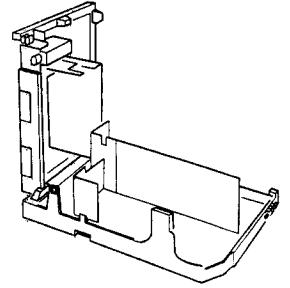


Service  
Service  
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MD1.2E  
AA

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Email:- enquiries@mauritron.co.uk



# Service Manual

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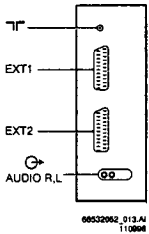
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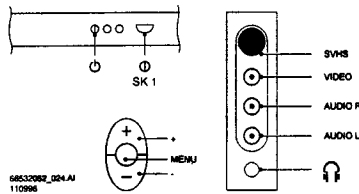
# 1. Technical specifications

Mains voltage	: 220-240V AC (±10%)
Power consumption	
nominal output power (Watt)	: 100 (21" 90°); 130 (110° SF 4:3); 150 (110° SF 16:9)
peak output power (Watt)	: 160 (21" 90°); 180 (110° SF 4:3); 220 (110° SF 16:9)
standby (Watt)	: 3 (±10%)
Mains frequency	: 50 Hz (±10%)
Pull-in range colour synchronisation	: > ± 300Hz
Pull-in range horizontal synchronisation	: > ± 600Hz

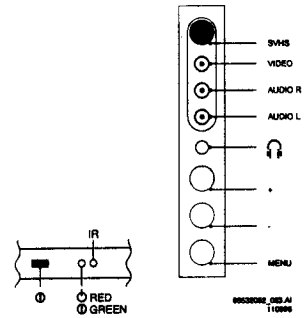
# 2. Connection facilities and Chassis overview



Rear connections



Front + Top control + Side I/O



Front + Side control + Side I/O

## Specification of the terminal sockets

### REAR

**EXT1 - CVBS (in/out) + RGB (in) - tuner at output**

- |   |   |
|---|---|
| 1 - Audio ⊕ R (0.5V <sub>RMS</sub> ≤ 1kΩ)                       | 1 - Audio ⊕ R (0.5V <sub>RMS</sub> ≤ 1kΩ)                         |
| 2 - Audio ⊖ R (0.2-2V <sub>RMS</sub> ≥ 10kΩ)                    | 2 - Audio ⊖ R (0.2-2V <sub>RMS</sub> ≥ 10kΩ)                      |
| 3 - Audio ⊕ L (0.5V <sub>RMS</sub> ≤ 1kΩ)                       | 3 - Audio ⊕ L (0.5V <sub>RMS</sub> ≤ 1kΩ)                         |
| 4 - Audio ⊥   | 4 - Audio ⊥   |
| 5 - Blue ⊥  | 5 -   |
| 6 - Audio ⊖ L (0.2-2V <sub>RMS</sub> ≥ 10kΩ)                    | 6 - Audio ⊖ L (0.2-2V <sub>RMS</sub> ≥ 10kΩ)                      |
| 7 - Blue ⊖ (0,7V <sub>pp</sub> /75Ω)                            | 7 -   |
| 8 - CVBS status(0-2V: INT; 4,5-7V: EXT1-16/9; 9.5-12V:EXT1-4/3) | 8 - CVBS status ⊖ (0-2V: INT; 4,5-7V: EXT2-16/9;9.5-12V:EXT2-4/3) |
| 9 - Green ⊥   | 9 -   |
| 10 -  | 10 -  |
| 11 - Green ⊖ (0,7V <sub>pp</sub> /75Ω)                          | 11 -  |
| 12 -  | 12 -  |
| 13 - Red ⊥  | 13 - C ⊥  |
| 14 - RGB status ⊥   | 14 -  |
| 15 - Red ⊖ (0,7V <sub>pp</sub> /75Ω)                            | 15 - C ⊖ (300mV <sub>pp</sub> /75Ω)                               |
| 16 - RGB status (0-0,4V: INT;1-3V: EXT1/75Ω)                    | 16 -  |
| 17 - CVBS ⊥   | 17 - CVBS ⊥   |
| 18 - CVBS ⊥   | 18 - CVBS ⊥   |
| 19 - CVBS ⊕ (1V <sub>pp</sub> /75Ω)                             | 19 - CVBS ⊕ (1V <sub>pp</sub> /75Ω)                               |
| 20 - CVBS ⊖ (1V <sub>pp</sub> /75Ω)                             | 20 - CVBS/Y ⊖ (1V <sub>pp</sub> /75Ω)                             |
| 21 - Earth screen   | 21 - Earth screen   |

**EXT2 - CVBS (in/out) + SVHS (in) - Input: EXT2 then output = tuner; input: other then output = input**

### Cinch - audio out

- ⊕ CINCH Audio L (red) ⊕ (0.5V<sub>RMS</sub> < 1kΩ)
- ⊖ CINCH Audio R (white) ⊖ (0.5V<sub>RMS</sub> < 1kΩ)

### FRONT

#### Audio/video in

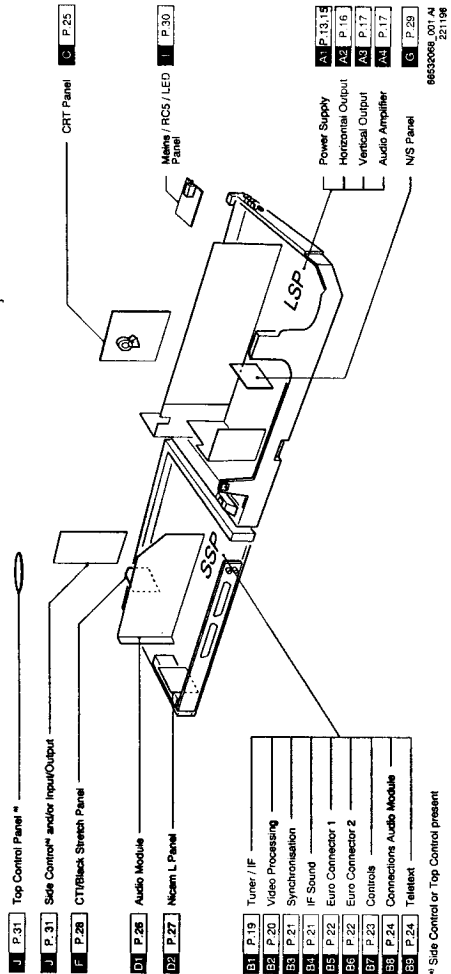
- ⊖ CINCH CVBS ⊖ (1V<sub>pp</sub>/75Ω)
- ⊖ CINCH Audio L (red) ⊖ (2V<sub>RMS</sub> ≥ 10kΩ)
- ⊖ CINCH Audio R (white) ⊖ (2V<sub>RMS</sub> ≥ 10kΩ)

#### Headphone

⊕ ⊖ ⊕ 8-600Ω

#### SVHS

- |   |                                   |
|---|-----------------------------------|
| ⊖ | 1 - ⊥                             |
| ⊖ | 2 - ⊥                             |
| ⊖ | 3 - Y ⊖ (1V <sub>pp</sub> /75Ω)   |
| ⊖ | 4 - C ⊖ (0,3V <sub>pp</sub> /75Ω) |



### 3. Safety instructions for repairs, Maintenance instructions, Warnings and Notes

#### Safety instructions for repairs

1. Safety regulations require that during a repair:
  - the set should be connected to the mains via an isolating transformer;
  - safety components, indicated by the symbol ▲ should be replaced by components identical to the original ones;
  - when replacing the CRT, safety goggles must be worn.
2. Safety regulations require that after a repair the set must be returned in its original condition. In particular attention should be paid to the following points:
  - As a strict precaution, we advise you to resolder the solder joints through which the horizontal deflection current is flowing, in particular:
    - all pins of the line output transformer (LOT);
    - fly-back capacitor(s);
    - S-correction capacitor(s);
    - line output transistor;
    - pins of the connector with wires to the deflection coil;
    - other components through which the deflection current flows.

- Note:**  
This resoldering is advised to prevent bad connections due to metal fatigue in solder joints and is therefore only necessary for television sets older than 2 years.
- The wire trees and EHT cable should be routed correctly and fixed with the mounted cable clamps.
  - The insulation of the mains lead should be checked for external damage.
  - The mains lead strain relief should be checked for its function in order to avoid touching the CRT, hot components or heat sinks.
  - The electrical DC resistance between the mains plug and the secondary side should be checked (only for sets which have a mains isolated power supply). This check can be done as follows:
    - unplug the mains cord and connect a wire between the two pins of the mains plug;
    - set the mains switch to the on position (keep the mains cord unplugged!);
    - measure the resistance value between the pins of the mains plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 MΩ and 12 MΩ;
    - switch off the TV and remove the wire between the two pins of the mains plug.
  - The cabinet should be checked for defects to avoid touching of any inner parts by the customer.

#### Maintenance instructions

- It is recommended to have a maintenance inspection carried out by a qualified service employee. The interval depends on the usage conditions:
- when the set is used under normal circumstances, for example in a living room, the recommended interval is 3 to 5 years;
  - when the set is used in circumstances with higher dust, grease or moisture levels, for example in a kitchen, the recommended interval is 1 year.
- The maintenance inspection contains the following actions:
- execute the above mentioned "general repair instruction";
  - clean the power supply and deflection circuitry on the chassis;
  - clean the picture tube panel and the neck of the picture tube.

#### Warnings

1. In order to prevent damage to ICs and transistors, all high-voltage flashovers must be avoided. In order to prevent damage to the picture tube, the method shown in Fig. 3.1 should be used to discharge the picture tube. Use a high-voltage probe and a multimeter (position DC-V). Discharge until the meter reading is 0V (after approx. 30s).

#### ESD

2. All ICs and many other semiconductors are sensitive to electrostatic discharges (ESD). Careless handling during repair can drastically shorten the life. Make sure that during repair you are connected by a pulse band with resistance to the same potential as the earth of the unit. Keep components and tools also at this same potential.
3. Together with the deflection unit and any multipole unit, the flat square picture tubes used form an integrated unit. The deflection and the multipole units are set optimally at the factory. Adjustment of this unit during repair is therefore not recommended.

4. Be careful when taking measurements in the high-voltage section and on the picture tube.
5. Never replace modules or other components while the unit is switched on.
6. When making settings, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

#### Notes

1. The direct voltages and oscillograms should be measured with regard to the tuner earth (⊥), or hot earth (⊥<sub>T</sub>) as this is called.
2. The direct voltages and oscillograms shown in the diagrams should be measured in the Service Default Mode (see chapter B) with a colour bar signal and stereo sound (L3 KHz, R:1 KHz unless stated otherwise) and picture carrier at 475.25 MHz.
3. Where necessary, the oscillograms and direct voltages are measured with (T) and without aerial signal (X). Voltages in the power supply section are measured both for normal operation (D) and in standby (O). These values are indicated by means of the appropriate symbols.
4. The picture tube PWB has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aquadag coating.
5. The semiconductors indicated in the circuit diagram and in the parts lists are completely interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

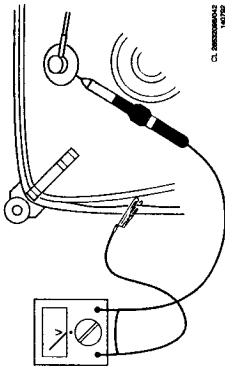


Figure 3.1

#### DOLBY SURROUND PRO • LOGIC

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## 4. Mechanical instructions

The MD1.2E chassis has two different mechanical executions.

### 4.1 Styling with top control and side input/output (also applicable for MD1.1E Widescreen)

- Removing the rear cover**
1. First all screws on the rear cover have to be removed.
    - 4 Screws are located at each corner of the cabinet.
    - 2 Screws are located at the left and right bottom corners of the rear cover.
    - 4 Screws are fixed at the 4 corners of the I/O panel with the Euroconnectors and aerial input.
  2. The rear cover is now held in position by 6 clicks between the cabinet and the rear cover. There are 2 clicks at the left, 2 at the right and 2 at the top. After loosening all clicks (by releasing them with a screw-driver), the rear cover can be removed.
  3. The cover plate on the I/O panel with the Euro-connectors and aerial input can be removed in the following way: remove the screw in the middle, release the click connection at the bottom and lift the cover plate.

### Process position

- The process position provides easier access to the entire chassis.
1. Release the mains cord from its fixation brackets.
  2. Push back the clicks between bottom plate and rear cover and pull the cabinet at the same time backwards.

For some service positions cables may have to be removed from their cable clamps and channels. Afterwards, put the cables back in their original position.

### Service positions

**Small Signal Panel (SSP) component side (Figure 4.1)**

1. Push down the clicks of the SSP bracket (1) and shift the SSP to the left.
2. Pull up the SSP and tilt the SSP counter clockwise to a horizontal position (180° with Large Signal Panel (LSP)).
3. Put the SSP in the clicks (2) marked "Service" on the bottom plate.

When all cables on the SSP are disconnected, the SSP can also be removed from its bracket (Figure 4.2), providing better access to component and copper side.

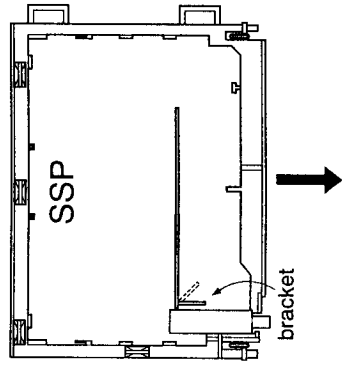


Figure 4.2

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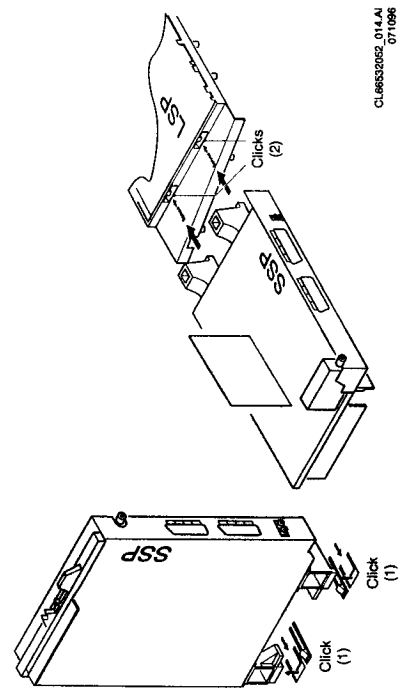


Figure 4.1

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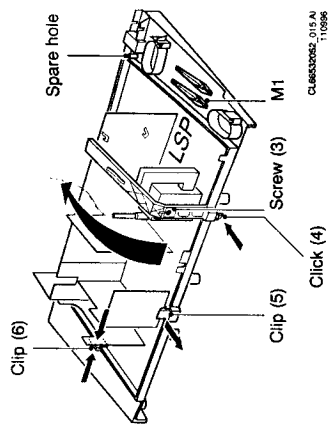


Figure 4.3

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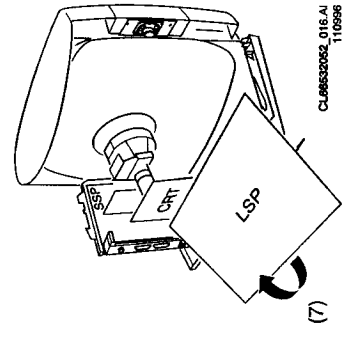


Figure 4.4

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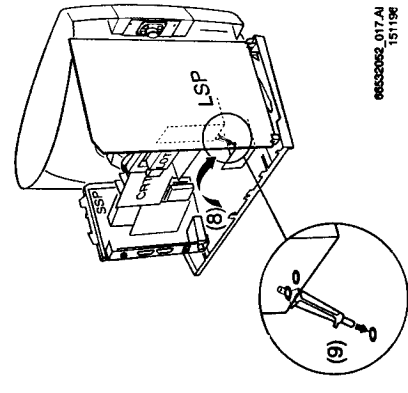


Figure 4.5

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- LSP component side (Figure 4.3)**
1. Put the SSP in the horizontal service position as described above.
  2. Remove screw (3) from the LOT bracket.
  3. Remove the bracket by releasing click (4) and pulling the bracket upwards.
  4. Release clicks (5) and (6).
  5. Lift the LSP PWB out of its bracket (indicated by the arrow) and pull it a little back.

**Warning!** The heat sinks are not connected to ground.

- LSP copper side with table/workbench (Figure 4.4)**
1. Disconnect the cable to the degaussing coil (yellow connector L02 on LSP).
  2. If necessary, disconnect the cable on the left loudspeaker.
  3. Lift the LSP from its bracket as described above (LSP component side).
  4. Turn the LSP underneath the CRT panel (keep cable S15/L15 UNDER the audio module) as indicated by the arrow (7).
- The LSP now rests on the bottom plate, held in place by the cable clamp on the heat sink and the LOT bracket.

**Warning!** Be careful not to damage the CRT-panel or picture tube neck.  
 The heat sinks are not connected to ground.

**SSP and LSP copper side without table/workbench (Figure 4.5)**  
 For this service position MD1 cable extension kit (service code number 4822 320 11695) is required.

1. Break the service pin (marked M1 - see Figure 4.3) from its position at the right hand side of the bottom plate.
2. Disconnect the cable to the degaussing coil (yellow connector L02 on LSP) and the cable on the left loudspeaker.
3. Remove cables S10/L10, S11/L11 and S15/L15 from LSP to SSP and cable I28/L28 from Audio module to LSP.
4. Lift the LSP from its bracket as described earlier (LSP component side).
5. Put the LSP to the vertical position (Figure 4.5), copper side at the right hand, LOT above (8). For this position, special grooves are made in the bottom plate of the cabinet.
6. Fix the position of the LSP by putting the service pin between LSP (heat sink) and bottom plate (9). There are special holes in the heat sink and the bottom plate to put the service pin in.
7. Reconnect cable I28/L28.
8. Use the cables from the MD1 cable extension kit to reconnect connectors S10/L10, S11/L11 and S15/L15.

**Warning!** All cables should be reconnected correctly.

After use the service pin can be placed in the spare hole at the right hand side in the bottom plate.

Accessing the module with mains switch, LED and RCS receiver (Fig. 4.6)

1. Cut the tie rap of the degaussing coil at the left hand bottom side (10). Remove the degaussing coil in the left bottom corner from its fixation bracket (11) to get more space to handle the mains module.
2. Remove the red mains panel bracket by lifting the end and pulling it backwards (12).
3. To get more movement space, the left top of the cabinet can be pushed or pulled upwards (13).
4. The mains panel can now be removed.

Afterwards the degaussing coil should be refixed at position (10).

### 4.2 Styling with side control and side input/output (no top control)

**Removing the rear cover**

1. First all screws on the rear cover have to be removed.
  - 6 Screws are located at the corners of the cabinet.
  - 2 Screws are located at the left and right bottom of the rear cover.
  - 3 Screws are located just above, under and left of the cover plate of the I/O connections.

*For some service positions cables may have to be removed from their cable clamps and channels. Afterwards, put the cables back in their original position.*

**Process position**

The process position provides easier access to the entire chassis during the service positions.

1. The chassis can be lifted, pulled forward ( $\pm 5$ cm) and fixed in the bottom plate.
2. When the clicks between bottom plate rear cover are pushed back, the chassis and the bottom plate can be pulled backwards.

**Service positions**

**SSP copper and component side, module servicing (Figure 4.7)**

1. Release the click construction (14) between the SSP and LSP.
2. Lift the SSP a little and turn it to an angle of 135° (15) or 180° (16) from the LSP. This provides better access to the component side of the SSP and also allows for the removal of modules.

**Service position with table/workbench (Fig. 4.8)**

1. Disconnect the cable to the degaussing coil (yellow connector L02 on the LSP).
2. Lift the chassis from the bottom plate and pull it backwards (17).
3. Turn the entire chassis around the CRT-panel (18). The chassis rests on the SSP with the copper side of the LSP backwards.

**Warning!** *Be careful not to damage the CRT-panel or picture tube neck. The heat sinks are not connected to ground.*

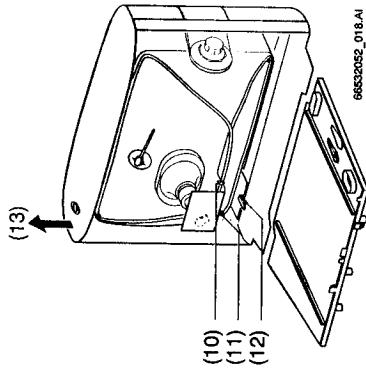


Figure 4.6

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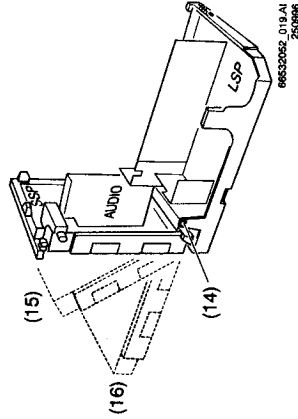


Figure 4.7

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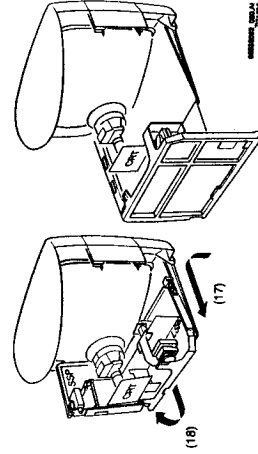


Figure 4.8

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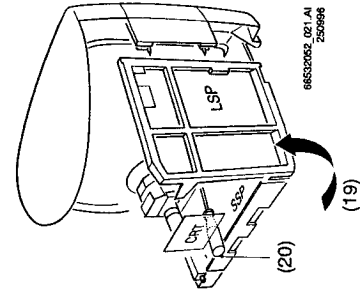


Figure 4.9

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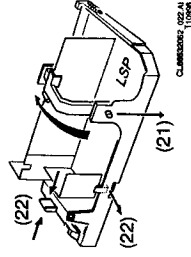


Figure 4.10

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**Service position (LSP copper side) without table/workbench (Fig. 4.9)**

1. Disconnect the cable to the degaussing coil (yellow connector L02 on the LSP).
2. Lift the chassis from the bottom plate and turn it counter clockwise (19).
3. The SSP can be fixed with a screwdriver to the bottom plate (20). The copper side of the LSP can now be accessed.

**Warning!** *Be careful not to damage the CRT-panel or picture tube neck. The heat sinks are not connected to ground.*

**Small Signal Panel (Fig. 4.10)**

First, remove all cables connected to the Small Signal Panel. The SSP can be removed by sliding it out of the SSP bracket (in the direction of the arrow).

**Large Signal Panel (Fig. 4.10)**

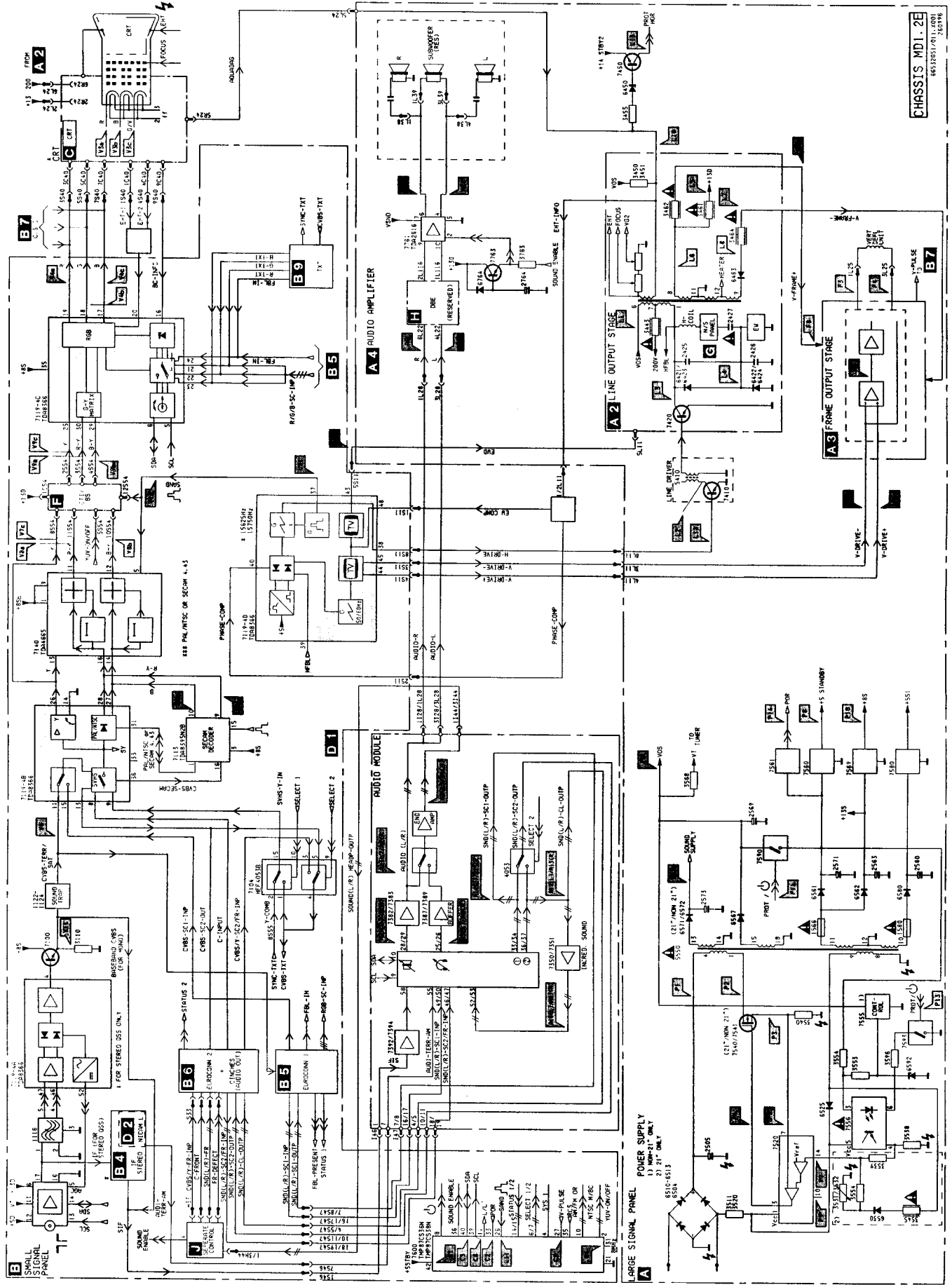
After removing the screw (21), and pushing back the clips (22), the LSP can be lifted out the bracket as indicated by the arrow.

**Accessing the panel with mains switch, LED and RCS receiver**

The mains module is located in the middle of the set, below the picture tube.

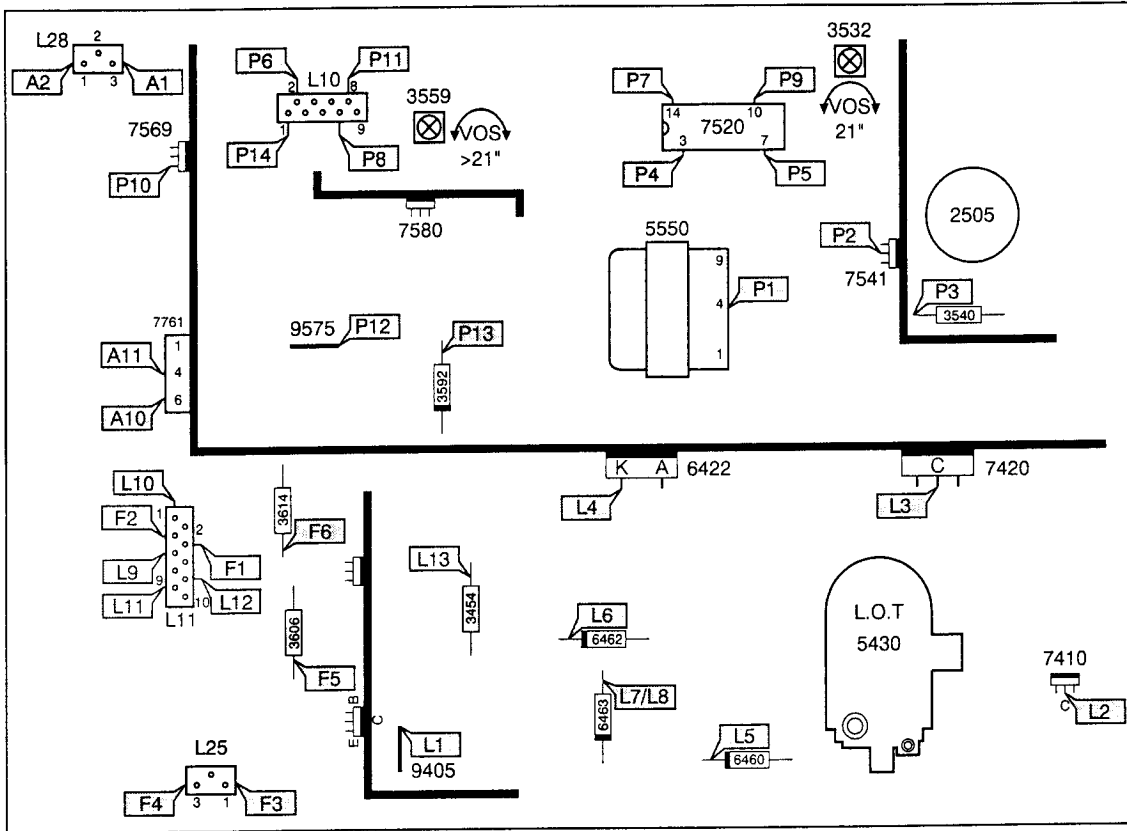
1. Push the clicks between bottom plate and rear cover back and pull the chassis back as far as possible.
2. Release the click construction (14 - Fig. 4.7) between the SSP and LSP. Lift the SSP a little and turn it to an angle of 180° (16 - see Fig. 4.7) from the LSP. The mains panel can now be accessed when reaching over the SSP/LSP bracket.
3. Remove the 2 screws left and right on the mains panel. The complete mains panel can now be removed by pulling it backwards.

5. Block diagram / Blockschaltbild / Schéma-bloc 6

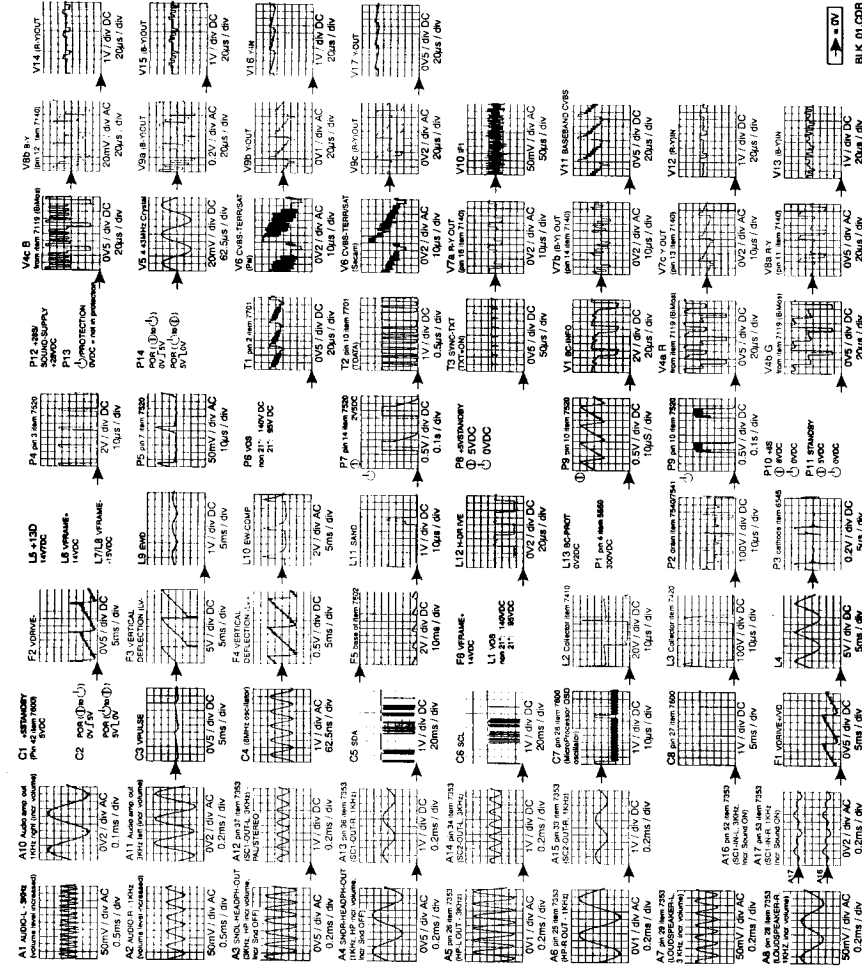
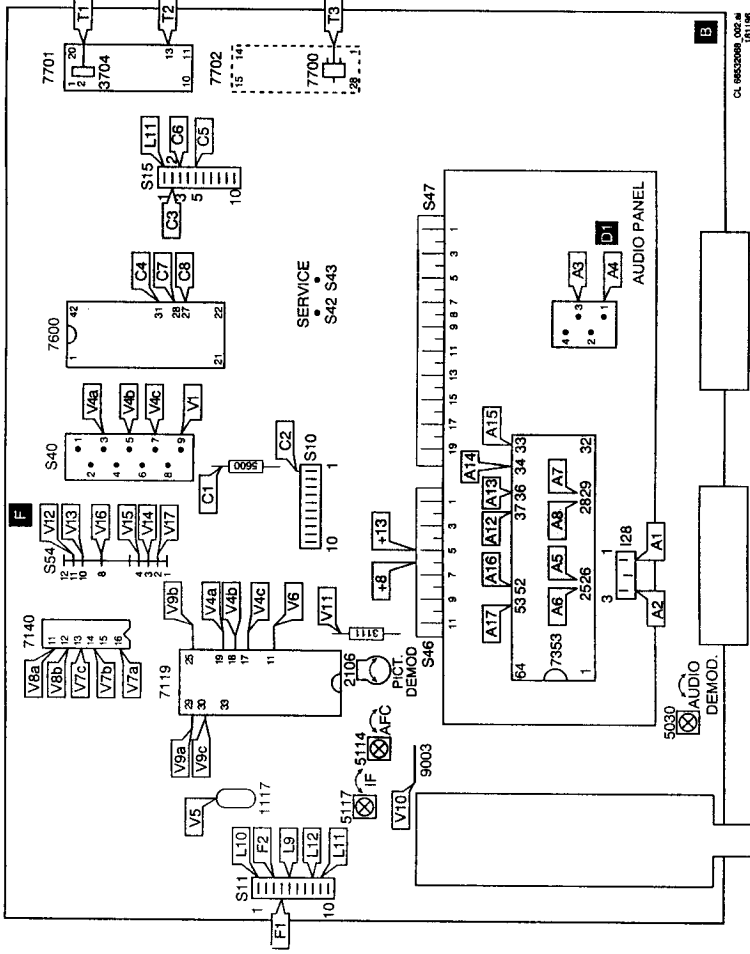


# Testpoint overview / Testpunkt Übersicht / Relevé des points de test

## Large signal panel / Groß-Signal Platine / Platine forts signaux



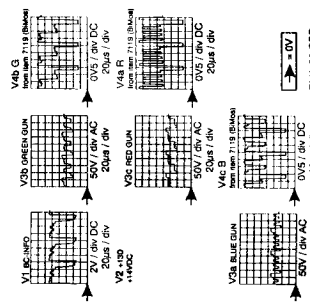
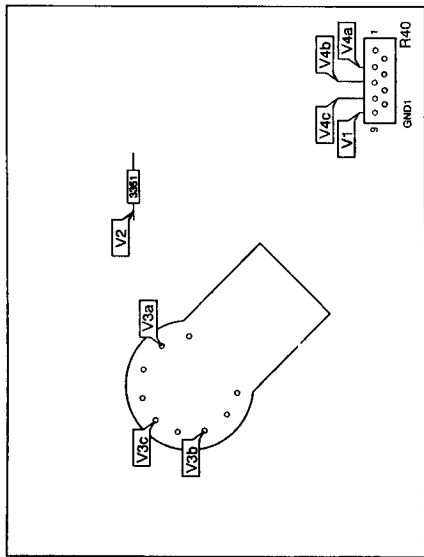
Small signal panel / Klein-Signal Platine / Platine petits signaux



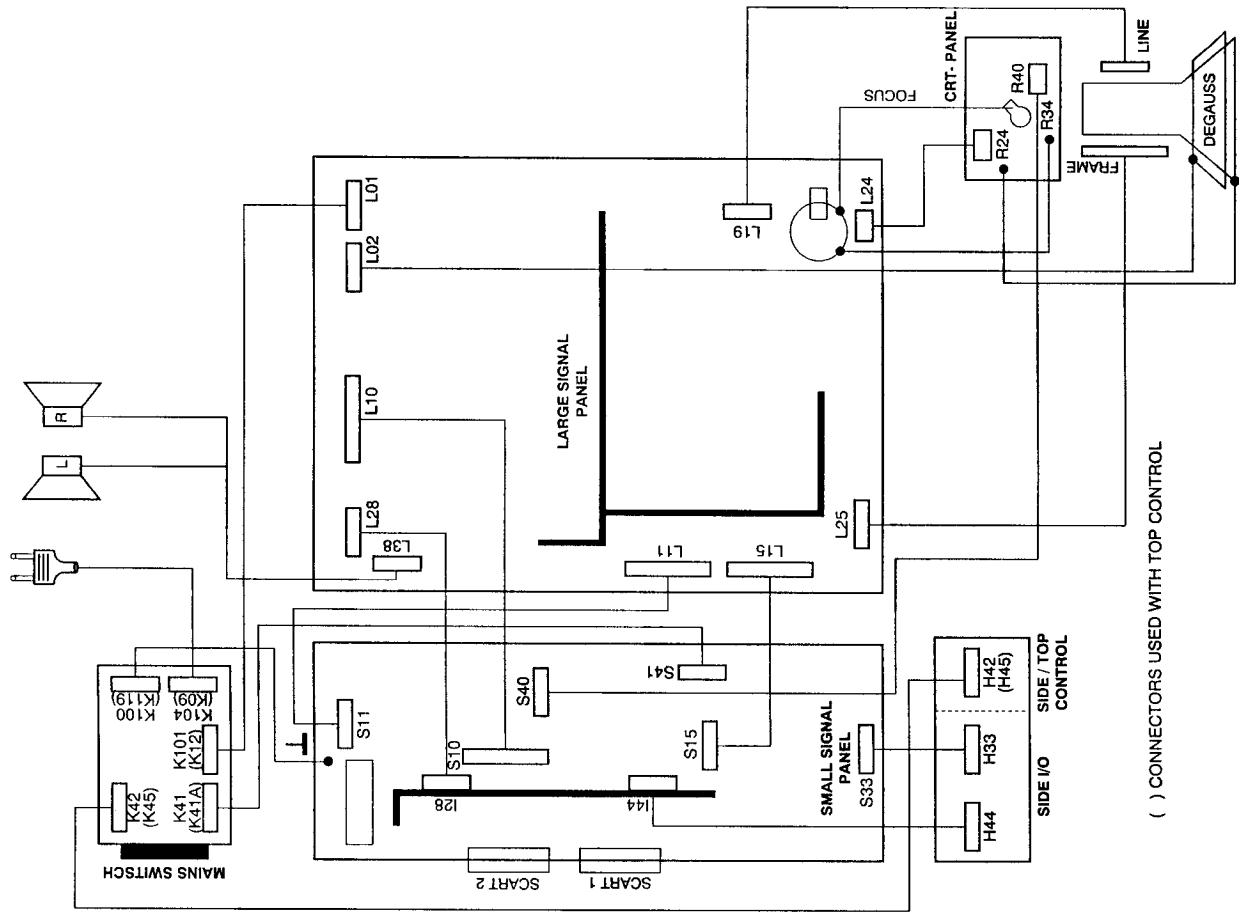
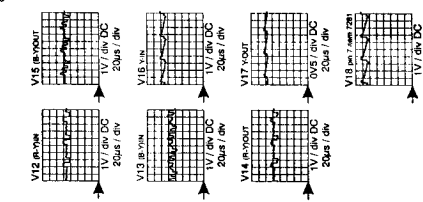
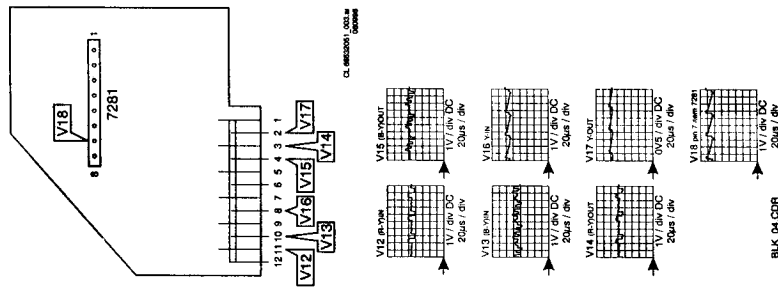
BLK 01.00R



CRT panel / CRT-Platine / Platine tube cathodique



CTI/Black Stretch panel /  
CTI/Black Stretch Platine /  
Platine CTI/Black Stretch



( ) CONNECTORS USED WITH TOP CONTROL

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 Email:- enquiries@mauritron.co.uk

## 6. Service Modes, DST, Error messages, Protections, Faultfinding and Repair tips

In this chapter the following paragraphs are included:

- 6.1 Test points
- 6.2 Service Modes and Dealer Service Tool (DST)
- 6.3 Error codes and "blinking LED" procedure
- 6.4 Protections
- 6.5 Fault finding and repair tips

### 6.1 Test points

The MD1 chassis is equipped with test points in the service printing. These test points are referring to the functional blocks:

- \* A1-A2-A3, etc.: Test points for the audio processing circuitry
- \* C1-C2-C3, etc.: Test points for the control circuitry
- \* F1-F2-F3, etc.: Test points for the frame drive and frame output circuitry
- \* L1-L2-L3, etc.: Test points for the line drive and line output circuitry
- \* P1-P2-P3, etc.: Test points for the power supply
- \* T1-T2-T3, etc.: Test point for the teletext circuitry
- \* V1-V2-V3, etc.: Test points for the video processing circuitry

### 6.2 Service modes and Dealer Service Tool (DST)

For easy installation and diagnosis the dealer remote control RC7150 is introduced. The RC7150 can be used for all new TV sets, including all set of the MD1 chassis. The RC7150 is also called Dealer Service Tool or DST. The ordering number of the DST (RC7150) is 4822 218 21232.

#### 6.2.1 Installation features for the dealer

The dealer can use the RC7150 for programming the TV-set with presets, TV-settings, Dish settings.

10 Different program tables can be programmed into the DST via a GFL or MD2 TV-set (downloading from the GFL or MD2 to the DST; see GFL or MD2 service manuals) or by the DST-I (DST/PC interface; ordering code 4822 218 21277). For explanation of the installation features of the DST, the directions for use of the DST are recommended (For the MD1 chassis, download code 4 should be used).

#### 6.2.2 Diagnose features for the servicer

The MD1.2 sets can be put in the two service modes via the DST RC7150. These are the Service Alignment Mode (SAM) and the Service Default Mode (SDM). SDM can also be entered by short circuiting the "service" pins on the SSP.

##### 6.2.2.1 Service Default Mode (SDM)

Entering the SDM:

- By transmitting the "DEFAULT" command with the RC7150 Dealer Service Tool.
- By temporarily shorting pins S42 and S43 on the Small Signal Panel.

Exiting the SDM:

- Switch the set to stand-by (the error buffer is also cleared).

**Note:** *When the mains power is switched off while the set is in SDM, the set will enter to SDM immediately when the mains is switched on again.*

The SDM has the following pre-defined conditions for all microprocessor controlled tuning and linear functions:

- For recognition of the SDM "SER" is displayed at the top of the screen.
  - Tuning at 475.25 MHz (Secam on Multi-France sets (with Nicam L), PAL on other sets).
  - Volume level is set to 25% (of the maximum volume level). Other picture and sound settings are set to 50%.
  - Auto switch off disabled (normally the set is automatically switched off when no video signal (IDENT) was received for 15 minutes).
  - Sleep timer is disabled.
  - All other controls operate normally.
  - *When the microprocessor supports the "blinking LED" procedure (See 6.3) and an error code is present in the error buffer, the LED will blink the number of times, equal to the value of the last error code.*
- This function will also work when there is no sound or picture.**

##### 6.2.2.2 Service Alignment Mode (SAM)

Entering SAM:

- By transmitting the "ALIGN" command with the RC7150 Dealer Service Tool (this works both while the set is in normal operation mode or in the SDM).
- By pressing the "MENU" and "." key on the local keyboard simultaneously when the set is in SDM.

Exiting SAM:

- Switch the set to stand-by.

**Note:** *When the mains power is switched off while the set is in SAM, the set will enter SDM immediately when the mains is switched on again.*

In the SAM the following information is displayed on the screen:

- Software version (the software version of the microprocessor in the set is displayed. This software version identification corresponds with the software versions in the Software Survey as published in the Product Survey.
- Error code buffer (see paragraph 6.3).
- Options (see paragraph 8.4).
- Alignment and geometry information (see paragraph 8.2.1, 8.3.1 and 8.3.2).