



**Service Manual**  
**K1 CHASSIS**

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## 1. 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  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.

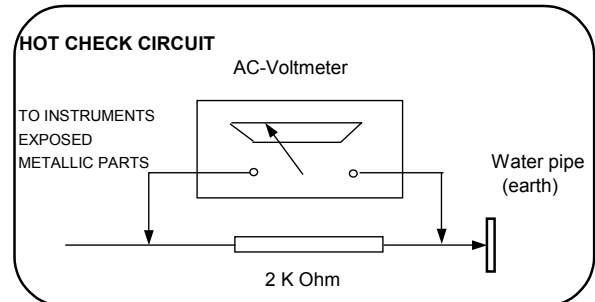


Figure 1

### 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

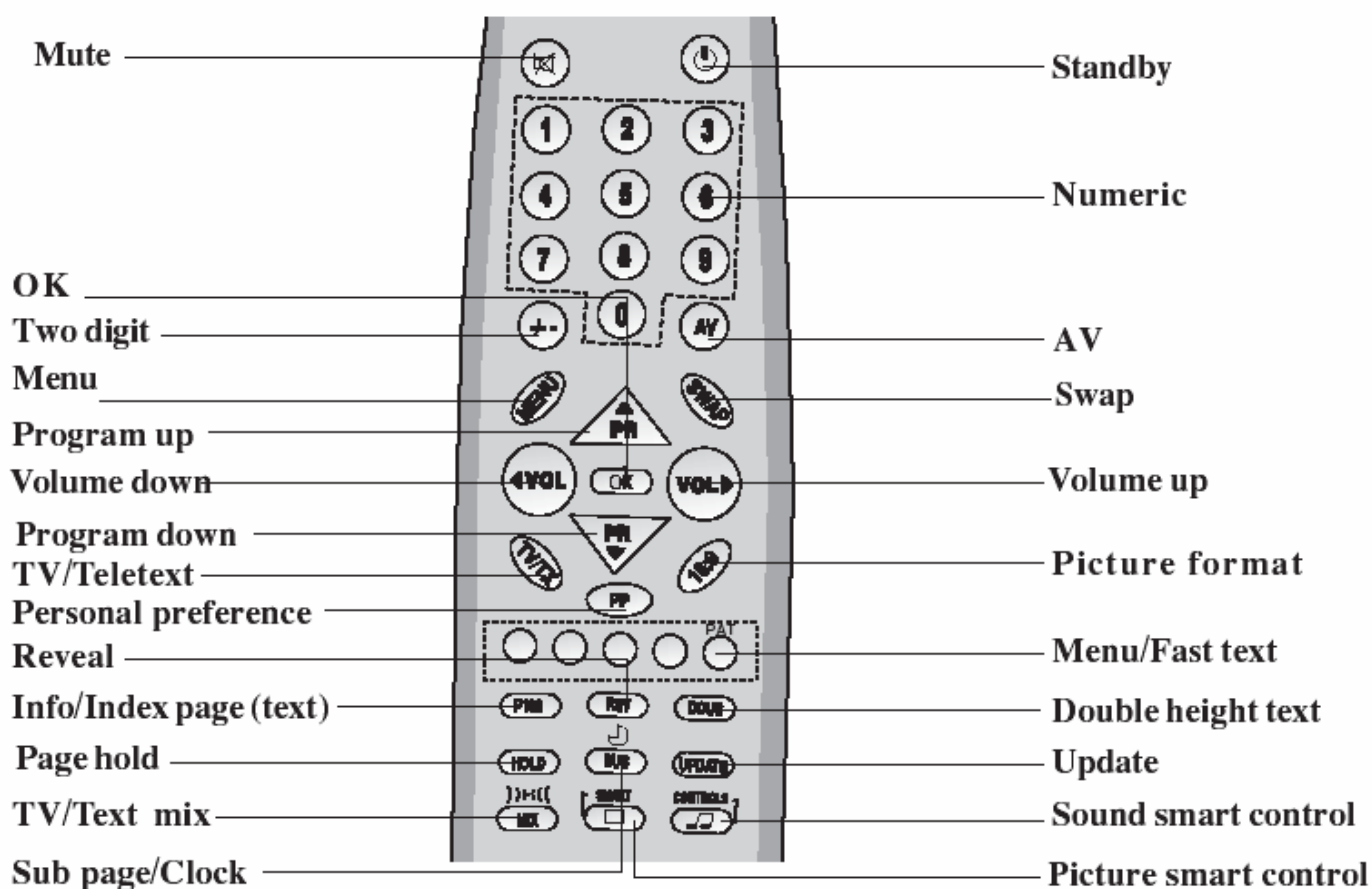
**AFTER REMOVAL OF THE ANODE CAP, DISCHARGE THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR THE CARBON PAINTED ON THE CRT WITH A HIGH VOLTAGE PROBE AND MULTIMETER (SELECT VDC) AND THEN SHORT CIRCUIT DIRECTLY TO DISCHARGE COMPLETELY**

## 2. TECHNICAL SPECIFICATIONS

|                                       |                                                    |                                                            |
|---------------------------------------|----------------------------------------------------|------------------------------------------------------------|
| <b>Power source:</b>                  | 220-240V AC, 50-60Hz                               |                                                            |
| <b>Power consumption (nom.) :</b>     | 55W                                                | 20", 21"                                                   |
| <b>Standby power consumption :</b>    | 2 W                                                |                                                            |
| <b>Aerial impedance :</b>             | 75Ohm, coaxial type                                |                                                            |
| <b>Receiving system <sup>1</sup>:</b> | PAL BG<br>PAL SECAM BG<br>PAL SECAM BG DK<br>PAL I |                                                            |
| <b>Receiving channels:</b>            | VHF BAND I                                         | CH2-4                                                      |
|                                       | VHF BAND III                                       | CH5-12                                                     |
|                                       | CABLE TV                                           | S1-41                                                      |
|                                       | UHF BAND                                           | CH21-69                                                    |
| <b>Audio outputs :</b>                | 7W RMS at %10 THD                                  | 20", 21"                                                   |
| <b>High Voltage :</b>                 | 25 ± 0.5 KV                                        | 20", 21"                                                   |
| <b>Focus voltage :</b>                | %25.6 ± %38 of EHT                                 |                                                            |
| <b>Grid 2 voltage :</b>               | 0-1400 V                                           |                                                            |
| <b>Heater voltage :</b>               | 6.2 ± 0.2 Vrms                                     |                                                            |
| <b>Video/Audio Terminals :</b>        | AV1 IN                                             | Video : 1 Vpp, 75 Ohm<br>Audio : 0.5 Vrms, >10 Kohm<br>RGB |
|                                       | AV1OUT                                             | Video : 1 Vpp, 75 Ohm<br>Audio : 0.5 Vrms, <1 Kohm         |
|                                       | AV2 IN (RCA, optional)                             | Video : 1 Vpp, 75 Ohm<br>Audio : 0.5 Vrms, >10 Kohm        |
| <b>Operating temperature :</b>        | 0-45 Degrees                                       |                                                            |
| <b>Safety :</b>                       | IEC 65 /BS P2N                                     |                                                            |
| <b>X-Ray radiation :</b>              | ACC. IEC 65/BS P2N                                 |                                                            |

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

### 3. REMOTE CONTROL



## Special features

- Your TV can receive stereo channels directly (NICAM optional).
- Automatic tuning system with country selection.
- 100 Programme Memory
- Available for Cable Channels (A decoder maybe required)
- Manual Fine Tuning
- Child Lock
- Return to the last channel viewed (SWAP)
- Spatial Sound effect
- 16:9 picture format
- S-Video connection (optional)
- Audio/Video RCA sockets (optional).
- Normalisation system to recall the setting in memory after the colour, contrast, brightness setting have been changed.
- Picture adjustment using one button (Smart control).
- Sound adjustment using one button (Smart control).
- Equalizer Sound Setup
- Automatic Volume Limiting
- Your TV set is equipped with an On-Screen Display system. This system enables the user to see the function on-screen and to control them efficiently.
- Infrared Remote Control
- Virtual Dolby Surround (optional)
- Dynamic Bass (optional)
- Multi language menu system
- On Timer
- Off Timer
- Stereo headphone socket (optional)

- Scart Socket: Video cassette recorder, satellite receiver, video disc player, DVD, TV games or a home computer can be connected to this AV socket with an appropriate connecting cable.
- Second scart socket (optional)
- Naming the channels
- Teletext reception
- Auto recognition of the broadcasting format (4:3, 16-9) via WSS feature.
- Digital Colour Transition Improvement (DCTI) (Optional).
- Digital Comb Filter (DCF) (Optional).
- Digital Luminance Transition Improvement (DLTI) (Optional)
- Dynamic Noise Reduction (Optional)
- Picture and Text (optional)
- Blueback (Optional)
- Component input via Scart (optional)
- Program Naming, Editing
- Quick Program Display
- Games (Optional)
- Now&Next (TV Guide), (Optional)
- Alarm function (Optional)

(\*): These features are not available in all models.

## 4. PREPARATIONS

### MAIN SUPPLY CONNECTIONS

Connect the TV mains plug into your domestic mains socket outlet (230 V 50Hz AC).

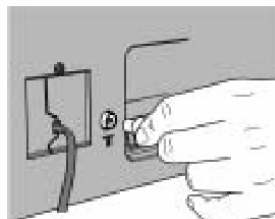
Press the Program up, Program down button or Numeric Buttons on the remote handset to switch

- the TV on.



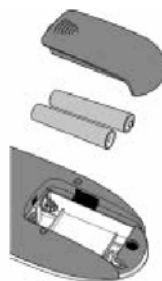
### AERIAL CONNECTION

Using a 75Ω aerial lead connect your TV to the aerial outlet in your home.



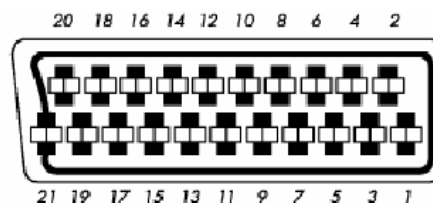
### BATTERY FITTING

Insert the 2 AAA Batteries supplied into the compartment on the rear of the remote control, ensure you follow the polarity diagram inside the compartment.

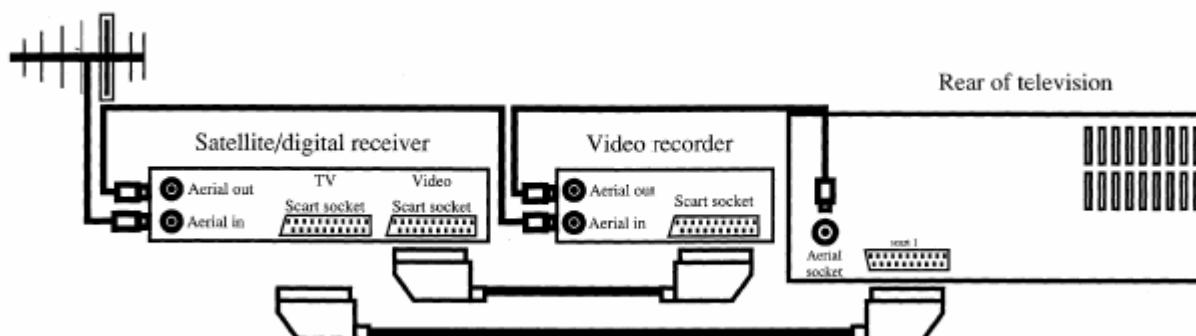


### PIN CONNECTIONS FOR SCART SOCKET

- |                            |                         |
|----------------------------|-------------------------|
| 1- Audio output Right      | 11- RGB input, Green    |
| 2- Audio input Right       | 12-                     |
| 3- Audio output Left(Mono) | 13- Red ground          |
| 4- Audio ground            | 14- Ground              |
| 5- Blue ground             | 15- RGB input, Red      |
| 6- Audio input Left(Mono)  | 16- Blanking Signal     |
| 7- RGB input, Blue         | 17- Video output ground |
| 8- Switching voltage       | 18- Video input ground  |
| 9- Green ground            | 19- Video output        |
| 10-                        | 20- Video input         |
|                            | 21- Screening           |



### CONNECTING TV WITH VIDEO AND SATELLITE/DIGITALRECEIVER



## 5. OPERATING YOUR TV

### A. SWAP FUNCTION



Allows you to swap between the program you are watching and the last selected program. i.e. If you were watching Program 1 and change to Program 11, press the SWAP button to go back to Program 1. Press it again to return to Program 11.



### B. AV



Press the AV button to select your For use when you are connecting an external source to your TV (Video recorder, DVD player etc.) via the SCART sockets or RCA sockets.

#### See 'Connecting external equipment'.

Press the AV button to select your input as follows:

#### 2 Scart models:

- 1 AV1 when using SCART socket 1.
- 2 AV2 when using SCART socket 2.
- 3 AV2-S for S-Video equipment. (Optional)
- 4 AV3 when using the RCA sockets of the TV. (Optional)
- 5 AV3-S when using the S-video socket and RCA audio sockets of the TV. (Optional)

#### 1 Scart models:

- 1 AV1 when using SCART socket 1.
- 2 AV2 when using the RCA sockets of the TV. (Optional)
- 3 AV2-S when using the S-video socket and RCA audio sockets of the TV. (Optional)



Press the AV button again to return to TV

### C. TUNING THE TELEVISION

There are two ways of tuning your television:

- Manual, where you control the tuning process or Autoprogram where the television does it all automatically.
- The TV sets equipped with ATS (Automatic Tuning System) sorts the channels regarding the broadcasting system of your country (optionally).

#### Please Note

If the TV is set to a channel with no signal the TV will return to standby after 5 minutes. The time remaining is displayed on the screen.

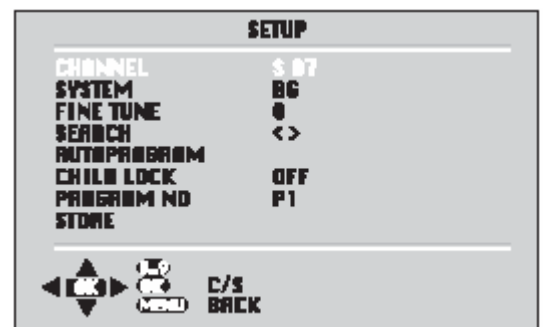
#### Manual Tuning

Tuning the TV is accessed through the SETUP menu.

There are two ways to access the SETUP menu:



Press the blue **Setup** button or Press the **Menu** button and use the **Program down** button to select **SETUP**. Press the **OK** button to enter the **SETUP** menu.



#### Please note

The system will displayed automatically on **SYSTEM** row i.e. BG, L, I, DK depending the receiving broadcasting system of the country. In some countries the broadcasting system can be both in BG/DK or BG/LL'. Only the TV sets produced with Pal Secam BG/DK or Pal Secam BG/LL' systems can receive both BG/DK or BG/LL' broadcasts. In this case the user can select the required **SYSTEM** using Volume up/down buttons.

### Please note

If you do not press any buttons for 15 seconds the TV will exit the menu system.

In the Setup menu select PROG NO and change to P1 using the **Program down** button to select it and the **Volume up** button to change it.

Starting with Program 1, tune in the first channel as follows:

Use the **Program down** button to select SEARCH.

Press the **Volume up** or **Volume down** button to start the tuning search.

When the search finds a strong channel signal it will stop searching. The picture will appear.

Identify which channel you are watching (BBC 1, ITV 1 etc.) and decide which program number you want it to be.

Use the **Program down** button to select PROGRAM NO.

Use the **Volume up/down** buttons to select the program number.

Use the **Program down** button to select Store. Press the OK button and STORED will appear on the STORE line.

You have now stored the first channel.

Use the **Program up** button to select again SEARCH and continue the tuning procedure until you have tuned in all the programmes you want or the television can receive.

### Tuning with channel numbers

Enter the SETUP menu by pressing the blue button. Press the **OK** button to enter the CHANNEL row.

Use the **OK** button to select "S" for cable channels and "C" for terrestrial broadcast.

Use **Volume up** button to select the channel number buttons.

Enter the channel number using the Numeric buttons.

Press the **Program down/up** buttons to exit the channel row.

Use the **Program down** button to select PROGRAM NO.

Use the **Volume up/down** buttons to select the program number.

Use the **Program down** button to select STORE. Press the **OK** button and STORED will appear on the STORE line.

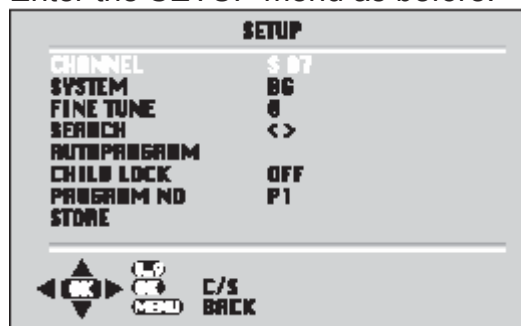
You have now stored the first channel.

Use the **Program up** button to select again SEARCH and continue the tuning procedure until you have tuned in all the programmes you want or the television can receive.

To exit the SETUP menu press the TV/TX button.

### Automatic tuning (Autoprogram)

Enter the SETUP menu as before.







Use the Program down button to select AUTOPROGRAM and the **OK** button. A list of Press countries will appear. Select the desired country using **Program** and **Volume** buttons.



When you are sure the aerial is connected properly press the **OK** button. Autoprogram will start.

To cancel Autoprogram while it is working press the **Menu** button.

**Your TV is now tuned and ready to use.**

#### Please note:

If auto sort fails to arrange the programmes in the required sequence please refer to programme table.

#### Fine tuning

Although the search and Autoprogram will automatically try and tune to the best reception, in areas of poor reception a bit of fine tuning may be required.



In the SETUP menu use the Program up/down buttons to select FINE TUNE. Use the Volume up and Volume down buttons to fine tune.

When you have finished use the **Program down** button to select STORE and press the **OK** button.

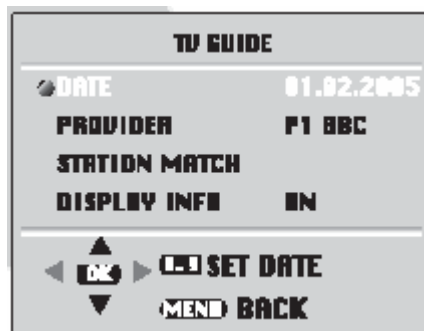
## D. FEATURES

### 1-) TV GUIDE(Optional)

You can see the TV Guide information on the screen by pressing "**DOUB**" button while a provider channel or a supported channel by provider is selected. The information of the current and next programmes which is sent by provider is displayed on the screen.

**Note:** TV Guide information may not have for all programmes. It depends on the broadcasting and determined by broadcasting company.

**Note:** TV Guide is not displayed on the screen, if there is not a provider in the saved channels.



**DATE:** Date information is given by provider channel. You can use the numeric buttons to change the date.

**PROVIDER:** Provider is the channel which send the TV Guide information. You can select the provider via this function. Press **Volume up/down** buttons to select the provider and then press "**OK**".



**STATION MATCH:** The supported channels by provider may not be defined automatically. You can open this menu and define the provider for these channels. Adjusting the provider just one time is enough for these channels.

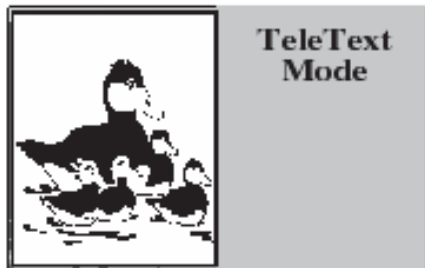


**DISPLAY INFO:** If you want to see the TV Guide information automatically while changing the channels, this option should be open. In this case, if you open the provider channel Mini Guide occurs on the screen.



## 2-) PAT (Picture and Text) (OPTIONAL)

In the double window function, you can also display the teletext screen in the second window.

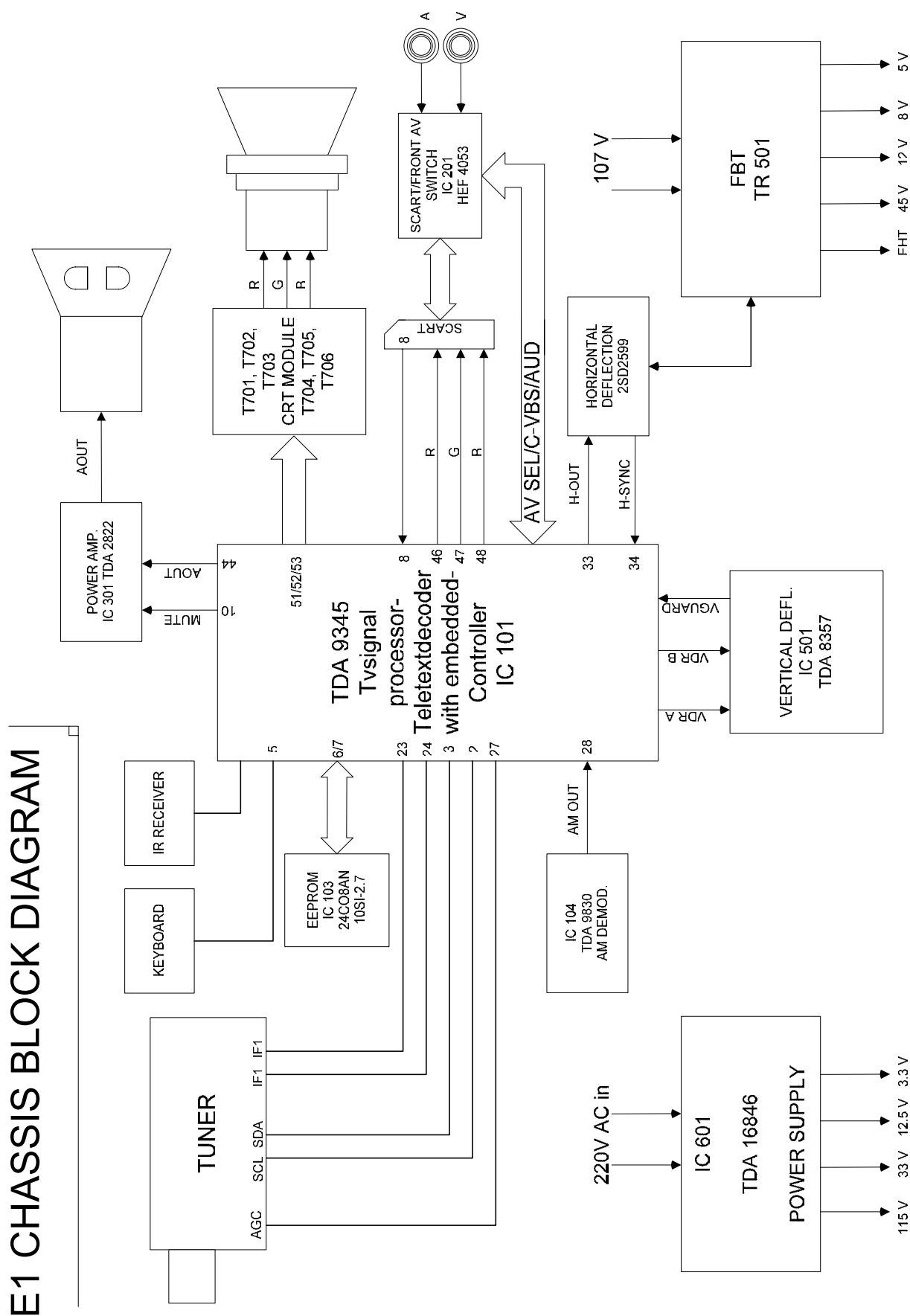


## 3-) PIP Picture Position Change



Press the **POS** button repeatedly until desired position is achieved. The PIP picture moves clockwise.

## 6. BLOCK DIAGRAM OF E1 CHASSIS

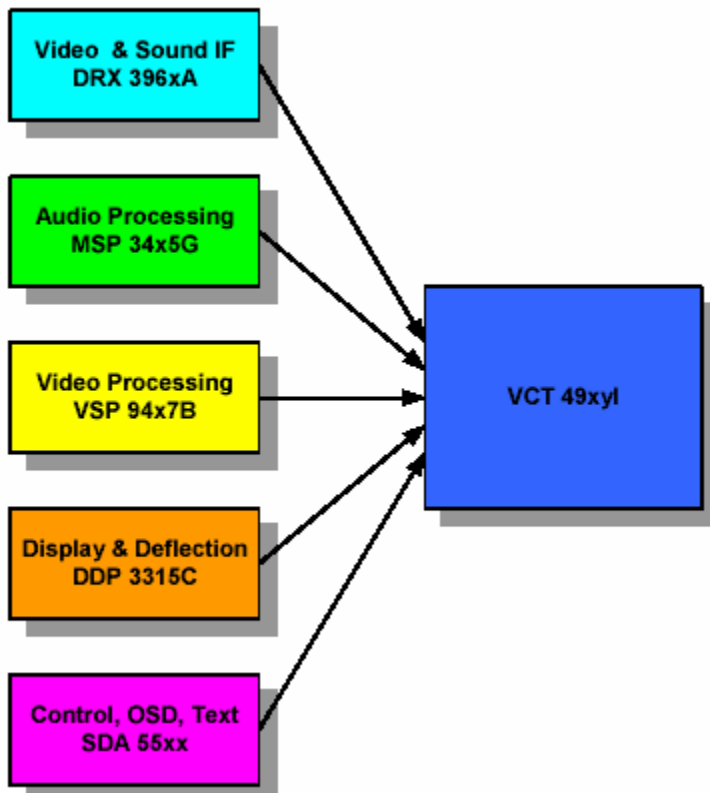


## 7.1)VCT 49XYI

### GENERAL DESCRIPTION

The VCT 49xyl is an IC family of high-quality singlechip TV processors. Modular design and deep-submicron technology allow the economic integration of features in all classes of single-scan TV sets. The VCT 49xyl family is based on functional blocks contained and approved in existing products like DRX 396xA, MSP 34x5G, VSP 94x7B, DDP 3315C, and SDA 55xx.

Each member of the family contains the entire IF, audio, video, display, and deflection processing for 4:3 and 16:9 50/60-Hz mono and stereo TV sets. The integrated microcontroller is supported by a powerful OSD generator with integrated Teletext & CC acquisition including on-chip page memory.

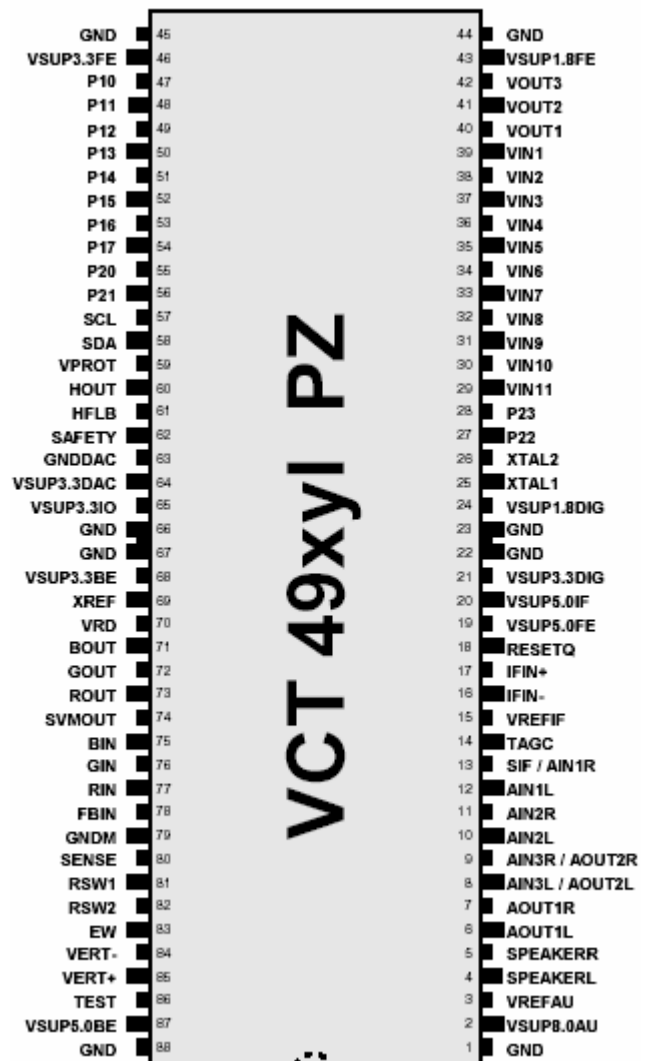


- Single 20.25 MHz reference crystal
- 8-bit 8051 instruction set compatible CPU
- Up to 256 kB on-chip program ROM
- WST, PDC, VPS, and WSS acquisition
- Closed Caption and V-chip acquisition
- Up to 10 pages on-chip teletext memory
- Multi-standard QSS IF processing with single SAW
- FM Radio and RDS with standard TV tuner
- TV-sound demodulation:
  - all A2 standards
  - all NICAM standards
  - BTSC/SAP with MNR (DBX optional)
  - EIA-J
- Baseband sound processing for loudspeaker channel:
  - volume and balance

### Features

The VCT 49xyl family offers a rich feature set, covering the whole range of state-of-the-art 50/60-Hz TV applications.

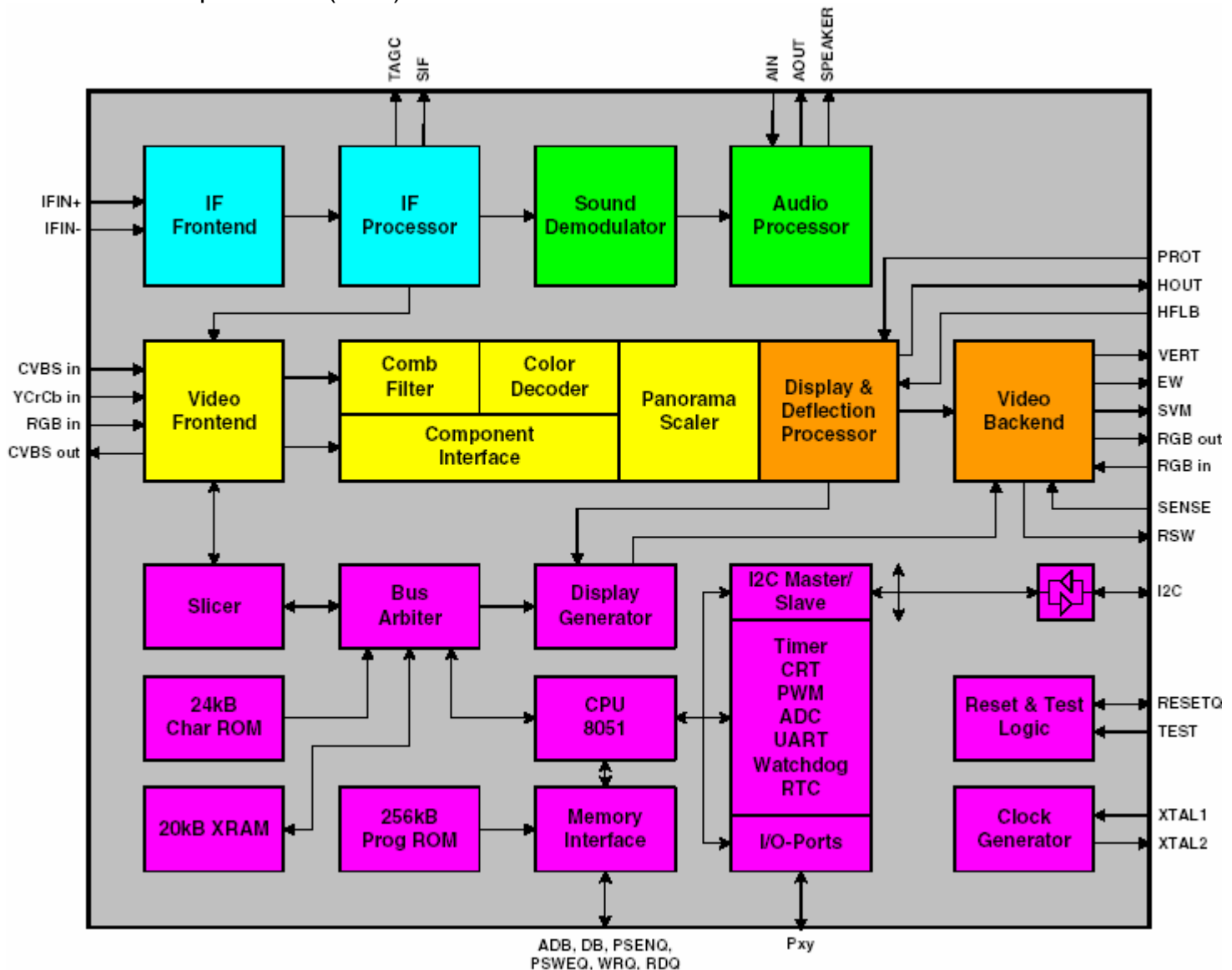
- PSSDIP88-1/-2 package
- PMQFP144-2 package
- Submicron CMOS technology
- Low-power standby mode



- bass/treble or equalizer
- loudness and spatial effect (e.g. pseudo stereo)
- Micronas AROUND (virtual Dolby optional)
- Micronas BASS
- further optional and licence requiring sound enhancements as BBE, SRS Wow and Micronas

## VOICE

- CVBS, S-VHS, YCrCb and RGB inputs
- 4H adaptive comb filter (PAL/NTSC)
- multi-standard color decoder (PAL/NTSC/SECAM)
- Nonlinear horizontal scaling “panorama vision”
- Luma and chroma transient improvement (LTI, CTI)
- Non-linear color space enhancement (NCE)
- Dynamic black level expander (BLE)
- Scan velocity modulation output
- Soft start/stop of H-drive
- Vertical angle and bow correction
- Average and peak beam current limiter
- Nonlinear and dynamic EHT compensation
- Black switch off procedure (BSO)



## PIN CONNECTIONS AND SHORT DESCRIPTIONS

NC = not connected

LV = if not used, leave vacant

OBL = obligatory; connect as described in circuit diagram

IN = Input Pin

OUT = Output Pin

SUPPLY = Supply Pin

| Pin No | Pin Name     | Type   | Connection (If not used) | Short Description                                             |
|--------|--------------|--------|--------------------------|---------------------------------------------------------------|
| 1      | GND          | SUPPLY | OBL                      | Ground Platform                                               |
| 2      | VSUP8.0AU    | SUPPLY | OBL                      | Supply Voltage Analog Audio, 8.0 V                            |
| 3      | VREFAU       |        | OBL                      | Reference Voltage, Audio                                      |
| 4      | SPEAKERL     | OUT    | LV                       | Analog Loudspeaker Output, Right                              |
| 5      | SPEAKERR     | OUT    | LV                       | Analog Loudspeaker Output, Right                              |
| 6      | AOUT1L       | OUT    | LV                       | Analog Audio 1 Output, Left                                   |
| 7      | AOUT1R       | OUT    | LV                       | Analog Audio 1 Output, Right                                  |
| 8      | AIN3L/AOUT2L | IN/OUT | LV                       | Analog Audio 3 Input, Left / Analog Audio 2 Output, Left      |
| 9      | AIN3R/AOUT2R | IN/OUT | LV                       | Analog Audio 3 Input, Right / Analog Audio 2 Output, Right    |
| 10     | AIN2L        | IN     | GND                      | Analog Audio 2 Input, Left                                    |
| 11     | AIN2R        | IN     | GND                      | Analog Audio 2 Input, Right                                   |
| 12     | AIN1L        | IN     | GND                      | Analog Audio 1 Input, Left                                    |
| 13     | AIN1R/SIF    | IN/OUT | GND                      | Analog Audio 1 Input Right/Analog 2nd Sound IF Output         |
| 14     | TAGC         | OUT    | LV                       | Tuner AGC Output                                              |
| 15     | VREFIF       |        | OBL                      | Reference Voltage, IF ADCs                                    |
| 16     | IFIN-        | IN     | VREFif                   | Differential IF Input                                         |
| 17     | IFIN+        | IN     | VREFif                   | Differential IF Input                                         |
| 18     | RESETQ       | IN/OUT | OBL                      | Reset Input/Output                                            |
| 19     | VSUP5.0FE    | SUPPLY | OBL                      | Supply Voltage Analog IF Front-end, 5.0 V                     |
| 20     | VSUP5.0IF    | SUPPLY | OBL                      | Supply Voltage IF ADC, 5.0 V                                  |
| 21     | VSUP3.3DIG   | SUPPLY | OBL                      | Supply Voltage Digital Core, 3.3 V                            |
| 22     | GND          | SUPPLY | OBL                      | Ground Platform                                               |
| 23     | GND          | SUPPLY | OBL                      | Ground Platform                                               |
| 24     | VSUP1.8DIG   | SUPPLY | OBL                      | Supply Voltage Digital Core, 1.8 V (main and stand by supply) |
| 25     | XTAL1        | IN     | OBL                      | Analog Crystal Input                                          |
| 26     | XTAL2        | OUT    | OBL                      | Analog Crystal Output                                         |
| 27     | P22          | IN/OUT | LV                       | Port 2, Bit 2 Input/Output                                    |
| 28     | P23          | IN/OUT | LV                       | Port 2, Bit 3 Input/Output                                    |
| 29     | VIN11        | IN     | GND                      | Analog Video 11 Input                                         |
| 30     | VIN10        | IN     | GND                      | Analog Video 10 Input                                         |
| 31     | VIN9         | IN     | GND                      | Analog Video 9 Input                                          |
| 32     | VIN8         | IN     | GND                      | Analog Video 8 Input                                          |
| 33     | VIN7         | IN     | GND                      | Analog Video 7 Input                                          |
| 34     | VIN6         | IN     | GND                      | Analog Video 6 Input                                          |
| 35     | VIN5         | IN     | GND                      | Analog Video 5 Input                                          |
| 36     | VIN4         | IN     | GND                      | Analog Video 4 Input                                          |
| 37     | VIN3         | IN     | GND                      | Analog Video 3 Input                                          |
| 38     | VIN2         | IN     | GND                      | Analog Video 2 Input                                          |
| 39     | VIN1         | IN     | GND                      | Analog Video 1 Input                                          |
| 40     | VOUT1        | OUT    | LV                       | Analog Video 1 Output                                         |
| 41     | VOUT2        | OUT    | LV                       | Analog Video 2 Output                                         |
| 42     | VOUT3        | OUT    | LV                       | Analog Video 3 Output                                         |

|    |            |        |           |                                                                         |
|----|------------|--------|-----------|-------------------------------------------------------------------------|
| 43 | VSUP1.8FE  | SUPPLY | OBL       | Supply Voltage Analog Video Front-end, 1.8 V (main and stand by supply) |
| 44 | GND        | SUPPLY | OBL       | Ground Platform                                                         |
| 45 | GND        | SUPPLY | OBL       | Ground Platform                                                         |
| 46 | VSUP3.3FE  | SUPPLY | OBL       | Supply Voltage Analog Video Front-end, 3.3 V (main and stand by supply) |
| 47 | P10        | IN/OUT | LV        | Port 1, Bit 0 Input/Output                                              |
| 48 | P11        | IN/OUT | LV        | Port 1, Bit 1 Input/Output                                              |
| 49 | P12        | IN/OUT | LV        | Port 1, Bit 2 Input/Output                                              |
| 50 | P13        | IN/OUT | LV        | Port 1, Bit 3 Input/Output                                              |
| 51 | P14        | IN/OUT | LV        | Port 1, Bit 4 Input/Output                                              |
| 52 | P15        | IN/OUT | LV        | Port 1, Bit 5 Input/Output                                              |
| 53 | P16        | IN/OUT | LV        | Port 1, Bit 6 Input/Output                                              |
| 54 | P17        | IN/OUT | LV        | Port 1, Bit 7 Input/Output                                              |
| 55 | P20        | IN/OUT | LV        | Port 2, Bit 0 Input/Output                                              |
| 56 | P21        | IN/OUT | LV        | Port 2, Bit 1 Input/Output                                              |
| 57 | SCL        | IN/OUT | OBL       | I <sup>2</sup> C Bus Clock Input/Output                                 |
| 58 | SDA        | IN/OUT | OBL       | I <sup>2</sup> C Bus Data Input/Output                                  |
| 59 | VPROT      | IN     | GND       | Vertical Protection Input                                               |
| 60 | HOUT       | OUT    | LV        | Horizontal Drive Output                                                 |
| 61 | HFLB       | IN     | HOUT      | Horizontal Flyback Input                                                |
| 62 | SAFETY     | IN     | GND       | Safety Input                                                            |
| 63 | GNDDAC     | SUPPLY | OBL       | Ground Video DACs                                                       |
| 64 | VSUP3.3DAC | SUPPLY | OBL       | Supply Voltage Video DACs, 3.3 V                                        |
| 65 | VSUP3.3IO  | SUPPLY | OBL       | Supply Voltage I/O Ports, 3.3 V (main and Standby supply)               |
| 66 | GND        | SUPPLY | OBL       | Ground Platform                                                         |
| 67 | GND        | SUPPLY | OBL       | Ground Platform                                                         |
| 68 | VSUP3.3BE  | SUPPLY | OBL       | Supply Voltage Analog Video Back-end, 3.3 V                             |
| 69 | XREF       |        | OBL       | Reference Current for RGB DACs                                          |
| 70 | VRD        |        | OBL       | Reference Voltage for RGB DACs                                          |
| 71 | BOUT       | OUT    | VSUP5.0BE | Analog Blue Output                                                      |
| 72 | GOUT       | OUT    | VSUP5.0BE | Analog Green Output                                                     |
| 73 | ROUT       | OUT    | VSUP5.0BE | Analog Red Output                                                       |
| 74 | SVMOUT     | OUT    | VSUP5.0BE | Scan Velocity Modulation Output                                         |
| 75 | BIN        | IN     | GND       | Analog Blue Input, Back-end                                             |
| 76 | GIN        | IN     | GND       | Analog Green Input, Back-end                                            |
| 77 | RIN        | IN     | GND       | Analog Red Input, Back-end                                              |
| 78 | FBIN       | IN     | GND       | Fast Blank Input, Back-end                                              |
| 79 | GNDM       | IN     | GND       | Reference Ground for Sense ADC                                          |
| 80 | SENSE      | IN     | GND       | Sense ADC Input                                                         |
| 81 | RSW1       | OUT    | LV        | Range Switch 1 Output                                                   |
| 82 | RSW2       | OUT    | LV        | Range Switch 2 Output                                                   |
| 83 | EW         | OUT    | GND       | Vertical Parabola Output                                                |
| 84 | VERT-      | OUT    | GND       | Differential Vertical Sawtooth Output                                   |
| 85 | VERT+      | OUT    | GND       | Differential Vertical Sawtooth Output                                   |
| 86 | TEST       | IN     | GND       | Test Input, reserved for Test                                           |
| 87 | VSUP5.0BE  | SUPPLY | OBL       | Supply Voltage Analog Video Back-end, 5.0 V                             |
| 88 | GND        | SUPPLY | OBL       | Ground Platform                                                         |

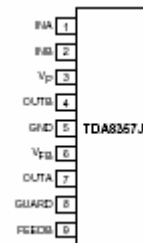
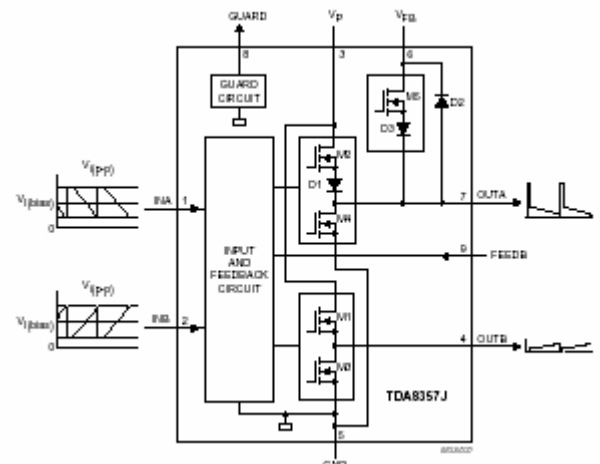
## 7.2)TDA 8357

### GENERAL DESCRIPTION

The TDA8357J is a power circuit for use in 90° and 110° colour deflection systems for 25 to 200 Hz field frequencies, and for 4 : 3 and 16 : 9 picture tubes. The IC contains a vertical deflection output circuit, operating as a high efficiency class G system. The full bridge output circuit allows DC coupling of the deflection coil in combination with single positive supply voltages. The IC is constructed in a Low Voltage DMOS (LVDMOS) process that combines bipolar, CMOS and DMOS devices. DMOS transistors are used in the output stage because of absence of second breakdown.

### FEATURES

- Few external components required
- High efficiency fully DC coupled vertical bridge output circuit
- Vertical flyback switch with short rise and fall times
- Built-in guard circuit
- Thermal protection circuit
- Improved EMC performance due to differential inputs



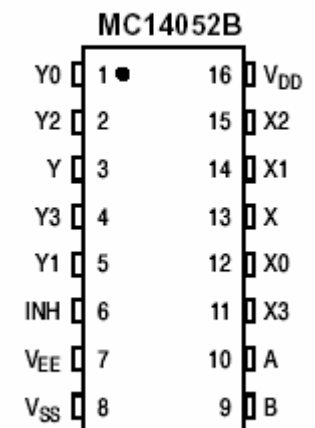
| SYMBOL                                              | PARAMETERS                          | CONDITIONS  | MIN.   | TYP. | MAX.  | UNIT |
|-----------------------------------------------------|-------------------------------------|-------------|--------|------|-------|------|
| <b>Supplies</b>                                     |                                     |             |        |      |       |      |
| Vp                                                  | Supply voltage                      |             | 7.5    | 12   | 18    | V    |
| VFB                                                 | flyback supply voltage              |             | 2 x VP | 45   | 66    | V    |
| Iq(P)(av)                                           | average quiescent supply current    | during scan | -      | 10   | 15    | mA   |
| Iq(FB)(av)                                          | Iq(FB)(av)                          | during scan | -      | -    | 10    | mA   |
| Ptot                                                | total power dissipation             |             | -      | -    | 8     | W    |
| <b>Inputs and outputs</b>                           |                                     |             |        |      |       |      |
| Vi(p-p)                                             | input voltage (peak-to-peak value)  |             | -      | 1000 | 1500  | mV   |
| Io(p-p)                                             | output current (peak-to-peak value) |             | -      | -    | 2.0   | A    |
| <b>Flyback switch</b>                               |                                     |             |        |      |       |      |
| Io(peak)                                            | maximum (peak) output current       | t ≤ 1.5 ms  | -      | -    | ± 1.2 | A    |
| <b>Thermal data; in accordance with IEC 60747-1</b> |                                     |             |        |      |       |      |
| Tstg                                                | storage temperature                 |             | -55    | -    | +150  | °C   |
| Tj                                                  | junction temperature                |             | -      | -    | +150  | °C   |

## 7.3)MC14052B

The MC14052B analog multiplexer is a digitally-controlled analog switch. The MC14052B effectively implements a DP4T solid state switch. This device's feature low ON impedance and very low OFF leakage current. Control of analog signals up to the complete supply voltage range can be achieved.

- Triple Diode Protection on Control Inputs
- Switch Function is Break Before Make
- Supply Voltage Range = 3.0 Vdc to 18 Vdc

### PIN ASSIGNMENT





- Analog Voltage Range ( $V_{DD} - V_{EE}$ ) = 3.0 to 18 V Note:  $V_{EE}$  must be  $\_VSS$
- Linearized Transfer Characteristics
- Low-noise – 12 nV//Cycle,  $f . 1.0$  kHz Typical

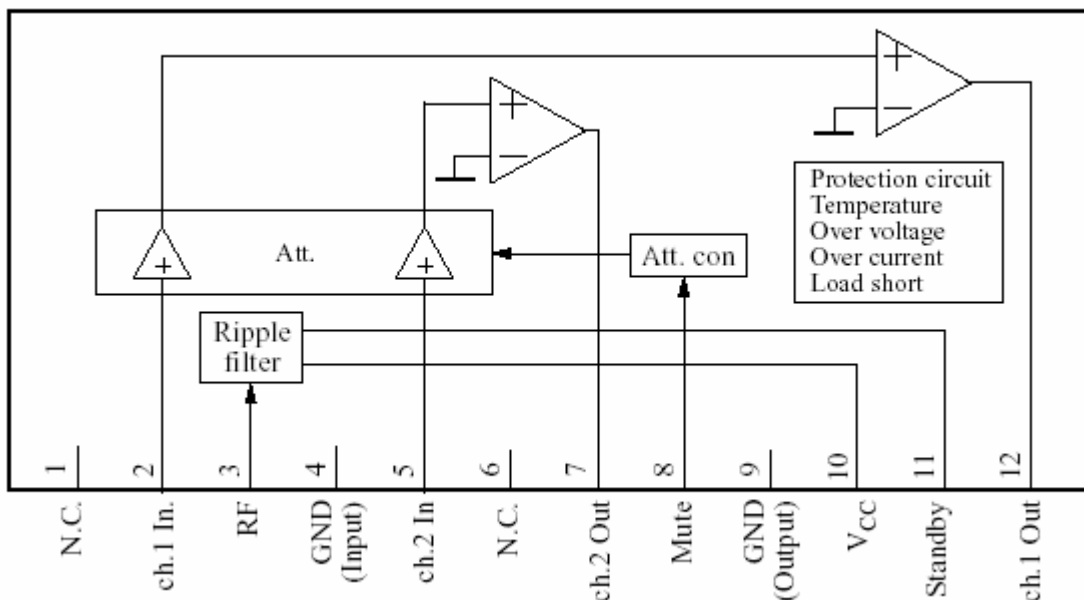
This device contains protection circuitry to guard against damage due to high static voltages or electric fields. However, precautions must be taken to avoid applications of any voltage higher than maximum rated voltages to this high-impedance circuit. For proper operation,  $V_{in}$  and  $V_{out}$  should be constrained to the range  $VSS \_ (V_{in} \text{ or } V_{out}) \_ V_{DD}$ . Unused inputs must always be tied to an appropriate logic voltage level (e.g., either  $VSS$ ,  $V_{EE}$  or  $V_{DD}$ ). Unused outputs must be left open.

#### 7.4)AN5277(Dual Channel SEPP Power Amplifier)

The AN5277 is a monolithic integrated circuit designed for 10.0 W (26 V, 8 W)output audio power amplifier. It is a dual channel SEPP IC suitable for stereo operation in TV application.

##### Features

- Few external components :
- No Boucherot cells(output C, R)
- No Bootstrap Capacitors
- No Negative Feedback Capacitors
- Built-in muting circuit
- Built-in standby circuit
- Built-in various protection circuits (Load-short, thermal, over-voltage and current)
- High ripple rejection(55 dB)
- Compatible with AN5275, AN5276
- Operating voltage range 10 ~ 32 V(26 V typ.)

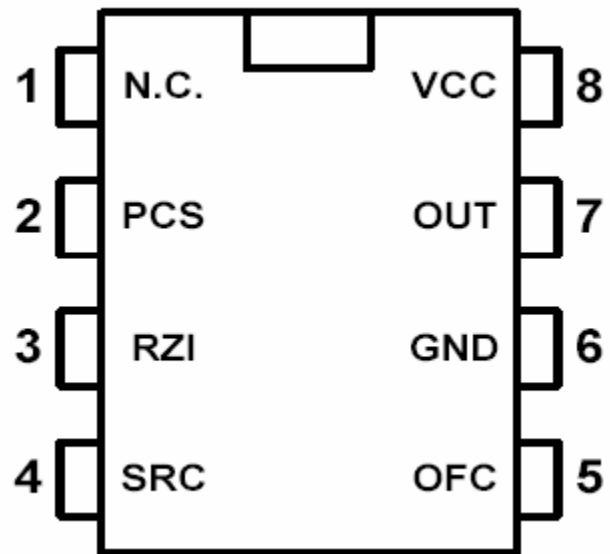


#### 7.5)ICE1QS01(Controller for Switch Mode Power Supplies Supporting Low Power Standby and Power Factor Correction (PFC))

##### Features

- Line Current Consumption with PFC
- Standby Input Power < 1 W
- Stable Standby Frequency

- Low Power Consumption
- Very Low Start-up Current
- Soft-Start for noiseless Start-up
- Standby Burst Mode with and without Control Signal for lowered Output Voltages
- Digital Frequency Reduction in small Steps at Decreasing Load
- Over- and Undervoltage Lockout
- Switch Off at Mains Undervoltage
- Mains Voltage Dependent Fold Back Point Correction
- Ringing Suppression Time Controlled from Output Voltage
- Easy Design In
- Free usable Fault Comparator



### Functional Description

The ICE1QS01 is optimized to control free running flyback converters with and without Power Factor Correction (with PFC Charge Pump). The switching frequency is reduced in small steps with decreasing load towards a minimum of 20 kHz in standby mode. This function is performed by a digital circuit to avoid any jitter also with periodically pulsed loads. To provide extremely low power consumption at light loads, this device can be switched into Standby Burst Mode. This is also possible without standby control signal (for adapter application). Additionally, the start up current is very low. To avoid switching stresses of the power devices, the power transistor is always switched on at minimum voltage. The device has several protection functions: VCC over and undervoltage, mains undervoltage and current limiting. Regulation can be done by using the internal error amplifier or an opto coupler feedback. The output driver is ideally suited for driving a power MOSFET. The ICE1QS01 is suited for TV-sets, VCR- sets, SAT- receivers and other consumer applications in the power range from 0 to app. 300 W.

## 8. PIN VOLTAGES OF IC'S

### IC 101(VCTI) Video-Controller-Text-IFAudio IC Family

| Pin No | Pin Name     | Short Description                                             | V DC | ST-BY | Pin No | Pin Name   | Short Description                                         | V DC | ST-BY |
|--------|--------------|---------------------------------------------------------------|------|-------|--------|------------|-----------------------------------------------------------|------|-------|
| 1      | GND          | Ground Platform                                               | 0    | 0     | 45     | GND        | Ground Platform                                           | 0    | 0     |
| 2      | VSUP8.0AU    | Supply Voltage Analog Audio, 8.0 V                            | 8,13 | 1,35  | 46     | VSUP3.3FE  | Supply Voltage Analog Video Front-end, 3.3 V              | 3,3  | 3,3   |
| 3      | VREFAU       | Reference Voltage, Audio                                      | 3,67 | 0     | 47     | P10        | Port 1, Bit 0 Input/Output                                | 3,27 | 0     |
| 4      | SPEAKERL     | Analog Loudspeaker Output, Right                              | 3,72 | 0     | 48     | P11        | Port 1, Bit 1 Input/Output                                | 0    | 3,27  |
| 5      | SPEAKERR     | Analog Loudspeaker Output, Right                              | 3,72 | 0     | 49     | P12        | Port 1, Bit 2 Input/Output                                | 3,3  | 3,29  |
| 6      | AOUT1L       | Analog Audio 1 Output, Left                                   | 3,72 | 0     | 50     | P13        | Port 1, Bit 3 Input/Output                                | 0    | 3,28  |
| 7      | AOUT1R       | Analog Audio 1 Output, Right                                  | 3,72 | 0     | 51     | P14        | Port 1, Bit 4 Input/Output                                | 0    | 0     |
| 8      | AIN3L/AOUT2L | Analog Audio 3 Input, Left / Analog Audio 2 Output, Left      | 3,43 | 0     | 52     | P15        | Port 1, Bit 5 Input/Output                                | 0    | 0     |
| 9      | AIN3R/AOUT2R | Analog Audio 3 Input, Right / Analog Audio 2 Output, Right    | 3,44 | 0     | 53     | P16        | Port 1, Bit 6 Input/Output                                | 2,77 | 2,77  |
| 10     | AIN2L        | Analog Audio 2 Input, Left                                    | 3,7  | 0     | 54     | P17        | Port 1, Bit 7 Input/Output                                | 2,79 | 2,79  |
| 11     | AIN2R        | Analog Audio 2 Input, Right                                   | 3,7  | 0     | 55     | P20        | Port 2, Bit 0 Input/Output                                | 3,32 | 2,9   |
| 12     | AIN1L        | Analog Audio 1 Input, Left                                    | 3,7  | 0     | 56     | P21        | Port 2, Bit 1 Input/Output                                | 3,24 | 0,6   |
| 13     | AIN1R/SIF    | Analog Audio 1 Input Right/Analog 2nd Sound IF Output         | 3,7  | 0     | 57     | SCL        | I <sup>2</sup> C Bus Clock Input/Output                   | 3,3  | 3,06  |
| 14     | TAGC         | Tuner AGC Output                                              | 3,77 | 0,82  | 58     | SDA        | I <sup>2</sup> C Bus Data Input/Output                    | 3,3  | 3,06  |
| 15     | VREFIF       | Reference Voltage, IF ADCs                                    | 2,42 | 0,9   | 59     | VPROT      | Vertical Protection Input                                 | 0,05 | 0     |
| 16     | IFIN-        | Differential IF Input                                         | 2,43 | 0,76  | 60     | HOUT       | Horizontal Drive Output                                   | 1,55 | 3,29  |
| 17     | IFIN+        | Differential IF Input                                         | 2,43 | 0,76  | 61     | HFLB       | Horizontal Flyback Input                                  | 0,65 | 0     |
| 18     | RESETQ       | Reset Input/Output                                            | 3,29 | 3,27  | 62     | SAFETY     | Safety Input                                              | 0,03 | 0,43  |
| 19     | VSUP5.0FE    | Supply Voltage Analog IF Front-end, 5.0 V                     | 4,96 | 1     | 63     | GNDDAC     | Ground Video DACs                                         | 0    | 0     |
| 20     | VSUP5.0IF    | Supply Voltage IF ADC, 5.0 V                                  | 4,92 | 1     | 64     | VSUP3.3DAC | Supply Voltage Video DACs, 3.3 V                          | 3,29 | 1     |
| 21     | VSUP3.3DIG   | Supply Voltage Digital Core, 3.3 V                            | 3,14 | 1     | 65     | VSUP3.3IO  | Supply Voltage I/O Ports, 3.3 V (main and Standby supply) | 3,31 | 3,31  |
| 22     | GND          | Ground Platform                                               | 0    | 0     | 66     | GND        | Ground Platform                                           | 0    | 0     |
| 23     | GND          | Ground Platform                                               | 0    | 0     | 67     | GND        | Ground Platform                                           | 0    | 0     |
| 24     | VSUP1.8DIG   | Supply Voltage Digital Core, 1.8 V (main and stand by supply) | 1,85 | 1,97  | 68     | VSUP3.3BE  | Supply Voltage Analog Video Back-end, 3.3 V               | 3,28 | 1     |
| 25     | XTAL1        | Analog Crystal Input                                          | 1,71 | 1,7   | 69     | XREF       | Reference Current for RGB DACs                            | 1,22 | 0     |
| 26     | XTAL2        | Analog Crystal Output                                         | 1,74 | 1,72  | 70     | VRD        | Reference Voltage for RGB DACs                            | 1,24 | 0,95  |
| 27     | P22          | Port 2, Bit 2 Input/Output                                    | 3,27 | 3,26  | 71     | BOUT       | Analog Blue Output                                        | 4,66 | 1     |
| 28     | P23          | Port 2, Bit 3 Input/Output                                    | 3,27 | 3,26  | 72     | GOUT       | Analog Green Output                                       | 4,66 | 1     |
| 29     | VIN11        | Analog Video 11 Input                                         | 0,12 | 0,09  | 73     | ROUT       | Analog Red Output                                         | 4,66 | 1     |
| 30     | VIN10        | Analog Video 10 Input                                         | 0    | 0,09  | 74     | SVMOUT     | Scan Velocity Modulation Output                           | 1,77 | 0,37  |
| 31     | VIN9         | Analog Video 9 Input                                          | 0,5  | 0,09  | 75     | BIN        | Analog Blue Input, Back-end                               | 0,19 | 0     |
| 32     | VIN8         | Analog Video 8 Input                                          | 0,5  | 0,09  | 76     | GIN        | Analog Green Input, Back-end                              | 0,19 | 0     |
| 33     | VIN7         | Analog Video 7 Input                                          | 0,99 | 0,09  | 77     | RIN        | Analog Red Input, Back-end                                | 0,19 | 0     |
| 34     | VIN6         | Analog Video 6 Input                                          | 0,99 | 0,09  | 78     | FBIN       | Fast Blank Input, Back-end                                | 0,07 | 0,07  |
| 35     | VIN5         | Analog Video 5 Input                                          | 0,99 | 0,09  | 79     | GNDM       | Reference Ground for Sense ADC                            | 0    | 0     |
| 36     | VIN4         | Analog Video 4 Input                                          | 1    | 0,09  | 80     | SENSE      | Sense ADC Input                                           | 0,23 | 0     |
| 37     | VIN3         | Analog Video 3 Input                                          | 1    | 0,09  | 81     | RSW1       | Range Switch 1 Output                                     | 0,03 | 0     |
| 38     | VIN2         | Analog Video 2 Input                                          | 1    | 0,09  | 82     | RSW2       | Range Switch 2 Output                                     | 0,01 | 0     |
| 39     | VIN1         | Analog Video 1 Input                                          | 1    | 0,09  | 83     | EW         | Vertical Parabola Output                                  | 4,37 | 0     |
| 40     | VOUT1        | Analog Video 1 Output                                         | 1,08 | 1,49  | 84     | VERT-      | Differential Vertical Sawtooth Output                     | 0,82 | 0     |
| 41     | VOUT2        | Analog Video 2 Output                                         | 1,08 | 1,49  | 85     | VERT+      | Differential Vertical Sawtooth Output                     | 0,79 | 0     |
| 42     | VOUT3        | Analog Video 3 Output                                         | 1,17 | 0,98  | 86     | TEST       | Test Input, reserved for Test                             | 3,71 | 0     |
| 43     | VSUP1.8FE    | Supply Voltage Analog Video Front-end, 1.8 V                  | 1,9  | 1,9   | 87     | VSUP5.0BE  | Supply Voltage Analog Video Back-end, 5.0 V               | 5,01 | 0     |
| 44     | GND          | Ground Platform                                               | 0    | 0     | 88     | GND        | Ground Platform                                           | 0    | 0     |

**IC 301(AN 5277)**  
**Dual Channel SEPP Power Amplifier**

| Pin No | Pin Name   | Short Description | V DC | ST-BY | Pin No | Pin Name    | Short Description | V DC | ST-BY |
|--------|------------|-------------------|------|-------|--------|-------------|-------------------|------|-------|
| 1      | N.C        | NOT CONNECTED     | 0    | 0     | 7      | CH.2 OUT    | CHANNEL 2 OUTPUT  | 12   | 0     |
| 2      | CH.1 IN.   | CHANNEL 1 INPUT   | 0    | 0     | 8      | MUTE        | MUTE              | 0,37 | 4,44  |
| 3      | RF         | RIPPLE FILTER     | 23,1 | 0,76  | 9      | GND(OUTPUT) | OUTPUT GROUND     | 0    | 0     |
| 4      | GND(INPUT) | INPUT GROUND      | 0    | 0     | 10     | Vcc         | Vcc               | 25,3 | 8,47  |
| 5      | CH.2 IN    | CHANNEL 2 INPUT   | 0    | 0     | 11     | ST-BY       | STANDBY           | 16,5 | 0,43  |
| 6      | N.C        | NOT CONNECTED     | 0    | 0     | 12     | CH.1 OUT    | CHANNEL 1 OUTPUT  | 12   | 0     |

**IC 602(ICE1QS01)**  
**Dual Channel SEPP Power Amplifier**

| Pin No | Pin Name | Short Description                  | V DC | ST-BY | Pin No | Pin Name | Short Description            | V DC | ST-BY |
|--------|----------|------------------------------------|------|-------|--------|----------|------------------------------|------|-------|
| 1      | N.C      | NOT CONNECTED                      | 0    | 0     | 5      | OFC      | OVERVOLTAGE FAULT COMPARATOR | 0    | 0     |
| 2      | PCS      | PRIMARY CURRENT SIMULATION         | 1,3  | 9,06  | 6      | GND      | GROUND                       | 0    | 0     |
| 3      | RZI      | REGULATION AND ZERO CROSSING INPUT | 1,35 | 0,04  | 7      | OUT      | OUTPUT                       | 1,79 | 0     |
| 4      | SRC      | SOFT-START AND REGULATION CPACITOR | 2,76 | 0,34  | 8      | Vcc      | SUPPLY VOLTAGE               | 11,4 | 10,1  |

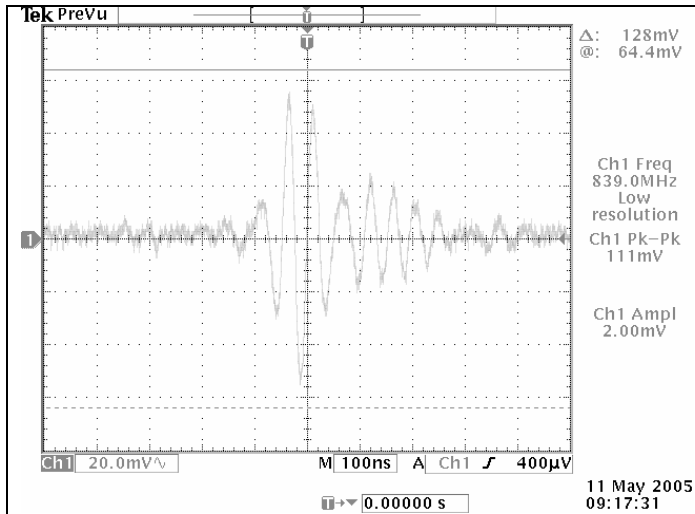
**IC 501(TDA 8357)**  
**VERTICAL DEFLECTION**

| Pin No | Pin Name | Short Description | V DC | ST-BY | Pin No | Pin Name | Short Description       | V DC | ST-BY |
|--------|----------|-------------------|------|-------|--------|----------|-------------------------|------|-------|
| 1      | INA      | INPUT A           | 0,79 | 0     | 6      | Vfb      | FLAYBACK SUPPLY COLTAGE | 46,5 | 0     |
| 2      | INB      | INPUT B           | 0,77 | 0     | 7      | OUTA     | OUTPUT A                | 6,46 | 0     |
| 3      | Vp       | SUPPLY VOLTAGE    | 12,4 | 0     | 8      | GUARD    | GUARD OUTPUT            | 0,25 | 0     |
| 4      | OUTB     | OUTPUT B          | 6,5  | 0     | 9      | FEEDB    | FEEDBACK INPUT          | 6,55 | 0     |
| 5      | GND      | GROUND            | 0    | 0     |        |          |                         |      |       |

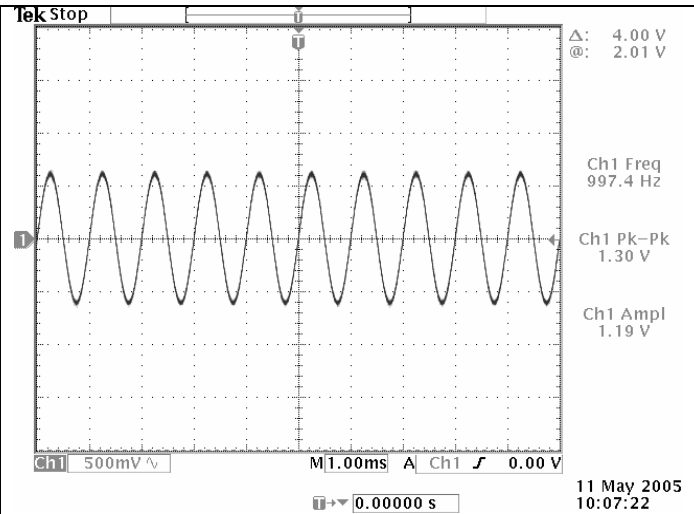
## 9. OSCILLOGRAPHS OF SOME IC PINS

**Note** : A pattern Generator is connected to the TV (Colour Bar, sound 1 kHz)

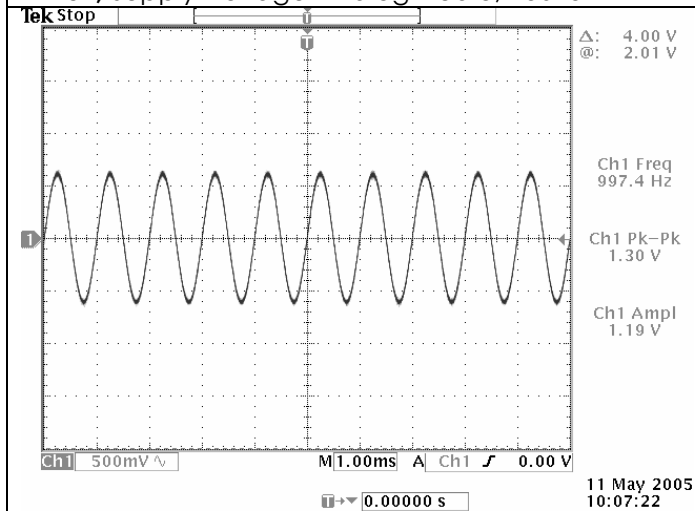
### 9.1 VCTI-IC 101



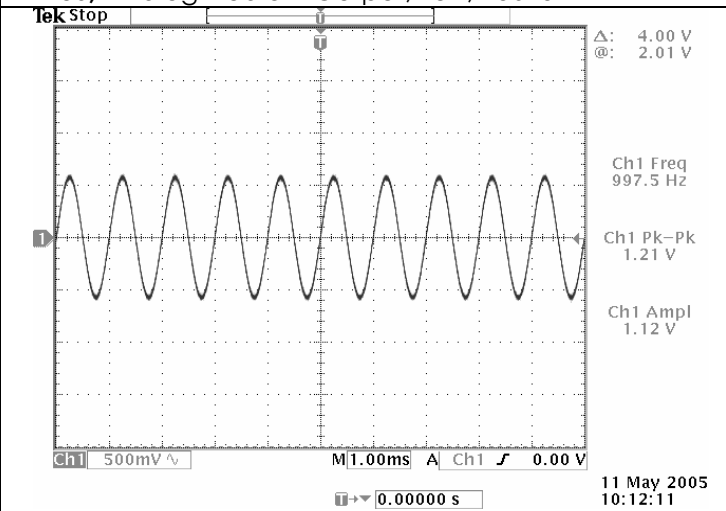
**Pin 02, Supply Voltage Analog Audio, 15625 kHz**



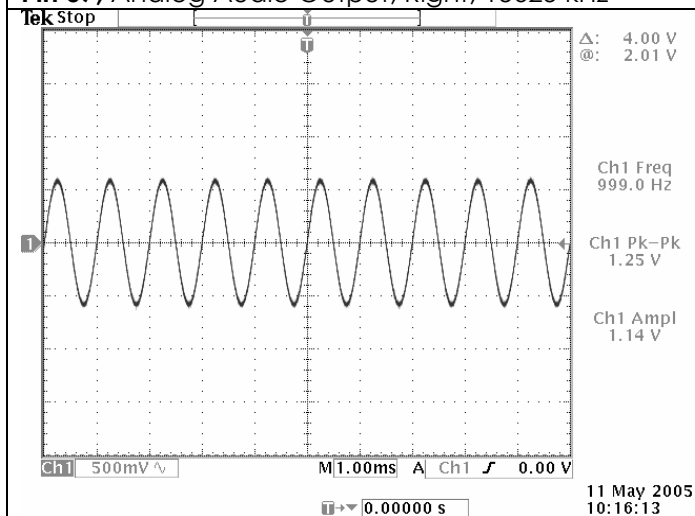
**Pin 06, Analog Audio 1 Output, Left, 15625 kHz**



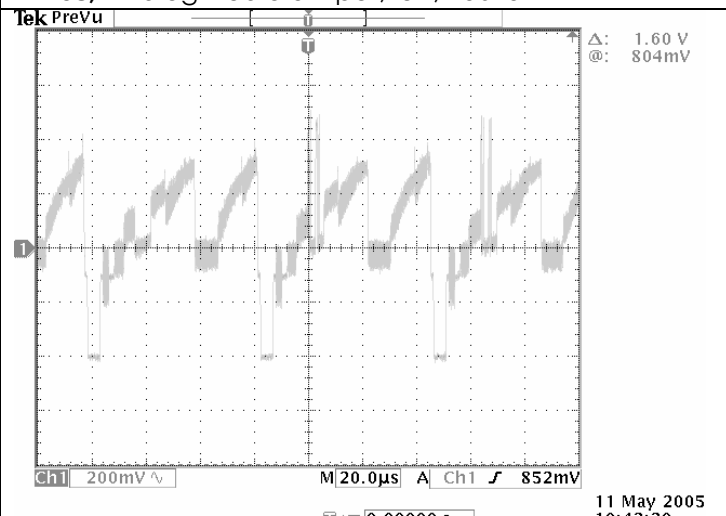
**Pin 07, Analog Audio Output, Right, 15625 kHz**



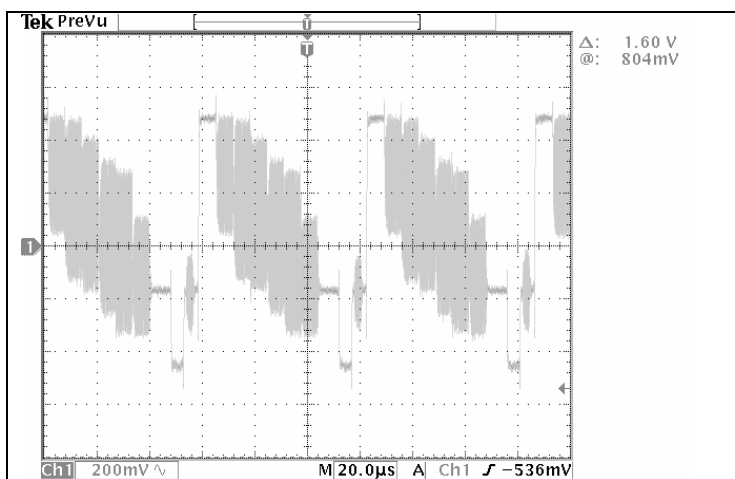
**Pin 08, Analog Audio 3 Input, Left, 15625 kHz**



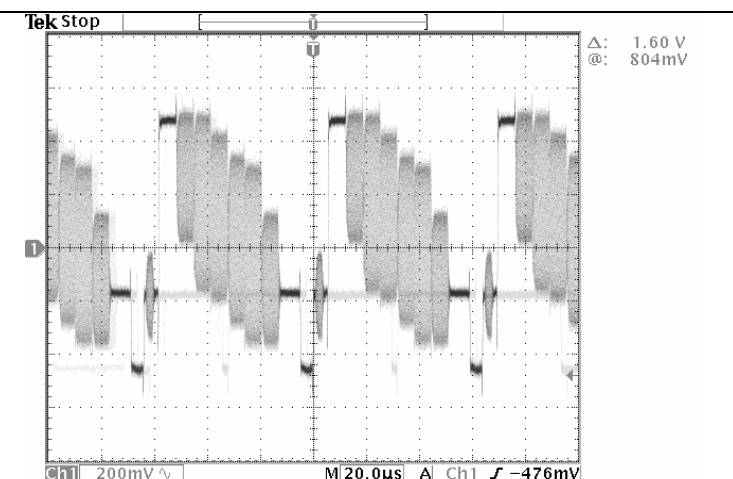
**Pin 09, Analog Audio 3 Input, Right, 15625 kHz**



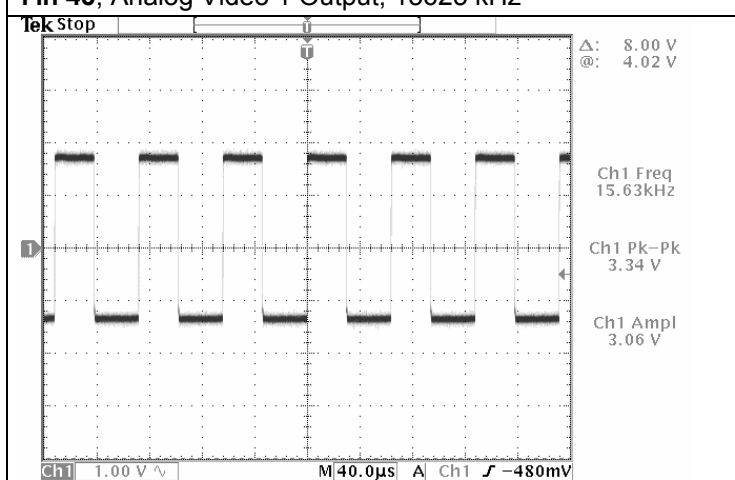
**Pin 38, Analog Video 2 Input, 15625 kHz**



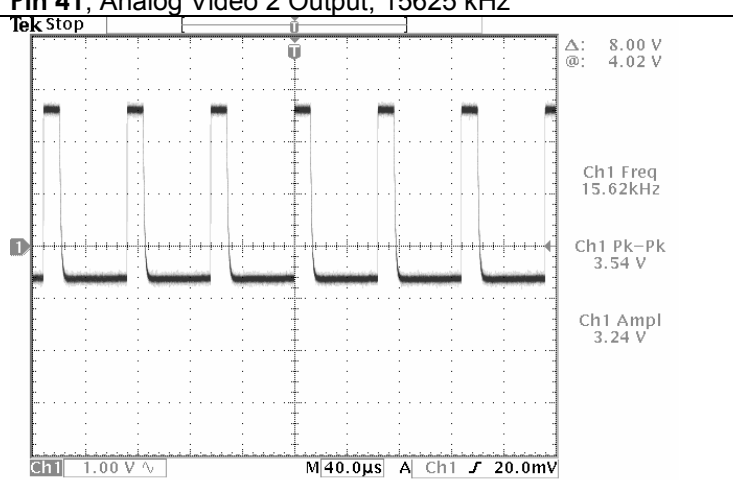
**Pin 40, Analog Video 1 Output, 15625 kHz**



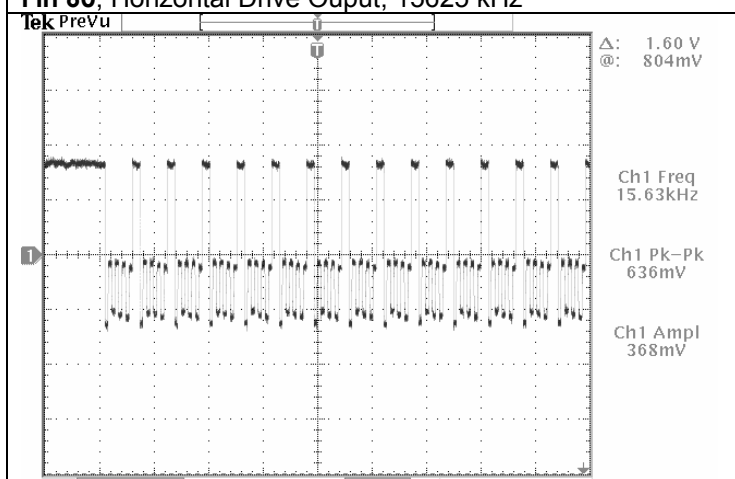
**Pin 41, Analog Video 2 Output, 15625 kHz**



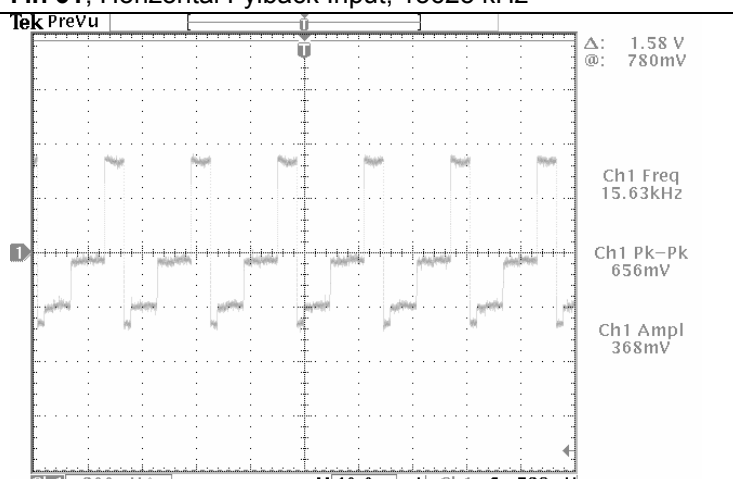
**Pin 60, Horizontal Drive Output, 15625 kHz**



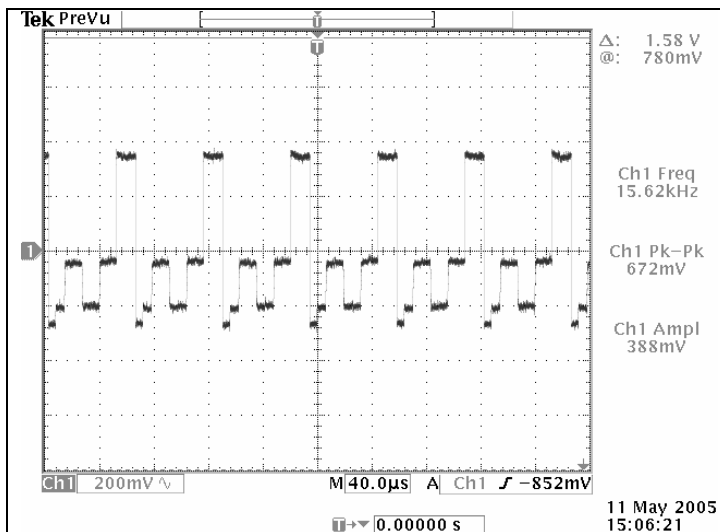
**Pin 61, Horizontal Flyback Input, 15625 kHz**



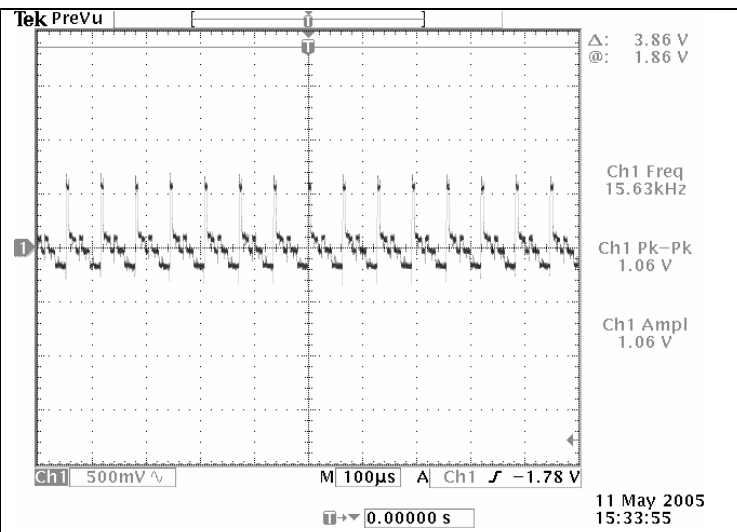
**Pin 71, Analog Blue Output, 15625 kHz**



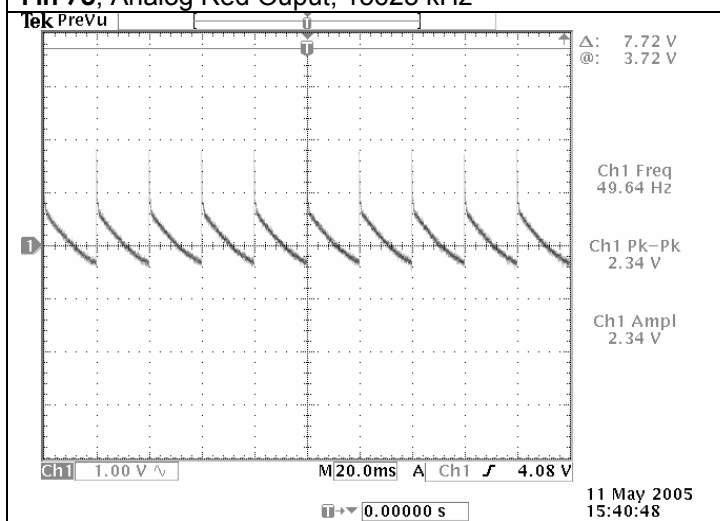
**Pin 72, Analog Green Output, 15625 kHz**



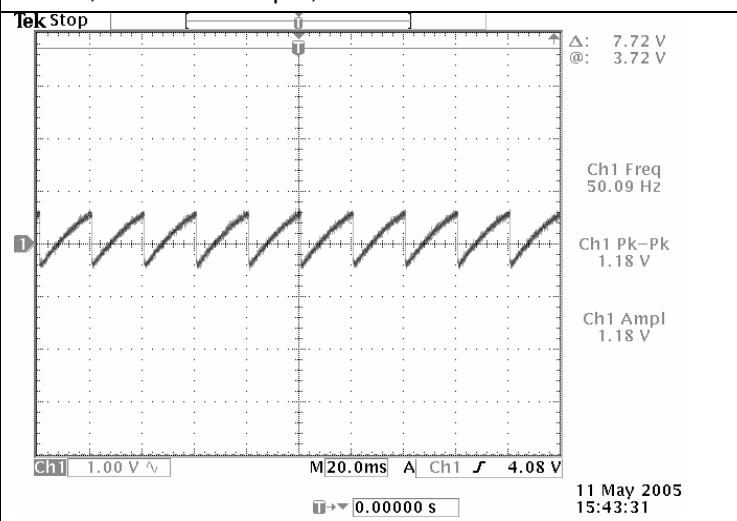
**Pin 73, Analog Red Output, 15625 kHz**



**Pin 80, Sense ADC Input, 15625 kHz**

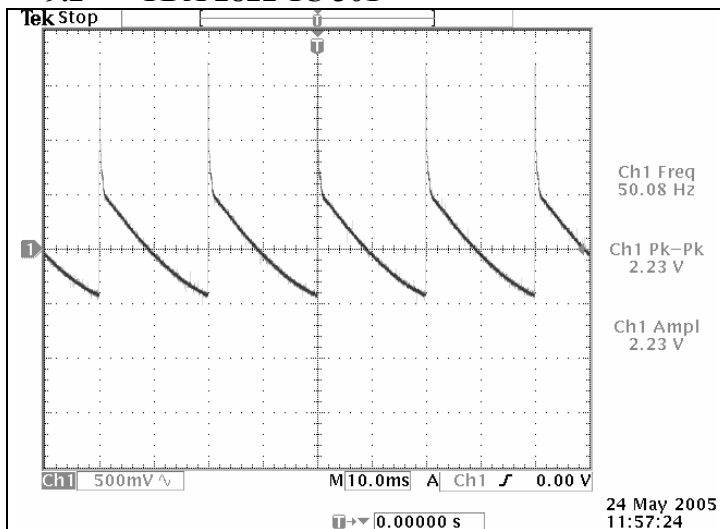


**Pin 84, Differential Vert. Sawtooth Out(VERT-), 15625 kHz**

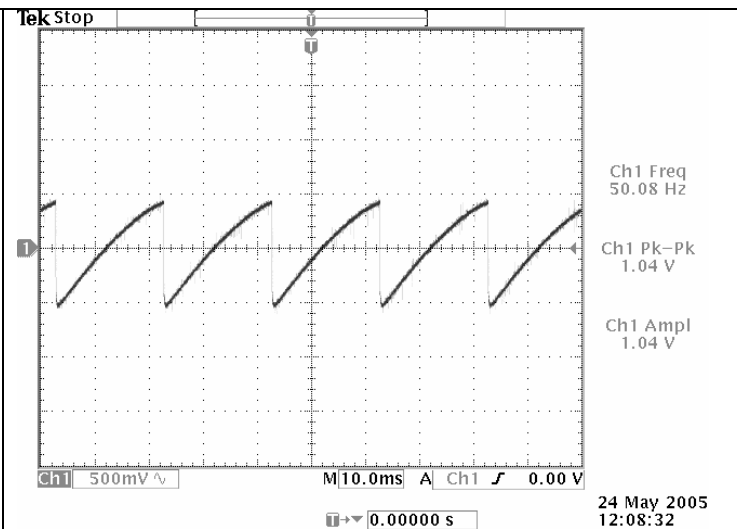


**Pin 85, Differential Vert. Sawtooth Out(VERT+), 15625 kHz**

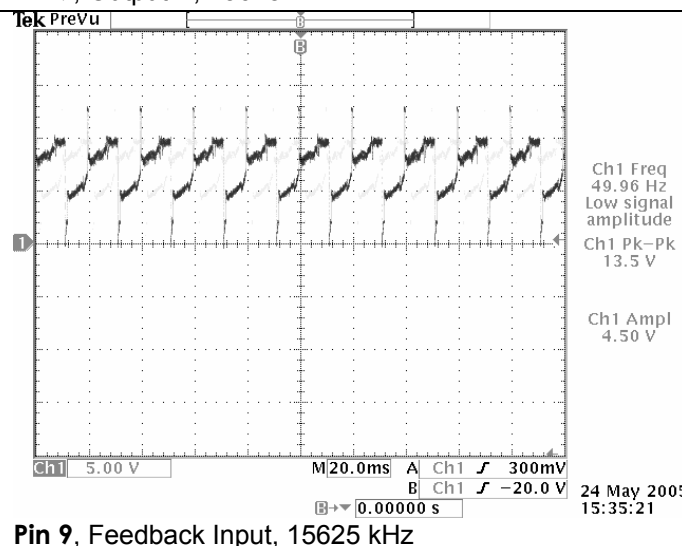
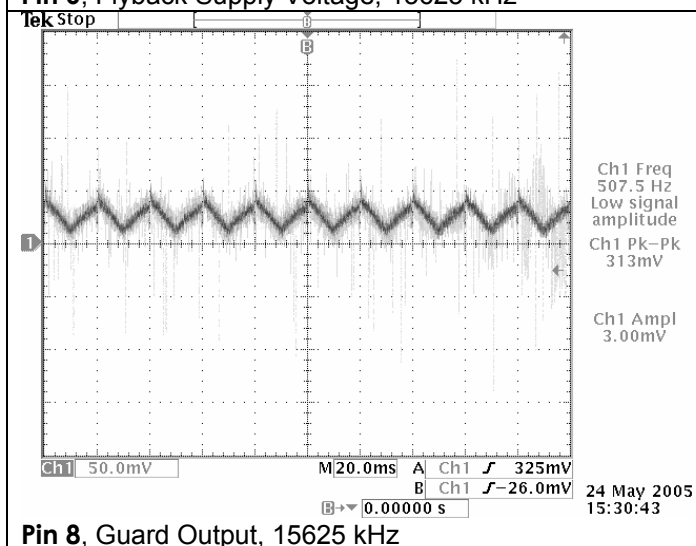
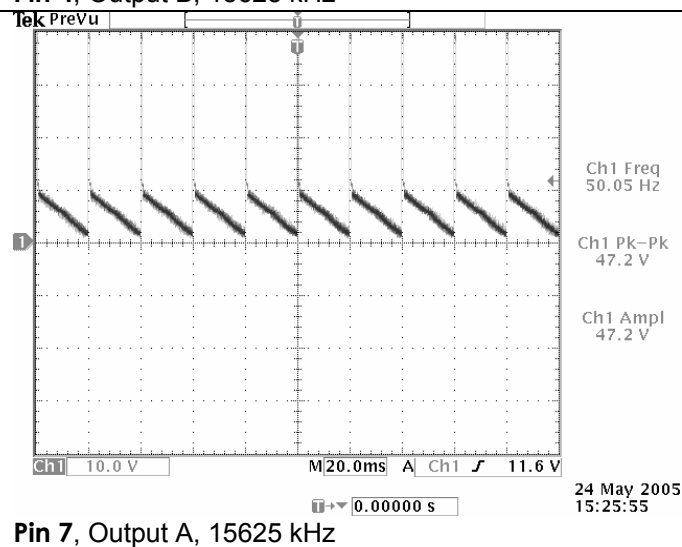
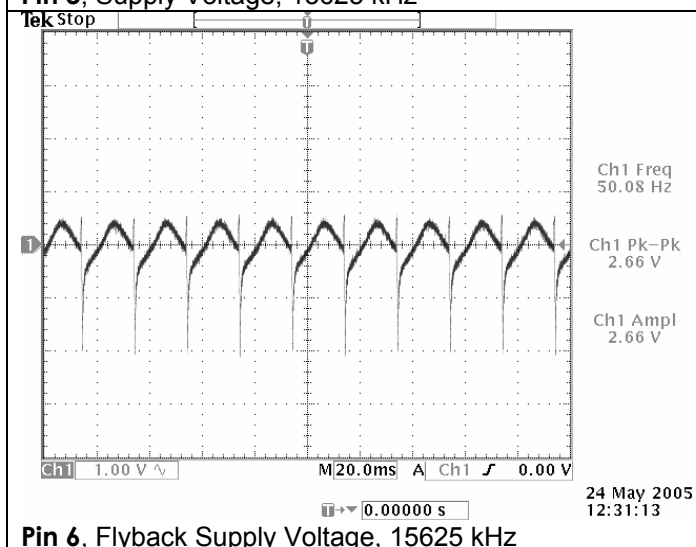
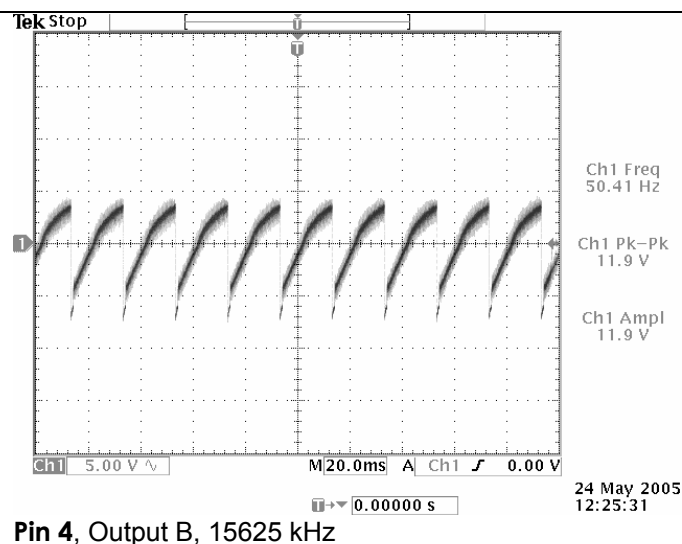
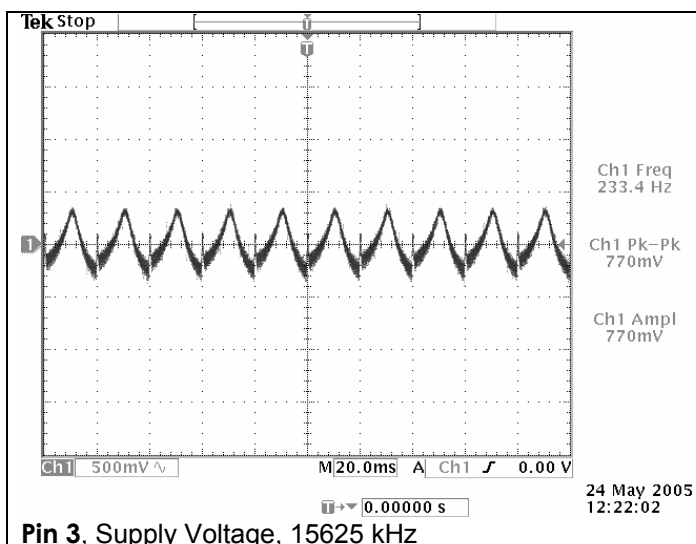
## 9.2 TDA 2822-IC 301



**Pin 1, Input A, 15625 kHz**



**Pin 2, Input B, 15625 kHz**





## 10. ELECTRICAL ADJUSTMENTS

### 1. ELECTRICAL ADJUSTMENTS

#### 1.1 Supply Voltage Adjustment

Connect a digital voltmeter to the cathode of diode D609 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 P602 potentiometer to the following value (after supply adjustment, readjust Screen and focus voltage).

|        |                               |
|--------|-------------------------------|
| 20"    | : 114 VDC (for A48ECR43X51)   |
| 21"    | : 111 VDC (for A51EFS13X191)  |
| 21"    | : 114 VDC (for A51EER33X78)   |
| 21" PF | : 122 VDC (for A51QDX993X030) |
| 21" PF | : 125 VDC (for A51ERF135X80)  |
| 21" PF | : 125 VDC (for A51ELD032X001) |

### 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). To exit from the service menu, TV/TX button should be typed on the Remote Control.

While the service menu is on screen, version and the date of the software are written on right bottom of the screen.

For Example:

SK12256-01 T01

20:29:29

24/12/04



#### 2.1 AGC Adjustment

- Switch to Service Menu
- Find the "AGC METHOD" under "OPTIONS" sub-menu with P+/P-,
- Set its value to "SYNC+PEAK WHITE".
- Find "AGC" under "IF ADJ." sub-menu with P+/P-,
- Set its value to "4"
- Find "AGC FOR VHF I" under "IF ADJ." sub-menu with P+/P-,
- Set its value to "4"
- Set "PIP AGC" topic's value to "15"
- Set "PIP AGC FOR VHF I" topic's value to "20"
- Exit from the service menu.

#### 2.2 Screen Adjustment

- Switch the TV to the AV mode
- Do not make any connection from the scart switch
- Switch on the service menu
- Set the value of "BLUEBLACK" option to "OFF"
- Set the value of the "SCREEN ADJ." to the indicated value in FACTORY SETTINGS TABLE
- Press "OK" button on the RC

- There should appear a horizontal line on the center of the set
- Adjust the screen potentiometer to set the line at the first seen point.
- Exit from the service menu

## 2.3 White Balance Adjustment

- Apply a white pattern with a pattern generator to the antenna input.
- Enter the Service Menu and access to VIDEO ADJ. I sub-menu
- Set the value of "G.CUT OFF" value to "156" and "G.DRIVE" value to "356".
- Adjust red drive with "R.DRIVE" and blue drive with "B.DRIVE".
- Adjust red cut off with "R.CUT OFF" and blue cut off with "B. CUT OFF"
- If white balance can not be adjusted properly, slightly change the values of "G.CUT OFF" and "G.DRIVE".
- Exit from Service menu.

## 2.4 Geometry Adjustments

- Apply the cross hatch pattern with a pattern generator to the antenna input.
- Enter Service Menu and access to GEOMETRY sub-menu
- The options, "50Hz GEOM.", "50Hz. GEOM.HOR.II", "50Hz GEOM.EHT" are for PAL/SECAM.
- The options, "60Hz GEOM.", "60Hz. GEOM.HOR.II", "60Hz GEOM.EHT" are for NTSC.
- Adjust Vertical Amplitude with "VERTICAL AMPLITUDE" option.
- Adjust vertical centring with "VERTICAL SHIFT", vertical linearity with "LINEARITY", vertical s-correction with "S-CORRECTION", vertical parallelogram with "VERTICAL ANGLE", vertical bow with "VERTICAL BOW", horizontal centering with "HORIZONTAL SHIFT", trapeze adjustment with "TRAPEEZE CORR.I", general parabola adjustment with "CUSHION CORR.I" options.
- Adjust the parabola of the top corners with "UPPER CORNER 1" and "UPPER CORNER 2".
- Adjust the parabola of the bottom corners with "LOWER CORNER 1" and "LOWER CORNER 2".
- Adjust the horizontal OSD centering with "HORIZONTAL OSD POSITION" and vertical OSD centering with "VERTICAL OSD POSITION"
- For NTSC adjustments, connect an NTSC signal from AV1 follow the adjustments explained above under the sub-menus "60Hz GEOM.", "60Hz. GEOM.HOR.II", "60Hz GEOM.EHT".
- Exit from the Service Menu.

## 2.5 Options Menu

Enter the Service Menu with the Service RC and access to OPTION sub-menu and the options and their definitions are written below.

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AV1YUV    | : AVAILABLE(Component input is available from Scart 1); N/A(Not Available)                                                                                                                                                                                                                                                                                                                                                                                                                              |
| AV2&AV3   | : AV2&AV3 N/A (Not Available); AV2 AVAIL.-AV3 N/A (AV1 Available, AV2 Not Av.); AV2&AV3 AVAILABLE ( Both Available)                                                                                                                                                                                                                                                                                                                                                                                     |
| AV4       | : NONE(No Front AV); CVBS+SVHS(Both Available); CVBS ONLY(Front AV Available); SVHS ONLY(SVHS available)                                                                                                                                                                                                                                                                                                                                                                                                |
| TELETEXT  | : DEFAULT(Teletext); FASTEXT; TOPTXT; FASTEXT+TOPTXT                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| LANGUAGE  | : A (English, French, German, Italian, Spanish, Portuguese, Dutch, Greek, Danish, Swedish, Finnish, Norwegian, Turkish, Hebrew, Russian, Hungarian, Slovak, Czech, Polish, Albanian, Macedonian, Serbian, Slovenian, Romanian, Croatia, Bulgarian);<br>B (English, French, German, Italian, Dutch, Greek, Danish, Swedish, Spanish, Portuguese, Norwegian, Finnish, Albanian, Macedonian, Turkish, Russian, Hebrew, Hungarian, Croatia, Romanian, Bulgarian, Slovenian, Czech, Slovak, Arabic, Persian) |
| TXT TABLE | : AUTO; WEST(English, French, German, Turkish, Spanish, Italian, Finnish, Swedish, Norwegian, Danish); EAST(Polish, French, Hungarian, Czech, German, Slovenian, Italian, Romanian); GREEK(English, French, Turkish, German, Finnish, Norwegian, Swedish, Danish, Spanish, Italian, Greek); CYRILLIC(English, Russian, German, Czech, Estonian, Ukrainian, Latvian); ARABIC(English,                                                                                                                    |

French, German, Turkish, Spanish, Italian, Finnish, Swedish, Norwegian, Danish, Arabic);  
 FARSI(English, French, German, Turkish, Spanish, Italian, Finnish, Swedish, Norwegian, Danish,  
 Persian); HEBREW(English, French, German, Turkish, Italian, Finnish, Swedish, Norwegian, Danish)

CRT : 4:3; 16:9  
 PIP : AVAILABLE; N/A  
 MAIN TUNER : Philips; Panasonic DB2G3-DA5G3; Temic; Panasonic D44G3; Sharp or Alps  
 PIP TUNER : Philips; Panasonic DB2G3-DA5G3; Temic; Panasonic D44G3; Sharp or Alps  
 SVM&DCI : ON; OFF; MENU  
 BLUEBLACK : ON(blueblack acticated), OFF(Blueblack inactivated)  
 LTI&COMB : ON; OFF  
 CTI : ON(Colour Transition Improvement available); OFF(N/A)  
 ADAPTIVE PKG : ON(Digital Noise Reduction available); OFF(N/A); MENU(via menu)  
 PROTECTION : N/A(No Protection circuit); BCL ONLY(Only Beem Current Limiting available); VERTICAL ONLY(Only Vertical protection available); BCL&VERTICAL(Both available)  
 PANORAMA : AVAILABLE; N/A  
 KEYBOARD : P-P+V-V+; MENU P/V-+  
 CALCULATOR : AVAILABLE; N/A  
 ALARM TIMER : AVAILABLE; N/A  
 DEMO : 0(Otoprogram in first start, closed); 1(open)

## 2.6 Sound Options Menu

BG : EUROPE(BG Europe); NEW ZELLAND(BG New Zelland); AUSTRALIA(BG Australia); N/A(BG not available)  
 DK : AVAILABLE; N/A  
 I : AVAILABLE; N/A  
 L/L' : AVAILABLE; N/A  
 FM RADIO  
   / TV GUIDE : NONE(Radio&EPG, not available); FM RADIO(Only radio available); TV GUIDE(Only TV Guide available)  
 NICAM : AVAILABLE; N/A  
 DOLBY VITUAL : AVAILABLE; N/A  
 BASS OPTION : DYNAMIC BASS(Dynamic Bass available); SUBWOOFER(Subwoofer available); NONE  
 HEADPHONE : AVAILABLE; N/A  
 CARRIER MUTE : VIA MSP; VIA MICRO  
 PAT : AVAILABLE(Picture and Text available); N/A  
 SIMPLE HOTEL : AVAILABLE; N/A  
 HOTEL MAX  
   VOL : Limites the max volume level in hotel mode  
 AGC METHOD : SYNC PEAK WHITE; FIXED  
 TILT : N/A; AVAILABLE  
 CRT 4:3  
 MODE 16:9 : VIA FLYBL(Prevents cut off line to be seen by shifting up); DISABLE CUTOFF( Directly Prevents Cut off line to be seen)

## 2.7 Hotel Mode

If "Simple Hotel" option in the Service Menu is selected as "ON", to access set up menu "4658" should be typed whilst the "Features Menu" is on screen. After finishing the adjustments by taking the TV to St.by or shutting down, the access can be re-inhibited.

## 2.8 Factory Settings for Service Mode

| FACTORY SETTINGS FOR SERVICE MODE |      |             |         |                     |      |             |         |
|-----------------------------------|------|-------------|---------|---------------------|------|-------------|---------|
| VIDEO ADJ. I                      | 20"  | 21"SF (SS8) | 21" VC6 | 50 HZ GEOM.         | 20"  | 21"SF (SS8) | 21" VC6 |
| R.DRIVE                           | 356  | 356         | 356     | VERTICAL AMPLITUDE  | -210 | 140         | 110     |
| G.DRIVE                           | 356  | 356         | 356     | VERTICAL SHIFT      | 3    | 7           | 7       |
| B.DRIVE                           | 356  | 356         | 356     | LINEARITY           | 20   | 40          | 0       |
| R. CUTOFF                         | 156  | 156         | 156     | S-CORRECTION        | 90   | 40          | 80      |
| G. CUTOFF                         | 156  | 156         | 156     | VERTICAL ANGLE      | 0    | 0           | 0       |
| B. CUTOFF                         | 156  | 156         | 156     | VERTICAL BOW        | 0    | 0           | 0       |
| IBRM                              | 280  | 280         | 260     | START LINE MEASUR.  | 11   | 11          | 11      |
| WDRM                              | 290  | 270         | 270     | VER. BLANKING STOP  | 25   | 22          | 22      |
| SCREEN ADJ.                       | 250  | 297         | 375     | VER. BLANKING START | 293  | 333         | 333     |
| VIDEO ADJ. II                     |      |             |         | HORIZONTAL WIDTH    | 0    | 0           | 0       |
| BCL GAIN                          | 310  | 280         | 280     | HORIZONTAL SHIFT    | -27  | -44         | -37     |
| BCL TRESHOLD                      | 245  | 180         | 180     | TRAPEZE CORR. I     | 0    | 0           | 0       |
| BCL TRESHOLD II                   | 155  | 175         | 175     | CUSHION CORR. I     | 0    | 0           | 0       |
| BCL TIME CONSTANT 1               | 511  | 511         | 511     | UPPER CORNER 1 I    | 0    | 0           | 0       |
| BCL TIME CONSTANT 2               | 0    | 0           | 0       | LOWER CORNER 1 I    | 0    | 0           | 0       |
| OSD BRIGHTNESS                    | 135  | 130         | 130     | UPPER CORNER 2 I    | 0    | 0           | 0       |
| OSD CONTRAST                      | 140  | 120         | 120     | LOWER CORNER 2 I    | 0    | 0           | 0       |
| TXT BRIGHTNESS                    | 130  | 100         | 100     | HOR. BLANKING STOP  | 225  | 205         | 205     |
| TXT CONTRAST                      | 135  | 120         | 120     | HOR. BLANKING START | 1225 | 1245        | 1245    |
| YC DELAY FOR PAL                  | 9    | 9           | 9       | HOR. OSD POSITION   | 31   | 31          | 31      |
| YC DELAY FOR SECAM                | 2    | 2           | 2       | VER. OSD POSITION   | 18   | 18          | 18      |
| YC DELAY FOR NTSC                 | 10   | 10          | 10      | 60 HZ GEOM.         |      |             |         |
| SUBCARRIER ADJ.                   | 8    | 18          | 18      | VERTICAL AMPLITUDE  | -198 | 210         | 120     |
| VIDEO ADJ. III                    |      |             |         | VERTICAL SHIFT      | 7    | 17          | 18      |
| DPWL GAIN                         | -300 | -300        | -300    | LINEARITY           | 0    | 40          | 10      |
| DPWL START P.                     | 380  | 500         | 500     | S-CORRECTION        | -41  | -30         | 0       |
| PWL TIME CONSTANT                 | 1    | 1           | 1       | VERTICAL ANGLE      | 0    | 0           | 0       |
| PWL                               | 60   | 70          | 70      | VERTICAL BOW        | 0    | 0           | 0       |
| SVM GAIN                          | 0    | 0           | 0       | START LINE MEASUR.  | 11   | 12          | 12      |
| SVM CORING                        | 0    | 0           | 0       | VER. BLANKING STOP  | 20   | 18          | 18      |
| SVM LIMITTER                      | 0    | 0           | 0       | VER. BLANKING START | 310  | 333         | 333     |
| SVM DELAY                         | 0    | 0           | 0       | HORIZONTAL WIDTH    | 0    | 0           | 0       |
| SVM DIFF. WINDOW                  | 0    | 0           | 0       | HORIZONTAL SHIFT    | -61  | -61         | -48     |
| PIP POSITION                      |      |             |         | TRAPEZE CORR. I     | 0    | 0           | 0       |
| HORIZONTAL                        |      |             |         | CUSHION CORR. I     | 0    | 0           | 0       |
| VERTICAL                          |      |             |         | UPPER CORNER 1 I    | 0    | 0           | 0       |
| SOUND OPTIONS                     |      |             |         | LOWER CORNER 1 I    | 0    | 0           | 0       |
| BCL DELTA                         | 50   | 50          | 50      | UPPER CORNER 2 I    | 0    | 0           | 0       |
| TILT                              | 0    | 0           | 0       | LOWER CORNER 2 I    | 0    | 0           | 0       |
| 50HZ GEOM. EHT                    |      |             |         | HOR. BLANKING STOP  | 225  | 175         | 175     |
| EHT TRESHOLD                      | 63   | 63          | 63      | HOR. BLANKING START | 1220 | 1235        | 1235    |
| EHT TIME CONSTANT                 | 60   | 60          | 60      | HOR. OSD POSITION   | 18   |             | 16      |
| VERTICAL EHT 1                    | -142 | -110        | -110    | VER. OSD POSITION   | 6    |             | 8       |
| VERTICAL EHT 2                    | -122 | -120        | -120    | 50 HZ GEOM. HOR. II |      |             |         |
| HORIZONTAL EHT 1                  | 0    | 0           | 0       | HOR. WIDTH II       | 110  | 110         | 110     |
| HORIZONTAL EHT 2                  | 0    | 0           | 0       | VER. ZOOM II        | 47   | 68          | 60      |
| EHT DTC                           | -50  | -50         | -50     | FLYBL               | 16   | 14          | 14      |
| EHT P1                            | -49  | -49         | -49     | TRAPEZE CORR. II    | 0    | 0           | 0       |
| EHT P2                            | -50  | -50         | -50     | CUSHION CORR. II    | 0    | 0           | 0       |
| 60 HZ GEOM. EHT                   |      |             |         | UPPER CORNER 1 II   | 0    | 0           | 0       |
| EHT TRESHOLD                      | 50   | 50          | 50      | LOWER CORNER 1 II   | 0    | 0           | 0       |
| EHT TIME CONSTANT                 | 40   | 40          | 40      | UPPER CORNER 2 II   | 0    | 0           | 0       |
| VERTICAL EHT 1                    | -109 | -123        | -123    | LOWER CORNER 2 II   | 0    | 0           | 0       |
| VERTICAL EHT 2                    | -123 | -120        | -120    | 60 HZ GEOM. HOR. II |      |             |         |
| HORIZONTAL EHT 1                  | 0    | 0           | 0       | HOR. WIDTH II       | 110  | 0           | 0       |
| HORIZONTAL EHT 2                  | 0    | 0           | 0       | VER. ZOOM II        | 50   | 65          | 57      |
| EHT DTC                           | -50  | -50         | -50     | FLYBL               | 10   | 10          | 10      |
| EHT P1                            | -39  | -50         | -50     | TRAPEZE CORR. II    | 0    | 0           | 0       |
| EHT P2                            | -34  | -55         | -55     | CUSHION CORR. II    | 0    | 0           | 0       |
|                                   |      |             |         | UPPER CORNER 1 II   | 0    | 0           | 0       |
|                                   |      |             |         | LOWER CORNER 1 II   | 0    | 0           | 0       |
|                                   |      |             |         | UPPER CORNER 2 II   | 0    | 0           | 0       |
|                                   |      |             |         | LOWER CORNER 2 II   | 0    | 0           | 0       |

**FACTORY SETTINGS FOR SERVICE MODE**

| <b>VIDEO ADJ. I</b>    | <b>21" PF<br/>(SS0)</b> | <b>21"PF<br/>(GS9)</b> | <b>21" PF<br/>(VC0)</b> | <b>50 HZ GEOM.</b>         | <b>21" PF<br/>(SS0)</b> | <b>21"PF<br/>(GS9)</b> | <b>21" PF<br/>(VC0)</b> |
|------------------------|-------------------------|------------------------|-------------------------|----------------------------|-------------------------|------------------------|-------------------------|
| R.DRIVE                | 356                     | 356                    | 356                     | VERTICAL AMPLITUDE         | -250                    | -170                   | -105                    |
| G.DRIVE                | 356                     | 356                    | 356                     | VERTICAL SHIFT             | 2                       | 2                      | 2                       |
| B.DRIVE                | 356                     | 356                    | 356                     | LINEARITY                  | 20                      | 12                     | -12                     |
| R. CUTOFF              | 156                     | 156                    | 156                     | S-CORRECTION               | 140                     | 130                    | 140                     |
| G. CUTOFF              | 156                     | 156                    | 156                     | VERTICAL ANGLE             | 0                       | 0                      | 0                       |
| B. CUTOFF              | 156                     | 156                    | 156                     | VERTICAL BOW               | 0                       | 0                      | 0                       |
| IBRM                   | 270                     | 280                    | 280                     | START LINE MEASUR.         | 11                      | 14                     | 11                      |
| WDRM                   | 290                     | 240                    | 250                     | VER. BLANKING STOP         | 20                      | 22                     | 20                      |
| SCREEN ADJ.            | 296                     | 250                    | 405                     | VER. BLANKING START        | 333                     | 333                    | 333                     |
| <b>VIDEO ADJ. II</b>   |                         |                        |                         | HORIZONTAL WIDTH           | 0                       | 0                      | 0                       |
| BCL GAIN               | 270                     | 270                    | 330                     | HORIZONTAL SHIFT           | -23                     | -34                    | -39                     |
| BCL TRESHOLD           | 200                     | 200                    | 160                     | TRAPEZE CORR. I            | 0                       | 0                      | 0                       |
| BCL TRESHOLD II        | 130                     | 80                     | 74                      | CUSHION CORR. I            | 0                       | 0                      | 0                       |
| BCL TIME CONSTANT 1    | 511                     | 511                    | 511                     | UPPER CORNER 1 I           | 0                       | 0                      | 0                       |
| BCL TIME CONSTANT 2    | 0                       | 0                      | 0                       | LOWER CORNER 1 I           | 0                       | 0                      | 0                       |
| OSD BRIGHTNESS         | 120                     | 120                    | 120                     | UPPER CORNER 2 I           | 0                       | 0                      | 0                       |
| OSD CONTRAST           | 140                     | 110                    | 120                     | LOWER CORNER 2 I           | 0                       | 0                      | 0                       |
| TXT BRIGHTNESS         | 110                     | 110                    | 110                     | HOR. BLANKING STOP         | 215                     | 215                    | 210                     |
| TXT CONTRAST           | 110                     | 110                    | 110                     | HOR. BLANKING START        | 1235                    | 1235                   | 1235                    |
| YC DELAY FOR PAL       | 9                       | 9                      | 9                       | HOR. OSD POSITION          | 31                      | 31                     | 31                      |
| YC DELAY FOR SECAM     | 2                       | 2                      | 2                       | VER. OSD POSITION          | 18                      | 18                     | 18                      |
| YC DELAY FOR NTSC      | 10                      | 10                     | 10                      | <b>60 HZ GEOM.</b>         |                         |                        |                         |
| SUBCARRIER ADJ.        | 18                      | 18                     | 18                      | VERTICAL AMPLITUDE         | -206                    | -180                   | -130                    |
| <b>VIDEO ADJ. III</b>  |                         |                        |                         | VERTICAL SHIFT             | 9                       | 4                      | 5                       |
| DPWL GAIN              | -300                    | -300                   | -300                    | LINEARITY                  | 0                       | -50                    | -70                     |
| DPWL START P.          | 400                     | 400                    | 400                     | S-CORRECTION               | -41                     | 100                    | 140                     |
| PWL TIME CONSTANT      | 1                       | 1                      | 1                       | VERTICAL ANGLE             | 0                       | 0                      | 0                       |
| PWL                    | 90                      | 70                     | 90                      | VERTICAL BOW               | 0                       | 0                      | 0                       |
| SVM GAIN               | 0                       | 0                      | 0                       | START LINE MEASUR.         | 11                      | 16                     | 11                      |
| SVM CORING             | 0                       | 0                      | 0                       | VER. BLANKING STOP         | 18                      | 21                     | 18                      |
| SVM LIMITTER           | 0                       | 0                      | 0                       | VER. BLANKING START        | 333                     | 333                    | 333                     |
| SVM DELAY              | 0                       | 0                      | 0                       | HORIZONTAL WIDTH           | 0                       | 0                      | -57                     |
| SVM DIFF. WINDOW       | 0                       | 0                      | 0                       | HORIZONTAL SHIFT           | -42                     | -50                    | -42                     |
| <b>PIP POSITION</b>    |                         |                        |                         | TRAPEZE CORR. I            | 0                       | 0                      | 0                       |
| HORIZONTAL             |                         |                        |                         | CUSHION CORR. I            | 0                       | 0                      | 0                       |
| VERTICAL               |                         |                        |                         | UPPER CORNER 1 I           | 0                       | 0                      | 0                       |
| <b>SOUND OPTIONS</b>   |                         |                        |                         | LOWER CORNER 1 I           | 0                       | 0                      | 0                       |
| BCL DELTA              | 50                      | 20                     | 50                      | UPPER CORNER 2 I           | 0                       | 0                      | 0                       |
| TILT                   | 0                       | 0                      | 0                       | LOWER CORNER 2 I           | 0                       | 0                      | 0                       |
| <b>50HZ GEOM. EHT</b>  |                         |                        |                         | HOR. BLANKING STOP         | 190                     | 175                    | 183                     |
| EHT TRESHOLD           | 70                      | 70                     | 70                      | HOR. BLANKING START        | 1225                    | 1225                   | 1225                    |
| EHT TIME CONSTANT      | 40                      | 40                     | 40                      | HOR. OSD POSITION          | 18                      | 16                     | 18                      |
| VERTICAL EHT 1         | -162                    | -130                   | -200                    | VER. OSD POSITION          | 6                       | 10                     | 9                       |
| VERTICAL EHT 2         | -160                    | -50                    | -40                     | <b>50 HZ GEOM. HOR. II</b> |                         |                        |                         |
| HORIZONTAL EHT 1       | 0                       | 0                      | 0                       | HOR. WIDTH II              | 110                     | 110                    | 110                     |
| HORIZONTAL EHT 2       | 0                       | 0                      | 0                       | VER. ZOOM II               | 60                      | 50                     | 60                      |
| EHT DTC                | 0                       | 0                      | 0                       | FLYBL                      | 14                      | 17                     | 14                      |
| EHT P1                 | 0                       | 0                      | 0                       | TRAPEZE CORR. II           | 0                       | 0                      | 0                       |
| EHT P2                 | 0                       | 0                      | 0                       | CUSHION CORR. II           | 0                       | 0                      | 0                       |
| <b>60 HZ GEOM. EHT</b> |                         |                        |                         | UPPER CORNER 1 II          | 0                       | 0                      | 0                       |
| EHT TRESHOLD           | 80                      | 80                     | 80                      | LOWER CORNER 1 II          | 0                       | 0                      | 0                       |
| EHT TIME CONSTANT      | 40                      | 40                     | 40                      | UPPER CORNER 2 II          | 0                       | 0                      | 0                       |
| VERTICAL EHT 1         | -93                     | -130                   | -180                    | LOWER CORNER 2 II          | 0                       | 0                      | 0                       |
| VERTICAL EHT 2         | -80                     | -40                    | -40                     | <b>60 HZ GEOM. HOR. II</b> |                         |                        |                         |
| HORIZONTAL EHT 1       | 0                       | 0                      | 0                       | HOR. WIDTH II              | 110                     | 110                    | 110                     |
| HORIZONTAL EHT 2       | 0                       | 0                      | 0                       | VER. ZOOM II               | 60                      | 60                     | 60                      |
| EHT DTC                | 0                       | 0                      | 0                       | FLYBL                      | 10                      | 10                     | 10                      |
| EHT P1                 | 0                       | 0                      | 0                       | TRAPEZE CORR. II           | 0                       | 0                      | 0                       |
| EHT P2                 | 0                       | 0                      | 0                       | CUSHION CORR. II           | 0                       | 0                      | 0                       |
|                        |                         |                        |                         | UPPER CORNER 1 II          | 0                       | 0                      | 0                       |
|                        |                         |                        |                         | LOWER CORNER 1 II          | 0                       | 0                      | 0                       |
|                        |                         |                        |                         | UPPER CORNER 2 II          | 0                       | 0                      | 0                       |
|                        |                         |                        |                         | LOWER CORNER 2 II          | 0                       | 0                      | 0                       |

## 11. CHANNEL FREQUENCY TABLE

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 |  |  |  |

| 12. SPARE PARTS LIST |                                        |            |                                    |
|----------------------|----------------------------------------|------------|------------------------------------|
| Inst/Point           | Object description                     | Component  | Definitions                        |
|                      | AV3/KLK MODULE ASSY 21T29/T34 12.3SX   | M16130     |                                    |
|                      | S-VHS AUTO INSR 29" 14.1               | 7S2129     |                                    |
|                      | HEADPHONE JACK YKB21-5103              | 031423R    |                                    |
|                      | CPT SS A48ECR43X51 (HUNGARY)           | 056320-SS4 |                                    |
|                      | DEGAUSSING COIL ASSY 20" BAND          | 620167-AS  |                                    |
|                      | K1 CHASSIS 20"P/SX/HP/AV/2SC A-OSD     | KX2110     |                                    |
|                      | KNOB POWER SWITCH SILV.MAS.20K08       | J50208F    |                                    |
|                      | KNOB VOL.20K08 SILVER PAINTED          | J50262F    |                                    |
|                      | KNOB PROGRAM VOLUME SILVER 20K08       | J50212F    |                                    |
|                      | RC BEKO TYPE SILVER C7/C8              | ZX6187F    |                                    |
|                      | SPEAKER 8R./5W (N)/7W (MAX) 50X90      | 7GA107R    |                                    |
| AQUA                 | CABLE HARNESS                          | 60U535-AS  | See the "CPT Difference List", too |
| C01                  | EC 47UF M 6.3V 11*5 R:5                | 251487R    |                                    |
| C02-C03              | CC-CHIP 100PF J 50V /1206 NPO          | 291101R    |                                    |
| C102                 | EC 47UF 16V 11*5 R:5                   | 251478R    |                                    |
| C103                 | CC-CHIP 10NF K 50V /0603 X7R           | 293113R    |                                    |
| C104-C109            | CC-CHIP 1NF K 50V /0603 X7R            | 292114R    |                                    |
| C111-C128            | CC-CHIP 100NF K 50V /0603 X7R          | 294122R    |                                    |
| C129                 | EC 3.3UF 16V 11*5 R:5                  | 250333R    |                                    |
| C130-C135            | EC 100UF 16V 11*6 R:5                  | 252112R    |                                    |
| C136-C151            | CC-CHIP 47PF J 50V /0603 NPO TAPE      | 290475R    |                                    |
| C152-C155            | CC-CHIP 22PF J 50V /0603 NPO TAPE      | 290223R    |                                    |
| C156-C157            | CC-CHIP 100PF J 50V /0603 NPO          | 291104R    |                                    |
| C158                 | CC-CHIP 27NF J 25V /0603 X7R           | 293271R    |                                    |
| C160                 | EC 4.7UF 63V 11*5 R:5                  | 250475R    |                                    |
| C161                 | CC-CHIP 1UF K 16V /0805 X7R            | 295110R    |                                    |
| C162-C163            | CC-CHIP 1NF K 50V /0603 X7R            | 292114R    |                                    |
| C203-C210            | EC 4.7UF 16V 11*5 R:5                  | 250470R    |                                    |
| C211-C212            | CC-CHIP 220PF J 50V /0603 NPO TAPE     | 291226R    |                                    |
| C215-C219            | CC-CHIP 22NF K 50V/0603 X7R TAPE       | 293234R    |                                    |
| C221-C224            | CC-CHIP 220PF J 50V /0603 NPO TAPE     | 291226R    |                                    |
| C228-C230            | EC 47UF 16V 11*5 R:5                   | 251478R    |                                    |
| C233-C235            | CC-CHIP 10NF K 50V /0603 X7R           | 293113R    |                                    |
| C237-C240            | CC-CHIP 4.7NF K 50V /0603 X7R          | 292475R    |                                    |
| C242                 | EC 47UF 16V 11*5 R:5                   | 251478R    |                                    |
| C247-C248            | CC-CHIP 1NF K 50V /0603 X7R            | 292114R    |                                    |
| C249                 | EC 10UF 16V 5*3.5 R:5                  | 251105R    |                                    |
| C250                 | CC-CHIP 220NF K 50V /0805 X7R          | 294233R    |                                    |
| C251                 | CC-CHIP 10NF K 50V /0603 X7R           | 293113R    |                                    |
| C252-C253            | CC-CHIP 100PF J 50V /0603 NPO          | 291104R    |                                    |
| C301                 | CC-CHIP 10NF K 50V /0603 X7R           | 293113R    |                                    |
| C302                 | CC 1NF K 63V NPO R:5                   | 202109R    |                                    |
| C304-C307            | CC-CHIP 1NF K 50V /0603 X7R            | 292114R    |                                    |
| C308                 | EC 10UF 16V 5*3.5 R:5                  | 251105R    |                                    |
| C309-C310            | CC-CHIP 100NF K 50V /0603 X7R          | 294122R    |                                    |
| C311-C313            | EC 100UF 16V 11*6 R:5                  | 252112R    |                                    |
| C315                 | CC-CHIP 47NF K 25V /0603 X7R TAPE      | 293478R    |                                    |
| C316-C317            | CC-CHIP 470NF K 16V /0805 X7R          | 294476R    |                                    |
| C318-C321            | CC-CHIP 1NF K 50V /0603 X7R            | 292114R    |                                    |
| C322                 | EC 100UF 25V 11*6 R:5                  | 252113R    |                                    |
| C323-C324            | CC-CHIP 1.5NF K 50V /0603 X7R TAPE     | 292153R    |                                    |
| C325                 | CC-CHIP 68NF K 50V /0603 X7R           | 293685R    |                                    |
| C326                 | EC 1500UF 35V 20*13 R:5                | 253155R    |                                    |
| C327-C328            | EC 1000UF 16V 20*10 R:5                | 253115R    |                                    |
| C329-C330            | C-PEM 100NF J 100V R:5                 | 274107R    |                                    |
| C331                 | C-CE 100NF 50V K R:5                   | 224112R    |                                    |
| C401                 | EC 4.7UF 16V 11*5 R:5                  | 250470R    |                                    |
| C402                 | CC-CHIP 22NF K 50V/0603 X7R TAPE       | 293234R    |                                    |
| C404-C405            | CC-CHIP 10NF K 50V /0603 X7R           | 293113R    |                                    |
| C406-C407            | CC-CHIP 33NF K 50V /0603 X7R           | 293334R    |                                    |
| C408-C410            | CC-CHIP 10NF K 50V /0603 X7R           | 293113R    |                                    |
| C412-C420            | CC-CHIP 1NF K 50V /0603 X7R            | 292114R    |                                    |
| C422-C424            | EC 10UF 16V 5*3.5 R:5                  | 251105R    |                                    |
| C426-C428            | CC-CHIP 100NF K 50V /0603 X7R          | 294122R    |                                    |
| C429-C431            | EC 100UF 16V 11*6 R:5                  | 252112R    |                                    |
| C435-C437            | CC-CHIP 330PF J 50V /0603 NPO          | 291337R    |                                    |
| C438                 | CC-CHIP 47NF K 25V /0603 X7R TAPE      | 293478R    |                                    |
| C440                 | EC 47UF 16V 11*5 R:5                   | 251478R    |                                    |
| C441                 | CC-CHIP 100PF J 50V /0603 NPO          | 291104R    |                                    |
| C442                 | CC-CHIP 33PF J 50V /0603 NPO TAPE      | 290335R    |                                    |
| C445-C446            | CC-CHIP 10PF J 50V /0603 NPO TAPE      | 290107R    |                                    |
| C447                 | CC-CHIP 220NF Z 16V /0603 Y5V TAPE     | 294235R    |                                    |
| C502                 | CC 470PF K 500V Y5P R:5                | 201470     |                                    |
| C503                 | CC-CHIP 100NF K 50V /0603 X7R          | 294122R    |                                    |
| C504                 | CC-CHIP 47NF K 25V /0603 X7R TAPE      | 293478R    |                                    |
| C506-C507            | CC-CHIP 10NF K 50V /0603 X7R           | 293113R    |                                    |
| C508-C509            | CC-CHIP 100NF K 50V /0805 X7R          | 294109R    |                                    |
| C510                 | C-PEM 1NF J 100V R:5                   | 272110R    |                                    |
| C511                 | C-PEM 47NF K 63V R:5                   | 273471R    |                                    |
| C512                 | EC 47UF 25V 11*5 R:5                   | 251479R    |                                    |
| C513                 | CC 220PF K 2KV Y5P R:5                 | 201226R    | See the "CPT Difference List", too |
| C514                 | CC-CHIP 1NF K 50V /0603 X7R            | 292114R    |                                    |
| C514                 | C-CE 100NF 50V K R:5                   | 224112R    |                                    |
| C515                 | EC 4.7UF 50V 11*5 R:5                  | 250479R    |                                    |
| C517                 | CC 10NF K 50V R:5                      | 203106R    |                                    |
| C518                 | C-PEM 220NF J 100V R:5                 | 274230R    |                                    |
| C519                 | CC 68PF J 500V NPO R:5                 | 200680R    |                                    |
| C522                 | C-PEM 330NF J 250V R:15                | 274330R    |                                    |
| C523                 | JUMPER WIRE D=6                        | 500700-KD  |                                    |
| C527                 | C-PPM 9.1NF %3.5 1.5/1.6KV R:15 CLAS-B | 272912     | See the "CPT Difference List", too |
| C528                 | C-PPM 360NF J 250V R:15 CLASS B        | 274363R    | See the "CPT Difference List", too |
| C530                 | EC 1UF 160V 11*6.3 R:5                 | 250100R    |                                    |
| C531                 | EC 47UF 63V 11*6.3 R:5                 | 251475R    |                                    |
| C532                 | EC 22UF 250V 20*13 R:5                 | 251230R    |                                    |
| C533                 | EC 470UF 16V 12.5*10 R:5               | 252482R    |                                    |
| C602                 | CC-CHIP 47NF K 25V /0603 X7R TAPE      | 293478R    |                                    |
| C603-C606            | CC-CHIP 10NF K 50V /0603 X7R           | 293113R    |                                    |
| C608                 | EC 10UF 63V 11*5 R:5                   | 251116R    |                                    |

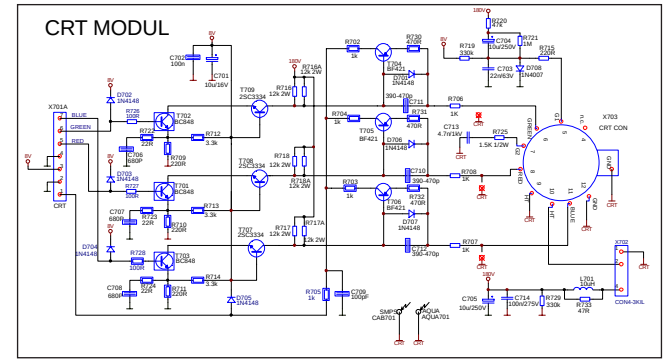
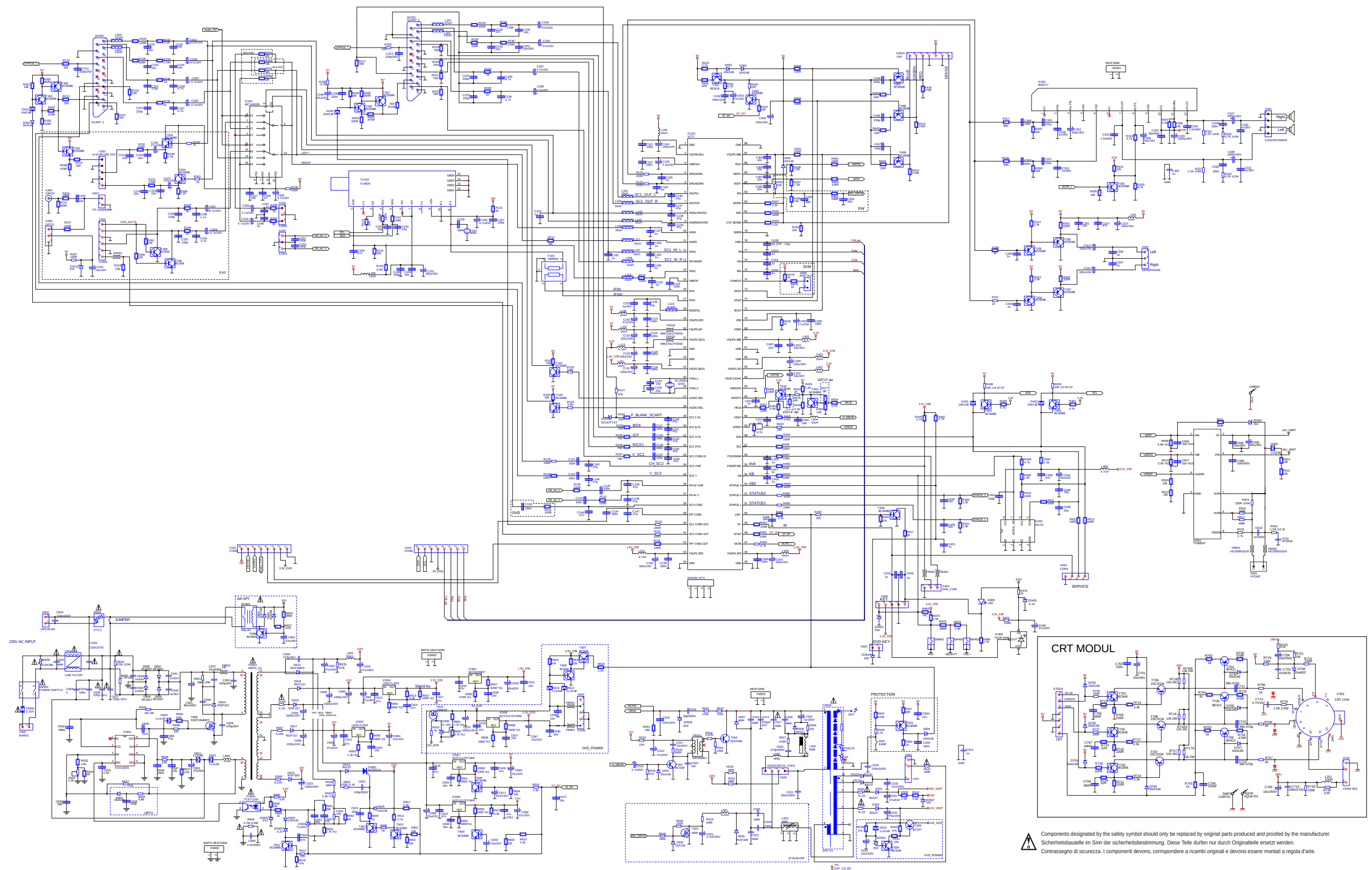


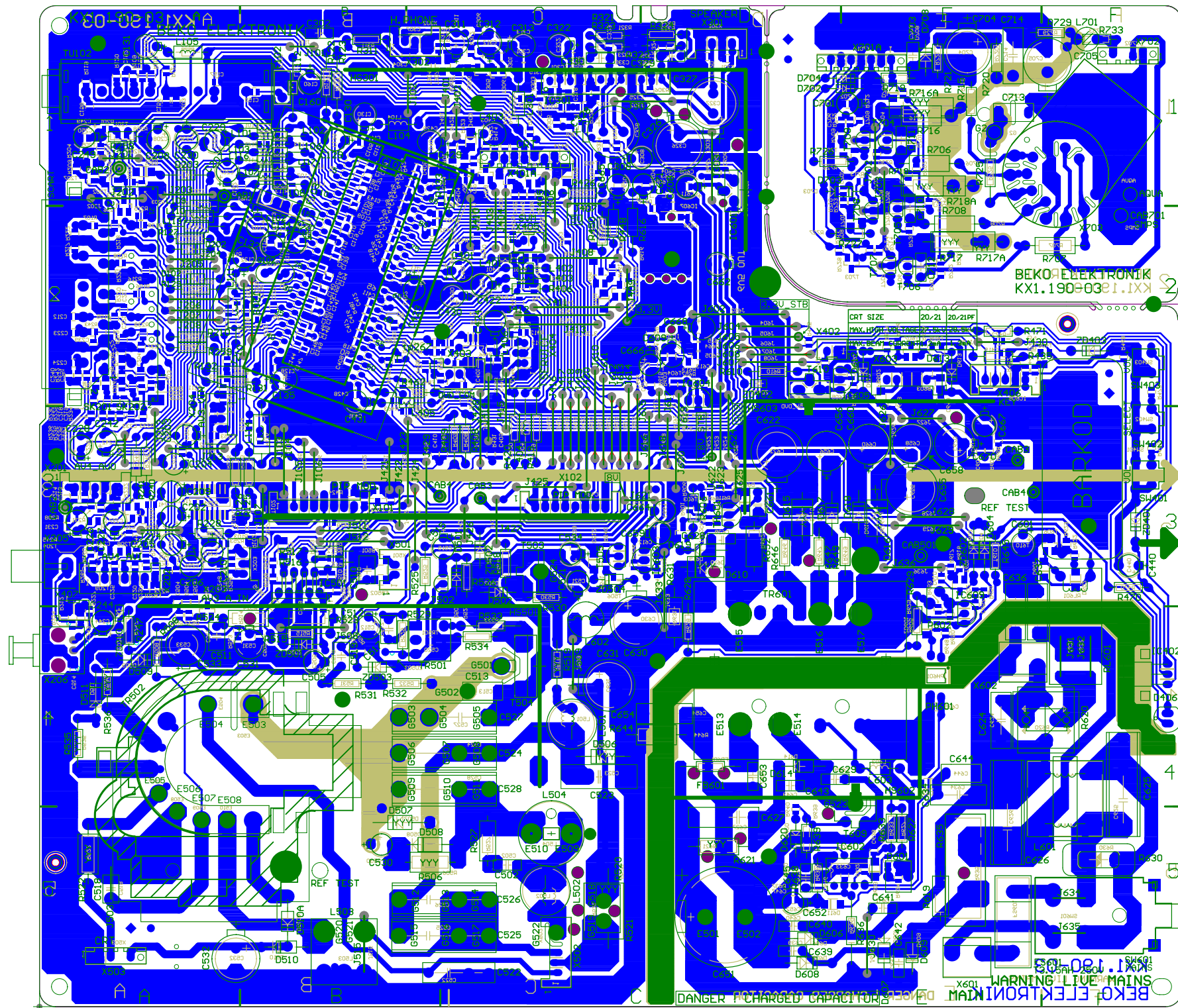
| InstPoint   | Object description                      | Component | Definitions |
|-------------|-----------------------------------------|-----------|-------------|
| C611        | CC-CHIP 33NF K 50V /0603 X7R            | 293334R   |             |
| C612-C621   | CC-CHIP 47NF K 25V /0603 X7R TAPE       | 293478R   |             |
| C622        | EC 1500UF 35V 20*13 R:5                 | 253155R   |             |
| C623        | CC-CHIP 100NF K 50V /0603 X7R           | 294122R   |             |
| C624        | C-PEM 100NF J 250V R:10                 | 274105R   |             |
| C625        | C-PPM 330NF K 275V-AC R:22.5 CLASS-B    | 274342R   |             |
| C626        | C-PEM 220NF K 275V-AC R:15 CLASS-B      | 274238R   |             |
| C627        | C-PPM 33NF J 630V R:15                  | 203330R   |             |
| C628-C629   | CC 470PF 2KV                            | 201471R   |             |
| C630-C631   | EC 47UF 160V 21*13 R:5                  | 251489R   |             |
| C632        | CC-CHIP 56PF J 50V/0603 NPO TAPE        | 290562R   |             |
| C633        | CC-CHIP 680PF J 0603 50V NPO            | 291688R   |             |
| C634        | C-PEM 100NF J 250V R:10                 | 274105R   |             |
| C635        | CC-CHIP 1.5NF K 50V /0603 X7R TAPE      | 292153R   |             |
| C636-C637   | CC 220PF M 250VAC R:10 Y5U AH/NSA       | 201227R   |             |
| C639-C642   | CC 1NF K 1KV Y5P R:5                    | 202105R   |             |
| C644        | C-PEM 100NF J 250V R:10                 | 274105R   |             |
| C646        | CC-CHIP 100NF K 50V /0805 X7R           | 294109R   |             |
| C647        | CC-CHIP 10NF K 50V /0603 X7R            | 293113R   |             |
| C650        | CC-CHIP 47PF J 50V /0603 NPO TAPE       | 290475R   |             |
| C651        | EC 100UF 400V 30*22 R:10                | 252121R   |             |
| C652        | EC 47UF 25V 11*5 R:5                    | 251479R   |             |
| C653        | CC 220PF K 2KV Y5P R:5                  | 201226R   |             |
| C654        | CC 2.2NF M 250VAC Y5U R:10 AH/NSA       | 202220R   |             |
| C655-C656   | EC 1000UF 16V 20*10 R:5                 | 253115R   |             |
| C657        | CC-CHIP 56PF J 50V/0603 NPO TAPE        | 290562R   |             |
| C658        | EC 1000UF 16V 20*10 R:5                 | 253115R   |             |
| C659        | EC 47UF 25V 11*5 R:5                    | 251479R   |             |
| C660        | EC 1000UF 16V 20*10 R:5                 | 253115R   |             |
| C661        | CC 100PF 500V NPO R:5                   | 201108R   |             |
| C662        | EC 1000UF 16V 20*10 R:5                 | 253115R   |             |
| C664-C66    | EC 22UF 16V 11*5 R:5                    | 251225R   |             |
| C668        | EC 22UF 25V 11*5 R:5                    | 251226    |             |
| C701        | EC 10UF 16V 5*3.5 R:5                   | 251105R   |             |
| C702        | CC-CHIP 100NF K 50V /0603 X7R           | 294122R   |             |
| C704-C705   | EC 10UF 250V 16*10 R:5                  | 251109R   |             |
| C706-C708   | CC-CHIP 680PF J 0603 50V NPO            | 291688R   |             |
| C709        | CC-CHIP 10PF J 50V /0603 NPO TAPE       | 290107R   |             |
| C710-C712   | CC 390PF J 50V SL R:5                   | 201390    |             |
| C713        | CC 4.7NF K 1KV Z4V R:7.5                | 222477R   |             |
| C714        | C-PEM 100NF J 250V R:10                 | 274105R   |             |
| C920-C923   | CC 1NF K 50V Y5P R:5                    | 202106R   |             |
| C940-C941   | C-PEM 47NF K 63V R:5                    | 273471R   |             |
| CAB1        | CABLE SINGLE ISO. L=90 BLUE             | 500560-AS |             |
| D01         | LED IR SIR563SB3F 23/940                | 303991R   |             |
| D102        | DIODE 1N5819 SHOTH                      | 303246R   |             |
| D201        | DIODE 4148 MELF SOD-80C                 | 303195R   |             |
| D202        | DIODE 1N4148 52MM                       | 302289R   |             |
| D203        | JUMPER WIRE D=6                         | 500700-KD |             |
| D401-D405   | DIODE 4148 MELF SOD-80C                 | 303195R   |             |
| D406        | LED L-513LR1D KIRM. L=25.4 (PARALIGHT)  | 303295R   |             |
| D501        | DIODE 1N4148 52MM                       | 302289R   |             |
| D504-D505   | DIODE 4148 MELF SOD-80C                 | 303195R   |             |
| D506        | JUMPER WIRE D=6                         | 500700-KD |             |
| D508-D511   | DIODE BA157                             | 300311R   |             |
| D604        | DIODE 1N4148 52MM                       | 302289R   |             |
| D605        | DIODE 4148 MELF SOD-80C                 | 303195R   |             |
| D606-D609   | DIODE RF2007                            | 303308R   |             |
| D610        | DIODE RGP30MS                           | 303206R   |             |
| D611        | DIODE 4148 MELF SOD-80C                 | 303195R   |             |
| D614        | DIODE RGP10J                            | 303217R   |             |
| D615        | DIODE RGP30D                            | 303228R   |             |
| D616-D618   | DIODE RGP10J                            | 303217R   |             |
| D619        | DIODE BA157                             | 300311R   |             |
| D620        | DIODE 1N4148 52MM                       | 302289R   |             |
| D621-D701   | DIODE 4148 MELF SOD-80C                 | 303195R   |             |
| D702-D074   | DIODE 1N4148 52MM                       | 302289R   |             |
| D705-D07    | DIODE 4148 MELF SOD-80C                 | 303195R   |             |
| D708        | DIODE 1N4007                            | 302948R   |             |
| F103        | SAW FILTER X6966M                       | 056298R   |             |
| FB102-FB103 | FERRIT-CHIP 600R/100MHZ 200MA/0805      | 055531R   |             |
| FB501-FB502 | FERRIT HI1206N101R                      | 055578R   |             |
| FB601       | FERRITE BEAD BI3857 5.7X3.6MM AXIAL     | 055600R   |             |
| FS601       | FUSE 3.15AT (215)                       | 054280R   |             |
| IC01        | IC-CHIP S3C1840DA9/SMB91 T&R            | 452382R   |             |
| IC101       | IC VCTL-ECO-90DEG.-NO VD-FLASH-F1       | 453987R   |             |
| IC201       | IC-CHIP MC14052BDR2 G T&R               | 453174R   |             |
| IC301       | IC AN5277                               | 453170R   |             |
| IC401       | IC-CHIP AT24C16AN 10SU2.7 TAPE&REEL     | 452662R-2 |             |
| IC402       | IR RECEIVER TSOP34838 SS1A              | 452521R-1 |             |
| IC501       | IC TDA8357 J N2                         | 452975R-1 |             |
| IC601       | IC MC33269T G 0.8A LD TO220             | 453177R   |             |
| IC601       | INSULATOR SILICON 19.5*12*.25           | 50S313    |             |
| IC602       | IC ICE1QS01                             | 452785R   |             |
| IC603-IC604 | IC LM317LZ RAG 0.1A TO92                | 453176R   |             |
| IC606-IC607 | IC-CHIP NCP1117DTARK G (DPAK) T&R TO252 | 453095R   |             |
| IC609       | IC TL431CLPRA G                         | 451885R-1 |             |
| L101-L102   | COIL CHOKE 10UH LAN02 280MA/1R          | 053823R   |             |
| L103        | COIL 10UH LAL02                         | 053331R   |             |
| L104-L105   | COIL 10UH K (TAIYO) LAL03               | 053711R   |             |
| L106        | COIL 10UH LAL02                         | 053331R   |             |
| L107-L108   | COIL CHOKE 10UH LAN02 280MA/1R          | 053823R   |             |
| L109-L110   | COIL 10UH K (TAIYO) LAL03               | 053711R   |             |
| L111        | COIL 10UH K AXIAL LAL04                 | 053500R   |             |
| L112        | COIL CHOKE 10UH LAN02 280MA/1R          | 053823R   |             |
| L113        | COIL 4.7UH LAL03                        | 053734R   |             |
| L114        | COIL 4.7UH LAL04 52MM                   | 053732R   |             |
| L115        | COIL-CHIP 8.2UH K /0805                 | 053806R   |             |
| L116-L117   | COIL 10UH LAL02                         | 053331R   |             |

| InstPoint | Object description                       | Component  | Definitions                        |
|-----------|------------------------------------------|------------|------------------------------------|
| L203-L208 | COIL-CHIP 10UH K 0805                    | 053804R    |                                    |
| L301      | COIL 10UH K (TAIYO) LAL03                | 053711R    |                                    |
| L401-L403 | COIL CHOKE 10UH LAN02 280MA/1R           | 053823R    |                                    |
| L404      | COIL 10UH K (TAIYO) LAL03                | 053711R    |                                    |
| L405      | COIL CHOKE 10UH LAN02 280MA/1R           | 053823R    |                                    |
| L406      | COIL 4.7UH LAL03                         | 053734R    |                                    |
| L502      | JUMPER WIRE D=6                          | 500700-KD  |                                    |
| L504      | COIL H-LIN 55UH NEOSID DIALTECH          | 051591R-10 | See the "CPT Difference List", too |
| L601      | LINE FILTRE 2*18MH R<0.7R /2416008010122 | 51828      |                                    |
| L602      | COIL CHOKE 50UH DIALTECH                 | 053739R-10 |                                    |
| L603      | COIL 47UH J LAL03                        | 053778R    | See the "CPT Difference List", too |
| L701      | COIL- CHOKE 10UH R0814 14.1              | 053352R    |                                    |
| P602      | R-VAR 10K V(2.5MM) 5*3                   | 133118R    |                                    |
| PH601     | IC OPTOCOUPLER TCET1100/V310U27 VISHAY   | 452297R-2  |                                    |
| Q01       | CER RESONATOR GSB455E                    | 056210R    |                                    |
| Q102      | CRYSTAL 20.25MHZ 20PPM (106478)          | 056038R    |                                    |
| R01       | RC-CHIP 0R /1206                         | 179002R    |                                    |
| R102-R108 | RC-CHIP 10K J 1/16W /0603                | 173108R    |                                    |
| R109-R115 | RC-CHIP 100R J 1/16W /0603               | 171107R    |                                    |
| R119      | RC-CHIP 33K J 1/16W /0603 TAPE           | 173332R    |                                    |
| R120      | RC-CHIP 0R /0603 1.6*0.8 TAPE            | 179005R    |                                    |
| R121      | RC-CHIP 1K J 1/16W /0603                 | 172104R    |                                    |
| R122-R123 | CFR 220R J 1/4W 52MM                     | 101223R    |                                    |
| R124      | RC-CHIP 6.8K J 1/16W /0603               | 172686R    |                                    |
| R125-R127 | CFR 4.7K J 1/4W /6 26MM                  | 102487R    |                                    |
| R128      | RC-CHIP 100R J 1/16W /0603               | 171107R    |                                    |
| R129      | CFR 100R J 1/4W 26MM                     | 101117R    |                                    |
| R130      | RC-CHIP 100R J 1/16W /0603               | 171107R    |                                    |
| R131-R132 | CFR 100R J 1/4W 26MM                     | 101117R    |                                    |
| R133      | RC-CHIP 0R /0805 2*1.25                  | 179001R    |                                    |
| R201-R202 | RC-CHIP 18K J 1/16W /0603 TAPE           | 173183R    |                                    |
| R203-R204 | RC-CHIP 330R J 1/16W /0603 TAPE          | 171336R    |                                    |
| R205-R206 | RC-CHIP 560R J 1/16W/0603 TAPE           | 171562R    |                                    |
| R207-R209 | RC-CHIP 470R J 1/16W/0603 TAPE           | 171472R    |                                    |
| R210      | CFR 10K J 1/4W /6 52MM                   | 103116R    |                                    |
| R211      | RC-CHIP 0R /0603 1.6*0.8 TAPE            | 179005R    |                                    |
| R213-R222 | RC-CHIP 75R J 1/16W /0603                | 170754R    |                                    |
| R225-R226 | RC-CHIP 100R J 1/16W /0603               | 171107R    |                                    |
| R228      | CFR 100R J 1/4W 26MM                     | 101117R    |                                    |
| R229-R230 | RC-CHIP 100R J 1/16W /0603               | 171107R    |                                    |
| R233-R236 | RC-CHIP 270R J 1/16W/0603 TAPE           | 171227R    |                                    |
| R238-R257 | RC-CHIP 1K J 1/16W /0603                 | 172104R    |                                    |
| R258      | CFR 4.7R J 1/4W /6 26MM                  | 109473R    |                                    |
| R259      | CFR 10K J 1/4W /6 52MM                   | 103116R    |                                    |
| R301-R302 | RC-CHIP 330R J 1/16W /0603 TAPE          | 171336R    |                                    |
| R303-R304 | RC-CHIP 7.5K J 1/16W /0603               | 172751R    |                                    |
| R305-R306 | RC-CHIP 10K J 1/16W /0603                | 173108R    |                                    |
| R307      | RC-CHIP 6.8K J 1/16W /0603               | 172686R    |                                    |
| R308      | RC-CHIP 1K J 1/10W /0805                 | 172101R    |                                    |
| R311      | CFR 1K J 1/4W /6 52MM                    | 102101R    |                                    |
| R312-R313 | RC-CHIP 3.3K J 1/16W /0603               | 172336R    |                                    |
| R317-R318 | RC-CHIP 56K J 1/16W /0603                | 173563R    |                                    |
| R319-R320 | RC-CHIP 4.7K J 1/16W /0603 TAPE          | 172479R    |                                    |
| R323-R324 | CFR 4.7R J 1/4W /6 26MM                  | 109473R    |                                    |
| R325      | RC-CHIP 18K J 1/10W /0805                | 173182     |                                    |
| R401      | RC-CHIP 470R J 1/16W /0603 TAPE          | 171472R    |                                    |
| R402      | RC-CHIP 10K J 1/16W /0603                | 173108R    |                                    |
| R404-R407 | RC-CHIP 100R J 1/16W /0603               | 171107R    |                                    |
| R408-R409 | CFR 100R J 1/4W 26MM                     | 101117R    |                                    |
| R410-R413 | RC-CHIP 100R J 1/16W /0603               | 171107R    |                                    |
| R414-R416 | RC-CHIP 270R J 1/16W/0603 TAPE           | 171227R    |                                    |
| R417-R418 | RC-CHIP 1K J 1/16W /0603                 | 172104R    |                                    |
| R419      | CFR 1K J 1/4W /6 52MM                    | 102101R    |                                    |
| R420      | CFR 10K J 1/4W /6 52MM                   | 103116R    |                                    |
| R423-R424 | RC-CHIP 2.7K J 1/16W /0603               | 172276R    |                                    |
| R425      | RC-CHIP 22R J 1/16W /0603 TAPE           | 170221R    |                                    |
| R427-R431 | RC-CHIP 3.3K J 1/16W /0603               | 172336R    |                                    |
| R432      | RC-CHIP 180R J 1/16W /0603               | 171184R    |                                    |
| R434      | RC-CHIP 22K J 1/16W /0603                | 173229R    |                                    |
| R435      | CFR 22K J 1/4W 26MM                      | 103234R    |                                    |
| R436-R437 | RC-CHIP 7.5K J 1/16W /0603               | 172751R    |                                    |
| R439-R441 | RC-CHIP 150R J 1/16W /0603               | 171154R    |                                    |
| R442-R444 | RC-CHIP 33R J 1/16W /0603 TAPE           | 170333R    |                                    |
| R446      | RC-CHIP 100K J 1/16W /0603               | 173114R    |                                    |
| R448      | CFR 10K J 1/4W /6 52MM                   | 103116R    |                                    |
| R449      | RC-CHIP 4.7K J 1/16W /0603 TAPE          | 172479R    |                                    |
| R450      | CFR 10K J 1/4W /6 52MM                   | 103116R    |                                    |
| R451      | RC-CHIP 5.6K J 1/16W /0603 TAPE          | 172567R    |                                    |
| R452      | RC-CHIP 47K J 1/16W /0603 TAPE           | 173478R    |                                    |
| R453      | RC-CHIP 1.2K J 1/16W/0603 TAPE           | 172125R    |                                    |
| R454-R459 | RC-CHIP 100R J 1/16W /0603               | 171107R    |                                    |
| R461      | RC-CHIP 4.7K J 1/16W /0603 TAPE          | 172479R    |                                    |
| R462      | CFR 4.7K J 1/4W /6 26MM                  | 102487R    |                                    |
| R463      | RC-CHIP 220R J 1/16W/0603 TAPE           | 171224R    |                                    |
| R464      | RC-CHIP 22R J 1/10W /0603                | 170225R    |                                    |
| R466-R467 | RC-CHIP 1.5K J 1/16W /0603 TAPE          | 172154R    |                                    |
| R468      | RC-CHIP 1K J 1/16W /0603                 | 172104R    |                                    |
| R471      | CFR 150R J 1/4W 26MM                     | 101163R    |                                    |
| R472-R473 | RC-CHIP 1.5K J 1/16W /0603 TAPE          | 172154R    |                                    |
| R475      | RC-CHIP 680R J 1/16W /0603               | 171683R    |                                    |
| R481      | RC-CHIP 15K J 1/16W /0603 TAPE           | 173153R    |                                    |
| R501      | RC-CHIP 18K J 1/16W /0603 TAPE           | 173183R    |                                    |
| R502      | RC-CHIP 220R J 1/16W/0603 TAPE           | 171224R    |                                    |
| R504      | RC-CHIP 1K J 1/16W /0603                 | 172104R    |                                    |
| R506      | RM 10K J 1/2W 52MM                       | 113114     |                                    |
| R508      | CFR 2.7K J 1/4W /6 52MM                  | 102273R    |                                    |
| R509-R510 | RC-CHIP 5.6K J 1/10W /0805               | 172561R    |                                    |
| R511      | RC-CHIP 560K J 1/16W /0603               | 174563     |                                    |
| R513-R514 | RC-CHIP 10K J 1/16W /0603                | 173108R    |                                    |

| InstPoint   | Object description                       | Component  | Definitions                        |
|-------------|------------------------------------------|------------|------------------------------------|
| R515        | CFR 2.7K J 1/4W /6 52MM                  | 102273R    |                                    |
| R516-R517   | RM 3.9R J 1/2W /9 52MM                   | 111396R    |                                    |
| R521        | RW 4.7R J 7W R:5                         | 129487R    |                                    |
| R522        | RMF 0.22R J 1W                           | 119224     | See the "CPT Difference List", too |
| R523        | CFR 330R J 1/4W /6 52MM                  | 101331R    | See the "CPT Difference List", too |
| R524        | CFR 1.5R J 1/2W /9                       | 109150R    |                                    |
| R525        | RMF 10R 1/4W                             | 120118R    |                                    |
| R526        | CFR 47K J 1/4W /6 26MM                   | 103484R    |                                    |
| R527        | CFR 470R J 1/2W /9 52MM                  | 101471R    |                                    |
| R529        | CFR 560R J 1/4W /6 52MM                  | 101562R    |                                    |
| R531-R532   | RM 150K J 1/2W " SAFETY"                 | 114151R    |                                    |
| R533        | CFR 0.47R J 1/2W /9 52MM                 | 109472R    |                                    |
| R534        | CFR 47R J 1/4W /6 52MM                   | 100473R    |                                    |
| R537        | RC-CHIP 56R J 1/16W /0603 TAPE           | 170560R    |                                    |
| R538-R542   | RC-CHIP 1.5K J 1/16W /0603 TAPE          | 172154R    |                                    |
| R601-R602   | RC-CHIP 10K J 1/16W /0603                | 173108R    |                                    |
| R605        | RC-CHIP 1K J 1/16W /0603                 | 172104R    |                                    |
| R606        | CFR 1K J 1/4W /6 26MM                    | 102141R    |                                    |
| R609        | RC-CHIP 1K J 1/16W /0603                 | 172104R    |                                    |
| R611        | RC-CHIP 2.7K J 1/16W /0603               | 172276R    |                                    |
| R617        | RC-CHIP 22K J 1/16W /0603                | 173229R    |                                    |
| R618        | RC-CHIP 47K J 1/16W /0603 TAPE           | 173478R    |                                    |
| R619        | RM 1M J .5W 52MM SAFETY                  | 115110R    |                                    |
| R620        | PTC 9R/2 PIN - 3 CYCLE BOX TYPE          | 154234R    |                                    |
| R621        | RMO 68K J 2W 73MM                        | 113684R    |                                    |
| R627        | CFR 47K J 1/4W /6 26MM                   | 103484R    |                                    |
| R628        | RM 115K %1 1/4W                          | 114115R    |                                    |
| R629        | CFR 2.2K J 1/4W /6 26MM                  | 102228R    | See the "CPT Difference List", too |
| R631        | RMO 47K 2W                               | 113479     |                                    |
| R631        | RMO 47K J 1W                             | 113475R    |                                    |
| R632        | RC-CHIP 12K J 1/16W /0603 TAPE           | 173124R    |                                    |
| R634        | RC-CHIP 0R /0603 1.6*0.8 TAPE            | 179005R    |                                    |
| R635        | RW 2.7R K 5W R:15 MM                     | 129272R    |                                    |
| R636        | RM 1M J 1W 52MM                          | 115103R    |                                    |
| R637        | RC-CHIP 68K J 1/16W /0603                | 173685     |                                    |
| R638        | CFR 47R J 1/4W /6 52MM                   | 100473R    |                                    |
| R639        | CFR 120R J 1/4W 52MM                     | 101124R    |                                    |
| R640        | RC-CHIP 33R J 1/16W /0603 TAPE           | 170333R    |                                    |
| R644        | RM 4.7M J 1/2W 52MM "SAFETY"             | 115470R    |                                    |
| R645        | CFR 47R J 1/4W /6 52MM                   | 100473R    |                                    |
| R648        | RC-CHIP 820R J 1/16W /0603 TAPE          | 171824R    |                                    |
| R649        | RNF 0.1R J 0.4W (UFLB) 52MM              | 119109R    |                                    |
| R650        | RC-CHIP 2.7K %1 1/16W /0603              | 172278R    |                                    |
| R651        | RC-CHIP 39K J 1/16W /0603 TAPE           | 173394R    |                                    |
| R652        | RM 150K J 1/2W " SAFETY"                 | 114151R    |                                    |
| R654        | RC-CHIP 1.3K %1 1/16W /0603 TAPE         | 172131R    |                                    |
| R656-R658   | RC-CHIP 240R %1 1/16W /0603 TAPE         | 171241R    |                                    |
| R659        | RC-CHIP 390R %1 1/16W /0603 TAPE         | 171392R    |                                    |
| R663        | RC-CHIP 365R %1 1/16W /0603 TAPE         | 171363R    |                                    |
| R664        | RC-CHIP 390R %1 1/16W /0603 TAPE         | 171392R    |                                    |
| R665        | RC-CHIP 470R %1 1/16W /0603 TAPE         | 171479R    |                                    |
| R666        | RC-CHIP 120R J 1/10W /0805               | 171122     |                                    |
| R666        | RC-CHIP 120R %1 1/16W /0805              | 171128R    |                                    |
| R667        | RC-CHIP 820R %1 1/16W /0603 TAPE         | 171825R    |                                    |
| R702-R705   | RC-CHIP 1K J 1/16W /0603                 | 172104R    |                                    |
| R706-R708   | CFR 1K J 1/2W /6 52MM                    | 102105R    |                                    |
| R709-R711   | RC-CHIP 220R J 1/16W /0603 TAPE          | 171224R    |                                    |
| R712-R714   | RC-CHIP 3.3K J 1/16W /0603               | 172336R    |                                    |
| R715        | CFR 220R J 1/4W 26MM                     | 101236R    |                                    |
| R716-R718   | RMO 12K J 2W                             | 113121R    |                                    |
| R719        | CFR 330K J 1/4W /6 52MM                  | 104332R    |                                    |
| R720        | CFR 47K J 1/4W /6 26MM                   | 103484R    |                                    |
| R721        | CFR 1M J 1/4W /6 26MM                    | 105110R    |                                    |
| R722-R724   | RC-CHIP 22R J 1/10W /0603                | 170225R    |                                    |
| R725        | CFR 1.5K J 1/2W /9 52MM                  | 102159R    |                                    |
| R726-R727   | CFR 100R J 1/4W 26MM                     | 101117R    |                                    |
| R728        | RC-CHIP 100R J 1/16W /0603               | 171107R    |                                    |
| R729        | CFR 470K J 1/4W /6 26MM                  | 104470R    |                                    |
| R730-R732   | RC-CHIP 470R J 1/16W /0603 TAPE          | 171472R    |                                    |
| R920-R921   | CFR 75R J 1/4W /6 26MM                   | 100751R    |                                    |
| R922-R923   | CFR 470R J 1/4W /6 26MM                  | 101494R    |                                    |
| R940-R941   | CFR 180R J 1/2W (A) 52MM                 | 101184R    |                                    |
| R942-R943   | CFR 390R J 1/4W /6 26MM                  | 101396R    |                                    |
| SK202       | SCART SOKET HR-DM2441S-O                 | 31197      |                                    |
| SW401-SW403 | TACT SW LONG STEN                        | 010860R    |                                    |
| SW601       | ON/OFF SWITCH BK98                       | 010861R    |                                    |
| T01         | TRN BC337-25                             | 401047R    |                                    |
| T102-T307   | TRN-CHIP BC848BLT1G SOT23                | 401141R    |                                    |
| T401        | TRN-CHIP BC818-215 SOT23                 | 401193R    |                                    |
| T403-T501   | TRN-CHIP BC848BLT1G SOT23                | 401141R    |                                    |
| T502        | TRN BC639                                | 400240R    |                                    |
| T504        | TRN. 2SD2586                             | 401506R    |                                    |
| T601-T603   | TRN-CHIP BC848BLT1G SOT23                | 401141R    |                                    |
| T609        | TRN 2SK3567 TO220SIS                     | 401512R    |                                    |
| T701-T703   | TRN-CHIP BC848BLT1G SOT23                | 401141R    |                                    |
| T704-T706   | TRN BF421                                | 401366R    |                                    |
| T707-T709   | TRN 2SC3619                              | 400891R    |                                    |
| TH601       | THRYSTOR MCR22-8RL1G                     | 410026R    |                                    |
| TR501       | TRANSFORMER HORIZONTAL DRIVE E1          | 051839R    |                                    |
| TR502       | FBT 20/21 EL/ 1142.5162 25KV             | 040146-EL1 | See the "CPT Difference List", too |
| TR601       | SMT 20/21 EL/ 2084.0130 23V              | 050150R-E1 | See the "CPT Difference List", too |
| TU102       | TUNER PS ASIMETRIK ENV57DA5G3R(SEC LL IY | 7R2136RPS4 |                                    |
| TUN-SC2     | METAL FOR EMC                            | KX1325R    |                                    |
| X203        | CONN.HOUSING X2003 RED                   | 31857      |                                    |
| X204        | CONN.HOUSING X2003 BLACK                 | 31856      |                                    |
| X301        | CONN.HOUSING X2004 GREY                  | 31858      |                                    |
| X302        | CONN.HOUSING X2003 GREY                  | 31854      |                                    |
| X401A       | CABLE WITH HOLDER 5P L=375 CRT/CHAS      | ZX8558-AS  | See the "CPT Difference List", too |
| X404        | CONN.HOUSING 2.5TMM 2104 GRI             | 31989      |                                    |

| InstPoint | Object description                       | Component | Definitions                        |
|-----------|------------------------------------------|-----------|------------------------------------|
| X501      | CONN.HOUSING 2'LI GREY                   | 31850     |                                    |
| X502      | CON.HOUSING LOCKED 5/4                   | 31777     |                                    |
| X503      | CABLE WITH HOLDER 3+1P L=430 CRT/SASI K1 | KX1553R   | See the "CPT Difference List", too |
| X601      | CON.HOUSING 2P MALE                      | 31675     |                                    |
| X602      | CON.HOUSING 2P MALE TPK75(POW)12.6 RED   | 31797     |                                    |
| X703      | CRT SOCKET NARROW INCHANG                | 31532     | See the "CPT Difference List", too |
| X920      | CABLE HARNESS 3+3P L=400 HP.MOD.         | 7KY537-AS |                                    |
| X921      | KONN. CINCH ..... YELLOW HOR.14.1        | 031165R   |                                    |
| X922      | KONN. CINCH ..... RED HOR.14.1           | 031164R   |                                    |
| X923      | KONN. CINCH ..... WHITE HOR.14.1         | 031163R   |                                    |
| X940      | CABLE HARNESS 3P L=360 HP.MOD.           | 7XY517-AS |                                    |
| ZD501     | DIODE Z. BZX55C 15V                      | 303826R   |                                    |
| ZD502     | DIODE Z. BZX55C33 52MM                   | 302318R   |                                    |
| ZD503     | DIODE Z. BZX55C8V2 26MM                  | 302294R   |                                    |
| ZD601     | DIODE Z.TZMB9V1                          | 303454R   |                                    |
| ZD602     | DIODE Z. BZX55C5V1                       | 302298R   |                                    |





K00-02111XXA

BEKO ELEKTRONIK

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KX1.190-0321.1XX

DANGER - CHARGED CAPACITORS

WARNING - LIVE MAINS

K00-02111XXA

BEKOD

CRT SIZE 20/21 20/21PF

MAX. HORIZ. SYNC. 20/21PF

MAX. VERT. SYNC. 20/21PF

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