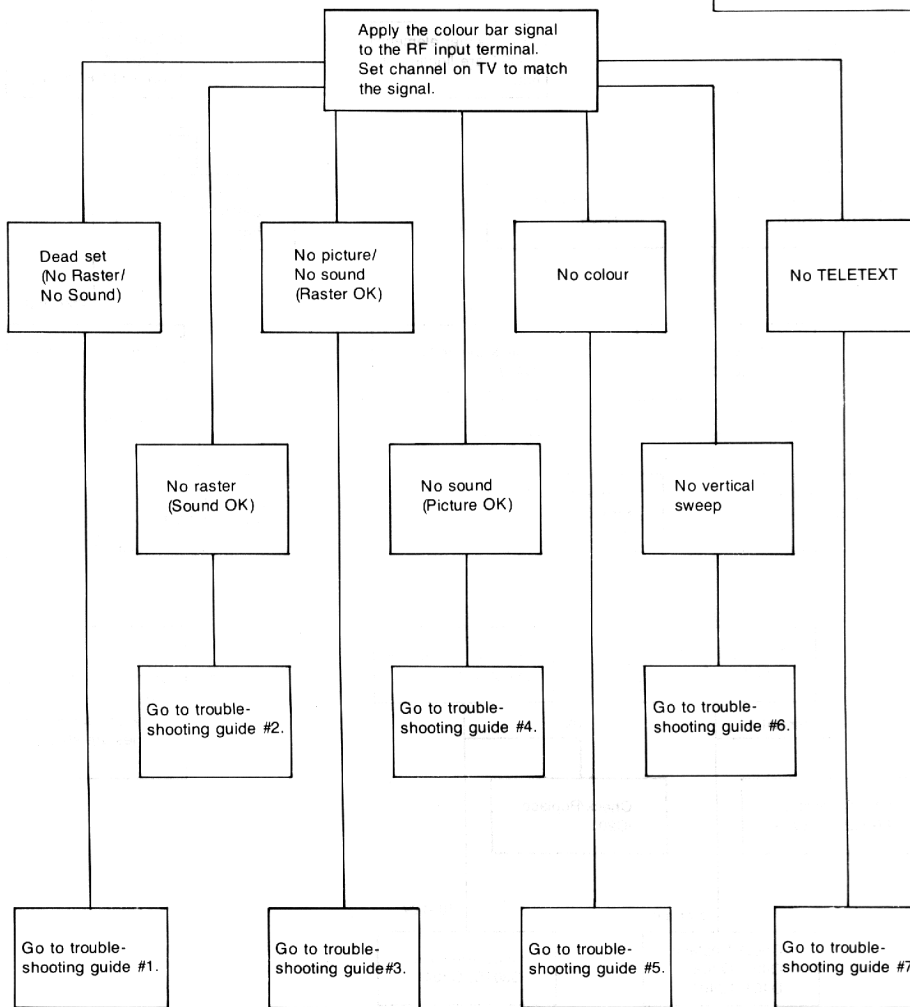
If you use a big capacitor of C804P, the maximum load electric power will increase.

#### HIGH VOLTAGE PROTECTION

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

# TROUBLESHOOTING GUIDE

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



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

Check +B voltage at TP6. (J122)

130-140V

120V (Normal)

0V

Check stand-by 12V  
of C804S(+).

Check/heater elements  
of CRT are lighting or  
not.

Check the rectified  
voltage of main supply  
power of C808P(+).

0V

Check/Replace  
D801S, FR801.

No

Check/Replace  
FR404.

0V

Check/Replace  
D801P-D804P  
F851, Q801.

12V

Check the voltage of  
pin5 of IC201.

Check the voltage of  
C429(+).

250-380V

Check the voltage of  
pin9 of IC801.

4V-5V

Check/Replace  
Q801S, Q704  
IC701.

0V

Check/Replace  
FR403, D403  
R427.

Less than 8V

Check/Replace  
R811P, D805P.

0V

Check the voltage  
of SMPS 19V.

12V

Check the voltage of  
pin5 of IC201.

8V-18V

Check/Replace  
FR803S, D806P  
D801S-803S  
Check the secondary  
voltages are short.

Abnormal

Check/Replace  
FR802S, D802S.

0V

Check/Replace  
IC201.

Normal

Check/Replace  
Q401, Q402  
D401, IC401.

10-12V

Check/Replace  
Q801S, Q704.

**#2. NO RASTER  
(SOUND OK)**

Check/heater elements of  
CRT are lighting.

No

Yes

Check the connecting  
condition from  
connector 3P on  
CPT board to main  
P401.

The screen  
is blinking.

Check/Replace  
PIC501.

Retrace line is  
visible.

Check the screen  
voltage(G2) alignment  
is correct or not.

Abnormal

Normal

Realign  
White Balance.

Check the screen  
colour.

White

R/G/B

Check the 180V  
line of C431(+).

Check the base  
voltage of  
Q901-Q903.

Abnormal

Check/Replace  
FR404, D406.

12V

4-5V

Check/Replace  
D501-D503.

Check/Replace  
R904-R906 or  
soldering condition.  
on CPT board

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

Check the voltage of  
TUNER MB. (12V)

11.8-12.2V

Check/Replace  
TUNER.

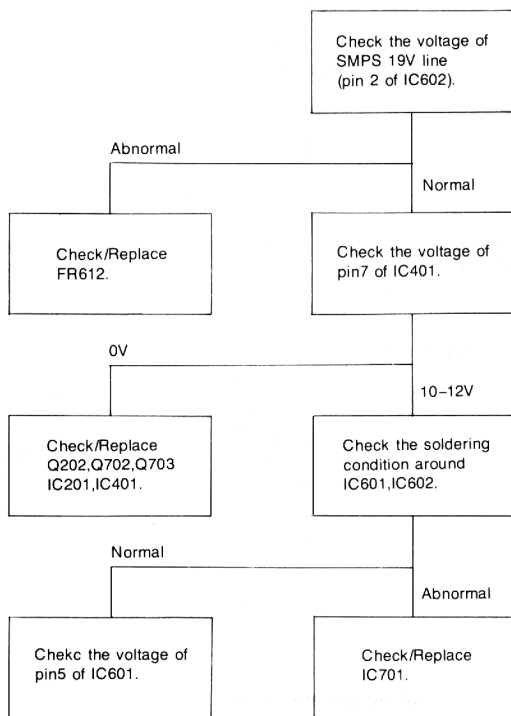
Check the tuning  
condition

Check/Replace  
Q161.

Check the 33V line  
of C425(+).

Check/Replace  
FR428, ZD401.  
D405.

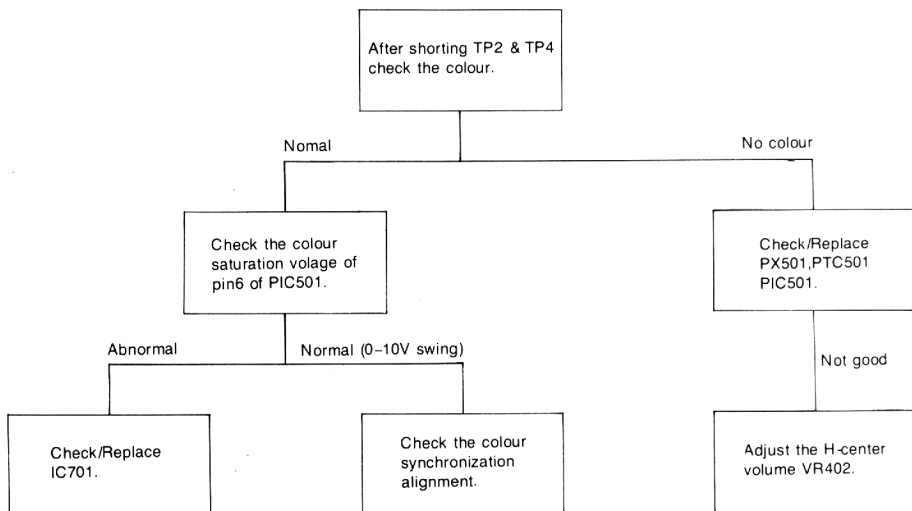
**#4. NO SOUND  
(PICTURE OK)**



**NOTE:**

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

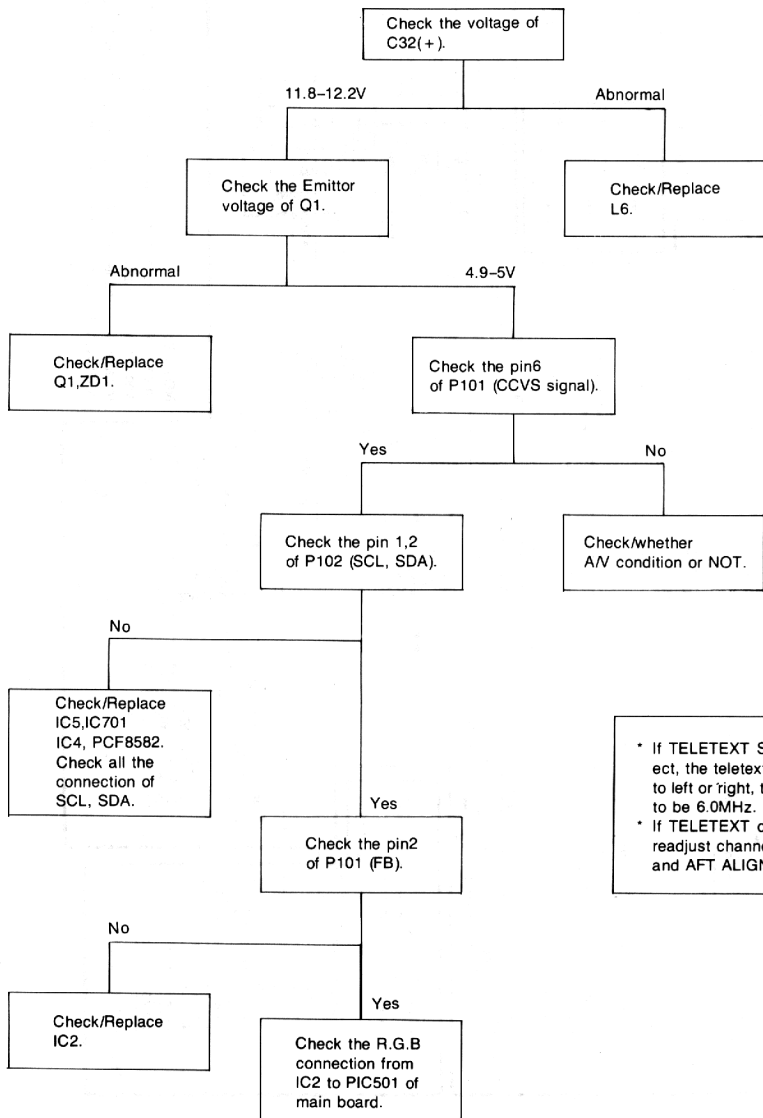
## #5. NO COLOUR



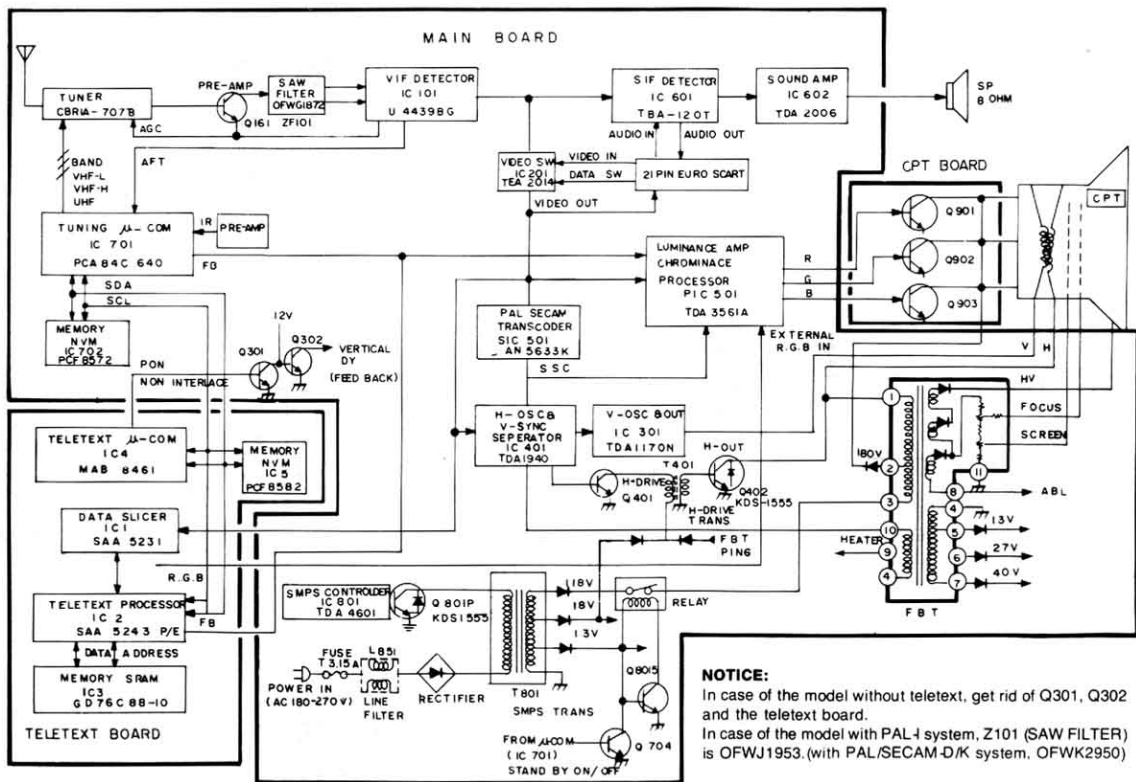
## #6. NO VERTICAL SWEEP

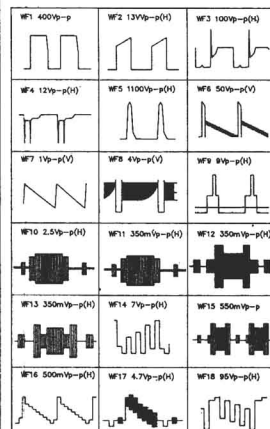
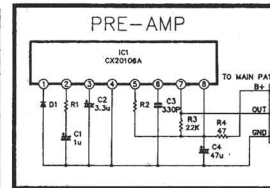
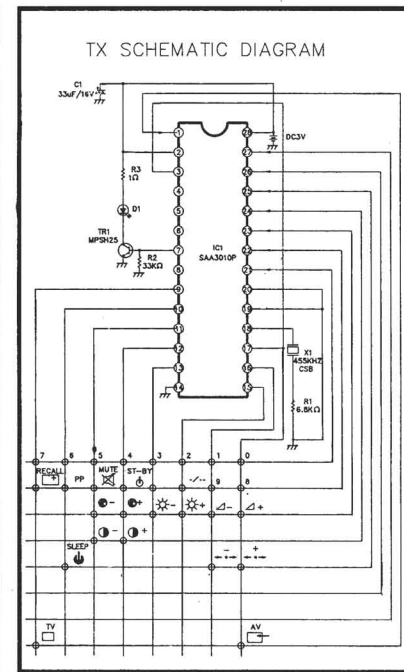
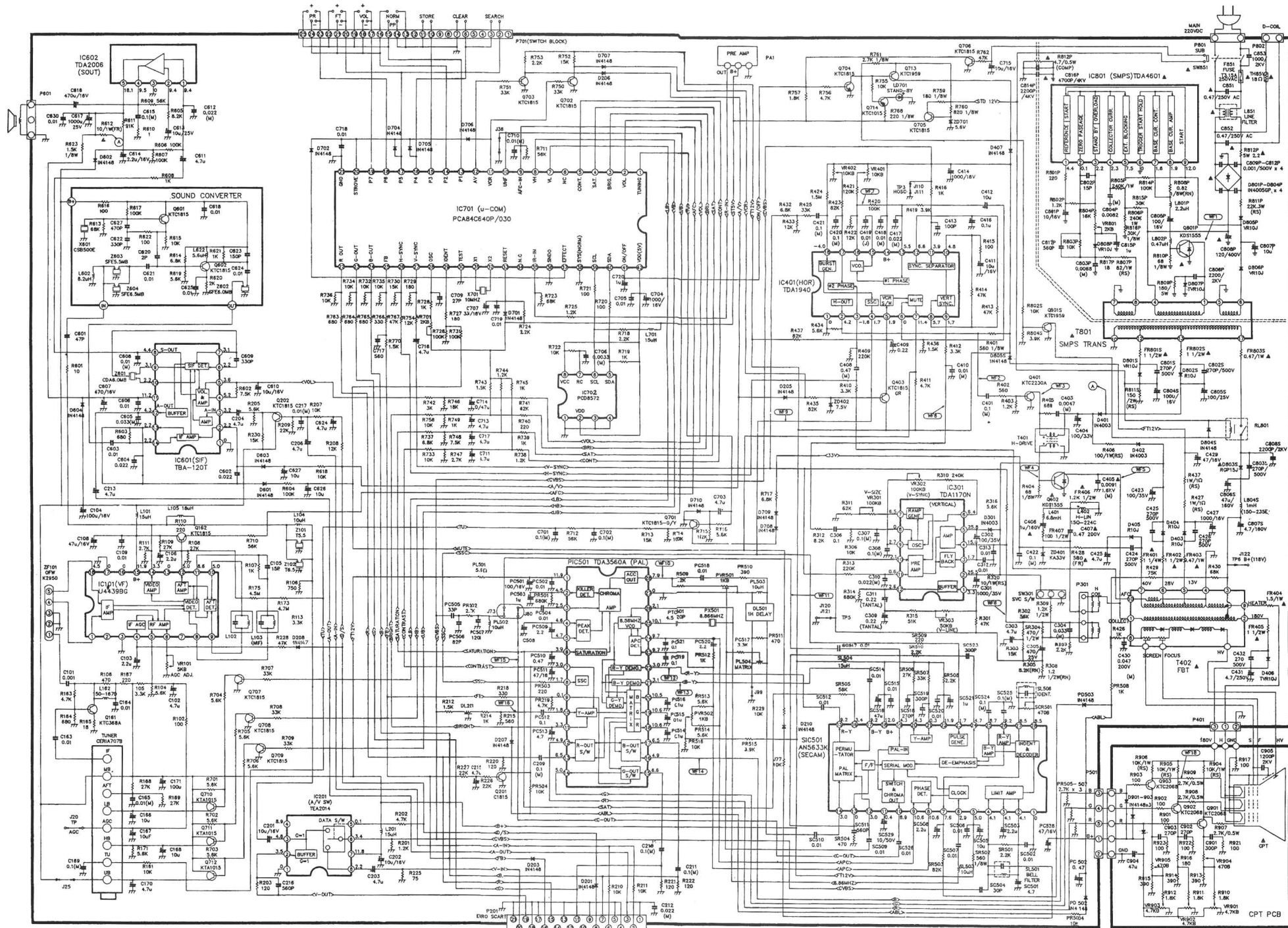
Check the around IC301  
soldering condition  
check/Replace  
IC301.

**#7. NO TELETEXT  
(not in use)**



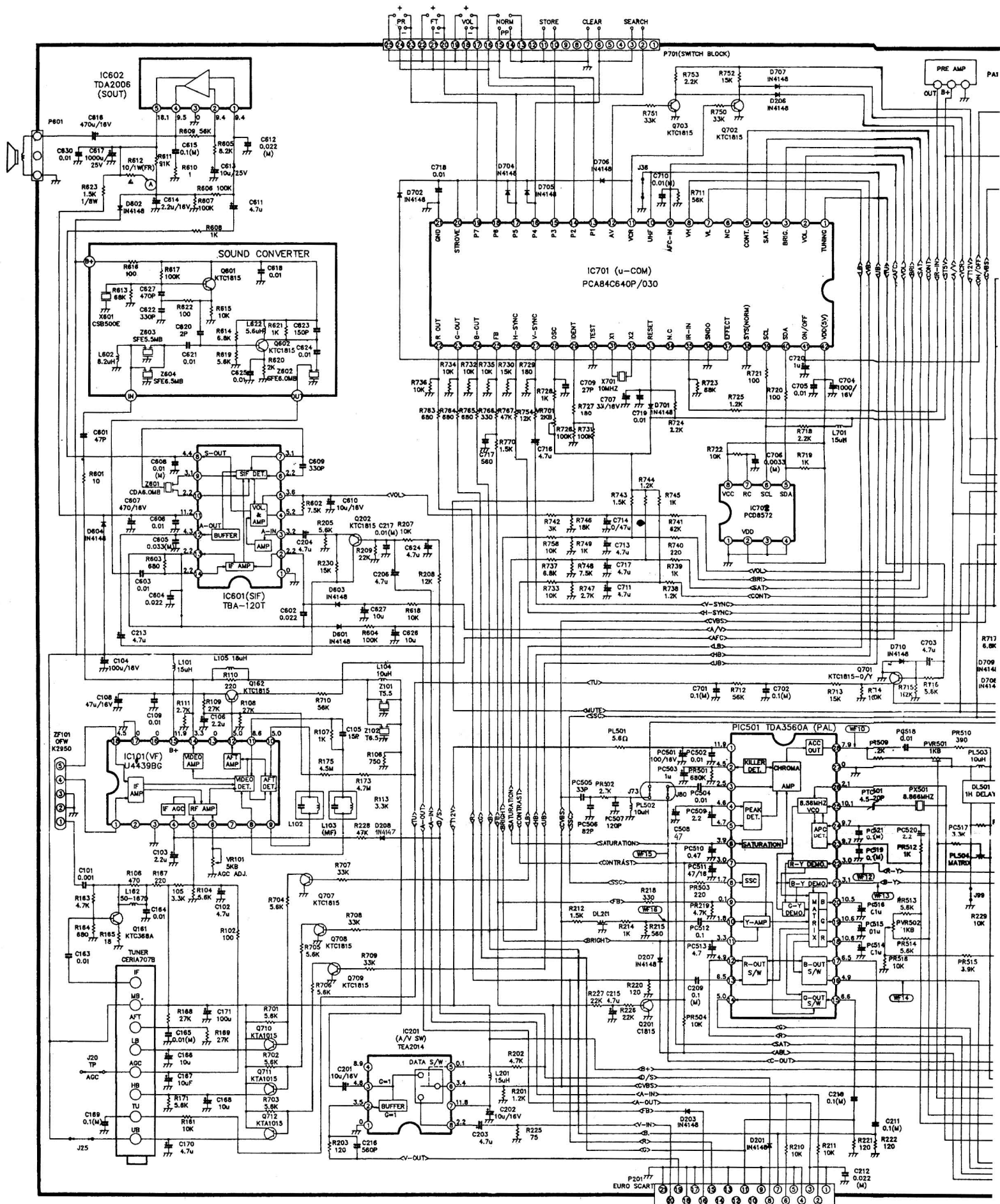
# GOLDSTAR PC04A CHASSIS BLOK DIAGRAM

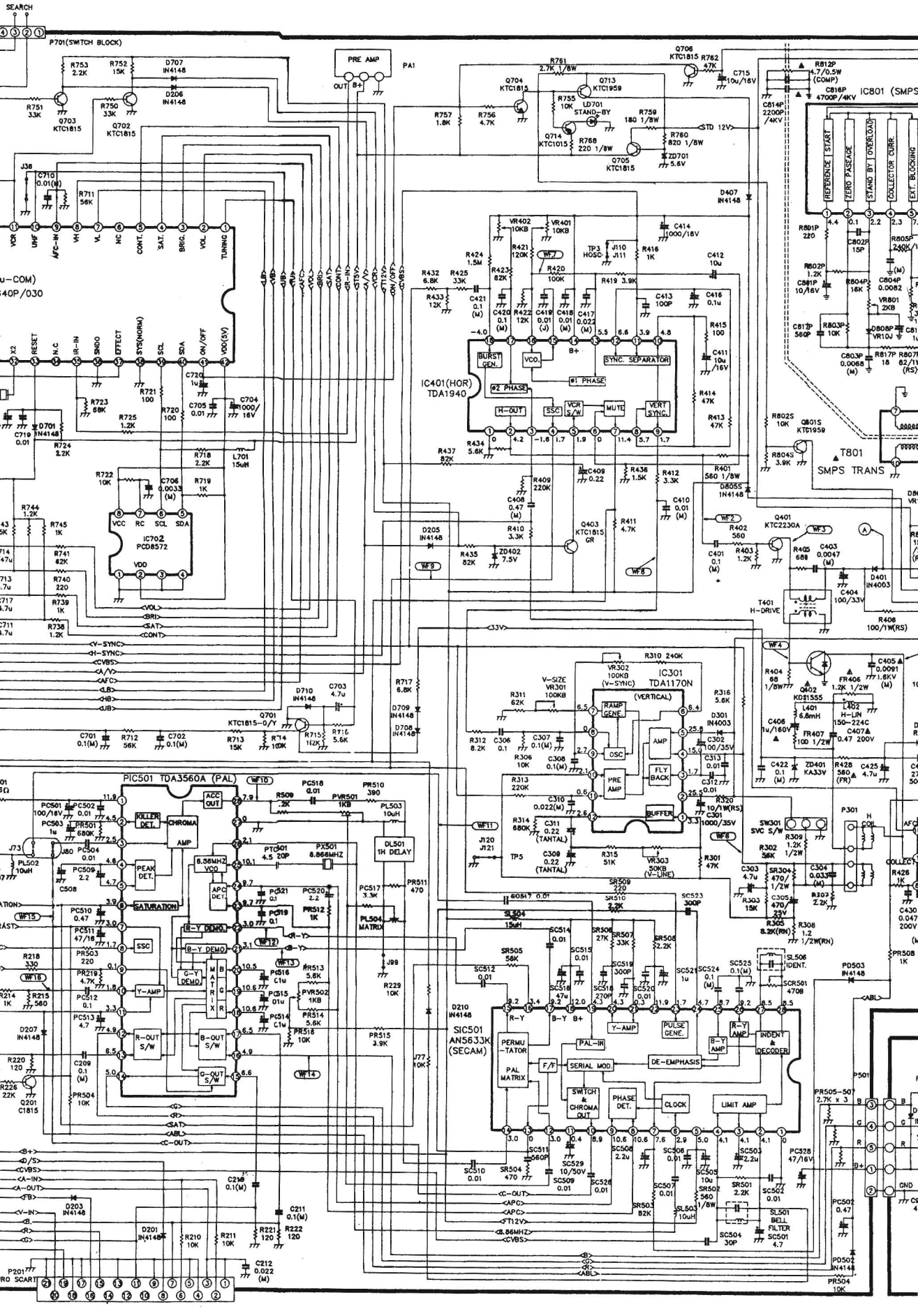


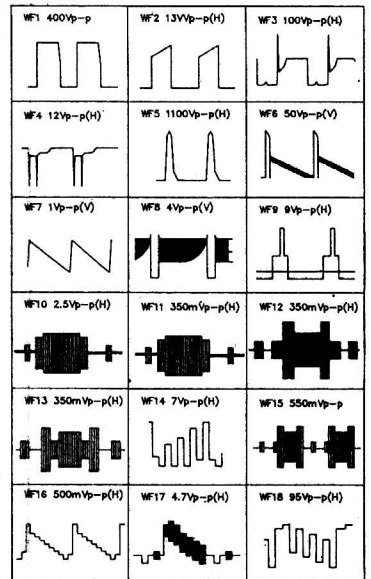
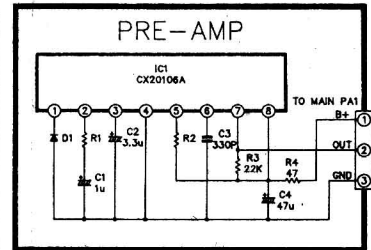
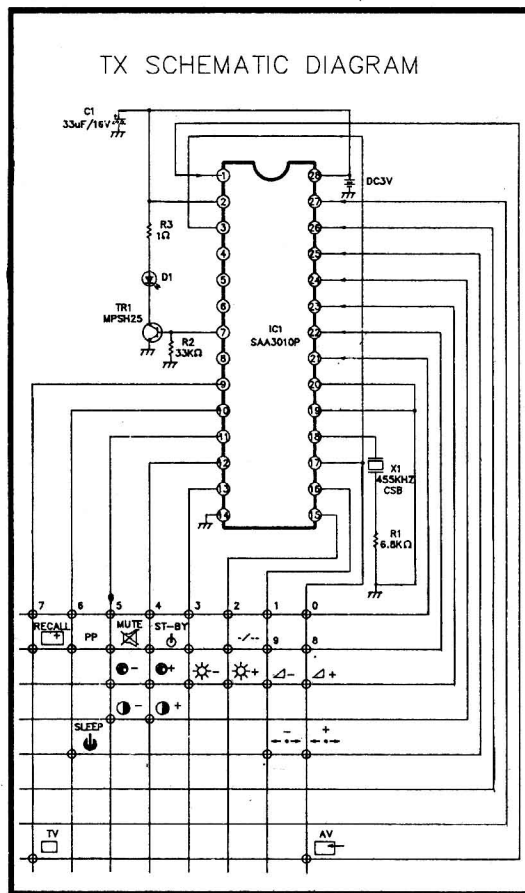
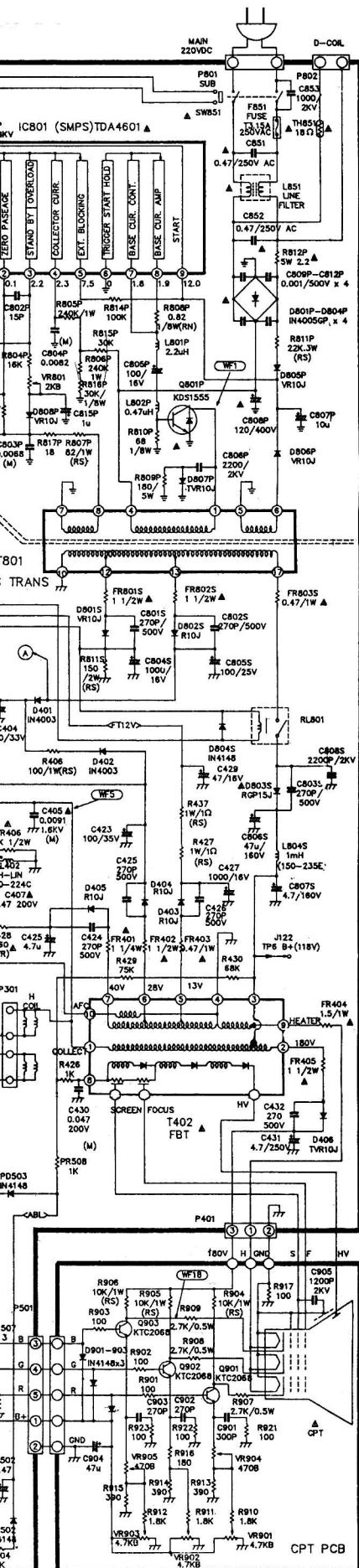


### TABLE OF INCH CONVERSION (TABLE 1)

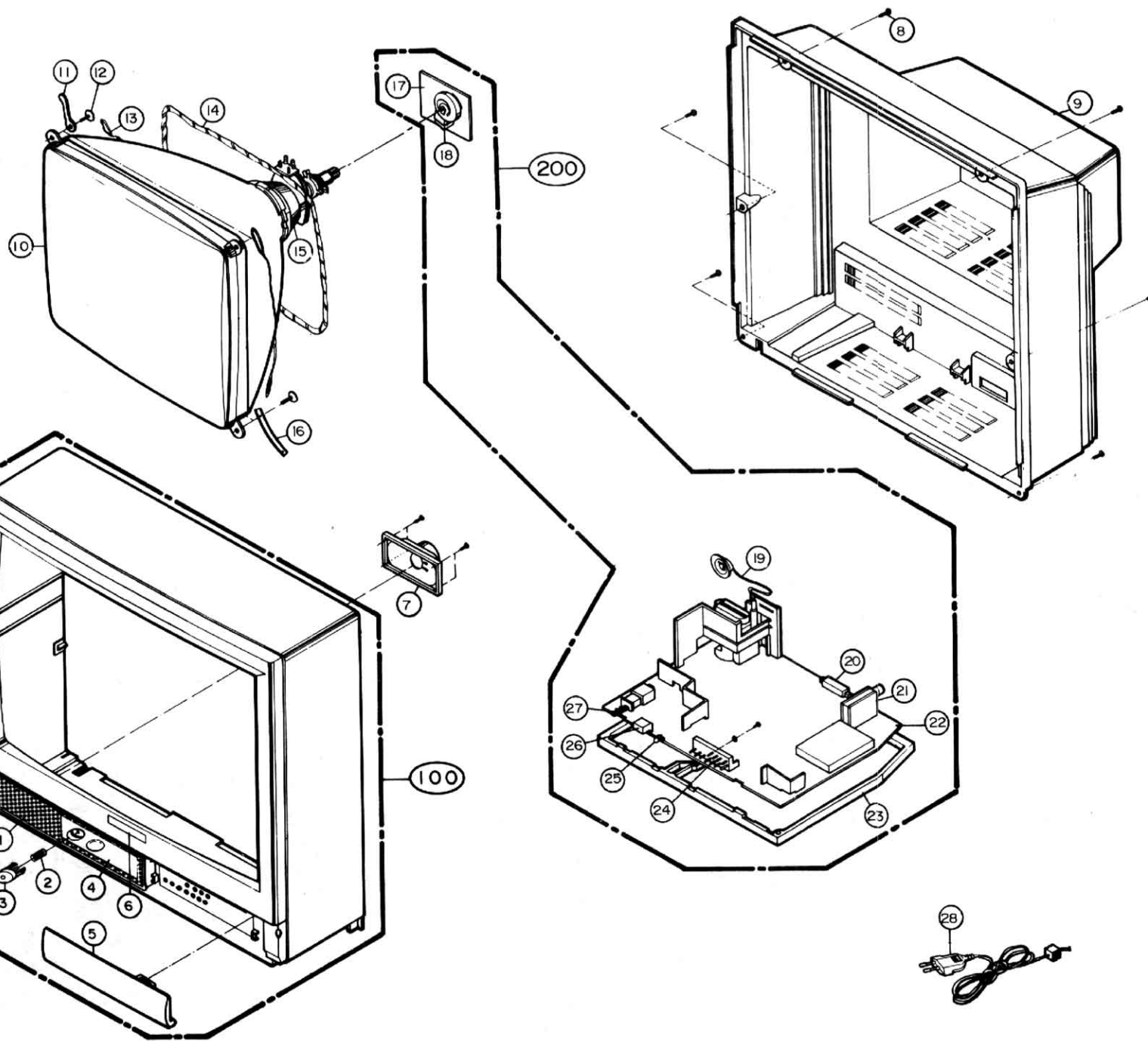
| ORDINATE NO. | INCH         | 14"          | 20"          | 24"          | REMARK                    |
|--------------|--------------|--------------|--------------|--------------|---------------------------|
| R302         | 47KΩ         | 56KΩ         | 56KΩ         | 56KΩ         | CARBON FILM RESISTOR      |
| R311         | 91KΩ         | 91KΩ         | 91KΩ         | 91KΩ         | CARBON FILM RESISTOR      |
| R315         | 27KΩ         | 39KΩ         | 39KΩ         | 39KΩ         | CARBON FILM RESISTOR      |
| R427         | 10.1W        | 1.01W        | 1.01W        | 1.01W        | METAL OXIDE FILM RESISTOR |
| R437         | 10.1W        | 0.47Ω        | 1.01W        | 1.01W        | METAL OXIDE FILM RESISTOR |
| R439         | 10KΩ         | 5.6KΩ        | 75KΩ         | 75KΩ         | CARBON FILM RESISTOR      |
| FR404        | 1.5Ω         | 1.5Ω         | 1.5Ω         | 1.5Ω         | PRECISION RESISTOR        |
| FR418        | 390Ω         | 390Ω         | 560Ω         | 560Ω         | PRECISION RESISTOR        |
| C303         | 3.3μF        | 4.7μF        | 4.7μF        | 4.7μF        | DE CAPACITOR              |
| C405         | 0.0022/1.8KV | 0.0091/1.8KV | 0.0091/1.8KV | 0.0091/1.8KV | DE CAPACITOR              |
| C407         | 0.36/200V    | 0.36/200V    | 0.36/200V    | 0.36/200V    | PEAKING CAPACITOR         |
| L401         | 3.3mH        | 8.2mH        | 8.2mH        | 8.2mH        | INDUCTOR                  |
| L402         | 150-224Ω     | 150-224Ω     | 150-224Ω     | 150-224Ω     | COIL                      |
| T402         | 154-064"     | 154-177"     | 154-194"     | 154-194"     | FBT                       |







| CIRCUIT NO. | 14"          | INCH         | 20"          | 21"          | REMARK                    |
|-------------|--------------|--------------|--------------|--------------|---------------------------|
| R302        | 47KΩ         | 56KΩ         | 56KΩ         | 56KΩ         | CARBON FILM RESISTOR      |
| R311        | 91KΩ         | 91KΩ         | 91KΩ         | 91KΩ         | "                         |
| R315        | 27KΩ         | 39KΩ         | 39KΩ         | 39KΩ         | "                         |
| R427        | 1Ω 1W        | 1Ω 1W        | 1Ω 1W        | 1Ω 1W        | METAL OXIDE FILM RESISTOR |
| R437        | 1Ω 1W        | 0.47Ω 1W     | 1Ω 1W        | 1Ω 1W        | "                         |
| R429        | 10KΩ         | 56KΩ         | 75KΩ         | 75KΩ         | CARBON FILM RESISTOR      |
| FR404       | 1.2Ω         | 1.5Ω         | 1.5Ω         | 1.5Ω         | FUSIBLE RESISTOR          |
| FR428       | 390Ω         | 390Ω         | 560Ω         | 560Ω         | "                         |
| C303        | 3.3μF        | 4.7μF        | 4.7μF        | 4.7μF        | CE CAPACITOR              |
| C405        | 0.0073/1.6KV | 0.0091/1.6KV | 0.0091/1.6KV | 0.0091/1.6KV | MPP CAPACITOR             |
| C407        | 0.38/200V    | 0.38/200V    | 0.47/200V    | 0.47/200V    | "                         |
| L401        | 3.3uH        | 6.8uH        | 6.8uH        | 6.8uH        | PEAKING COIL              |
| L402        | 150-224L     | 150-224C     | 150-224C     | 150-224C     | LINEARITY COIL            |
| T402        | 154-064F     | 154-177J     | 154-194B     | 154-194B     | FBT                       |

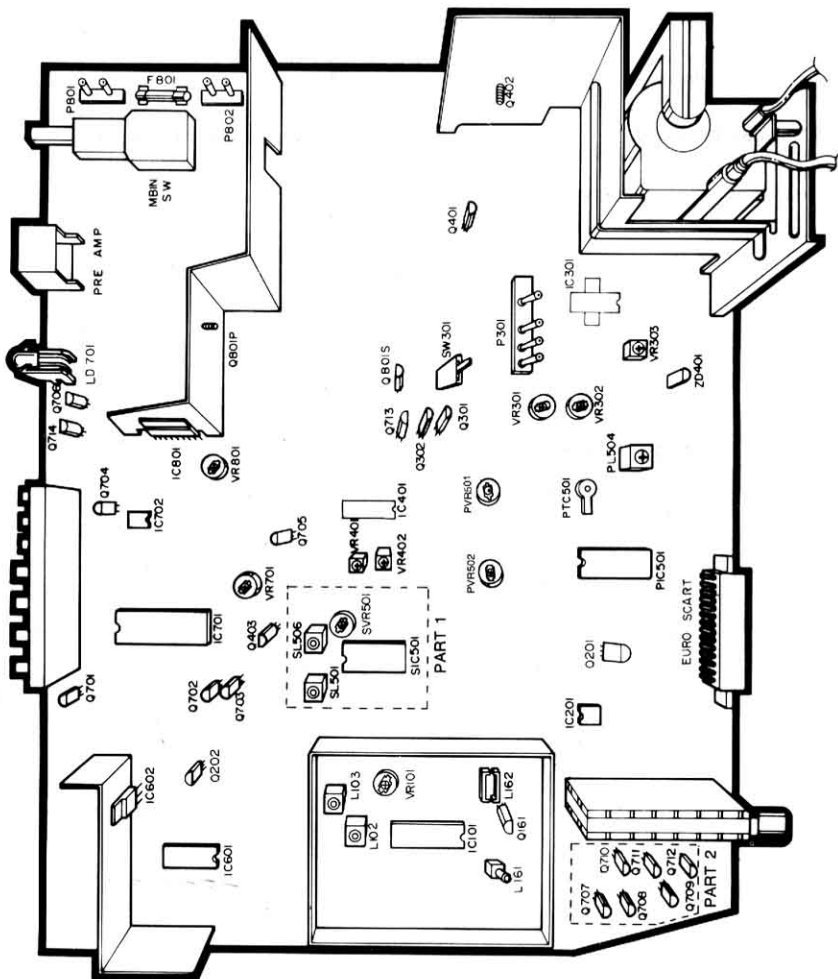


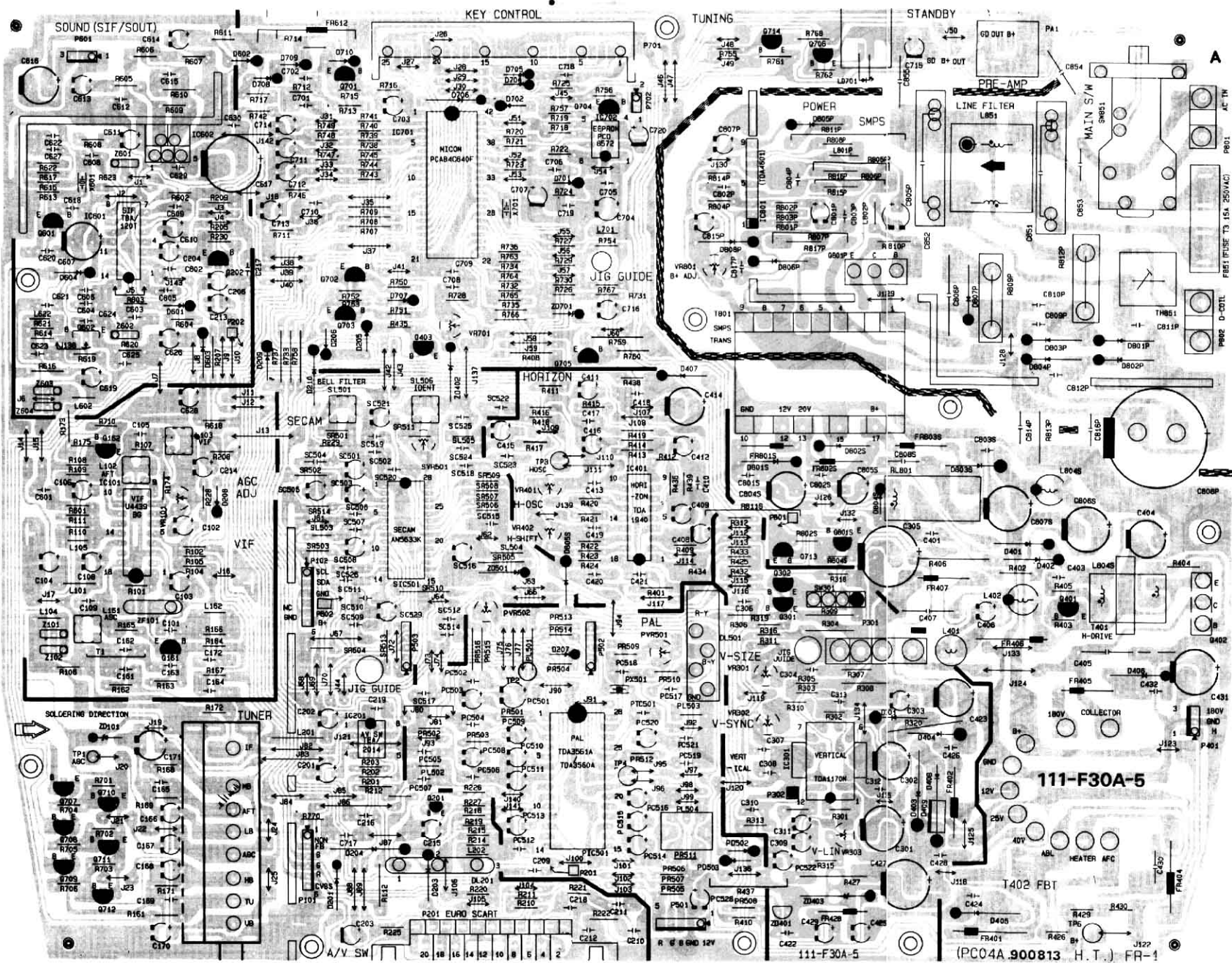
SP : Serviceable Parts  
NSP : Not Serviceable Parts

| NO. | DESCRIPTIONS                         | PART NO.    | REMARKS |
|-----|--------------------------------------|-------------|---------|
| 1   | GRILL, SPEAKER                       | 314-198B    | SP      |
| 2   | SPRING, COIL                         | 320-062H    | SP      |
| 3   | BUTTON, POWER                        | 441-165B    | SP      |
| 4   | WINDOW, LED DISPLAY                  | 316-262A    | SP      |
| 5   | DOOR, FRONT CONTROL                  | 315-455B    | SP      |
| 6   | MARK, BRAND                          | 410-552A    | SP      |
| 7   | SPEAKER                              | 120-480A    | SP      |
| 8   | SCREW, D4x L16                       | 1TTG0403118 | NSP     |
| 9   | COVER, BACK                          | 303-D72S    | SP      |
| 10  | COLOUR PICTURE TUBE (WITH DY)        | 2055-V0083E | SP      |
| 11  | HOLDER, METAL ASSY                   | 341-335A    | SP      |
| 12  | SCREW, HEXAGON HEAD                  | 332-235A    | SP      |
| 13  | LEAD SET, EARTH                      | 170-799C    | SP      |
| 14  | COIL, DEGAUSSING                     | 150-276M    | SP      |
| 15  | DEFLECTION YOKE                      | 153-151D    | SP      |
| 16  | HOLDER, LEAD WIRE                    | 341-409H    | NSP     |
| 17  | PRINTED CIRCUIT BOARD ASSEMBLY, CPT  | 110-A31P    | SP      |
| 18  | SOCKET, CPT                          | 381-094C    | SP      |
| 19  | FLYBACK TRANSFORMER                  | 154-177J    | SP      |
| 20  | PIN PERI-SOCKET                      | 381-090A    | SP      |
| 21  | TUNER                                | 113-105K    | SP      |
| 22  | PRINTED CIRCUIT BOARD ASSEMBLY, MAIN | 110-M77M    | SP      |
| 23  | FRAME, MAIN CHASSIS ASSEMBLY         | 312-258A    | SP      |
| 24  | SWITCH, BLOCK                        | 140-306A    | SP      |
| 25  | HOLDER, LED                          | 341-596A    | SP      |
| 26  | PRE-AMP                              | 106-042B    | SP      |
| 27  | SWITCH MAIN                          | 140-278C    | SP      |
| 28  | CORD, POWER                          | 174-171L    | NSP     |
| 29  | COVER, BATTERY                       | 303-E27A    | SP      |

#### SUB ASSY

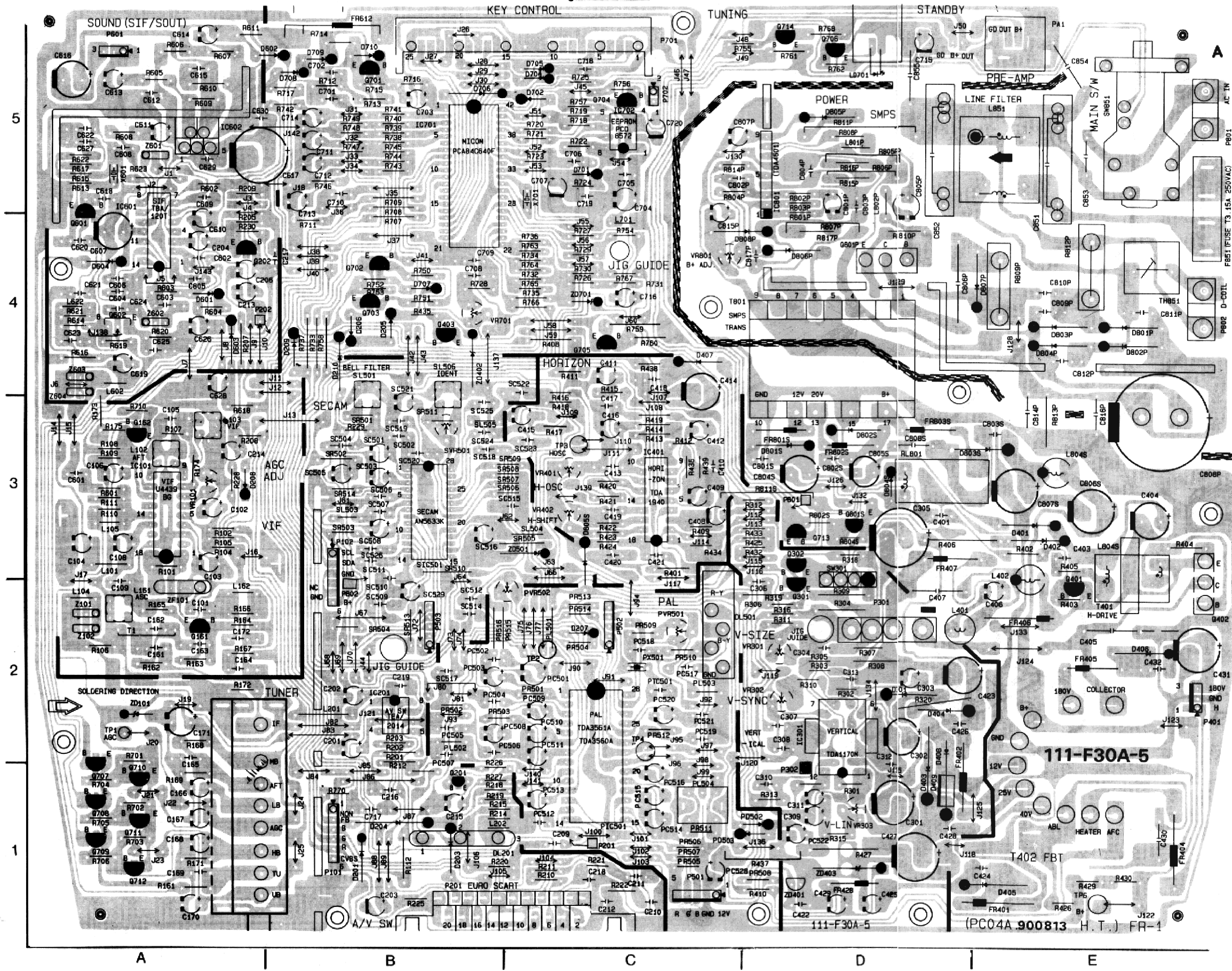
|     |                              |          |    |
|-----|------------------------------|----------|----|
| 100 | CABINET ASSEMBLY             | 300-875D | SP |
| 200 | CHASSIS ASSEMBLY, PC04A MAIN | 309-829M | SP |
| 300 | REMOTE CONTROL ASSY          | 105-068A | SP |



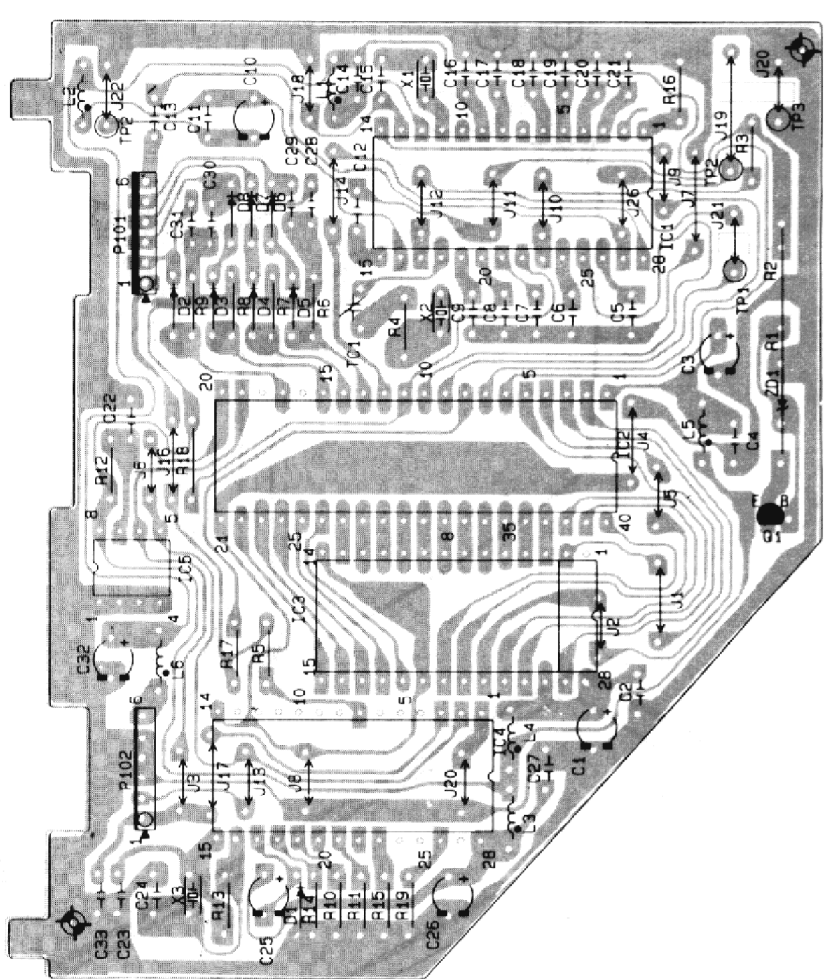


PRINTED CIRCUIT BOARD

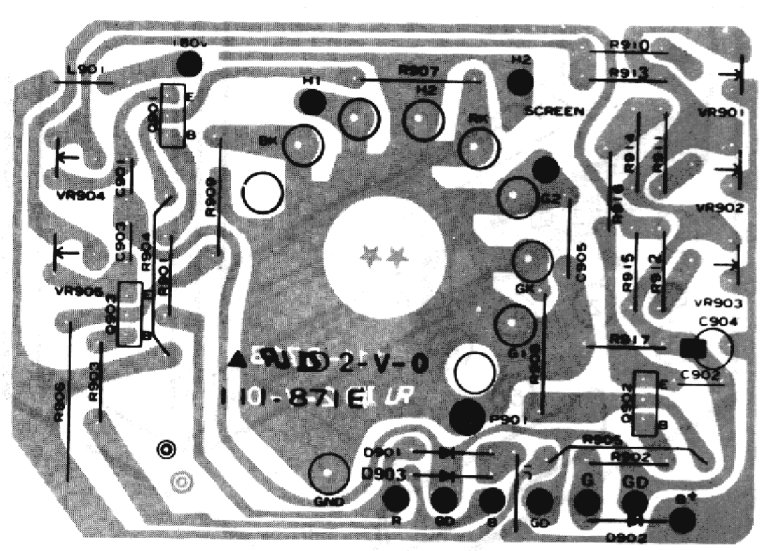
MAIN P.C.BOARD (COMPONENT SIDE)



TXT P.C.BOARD (COMPONENT SIDE) : (NOT IN USE)

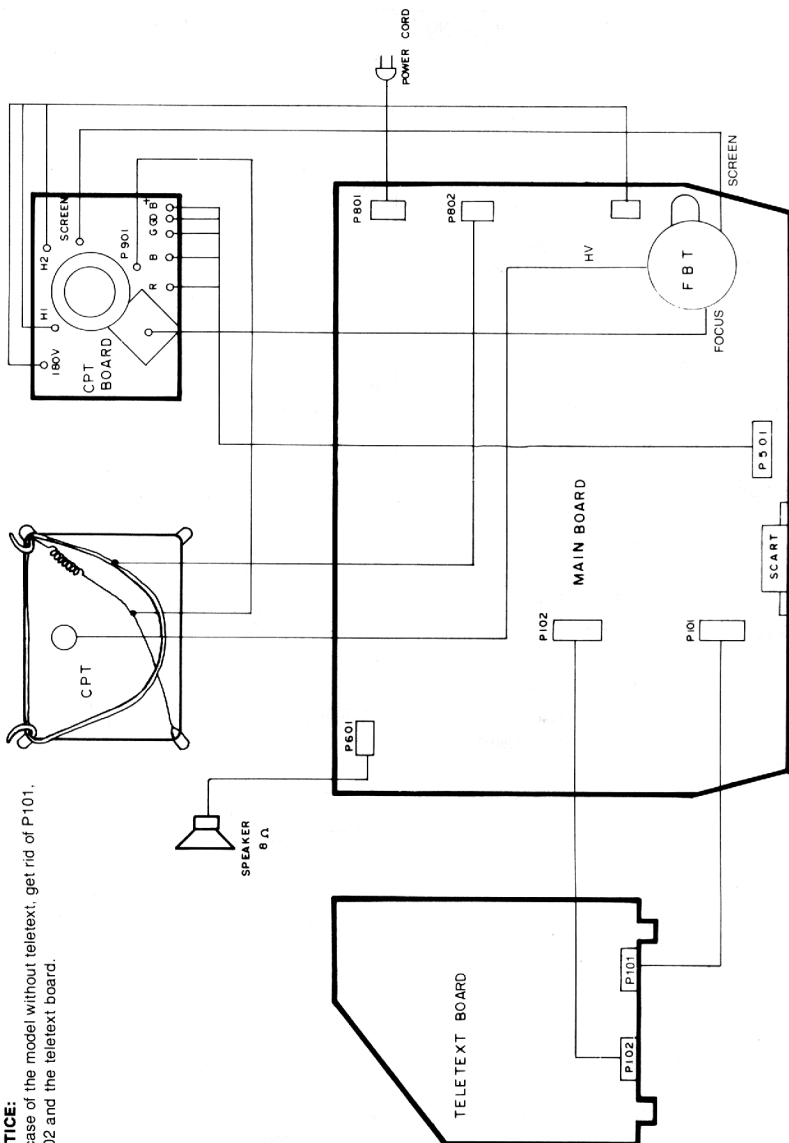


CPT P.C.BOARD (COMPONENT SIDE)



# 

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



# TERMINAL VIEW OF SEMICONDUCTOR

## DIODE

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

## TRANSISTOR

|                                                                                  |             |                                       |
|----------------------------------------------------------------------------------|-------------|---------------------------------------|
|  | 2SD1555     | Q402, Q801                            |
|                                                                                  | KTC1815-GR  | Q403                                  |
|  | KTC1815-O/Y | Q201, Q202, Q301<br>Q302<br>Q701-Q709 |
|                                                                                  | KTC388A     | Q161                                  |
|                                                                                  | KTA1015-O/Y | Q710, Q711, Q712<br>Q714              |
|  | KTC2230A    | Q401                                  |
|                                                                                  | KTC1959-Y   | Q713, Q801S                           |
|                                                                                  | KTC2236A-O  | Q1                                    |
|                                                                                  | KTC2068     | Q901-Q903                             |

## IC

|                                                                                    |                    |       |
|------------------------------------------------------------------------------------|--------------------|-------|
|  | TDA4439<br>u4439BG | IC101 |
|  | TEA1014            | IC201 |
|  | TDA1170N           | IC301 |

|                                                                                     |                          |        |
|-------------------------------------------------------------------------------------|--------------------------|--------|
|    | TDA1940                  | IC401  |
|    | GD76C88-10               | IC3    |
|    | TDA-3560B<br>GD76C88-15  | PIC501 |
|    | TDA-3560A                | IC601  |
|    | TDA4601                  | IC801  |
|    | SAA5243P/E               | IC2    |
|    | PCF84C640/030            | IC701  |
|    | AN5633K                  | SIC501 |
|  | PCF84C640/030<br>PCD8582 | IC5    |
|                                                                                     | PCD85C72<br>PCD8572      | IC702  |
|  | MAB8461                  | IC4    |
|  | SAA5231-2<br>SAA5231     | IC1    |

# COMPONENT LOCATION GUIDE

(Refer to page 33)

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

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

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| REPLACEMENT PARTS LIST                         |     |             | PAGE : 2                        |                         |         |
|------------------------------------------------|-----|-------------|---------------------------------|-------------------------|---------|
| MODEL : SGR19902 UPMR2 BUYER NAME : ELECTRONUM |     |             | RUN-DATE : 92.01.29             |                         |         |
| S I                                            | QTY | PART NO     | DESCRIPTION                     | SPECIFICATION           | REMARKS |
| C415                                           |     | 00C1010K15  | CAPACITOR CERAMIC (TEMP COMP)   | 100M 50V J MPO TS       |         |
| C416                                           |     | 00C10M4118  | CAPACITOR CERAMIC (HIGH DIELE)  | 1.0M 50M S M FMS1 TP(S) |         |
| C417                                           |     | 00C10ELECTR | CAPACITOR ELECTROLYTIC          | 0.1U 50M 50V M FS TS    |         |
| C418                                           |     | 00C22310K45 | CAPACITOR POLYESTER (TEMP COMP) | 0.022MF 100M K POLY TP  |         |
| C419                                           |     | 00C1030K45  | CAPACITOR CERAMIC (HIGH DIELE)  | 0.01MF 50V Z F TS       |         |
| C419                                           |     | 181-955A    | CAPACITOR                       | PE 100V 0.01MF          |         |
| C420                                           |     | 00C0141050R | CAPACITOR POLYESTER (TEMP COMP) | 0.1MF 100V L POLY TP    |         |
| C421                                           |     | 00C1050R45  | CAPACITOR POLYESTER (TEMP COMP) | 1.0MF 50M S M FS TS     |         |
| C423                                           |     | 00C10ELECTR | CAPACITOR ELECTROLYTIC          | 100M 50M S M FMS1 TP(S) |         |
| C427                                           |     | 00C270M515  | CAPACITOR CERAMIC (HIGH DIELE)  | 270M 50M S M FS TS      |         |
| C428                                           |     | 00C746418   | CAPACITOR CERAMIC (HIGH DIELE)  | 4.7MF 50M S M FS TS     |         |
| C428                                           |     | 00C270M515  | CAPACITOR CERAMIC (HIGH DIELE)  | 270P 500V K B TS        |         |
| C428                                           |     | 00C10ELECTR | CAPACITOR ELECTROLYTIC          | 1000M 50M M FMS1 TP(S)  |         |
| C428                                           |     | 00C1710M515 | CAPACITOR CERAMIC (HIGH DIELE)  | 170M 50M S M FS TS      |         |
| C429                                           |     | 00C464618   | CAPACITOR ELECTROLYTIC          | 4.7MF 50M 16M M FS TS   |         |
| C430                                           |     | 181-939D    | CAPACITOR                       | PP 200V 0.047MF         |         |
| C435                                           |     | 00C1510M18  | CAPACITOR ELECTROLYTIC          | 150M 50M S M FS TS      |         |
| C437                                           |     | 00C2710M515 | CAPACITOR CERAMIC (HIGH DIELE)  | 270P 500V K B TS        |         |
| C461                                           |     | 00C400K415  | CAPACITOR CERAMIC (TEMP COMP)   | 47P 500V J MPO TP       |         |
| C462                                           |     | 00C22310K45 | CAPACITOR POLYESTER (TEMP COMP) | 0.022MF 100M K POLY TP  |         |
| C462                                           |     | 00C1030K45  | CAPACITOR CERAMIC (HIGH DIELE)  | 0.01MF 50V Z F TS       |         |
| C464                                           |     | 00C22310K45 | CAPACITOR POLYESTER (TEMP COMP) | 0.022MF 100M K POLY TP  |         |
| C464                                           |     | 00C1030K45  | CAPACITOR CERAMIC (HIGH DIELE)  | 0.01MF 50V Z F TS       |         |
| C467                                           |     | 00C474618   | CAPACITOR ELECTROLYTIC          | 4.7MF 50M 16M M FS TS   |         |
| C468                                           |     | 00C013050R  | CAPACITOR POLYESTER (TEMP COMP) | 0.01U 100V K POLY TP    |         |
| C469                                           |     | 00C3310K45  | CAPACITOR CERAMIC (TEMP COMP)   | 330P 50V J SL TS        |         |
| C469                                           |     | 00C10M4118  | CAPACITOR CERAMIC (HIGH DIELE)  | 1.0M 50M S M FS TS      |         |
| C461                                           |     | 00C4754618  | CAPACITOR ELECTROLYTIC          | 4.7MF 50M 50V M FS TS   |         |
| C4612                                          |     | 00C22310K45 | CAPACITOR POLYESTER (TEMP COMP) | 0.022MF 100M K POLY TP  |         |
| C4613                                          |     | 00C10M4118  | CAPACITOR CERAMIC (HIGH DIELE)  | 1.0M 50M S M FS TS      |         |
| C4613                                          |     | 00C254618   | CAPACITOR ELECTROLYTIC          | 2.5MF 50M S M FS TS     |         |
| C4614                                          |     | 00C0141050R | CAPACITOR POLYESTER (TEMP COMP) | 0.1MF 100V L POLY TP    |         |
| C4614                                          |     | 00C474618   | CAPACITOR ELECTROLYTIC          | 4.7MF 50M 16M M FS TS   |         |
| C4615                                          |     | 00C1-22H    | CAPACITOR                       | 0.022MF 50V Z F TS      |         |
| C418                                           |     | 00C1030K45  | CAPACITOR CERAMIC (HIGH DIELE)  | 0.01MF 50V Z F TS       |         |
| C420                                           |     | 00C180K415  | CAPACITOR CERAMIC (TEMP COMP)   | 180P 50V J MPO TP       |         |
| C421                                           |     | 00C1030K45  | CAPACITOR CERAMIC (HIGH DIELE)  | 0.01MF 50V Z F TS       |         |
| C422                                           |     | 00C3310K45  | CAPACITOR CERAMIC (TEMP COMP)   | 330P 50V J SL TS        |         |
| C423                                           |     | 00C1510K45  | CAPACITOR CERAMIC (TEMP COMP)   | 150MF 50V J SL TS       |         |
| C423                                           |     | 00C1030K45  | CAPACITOR CERAMIC (HIGH DIELE)  | 0.01MF 50V Z F TS       |         |
| C425                                           |     | 00C1030K45  | CAPACITOR CERAMIC (HIGH DIELE)  | 0.01MF 50V Z F TS       |         |
| C426                                           |     | 00C474618   | CAPACITOR ELECTROLYTIC          | 4.7MF 50M 50V M FS TS   |         |
| C427                                           |     | 00C4710K45  | CAPACITOR CERAMIC (TEMP COMP)   | 470P 50V J SL TS        |         |
| C428                                           |     | 00C10M4118  | CAPACITOR CERAMIC (HIGH DIELE)  | 1.0M 50M S M FS TS      |         |
| C428                                           |     | 00C1030K45  | CAPACITOR CERAMIC (HIGH DIELE)  | 0.01MF 50V Z F TS       |         |
| C430                                           |     | 00C0141050R | CAPACITOR POLYESTER (TEMP COMP) | 0.1MF 100V L POLY TP    |         |
| C430                                           |     | 00C10M4118  | CAPACITOR CERAMIC (HIGH DIELE)  | 1.0M 50M S M FS TS      |         |
| C701                                           |     | 00C22710K45 | CAPACITOR CERAMIC (TEMP COMP)   | 220P 50V J SL TP        |         |

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| (REPLACEMENT PARTS LIST)                    |              |                                |                            | PAGE : 4            |         |
|---------------------------------------------|--------------|--------------------------------|----------------------------|---------------------|---------|
| MODEL: SGP7992 UPG82 BUYER NAME: ELECTRONUM |              |                                |                            | RUN-DATE : 92.01.29 |         |
| NO.                                         | ALQ,NO.      | PART NO                        | DESCRIPTION                | SPECIFICATION       | REMARKS |
| C705                                        | 00C305045    | CAPACITOR,CERAMIC(OHIGH DIELE) | 0.01MF 50V                 | J F T5              |         |
| C706                                        | 00C3364F18   | CAPACITOR,ELECTROLYTIC         | 4.7MF 35V 14W H PMS TP5    |                     |         |
| C707                                        | 00C2700K45   | CAPACITOR,CERAMIC(TEMP COEF)   | 27P 50V 1 J M F TS         |                     |         |
| C710                                        | 00C0103109   | CAPACITOR,POLYESTER(OMIAL)     | 0.010 100V H POLY          |                     |         |
| C711                                        | 00C4756A618  | CAPACITOR,ELECTROLYTIC         | 4.7MF 35V 14W H PMS TP5    |                     |         |
| C712                                        | 00C4756A618  | CAPACITOR,ELECTROLYTIC         | 4.7MF 35V 14W H PMS TP5    |                     |         |
| C713                                        | 00C4756A618  | CAPACITOR,ELECTROLYTIC         | 4.7MF 35V 14W H PMS TP5    |                     |         |
| C714                                        | 00C4756A618  | CAPACITOR,ELECTROLYTIC         | 4.7MF 35V 14W H PMS TP5    |                     |         |
| C715                                        | 00C1046F18   | CAPACITOR,ELECTROLYTIC         | 10MF 35V 14W H PMS TP5     |                     |         |
| C716                                        | 00C4756A618  | CAPACITOR,ELECTROLYTIC         | 4.7MF 35V 14W H PMS TP5    |                     |         |
| C717                                        | 00C510K315   | CAPACITOR,CERAMIC(OHIGH DIELE) | 560P 50V                   | J F T5              |         |
| C718                                        | 00C1030K45   | CAPACITOR,CERAMIC(OHIGH DIELE) | 0.01MF 50V J F T5          |                     |         |
| C719                                        | 00C1030K45   | CAPACITOR,CERAMIC(OHIGH DIELE) | 0.01MF 50V J F T5          |                     |         |
| C720                                        | 00C1046F18   | CAPACITOR,ELECTROLYTIC         | 10MF 35V 14W H PMS TP5     |                     |         |
| C80P                                        | 00C1046F18   | CAPACITOR,ELECTROLYTIC         | 10MF 35V 14W H PMS TP5     |                     |         |
| C801S                                       | 00C2710W515  | CAPACITOR,CERAMIC(TEMP COEF)   | 270P 500V K B TS           |                     |         |
| C802                                        | 00C50014K15  | CAPACITOR,CERAMIC(TEMP COEF)   | 15P 500V J M B TP          |                     |         |
| C803                                        | 00C2710W515  | CAPACITOR,CERAMIC(TEMP COEF)   | 27P 500V K B TS            |                     |         |
| C80P                                        | 00C68210W5   | CAPACITOR,POLYESTER(OMIAL)     | 0.0068U 100V K POLY N T5   |                     |         |
| C805S                                       | 00C2710W515  | CAPACITOR,CERAMIC(TEMP COEF)   | 27P 500V K B TS            |                     |         |
| C806                                        | 00C10105F7   | CAPACITOR                      | 20 100V 0.0006P            |                     |         |
| C80AS                                       | 00C1086A418  | CAPACITOR,ELECTROLYTIC         | 1000UF 35V 14W H PMS TP(5) |                     |         |
| C80P                                        | 00C10746F18  | CAPACITOR,ELECTROLYTIC         | 100UF 35V 25W H PMS TP(5)  |                     |         |
| C80P                                        | 00C10746F18  | CAPACITOR,ELECTROLYTIC         | 100UF 35V 25W H PMS TP(5)  |                     |         |
| C80P                                        | 181-151E     | CAPACITOR                      | MPP 20K 222J               |                     |         |
| C80AS                                       | 00C47419A18  | CAPACITOR,ELECTROLYTIC         | 47N 35 160W H TP7, S       |                     |         |
| C80AS                                       | 00C47419A18  | CAPACITOR,ELECTROLYTIC         | 10W 35V 50W H TP7, S       |                     |         |
| C80P                                        | 00C336F18P18 | CAPACITOR,ELECTROLYTIC         | 330U 35 160W H FL TP5      |                     |         |
| C80B                                        | 181-124A     | CAPACITOR                      | C 400M/120P                |                     |         |
| C80BS                                       | 181-034L     | CAPACITOR                      | 0454002272 LEAD7.0 CERAMIC |                     |         |
| C80P                                        | 00C1020W515  | CAPACITOR,CERAMIC(OHIGH DIELE) | 10000P 500V K B TS         |                     |         |
| C810P                                       | 00C1020W515  | CAPACITOR,CERAMIC(OHIGH DIELE) | 10000P 500V K B TS         |                     |         |
| C811P                                       | 00C1020W515  | CAPACITOR,CERAMIC(OHIGH DIELE) | 10000P 500V K B TS         |                     |         |
| C812P                                       | 00C1020W515  | CAPACITOR,CERAMIC(OHIGH DIELE) | 10000P 500V K B TS         |                     |         |
| C814P                                       | 181-157A     | CAPACITOR                      | EXX-0052 22X NEX           |                     |         |
| C815P                                       | 00C2710K45   | CAPACITOR,ELECTROLYTIC         | 1.0MF 35V 50W H PMS TP5    |                     |         |
| C816P                                       | 00C11410R    | CAPACITOR                      | EXX-0042329                |                     |         |
| C817P                                       | 00C2710K45   | CAPACITOR,CERAMIC(TEMP COEF)   | EXX-0042329                |                     |         |
| C851                                        | 181-40AC     | CAPACITOR                      | EXX-0047F(12000)           |                     |         |
| C852                                        | 181-40AC     | CAPACITOR                      | 250V 0.47UF(12000)         |                     |         |
| C853                                        | 181-09VA     | CAPACITOR                      | DE 7090H 12000 NMCA-14     |                     |         |
| C901                                        | 00C3010K40   | CAPACITOR,CERAMIC(TEMP COEF)   | 300P 50V J S L S           |                     |         |
| C902                                        | 00C2710K40   | CAPACITOR,CERAMIC(TEMP COEF)   | 27P 50V J S L S            |                     |         |
| C903                                        | 00C2710K40   | CAPACITOR,CERAMIC(TEMP COEF)   | 27P 50V J S L S            |                     |         |
| C904                                        | 00C4746A418  | CAPACITOR,ELECTROLYTIC         | 47MF 35V 14W H PMS TP5     |                     |         |
| C905                                        | 00C1220S10   | CAPACITOR,CERAMIC(OHIGH DIELE) | 1200P 20V K B TS           |                     |         |
| B.201                                       | 150-37TT     |                                | 1-REEL 6000MS(4,370P)      |                     |         |
| B.501                                       | 171-013A     | DELAY LINE                     | HS-111 P10                 |                     |         |
| D201                                        | 00014499D    | DIODE                          | 1N5410B                    |                     |         |
| D401                                        | 00014499D    | DIODE                          | 1N5410B                    |                     |         |

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|------------------------|-------|------|-------------------------|-------------|-------------------------------|--------------------|---------|
| MODEL : SCKT19P2 UPR02 |       |      | BUYER NAME : ELECTRONUM |             | RUN-DATE : 97.01.29           |                    |         |
| S                      | AL    | LOC. | NO.                     | PART NO.    | DESCRIPTION                   | SPECIFICATION      | REMARKS |
|                        | D295  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D296  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D297  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D298  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D210  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D301  |      |                         | 000400399MA | DIODE                         | JM4003TA           |         |
|                        | D401  |      |                         | 000400399MA | DIODE                         | JM4003TA           |         |
|                        | D402  |      |                         | 000400399MA | DIODE                         | HP1512 TP(5200)-6E |         |
|                        | D403  |      |                         | 000100009FA | DIODE                         | R10J SYMBOL TP     |         |
|                        | D404  |      |                         | 000100009FA | DIODE                         | R10J SYMBOL TP     |         |
|                        | D405  |      |                         | 000100009FA | DIODE                         | R10J SYMBOL TP     |         |
|                        | D406  |      |                         | 000100009FA | DIODE                         | R10J SYMBOL TP     |         |
|                        | D407  |      |                         | 000100009FA | DIODE                         | R10J SYMBOL TP     |         |
|                        | D401  |      |                         | 000100009FA | DIODE                         | (DS1481) TA        |         |
|                        | D402  |      |                         | 000100009FA | DIODE                         | (DS1481) TA        |         |
|                        | D403  |      |                         | 000100009FA | DIODE                         | (DS1481) TA        |         |
|                        | D404  |      |                         | 000100009FA | DIODE                         | (DS1481) TA        |         |
|                        | D192  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D704  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D705  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D706  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D707  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D708  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D709  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D801P |      |                         | 000400399MA | DIODE                         | 1M4005 GP TA       |         |
|                        | D801P |      |                         | 000400399MA | DIODE                         | R10J SYMBOL TP     |         |
|                        | D802P |      |                         | 000400399MA | DIODE                         | 1M4005 GP TA       |         |
|                        | D802S |      |                         | 000100009FA | DIODE                         | R10J SYMBOL TP     |         |
|                        | D803P |      |                         | 000400399MA | DIODE                         | 1M4005 GP TA       |         |
|                        | D803S |      |                         | 000100009FA | DIODE                         | R10J SYMBOL TP     |         |
|                        | D804P |      |                         | 000400399MA | DIODE                         | 1M4005 GP TA       |         |
|                        | D805P |      |                         | 000100009FA | DIODE                         | R10J SYMBOL TP     |         |
|                        | D807S |      |                         | 000100009FA | DIODE                         | R10J SYMBOL TP     |         |
|                        | D808P |      |                         | 000100009FA | DIODE                         | R10J SYMBOL TP     |         |
|                        | D901  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D902  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | D903  |      |                         | 00041480EPD | DIODE                         | (DS1481) TA        |         |
|                        | FR401 |      |                         | 0001010400  | RESISTOR FUSIBLE              | 1.0 1/2W 5 A       |         |
|                        | FR402 |      |                         | 0001010400  | RESISTOR FUSIBLE              | 1.0 1/2W 5 A       |         |
|                        | FR404 |      |                         | 190-305     | RESISTOR                      | FUSING 1W 1.5 OHM  |         |
|                        | FR405 |      |                         | 0001010400  | RESISTOR FUSIBLE              | 1.0 1/2W 5 A       |         |
|                        | FR406 |      |                         | 0001201A65  | RESISTOR-FIX METAL FILM OXIDE | 1.2W 1W 5F20       |         |
|                        | FR407 |      |                         | 0001001A65  | RESISTOR-FIX METAL FILM OXIDE | 100 1W 5F20        |         |
|                        | FR428 |      |                         | 190-305     | RESISTOR                      | FUSING 1/2W 1.2K   |         |
|                        | FR612 |      |                         | 0001010400  | RESISTOR FUSIBLE              | 5-10W 1W 5F20      |         |
|                        | FR613 |      |                         | 0001010400  | RESISTOR FUSIBLE              | 1.0 1/2W 5 A       |         |
|                        | FR625 |      |                         | 0001010400  | RESISTOR FUSIBLE              | 1.0 1/2W 5 A       |         |
|                        | FR625 |      |                         | 0004107A75  | RESISTOR FUSIBLE              | 5-10W 1W 5F20      |         |

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| REPLACEMENT PARTS LIST |             |                            |                          | PAGE 1             |         |
|------------------------|-------------|----------------------------|--------------------------|--------------------|---------|
| MODEL: 50K1902 UPGR82  |             | BUYER NAME: ELECTRONICS    |                          | RUN DATE: 92.01.29 |         |
| S/N                    | ALC NO.     | PART NO.                   | DESCRIPTION              | SPECIFICATION      | REMARKS |
| Q710                   | 01T12602R6  | TRANSISTOR                 | KT12602-IP Y KT126015JEE |                    |         |
| Q712                   | 01T12602R6  | TRANSISTOR                 | KT12602-IP Y KT126015JEE |                    |         |
| Q713                   | 01T12602R6  | TRANSISTOR                 | KT12602-IP Y KT126015JEE |                    |         |
| Q714                   | 01T23002R6  | TRANSISTOR                 | KT23002-IP Y KT230159JEE |                    |         |
| Q810P                  | 01T155500R6 | TRANSISTOR                 | KT15550-IP Y KT155015JEE |                    |         |
| Q801S                  | 01T200400R6 | TRANSISTOR                 | KT20040-IP Y KT205159JEE |                    |         |
| Q801S                  | 01T200400R6 | TRANSISTOR                 | KT20040-ICE              |                    |         |
| Q801S                  | 01T200400R6 | TRANSISTOR                 | KT20040-ICE              |                    |         |
| Q801S                  | 01T200400R6 | TRANSISTOR                 | KT20040-ICE              |                    |         |
| Q930                   | 100144092R  | DIODE                      | 05144D 1/2W              |                    |         |
| R101                   | 141-01R0    | RESISTOR                   | 141-01R0-100P            |                    |         |
| R102                   | 0100100F60P | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TASE2         |                    |         |
| R104                   | 0100501F60P | RESISTOR-FIXED CARBON FILM | 5.4K 1/4W 5 TASE2        |                    |         |
| R105                   | 0100350F60P | RESISTOR-FIXED CARBON FILM | 3.3K 1/4W 5 TASE2        |                    |         |
| R106                   | 0100500F60P | RESISTOR-FIXED CARBON FILM | 75K 1/4W 5 TASE2         |                    |         |
| R107                   | 0100101F60P | RESISTOR-FIXED CARBON FILM | 1.0K 1/4W 5 TASE2        |                    |         |
| R108                   | 0100270F60P | RESISTOR-FIXED CARBON FILM | 27K 1/4W 5 TASE2         |                    |         |
| R109                   | 0100270F60P | RESISTOR-FIXED CARBON FILM | 27K 1/4W 5 TASE2         |                    |         |
| R110                   | 0100200F60P | RESISTOR-FIXED CARBON FILM | 20K 1/4W 5 TASE2         |                    |         |
| R111                   | 0100701F60P | RESISTOR-FIXED CARBON FILM | 7.0K 1/4W 5 TASE2        |                    |         |
| R112                   | 0100701F60P | RESISTOR-FIXED CARBON FILM | 7.0K 1/4W 5 TASE2        |                    |         |
| R141                   | 0100101F60P | RESISTOR-FIXED CARBON FILM | 1.0K 1/4W 5 TASE2        |                    |         |
| R142                   | 0100180F60P | RESISTOR-FIXED CARBON FILM | 18K 1/4W 5 TASE2         |                    |         |
| R143                   | 0100701F60P | RESISTOR-FIXED CARBON FILM | 7.0K 1/4W 5 TASE2        |                    |         |
| R144                   | 0100800F60P | RESISTOR-FIXED CARBON FILM | 80K 1/4W 5 TASE2         |                    |         |
| R145                   | 0100180F60P | RESISTOR-FIXED CARBON FILM | 18K 1/4W 5 TASE2         |                    |         |
| R146                   | 0100700F60P | RESISTOR-FIXED CARBON FILM | 470K 1/4W 5 TASE2        |                    |         |
| R147                   | 0100200F60P | RESISTOR-FIXED CARBON FILM | 20K 1/4W 5 TASE2         |                    |         |
| R148                   | 0100270F60P | RESISTOR-FIXED CARBON FILM | 27K 1/4W 5 TASE2         |                    |         |
| R149                   | 0100270F60P | RESISTOR-FIXED CARBON FILM | 27K 1/4W 5 TASE2         |                    |         |
| R150                   | 0100501F60P | RESISTOR-FIXED CARBON FILM | 5.4K 1/4W 5 TASE2        |                    |         |
| R173                   | 0100470F60P | RESISTOR-FIXED CARBON FILM | 4.7K 1/4W 5 TASE2        |                    |         |
| R174                   | 0100704F60P | RESISTOR-FIXED CARBON FILM | 4.7K 1/4W 5 TASE2        |                    |         |
| R201                   | 0100120F60P | RESISTOR-FIXED CARBON FILM | 1.2K 1/4W 5 TASE2        |                    |         |
| R202                   | 0100470F60P | RESISTOR-FIXED CARBON FILM | 4.7K 1/4W 5 TASE2        |                    |         |
| R203                   | 0100120F60P | RESISTOR-FIXED CARBON FILM | 1.2K 1/4W 5 TASE2        |                    |         |
| R205                   | 0100120F60P | RESISTOR-FIXED CARBON FILM | 5.4K 1/4W 5 TASE2        |                    |         |
| R206                   | 0100100F60P | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TASE2         |                    |         |
| R207                   | 0100220F60P | RESISTOR-FIXED CARBON FILM | 22K 1/4W 5 TASE2         |                    |         |
| R209                   | 0100100F60P | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TASE2         |                    |         |
| R210                   | 0100100F60P | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TASE2         |                    |         |
| R212                   | 0100150F60P | RESISTOR-FIXED CARBON FILM | 1.5K 1/4W 5 TASE2        |                    |         |
| R214                   | 0100100F60P | RESISTOR-FIXED CARBON FILM | 1.0K 1/4W 5 TASE2        |                    |         |
| R215                   | 0100100F60P | RESISTOR-FIXED CARBON FILM | 1.0K 1/4W 5 TASE2        |                    |         |
| R216                   | 0100300F60P | RESISTOR-FIXED CARBON FILM | 33K 1/4W 5 TASE2         |                    |         |
| R218                   | 0100501F60P | RESISTOR-FIXED CARBON FILM | 4.7K 1/4W 5 TASE2        |                    |         |
| R219                   | 0100701F60P | RESISTOR-FIXED CARBON FILM | 7.0K 1/4W 5 TASE2        |                    |         |
| R200                   | 0100700F60P | RESISTOR-FIXED CARBON FILM | 18K 1/4W 5 TASE2         |                    |         |
| R201                   | 0100800F60P | RESISTOR-FIXED CARBON FILM | 180 1/4W 5 TASE2         |                    |         |
| R221                   | 0100800F60P | RESISTOR-FIXED CARBON FILM | 180 1/4W 5 TASE2         |                    |         |
| R222                   | 0100800F60P | RESISTOR-FIXED CARBON FILM | 180 1/4W 5 TASE2         |                    |         |
| R223                   | 0100800F60P | RESISTOR-FIXED CARBON FILM | 180 1/4W 5 TASE2         |                    |         |

REPLACEMENT PARTS LIST

PAGE : 2

MODEL : SXC192E UPGRA2 BUTER WIRE : ELECTRONMP

RUN DATE : 9/21/2019

| ITEM NO. | PART NUMBER | DESCRIPTION                | SPECIFICATION      | REMARKS |
|----------|-------------|----------------------------|--------------------|---------|
| R226     | 08022029469 | RESISTOR-FIXED CARBON FILM | 20K 1/4W 5% TASE2  |         |
| R227     | 08022031469 | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5% TASE2  |         |
| R228     | 08022029469 | RESISTOR-FIXED CARBON FILM | 47K 1/4W 5% TASE2  |         |
| R229     | 08022029469 | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5% TASE2  |         |
| R230     | 08022029469 | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5% TASE2  |         |
| R231     | 08022029469 | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5% TASE2  |         |
| R232     | 08022029469 | RESISTOR-FIXED CARBON FILM | 47K 1/4W 5% TASE2  |         |
| R304     | 08022029469 | RESISTOR-FIXED CARBON FILM | 56K 1/4W 5% TASE2  |         |
| R305     | 08022029469 | RESISTOR-FIXED CARBON FILM | 56K 1/4W 5% TASE2  |         |
| R306     | 08022029469 | RESISTOR-FIXED CARBON FILM | 47K 1/2W 5% TASE2  |         |
| R307     | 08022029469 | RESISTOR-FIXED CARBON FILM | 47K 1/2W 5% TASE2  |         |
| R308     | 08022029469 | RESISTOR-FIXED CARBON FILM | 8.2K 1/4W 5% TASE2 |         |
| R309     | 08022029469 | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5% TASE2  |         |
| R310     | 08022029469 | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5% TASE2  |         |
| R311     | 08022029469 | RESISTOR-FIXED CARBON FILM | 1.5 1/2W 5% TASE2  |         |
| R312     | 08022029469 | RESISTOR-FIXED CARBON FILM | 1.5 1/2W 5% TASE2  |         |
| R313     | 08022029469 | RESISTOR-FIXED CARBON FILM | 1.5 1/2W 5% TASE2  |         |
| R314     | 08022029469 | RESISTOR-FIXED CARBON FILM | 1.5 1/2W 5% TASE2  |         |
| R315     | 08022029469 | RESISTOR-FIXED CARBON FILM | 1.5 1/2W 5% TASE2  |         |
| R316     | 08022029469 | RESISTOR-FIXED CARBON FILM | 91K 1/4W 5% TASE2  |         |
| R317     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R318     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
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| R453     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R454     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R455     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R456     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R457     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R458     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R459     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R460     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R461     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R462     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R463     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R464     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R465     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R466     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R467     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R468     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R469     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |
| R470     | 08022029469 | RESISTOR-FIXED CARBON FILM | 2.7K 1/4W 5% TASE2 |         |

(REPLACEMENT PARTS LIST)

PAGE: 1

\* MODEL: 307992Z

BUSTER NAME: ELECTRON

RUN-DATE: 92.01.29

| NO   | AL | LOC | NO | PART NO/DESCRIPTION | SPECIFICATION              | REMARKS          |
|------|----|-----|----|---------------------|----------------------------|------------------|
| R727 |    |     |    | 00101803F00         | RESISTOR-FIXED CARBON FILM | 1.0K 1/4W 5 TOL2 |
| R728 |    |     |    | 00101804F00         | RESISTOR-FIXED CARBON FILM | 1.0K 1/4W 5 TOL2 |
| R729 |    |     |    | 00101805F00         | RESISTOR-FIXED CARBON FILM | 8.2K 1/4W 5 TOL2 |
| R730 |    |     |    | 00101507F00         | RESISTOR-FIXED CARBON FILM | 15K 1/4W 5 TOL2  |
| R731 |    |     |    | 00101508F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R732 |    |     |    | 00101509F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R733 |    |     |    | 00505016F00         | RESISTOR-FIXED CARBON FILM | 5.6K 1/4W 5 TOL2 |
| R734 |    |     |    | 00101024F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R735 |    |     |    | 00101024F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R736 |    |     |    | 00101024F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R737 |    |     |    | 00404015F00         | RESISTOR-FIXED CARBON FILM | 4.7K 1/4W 5 TOL2 |
| R738 |    |     |    | 00101216F00         | RESISTOR-FIXED CARBON FILM | 1.2K 1/4W 5 TOL2 |
| R739 |    |     |    | 00101016F00         | RESISTOR-FIXED CARBON FILM | 1.0K 1/4W 5 TOL2 |
| R740 |    |     |    | 00202006F00         | RESISTOR-FIXED CARBON FILM | 22K 1/4W 5 TOL2  |
| R741 |    |     |    | 00364025F00         | RESISTOR-FIXED CARBON FILM | 6.2K 1/4W 5 TOL2 |
| R742 |    |     |    | 00303016F00         | RESISTOR-FIXED CARBON FILM | 3.0K 1/4W 5 TOL2 |
| R743 |    |     |    | 00101508F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R744 |    |     |    | 00101508F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R745 |    |     |    | 00101016F00         | RESISTOR-FIXED CARBON FILM | 1.0K 1/4W 5 TOL2 |
| R746 |    |     |    | 00180255F00         | RESISTOR-FIXED CARBON FILM | 18K 1/4W 5 TOL2  |
| R747 |    |     |    | 00201716F00         | RESISTOR-FIXED CARBON FILM | 2.2K 1/4W 5 TOL2 |
| R748 |    |     |    | 00575015F00         | RESISTOR-FIXED CARBON FILM | 7.5K 1/4W 5 TOL2 |
| R749 |    |     |    | 00101016F00         | RESISTOR-FIXED CARBON FILM | 1.0K 1/4W 5 TOL2 |
| R750 |    |     |    | 00353024F00         | RESISTOR-FIXED CARBON FILM | 35K 1/4W 5 TOL2  |
| R751 |    |     |    | 00353024F00         | RESISTOR-FIXED CARBON FILM | 35K 1/4W 5 TOL2  |
| R752 |    |     |    | 00150204F00         | RESISTOR-FIXED CARBON FILM | 15K 1/4W 5 TOL2  |
| R753 |    |     |    | 00202014F00         | RESISTOR-FIXED CARBON FILM | 20K 1/4W 5 TOL2  |
| R754 |    |     |    | 00101024F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R755 |    |     |    | 00101024F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R756 |    |     |    | 00471016F00         | RESISTOR-FIXED CARBON FILM | 4.7K 1/4W 5 TOL2 |
| R757 |    |     |    | 00101016F00         | RESISTOR-FIXED CARBON FILM | 1.0K 1/4W 5 TOL2 |
| R758 |    |     |    | 00101024F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R759 |    |     |    | 00180006F00         | RESISTOR-FIXED CARBON FILM | 18K 1/4W 5 TOL2  |
| R760 |    |     |    | 00180206F00         | RESISTOR-FIXED CARBON FILM | 8.2K 1/4W 5 TOL2 |
| R761 |    |     |    | 00201716F00         | RESISTOR-FIXED CARBON FILM | 2.2K 1/4W 5 TOL2 |
| R762 |    |     |    | 00471024F00         | RESISTOR-FIXED CARBON FILM | 47K 1/4W 5 TOL2  |
| R763 |    |     |    | 00180206F00         | RESISTOR-FIXED CARBON FILM | 8.2K 1/4W 5 TOL2 |
| R764 |    |     |    | 00580005F00         | RESISTOR-FIXED CARBON FILM | 68K 1/4W 5 TOL2  |
| R765 |    |     |    | 00580005F00         | RESISTOR-FIXED CARBON FILM | 68K 1/4W 5 TOL2  |
| R766 |    |     |    | 00151016F00         | RESISTOR-FIXED CARBON FILM | 15K 1/4W 5 TOL2  |
| R767 |    |     |    | 00201724F00         | RESISTOR-FIXED CARBON FILM | 27K 1/4W 5 TOL2  |
| R768 |    |     |    | 00202006F00         | RESISTOR-FIXED CARBON FILM | 22K 1/4W 5 TOL2  |
| R769 |    |     |    | 00202006F00         | RESISTOR-FIXED CARBON FILM | 22K 1/4W 5 TOL2  |
| R770 |    |     |    | 00202014F00         | RESISTOR-FIXED CARBON FILM | 20K 1/4W 5 TOL2  |
| R771 |    |     |    | 00041489B00         | DIODE                      | (1.6K4H) 1A      |
| R772 |    |     |    | 00202006F00         | RESISTOR-FIXED CARBON FILM | 22K 1/4W 5 TOL2  |
| R773 |    |     |    | 00101024F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R774 |    |     |    | 00101024F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R775 |    |     |    | 00101024F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R776 |    |     |    | 00101024F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |
| R777 |    |     |    | 00101024F00         | RESISTOR-FIXED CARBON FILM | 10K 1/4W 5 TOL2  |

| REPLACEMENT PARTS LIST |                                 |                            | PAGE : 2             |        |
|------------------------|---------------------------------|----------------------------|----------------------|--------|
| MODEL : 50X7902        | UPGRADE BUYER NAME : ELECTRONUM | RUN DATE : 9/21/2019       |                      |        |
| S/AL                   | LOC                             | PARTS LIST DESCRIPTION     | SPECIFICATION        | REMARK |
| R435                   | OR040207409                     | RESISTOR-FIXED CARBON FILM | 8.2K 1/8W 5% TASE2   |        |
| R436                   | OR015011409                     | RESISTOR-FIXED CARBON FILM | 10K 1/8W 5% TASE2    |        |
| R437                   | OR020713465                     | RESISTOR-FIX METAL FILM    | 2.7 1/4 W 5% 2FO     |        |
| R438                   | OR040207409                     | RESISTOR-FIXED CARBON FILM | 8.2K 1/8W 5% TASE2   |        |
| R439                   | OR015011409                     | RESISTOR-FIXED CARBON FILM | 10K 1/8W 5% TASE2    |        |
| R440                   | OR075011409                     | RESISTOR-FIXED CARBON FILM | 7.5K 1/8W 5% TASE2   |        |
| R441                   | OR040207409                     | RESISTOR-FIXED CARBON FILM | 680 1/8W 5% TASE2    |        |
| R442                   | OR030214609                     | RESISTOR-FIXED CARBON FILM | 10K 1/8W 5% TASE2    |        |
| R443                   | OR08001609                      | RESISTOR-FIXED CARBON FILM | 8.2K 1/8W 5% TASE2   |        |
| R444                   | OR010358409                     | RESISTOR-FIXED CARBON FILM | 100K 1/8W 5% TASE2   |        |
| R445                   | OR010358409                     | RESISTOR-FIXED CARBON FILM | 100K 1/8W 5% TASE2   |        |
| R446                   | OR010314609                     | RESISTOR-FIXED CARBON FILM | 100K 1/8W 5% TASE2   |        |
| R447                   | OR040207409                     | RESISTOR-FIXED CARBON FILM | 56K 1/8W 5% TASE2    |        |
| R448                   | OR010114609                     | RESISTOR-FIXED CARBON FILM | 1.0 1/8W 5% TASE2    |        |
| R449                   | OR011358409                     | RESISTOR-FIXED CARBON FILM | 15K 1/8W 5% TASE2    |        |
| R450                   | OR040207409                     | RESISTOR-FIXED CARBON FILM | 68K 1/8W 5% TASE2    |        |
| R451                   | OR040207409                     | RESISTOR-FIXED CARBON FILM | 6.8K 1/8W 5% TASE2   |        |
| R452                   | OR0103214609                    | RESISTOR-FIXED CARBON FILM | 10K 1/8W 5% TASE2    |        |
| R453                   | OR010000409                     | RESISTOR-FIXED CARBON FILM | 100 1/8W 5% TASE2    |        |
| R454                   | OR010314609                     | RESISTOR-FIXED CARBON FILM | 100K 1/8W 5% TASE2   |        |
| R455                   | OR0103214609                    | RESISTOR-FIXED CARBON FILM | 10K 1/8W 5% TASE2    |        |
| R456                   | OR0103214609                    | RESISTOR-FIXED CARBON FILM | 5.6K 1/8W 5% TASE2   |        |
| R457                   | OR0200114609                    | RESISTOR-FIXED CARBON FILM | 2.0K 1/8W 5% TASE2   |        |
| R458                   | OR010114609                     | RESISTOR-FIXED CARBON FILM | 1.0K 1/8W 5% TASE2   |        |
| R459                   | OR020000409                     | RESISTOR-FIXED CARBON FILM | 100 1/8W 5% TASE2    |        |
| R460                   | OR01501609                      | RESISTOR-FIXED CARBON FILM | 1.5K 1/8W 1/8W TASE2 |        |
| R461                   | OR040114609                     | RESISTOR-FIXED CARBON FILM | 5.6K 1/8W 5% TASE2   |        |
| R462                   | OR040114609                     | RESISTOR-FIXED CARBON FILM | 5.6K 1/8W 5% TASE2   |        |
| R463                   | OR040114609                     | RESISTOR-FIXED CARBON FILM | 5.6K 1/8W 5% TASE2   |        |
| R464                   | OR040114609                     | RESISTOR-FIXED CARBON FILM | 5.6K 1/8W 5% TASE2   |        |
| R465                   | OR040114609                     | RESISTOR-FIXED CARBON FILM | 5.6K 1/8W 5% TASE2   |        |
| R466                   | OR0150214609                    | RESISTOR-FIXED CARBON FILM | 39K 1/8W 5% TASE2    |        |
| R467                   | OR0150214609                    | RESISTOR-FIXED CARBON FILM | 39K 1/8W 5% TASE2    |        |
| R468                   | OR0150214609                    | RESISTOR-FIXED CARBON FILM | 39K 1/8W 5% TASE2    |        |
| R469                   | OR040207409                     | RESISTOR-FIXED CARBON FILM | 56K 1/8W 5% TASE2    |        |
| R470                   | OR040207409                     | RESISTOR-FIXED CARBON FILM | 56K 1/8W 5% TASE2    |        |
| R471                   | OR040207409                     | RESISTOR-FIXED CARBON FILM | 56K 1/8W 5% TASE2    |        |
| R472                   | OR040207409                     | RESISTOR-FIXED CARBON FILM | 56K 1/8W 5% TASE2    |        |
| R473                   | OR0150214609                    | RESISTOR-FIXED CARBON FILM | 15K 1/8W 5% TASE2    |        |
| R474                   | OR010358409                     | RESISTOR-FIXED CARBON FILM | 100K 1/8W 5% TASE2   |        |
| R475                   | OR0150214609                    | RESISTOR-FIXED CARBON FILM | 39K 1/8W 5% TASE2    |        |
| R476                   | OR0270214609                    | RESISTOR-FIXED CARBON FILM | 27K 1/8W 5% TASE2    |        |
| R477                   | OR040114609                     | RESISTOR-FIXED CARBON FILM | 6.8K 1/8W 5% TASE2   |        |
| R478                   | OR020114609                     | RESISTOR-FIXED CARBON FILM | 2.0K 1/8W 5% TASE2   |        |
| R479                   | OR0100114609                    | RESISTOR-FIXED CARBON FILM | 1.0K 1/8W 5% TASE2   |        |
| R480                   | OR010000409                     | RESISTOR-FIXED CARBON FILM | 100 1/8W 5% TASE2    |        |
| R481                   | OR010000409                     | RESISTOR-FIXED CARBON FILM | 100 1/8W 5% TASE2    |        |
| R482                   | OR040207409                     | RESISTOR-FIXED CARBON FILM | 68K 1/8W 5% TASE2    |        |
| R483                   | OR0120114609                    | RESISTOR-FIXED CARBON FILM | 1.2K 1/8W 5% TASE2   |        |
| R484                   | OR01001609                      | RESISTOR-FIXED CARBON FILM | 100 1/8W 5% TASE2    |        |

| REPLACEMENT PARTS LIST   |        |     |            |                                 |                   | PAGE: 12 of 21     |         |
|--------------------------|--------|-----|------------|---------------------------------|-------------------|--------------------|---------|
| PART NO: 52X79070 URGENT |        |     |            | DISC NAME: ELECTRONICS          |                   | RUN-DATE: 97.01.29 |         |
| S                        | AL     | LOC | NO         | PART NUMBER                     | DESCRIPTION       | SPECIFICATION      | REMARKS |
|                          | R8201  |     | 0004148995 | DIODE                           | 250V 10A          | 250V 10A           |         |
|                          | R8202  |     | 0005019497 | RESISTOR-FIRED CARBON FILM      | 5K 1/4W 5% TASE2  | 5K 1/4W 5% TASE2   |         |
|                          | R8203  |     | 0002403465 | RESISTOR-FIRED METAL FILM OXIDE | 100K 1/4W 5% SFD2 | 100K 1/4W 5% SFD2  |         |
|                          | R8204  |     | 0008223445 | RESISTOR-FIRED METAL FILM OXIDE | 82 1/4W 5% TASE2  | 82 1/4W 5% TASE2   |         |
|                          | R8205  |     | 0004064809 | RESISTOR-FIRED METAL FILM OXIDE | 10K 1/4W 5% TASE2 | 10K 1/4W 5% TASE2  |         |
|                          | R8206  |     | 100-14-12E | RESISTOR                        | 100K 1/4W 5% SFD2 | 100K 1/4W 5% SFD2  |         |
|                          | R8207  |     | 0000426406 | RESISTOR-FIRED CARBON FILM      | 40K 1/4W 5% TASE2 | 40K 1/4W 5% TASE2  |         |
|                          | R8208  |     | 0511021447 | RESISTOR-FIRED CARBON FILM      | 10K 1/4W 5% TASE2 | 10K 1/4W 5% TASE2  |         |
|                          | R8209  |     | 0015006000 | RESISTOR-FIRED METAL FILM OXIDE | 150 2W 5% A       | 150 2W 5% A        |         |
|                          | R8210  |     | 100-14-12E | RESISTOR                        | 100K 1/4W 5% SFD2 | 100K 1/4W 5% SFD2  |         |
|                          | R8211  |     | 0005019497 | RESISTOR-FIRED CARBON FILM      | 5K 1/4W 5% TASE2  | 5K 1/4W 5% TASE2   |         |
|                          | R8212  |     | 0005002649 | RESISTOR-FIRED CARBON FILM      | 30K 1/4W 5% TASE2 | 30K 1/4W 5% TASE2  |         |
|                          | R8213  |     | 0005002649 | RESISTOR-FIRED CARBON FILM      | 30K 1/4W 5% TASE2 | 30K 1/4W 5% TASE2  |         |
|                          | R8214  |     | 0001018260 | RESISTOR-FIRED CARBON FILM      | 10K 1/4W 5% TASE2 | 10K 1/4W 5% TASE2  |         |
|                          | R8200B |     | 0002403465 | RESISTOR-FIRED METAL FILM OXIDE | 240K 1/4W 5% SFD2 | 240K 1/4W 5% SFD2  |         |
|                          | R8200C |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200D |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200E |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200F |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200G |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200H |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200I |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200J |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200K |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200L |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200M |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200N |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200O |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200P |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200Q |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200R |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200S |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200T |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200U |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200V |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200W |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200X |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200Y |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R8200Z |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82010 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82011 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82012 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82013 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82014 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82015 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82016 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82017 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82018 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82019 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82020 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82021 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82022 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82023 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82024 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82025 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82026 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82027 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82028 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82029 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82030 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82031 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82032 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82033 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82034 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82035 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82036 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82037 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82038 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82039 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82040 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82041 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82042 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82043 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82044 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82045 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82046 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82047 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82048 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82049 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82050 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82051 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82052 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82053 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82054 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82055 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82056 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82057 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82058 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82059 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82060 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82061 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82062 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82063 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82064 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82065 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82066 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82067 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82068 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82069 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82070 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82071 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82072 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82073 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82074 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82075 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82076 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82077 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82078 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82079 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82080 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82081 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82082 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82083 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82084 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82085 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82086 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82087 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82088 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82089 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82090 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82091 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82092 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82093 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82094 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82095 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82096 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82097 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82098 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82099 |     | 0010006049 | RESISTOR-FIRED CARBON FILM      | 100 1/4W 5% TASE2 | 100 1/4W 5% TASE2  |         |
|                          | R82100 |     |            |                                 |                   |                    |         |

| REPLACEMENT PARTS LIST |    |        |    |                         |                     | PAGE : 13                     |                                |
|------------------------|----|--------|----|-------------------------|---------------------|-------------------------------|--------------------------------|
| MODEL : SKT1990Z       |    | UP09RZ |    | BUYER NAME : ELECTRONUM | RUN-DATE : 92.01.29 |                               |                                |
| S                      | AL | LOC    | NO | PART NO                 | DESCRIPTION         | SPECIFICATION                 | REMARKS                        |
|                        |    |        |    | SC518                   | OCCE08A418          | CAPACITOR-ELECTROLYTIC        | 1000R 5MS14W M PHS1(TP)S       |
|                        |    |        |    | SC517                   | OCX1030K405         | CAPACITOR-CERAMIC(HIGH DIELE) | 0.01MF 50V Z F TS              |
|                        |    |        |    | SC518                   | OCCE271K405         | CAPACITOR-CERAMIC(TEMP.COMP)  | 270P 50V J SL TP               |
|                        |    |        |    | SC519                   | OCCE3010K405        | CAPACITOR-CERAMIC(TEMP.COMP)  | 300P 50V J SL TS               |
|                        |    |        |    | SC520                   | OCX1030K945         | CAPACITOR-CERAMIC(HIGH DIELE) | 0.01MF 50V Z F TS              |
|                        |    |        |    | SC521                   | OCCE1054K418        | CAPACITOR-ELECTROLYTIC        | 1.0MF 50V M PHS TFS            |
|                        |    |        |    | SC523                   | OCCE3010K405        | CAPACITOR-CERAMIC(TEMP.COMP)  | 300P 50V J SL TS               |
|                        |    |        |    | SC524                   | OCX1041N509         | CAPACITOR-POLYESTER(MYLAR)    | 0.1MF 100V L POLY TP           |
|                        |    |        |    | SC525                   | OCX1041N509         | CAPACITOR-POLYESTER(MYLAR)    | 0.1MF 100V L POLY TP           |
|                        |    |        |    | SC526                   | OCX1030K945         | CAPACITOR-CERAMIC(HIGH DIELE) | 0.01MF 50V Z F TS              |
|                        |    |        |    | SC529                   | OCCE475K618         | CAPACITOR-ELECTROLYTIC        | 4.7MF 50V M PHS TFS            |
|                        |    |        |    | SL501                   | 02W563500A          | IC: MITSUBISHI                | ANALOG(DMT-)                   |
|                        |    |        |    | SL501                   | 150-4890            | COIL                          | SECAM BELL FILTER              |
|                        |    |        |    | SL503                   | 0L40102K119         | INDUCTOR AXIAL LEAD           | 100H K 2.343.4 TP              |
|                        |    |        |    | SL506                   | 150-4890            | COIL                          | SECAM DEN.                     |
|                        |    |        |    | SR501                   | 0R022011609         | RESISTOR-FIXED CARBON FILM    | 2.2K 1/4W 5 T5A2               |
|                        |    |        |    | SR502                   | 0R025600609         | RESISTOR-FIXED CARBON FILM    | 560 1/4W 5 T5A2                |
|                        |    |        |    | SR503                   | 0R082020769         | RESISTOR-FIXED CARBON FILM    | 82K 1/4W 5 T5A2                |
|                        |    |        |    | SR504                   | 0R041700769         | RESISTOR-FIXED CARBON FILM    | 470 1/4W 5 T5A2                |
|                        |    |        |    | SR505                   | 0R025602F69         | RESISTOR-FIXED CARBON FILM    | 56K 1/4W 5 T5A2                |
|                        |    |        |    | SR506                   | 0R027020769         | RESISTOR-FIXED CARBON FILM    | 27K 1/4W 5 T5A2                |
|                        |    |        |    | SR507                   | 0R023020769         | RESISTOR-FIXED CARBON FILM    | 33K 1/4W 5 T5A2                |
|                        |    |        |    | SR508                   | 0R022011609         | RESISTOR-FIXED CARBON FILM    | 2.2K 1/4W 5 T5A2               |
|                        |    |        |    | SR509                   | 0R022000F69         | RESISTOR-FIXED CARBON FILM    | 220 1/4W 5 T5A2                |
|                        |    |        |    | SR510                   | 0R022011609         | RESISTOR-FIXED CARBON FILM    | 2.2K 1/4W 5 T5A2               |
|                        |    |        |    | SK501                   | 180-451C            | RESISTOR                      | EVM-DJAA03 B501 HORIZONTAL CTA |
|                        |    |        |    | SK501                   | 180-111A            | SWITCH                        | SVC P12721                     |
|                        |    |        |    | SM51                    | 140-278C            | SWITCH                        | MAIN.PE3C(TV-5)                |
|                        |    |        |    | TM51                    | 163-012A            | THERMISTOR                    | PTE.PTH51A10200180M200         |
|                        |    |        |    | TUNER                   | 113-105K            | TUNER                         | CERIA-707B(CALP3).PAL B/G      |
|                        |    |        |    | T401                    | 151-387A            | TRANSFORMER                   | H.DRIVE                        |
|                        |    |        |    | T402                    | 154-171J            | FBT                           | FCCE21477Z-19SP3               |
|                        |    |        |    | T801                    | 151-425A            | TRANSFORMER                   | 5MPS PC04A (F01)               |
|                        |    |        |    | VR101                   | 180-4280            | RESISTOR                      | SEMI VR EVM-D4A A01 B5.0KOHM   |
|                        |    |        |    | VR301                   | 180-454L            | RESISTOR                      | VARIABLE B104 HORIZONTAL CTA   |
|                        |    |        |    | VR302                   | 180-454L            | RESISTOR                      | VARIABLE B104 HORIZONTAL CTA   |
|                        |    |        |    | VR303                   | 0R15030230          | VARIABLE RESISTOR-CARBON FILM | 50K 6 ST P3 L2.5 S             |
|                        |    |        |    | VR401                   | 180-451H            | RESISTOR                      | EVM-DJAA03 B103 HORIZONTAL CTA |
|                        |    |        |    | VR402                   | 180-451H            | RESISTOR                      | EVM-DJAA03 B103 HORIZONTAL CTA |
|                        |    |        |    | VR701                   | 180-451E            | RESISTOR                      | EVM-DJAA03 B502 HORIZONTAL CTA |
|                        |    |        |    | VR801                   | 180-451G            | RESISTOR                      | EVM-DJAA03 B502 HORIZONTAL CTA |
|                        |    |        |    | VR901                   | 180-4280            | RESISTOR                      | SEMI VR EVM-D4A A01 B5.0KOHM   |
|                        |    |        |    | VR902                   | 180-4280            | RESISTOR                      | SEMI VR EVM-D4A A01 B5.0KOHM   |
|                        |    |        |    | VR903                   | 180-4280            | RESISTOR                      | SEMI VR EVM-D4A A01 B5.0KOHM   |
|                        |    |        |    | VR904                   | 180-428C            | RESISTOR                      | SEMI VR EVM-D4A A01 B500 OHM   |
|                        |    |        |    | VR905                   | 180-428C            | RESISTOR                      | SEMI VR EVM-D4A A01 B500 OHM   |
|                        |    |        |    | X601                    | 166-015B            | FILTER                        | CSB000E                        |
|                        |    |        |    | X701                    | 154-007L            | OSCILLATOR                    | X-TAL 10.000MHZ                |
|                        |    |        |    | ZM007                   | 0025400090A         | DIODE ZENER                   | MTZ5.6B-TP152MM-ROHM           |
|                        |    |        |    | ZH401                   | 00213300209A        | DIODE ZENER                   | ZENER 34233 TAPING             |

| REPLACEMENT PARTS LIST  |    |                         |    | PAGE : 14           |             |               |                      |
|-------------------------|----|-------------------------|----|---------------------|-------------|---------------|----------------------|
| MODEL : SKT1990Z UP09RZ |    | BUYER NAME : ELECTRONUM |    | RUN-DATE : 92.01.29 |             |               |                      |
| S                       | AL | LOC                     | NO | PART NO             | DESCRIPTION | SPECIFICATION | REMARKS              |
|                         |    |                         |    | Z0402               | 0027500090A | DIODE ZENER   | MTZ7.5B-TP152MM-ROHM |
|                         |    |                         |    | Z0701               | 0025600090A | DIODE ZENER   | MTZ5.6B-TP152MM-ROHM |
|                         |    |                         |    | Z0730               | 0025600090A | DIODE ZENER   | MTZ5.6B-TP152MM-ROHM |
|                         |    |                         |    | Z7101               | 166-227A    | FILTER        | 5MVA FILTER K2950    |
|                         |    |                         |    | Z101                | 166-051B    | FILTER        | CERAMIC TFS 5.5MB    |
|                         |    |                         |    | Z102                | 166-051E    | FILTER        | TFS 6.5MB            |
|                         |    |                         |    | Z601                | 166-126D    | FILTER        | CON 6.0PC24B         |
|                         |    |                         |    | Z602                | 166-002E    | FILTER        | SFE 6.0MBP           |
|                         |    |                         |    | Z603                | 166-002D    | FILTER        | CERAMIC SFE 5.5MB    |
|                         |    |                         |    | Z604                | 166-002F    | FILTER        | SFE 6.5MBP           |
| *** END OF DATA ***     |    |                         |    |                     |             |               |                      |