

SERVICE MANUAL

ORION

Chassis 12.8 und 12.7

COLOR TELEVISION RECEIVER

TV-5177 / TV-5177SI

TV-20136 / 20136SI / 20136DK

TV-20151 / 20151SI

Chassis 12.8

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SAFETY INSTRUCTIONS

GENERAL GUIDELINES

1. It is advised to insert an isolation transformer in the AC supply before servicing a hot chassis.
2. Potentials as high as 33KV are present when this receiver is in operation. Operation of the receiver without the rear cover involves the danger of a shock hazard from the receiver power supply. Servicing should not be attempted by any one who is not competent with the precautions necessary when working on the high voltage equipment. Always discharge the anode of the tube.
3. When servicing observe the original lead dress in the high voltage circuits. If a short circuit is found, replace all the parts which have been overheated or damaged by the short circuit.
4. Always use the manufacturer's replacement safety components. The critical safety components marked with Δ on the schematics diagrams should not be replaced by other substitutes. Other substitute may create the electrical shock, fire or other hazards. Take attention to replace the spacers with the originals. Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.
5. After servicing, see that all the protective devices such as insulation barriers, insulation papers, shields and isolation R-C combinations are correctly installed.
6. When the receiver is not being used for a long time of period of time, unplug the power cord from the AC outlet.
7. After servicing make the following leakage current checks to prevent the customer from being exposed to shock hazard.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs of the plug.
2. Turn the receiver's power switch on.
3. Measure the resistance value with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the receiver, such as screw heads, aerials,

connectors, control shafts etc. When the exposed metallic part a return path to the chassis the reading should be between 4Mohm and the 20Mohm. When the exposed metal does not have a return path to the chassis, the reading must be infinite.

LEAKAGE CURRENT HOT CHECK

1. Plug the AC cord directly in to the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 2Kohm 10W resistor in series with an exposed metallic part on the receiver and an earth, such as a water pipe.
3. Use an AC voltmeter with high impedance to measure the potential across the resistor.
4. Check each exposed metallic part and check the voltage at the each point.
5. Reverse the AC plug at the outlet and repeat each of the above measurements.
6. The potential at the any point should not exceed 1.4 Vrms. In case a measurement is outside the limits specified, there is the possibility of a shock hazard, and the receiver should be repaired and rechecked before it is returned to the customer.

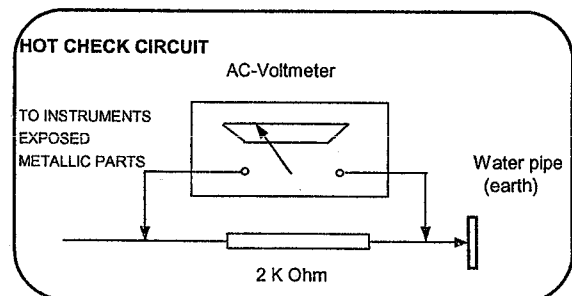


Figure 1

X-RAY RADIATION WARNING

The primary source of X-ray radiation in this receiver is the picture tube. The chassis is specially constructed to limit X-ray radiation. For continued X-ray radiation protection, replace the tube with the same type of the original one.

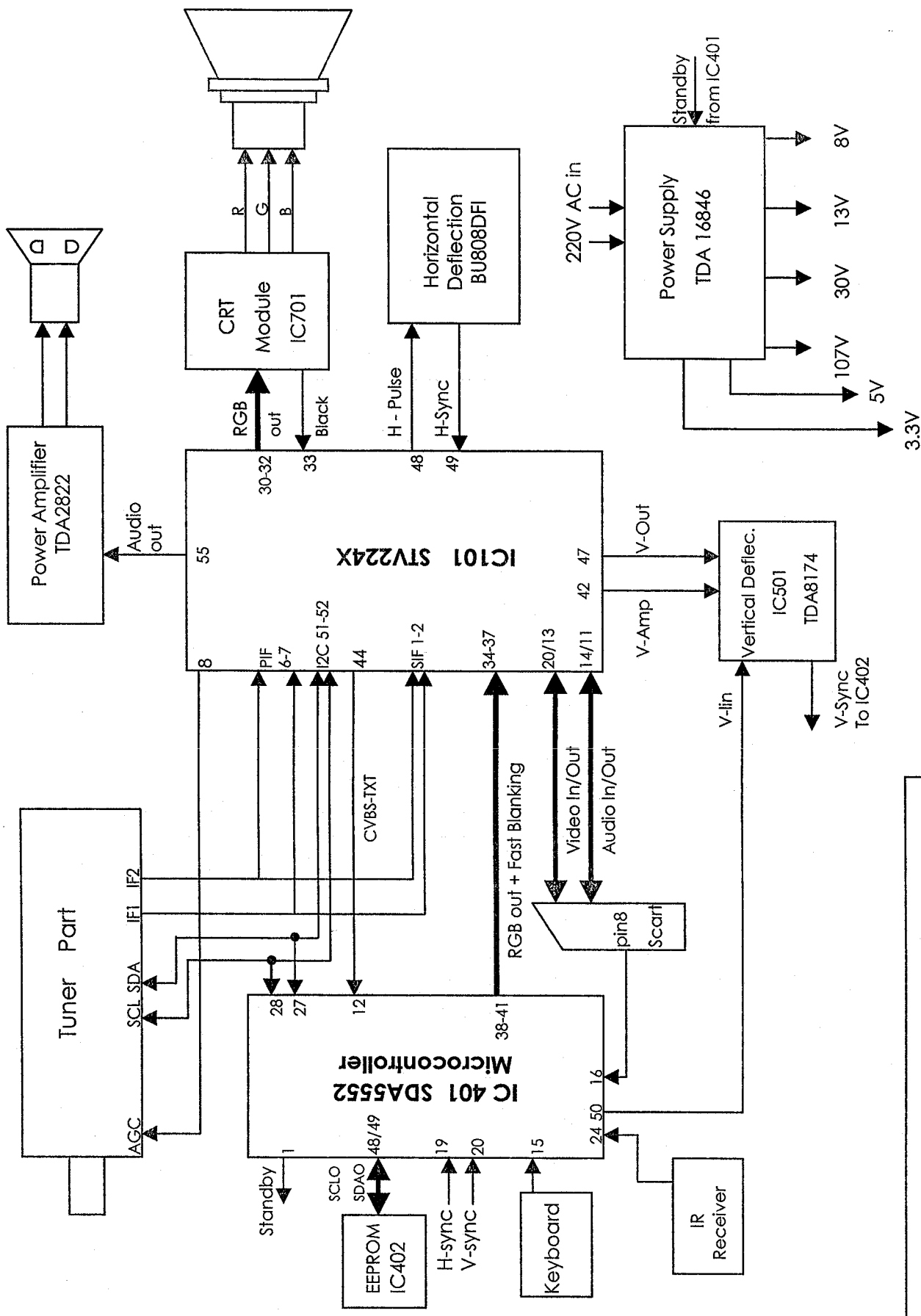
CAUTION

AFTER REMOVAL OF THE ANODE CAP, DISCHARGE THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR THE CARBON PAINTED ON THE CRT WITH A HIGH VOLTAGE PROBE AND MULTIMETER (SELECT VDC) AND THEN SHORT CIRCUIT DIRECTLY TO DISCHARGE COMPLETELY.

TECHNICAL SPECIFICATIONS

| | | |
|---------------------------------------|--|---|
| Power source: | 220-240V AC, 50-60Hz | |
| Power consumption (max.): | 65 W | 14" |
| | 85 W | 20", 21" |
| Standby power consumption : | 5 W | |
| Aerial impedance : | 75Ohm, coaxial type | |
| Receiving system ¹: | PAL BG PAL SECAM BG PAL SECAM BG DK PAL I | |
| Receiving channels: | VHF BAND I | CH2-4 |
| | VHF BAND III | CH5-12 |
| | CABLE TV | S1-41 |
| | UHF BAND | CH21-69 |
| Audio outputs : | 2.0W RMS at %10 THD | 14" |
| | 2.5W RMS at %10 THD | 20", 21" |
| High Voltage : | 23 ± 0.5 KV | 14" |
| | 25 ± 0.5 KV | 20", 21" |
| Focus voltage : | %25.6 ± %38 of EHT | |
| Grid 2 voltage : | 0-1400 V | |
| Heater voltage : | 6.2 ± 0.2 Vrms | |
| Video/Audio Terminals : | AV1 IN | Video : 1 Vpp, 75 Ohm Audio : 0.5 Vrms, >10 Kohm |
| | AV1OUT | RGB Video : 1 Vpp, 75 Ohm Audio : 0.5 Vrms, <1 Kohm |
| | AV2 IN (RCA, optional) | Video : 1 Vpp, 75 Ohm Audio : 0.5 Vrms, >10 Kohm |
| Operating temperature : | 0-45 Degrees | |
| Safety : | IEC 65 /BS P2N | |
| X-Ray radiation : | ACC. IEC 65/BS P2N | |

¹ : TV set is produced to receive "one" of these colour and sound systems.



Chassis 12.8 Block Diagram

PIN VOLTAGES OF IC'S

| IC101 (STV2246) | | | | | |
|--|---|----------|-----|--|----------|
| BUS CONTROLLED MULTISTANDARD ONE CHIP TV PROCESSOR | | | | | |
| Pin | Connection | V DC (*) | Pin | Connection | V DC (*) |
| 1 | Sound IF Input 1 | 0.96 | 29 | Not connected | 3.20 |
| 2 | Sound IF Input 2 | 0.96 | 30 | Blue Output | 2.30 |
| 3 | AGC SIF Capacitor (not connected) | 0.22 | 31 | Green Output | 2.34 |
| 4 | IF Voltage Reference Filtering | 3.15 | 32 | Red Output | 2.48 |
| 5 | AGC Picture IF Capacitor | 2.42 | 33 | Cathode Current Measurement Input | 4.17 |
| 6 | Picture IF Input 1 | 2.47 | 34 | OSD Blue Input | 4.22 |
| 7 | Picture IF Input 2 | 2.47 | 35 | OSD Green Input | 4.35 |
| 8 | AGC Tuner Output | 2.54 | 36 | OSD Red Input | 4.21 |
| 9 | IF PLL Filter | 2.03 | 37 | OSD Fast Blanking | 0.31 |
| 10 | IF Ground | 0.00 | 38 | Cloche Filter Tuning Capacitor | 0.11 |
| 11 | AM/FM Mono Sound Output | 3.78 | 39 | 3.5X MHz Crystal | 0.35 |
| 12 | 5 V IF Supply | 4.97 | 40 | 4.43 MHz Crystal | - |
| 13 | Internal CVBS Output | 3.00 | 41 | Chroma PLL Filter | - |
| 14 | External Audio Input | 2.42 | 42 | Vertical Amplitude DAC Output | 4.03 |
| 15 | LC Input 1 | 3.90 | 43 | Chroma/Scanning Ground | 0.00 |
| 16 | LC Input 2 | 3.90 | 44 | Second Video Switch Output | 4.09 |
| 17 | Video/Luma Supply Voltage (8 V) | 8.05 | 45 | Chroma/Scanning Power Supply (8V) | 8.06 |
| 18 | Internal Video Input | 3.63 | 46 | Beam Current Limiter Control Voltage and Safety Input (XRAY) | 6.54 |
| 19 | Video/Luma Ground | 0.00 | 47 | Vertical Output Pulse | 5.62 |
| 20 | External Video Input | 3.22 | 48 | Horizontal Output Pulse | 1.39 |
| 21 | Black Stretch Capacitor | 2.74 | 49 | Line Flyback Input and Super-sandcastle Output | 0.72 |
| 22 | Y/CVBSIN3 Y(SVHS) or CVBS3 External Input | 3.22 | 50 | Scanning PLL Filter | 3.98 |
| 23 | Chroma (SVHS) Input | 1.70 | 51 | SCL I2C Bus Clock Input | 3.10 |
| 24 | Automatic RGB Peak Regulation | 4.45 | 52 | SDA I2C Bus Data Input | 2.80 |
| 25 | External Blue Input | 2.52 | 53 | Digital Supply Voltage (5 V) | 5.00 |
| 26 | External Green Input | 1.73 | 54 | Digital Ground | 0.00 |
| 27 | External Red Input | 2.52 | 55 | Main Audio Output | 3.91 |
| 28 | External Fast Blanking Input | 0.00 | 56 | FM Demodulation Capacitor | 1.71 |

| IC301 (TDA2822) Audio Output IC | | | | | |
|---------------------------------|---------------|-------------|-----|---------------|------|
| Pin | Connection | V DC | Pin | Connection | V DC |
| 1 | Input A + | - | 9 | Not connected | 0.00 |
| 2 | Not connected | 0.00 | 10 | Not connected | 0.00 |
| 3 | Input A - | 0.52 | 11 | Output B | 5.99 |
| 4 | Ground | 0.00 | 12 | Ground | 0.00 |
| 5 | Ground | 0.00 | 13 | Ground | 0.00 |
| 6 | Output A | 5.96 | 14 | Input B- | 0.52 |
| 7 | Not connected | 0.00 | 15 | Not connected | 0.00 |
| 8 | VCC | 12.9 (13.5) | 16 | Input B - | 0.00 |

IC401 (SDA5552)
MICRO CONTROLLER WITH OSD AND TELETXT

| Pin | Connection | V DC (*) | Pin | Connection | V DC (*) |
|-----|------------------------------------|-------------|-----|-------------------------------|-------------|
| 1 | Standby | 0.06 (2.09) | 27 | SDA I2C Bus Data Input | 1.7 (1.93) |
| 2 | Not connected | 0.80 | 28 | SCL I2C Bus Clock Input | 1.7 (1.93) |
| 3 | Mute | 0.06 (1.62) | 29 | Ground | 0.00 |
| 4 | LED | 1.48 (0.07) | 30 | VDD 3.3 supply pin | 3.30 |
| 5 | Not connected | 0.8 (0.9) | 31 | Not connected | 0.00 |
| 6 | Not connected | 0.8 (0.9) | 32 | Not connected | 3.30 |
| 7 | Not connected | 0.8 (0.9) | 33 | Reset | 3.30 |
| 8 | Not connected | 0.8 (0.9) | 34 | XTAL2 | - |
| 9 | VDD 2.5 supply pin | 2.46 (2.54) | 35 | XTAL1 | - |
| 10 | Ground | 0.00 | 36 | Ground | 0.00 |
| 11 | VDD 3.3 supply pin | 3.30 | 37 | VDDA 2.5 supply pin | 2.41 (2.68) |
| 12 | CVBS input for TXT | 0.88 (0.99) | 38 | Red output for OSD and TXT | 0.28 (0.0) |
| 13 | VDDA 2.5 supply pin | 2.41 (2.68) | 39 | Green output for OSD and TXT | 0.28 (0.0) |
| 14 | Ground | 0.00 | 40 | Blue output for OSD and TXT | 0.28 (0.0) |
| 15 | Local keyboard input | 2.50 | 41 | Fast Blanking for OSD and TXT | 0.00 |
| 16 | Status signal input of Scart pin 8 | 0.00 | 42 | VDD 2.5 supply pin | 2.54 |
| 17 | Not connected | 0.7 (0.8) | 43 | Ground | 0.00 |
| 18 | Power Ctrl | 1.46 (0.24) | 44 | VDD 3.3 supply pin | 3.30 |
| 19 | Horizontal sync input | 2.00 (2.42) | 45 | Not connected | 3.30 |
| 20 | Vertical sync input | 3.13 (3.30) | 46 | Not connected | 0.00 |
| 21 | Not connected | 3.27 | 47 | Not connected | 3.28 |
| 22 | Not connected | 3.27 | 48 | SDA I2C Bus for Eeprom | 3.28 |
| 23 | Not connected | 3.27 | 49 | SCL I2C Bus Clock for Eeprom | 3.28 |
| 24 | Infra red input | 3.27 | 50 | Vertical linearity | 0.68 |
| 25 | AV selection | 0.00 | 51 | Not connected | 3.28 |
| 26 | Service | 3.27 | 52 | Not connected | 3.28 |

IC501 (TDA8174) Vertical Deflection Output IC

| Pin | Connection | V DC | Pin | Connection | V DC |
|-----|-------------------|-------|-----|-------------------|-------|
| 1 | Power output | 12.55 | 7 | Ramp generator | 4.76 |
| 2 | Output stage Vs | 26.78 | 8 | Buffer output | 5.68 |
| 3 | Trigger input | 5.41 | 9 | Inverting input | 4.48 |
| 4 | Height adjustment | 6.78 | 10 | Vs | 26.17 |
| 5 | Not connected | 4.48 | 11 | Flyback generator | 1.86 |
| 6 | Ground | 0.00 | | | |

IC701 TDA6107 RGB Output IC

| Pin | Connection | V DC | Pin | Connection | V DC |
|-----|----------------------|------|-----|------------|---------|
| 1 | Red in | 2.3 | 6 | Vdd supply | 191.8 |
| 2 | Green in | 2.3 | 7 | Red out | 134-139 |
| 3 | Blue in | 2.4 | 8 | Green out | 132-140 |
| 4 | Gnd | 0.0 | 9 | Blue out | 127-133 |
| 5 | Black current output | 4.6 | | | |

IC901 (TDA16846) Power Supply IC

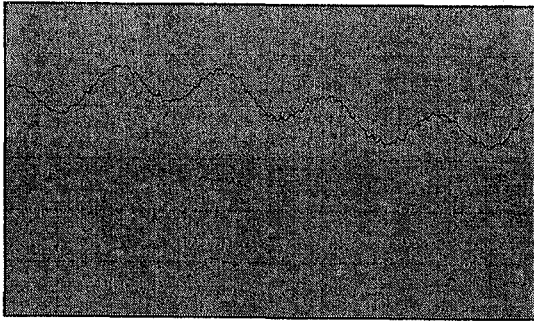
| Pin | Connection | V DC (*) | Pin | Connection | V DC (*) |
|-----|--|-------------|-----|-------------------------------|-------------|
| 1 | Off time circuit (for standby frequency) | 2.91 (2.70) | 8 | Not connected | - |
| 2 | Primary Current Simulation and Startup | 1.79 (1.53) | 9 | Reference Ref. Voltage (5V) | 5.59 (5.57) |
| 3 | Regulation and Zero Crossing Input | 2.17 (0.90) | 10 | Fault Comparator 1 (not used) | 0.00 |
| 4 | Soft-Start and Regulation Capacitor | 3.77 (2.14) | 11 | Primary Voltage Check | 2.61 (2.67) |
| 5 | Opto Coupler Input (not connected) | 4.64 (4.61) | 12 | Ground | 0.00 |
| 6 | Fault Comparator 2 (not used) | 0.00 | 13 | Output | 3.03 (1.06) |
| 7 | Synchronization Input (for fixed freq.) | 5.59 (5.57) | 14 | Supply Voltage | 13.3 (11.1) |

(*) Standby measurement values are given in parenthesis

WAVEFORMS OF SOME IC AND TRANSISTOR PINS

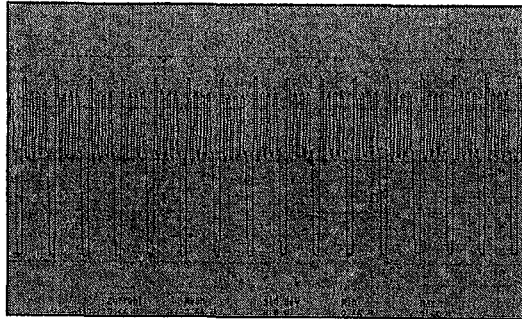
Note: TV is connected to a pattern generator (Colour bar, sound 1 kHz).

IC101 (STV224X)



Pin 11

1V/div, 100 usn/div, Vpp=1.6 V



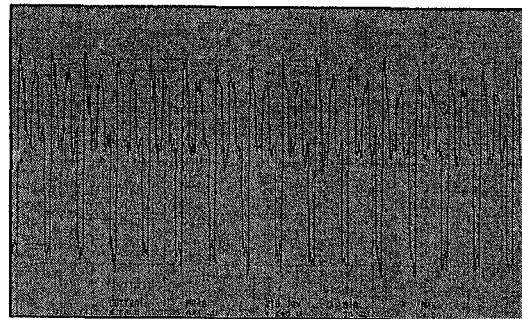
Pin 30

1V/div, 100 usn/div, Vpp=3.7 V, 15625 Hz



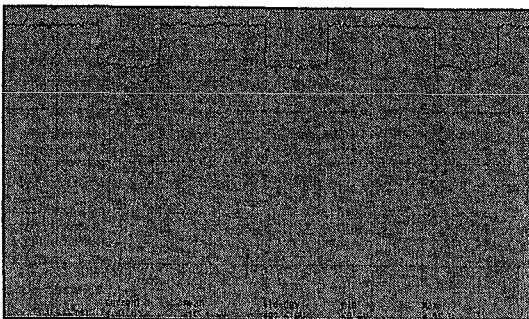
Pin 31

1V/div, 100 usn/div, Vpp=3.7 V, 15625 Hz



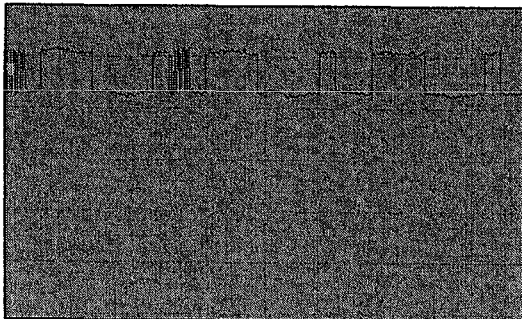
Pin 32

1V/div, 100 usn/div, Vpp=4.5 V, 15625 Hz



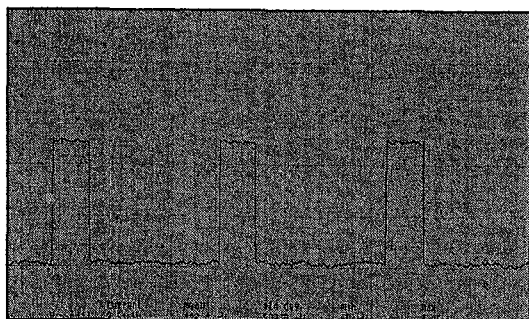
Pin 34 (OSD Off)

1V/div, 20 usn/div, Vpp=1 V, 15625 Hz



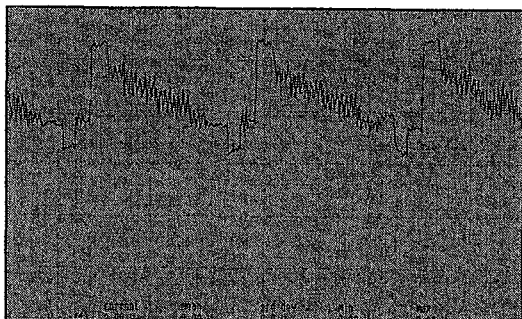
Pin 34 (OSD On)

1V/div, 20 usn/div, Vpp=1 V, 15625 Hz



Pin 37 (OSD On)

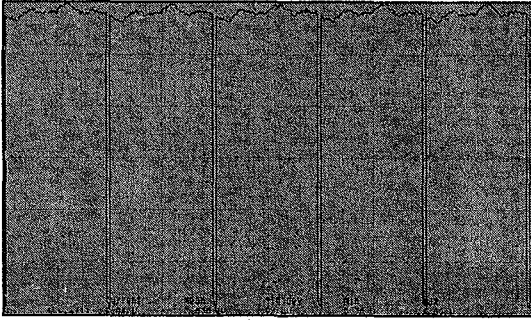
1V/div, 20 usn/div, Vpp=2.51 V, 15625 Hz



Pin 44

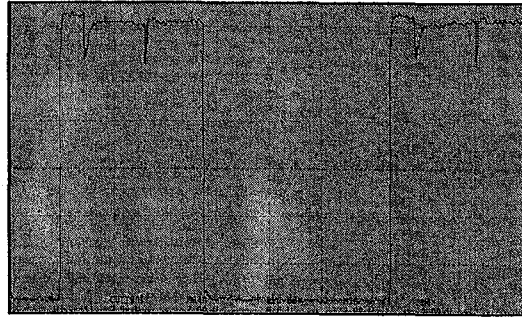
1V/div, 20 usn/div, Vpp=2.3 V, 15625 Hz

IC101 (STV224X)



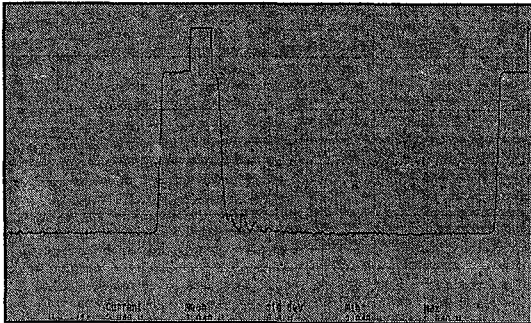
Pin 47

1V/div, 10 msn/div, $V_{pp}=6.0$ V, 50 Hz



Pin 48

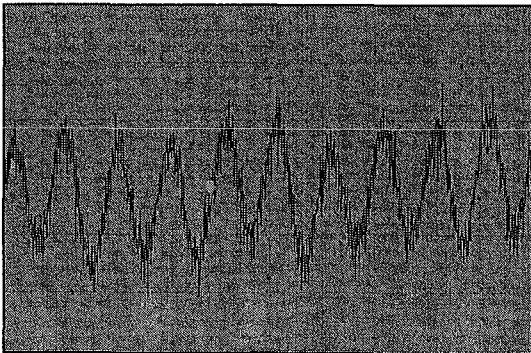
1V/div, 10 usn/div, $V_{pp}=3.1$ V, 15625 Hz



Pin 49

1V/div, 10 usn/div, $V_{pp}=3.9$ V, 15625 Hz

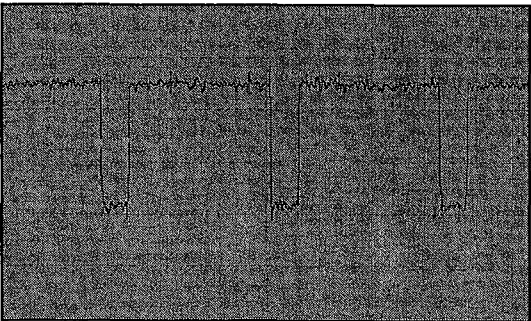
IC301 (TDA2822)



Pin 11

50mV/div, 1 msn/div, $V_{pp}=180$ mV

IC401 (SDA5552)



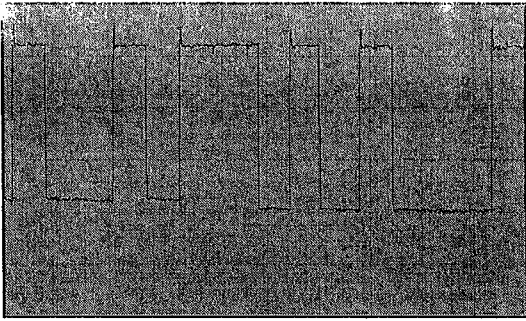
Pin 19

1V/div, 20 usn/div, $V_{pp}=3$ V



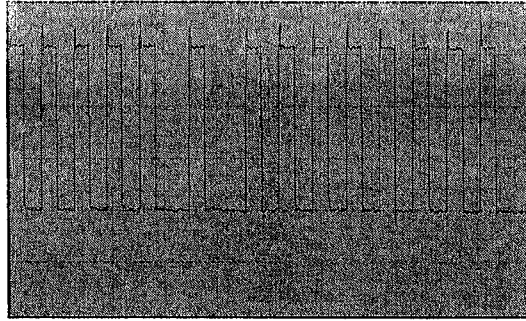
Pin 20

1V/div, 10 msn/div, $V_{pp}=3.6$ V, 50 Hz



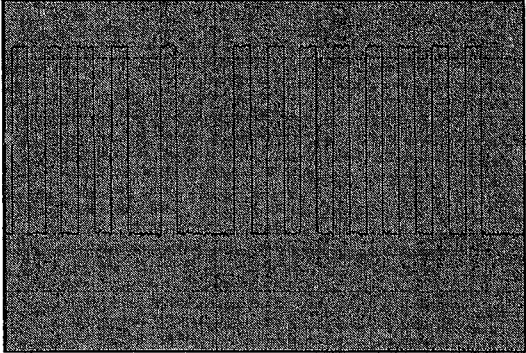
Pin 27

1V/div, 50 usn/div, Vpp=3.6 V, 10.4 kHz



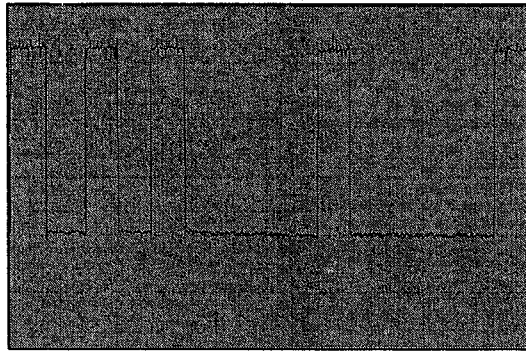
Pin 28

1V/div, 50 usn/div, Vpp=3.9 V, 31.2 kHz



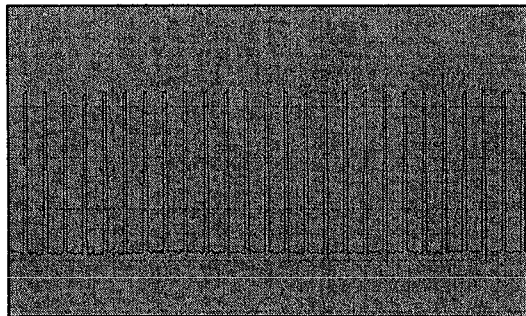
Pin 48

1V/div, 50 usn/div, Vpp=3.3 V, 31.2 kHz



Pin 49

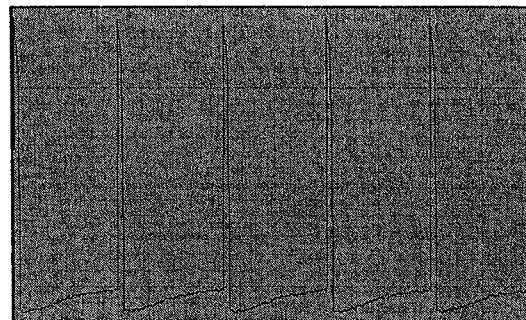
1V/div, 50 usn/div, Vpp=3.6 V, 13.7 kHz



Pin 50

1V/div, 10 usn/div, Vpp=3.7 V, 260 kHz

IC501 (TDA8174)



Pin 2

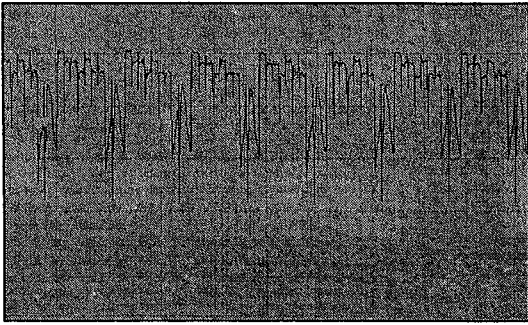
5V/div, 10 msn/div, Vpp=26.7 V, 50 Hz



Pin 7

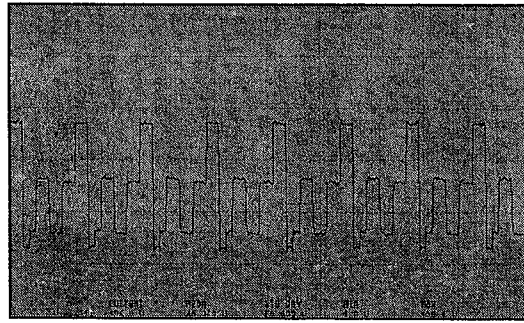
2V/div, 10 msn/div, Vpp=8.1 V, 50 Hz

IC701 TDA6107



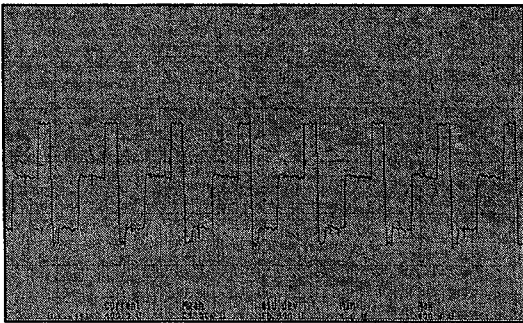
Pin 5

2V/div, 50 usn/div, $V_{pp}=5.8$ V, 15625 Hz



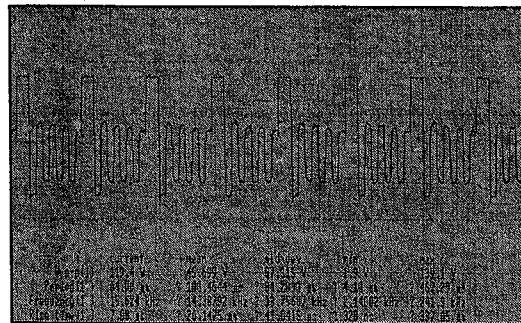
Pin 7

50V/div, 50 usn/div, $V_{pp}=126.8$ V, 15625 Hz



Pin 8

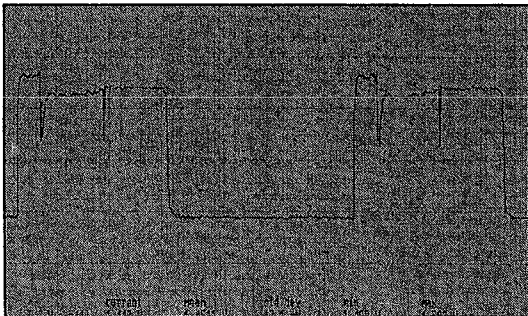
50V/div, 50 usn/div, $V_{pp}=122.7$ V, 15625 Hz



Pin 9

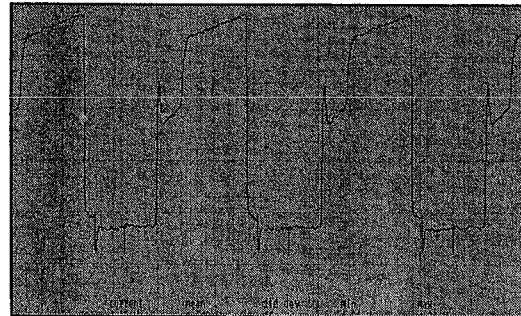
50V/div, 50 usn/div, $V_{pp}=119.4$ V, 15625 Hz

T551



Base

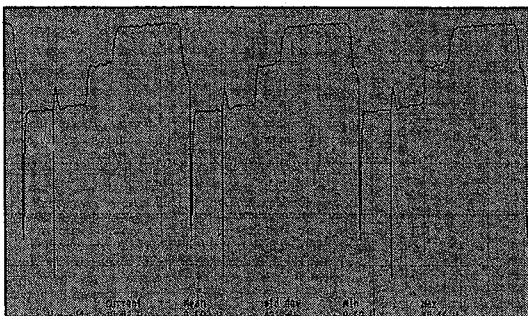
500mV/div, 10 usn/div, $V_{pp}=1.5$ V, 15625 Hz



Collector

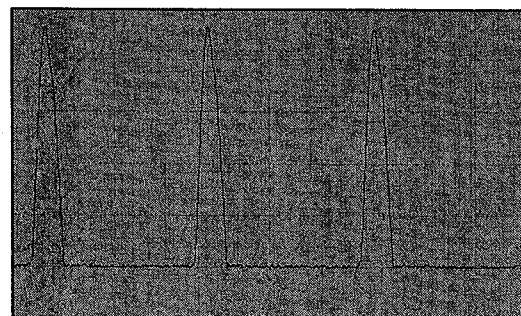
1 V/div, 20 usn/div, $V_{pp}=4.7$ V, 15625 Hz

T552



Base

2 V/div, 20 usn/div, $V_{pp}=10$ V, 15625 Hz



Collector

200 V/div, 20 usn/div, $V_{pp}=932$ V, 15625 Hz

1. ELECTRICAL ADJUSTMENTS

1.1 Supply Voltage Adjustment

Connect a digital voltmeter to the cathode of diode D950 at the AV mode of the TV and set the screen voltage to the minimum with the screen potentiometer. Adjust the main supply voltage (B+) with P901 potentiometer to the following value (after supply adjustment, readjust Screen and focus voltage).

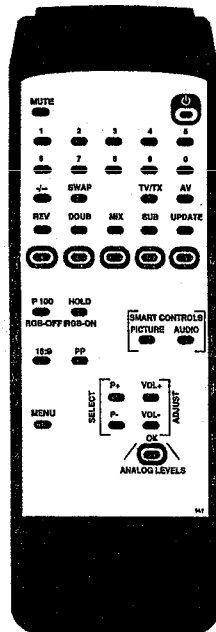
| | |
|-----|------------------------------|
| 14" | : 105 VDC (for A33EKC01X01) |
| 20" | : 118 VDC (for A48EJW011X21) |
| 21" | : 110 VDC (for A51EFS83X191) |

2. SERVICE ADJUSTMENTS

Press MENU on the remote control, the menu appears on the screen. Use the numerical keys and \square input 8500 for Service Menu. For Navigation please see the picture below. \square
Use the 0 button to exit the Service Menu.

Navigation

| | |
|---------|--|
| P+ / P- | : Moves upward / downward inside the menu appears on the screen. |
| V+ / V- | : Changes the values or options |
| Red | : for Feature Setup |
| Green | : for Geometry Adjustments |
| Yellow | : for White Balance Adjustments |
| Blue | : for IF adjustment |



2.1 IF Adjustments

2.1.1 PAL SECAM BG/DK/I

Apply a 38.9 MHz PAL colour bar RF signal to the pin 1 of SAW01 with a pattern generator. Switch on the Service Menu with the Service RC and press "Blue" teletext button. Check that value of "PVC38" is "07". Adjust the coil LC100 until the the "OK" is seen. Press "OK" button on the Service RC. Exit from the service menu with the Service RC.

Note: "PVF38" is for fine tuning. However, it is automatically applied when "OK" button is pressed at "PVC38" item. Thus any manual adjustment is not required.

TUNER : Phillips, Sharp&Alps, Panasonic, Temic
 ST.BY : YES (Default, Automatic switch off is active), NO (can be used during repair)
 AV2 : YES (Front AV is available), NO
 CLR.S : PAL, PAL/NTSC3.5 (+NTSC Playback), PAL/SECAM, PAL/SECAM/NTSC3.5 (NTSC Pback)
 SND.S : BG, I, BG+DK, BG+LL'
 QSS/I : INTERCARRIER, QSS
 TEXT : NON TEXT, DEFAULT (Teletext), FASTTEXT
 OSD CONTR : On (OSD level control is On), Off
 LANG : A (West Europe), B (East Europe)
 HOTEL : NORMAL TV, HOTEL TV
 RGBIN : YES (When RGB on Scart is available, TV can not show aerial signal), NO (Default)
 APR : ON (Auto RGB level control is available), OFF
 B.STR : ON (Black level control is available), OFF

2.7 Factory Settings for Service Mode

Values given in Table 1 are typical values and can vary according to the CRT type.

| | | 14" | 20" | 21" |
|--------|---------------------------------|--------------|--------------|--------------|
| AGC | Automatic Gain Control 1 | 32 | 32 | 32 |
| 2.AGC | Automatic Gain Control 2 | AGC + 5 | AGC + 5 | AGC + 5 |
| ST.BY | Standby | YES | YES | YES |
| PVC38 | VOC Coarse (BG/I/DK) | 07 | 07 | 07 |
| PVL38 | VCO Fine (BG/I/DK) | 68 | 62 | 62 |
| PVC33 | VOC Coarse (LL') | 07 | 13 | 13 |
| PVL33 | VCO Fine (LL') | 64 | 64 | 64 |
| APR | Auto RGB level control | ON | ON | ON |
| B.STR | Black level control | OFF | OFF | OFF |
| QSS/I | QSS/Intercarrier | INTERCARRIER | INTERCARRIER | INTERCARRIER |
| G.DRV | Green level | 32 | 32 | 32 |
| R.DRV | Red level | 40 | 40 | 32 |
| B.DRV | Blue level | 37 | 37 | 32 |
| R.CUT | Black level offset red | 36 | 36 | 32 |
| G.CUT | Black level offset green | 32 | 32 | 32 |
| SCRN | Screen (used for screen adj.) | 0 | 0 | 0 |
| HPOS | Horizontal shift | 30 | 32 | 32 |
| VPOS | Vertical shift | 12 | 11 | 07 |
| V.4:3 | Vertical amplitude 4/3 PAL/SEC | 23 | 32 | 36 |
| V.16:9 | Vertical amplitude 16/9 PAL/SEC | V.4:3 + 18 | V.4:3 + 18 | V.4:3 + 18 |
| LNRTY | Vertical linearity | 51 | 13 | 49 |
| VP.60 | Vertical amplitude NTSC | 12 | 11 | 07 |
| V1.60 | Vertical amplitude 4/3 NTSC | V.4:3 - 14 | V.4:3 - 14 | V.4:3 - 14 |
| V2.60 | Vertical amplitude 16/9 NTSC | V.4:3 + 4 | V.4:3 + 4 | V.4:3 + 4 |
| LN.60 | Linearity NTSC | 51 | 13 | 49 |
| OSD.H | OSD Horizontal Shift | 31 | 31 | 29 |
| OSD.V | OSD Vertical Shift | 39 | 39 | 38 |

Table 1

2.8 Exit from Service Menu

During exit from service menu, the software version and feature options (hexadecimal number) are shown on the screen.

For example: SB7.120-05 BEF9 T02020115

2.1.2 SECAM L/L'

- "PVC33" and "PVF33" are reserved for Secam LL'. However, since there will be no Secam LL' production, they would not be adjusted.

2.2 AGC Adjustment

- Apply a signal with amplitude 65 ± 1 dBuV to the antenna input of TV with a pattern generator (switch sound carrier to Off and switch "Video Ext" to On).
- Switch on the Service Menu with the Service RC and press "Red" teletext button.
- Find the "AGC" with P+ / P- buttons.
- Measure the amplitude of 38.9 MHz sinusoidal signal on pin 11 (IF2) of Tuner with an oscilloscope.
- Change "AGC" to get 640 ± 20 mVpp.
- Add 5 to "AGC" value and change "2.AGC" to this value.
- Exit from the service menu with the Service RC.

2.3 Screen Adjustment

- Switch on the Service Menu with the Service RC and press "Yellow" teletext button.
- Find item "SCRN" in the menu.
- Adjust the Screen potentiometre until the the "OK" is seen.
- Exit from the service menu with the Service RC.

2.4 White Balance Adjustment

- Apply a white pattern with a pattern generator to the antenna input.
- Enter the Service Menu with the Service RC and and press "Yellow" teletext button.
- Select "G.DRV" option with P+ / P- buttons and change its value to "32" with V+ / V- button.
- Adjust "R.DRV" and "B.DRV" for white balance. If white balance can not be adjusted properly change "GRN" value.
- Adjust "R.CUT" and "G. CUT" for red and green cut off (There is no blue cut off adjustment).
- Exit from Service menu.

2.5 Geometry Adjustments

- Apply the cross hatch pattern with a pattern generator to the antenna input.
- Enter Service Menu with Service RC and press "Green" teletext button.
- Adjust Vertical Amplitude with "V.4:3" option.
- Add 18 to ""V.4:3" value and change "V.16:9" to this value.
- Adjust vertical position with "V.POS", vertical linearity with "LNRTY", horizontal position with "H.POS".
- Subtract 14 from "V.4:3" value and change "V1. 60" to this value.
- Add 4 to "V.4:3" value and change "V2. 60" to this value.
- Change "VP.60" to "V.POS" value.
- Change "LN.60" to "LNRTY" value.
- OSD window position can be centered on the screen with "OSD.H" and "OSD.V".
- Exit from the Service Menu.

Note that: There is no horizontal width adjustment in this chassis. It can be adjusted by changing power supply voltage in the interval of -1 and +1 V.

2.6 Feature Setup

Enter the Service Menu with the Service RC and and press "Red" teletext button. Check that below features match with the set.

SPARE PARTS LIST

| PART NO | DESCRIPTION | NOTES | POSITION NUMBERS |
|---------|-----------------------------|----------|-------------------------------|
| 273471 | C-PEM 47NF K 63V R:5 | | C0001 C0002 |
| 201222 | CC 220PF K 50V NPO R:5 | | C0003 C0004 |
| 250111 | EC 1UF 16V 11*5 R:5 | | C101 C102 C138 |
| 251107 | EC 10UF M 16V 11*5 R:5 | | C105 C127 C134 C140 |
| 293230 | CC-CHIP 22NF K 50V /0805 X7 | | C108 C185 |
| 294331 | CC-CHIP 330NF K 16V /0805 X | | C109 |
| 292110 | CC-CHIP 1NF K 50V /0805 X7R | | C110 |
| 293474 | CC-CHIP 47NF K 50V /0805 X7 | | C114 C115 C116 C117 C118 |
| 294111 | CC-CHIP 100NF K 25V /0805 X | | C114 C115 C116 |
| 292476 | CC-CHIP 4.7NF K 50V /0805 X | | C128 C129 |
| 250227 | EC 2.2UF 16V 11*5 R:5 | | C130 |
| 252112 | EC 100UF 16V 11*6 R:5 | | C135 |
| 292110 | CC-CHIP 1NF K 50V /0805 X7R | | C146 C147 C148 C180 |
| 291225 | CC-CHIP 220PF K 50V /0805 X | | C150 C151 C184 |
| 291477 | CC-CHIP 470PF J 50V /0805 N | | C152 C153 |
| 291103 | CC-CHIP 100PF J 50V /0805 N | | C181 C182 C183 |
| 251107 | EC 10UF M 16V 11*5 R:5 | | C301 C426 C506 |
| 293108 | CC-CHIP 10NF K 50V /0805 X7 | | C303 |
| 292223 | CC-CHIP 2.2NF K 50V /0805 X | 14" | C304 |
| 292476 | CC-CHIP 4.7NF K 50V /0805 X | 20", 21" | C304 |
| 294111 | CC-CHIP 100NF K 25V /0805 X | | C306 C307 |
| 252482 | EC 470UF 16V 12.5*10 R:5 | | C308 |
| 294231 | CC-CHIP 220NF K 16V /0805 X | | C401 |
| 251478 | EC 47UF 16V 11*5 R:5 | | C402 C405 C407 C415 C430 C433 |
| 293108 | CC-CHIP 10NF K 50V /0805 X7 | | C409 C412 |
| 291225 | CC-CHIP 220PF K 50V /0805 X | | C413 |
| 291103 | CC-CHIP 100PF J 50V /0805 N | | C416 C428 |
| 292223 | CC-CHIP 2.2NF K 50V /0805 X | | C418 |
| 250227 | EC 2.2UF 16V 11*5 R:5 | | C419 |
| 290334 | CC-CHIP 33PF J 50V /0805 NP | | C424 C425 |
| 252229 | EC 220UF 16V 11*8 R:5 | | C430 |
| 290222 | CC-CHIP 22PF J 50V /0805 NP | | C431 C432 |
| 290684 | CC-CHIP 68PF J 50V /0805 NP | | C438 |
| 274227 | C-PEM 220NF J 50V R:5 | | C501 |
| 253106 | EC 1000UF 25V 20*13 R:5 | | C503 |
| 253101 | EC 1000UF 35V 25*13 R:5 | | C503 |
| 252476 | EC 470UF 25V 11*10 R:5 | 21" | C504 |
| 250111 | EC 1UF 16V 11*5 R:5 | | C505 C511 C512 |
| 293152 | CC-CHIP 15NF K 50V /0805 X7 | | C508 |
| 273333 | C-PEM 33NF K 100V R:5 | | C508A |
| 291477 | CC-CHIP 470PF J 50V /0805 N | | C509 |
| 252105 | EC 100UF 50V 12*8 R:5 | | C510 |
| 294109 | CC-CHIP 100NF K 50V /0805 X | | C513 C562 |
| 250100 | EC 1UF 160V 11*6.3 R:5 | | C553 |
| 271390 | C-PPM 390NF J 250V R:15 | | C554 |
| 272687 | C-PPM 6.8NF %3.5 1.5/1.6KV | 14" | C555 |
| 272820 | C-PPM 8.2NF %3.5 1.5/1.6KV | 21" | C555 |
| 274330 | C-PEM 330NF J 250V R:15 | | C556 |
| 251109 | EC 10UF 250V 16*10 R:5 | | C560 |
| 202105 | CC 1NF K 1KV Y5P R:5 | | C561 |
| 274107 | C-PEM 100NF J 100V R:5 | | C563 |
| 252229 | EC 220UF 16V 11*8 R:5 | 21" | C564 |
| 252482 | EC 470UF 16V 12.5*10 R:5 | 20" | C564 |
| 272154 | C-PPM 1.5NF J 1600V R:15 | | C565 |
| 293108 | CC-CHIP 10NF K 50V /0805 X7 | | C570 |
| 290473 | CC-CHIP 47PF J 50V /0805 NP | | C701 C706 C709 |
| 274105 | C-PEM 100NF J 250V R:10 | | C701 C713 |
| 251109 | EC 10UF 250V 16*10 R:5 | | C702 C703 |
| 291225 | CC-CHIP 220PF K 50V /0805 X | | C703 C707 C710 |

SPARE PARTS LIST

| PART NO | DESCRIPTION | NOTES | POSITION NUMBERS |
|-----------|------------------------------|----------------------|--------------------------|
| 273225 | C-PEM 22NF J 63V R:5 | | C704 |
| 202221 | C-CE 2.2NF K 2KV Y5P R:7.5 | | C705 C712 |
| 201476 | C-CE 470PF K 1KV R:5 | | C705 C708 C711 |
| 274103 | C-PEM 100NF K 275V-AC R:15 | | C901 |
| 274224 | C-PEM 220NF K 275V-AC R22. | | C901 |
| 251120 | EC 10UF 10V 5*4 R:5 | | C901 |
| 274103 | C-PEM 100NF K 275V-AC R:15 | | C902 |
| 202105 | CC 1NF K 1KV Y5P R:5 | | C903 C904 |
| 203330 | C-PPM 33NF J 630V R:15 | | C906 |
| 201471 | CC 470PF 2KV | | C907 |
| 292223 | CC-CHIP 2.2NF K 50V /0805 X | | C913 |
| 292151 | CC-CHIP 1.5NF K 50V /0805 X | 14", 21" | C914 |
| 292223 | CC-CHIP 2.2NF K 50V /0805 X | 20" | C914 |
| 274105 | C-PEM 100NF J 250V R:10 | | C915 |
| 273222 | C-PEM 22NF K 250V R:7.5 | | C915 |
| 202220 | CC 2.2NF M 250VAC Y5U R:10 | | C920 |
| 291560 | CC-CHIP 560PF J 50V /0805 N | | C921 |
| 290561 | CC-CHIP 56PF J 50V NPO 0805 | | C923 |
| 201226 | CC 220PF K 2KV Y5P R:5 | | C950 |
| 253106 | EC 1000UF 25V 20*13 R:5 | | C954 |
| 251107 | EC 10UF M 16V 11*5 R:5 | | C966 |
| 251478 | EC 47UF 16V 11*5 R:5 | | C968 |
| 291101 | CC-CHIP 100PF J 50V /1206 N | | C981 C982 |
| 179002 | RC-CHIP 0R /1206 | | D103 |
| 302289 | DIODE 1N4148 52MM | | D105 D106 |
| 303195 | DIODE 4148 MELF | | D105 D106 D107 |
| 302296 | DIODE 1N4148 26MM | | D110 |
| 303850 | LED LTL 4263 RED L=25.4 | | D401 |
| 303988 | LED LTL 4224 RED (SHORT LEG | | D401 |
| 302296 | DIODE 1N4148 26MM | | D402 D403 D404 D406 D407 |
| 302289 | DIODE 1N4148 52MM | | D402 D403 D404 D406 D407 |
| 303308 | DIODE RF2007 | | D502 |
| 302289 | DIODE 1N4148 52MM | | D503 D557 D558 D559 |
| 303195 | DIODE 4148 MELF | | D503 D557 |
| 300305 | DIODE BA157 | | D552 D556 D560 |
| 303227 | DIODE RGP15J | △ | D553 |
| 302948 | DIODE 1N4007 | | D701 |
| 302296 | DIODE 1N4148 26MM | | D702 D703 D704 |
| 303209 | DIODE BAV21 | | D702 D703 D704 |
| 303308 | DIODE RF2007 | | D901 D902 D903 D904 |
| 303244-01 | DIODE RGP30K(GENERAL SEMI C | | D901 D902 D903 D904 |
| 303206-01 | DIODE RGP30M (GENERAL SEMI | | D901 D902 D903 D904 |
| 303214 | DIODE UF4006 | | D901 D902 D903 D904 |
| 303217 | DIODE RGP10J | | D905 |
| 303227 | DIODE RGP15J | 14" | D950 |
| 303244 | DIODE RGP30K | 20", 21" | D950 |
| 303813 | DIODE RGP15D | | D951 |
| 303993 | LED LTL4221N D:3 R/D RED | | D980 |
| 303991 | LED IR SIR563SB3F 23/940 | | D981 |
| 056722 | SER.FILTER TPS5.5MB | BG | F102 |
| 056745 | SER.FILTER TPS6.0MB | I | F102 |
| 056762 | SER.FILTER TPT02B | BG/DK | F102 |
| 056640-01 | SER.FILTER MKT40.4MA1 TOP-TF | | F401 |
| 452842 | IC STV2246-5X | PAL BG, I SYSTEMS | IC101 |
| 452990 | IC STV2249C | PAL/SEC BG/DK SYSTEM | IC101 |
| 452439 | IC TDA2822 | | IC301 |

SPARE PARTS LIST

| PART NO | DESCRIPTION | NOTES | POSITION NUMBERS |
|-----------|-----------------------------|----------|--------------------------|
| 452807 | IC SDA555XFL | | IC401 |
| 452837 | IC-CHIP BR24C04 (SOP8) | | IC402 |
| 452648 | IC TDA8174AW | | IC501 |
| 452746 | IC TDA6107Q | | IC701 |
| 452795 | IC TDA16846 | | IC901 |
| 451518 | IC KA317TU T0220CASE | | IC951 IC952 |
| 452382 | IC-CHIP S3C1840DA9/SMB1 | | IC980 |
| 055139 | CHOKE COIL 50MHZ 600R PH-WB | | L0001 L0002 |
| 053725 | COIL-CHIP 10UH %20/0805 | | L101 L102 |
| 052828 | COIL 6.8UH K R:5 | | L103 |
| 053740 | COIL 1UH K LAL03 | | L104 |
| 053798 | COIL-CHIP 18UH K /0805 | | L109 |
| 053749 | COIL 18UH K /3.4 26MM | | L401 |
| 053711 | COIL 10UH K (TAIYO) LAL03 | | L402 L403 L404 |
| 053715 | COIL 6.8UH K R12.5 | △ | L502 |
| 051591 | COIL H-LIN 55UH NEOSID | 21" | L551 |
| 051585 | COIL H-LIN 70UH | 14", 20" | L551 |
| 053352 | COIL- CHOKE 10UH R0814 14.1 | | L701 |
| 051687-02 | LINE FILTER 27MH E-TYPE OPE | △ | L901 |
| 053759 | COIL 100UH LAL03 | | L902 |
| 053739 | COIL CHOKE 50UH | | L950 |
| 053506-01 | COIL DEMOD 38.9 HEX | | LC100 |
| 179001 | RC-CHIP OR /0805 2*1.25 | | LK501 |
| 132209 | R-VAR 2.2K (V) 5*3 | 14" | P901 |
| 132500 | R-VAR 5K (V) 5*3 | 20", 21" | P901 |
| 056023 | CRYSTAL 4.433619MHZ (NO LOA | | Q101 |
| 056660 | CRYSTAL 3.579545 90OHM BULK | | Q102 |
| 056620 | CRYSTAL 6MHZ (CL 30PF) | | Q401 |
| 056210 | CER.RESONATOR GSB455E | | Q980 |
| 101221 | CFR 220R J 1/2W 52MM | | R0001 R0003 |
| 173273 | CFR-CHIP 27K J 1/10W /0805 | | R101 |
| 171150 | RC-CHIP 150R J 1/10W /0805 | | R102 R113 |
| 172152 | RC-CHIP 1.5K J 1/10W /0805 | | R104 R105 |
| 173684 | RC-CHIP 68K J 1/10W /0805 | | R106 |
| 174180 | RC-CHIP 180K J 1/10W /0805 | | R108 |
| 171221 | RC-CHIP 220R J 1/10W /0805 | | R109 R110 R111 R142 |
| 172101 | RC-CHIP 1K J 1/10W /0805 | | R112 |
| 172561 | RC-CHIP 5.6K J 1/10W /0805 | | R115 R123 R172 |
| 171471 | RC-CHIP 470R J 1/10W /0805 | | R116 |
| 170683 | RC-CHIP 68R J 1/10W /0805 | | R117 |
| 171102 | RC-CHIP 100R J 1/10W /0805 | | R120 R151 R152 |
| 173154 | RC-CHIP 15K J 1/10W /0805 | | R122 R124 R125 |
| 170750 | RC-CHIP 75R J 1/10W /0805 | | R126 R127 R128 R129 R155 |
| 173562 | RC-CHIP 56K J 1/10W /0805 | | R130 |
| 174331 | RC-CHIP 330K J 1/10W /0805 | | R131 R175 R176 |
| 172225 | RC-CHIP 2.2K J 1/10W /0805 | | R132 R133 R144 R145 R146 |
| 172823 | RC-CHIP 8.2K J 1/10W /0805 | | R134 |
| 171270 | RC-CHIP 270R J 1/10W /0805 | | R135 R136 R137 |
| 173479 | RC-CHIP 47K J 1/10W /0805 | | R138 |
| 173101 | RC-CHIP 10K J 1/10W /0805 | | R139 |
| 174104 | RC-CHIP 100K J 1/10W /0805 | | R141 R149 R171 |
| 173333 | RC-CHIP 33K J 1/10W /0805 | | R148 |
| 172475 | RC-CHIP 4.7K J 1/10W /0805 | | R154 |
| 102141 | CFR 1K J 1/4W /6 26MM | AV | R157 R568 |
| 179001 | RC-CHIP OR /0805 2*1.25 | | R159 |




SPARE PARTS LIST

| PART NO | DESCRIPTION | NOTES | POSITION NUMBERS | | |
|-----------|----------------------------|----------|------------------|------|----------------|
| | | | | | |
| 171332 | RC-CHIP 330R J 1/10W /0805 | | R180 | R205 | R206 |
| 171471 | RC-CHIP 470R J 1/10W /0805 | | R181 | | |
| 171685 | RC-CHIP 680R J 1/10W 0805 | | R184 | | |
| 172475 | RC-CHIP 4.7K J 1/10W /0805 | 20", 21" | R301 | | |
| 172335 | RC-CHIP 3.3K J 1/10W /0805 | 14" | R301 | | |
| 173154 | RC-CHIP 15K J 1/10W /0805 | | R302 | | |
| 173333 | RC-CHIP 33K J 1/10W /0805 | | R303 | R308 | |
| 172823 | RC-CHIP 8.2K J 1/10W /0805 | | R304 | | |
| 173101 | RC-CHIP 10K J 1/10W /0805 | | R305 | | |
| 170047 | RC-CHIP 4.7R J 1/10W /0805 | | R306 | R307 | |
| 119331 | RMF 3.3R J 1W | 14" | R309 | | |
| 119485 | RMF 4.7R J 1.5W | 20", 21" | R309 | | |
| 172335 | RC-CHIP 3.3K J 1/10W /0805 | | R401 | | |
| 173101 | RC-CHIP 10K J 1/10W /0805 | | R404 | R414 | R418 |
| 172101 | RC-CHIP 1K J 1/10W /0805 | | R405 | R413 | R422 R423 |
| 171270 | RC-CHIP 270R J 1/10W /0805 | | R406 | | |
| 175102 | RC-CHIP 1M J 1/10W /0805 | | R407 | | |
| 172152 | RC-CHIP 1.5K J 1/10W /0805 | | R408 | R409 | |
| 171685 | RC-CHIP 680R J 1/10W 0805 | | R410 | | |
| 172475 | RC-CHIP 4.7K J 1/10W /0805 | | R411 | R412 | R467 R468 |
| 172561 | RC-CHIP 5.6K J 1/10W /0805 | | R415 | R416 | |
| 173273 | CFR-CHIP 27K J 1/10W /0805 | | R417 | | |
| 171150 | RC-CHIP 150R J 1/10W /0805 | | R425 | | |
| 102338 | CFR 3.3K J 1/4W /6 52MM | | R434 | R446 | |
| 172273 | RC-CHIP 2.7K J 1/10W /0805 | | R436 | R511 | |
| 173393 | RC-CHIP 39K J 1/10W /0805 | | R437 | | |
| 171221 | RC-CHIP 220R J 1/10W /0805 | | R441 | R442 | |
| 172823 | RC-CHIP 8.2K J 1/10W /0805 | | R445 | R464 | |
| 173154 | RC-CHIP 15K J 1/10W /0805 | | R447 | | |
| 172394 | RC-CHIP 3.9K J 1/10W /0805 | | R448 | R524 | |
| 179001 | RC-CHIP 0R /0805 2*1.25 | | R478 | | |
| 119227-01 | RMF 2.2R J 1W | | R501 | | |
| 101471 | CFR 470R J 1/2W /9 52MM | ⚠ | R502 | R557 | |
| 100220 | CFR 22R J 1/2W 52MM | | R503 | | |
| 172101 | RC-CHIP 1K J 1/10W /0805 | | R504 | R552 | |
| 174151 | RC-CHIP 150K J 1/10W /0805 | | R505 | R506 | |
| 172183 | RC-CHIP 1.8K J 1/10W /0805 | | R508 | R512 | |
| 119125 | RM 1.2R J 1/2W 52MM | 21" | R509 | | |
| 119153 | RM 1.5R J 1/2W 52MM | 20" | R509 | | |
| 170472 | RC-CHIP 47R J 1/10W /0805 | 21" | R510 | | |
| 171150 | RC-CHIP 150R J 1/10W /0805 | 14" | R510 | | |
| 102141 | CFR 1K J 1/4W /6 26MM | | R519 | R568 | |
| 172101 | RC-CHIP 1K J 1/10W /0805 | 20", 21" | R520 | | |
| 174104 | RC-CHIP 100K J 1/10W /0805 | | R521 | | |
| 173562 | RC-CHIP 56K J 1/10W /0805 | | R522 | R523 | |
| 173221 | RC-CHIP 22K J 1/10W /0805 | | R526 | | |
| 110823 | RMO 82R J 3W R:20 | | R554 | | |
| 100473 | CFR 47R J 1/4W /6 52MM | | R555 | | |
| 113114 | RM 10K J 1/2W 52MM | | R558 | | |
| 119337 | RMO 3.3R J 2W R:27.5 TAPE | | R559 | | |
| 119478 | RMF 0.47R J 1W | 14", 21" | R560 | | |
| 119684 | RMF 0.68R J 1W | 20" | R560 | | |
| 103116 | CFR 10K J 1/4W /6 52MM | | R562 | | |
| 103136 | CFR 10K J 1/4W /6 26MM | 14" | R563 | | |
| 171560 | RC-CHIP 560R J 1/10W /0805 | | R564 | | |
| 103475 | CFR 47K J 1/4W /6 52MM | | R705 | | |
| 102159 | CFR 1.5K J 1/2W /9 52MM | | R711 | R713 | R715 R716 R725 |
| 171471 | RC-CHIP 470R J 1/10W /0805 | | R711 | R716 | R721 |
| 171102 | RC-CHIP 100R J 1/10W /0805 | | R712 | R717 | |

SPARE PARTS

| PART NO | DESCRIPTION | NOTES | POSITION NUMBERS |
|------------|-----------------------------|--------------|-------------------|
| 154216 | NTC 5.1R M (S234R) | | R901 |
| 113683 | RMO 68K J 1.5W 73MM | | R903 |
| 115103 | RM 1M J 1W 52MM | | R908 |
| 115391 | RM 3.9M J 1W 52MM | | R912 |
| 173333 | RC-CHIP 33K J 1/10W /0805 | | R915 R918 |
| 172683 | RC-CHIP 6.8K J 1/10W /0805 | | R917 |
| 115470 | RM 4.7M J 1/2W 52MM | △ | R920 |
| 113180 | RMO 18K J 1W | | R950 |
| 171240 | RC-CHIP 240R %1 1/10W /0805 | | R953 R961 |
| 112131 | RM 1.3K %1 1/4W 26MM | | R954A |
| 109560 | CFR 5.6R J 1/4W /3.2 52MM | | R956 |
| 101106 | CFR 100R J 1/4W 52MM | | R957 |
| 119109 | RNF 0.1R J 0.4W (UFLB) 52MM | △ | R959 |
| 120234 | RMF 22R J 1/2W | | R960 |
| 171394 | RC-CHIP 390R %1 1/10W /0805 | | R962 |
| 179002 | RC-CHIP 0R /1206 | | R981 |
| 452521 | IR RECEIVER TSOP 1838 | | S401 |
| 054261 | FUSE 2.5AT (215 SER.) | △ | S901 |
| 056746 | SAW FILTER OFW G1968M | BG SYSTEM | SAW01 |
| 056760 | SAW FILTER OFW J1956M | I SYSTEM | SAW01 |
| 056070 | SAW FILTER OFW K2966M | BG/DK SYSTEM | SAW01 |
| 031229 | SCART SOCKET 11.1 | | SK101 |
| 010860 | TACT SW LONG STEN | | SW401 SW402 SW403 |
| 010861 | ON/OFF SWITCH BK98 | | SW901 |
| 401141 | TRN-CHIP BC848B SOT23 | | T101 T102 T107 |
| 401141 | TRN-CHIP BC848B SOT23 | | T301 T302 T303 |
| 401142 | TRN-CHIP BC858B SOT23 | | T401 |
| 401141 | TRN-CHIP BC848B SOT23 | | T501 T502 |
| 401334 | TRN STX112 | | T551 |
| 401332 | TRN BU808DFI | | T552 |
| 400338 | TRN BF422 | | T701 T703 T705 |
| 401366 | TRN BF421 | | T702 T704 T706 |
| 401219 | TRN STP3NB60FP | | T901 |
| 401047 | TRN BC337-25 | | T950 |
| 401142 | TRN-CHIP BC858B SOT23 | | T980 |
| 058013-TR1 | FBT 2021/MS TR/003071083 12 | △ 20", 21" | TR552 |
| 058413-TR1 | FBT 14" 12.1 | △ 14" | TR552 |
| 059013-TL1 | SMPS 20/21" 12.1 | △ 20", 21" | TR901 |
| 059413-TL2 | SMPS 14" 12.1 | △ 14" | TR901 |
| 7RZ136-PH3 | TUNER PH ASIMETRIK UV1316/A | | TU101 |
| 031176 | CONN.CINCH 12.1 FRONT-AV YE | | X0002 |
| 031162 | KONN. CINCH RCA PJ803-4 YEL | | X0002 |
| 031166 | CONN.CINCH 12.1 FRONT-AV WH | | X0003 |
| 031160 | KONN. CINCH RCA PJ803-2 WHI | | X0003 |
| 031180 | CONN.HEADPHONE 12.1 FRONT-A | | X0004 |
| 031856 | CONN.HOUSING X2003 BLACK | | X301 |
| 031860 | CONN.HOUSING X2004 BLACK | | X403 |
| 031864 | CONN.HOUSING X2005 BLACK | | X404 |
| 031780 | CONN.HOUSING 2"LI GREY | | X501 |
| 031777 | CON.HOUSING LOCKED 5/4 | | X551 |
| 031532 | CRT SOCKET NARROW INCHANG | 14" | X703 |
| 031530-01 | INCHANG/CRT SOCKET ISHM05S- | 20", 21" | X703 |
| 031675 | CON.HOUSING 2P MALE | | X901 X902 |
| 302786 | DIODE Z. MTZJ6.2B | | ZD101 |
| 303771 | DIODE Z. UZT33V | | ZD570 |

SPARE PARTS LIST

| | | | |
|------------|---|-----|-------|
| 303735 | MTZJ5.6B | | ZD952 |
| 056314-EK3 | CPT EK A33EKC01X01 | 14" | |
| 056321-GS7 | CPT GS A51QAE320X67 (WALES) | 21" | |
| 056320-VC1 | CPT VC A48EJW011X21 | 20" | |
| 614167-AS | DEGAUSSING COIL ASSY 14" BA  | 14" | |
| 620167-AS | DEGAUSSING COIL ASSY 20" BA  | 20" | |
| 621167-AS | DEGAUSSING COIL ASSY 21" BA  | 21" | |
| B25187 | R.CONTROL SILVER PAINTED B- | | |
| C29187 | RC A.TYPE SILVER PAINTED | | |
| M93187 | RC B.TYPE YLG PAINTED 12.4/ | | |
| 6BZ107-AS | SPEAKER SM 16R/3W | | |
| 5FZ107-AS | SPEAKER SM 8R/3W NOM.50*90 | | |

Please note that Product Part List Files should be investigated for the mechanical parts like cabinets, etc.

Chassis 12.7

| CONTENTS | PAGE |
|------------------------------------|-------------|
| Safety Instructions | 2 |
| Technical Specifications | 3 |
| Instructions Manual | 4 |
| Block Diagram | 9 |
| Pin Voltages of IC's | 11 |
| Oscillograms | 13 |
| Electrical and Service Adjustments | 17 |
| Channel Frequency Tables | 20 |
| Parts List | 22 |
| Circuit Diagrams | Attached |

SAFETY INSTRUCTIONS

GENERAL GUIDELINES

1. It is advised to insert an isolation transformer in the AC supply before servicing a hot chassis.
2. Potentials as high as 33KV are present when this receiver is in operation. Operation of the receiver without the rear cover involves the danger of a shock hazard from the receiver power supply. Servicing should not be attempted by any one who is not competent with the precautions necessary when working on the high voltage equipment. Always discharge the anode of the tube.
3. When servicing observe the original lead dress in the high voltage circuits. If a short circuit is found, replace all the parts which have been overheated or damaged by the short circuit.
4. Always use the manufacturer's replacement safety components. The critical safety components marked with Δ on the schematics diagrams should not be replaced by other substitutes. Other substitute may create the electrical shock, fire or other hazards. Take attention to replace the spacers with the originals. Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.
5. After servicing, see that all the protective devices such as insulation barriers, insulation papers, shields and isolation R-C combinations are correctly installed.
6. When the receiver is not being used for a long time of period of time, unplug the power cord from the AC outlet.
7. After servicing make the following leakage current checks to prevent the customer from being exposed to shock hazard.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs of the plug.
2. Turn the receiver's power switch on.
3. Measure the resistance value with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the receiver, such as screw heads, aerials,

connectors, control shafts etc. When the exposed metallic part a return path to the chassis the reading should be between 4Mohm and the 20Mohm. When the exposed metal does not have a return path to the chassis, the reading must be infinite.

LEAKAGE CURRENT HOT CHECK

1. Plug the AC cord directly in to the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 2Kohm 10W resistor in series with an exposed metallic part on the receiver and an earth, such as a water pipe.
3. Use an AC voltmeter with high impedance to measure the potential across the resistor.
4. Check each exposed metallic part and check the voltage at the each point.
5. Reverse the AC plug at the outlet and repeat each of the above measurements.
6. The potential at the any point should not exceed 1.4 Vrms. In case a measurement is outside the limits specified, there is the possibility of a shock hazard, and the receiver should be repaired and rechecked before it is returned to the customer.

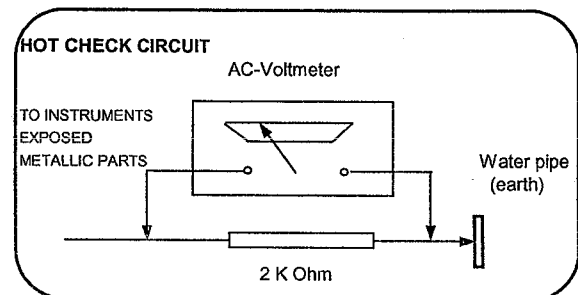


Figure 1

X-RAY RADIATION WARNING

The primary source of X-ray radiation in this receiver is the picture tube. The chassis is specially constructed to limit X-ray radiation. For continued X-ray radiation protection, replace the tube with the same type of the original one.

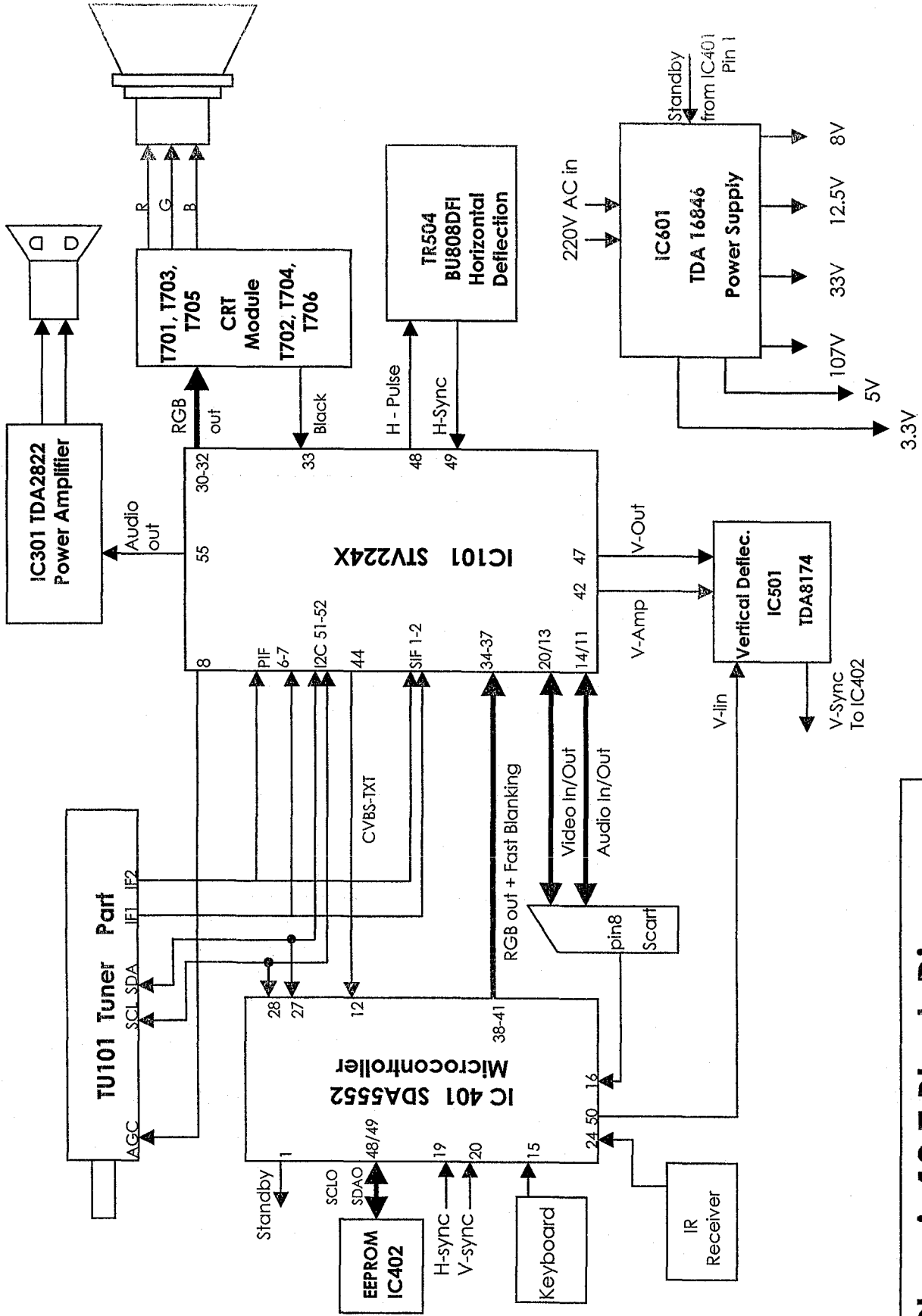
CAUTION

AFTER REMOVAL OF THE ANODE CAP, DISCHARGE THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR THE CARBON PAINTED ON THE CRT WITH A HIGH VOLTAGE PROBE AND MULTIMETER (SELECT VDC) AND THEN SHORT CIRCUIT DIRECTLY TO DISCHARGE COMPLETELY.

TECHNICAL SPECIFICATIONS

| | | |
|------------------------------------|--|---|
| Power source: | 220-240V AC, 50-60Hz | |
| Power consumption (max.): | 70 W | 14" |
| | 85 W | 20", 21" |
| Standby power consumption : | 5 W | |
| Aerial impedance : | 75Ohm, coaxial type | |
| Receiving system 1: | PAL BG PAL SECAM BG PAL SECAM BG DK PAL I | |
| Receiving channels: | VHF BAND I | CH2-4 |
| | VHF BAND III | CH5-12 |
| | CABLE TV | S1-41 |
| | UHF BAND | CH21-69 |
| Audio outputs : | 2.0W RMS at %10 THD | 14" |
| | 2.5W RMS at %10 THD | 20", 21" |
| High Voltage : | 23 ± 0.5 KV | 14" |
| | 25 ± 0.5 KV | 20", 21" |
| Focus voltage : | %25.6 ± %38 of EHT | |
| Grid 2 voltage : | 0-1400 V | |
| Heater voltage : | 6.2 ± 0.2 Vrms | |
| Video/Audio Terminals : | AV1 IN | Video : 1 Vpp, 75 Ohm Audio : 0.5 Vrms, >10 Kohm |
| | AV1OUT | RGB Video : 1 Vpp, 75 Ohm Audio : 0.5 Vrms, <1 Kohm |
| | AV2 IN (RCA, optional) | Video : 1 Vpp, 75 Ohm Audio : 0.5 Vrms, >10 Kohm |
| Operating temperature : | 0-45 Degrees | |
| Safety : | IEC 65 /BS P2N | |
| X-Ray radiation : | ACC. IEC 65/BS P2N | |

1 : TV set is produced to receive "one" of these colour and sound systems.



Chassis 127 Block Diagram

PIN VOLTAGES OF IC'S

| IC101 (STV2246) | | | | | |
|--|---|----------|-----|--|----------|
| BUS CONTROLLED MULTISTANDARD ONE CHIP TV PROCESSOR | | | | | |
| Pin | Connection | V DC (*) | Pin | Connection | V DC (*) |
| 1 | Sound IF Input 1 | 0.96 | 29 | Not connected | 3.20 |
| 2 | Sound IF Input 2 | 0.96 | 30 | Blue Output | 2.30 |
| 3 | AGC SIF Capacitor (not connected) | 0.22 | 31 | Green Output | 2.34 |
| 4 | IF Voltage Reference Filtering | 3.15 | 32 | Red Output | 2.48 |
| 5 | AGC Picture IF Capacitor | 2.42 | 33 | Cathode Current Measurement Input | 4.17 |
| 6 | Picture IF Input 1 | 2.47 | 34 | OSD Blue Input | 4.22 |
| 7 | Picture IF Input 2 | 2.47 | 35 | OSD Green Input | 4.35 |
| 8 | AGC Tuner Output | 2.54 | 36 | OSD Red Input | 4.21 |
| 9 | IF PLL Filter | 2.03 | 37 | OSD Fast Blanking | 0.31 |
| 10 | IF Ground | 0.00 | 38 | Cloche Filter Tuning Capacitor | 0.11 |
| 11 | AM/FM Mono Sound Output | 3.78 | 39 | 3.5X MHz Crystal | 0.35 |
| 12 | 5 V IF Supply | 4.97 | 40 | 4.43 MHz Crystal | - |
| 13 | Internal CVBS Output | 3.00 | 41 | Chroma PLL Filter | - |
| 14 | External Audio Input | 2.42 | 42 | Vertical Amplitude DAC Output | 4.03 |
| 15 | LC Input 1 | 3.90 | 43 | Chroma/Scanning Ground | 0.00 |
| 16 | LC Input 2 | 3.90 | 44 | Second Video Switch Output | 4.09 |
| 17 | Video/Luma Supply Voltage (8 V) | 8.05 | 45 | Chroma/Scanning Power Supply (8V) | 8.06 |
| 18 | Internal Video Input | 3.63 | 46 | Beam Current Limiter Control Voltage and Safety Input (XRAY) | 6.54 |
| 19 | Video/Luma Ground | 0.00 | 47 | Vertical Output Pulse | 5.62 |
| 20 | External Video Input | 3.22 | 48 | Horizontal Output Pulse | 1.39 |
| 21 | Black Stretch Capacitor | 2.74 | 49 | Line Flyback Input and Super-sandcastle Output | 0.72 |
| 22 | Y/CVBSIN3 Y(SVHS) or CVBS3 External Input | 3.22 | 50 | Scanning PLL Filter | 3.98 |
| 23 | Chroma (SVHS) Input | 1.70 | 51 | SCL I2C Bus Clock Input | 3.10 |
| 24 | Automatic RGB Peak Regulation | 4.45 | 52 | SDA I2C Bus Data Input | 2.80 |
| 25 | External Blue Input | 2.52 | 53 | Digital Supply Voltage (5 V) | 5.00 |
| 26 | External Green Input | 1.73 | 54 | Digital Ground | 0.00 |
| 27 | External Red Input | 2.52 | 55 | Main Audio Output | 3.91 |
| 28 | External Fast Blanking Input | 0.00 | 56 | FM Demodulation Capacitor | 1.71 |

| IC301 (TDA2822) Audio Output IC | | | | | |
|---------------------------------|---------------|-------------|-----|---------------|------|
| Pin | Connection | V DC | Pin | Connection | V DC |
| 1 | Input A + | - | 9 | Not connected | 0.00 |
| 2 | Not connected | 0.00 | 10 | Not connected | 0.00 |
| 3 | Input A - | 0.52 | 11 | Output B | 5.99 |
| 4 | Ground | 0.00 | 12 | Ground | 0.00 |
| 5 | Ground | 0.00 | 13 | Ground | 0.00 |
| 6 | Output A | 5.96 | 14 | Input B- | 0.52 |
| 7 | Not connected | 0.00 | 15 | Not connected | 0.00 |
| 8 | VCC | 12.9 (13.5) | 16 | Input B - | 0.00 |

| IC401 (SDA5552) | | | | | |
|---------------------------------------|------------------------------------|-------------|-----|-------------------------------|-------------|
| MICRO CONTROLLER WITH OSD AND TELETXT | | | | | |
| Pin | Connection | V DC (*) | Pin | Connection | V DC (*) |
| 1 | Standby | 0.06 (2.09) | 27 | SDA I2C Bus Data Input | 1.7 (1.93) |
| 2 | Not connected | 0.80 | 28 | SCL I2C Bus Clock Input | 1.7 (1.93) |
| 3 | Mute | 0.06 (1.62) | 29 | Ground | 0.00 |
| 4 | LED | 1.48 (0.07) | 30 | VDD 3.3 supply pin | 3.30 |
| 5 | Not connected | 0.8 (0.9) | 31 | Not connected | 0.00 |
| 6 | Not connected | 0.8 (0.9) | 32 | Not connected | 3.30 |
| 7 | Not connected | 0.8 (0.9) | 33 | Reset | 3.30 |
| 8 | Not connected | 0.8 (0.9) | 34 | XTAL2 | - |
| 9 | VDD 2.5 supply pin | 2.46 (2.54) | 35 | XTAL1 | - |
| 10 | Ground | 0.00 | 36 | Ground | 0.00 |
| 11 | VDD 3.3 supply pin | 3.30 | 37 | VDDA 2.5 supply pin | 2.41 (2.68) |
| 12 | CVBS input for TXT | 0.88 (0.99) | 38 | Red output for OSD and TXT | 0.28 (0.0) |
| 13 | VDDA 2.5 supply pin | 2.41 (2.68) | 39 | Green output for OSD and TXT | 0.28 (0.0) |
| 14 | Ground | 0.00 | 40 | Blue output for OSD and TXT | 0.28 (0.0) |
| 15 | Local keyboard input | 2.50 | 41 | Fast Blanking for OSD and TXT | 0.00 |
| 16 | Status signal input of Scart pin 8 | 0.00 | 42 | VDD 2.5 supply pin | 2.54 |
| 17 | Not connected | 0.7 (0.8) | 43 | Ground | 0.00 |
| 18 | Power Ctrl | 1.46 (0.24) | 44 | VDD 3.3 supply pin | 3.30 |
| 19 | Horizontal sync input | 2.00 (2.42) | 45 | Not connected | 3.30 |
| 20 | Vertical sync input | 3.13 (3.30) | 46 | Not connected | 0.00 |
| 21 | Not connected | 3.27 | 47 | Not connected | 3.28 |
| 22 | Not connected | 3.27 | 48 | SDA I2C Bus for Eeprom | 3.28 |
| 23 | Not connected | 3.27 | 49 | SCL I2C Bus Clock for Eeprom | 3.28 |
| 24 | Infra red input | 3.27 | 50 | Vertical linearity | 0.68 |
| 25 | AV selection | 0.00 | 51 | Not connected | 3.28 |
| 26 | Service | 3.27 | 52 | Not connected | 3.28 |

| IC501 (TDA8174) Vertical Deflection Output IC | | | | | |
|---|-------------------|-------|-----|-------------------|-------|
| Pin | Connection | V DC | Pin | Connection | V DC |
| 1 | Power output | 12.55 | 7 | Ramp generator | 4.76 |
| 2 | Output stage Vs | 26.78 | 8 | Buffer output | 5.68 |
| 3 | Trigger input | 5.41 | 9 | Inverting input | 4.48 |
| 4 | Height adjustment | 6.78 | 10 | Vs | 26.17 |
| 5 | Not connected | 4.48 | 11 | Flyback generator | 1.86 |
| 6 | Ground | 0.00 | | | |

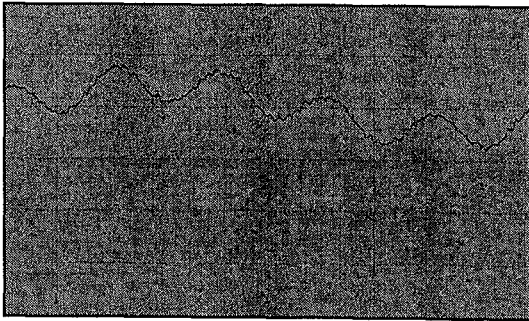
| IC601 (TDA16846) Power Supply IC | | | | | |
|----------------------------------|--|-------------|-----|-------------------------------|-------------|
| Pin | Connection | V DC (*) | Pin | Connection | V DC (*) |
| 1 | Off time circuit (for standby frequency) | 2.91 (2.70) | 8 | Not connected | - |
| 2 | Primary Current Simulation and Startup | 1.79 (1.53) | 9 | Reference Ref. Voltage (5V) | 5.59 (5.57) |
| 3 | Regulation and Zero Crossing Input | 2.17 (0.90) | 10 | Fault Comparator 1 (not used) | 0.00 |
| 4 | Soft-Start and Regulation Capacitor | 3.77 (2.14) | 11 | Primary Voltage Check | 2.61 (2.67) |
| 5 | Opto Coupler Input (not connected) | 4.64 (4.61) | 12 | Ground | 0.00 |
| 6 | Fault Comparator 2 (not used) | 0.00 | 13 | Output | 3.03 (1.06) |
| 7 | Synchronization Input (for fixed freq.) | 5.59 (5.57) | 14 | Supply Voltage | 13.3 (11.1) |

(*) Standby measurement values are given in parenthesis

WAVEFORMS OF SOME IC AND TRANSISTOR PINS

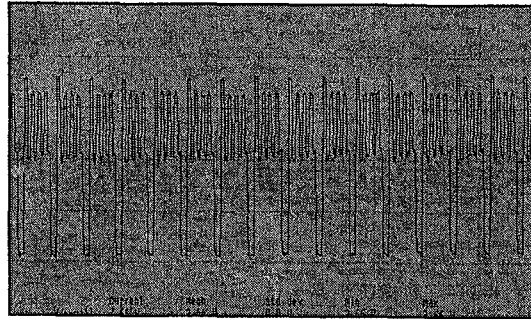
Note: TV is connected to a pattern generator (Colour bar, sound 1 kHz).

IC101 (STV224X)



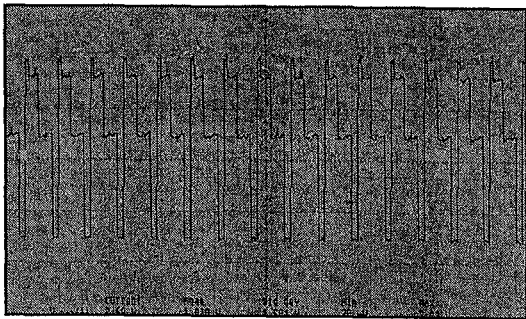
Pin 11

1V/div, 100 usn/div, Vpp=1.6 V



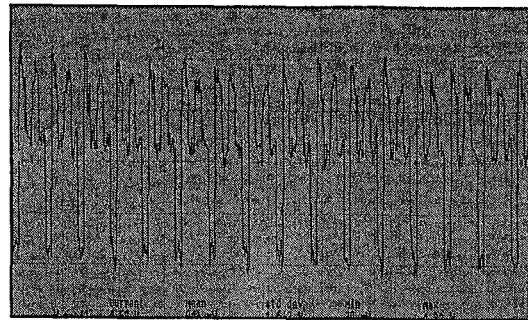
Pin 30

1V/div, 100 usn/div, Vpp=3.7 V, 15625 Hz



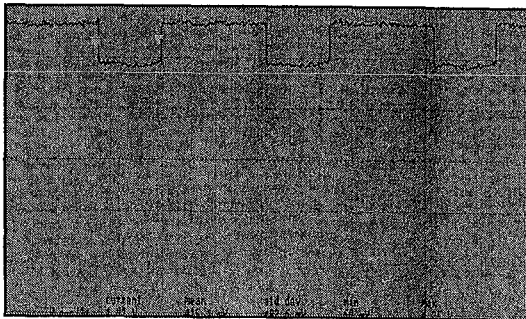
Pin 31

1V/div, 100 usn/div, Vpp=3.7 V, 15625 Hz



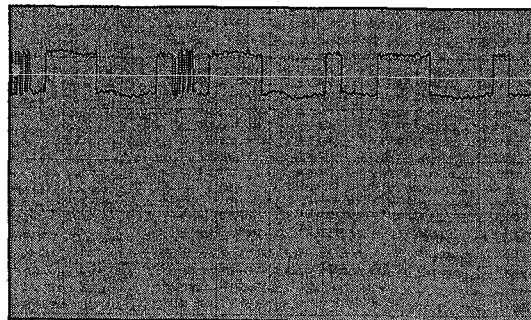
Pin 32

1V/div, 100 usn/div, Vpp=4.5 V, 15625 Hz



Pin 34 (OSD Off)

1V/div, 20 usn/div, Vpp=1 V, 15625 Hz



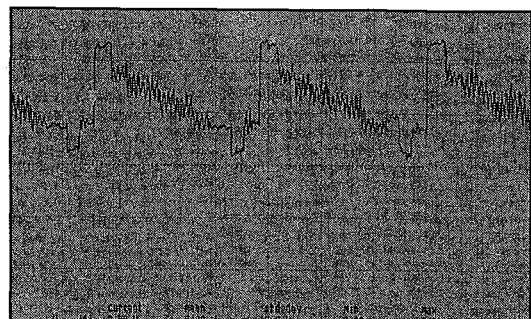
Pin 34 (OSD On)

1V/div, 20 usn/div, Vpp=1 V, 15625 Hz



Pin 37 (OSD On)

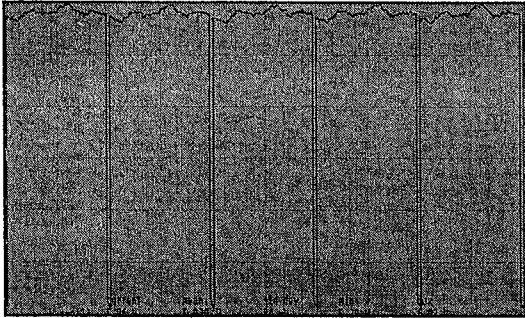
1V/div, 20 usn/div, Vpp=2.51 V, 15625 Hz



Pin 44

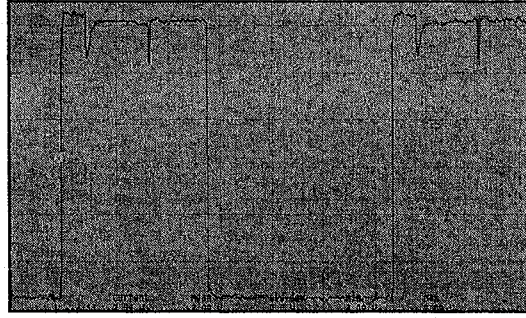
1V/div, 20 usn/div, Vpp=2.3 V, 15625 Hz

IC101 (STV224X)



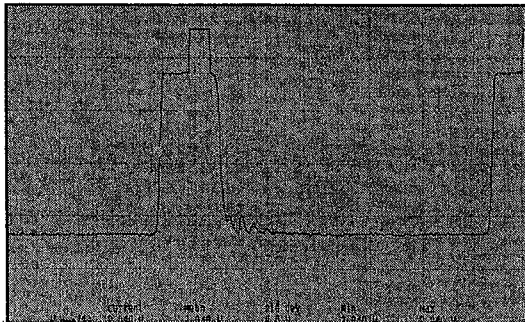
Pin 47

1V/div, 10 nsn/div, $V_{pp}=6.0$ V, 50 Hz



Pin 48

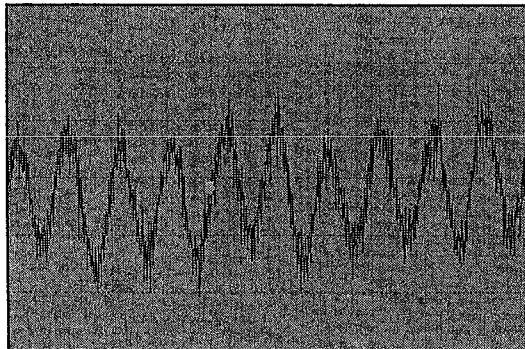
1V/div, 10 usn/div, $V_{pp}=3.1$ V, 15625 Hz



Pin 49

1V/div, 10 usn/div, $V_{pp}=3.9$ V, 15625 Hz

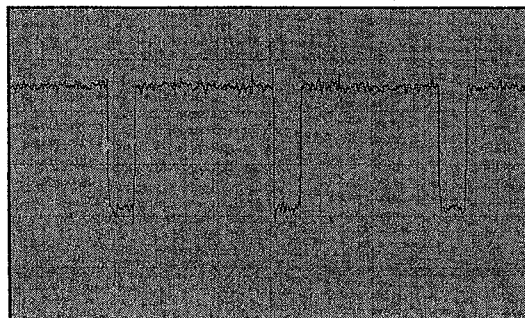
IC301 (TDA2822)



Pin 11

50mV/div, 1 msn/div, $V_{pp}=180$ mV

IC401 (SDA5552)



Pin 19

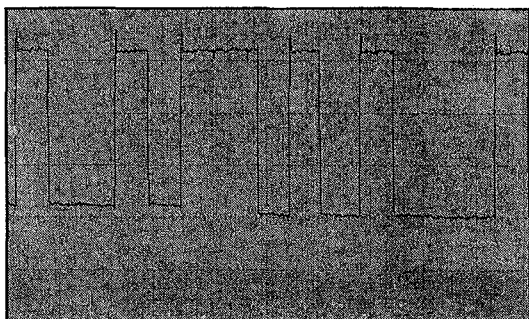
1V/div, 20 usn/div, $V_{pp}=3$ V



Pin 20

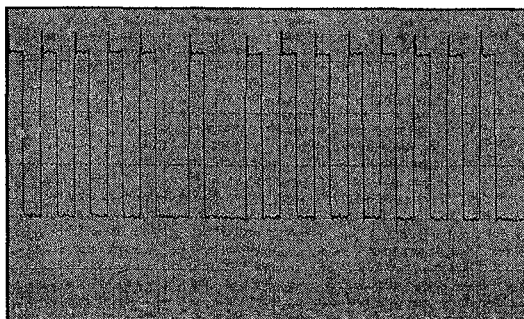
1V/div, 10 msn/div, $V_{pp}=3.6$ V, 50 Hz

IC401 (SDA5552)



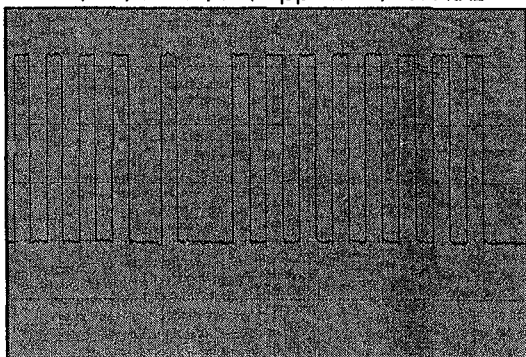
Pin 27

1V/div, 50 usn/div, Vpp=3.6 V, 10.4 kHz



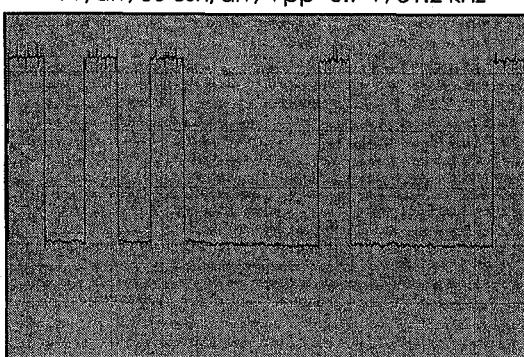
Pin 28

1V/div, 50 usn/div, Vpp=3.9 V, 31.2 kHz



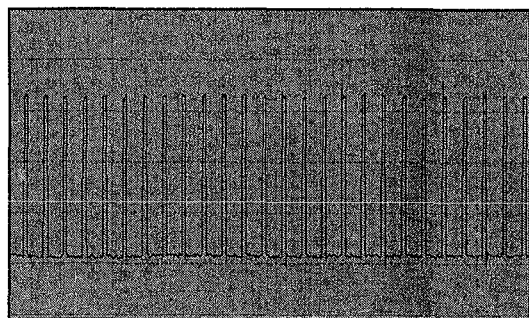
Pin 48

1V/div, 50 usn/div, Vpp=3.3 V, 31.2 kHz



Pin 49

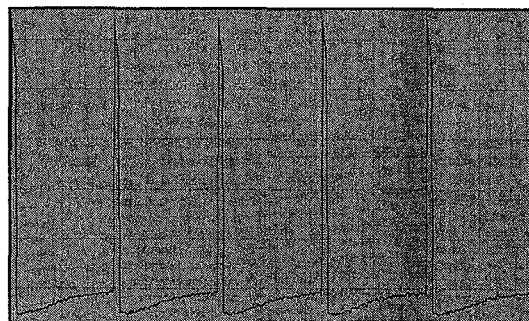
1V/div, 50 usn/div, Vpp=3.6 V, 13.7 kHz



Pin 50

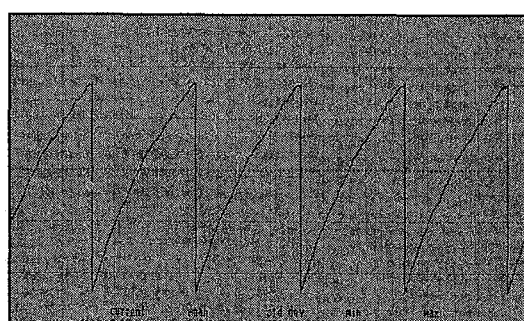
1V/div, 10 usn/div, Vpp=3.7 V, 260 kHz

IC501 (TDA8174)



Pin 2

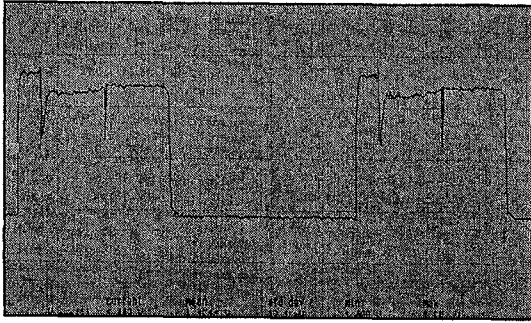
5V/div, 10 msn/div, Vpp=26.7 V, 50 Hz



Pin 7

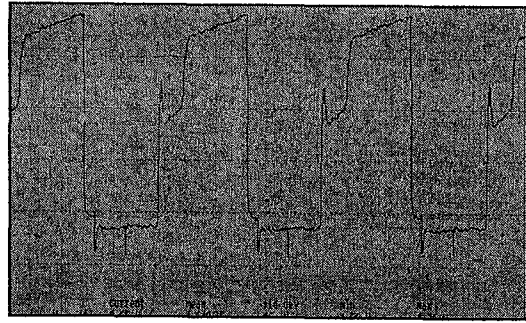
2V/div, 10 msn/div, Vpp=8.1 V, 50 Hz

T551



Base

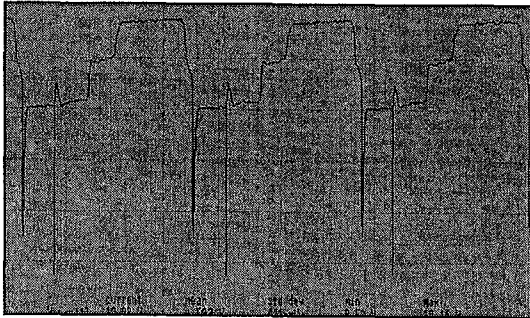
500mV/div, 10 usn/div, Vpp=1.5V, 15625 Hz



Collector

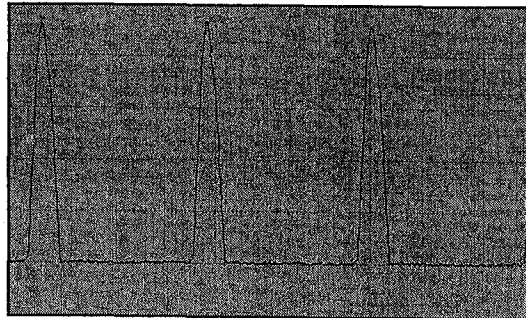
1 V/div, 20 usn/div, Vpp=4.7V, 15625 Hz

T504



Base

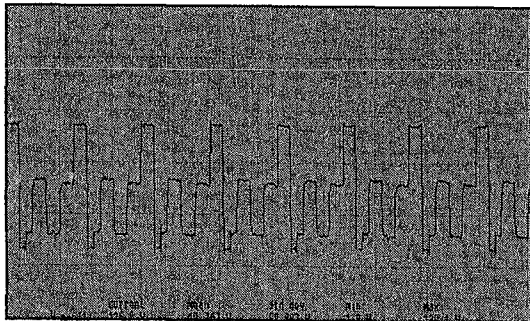
2 V/div, 20 usn/div, Vpp=10V, 15625 Hz



Collector

200 V/div, 20 usn/div, Vpp=932V, 15625 Hz

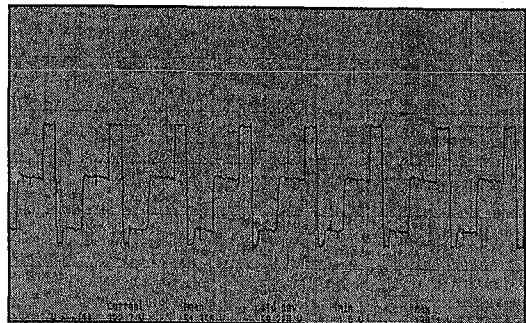
T701



Collector

50V/div, 50 usn/div, Vpp=126.8 V, 15625 Hz

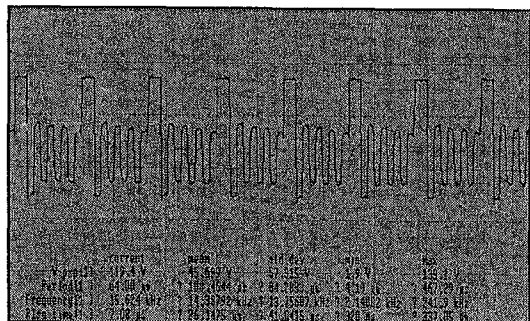
T703



Collector

50V/div, 50 usn/div, Vpp=122.7 V, 15625 Hz

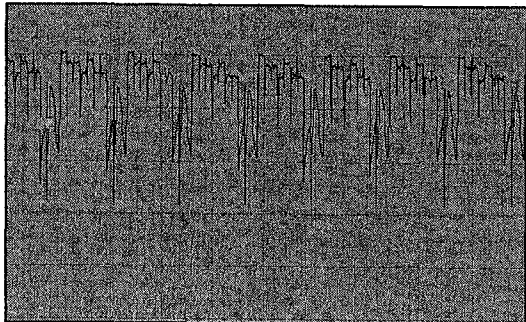
T705



Collector

50V/div, 50 usn/div, Vpp=119.4 V, 15625 Hz

T706



Collector

2V/div, 50 usn/div, Vpp=5.8 V, 15625 Hz

1. ELECTRICAL ADJUSTMENTS

1.1 Supply Voltage Adjustment

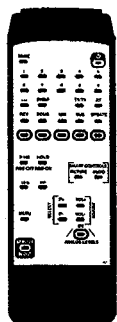
Connect a digital voltmeter to the cathode of diode D607 at the AV mode of the TV and set the screen voltage to the minimum with the screen potentiometer. Adjust the main supply voltage (B+) with P607 potentiometer to the following value (after supply adjustment, readjust Screen and focus voltage).

| | |
|-----|------------------------------|
| 14" | : 105 VDC (for A33EKC01X01) |
| 20" | : 118 VDC (for A48EJW011X21) |
| 21" | : 110 VDC (for A51EFS83X191) |

2. SERVICE ADJUSTMENTS

To enter the Service Mode, 'Service In/Out' button on the Service Remote Control or activate the "Picture Menu" with the user remote control and press "9301" (Press "0" button to exit the Service Mode).

"Red", "Green", "Yellow" and "Blue" Teletext buttons are for Feature Setup, Geometry, White Balance and IF menus respectively.



2.1 IF Adjustments

2.1.1 PAL SECAM BG/DK/I

- Supply a 471.25 MHz BG system colour bar RF signal to the set by a pattern generator and find this signal in "setup" menu (C21).
- In order to deactivate AFT loop, shift value of "fine tuning" from central point by one unit and then shift back to the central point again (2 small vertical lines are seen in scale on central point). Store the channel by selecting "Store" and pressing "OK" button.
- Switch on the Service Menu and press "Blue" teletext button.
- Check that value of "PVC38" is "07". Adjust the coil LC101 until the "OK" is seen.
- Press "OK" button on the Remote Control.
- Exit from the service menu.

Note: "PVF38" is for fine tuning. However, it is automatically applied when "OK" button is pressed at "PVC38" item. Thus any manual adjustment is not required.

2.1.2 SECAM L/L'

- They would not to be adjusted. "PVC33" and "PVF33" were reserved for Secam LL'.

2.2 AGC Adjustment

- Apply a signal with amplitude 65 ± 1 dBuV to the antenna input of TV with a pattern generator (switch sound carrier to Off and switch "Video Ext" to On).
- Switch on the Service Menu and press "Red" teletext button.
- Find the "AGC" with P+ / P- buttons.
- Measure the amplitude of 38.9 MHz sinusoidal signal on pin 11 (IF2) of Tuner with an oscilloscope.
- Change "AGC" to get 640 ± 20 mVpp.
- Add 5 to "AGC" value and change "2.AGC" to this value.
- Exit from the service menu.

2.3 Screen Adjustment

- Switch on the Service Menu and press "Yellow" teletext button.
- Find item "SCRN" in the menu. Apply color bar pattern
- For 14" sets: Adjust the Screen potentiometre until the voltage across the pin of R727 (that is connected CRT cathode) and ground is 139 ± 3 VDC.
- For 20"-21" sets: Adjust the Screen potentiometre until the voltage across the pin of R727 (that is connected CRT cathode) and ground is 164 ± 3 VDC (For 20" Ekranas CPT, adjustment value is 154 ± 3 VDC)
- Exit from the service menu

2.4 White Balance Adjustment

- Apply a white pattern with a pattern generator to the antenna input.
- Enter the Service Menu and and press "Yellow" teletext button.
- Select "B.DRV" option with P+ / P- buttons and change its value to "32" with V+ / V- button.
- Adjust "R.DRV" and "G.DRV" for white balance.
- Adjust "R.CUT" and "G. CUT" for red and green cut off (There is no blue cut off adjustment).
- If white balance can not be adjusted properly change "B.DRV" value.
- Exit from Service menu.

2.5 Geometry Adjustments

- Apply the cross hatch pattern with a pattern generator to the antenna input.
- Enter Service Menu and press "Green" teletext button.
- Adjust Vertical Amplitude with "V.4:3" option.
- Add 18 to "V.4:3" value and change "V.16:9" to this value.
- Adjust vertical position with "V.POS", vertical linearity with "LNRTY", horizontal position with "H.POS".
- Subtract 14 from "V.4:3" value and change "V1. 60" to this value.
- Add 4 to "V.4:3" value and change "V2. 60" to this value.
- Set "VP.60" to the same value of "V.POS".
- Set "LN.60" to the same value of "LNRTY".
- OSD window position can be centered on the screen with "OSD.H" and "OSD.V".
- Exit from the Service Menu.

Note that: There is no horizontal width adjustment in this chassis. It can be adjusted by changing power supply voltage in the interval of -1 and +1 V.

2.6 Feature Setup

Enter the Service Menu with the Service RC and and press "Red" and "Blue" teletext button. Check that below features match with the set.

| | |
|-------|---|
| TUNER | : Phillips, Sharp&Alps, Panasonic, Temic |
| ST.BY | : YES (Default, Automatic switch off is active), NO (can be used during repair) |
| AV2 | : YES (Front AV is available), NO |
| CLR.S | : PAL, PAL/NTSC3.5 (+NTSC Playback), PAL/SECAM, PAL/SECAM/NTSC3.5 (NTSC Pback) |
| SND.S | : BG, I, BG+DK, BG+LL' |
| QSS/I | : INTERCARRIER, QSS |
| TEXT | : NON TEXT, DEFAULT (Teletext), FASTTEXT |
| LANG | : A (West Europe), B (East Europe) |
| HOTEL | : NORMAL TV, HOTEL TV |
| RGBIN | : YES (When Scart RGB exists, aerial isn't showed—for only for some Hotel TVs), NO (Default) |
| APR | : ON (Auto RGB level control is available) , OFF |
| B.STR | : ON (Black level control is available), OFF |
| ATS | : YES (Automatic tuning system is on), NO Note : ATS must be NO for non-teletext sets. For Hotel TV's, ATS can not selectes YES. |
| AVL | : YES (Automatic Volume Limiter is on), NO |
| ZPG | : YES (Timer Programmed channel switching function is on), NO |
| ZAPP | : YES (One button channel switching function is on), NO |

2.7 Hotel Mode

If "Hotel" option in the Service Menu is selected as "HOTEL TV", the setup menu is get by entering "4658" in the "Features Menu". The setup menu includes the following items:

1. HOTEL MODE : On/off selection and end of TV channels (start is "00")
2. RADIO MODE : On/off selection and start of Radio channels (end is "99").
3. MAX VOLUME : Maximum allowed volume level
4. RESET ADJ. : Sound and picture preset values that will be applied after reset operation
5. MESSAGE : Welcome Message can be edited (max. 148 character long)
6. INFO SCREEN : Information Message can be edited (3 pages, each 500 character long)
Customer gets these pages by pressing "INFO" button of Remote Control
7. LOAD DATA : Not operational
8. SAVE DATA : Not operational

2.8 Factory Settings for Service Mode

Values given in Table 1 are typical values and can vary according to the CRT type.

| | | 14" | 20" | 21" |
|--------|---------------------------------|--------------|--------------|--------------|
| AGC | Automatic Gain Control 1 | 32 | 32 | 32 |
| 2.AGC | Automatic Gain Control 2 | AGC + 5 | AGC + 5 | AGC + 5 |
| ST.BY | Standby | YES | YES | YES |
| PVC38 | VOC Coarse (BG/I/DK) | 07 | 07 | 07 |
| PVF38 | VCO Fine (BG/I/DK) | 68 | 62 | 62 |
| PVC33 | VOC Coarse (LL') | 07 | 13 | 13 |
| PVF33 | VCO Fine (LL') | 64 | 64 | 64 |
| APR | Auto RGB level control | ON | ON | ON |
| B.STR | Black level control | OFF | OFF | OFF |
| QSS/I | QSS/Intercarrier | INTERCARRIER | INTERCARRIER | INTERCARRIER |
| G.DRV | Green level | 32 | 32 | 32 |
| R.DRV | Red level | 40 | 40 | 32 |
| B.DRV | Blue level | 37 | 37 | 32 |
| R.CUT | Black level offset red | 36 | 36 | 32 |
| G.CUT | Black level offset green | 32 | 32 | 32 |
| SCRN | Screen (used for screen adj.) | 0 | 0 | 0 |
| HPOS | Horizontal shift | 30 | 32 | 32 |
| VPOS | Vertical shift | 12 | 11 | 07 |
| V.4:3 | Vertical amplitude 4/3 PAL/SEC | 23 | 32 | 36 |
| V.16:9 | Vertical amplitude 16/9 PAL/SEC | V.4:3 + 18 | V.4:3 + 18 | V.4:3 + 18 |
| LNRTY | Vertical linearity | 51 | 13 | 49 |
| VP.60 | Vertical amplitude NTSC | 12 | 11 | 07 |
| V1.60 | Vertical amplitude 4/3 NTSC | V.4:3 - 14 | V.4:3 - 14 | V.4:3 - 14 |
| V2.60 | Vertical amplitude 16/9 NTSC | V.4:3 + 4 | V.4:3 + 4 | V.4:3 + 4 |
| LN.60 | Linearity NTSC | 51 | 13 | 49 |
| OSD.H | OSD Horizontal Shift | 31 | 31 | 29 |
| OSD.V | OSD Vertical Shift | 39 | 39 | 38 |

Table 1

2.8 Exit from Service Menu

During exit from service menu, the software version and feature options (hexadecimal number) are shown on the screen.

For example: **SC1.120-01 66F3 T03030702**

CHANNEL FREQUENCY TABLE (BG,I,DK,LL')

| CHANNEL NO | BG | I | DK | L/L' | | | |
|------------|--------|--------|--------|--------|--|--|--|
| CH1 | | 49.75 | 49.75 | 47.75 | | | |
| CH2 | 48.25 | 59.25 | 59.25 | 55.75 | | | |
| CH3 | 55.25 | 77.25 | 77.25 | 60.50 | | | |
| CH4 | 62.25 | 85.25 | 85.25 | 63.75 | | | |
| CH5 | 175.25 | 93.25 | 93.25 | 176.00 | | | |
| CH6 | 182.25 | 175.25 | 175.25 | 184.00 | | | |
| CH7 | 189.25 | 183.25 | 183.25 | 192.00 | | | |
| CH8 | 196.25 | 191.25 | 191.25 | 200.00 | | | |
| CH9 | 203.25 | 199.25 | 199.25 | 208.00 | | | |
| CH10 | 210.25 | 207.25 | 207.25 | 216.00 | | | |
| CH11 | 217.25 | 215.25 | 215.25 | 189.25 | | | |
| CH12 | 224.25 | 223.25 | 223.25 | 182.25 | | | |
| CH13 | 53.75 | 45.75 | | 196.25 | | | |
| CH14 | 62.25 | 53.75 | | 210.25 | | | |
| CH15 | 82.25 | 61.75 | | | | | |
| CH16 | 175.25 | 69.75 | | | | | |
| CH17 | 183.25 | 95.25 | | | | | |
| CH18 | 192.25 | | | | | | |
| CH19 | 201.25 | | | | | | |
| CH20 | 210.25 | | | | | | |
| CH21 | 471.25 | 471.25 | 471.25 | 471.25 | | | |
| CH22 | 479.25 | 479.25 | 479.25 | 479.25 | | | |
| CH23 | 487.25 | 487.25 | 487.25 | 487.25 | | | |
| CH24 | 495.25 | 495.25 | 495.25 | 495.25 | | | |
| CH25 | 503.25 | 503.25 | 503.25 | 503.25 | | | |
| CH26 | 511.25 | 511.25 | 511.25 | 511.25 | | | |
| CH27 | 519.25 | 519.25 | 519.25 | 519.25 | | | |
| CH28 | 527.25 | 527.25 | 527.25 | 527.25 | | | |
| CH29 | 535.25 | 535.25 | 535.25 | 535.25 | | | |
| CH30 | 543.25 | 543.25 | 543.25 | 543.25 | | | |
| CH31 | 551.25 | 551.25 | 551.25 | 551.25 | | | |
| CH32 | 559.25 | 559.25 | 559.25 | 559.25 | | | |
| CH33 | 567.25 | 567.25 | 567.25 | 567.25 | | | |
| CH34 | 575.25 | 575.25 | 575.25 | 575.25 | | | |
| CH35 | 583.25 | 583.25 | 583.25 | 583.25 | | | |
| CH36 | 591.25 | 591.25 | 591.25 | 591.25 | | | |
| CH37 | 599.25 | 599.25 | 599.25 | 599.25 | | | |
| CH38 | 607.25 | 607.25 | 607.25 | 607.25 | | | |
| CH39 | 615.25 | 615.25 | 615.25 | 615.25 | | | |
| CH40 | 623.25 | 623.25 | 623.25 | 623.25 | | | |
| CH41 | 631.25 | 631.25 | 631.25 | 631.25 | | | |
| CH42 | 639.25 | 639.25 | 639.25 | 639.25 | | | |
| CH43 | 647.25 | 647.25 | 647.25 | 647.25 | | | |
| CH44 | 655.25 | 655.25 | 655.25 | 655.25 | | | |
| CH45 | 663.25 | 663.25 | 663.25 | 663.25 | | | |
| CH46 | 671.25 | 671.25 | 671.25 | 671.25 | | | |
| CH47 | 679.25 | 679.25 | 679.25 | 679.25 | | | |
| CH48 | 687.25 | 687.25 | 687.25 | 687.25 | | | |
| CH49 | 695.25 | 695.25 | 695.25 | 695.25 | | | |
| CH50 | 703.25 | 703.25 | 703.25 | 703.25 | | | |
| CH51 | 711.25 | 711.25 | 711.25 | 711.25 | | | |
| CH52 | 719.25 | 719.25 | 719.25 | 719.25 | | | |
| CH53 | 727.25 | 727.25 | 727.25 | 727.25 | | | |
| CH54 | 735.25 | 735.25 | 735.25 | 735.25 | | | |
| CH55 | 743.25 | 743.25 | 743.25 | 743.25 | | | |
| CH56 | 751.25 | 751.25 | 751.25 | 751.25 | | | |
| CH57 | 759.25 | 759.25 | 759.25 | 759.25 | | | |
| CH58 | 767.25 | 767.25 | 767.25 | 767.25 | | | |
| CH59 | 775.25 | 775.25 | 775.25 | 775.25 | | | |

| | | | | | | | |
|------|--------|--------|--------|--------|--|--|--|
| CH60 | 783.25 | 783.25 | 783.25 | 783.25 | | | |
| CH61 | 791.25 | 791.25 | 791.25 | 791.25 | | | |
| CH62 | 799.25 | 799.25 | 799.25 | 799.25 | | | |
| CH63 | 807.25 | 807.25 | 807.25 | 807.25 | | | |
| CH64 | 815.25 | 815.25 | 815.25 | 815.25 | | | |
| CH65 | 823.25 | 823.25 | 823.25 | 823.25 | | | |
| CH66 | 831.25 | 831.25 | 831.25 | 831.25 | | | |
| CH67 | 839.25 | 839.25 | 839.25 | 839.25 | | | |
| CH68 | 847.25 | 847.25 | 847.25 | 847.25 | | | |
| CH69 | 855.25 | 855.25 | 855.25 | 855.25 | | | |
| CH70 | | | | 863.25 | | | |
| CH71 | | | | | | | |
| CH72 | | | | | | | |
| CH73 | | | | | | | |
| CH74 | 69.25 | | | | | | |
| CH75 | 76.25 | | | | | | |
| CH76 | 83.25 | | | | | | |
| CH77 | 90.25 | | | | | | |
| CH78 | 97.25 | | | | | | |
| CH79 | 59.25 | | | | | | |
| CH80 | 93.25 | | | | | | |
| S1 | 105.25 | 103.25 | 103.25 | 116.75 | | | |
| S2 | 112.25 | 111.25 | 111.25 | 128.75 | | | |
| S3 | 119.25 | 119.25 | 119.25 | 140.75 | | | |
| S4 | 126.25 | 127.25 | 127.25 | 152.75 | | | |
| S5 | 133.25 | 135.25 | 135.25 | 164.75 | | | |
| S6 | 140.25 | 143.25 | 143.25 | 176.75 | | | |
| S7 | 147.25 | 151.25 | 151.25 | 188.75 | | | |
| S8 | 154.25 | 159.25 | 159.25 | 200.75 | | | |
| S9 | 161.25 | 167.25 | 167.25 | 212.75 | | | |
| S10 | 168.25 | 231.25 | 231.25 | 224.75 | | | |
| S11 | 231.25 | 239.25 | 239.25 | 236.75 | | | |
| S12 | 238.25 | 247.25 | 247.25 | 248.75 | | | |
| S13 | 245.25 | 255.25 | 255.25 | 260.75 | | | |
| S14 | 252.25 | 263.25 | 263.25 | 272.75 | | | |
| S15 | 259.25 | 271.25 | 271.25 | 284.75 | | | |
| S16 | 266.25 | 279.25 | 279.25 | 296.75 | | | |
| S17 | 273.25 | 287.25 | 287.25 | 55.75 | | | |
| S18 | 280.25 | 295.25 | 295.25 | 60.50 | | | |
| S19 | 287.25 | 303.25 | 303.25 | 63.75 | | | |
| S20 | 294.25 | | | | | | |
| S21 | 303.25 | | | 303.25 | | | |
| S22 | 311.25 | 311.25 | 311.25 | 311.25 | | | |
| S23 | 319.25 | 319.25 | 319.25 | 319.25 | | | |
| S24 | 327.25 | 327.25 | 327.25 | 327.25 | | | |
| S25 | 335.25 | 335.25 | 335.25 | 335.25 | | | |
| S26 | 343.25 | 343.25 | 343.25 | 343.25 | | | |
| S27 | 351.25 | 351.25 | 351.25 | 351.25 | | | |
| S28 | 359.25 | 359.25 | 359.25 | 359.25 | | | |
| S29 | 367.25 | 367.25 | 367.25 | 367.25 | | | |
| S30 | 375.25 | 375.25 | 375.25 | 375.25 | | | |
| S31 | 383.25 | 383.25 | 383.25 | 383.25 | | | |
| S32 | 391.25 | 391.25 | 391.25 | 391.25 | | | |
| S33 | 399.25 | 399.25 | 399.25 | 399.25 | | | |
| S34 | 407.25 | 407.25 | 407.25 | 407.25 | | | |
| S35 | 415.25 | 415.25 | 415.25 | 415.25 | | | |
| S36 | 423.25 | 423.25 | 423.25 | 423.25 | | | |
| S37 | 431.25 | 431.25 | 431.25 | 431.25 | | | |
| S38 | 439.25 | 439.25 | 439.25 | 439.25 | | | |
| S39 | 447.25 | 447.25 | 447.25 | 447.25 | | | |
| S40 | 455.25 | 455.25 | 455.25 | 455.25 | | | |
| S41 | 463.25 | 463.25 | 463.25 | 463.25 | | | |

SPARE PARTS LIST

| PART NO | DESCRIPTION | NOTES | POSITION NUMBERS |
|---------|-------------------------------|-------|---------------------|
| 273471 | C-PEM 47NF K 63V R:5 | | C0001 C0002 |
| 274231 | C-PPM 220NF J 250V R:15 | | C0001 C0002 |
| 274230 | C-PEM 220NF J 100V R:5 | | C0002 |
| 201222 | CC 220PF K 50V NPO R:5 | | C0003 C0004 |
| 250111 | EC 1UF 16V 11*5 R:5 | | C101 C102 C138 |
| 251107 | EC 10UF M 16V 11*5 R:5 | | C105 |
| 294331 | CC-CHIP 330NF K 16V /0805 X | | C109 |
| 251115 | EC 10UF 25V 11*5 R:5 | | C112 C127 C140 |
| 251478 | EC 47UF 16V 11*5 R:5 | | C113 C134 |
| 251221 | C-ELA 22UF M 50V 11*5 R:5 | | C126 C131 |
| 292475 | CC-CHIP 4.7NF K 50V /0603 X | | C128 C129 |
| 250227 | EC 2.2UF 16V 11*5 R:5 | | C130 |
| 252112 | EC 100UF 16V 11*6 R:5 | | C135 |
| 250111 | EC 1UF 16V 11*5 R:5 | | C138 |
| 291104 | CC-CHIP 100PF J 50V /0603 N | | C181 C182 C183 |
| 292114 | CC-CHIP 1NF K 50V /0603 X7R | | C201 C202 |
| 291226 | CC-CHIP 220PF J 50V /0603 | | C203 C205 |
| 291476 | CC-CHIP 470PF J 50V /0603 N | | C204 C206 |
| 293113 | CC-CHIP 10NF K 50V /0603 | | C208 |
| 251107 | EC 10UF M 16V 11*5 R:5 | | C301 |
| 293113 | CC-CHIP 10NF K 50V /0603 X7R | | C303 |
| 292228 | CC-CHIP 2.2NF K 50V/0603 X7R | | C304 |
| 294118 | CC-CHIP 100NF K 16V /0603 X7R | | C306 C307 |
| 252482 | EC 470UF 16V 12.5*10 R:5 | | C308 |
| 251478 | EC 47UF 16V 11*5 R:5 | | C402 C405 C407 C430 |
| 251115 | EC 10UF 25V 11*5 R:5 | | C406 |
| 291104 | CC-CHIP 100PF J 50V /0603 N | | C416 C428 C436 C437 |
| 250227 | EC 2.2UF 16V 11*5 R:5 | | C419 |
| 251115 | EC 10UF 25V 11*5 R:5 | | C426 |
| 291104 | CC-CHIP 100PF J 50V /0603 N | | C428 C436 C437 |
| 274227 | C-PEM 220NF J 50V R:5 | | C501 |
| 253106 | EC 1000UF 25V 20*13 R:5 | | C503 |
| 250111 | EC 1UF 16V 11*5 R:5 | | C505 C511 C512 |
| 251115 | EC 10UF 25V 11*5 R:5 | | C506 |
| 293155 | CC-CHIP 15NF K 50V /0603 X7R | | C508 |
| 273333 | C-PEM 33NF K 100V R:5 | | C508A |
| 291476 | CC-CHIP 470PF J 50V /0603 N | | C509 |
| 252105 | EC 100UF 50V 12*8 R:5 | | C510 |
| 294109 | CC-CHIP 100NF K 50V /0805 X | | C513 |
| 251484 | C-ELA 47UF 35V 11*6.3 R:5 | | C553 |
| 271390 | C-PPM 390NF J 250V R:15 CLA | | C554 |
| 272688 | C-PPM 6.8NF %3.5 1.5/1.6KV | | C555 |
| 239490 | C-ELA 4.7UF 160V 11*6.3 R:5 | | C556 |
| 252481 | C-ELA 470UF 50V 20*10 R:5 | | C557 |
| 293478 | CC-CHIP 47NF K 25V /0603 X7R | | C558 |
| 251109 | EC 10UF 250V 16*10 R:5 | | C560 |
| 274102 | C-PEM 100NF J 63V R:5 | | C562 |
| 274107 | C-PEM 100NF J 100V R:5 | | C563 |
| 252482 | EC 470UF 16V 12.5*10 R:5 | | C564 |
| 221571 | C-CE 560PF 500V TAPE R:5 | | C566 |
| 274340 | C-PEM 330NF K 275V-AC R:22. | | C601 |
| 274103 | C-PEM 100NF K 275V-AC R:15 | | C602 |
| 202105 | CC 1NF K 1KV Y5P R:5 | | C603 C604 |
| 251681 | C-ELA 68UF 400V 25*22 R:10 | | C605 |
| 203330 | C-PPM 33NF J 630V R:15 | | C606 |
| 273222 | C-PEM 22NF K 250V R:7.5 | | C607 |
| 201471 | CC 470PF 2KV | | C608 |
| 292228 | CC-CHIP 2.2NF K 50V/0603 | | C609 |
| 293113 | CC-CHIP 10NF K 50V /0603 X7R | | C610 C620 C621 |

SPARE PARTS LIST

| | | | |
|-----------|-------------------------------|--------------|---------------------|
| 251221 | C-ELA 22UF M 50V 11*5 R:5 | | C611 |
| 291561 | CC-CHIP 560PF J 50V /0603 NPO | | C612 |
| 290562 | CC-CHIP 56PF J 50V/0603 NPO | | C613 |
| 250115 | C-ELA 1UF 50V 11*5 R:5 | | C615 |
| 202220 | CC 2.2NF M 250VAC Y5U R:10 | | C616 |
| 201226 | CC 220PF K 2KV Y5P R:5 | | C617 |
| 251489 | C-ELA 47UF 160V 21*13 R:5 | | C618 |
| 251337 | C-ELA 33UF 160V 21*10 R:5 | | C619 |
| 293478 | CC-CHIP 47NF K 25V /0603 | | C622 C625 C626 |
| 252111 | C-ELA 100UF 10V 11*5 R:5 | | C623 |
| 253106 | EC 1000UF 25V 20*13 R:5 | | C624 |
| 252223 | C-ELA 220UF 16V 11*8 105 R:5 | | C627 |
| 293478 | CC-CHIP 47NF K 25V /0603 | | C628 C629 C630 |
| 252127 | C-ELA 100UF 10V 11*5 105 R:5 | | C632 |
| 251225 | EC 22UF 16V 11*5 R:5 | | C634 |
| 250228 | C-ELA 2.2UF 250V 11*8 R:5 | | C702 |
| 291476 | CC-CHIP 470PF J 50V /0603 N | | C703 C707 C710 |
| 201476 | C-CE 470PF K 1KV R:5 | | C705 C708 C711 |
| 202221 | C-CE 2.2NF K 2KV Y5P R:7.5 | | C712 |
| 274105 | C-PEM 100NF J 250V R:10 | | C713 |
| 291101 | CC-CHIP 100PF J 50V /1206 N | | C981 C982 |
| | | | |
| 302289 | DIODE 1N4148 52MM | | D105 |
| 302289 | DIODE 1N4148 52MM | | D105 D106 |
| 302289 | DIODE 1N4148 52MM | | D107 D110 |
| 303850 | LED LTL 4263 RED L=25.4 | | D401 |
| 302289 | DIODE 1N4148 52MM | | D402 D403 |
| 303308 | DIODE RF2007 | | D502 |
| 302289 | DIODE 1N4148 52MM | | D503 D557 D558 |
| 300305 | DIODE BA157 | | D552 D556 D560 |
| 303227 | DIODE RGP15J | ⚠ | D553 |
| 300305 | DIODE BA157 | | D556 D560 |
| 303308 | DIODE RF2007 | | D601 D602 D603 D604 |
| 303217 | DIODE RGP10J | | D605 |
| 302289 | DIODE 1N4148 52MM | | D606 |
| 303206 | DIODE RGP30MS | | D607 |
| 303813 | DIODE RGP15D | | D608 |
| 302948 | DIODE 1N4007 | | D701 |
| 303195 | DIODE 4148 MELF | | D702 D703 D704 |
| 303993 | LED LTL4221N D:3 R/D RED | | D980 |
| 303991 | LED IR SIR563SB3F 23/940 | | D981 |
| | | | |
| 056070 | SAW FILTRE OFW K2966M | DK | F101 |
| 056746 | SAW FILTER OFW G1968M | BG | F101 |
| 056760 | SAW FILTRE OFW J1956M | I | F101 |
| 056734 | SER.FILTER TPSRA5M50B00-A0 | | F103 |
| 056734 | SER.FILTER TPSRA5M50B00-A0 | BG | F103 |
| 056739 | SER.FILTRE TPSA6M00B00-A0 | I | F103 |
| 056762 | SER.FILTRE TPT02B | DK | F103 |
| 054261 | FUSE 2.5AT (215 SER.) | ⚠ | F601 |
| | | | |
| 452990 | IC STV2249C | PAL SECAM | IC101 |
| 452842-01 | IC STV2246C | PAL BG | IC101 |
| 452439 | IC TDA2822 | | IC301 |
| MC1120-02 | IC SDA5535 A056 | | IC401 |
| 452662 | IC-CHIP AT24C16N SC2.7 | HOTEL TV | IC402 |
| 453031-01 | IC-CHIP AT24C08N-10SI-2.7 (| NON HOTEL TV | IC402 |
| 452521 | IR RECEIVER TSOP 1838 | | IC403 |
| 452648 | IC TDA8174AW | | IC501 |
| 452795 | IC TDA16846 | | IC601 |

SPARE PARTS LIST

| | | | |
|-----------|-----------------------------|------|--------------------------|
| 451518 | IC KA317TU T0220CASE | | IC602 |
| 505310 | INSULATOR BUZ90 17*12*.15 | | IC602 |
| 451517 | IC TDB7805CT T0220CASE | | IC603 |
| 452382 | IC-CHIP S3C1840DA9/SMB1 | | IC980 |
| 055139 | CHOKE COIL 50MHZ 600R PH-WB | | L0001 L0002 |
| 053711 | COIL 10UH K (TAIYO) LAL03 | | L0003 |
| 053711 | COIL 10UH K (TAIYO) LAL03 | | L101 L102 |
| 053724 | COIL-CHIP 6.8UH K/0805 | | L103 |
| 053805 | COIL-CHIP 1UH K /0805 | | L104 |
| 179005 | RC-CHIP 0R /0603 1.6*0.8 | | L109 |
| 053711 | COIL 10UH K (TAIYO) LAL03 | | L401 L402 |
| 053805 | COIL-CHIP 1UH K /0805 | DK | L404 |
| 053749 | COIL 18UH K /3.4 26MM | | L405 |
| 051585-SN | COIL H-LIN 70UH | | L551 |
| 053781 | COIL 2.2UH LAL04 | ⚠ | L552 |
| 051687-SN | LINE FILTER 27MH E-TYPE | ⚠ | L601 |
| 053778 | COIL 47UH J LAL03 | | L602 |
| 053739-SN | COIL CHOKE 50UH | | L603 |
| 053506-01 | COIL DEMOD 38.9 HEX | | LC101 |
| 132209 | R-VAR 2.2K (V) 5*3 | | F601 |
| 132500 | R-VAR 5K (V) 5*3 | | F601 |
| 056023 | CRYSTAL 4.433619MHZ (NO LOA | | Q101 |
| 056660 | CRYSTAL 3.579545 90OHM BULK | NTSC | Q102 |
| 056620 | CRYSTAL 6MHZ (CL 30PF) | | Q401 |
| 056210 | CER.RESONATOR GSB455E | | Q980 |
| 101221 | CFR 220R J 1/2W 52MM | | R0001 R0003 |
| 102141 | CFR 1K J 1/4W /6 26MM | | R0002 R0004 |
| 101471 | CFR 470R J 1/2W /9 52MM | | R0005 |
| 173277 | RC-CHIP 27K J 1/16W /0603 T | | R101 R417 |
| 172224 | RC-CHIP 2.2K J 1/16W/0603 T | | R132 R133 R156 |
| 173108 | RC-CHIP 10K J 1/16W /0603 | | R139 |
| 173153 | RC-CHIP 15K J 1/16W /0603 T | | R201 R211 R213 |
| 172393 | RC-CHIP 3.9K J 1/16W/0603 T | | R202 |
| 170750 | RC-CHIP 75R J 1/10W /0805 | | R203 R204 R205 R206 R217 |
| 171562 | RC-CHIP 560R J 1/16W/0603 T | | R207 R208 |
| 171107 | RC-CHIP 100R J 1/16W /0603 | | R209 R214 |
| 172104 | RC-CHIP 1K J 1/16W /0603 | | R210 R212 |
| 173153 | RC-CHIP 15K J 1/16W /0603 T | | R211 R213 |
| 100752 | RC 75R J 1/4W /6 52MM | | R215 |
| 172224 | RC-CHIP 2.2K J 1/16W/0603 T | | R216 |
| 179001 | RC-CHIP 0R /0805 2*1.25 | | R218 |
| 173153 | RC-CHIP 15K J 1/16W /0603 T | | R302 |
| 173685 | RC-CHIP 68K J 1/16W /0603 | | R303 |
| 172824 | RC-CHIP 8.2K J 1/16W /0603 | | R304 |
| 173108 | RC-CHIP 10K J 1/16W /0603 | | R305 |
| 179475 | RC-CHIP 4.7R J 1/16W/0603 | | R306 R307 |
| 119331 | RMF 3.3R J 1W | | R309 |
| 119485 | RMF 4.7R J 1.5W | | R309 |
| 172182 | RC-CHIP 1.8K J 1/16W /0603 | | R310 |
| 172336 | RC-CHIP 3.3K J 1/16W /0603 | | R401 R434 R446 |
| 103116 | CFR 10K J 1/4W /6 52MM | | R404 |
| 102487 | RC 4.7K J 1/4W /6 26MM | | R412 |
| 173108 | RC-CHIP 10K J 1/16W /0603 | | R414 R418 |
| 173277 | RC-CHIP 27K J 1/16W /0603 T | | R417 |
| 103136 | CFR 10K J 1/4W /6 26MM | | R419 |
| 102101 | RC 1K J 1/4W /6 52MM | | R422 |

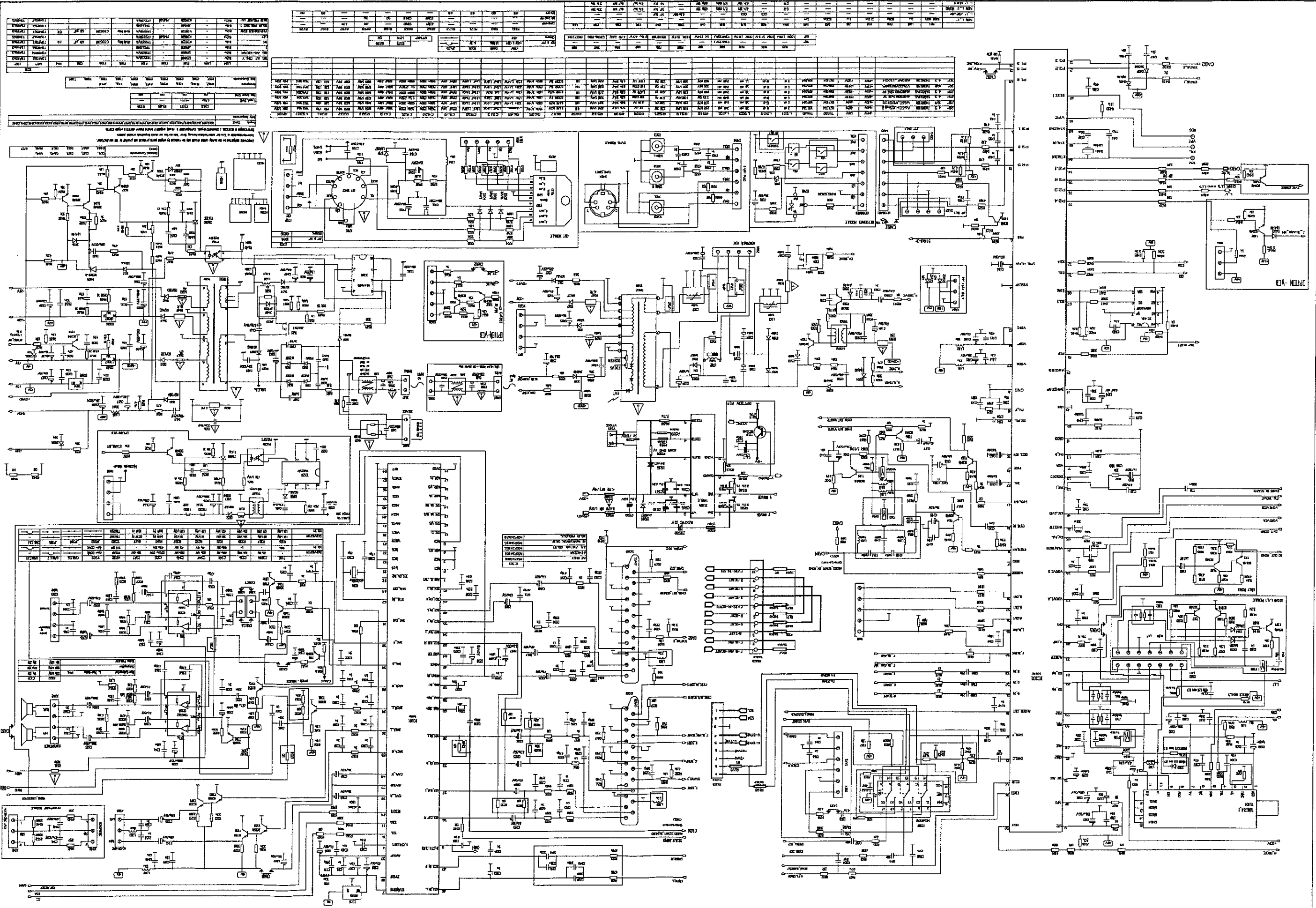
SPARE PARTS LIST

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|-----------|-----------------------------|---|----------------|
| 102141 | CFR 1K J 1/4W /6 26MM | | R423 |
| 171107 | RC-CHIP 100R J 1/16W /0603 | | R431 R469 |
| 101494 | RC 470R J 1/4W /6 26MM | | R432 |
| 172336 | RC-CHIP 3.3K J 1/16W /0603 | | R434 R446 |
| 142272 | RC 2.7K J 1/4W /3.2 26MM | | R436 |
| 053816 | RC 220R J 1/4W 26MM | | R441 R442 |
| 171224 | RC-CHIP 220R J 1/16W/0603 T | | R450 R451 R452 |
| 172224 | RC-CHIP 2.2K J 1/16W/0603 T | | R454 |
| 179001 | RC-CHIP OR /0805 2*1.25 | | R481 R185 |
| 119227-01 | RMF 2.2R J 1W | | R501 |
| 101471 | CFR 470R J 1/2W /9 52MM | △ | R502 R567 |
| 100220 | CFR 22R J 1/2W 52MM | | R503 |
| 172104 | RC-CHIP 1K J 1/16W /0603 | | R504 R551 |
| 174152 | RC-CHIP 150K J 1/16W /0603 | | R505 R506 |
| 172182 | RC-CHIP 1.8K J 1/16W /0603 | | R508 R512 |
| 119153 | RM 1.5R J 1/2W 52MM | | R509 |
| 172276 | RC-CHIP 2.7K J 1/16W /0603 | | R511 |
| 173108 | RC-CHIP 10K J 1/16W /0603 | | R513 R562 R565 |
| 172165 | RC-CHIP 1.6K %1 1/16W /0603 | | R516 |
| 173822 | RC-CHIP 82K J 1/16W/0603 TA | | R518 |
| 102101 | RC 1K J 1/4W /6 52MM | | R519 |
| 173114 | RC-CHIP 100K J 1/16W /0603 | | R521 |
| 173563 | RC-CHIP 56K J 1/16W /0603 | | R522 R523 |
| 172393 | RC-CHIP 3.9K J 1/16W/0603 T | | R524 |
| 113225 | RM 22K J 1/2W 52MM | | R526 |
| 170472 | RC-CHIP 47R J 1/10W /0805 | | R555 |
| 101343 | RC 330R J 1/4W /6 26MM | | R557 |
| 119337 | RMO 3.3R J 2W R:27.5 TAPE | | R559 |
| 119684 | RMF 0.68R J 1W | | R560 |
| 171562 | RC-CHIP 560R J 1/16W/0603 T | | R564 |
| 110823 | RMO 82R J 3W R:20 | | R566 |
| 102141 | CFR 1K J 1/4W /6 26MM | | R568 |
| 113225 | RM 22K J 1/2W 52MM | | R569 |
| 100271 | RC 27R J 1/2W/9 52MM | | R570 |
| 119331 | RMF 3.3R J 1W | | R571 |
| 129272 | RW 2.7R K 5W R:10 | | R601 |
| 113683 | RMO 68K J 1.5W 73MM | | R603 |
| 154234 | PTC 9R/2 PIN - 3CYCLE | | R604 |
| 100220 | CFR 22R J 1/2W 52MM | | R605 |
| 115103 | RM 1M J 1W 52MM | | R606 |
| 173332 | RC-CHIP 33K J 1/16W /0603 | | R607 |
| 115391 | RM 3.9M J 1W 52MM | | R608 |
| 173277 | RC-CHIP 27K J 1/16W /0603 T | | R611 |
| 103155 | RC 15K J 1/4W 52MM | | R612 |
| 115470 | RM 4.7M J 1/2W 52MM | △ | R613 |
| 113393 | RM 39K J .5W 52MM | | R614 |
| 119109 | RNF 0.1R J 0.4W (UFLB) 52MM | △ | R615 |
| 171241 | RC-CHIP 240R %1 1/16W /0603 | | R616 R621 |
| 172131 | RC-CHIP 1.3K %1 1/16W/0603 | | R617 |
| 171392 | RC-CHIP 390R %1 1/16W/0603 | | R622 |
| 114470 | RM 470K J 1/2W 52MM | | R623 |
| 171824 | RC-CHIP 820R J 1/16W /0603 | | R624 |
| 172336 | RC-CHIP 3.3K J 1/16W /0603 | | R625 |
| 171224 | RC-CHIP 220R J 1/16W/0603 T | | R704 R702 R703 |
| 104103 | RC 100K J 1/2W 52MM | | R708 |
| 141222 | RC 220R J 1/4W /3.2 26MM | | R709 |
| 113153 | RMO 15K J 1W R:15 | | R710 R715 R720 |
| 142272 | RC 2.7K J 1/4W /3.2 26MM | | R713 R718 |
| 102159 | CFR 1.5K J 1/2W /9 52MM | | R725 R726 R727 |
| 104103 | CFR 100K J 1/2W 52MM | | R728 |

SPARE PARTS LIST

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|------------|-------------------------------|---|---------|-------------------|
| 179002 | RC-CHIP OR /1206 | | | R981 |
| 031244 | SCART SOCKET 12.6/12.7 | | | SK201 |
| 010860 | TACT SW LONG STEN | | | SW401 SW402 SW403 |
| 010861 | ON/OFF SWITCH BK98 | | | SW601 |
| 401141 | TRN-CHIP BC848B SOT23 | | | T101 T102 T107 |
| 401141 | TRN-CHIP BC848B SOT23 | | | T201 T202 |
| 401141 | TRN-CHIP BC848B SOT23 | | | T301 T302 |
| 401142 | TRN-CHIP BC858B SOT23 | | | T401 |
| 401141 | TRN-CHIP BC848B SOT23 | | | T501 T502 |
| 401332 | TRN BU808DFI | | | T504 |
| 401334 | TRN STX112 | | | T551 |
| 401219 | TRN STP3NB60FP | | | T601 |
| 401141 | TRN-CHIP BC848B SOT23 | | | T602 |
| 401397 | TRN 2SC 2482 | | | T701 T703 T705 |
| 401142 | TRN-CHIP BC858B SOT23 | | | T980 |
| 058019 | FBT-SANAL 20/21" 12.6 | △ | 20"/21" | TR501 |
| 058419 | FBT-SANAL 14" 12.8 | △ | 14" | TR501 |
| 059013 | SMPS-SANAL 20/21" 12.1 | △ | 20"/21" | TR601 |
| 059413 | SMPS-SANAL 14" 12.1 | △ | 14" | TR601 |
| G99136-PH2 | TUNER PH ASM.PLL UV1316/AIG-3 | | | TU101 |
| 031165 | KONN. CINCH YEL | | | X0002 |
| 031176 | CONN.CINCH 12.1 FRONT-AV YE | | | X0002 |
| 031163 | KONN. CINCH WHITE | | | X0003 |
| 031166 | CONN.CINCH 12.1 FRONT-AV WH | | | X0003 |
| 031180 | CONN.HEADPHONE 12.1 FRONT-A | | | X0004 |
| 031791 | EARPHONE JACK | | | X0005 |
| 031860 | CONN.HOUSING X2004 BLACK | | | X201 |
| 031856 | CONN.HOUSING X2003 BLACK | | | X301 |
| 031850 | CONN.HOUSING 2'LI GREY | | | X501 |
| 031777 | CON.HOUSING LOCKED 5/4 | | | X502 |
| 031793 | CON.HOUSING 2P MALE TPK75(P | | | X601 X602 |
| 031530-02 | INCHANG/CRT SOCKET ISHM23S- | | | X703 |
| 031532 | CRT SOCKET NARROW INCHANG | | | X703 |
| 302786 | DIODE Z. MTZJ6.2B 52MM | | | ZD101 |
| 302294 | DIODE Z. C8V2 26MM | | | ZD102 |
| 303771 | DIODE Z. UZT33V | | | ZD601 |
| 010861 | ON/OFF SWITCH BK98 | | | |
| 031163 | KONN. CINCH WHITE | | | |
| 031165 | KONN. CINCH YEL | | | |
| 031777 | CON.HOUSING LOCKED 5/4 | | | |
| 031791 | EARPHONE JACK | | | |
| 031850 | CONN.HOUSING 2 PIN GREY | | | |
| 031856 | CONN.HOUSING X2003 BLACK | | | |
| 031860 | CONN.HOUSING X2004 BLACK | | | |
| 056314-EK3 | CPT EK A33EKC01X01 | | | |
| 056320-VC1 | CPT VC A48EJW011X21 | | | |
| 056321-GS8 | CPT GS A51QAE320X67(P) | | | |
| 5FZ107-AS | SPEAKER 8R 3W(N)/5W(M) 50X9 | | | |
| 614167-AS | DEGAUSSING COIL ASSY 14" BA | △ | | |
| 620167-AS | DEGAUSSING COIL ASSY 20" BA | △ | | |
| 621167-AS | DEGAUSSING COIL ASSY 21" BA | △ | | |
| 6BZ107-AS | SPEAKER 16R 3W(N)/5W(M) 50X | | | |

Please note that Product Part List Files should be investigated for the mechanical parts like cabinets, etc.



Subject to change without notice

