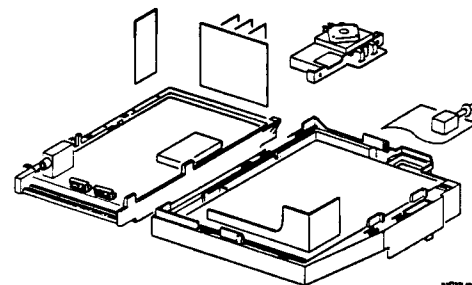


Service  
Service  
Service



# Service Manual

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Provisional

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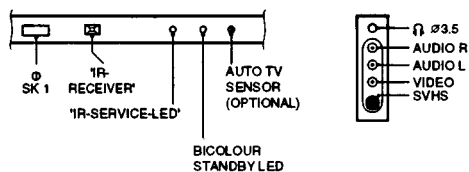


**PHILIPS**

- Mains voltage: 220V - 240V ( $\pm 10\%$ ); 50-60Hz ( $\pm 5\%$ )
- Aerial input impedance: coaxial 75  $\Omega$
- Minimal aerial voltage: 30 $\mu$ V (VHF), 40 $\mu$ V (UHF)
- Maximum aerial voltage: 180 mV
- Programmes: 0-99
- VCR programmes: 0, 90-99

## 2.1 Front connections

### TOP CONTROL FL7/FL8 STYLING



CL 86532057\_top.AI  
310798

Figure 2-1

### 2.1.1 Audio/Video

Video	1Vpp/75Ω	⊕ ⊗
Audio	L(0.5Vrms ≥10kΩ)	⊕ ⊗
Audio	R(0.5Vrms ≥10kΩ)	⊕ ⊗
Headphone	(32-600Ω ≥10mW)	⊕ ⊗

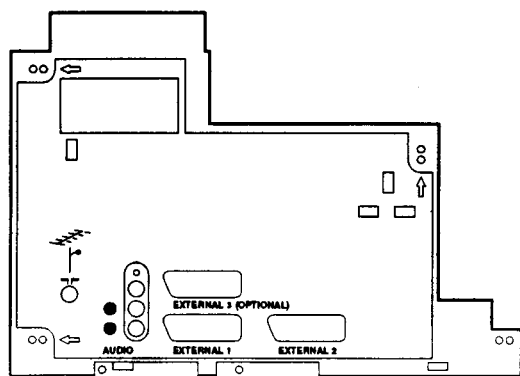
### 2.1.2 SVHS

1-		⊕
2-		⊕
3- Y	(1Vpp; 75Ω)	⊕ ⊗
4- C	(0.3 Vpp;75Ω)	⊕ ⊗

## 2.2 Rear connections

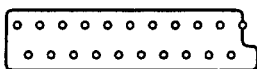
See figure 2.2

### 2.2.1 External 1(in/out): RGB+CVBS



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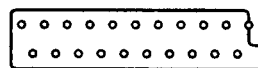
Figure 2-2



1- Audio	R (0.5Vrms ≤1kΩ)	⊕
2- Audio	R (0.5Vrms ≥10kΩ)	⊕
3- Audio	L (0.5Vrms ≤1kΩ)	⊕ ⊗
4- Audio		⊕ ⊗

5- Blue		⊕
6- Audio	L (0.5Vrms ≥10kΩ)	⊕ ⊗
7- Blue	(0.7Vpp/75Ω)	⊕ ⊗
8- CVBS-status	0-1.3V:INT	
	4.5-7V:EXT 16:9	
	9.5-12V:EXT 4:3	⊕
9- Green		⊕
10-		⊕
11- Green	(0.7Vpp/75Ω)	⊕
12-		⊕
13- Red		⊕
14- RGB-status		⊕
15- Red	(0.7Vpp/75Ω)	⊕ ⊗
16- RGB-status	0-0.4V:INT	
	1-3V:EXT/75Ω	
17- CVBS		⊕
18- CVBS		⊕
19- CVBS	(1Vpp/75Ω)	⊕ ⊗
20- CVBS	(1Vpp/75Ω)	⊕ ⊗
21- Earth socket		⊕

### 2.2.2 External 2 (in/out): SVHS+RGB+CVBS (intended for VCR.)

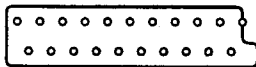


1- Audio	R (0.5Vrms ≤1kΩ)	⊕
2- Audio	R (0.5Vrms ≥10kΩ)	⊕
3- Audio	L (0.5Vrms ≤1kΩ)	⊕ ⊗
4- Audio		⊕ ⊗
5- Blue		⊕
6- Audio	L (0.5Vrms ≥10kΩ)	⊕ ⊗
7- Blue / Chroma out	(0.7Vpp/75Ω)	⊕
8- CVBS-status	0-1.3V:INT	
	4.5-7V:EXT 16:9	
	9.5-12V:EXT 4:3	⊕
9- Green		⊕
10- Easy link		⊕
11- Green	(0.7Vpp/75Ω)	⊕
12-		⊕
13- Red		⊕
14- RGB-status		⊕
15- Red / chroma-in	(0.7Vpp/75Ω)	⊕ ⊗
16- RGB-status	(0-0.4V:INT	
	1-3V:EXT/75Ω)	
17- CVBS		⊕
18- CVBS		⊕
19- Y/CVBS	(1Vpp/75Ω)	⊕ ⊗
20- Y/CVBS	(1Vpp/75Ω)	⊕ ⊗
21- Earth socket		⊕

## 2.2.3 External 3 (in): CVBS+Audio (optional)

4.5-7V:EXT 16:9

9.5-12V:EXT 4:3



- 1-
- 2- Audio R (0.5Vrms >10kΩ) ⊕
- 3-
- 4- Audio ⊥
- 5-
- 6- Audio L (0.5Vrms >10kΩ) ⊕
- 7-
- 8- CVBS-status 0-1.3V:INT

- 9-
- 10-
- 11-
- 12-
- 13-
- 14-
- 15-
- 16-
- 17- CVBS
- 18- CVBS
- 19-
- 20- CVBS (1Vpp/75Ω)
- 21- Earth socket

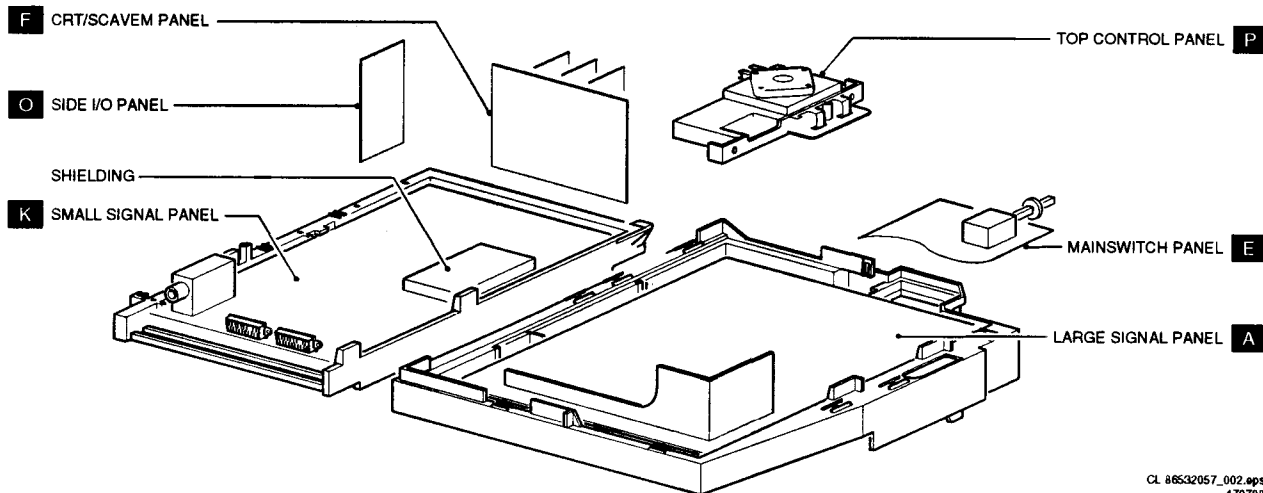


Figure 2-3

## 3.1 Safety instructions for repairs



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  $\Delta$ , 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. h

- As a strict precaution, we advise you to resolder the solder joints through which the horizontal deflection current is flowing, in particular: ('general repair instruction')
  - 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 MW and 12 MW;
- 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.

## 3.2 Maintenance instruction

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.

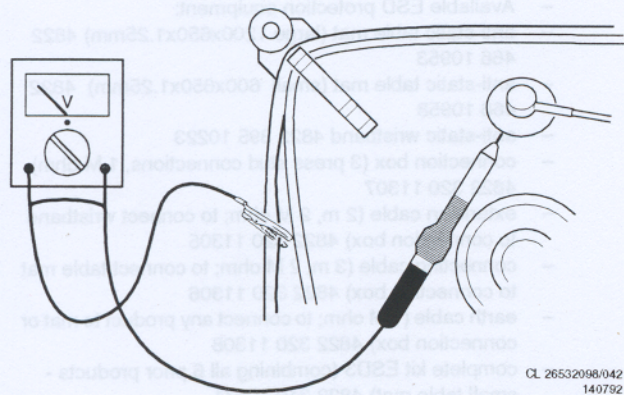
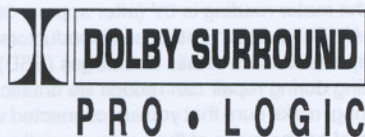
## 3.3 Warnings



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).
2. ESD All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.
  - Available ESD protection equipment:
    - anti-static table mat (large 1200x650x1.25mm) 4822 466 10953
    - anti-static table mat (small 600x650x1.25mm) 4822 466 10958
    - anti-static wristband 4822 395 10223
    - connection box (3 press stud connections, 1 M ohm) 4822 320 11307
    - extension cable (2 m, 2 M ohm; to connect wristband to connection box) 4822 320 11305
    - connecting cable (3 m, 2 M ohm; to connect table mat to connection box) 4822 320 11306
    - earth cable (1 M ohm; to connect any product to mat or connection box) 4822 320 11308
    - complete kit ESD3 (combining all 6 prior products - small table mat) 4822 310 10671
    - wristband tester 4822 344 13999
3. Together with the deflection unit and any multipole unit, the flat square picture tubes used from 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 during 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.
7. Wear safety goggles during replacement of the picture tube

## 3.4 Notes

1. The direct voltages and oscillograms should be measured with regard to the tuner earth ( $\perp$ ), or hot earth ( $\perp$ ) as this is called.
2. The direct voltages and oscillograms shown in the diagrams are indicative and should be measured in the Service Default Mode (see chapter 5) with a colour bar signal and stereo sound (L:3 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 ( $\perp$ ) and without aerial signal ( $\perp$ ). Voltages in the power supply section are measured both for normal operation ( $\perp$ ) and in standby ( $\perp$ ). 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.
6. Manufactured under license from Dolby Laboratories Licensing Corporation.
7. DOLBY, the double D symbol and PRO LOGIC are trademarks of Dolby Laboratories Licensing Corporation.



## 4.1 Removing the rear cover

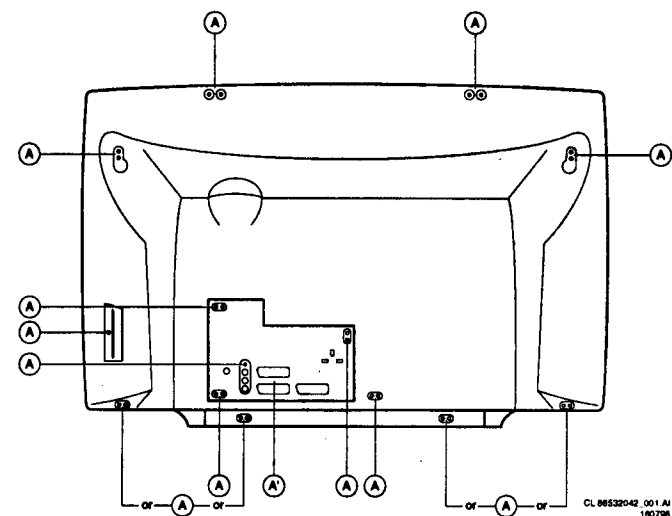


Figure 4-1

1. Remove the fixation screws (A) of the rear cover, notice also the side-I/O-screw; see figure 4.1 (A') screw only valid for 3-scarts configuration.
2. Remove the rear cover.

## 4.2 Service positions

There are two predefined service positions

1. Service position for the top side (component-side)
2. Service position for the bottom side (only valid for LSP) (copper-side)

### 4.2.1 Service position top side

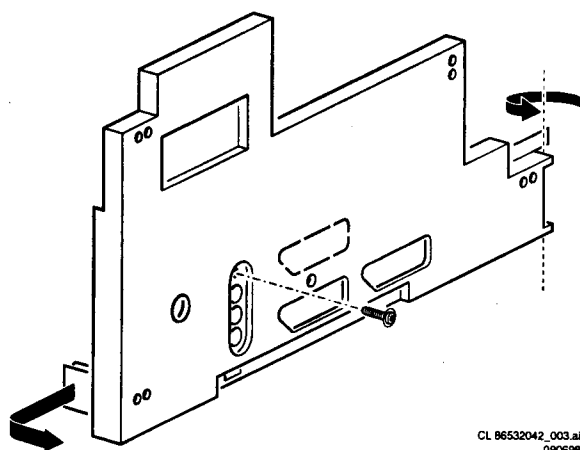


Figure 4-2

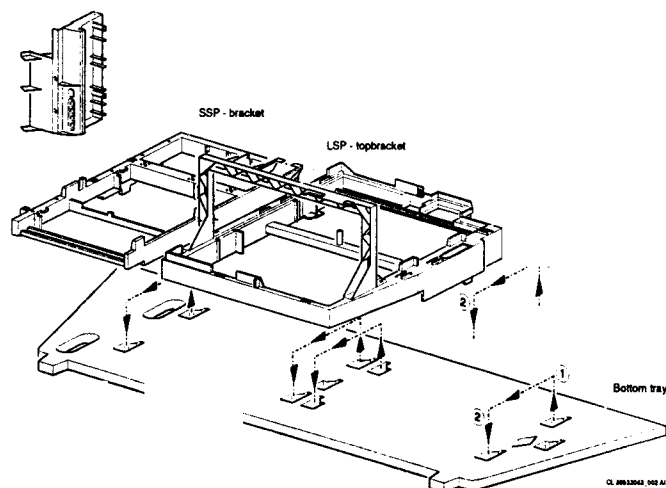


Figure 4-3

1. Remove 1 screw in case of 2-scarts I/O-backplate and 2 screws in case of a 3-scarts I/O-backplate. (See figure 4.2)
2. Remove I/O-backplate by releasing snap at left side. Pull to left and backwards. The I/O-bracket hinges at the right side. It can be removed now.
3. Pull backwards (about 8 cm) the bracket with the SSP and the LSP. These brackets are not fixed to each other, but can be repositioned backwards, as if they were one bracket.
4. Hook the brackets in the first row of fixation-holes of the bottom tray; see figure 4.3. In other words re-position the fixation from (1) TO (2)

### 4.2.2 Service position bottom side (only for LSP)

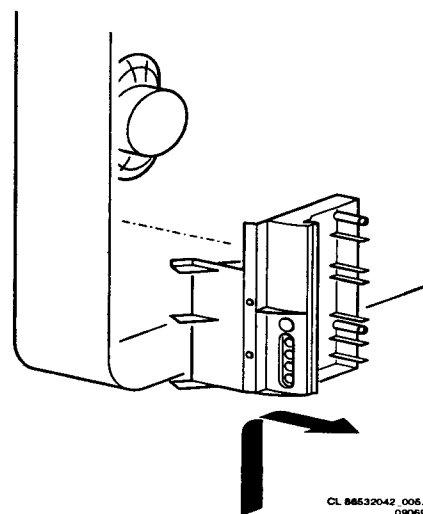


Figure 4-4

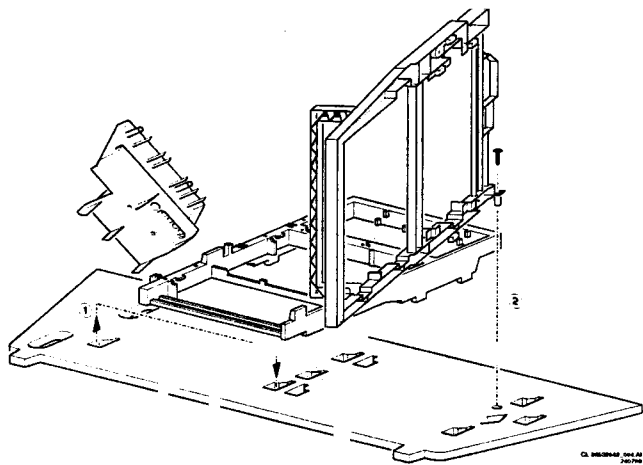


Figure 4-5

1. Referring to previous Service position one must remove the SSP and LSP from bottom tray by pulling back these two panels.
2. Disconnect the SSP from the LSP bracket
3. The two panels must be shifted some 25 cm to the right. When doing this the side-assembly can be taken out of the hinge (see figure 4.4), and placed on the bottom tray.
4. Either the LSP-topbracket must be removed first, or the cabling from SSP to LSP (O310 and O311) must be re-routed outside the LSP-topbracket to get room to position these panels
5. Turn the LSP 90 degrees anti clock wise and place the LSP in the hole of the bottom tray. If needed a screw can reinforce the stability of this position. (see figure 4.5) (See (2)).
6. The left front hook of the SSP panel can be fixed in a fixation-hole, that was used in previous service-position for the right front hook of the SSP. See described movement-action (1). (there is no right fixation hole)

#### 4.2.3 (Service position bottom side SSP)

1. In fact there is no service position for the bottom of the SSP. Almost all components are present on the component-side. All test points are located on the component-side.
2. If ICs must be replaced take the complete panel out. If still a service-position is needed take SSP out of bracket and rotate it so that one (sitting behind the set) sees the copper-side of the SSP, with Tuner pointed to the upper-side.

#### 4.3 Removing the LSP-top bracket

1. (See figure 4.3). Remove the two fixation screws of the LSP-topbracket (one on the left hand side, one on the right hand side)
2. Disconnect wirings from cable-clamps of LSP-topbracket
3. In case the line transformer is changed by a bigger type a part of the LSP-topbracket can be removed by breaking it

#### 4.4 Removing the SSP from SSP-bracket

1. Release the three fixation clamps on the right hand side of the bracket
2. Press the board upwards and remove the board from the bracket

#### 4.5 Removing the LSP from LSP-bracket

1. Release the two fixation clamps on the right hand side of the bracket
2. Press the board upwards and remove the board from the bracket

#### 4.6 Removing the top control board

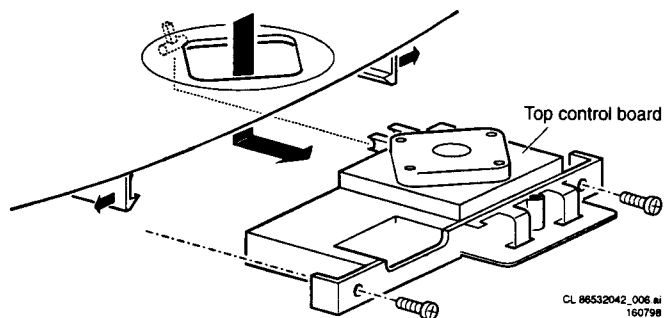


Figure 4-6

1. See figure 4.6. Pull 2 clamps to the outer side
2. Top control board can be pushed down now, while it hinges still in the front
3. Now the board can be pulled backwards
4. (If by accident the hinge in front is damaged or one of the clamps is broken, the top control board can also be fixed by 2 screws)

#### 4.7 Removing the side I/O board

1. The complete Side I/O-assembly can be lifted out of the hinges and placed on the bottom tray of the set. (see fig 4.3)
2. The pcb can easily be removed out of the bracket by releasing the fixation clamps

#### 4.8 Removing the mains switch/LED board

1. Release the two fixation clamps
2. Pull the board backwards

#### 4.9 Mounting the rear cover

Before mounting the rear cover, check whether the mains cord is mounted correctly in the guiding brackets



In this chapter the following paragraphs are included:

- 5.1 Test points
- 5.2 Service modes, Dealer Service Tool and ComPair (including fault finding tips related to CSM-mode)
- 5.3 Error codes
- 5.4 Protections
- 5.5 Fault find tree

## 5.1 Test points

The MG2.1E chassis is equipped with test points in the service printing. These test points are referring to the functional blocks:

- P1-P2-P3, etc: Test points for the power supply
- L1-L2-L3, etc: Test points for the line drive and line output circuitry
- F1-F2-F3, etc on Small Signal Panel: Test points for the frame drive
- F1-F2-F3, etc. on CRT/Scavem Panel: Test points for the CRT-panel circuitry
- F1-F2-F3, etc. on Large Small Signal Panel: Test points for the frame output circuitry,
- S1-S2-S3, etc: Test points for the synchronisation circuitry
- V1-V2-V3, etc: Test points for the video processing circuitry
- I1-I2-I3, etc: Test points for the Tuner/IF part
- A1-A2-A3, etc. on Small Signal Panel: Test points for the audio processing circuitry
- A1-A2-A3, etc. on Large Signal Panel: Test points for the audio amplifiers
- C1-C2-C3, etc: Test points for the control circuitry
- T1-T2-T3, etc: Testpoints for the teletext circuitry
- SC1-SC2-SC3, etc: Test points for the Scavem circuitry

The numbering is done in a for diagnostics logical sequence; always start diagnosing within a functional block in the sequence of the relevant test points for that functional block.

## 5.2 Service modes, Dealer Service Tool and ComPair

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 MG2.1E chassis. The RC7150 is also called Dealer Service Tool or DST. The ordering number of the DST (RC7150) is 4822 218 21232.

### *Installation features for the dealer*

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

10 Different program tables can be programmed into the DST via a TV-set (downloading from the GFL, MD2 or MG2.1 to the DST; see GFL, MD2 and MG2.1 service manuals) or by the DST-I (DST interface; ordering code 4822 218 21277).

For explanation of the installation features of the DST, the directions for use of the DST (4822 727 20073) are recommended (For the MG2.1E chassis, download code 4 should be used).

### *Diagnose features for the servicer*

The MG2.1E sets can be put in the two service modes via the DST RC7150. These are the Service Default Mode (SDM) and the Service Alignment Mode (SAM).

The SDM and SAM can also be entered by short circuiting the relevant pins on the SSP.

### **Service Default Mode (SDM)**

Specification of the SDM:

- Tuning frequency 475.25 MHz
- TV-system for BGLM set to BG, for BGLL'I sets to LL'
- All picture settings at 50% (brightness, colour, contrast, HUE)
- All sound settings at 50% except volume at 25% (so bass, treble, balance at 50%, volume at 25%)
- All service-unfriendly modes are disabled (like sleep timer, child lock, blue mute)

Entering the SDM can be done in 2 ways:

- By the "DEFAULT" key on the DST while the set is in the normal operation mode.
- By shortcircuiting for a moment the two pins (pin 2 and 3 of connector 0356) on the component side of the SSP with the indication "SDM" (activation can be performed in all modes except when the set has a problem with the main-processor).

Note: If the SDM is entered via the pins, all the protections are de-activated.

Exiting the SDM can only be done via the STANDBY command. By switching off-on the set with the mains switch the MG2.1E will come up again in the SDM.

### **Service Alignment Mode (SAM)**

Specification of the SAM:

- Software alignments (see chapter 8)
- Option settings (see chapter 8)
- Error buffer reading and erasing. The most recent error code is displayed on the left side.
- Operation counter
- Software version

Entering the SAM can be done in 2 ways:

- By the > button on the DST while the set is in the normal operation mode (or SDM). Enter the password '3-1-4-0' and press OK.
- By shortcircuiting for a moment the two pins (pin 1 and 2 of connector 0356) on the component side of the SSP with the indication "SAM" (activation can be performed in all modes except when the set has a problem with the microprocessor).

Note: If the SAM is entered via the pins, all protections are de-activated.

Exiting the SAM can be done via the MENU command or via switching off-on the set with the mains switch.

### **Customer Service Mode (CSM)**

All MG2.1E sets are equipped with the 'Customer Service Mode' (CSM). This 'Customer Service Mode' (CSM) is a special service mode which can be activated and deactivated by the customer upon request of the service technician/dealer during a telephone conversation in order to identify the status of the set. This CSM is a 'read only' mode, therefore modifications in this mode are not possible.

### **Switching-on of the Customer Service Mode**

The Customer Service Mode will switch-on after pressing simultaneously the "MUTE" knob on the remote control handset and the "MENU" button on the TV for at least 4

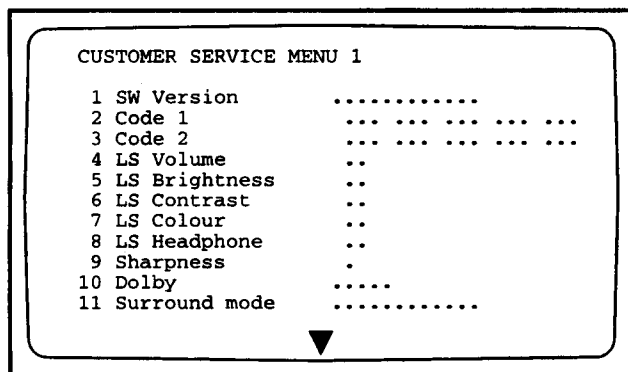
seconds. This activation only works if there is no menu on the screen.

#### Switching-off the Customer Service Mode

The Customer Service Mode will switch-off after pressing any key of the remote control handset (with exception of the 'cursor-up' and 'cursor-down' keys, or the buttons on the TV or by switching off the TV set with the mains switch).

#### Detailed explanation of the Customer service Mode

After switching on the Customer Service Menu the following screen will appear:



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230798

Figure 5-1 Customer Service Menu 1

Line 1: Software version; the build in software version AAAA=MG21(chassis name) B = E (Europe) C = 1 (language cluster) X = main version number Y = sub version number Details on the software version can be found in the chapter "Software Survey" of the publication "Product Survey - Colour Television".

Line 2: Code 1; gives the last 5 errors of the error buffer. As soon as the built-in diagnose software has detected an error the buffer is adapted.

Line 3: Code 2; gives the first 5 errors of the error buffer. As soon as the built-in diagnose software has detected an error the buffer is adapted. The last occurred error is displayed on the leftmost position of code 2. Each error code is displayed as a 3 digit number. When less than 10 errors occur, the rest of the line(s) is(are) empty. In case of no errors the text "No Errors" is displayed. See paragraph 5.3 of this chapter for a description of the error codes.

Line 4: LS Volume; gives the Last Status of the volume as set by the customer for this selected transmitter. Volume values can be changed via the volume key on the remote control handset.

Line 5: LS Brightness; gives the Last Status of the brightness as set by the customer for this selected transmitter. Brightness values can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the red button for picture menu and selecting "brightness".

Line 6: LS Contrast; gives the Last Status of the contrast as set by the customer. The value can vary from 0 (contrast is minimum) to 63 (contrast is maximum). Contrast values can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the red button for picture menu and selecting "contrast".

Line 7: LS Colour; gives the Last Status of the colour saturation, as set by the customer. The value can vary from 0

(colour is minimum) to 63 (colour is maximum). Colour values can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the red button for picture menu and selecting "colour".

Line 8: LS Headphone; gives the Last Status of the headphone volume, as set by the customer. The value can vary from 0 (volume is minimum) to 63 (volume is maximum). Headphone volume values can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the green button for sound menu and selecting "headphone".

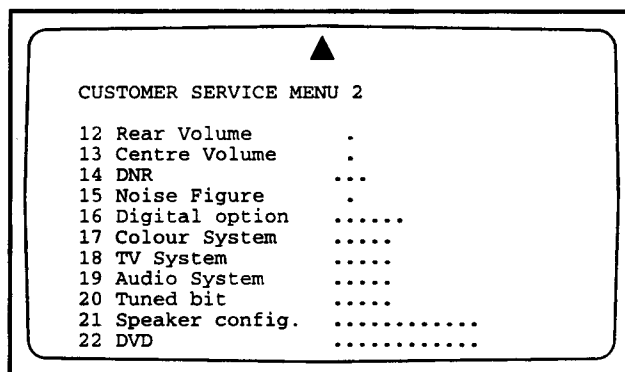
Line 9: Sharpness; gives the sharpness value. The value can vary from 0 (sharpness is minimum) to 4 (sharpness is maximum). In case of bad antenna signals a too high value of the sharpness can result in a noisy picture. Sharpness values can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the red button for picture menu and selecting "sharpness".

Line 10: Dolby; indicates whether the received transmitter transmits Dolby sound (present) or not (not present). Attention: The presence of Dolby can only be tested by the software on the Dolby Signalling bit. If a Dolby transmission is therefore received without a Dolby Signalling bit, then this indicator will show "not present" even though such a Dolby transmission is received.

Line 11: Surround Mode; indicates the by the customer selected surround mode. In case the set is a Non-dolby set there will be displayed "0". If it is a Dolby-set then is displayed: "Pro Logic", "Dolby 3 Stereo", "Hall" or "Off". For Dolby-set surround mode can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the green button for sound menu and selecting "Surround settings".

By means of the 'cursor-down' knob on the remote control handset the Customer Service Menu 2 will appear. By means of the 'cursor-up' knob on the remote control handset the Customer Service Menu 1 will appear again.

Customer Service Menu 2 represents following information:



86532061\_005.AI  
230798

Figure 5-2 Customer Service Menu 2

Line 12: Rear Volume; gives the volume value of the surround sound loudspeakers. This value can vary from 0 (minimum volume) to 63 (maximum volume). Rear volume can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the green button for sound menu, selecting "Surround settings" and selecting "Rear volume". This feature is only available when surround mode is in "Dolby Pro Logic" or "Hall".

Line 13: Centre Volume; gives the volume value of the centre loudspeakers. This value can vary from 0 (minimum volume) to 63 (maximum volume). Centre volume can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the green button for sound menu, selecting 'Dolby Pro Logic' and selecting "centre volume". This feature is only available when surround mode is in "Dolby Pro Logic" or "Dolby 3 Stereo".

Line 14: DNR (Dynamic Noise Reduction); gives the setting of the DNR for the selected transmitter. The following selections are possible:

"off", "min", "med" or "max"  
 "off" or "automatic" (MG2.1E with "Automatic Noise Reduction").

The DNR can be changed via the "DNR" key on the remote control handset.

Line 15: Noise Figure; gives the selected noise ratio for this selected transmitter. This value can vary from 0-2 (good signal) to 4-5 (average signal) and to 7 or higher (bad signal). This only works in case the DNR selection is "off/automatic".

Line 16: Digital Option; gives the selected digital mode, "100Hz", Digital Scan" or "Natural Motion". Digital option can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the red button for picture menu and selecting "digital options".

Line 17: Colour System; gives information about the colour system of the selected transmitter.

Black and white:no colour carrier received  
 PAL:PAL signal received  
 SECAM:SECAM signal received  
 NTSC:NTSC signal received

Line 18: TV System; gives information about the video system of the selected transmitter.

- BG:BG signal received
- DK:DK signal received
- I:PAL I signal received
- L:SECAM L signals received
- M38.9:NTSC M signal received with video carrier on 38.9 MHz
- MN:NTSC M signal received

Line 19: Audio System; gives information about the audio system of the selected transmitter.

- Sound Muted:No sound
- Dolby Pro Logic:Dolby Pro Logic sound received
- Mono:Mono sound received
- Stereo:Stereo sound received
- Dual I:Language I received
- Dual II:Language II received
- Digital Mono:Digital mono sound is received
- Digital Stereo:Digital stereo sound is received
- Digital Dual I:Digital language I is received
- Digital Dual II:Digital language II is received

Line 20: Tuned Bit; gives information about the tuning method of the stored preset. If the value is "Yes" the preset is stored via manual entry of the frequency when a transmitter was not present on that frequency. In that case the TV will attempt to perform a micro-search every time the preset number is selected. Once the micro-search has been successful the Tuned Bit will be set to "No".

Line 21: Speaker configuration; gives the configuration setting for the speakers.

In case the set is a Non-dolby set there will be displayed "0". If it is a Dolby-set then is displayed:

"Full internal", "L/R external", "Surround external" or "Full external". For the Dolby-set the speaker configuration can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after opening the installation menu and selecting "set up". The installation menu can be opened by pressing 'timer' and 'enlarge' at the same time. This feature is only available when the set has virtual Dolby.

Line 22: DVD; gives the configuration setting for DVD. This can be "Present" or "Not Present". If "Present" is selected the starting point is a top quality signal and a number of settings are therefore changed automatically. DVD can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after opening the installation menu and selecting "set up". The installation menu can be opened by pressing 'timer' and 'enlarge' at the same time.

### Problems and solving tips

The procedures to change the value or the status of the different settings is described in the paragraph 'Detailed explanation of the Customer Service Mode'

### Picture problems

Worse picture quality in case of DVD pictures Check line 22 "DVD". In case line 22 gives the indication "Not Present" change the setting into "Present".

### Snowy/noisy picture

1. Check line 15 "Noise Figure". In case the value is 7 or higher and the value is also high on other programs check the aerial cable / aerial system.
2. Check lines 9 "Sharpness", 14 "DNR" and 15 "Noise Figure". In case the value of line 9 is 3 or 4 and the value of line 15 is high (7 or higher), lower the value of line 9 "sharpness" and switch DNR (line 14) to "automatic", "on" or to a higher value.

### Picture too dark

1. Press "Smart Picture" button on the Remote Control handset. In case picture improves, raise the brightness value or raise the contrast value. The new value(s) are automatically stored for all TV channels.
2. After switching on the Customer Service Mode the picture is OK. Raise the brightness value or raise the contrast value. The new value(s) are automatically stored for all TV channels.
3. Check lines 6 "PP Brightness" and 7 "PP Contrast". The value of line 6 is low (<10) or the value of line 7 is low (<10). Raise the brightness value or raise the contrast value.

### Picture too bright

1. Press "Smart Picture" button on the Remote Control handset. In case picture improves, reduce the brightness value or reduce the contrast value. The new value(s) are automatically stored for all TV channels.
2. After switching on the Customer service Mode the picture is OK. Reduce the brightness value or reduce the contrast value. The new value(s) are automatically stored for all TV channels.
3. Check lines 6 "PP Brightness" and 7 "PP Contrast". The value of line 6 is high(>40) or the value of line 7 is high (>50). Reduce the brightness value or raise the contrast value.

**Fading picture**

Digital scan effect. Check line 14 "DNR". The status of "DNR" is 'med' or 'max'. Reduce "DNR" to 'min' or switch off the digital scan.

**White line around picture elements and text**

1. Press "Smart Picture" button on the Remote Control handset. In case picture improves, reduce the sharpness value. The new value(s) are automatically stored for all TV channels.
2. After switching on the Customer service Mode the picture is OK. Reduce the sharpness value. The new value(s) are automatically stored for all TV channels.
3. Check lines Check line 8 "Sharpness". Reduce the sharpness value. The new value(s) are automatically stored for all TV channels

No picture Check line 20 "Tuned bit". In case the value is 'Yes', install the required program again. Open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation.

Blue picture No proper signal is received. Check the aerial cable/aerial system.

Blue picture and/or unstable picture A scrambled or decoded signal is received

Black and white picture Check line 5 "PP colour" In case the value is low (<10) raise the value of colour. The new value(s) are automatically stored for all TV channels.

**No colours/colour lines around picture elements**

1. Check lines 17 "Colour System" and 18 "TV System". In case line 17 is 'PAL' and line 18 is 'M 38,9', the installed system for this preset is 'USA', while 'West Europe' is required. Install the required program again. Open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; West Europe'.
2. In case line 17 is 'PAL' and line 18 is 'L', the installed system for this preset is 'France', while 'West Europe' is required. Install the required program again. Open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; West Europe'

**No colours/noise in picture**

1. Check lines 17 "Colour System" and 18 "TV System". In case line 17 is 'Black and White' and line 18 is 'BG', the installed system for this preset is 'West Europe', while 'USA' is required. Install the required program again. Open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; USA'.
2. In case line 17 is 'Black and White' and line 18 is 'L', the installed system for this preset is 'France', while 'USA' is required. Install the required program again. Open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; USA'

Colours not correct Check lines 17 "Colour System" and 18 "TV System". In case line 17 is 'PAL' and line 18 is 'L', the installed system for this preset is 'France', while 'West Europe' is required. Install the required program again. Open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; West Europe'.

Colours not correct/unstable picture Check lines 17 "Colour System" and 18 "TV System". In case line 17 is 'SECAM' and line 18 is 'BG', the installed system for this preset is 'USA', while 'France' is required. Install the required program again. Open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; France'.

Unstable picture Check lines 17 "Colour System" and 18 "TV System". In case line 17 is 'SECAM' and line 18 is 'M 38,9', the installed system for this preset is 'West Europe', while 'France' is required. Install the required program again. Open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; France'.

**Menu text not sharp enough**

1. Press "Smart Picture" button on the Remote Control handset. In case picture improves, reduce the contrast value. The new value(s) are automatically stored for all TV channels.
2. After switching on the Customer Service Mode the picture is OK. Reduce the contrast value The new value(s) are automatically stored for all TV channels.
3. Check line 7 "PP Contrast". The value of line 7 is high (>50). Reduce the contrast value.

**Sound problems****No sound from left and right speaker**

1. Press "Smart Sound" button on the Remote Control handset. In case sound improves, raise the volume value. The new value(s) are automatically stored for all TV channels.
2. After switching on the Customer Service Mode the volume is OK. Raise the volume value. The new value(s) are automatically stored for all TV channels.
3. Check line 4 "PP Volume". The value is low. Raise the value of "PP Volume". The new value(s) are automatically stored for all TV channels.

**Sound too loud for left and right speaker**

1. Press "Smart Sound" button on the Remote Control handset. In case sound improves, reduce the volume value. The new value(s) are automatically stored for all TV channels.
2. After switching on the Customer Service Mode the volume is OK. Reduce the volume value. The new value(s) are automatically stored for all TV channels.
3. Check line 4 "PP Volume". The value is high. Reduce the value of "PP Volume". The new value(s) are automatically stored for all TV channels.

No sound from "centre" speaker Check line 12 "Centre Volume" The value is low. Raise the value of the "Centre Volume"

Sound too loud from "centre" speaker Check line 12 "Centre Volume" The value is high. Reduce the value of the "Centre Volume"

**Diagnose Mode (only active during transmission of error codes and diagnose 99)**

This mode is activated by the DIAGNOSE command on the DST for reading the error codes and erasing the error buffer by the DST even when the set is in protection and so there is no picture (assuming that the power supply and the control part are working). For activation see paragraph 5.3. The diagnose Mode is only a temporarily mode (the set will go back to the previous mode), and can not be switched on permanently.

Note: The diagnose mode can not be entered if the SAM is activated.

### Compair

Compair (Computer Aided Repair) is a service tool for Philips Consumer Electronics products. Compair is a further development on the DST service remote control allowing faster and more accurate diagnostics. Compair has three big advantages:

Compair helps you to quickly get an understanding how to repair the MG2.1E in short time by guiding you step by step through the repair procedures

Compair allows very detailed diagnostics (on I<sup>2</sup>C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I<sup>2</sup>C commands yourself; Compair takes care of this. Compair speeds up the repair time since it can automatically communicate with the MG2.1E (when the micro processor is working) and all repair information is directly available. When Compair is installed together with the SearchMan MG2.1E electronic manual, schematics and PCBs are only a mouse-click away

Compair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The Compair interface box is connected to the PC via a serial or RS232 cable. In case of the MG2.1E chassis, the Compair interface box and the television communicate with each other via bi-directional infrared signal.

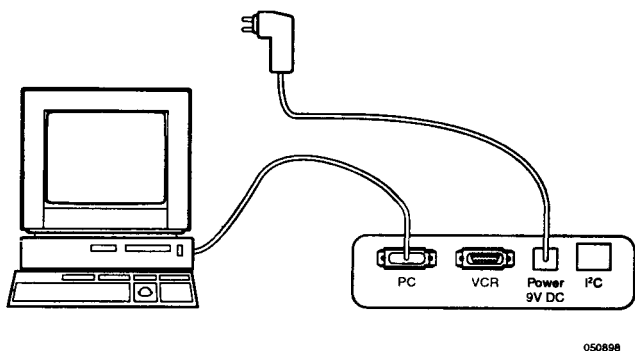


Figure 5-3

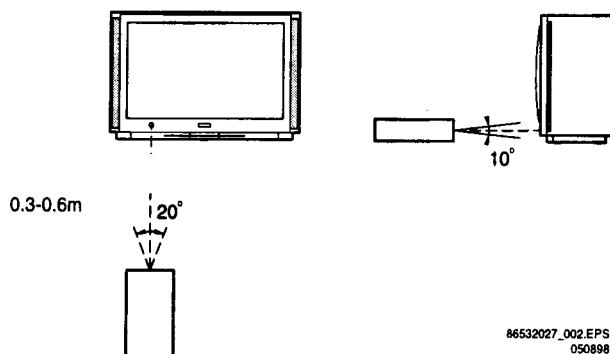


Figure 5-4

The Compair fault finding program is able to determine the problem of the defective television. Compair can gather diagnostic information in 2 ways:

1. communication to the television (automatic)
2. asking questions to you (manually)

Compair combines this information with the repair information in its database to find out how to repair the MG2.1E.

### Automatic information gathering

Step-by-step start up Under normal circumstances, a fault in the power supply or an error during start-up will switch the television to protection-mode. Compair can take over the initialisation of the television. In this way it is possible to distinguish which part of the start-up routine (hence which circuitry) is causing the problem.

Reading out the error buffer Compair can automatically read out the contents of the entire error buffer.

Diagnosis on I<sup>2</sup>C level. Compair can access the I<sup>2</sup>C bus of the television without a physical connection. Compair can send and receive infrared commands to the micro controller of the television. These commands are translated by the controller to I<sup>2</sup>C commands and vice versa. In this way it is possible for Compair to communicate (read and write) to devices on the I<sup>2</sup>C busses of the MG2.1E.

### Manual information gathering

Automatic diagnosis is only possible if the micro controller of the television is working correctly and only to a certain extend. When this is not the case, Compair will guide you through the fault finding tree by asking you questions and showing you examples. You can answer by clicking on a link (e.g. text or an oscillogram) that will bring you to the next step in the fault findig process.

A question could be: Do you see snow? (Click on the correct answer)

YES / NO

An example can be: Measure testpoint I7 and click on the correct oscillogram you see on the oscilloscope

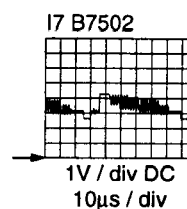


Figure 5-5

By a combination of automatic diagnostics and an interactive question/answer procedure, Compair will enable you to find most problems in a fast and effective way.

### Additional features

Beside fault finding, Compair provides some additional features like:

- Uploading / downloading of presets
- Managing of preset lists
- Emulation of the Dealer Service Tool

### SearchMan (electronic service manual)

When Compair is installed in combination with SearchMan, all schematics and PCBs will be directly available while you repair a television if you click on a PCB or schematic link:

Example: Measure the DC voltage on C2568 ( PCB / schematic ) on the small signal level..

Clicking on PCB will automatically pop-up a picture of the PCB with the location of C2568 marked. Clicking on schematic will automatically pop-up the schematic with the location of C2568 marked.

### 5.3 Error codes

#### 5.3.1 Reading error codes from the error buffer

The error buffer can be read in 2 ways:

- On the screen via the Service Alignment Mode (SAM) In case picture is OK, the error buffer can be read the easiest via the SAM. In the main menu of the SAM the last 10 different error codes occurred are displayed. The most recent detected error code is displayed on the left side, so e.g.: 0 0 0 0 means no error codes present in the buffer 3 0 0 0 means one error code present in the buffer; error code 3 2 3 0 0 means two error codes present in the buffer; error code 2 is the most recent, error code 3 is detected before 2
- On the display of the DST If an error has been detected by the MG2.1E chassis, the set might go into protection. Without the presence of a picture the errors can be read by the DST, as long as the main-processor is still active (green LED continuous and red LED blinking fast (5Hz); in case of red LED is blinking slow (1,25Hz) there is a main-processor problem). To transmit the errors from the TV to the DST:
  - Press the "DIAGNOSE" key (in all modes except the SAM)
  - Press "1" to view the last error detected.

- Hold the DST 5 to 10 cm from in front of the stand-by LED of the set (the IR-sending LED of MG2.1E is located near the stand-by LED).
- Press the "OK" key.

The error is represented by a 2 digit number. The 2 digits on the DST are displayed sequentially, with a pause before it is repeated. The digit after the pause is the 1st digit. If the display reads 4 - 7, the error code is 47. To read other error codes, press "DIAGNOSE" and one of the other digit keys. Note:

- If the DST cannot communicate to the MG2.1E in a proper way, ERROR 2 is shown in the display of the DST. Trying again by changing the DST position a little bit might often help.
- If the error buffer of MG2.1E is empty, no errors are displayed by the DST; the display remains blank.

#### 5.3.2 Clearing the error buffer

The error buffer can be cleared in 2 ways:

- In the SAM by selecting the item RESET ERROR BUFFER in the main menu.
- By the "DIAGNOSE 99" command of the DST (in all modes except the SAM). Press the DIAGNOSE key on the DST, followed by 9 and 9 and then >.

#### 5.3.3 Error code table

**Table 5-1 Error messages**

Error	Device	Description	item	Diagram	Defective module indication
1	ST24E16	Non volatile memory	IC7008	K7	Control
2	ST24E32 or M24C32	Non volatile memory	IC7008	K7	
3	SAA5800	OTC2.5 microprocessor/TXT	IC7003	K7	
5	UV1316	Tuner	U1102	K1	Tuner
15	TDA9320H	HIP I/O-video processing	IC7501	K1	Chroma IF IO
20	TDA9330H	HOP video control/deflection processor	IC7300	K6	Video Controller
25	MSP3410D	ITT sound processor	IC7751	K3	Audio module
26	SAA7712H	SEDSP dolby processor	IC7770	K4	
50	SAA4978H	Picnic	IC7609	K5	Feature Box
51	SAA4990H	Prozonic	IC7608	K5	
65	Slow I <sup>2</sup> C		fig 5.7		Slow I <sup>2</sup> C
66	Fast I <sup>2</sup> C		fig 5.7		Fast I <sup>2</sup> C
67	Supply 5V	5V2	fig 5.6		+5 V Supply
68	Supply 8V	8V6	fig 5.8		+8V Supply
20	V fail protection	VFB	fig 5.9	A3/A2/K6	Vertical Flyback
71	H fail protection	HFB	fig 5.9	A2/K6	Horizontal Flyback
73	Line Deflection protection	LDP	IC7484	A2/K6	Line Deflection
74	Beam Current Protection	BC-PROT	TS7351	K6/K7	Beam Current
76	DC Sound protection	DC-PROT	TS7762	A4/A1	Sound Output
77	Feature box protection	FBX-PROT	fig 5.5	K4	+3V3 (FBX) Supply

Remark: If on the DST the text "ERROR 2" is displayed, this means that the communication from the TV to the DST has failed

## 5.4 Protections

### 5.4.1 General

The MG2.1E "Protection Diagram" shows the structure of the protection system. See protection diagram (fig 5.6)

One micro-processor.

The MG2.1E has only one micro-processor (OTC) and it remains active during Standby. This because power of the uP and the attached memory chip set is coming from the 3V3 supply, which is derived from the 5V Standby-circuitry. So in both power-on as in Standby-mode the uP is connected to this power supply. The micro processor controls the Standby-line for switching on and off the main supply. In the standby-mode or in the protection-mode the Standby-line will open the contacts of relay 1002 via T7000 and T7001, this results in switching off the mains input to the main supply (FFS). In the mean time via T7550 the intensity of LED of the opto-coupler will increase, which results in a quick slow-down of the FFS supply.

Two service-modes

To get a quick diagnoses the MG2.1E has two service-modes implemented:

The service default mode. Start-up of the set in a predefined way.

The service alignment mode. In this mode items of the set can be adjusted via a menu and with the help of test patterns.

Both modes can be entered via the service connector on the SSP (connector 0356) or via the DST (dealer service tool) or via Compar. The service alignment mode can not be entered in Standby, the set has to be in normal operation.

Protection levels

If a fault situation is detected an error code will be generated and if necessary the set will be put in the protection-mode. The protection-mode is indicated by blinking of the red LED. In some error cases the micro processor does not put the set in the protection-mode. The error codes of the error buffer can be read via the service-menu (SAM) or via the service send-LED and the DST/ Compar. The DST diagnose functionality will force the set in to the Service-standby, which is alike the usual Standby, however the micro-processor has to remain in normal operation completely.

The protections of the MG2.1E can be divided in 4 groups

- Protection from I<sup>2</sup>C-busses (Fast and Slow) or I<sup>2</sup>C-IC errors (device errors)
- Protection from the inputs on the OTC
- Protections from the status register of the HOP (communicated via I<sup>2</sup>C-bus)
- DC-protection (sound amplifiers) monitored on OTC

### 5.4.2 Protection from the I<sup>2</sup>C bus (fig. 5.7)

In normal operation some registers of the I<sup>2</sup>C controlled ICs will be refreshed every 200 msec. During this sequence three I<sup>2</sup>C-busses and the I<sup>2</sup>C -ICs as well will be checked. The I<sup>2</sup>C protection will take place if the SDA and SCL are whether short

circuited to ground or to each other. An I<sup>2</sup>C error can also occur, if the power supply of the IC is missing.

*Protection from the inputs on the OTC (fig.5.8)*

If a protection is detected at an input of the OTC, all protection inputs of the OTC will be scanned every 200 msec. for 5 times. If the protection on one of the inputs is still activated after 1 sec., then the set will be put in the protection-mode. Before the scanning is started a so called ESD-refresh will be carried out first, because the interrupt on one of the inputs may be caused either by a FLASH or by ESD. As a FLASH or ESD can harm the settings of some ICs, the HOP-HIP-ITT-EDRIC (Dolby-IC)-TEA6417-TEA6422-LTP-PICNIC and Tuner are initialised again to ensure the normal picture and sound conditions of the set.

- 8V6 and 5V2 protection. (See detailed figure 5.8)
- The presence of the 8V6 and 5V2 is sensed by the OTC. If the 8V6 and 5V2 is not present, then an error code is stored in the error buffer and the set is put in the protection-mode.
- BC protection (Beam Current). (See detailed figure 5.8)
- The beam current is measured by a circuit on the SSP. If the beam current exceeds a certain reference level, then via D6350 and T7351 the BC-input of the OTC is set to high. The error code is stored in the error buffer and the set is put in the protection-mode.
- LDP-protection (Line Deflection Protection) (See detailed figure 5.8)
- Two protection circuits are connected to the LDP-input of the HOP :
  1. Flash detection. From the EHT-info, via D6341 and T7341 a flash will stop the H-drive and line output stage immediately. The FLS-bit in the status register of the HOP is set to 'high'. As the duration of a flash is very short the FLS-bit will be reset to 'low' again after the flash refresh, so via a slow start the set will be started again.
  2. LDP detection. The EW-protection, coming from the line-output is also connected to the same input as above. The current through the EW-stage is measured by R3483 and R3484 on the LSP. The voltage across these precision resistors will increase in case of a failure at the line output stage. If the voltage becomes higher than 1 V, then the output of IC7484 will become 'high' and remains 'high' via D6485 and R3490. Via D6344 the H-drive will be stopped. The FLS-bit will be set to 'high' and remains 'high' by means of the software filtering even after a flash refresh. The OTC will put the set Standby-mode. The error code is stored in the error buffer and the set gets into the protection mode.

### 5.4.4 Protections from the status register of the HOP (fig. 5.9)

Every 200 msec. the status register of the HOP is read by the OTC via I<sup>2</sup>C. If a protection signal is detected on one of the inputs of the HOP, then the relevant error bit in the HOP register is set to 'high'. If the error bit is still 'high' after 1 sec., the OTC will store the error code in the error buffer and depending on the relevancy of the error bit the set will either go into the protection-mode or not.

HFB : Horizontal Flyback (See detailed figure 5.9) Missing the horizontal fly back pulse is detected via an input of the HOP. One status bit is set to 'high'. The error code is stored in the error buffer and the set will go into the protection mode

VFB : Vertical Flyback (See detailed figure 5.9) The HOP will blank the screen , if the vertical flyback signals are not present at the VFB-guard input .The relevant status bit will

be set in the register of the HOP. The error code is stored in the error buffer, in this case protection is not necessary.

#### **5.4.5 DC-protection, sound amplifiers (Fig. 5.10)**

This is an urgent protection, the circuitry is located at the LSP. The output of the protection circuit will slow-down the FFS power supply immediately via the opto-coupler and via the Standby-relay the supply will be switched into Standby-mode at once. To be able to store the error code in the error buffer the protection signals are also wired to the OTC.

The protection is activated in case of

- unbalance of +Vs and -Vs

- unbalance of +7V7 and -7V7

- DC output present on one of the audio amplifiers

### **5.5 Fault find trees**

See fault find trees at the end of this chapter. (figures 5.11-5.17)



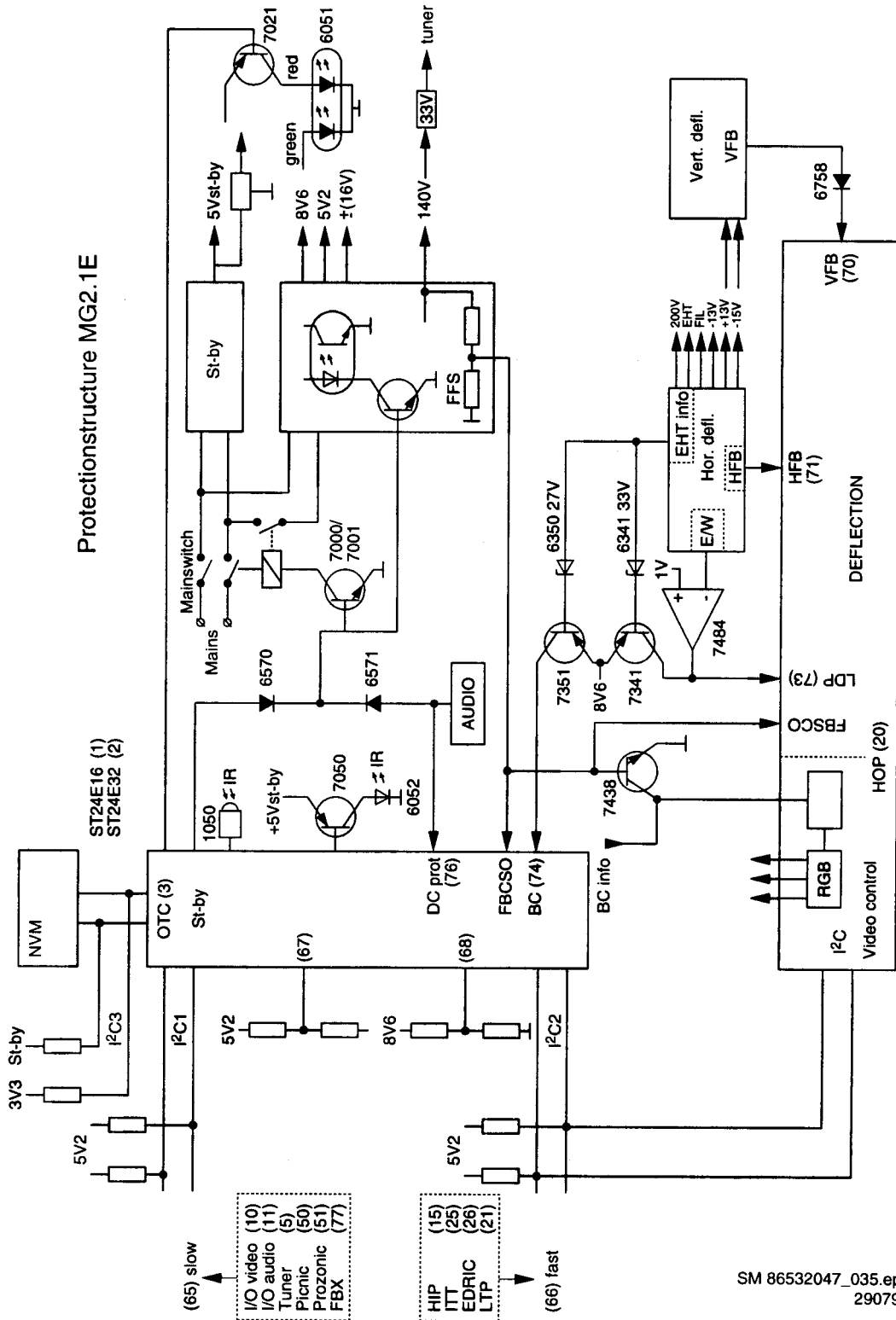
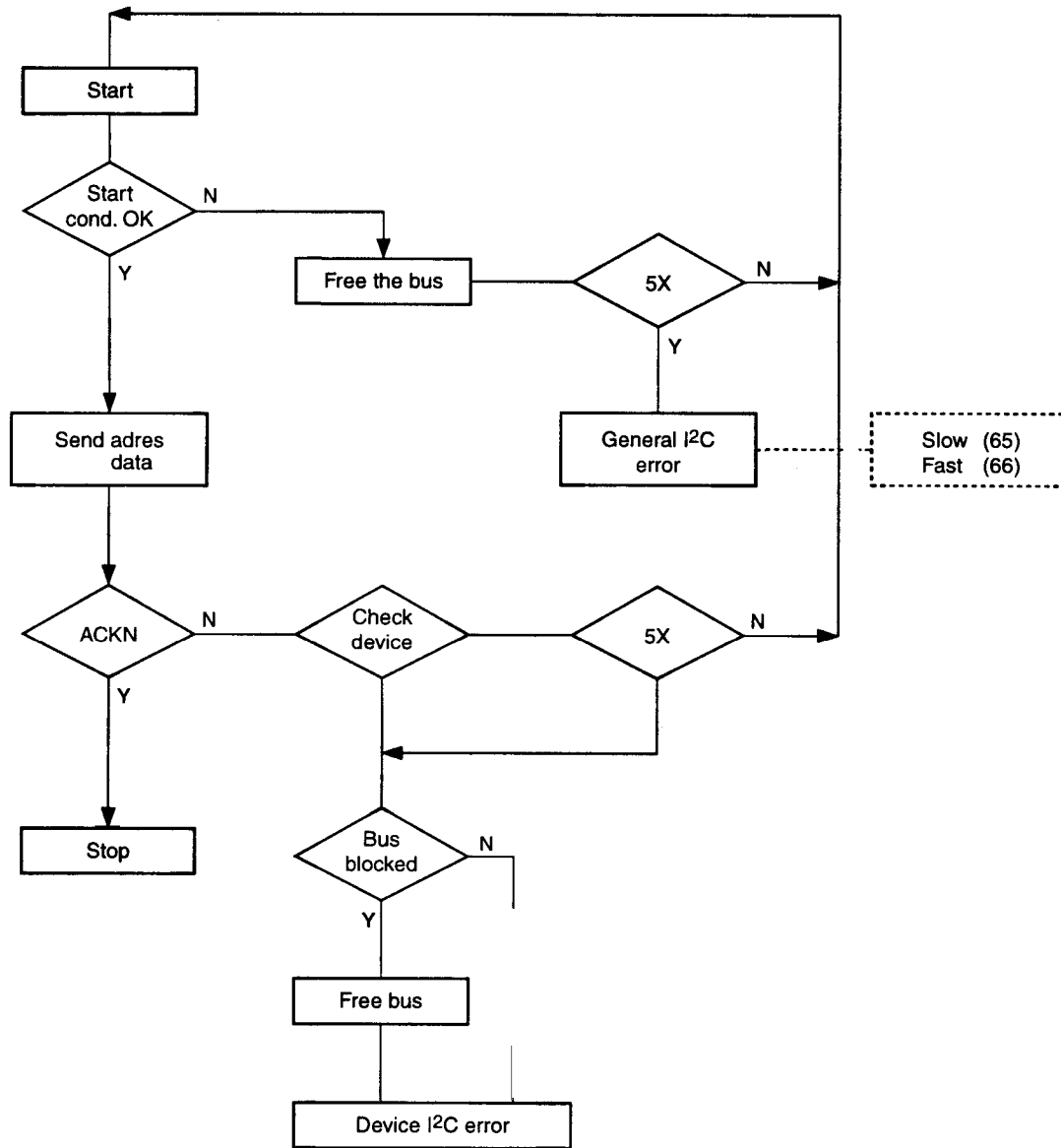


Figure 5-6

I<sup>2</sup>C drivers



Slow (65)  
Fast (66)

Slow	
TEA 6422	(11)
Tuner	(5)
Picnic	(50)
Prozonic	(51)
I/O video	(10)
FBX PROT	(77)

Fast	
LTP	(21)
Dolby	(26)
ITT	(25)
HIP	(15)
HOP	(20)

NVM-bus	
NVM	(1)
	(2)

Figure 5-7

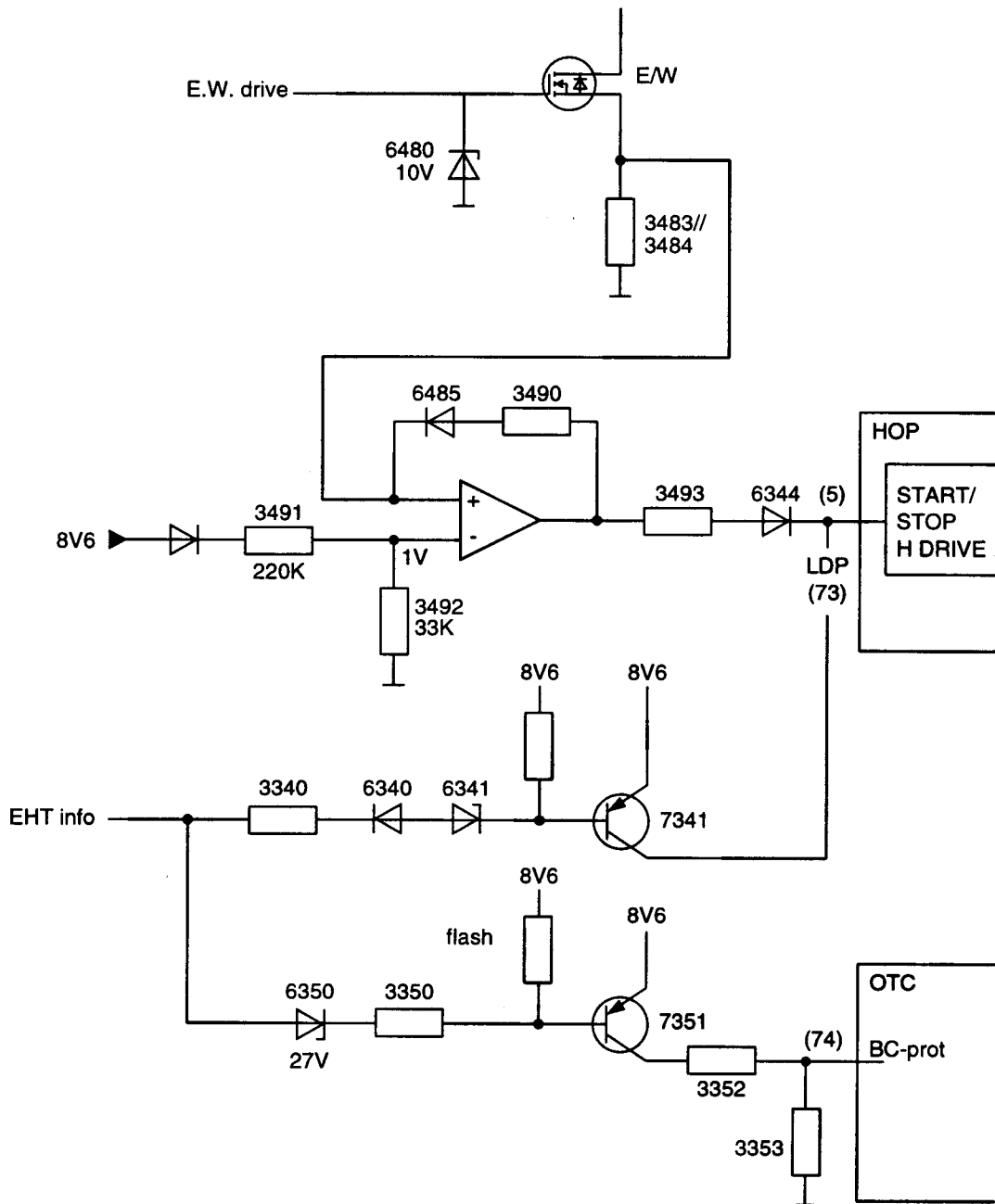
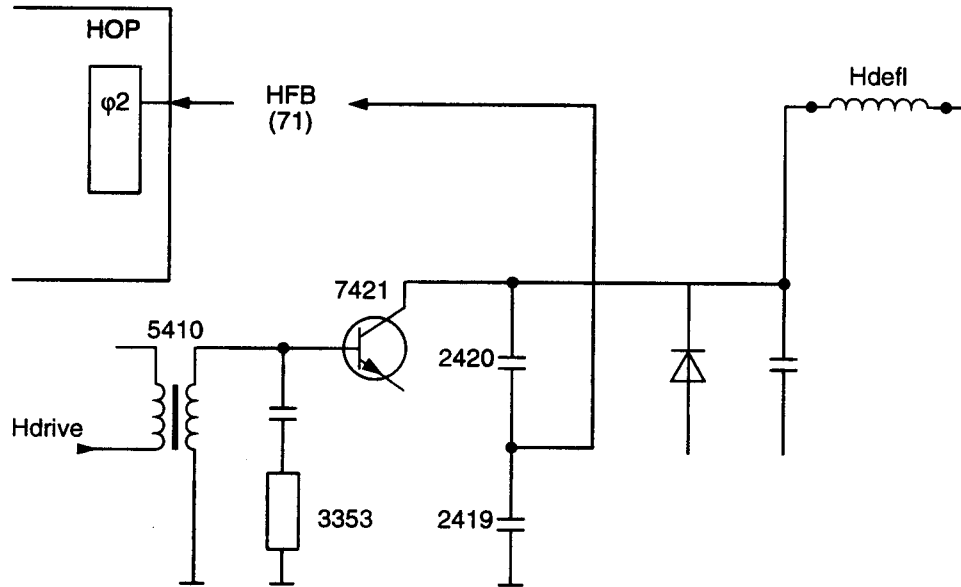


Figure 5-8

## HFB horizontal fly-back



## VFB vertical fly-back

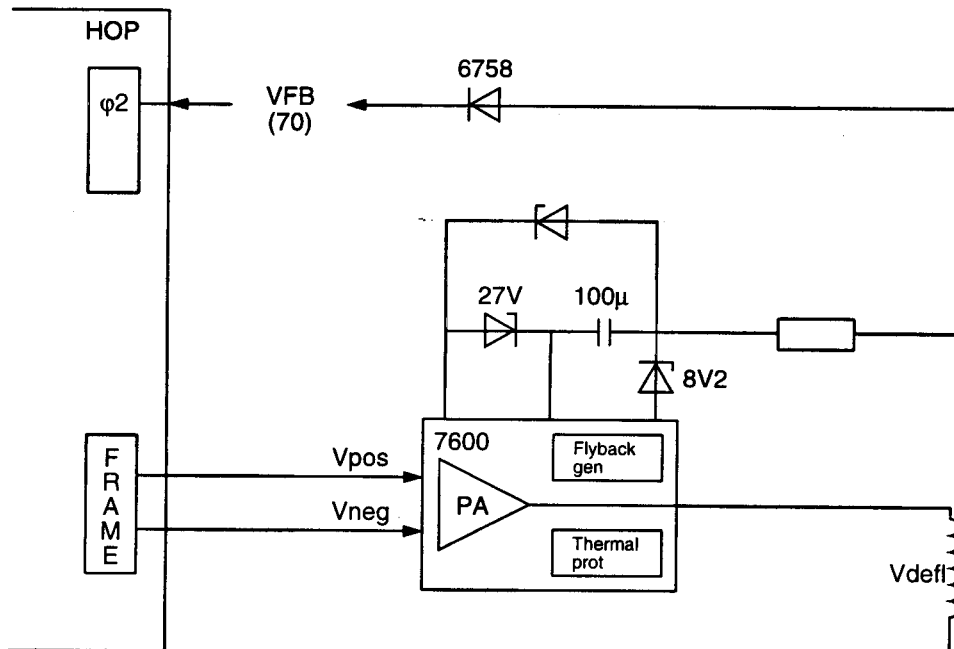


Figure 5-9

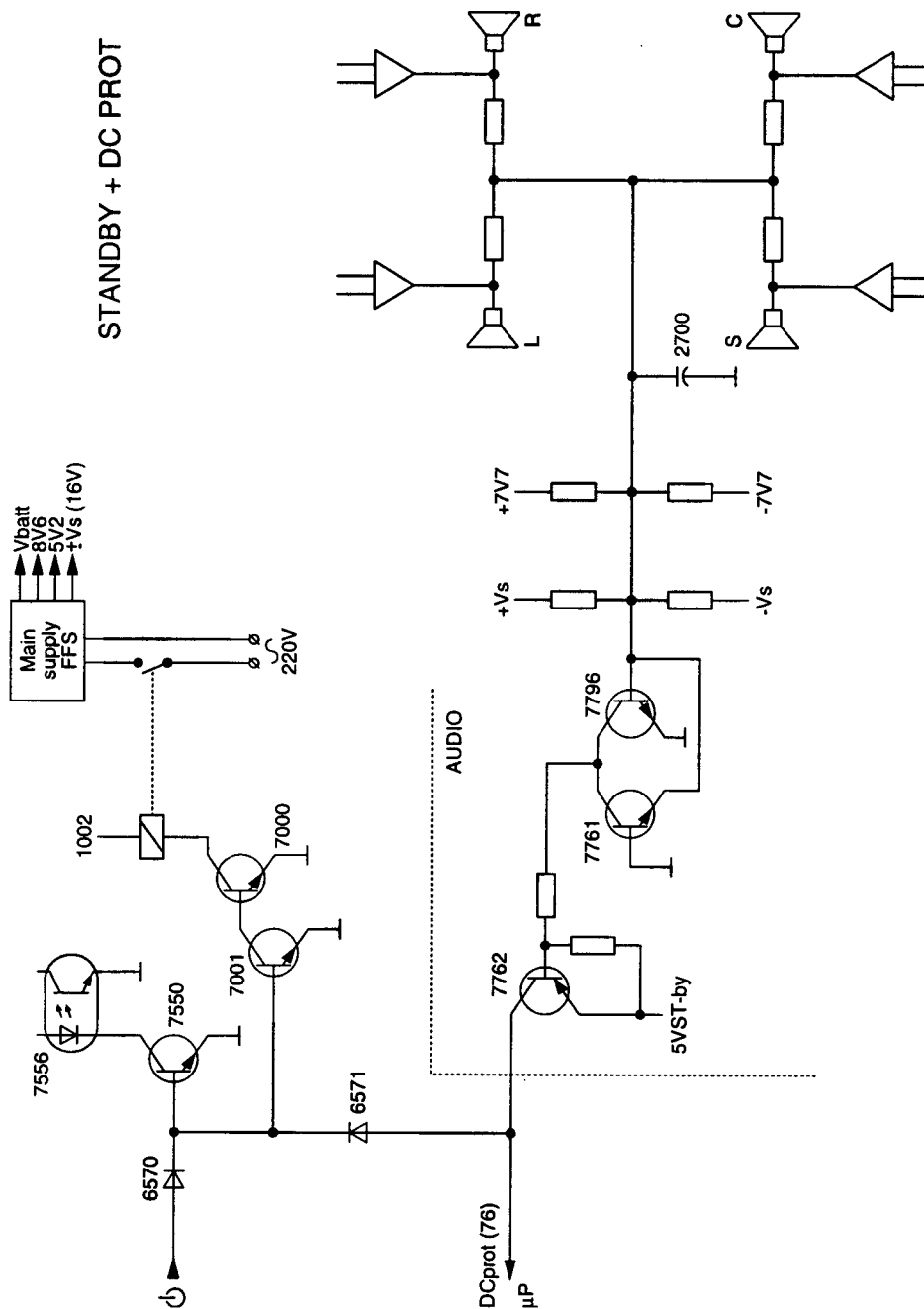
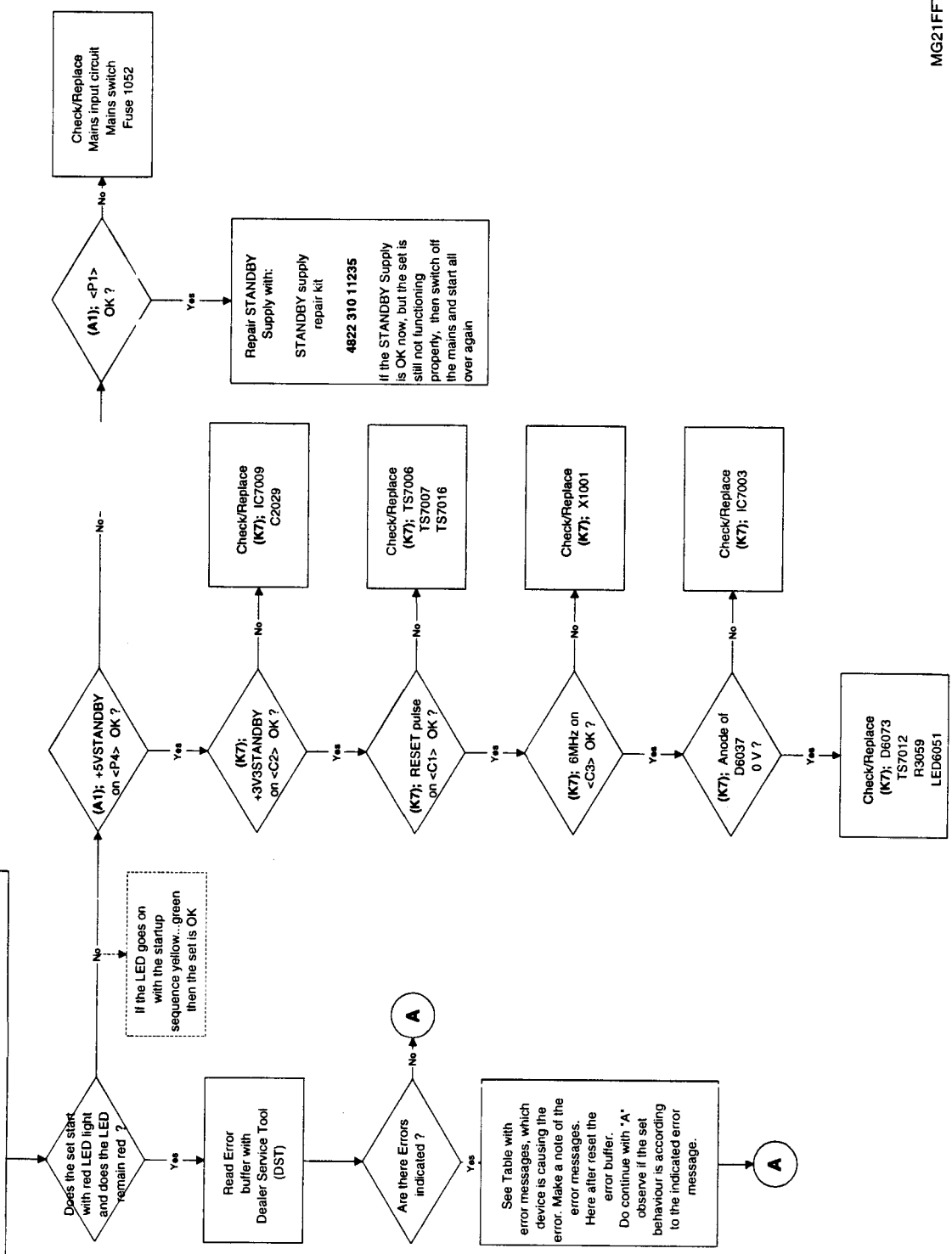


Figure 5-10

**START**

Connect a pattern generator to the aerial input.  
 Set Pat.gen. to 475,25 MHz, colourbar, stereound, PAL B/G (for France SECAM L).  
 Put Mainsswitch : on  
 In normal conditions the set will start with the sequence :  
 red LED...yellow LED...green LED.  
 Then after few seconds sound and picture will appear



Note: (K1) means Drawing K1  
 <F1> means Test point F11

Figure 5-11

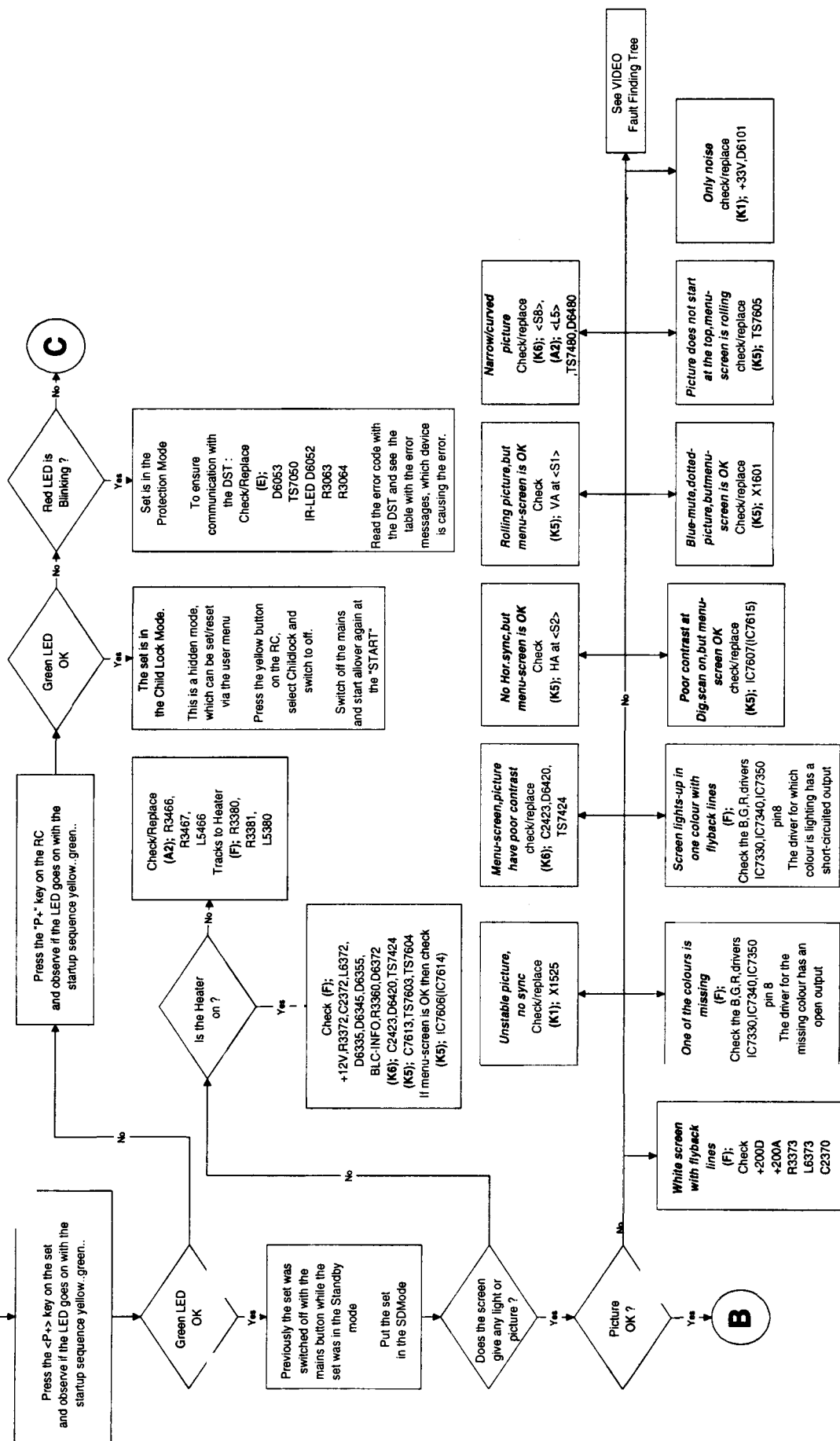


Figure 5-12

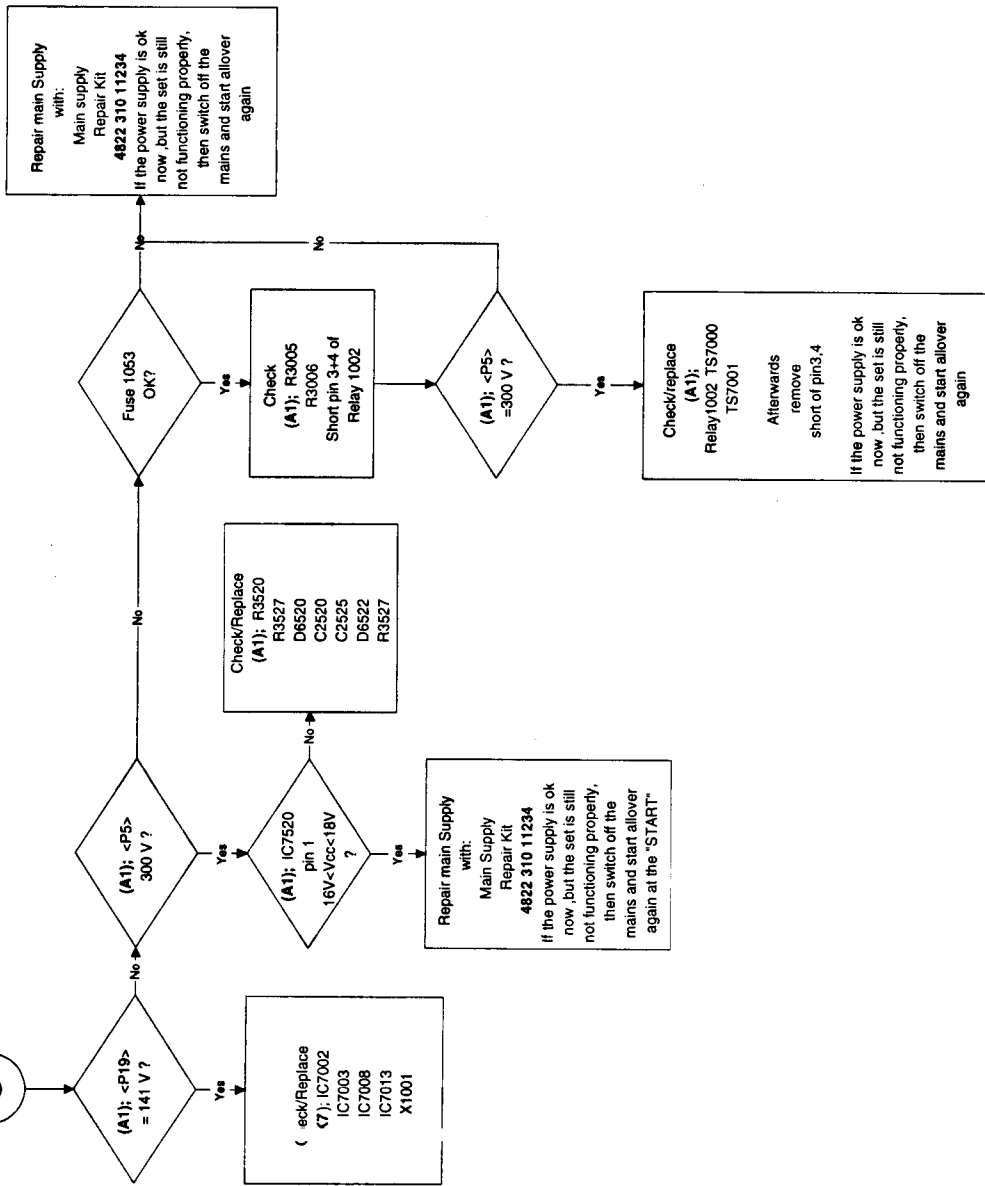


Figure 5-13



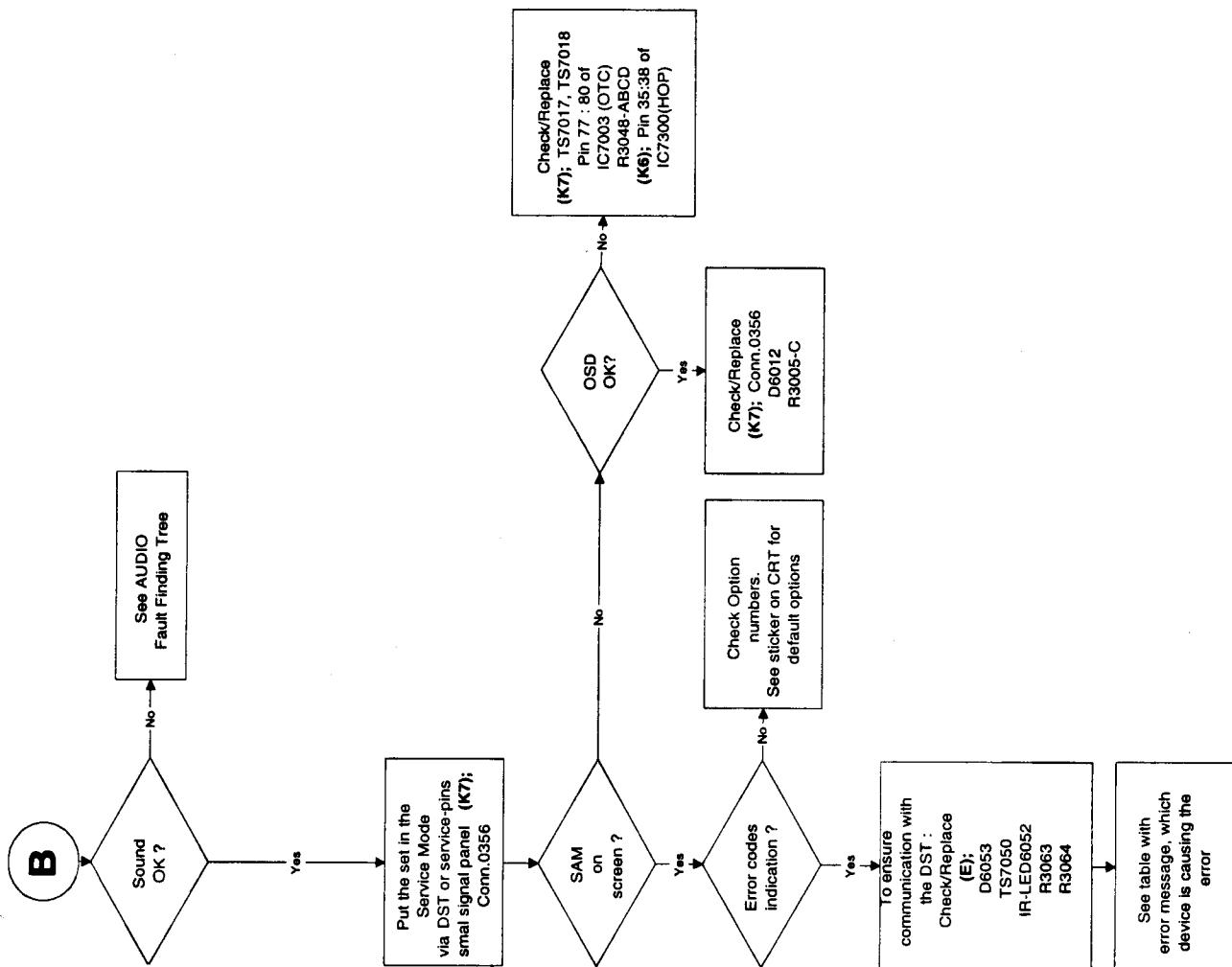


Figure 5-14

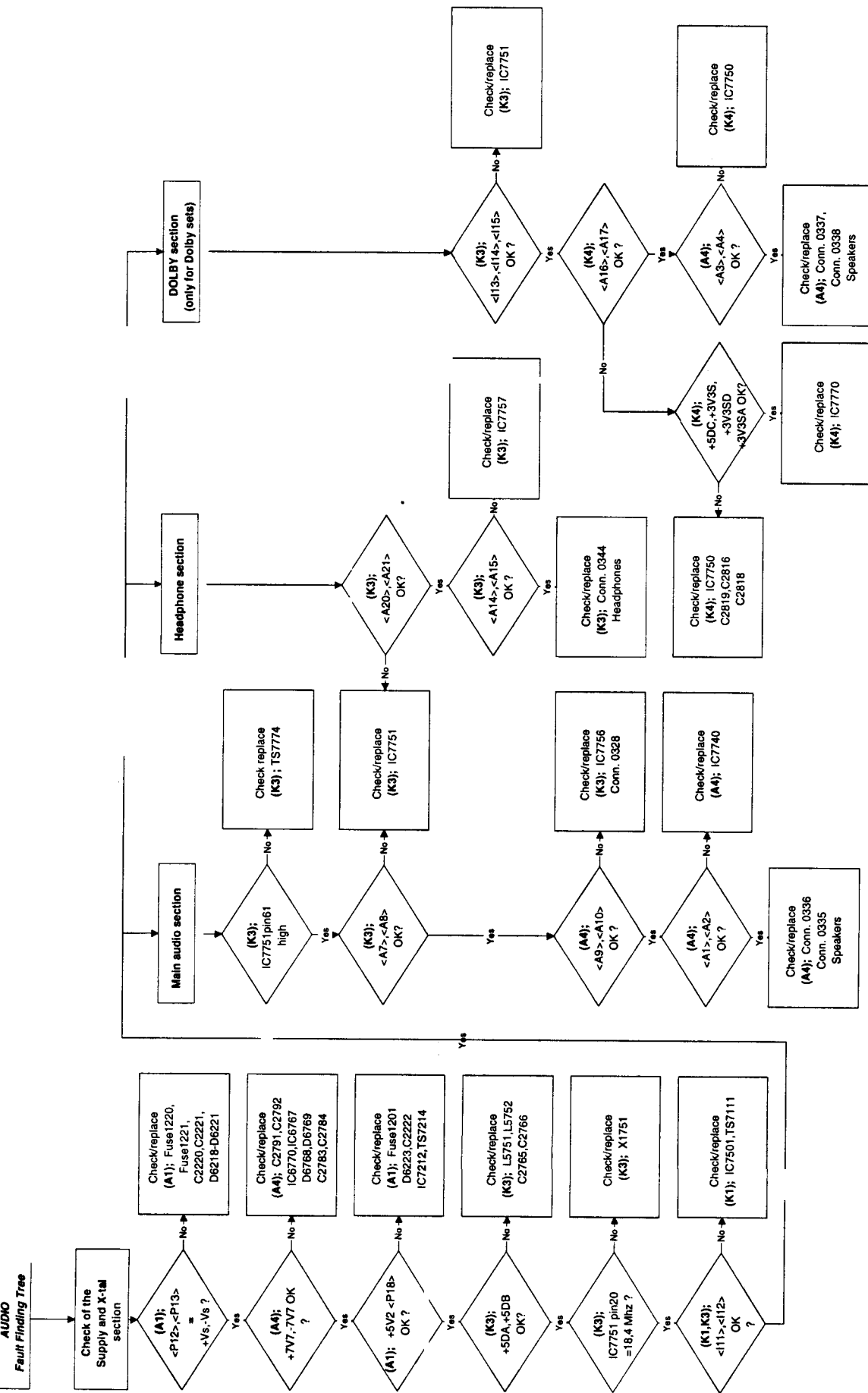
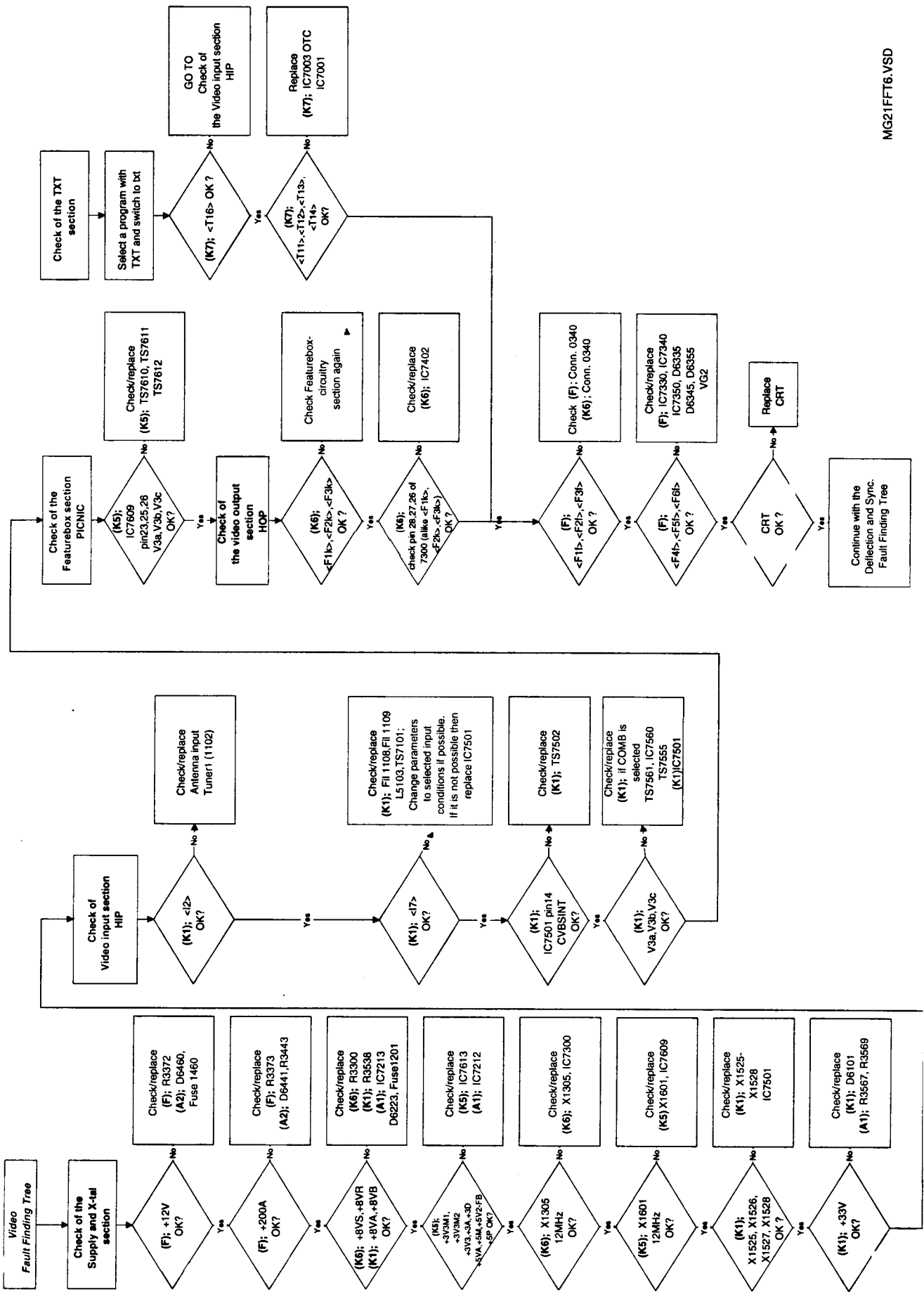


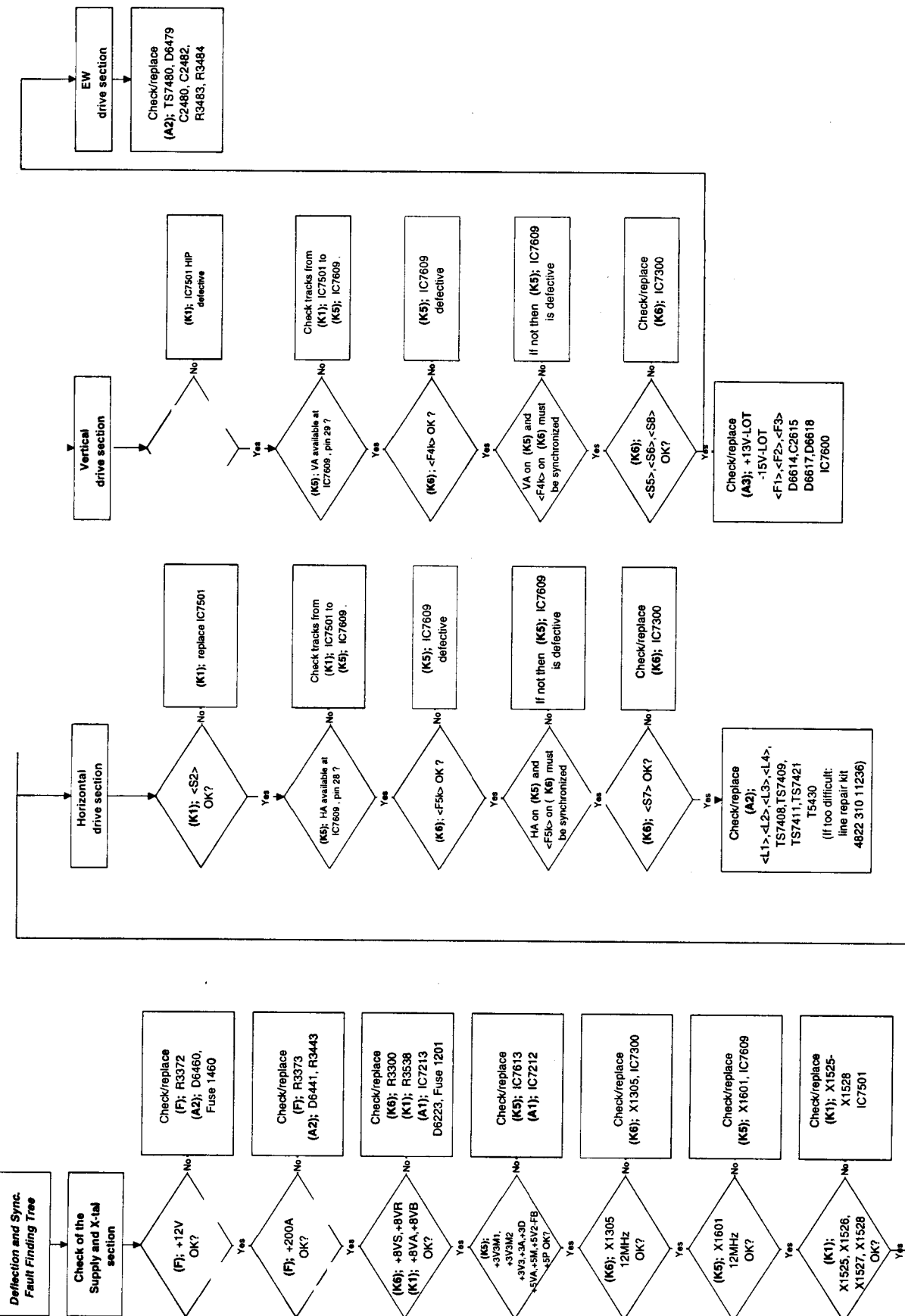
Figure 5-15



MG21FF16.VSD

Figure 5-16

MG21FF77.VSD



## 8.1 General alignment conditions

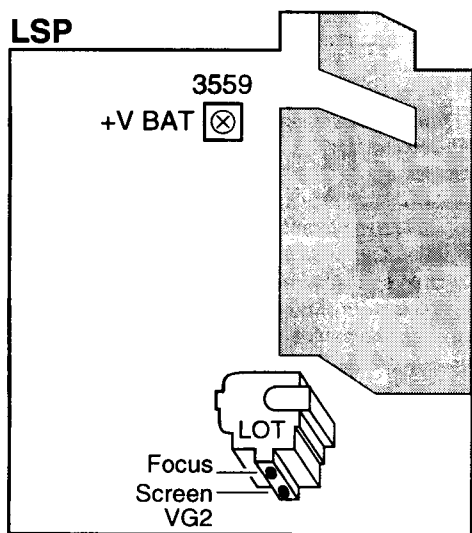
All electrical alignments should be made under the following conditions:

- Power supply voltage: 220-240V  $\pm$  10%; 50-60 Hz  $\pm$  5%
- Warm-up time >10 minutes
- Voltages and oscillograms are measured in relation to tuner earth (with exception to the voltages on the primary side - of the power supply). Never use the cooling fins/ plates as ground.
- Test probe: Ri > 10 MOHM, Ci < 20 pF.

## 8.2 Alignments on the large signal panel (LSP)

### +141V (VBAT) supply voltage

Connect a voltmeter across C2569 (diagram A1, +VBAT). Switch on the set. Using potentiometer R3559 (diagram A1) adjust the VBAT supply voltage to +141V  $\pm$  0V5. (see fig. 8.1)



CL 86532057\_004b.A1  
240798

Figure 8-1

### Focusing

Tune the set to a cross hatch test-pattern. Adjust the focus potentiometer (diagram A1, upper knob on the LOT) for an overall optimum focusing of the picture.

### Vg2 adjustment

Elucidation: In the frame blanking period of the R,G and B signals applied to the CRT, alternately per frame two measuring pulses with different DC levels are inserted by the "HOP" video processor IC7300. In one frame blanking a pulse is inserted used as reference for the Vg2 adjustment and in the next frame blanking a pulse is inserted used as reference for the internal white "D" adjustment. For the Vg2 adjustment the pulse with the highest DC-level is used.

Put the set in the SDM mode (via the <default> button on the DST, or via short circuiting the SDM pins 2 and 3 of connector 0356 on the SSP (diagram K7).

Insert a black test-pattern signal (carrier 475.25 MHz) to the tuner input.

Connect an oscilloscope ( position 50V/Div DC and 2ms/ Div) alternately to the CRT cathodes (red pin 8, green pin

6, blue pin 11) and measure for each cathode the DC level of the measuring pulse (see elucidation above and fig. 8.2) and write down each value. Remark: Trigger the scope extern via a CVBS signal (for instance via pin 19 of the scart1 connection).

- Adjust the VG2 potentiometer (fig. 8.1, lower knob on the LOT) so that the measuring pulse with the highest noted level is on 160V level.

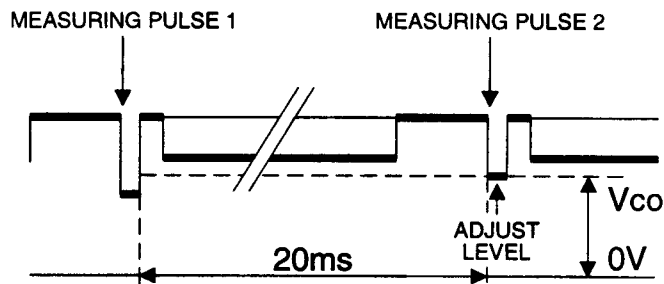


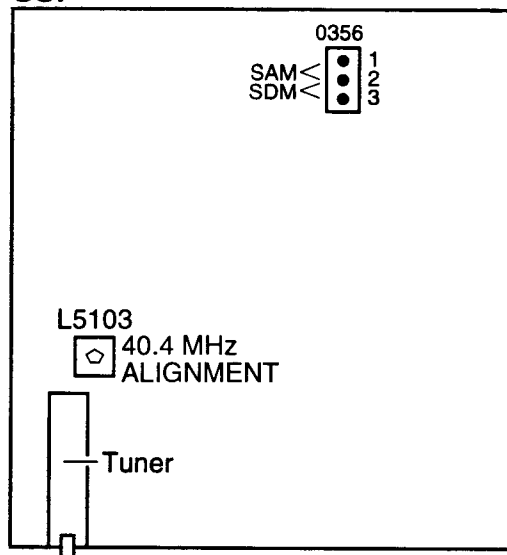
Figure 8-2

## 8.3 Alignments on the small signal panel (SSP)

### 8.3.1 40.4 MHz neighbour-channel sound trap

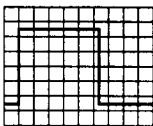
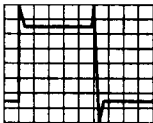
- Tune to a checker board test-pattern (system BG or relevant system - and carrier frequency of 475.25 MHz).
- Connect an oscilloscope (trigger line frequent) to pin 19 (CVBS out) of the scart1 connection.
- Turn the core of L5103 (diagram K1) completely downwards. (see fig. 8.3)
- Turn the core upwards till under and overshoot arise at the black/white and white/black transitions in the video signal. (see fig. 8.4)
- Turn the core downwards again till above mentioned under and overshoot is just disappeared.

### SSP



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Figure 8-3



CL 86532057\_006.AI  
170798

Figure 8-4

## 8.4 Alignments needing SAM-mode + measuring equipment

(these alignments could be of interest when ICs (7501, TDA9320H), or the EAROM (7008, ST24E16) are exchanged on the SSP)

### 8.4.1 'IF AFC' (navigation to this menu item via Alignment --> General--> IF AFC)

Supply via a Service generator (e.g. PM5518) a TV-signal, with a signal-strength of about 1 mV. Preferable this signal is a multiburst signal. Frequency 475.25 Mhz. Use BG if possible, otherwise match the system of your generator with the received signal in the set. In this procedure Servicer will be asked to swap sometimes from Install-menu to Service Alignment Menu. Procedure how to check correct alignment:

- First set frequency TV-set to 475 Mhz in 'search-line' of Manual Installation Menu
- IF frequency-value in 'Fine Tune'-line between 475.18 and 475.31, you do not need to re-align AFC-value as mentioned above (SAM-menu)
- IF this is NOT the case, decrease 'IF AFC'-value (in SAM-menu) if frequency on 'Fine-tune'-line was lower than 475.18, or increase 'IF AFC'-value if frequency on 'Fine-tune'-line was higher than 475.31. (initially first a 'IF AFC'-alignment can be done, making the multiburst signal flat. This signal can be measured at pin 19 of scart 1. This is however not accurate enough to optimise the 'IF AFC'.

Alignment procedure:

- set 'IF AFC'-value in SAM
- store in SAM this setting
- go to manual install menu
- set frequency to 475
- read in 'Fine tune'-line how set responds
- if this value is between 475.18 and 475.31 then OK, otherwise proceed alignment by setting other 'IF AFC'-setting

Service-tip:

If you do not trust the accuracy of the frequency of your Service-generator first 'measure' with 'Fine tune'-line (manual install-menu) of a good set your Service generator.

### 8.4.2 'Tuner AGC'

Supply a TV-signal, with a frequency of 475.25 Mhz and a signal-strength of about 2 mV.

Measure the DC-voltage on pin 1 of the Tuner. (item 1102) With the 'Tuner AGC'-alignment in the SAM-menu, this voltage

can be aligned. Alignment is correct when DC-voltage is just below 3.8 V

## 8.5 Alignments and settings in the Service Alignment Menu

### 8.5.1 General

To switch to SAM-mode you have to do the following:

briefly shorting the service pins 'SERVICE ALIGNMENT MODE' on the frontside of the SSP (pins 1 and 2 of connector 0356) or:  
pressing the <align>- key on the Dealer Service Tool (DST) (RC7150), followed by keying in the password "3140" and then pressing the <OK> key.

The Service Alignment Mode menu will now appear on the screen. The following information is now displayed:

1. The software date ('Date') and version ('ID.') of the ROM. (Example: MG21E11.0\_01381) (this software-code stands for MG21 (chassis), E for Europe, 1-language, 1.0 software version, xxxxx latest 5 digits of 12nc code software)
2. The accumulated total of operation hours ('Operation Hours').
3. ('Errors') followed by maximal 10 errors. The most recent error is displayed at the upper left. For explanation errors see chapter 5
4. ('Defect. Module'). Here the module that generates the error is displayed. (if there are multiple errors in the buffer that have not all been generated by a single module, there is probably another defect. The message 'Unknown' will then be displayed here).
5. ('Reset Error Buffer'). The error buffer can be resetted by pressing the 'cursor right' key.
6. ('Functional Test'). All devices are tested via the > key. Eventual errors are displayed in the error buffer. The error buffer is not erased, the contents return when the Functional Test is terminated.
7. ('Alignments'). This enables the Alignments sub-menu to be called up.

The following alignments can be selected:

'General':

- Alignment of 'Drive'
- 'Peak White Limiter'
- 'Luminance Delays'
- 'EHT Compensation'
- 'Soft Clipper'
- 'Luma Gain'
- 'IF AFC'
- 'Tuner AGC'

'Normal Geometry':

- General geometry alignments.

'Super wide geometry': (only valid for widescreen sets)

- Geometry alignments for the 'Panorama' position in 16:9 sets. (only valid for wide screen sets; alignments can be performed, however it is better to set values as mentioned below)

'Options':

- Setting the initialisation codes in the set via text.

'Option number':

All options together, expressed in two long numbers. The original factory setting for these numbers can be found on the picture tube sticker on the inside of the set.

'Store':

- Store all alignments.

'Store default settings':

Reset all values in the EAROM to pre-programmed values, related to picture and sound settings (has the same effect as replacing the EAROM with a new one, only here also the programs are gone).

The alignments are explained now in the sequence of the sub-menu:

### 8.5.2 General alignments in Service Alignment Menu:

Once all alignments/settings have been completed the item 'Store' must be selected to record all the values in the permanent memory of the set.

If the option codes have been changed and stored, the set has to be switched on and off using the mains switch to activate the new settings (when switching on and off via Standby, the option code settings are NOT read by the microprocessor).

If an empty EAROM (permanent memory) is detected, all settings are set to pre-programmed default (standard) values.

A built-in test pattern can be called up in various sub-menus. The test pattern generator can be switched on using the item 'Test pattern on/off'. The test pattern only appears AFTER the specific alignment has been selected. The test patterns are generated by the teletext-IC.

'Drive'

Tint-settings:

Set the white levels for the three tint-settings 'Normal' . 'Warm' and 'Cool' is calculated by the processor then ('Warm': R+4, B-7 and 'Cool': R-3, B+3) For 4:3 picture tubes (25" and 29") the next values must be entered:

	Cool	Normal	Warm
R	22	25	29
G	20	20	20
B	17	14	7

For wide screen picture tubes (24", 28" and 32") the next values must be entered:

	Cool	Normal	Warm
R	22	25	29
G	20	20	20
B	17	14	7

'Cathode':

This alignment, must also be covered by a table with values for all picture-tube sizes. For 4:3 picture tubes (25" and 29") the next value must be entered: 5 For wide screen picture tubes (24", 28" and 32") the next values must be entered:

'Peak White Limiter'

Dependent of the picture-tube size (25", 29", and 24"/28"/32" widescreen tubes) the next value of the table must be

entered:

24"	10
25"	10
28"	10
29"	10
32"	10

'Luminance delays'

With the 'Luminance delays' alignment the luminance information is placed on the chrominance information (brightness is pushed onto the colour). Use a colour bar/ grey scale pattern as test signal.

Lum. Delay Pal: Apply a PAL colour bar/greyscale pattern as a test signal. Adjust 'Lum. Delay Pal' until the transients of the colour part and black and white part of the test pattern are at the same position.

Lum. Delay Secam: Apply a SECAM colour bar/greyscale pattern as a test signal. Adjust 'Lum. Delay Pal' until the transients of the colour part and black and white part of the test pattern are at the same position.

Lum. Delay Bypass: Apply a NTSC colour bar/greyscale pattern as a test signal. Adjust 'Lum. Delay Bypass' until the transients of the colour part and black and white part of the test pattern are at the same position.

'EHT compensation'

Fixed value: 0

'Soft clipper'

Fixed setting: 'Pwl+0%'

'Luma gain'

Fixed value:

'IF AFC'

See chapter 8.4.1. The SAM-mode is needed to make alignment, a test generator to make signal, an oscilloscope to measure at scart-output and the Install-menu to check finetuning-value

'Tuner AGC'

See chapter 8.4.2. The SAM-mode is needed to make alignment, a test generator to make signal, a DC-Voltmeter to measure at pin 1 of Tuner.

### 8.5.3 Geometry alignments 'Normal Geometry' in the Service Alignment Menu

**Vertical amplitude and centring**

Select 'Test Pattern on'

Set the begin conditions for 4:3 sets (25", 28" and 29"):

- Vertical S-correction value on 13 for 29"-set and on 19 for the 25"- and 28"-sets.

The boundary-stripes of the test pattern should be positioned on the edge of the picturetube.

Set the begin conditions for 16:9 sets (24", 28", 32"):

- Vertical S-correction value on 7 for 24"-set, on 8 for the 28" and on 7 for the 32"-set.

The boundary-stripes of the test pattern should be positioned on the edge of the picturetube.

1. Align 'Vslope' (when aligning the below half of the picture is blanked). The middle line of the test pattern must be matched with the edge of this blanking/picture transient in the middle of the picture. Pushing > button again, gives you previous menu again. (This alignment is meant to align the zero-crossing of the frame-deflection to the mechanical middle of the picture tube)
2. Align the vertical amplitude using 'V amplitude' so that the test pattern is fully visible.
3. Align the vertical centring using 'V shift' so that the test pattern is located vertically in the middle.
4. If necessary repeat the alignment of 'V amplitude', in order to get 'V shift' OK.

#### Vertical S correction

Select 'Test pattern on'.

Align the vertical S correction using 'V S-correction' so that the vertical amplitude at the top of the picture is equal to the amplitude in the middle of the picture.

#### Horizontal centring and amplitude

Select 'Test pattern on'.

1. Using 'H amplitude' align the horizontal amplitude so that the entire test pattern is visible.
2. Use an external test signal, with a centre-reference from a service-generator. Use 'H shift' to align the picture horizontally in the middle.
3. Repeat the 'H amplitude' alignment if necessary.

#### East/west alignment

Select 'Test pattern on'.

1. Use 'East/West Parabola' to align the vertical lines until straight.
2. Use 'East/West Corner' to align the vertical lines in the corners until straight.
3. Use 'East/West Trapezium' to align for a rectangular
4. Use 'Horizontal Parallelogram' to align for straight vertical lines if necessary.
5. If necessary select 'East/West Corner' and align as required.
6. Repeat steps 1 to 4 if necessary.

#### 8.5.4 Geometry alignments 'Super wide geometry' in the Service Alignment Menu

Only applicable to 16:9 sets

The header of this paragraph and also the menu's are misleading.

We only need to set the following values, if the normal geometry alignment has been performed correctly.

Vertical S correction: enter the value of normal geometry.

Horizontal amplitude: enter the value of normal geometry subtracted by 4.

East/west parabola: enter the value of normal geometry.

## 8.6 Option menu

### Introduction

The microprocessor communicates with a large number of I<sup>2</sup>C-ICs in the set. To ensure good communication and make digital diagnosis possible, the microprocessor has to know which ICs have to be addressed. The presence of specific ICs or functions is made known by means of the option codes.

All options codes can be manipulated using both the option numbers and/or the Option menu.

All hardware related options are incorporated under the heading 'Options' of the 'Alignments' sub-menu of the 'Service Alignment Mode'.

All software related options that are incorporated under the heading 'Dealer Options' of the 'Service Alignment Mode', can also be reached directly via the <dealer>-button of the DST.



## 8.7 Dealer Options in the Service Alignment Mode

Menu-item	Subjects	Options	Physically in the set
Teletext	TXT	Yes	Teletext software feature on
		No	Teletext software feature off
Communication	Easylink	Yes	Project 50 (easylink) set
		No	No project 50 (easylink) set
Picture tube	CRT Type	4:3	4:3 picture tube
		16:9	16:9 picture tube
		only for 16:9: Picture Rotation	Yes
		No	Frame rotation circuitry not present on LSP (IC7440 diagram A3)
Video Repro Options	Feature box type	100Hz	IC7606 present on SSP (diagram K5)
		Digital Scan	IC7606 and IC7607 present on SSP (diagram K5)
	Combfiler	Yes	IC7560 present on SSP (diagram K1)
		No	IC7560 not present on SSP (diagram K1)
	Picnic AGC	Yes	In normal operation: Yes
		No	During 'Drive' alignments: No
TXT Dualscreen	Yes	TXT DualScreen software feature on	
	No	TXT DualScreen software feature off	
EPG Dualscreen	Yes	IC7013 present on the SSP (diagram K7)	
	No	IC7013 not present on the SSP (diagram K7)	
Source Selection	External 3	Yes	3rd EURO connector present
		No	No 3rd EURO connector present
Audio Repro	Acoustic system	Normal	Applicable for sets without subwoofer
		Enhanced	Applicable for sets with subwoofer
Miscellaneous	NextView	Yes	NextView present
		No	Nextview not present
	Heatsink Present	Yes	Heatsinks present on CRT/Scavem panel (diagram F)
No		Heatsinks not present on CRT/Scavem panel (diagram F)	

After the option(s) have been changed, they must be stored via the STORE command.

The new option is only active after the TV is switched off and then back on again using the mains switch (the EAROM is then read out again).

## 8.8 'Option number'

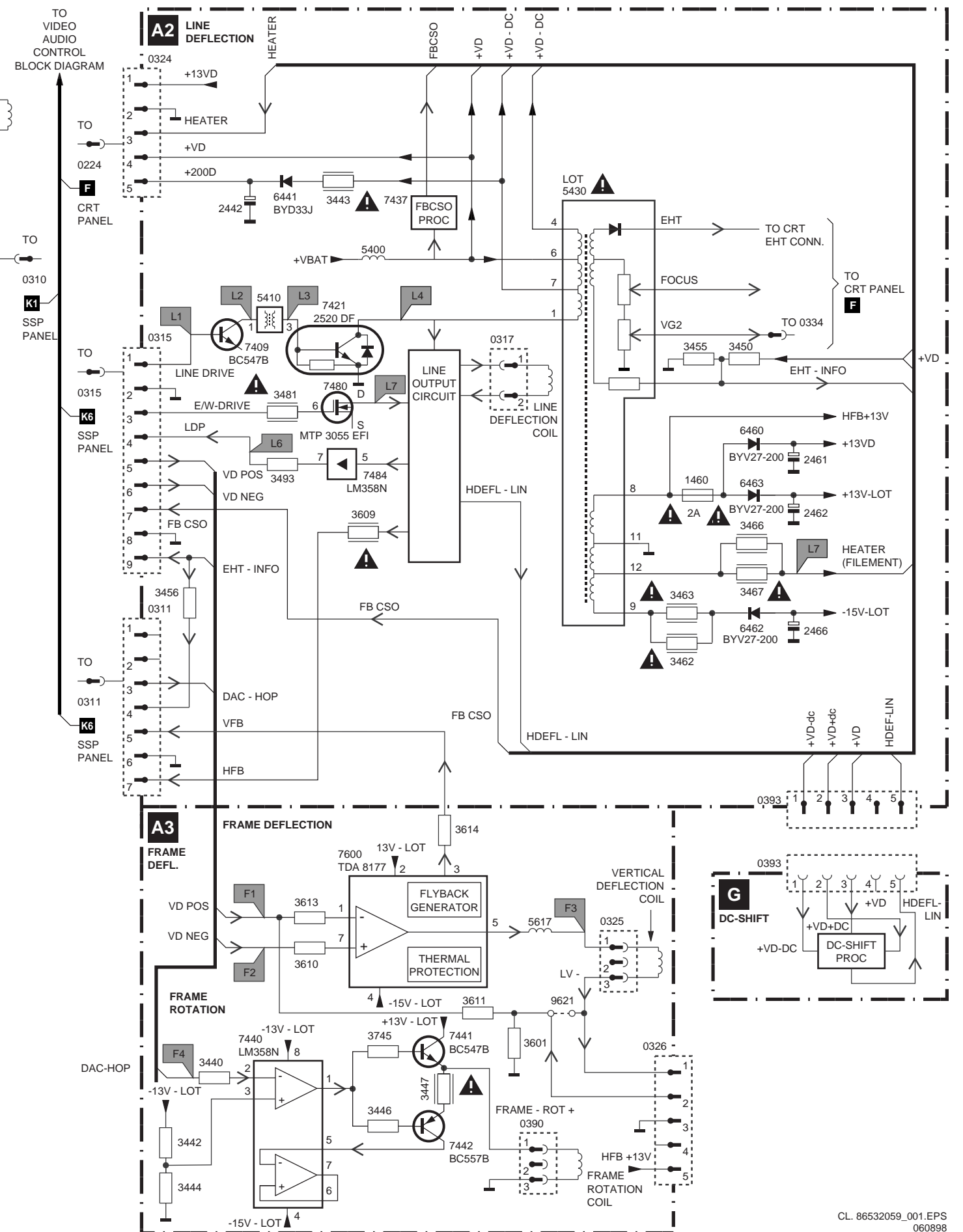
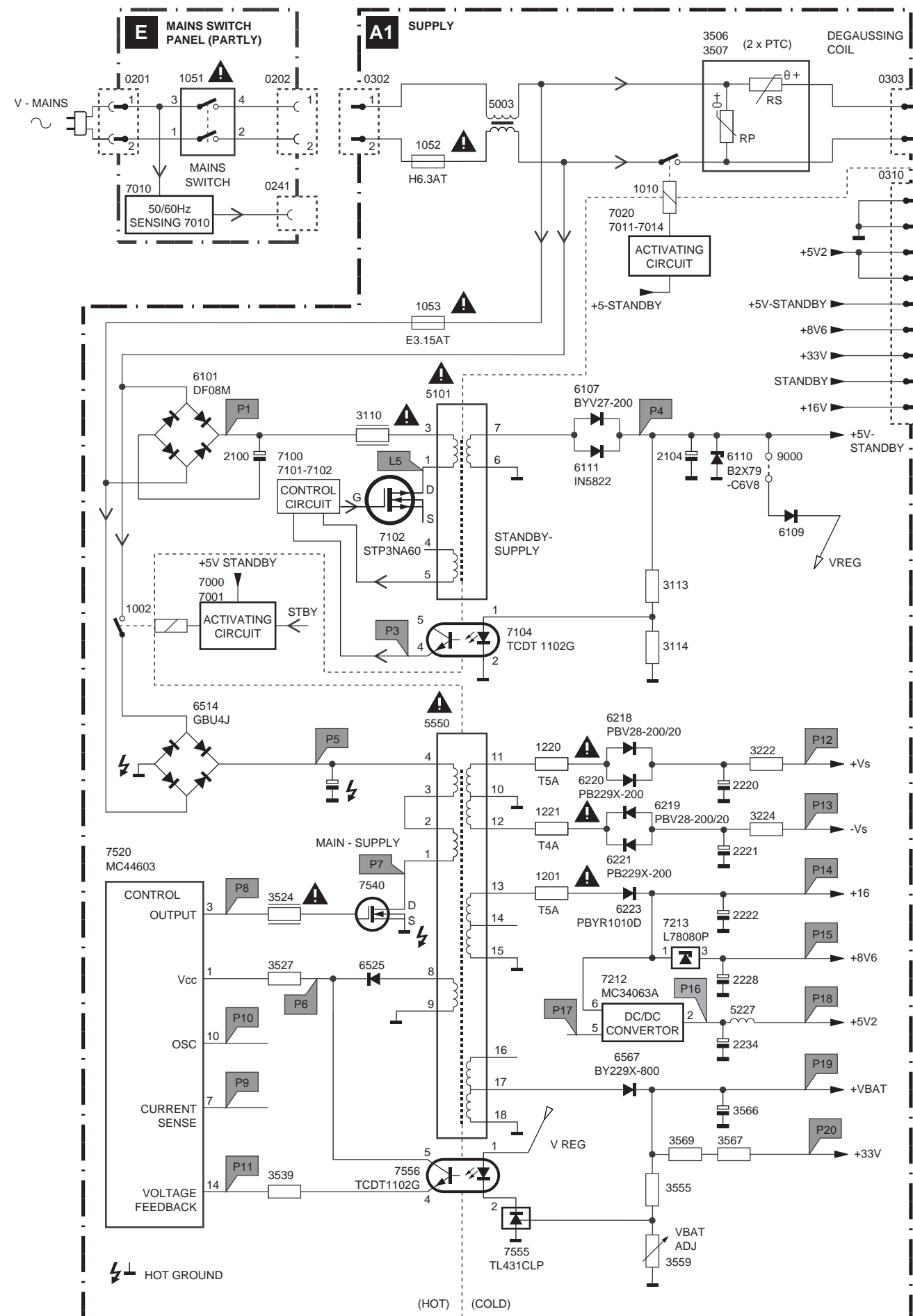
In case the EAROM has to be replaced, all the options will also require resetting. To be certain that the factory settings are reproduced exactly, both option numbers have to be set. These numbers can be found on a sticker on the picture tube.

Example: option number of 29PT8304/12 is:

00512 04352 04096 00016

04134 00001 00000 00000

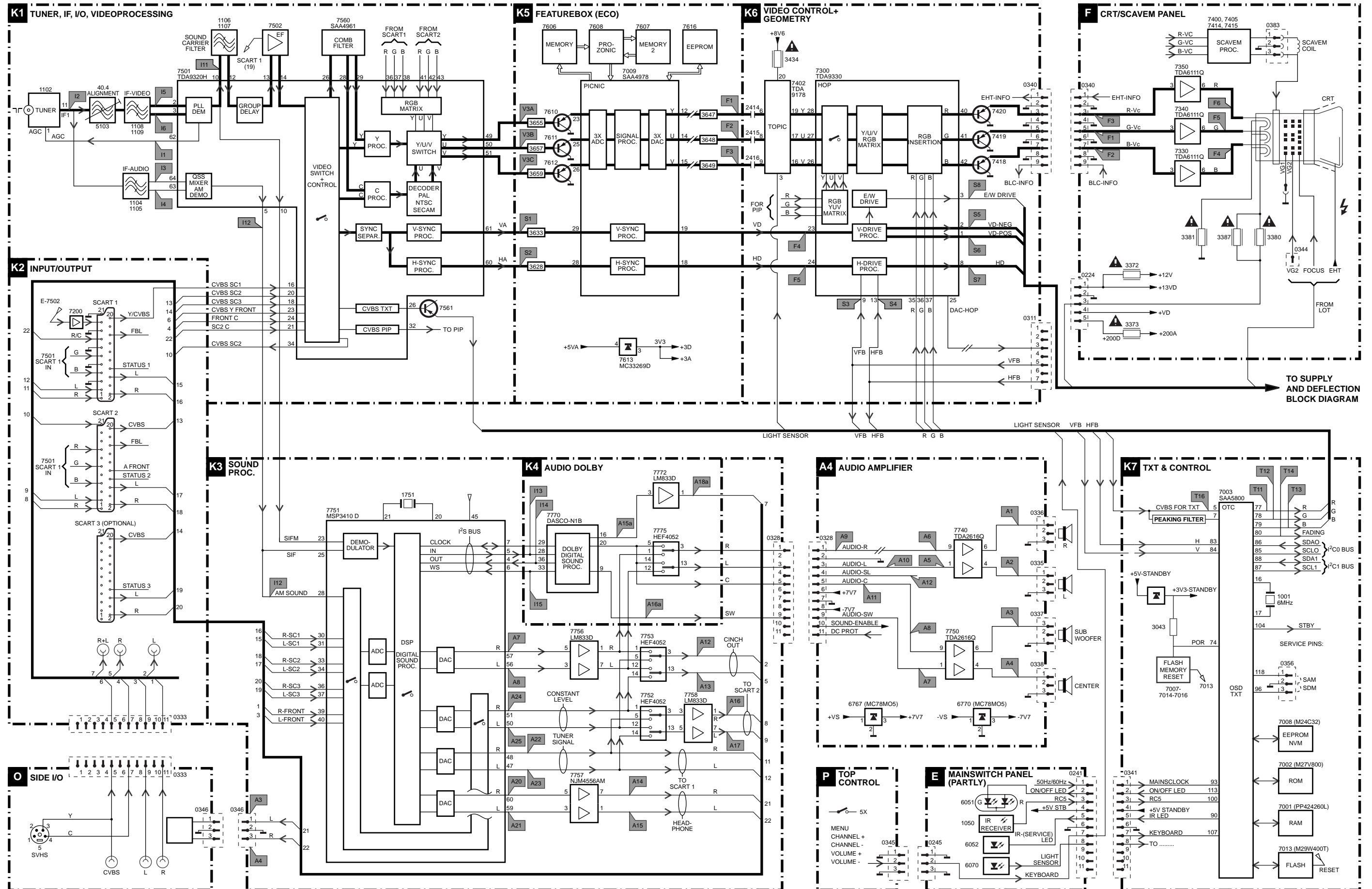
# 6 Block diagrams



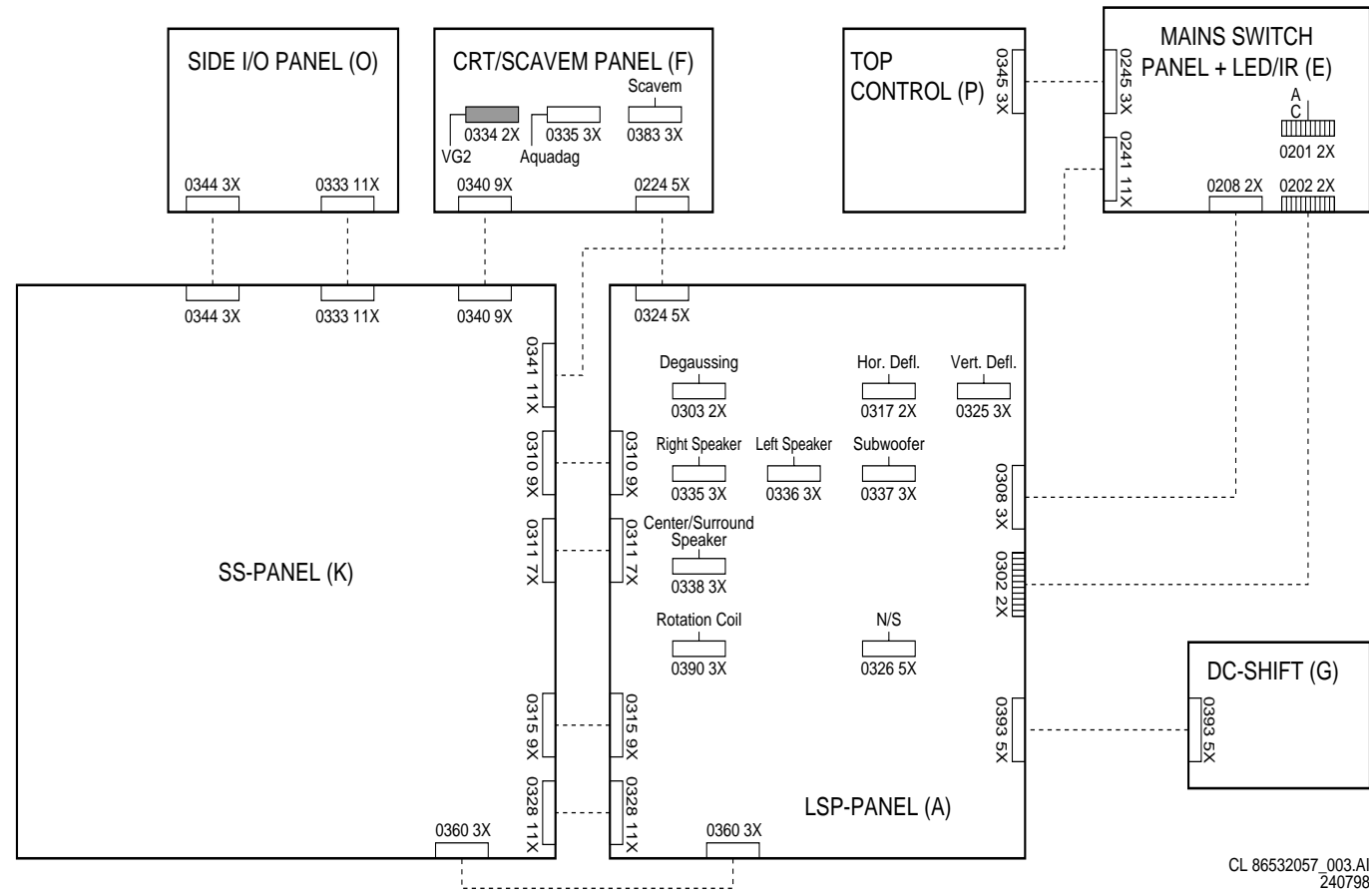
# 6 Block diagrams

MG2.1E

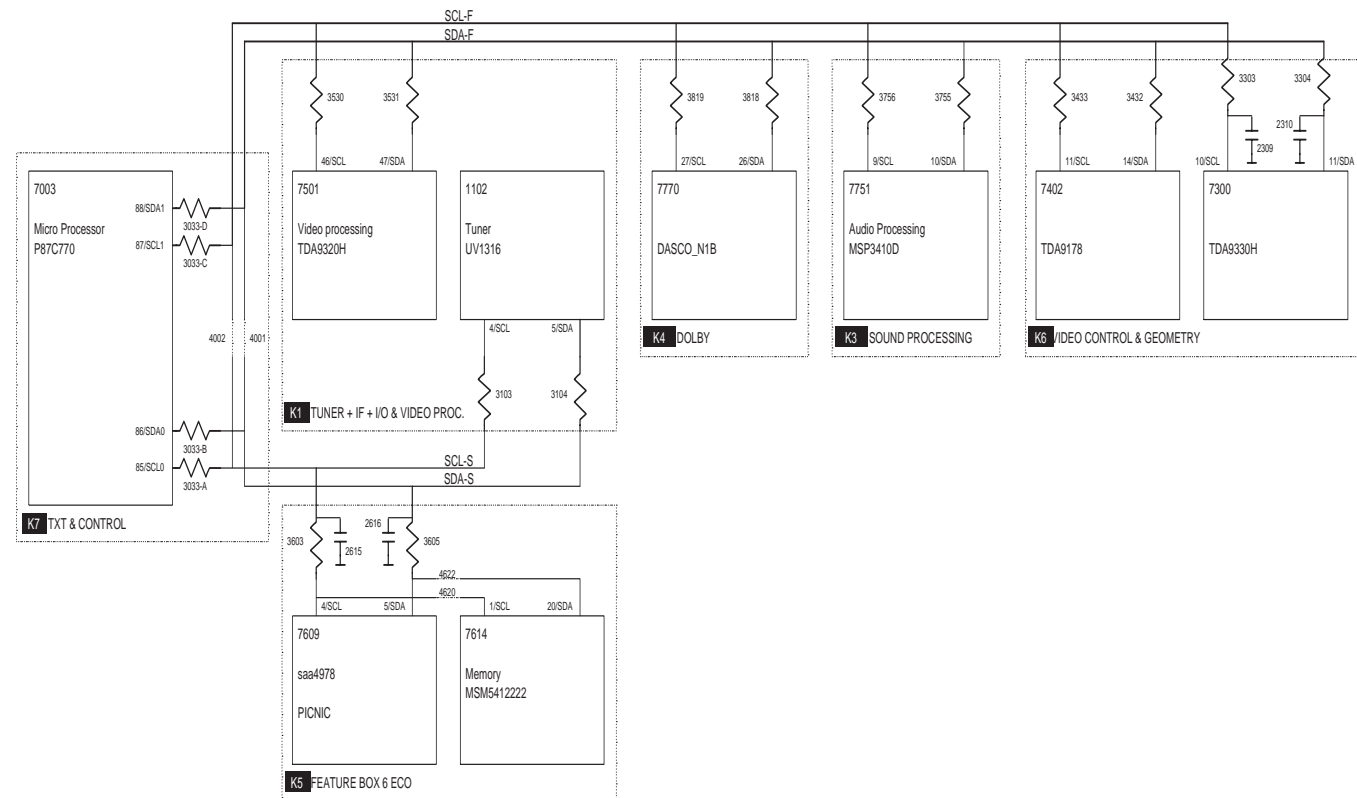
30



WIRING DIAGRAM MG2.1 E



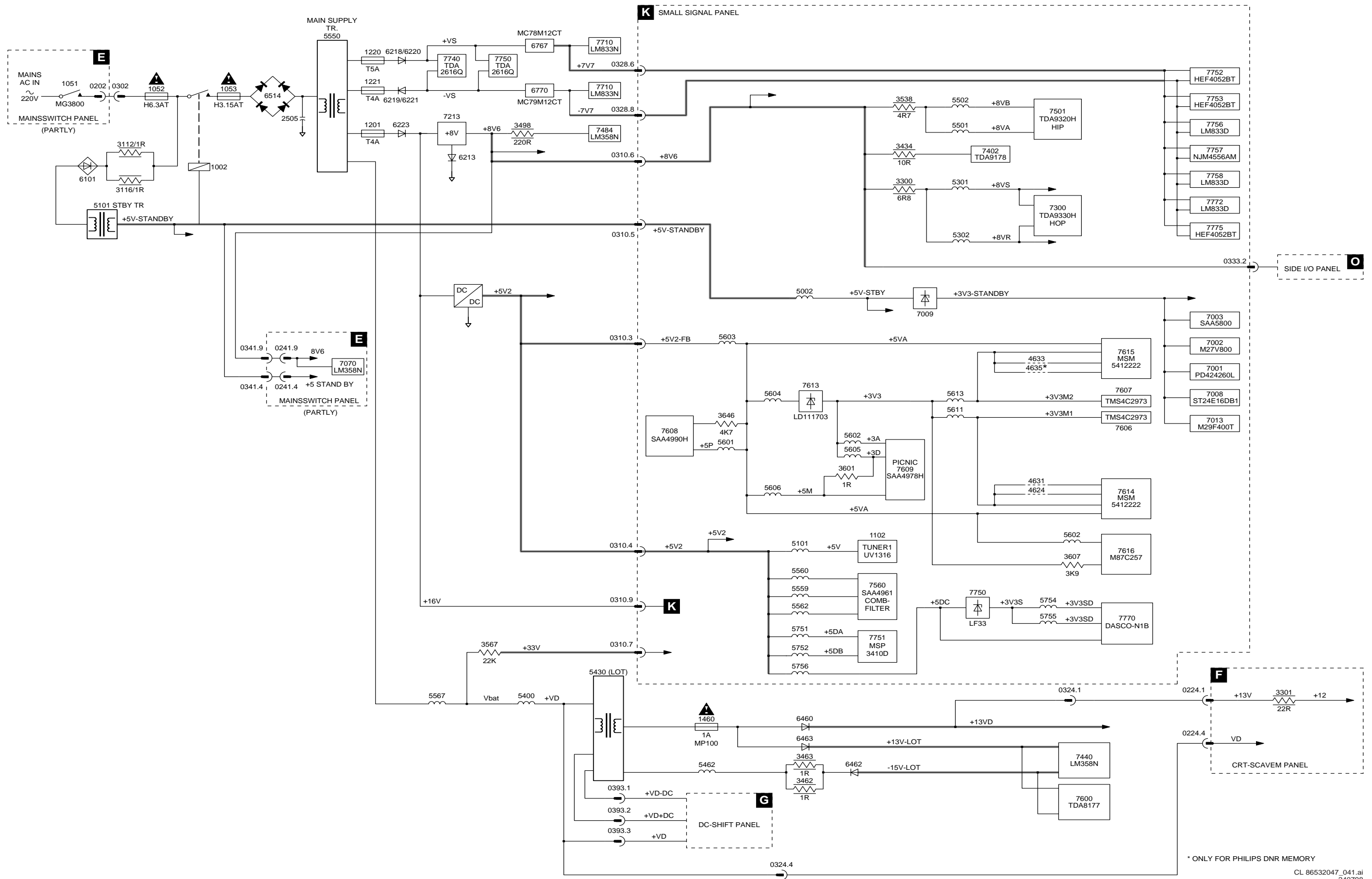
Overview I<sup>2</sup>C-ICs



# 6 Block diagrams

MG2.1E

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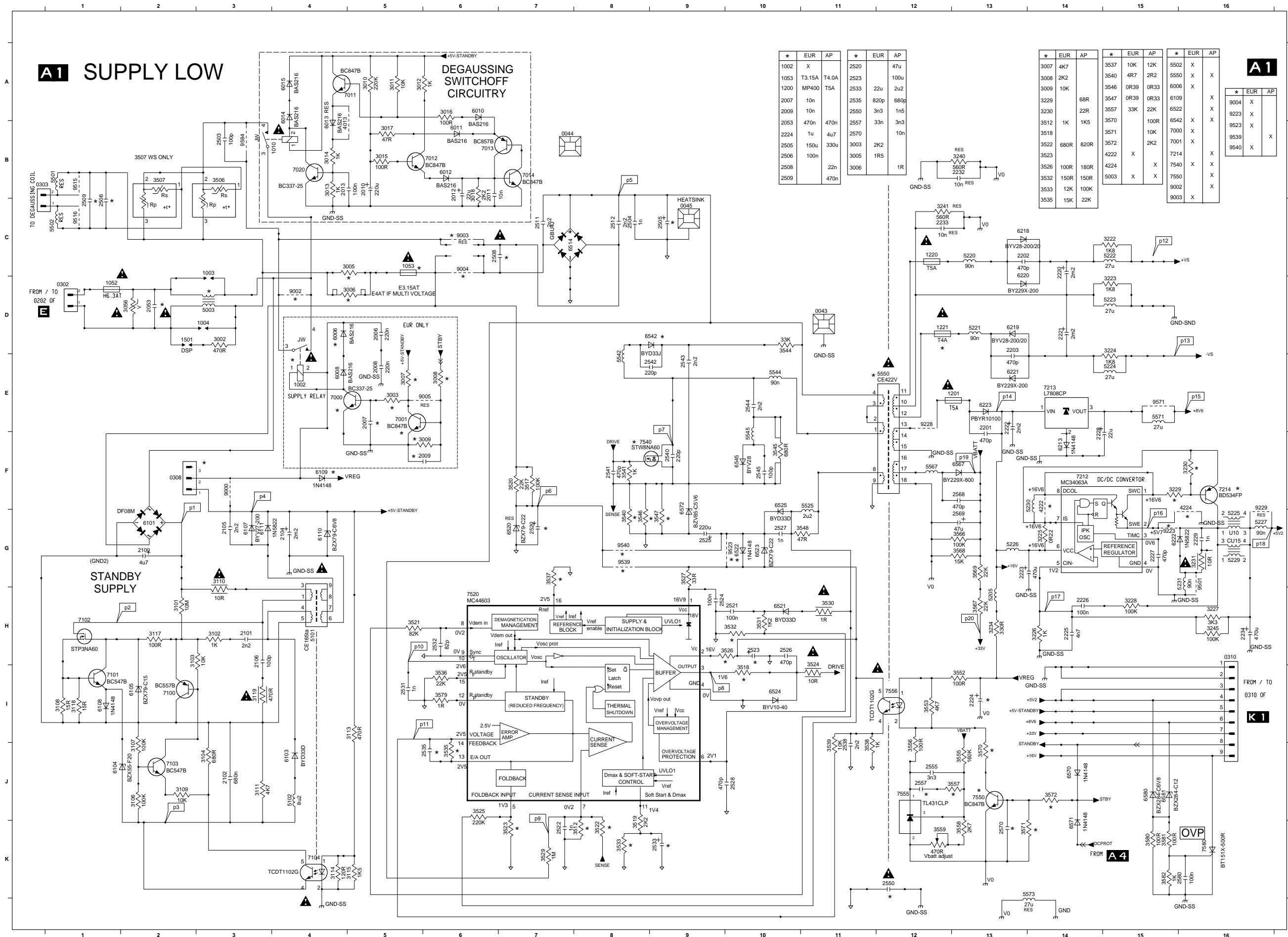


\* ONLY FOR PHILIPS DNR MEMORY  
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# 7 Electrical diagrams and print lay-outs

MG2.1E

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Component values table:

EUR	AP	EUR	AP	EUR	AP	EUR	AP	EUR	AP				
1002	X	2520	47u	3007	4K7	3537	10K	12K	5502	X	X		
1053	T3.15A	T4.0A	2523	100u	3540	4R7	2R2	2523	5550	X	X		
1200	MP400	T5A	2533	22u	2u2	3546	OR39	OR33	6006	X	X		
2007	10n	2535	820p	680p	3229	10K	68R	3547	OR39	OR33	6109	X	X
2009	10n	2550	3n3	1n5	3230	22R	22R	3570	33K	22K	6522	X	X
2053	470n	470n	2557	33n	3n3	3512	1K	1K5	3570	100R	6542	X	X
2224	1u	4u7	2570	10n	3005	1R5	3571	10K	7000	X	X	X	X
2505	150u	330u	3003	2K2	3000	1R5	3572	820R	7001	X	X	X	X
2506	100n	3000	3005	1R5	3006	1R5	3573	X	7214	X	X	X	X
2508	22n	3000	3006	1R5	3006	1R5	5003	X	7540	X	X	X	X
2509	470n	3006	3006	1R5	3006	1R5	5003	X	7550	X	X	X	X
2509	470n	3006	3006	1R5	3006	1R5	5003	X	9002	X	X	X	X
2509	470n	3006	3006	1R5	3006	1R5	5003	X	9003	X	X	X	X

Legend Table:

EUR	AP
9004	X
9223	X
9523	X
9539	X
9540	X

	0043 D11	3114 K4	6110 G4
0044 B7	3115 K5	6111 G3	
0045 C9	3117 H2	6213 F14	
0302 D1	3118 I1	6218 C13	
0303 B1	3119 I3	6219 D13	
0308 F2	3222 C15	6220 D13	
0310 H16	3223 D15	6221 E13	
1002 E4	3224 D15	6222 G15	
1003 C3	3225 G14	6223 E13	
1004 D3	3226 H14	6514 C7	
1010 B4	3227 H16	6520 G7	
1052 D1	3228 H15	6521 H10	
1053 C5	3229 F15	6522 G10	
1201 E13	3230 F16	6523 G10	
1220 C12	3231 G16	6524 H10	
1221 D12	3234 H13	6525 F10	
1501 D2	3240 B13	6542 D9	
2006 D5	3241 C12	6545 F10	
2007 E5	3242 H16	6567 F13	
2008 E5	3506 B3	6570 J14	
2009 F6	3507 B2	6571 K14	
2010 B5	3512 K8	6572 F9	
2011 B6	3517 F7	6580 J15	
2012 B6	3518 I0	6581 J15	
2013 B4	3519 K8	7000 E4	
2053 D2	3520 F7	7001 E5	
2100 G2	3521 H5	7011 A5	
2101 H3	3522 K8	7012 B6	
2102 J3	3523 K7	7013 B6	
2104 G4	3524 H11	7014 B7	
2105 G3	3525 J6	7020 B4	
2106 H3	3526 H10	7100 I2	
2201 E13	3527 G9	7101 I1	
2202 C13	3528 K7	7102 H1	
2203 D13	3530 H11	7103 J2	
2220 C14	3531 H10	7104 K4	
2221 D14	3532 H10	7212 F14	
2222 E13	3533 K8	7213 E14	
2223 G13	3535 J6	7214 F16	
2224 H13	3536 I6	7520 H6	
2225 H14	3537 G7	7540 F8	
2226 H14	3538 J11	7550 J13	
2227 G15	3539 J11	7555 J12	
2228 F14	3540 G8	7556 J12	
2229 B16	3541 F8	7580 K16	
2232 B13	3544 D10	9000 F3	
2233 C12	3545 F10	9002 D4	
2234 H16	3546 G8	9003 C6	
2503 B3	3547 G9	9004 C6	
2504 C8	3548 G11	9005 E6	
2505 C9	3552 H3	9223 G15	
2506 C1	3553 H2	9228 E12	
2508 C6	3555 J13	9229 G16	
2509 C1	3556 J12	9501 G16	
2511 C7	3557 J13	9515 B1	
2512 C8	3558 K13	9516 C1	
2520 G7	3559 K12	9523 G10	
2521 H10	3566 G13	9539 G8	
2522 K7	3567 H13	9540 G8	
2523 H10	3568 G13	9571 E15	
2524 H9	3569 G13	9571 K13	
2525 G9	3570 J13	9571 J13	
2526 H10	3571 J13	9571 K13	
2527 G10	3572 J16	3579 J6	
2528 J10	3573 J16	3579 J6	
2531 I5	3580 K15	3581 K15	
2532 H6	3581 K15	3582 K15	
2533 K9	3585 J15	4013 B4	
2535 J6	4013 B4	4222 F14	
2538 J11	4222 F14	4224 G16	
2540 F9	5003 D3	5101 H4	
2541 F8	5101 H4	5102 J4	
2542 E9	5102 J4	5205 H13	
2543 E9	5205 H13	5220 C13	
2544 E10	5220 C13	5221 D13	
2545 F10	5221 D13	5222 C15	
2550 K12	5222 C15	5223 D15	
2555 J12	5222 C15	5224 E15	
2557 J12	5223 D15	5224 E15	
2568 F13	5224 E15	5225 G16	
2569 G13	5225 G16	5226 G13	
2570 K13	5226 G13	5231 G16	
2580 K16	5227 G16	5501 B1	
3002 D3	5229 G16	5502 C1	
3003 E5	5230 F14	5525 F11	
3005 C5	5231 G16	5542 E10	
3006 D5	5501 B1	5544 E10	
3007 E5	5502 C1	5545 E10	
3008 E6	5525 F11	5550 E12	
3009 F6	5542 E10	5571 F12	
3010 A5	5544 E10	6006 D4	
3011 A5	5545 F10	6008 E4	
3012 A5	5550 E12	6010 A6	
3013 B4	5567 F12	6011 B6	
3014 B4	5571 F12	6012 B6	
3015 B5	5573 K14	6013 B4	
3016 A6	6006 D4	6014 A4	
3017 B5	6008 E4	6015 A4	
3018 B6	6010 A6	6101 G2	
3019 B6	6011 B6	6102 J2	
3101 H2	6012 B6	6103 J4	
3102 H3	6013 B4	6104 A4	
3103 H2	6014 A4	6105 A4	
3104 J3	6015 A4	6106 J2	
3106 J2	6101 G2	6107 J2	
3107 J2	6103 J4	6108 I1	
3108 I1	6104 J1	6109 J2	
3109 J2	6105 I2	6109 J2	
3110 G3	6107 G3	6109 J2	
3111 J3	6108 I1	6109 J2	
3113 J3	6109 F4	6109 J2	

**A1**

**K1**

**A 4**



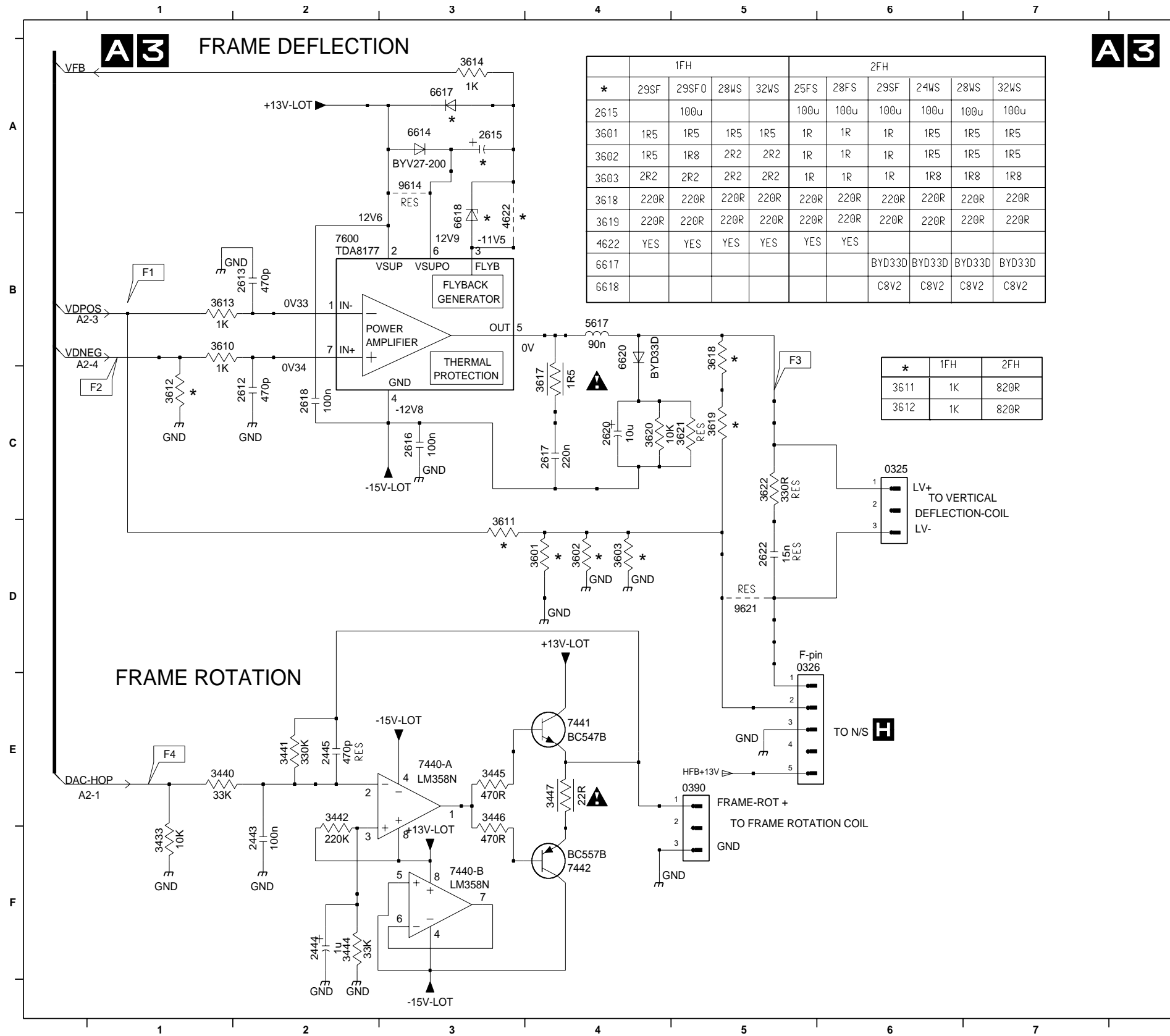
# 7 Electrical diagrams and print lay-outs

MG2.1E

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*	1FH				2FH					
	29SF	29SFO	28WS	32WS	25FS	28FS	29SF	24WS	28WS	32WS
2401										
2420	2n7	2n7	3n3	2n2	1n2	1n2	1n	1n2	1n	1n
2421					470n	470n	560n			
2422								1u2	1u2	1u2
2423	470n	470n	470n	470n						
2425	15n	12n	15n	15n			11n	11n	11n	11n
2426	27n	27n	18n	22n	27n	27n	24n	27n	27n	27n
2432	560n		560n	680n						
2433					390n	470n	560n	390n	390n	430n
2434		470n								
2435					9n1	10n				
2448	10n	10n	4n7	1n5	3n3	1n5	22n	4n7	22n	22n
2454							100n		100n	100n
2457	47n	47n	47n	47n	33n	33n	100n	33n	100n	100n
3401										
3415	33R	33R	33R	33R	22R	22R	18R	18R	18R	18R
3448	100k	100k	100k	100k	10K	33K	100K	100K	100K	100K
3449	47k	47k	47k	47k	33k	220k	47k	100K	47K	47K
3451	27k	47k	27k	27k	39k	39k	27k	27k	27k	27k
3452	22k	27k	22k	22k	27k	27k	22k	22k	22k	22k
3454	10R	10R	10R	10R	10R	10R	47K	10R	47K	47K
3455	220k	220k	220k	220k	220k	220k	220k	220k	220k	220k
3457	560k	560k	560k	560k	1M	1M	680k	680k	560k	680k
3458	220k	220k	270k	270k	150k	100K	100K	100K	100K	100K
3467	15R	3R3	15R	15R	1R	1R				
3483	4R7	5R6	4R7	4R7	4R7	3R3	4R7	4R7	4R7	4R7
3484	4R7	4R7	4R7	4R7	4R7	4R7	4R7	10R	10R	10R
3485	7M5	5M6	7M5	7M5	5M6	5M6	7M5	5M6	5M6	7M5
5401										
5421	X	X	X	X	X	X	X	X	X	X
5422										
5424	X	X	X	X	X	X				
5430	X	X	X	X	X	X	X	X	X	X
6451	C12	C12	C10	C10	C12	C12	C12	C10	C10	C10
9403	X	X	X	X	X	X	X	X	X	X

*	non CRT-size related	
	1FH	2FH
2410		4n7
2416		100n
2417		100n
2418		220p
2424		
2455	1u5	
2457	47n	33n
2480	4u7	2u2
3417	47R	10R
3420		47R
3423		6R8
3425		10R
3426		10R
3430	3K3	1k
3431	3K3	1k
3434	33K	
3435	33k	
3466	4R7	1R
3468		150R
3469		33R
4410	X	X
4416	X	X
5410	X	X
5423	X	X
5425	X	X
5460	X	X
5462	X	X
5466	X	X
5468	X	X
5480	X	X
6420	X	X
6421	X	X
6422	X	X
6423	X	X
6424	X	X
6425	X	X
6426	X	X
6483	X	X
7421	2508AF	2520DF
9402	X	X
9408	X	X
9427	X	X
9436	X	X
9451	X	X
9452	X	X
9481	X	X



*	1FH				2FH					
	29SF	29SFO	28WS	32WS	25FS	28FS	29SF	24WS	28WS	32WS
2615		100u			100u	100u	100u	100u	100u	100u
3601	1R5	1R5	1R5	1R5	1R	1R	1R	1R5	1R5	1R5
3602	1R5	1R8	2R2	2R2	1R	1R	1R	1R5	1R5	1R5
3603	2R2	2R2	2R2	2R2	1R	1R	1R	1R8	1R8	1R8
3618	220R	220R	220R	220R	220R	220R	220R	220R	220R	220R
3619	220R	220R	220R	220R	220R	220R	220R	220R	220R	220R
4622	YES	YES	YES	YES	YES	YES				
6617							BYD33D	BYD33D	BYD33D	BYD33D
6618							C8V2	C8V2	C8V2	C8V2

*	1FH	2FH
3611	1K	820R
3612	1K	820R

- 0325 C6
- 0326 D5
- 0390 E5
- 2443 F2
- 2444 F2
- 2445 E2
- 2612 C2
- 2613 B2
- 2615 A3
- 2616 C3
- 2617 C4
- 2618 C2
- 2620 C4
- 2622 D5
- 3433 F1
- 3440 E1
- 3441 E2
- 3442 E2
- 3444 F2
- 3445 E3
- 3446 E3
- 3447 E4
- 3601 D4
- 3602 D4
- 3603 D4
- 3610 B1
- 3611 D3
- 3612 C1
- 3613 B1
- 3614 A3
- 3617 C4
- 3618 B5
- 3619 C5
- 3620 C4
- 3621 C5
- 3622 C5
- 4622 B3
- 5617 B4
- 6614 A3
- 6617 A3
- 6618 B3
- 6620 B4
- 7440-A E3
- 7440-B F3
- 7441 E4
- 7442 F4
- 7600 B2
- 9614 A3
- 9621 D5

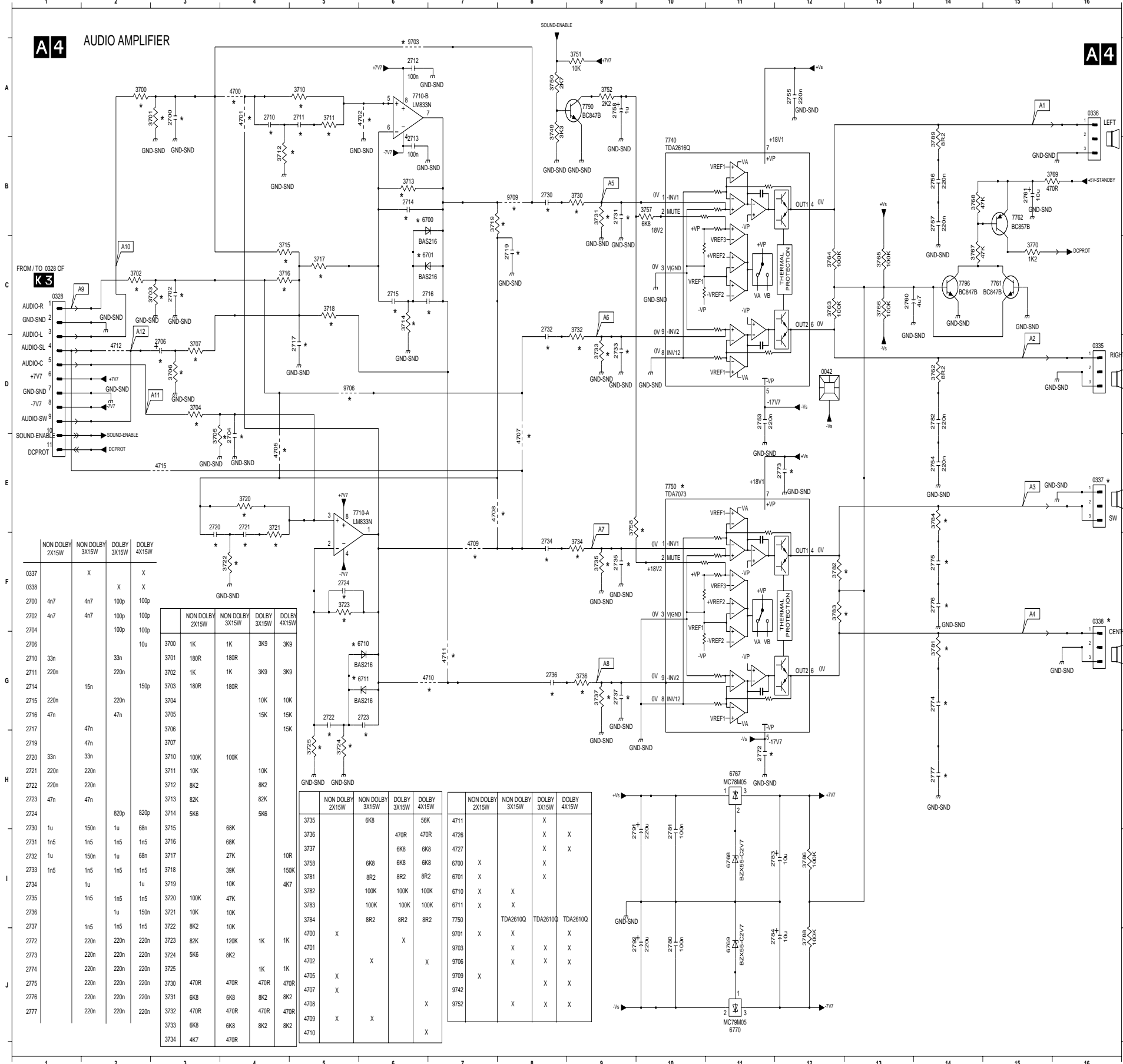


# 7 Electrical diagrams and print lay-outs

MG2.1E

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0328 C1	2700 A3	2711 A5	2716 C6	2722 G5	2732 C8	2737 G9	2757 B14	2773 E12	2780 J10	2791 B9	3703 C3	3710 A5	3715 C4	3720 E4	3725 H5	3734 F9	3750 A8	3762 D14	3767 C14	3782 F12	3789 B14	4707 E8	4712 D2	6711 G6	7710-A E5	7762 B15	9709 B8
0335 D16	2702 C3	2712 A6	2717 D5	2723 G6	2733 D9	2753 D11	2758 A9	2774 G14	2781 I10	2792 J9	3704 D3	3711 A5	3716 C4	3721 E4	3730 B9	3735 F9	3751 A9	3763 C12	3768 B14	3783 F12	4700 A4	4708 E7	4715 E3	6767 H11	7710-B A6	7790 A9	
0336 A16	2704 E4	2713 B6	2719 C8	2724 F5	2734 F8	2754 E14	2760 C13	2775 F14	2782 D14	3700 A2	3705 E3	3712 B4	3717 C5	3722 F4	3731 B9	3736 G9	3752 A9	3764 C12	3769 B16	3784 E14	4701 A4	4709 F7	6700 B6	6768 H11	7740 B10	7796 C14	
0337 E16	2706 D3	2720 E3	2730 B8	2735 F9	2755 A12	2761 B15	2776 F14	2783 H11	3701 A3	3706 D3	3718 C5	3723 F5	3732 C9	3737 G9	3757 B10	3765 C13	3770 C15	3786 H12	4702 A6	4710 G7	6701 C7	6769 J11	7750 E10	9703 A6			



	NON DOLBY 2X15W	NON DOLBY 3X15W	DOLBY 3X15W	DOLBY 4X15W
0337		X	X	X
0338		X	X	X
2700	4n7	4n7	100p	100p
2702	4n7	4n7	100p	100p
2704			100p	100p
2706			10u	
2710	33n	33n		
2711	220n	220n		
2714		15n	150p	
2715	220n	220n		
2716	47n	47n		
2717				
2719	47n			
2720	33n	33n		
2721	220n	220n		
2722	220n	220n		
2723	47n	47n		
2724		820p	820p	
2730	1u	150n	68n	3715
2731	1n5	1n5	1n5	3716
2732	1u	150n	1u	68n
2733	1n5	1n5	1n5	3718
2734	1u	10K	10K	3719
2735	1n5	1n5	1n5	3720
2736		1u	150n	3721
2737	1n5	1n5	1n5	3722
2772		220n	220n	3723
2773		220n	220n	3724
2774		220n	220n	3725
2775		220n	220n	3730
2776		220n	220n	3731
2777		220n	220n	3732
				3733
				3734

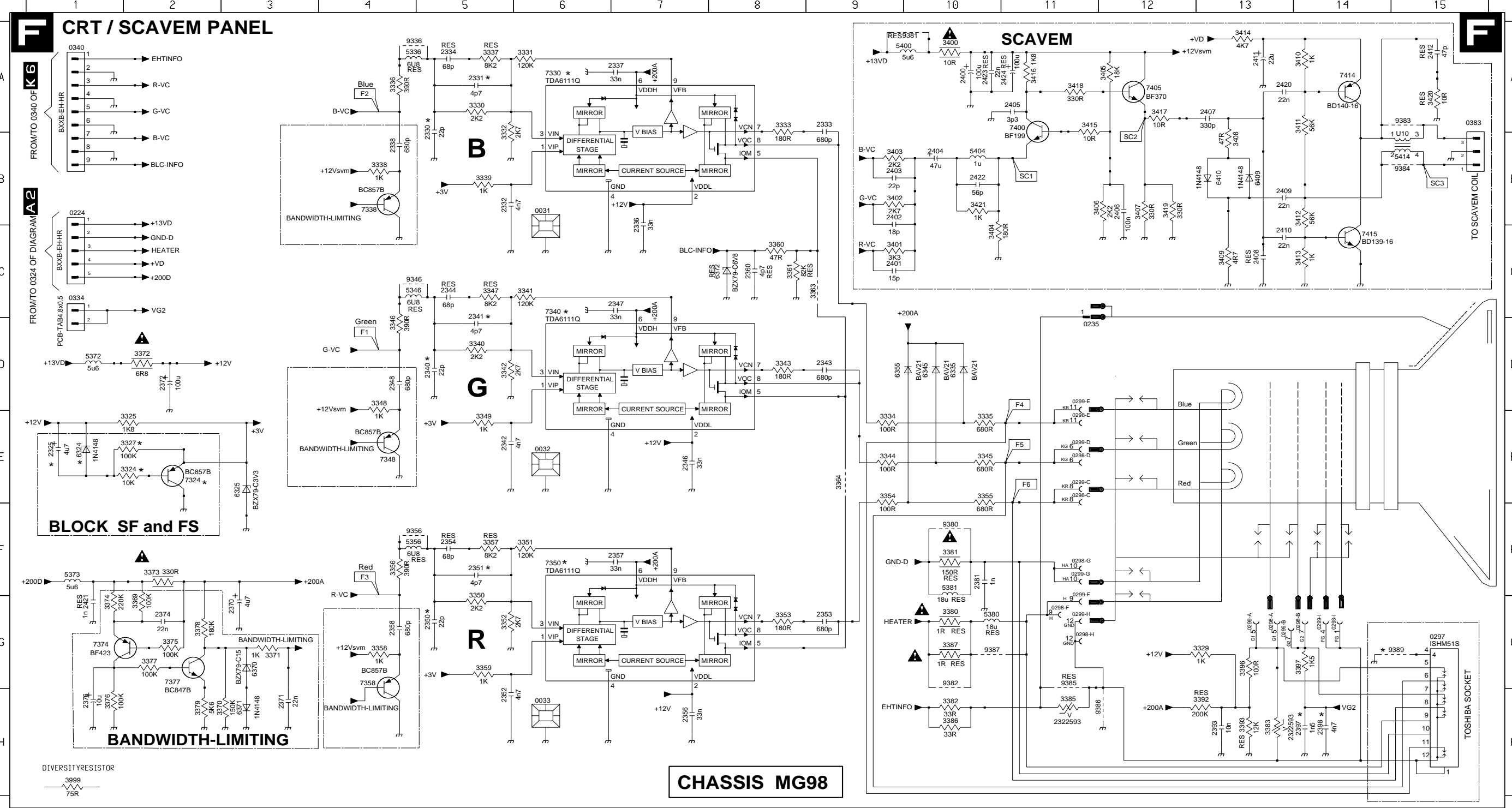
  

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3701	180R	180R		
3702	1K	1K	3K9	3K9
3703	180R	180R		
3704		10K	10K	
3705		15K	15K	
3706		15K	15K	
3707				
3710	100K	100K		
3711	10K	10K		
3712	8K2	8K2		
3713	82K	82K		
3714	5K6	5K6		
3715		68K		
3716		68K		
3717		27K		
3718		39K		
3719		10K		
3720		100K		
3721		10K		
3722		8K2		
3723		82K		
3724		5K6		
3725			1K	1K
3726			1K	1K
3727			470R	470R
3728			470R	470R
3729			8K2	8K2
3730			8K2	8K2
3731			470R	470R
3732			470R	470R
3733			8K2	8K2
3734			470R	470R

	NON DOLBY 2X15W	NON DOLBY 3X15W	DOLBY 3X15W	DOLBY 4X15W
3735		6K8		56K
3736			470R	470R
3737			6K8	6K8
3738		6K8	6K8	6K8
3739		8R2	8R2	8R2
3740		100K	100K	100K
3741		100K	100K	100K
3742		8R2	8R2	8R2
4700		X		X
4701			X	
4702				X
4705		X		
4707		X		
4708				X
4709		X		
4710				X
4711			X	
4726		X	X	X
4727		X	X	X
6700	X	X		
6701	X	X		
6710	X	X		
6711	X	X		
7750		TDA2610Q	TDA2610Q	TDA2610Q
9701	X	X	X	X
9703		X	X	X
9706		X	X	X
9709	X		X	X
9742				X
9752		X	X	X

0031 0032 0033 0034 0035 0036 0037 0038 0039 0040 0041 0042 0043 0044 0045 0046 0047 0048 0049 0050 0051 0052 0053 0054 0055 0056 0057 0058 0059 0060 0061 0062 0063 0064 0065 0066 0067 0068 0069 0070 0071 0072 0073 0074 0075 0076 0077 0078 0079 0080 0081 0082 0083 0084 0085 0086 0087 0088 0089 0090 0091 0092 0093 0094 0095 0096 0097 0098 0099 0100 0101 0102 0103 0104 0105 0106 0107 0108 0109 0110 0111 0112 0113 0114 0115 0116 0117 0118 0119 0120 0121 0122 0123 0124 0125 0126 0127 0128 0129 0130 0131 0132 0133 0134 0135 0136 0137 0138 0139 0140 0141 0142 0143 0144 0145 0146 0147 0148 0149 0150 0151 0152 0153 0154 0155 0156 0157 0158 0159 0160 0161 0162 0163 0164 0165 0166 0167 0168 0169 0170 0171 0172 0173 0174 0175 0176 0177 0178 0179 0180 0181 0182 0183 0184 0185 0186 0187 0188 0189 0190 0191 0192 0193 0194 0195 0196 0197 0198 0199 0200 0201 0202 0203 0204 0205 0206 0207 0208 0209 0210 0211 0212 0213 0214 0215 0216 0217 0218 0219 0220 0221 0222 0223 0224 0225 0226 0227 0228 0229 0230 0231 0232 0233 0234 0235 0236 0237 0238 0239 0240 0241 0242 0243 0244 0245 0246 0247 0248 0249 0250 0251 0252 0253 0254 0255 0256 0257 0258 0259 0260 0261 0262 0263 0264 0265 0266 0267 0268 0269 0270 0271 0272 0273 0274 0275 0276 0277 0278 0279 0280 0281 0282 0283 0284 0285 0286 0287 0288 0289 0290 0291 0292 0293 0294 0295 0296 0297 0298 0299 0300 0301 0302 0303 0304 0305 0306 0307 0308 0309 0310 0311 0312 0313 0314 0315 0316 0317 0318 0319 0320 0321 0322 0323 0324 0325 0326 0327 0328 0329 0330 0331 0332 0333 0334 0335 0336 0337 0338 0339 0340 0341 0342 0343 0344 0345 0346 0347 0348 0349 0350 0351 0352 0353 0354 0355 0356 0357 0358 0359 0360 0361 0362 0363 0364 0365 0366 0367 0368 0369 0370 0371 0372 0373 0374 0375 0376 0377 0378 0379 0380 0381 0382 0383 0384 0385 0386 0387 0388 0389 0390 0391 0392 0393 0394 0395 0396 0397 0398 0399 0400 0401 0402 0403 0404 0405 0406 0407 0408 0409 0410 0411 0412 0413 0414 0415 0416 0417 0418 0419 0420 0421 0422 0423 0424 0425 0426 0427 0428 0429 0430 0431 0432 0433 0434 0435 0436 0437 0438 0439 0440 0441 0442 0443 0444 0445 0446 0447 0448 0449 0450 0451 0452 0453 0454 0455 0456 0457 0458 0459 0460 0461 0462 0463 0464 0465 0466 0467 0468 0469 0470 0471 0472 0473 0474 0475 0476 0477 0478 0479 0480 0481 0482 0483 0484 0485 0486 0487 0488 0489 0490 0491 0492 0493 0494 0495 0496 0497 0498 0499 0500 0501 0502 0503 0504 0505 0506 0507 0508 0509 0510 0511 0512 0513 0514 0515 0516 0517 0518 0519 0520 0521 0522 0523 0524 0525 0526 0527 0528 0529 0530 0531 0532 0533 0534 0535 0536 0537 0538 0539 0540 0541 0542 0543 0544 0545 0546 0547 0548 0549 0550 0551 0552 0553 0554 0555 0556 0557 0558 0559 0560 0561 0562 0563 0564 0565 0566 0567 0568 0569 0570 0571 0572 0573 0574 0575 0576 0577 0578 0579 0580 0581 0582 0583 0584 0585 0586 0587 0588 0589 0590 0591 0592 0593 0594 0595 0596 0597 0598 0599 0600 0601 0602 0603 0604 0605 0606 0607 0608 0609 0610 0611 0612 0613 0614 0615 0616 0617 0618 0619 0620 0621 0622 0623 0624 0625 0626 0627 0628 0629 0630 0631 0632 0633 0634 0635 0636 0637 0638 0639 0640 0641 0642 0643 0644 0645 0646 0647 0648 0649 0650 0651 0652 0653 0654 0655 0656 0657 0658 0659 0660 0661 0662 0663 0664 0665 0666 0667 0668 0669 0670 0671 0672 0673 0674 0675 0676 0677 0678 0679 0680 0681 0682 0683 0684 0685 0686 0687 0688 0689 0690 0691 0692 0693 0694 0695 0696 0697 0698 0699 0700 0701 0702 0703 0704 0705 0706 0707 0708 0709 0710 0711 0712 0713 0714 0715 0716 0717 0718 0719 0720 0721 0722 0723 0724 0725 0726 0727 0728 0729 0730 0731 0732 0733 0734 0735 0736 0737 0738 0739 0740 0741 0742 0743 0744 0745 0746 0747 0748 0749 0750 0751 0752 0753 0754 0755 0756 0757 0758 0759 0760 0761 0762 0763 0764 0765 0766 0767 0768 0769 0770 0771 0772 0773 0774 0775 0776 0777 0778 0779 0780 0781 0782 0783 0784 0785 0786 0787 0788 0789 0790 0791 0792 0793 0794 0795 0796 0797 0798 0799 0800 0801 0802 0803 0804 0805 0806 0807 0808 0809 0810 0811 0812 0813 0814 0815 0816 0817 0818 0819 0820 0821 0822 0823 0824 0825 0826 0827 0828 0829 0830 0831 0832 0833 0834 0835 0836 0837 0838 0839 0840 0841 0842 0843 0844 0845 0846 0847 0848 0849 0850 0851 0852 0853 0854 0855 0856 0857 0858 0859 0860 0861 0862 0863 0864 0865 0866 0867 0868 0869 0870 0871 0872 0873 0874 0875 0876 0877 0878 0879 0880 0881 0882 0883 0884 0885 0886 0887 0888 0889 0890 0891 0892 0893 0894 0895 0896 0897 0898 0899 0900 0901 0902 0903 0904 0905 0906 0907 0908 0909 0910 0911 0912 0913 0914 0915 0916 0917 0918 0919 0920 0921 0922 0923 0924 0925 0926 0927 0928 0929 0930 0931 0932 0933 0934 0935 0936 0937 0938 0939 0940 0941 0942 0943 0944 0945 0946 0947 0948 0949 0950 0951 0952 0953 0954 0955 0956 0957 0958 0959 0960 0961 0962 0963 0964 0965 0966 0967 0968 0969 0970 0971 0972 0973 0974 0975 0976 0977 0978 0979 0980 0981 0982 0983 0984 0985 0986 0987 0988 0989 0990 0991 0992 0993 0994 0995 0996 0997 0998 0999 1000



FAKE DAF	NON DAF	REAL DAF	DIVERSITY RESISTOR
3104-328-00321	X	X	150R
3104-328-00341	X	X	180R
3104-328-00361	X	X	220R
3104-328-00381	X	X	270R
3104-328-00401	X	X	330R
3104-328-01381	X	X	470R

FAKE DAF	NON DAF	REAL DAF
2397	1n5	1n5
2398	-	4n7

FQS	NON FQS
2325	10u
3324	10K
3327	100K
6324	1N4148
7324	BC857B

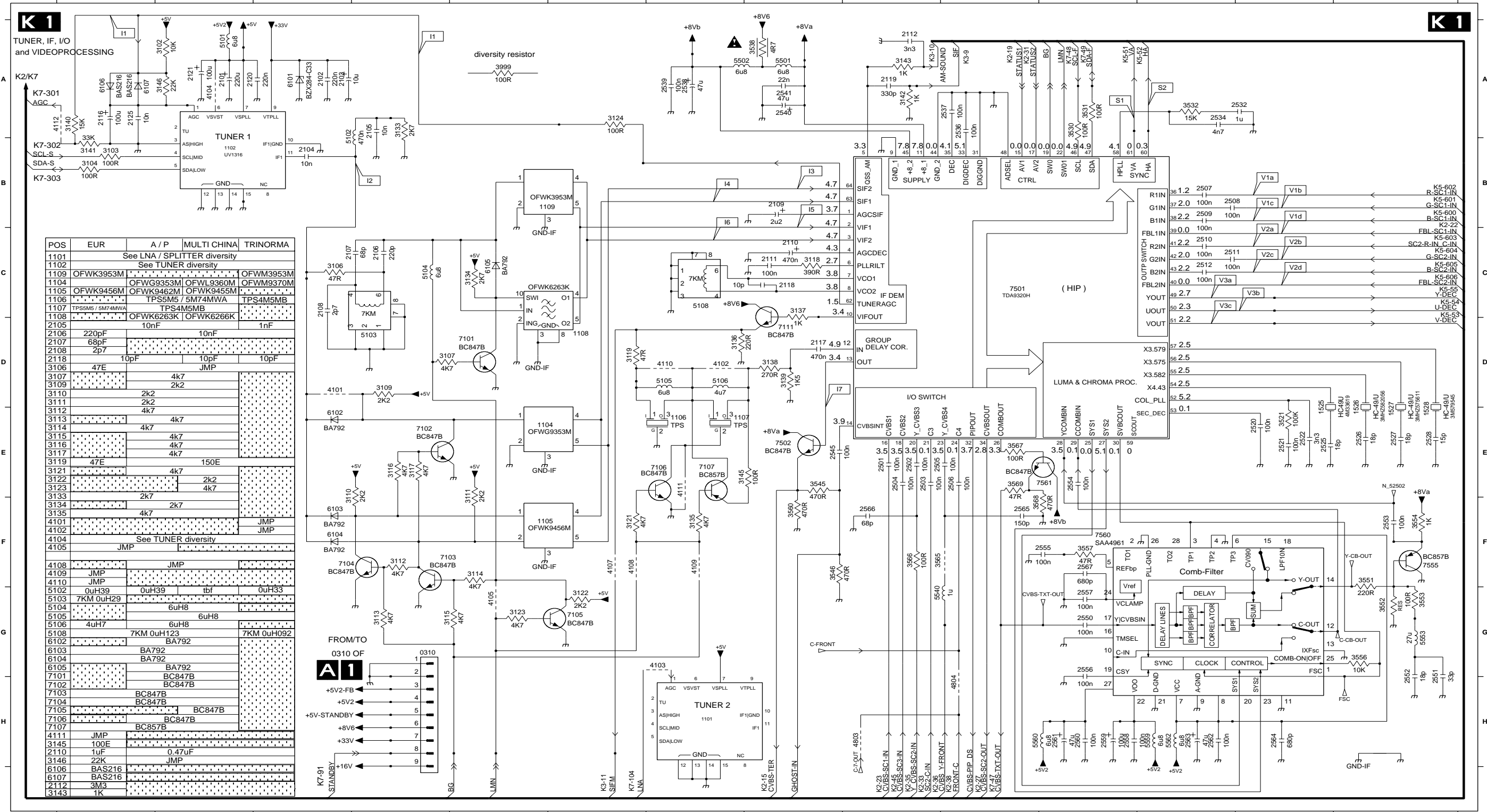
TDA	TDA6111	TDA6101
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2331	1p8	1p8
2340	22p	15p
2341	1p8	1p8
2350	22p	15p
2351	2p7	2p7
7330	TDA6111	TDA6101
7340	TDA6111	TDA6101
7350	TDA6111	TDA6101

# 7 Electrical diagrams and print lay-outs

MG2.1E

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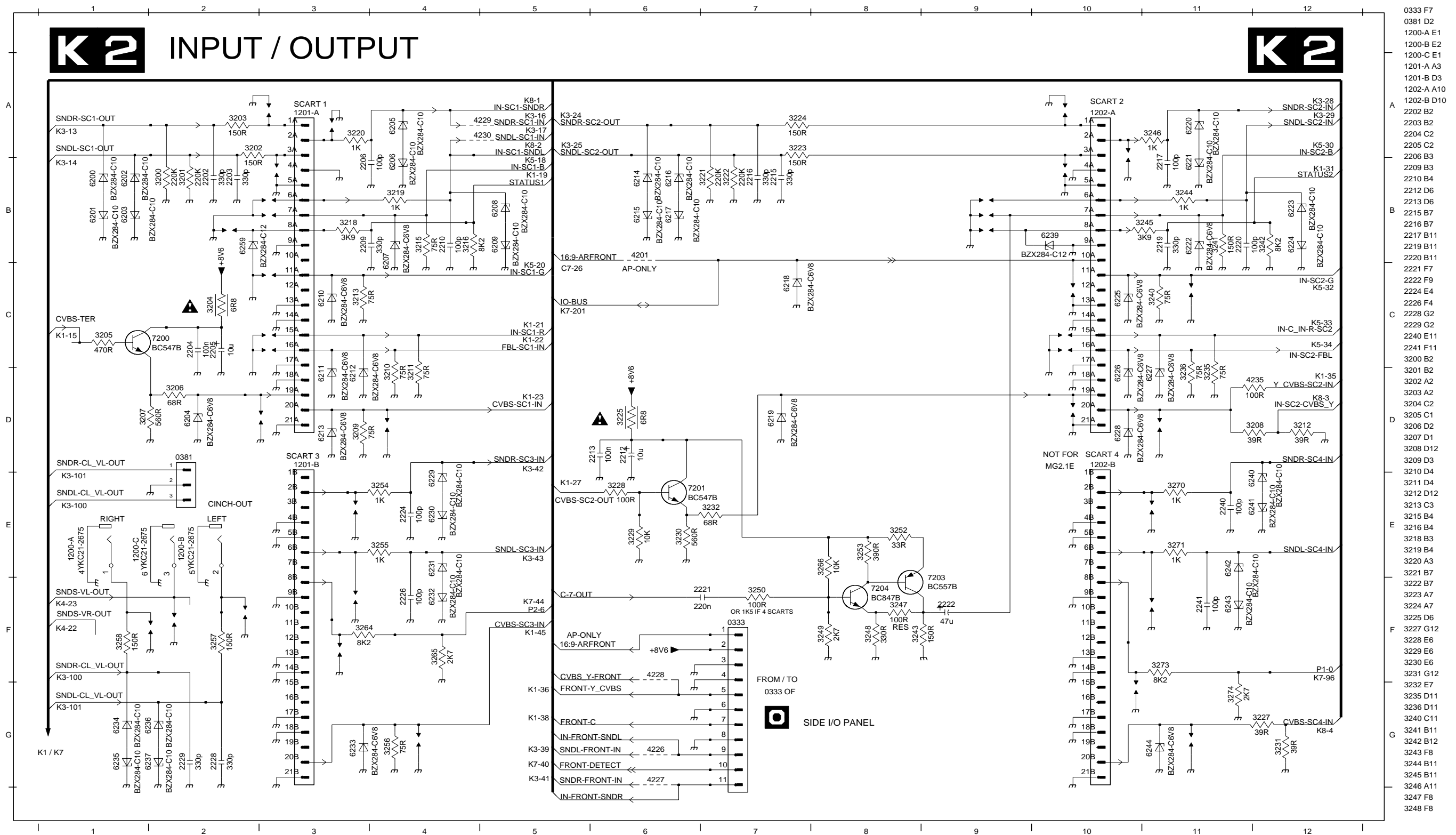
0310 G4	1108 C5	2102 A3	2109 B8	2119 A9	2504 E9	2511 C12	2527 E14	2539 A7	2553 F14	2560 H11	2567 F11	3110 E3	3117 E4	3133 A4	3140 A1	3530 A11	3552 G14	3566 F9	4103 G7	4111 E7	5104 C4	5553 G14	6104 F3	7104 F4	7555 F14
1101 H7	1109 B5	2103 A3	2110 C8	2120 A2	2505 E9	2512 C12	2528 E14	2540 A8	2554 E11	2561 H11	3102 A2	3111 E5	3118 C8	3134 C5	3141 B1	3531 A11	3553 G14	3567 E10	4104 A2	4112 A1	5105 D7	5559 H12	6105 C5	7105 G6	7560 F11
1102 B2	1525 D13	2104 B3	2111 C8	2121 A2	2506 E10	2520 E13	2532 A13	2541 A8	2555 F11	2562 H12	3103 B1	3112 F4	3119 D6	3135 F7	3142 A9	3532 A12	3554 F14	3568 F10	4105 G5	4803 H9	5106 D7	5560 H10	6106 A1	7106 E7	7561 E10
1104 E5	1526 D14	2105 A4	2112 A9	2125 A1	2507 B12	2521 E13	2534 A12	2545 E8	2556 G11	2563 H12	3104 B1	3113 G4	3121 F6	3136 D7	3143 A9	3538 A8	3556 G14	3569 E10	4107 F6	4804 H10	5108 C7	5562 H12	6107 A1	7107 E7	
1105 F5	1527 E14	2106 C4	2116 A1	2501 E9	2508 B12	2522 E13	2536 A10	2550 G11	2557 G11	2564 H13	3106 C3	3114 F5	3122 G6	3137 C8	3145 E7	3545 E8	3557 F11	3569 A5	4108 F6	5101 A2	5501 A8	6101 A3	7101 D5	7111 D8	
1106 E7	1528 E14	2107 C3	2117 D8	2502 E9	2509 B12	2525 E13	2537 A10	2551 G14	2558 H11	2565 F10	3107 D4	3115 G4	3123 G5	3138 D8	3146 A2	3546 F8	3560 F8	4101 D3	4109 F7	5102 A3	5502 A7	6102 E3	7102 E4	7501 C10	
1107 E7	2101 A2	2108 C3	2118 C8	2503 E9	2510 C12	2526 E14	2538 A7	2552 G14	2559 H11	2566 F9	3109 D4	3116 E4	3124 A6	3139 D8	3521 E13	3551 F14	3565 F9	4102 D7	4110 D7	5103 D4	5540 G9	6103 F3	7103 F5	7502 E8	



POS	EUR	A/P	MULTI CHINA	TRINORMA
1101	See LNA / SPLITTER diversity			
1102	See TUNER diversity			
1109	OFWK3953M			OFWM3953M
1104	OFWK9456M	OFWG9353M	OFWL9360M	OFWM9370M
1105	TPS5M5 / 5M74MWA	TPS4MSMB		
1107	OFWK6263K	OFWK6266K		
2105	10nF	10nF		
2106	220pF	10nF		
2107	68pF			
2108	2pF			
2118	10pF	10pF		
3106	47E	JMP		
3107		4k7		
3109		2k2		
3110		2k2		
3111		4k7		
3112		4k7		
3113		4k7		
3114		4k7		
3115		4k7		
3116		4k7		
3117		4k7		
3119	47E	150E		
3121		4k7		
3122		2k2		
3123		4k7		
3133		2k7		
3134		2k7		
3135		4k7		
4101		JMP		
4102		JMP		
4104		JMP		
4105		JMP		
4108		JMP		
4109		JMP		
4110		JMP		
5102	0uH39	0uH39	tbF	0uH33
5103	7KM 0uH29			
5104		6uH8		
5105		6uH8		
5106	4uH7	6uH8		
5108		7KM 0uH123		7KM 0uH092
6102	BA792	BA792		
6104	BA792	BA792		
7103	BC847B	BC847B		
7104	BC847B	BC847B		
7105		BC847B		
7106		BC847B		
7107		BC857B		
4111	JMP			
3145	100E			
2110	1uF	0.47uF		
3146	22K	JMP		
6106	BAS216			
6107	BAS216			
2112	3M3			
3143	1K			

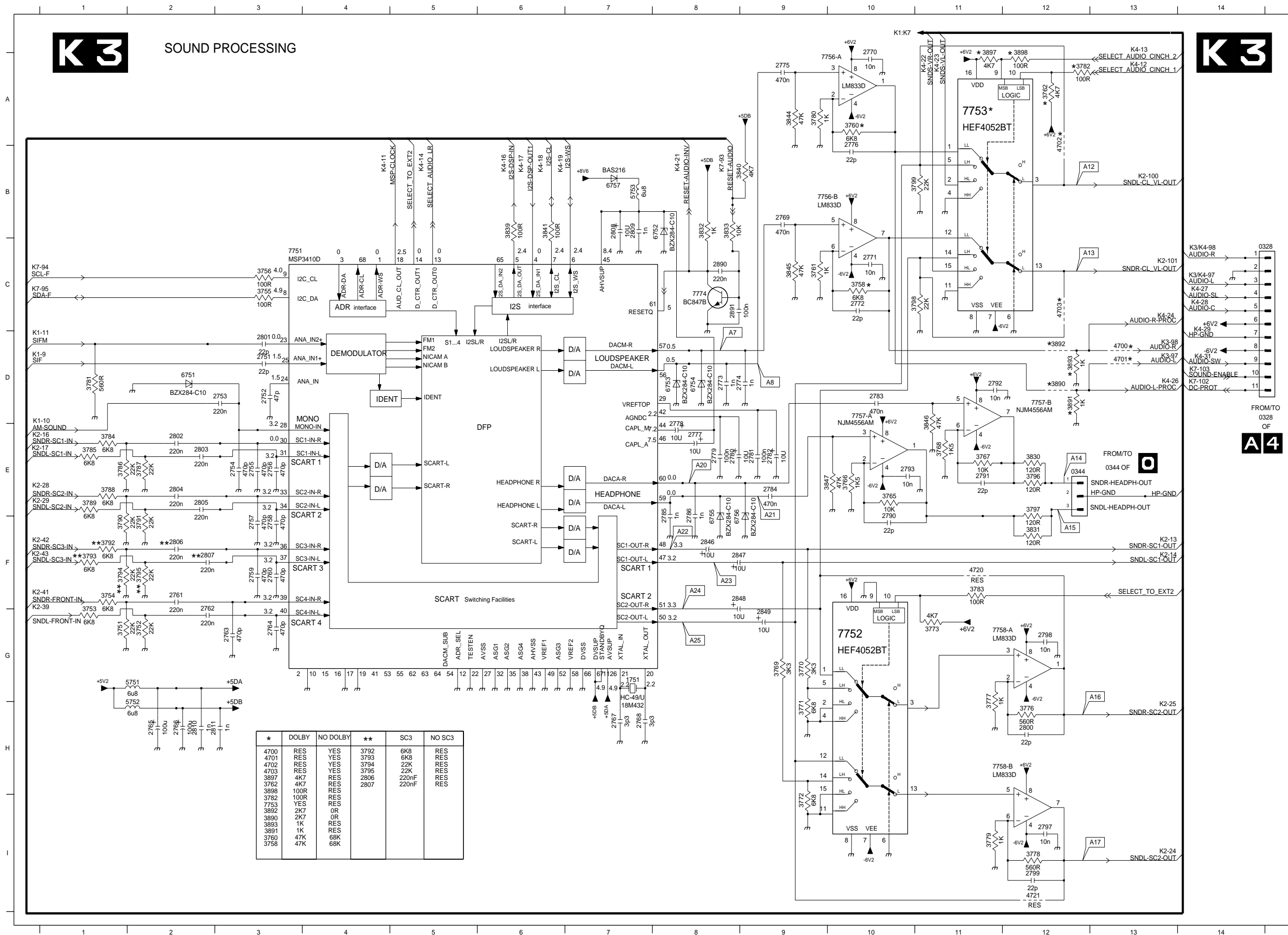
Main HIP	LOW	TOP				
Pinnr	PinName	100Hz ECO Eur	50Hz Eur	1FH AP/US	100Hz Med/Top Eur	100 Hz AP
15	INPUT	STATUS1	STATUS1	Ext1AR	STATUS1	Ext1 AR
17	INPUT	STATUS2	STATUS2	Ext2AR	STATUS2	Ext2 AR
22	OUTPUT	L'	L'	M	L'	M

POS	EUR LOW	EUR TOP	A/P MULTI	A/P NTSC KOREA	A/P NTSC TAIWAN LOW	A/P NTSC TAIWAN TOP	ARGENTINA	USA
1102	UV1316/AI-2	UV1316/AP-2	UV1316/AP-2	UV1336B/AP	UV1336B/APS	UV1336B/APS	UV 1336B/AP	UV1336B/AP
1101		PS1311 / I	PS1315 / I	PS1315 / P		PS1311	PS1315 / I	



0333 F7	3249 F8
0381 D2	3250 F7
1200-A E1	3252 E8
1200-B E2	3253 E8
1200-C E1	3254 E4
1201-A A3	3255 E4
1201-B D3	3256 G4
1202-A A10	3257 F2
1202-B D10	3258 F1
2202 B2	3264 F3
2203 B2	3265 F4
2204 C2	3266 E8
2205 C2	3270 E11
2206 B3	3271 E11
2209 B3	3273 F11
2210 B4	3274 G11
2212 D6	4201 B6
2213 D6	4226 G6
2215 B7	4227 G6
2216 B7	4228 F6
2217 B11	4229 A5
2219 B11	4230 A5
2220 B11	4235 D12
2221 F7	6200 B1
2222 F9	6201 B1
2224 E4	6202 B1
2226 F4	6203 B1
2228 G2	6204 D2
2229 G2	6205 A4
2240 E11	6206 B4
2241 F11	6207 B4
3200 B2	6208 B5
3201 B2	6209 B5
3202 A2	6210 C3
3203 A2	6211 D3
3204 C2	6212 D3
3205 C1	6213 D3
3206 D2	6214 B6
3207 D1	6215 B6
3208 D12	6216 B6
3209 D3	6217 B6
3210 D4	6218 C7
3211 D4	6219 D7
3212 D12	6220 A11
3213 C3	6221 B11
3215 B4	6222 B11
3216 B4	6223 B12
3218 B3	6224 B12
3219 B4	6225 C10
3220 A3	6226 D10
3221 B7	6227 D11
3222 B7	6228 D10
3223 A7	6229 E4
3224 A7	6230 E4
3225 D6	6231 E4
3227 G12	6232 F4
3228 E6	6233 G3
3229 E6	6234 G1
3230 E6	6235 G1
3231 G12	6236 G2
3232 E7	6237 G2
3235 D11	6239 B10
3236 D11	6240 E12
3240 C11	6241 E12
3241 B11	6242 E11
3242 B12	6243 F11
3243 F8	6244 G11
3244 B11	6259 B2
3245 B11	7200 C2
3246 A11	7201 E9
3247 F8	7203 E6
3248 F8	7204 F8

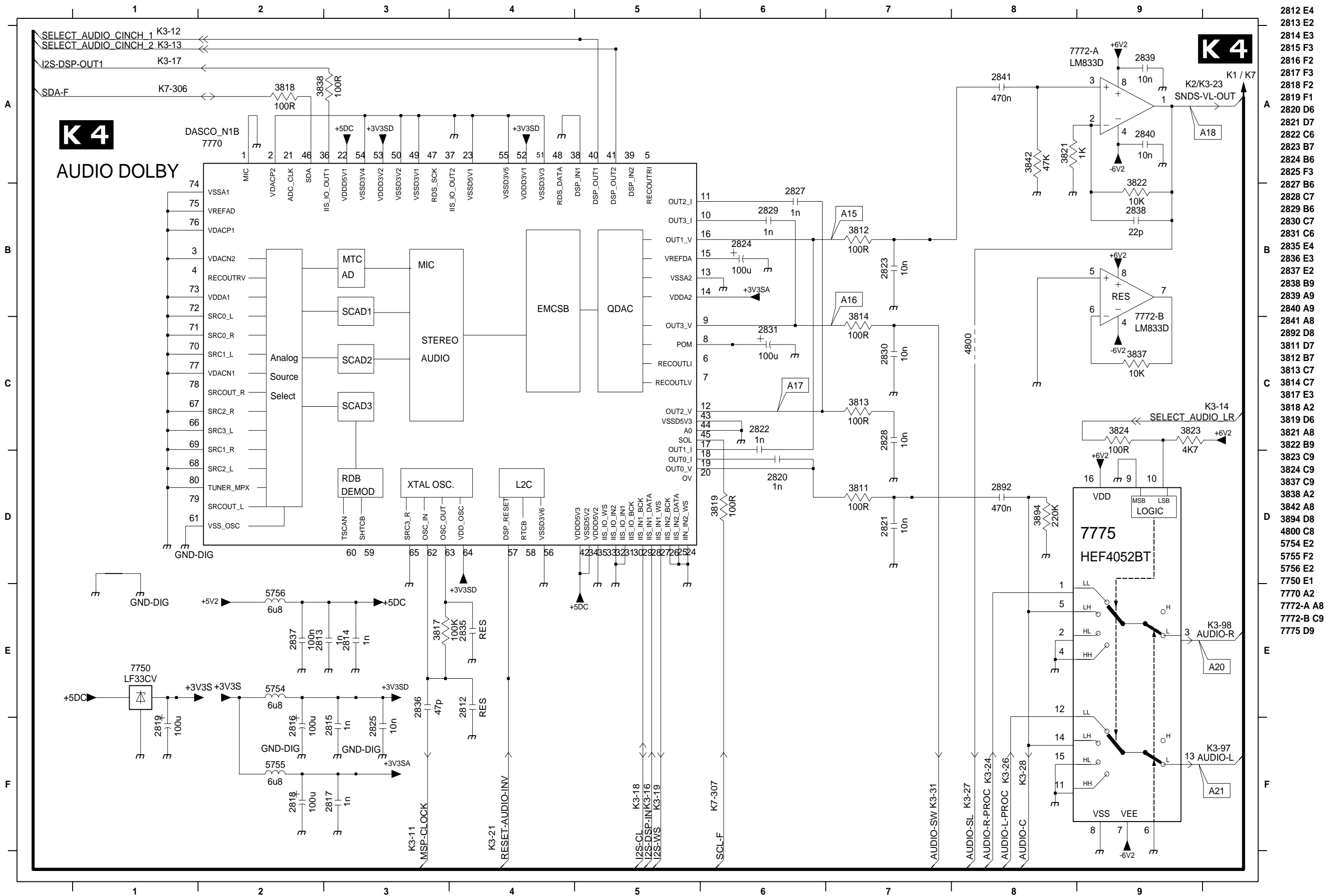
	LOW			TOP	
PinName	100Hz ECO Eur	50Hz Eur	1FH AP/US	100Hz TOP/MED Eur	100Hz AP
P1-0			MAINS CLOCK	STATUS4	MAINS CLOCK
P1-4	I/O_CNTRL_BUS IN	I/O_CNTRL_BUS IN	16:9 ARFRONT	I/O_CNTRL_BUS IN	16:9 ARFRONT
P2-6		STATUS3	Ext2 FRONT	STATUS3	
P3-7	I/O_CNTRL_BUS OUT	I/O_CNTRL_BUS OUT	REMOTE LOCATOR	I/O_CNTRL_BUS OUT	



*	DOLBY	NO DOLBY	**	SC3	NO SC3
4700	RES	YES	3792	6K8	RES
4701	RES	YES	3793	6K8	RES
4702	RES	YES	3794	22K	RES
4703	RES	YES	3795	22K	RES
3897	4K7	RES	2806	220nF	RES
3762	4K7	RES	2807	220nF	RES
3898	100R	RES			
3782	100R	RES			
7753	YES	RES			
3882	2K7	OR			
3890	2K7	OR			
3893	1K	RES			
3891	1K	RES			
3760	47K	RES			
3758	47K	RES			

- 0328 C14
- 0344 E12
- 1751 G7
- 2751 D3
- 2752 D3
- 2753 D3
- 2754 E3
- 2755 E3
- 2756 E3
- 2757 F3
- 2758 F3
- 2759 F3
- 2760 F3
- 2761 F2
- 2762 G2
- 2763 G3
- 2764 G3
- 2765 H2
- 2766 H2
- 2767 H7
- 2768 H7
- 2769 B9
- 2770 A10
- 2771 C10
- 2772 C10
- 2773 D8
- 2774 D9
- 2775 A9
- 2776 B10
- 2777 E8
- 2778 E8
- 2779 E8
- 2780 E8
- 2781 E9
- 2782 E9
- 2783 D10
- 2784 E9
- 2785 E8
- 2786 E8
- 2787 F10
- 2791 E11
- 2792 D11
- 2793 E10
- 2797 I12
- 2798 G12
- 2799 I12
- 2800 H12
- 2801 D3
- 2802 E2
- 2803 E2
- 2804 E2
- 2805 E2
- 2806 F2
- 2807 F2
- 2808 B7
- 2809 B7
- 2810 H2
- 2811 H3
- 2846 F8
- 2847 F8
- 2848 F8
- 2849 G9
- 2890 C8
- 2891 C8
- 3751 G1
- 3752 G2
- 3753 G1
- 3754 F1
- 3755 C3
- 3756 C3
- 3758 C10
- 3760 A10
- 3761 C9
- 3762 A12
- 3765 E10
- 3766 E10
- 3767 E11
- 3768 G9
- 3769 G9
- 3770 G9
- 3771 H9
- 3772 I9
- 3773 G11
- 3776 H12
- 3777 G11
- 3778 I12
- 3779 I11
- 3780 A9
- 3781 D1
- 3782 A12
- 3783 F11
- 3784 E1
- 3785 E1
- 3786 E1
- 3787 E2
- 3788 E1
- 3789 E1
- 3790 F1
- 3791 F1
- 3792 F1
- 3793 F1
- 3794 F1
- 3795 F2
- 3796 E12
- 3797 E12
- 3798 C11
- 3799 B11
- 3830 E12
- 3831 F12
- 3832 B8
- 3833 B8
- 3839 B6
- 3840 B9
- 3841 B6
- 3844 A9
- 3845 C9
- 3846 D11
- 3847 E10
- 3890 D12
- 3891 D12
- 3892 D12
- 3893 D12
- 4700 D13
- 4701 D13
- 4702 A12
- 4703 C12
- 4720 F11
- 4721 I12
- 4722 H2
- 4752 H2
- 4753 B7
- 4754 D2
- 4755 D2
- 4756 D2
- 4757 D2
- 4758 D2
- 4759 D2
- 4760 D2
- 4761 D2
- 4762 G2
- 4763 G2
- 4764 G2
- 4765 B8
- 4766 D8
- 4767 H7
- 4768 F8
- 4769 B7
- 4770 A10
- 4771 C10
- 4772 C10
- 4773 D8
- 4774 D9
- 4775 A9
- 4776 B10
- 4777 E8
- 4778 E8
- 4779 E8
- 4780 E8
- 4781 E9
- 4782 E9
- 4783 D10
- 4784 E9
- 4785 E8
- 4786 E8
- 4787 F10
- 4791 E11
- 4792 D11
- 4793 E10
- 4797 I12
- 4798 G12
- 4799 I12
- 4800 H12
- 4801 D3
- 4802 E2
- 4803 E2
- 4804 E2
- 4805 E2
- 4806 F2
- 4807 F2
- 4808 B7
- 4809 B7
- 4810 H2
- 4811 H3
- 4846 F8
- 4847 F8
- 4848 F8
- 4849 G9
- 4890 C8
- 4891 C8
- 4751 G1
- 4752 G2
- 4753 G1
- 4754 F1
- 4755 C3
- 4756 C3
- 4758 C10
- 4760 A10
- 4761 C9
- 4762 A12
- 4765 E10
- 4766 E10
- 4767 E11
- 4768 G9
- 4769 G9
- 4770 G9
- 4771 H9
- 4772 I9
- 4773 G11
- 4776 H12
- 4777 G11
- 4778 I12
- 4779 I11
- 4780 A9
- 4781 D1
- 4782 A12
- 4783 F11
- 4784 E1
- 4785 E1
- 4786 E1
- 4787 E2
- 4788 E1
- 4789 E1
- 4790 F1
- 4791 F1
- 4792 F1
- 4793 F1
- 4794 F1
- 4795 F2
- 4796 E12
- 4797 E12
- 4798 C11
- 4799 B11
- 4830 E12
- 4831 F12
- 4832 B8
- 4833 B8
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- 4840 B9
- 4841 B6
- 4844 A9
- 4845 C9

FROM/TO  
0328  
OF  
**A4**

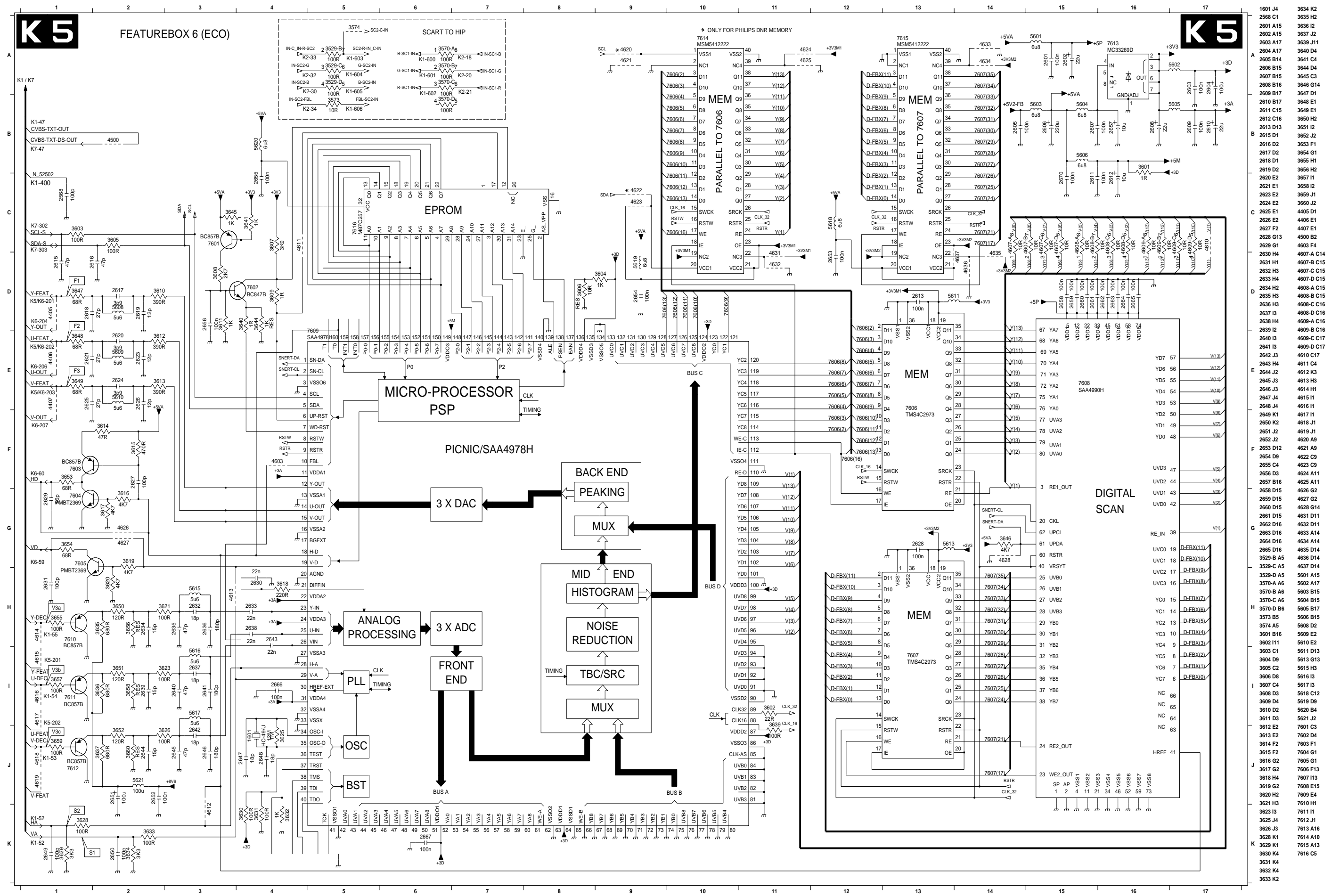


- 2812 E4
- 2813 E2
- 2814 E3
- 2815 F3
- 2816 F2
- 2817 F3
- 2818 F2
- 2819 F1
- 2820 D6
- 2821 D7
- 2822 C6
- 2823 B7
- 2824 B6
- 2825 F3
- 2827 B6
- 2828 C7
- 2829 B6
- 2830 C7
- 2831 C6
- 2835 E4
- 2836 E3
- 2837 E2
- 2838 B9
- 2839 A9
- 2840 A9
- 2841 A8
- 2892 D8
- 3811 D7
- 3812 B7
- 3813 C7
- 3814 C7
- 3817 E3
- 3818 A2
- 3819 D6
- 3821 A8
- 3822 B9
- 3823 C9
- 3824 C9
- 3837 C9
- 3838 A2
- 3842 A8
- 3894 D8
- 4800 C8
- 5754 E2
- 5755 F2
- 5756 E2
- 7750 E1
- 7770 A2
- 7772-A A8
- 7772-B C9
- 7775 D9

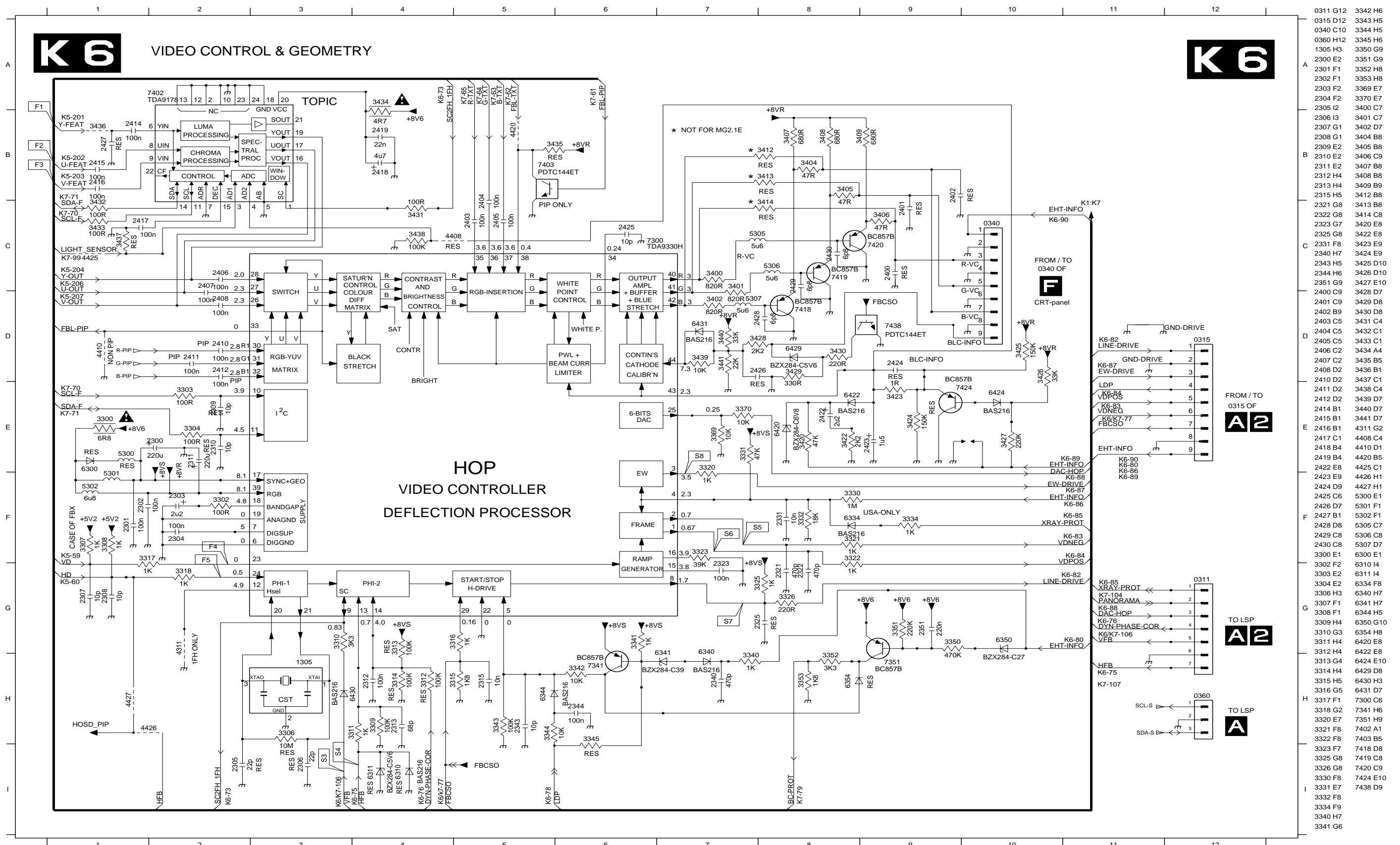
# 7 Electrical diagrams and print lay-outs

MG2.1E

50



1601 J4	3634 K2
2568 C1	3635 H2
2601 A15	3636 I2
2602 A15	3637 J2
2603 A17	3639 J11
2604 A17	3640 D4
2605 B14	3641 C4
2606 B15	3644 D4
2607 B15	3645 C3
2608 B16	3646 G14
2609 B17	3647 D1
2610 B17	3648 E1
2611 C15	3649 E1
2612 C16	3650 H2
2613 D13	3651 I2
2615 D1	3652 J2
2616 D2	3653 F1
2617 D2	3654 G1
2618 D1	3655 H1
2619 D2	3656 H2
2620 E2	3657 H1
2621 E1	3658 I2
2623 E2	3659 J1
2624 E2	3660 J2
2625 E1	4405 D1
2626 E2	4406 E1
2627 F2	4407 E1
2628 G13	4500 B2
2629 G1	4503 F4
2630 H4	4607-A C14
2631 H1	4607-B C15
2632 H3	4607-C C15
2633 H4	4607-D C15
2634 H2	4608-A C15
2635 H3	4608-B C15
2636 H3	4608-C C16
2637 I3	4608-D C16
2638 H4	4609-A C16
2639 I2	4609-B C16
2640 I3	4609-C C17
2641 I3	4609-D C17
2642 J3	4611 C4
2643 H4	4612 K3
2644 J2	4613 H3
2645 J3	4614 H1
2646 J3	4615 H1
2647 J4	4616 I1
2648 J4	4617 I1
2649 K1	4618 J1
2650 K2	4619 J1
2651 J2	4620 A9
2652 J2	4621 A9
2653 D12	4622 C9
2654 D9	4623 C9
2655 C4	4624 A11
2656 D3	4625 A11
2657 B16	4626 G2
2658 D15	4627 G2
2659 D15	4628 G14
2660 D15	4631 D11
2661 D15	4632 D11
2662 D16	4633 A14
2663 D16	4634 A14
2664 D16	4635 D14
2665 D16	4636 D14
3529-B A5	4637 D14
3529-C A5	5601 A15
3529-D A5	5602 A17
3570-A A6	5603 B15
3570-B A6	5604 B15
3570-C A6	5605 B17
3570-D B6	5606 B15
3573 B5	5608 D2
3574 A5	5609 E2
3601 B16	5610 E2
3602 I11	5611 D13
3603 C1	5613 G13
3604 D9	5615 H3
3605 C2	5616 I3
3606 D8	5617 I3
3607 C4	5618 C12
3608 D3	5619 D9
3609 D4	5620 B4
3610 D2	5621 J2
3611 D3	7601 C3
3612 E2	7602 D4
3613 E2	7603 F1
3614 F2	7604 G1
3615 F2	7605 G1
3616 G2	7606 F13
3617 H4	7607 H3
3618 H4	7608 E15
3619 G2	7609 E4
3620 H2	7610 H1
3621 H3	7611 H1
3622 J3	7612 J1
3623 J4	7613 A16
3626 K1	7614 A10
3628 K1	7615 A13
3629 K4	7616 C5
3630 K4	
3631 K4	
3632 K4	
3633 K2	



**K6**

VIDEO CONTROL & GEOMETRY

HOP  
VIDEO CONTROLLER  
DEFLECTION PROCESSOR

- 0311 G12
- 0315 D12
- 0340 C10
- 0360 H12
- 1305 H3
- 2300 E2
- 2301 F1
- 2302 F1
- 2303 F2
- 2304 F2
- 2305 I2
- 2306 I3
- 2307 G1
- 2308 G1
- 2309 E2
- 2310 E2
- 2311 E2
- 2312 H4
- 2313 H4
- 2315 H5
- 2321 G8
- 2322 G8
- 2323 G7
- 2325 G8
- 2331 F8
- 2340 H7
- 2343 H5
- 2344 H6
- 2351 G9
- 2400 C9
- 2401 C9
- 2402 B9
- 2403 C5
- 2404 C5
- 2405 C5
- 2406 C2
- 2407 C2
- 2408 D2
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- 2411 D2
- 2412 D2
- 2414 B1
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- 2416 B1
- 2417 C1
- 2418 B4
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- 2422 E8
- 2423 E9
- 2424 D9
- 2425 C6
- 2426 D7
- 2427 B1
- 2428 D8
- 2429 C8
- 2430 C8
- 3300 E1
- 3302 F2
- 3303 E2
- 3304 E2
- 3306 H3
- 3307 F1
- 3308 F1
- 3309 H4
- 3310 G3
- 3311 H4
- 3312 H4
- 3313 G4
- 3314 H4
- 3315 H5
- 3316 G5
- 3317 F1
- 3318 G2
- 3320 E7
- 3321 F8
- 3322 F8
- 3323 F7
- 3325 G8
- 3326 G8
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- 3331 E7
- 3332 F8
- 3334 F9
- 3340 H7
- 3341 G6
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- 3398 H8
- 3399 H8
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- 3434 A4
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- 3450 E1
- 3451 F1
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- 3465 H5
- 3466 H5
- 3467 H5
- 3468 H5
- 3469 H5
- 3470 H5
- 3471 H5
- 3472 H5
- 3473 H5
- 3474 H5
- 3475 H5
- 3476 H5
- 3477 H5
- 3478 H5
- 3479 H5
- 3480 H5
- 3481 H5
- 3482 H5
- 3483 H5
- 3484 H5
- 3485 H5
- 3486 H5
- 3487 H5
- 3488 H5
- 3489 H5
- 3490 H5
- 3491 H5
- 3492 H5
- 3493 H5
- 3494 H5
- 3495 H5
- 3496 H5
- 3497 H5
- 3498 H5
- 3499 H5
- 3500 H5
- 3501 H5
- 3502 H5
- 3503 H5
- 3504 H5
- 3505 H5
- 3506 H5
- 3507 D7
- 3508 D7
- 3509 D7
- 3510 D7
- 3511 D7
- 3512 D7
- 3513 D7
- 3514 D7
- 3515 D7
- 3516 D7
- 3517 D7
- 3518 D7
- 3519 D7
- 3520 D7
- 3521 D7
- 3522 D7
- 3523 D7
- 3524 D7
- 3525 D7
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- 3530 D7
- 3531 D7
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- 3533 D7
- 3534 D7
- 3535 D7
- 3536 D7
- 3537 D7
- 3538 D7
- 3539 D7
- 3540 D7
- 3541 D7
- 3542 D7
- 3543 D7
- 3544 D7
- 3545 D7
- 3546 D7
- 3547 D7
- 3548 D7
- 3549 D7
- 3550 D7

PinName	100Hz ECO Eur	50Hz Eur	1FH AP/US	100Hz TOP/MED Eur	100Hz AP
P2-7			RESET GEMSTAR	RGB1FH/Front UI	H SEL

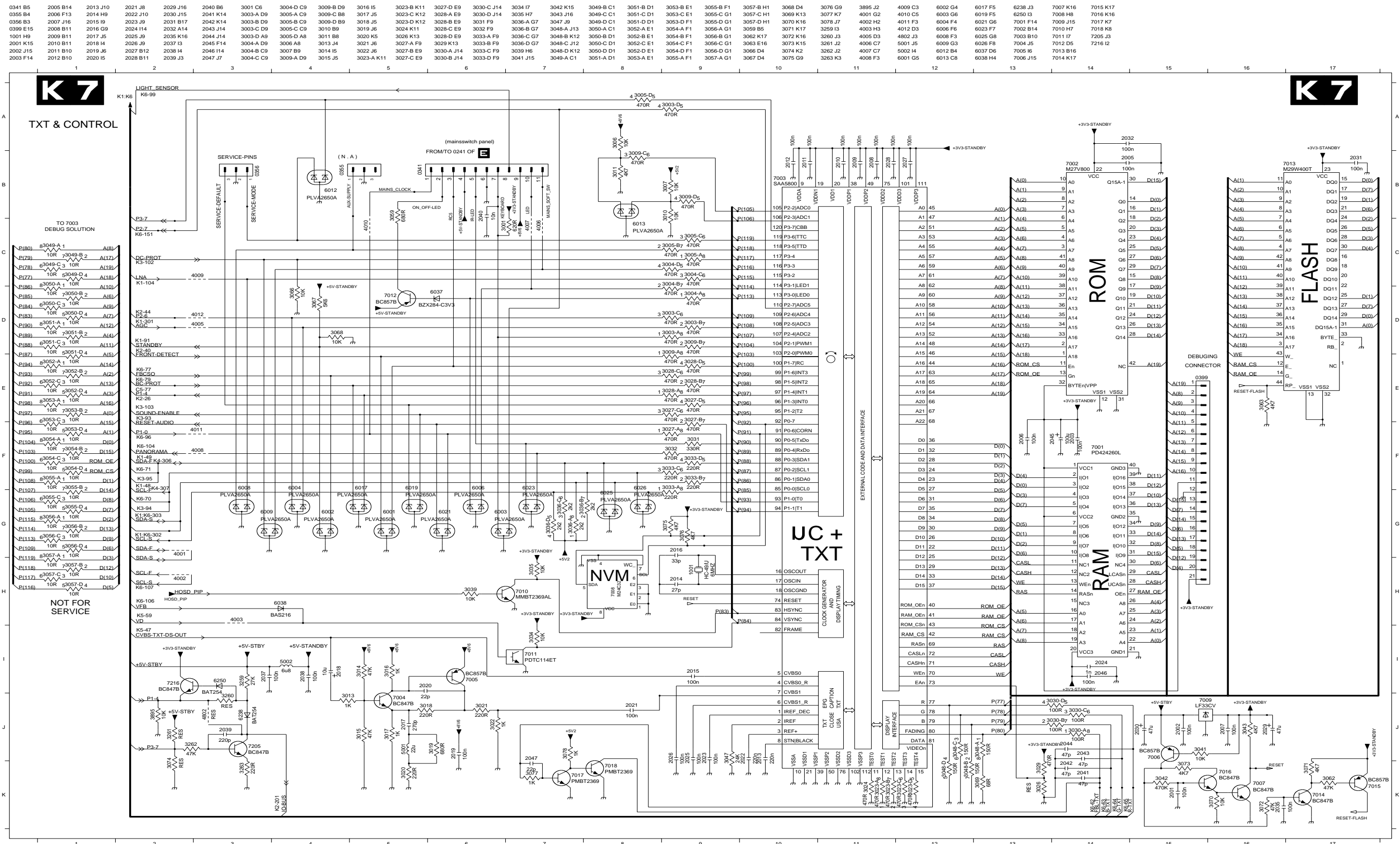
FROM / TO  
0315 OF  
**A2**

TO LSP  
**A2**

TO LSP  
**A**



# 7 Electrical diagrams and print lay-outs



PinName	LOW	TOP
P1-0	100Hz ECO Eur	50Hz Eur
P1-4	I/O_CNTRL_BUS IN	I/O_CNTRL_BUS IN
P2-6	STATUS3	Ex2 FRONT
P2-7	STATUS3	RESET GEMSTAR
P3-7	I/O_CNTRL_BUS OUT	I/O_CNTRL_BUS OUT
		1FH AP/US
		16:9 ARFRONT
		Ex2 FRONT
		RESET GEMSTAR
		RGB1FH/FRONT UI
		REMOTE LOCATOR
		STATUS4
		16:9 ARFRONT
		STATUS3
		H SEL
		I/O_CNTRL_BUS OUT