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Service Manual

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PHILIPS

1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

Notes:

- Figures can deviate due to the different set executions.
- Specifications are indicative (subject to change).

1.1 Technical Specifications

1.1.1 Vision

Display type	:	LCD, IPS
Screen size	:	
- 26PF4310/10	:	26” (66 cm), 15:9
- 26PF5320/10	:	26” (66 cm), 16:9
- 32PF5320/10	:	32” (82 cm), 16:9
- 32PF7320/10	:	32” (82 cm), 16:9
Resolution (HxV pixels)	:	
- 26PF4310/10	:	1280 x 768
- 26PF5320/10	:	1366 x 768
- 32PF5320/10	:	1366 x 768
- 32PF7320/10	:	1366 x 768
Contrast ratio	:	
- 26PF4310/10	:	500:1
- 26PF5320/10	:	600:1
- 32PF5320/10	:	600:1
- 32PF7320/10	:	600:1
Light output (cd/m^2)	:	
- 26PF4310/10	:	400
- 26PF5320/10	:	500
- 32PF5320/10	:	500
- 32PF7320/10	:	500
Response time (ms)	:	
- 26PF4310/10	:	16
- 26PF5320/10	:	16
- 32PF5320/10	:	18
- 32PF7320/10	:	18
Viewing angle (HxV degrees)	:	
- 26PF4310/10	:	176x176
- 26PF5320/10	:	178x178
- 32PF5320/10	:	176x176
- 32PF7320/10	:	176x176
Tuning system	:	PLL
TV Colour systems	:	PAL B/G, D/K, I
	:	SECAM B/G, D/K, L/L’
Video playback	:	
- 26PF4310/10	:	PAL B/G; SECAM L/L’
- 26PF5320/10,	:	
- 32PF5320/10,	:	
- 32PF7320/10:	:	NTSC M/N 3.58, 4.43
	:	PAL B/G
	:	SECAM L/L’
Supported computer formats	:	VGA (640x480)
	:	MAC (640x480)
	:	SVGA (800x600)
	:	XVGA (1024x768)
	:	WXGA (1280x768)
Supported video formats	:	640x480i - 1fH
	:	720x576i - 1fH
	:	640x480p - 2fH
	:	720x576p - 2fH
	:	1920x1080i - 2fH
Presets/channels	:	100 presets
Tuner bands	:	VHF
	:	UHF
	:	S-band
	:	Hyper-band

1.1.2 Sound

Sound systems	:	FM-mono
	:	FM-stereo B/G
	:	NICAM B/G, D/K, I, L
	:	AV Stereo
Maximum power (W_{RMS})	:	
- 26PF4310/10	:	2 x 5
- 26PF5320/10	:	2 x 5
- 32PF5320/10	:	2 x 15
- 32PF7320/10	:	2 x 15

1.1.3 Miscellaneous

Power supply:		
- Mains voltage (V_{AC})	:	95 - 240
- Mains frequency (Hz)	:	50 / 60
Ambient conditions:		
- Temperature range (°C)	:	+5 to +40
- Maximum humidity	:	90% R.H.
Power consumption		
- Normal operation (W)	:	≈ 96
- Stand-by (W)	:	< 1
Dimensions (WxHxD cm)	:	
- 26PF4310/10	:	79.2 x 43.1 x 24.2
- 26PF5320/10	:	80.45 x 47.7 x 22.2
- 32PF5320/10	:	92.4 x 55.0 x 22.2
- 32PF7320/10	:	92.4 x 55.0 x 22.2
Weight (kg)	:	
- 26PF4310/10	:	15
- 26PF5320/10	:	16
- 32PF5320/10	:	18.2
- 32PF7320/10	:	18.2

1.2 Connection Overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, and Ye= Yellow.

1.2.1 Side I/O connections

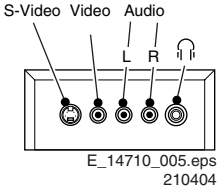

Figure 1-1 Side I/O connections

SVHS (Hosiden): Video Y/C - In

1	- Ground Y	Gnd	⏚
2	- Ground C	Gnd	⏚
3	- Video Y	1 V_{PP} / 75 ohm	⊖
4	- Video C	0.3 V_{PP} / 75 ohm	⊖

Cinch: Video CVBS - In, Audio - In

Ye	- Video CVBS	1 V_{PP} / 75 ohm
Wh	- Audio L	0.5 V_{RMS} / 10 kohm
Rd	- Audio R	0.5 V_{RMS} / 10 kohm

Mini Jack: Audio Head phone - Out

Bk	- Head phone	32 - 600 ohm / 10 mW	

1.2.2 Rear Connections

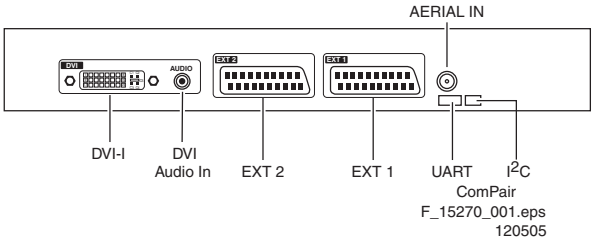

Figure 1-2 Rear I/O

Aerial - In

-	- IEC-type (EU)	Coax, 75 ohm	

Mini Jack: PC-Audio - In

1	- Ground	Gnd	
2	- Audio L	0.5 V_{RMS} / 10 kohm	
3	- Audio R	0.5 V_{RMS} / 10 kohm	

Service connector (ComPair)

1	- SDA-S	I^2C Data (0 - 5 V)	
2	- SCL-S	I^2C Clock (0 - 5 V)	
3	- Ground	Gnd	

Service connector (UART)

1	- UART_TX	Transmit	
2	- Ground	Gnd	
3	- UART_RX	Receive	

DVI-I: Digital/Analogue Video - In

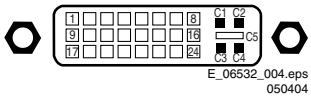

Figure 1-3 DVI-I connector

1	- D2-		
2	- D2+		
3	- Shield	Gnd	
4	- D4-		
5	- D4+		
6	- DDC_SCL	DDC clock	
7	- DDC_SDA	DDC data	
8	- V-sync	0 - 5 V	
9	- D1-		
10	- D1+		
11	- Shield	Gnd	
12	- D3-		
13	- D3+		
14	- +5V		
15	- Ground	Gnd	
16	- HPD	Hot Plug Detect	
17	- D0-		
18	- D0+		
19	- Shield	Gnd	
20	- D5-		
21	- D5+		
22	- Shield	Gnd	
23	- CLK+		
24	- CLK-		
C1	- Video Red	0.7 V_{PP} / 75 ohm	
C2	- Video Green	0.7 V_{PP} / 75 ohm	
C3	- Video Blue	0.7 V_{PP} / 75 ohm	
C4	- H-sync	0 - 5 V	
C5	- Ground	Gnd	

EXT1: Video RGB - In, CVBS - In/Out, Audio - In/Out

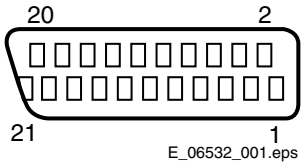

Figure 1-4 SCART connector

1	- Audio R	0.5 V_{RMS} / 1 kohm	
2	- Audio R	0.5 V_{RMS} / 10 kohm	
3	- Audio L	0.5 V_{RMS} / 1 kohm	
4	- Ground Audio	Gnd	
5	- Ground Blue	Gnd	
6	- Audio L	0.5 V_{RMS} / 10 kohm	
7	- Video Blue	0.7 V_{PP} / 75 ohm	
8	- Function Select	0 - 2 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	
9	- Ground Green	Gnd	
10	- n.c.		
11	- Video Green	0.7 V_{PP} / 75 ohm	
12	- n.c.		
13	- Ground Red	Gnd	
14	- Ground	Gnd	
15	- Video Red	0.7 V_{PP} / 75 ohm	
16	- Status/FBL	0 - 0.4 V: INT 1 - 3 V: EXT / 75 ohm	
17	- Ground Video	Gnd	
18	- Ground FBL	Gnd	
19	- Video Terr. CVBS	1 V_{PP} / 75 ohm	
20	- Video CVBS/Y	1 V_{PP} / 75 ohm	
21	- Shield	Gnd	

EXT2: Video Y/C - in, CVBS - In/Out, Audio - In/Out

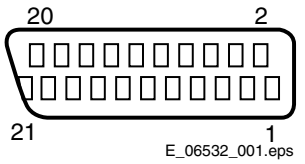

Figure 1-5 SCART connector

1	- Audio R	0.5 V_{RMS} / 1 kohm	
2	- Audio R	0.5 V_{RMS} / 10 kohm	
3	- Audio L	0.5 V_{RMS} / 1 kohm	
4	- Ground Audio	Gnd	
5	- Ground Blue	Gnd	
6	- Audio L	0.5 V_{RMS} / 10 kohm	
7	- n.c.		
8	- Function Select	0 - 2 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	
9	- Ground Green	Gnd	
10	- n.c.		
11	- n.c.		
12	- n.c.		
13	- Ground Red	Gnd	
14	- Ground	Gnd	
15	- YC/C - in	0.7 V_{PP} / 75 ohm	
16	- n.c.		
17	- Ground Video	Gnd	
18	- Ground	Gnd	
19	- Video Mon. CVBS	1 V_{PP} / 75 ohm	
20	- YC/Y - in	0.7 V_{PP} / 75 ohm	
21	- Shield	Gnd	

1.3 Chassis Overview

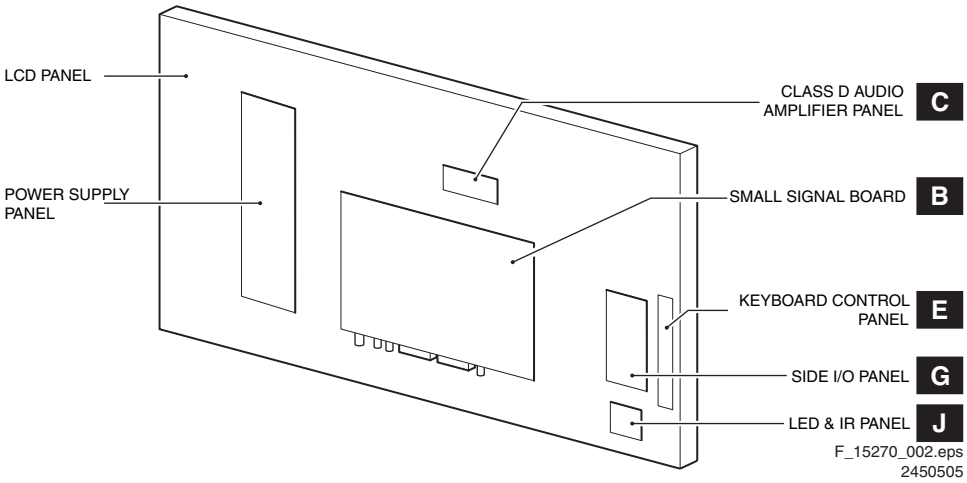

Figure 1-6 Chassis overview

2. Safety Instructions, Warnings, and Notes

Index of this chapter:

2.1 Safety Instructions

Safety regulations require the following **during** a repair:
- Connect the set to the Mains (AC Power) via an isolation transformer (> 800 VA).
- Replace safety components, indicated by the symbol ⚠, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that **after** a repair, the set must be returned in its original condition. Pay in particular attention to the following points:
- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the Mains (AC Power) lead for external damage.
- Check the strain relief of the Mains (AC Power) cord for proper function.
- Check the electrical DC resistance between the Mains (AC Power) plug and the secondary side (only for sets that have a Mains (AC Power) isolated power supply):
  1. Unplug the Mains (AC Power) cord and connect a wire between the two pins of the Mains (AC Power) plug.
  2. Set the Mains (AC Power) switch to the "on" position (keep the Mains (AC Power) cord unplugged!).
  3. Measure the resistance value between the pins of the Mains (AC Power) plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 Mohm and 12 Mohm.
  4. Switch "off" the set, and remove the wire between the two pins of the Mains (AC Power) plug.
- Check the cabinet for defects, to prevent touching of any inner parts by the customer.

2.2 Warnings

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD ⚠). Careless handling during repair can reduce life drastically. Make sure that, during repair, 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:
  – Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
  – Wristband tester 4822 344 13999.
- Be careful during measurements in the high voltage section.
- Never replace modules or other components while the unit is switched "on".
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

2.3 Notes

2.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⏚), or hot ground (⏚), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them 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 for PAL, or 61.25 MHz for NTSC (channel 3).
- Where necessary, measure the waveforms and voltages with (⊓) and without (⊼) aerial signal. Measure the voltages in the power supply section both in normal operation (⏻) and in stand-by (⏻). These values are indicated by means of the appropriate symbols.
- The semiconductors indicated in the circuit diagram and in the parts lists, are interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

2.3.2 Schematic Notes

- All resistor values are in ohms, and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kohm).
- Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220 ohm).
- All capacitor values are given in micro-farads (μ= x10^{-6}), nano-farads (n= x10^{-9}), or pico-farads (p= x10^{-12}).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An "asterisk" (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed in the Spare Parts List. Therefore, always check this list when there is any doubt.

2.3.3 Rework on BGA (Ball Grid Array) ICs

General
Although (LF)BGA assembly yields are very high, there may still be a requirement for component rework. By rework, we mean the process of removing the component from the PWB and replacing it with a new component. If an (LF)BGA is removed from a PWB, the solder balls of the component are deformed drastically so the removed (LF)BGA has to be discarded.

Device Removal
As is the case with any component that, is being removed, it is essential when removing an (LF)BGA, that the board, tracks, solder lands, or surrounding components are not damaged. To remove an (LF)BGA, the board must be uniformly heated to a temperature close to the reflow soldering temperature.
A uniform temperature reduces the risk of warping the PWB. To do this, we recommend that the board is heated until it is certain that all the joints are molten. Then carefully pull the component off the board with a vacuum nozzle. For the appropriate temperature profiles, see the IC data sheet.

Area Preparation
When the component has been removed, the vacant IC area must be cleaned before replacing the (LF)BGA.
Removing an IC often leaves varying amounts of solder on the mounting lands. This excessive solder can be removed with either a solder sucker or solder wick. The remaining flux can be removed with a brush and cleaning agent.

After the board is properly cleaned and inspected, apply flux on the solder lands and on the connection balls of the (LF)BGA.
Note: Do not apply solder paste, as this has been shown to result in problems during re-soldering.

Device Replacement
The last step in the repair process is to solder the new component on the board. Ideally, the (LF)BGA should be aligned under a microscope or magnifying glass. If this is not possible, try to align the (LF)BGA with any board markers. So as not to damage neighbouring components, it may be necessary to reduce some temperatures and times.

More Information
For more information on how to handle BGA devices, visit this URL: *www.atyourservice.ce.philips.com* (needs subscription, not available for all regions). After login, select “Magazine”, then go to “Workshop Information”. Here you will find Information on how to deal with BGA-ICs.

2.3.4 Lead-free Solder

Philips CE is producing lead-free sets (PBF) from 1.1.2005 onwards.

Identification: The bottom line of a type plate gives a 14-digit serial number. Digits 5 and 6 refer to the production year, digits 7 and 8 refer to production week (in example below it is 1991 week 18).

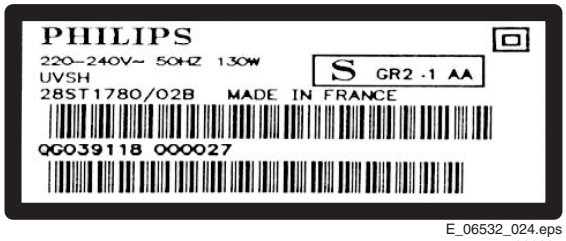

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Figure 2-1 Serial number example

Regardless of the special lead-free logo (which is not always indicated), one must treat all sets from this date onwards according to the rules as described below.

Figure 2-2 Lead-free logo

Due to lead-free technology some rules have to be respected by the workshop during a repair:
- Use only lead-free soldering tin Philips SAC305 with order code 0622 149 00106. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
  - To reach a solder-tip temperature of at least 400°C.
  - To stabilise the adjusted temperature at the solder-tip.
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilised at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch “off” unused equipment or reduce heat.
- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly **to avoid** mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.
- Use only original spare-parts listed in the Service-Manuals. Not listed standard material (commodities) has to be purchased at external companies.
- Special information for lead-free BGA ICs: these ICs will be delivered in so-called "dry-packaging" to protect the IC against moisture. This packaging may only be opened shortly before it is used (soldered). Otherwise the body of the IC gets "wet" inside and during the heating time the structure of the IC will be destroyed due to high (steam-) pressure inside the body. If the packaging was opened before usage, the IC has to be heated up for some hours (around 90°C) for drying (think of ESD-protection!).
  Do not re-use BGAs at all!
- For sets produced before 1.1.2005, containing leaded soldering tin and components, all needed spare parts will be available till the end of the service period. For the repair of such sets nothing changes.

In case of doubt whether the board is lead-free or not (or with mixed technologies), you can use the following method:
- Always use the highest temperature to solder, when using SAC305 (see also instructions below).
- De-solder thoroughly (clean solder joints to avoid the mixing of two alloys).

Caution: For BGA-ICs, you **must** use the correct temperature profile, which is coupled to the 12NC. For an overview of these profiles, visit the website *www.atyourservice.ce.philips.com* (needs subscription, but is not available for all regions).
You will find this and more technical information within the "Magazine", chapter "Workshop information".
For additional questions please contact your local repair help desk.

2.3.5 Practical Service Precautions

- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages**. While some may not be dangerous in themselves, they can cause unexpected reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage insulation. It is easy to do, and is a good service precaution.

3. Directions for Use

You can download this information from the following websites:
http://www.philips.com/support
http://www.p4c.philips.com

4. Mechanical Instructions

Index of this chapter:

Notes:

- Figures below can deviate slightly from the actual situation, due to the different set executions.
- Follow the disassembling instructions in described order.

4.1 Cable Dressing

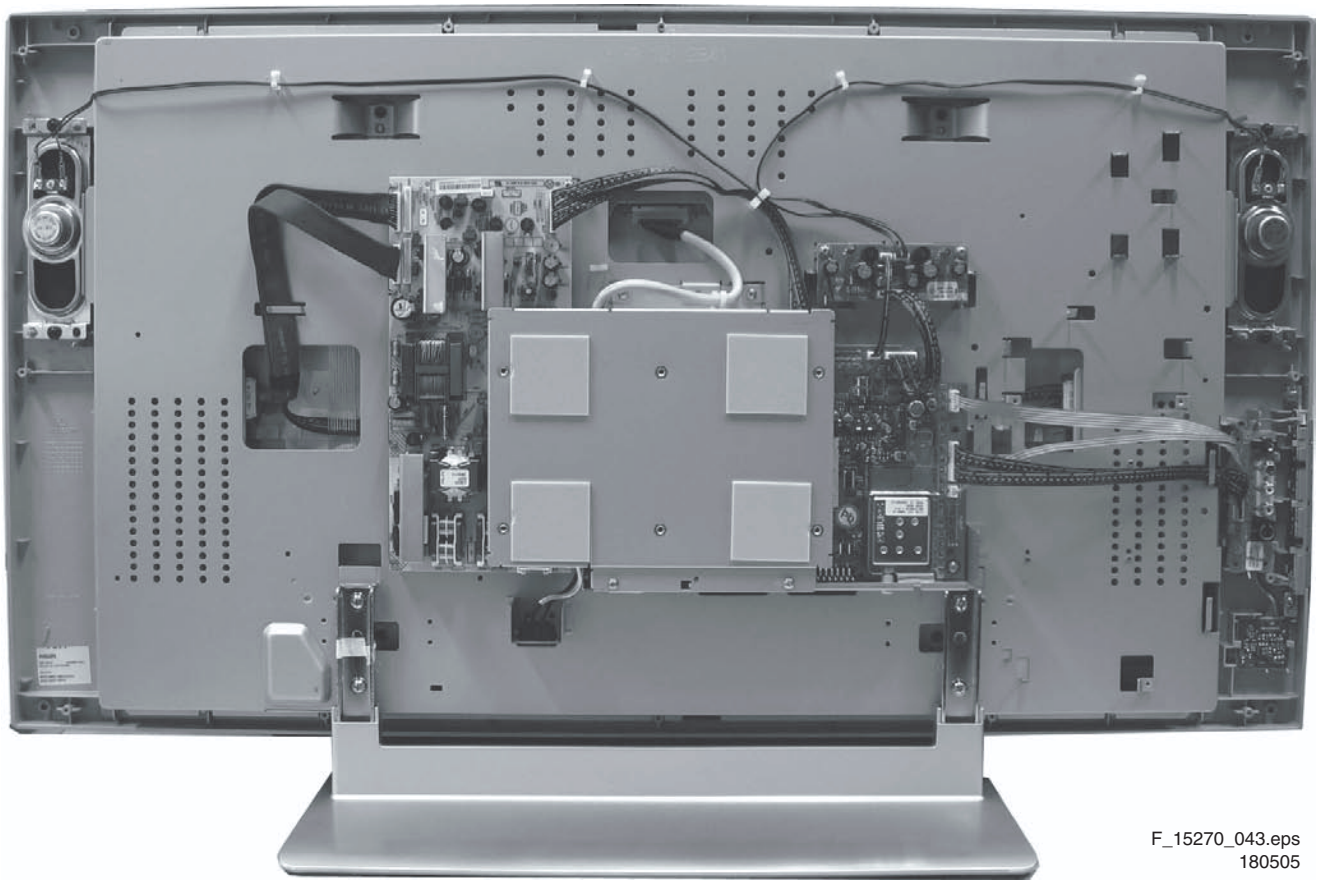

Figure 4-1 Cable dressing

4.2 Service Position

First, put the TV set in its service position. Therefore, place it upside down on a table top (use a protection sheet or foam bars).

4.2.1 The Foam Bars

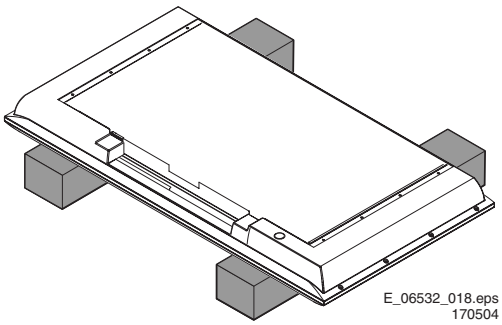

Figure 4-2 Foam bars

The foam bars (order code 3122 785 90580) can be used for all types and sizes of Flat TVs. By laying the plasma or LCD TV flat on the (ESD protective) foam bars, a stable situation is created to perform measurements and alignments. By first placing a mirror flat on the table under the TV you can easily see if something is happening on the screen.

4.3 Assy/Panel Removal

4.3.1 Rear Cover

Warning: Disconnect the mains power cord before you remove the rear cover.

1. Remove the screws that secure the rear cover.
2. Lift the rear cover from the cabinet cautiously. Make sure that wires and other internal components are not damaged during cover removal.

4.3.2 Side I/O Panel

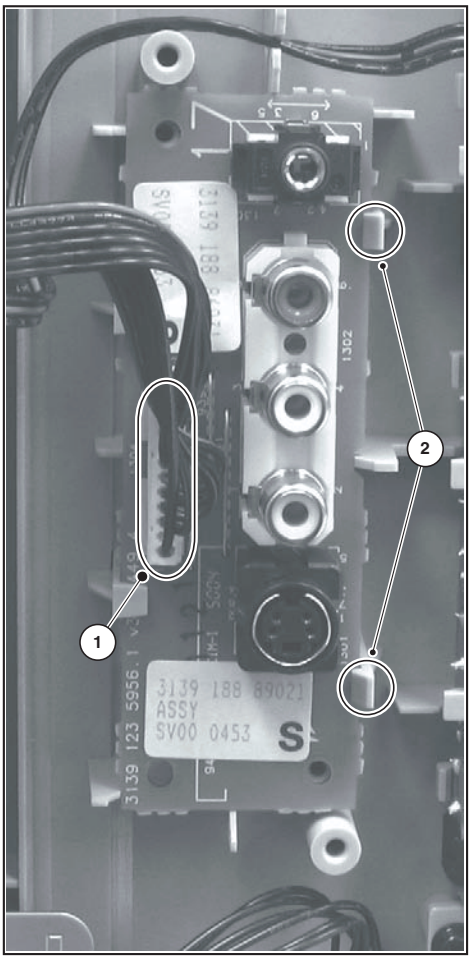

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Figure 4-3 Side I/O panel

1. Disconnect the cable (1) from the panel.
2. Release the two fixation clamps (2) and lift the panel out of the bracket.

4.3.3 LED Panel

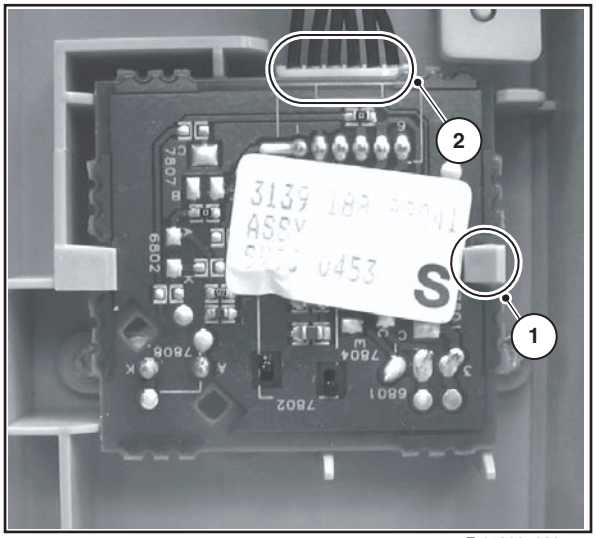

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Figure 4-4 LED panel

1. Release the fixation clamp (1) and take the panel out of the bracket.
2. Disconnect the cable (2) from the panel.

4.3.4 Keyboard Control Panel

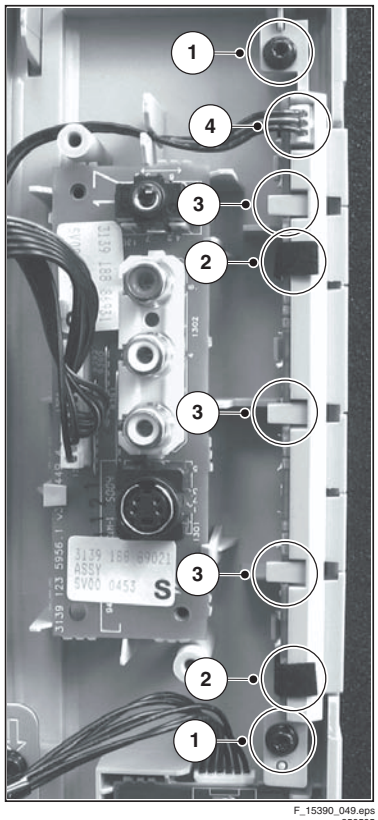

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Figure 4-5 Keyboard control panel

1. Remove the two fixation screws (1) from the bracket and take out the panel/bracket combination.
2. Remove the fixation tape (2) from the panel/bracket combination.
3. Release the three fixation clamps (3) and lift the panel out of the bracket.
4. Disconnect the cable (4) from the panel.

4.3.5 SSB Board Cover Shield (depending on model)

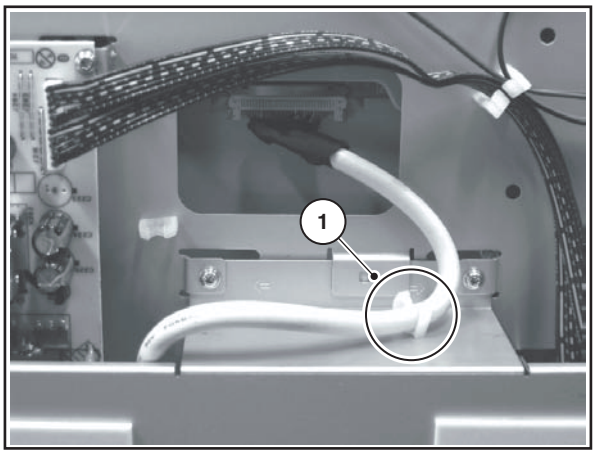

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Figure 4-6 Cable clip on cover shield

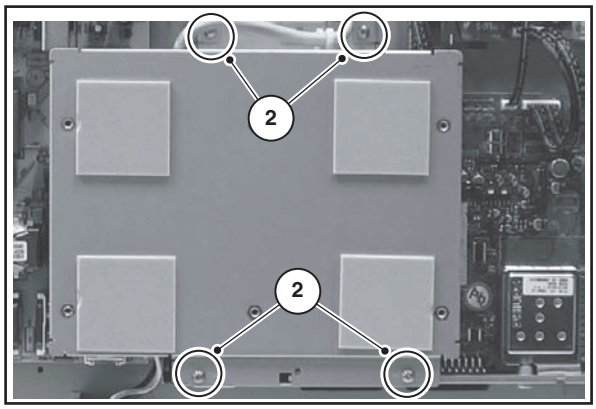

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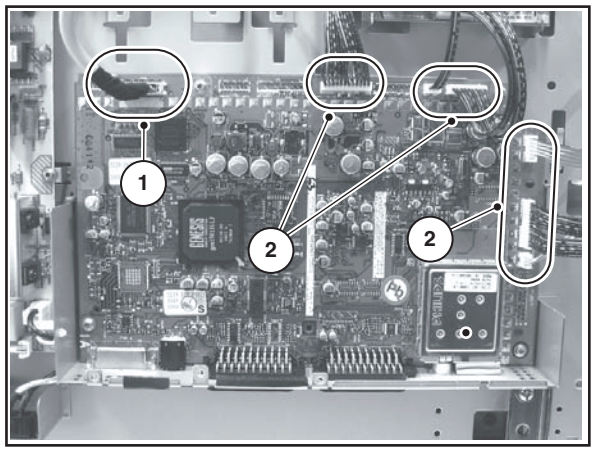
Figure 4-7 SSB board cover shield

1. Release the cable from the plastic cable clip (1) on the shield (see Figure “Cable clip on cover shield” above).
2. Remove the four fixation screws (2, see Figure “SSB board cover shield”; the screws are also indicated by arrows on the shield) and remove the shield.
   Notice that on one side, the shield is not only held by two screws, but also by two brackets (see Figure “Cable clip on cover shield” above).

4.3.6 SSB Board



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180505

Figure 4-8 SSB board connectors

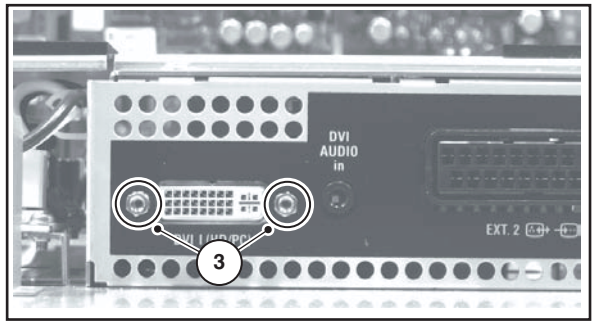

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Figure 4-9 DVI-I connector screws

1. Very **cautiously** disconnect the LVDS cable (1) from the panel (see Figure “SSB board connectors”). Notice that this cable is very fragile.
2. Disconnect the six remaining cables (2) from the panel.
3. Remove the fixation screws that secure the SSB board (depending on model) and also the two fixation screws (3) from the DVI-I connector on the SSB board (see Figure “DVI-I connector screws”).
4. Take the panel out of its brackets.

4.3.7 Power Supply Panel (various models used)

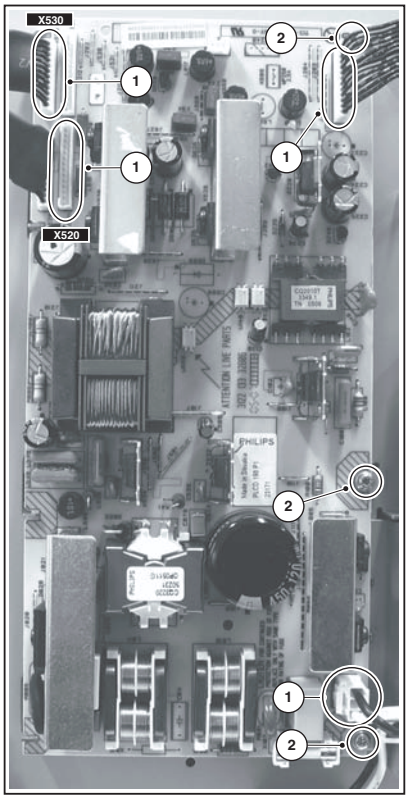

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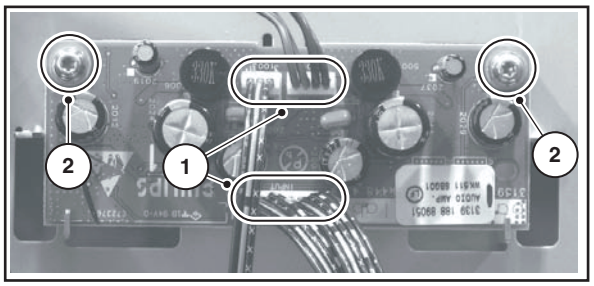
Figure 4-10 Power supply panel

1. Disconnect all cables (1) from the panel.
   Notice that the two connectors for X520 and X530 on this panel are similar, and should not be mixed up later when they are reconnected (X520 is connected via its flatcable to connector CN01 on the LCD panel, near the R-speaker; X530 is connected via its flatcable to connector CN04 on the LCD panel, near the L-speaker).
2. Remove the three fixation screws (2) from the panel.
3. Take the panel out of its brackets.

4.3.8 Audio Amplifier Panel



F_15270_049.eps
180505

Figure 4-11 Audio amplifier panel

1. Disconnect all cables (1) from the panel.
2. Remove the fixation screws (2) from the panel.
3. Remove the panel.

4.3.9 LCD Panel

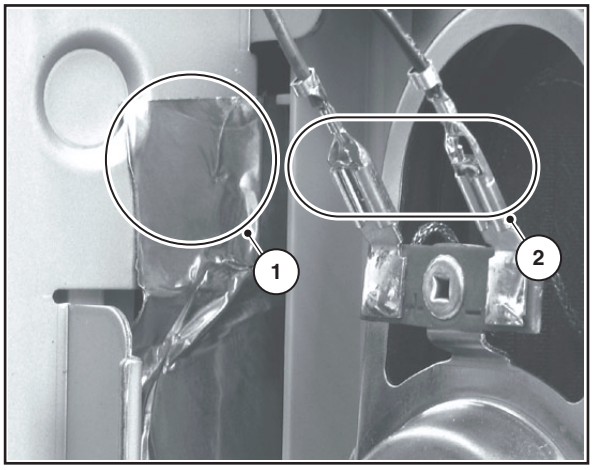


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Figure 4-12 Anti-static copper foil

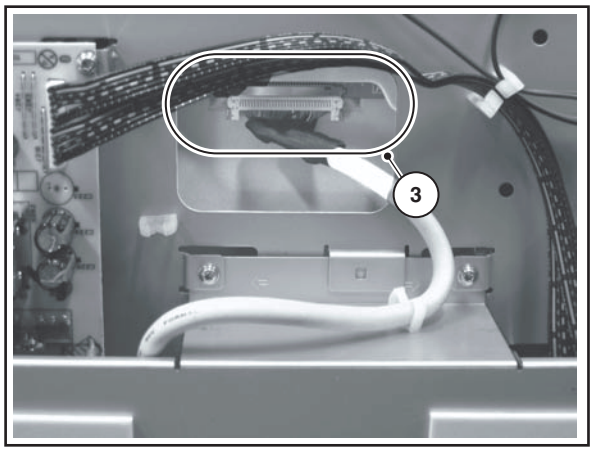

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Figure 4-13 LVDS connector

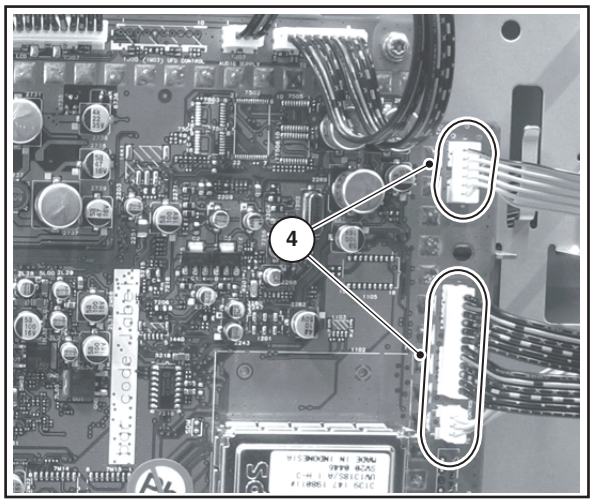

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Figure 4-14 SSB board connectors for side I/O, keyboard control, and LED

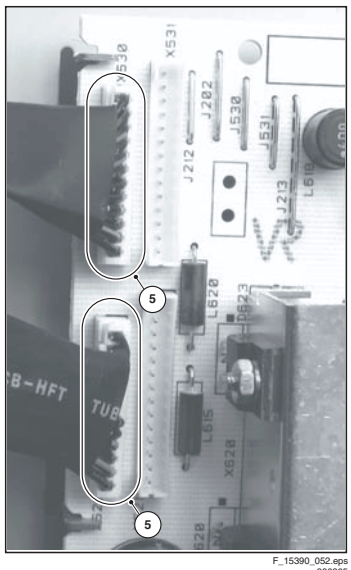

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Figure 4-15 Connectors X520 and X530 on power supply panel

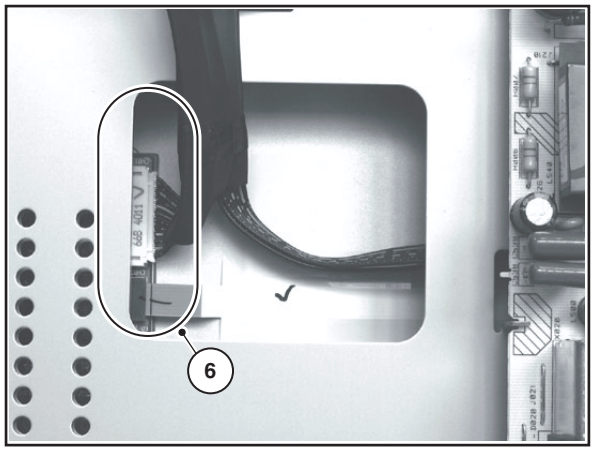

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Figure 4-16 Connector 66B on LCD panel

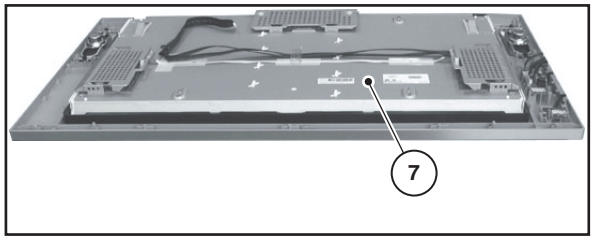

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Figure 4-17 LCD panel

To remove the LCD-panel, carry out the following steps:

1. Cautiously pull back the upper parts of the anti-static copper foils next to the “L” and “R” loudspeakers (see Figure “Anti-static copper foil”). Do this in such a way that the foils are no longer attached to the metal ground plate on which the SSB board is mounted.
2. Disconnect the cables (2) from the “L” and the “R” loudspeakers (see Figure “Anti-static copper foil”).
3. **Important:** Unplug the LVDS connector (3) on the LCD panel (see Figure “LVDS connector”).
   Be careful, as this is a very fragile connector!
4. Unplug the connectors (4) of the Side I/O panel, the Top Control panel, and the LED panel on the SSB board (see Figure “SSB board connectors for side I/O, keyboard control, and LED”).
5. Unplug the X520 and X530 connectors (5) on the Power Supply board (see Figure “ Connectors X520 and X530 on power supply panel”). Instead of X520, also connector 66B (6) on the other end of the flatcable can be unplugged (see Figure “Connector 66B on LCD panel”).
6. Lift the metal frame (together with all PWBs) from the LCD panel.
   Take care not to damage the fragile LVDS cable, the 66B connector and the anti-static copper foils near the “L” and “R” loudspeakers (take care of this too when later re-assembling the TV set and replacing the copper foil).
7. After removal of the metal frame, you can lift the LCD display (7) from its plastic frame (see Figure “LCD panel”).
8. If the plastic frame is damaged, replace it by a new frame, after removing the loudspeakers, the Side I/O panel, the Top Control panel, and the LED panel.

4.4 Set Re-assembly

To re-assemble the whole set, execute all processes in reverse order.

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original positions. See Figure "Cable dressing". Also make sure that the anti-static copper foils are not damaged and that they make good electrical contact with the metal frame. Be careful with the fragile LVDS cable.

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

5.1 Test Points

This chassis is equipped with test points in the service printing. In the schematics test points are identified with a rectangle box around Fxxx or Ixxx.
Perform measurements under the following conditions:

- Television set in Service Default Alignment Mode.
- Video input: Colour bar signal.
- Audio input: 3 kHz left channel, 1 kHz right channel.

5.2 Service Modes

Service Default mode (SDM) and Service Alignment Mode (SAM) offers several features for the service technician, while the Customer Service Mode (CSM) is used for communication between the call centre and the customer.

This chassis also offers the option of using ComPair, a hardware interface between a computer and the TV chassis. It offers the possibilities of structured troubleshooting, error code reading, and software version readout for all chassis.
Minimum requirements for ComPair: a Pentium processor, a Windows OS, and a CD-ROM drive (see also paragraph "ComPair").

5.2.1 Service Default Mode (SDM)

Purpose

- To create a predefined setting for measurements to be made.
- To override software protections.
- To start the blinking LED procedure.
- To inspect the error buffer.
- To check the life timer.

Specifications

- Tuning frequency: 475.25 MHz.
- Colour system: PAL-BG.
- All picture settings at 50% (brightness, colour contrast, hue).
- Bass, treble, and balance at 50 %; volume at 25 %.
- All service-unfriendly modes (if present) are disabled. The service unfriendly modes are:
  - Timer / Sleep timer.
  - Child / parental lock.
  - Blue mute.
  - Hotel / hospital mode.
  - Auto shut off (when no “IDENT” video signal is received for 15 minutes).
  - Skipping of non-favourite presets / channels.
  - Auto-storage of personal presets.
  - Auto user menu time-out.
  - Auto Volume Levelling (AVL).

How to Enter

To enter SDM, use one of the following methods:

- Press the following key sequence on the remote control transmitter: “**062596**” directly followed by the MENU button (do not allow the display to time out between entries while keying the sequence).
- Short "Service" jumpers on the TV board during cold start and apply mains (see Figure "Service jumpers"). Then press the mains button (remove the short after start-up). **Caution**: Entering SDM by shorting "Service" jumpers will override the +8V-protection. Do this only for a short period. When doing this, the service-technician must know exactly what he is doing, as it could damage the television set.
- Or via ComPair.

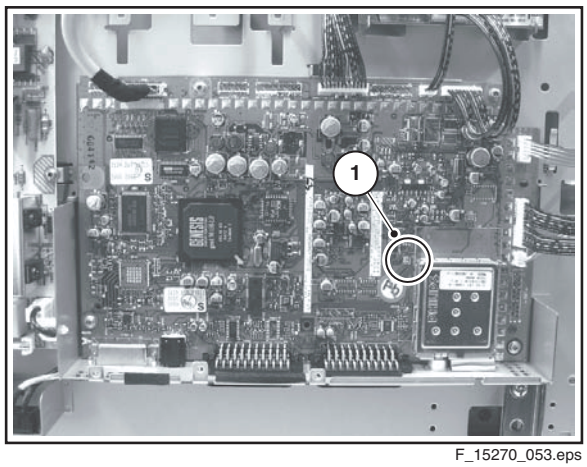

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Figure 5-1 Service jumpers

After entering SDM, the following screen is visible, with SDM in the upper right corner of the screen to indicate that the television is in Service Default Mode.

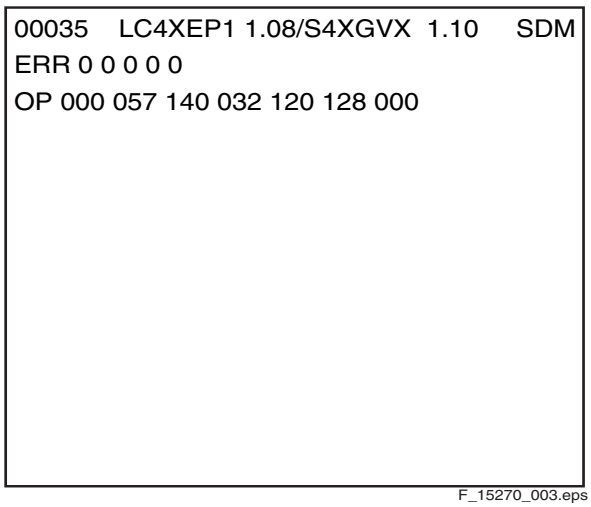

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Figure 5-2 SDM menu

How to Navigate

Use one of the following methods:

- When you press the MENU button on the remote control, the set will switch on the normal user menu in the SDM mode.
- On the TV, press and hold the VOLUME DOWN and press the CHANNEL DOWN for a few seconds, to switch from SDM to SAM and reverse.

How to Exit

Switch the set to STANDBY by pressing the mains button on the remote control transmitter or the television set.
If you turn the television set off by removing the mains (i.e., unplugging the television) without using the mains button, the television set will remain in SDM when mains is re-applied, and the error buffer is not cleared.

5.2.2 Service Alignment Mode (SAM)

Purpose

- To change option settings.
- To display / clear the error code buffer.
- To perform alignments.

Specifications

- Operation hours counter (maximum five digits displayed).
- Software version, Error codes, and Option settings display.
- Error buffer clearing.
- Option settings.
- AKB switching.
- Software alignments (Tuner, White Tone, Geometry & Audio).
- NVM Editor.
- ComPair Mode switching.

How to Enter

To enter SAM, use one of the following methods:

- Press the following key sequence on the remote control transmitter: "**062596**" directly followed by the OSD/ STATUS/INFO(I+) button (do not allow the display to time out between entries while keying the sequence).
- Or via ComPair.

After entering SAM, the following screen is visible, with SAM in the upper right corner of the screen to indicate that the television is in Service Alignment Mode.

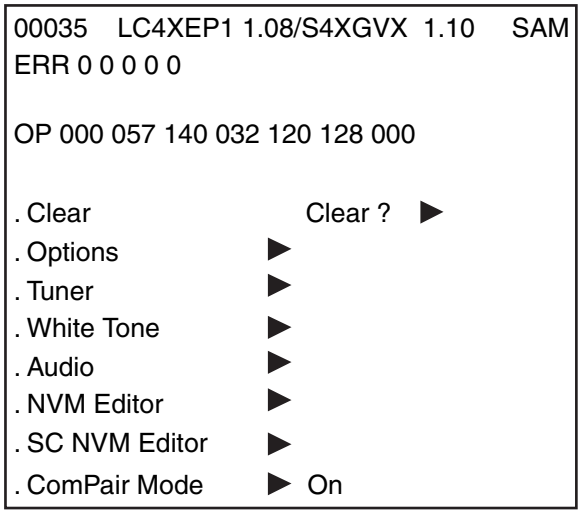

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Figure 5-3 SAM menu

Menu Explanation

1. **LLLLL.** This represents the run timer. The run timer counts normal operation hours, but does not count standby hours.
2. **AAABCD-X.Y.** This is the software identification of the main microprocessor:
   - **A**= the project name (LC04.x).
   - **B**= the region: E= Europe, A= Asia Pacific, U= NAFTA, L= LATAM.
   - **C**= the software diversity:
     - **Europe:** T= 1 page TXT, F= Full TXT, V= Voice control.
     - **LATAM and NAFTA:** N= Stereo non-dBx, S= Stereo dBx.
     - **Asian Pacific:** T= TXT, N= non-TXT, C= NTSC.
     - **ALL regions:** M= mono, D= DVD, Q= Mk2.
   - **D**= the language cluster number.
   - **X**= the main software version number (updated with a major change that is incompatible with previous versions).
   - **Y**= the sub software version number (updated with a minor change that is compatible with previous versions).
3. **EEEEE-F.GG.** This is the software identification of the Scaler:
   - **EEEEEE**= the scaler sw cluster
   - **F**= the main sw version no.
   - **GG**= the sub-version no.
4. **SAM.** Indication of the Service Alignment Mode.
5. **Error Buffer.** Shows all errors detected since the last time the buffer was erased. Five errors possible.
6. **Option Bytes.** Used to set the option bytes. See "Options" in the Alignments section for a detailed description. Seven codes are possible.
7. **Clear.** Erases the contents of the error buffer. Select the CLEAR menu item and press the MENU RIGHT key. The content of the error buffer is cleared.
8. **Options.** Used to set the option bits. See "Options" in the Alignments section for a detailed description.
9. **Tuner.** Used to align the tuner. See "Tuner" in the Alignments section for a detailed description.
10. **White Tone.** Used to align the white tone. See "White Tone" in the Alignments section for a detailed description.
11. **Audio.** No audio alignment is necessary for this television set.
12. **NVM Editor.** Can be used to change the NVM data in the television set. See table "NVM data" further on.
13. **SC NVM Editor.** Can be used to edit Scaler NVM.
14. **ComPalr.** Can be used to switch on the television to In System Programming (ISP) mode, for software uploading via ComPair.
    Caution: When this mode is selected without ComPair connected, the TV will be blocked. Remove the AC power to reset the TV.

How to Navigate

- In SAM, select menu items with the MENU UP/DOWN keys on the remote control transmitter. The selected item will be highlighted. When not all menu items fit on the screen, use the MENU UP/DOWN keys to display the next / previous menu items.
- With the MENU LEFT/RIGHT keys, it is possible to:
  - Activate the selected menu item.
  - Change the value of the selected menu item.
  - Activate the selected submenu.
- In SAM, when you press the MENU button twice, the set will switch to the normal user menus (with the SAM mode still active in the background). To return to the SAM menu press the MENU or STATUS/EXIT button.
- When you press the MENU key in while in a submenu, you will return to the previous menu.

How to Store SAM Settings
To store the settings changed in SAM mode, leave the top level SAM menu by using the POWER button on the remote control transmitter or the television set.

How to Exit
Switch the set to STANDBY by pressing the mains button on the remote control transmitter or the television set.
If you turn the television set "off" by removing the mains (i.e., unplugging the television) without using the mains button, the television set will remain in SAM when mains is re-applied, and the error buffer is not cleared.

5.2.3 Customer Service Mode (CSM)

Purpose
The Customer Service Mode shows error codes and information on the TV's operation settings. The call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set. This helps the call centre to diagnose problems and failures in the TV set before making a service call.
The CSM is a read-only mode; therefore, modifications are not possible in this mode.

How to Enter
To enter CSM, press the following key sequence on the remote control transmitter: "**123654**" (do not allow the display to time out between entries while keying the sequence).

Upon entering the Customer Service Mode, the following screen will appear:

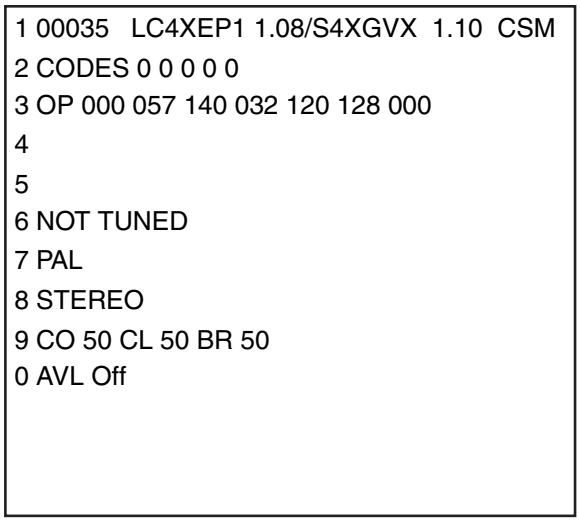

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Figure 5-4 CSM menu

Menu Explanation
1. Indication of the decimal value of the operation hours counter, Software identification of the main microprocessor (see "Service Default or Alignment Mode" for an explanation), and the service mode (CSM = Customer Service Mode).
2. Displays the last five errors detected in the error code buffer.
3. Displays the option bytes.
4. Displays the type number version of the set.
5. Reserved item for P3C call centres (AKBS stands for Advanced Knowledge Base System).
6. Indicates the television is receiving an "IDENT" signal on the selected source. If no "IDENT" signal is detected, the display will read "NOT TUNED"
7. Displays the detected Colour system (e.g. PAL/NTSC).
8. Displays the detected Audio (e.g. stereo/mono).
9. Displays the picture setting information.
10. Displays the sound setting information.

How to Exit
To exit CSM, use one of the following methods:
- Press the MENU, STATUS/EXIT, or POWER button on the remote control transmitter.
- Press the POWER button on the television set.

5.3 Problems and Solving Tips Related to CSM

5.3.1 Picture Problems

Note: The problems described below are all related to the TV settings. The procedures used to change the value (or status) of the different settings are described.

Picture too Dark or too Bright

If:
- The picture improves when you press the AUTO PICTURE button on the remote control transmitter, or
- The picture improves when you enter the Customer Service Mode,

Then:
1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the MENU UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the MENU LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the MENU UP/DOWN keys (if necessary) to select BRIGHTNESS.
6. Press the MENU LEFT/RIGHT keys to increase or decrease the BRIGHTNESS value.
7. Use the MENU UP/DOWN keys to select PICTURE.
8. Press the MENU LEFT/RIGHT keys to increase or decrease the PICTURE value.
9. Press the MENU button on the remote control transmitter twice to exit the user menu.
10. The new PERSONAL preference values are automatically stored.

White Line around Picture Elements and Text

If:
The picture improves after you have pressed the AUTO PICTURE button on the remote control transmitter,

Then:
1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the MENU UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the MENU LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the MENU UP/DOWN keys to select SHARPNESS.
6. Press the MENU LEFT key to decrease the SHARPNESS value.
7. Press the MENU button on the remote control transmitter twice to exit the user menu.
8. The new PERSONAL preference value is automatically stored.

Snowy Picture

Check CSM line 6. If this line reads “Not Tuned”, check the following:

- Antenna not connected. Connect the antenna.
- No antenna signal or bad antenna signal. Connect a proper antenna signal.
- The tuner is faulty (in this case line 2, the Error Buffer line, will contain error number 10). Check the tuner and replace/ repair the tuner if necessary.

Black and White Picture

If:

- The picture improves after you have pressed the AUTO PICTURE button on the remote control transmitter,

Then:

1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the MENU UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the MENU LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the MENU UP/DOWN keys to select COLOR.
6. Press the MENU RIGHT key to increase the COLOR value.
7. Press the MENU button on the remote control transmitter twice to exit the user menu.
8. The new PERSONAL preference value is automatically stored.

Menu Text not Sharp Enough

If:

- The picture improves after you have pressed the AUTO PICTURE button on the remote control transmitter,

Then:

1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the MENU UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the MENU LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the MENU UP/DOWN keys to select PICTURE.
6. Press the MENU LEFT key to decrease the PICTURE value.
7. Press the MENU button on the remote control transmitter twice to exit the user menu.
8. The new PERSONAL preference value is automatically stored.

5.4 ComPair

5.4.1 Introduction

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

- ComPair helps you to quickly get an understanding on how to repair the chassis in a short time by guiding you systematically through the repair procedures.
- ComPair allows very detailed diagnostics (on I^2C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I^2C commands yourself because ComPair takes care of this.
- ComPair speeds up the repair time since it can automatically communicate with the chassis (when the microprocessor is working) and all repair information is directly available. When ComPair is installed together with the Force/SearchMan electronic manual of the defective chassis, schematics and PWBs are only a mouse click away.

5.4.2 Specifications

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 RS-232) cable.
For this chassis, the ComPair interface box and the TV communicate via a bi-directional service cable via the service connector(s).

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

- Automatic (by communication with the television): ComPair can automatically read out the contents of the entire error buffer. Diagnosis is done on I^2C/UART level. ComPair can access the I^2C/UART bus of the television. ComPair can send and receive I^2C/UART commands to the micro controller of the television. In this way, it is possible for ComPair to communicate (read and write) to devices on the I^2C/UART buses of the TV-set.
- Manually (by asking questions to you): 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 (e.g. *Does the screen give a picture? Click on the correct answer: YES / NO*) and showing you examples (e.g. *Measure test-point I7 and click on the correct oscillogram you see on the oscilloscope*). You can answer by clicking on a link (e.g. text or a waveform picture) that will bring you to the next step in the fault finding process.

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.

5.4.3 How to Connect

This is described in the chassis fault finding database in ComPair.

CAUTION: It is compulsory to connect the TV to the PC as shown in the picture below (with the ComPair interface in between), as the ComPair interface acts as a level shifter. If one connects the TV directly to the PC (via UART), ICs will be blown!

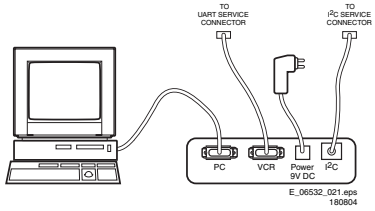


Figure 5-5 ComPair interface connection

5.4.4 How to Order

ComPair order codes (EU/AP/LATAM):

- Starter kit ComPair32/SearchMan32 software and ComPair interface (excl. transformer): 3122 785 90450.
- ComPair interface (excl. transformer): 4822 727 21631.

- Starter kit ComPair32 software (registration version): 3122 785 60040.
- Starter kit SearchMan32 software: 3122 785 60050.
- ComPair32 CD (update): 3122 785 60070 (year 2002), 3122 785 60110 (year 2003 onwards).
- SearchMan32 CD (update): 3122 785 60080 (year 2002), 3122 785 60120 (year 2003), 3122 785 60130 (year 2004).
- ComPair firmware upgrade IC: 3122 785 90510.
- Transformer (non-UK): 4822 727 21632.
- Transformer UK: 4822 727 21633.
- ComPair interface cable: 3122 785 90004.
- ComPair interface extension cable: 3139 131 03791.
- ComPair UART interface cable: 3122 785 90630.

Note: If you encounter any problems, contact your local support desk.

5.5 Error Codes

The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, it is displayed at the left side and all other errors shift one position to the right.

5.5.1 How to Read the Error Buffer

You can read the error buffer in 3 ways:
- On screen via the SAM (if you have a picture).
  Examples:
  - ERROR: 0 0 0 0 0 : No errors detected
  - ERROR: 6 0 0 0 0 : Error code 6 is the last and only detected error
  - ERROR: 9 6 0 0 0 : Error code 6 was detected first and error code 9 is the last detected (newest) error
- Via the blinking LED procedure (when you have no picture). See “The Blinking LED Procedure”.
- Via ComPair.

5.5.2 How to Clear the Error Buffer

The error code buffer is cleared in the following cases:
- By using the CLEAR command in the SAM menu:
  - To enter SAM, press the following key sequence on the remote control transmitter: “**062596**” directly followed by the OSD/STATUS button (do not allow the display to time out between entries while keying the sequence).
  - Make sure the menu item CLEAR is highlighted. Use the MENU UP/DOWN buttons, if necessary.
  - Press the MENU RIGHT button to clear the error buffer. The text on the right side of the “CLEAR” line will change from “CLEAR?” to “CLEARED”
- If the contents of the error buffer have not changed for 50 hours, the error buffer resets automatically.

Note: If you exit SAM by disconnecting the mains from the television set, the error buffer is not reset.

5.5.3 Error Codes

In case of non-intermittent faults, write down the errors present in the error buffer and clear the error buffer before you begin the repair. This ensures that old error codes are no longer present.
If possible, check the entire contents of the error buffer. In some situations, an error code is only the result of another error and not the actual cause of the problem (for example, a fault in the protection detection circuitry can also lead to a protection).

Table 5-1 Error code overview

Error	Device	Error Description	Check Item	Diagram
0	Not applicable	No Error		
1	Not applicable	Mis-match of TV Hercules SW and Scaler SW	-	-
2	Not applicable	-	-	-
3	Not applicable	-	-	-
4	Genesis Scaler Flash-ROM	I^2C error while communicating with the Genesis Scaler and/or Flash-ROM is faulty/empty	7801 7B01	B7 + B8 B10
5	Scaler supply 7752	+5V protection	7752	B6
6	Not applicable	General I^2C error	1102, 7L04, 7M00	B1 + B18 + B19
7	ADC	I^2C error	7L04	B18
8	Scaler EEPROM	I^2C error while communicating with the Scaler EEPROM	7C01	B11
9	Hercules EEPROM	I^2C error while communicating with the Hercules EEPROM (NVM for TV). **Remark:** when the Hercules EEPROM is defective, the Hercules should operate with its default values.	7207	B2
10	Tuner	I^2C error while communicating with the PLL tuner	1102, F102, F104, F107	B1
11	Columbus	I^2C error while communicating with the 2D/3D combfilter Columbus	7M00	B19
12	Not applicable	-	-	-
13	HDMI Panellink Receiver/ Decoder	I^2C error while communicating with the iBoard HDMI Panellink Receiver/ Decoder (only in NAFTA and AP sets)	7D03	B12 (only in NAFTA and AP sets)
14	Scaler SDRAM	Read-write error with the Scaler SDRAM	7B01	B10
15	Not applicable	-	-	-
16	EPLD	I^2C error while communicating with EPLD	7N02	B20 + B21
17	Digital Module (only on Digital sets)	I^2C error while communicating with the Digital Module (only on Digital sets)	Digital Module (only on Digital sets)	
18	Not applicable	-	-	-

5.6 The Blinking LED Procedure

Using this procedure, you can make the contents of the error buffer visible via the front LED. This is especially useful when there is no picture.

When the SDM is entered, the front LED will blink the contents of the error-buffer:
- The LED blinks with as many pulses as the error code number, followed by a time period of 1.5 seconds, in which the LED is off.
- Then this sequence is repeated.

Any RC5 command terminates this sequence.

Example of error buffer: **12 9 6 0 0**
After entering SDM, the following occurs:
- 1 long blink of 5 seconds to start the sequence,
- 12 short blinks followed by a pause of 1.5 seconds,
- 9 short blinks followed by a pause of 1.5 seconds,
- 6 short blinks followed by a pause of 1.5 seconds,
- 1 long blink of 1.5 seconds to finish the sequence,
- The sequence starts again with 12 short blinks.

5.7 Fault Finding and Repair Tips

Notes:
- It is assumed that the components are mounted correctly with correct values and no bad solder joints.
- Before any fault finding actions, check if the correct options are set.

5.7.1 NVM Editor

In some cases, it can be handy if one directly can change the NVM contents. This can be done with the “NVM Editor” in SAM mode. With this option, single bytes can be changed.

Caution:
- **Do not change the NVM settings without understanding the function of each setting, because incorrect NVM settings may seriously hamper the correct functioning of the TV set!**
- **Do not change the Scaler NVM settings, as this will hamper the DVI functionality of the TV set!**
- Always note down the existing NVM settings, before changing the settings. This will enable you to return to the orgininal settings, if the new settings turn out to be incorrect.

Table 5-2 NVM editor overview

	Hex	Dec	Description
.ADR	0x000A	10	Existing value
.VAL	0x0000	0	New value
.Store	Store?		

Table 5-3 NVM Default values (option bit settings through NVM Editor in SAM Mode)

Byte Nr.	Bit	Feature/Mode	Description	32PF7320/10	32PF5320/10	26PF5320/10	26PF4310/10
Byte 0 174(dec)	0	QSS (LSB)	Mode of quasi split sound amplifier	1	1	1	1
	1	FMI	Connection of output of QSS amplifier	1	1	1	1
	2	HCO	EHT tracking mode	0	0	0	0
	3	HP2	Synchronization of OSD/Text display	1	1	1	1
	4	FSL	Forced slicing level for vertical sync	1	1	1	1
	5	TFR	DC transfer ratio of luminance signal	1	1	1	1
	6	OSVE	Black current measuring in overscan	0	0	0	0
	7	MVK (MSB)	(For Future Usage, as defined by software)	0	0	0	0
		Total Dec Values		59	59	59	59
		Total Hex Values		3B	3B	3B	3B
Byte 1 175(dec)	0	PSE	PSE	0	0	0	0
	1	OPC	OPC	0	0	0	0
	2	PRIS	PRIS	0	0	0	0
	3	CONTINUOUS FACTORY	Continuous factory mode	0	0	0	0
	4	WHITE PATTERN ON	Last color pattern status in factory mode	0	0	0	0
	5	SDM MODE	Service default mode on/off	0	0	0	0
	6	SAM MODE	Service Align mode on/off	0	0	0	0
	7	SVMA	Scavm On / Off	0	0	0	0
		Total Dec Values		0	0	0	0
		Total Hex Values		00	00	00	00
Byte 2 176(dec)	0	MUTE STATUS	Mute status	0	0	0	0
	1	TUNER AUTO MODE	Auto mode	1	1	1	1
	2	CABLE MODE	Cable/Antenna mode	0	0	0	0
	3	LAST POWER MODE	Last power status of the set	1	1	1	1
	4	CHILD LOCK MODE	Child lock enabled	0	0	0	0
	5	SURF MODE	Surf mode on/off	0	0	0	0
	6	FACTORY MODE	Factory mode on	0	0	0	0
	7	PSNS	For PAL color enhancement in ES4	1	1	1	1
		Total Dec Values		138	138	138	138
		Total Hex Values		8A	8A	8A	8A
Byte 3 177(dec)	0	RADIO/TV MODE	Radio mode or TV mode	0	0	0	0
	1	WAKE-UP MODE	WAKE-UP MODE	0	0	0	0
	2	HOTEL MODE	TV in Hotel mode	0	0	0	0
	3	HOTEL KBD LOCK	Keyboard locked	0	0	0	0
	4	HBL	HBL	0	0	0	0
	5	BLS	Blue stretch mode	1	1	1	1
	6	SL	SL	0	0	0	0
	7	CFA0	Comb filter On/Off	0	0	0	0
		Total Dec Values		32	32	32	32
		Total Hex Values		20	20	20	20
Byte 4 178(dec)	0	Signal Strength	Signal Strength Switch in MK2	0	0	0	0
	1	LPG	LPG	0	0	0	0
	2	DVD TRAY LOCK	Lock/Unlock DVD tray	0	0	0	0
	3	SCRSAVER MODE	Screen saver mode	1	1	1	1
	4	BKS	Black Stretch Mode	1	1	1	1
	5	BSD	Black Stretch Depth	1	1	1	0
	6	CRA0	Coring on SVM	1	1	1	1
	7	PIP QSS	PIP QSS	0	0	0	0
		Total Dec Values		120	120	120	88
		Total Hex Values		78	78	78	58

Byte Nr.	Bit	Feature/Mode	Description	32PF7320/10	32PF5320/10	26PF5320/10	26PF4310/10
Byte 5 179(dec)	0	FFI	Fast Filter	0	0	0	0
	1	NNR	No red reduction during blue stretch	1	1	1	1
	2	MUS	NTSC matrix	1	1	1	1
	3	GAM	Gamma control	1	1	1	1
	4	CBS	Control sequence of beam current limiting	0	0	0	0
	5	LLB	Low level of beam current limiter	0	0	0	0
	6	DSA	Dynamic skin tone angle area	1	1	1	0
	7	DSK	Dynamic skin tone angle on/ off	0	0	0	1
		Total Dec Values		78	78	78	142
		Total Hex Values		4E	4E	4E	8E
Byte 6 180(dec)	0	LTI status	LTI last status	0	0	0	0
	1	Inc_Life_Time	Inc_Life_Time	0	0	0	0
	2	PC_Mode	PC_Mode	0	0	0	0
	3	HD_Mode	HD_Mode	0	0	0	0
	4	Tact_Switch	Tact_Switch	0	0	0	0
	5	Set_In_Special_Stby	Set_In_Special_Stby	0	0	0	0
	6	Hotel_OSDDisplay	Hotel_OSDDisplay	0	0	0	0
	7	Hotel_MonitorOut	Hotel_MonitorOut	0	0	0	0
		Total Dec Values		0	0	0	0
		Total Hex Values		00	00	00	00
Byte 7 181(dec)	0	Hotel_IconMode	Hotel_IconMode	0	0	0	0
	1	DBE	DBE	1	1	1	1
	2	SD	SD	0	0	0	0
	3	Set_in_PC_Sleep_Mode	Set_in_PC_Sleep_Mode	0	0	0	0
	4	Reserved	Reserved	0	0	0	0
	5	Reserved	Reserved	0	0	0	0
	6	Reserved	Reserved	0	0	0	0
	7	Reserved	Reserved	0	0	0	0
		Total Dec Values		2	2	2	2
		Total Hex Values		02	02	02	02

5.7.2 Load Default NVM Values

In case a blank NVM is placed or when the NVM content is corrupted, default values can be downloaded into the NVM. (For empty NVM replacement, short the SDM with a jumper and apply the mains voltage. Remember to remove the jumper after the reload is completed). After the default values are downloaded, it will be possible to start up and to start aligning the TV set. This is no longer initiated automatically; to initiate the download the following action has to be performed:

1. Switch “off” the TV set by disconnecting the AC Power plug.
2. Short circuit the SDM jumpers (keep short-circuited).
3. Press P+ or Ch+ on the local keyboard (and keep it pressed).
4. Switch on the TV set via the AC Power plug.
5. Keep pressing the P+/Ch+ button until the set has started up and the SDM is shown.

Alternative method:

1. Go to SAM.
2. Select NVM Editor (not SC NVM Editor).
3. Select ADR (address) to 1 (dec).
4. Change the VAL (value) to 170 (dec).
5. Store the value.
6. Disconnect the mains plug and wait for a few seconds.
7. Reconnect the mains plug and wait until the set goes into its standby mode (red LED lights up).
8. Restart the set.

5.7.3 Tuner and IF

No Picture in RF Mode, but there is a Noise Raster

1. Check whether picture is present in AV. If not, go to Video processing troubleshooting section.
2. If present, check if the Option settings are correct.
3. Check if all the supply voltages are present (3.3/5/8/12/33 V).
4. Check if the I^2C lines are working correctly (3.3 V).
5. Manually store a known channel and check if there is IF output at Tuner pin 11.
6. Check the tuning DC voltage at pin 2 of the Tuner. The DC voltage should vary according to the frequency/channel being chosen.
7. If the tuning voltage is OK, check the tuner output, pin 11.
8. If it has no output, the Tuner may have a defect. Change the Tuner.

Sound in Picture Problem for L' System (rolling horizontal lines)

1. Check whether AGC L' in SAM mode is set to 0.
2. If yes, align the set to correct value.

Required System is not Selected Correctly

Check whether a Service jumper (#4204 & 4205, 0805 size) is present. If yes, remove it.

5.7.4 Video Processing

No Power
1. Check +12 V and 3V3 at position 1J02.
2. If no supply, check the connector 1J02.
3. If it is correct, check the power supply board.

Power Supply is Correct, but no Green LED
1. Check if the connectors 1K00 are properly inserted.
2. If they are inserted correctly, check if the 3V3 is present.

No Picture Display (blank screen with correct sound output)
1. Check whether the user menu is visible.
2. If the user menu is OK, activate teletext mode.
3. If teletext is OK, the problem is in the ADC (B18) & Columbus 3D combfilter (B19), if present (depending on model, see also paragraph “Teletext Path” in chapter 9).
4. If the user menu is not visible, check if the LCD panel backlight is ON.
5. If the backlight is OFF, the problem is in the power supply board or LCD panel. Also check pin 12 (LAMP_ON_OFF) of 1J02. It should be HIGH during normal operation.

Note: For faultfinding purposes, it is important to know the following: in Pixel Plus and Digital Crystal Clear models, which have an ADC (B18) and Columbus 3D combfilter (B19), the digital input of the scaler is used for the digital video path (Hercules output), whereas the analogue RGB input (analogue input of the scaler) is only used for teletext. This means that no mixed mode (video plus teletext simultaneously) is possible. If there is sound and teletext, but no video and user menu (blank screen), the digital path (Hercules - ADC - Columbus - Scaler) is faulty. If there is sound but no teletext, the back-end part (Scaler - LCD panel) is faulty. In Crystal Clear models, which do not have an ADC and Columbus, the RGB path (analogue input of scaler) is used for both video and teletext.

No TV, but PC is Present
1. Check if Hsync_SDTV and Vsync_SDTV are present at pin 1 & pin13 of 7E03.
2. If they are present, check teletext output.
3. If there is no teletext output, the IC TDA150xx may be defect.

5.7.5 Power Supply

Check Fuse
The power supply (various models are used) contains one fuse near the AC input connector X002.

1. Check with power supply in “off” state by means of ohmic measurement.
2. Fuse X102 may open in case of severe lightning strikes and/or failures in the power supply.
3. Check the standby signal at pin 10 of X200. ON is HIGH, OFF is LOW. During standby mode only the 3V3 is present at pin 10.

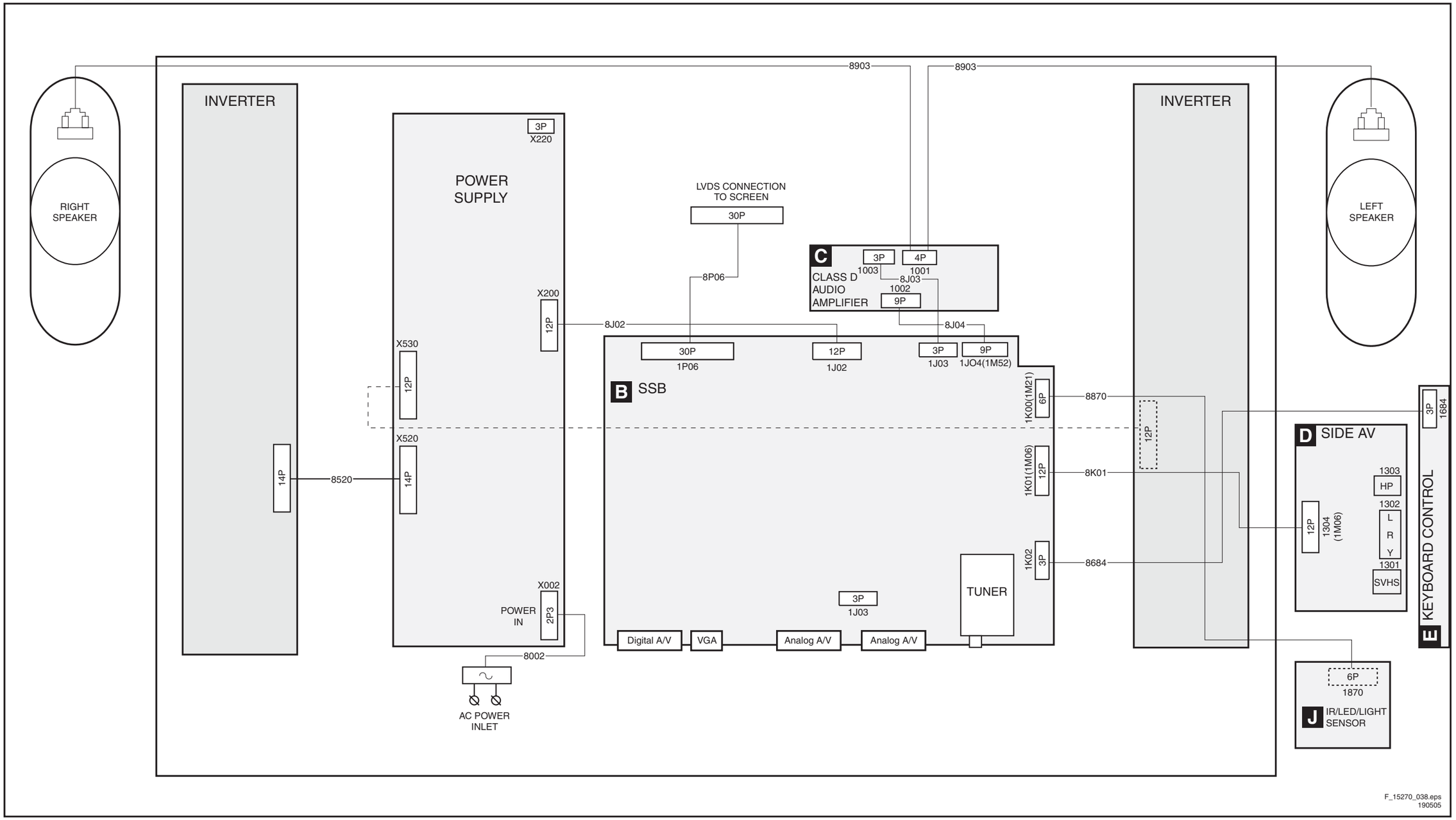
Protections Concept on Power Supply Board (two models)
1. **12 V output (pin 8 of X200):** Short-circuit protected by 2.5 A fuse X610. Over-voltage protection when output voltage is more than 40% above nominal value.
2. **Vaudio output (+18 or +24 V, depending on power supply model used); (pin 1 of X200):** Short-circuit proof (+18 V version has 2.5 A fuse X660). Over voltage protection when output voltage is more than 40% above nominal value.
3. **3V3STBY output (pin 3&4 of X200):** Short-circuit proof with auto-restart. Over voltage protection when output voltage is more than 40% above nominal value.
4. **24 V output (for inverter X520 & X530):** Short-circuit proof with auto-restart. Over voltage protection when output voltage is more than 40% above nominal value.

Standby Mode
1. Apply a 12 ohm load resistor of sufficient power rating to all outputs mentioned above (+12 V, +18/ 24 V, +3V3 and +24 V). Connect the STBY pin (pin 10 of X200) to logical “L” (low), i.e. to GND.
2. Over an input voltage range of 90 V_{AC} to 276 V_{AC} only the +3V3 STBY output shall be up.

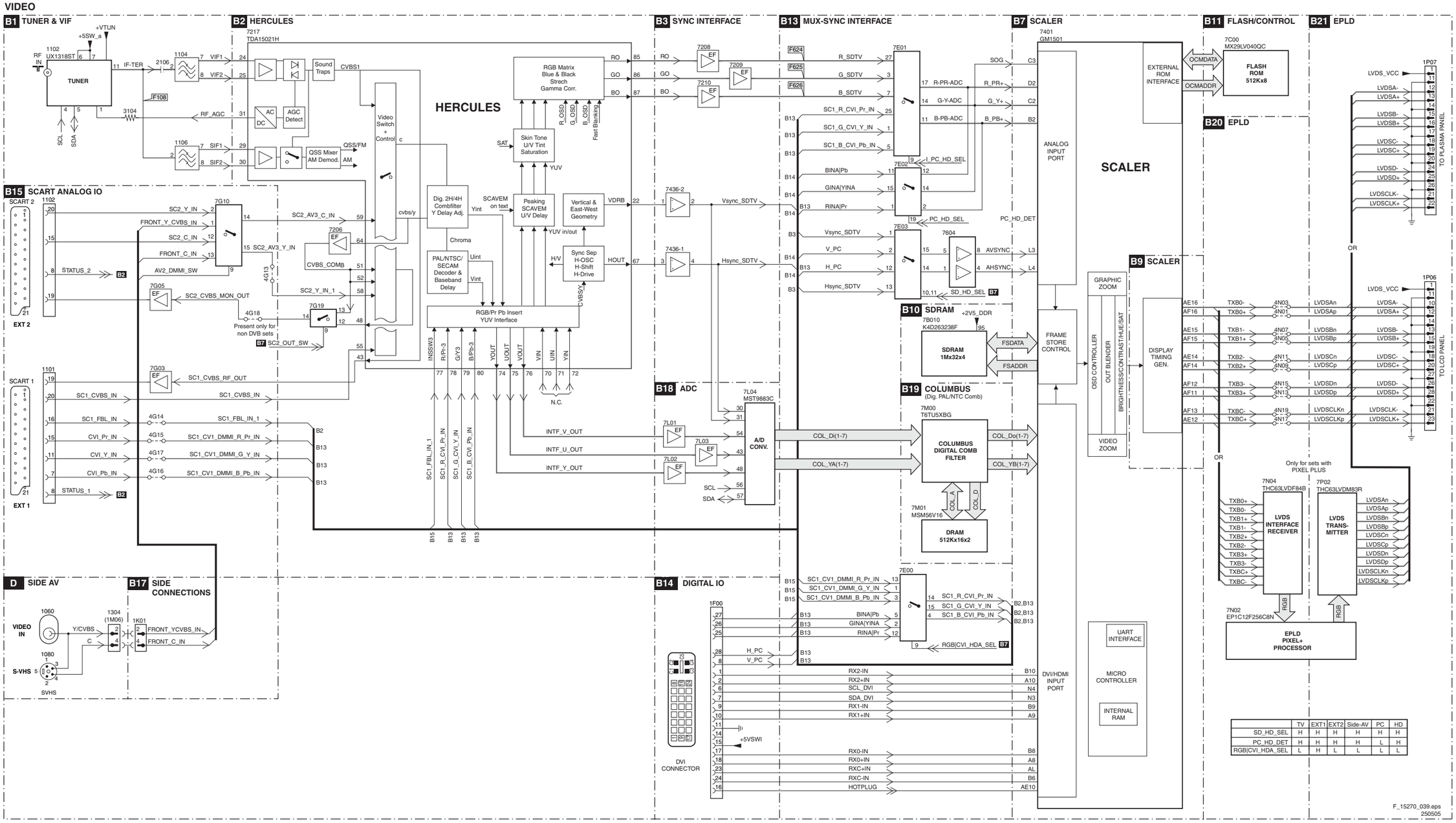
Normal Mode:
1. Apply a 12 ohm load resistor of sufficient power rating to all outputs mentioned above (+12 V, +18/ 24 V, +3V3 and +24 V). Connect the STBY pin (pin 10 of X200) to logical “H” (high), i.e. to the +3V3 STBY output via a 2,2 k pull up resistor.
2. Over an input voltage range of 90 V_{AC} to 276 V_{AC} all outputs shall be up. The voltage on the +3V3 STBY output shall be 3.3 V over the entire input voltage range. The voltage on the big 400 V capacitor on the power supply should also be 400 V ±10%.

6. Block Diagrams, Testpoint Overviews, and Waveforms

Wiring Diagram



Block Diagram Video



	TV	EXT1	EXT2	Side-AV	PC	HD
SD_HD_SEL	H	H	H	H	H	H
PC_HD_DET	H	H	H	H	L	H
RGB|CVI_HDA_SEL	L	H	L	L	L	L

Block Diagram Audio

AUDIO

B1 TUNER & IF

1102
UR1318S(D)
TUNER
RF IN
RF OUT
Only on DVB Sets
IFOUT 11
F108
IF-TER
2106
4110
1106
6104
SIF1
SIF2
SCL
SDA
7101
SEL_IF_SDM B2

B2 HERCULES

7217
TDA15021H
QSS Mixer AM Demod.
AM
QSS/FM
AD Conv. Std Stereo Decoder
AUDIO CONTROL Vol/Treb/ Bass Features DACs
AUDIO SELECT ADC/DAC
I2S Processor
29
30
33
61 4211 AUDOUTLSR
60 4212 AUDOUTLSL
34
35
56
57
62
63
36
37
49
50
53
54

B5 AUDIO PROCESSING

SOUND-ENABLE
7601
TS482ID
7606
MUTE
OUT_MUTE
7602
74HC08PW
HP_DET_R_DC_1
SOUND_ENABLE B2
POWER_DOWN B16
EXT_MUTE B2
7202
MUTE
7201
MUTE
SC2_L
SC2_R
SC1_L
SC1_R

B16

1J04

C AUDIO AMPLIFIER (CLASS-D)

1002
AUDIO-R
AUDIO-L
SOUND-ENABLE
7004
PHASE INVERTER
7001
TDA8931T
7000
TDA8931T
POWER COMPARATOR
OUT
IN+
HVPI
1001
RIGHT SPEAKER
LEFT SPEAKER

B17 SIDE CONNECTORS

1K01
HP_LOUT
HP_ROUT
HP_DET_R_DC_1
HP_DET_R_DC1

D SIDE AV

1304
(1M06)
HEAD_PH_L
HEAD_PH_R
1303
HEADPHONE

B15 SCART ANALOG IO

1G01
SC1_COMP_AV1_L_IN
SC1_COMP_AV1_R_IN
EXT 1
SCART 1
4G11
4G12
7G07*
74HC4053D
1G02
SC2_L_IN
SC2_R_IN
EXT 2
SCART 2
Only for DVB sets
1G03
DMMI_L_IN
DMMI_R_IN
DMM1
CONNECTOR
*Only for DVB Set
10,11
AV2_DMMI_SW B2

B15 SCART ANALOGUE IO

1G02-1
SC2_L_MON_OUT
SC2_R_MON_OUT
EXT 2
SCART 2
1G01-1
SC1_L_RF_OUT
SC1_R_RF_OUT
EXT 1
SCART 1

D SIDE AV

1302
AUDIO L/R IN
L_FRONT_IN
R_FRONT_IN

B17 SIDE CONNECTORS

1304
(1M06)
1K01
(1M06)
FRONT_L_IN
FRONT_R_IN

B14 DIGITAL IO

1F01
PC AUDIO IN
AudioIN2L
AudioIN2R

CONTROL

E KEYBOARD CONTROL

Channel+
Channel-
Menu
Volume+
Volume-
Power
1309
1310
3324
1311
1312
1313
KEYBOARD
1684

B17 SIDE CONNECTORS

1K02
(1M06)
KEYBOARD

B2 HERCULES

7217
TDA15021H
HERCULES
120
97
115
123
107
114 SEL_IF_SDM B1
4022
SERVICE SMD
116 STATUS_1 B3
119 STATUS_2 B3
102 EXT_MUTE B5
111 SOUND-ENABLE B5
122 SC_STANDBY B6 B15
127 AV2_DMMI_SW B15
10
11
1202

J IR/LED/LIGHT-SENSOR

7802
+3V3STBY
IR
1870
1K00
7808
LIGHT-SENSOR-SDM
LIGHT_SENSOR
6801-2
Green
7804
7801
6801-1
Red
7803
3802
3801
LED_SEL
PC-TV-LED

B3 SYNC INTERFACE

3431
7430
6F00
+5VSW
3432
RES
ITV_IR_SW_RESET

B6 DC-DC CONVERTER

+12VSW
5756
7758
5757
LVDS_VCC
PAN_VCC
3758
3755
7755
PANEL-PWR-CTL B8
+3V3STBY
+3V3SW
3759
3750
7756
SC_STANDBY B2

F_15270_040.eps
180505

I2C IC Overview

IIC

B2 HERCULUS

7217
TDA15021H

HERCULES
SET
PROCESSOR

+3V3STBY

3233

3232

109 SDA

108 SCL

ERR 6

+3V3STBY

3249

104 NVM_WP_HERC

7207
M24C16

EEPROM
NVM

ERR 9

B8 SCALER

7801
GM1501H

SCALER

ERR 4

B7 SCALER

M1 UART_TX

M2 UART_RX

3122

3123

1107

SERVICE
CONNECTOR
UART

B1 TUNER & IF

3102 (5108)

3101 (5107)

1102
UR1318S

TUNER

ERR 10

3125

3124

1101

SDA

SCL

SERVICE
CONNECTOR
COMPAIR

B19 COLUMBUS

3M14

3M15

7M00
T6TU5XBG

COLUMBUS
CTRL

ERR 11

B18 ADC

+3V3SWB

3L36

3L37

7L07

7L06

+3V3SWB

3L19

3L20

7L04
MST9883C

ANALOG
INTERFACE

ERR 7

B14 DIGITAL IO

DVI-D
CONNECTOR

DCC_5V

1F00

3F18

3F17

SDA_DVI N3

SCL_DVI N4

7F03
M24C02

EEPROM
256x8

B11 FLASH / CONTROL

+3V3SW

3818

3817

P3 SDA_IO

P4 SCL_IO

7C01
M24C32

EEPROM

ERR 8

AF5 NVM_WP_SCALER

ADDRESS OCMADDR

DATA OCMDATA

7C00
MX29LV040

FLASH ROM

B9 SCALER INTERFACE

7A00
PCA9515ADP

FOR
PDP ONLY

B21 EPLD

1P07
(1G50)

TO
DISPLAY

B20 EPLD

4N21

4N22

7N02
EP1C12F256C8N

EPLD
BANK 4

ERR 16

3N47

3N46

+3V3SW

1N02

SDA

SCL

FOR
DEVELOPMENT
USE ONLY

B10 SDRAM

+3V3IO

3838

3837

1802

JTAG_TDI_SDA AF7

JTAG_CLK_SCL AD6

JTAG
I2C

ADDRESS FSADDR

DATA FSDATA

7B01
K4D263238F

SDRAM

ERR 14

IBO ZAPPER (Only For DVB Sets)

B15 SCART ANALOGUE IO

112 SW_I2C_SDA

113 SW_I2C_SCL

ERR 17

1G03

1500

3513 I2C_TV_SDA

3512 I2C_TV_SCL

K5 ANALOG BACKEND

K6 FRONT END

+5V

3626

3627

3607

3605

3632

3633

1600
TD1316L

TUNER
DIGITAL

7602
M24C256

EEPROM

3630

3631

3625

3629

7600
TDA10046

COFDM
CHANNEL DECODER

I2C_local_SDA

I2C_local_SCL

K1 MOJO

+5V

3207

3206

3147

3146

3144

3143

7100
PNX8316HS

MOJO

185 WP

+5V

3625

K2 MEMORY

3209

3210

7203
M24C64

EEPROM

K7 MEMORY

3701

3700

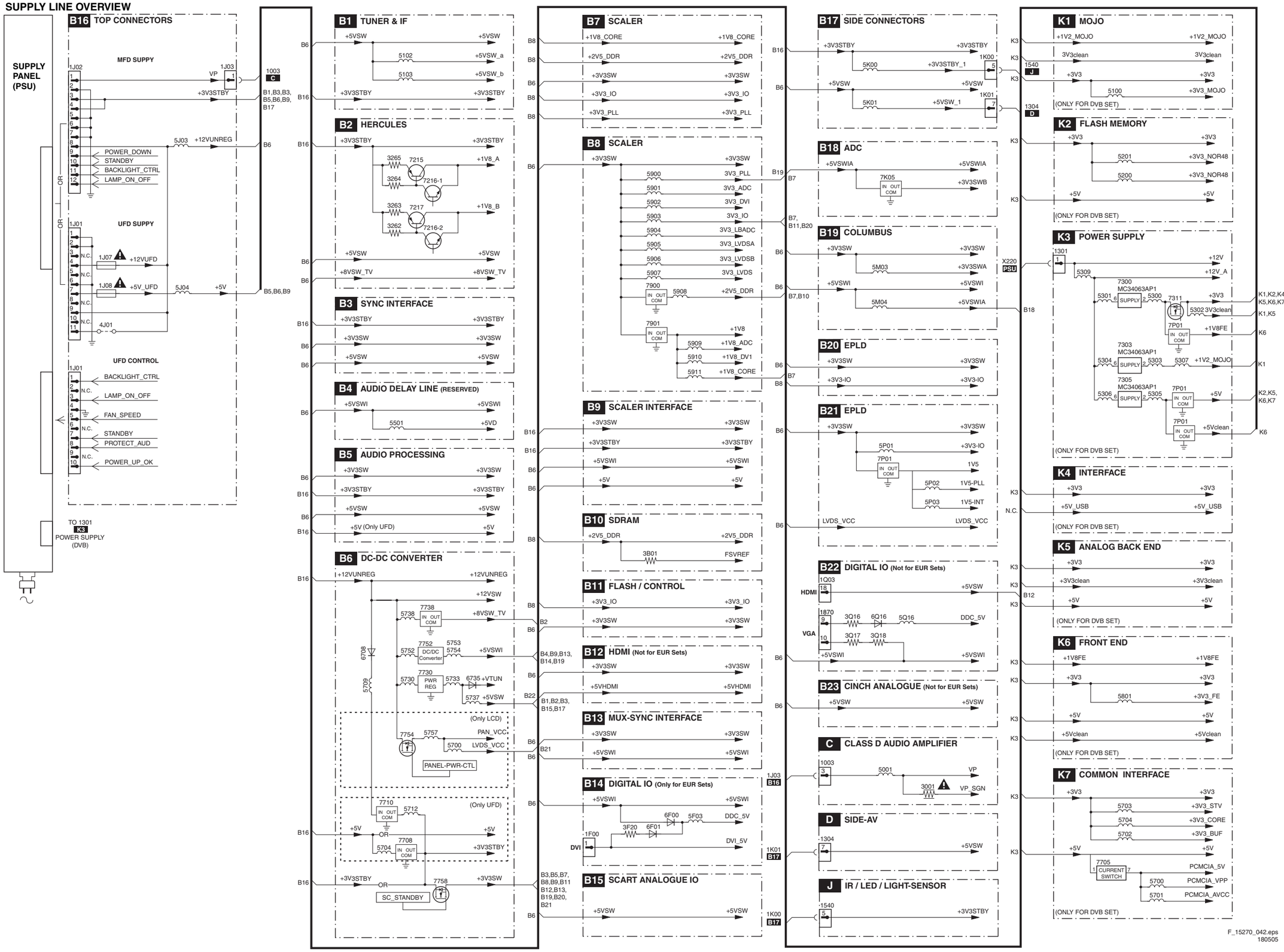
7700
ST70700

PCMCIA
CONTROLLER

F_15270_041.eps
180505

Supply Voltage Overview

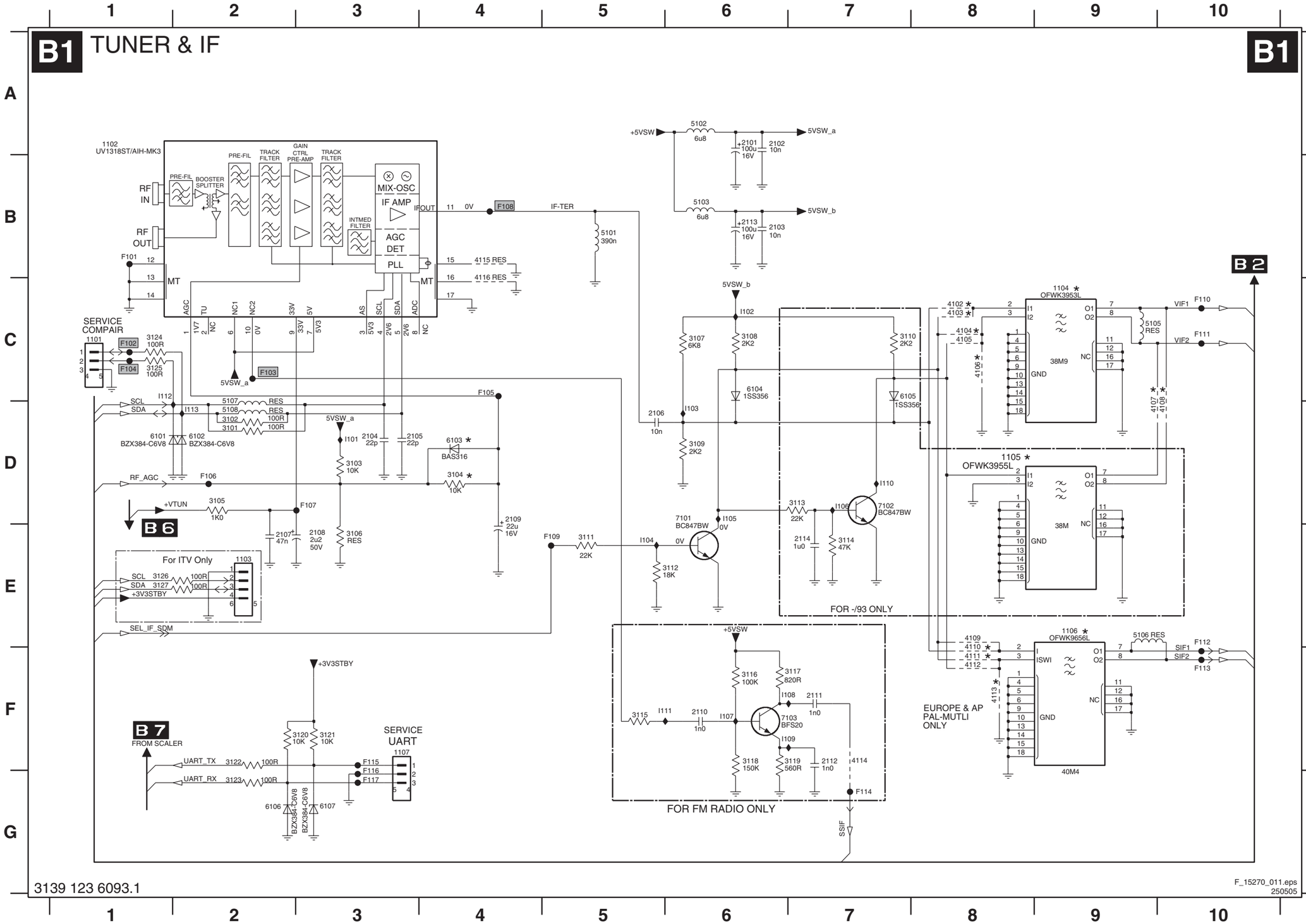
SUPPLY LINE OVERVIEW



F_15270_042.eps
180505

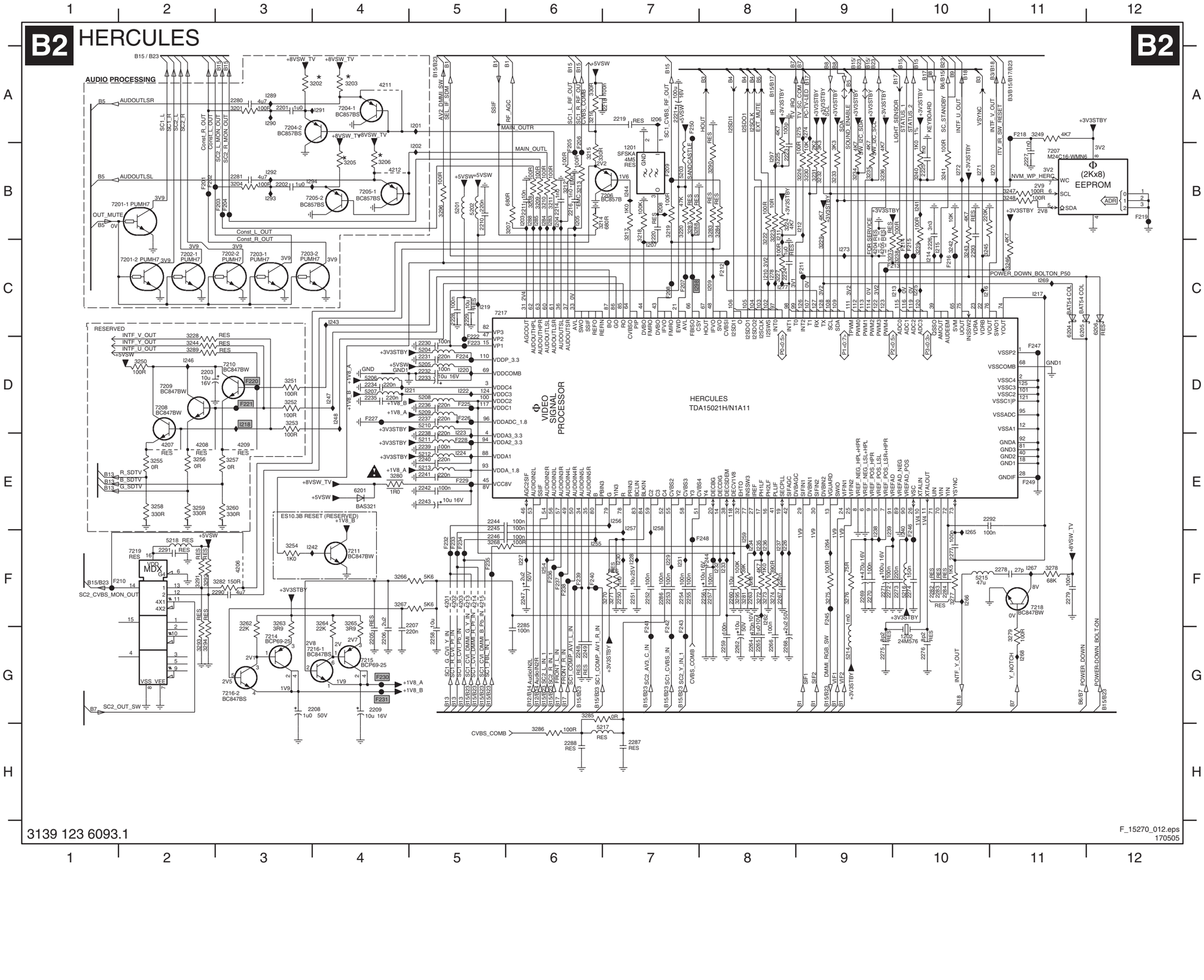
7. Circuit Diagrams and PWB Layouts

SSB: Tuner and VIF



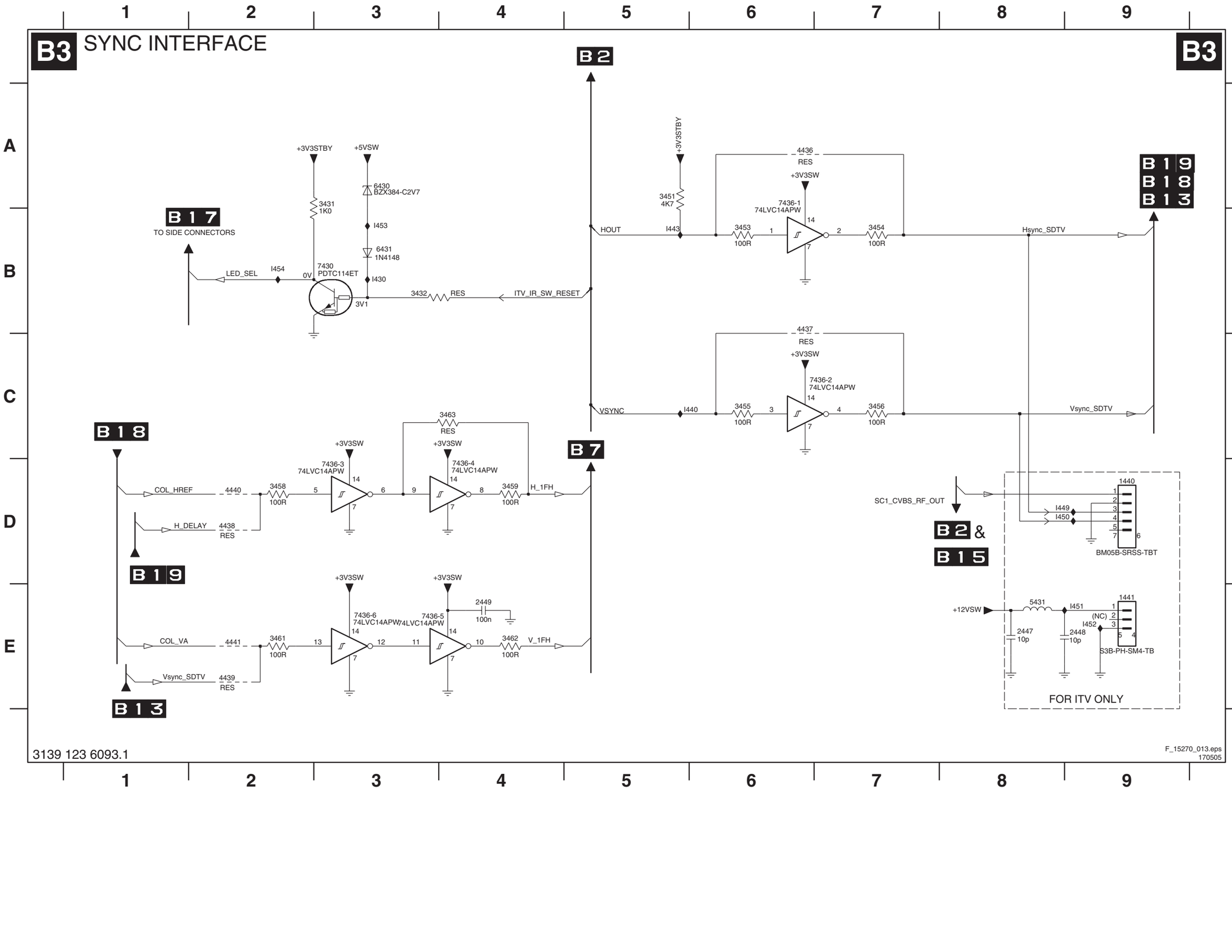
1101 C1 F106 D2
1102 A1 F107 D3
1103 E2 F108 B4
1104 C9 F109 E5
1105 D8 F110 C10
1106 E9 F111 C10
1107 F3 F112 E10
2101 A6 F113 F10
2102 A6 F114 G7
2103 B6 F115 F3
2104 D3 F116 G3
2105 D3 F117 G3
2106 D5 I101 D3
2107 E2 I102 C6
2108 E3 I103 D6
2109 D4 I104 E5
2110 F6 I105 D6
2111 F7 I106 D7
2112 F7 I107 F6
2113 B6 I108 F7
2114 E7 I109 F7
3101 D2 I110 D7
3102 D2 I111 F6
3103 D3 I112 C1
3104 D4 I113 D2
3105 D2
3106 E3
3107 C6
3108 C6
3109 D6
3110 C7
3111 E5
3112 E5
3113 D7
3114 E7
3115 F5
3116 F6
3117 F7
3118 F6
3119 F6
3120 F3
3121 F3
3122 F2
3123 G2
3124 C1
3125 C1
3126 E1
3127 E1
4102 C8
4103 C8
4104 C8
4105 C8
4106 C8
4107 D9
4108 D10
4109 E8
4110 F8
4111 F8
4112 F8
4113 F8
4114 F7
4115 B4
4116 C4
5101 B5
5102 A6
5103 B6
5105 C9
5106 E9
5107 D2
5108 D2
6101 D1
6102 D2
6103 D4
6104 C6
6105 C7
6106 G2
6107 G3
7101 D6
7102 D7
7103 F6
F101 B1
F102 C1
F103 C2
F104 C1
F105 C4

SSB: Hercules



1201 B7	3215 B6	5209 D5	I216 C10
1202 G10	3216 A6	5210 D5	I217 C11
2201 A3	3217 B7	5211 E5	I218 D3
2202 B3	3218 B7	5212 E5	I219 C5
2203 D2	3219 B7	5213 E5	I220 D5
2205 G4	3220 B7	5214 G9	I221 D5
2206 G4	3222 B8	5215 F10	I222 D5
2207 F5	3223 B8	5216 F10	I223 D5
2208 G4	3224 B8	5217 H7	I224 E5
2209 G4	3225 B8	5218 F2	I225 C10
2210 B5	3226 B9	6201 E4	I226 F8
2211 B6	3227 C8	6204 C11	I227 F6
2214 B6	3228 D2	6205 C11	I228 F7
2216 B6	3229 C9	6206 C12	I229 F7
2218 A7	3230 B9	7201-1 B1	I230 F7
2219 A7	3231 B9	7201-2 C2	I231 F7
2220 B7	3232 B9	7202-1 C2	I232 F8
2221 A7	3233 B9	7202-2 C3	I233 F8
2223 B8	3234 B9	7203-1 C3	I234 F8
2224 C8	3235 B9	7203-2 C3	I235 F8
2225 B10	3236 B9	7204-1 A4	I236 F8
2226 C10	3237 C9	7204-2 A3	I237 F8
2227 B11	3238 C10	7205-1 B4	I238 F9
2228 C5	3239 C10	7205-2 B4	I239 F9
2229 C5	3240 B10	7206 B6	I240 F10
2230 D5	3241 B10	7207 B11	I241 B10
2231 D5	3242 C10	7208 D2	I242 F4
2232 D5	3243 C10	7209 D2	I243 C4
2233 D5	3244 D2	7210 D3	I244 B7
2234 D4	3245 C10	7211 F4	I246 D2
2235 D4	3246 C11	7214 G3	I247 D4
2236 D5	3247 B11	7215 G4	I248 D4
2237 D5	3248 B11	7216-1 G3	I254 F6
2238 E5	3249 A11	7216-2 G3	I255 F6
2239 E5	3250 D2	7217 C6	I256 E7
2240 E5	3251 D3	7218 F11	I257 E7
2241 E5	3252 D3	7219 F2	I258 E7
2242 E5	3253 D3	F201 B2	I259 F8
2243 E5	3254 F3	F202 B2	I262 F8
2244 E5	3255 E2	F203 B3	I264 F9
2245 E5	3256 E2	F204 B3	I265 F10
2246 F5	3257 E3	F205 B6	I266 F10
2247 F6	3258 E2	F206 B6	I267 F11
2248 G6	3259 E2	F207 C7	I268 G11
2249 G6	3260 E3	F208 C7	I269 C11
2250 F7	3262 F3	F209 B7	I270 B11
2251 F7	3263 F3	F210 F1	I271 B10
2252 F7	3264 F4	F211 C9	I272 B10
2253 F7	3265 F4	F212 C8	I273 C9
2254 F7	3266 F4	F213 C10	I274 A9
2255 F7	3267 F4	F214 C10	I275 A9
2256 F8	3268 F5	F215 C10	I277 C8
2257 F8	3270 F7	F216 C10	I278 C8
2258 G5	3271 F7	F218 A11	I283 B6
2259 G8	3272 F8	F219 B12	I284 B6
2260 F8	3273 F8	F220 D3	I285 B6
2262 G8	3274 F8	F221 D3	I288 B6
2263 F8	3275 F9	F222 D5	I289 A3
2264 G8	3276 F9	F223 D5	I290 A3
2265 G8	3277 F10	F224 D5	I291 A4
2266 G8	3278 F11	F225 D5	I292 B3
2267 F8	3279 G11	F226 D5	I293 B3
2268 G8	3280 E4	F227 D4	I294 B3
2269 F9	3281 F8	F228 E5	I297 B8
2270 F9	3282 F3	F229 E5	I298 C7
2271 F9	3283 B8	F230 G4	
2272 F9	3284 B8	F231 G4	
2273 F10	3285 G6	F232 F5	
2274 F10	3286 H6	F233 F5	
2275 G9	3287 B7	F234 F5	
2276 G10	3288 B7	F235 F5	
2277 F10	3289 D2	F236 F6	
2278 F11	3290 B8	F237 F6	
2279 F11	3291 F2	F238 F6	
2280 A3	3292 F2	F239 F6	
2281 B3	3293 G2	F240 F6	
2282 F10	3294 G2	F241 G7	
2283 F10	3295 F8	F242 G7	
2284 F10	3296 B5	F243 G7	
2285 F6	4201 F5	F244 F8	
2286 F7	4202 F5	F245 F9	
2287 H7	4203 F5	F246 F10	
2288 H6	4204 C9	F247 D11	
2290 F3	4205 C9	F248 F8	
2291 F2	4206 F3	F249 E11	
2292 E11	4207 E2	F250 A7	
2293 C10	4208 E2	I201 A5	
3201 A3	4209 E3	I202 B5	
3202 A4	4211 A4	I203 B6	
3203 A4	4212 B4	I204 B6	
3204 B3	4213 F5	I205 B6	
3205 B4	4214 F5	I206 A7	
3206 B4	4215 F5	I207 C7	
3207 B6	5201 B5	I208 B7	
3208 B6	5202 B5	I209 C8	
3209 B6	5203 B7	I210 C8	
3210 B6	5204 D5	I211 B8	
3211 B6	5205 D5	I212 B9	
3212 B6	5206 D4	I213 C10	
3213 B6	5207 D4	I214 C10	
3214 B7	5208 D5	I215 C10	

SSB: Sync Interface



1440 D9
1441 E9
2447 E8
2448 E9
2449 E4
3431 A3
3432 B3
3451 A5
3453 B6
3454 B7
3455 C6
3456 C7
3458 D2
3459 D4
3461 E2
3462 E4
3463 C4
4436 A6
4437 B6
4438 D2
4439 E2
4440 D2
4441 E2
5431 E8
6430 A3
6431 B3
7430 B3
7436-1 A6
7436-2 C7
7436-3 D3
7436-4 D4
7436-5 E4
7436-6 E3
I430 B3
I440 C6
I443 B5
I449 D8
I450 D8
I451 E9
I452 E9
I453 B3
I454 B2

SSB: Audio Delay Line (Reserved)

B4 AUDIO DELAY LINE (RESERVED)

3139 123 6093.1

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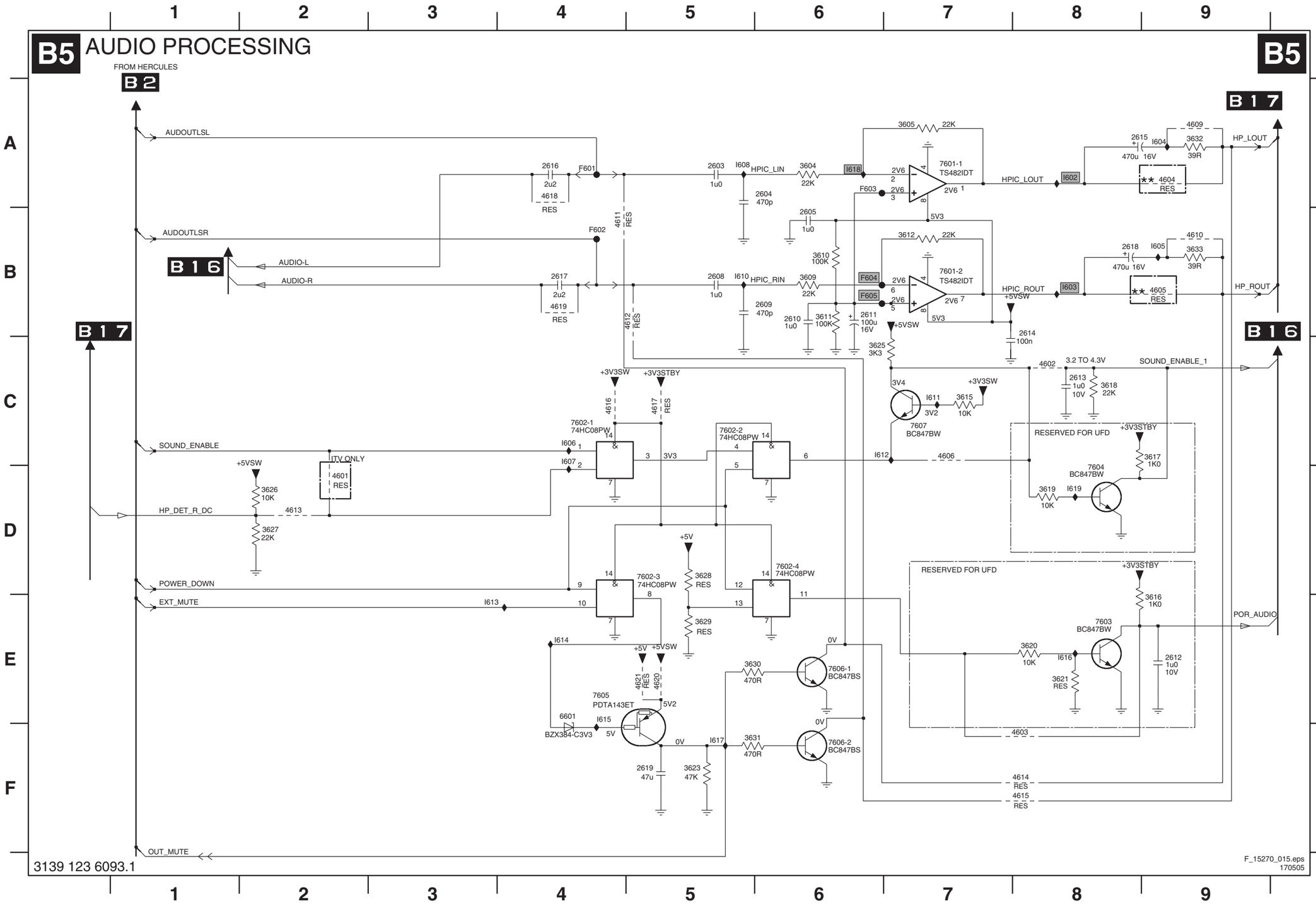
240505

SSB: Audio Processing

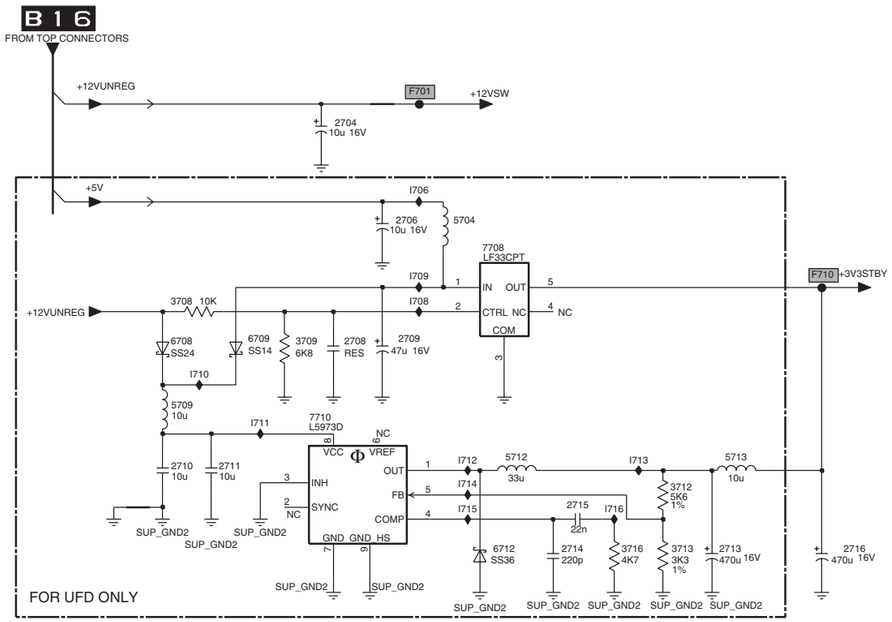


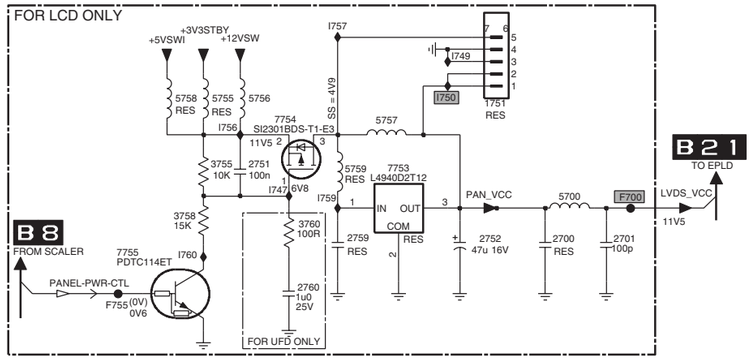
2603 A5 I602 A8
2604 A6 I603 B8
2605 B6 I604 A9
2608 B5 I605 B9
2609 B6 I606 C4
2610 B6 I607 C4
2611 B6 I608 A5
2612 E9 I610 B5
2613 C8 I611 C7
2614 B8 I612 C6
2615 A8 I613 E3
2616 A4 I614 E4
2617 B4 I615 E4
2618 B8 I616 E8
2619 F5 I617 F5
3604 A6 I618 A6
3605 A7 I619 D8
3609 B6
3610 B6
3611 B6
3612 B7
3615 C7
3616 E9
3617 C9
3618 C8
3619 D8
3620 E8
3621 E8
3623 F5
3625 C6
3626 D2
3627 D2
3628 D5
3629 E5
3630 E5
3631 F5
3632 A9
3633 B9
4601 D2
4602 C8
4603 F8
4604 A9
4605 B9
4606 C7
4609 A9
4610 B9
4611 B4
4612 B4
4613 D2
4614 F8
4615 F8
4616 C4
4617 C5
4618 A4
4619 B4
4620 E5
4621 E5
6601 E4
7601-1 A7
7601-2 B7
7602-1 C4
7602-2 C5
7602-3 D5
7602-4 D6
7603 E8
7604 D8
7605 E4
7606-1 E6
7606-2 F6
7607 C7
F601 A4
F602 B4
F603 A6
F604 B6
F605 B6

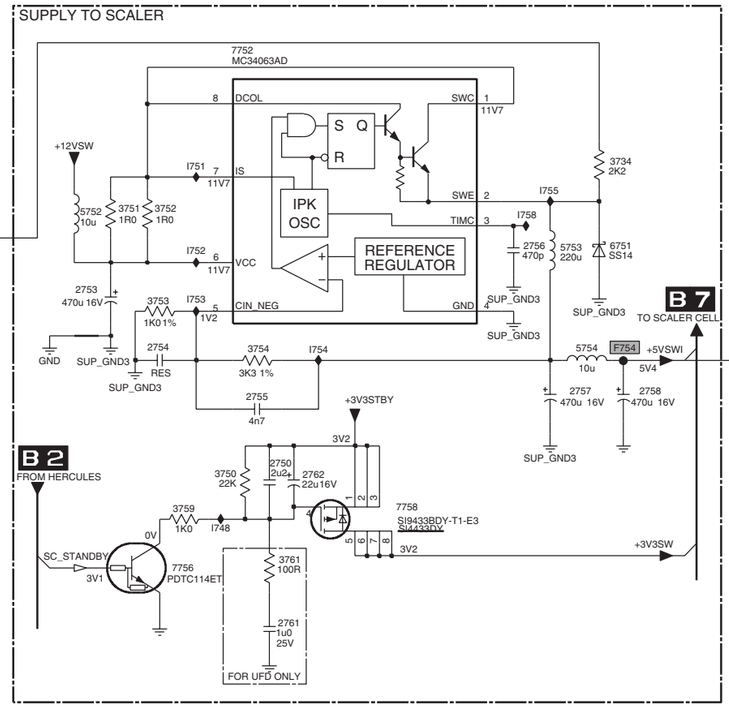
SSB: DC-DC Converter

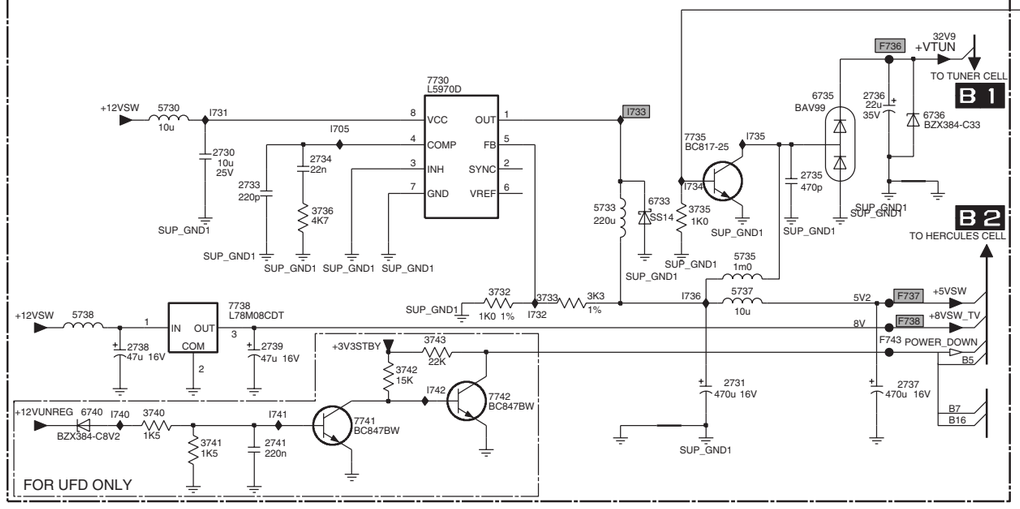
B6 DC-DC CONVERTER

B6









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250505

1751	A10	7738	F2
2700	B11	7741	G3
2701	B11	7742	G4
2704	A3	7752	D9
2706	B3	7753	B10
2708	C3	7754	A9
2709	C3	7755	B8
2710	C2	7756	G8
2711	C2	7758	F10
2713	D5	F700	B11
2714	D4	F701	A3
2715	D4	F710	B6
2716	D6	F736	E6
2730	E2	F737	F6
2731	G5	F738	F6
2733	F2	F743	G6
2734	E3	F754	E11
2735	F6	F755	C8
2736	E6	I705	E3
2737	G6	I706	B3
2738	G2	I708	B3
2739	G3	I709	B3
2741	G3	I710	C2
2750	F9	I711	C2
2751	B9	I712	C4
2752	B10	I713	C5
2753	E8	I714	C4
2754	E8	I715	D4
2755	F9	I716	D5
2756	E10	I731	E2
2757	E11	I732	F4
2758	E11	I733	E5
2759	B9	I734	F5
2760	B9	I735	E5
2761	G9	I736	F5
2762	F9	I740	G2
3708	B2	I741	G3
3709	C3	I742	G4
3712	D5	I747	B9
3713	D5	I748	F8
3716	D5	I749	A10
3732	F4	I750	A10
3733	F4	I751	D8
3734	D11	I752	E8
3735	F5	I753	E8
3736	F3	I754	E9
3740	G2	I755	D10
3741	G2	I756	B9
3742	G3	I757	A9
3743	G4	I758	D10
3750	F9	I759	B9
3751	D8	I760	B8
3752	D8		
3753	E8		
3754	E9		
3755	B9		
3758	B8		
3759	F8		
3760	B9		
3761	F9		
5700	B11		
5704	B4		
5709	C2		
5712	C4		
5713	C5		
5730	E2		
5733	F5		
5735	F5		
5737	F5		
5738	F1		
5752	D8		
5753	E11		
5754	E11		
5755	A9		
5756	A9		
5757	A9		
5758	A8		
5759	B9		
6708	C2		
6709	C2		
6712	D4		
6733	F5		
6735	E6		
6736	E6		
6740	G2		
6751	E11		
7708	B4		
7710	C3		
7730	E3		
7735	E5		

SSB: Diversity Tables B1-B6

B1 TUNER & IF

Item	AP - non China	Europe	NAFTA/LT	AP - DVB	Europe - DVB	China	Description
1102						V	TUN V+U PLL IEC BGDKM B
1102		V					TUN V+U PLL IEC BGHIL B
1102			V				TUNER UV1338/A F S H-4
1102	V						TUNER UV1316E/A I H-4
1102				V	V		TUNER UV1318SD/A CP H N-4
1104		V			V		FIL SAW SM 38MHZ9 OFWK3953L R
1104						V	FIL SAW SM 38MHZ OFWM3956L R
1104			V				FIL SAW SM 45MHZ75 OFWM1967L R
1104	V			V			FIL SAW SM 38MHZ9 OFWK7265L R
1105						V	FIL SAW SM 38MHZ OFWK3955L R
1106		V			V		FIL SAW SM 38MHZ9 OFWK9656L R
1106						V	FIL SAW SM 38MHZ OFWK9352L R
1106	V			V			FIL SAW SM 38MHZ9 OFWK9361L R
3101	V		V			V	RST SM 0603 100R PM5 COL
3102	V		V			V	RST SM 0603 100R PM5 COL
3104		V			V		RST SM 0603 10K PM5COL
3104	V		V	V		V	RST SM 0603 JUMP. 0R05 COL
3107	V	V		V	V	V	RST SM 0603 6K8 PM5 COL
3108	V	V		V	V	V	RST SM 0603 2K2 PM5 COL
3109	V	V		V	V	V	RST SM 0603 2K2 PM5 COL
3110						V	RST SM 0603 2K2 PM5 COL
3111	V	V		V	V	V	RST SM 0603 22K PM5 COL
3112	V	V		V	V	V	RST SM 0603 18K PM5 COL
3113						V	RST SM 0603 22K PM5 COL
3114						V	RST SM 0603 47K PM5 COL
4102	V	V	V	V	V		RST SM 0603 JUMP. 0R05 COL
4103						V	RST SM 0603 JUMP. 0R05 COL
4104	V			V			RST SM 0603 JUMP. 0R05 COL
4106		V	V		V	V	RST SM 0603 JUMP. 0R05 COL
4107						V	RST SM 0603 JUMP. 0R05 COL
4108						V	RST SM 0603 JUMP. 0R05 COL
4110	V	V		V	V	V	RST SM 0603 JUMP. 0R05 COL
4111		V			V		RST SM 0603 JUMP. 0R05 COL
4113	V			V		V	RST SM 0603 JUMP. 0R05 COL
5101	V	V		V	V	V	FXDIND SM 0805 0U39 PM10 COL R
5101			V				FXDIND SM 0805 0U68 PM10 COL R
5102	V	V	V	V		V	FXDIND SM 0805 12U PM10 COL R
5102					V		FXDIND SM 1008 6U8 PM5 COL R
5107				V	V		FXDIND 0603 100MHZ 600R COL R
5107		V					RST SM 0603 100R PM5 COL
5108				V	V		FXDIND 0603 100MHZ 600R COL R
5108		V					RST SM 0603 100R PM5 COL
6103		V			V		DIO SIG SM BAS316 (COL) R
6105						V	DIO SIG SM 1SS356 (RHM0) R
7101	V	V		V	V	V	TRA SIG SM BC847BW (COL) R
7102						V	TRA SIG SM BC847BW (COL) R

B2 HERCULES

Item	LC4.3A AB (DVB-T)	LC4.3E AB/LC4.8E AB/LC4.9E AB (DVB-T)	LC4.3U/L	LC4.3E/LC4.8E/LC4.9E	LC4.3E W/O 3D COMB FILTER	LC4.3A - CHINA	LC4.3A - AP (non-China)	Description
2203	V	V		V	V	V	V	ELCAP SM 16V 10U PM20 COL R
2229			V					CER2 0805 X5R 6V3 10U PM10 R
2244	V	V		V	V			CER2 0402 Y5V 16V 100N COL
2245	V	V		V	V			CER2 0402 Y5V 16V 100N COL
2246	V	V		V	V			CER2 0402 Y5V 16V 100N COL
2255	V	V	V	V		V	V	CER2 0402 Y5V 16V 100N COL
2286	V	V	V	V		V	V	CER2 0402 Y5V 16V 100N COL
2289	V							CER2 0805 Y5V 10V 4U7 P8020 R
2289				V				RST SM 0603 150R PM5 COL
2290	V	V		V	V			CER2 0805 Y5V 10V 4U7 P8020 R
2291	V	V		V				CER2 0402 Y5V 16V 100N COL
2292		V						CER2 0402 Y5V 16V 100N COL
3250		V		V	V	V	V	RST SM 0402 100R PM5 COL
3251		V		V	V	V	V	RST SM 0402 100R PM5 COL
3252		V		V	V	V	V	RST SM 0402 100R PM5 COL
3253		V		V	V	V	V	RST SM 0402 100R PM5 COL
3255		V		V	V	V	V	RST SM 0402 JUMP. 0R05 COL
3256		V		V	V	V	V	RST SM 0402 JUMP. 0R05 COL
3257		V		V	V	V	V	RST SM 0402 JUMP. 0R05 COL
3258		V		V	V	V	V	RST SM 0402 1K PM5 COL
3259		V		V	V	V	V	RST SM 0402 1K PM5 COL
3260		V		V	V	V	V	RST SM 0402 1K PM5 COL
3270								RST SM 0402 10K PM5 COL
3282		V						RST SM 0603 150R PM5 COL
3285	V	V	V	V		V	V	RST SM 0402 JUMP. 0R05 COL
3286	V	V	V	V		V	V	RST SM 0402 100R PM5 COL
3291	V							RST SM 0402 47K PM5 COL
3292		V		V				RST SM 0402 12K PM5 COL
3292	V							RST SM 0402 47K PM5 COL
3293	V							RST SM 0402 47K PM5 COL
3294	V	V		V				RST SM 0402 47K PM5 COL
3295	V	V		V	V	V	V	RST SM 0402 100K PM5 COL
3296	V	V						RST SM 0402 100R PM5 COL
4206			V		V	V	V	RST SM 0805 JUMP. 0R05 COL R
4213	V	V						RST SM 0402 JUMP. 0R05 COL
4214	V	V						RST SM 0402 JUMP. 0R05 COL
4215	V	V						RST SM 0402 JUMP. 0R05 COL
5218	V	V		V				IND FXD 1206 EMI 100MHZ 120R R
6206	V	V						DIO SIG SM BAT54 SOD323 COL R
7208		V		V	V	V	V	TRA SIG SM BC847BW (COL) R
7209		V		V	V	V	V	TRA SIG SM BC847BW (COL) R
7210		V		V	V	V	V	TRA SIG SM BC847BW (COL) R
7217			V			V		IC SM TDA15011H/N1BD0 (PHSE) Y
7217	V	V		V	V		V	IC SM TDA15021H/N1B91 (PHSE) Y
7219	V	V		V				IC SM 74HC4053D (PHSE) R

B3 SYNC INTERFACE

Item	26/32PFxxxx - AP/NAFTA/LT	EU & AP DVB sets	LC4.3E/LC4.9x/LC4.8x/LC4.3A-China	26PF4310/10	Description
2449	V	V	V		CER2 0402 Y5V 16V 100N COL
3432		V			RST SM 0402 2K7 PM5 COL
3458	V	V	V		RST SM 0402 100R PM5 COL
3459	V	V	V		RST SM 0402 100R PM5 COL
3461	V	V	V		RST SM 0402 100R PM5 COL
3462	V	V	V		RST SM 0402 100R PM5 COL
4436				V	RST SM 0402 JUMP. 0R05 COL
4437				V	RST SM 0402 JUMP. 0R05 COL
4440	V	V	V		RST SM 0402 JUMP. 0R05 COL
4441	V	V	V		RST SM 0402 JUMP. 0R05 COL
6430	V		V	V	DIO REG SM PDZ2.4B (PHSE) R
6431	V		V	V	DIO SIG SM 1N4148WS (VISH) R
7436	V	V	V		IC SM 74LVC14APW (PHSE) R

B5 AUDIO WITHOUT AMPLIFIER

Item	26/32PF	37/42/50PF	Description
2612		V	CER2 0603 Y5V 10V 1U COL
2613	V		CER2 0603 Y5V 10V 1U COL
2616	V		CER2 0603 X5R 6V3 2U2 PM10 R
2617	V		CER2 0603 X5R 6V3 2U2 PM10 R
3615	V		RST SM 0402 10K PM5 COL
3616		V	RST SM 0402 1K PM5 COL
3617		V	RST SM 0402 1K PM5 COL
3618	V		RST SM 0402 22K PM5 COL
3619		V	RST SM 0402 10K PM5 COL
3620		V	RST SM 0402 10K PM5 COL
3623	V		RST SM 0402 47K PM5 COL
3625	V		RST SM 0402 3K3 PM5 COL
3627	V		RST SM 0402 22K PM5 COL
3628		V	RST SM 0402 10K PM5 COL
3629		V	RST SM 0402 22K PM5 COL
3630	V		RST SM 0402 330R PM5 COL
3630		V	RST SM 0402 470R PM5 COL
3631	V		RST SM 0402 330R PM5 COL
3631		V	RST SM 0402 470R PM5 COL
3632		V	RST SM 0402 RC31 39R PM5 R
3633		V	RST SM 0402 RC31 39R PM5 R
4601		V	RST SM 0603 JUMP. 0R05 COL
4602	V		RST SM 0603 JUMP. 0R05 COL
4603	V		RST SM 0603 JUMP. 0R05 COL
4606		V	RST SM 0603 JUMP. 0R05 COL
4609	V		RST SM 0603 JUMP. 0R05 COL
4610	V		RST SM 0603 JUMP. 0R05 COL
4611	V		RST SM 0603 JUMP. 0R05 COL
4612	V		RST SM 0603 JUMP. 0R05 COL
4613	V		RST SM 0603 JUMP. 0R05 COL
4614		V	RST SM 0603 JUMP. 0R05 COL
4615		V	RST SM 0603 JUMP. 0R05 COL
4616	V		RST SM 0603 JUMP. 0R05 COL
4617		V	RST SM 0603 JUMP. 0R05 COL
4618		V	RST SM 0603 JUMP. 0R05 COL
4619		V	RST SM 0603 JUMP. 0R05 COL
4620	V		RST SM 0603 JUMP. 0R05 COL
4621		V	RST SM 0603 JUMP. 0R05 COL
7603		V	TRA SIG SM BC847BW (COL) R
7604		V	TRA SIG SM BC847BW (COL) R
7607	V		TRA SIG SM BC847BW (COL) R

B6 DC DC CONVERTER

Item	26/32PF LCD	37/42PF LCD	42/50PF PDP	DVB PDP 42PF	DVB LCD 37PF	Description
2701	V	V			V	CER1 0402 NP0 50V 100P COL
2706		V	V	V	V	ELCAP SM 16V 10U PM20 COL R
2709		V	V	V	V	ELCAP SM 16V 47U PM20 COL R
2710		V	V	V	V	CER2 1210 Y5V 25V 10U P8020 R
2711		V	V	V	V	CER2 1210 Y5V 25V 10U P8020 R
2713		V	V	V	V	ELCAP SM SEV 16V 470U PM20 R
2714		V	V	V	V	CER2 0402 X7R 50V 220P COL
2715		V	V	V	V	CER2 0402 X7R 16V 22N PM10 R
2741		V	V	V	V	CER2 0603 X7R 10V 220N COL
2751	V	V			V	CER2 0402 Y5V 16V 100N COL
2752	V	V			V	ELCAP SM 16V 47U PM20 COL R
2760	V	V			V	CER2 1206 X7R 25V 1U PM10 R
2761		V	V	V	V	CER2 1206 X7R 25V 1U PM10 R
3708		V	V	V	V	RST SM 0402 10K PM5 COL
3709		V	V	V	V	RST SM 0402 6K8 PM5 COL
3712		V	V	V	V	RST SM 0603 RC22H 5K6 PM1 R
3713		V	V	V	V	RST SM 0603 RC22H 3K3 PM1 R
3716		V	V	V	V	RST SM 0402 4K7 PM5 COL
3740		V	V	V	V	RST SM 0402 1K5 PM5 COL
3741		V	V	V	V	RST SM 0402 1K5 PM5 COL
3742		V	V	V	V	RST SM 0402 15K PM5 COL
3743		V	V	V	V	RST SM 0402 22K PM5 COL
3755	V	V			V	RST SM 0402 10K PM5 COL
3758	V	V			V	RST SM 0402 15K PM5 COL
3760	V	V			V	RST SM 0402 100R PM5 COL
3761		V	V	V	V	RST SM 0402 100R PM5 COL
5700	V	V			V	IND FXD 1206 EMI 100MHZ 120R R
5704		V	V	V	V	IND FXD SM 1206 10U PM20 R
5709		V	V	V	V	IND FXD SM 7032 10U PM20 R
5712		V	V	V	V	IND FXD SM 12565 33U PM20 R
5713		V	V	V	V	INDFXD SM 10145 10U PM20 R
5756	V	V			V	IND FXD 1206 EMI 100MHZ 120R R
5757	V	V			V	IND FXD 1206 EMI 100MHZ 120R R
6708		V	V	V	V	DIO REC SS24 COL R
6709		V	V	V	V	DIO REC SS14 COL R
6712		V	V	V	V	DIO REC SS36 COL R
6740		V	V	V	V	DIO REG SM PDZ8.2B (PHSE) R
7708		V	V	V	V	IC SM LF33CPT (ST00) R
7710		V	V	V	V	IC SM E-L5973D (ST00) R
7741		V	V	V	V	TRA SIG SM BC847BW (COL) R
7742		V	V	V	V	TRA SIG SM BC847BW (COL) R
7754	V	V			V	FET POW SM SI2301BDS-E3(VISH)R
7755	V	V			V	TRA SIG SM PDTC114ET (COL) R

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SSB: Scaler

B7 SCALER

B7

FROM SDRAM → B11 (#RESET)

FROM SDRAM → B10 (FSVREF)

TO SDRAM ← B10

TO SCALER INTRF ← B9

TO FLASH CONTROL ← B11

TO HDMI ← B12

TO EPLD ← B20

TO COLUMBUS ← B19

FROM HDMI → B12

FROM MUX-SYNC INTF → B13 (COL_Do(8)_INV)

FROM SYNC INTERFACE → B3 (V_1FH, H_1FH)

COL_YB(1:8)

COL_Do(1:7)

FROM MUX-SYNC INTF ← B13

FROM HDMI ← B12

FROM COLUMBUS → B19

TO SCALER INTRF ← B9

TO TUNER ← B1

TO DC-DC CONVERTER ← B6

TO MUX-SYNC INTF ← B13

TO FLASH / CONTROL ← B11

TO HERCULES → B2

TO ANALOG-IO → B15/B23 (SCART) (CINCH)

FROM DIGITAL-IO (CINCH) → B22

TO EPLD ← B20

FROM HDMI → B12

RESERVED FROM ANALOG-IO (CINCH) → B23

TO DIGITAL-IO → B14 (SCART)

FROM MUX-SYNC INTF ← B13

TO HDMI ← B12

TO FLASH / CONTROL ← B11

TO FLASH / CONTROL ← B11

TO COLUMBUS ← B19

TO MUX-SYNC INTF ← B13

TO FLASH / CONTROL ← B11

TO HERCULES → B2

TO ANALOG-IO → B15/B23 (SCART) (CINCH)

TO DC-DC CONVERTER ← B6

TO TUNER ← B1

TO SCALER INTRF ← B9

TO EPLD ← B20

TO HDMI ← B12

TO DIGITAL-IO → B14 (SCART)

FROM HDMI → B12

FROM COLUMBUS → B19

FROM MUX-SYNC INTF ← B13

TO FLASH / CONTROL ← B11

TO HERCULES → B2

TO ANALOG-IO → B15/B23 (SCART) (CINCH)

FROM DIGITAL-IO (CINCH) → B22

TO EPLD ← B20

RESERVED FROM ANALOG-IO (CINCH) → B23

TO DIGITAL-IO → B14 (SCART)

1801 B12	7801-12 A4
1802 G14	7801-4 C11
2800 A1	7801-5 E11
2801 A1	7801-6 F4
2802 A1	7801-9 G11
2803 A1	F800 A1
2804 A2	F801 B3
2805 A2	F802 A9
2806 A2	F803 G14
2807 A2	F804 G14
2808 A2	I800 G2
2809 A3	I801 B12
2810 A3	I802 F10
2811 A3	I803 F10
2812 A3	I804 E12
2813 B2	I805 E12
2814 B3	I806 F12
2815 A9	I807 F12
2816 A9	I808 F12
2817 A10	I809 G12
2818 A10	I810 G12
2819 A10	I811 G14
2820 A12	I812 F3
2821 A12	I813 A1
2822 A12	I815 G3
2823 A10	I816 G2
2824 A12	I817 H5
3800 B3	I818 F3
3801-1 C1	I819 I10
3801-2 C1	I820 I10
3801-3 C1	I821 I10
3801-4 C1	I822 G12
3802-1 C1	
3802-2 C1	
3802-3 C1	
3802-4 C1	
3803-1 D1	
3803-2 D1	
3803-3 C1	
3803-4 C1	
3804-1 D1	
3804-2 D1	
3804-3 D1	
3804-4 D1	
3805-1 D1	
3805-2 D1	
3805-3 D1	
3805-4 D1	
3806-1 D1	
3806-2 E1	
3806-3 E1	
3806-4 E1	
3807-1 E1	
3807-2 E1	
3807-3 E1	
3807-4 E1	
3808-1 E1	
3808-2 E1	
3808-3 E1	
3808-4 E1	
3809-1 B6	
3809-2 B6	
3809-3 B6	
3809-4 B6	
3810-1 B6	
3810-2 B6	
3810-3 B6	
3810-4 B6	
3811-1 C6	
3811-2 C6	
3811-3 C6	
3811-4 C6	
3812-1 C6	
3812-2 C6	
3812-3 C6	
3812-4 C6	
3813-1 C6	
3813-2 D6	
3813-3 D6	
3813-4 D6	
3814 D6	
3815 D6	
3816 D6	
3817 D6	
3818 E6	
3819 F2	
3820 F1	
3822 G5	
3823 F5	
3824 B12	
3825-1 F9	
3825-2 F9	
3825-3 F9	
3825-4 F9	
3826-1 F9	
3826-2 F9	
3826-3 F9	
3826-4 F9	
3827 F13	
3828 F13	
3829 F13	
3830 H10	
3831 I9	
3832 I9	
3833 I9	
3834 G13	
3835 G13	
3836 G13	
3837 G14	
3838 G14	
3839 G3	
3840 I3	
3841 H14	
4801 H5	
7801-11 A11	

SSB: Scaler

B8 SCALER

SUPPLY FOR SCALER

+3V3SW
5900 +3V3_PLL
5901 +3V3_ADC
5902 +3V3_DVI
5903 +3V3_IO
5904 F900 +3V3_LBADC
5905 +3V3_LVDSA
5906 +3V3_LVDSB
5907 +3V3_LVDS

+3V3SW 7900 LF25CDT I900 5908 +2V5_DDR
2900 100n, 2901 1n0, 2902 470u 16V

+3V3SW 7901 LD1086D2T18 I901 I902 +1V8
2903 100n, 2904 47u 16V
5909 +1V8_ADC
5910 +1V8_DVI
5911 +1V8_CORE

+3V3_IO F901 2905 100u 16V; 2906–2916 100n
+1V8_CORE F902 2917 100u 16V; 2918–2929 100n

7801-13 GM1501-LF-BD SUPPLY
IO_3.3: AC10 AC8 AC6 AC4 AB4 Y4 W4 D23 D22 D17
CORE_1.8: U17 U16 U11 U10 T7 T6 T1 L16 L11 K17 K16 K11 K10
D_GND: A13 B13 K12 K13 K14 K15 L10 L12 L13 L14 L15 L17 M10 M11 M12 M13 M14 M15 M16 M17 N10 N11 N12 N13 N14 N15 N16 N17 P10 P11 P12 P13 P14 P15 P16 P17 R10 R11 R12 R13 R14 R15 R16 R17 T10 T12 T13 T14 T15 U12 U13 U14 U15 AD18
I905

7801-14 GM1501-LF-BD NC
NC A1, NC C5, NC D5, NC AC17, NC K3, NC F1

+3V3_LBADC
2940 47u 16V, 2941 100n
7801-3 GM1501-LF-BD ADC C13
KEYBOARD 4900 RES
C12 LBADC_IN1
(RES) B12 LBADC_IN2
(RES) A12 LBADC_IN3
D12 LBADC_RETURN
LBADC_GND D13
LBADC_33
2942 100n

B2

F903: 2930 2931 2932 2933 100n
+1V8_DVI: D6 D8 D9 D10
F904: 2934 47u 16V; 2935–2939 100n
+3V3_DVI: C10 C9 C8 C6
7801-2 GM1501-LF-BD DVI
DVI_1.8: D11
DVI_3.3

B14 TO DIGITAL-IO (SCART ONLY)
SCL_DVI N4 DVI_SCL|GPI_07
SDA_DVI N3 DVI_SDA|GPI_08
RXC+IN A6 RXCp
RXC-IN B6 RXCn
RX0+IN A8 RX0p
RX0-IN B8 RX0n
RX1+IN A9 RX1p
RX1-IN B9 RX1n
RX2+IN A10 RX2p
RX2-IN B10 RX2n
B11 REXT
DVI_GND: A7 A11 B5 B7 C7 D7 D11
I906

7801-10 GM1501-LF-BD DISPLAY PWR
AD19 LVDSA_GND_1, AC19 LVDSA_GND_2, AC20 LVDSA_GND_3
AC13 LVDSB_GND_1, AC14 LVDSB_GND_2, AC15 LVDSB_GND_3, AD17 VSSD33_LVDS
VDDD33_LVDS AE17 F905 +3V3_LVDS
LVDSA_3.3_3 AC22 F906 +3V3_LVDSA
LVDSA_3.3_2 AC21
LVDSA_3.3_1 AD20
LVDSB_3.3_3 AC12 F907 +3V3_LVDSB
LVDSB_3.3_2 AD13
LVDSB_3.3_1 AD12
2945 22u 16V, 2946–2948 100n, 2949 100n
2950 22u 16V, 2951 100n, 2952 100n

B18 ADC
B19 & B2 TO COLUMBUS / HERCULES
B13 TO MUX-SYNC INTERFACE
B16 TO TOP CONN.
FROM DC-DC CONVERTER B6

7801-7 GM1501-LF-BD CTRL
3900 3K3 I904 AC16 OEXTR
FAN_SPEED C26 PWM0|GPIO_10
HD_FILTER C25 PWM1|GPIO_11
PPWR|GPIO_08 A26 PANEL-PWR-CTL
PBIAS|GPIO_09 B26 LAMP_ON_OFF
DCLK|GPIO_17 AC7 NC
PWM2|GPIO_12 D26 I903 BU_LHT_ADJ2 (RES)

+3V3STBY
3901 RES, 3902 RES
2953 100n, 2954 100n
F908 +1V8_ADC
+3V3_ADC F909
2955 22u 16V; 2956–2959 100n
7801-1 GM1501-LF-BD ANA-IN
ADC_1.8: A4 A3
ADC_3.3: B3 E3 D3 A2
AVSYNC L3
AHSYNC L4
SCL, SDA 3903 100R N2, 3904 100R N1 VGA_SCL|GPI_05, VGA_SDA|GPI_06
SOG C3
R_PR+ D2 REDp
R_PR- D1 REDn
G_Y+ C2 GREENp
G_Y- C1 GREENn
B_PB+ B2 BLUEp
B_PB- B1 BLUEn
ADC_AGND C4 D4 E1 E2 E4 A5 B4 F910
ADC_DGND B4

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2900 D1 F906 D10
2901 D2 F907 D10
2902 D2 F908 E9
2903 E1 F909 E10
2904 E2 F910 G9
2905 A4 I900 C2
2906 A4 I901 E1
2907 A4 I902 E2
2908 A4 I903 G6
2909 A4 I904 F4
2910 A5 I905 C4
2911 A5 I906 E6
2912 A5
2913 A5
2914 A6
2915 A6
2916 A6
2917 A7
2918 A7
2919 A7
2920 A7
2921 A7
2922 A8
2923 A8
2924 A8
2925 A8
2926 A9
2927 A9
2928 A9
2929 A9
2930 C5
2931 C5
2932 C5
2933 C5
2934 C7
2935 C7
2936 C7
2937 C8
2938 C8
2939 C8
2940 B9
2941 B10
2942 C9
2945 D10
2946 D11
2947 D11
2948 D11
2949 D11
2950 D10
2951 D11
2952 D11
2953 E8
2954 E8
2955 E10
2956 E10
2957 E10
2958 E11
2959 E11
3900 F4
3901 E8
3902 E8
3903 F8
3904 F8
4900 B9
5900 A1
5901 B1
5902 B1
5903 B1
5904 B1
5905 C1
5906 C1
5907 C1
5908 C2
5909 D2
5910 E2
5911 E2
7801-1 F9
7801-10 C9
7801-13 B6
7801-14 A10
7801-2 C6
7801-3 B10
7801-7 F5
7900 C1
7901 D1
F900 B2
F901 A4
F902 A7
F903 C5
F904 C7
F905 D10

SSB: Scaler Interface

B9 SCALER INTERFACE

B9

7801-8
GM1501-LF-BD

ACp|GPIO_G06_B6|DORED8 AE20
ACn|GPIO_G06_B7|DORED9 AF20
A3p|GPIO_G06_B4|DORED6 AE19
A3n|GPIO_G06_B5|DORED7 AF19
A2p|GPIO_G05_B1|DOGRN3 AE21
A2n|GPIO_G05_B2|DOGRN4 AF21
A1p|GPIO_G05_B4|DOGRN6 AE22
A1n|GPIO_G05_B5|DOGRN7 AF22
A0p|GPIO_G05_B6|DOGRN8 AE23
A0n|GPIO_G05_B7|DOGRN9 AF23
NC
SHIELD5|DEBLU5 AD14
SHIELD4|DEBLU2 AE13
SHIELD3|DEGRN5 AE11
SHIELD2|DEGRN4 AD11
SHIELD1|DEGRN3 AC11
SHIELD0|DEGRN2 AF10
BCp|DEGRN8 AE12
BCn|DEGRN9 AF13
B3p|DEGRN6 AF11
B3n|DEGRN7 AF12
B2p|DEBLU3 AF14
B2n|DEBLU4 AE14
B1p|DEBLU6 AF15
B1n|DEBLU7 AE15
B0p|DEBLU8 AF16
B0n|DEBLU9 AE16
LVDS

TXBC+ TXBC- TXB3+ TXB3- TXB2+ TXB2- TXB1+ TXB1- TXB0+ TXB0-

B20 TO EPLD

B7 TO SCALER

BU_LHT_ADJ1

3A02 1K0

RESERVED

IA07 4A02 RES

RES +5VSWI

3A03 RES

3A05 RES

7A01 SI2301DS-T1

IA06 3A06 10K IA00

3A04 1K0

2A03 1u0

4A03

IA05 BACKLIGHT_DIM

B20 FROM EPLD

B16 TO TOP CONNECTORS

BACKLIGHT_CTRL

FOR PDP ONLY

B21 TO EPLD

+3V3SW

3A07 10K 3A08 10K

2A00 100n

+3V3SW 5A00

7A00 PCA9515ADP

VCC SDA1 SDA0 SCL1 SCL0 EN NC GND

SDA_DMA_BUS1_DISP 3A00 68R IA08 SDA_IO

SCL_DMA_BUS1_DISP 3A01 68R IA09 SCL_IO

2A01 100p 2A02 100p

4A04 (PDP) BUF_ENABLE

4A00_RES 4A01_RES

FOR UFD ONLY

+3V3STBY

2A13 100n 3A13 10K

+3V3STBY 3A11 4K7

+5V 3A14 4K7

7A03 BC847BW

B2 FROM HERCULES

SC_STANDBY

3A10 10K IA03

7A02 BC847BW

2A12 10n

6A01 BZX384-C3V9

STANDBY

4A05 4A06

2A00 E3
2A01 F2
2A02 F2
2A03 C7
2A12 F6
2A13 E8
3A00 E2
3A01 E2
3A02 C5
3A03 C6
3A04 C6
3A05 C6
3A06 C7
3A07 E2
3A08 E2
3A10 F6
3A11 E7
3A13 E8
3A14 E9
4A00 F3
4A01 F3
4A02 B6
4A03 D6
4A04 F4
4A05 F6
4A06 F8
5A00 E3
6A01 F8
7801-8 A2
7A00 E4
7A01 C6
7A02 F6
7A03 E8
IA00 C7
IA03 F6
IA05 B8
IA06 C7
IA07 B6
IA08 E3
IA09 E3

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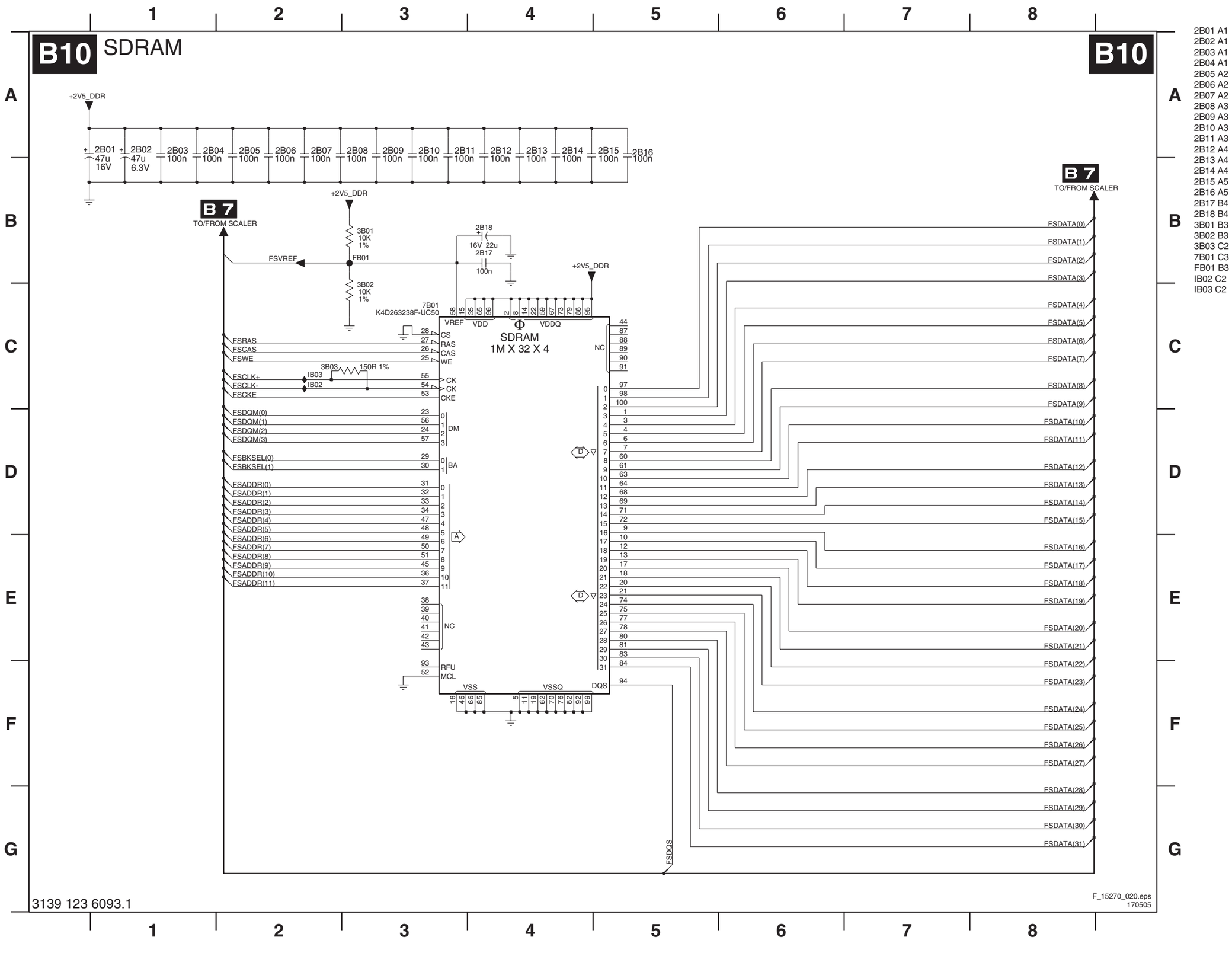
SSB: SDRAM


B10 SDRAM
B10
+2V5_DDR
2B01 47u 16V
2B02 47u 6.3V
2B03 100n
2B04 100n
2B05 100n
2B06 100n
2B07 100n
2B08 100n
2B09 100n
2B10 100n
2B11 100n
2B12 100n
2B13 100n
2B14 100n
2B15 100n
2B16 100n
B 7
TO/FROM SCALER
3B01 10K 1%
3B02 10K 1%
FSVREF
FB01
2B18 16V 22u
2B17 100n
7B01
K4D263238F-UC50
SDRAM
1M X 32 X 4
VREF
VDD
VDDQ
VSS
VSSQ
NC
RFU
MCL
DQS
FSRAS
FSCAS
FSWE
FSCLK+
FSCLK-
FSCKE
3B03 150R 1%
IB03
IB02
FSDQM(0)
FSDQM(1)
FSDQM(2)
FSDQM(3)
FSBKSEL(0)
FSBKSEL(1)
FSADDR(0)
FSADDR(1)
FSADDR(2)
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FSDATA(0)
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FSDATA(31)
FSDQS
2B01 A1
2B02 A1
2B03 A1
2B04 A1
2B05 A2
2B06 A2
2B07 A2
2B08 A3
2B09 A3
2B10 A3
2B11 A3
2B12 A4
2B13 A4
2B14 A4
2B15 A5
2B16 A5
2B17 B4
2B18 B4
3B01 B3
3B02 B3
3B03 C2
7B01 C3
FB01 B3
IB02 C2
IB03 C2
F_15270_020.eps
170505
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SSB: Flash / Control

B11 FLASH / CONTROL

B11

B 7 TO SCALER

B 7 TO SCALER

+3V3_IO

5C00

FC00

2C00 100n

2C01 10u 16V

7C00 M29W040B-55K1

ROM 512Kx8 [FLASH]

OCMADDR(0) 12
OCMADDR(1) 11
OCMADDR(2) 10
OCMADDR(3) 9
OCMADDR(4) 8
OCMADDR(5) 7
OCMADDR(6) 6
OCMADDR(7) 5
OCMADDR(8) 27
OCMADDR(9) 26
OCMADDR(10) 23
OCMADDR(11) 25
OCMADDR(12) 4
OCMADDR(13) 28
OCMADDR(14) 29
OCMADDR(15) 3
OCMADDR(16) 2
OCMADDR(17) 30
OCMADDR(18) 1

A 0 512K-1

DQ 0 7

OCMDATA(0) 13
OCMDATA(1) 14
OCMDATA(2) 15
OCMDATA(3) 17
OCMDATA(4) 18
OCMDATA(5) 19
OCMDATA(6) 20
OCMDATA(7) 21

#OCM_RE 24 OE
#OCM_WE 31 WE
#ROM_CS 22 CE

32 16

OCMADDR(0:19)

OCMDATA(0:7)

+3V3_IO

3C06-1 1 8 10K
3C06-2 2 7 10K
3C06-3 3 6 10K
3C06-4 4 5 10K

3C04-1 1 10K
3C04-2 2 10K
3C04-3 3 10K
3C04-4 4 10K
3C05 10K

3C11 RES
3C12 RES
3C13 RES
3C14 RES
3C15 RES

+3V3_IO

3C07-1 1 8 10K
3C07-2 2 7 10K
3C07-3 3 6 10K
3C07-4 4 5 10K

3C16-4 5 4
3C17 10K
3C16-3 6 3 10K
3C16-1 8 1
3C16-2 7 2
3C18 10K

3C08-2 2 7 10K
3C08-1 1 8 10K
3C08-3 3 6 10K
3C08-4 4 5 10K

FC09 FC10 FC08

3C09-1 1 8 10K
3C09-2 2 7 10K
3C09-3 3 6 10K
3C09-4 4 5 10K

FC07

3C10-1 1 8 10K
3C10-2 2 7 10K
3C10-3 3 6 10K
3C10-4 4 5 10K

FC06

3C19 RES
3C20 RES
3C21 RES

+3V3SW

3C00 10K

2C02 100n

3V2

7C01 M24C32-WMN6

Φ (4Kx8) EEPROM

NVM_WP_SCALER 0V FC01 7 WC
SCL_IO 3V2 FC02 6 SCL
SDA_IO 3V2 FC03 5 SDA

ADR 0 1 2

4

+3V3SW

3V2

2C03 100n

1C00 SKQR

For Software Development only - (RES)

FC04

3C01 10K

7C02 PST596J

MR SUB VCC GND VOUT

0V 3V2

FC05

3C02 1K0

3C03 RES

#RESET

B 7 & B 12 TO SCALER TO HDMI

& B 19 TO COLUMBUS

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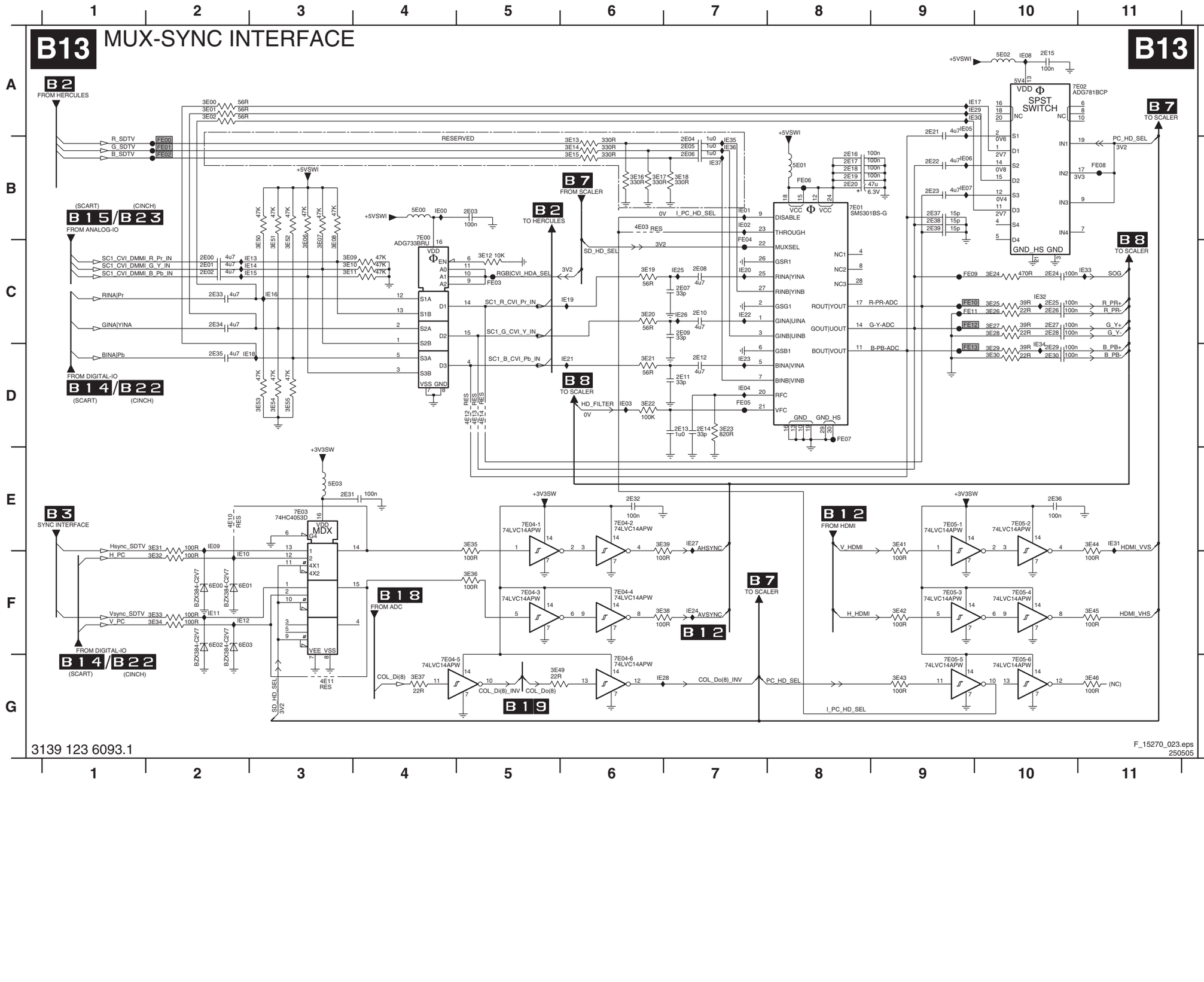
1C00 E4
2C00 A3
2C01 A3
2C02 E2
2C03 E5
3C00 E2
3C01 E5
3C02 E6
3C03 E6
3C04-1 A6
3C04-2 A6
3C04-3 A6
3C04-4 A6
3C05 A6
3C06-1 B5
3C06-2 B5
3C06-3 B5
3C06-4 B5
3C07-1 B5
3C07-2 B5
3C07-3 B5
3C07-4 B5
3C08-1 B5
3C08-2 B5
3C08-3 C5
3C08-4 C5
3C09-1 C5
3C09-2 C5
3C09-3 C5
3C09-4 C5
3C10-1 C5
3C10-2 C5
3C10-3 C5
3C10-4 C5
3C11 A6
3C12 A6
3C13 A6
3C14 B6
3C15 B6
3C16-1 B7
3C16-2 B7
3C16-3 B6
3C16-4 B6
3C17 B6
3C18 B7
3C19 C6
3C20 C7
3C21 C7
5C00 A3
7C00 A2
7C01 E3
7C02 E5
FC00 A3
FC01 E2
FC02 E2
FC03 E2
FC04 E4
FC05 E6
FC06 C6
FC07 C6
FC08 C7
FC09 B7
FC10 B7

SSB: MUX-Sync Interface

B13 MUX-SYNC INTERFACE



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2E00 C2	3E50 C3	IE34 D10
2E01 C2	3E51 C3	IE35 B7
2E02 C2	3E52 C3	IE36 B7
2E03 B5	3E53 D3	IE37 B7
2E04 B7	3E54 D3	
2E05 B7	3E55 D3	
2E06 B7	4E03 B6	
2E07 C7	4E10 E2	
2E08 C7	4E11 G3	
2E09 C7	4E12 D5	
2E10 C7	4E13 D5	
2E11 D7	4E14 D5	
2E12 D7	5E00 B4	
2E13 D7	5E01 B8	
2E14 D7	5E02 A10	
2E15 A10	5E03 E3	
2E16 B8	6E00 F2	
2E17 B8	6E01 F2	
2E18 B8	6E02 F2	
2E19 B8	6E03 F2	
2E20 B8	7E00 B4	
2E21 A9	7E01 B8	
2E22 B9	7E02 A10	
2E23 B9	7E03 E3	
2E24 C10	7E04-1 E5	
2E25 C10	7E04-2 E6	
2E26 C10	7E04-3 F5	
2E27 C10	7E04-4 F6	
2E28 C10	7E04-5 G5	
2E29 D10	7E04-6 G6	
2E30 D10	7E05-1 E9	
2E31 E3	7E05-2 E10	
2E32 E6	7E05-3 F9	
2E33 C2	7E05-4 F10	
2E34 C2	7E05-5 G9	
2E35 D2	7E05-6 G10	
2E36 E10	FE00 B2	
2E37 B9	FE01 B2	
2E38 B9	FE02 B2	
2E39 B9	FE03 C5	
3E00 A2	FE04 C7	
3E01 A2	FE05 D7	
3E02 A2	FE06 B8	
3E06 C3	FE07 D8	
3E07 C3	FE08 B11	
3E08 C3	FE09 C9	
3E09 C3	FE10 C9	
3E10 C3	FE11 C9	
3E11 C3	FE12 C9	
3E12 C5	FE13 D9	
3E13 B6	IE00 B4	
3E14 B6	IE01 B7	
3E15 B6	IE02 B7	
3E16 B6	IE03 D6	
3E17 B6	IE04 D7	
3E18 B7	IE05 A9	
3E19 C6	IE06 B9	
3E20 C6	IE07 B9	
3E21 D6	IE08 A10	
3E22 D6	IE09 E2	
3E23 D7	IE10 F2	
3E24 C10	IE11 F2	
3E25 C10	IE12 F2	
3E26 C10	IE13 C3	
3E27 C10	IE14 C3	
3E28 C10	IE15 C3	
3E29 D10	IE16 C3	
3E30 D10	IE17 A10	
3E31 E2	IE18 D2	
3E32 F2	IE19 C6	
3E33 F2	IE20 C7	
3E34 F2	IE21 D6	
3E35 E5	IE22 C7	
3E36 F5	IE23 D7	
3E37 G4	IE24 F7	
3E38 F6	IE25 C7	
3E39 E6	IE26 C7	
3E41 E9	IE27 E7	
3E42 F9	IE28 G6	
3E43 G9	IE29 A10	
3E44 E11	IE30 A10	
3E45 F11	IE31 E11	
3E46 G11	IE32 C10	
3E49 G5	IE33 C11	

SSB: Digital I/O

B14 DIGITAL IO

B14

B13 TO MUX-SYNC INTERFACE

B2 To HERCULES

B8 TO SCALER

B7 TO SCALER

RGB/COMPONENT VIDEO INPUT
1F00-4 YKF45-7005
5F00 2F00 RES 3F00 75R
5F01 2F02 RES 3F09 75R 2F04 100p
5F02 2F05 RES 3F11 75R
3F10 1R0
IF12 IF13 IF14 IF15
IF11 RINA|Pr
IF17 GINA|YINA
H_PC
IF20 BINA|Pb
V_PC

PC AUDIO IN
1F01 YKB21-5101A
IF04 IF05
S001 S002
3F25 10K 3F24 10K
IF23 IF22
2F13 180p 2F14 180p
3F26 15K 3F27 15K
2F16 2u2 2F15 2u2
AudioIN2L AudioIN2R

DDC_5V
7F03 M24C02-WMN6
2F07 100n
(256x8) EEPROM
WC SCL SDA ADR
IF00 3F16 10K
3F17 10K 3F18 10K
SCL_DVI SDA_DVI

DVI INPUT
ROW_A 1F00-1 YKF45-7005
FF00 FF01 FF02 FF03 FF04 FF05
3F28 100R 3F29 100R
3F19 1R0
2F08 330p 2F09 330p 2F10 100p
RX2-IN RX2+IN

DVI CONNECTOR
ROW_B 1F00-2 YKF45-7005
FF06 FF07 FF08 IF06 IF07 FF09
DVI_5V 3F20 100R IF01
3F21 1K0
2F11 330p 2F12 330p
BAS316 6F00 +5VSWI
6F01 BAS316 3F22 10K 3F23 1K0
5F03 IF03 IF02 IF21
DDC_5V HOT_PLUG
RX1-IN RX1+IN

ROW_C 1F00-3 YKF45-7005
FF10 FF11 IF08 FF12 FF13
RX0-IN RX0+IN
RXC+IN RXC-IN

1F00-1 D1
1F00-2 E1
1F00-3 F1
1F00-4 B1
1F01 A7
2F00 A2
2F02 B2
2F04 B3
2F05 C2
2F07 C3
2F08 E2
2F09 E2
2F10 E3
2F11 F2
2F12 F2
2F13 B9
2F14 B9
2F15 B9
2F16 B9
3F00 A2
3F09 B2
3F10 B3
3F11 C2
3F16 D4
3F17 D4
3F18 D4
3F19 E2
3F20 F2
3F21 F2
3F22 F3
3F23 F3
3F24 B8
3F25 B8
3F26 B9
3F27 B9
3F28 E2
3F29 E2
5F00 A3
5F01 B3
5F02 C3
5F03 F4
6F00 F4
6F01 F3
7F03 D2
FF00 D1
FF01 E1
FF02 E1
FF03 E1
FF04 E1
FF05 E1
FF06 E1
FF07 F1
FF08 F1
FF09 F1
FF10 F1
FF11 G1
FF12 G1
FF13 G1
IF00 D3
IF01 F2
IF02 F4
IF03 F5
IF04 B8
IF05 B8
IF06 F1
IF07 F1
IF08 G1
IF11 A6
IF12 B1
IF13 B1
IF14 B2
IF15 B2
IF17 B6
IF20 C6
IF21 F5
IF22 B9
IF23 B9
S001 B8
S002 B8

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SSB: SCART Analogue I/O

B15 SCART ANALOGUE IO

B15

SCART 1

1G01-1
Audio-R_out
Audio-R_in
Audio-L_out
Audio-L_in
RGB-B_in
Function_Sw
RGB-G_in
RGB-R_in
RGB-BL_in
Terr_CVBS_out
Video_in
HR-AR0761S-2
MT 1G01-2

SCART 2

1G02-1
Audio-R_out
Audio-R_in
Audio-L_out
Audio-L_in
RGB-B_in
Function_Sw
RGB-G_in
RGB-R/YC-C_in
CVBS_out
Video/YC-Y_in
HR-AR0761S-2
MT 1G02-2

TO HERCULES B2

SC1_R B2
SC1_R_RF_OUT B2
SC1_COMP_AV1_R_IN B2
SC1_L B2
SC1_L_RF_OUT B2
SC1_COMP_AV1_L_IN B2
CVI_Pb_IN
CVI_Y_IN
CVI_Pr_IN
IG09_STATUS_1 B2
SC1_CVBS_RF_OUT B2
SC1_CVBS_IN B2
SC2_R B2
SC2_R_MON_OUT B2
SC2_L B2
SC2_L_MON_OUT B2
STATUS_2 B2
SC2_CVBS_MON_OUT B2
SC2_Y_IN

RESERVED FOR DMMI +5VSW

7G07 74HC4053D VDD MDJ
7G08 BC847B
BAS316
SC2_Y_IN_1
SC2_L_IN_1
SC2_R_IN_1
SC2_L_IN DMMI_L_IN AV2_DMMI_SW DMMI_RGB_SW
SC2_R_IN DMMI_R_IN
DMMI_CVBS_IN

RESERVED FOR DMMI +5VSW 5G01

7G09 ADG734BRU SPDT SWITCH
SC1_FBL_IN
SC1_FBL_IN_1
DMMI_FBL_IN
DMMI_RGB_SW
CVI_Pr_IN
SC1_CVI_DMMI_R_Pr_IN
DMMI_R_Pr_IN
SC1_CVI_DMMI_G_Y_IN
SC1_CVI_DMMI_B_Pb_IN

B13 TO MUX-SYNC INTF
B2 TO HERCULES

B17 FROM SIDE CONNECTOR
FRONT_C_IN
FRONT_Y_CVBS_IN
B7 FROM SCALER
SC2_C_IN
SC2_AV3_C_IN
SC2_AV3_Y_IN
SC2|AV2_SIDE_SW
0V AV2_DMMI_SW

7G10 74HC4053D VDD MDX

B2 TO HERCULES
SW_I2C_SDA
SW_I2C_SCL
POWER-DOWN_BOLT-ON

1G03 DMMI CONNECTOR
AF732L-N2G1A
DMMI_B_Pb_IN
DMMI_G_Y_IN
SC2_L_MON_OUT
SC2_R_MON_OUT
SC2_CVBS_MON_OUT
IR
HP_DET_R_DC
SC_STANDBY
ITV_IR_SW_RESET
+3V3STBY

RESERVED FOR DMMI

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1G01-1 A1	3G95 I9	IG55 C11
1G01-2 E1	3G96 I9	IG56 D10
1G02-1 F1	3G99 I8	IG57 B13
1G02-2 J1	3S00 J9	IG58 B13
1G03 G15	3S01 G9	IG59 D14
2G01 A3	3S03 J8	IG60 E11
2G02 A2	4G00 A3	IG61 F11
2G03 B3	4G01 B3	IG62 F11
2G04 B3	4G05 G3	IG63 F11
2G05 A3	4G06 G3	IG64 E12
2G06 B3	4G09 B11	IG67 F12
2G07 A4	4G10 B11	IG69 F12
2G08 A4	4G11 D12	IG73 I8
2G09 B3	4G12 D12	IG75 I9
2G10 B3	4G13 D12	IG76 J8
2G11 B4	4G14 E9	IG78 J9
2G12 B4	4G15 F9	IG79 K9
2G16 E4	4G16 G11	IG80 I10
2G17 E5	4G17 G11	S011 A2
2G18 G4	4G18 J5	S012 B2
2G19 G4	4G19 H9	S013 B2
2G20 G5	4G20 K9	S014 B2
2G21 G4	4G21 I9	S015 C2
2G22 H4	4G22 K10	S016 C2
2G23 H4	4G26 E4	S017 C3
2G24 G5	5G00 E4	S018 C2
2G25 H4	5G01 D10	S019 D2
2G26 I5	5G02 I11	S020 E2
2G28 J4	6G00 F3	S021 E2
2G29 B11	6G01 K3	S022 E2
2G30 B11	6G02 B13	S023 F2
2G31 C11	6G03 B2	S024 G3
2G32 C11	6G04 C2	S025 G3
2G33 C13	6G05 A2	S026 H3
2G34 D11	6G06 B2	S027 H2
2G35 D11	6G07 F2	S028 G2
2G36 F9	6G08 F2	S029 H2
2G37 F9	6G09 G2	S030 H2
2G38 F12	6G10 G2	S031 H2
2G39 E13	7G03 E4	S032 I2
2G40 E13	7G05 J4	S033 I2
2G41 F13	7G07 B11	S034 I2
2G43 I14	7G08 B13	S035 J2
2G45 I14	7G09 E11	S036 K2
2G46 I14	7G10 J10	
2G47 J11	FG00 A2	
2G48 G3	FG01 A2	
2G49 G3	FG02 B1	
2G50 H3	FG03 B2	
2G51 H3	FG04 B2	
2G52 F2	FG05 C2	
2G53 K2	FG06 C2	
2G55 I8	FG07 C2	
2G56 J8	FG08 D2	
2G63 B10	FG09 E2	
2G64 C10	FG10 D2	
2G65 K9	FG11 E2	
2G66 I9	FG12 F2	
3G00 A3	FG13 F6	
3G01 A3	FG14 G2	
3G02 A4	FG15 G2	
3G03 B4	FG16 G1	
3G04 B3	FG17 G2	
3G05 B3	FG18 H2	
3G06 B4	FG19 H1	
3G07 B4	FG20 I2	
3G08 J5	FG21 H2	
3G09 I4	FG22 J2	
3G12 C3	FG23 J2	
3G13 C3	FG24 C1	
3G14 D3	FG25 C1	
3G15 C3	FG26 G2	
3G16 C3	FG27 H2	
3G17 D3	FG28 H2	
3G26 D2	FG30 I2	
3G27 D3	FG32 G14	
3G28 E3	FG33 G14	
3G29 E3	FG34 G14	
3G30 E3	FG35 G14	
3G31 F3	FG36 G14	
3G32 E4	FG37 H14	
3G33 F3	FG38 H14	
3G34 E5	FG39 H14	
3G37 G3	FG40 H15	
3G38 G3	FG41 H14	
3G39 G4	FG42 H14	
3G40 G4	FG43 H14	
3G41 G3	FG44 H14	
3G42 H3	FG45 H14	
3G43 H4	FG47 I14	
3G44 H4	FG48 I14	
3G45 I3	FG49 I14	
3G46 I3	FG50 I14	
3G47 I6	FG51 I14	
3G48 I6	FG53 I14	
3G51 H3	FG54 I14	
3G52 H4	FG56 I14	
3G53 J3	IG00 A4	
3G54 J4	IG01 A4	
3G55 I5	IG02 A5	
3G56 J5	IG03 B5	
3G57 K3	IG04 B4	
3G58 J3	IG05 B4	
3G59 J4	IG06 C6	
3G60 K4	IG07 C6	
3G63 B9	IG08 D6	
3G64 C9	IG09 D6	
3G65 B11	IG10 D6	
3G66 C9	IG11 E3	
3G67 C10	IG12 E4	
3G68 C10	IG13 E6	
3G69 B12	IG14 G4	
3G70 C12	IG15 G4	
3G71 C14	IG16 G5	
3G72 D10	IG17 G5	
3G73 D10	IG18 G4	
3G74 D10	IG19 H4	
3G75 E9	IG20 G5	
3G76 F9	IG21 H5	
3G77 F10	IG23 H5	
3G78 F10	IG24 J4	
3G79 D12	IG25 J5	
3G80 D13	IG26 J5	
3G81 D13	IG27 K5	
3G82 D13	IG28 D10	
3G83 E12	IG29 E11	
3G84 F12	IG30 F12	
3G85 F13	IG40 I4	
3G86 F13	IG42 I5	
3G87 F13	IG43 J4	
3G88 H12	IG46 I11	
3G89 F12	IG47 K9	
3G90 H11	IG49 B8	
3G91 H12	IG50 B11	
3G92 J9	IG52 C11	
3G93 K9	IG53 C11	
3G94 I9	IG54 C11	

SSB: Top Connectors

B16 TOP CONNECTORS

B16

FOR UFD ONLY

UFD CONTROL

(1M03) 1J00

IJ01 POR (NC)
IJ02 LAMP_ON_OFF_1
IJ03
IJ04
TEMP_SENSOR (NC)
IJ05 STANDBY_1
IJ06 NC
IJ07 POWER_UP_OK_1

5J05 RES
FAN_SPEED
PROTECT_AUD
3J06 RES
POWER_UP_OK
IJ12

4J02 RES
2J16 RES
2J33 RES
2J20 RES
2J34 RES

FROM SCALER INTERFACE B6
FROM SCALER B8
FROM SCALER B7

PROTECT_AUD

FROM AUDIO B5

AUDIO-L
AUDIO-R
5J01
5J02
FJ10
FJ12
FJ11
AUDIO-SW (NC)
3V3 SOUND_ENABLE_1
3V3 POR_AUDIO
FJ13
FJ14

(1M52) 1J04
B9B-PH-K-S(LF)

2J26 100p
2J27 100p
2J28 100p
2J29 100p
2J36 1n0

TO/FROM 1002 OF CLASS-D AUDIO AMPLIFIER C

UFD SUPPLY

(1M46) 1J01

FJ00
FJ01 (NC)
FJ02
5V(NC)
FJ03
FJ04
+33V_TUN(NC)
FJ05 NC
4J01

1J07 +12V_UFD
3A T
1J08 +5V_UFD
5J04
+5V
2J31 1n0

TO DC-DC CONVERTER B6

FROM EPLD B20

B_LT_PWM
G_LT_PWM
R_LT_PWM
B_RT_PWM
G_RT_PWM
R_RT_PWM

FJ15
FJ16
FJ17
FJ18
FJ19
FJ20

1J05
B7B-PH-K-S(LF)
AMBIENT LIGHT (TOP)

100p 2J04
100p 2J05
100p 2J06
100p 2J07
100p 2J08
100p 2J09

B_LB_PWM
G_LB_PWM
R_LB_PWM
B_RB_PWM
G_RB_PWM
R_RB_PWM

FJ21
FJ22
FJ23
FJ24
FJ25
FJ26

1J06
B7B-PH-K-S(LF)
AMBIENT LIGHT (BOTTOM)

100p 2J10
100p 2J11
100p 2J12
100p 2J13
100p 2J14
100p 2J15

RESERVED

TO/FROM PSU (SUPPLY FOR LCD)

1J02
B12P-PH-K-S(LF)

VP
GND_AUDIO
FJ06
3V2 +3V3STBY
FJ07
IJ08
IJ09
IJ10
IJ11
5J03 POWER_DOWN
+12VUNREG 11V6
3J05 68R STANDBY 3V1
3J03 68R BACKLIGHT_CTRL
3J04 68R LAMP_ON_OFF 3V2
IJ13

FROM SCALER INTERFACE B9
FROM SCALER B8

2J30 1n0
2J02 1n0
2J35 1n0
2J18 100p
2J19 100p
2J17 100p
2J22 100p
2J23 100p
2J21 100p

TO/FROM 1003 OF CLASS-D AUDIO AMP (+18V / +24V) C

1J03
B3B-PH-K-S(LF)

FJ08 VP
FJ09
GND_AUDIO
2J03 1n0
GND_AUDIO

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1J00 B1	FJ25 E7
1J01 C1	FJ26 E7
1J02 D1	IJ01 B1
1J03 F1	IJ02 B1
1J04 B8	IJ03 B1
1J05 C8	IJ04 B1
1J06 E8	IJ05 B1
1J07 C2	IJ06 B1
1J08 C2	IJ07 B1
2J02 F2	IJ08 E2
2J03 F2	IJ09 E2
2J04 D6	IJ10 E2
2J05 D7	IJ11 E2
2J06 D7	IJ12 B4
2J07 D7	IJ13 E4
2J08 D7	
2J09 D7	
2J10 E6	
2J11 E7	
2J12 E7	
2J13 E7	
2J14 E7	
2J15 E7	
2J16 C2	
2J17 F3	
2J18 F2	
2J19 F3	
2J20 C3	
2J21 F3	
2J22 F3	
2J23 F3	
2J26 C6	
2J27 C7	
2J28 C7	
2J29 C7	
2J30 F2	
2J31 D2	
2J33 C2	
2J34 C3	
2J35 F2	
2J36 C7	
3J03 E3	
3J04 E3	
3J05 E3	
3J06 B3	
4J01 D2	
4J02 C2	
5J01 B7	
5J02 B7	
5J03 E2	
5J04 C2	
5J05 B3	
FJ00 C1	
FJ01 C1	
FJ02 C1	
FJ03 C1	
FJ04 C1	
FJ05 D1	
FJ06 E2	
FJ07 E2	
FJ08 F1	
FJ09 F2	
FJ10 B7	
FJ11 B8	
FJ12 B7	
FJ13 B7	
FJ14 C7	
FJ15 C7	
FJ16 C7	
FJ17 D7	
FJ18 D7	
FJ19 D7	
FJ20 D7	
FJ21 E7	
FJ22 E7	
FJ23 E7	
FJ24 E7	

SSB: Side Connectors

B17 SIDE CONNECTORS

B17

FOR DISC/ ARCH CABINET
RESERVED
1K03
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
+3V3STBY_1
4K06 +3V3STBY_1
4K07 RES
+5VSW_1
PC-TV-LED_1
LED_SEL_1
LIGHT_SENSOR_1
IR_1
KEYBOARD
ITV_IR_SW_RESET

B2
B3 B6
+3V3STBY
LED_SEL
PC-TV-LED
IR
LIGHT_SENSOR
4K01 RES
4K03 RES
3K11 68R
5K00 1u0
5K02 1u0
3K12 68R
3K13 68R
IK16
4K04 IK00 PC-TV-LED_1
4K05 IK01 LED_SEL_1
IK02 IR_1
IK03 LIGHT_SENSOR_1
2K01 1n0
2K00 1n0
2K21 100p
2K22 100p
2K23 100p
2K24 100p
2K25 100p
2K26 100p
2K27 100p
2K28 100p

J
TO/FROM 1540 OF IR/ LED
1K00 (1M21)
6 5 4 3 2 1
B6B-PH-K
FK11

B15/B23
3K00 100R
2K02 10p
2K03 10p
FRONT_Y_CVBS_IN
3K01 100R
2K04 10p
2K05 10p
FRONT_C_IN
3K02 10K
IK17
2K08 2u2
2K06 100p
2K07 100p
3K03 15K
FRONT_L_IN
5K01 1u0
+5VSW
2K19 1n0
2K20 1n0
3K05 10K
IK18
2K12 2u2
2K10 100p
2K11 100p
3K06 15K
FRONT_R_IN
* 3K07 39R
* 2K13 100p
* 2K14 100p
HP_LOUT
3K08 68R
2K15 100p
HP_DET_R_DC
* 3K09 39R
* 2K16 100p
* 2K17 100p
HP_ROUT

B2
B5
KEYBOARD

D
TO/FROM 1304 OF SIDE I/O
1K01 (1M06)
RES 1K04
1 2 3 4 5 6 7 8 9 10 11 12
FK00 FRONT_Y_CVBS_IN_1
FK01 FRONT_C_IN_1
FK02 FRONT_L_IN_1
FK03 +5VSW_1 3V3
FK04 FRONT_R_IN_1
FK10
FK05 HP_LOUT_1
FK06 HP_DET_R_DC_1 3V3
FK07 HP_ROUT_1
4K02 RES

E
TOP/SIDE KEYBOARD
1K02 (1M01)
FK08
FK09
1 2 3
B3B-PH-K-S(LF)
2K18 100p

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1K00 A8
1K01 D1
1K02 E8
1K03 A1
1K04 D1
2K00 B7
2K01 B6
2K02 C3
2K03 C3
2K04 D3
2K05 D3
2K06 D3
2K07 D3
2K08 D4
2K10 E3
2K11 E3
2K12 E4
2K13 F3
2K14 E3
2K15 F3
2K16 F3
2K17 F3
2K18 E8
2K19 E3
2K20 E3
2K21 B6
2K22 B6
2K23 B6
2K24 B6
2K25 B7
2K26 B7
2K27 B7
2K28 B7
3K00 C3
3K01 C3
3K02 D3
3K03 D3
3K05 E3
3K06 E3
3K07 E3
3K08 F3
3K09 F3
3K11 A7
3K12 A7
3K13 B7
4K01 A7
4K02 F2
4K03 A7
4K04 A7
4K05 A7
4K06 B1
4K07 B1
5K00 A7
5K01 D3
5K02 A7
FK00 E1
FK01 E1
FK02 E1
FK03 E1
FK04 E1
FK05 E1
FK06 E1
FK07 E1
FK08 E8
FK09 E8
FK10 E1
FK11 B8
IK00 A8
IK01 A8
IK02 A8
IK03 B8
IK16 A7
IK17 D3
IK18 E3

SSB: ADC

B18 ADC

B18

7L05 LD1117DT33
+5VSWIA
IN OUT COM
IL16 3V3 +3V3SWB
2L30 10u 16V

B2 TO HERCULES

+5VSWIA
3L01 RES
5V4
INTF_V_OUT IL04 3L00 1K0 1V5 7L01 BC847BW
2L35 RES
3L03 RES
3L04 0R
0V9
3L33 220R
3L05 150R
+3V3SWB
5L00
IL17
2L29 16V 10u
2L22 10u
2L23 100n
2L24 100n

+3V3SWB
5L01
5L02
IL18
IL19
2L02 10u
2L03 100n
2L04 100n
2L05 100n
2L06 100n
2L27 10u 16V
2L07 10u
2L08 100n
2L09 100n
2L10 100n
2L11 100n
2L33 100n
2L34 100n
2L28 10u 16V

+5VSWIA
4L04 RES
4L05
3L07 RES
7L02 BC847BW
CVBS_COMB 4L03 RES
INTF_Y_OUT 4L02
IL05 3L06 0R
3L09 RES
3L11 150R
3L10 330R
2L38 RES
5L03 10u
2L37 68p
5L04 10u
3L38 0R
2L39 82p
7L08 RES
+5VSWIA
3L39 RES
IL07

B3 FROM SYNC INTERFACE
Hsync_SDTV
Vsync_SDTV
4L00 RES
4L01 RES

7L04 AD9985KGT2 9883(MSTAR)
VD VDD PVD
ANALOG INTERFACE FOR FLAT PANEL DISPLAY

2L13 47n IL01 54 RAIN
2L26 220n IL02 48 GAIN
IL03 43 BAIN
3L34 0R IL08
3L21 2K2 30 HSYNC
3L22 2K2 31 VSYNC
2L15 RES 49 SOGIN
3L23 RES 38 CLAMP
3L24 2K2 29 COAST
2L20 100n 58 REF_BYPASS
2L21 100n 37 MIDSCV
2L18 82n 3L18 2K7 33 FILT
2L19 8n2
57 SDA
56 SCL
55 A0

B13

RED
77 IL10 3L25-1 22R
76 IL11 3L25-2 22R
75 IL12 3L25-3 22R
74 3L25-4 22R
73 3L26-1 22R
72 3L26-2 22R
71 3L26-3 22R
70
COL_Di(8)
COL_Di(1:7)
COL_Di(1)
COL_Di(2)
COL_Di(3)
COL_Di(4)
COL_Di(5)
COL_Di(6)
COL_Di(7)

GREEN
9 IL13 3L27-4 22R
8 IL14 3L27-3 22R
7 IL15 3L27-2 22R
6 3L27-1 22R
5 3L28-4 22R
4 3L28-3 22R
3 3L28-2 22R
2 3L28-1 22R
COL_YA(1:8)
COL_YA(1)
COL_YA(2)
COL_YA(3)
COL_YA(4)
COL_YA(5)
COL_YA(6)
COL_YA(7)
COL_YA(8)

BLUE
DATACK 67
HSOUT 66 3L30 22R
VSOUT 64 3L31 22R
SOGOUT 65 3L32 2K2
COL_CLKASA
COL_HREF
COL_VA

B19 TO COLUMBUS
B7 TO SCALER
SYNC INTF
B3

GND

B2 FROM HERCULES
SDA
SCL
+3V3SWB
3L36 3K3
3L37 3K3
3L19 150R
3L20 150R
7L06 BSN20
7L07 BSN20
CLAMP_ADC

+5VSWIA
3L13 RES
5V4
INTF_U_OUT IL06 3L12 1K0 1V5 7L03 BC847BW
2L36 RES
3L15 RES
3L16 0R
0V9
3L35 220R
3L17 150R
IL09 2L17 47n
2L31 100u 16V
2L32 100u 16V

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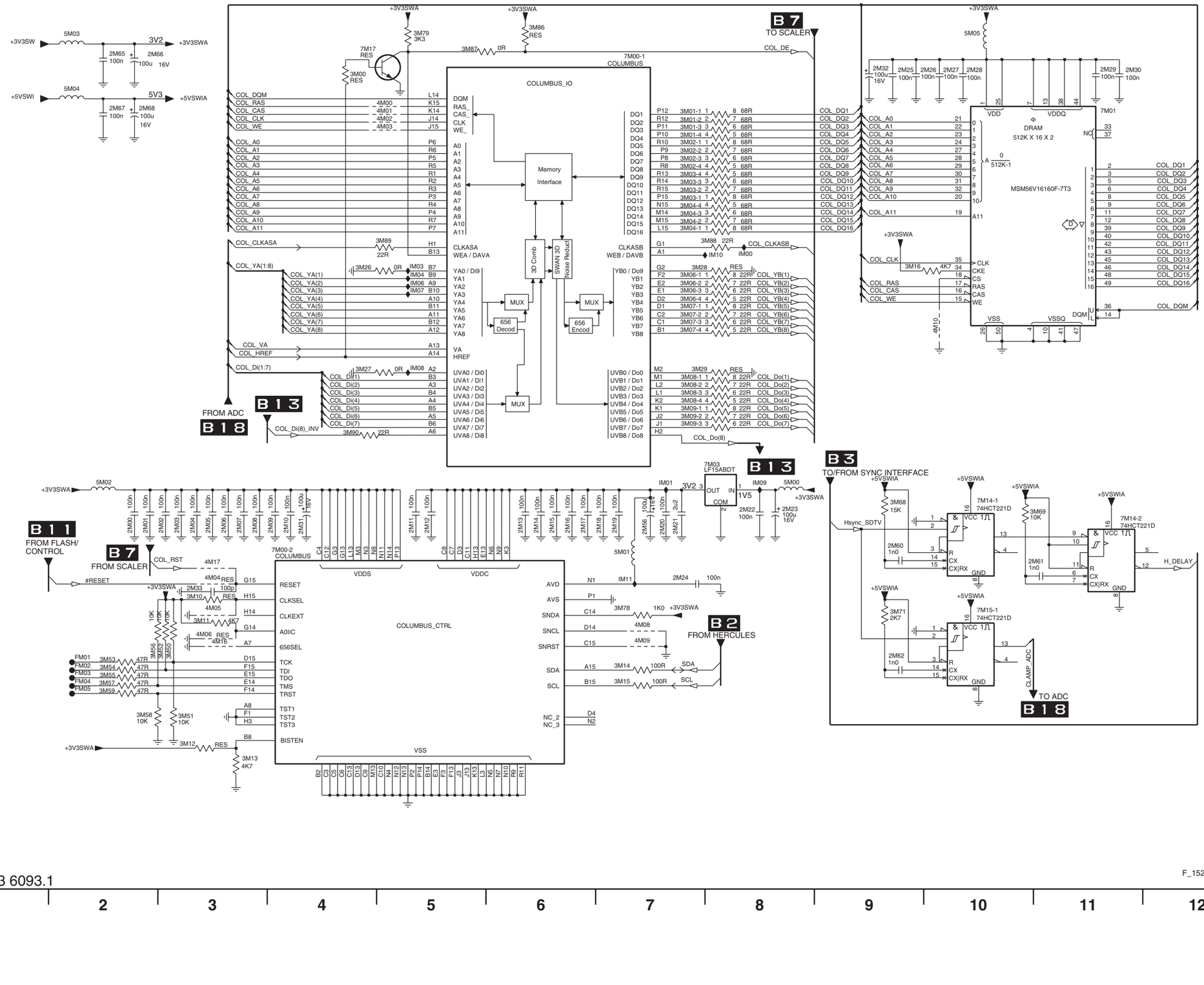
2L02 A7 3L37 E3
2L03 A7 3L38 C3
2L04 A7 3L39 C4
2L05 A8 4L00 D3
2L06 A8 4L01 D3
2L07 B7 4L02 C1
2L08 B7 4L03 C1
2L09 B7 4L04 C3
2L10 B8 4L05 C4
2L11 B8 5L00 B4
2L13 C4 5L01 A5
2L15 D4 5L02 A6
2L17 E3 5L03 C3
2L18 E4 5L04 C3
2L19 E4 7L01 B3
2L20 D4 7L02 C2
2L21 D4 7L03 E2
2L22 B5 7L04 C5
2L23 B5 7L05 A2
2L24 B5 7L06 F2
2L26 C4 7L07 F3
2L27 A8 7L08 C3
2L28 B9 IL01 C5
2L29 B4 IL02 C5
2L30 A3 IL03 C5
2L31 E4 IL04 B1
2L32 E5 IL05 C1
2L33 B8 IL06 E1
2L34 B8 IL07 C4
2L35 B2 IL08 C4
2L36 E1 IL09 E3
2L37 C3 IL10 C7
2L38 C3 IL11 C7
2L39 C3 IL12 C7
3L00 B2 IL13 D7
3L01 B2 IL14 D7
3L03 B2 IL15 D7
3L04 B3 IL16 A3
3L05 B3 IL17 B4
3L06 C1 IL18 A5
3L07 C2 IL19 B6
3L08 C3
3L09 C2
3L10 C2
3L11 C2
3L12 E1
3L13 D2
3L15 E2
3L16 E2
3L17 E3
3L18 E4
3L19 F3
3L20 F3
3L21 C4
3L22 D4
3L23 D4
3L24 D4
3L25-1 C7
3L25-2 C7
3L25-3 C7
3L25-4 C7
3L26-1 C7
3L26-2 C7
3L26-3 C7
3L27-1 D7
3L27-2 D7
3L27-3 D7
3L27-4 D7
3L28-1 D7
3L28-2 D7
3L28-3 D7
3L28-4 D7
3L30 E7
3L31 E7
3L32 E7
3L33 B3
3L34 C4
3L35 E3
3L36 E2

SSB: Columbus

B19 COLUMBUS



2M00 E2	3M87 A5
2M01 E2	3M88 C8
2M02 E3	3M89 C5
2M03 E3	3M90 E4
2M04 E3	4M00 B5
2M05 E3	4M01 B5
2M06 E3	4M02 B5
2M07 E3	4M03 B5
2M08 E3	4M04 F3
2M09 E4	4M05 F3
2M10 E4	4M06 F3
2M11 E5	4M08 F7
2M12 E5	4M09 F7
2M13 E6	4M10 D10
2M14 E6	4M16 F3
2M15 E6	4M17 F3
2M16 E6	5M00 E8
2M17 E6	5M01 F7
2M18 E7	5M02 E2
2M19 E7	5M03 A2
2M20 E7	5M04 A2
2M21 E7	5M05 A10
2M22 E8	7M00-1 A7
2M23 E8	7M00-2 F4
2M24 F7	7M01 B11
2M25 A9	7M03 E8
2M26 A10	7M14-1 E10
2M27 A10	7M14-2 E11
2M28 A10	7M15-1 F10
2M29 A11	7M17 A4
2M30 A11	FM01 G2
2M31 E4	FM02 G2
2M32 A9	FM03 G2
2M33 F3	FM04 G2
2M56 E7	FM05 G2
2M60 F9	IM00 C8
2M61 F11	IM01 E7
2M62 G9	IM03 C5
2M65 A2	IM04 C5
2M66 A2	IM06 C5
2M67 B2	IM07 C5
2M68 B2	IM08 D5
3M00 A4	IM09 E8
3M01-1 B7	IM10 C8
3M01-2 B7	IM11 F7
3M01-3 B7	
3M01-4 B7	
3M02-1 B7	
3M02-2 B7	
3M02-3 B7	
3M02-4 B7	
3M03-1 B7	
3M03-2 B7	
3M03-3 B7	
3M03-4 B7	
3M04-1 C7	
3M04-2 C7	
3M04-3 C7	
3M04-4 C7	
3M06-1 C7	
3M06-2 C7	
3M06-3 C7	
3M06-4 C7	
3M07-1 C7	
3M07-2 D7	
3M07-3 D7	
3M07-4 D7	
3M08-1 D7	
3M08-2 D7	
3M08-3 D7	
3M08-4 D7	
3M09-1 D7	
3M09-2 D7	
3M09-3 E7	
3M10 F3	
3M11 F3	
3M12 G3	
3M13 H3	
3M14 G7	
3M15 G7	
3M16 C9	
3M26 C4	
3M27 D4	
3M28 C7	
3M29 D7	
3M50 G3	
3M51 G3	
3M52 G3	
3M53 G2	
3M54 G2	
3M55 G2	
3M56 G2	
3M57 G2	
3M58 G2	
3M59 G2	
3M68 E9	
3M69 E11	
3M71 F9	
3M78 F7	
3M79 A5	
3M86 A6	

SSB: EPLD

B20 EPLD

B20

+3V3-IO

7N01 EPCS4SI8

7N02-1 EP1C12F256C8 CONTROL

FOR DEBUGGING

1N01 RES

LVDS IN

7N04 THC63LVDF84B

7N02-2 EP1C12F256C8

7N02-5 EP1C12F256C8

BANK 1

BANK 4

CONTROL SIGNALS

LCD PANEL INTERFACE RECEIVER

7N03-1 BC847BS

7N03-2 BC847BS

1N05 14M31818

1N02 B4B-PH-SM4-TBT(LF)

1N03 BM05B-SRSS-TBT

6N01 TLMG3100

B21 TO EPLD

B9 TO SCALER INTERFACE

B7 TO SCALER

B16 TO TOP CONN.

FOR NON-PIXEL+ SETS

FOR DEVELOPMENT USE ONLY

LVDS_PWR_DWN

PIXEL+_RESET

BACKLIGHT_DIM

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1N01 A9 7N02-2 D7
1N02 D11 7N02-5 D10
1N03 F12 7N03-1 C3
1N05 D5 7N03-2 C2
2N01 A2 7N04 D5
2N02 C1 FN01 B4
2N03 C2 FN02 B6
2N04 C2 FN03 C5
2N05 D4 FN04 A8
2N06 D4 FN05 B8
2N07 D5 FN06 B8
2N08 D5 FN07 B8
2N09 D5 FN08 B8
2N10 D6 FN09 B8
2N11 B7 FN10 B8
2N12 B7 FN11 D5
2N13 B7 FN12 E5
2N14 B7 FN13 E5
2N15 B8 FN14 F5
2N16 E11 FN15 F5
2N17 F11 FN16 F5
2N18 F11 FN17 G5
2N19 F11 FN18 D9
2N20 F11 FN19 D9
3N01 A3 FN20 F9
3N02 A3 FN21 F11
3N03 A3 FN22 F11
3N04 A3 FN23 F11
3N05 A3 FN24 F12
3N06 A3 FN25 F4
3N07 C2 FN26 D2
3N08 C2 FN27 D2
3N09 B4 FN28 D2
3N10 C2 FN29 D2
3N11 C4 FN30 D2
3N12 A5 FN31 D2
3N13 A5 FN32 D2
3N14 A5 FN33 D3
3N15 B6 FN34 D3
3N16 B6 FN35 D3
3N17 B6 IN01 B3
3N18 B6 IN02 B3
3N19 C5 IN03 B3
3N20 C5 IN04 B3
3N21 E3 IN05 B3
3N22 E3 IN06 C2
3N23 E3 IN07 D4
3N24 F3 IN08 C2
3N25 F3 IN09 C2
3N26 D4 IN10 B3
3N27 D6 IN11 B4
3N28 F8 IN12 C5
3N29 E11 IN13 D5
3N30 E11 IN14 D4
3N31 E11 IN15 D11
3N32 E11 IN16 D11
3N33 E11 IN17 D11
3N34 E11 IN18 D11
3N35 E11 IN19 F9
3N36 E11
3N37 E11
3N38 F11
3N39 F11
3N40 F11
3N41 F11
3N42 F11
3N43 F11
3N44 F11
3N45 F11
3N46 D10
3N47 D10
4N01 D2
4N02 D2
4N03 D2
4N04 D2
4N05 D2
4N06 D2
4N07 D2
4N08 D2
4N09 D2
4N10 D2
4N11 D2
4N12 D2
4N13 D2
4N14 D2
4N15 D3
4N16 D3
4N17 D3
4N18 D3
4N19 D3
4N20 D3
4N21 D9
4N22 D9
5N01 A8
5N02 D4
5N03 D4
5N04 D5
5N05 C6
6N01 F9
7N01 A2
7N02-1 A4

SSB: EPLD

B21 EPLD

B21

EAGLE INTERFACE

7N02-3
EP1C12F256C8

BANK 2

LVDS TRANSMITTER

+3V3SW

7P02
THC63LVDM83R

B20 (H=NORMAL)
LVDS_PWR_DWN
CLK_OUT
R(0)
R(1)
R(2)
R(3)
R(4)
R(5)
G(0)
G(1)
G(2)
G(3)
G(4)
G(5)
B(0)
B(1)
B(2)
B(3)
B(4)
B(5)
HS_OUT
VS_OUT
DE_OUT
R(6)
R(7)
G(6)
G(7)
B(6)
B(7)
PARITY_OUT

RS
PDWN
R/F
CLKIN
TCLK
TA
TB
TC
TD
VCC
LVDS VCC
PLL VCC
GND
LVDS GND
PLL GND

LVDSCLKp
LVDSCLKn
LVDSAp
LVDSAn
LVDSBp
LVDSBn
LVDSCp
LVDSCn
LVDSDp
LVDSDn

LVDS OUT

7N02-4
EP1C12F256C8

BANK 3

PARITY_OUT
HS_OUT
VS_OUT
DE_OUT
B(5)
B(4)
B(6)
B(3)
B(2)
G(4)
G(5)
B(1)
B(7)
B(0)
CLK_OUT
G(7)

7N02-6 EP1C12F256C8

POWER

BANK1
BANK2
BANK3
BANK4
VCCIO
VCCINT
GND
GNDA
GNDG
VCCA

+3V3-IO
+1V5-INT
+1V5-PLL

FOR MFD ONLY

1P06
LVDS_VCC
LVDS_OPT
NC
0-1453230-3
TO LCD PANEL (TIMING CONTROL)

FOR UFD ONLY

B9
FROM SCALER INTERFACE

B20
FROM EPLD

(1G50)
1P07
FP15
FP16
FP17
SDA_DMA_BUS1_DISP
SCL_DMA_BUS1_DISP
LVDS_OPT
CTRL_DISP2
CTRL_DISP1
(NC) VDISP_2
(NC) VDISP2
FI-WE31P-HFE-E1500
TO PLASMA PANEL (TIMING CONTROL)

LVDS_VCC
FROM DC-DC CONVERTER
B6
FOR LCD ONLY

1P01 E8	FP09 E4
1P02 E8	FP10 F4
1P03 F8	FP11 F4
1P04 F8	FP12 F4
1P05 G8	FP13 F4
1P06 A11	FP14 G4
1P07 D11	FP15 D11
2P01 B3	FP16 D11
2P02 B3	FP17 E11
2P03 B3	
2P04 B3	
2P05 B3	
2P06 B3	
2P07 B4	
2P08 B4	
2P09 B4	
2P10 B4	
2P11 B4	
2P12 B4	
2P13 B4	
2P14 B5	
2P15 B1	
2P16 B1	
2P17 B2	
2P18 B3	
2P19 B3	
2P20 B3	
2P21 B3	
2P22 C3	
2P23 C3	
2P24 C3	
2P25 C3	
2P26 C3	
2P27 C3	
2P28 C4	
2P29 C4	
2P30 C4	
2P31 C5	
2P32 D5	
2P33 D5	
2P34 D6	
2P35 D7	
2P36 D8	
2P37 E8	
2P38 E8	
2P39 E8	
2P40 F8	
2P41 F8	
2P42 F8	
2P43 F8	
2P44 G8	
2P45 G8	
3P01 D5	
3P03 E5	
3P04 D9	
3P05 D9	
4P01 F10	
4P02 F10	
4P03 F10	
4P04 F10	
4P05 F10	
4P06 F10	
4P07 F10	
4P08 F10	
4P09 D9	
4P10 E9	
5P01 A3	
5P02 B3	
5P03 C3	
5P04 D6	
5P05 D6	
5P06 D7	
7N02-3 A6	
7N02-4 E2	
7N02-6 A8	
7P01 B2	
7P02 D7	
FP01 A1	
FP02 A4	
FP03 B2	
FP04 B3	
FP05 C4	
FP06 D4	
FP07 E4	
FP08 E4	

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SSB: Diversity Tables B9-B21

B9 MUX-SYNC INTERFACE

Item	LC4.3x	LC4.8x	LC4.9x	Description
2A00			V	CER2 0603 X7R 16V 100N COL
2A01			V	CER1 0402 NP0 50V 100P COL
2A02			V	CER1 0402 NP0 50V 100P COL
2A03		V		CER2 0603 Y5V 10V 1U COL
2A12		V	V	CER2 0402 X7R 16V 10N COL
2A13		V	V	CER2 0402 Y5V 16V 100N COL
3A00			V	RST SM 0402 68R PM5 COL
3A01			V	RST SM 0402 68R PM5 COL
3A02	V	V		RST SM 0402 1K PM5 COL
3A06		V		RST SM 0603 10K PM5COL
3A06	V			RST SM 0603 JUMP. 0R05 COL
3A07			V	RST SM 0402 10K PM5 COL
3A07				RST SM 0402 68R PM5 COL
3A08			V	RST SM 0402 10K PM5 COL
3A10		V	V	RST SM 0402 10K PM5 COL
3A11		V	V	RST SM 0402 10K PM5 COL
3A13		V	V	RST SM 0402 10K PM5 COL
3A14		V	V	RST SM 0402 560R PM5 COL
4A03	V	V		RST SM 0603 JUMP. 0R05 COL
4A04			V	RST SM 0402 JUMP. 0R05 COL
4A05	V			RST SM 0402 JUMP. 0R05 COL
4A06	V			RST SM 0402 JUMP. 0R05 COL
5A00			V	FXDIND 0805 100MHZ 30R COL R
6A01		V	V	DIO REG SM BZX384-C3V9 COL R
7A00			V	IC SM PCA9515ADP (PHSE) R
7A02		V	V	TRA SIG SM BC847BW (COL) R
7A03		V	V	TRA SIG SM BC847BW (COL) R

B13 MUX-SYNC INTERFACE

ITEM	AP/EU/AP-DVB (with Teletext)	EU-DVB (with Teletext)	NAFTA/LT & China (non-Teletext)	DESCRIPTION
2E00	V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2E01	V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2E02	V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2E04	V	V		CER2 0402 X5R 6V3 1U PM20 R
2E05	V	V		CER2 0402 X5R 6V3 1U PM20 R
2E06	V	V		CER2 0402 X5R 6V3 1U PM20 R
3E06	V		V	RST SM 0402 47K PM5 COL
3E07	V		V	RST SM 0402 47K PM5 COL
3E08	V		V	RST SM 0402 47K PM5 COL
3E13	V	V		RST SM 0402 330R PM5 COL
3E14	V	V		RST SM 0402 330R PM5 COL
3E15	V	V		RST SM 0402 330R PM5 COL
3E16	V	V		RST SM 0402 330R PM5 COL
3E17	V	V		RST SM 0402 330R PM5 COL
3E18	V	V		RST SM 0402 330R PM5 COL

B15 ANALOG I/O SCART

Item	26/32PF	DVB.T 26/32PF	37/42PF	DVB.T 37/42PF	Description
1G01	V	V			SOC EURO H 21P F BK R-GRND B
1G01			V	V	SOC EURO H 21P F SHD R-GRND Y
1G02	V	V			SOC EURO H 21P F BK R-GRND B
1G02			V	V	SOC EURO H 21P F SHD R-GRND Y
1G03		V		V	CON H 32P F 0.50 SM FPC 0.3 R
2G29		V		V	ELCAP SM 16V 10U PM20 COL R
2G30		V		V	CER2 0603 X7R 16V 100N COL
2G31		V		V	CER2 0603 X7R 16V 100N COL
2G32				V	CER2 0603 Y5V 25V 100N COL
2G33		V		V	CER2 0603 Y5V 16V 220N COL
2G34		V		V	ELCAP SM 16V 10U PM20 COL R
2G35		V		V	CER2 0603 Y5V 25V 100N COL
2G36		V		V	CER2 0603 Y5V 10V 1U COL
2G37		V		V	RST SM 0603 330R PM5 COL
2G38		V		V	CER2 0603 Y5V 10V 1U COL
2G39		V		V	CER2 0603 Y5V 10V 1U COL
2G40		V		V	RST SM 0603 JUMP. 0R05 COL
2G41		V		V	RST SM 0603 330R PM5 COL
2G43		V		V	CER2 0603 X7R 50V 1N COL
2G45		V		V	CER2 0603 X7R 50V 1N COL
2G46		V		V	CER2 0603 X7R 50V 1N COL
2G63		V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2G64		V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2G65		V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2G65		V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2G66		V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2G66		V		V	CER2 0603 X5R 6V3 4U7 PM10 R
3G63		V		V	RST SM 0603 10K PM5COL
3G64		V		V	RST SM 0603 10K PM5COL
3G65		V		V	RST SM 0603 10K PM5COL
3G66				V	RST SM 0603 150R PM5 COL
3G67		V		V	RST SM 0603 15K PM5 COL
3G68		V		V	RST SM 0603 15K PM5 COL
3G69		V		V	RST SM 0603 47K PM5 COL
3G70		V		V	RST SM 0603 47K PM5 COL
3G71		V		V	RST SM 0603 560R PM5 COL
3G72		V		V	RST SM 0603 10K PM5COL
3G73		V		V	RST SM 0603 47K PM5 COL
3G75		V		V	RST SM 0603 100R PM5 COL
3G76		V		V	RST SM 0603 100R PM5 COL
3G77		V		V	RST SM 0603 47K PM5 COL
3G79		V		V	RST SM 0603 47K PM5 COL
3G81		V		V	RST SM 0603 47K PM5 COL
3G83		V		V	RST SM 0603 100R PM5 COL
3G84		V		V	RST SM 0603 100R PM5 COL
3G86		V		V	RST SM 0603 47K PM5 COL
3G88		V		V	RST SM 0603 75R PM5 COL
3G89		V		V	RST SM 0603 47K PM5 COL
3G92		V		V	RST SM 0603 47K PM5 COL
3G93		V		V	RST SM 0603 47K PM5 COL
3G94		V		V	RST SM 0603 47K PM5 COL
3G95		V		V	RST SM 0603 47K PM5 COL
4G09		V		V	RST SM 0603 JUMP. 0R05 COL
4G11	V		V		RST SM 0603 JUMP. 0R05 COL
4G12	V		V		RST SM 0603 JUMP. 0R05 COL
4G13	V		V		RST SM 0603 JUMP. 0R05 COL
4G14	V		V		RST SM 0603 JUMP. 0R05 COL
4G15	V		V		RST SM 0603 JUMP. 0R05 COL
4G16	V		V		RST SM 0603 JUMP. 0R05 COL
4G17	V		V		RST SM 0603 JUMP. 0R05 COL
4G18	V		V		RST SM 0603 JUMP. 0R05 COL
4G19	V		V		RST SM 0603 JUMP. 0R05 COL
4G22		V		V	RST SM 0603 JUMP. 0R05 COL
5G01		V		V	FXDIND 0603 100MHZ 120R COL R
6G02		V		V	DIO SIG SM BAS316 (COL) R
7G07		V		V	IC SM 74HC4053D (PHSE) R
7G08		V		V	TRA SIG SM BC847B (COL) R
7G09		V		V	IC SM ADG734BRUZ (ANA0) R

B16 SIDE CONNECTORS

Item	LC4.3x - CINCH	LC4.3E - SCART	LC4.9x - PDP	LC4.8x - LCD	Description
1J00			V	V	CON V 10P M 2.00 PH B
1J01			V	V	CON V 11P M 2.00 PH B
1J02	V	V			CON V 12P M 2.00 PH B
1J03	V	V			CON V 3P M 2.00 PH B
1J07			V	V	FUSE SM T 3A 125V UL R
1J08			V	V	FUSE SM F 630MA 50V UL R
2J31			V	V	CER1 0402 NP0 50V 100P COL
3J03	V	V		V	RST SM 0402 68R PM5 COL
3J04	V	V		V	RST SM 0402 68R PM5 COL
4J01			V	V	RST SM 0402 JUMP. 0R05 COL
5J04			V	V	IND FXD 1206 EMI 100MHZ 120R R

B17 SIDE CONNECTORS

Item	LC4.3x - ME5 styling	LC4.3x - Arch Styling	LC4.8x - LCD	LC4.9x - PDP	Description
1K00	V		V	V	CON V 6P M 2.00 PH B
1K01	V				CON V 12P M 2.00 PH B
1K03		V			CON V 20P F 1.25 FFC 0.3 B
1K04			V	V	CON V 11P M 2.00 PH B
2K15	V	V			CER1 0402 NP0 50V 100P COL
3K08	V	V			RST SM 0402 68R PM5 COL
4K02			V	V	RST SM 0603 JUMP. 0R05 COL
4K06		V			RST SM 0402 JUMP. 0R05 COL
5K01	V	V		V	FXDIND SM 0603 1U PM10 COL R

B18 ADC

Item	non-DVB sets with 3D Comb Filter	DVB sets with 3D Comb Filter	Description
3L38		V	RST SM 0402 JUMP. 0R05 COL
4L05		V	RST SM 0402 JUMP. 0R05 COL
5L04		V	RST SM 0603 JUMP. 0R05 COL

B20 & B21 PIXEL PLUS

Item	LC4.3 non PIXEL+	LC4.3 with PIXEL+	42PF7320/28	LC4.8/LC4.9 non PIXEL+	LC4.8/LC4.9 with PIXEL+	Description
1N02		V	V		V	CON V 4P M 2.00 SM PH R
1N05		V	V		V	OSC XTL SM 14M31818 15P OC R
1P06	V	V				CON V 30P M 1.25 SM 1453230 R
1P07			V	V	V	CON H 31P F 1.25 SM FI-WE R
2N01		V	V		V	CER2 0402 Y5V 16V 100N COL
2N02		V	V		V	CER2 0402 Y5V 16V 100N COL
2N03		V	V		V	CER2 0402 X5R 6V3 1U PM20 R
2N04		V	V		V	CER2 0402 X7R 50V 1N COL
2N05		V	V		V	CER2 0402 Y5V 16V 100N COL
2N06		V	V		V	CER2 0402 Y5V 16V 100N COL
2N07		V	V		V	CER2 0402 Y5V 16V 100N COL
2N08		V	V		V	CER2 0402 Y5V 16V 100N COL
2N09		V	V		V	CER2 0402 Y5V 16V 100N COL
2N10		V	V		V	CER2 0402 Y5V 16V 100N COL
2N11		V	V		V	CER1 0402 NP0 50V 100P COL
2N12		V	V		V	CER1 0402 NP0 50V 100P COL
2N13		V	V		V	CER1 0402 NP0 50V 100P COL
2N14		V	V		V	CER1 0402 NP0 50V 100P COL
2N15		V	V		V	CER1 0402 NP0 50V 100P COL
2N16		V	V		V	CER1 0402 NP0 50V 100P COL
2P01		V	V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2P02		V	V		V	CER2 0402 Y5V 16V 100N COL
2P03		V	V		V	CER2 0402 Y5V 16V 100N COL
2P04		V	V		V	CER2 0402 Y5V 16V 100N COL
2P05		V	V		V	CER2 0402 Y5V 16V 100N COL
2P06		V	V		V	CER2 0402 Y5V 16V 100N COL
2P07		V	V		V	CER2 0402 Y5V 16V 100N COL
2P08		V	V		V	CER2 0402 Y5V 16V 100N COL
2P09		V	V		V	CER2 0402 Y5V 16V 100N COL
2P10		V	V		V	CER2 0402 Y5V 16V 100N COL
2P11		V	V		V	CER2 0402 Y5V 16V 100N COL
2P12		V	V		V	CER2 0402 Y5V 16V 100N COL
2P13		V	V		V	CER2 0402 Y5V 16V 100N COL
2P14		V	V		V	CER2 0402 Y5V 16V 100N COL
2P15		V	V		V	ELCAP SM 16V 100U PM20 COL R
2P16		V	V		V	CER2 0402 Y5V 16V 100N COL
2P17		V	V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2P18		V	V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2P19		V	V		V	CER2 0402 Y5V 16V 100N COL
2P20		V	V		V	CER2 0402 Y5V 16V 100N COL
2P21		V	V		V	CER2 0402 Y5V 16V 100N COL
2P22		V	V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2P23		V	V		V	CER2 0402 Y5V 16V 100N COL
2P24		V	V		V	CER2 0402 Y5V 16V 100N COL
2P25		V	V		V	CER2 0402 Y5V 16V 100N COL
2P26		V	V		V	CER2 0402 Y5V 16V 100N COL
2P27		V	V		V	CER2 0402 Y5V 16V 100N COL
2P28		V	V		V	CER2 0402 Y5V 16V 100N COL
2P29		V	V		V	CER2 0402 Y5V 16V 100N COL
2P30		V	V		V	CER2 0402 Y5V 16V 100N COL
2P31		V	V		V	CER2 0402 Y5V 16V 100N COL
2P32		V	V		V	CER2 0402 Y5V 16V 100N COL
2P33		V	V		V	CER2 0402 Y5V 16V 100N COL
2P34		V	V		V	CER2 0402 Y5V 16V 100N COL
2P35		V	V		V	CER2 0402 Y5V 16V 100N COL
3N01		V	V		V	RST SM 0402 10K PM5 COL
3N02		V	V		V	RST SM 0402 10K PM5 COL
3N03		V	V		V	RST SM 0402 10K PM5 COL
3N04		V	V		V	RST SM 0402 10K PM5 COL
3N05		V	V		V	RST SM 0402 10K PM5 COL
3N06		V	V		V	RST SM 0402 10K PM5 COL
3N07		V	V		V	RST SM 0603 33K PM5 COL
3N08		V	V		V	RST SM 0402 10K PM5 COL
3N09		V	V		V	RST SM 0402 1K PM5 COL
3N10		V	V		V	RST SM 0402 33K PM5 COL
3N11		V	V		V	RST SM 0402 47R PM5 COL
3N12		V	V		V	RST SM 0402 10K PM5 COL
3N13		V	V		V	RST SM 0402 10K PM5 COL
3N14		V	V		V	RST SM 0402 10K PM5 COL
3N15		V	V		V	RST SM 0402 47R PM5 COL
3N16		V	V		V	RST SM 0402 47R PM5 COL

Item	LC4.3 non PIXEL+	LC4.3 with PIXEL+	42PF7320/28	LC4.8/LC4.9 non PIXEL+	LC4.8/LC4.9 with PIXEL+	Description
3N17		V	V		V	RST SM 0402 47R PM5 COL
3N18		V	V		V	RST SM 0402 47R PM5 COL
3N19		V	V		V	RST SM 0402 10K PM5 COL
3N20		V	V		V	RST SM 0402 47R PM5 COL
3N21		V	V		V	RST SM 0402 100R PM5 COL
3N22		V	V		V	RST SM 0402 100R PM5 COL
3N23		V	V		V	RST SM 0402 100R PM5 COL
3N24		V	V		V	RST SM 0402 100R PM5 COL
3N25		V	V		V	RST SM 0402 100R PM5 COL
3N26		V	V		V	RST SM 0402 4K7 PM5 COL
3N27		V	V		V	RST SM 0402 47R PM5 COL
3N28		V	V		V	RST SM 0603 180R PM5 COL
3N29		V	V		V	RST SM 0402 100R PM5 COL
3N30		V	V		V	RST SM 0402 100R PM5 COL
3N31		V	V		V	RST SM 0402 100R PM5 COL
3N32		V	V		V	RST SM 0402 100R PM5 COL
3N33		V	V		V	RST SM 0402 100R PM5 COL
3N34		V	V		V	RST SM 0402 100R PM5 COL
3N35		V	V		V	RST SM 0402 100R PM5 COL
3N46		V	V		V	RST SM 0402 100R PM5 COL
3N47		V	V		V	RST SM 0402 100R PM5 COL
3P01		V	V		V	RST SM 0402 4K7 PM5 COL
3P03		V	V		V	RST SM 0402 47R PM5 COL
3P04				V		RST SM 0402 100R PM5 COL
3P04					V	RST SM 0402 JUMP. 0R05 COL
3P05				V		RST SM 0402 100R PM5 COL
3P05					V	RST SM 0402 JUMP. 0R05 COL
4N01	V			V		RST SM 0402 JUMP. 0R05 COL
4N02	V			V		RST SM 0402 JUMP. 0R05 COL
4N03	V			V		RST SM 0402 JUMP. 0R05 COL
4N04	V			V		RST SM 0402 JUMP. 0R05 COL
4N05	V			V		RST SM 0402 JUMP. 0R05 COL
4N06	V			V		RST SM 0402 JUMP. 0R05 COL
4N07	V			V		RST SM 0402 JUMP. 0R05 COL
4N08	V			V		RST SM 0402 JUMP. 0R05 COL
4N09	V			V		RST SM 0402 JUMP. 0R05 COL
4N10	V			V		RST SM 0402 JUMP. 0R05 COL
4N11	V			V		RST SM 0402 JUMP. 0R05 COL
4N12	V			V		RST SM 0402 JUMP. 0R05 COL
4N13	V			V		RST SM 0402 JUMP. 0R05 COL
4N14	V			V		RST SM 0402 JUMP. 0R05 COL
4N15	V			V		RST SM 0402 JUMP. 0R05 COL
4N16	V			V		RST SM 0402 JUMP. 0R05 COL
4N17	V			V		RST SM 0402 JUMP. 0R05 COL
4N18	V			V		RST SM 0402 JUMP. 0R05 COL
4N19	V			V		RST SM 0402 JUMP. 0R05 COL
4N20	V			V		RST SM 0402 JUMP. 0R05 COL
4N21		V	V		V	RST SM 0402 JUMP. 0R05 COL
4N22		V	V		V	RST SM 0402 JUMP. 0R05 COL
4P01						RST SM 0402 JUMP. 0R05 COL
4P02						RST SM 0402 JUMP. 0R05 COL
4P07				V		RST SM 0402 JUMP. 0R05 COL
5N01		V	V		V	FXDIND 0805 100MHZ 30R COL R
5N02		V	V		V	FXDIND 0805 100MHZ 30R COL R
5N03		V	V		V	FXDIND 0805 100MHZ 30R COL R
5N04		V	V		V	FXDIND 0805 100MHZ 30R COL R
5N05		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P01		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P02		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P03		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P04		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P05		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P06		V	V		V	FXDIND 0805 100MHZ 30R COL R
6N01		V	V		V	LED VS SM TLMG3100 (VISH) R
7N01		V	V		V	IC SM EPCS4SI8N (ALT0) R
7N02		V	V		V	IC SM EP1C12F256C8N (ALT0) Y
7N03		V	V		V	TRA SIG SM BC847BS (PHSE) R
7N04		V	V		V	IC SM THC63LVDF84B (THIN) R
7P01		V	V		V	IC SM LF15ABDT (ST00) R
7P02		V	V		V	IC SM THC63LVDM83R (THIN) R

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Class D Audio Amplifier

C CLASS D AUDIO AMPLIFIER

POWER LINE FILTER

TO/FROM X200 OF PSU

B3B-PH-K

FROM 1752 OF SSB BOARD A5

PHASE INVERTER (UNITY GAIN)

Speaker Impedance	5006 & 5007	2023 & 2042
4 ohm	22uH	680n
6 ohm Selected	33uH	470n
8 ohm	47uH	330n

*Connection Inverted (R_CH)

RESERVED

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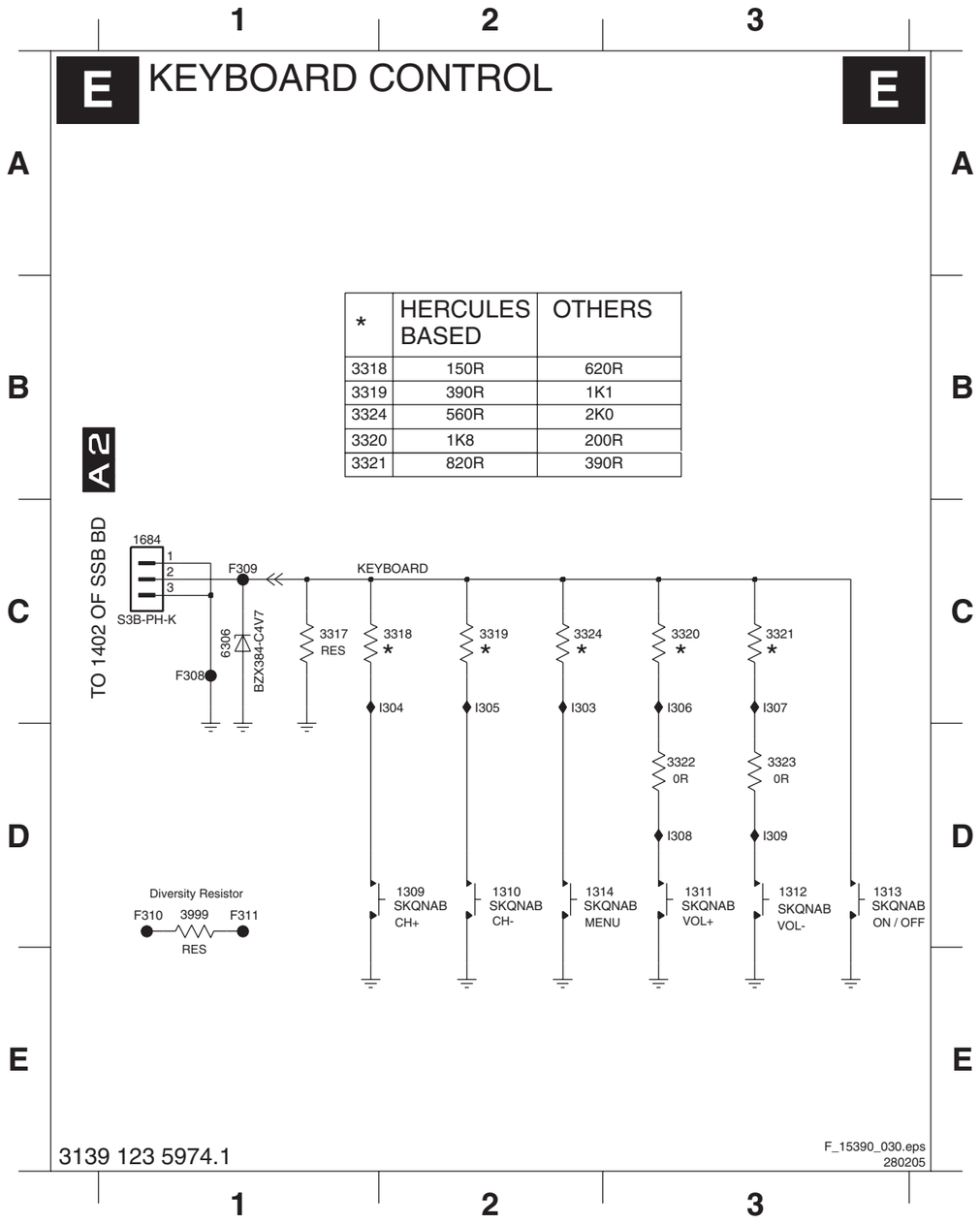
270205

Keyboard Control Panel



*	HERCULES BASED	OTHERS
3318	150R	620R
3319	390R	1K1
3324	560R	2K0
3320	1K8	200R
3321	820R	390R

1008 D1
1309 D2
1310 D2
1311 D3
1312 D3
1313 D3
1314 D2
1684 C1
3317 C1
3318 C2
3319 C2
3320 C3
3321 C3
3322 D3
3323 D3
3324 C2
3999 D1
6306 C1
F308 C1
F309 C1
F310 D1
F311 D1
I303 C2
I304 C2
I305 C2
I306 C3
I307 C3
I308 D3
I309 D3

Personal Notes:

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131004

Side A/V Panel

G SIDE-AV

SVHS
1301
1 I301
3
4
2
6
5
7
S301
S302
I302
3301 75R
6301 RES
6303 RES
I303
I305
I309
6302 RES
6304 RES
3304 75R
I307

3302 10R
2301 RES
EMC 2302 47p
3303 10R
2303 RES
EMC 2304 47p

CVBS
1302-1 1
2
YELLOW
I320
S303
2305 RES
2310 1u0
3309 75R
3310 8K2
I319
3305 10K
3307 1K0
+5VSW
BC857B 7301

L
1302-2 3
4
WHITE
S304
6305 RES
3306 15K
2306 330p
I318
6307 RES
I308

R
1302-3 5
6
RED
S305
6306 RES
3308 15K
2307 330p
I317
6308 RES
+5VSW
3311 10K

HEADPHONE
1303 4
2
7
1
6
3
5
TC38-103-01
S306
S307
S308
S309
2308 10n
2309 10n

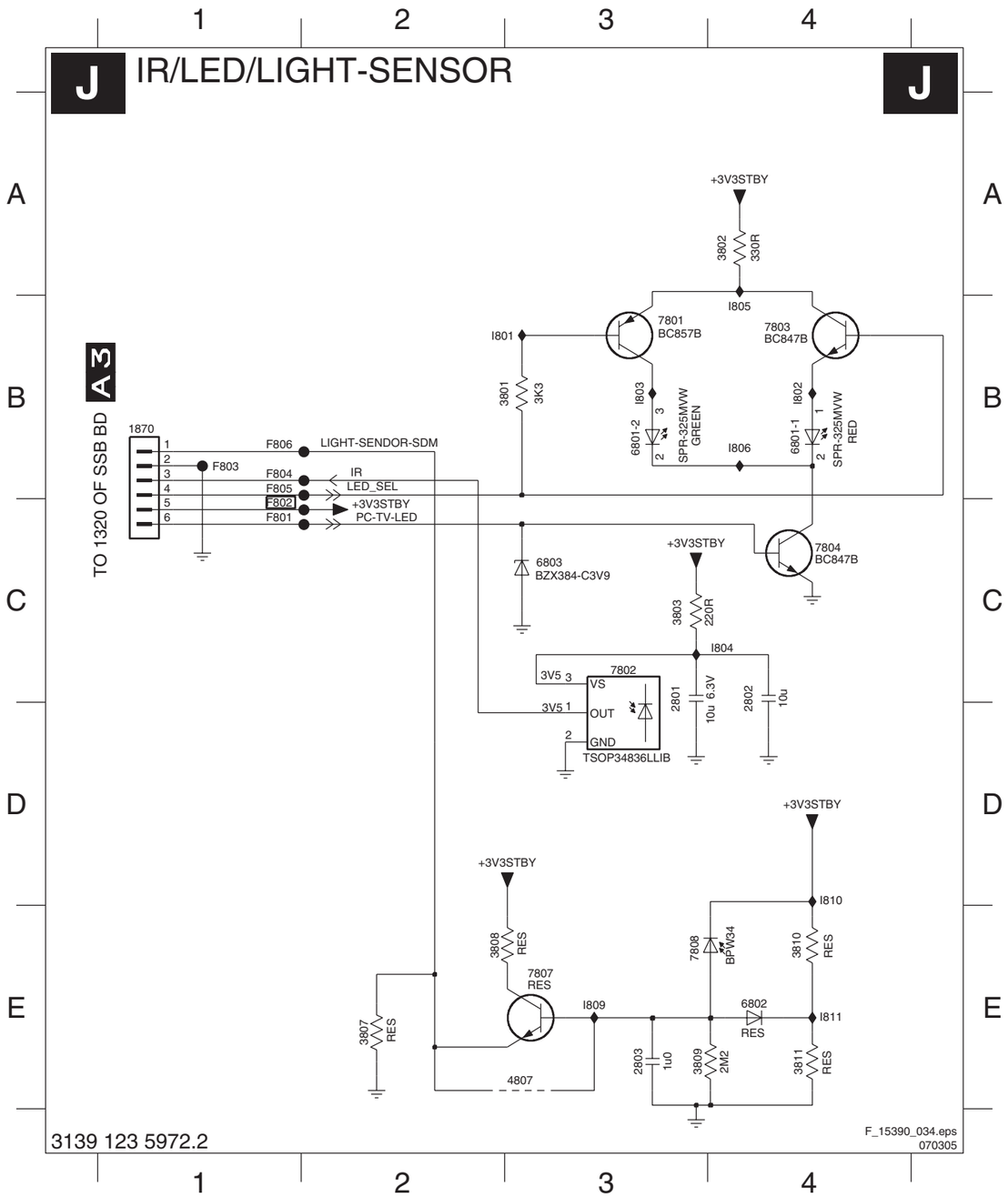
+5VSW
(1M06)
1304
FRONT_Y__CVBS_IN I310
FRONT_C_IN I311
L_FRONT_IN I304 I312
R_FRONT_IN I306
I313
HEAD_PH_L I314
HP_DET_R_DC1 I315
HEAD_PH_R I316
1 2 3 4 5 6 7 8 9 10 11 12
B 1 7
TO 1K01 OF SSB BD

3139 123 5956.1
F_15270_037.eps
180505

1301 A1
1302-1 B1
1302-2 C1
1302-3 D1
1303 E1
1304 C8
2301 A4
2302 A4
2303 A4
2304 A4
2305 C2
2306 D3
2307 D3
2308 E3
2309 E3
2310 C3
3301 A2
3302 A4
3303 A4
3304 B3
3305 C3
3306 D3
3307 C3
3308 D3
3309 C2
3310 C3
3311 E3
6301 A3
6302 B3
6303 A3
6304 B3
6305 D2
6306 D2
6307 D2
6308 E2
7301 C3
I301 A2
I302 A2
I303 A3
I304 C8
I305 B3
I306 D8
I307 B1
I308 D3
I309 B3
I310 C8
I311 C8
I312 C8
I313 D8
I314 D8
I315 D8
I316 D8
I317 E2
I318 D2
I319 C3
I320 C2
S301 A2
S302 A2
S303 C2
S304 D2
S305 D2
S306 E2
S307 E2
S308 E2
S309 E2

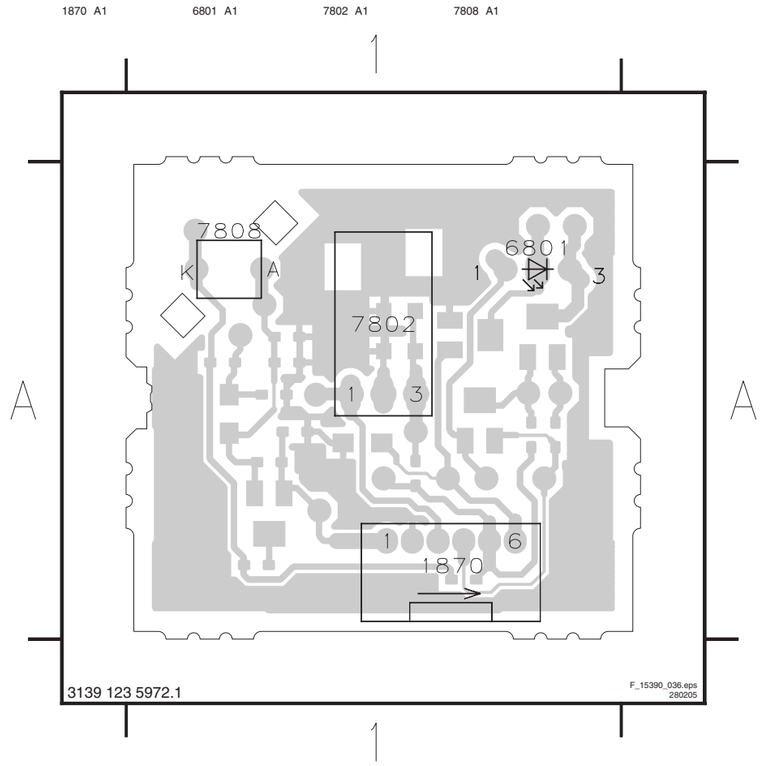
IR-LED and Light Sensor Panel

1870 B1	3801 B2	3808 E2	4807 E3	6803 C3	7804 C4	F802 C1	F806 B1	I804 C4	I810 D4
2801 C3	3802 A4	3809 E3	6801-1 B4	7801 B3	7807 E3	F803 B1	I801 B2	I805 B4	I811 E4
2802 C4	3803 C3	3810 E4	6801-2 B3	7802 C3	7808 E3	F804 B1	I802 B4	I806 B4	
2803 E3	3807 E2	3811 E4	6802 E4	7803 B4	F801 C1	F805 B1	I803 B3	I809 E3	



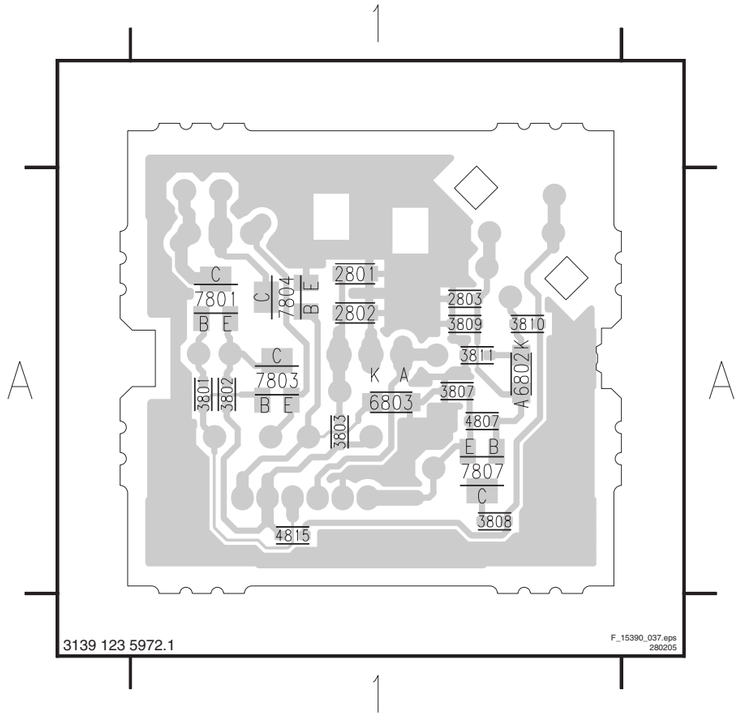
Layout IR-LED and Light Sensor Panel (Top Side)

1870 A1 6801 A1 7802 A1 7808 A1



Layout IR-LED and Light Sensor Panel (Bottom Side)

2801 A1 2803 A1 3802 A1 3807 A1 3809 A1 3811 A1 4815 A1 6803 A1 7803 A1 7807 A1
2802 A1 3801 A1 3803 A1 3808 A1 3810 A1 4807 A1 6802 A1 7801 A1 7804 A1



8. Alignments

Index of this chapter:

Note: Figures below can deviate slightly from the actual situation, due to the different set executions.

General: The Service Default Mode (SDM) and Service Alignment Mode (SAM) are described in chapter 5. Menu navigation is done with the Cursor Up, Down, Left or Right keys of the remote control transmitter.

8.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:
Mains voltage and frequency: 100-240 V / 50/60 Hz.
Allow the set to warm up for approximately 10 minutes.
Test probe: Ri > 10 MΩ; Ci < 2.5 pF.

8.2 Hardware Alignments

There are no hardware alignments foreseen for the LCD-TV.

8.3 Software Alignments

With the software alignments of the Service Alignment Mode (SAM) the geometry, white tone and tuner (IF) can be aligned.
To store the data: Use the RC button Menu to switch to the main menu and next, switch to ‘Stand-by’ mode.

8.3.1 SAM Menu

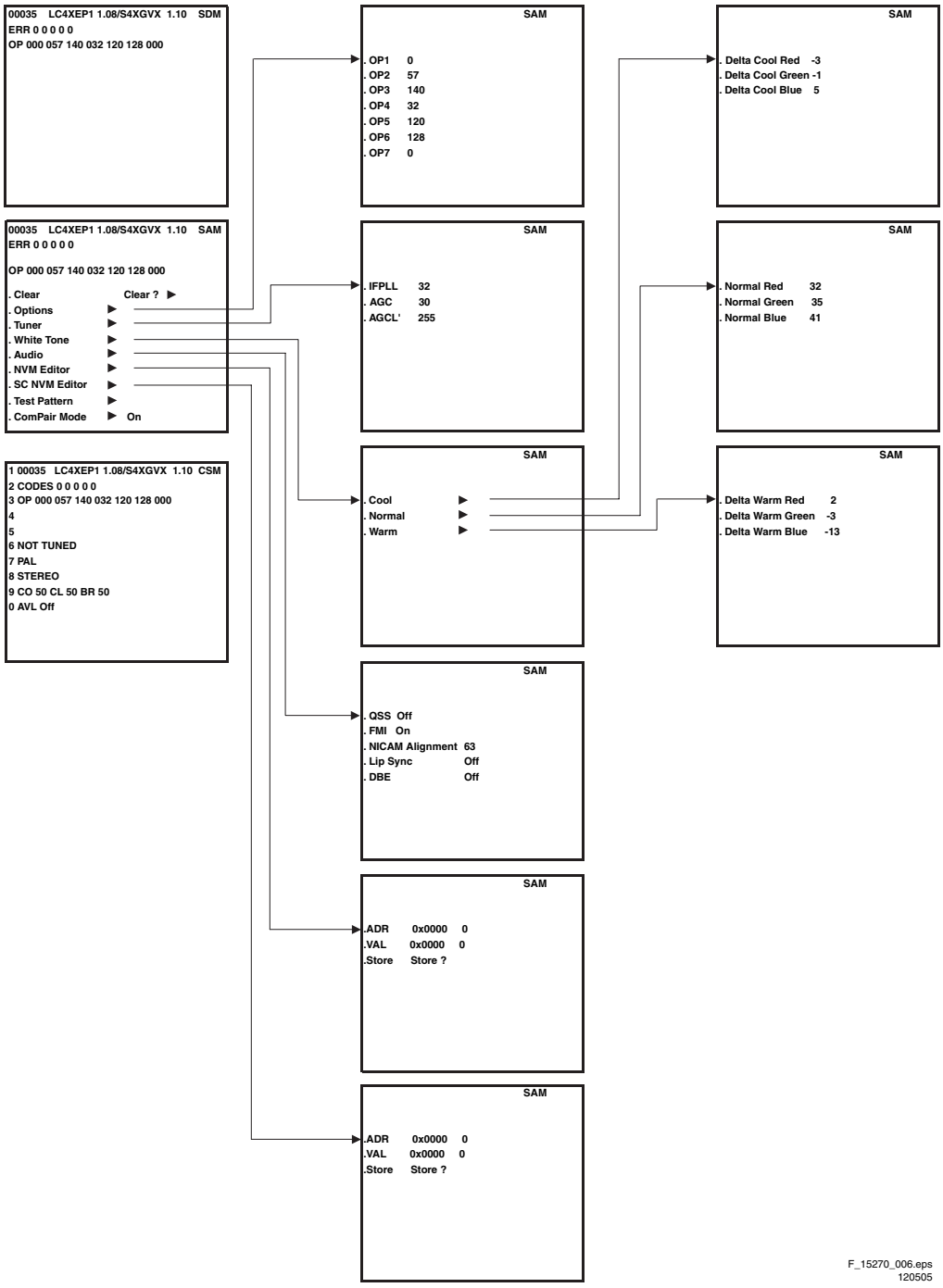


Figure 8-1 Overview SAM menu.

8.3.2 Tuner Adjustment

AGC (RF AGC Take Over Point)

- Activate the SAM menu.
- Go to the sub-menu Tuner.
- Select the AGC sub-menu.
- Adjust the AGC value to AGC = 27.
- Adjust the AGC L' value to AGC L' = 27 (Europe only).
- Adjust the IFPLL value to IFPLL = 32 (Europe only).
- Switch the set to standby to store the data.

8.3.3 DCXO (Digital Xtal Oscillator) Alignment (for NICAM sets only)

- Input a Colour bar signal with a colour subcarier frequency of 4.43 MHz on SCART1 or SCART2.
- Select as a signal source EXT1 or AV1.
- Go to the SAM menu and select Audio.
- Activate DCXO Alignment and wait until this process has finished (DONE).
- Check if the NICAM audio reception is OK, if not: repeat the procedure.
- Switch the set to standby to store the data.

8.3.4 ADC Gain, Grey Scale Alignment & Panel Size Settings

The table below shows a number of NVM settings used for each model of TV set. Be sure to use the correct editor in the SAM menu (NVM Editor or SC NVM Editor), because the first one is used for the Hercules NVM, and the second one for the SCALER (SC) part of the TV set. For further important NVM settings, see also the other NVM tables elsewhere in this manual.

Caution:

- **Do not change the NVM settings without understanding the function of each setting, because incorrect NVM settings may seriously hamper the correct functioning of the TV set!**
- **Do not change the Scaler NVM settings, as this will hamper the DVI functionality of the TV set!**
- Always note down the existing NVM settings, before changing the settings. This will enable you to return to the orginal settings, if the new settings turn out to be incorrect.

Table 8-1 ADC gain, grey scale alignment & panel size settings

SDTV ADC Gain settings: Use the NVM Editor in SAM to set these values in the Hercules NVM								
		These models are with ADC & Columbus 3D Combfilter					Without ADC & 3D Combfilter	
Setting	Hercules NVM Address (decimal value)	32PF7320/10	32PF5320/10	26PF5320/10	Settings Range (decimal value)		26PF4310/10	Settings Range (decimal value)
NVM_ADC_GAIN_R	006	110	110	110	075 - 155		N.A.	N.A.
NVM_ADC_GAIN_G	007	180	180	180	150 - 200		N.A.	N.A.
NVM_ADC_GAIN_B	008	110	110	110	075 - 155		N.A.	N.A.
SDTV Greyscale settings: Use the SC NVM Editor in SAM to set these values in the Scaler NVM								
		These models are with ADC & Columbus 3D Combfilter					Without ADC & 3D Combfilter	
Setting	Scaler NVM Address (decimal value)	32PF7320/10	32PF5320/10	26PF5320/10	Settings Range (decimal value)		26PF4310/10	Settings Range (decimal value)
ADC_RED_OFFSET2	338	080	080	080	050 - 110		080	050 - 110
ADC_GRN_OFFSET2	339	080	080	080	050 - 110		080	050 - 110
ADC_BLU_OFFSET2	340	080	080	080	050 - 110		080	050 - 110
ADC_RED_GAIN	341	065	065	065	040 - 095		170	135 - 190
ADC_GRN_GAIN	343	065	065	065	040 - 095		135	135 - 190
ADC_BLU_GAIN	345	065	065	065	040 - 095		170	135 - 190
PC Greyscale settings								
		These models are with ADC & Columbus 3D Combfilter					Without ADC & 3D Combfilter	
Setting	Scaler NVM Address (decimal value)	32PF7320/10	32PF5320/10	26PF5320/10	Settings Range (decimal value)		26PF4310/10	Settings Range (decimal value)
ADC_RED_OFFSET2	325	080	080	080	040 - 090		080	040 - 090
ADC_GRN_OFFSET2	326	080	080	080	040 - 090		080	040 - 090
ADC_BLU_OFFSET2	327	080	080	080	040 - 090		080	040 - 090
ADC_RED_GAIN	328	200	200	200	180 - 270		154	180 - 270
ADC_GRN_GAIN	330	200	200	200	180 - 270		154	180 - 270
ADC_BLU_GAIN	332	200	200	200	180 - 270		154	180 - 270
HD Greyscale settings								
		These models are with ADC & Columbus 3D Combfilter					without ADC & 3D Combfilter	
Setting	Scaler NVM Address (decimal value)	32PF7320/10	32PF5320/10	26PF5320/10	Settings Range (decimal value)		26PF4310/10	Settings Range (decimal value)
ADC_RED_OFFSET2	351	064	064	064	050 - 090		064	050 - 090
ADC_GRN_OFFSET2	352	082	082	082	050 - 090		082	050 - 090
ADC_BLU_OFFSET2	353	064	064	064	050 - 090		064	050 - 090
ADC_RED_GAIN	354	159	159	159	120 - 200		159	120 - 200
ADC_GRN_GAIN	356	144	144	144	120 - 200		144	120 - 200
ADC_BLU_GAIN	358	147	147	147	120 - 200		147	120 - 200
Panel size settings								
		WXGA 16x9 panel, brand: LPL					WXGA 15x9 panel	
Setting	Scaler NVM Address (decimal value)	32PF7320/10	32PF5320/10	26PF5320/10			26PF4310/10, brand: QDI	26PF4310/10, brand: LPL
NVM_PANEL_SEL	320	015	015	026			025	027

8.3.5 Sound

- For NICAM sets: see paragraph 8.3.3.
- For other sets: No adjustments needed for sound.

8.3.6 Options

Options OP1...OP7 in the SAM menu can be used for quickly restoring 64 features or settings of the SCALER part of the TV set to their orginal default factory values (8 groups of 8 features/settings each). When the decimal value of one option byte OP1...OP7 is changed (see the first table below) then a group of 8 bits, representing 8 SCALER options or features, is changed as well (see the second table below for a detailed description of the features or settings that are changed).
The second table shows which option byte (OP1...OP7) represents which group of 8 option bits. Each bit (0...7) switches a particular SCALER feature or setting ON or OFF, depending on its value (1 or 0).
It is also possible to change the features or settings mentioned in the second table directly at bit level, by means of the SC (i.e., SCALER) NVM Editor in the SAM menu. In the SC NVM Editor, first the correct NVM address (ADR) has to be entered, then the correct value (VAL, 1 or 0) for each bit (see second table), and finally the settings have to be stored (STORE). For quickly restoring the SCALER part of the TV set to its original factory settings, however, it is more convenient to simply enter the default factory settings OP1...OP7 that are given in the first table below. How to do this, is described in the next paragraph.

How to Change an Option Byte
As has been explained above, an Option byte (OP) represents a number of different SCALER options. Changing these bytes directly makes it possible to set all SCALER options very fast. All options are controlled via seven option bytes. Select the option byte (OP1.. OP7) with the Menu Up/ Down keys, and enter the new (decimal) value. For the correct Factory Default settings, see the first table below. For more detailed information, see the second table.

Leaving the Option submenu saves the changes in the Option Byte settings. Some changes will only take effect after the set has been switched “off” and “on” with the AC power switch (cold start).

Table 8-2 Option codes OP1...OP7

Option table for quickly restoring the SCALER to its Factory Default settings				
Model number	32PF7320/10	32PF5320/10	26PF5320/10	26PF4310/10
OP1	152	152	152	152
OP2	37	37	37	37
OP3	79	15	15	14
OP4	113	113	113	113
OP5	252	252	252	252
OP6	27	27	27	27
OP7	19	19	19	3
Options (can be changed only via the SAM menu)	Total decimal value for each option per model number			

How to Change Options at Bit Level
If you wish to know which features or settings of the SCALER are changed via OP1...OP7, or if you want to change each option or feature bit by bit, use the more detailed table below.
Note: the table below contains only part of the NVM settings that can be changed (i.e., only part of the SCALER settings). A second range of settings and features, belonging to the HERCULES part of the TV set, can be found in Chapter 5 of this manual, in Table 5-2. The HERCULES NVM settings mentioned there can only be changed via the NVM editor, and not via the SCALER “Options” OP1...OP7. For further settings, see also the NVM settings in the Table “ADC Gain, Grey scale alignment & panel size settings” elsewhere in this manual.

Table 8-3 Option codes in detail, at bit level

Option byte & bit table for restoring the SCALER to its original Factory Default settings via the SC NVM Editor in the SAM menu						
	Model number	32PF7320/10	32PF5320/10	26PF5320/10	26PF4310/10
OP1	**Description of feature/option to be switched ON or OFF**				
bit 7 (msb)	OP_PHILIPS_TUNER	1	1	1	1
bit 6	OP_FM_RADIO	0	0	0	0
bit 5	OP_LNA	0	0	0	0
bit 4	OP_ATS // for EU	1	1	1	1
bit 3	OP_ACI	1	1	1	1
bit 2	OP_UK_PNP	0	0	0	0
bit 1	OP_VIRGIN_MODE	0	0	0	0
bit 0 (lsb)	OP_CHINA	0	0	0	0
	Total DEC Value	152	152	152	152
	Total HEX Value	98	98	98	98
OP2					
bit 7 (msb)	OP_SC	0	0	0	0
bit 6	OP_IBEX	0	0	0	0
bit 5	OP_CHANNEL_NAMING	1	1	1	1
bit 4	OP_LTI (Lum Transcient Improvmt)	0	0	0	0
bit 3	OP_TILT	0	0	0	0
bit 2	OP_FINE_TUNING	1	1	1	1
bit 1	OP_PIP_PHILIPS_TUNER	0	0	0	0
bit 0 (lsb)	OP_HUE	1	1	1	1
	Total DEC Value	37	37	37	37
	Total HEX Value	25	25	25	25
OP3					
bit 7 (msb)	OP_EW_FUNCTION	0	0	0	0
bit 6	OP_PIXEL_PLUS	1	0	0	0
bit 5	OP_PIP_SPLITTER // temp	0	0	0	0
bit 4	OP_SPLITTER // temp	0	0	0	0
bit 3	OP_VIRTUAL_DOLBY	1	1	1	1
bit 2	OP_WIDE_SCREEN	1	1	1	1
bit 1	OP_WSSB	1	1	1	1
bit 0 (lsb)	OP_OP_ME5 // OP_ME5 - 5/6 local buttons implementation	1	1	1	0
	Total DEC Value	79	15	15	14
	Total HEX Value	4F	0F	0F	0E
OP4					
bit 7 (msb)	OP_LIP_SYNC	0	0	0	0
bit 6	OP_HD	1	1	1	1
bit 5	OP_ULTRA_BASS	1	1	1	1
bit 4	OP_DELTA_VOLUME	1	1	1	1
bit 3	OP_TAIWAN_KOREA	0	0	0	0
bit 2	OP_VOLUME_LIMITER	0	0	0	0
bit 1	OP_STEREO_DBX	0	0	0	0
bit 0 (lsb)	OP_STEREO_NICAM_2CS	1	1	1	1
	Total DEC Value	113	113	113	113
	Total HEX Value	71	71	71	71
OP5					
bit 7 (msb)	OP_AV1	1	1	1	1
bit 6	OP_AV2	1	1	1	1
bit 5	OP_AV3	1	1	1	1
bit 4	OP_CVI	1	1	1	1
bit 3	OP_SVHS2	1	1	1	1
bit 2	OP_SVHS3	1	1	1	1
bit 1	OP_HOTEL_MODE	0	0	0	0
bit 0 (lsb)	OP_SIMPLY_FACTORY=OP_BTSC_AVSTEREO	0	0	0	0
	Total DEC Value	252	252	252	252
	Total HEX Value	FC	FC	FC	FC
OP6					
bit 7 (msb)	OP_PERSONAL_ZAPPING	0	0	0	0
bit 6	OP_SMART_SURF	0	0	0	0
bit 5	OP_FMTRAP	0	0	0	0
bit 4	OP_COMBFILTER	1	1	1	1
bit 3	OP_ACTIVE_CONTROL	1	1	1	1
bit 2	OP_VIDEO_TEXT	0	0	0	0
bit 1	OP_LIGHT_SENSOR	1	1	1	1
bit 0 (lsb)	OP_TWIN_TEXT	1	1	1	1
	Total DEC Value	27	27	27	27
	Total HEX Value	1B	1B	1B	1B
OP7					
bit 7 (msb)	OP_TIME_WIN1	0	0	0	0
bit 6	OP_DVB_USB = OP_MALAY	0	0	0	0
bit 5	OP_AMBILIGHT	0	0	0	0
bit 4	OP_COLUMBUS	1	1	1	0
bit 3	OP_DUMMY6	0	0	0	0
bit 2	OP_DUMMY7	0	0	0	0
bit 1	OP_WEST_EU	1	1	1	1
bit 0 (lsb)	OP_MULTI_STANDARD_EUR	1	1	1	1
	Total DEC Value	19	19	19	3
	Total HEX Value	03	03	03	03

9. Circuit Descriptions, Abbreviation List, and IC Data Sheets

Index of this chapter:

9.1 Introduction

The LC4.3 LCD TV is a global LCD TV for the year 2005. It is the successor of the LC4.2 LCD TV and covers screens sizes 26 inch (in 15:9 and 16:9 ratio) and 32 inch (in 16:9 ratio) and has a new styling, called ME5. There are three different picture qualities available, depending on the model: Pixel Plus, Digital Cristal Clear and Cristal Clear. The block diagram below (Figure 2.1) shows the Pixel Plus architecture; the architectures of the other models are shown in the block diagram on the next page (Figure 2.2).

The architecture consists of a TV and Scaler panel, I/O panel, Side I/O and Local Keyboard panel and Power Supply panel. The functions for video/audio processing, microprocessor (P), and CC/Teletext (TXT) decoder are all combined in one IC (TDA150xx, item 7217), the so-called third generation Ultimate One Chip (UOC-III) or “Hercules”. This chip has the following features:

- Control, small signal, mono/stereo, and extensive Audio/ Video switching in one IC.
- Upgrade with digital sound & video processing.
- Alignment free IF, including SECAM-L/L1 and AM.
- FM sound 4.5/5.5/6.0/6.5, no traps/bandpass filters.
- Full multi-standard colour decoder.
- One Xtal reference for all functions (microprocessor, RCP, TXT/CC, RDS, colour decoder, and stereo sound processor).

9.2 Block Diagram

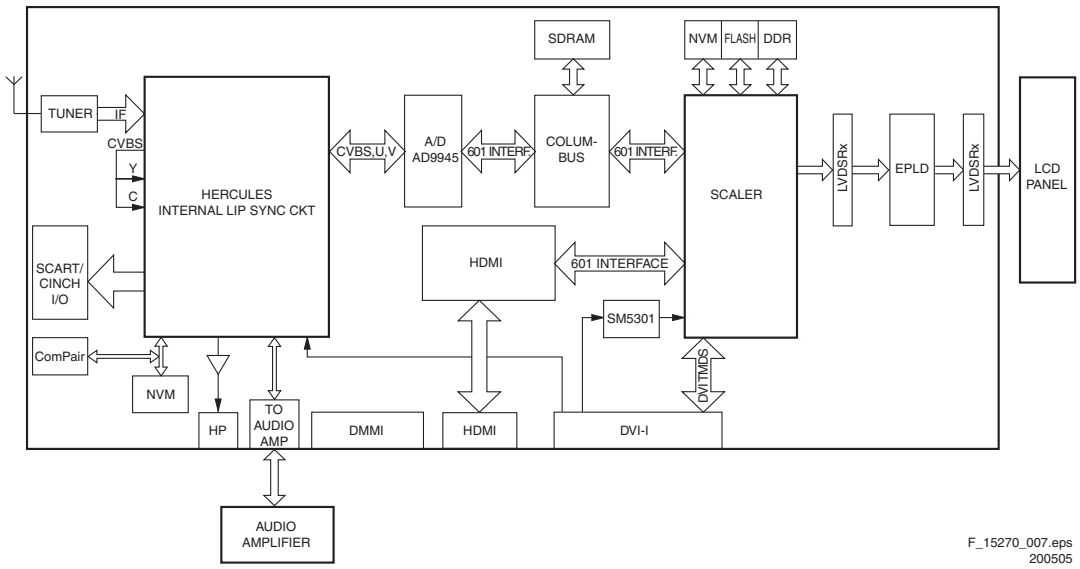


Figure 9-1 Block Diagram

The PLL tuner UV1318 delivers the IF-signal, via audio & video SAW-filters, to the Video Signal Processor and FLASH embedded TEXT/Control/Graphics Micro Controller TDA120x1 (item 7011, also called Hercules). This IC has the following functions:

- Analogue Video Processing
- Sound Demodulation
- Audio Interfaces and switching
- Volume and tone control for loudspeakers
- Reflection and delay for loudspeaker channels
- Micro Controller
- Data Capture
- Display

The Hercules has one input for the internal CVBS signal and a video switch with 3 external CVBS inputs and a CVBS output. All CVBS inputs can be used as Y-input for Y/C signals. However, only 2 Y/C sources can be selected because the circuit has 2 chroma inputs. It is possible to add an additional CVBS(Y)/C input (CVBS/YX and CX) when the YUV interface and the RGB/YPRPB input are not needed. Two SCART-connectors are used: SCART1 is for RGB-in, video in (CVBS) and terrestrial out (CVBS), and SCART2 is meant for VCR (CVBS out and Y/C in). The CVBS-out on pin 19 of SCART2 can be used for monitoring purposes: WYSIWYR (What You See Is What You Record).
Depending on the model of the TV set, the Hercules delivers its RGB signals either directly to the Scaler IC or indirectly, via a Columbus chip (for 2D/3D comb filtering and spatial/temporal noise reduction, for its description: see further down in this text). The EPLD, which is present in Pixel Plus models, provides additional sharpening to the picture. For a general outline, see the table and the block diagrams below, in which the architectures of the various models are given, together with their electronic building blocks.

Table 9-1 Models and picture quality

Model	Picture quality
32PF7320/10	Pixel Plus
32PF5320/10	Digital Crystal Clear
26PF5320/10	Digital Crystal Clear
26PF4310/10	Crystal Clear

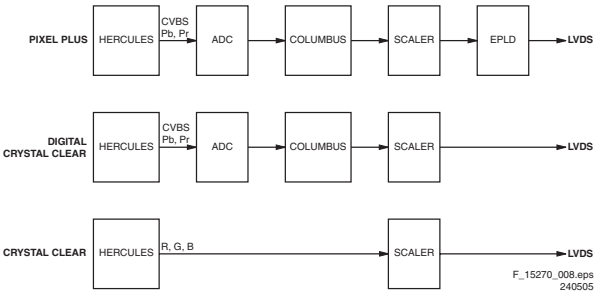


Figure 9-2 Block diagram of the internal building blocks

The Genesis GM1501 Malibu Scaler IC can receive two video input signals: SDTV (directly from Hercules or via Columbus), DVI (from an external DVI source), or PC (from external computer).
After the video processing, the digital data is sent via a Low Voltage Differential Signalling bus to the LCD panel. LVDS is used to improve data speed and to reduce EMI significantly.
There are two I^2C lines and two interrupt and communication lines (TV_IRQ and TV_SC_COM) for the Scaler control. The Scaler communicates with the Hercules as a slave device. To avoid buffer overflow at the Scaler side, the TV_SC_COM line provides the necessary hardware flow control. To allow bi-directional communication, the Scaler can initiate a service interrupt-request to the Hercules via the TV_IRQ line.

The Hercules, and EEPROM are supplied with 3.3 V, which is also present during STANDBY.
The EEPROM, or NVM (Non Volatile Memory) is used to store the settings.

The sound part is built up around the Hercules. The Source Selection, Decoding and Processing are all done by the Hercules.

Power supply input are several DC voltages coming from a supply panel.

9.3 Input/Output

The I/O is divided over two parts: Rear I/O and Side I/O. The rear has two SCART inputs, a PC/DVI-I input (VGA to DVI-I via an external adaptor) and an Audio input. The side has a CVBS and Y/C (SVHS) input, combined with L+R audio inputs, and has also a headphone output.

EXT1: The input of SCART1 is CVBS + RGB + L/R and the output is the video (+ sound) signal from the tuner (SC1_CVBS_RF_OUT).

EXT2: The input of SCART2 is Y/C + CVBS + L/R. The output signal is CVBS_SC2_MON_OUT (+ sound).
SCART2 is meant for VCR and has therefore some additional signals in relation to EXT1 but no RGB: it has the possibility for Y/C_in: Y_in on pin 20 and Chroma_in on pin 15.
The selection of the external I/O's is controlled by the Hercules.

PC in (DVI-I, or VGA via external VGA to DVI-I adaptor): This input is directly going to the Scaler IC. See paragraph “Video: Scaler Part”.

9.4 Tuner and IF

A Philips UV1318 Tuner is used in the TV board. The SIF signals are decoded by the Hercules. Tuning is done via I^2C.

9.4.1 Video IF Amplifier

The IF-filter is integrated in a SAW (Surface Acoustic Wave) filter. One for filtering IF-video (1104, in some models: 1105) and one for IF-audio (1106). The type of these filters depends on the standard(s) that has/have to be received.

The output of the tuner is controlled via an IF-amplifier with AGC-control. This is a voltage feedback from pin 31 of the Hercules to pin 1 of the tuner. The AGC-detector operates on top sync and top white level. AGC take-over point is adjusted via the service alignment mode ’Tuner' - 'AGC’. If there is too much noise in the picture, then it could be that the AGC setting is wrong. The AGC-setting could also be mis-aligned if the picture deforms with perfect signal; the IF-amplifier amplifies too much.

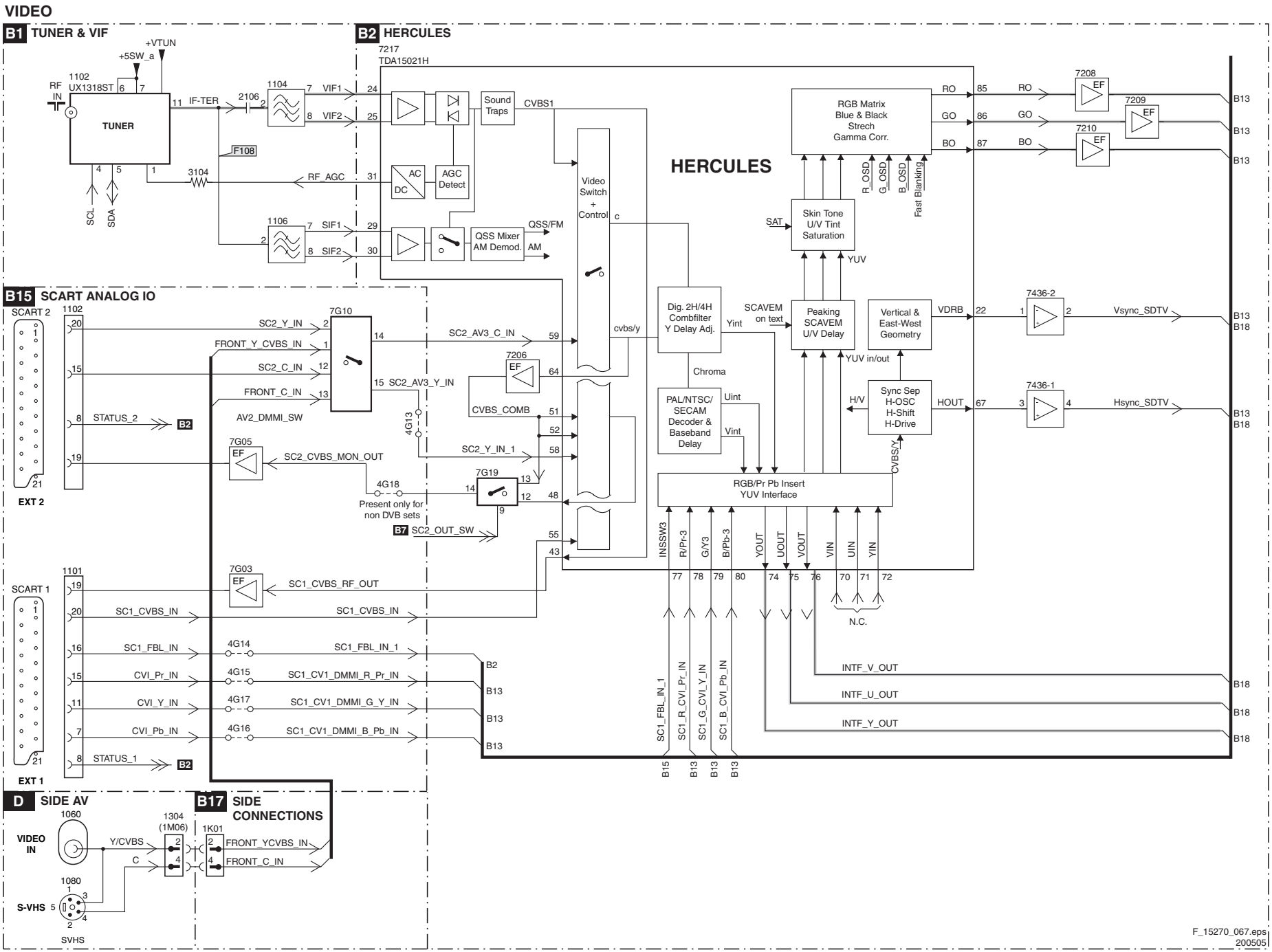


Figure 9-3 Block diagram video processing

The video processing is completely handled by the Hercules
- IF demodulator.
- Chrominance decoder
- Sync separator.
- Horizontal & vertical drive.
- RGB processing.
- CVBS and SVHS source select.

It has also built-in features like:
- CTI.
- Black stretch.
- Blue stretch.
- White stretch.
- Slow start up.
- Dynamic skin tone correction etc.

Further, it also incorporates sound IF traps and filters, and requires only one crystal for all systems.

9.6 Columbus

9.6.1 Introduction

The Columbus is a combination of:
- A **2D/3D Comb filter** for both PAL and NTSC, and
- A **spatial/temporal noise reduction system** for both colour and luminance signals.

The Columbus 3D Comb filter uses digitalised CVBS, U, and V (or C) signals and can be used with or without an external 16 Mbit SDRAM. Without external 16Mbit SDRAM, 3D comb filtering and temporal noise reduction are not possible.

The noise reduction part of the Columbus is controlled by the FBX software using the SNERT interface. The 2D/3D Comb filter part is controlled by the Main software using the I^2C bus.

9.6.2 2D/3D Comb Filter

Introduction
The “3D Comb filter Columbus” is a combined 2D/3D Comb filter function that is part of the Columbus chip (circuit diagram B19, item 7M00). It is a comb filter for both PAL and NTSC.

The 3D Comb filter is used to separate chroma and luminance components out of a CVBS signal. It is of no use when the CVBS signal is a SECAM signal (SECAM signals cannot be combed) The Columbus chip can be used with or without 16 Mbit external SDRAM (circuit diagram B10, item 7B01). When an external SDRAM is connected to the IC, the Comb filter function can work in combined 2D/3D processing (depending on the detected pixel based motion). When no external SDRAM is connected, only 2D Comb filtering is possible.

The Columbus can comb the following standard signals:
- PAL B, PAL G, PAL H, PAL I, PAL D, PAL K: Colour standard PAL, Colour carrier at 4.43 MHz, field frequency: 50 Hz
- PAL M: Colour standard PAL, Colour carrier at 3.58 MHz, field frequency: 60 Hz
- PAL N: Colour standard PAL, Colour carrier at 3.58 MHz, field frequency: 50 Hz
- NTSC M: Colour standard NTSC, Colour carrier at 3.58 MHz, field frequency: 60 Hz

For NTSC signals, the PAL delay line must always be bypassed.

The following signals CANNOT be combed:
- Double Window signals or Multi PIP. For these signals, only one part or even no part of the signal is in relation with the burst. The part that is not in relation with the burst can become very blurred when combed by the Columbus Comb filter. Such a signal must be bypassed. Notch mode is not even an option since e.g. in double window, one part can be a PAL signal while the other part is NTSC or SECAM.
- In cases where a SECAM signal is presented to the Columbus Comb filter; both the luminance and UV path must be bypassed. The PAL delay line inside the Columbus cannot be used for SECAM signals so it must also be bypassed. The luminance path must have luminance at its input instead of CVBS. A chroma delay line outside Columbus must be used for SECAM signals. Reason for this: the Columbus PAL delay line halves the output of the chroma signals in case of SECAM.
- Y/C, YPbPr, and RGB signals do not have to be combed. So both the luminance and UV path must be bypassed. The PAL delay line will also be bypassed.
- In cases where the Columbus Comb filter does not receive a CVBS signal with burst at the right place according to the standard (this includes black and white signals without burst), phase correction results become unpredictable and the Comb filter must be set in bypass (= luminance path bypassed, UV path bypassed, PAL delay line bypassed)
- VCR signals cannot be combed and must be processed in notch mode, or bypassed.

Columbus Modes
The several modes of the Columbus 3D Comb filter are:
- Bypass mode.
- Band-Pass-Notch mode.
- 2D Comb filter modes.
  - Simple median.
  - Median.
- Field Comb filter mode.
- Frame Comb filter mode.

Bypass Mode
The 3D Comb filter can be set in bypass mode. In this mode, the CVBS, U and V signals are just bypassed to the output.

Band-Pass-Notch Mode
This is a mode where no Comb filtering is applied. A “Band Pass Filter” is used to filter the chroma information out of the CVBS signal. A “Notch Filter” is used to subtract the sub carrier out of the CVBS in order to make a luminance signal without chroma sub carrier.
In terms of cross colour and cross luminance, this mode has the worst performance of all. It is only used on these signals where no comb filtering can be applied (non-standard signals and most VCR signals for example).

2D Comb Filter Modes
A Comb filter does an action on a current pixel and a delayed pixel. When the delayed pixel is a line-delayed pixel, we talk about a “Spatial or 2D Comb Filter” (for NTSC the delay must be 1 line, for PAL it must be 2 lines).
Spatial or 2D Comb filters show problems on vertical colour transients and on single coloured lines. For these situations, extra hardware is added in the Columbus chip to avoid these kinds of problems. However even with these extra measures, there are still situations where the 2D Comb filter does not perform optimally (diagonal resolution and single lines with equal luminance content). In order to restrict the working area of the 2D Comb filter to the frequencies where the sub carrier is present, a horizontal band pass filter always precedes a 2D Comb filter.
When a 2D Comb filter has no extra hardware to avoid problems at vertical colour transients (or this extra hardware is switched “off”), the Comb filter is called a “simple median filter”. When there is extra hardware to avoid these kinds of problems, the filter is called a “median filter”.

Field Comb Filter Mode
A Comb filter does an action on a current pixel and a delayed pixel. When the delayed pixel is a field-delayed pixel, we talk

about a “Field Comb Filter”. Field Comb filters are only for PAL of commercial interest.
Field Comb filters show also problems on vertical colour transients and on motion. For the vertical transients, a hanging dots detector has been added, however the performance on vertical transients of the field Comb filter, even with this hanging dots detector, is worse than the performance of the 2D Comb filter. On motion, the field Comb filter performs very badly. A motion detector must detect the pixels where there is motion and on these pixels, the Comb filter must be forced back to 2D Comb filter mode. This switching back is not implemented with a hard switch, but with a motion controlled fader. When there is a lot of motion, the fader will take a lot of the 2D Comb filter output, when there is less motion, more field-combed signal will be taken.
A field Comb filter is also called a “vertical-temporal filter” because it filters in the vertical and temporal direction.

Frame Comb Filter Mode
A Comb filter does an action on a current pixel and a delayed pixel. When the delay is a frame, we talk about a “Frame Comb Filter”. For NTSC we need a delay of one frame, for PAL however the delay must be two frames.
Frame Comb filters have the best performance, but just like the Field Comb filter, they perform very badly on motion. A motion detector will have to detect motion and on these motion pixels, 2D Comb filtering will have to be applied. A frame Comb filter is a pure “temporal filter”.
The Columbus needs an external memory connected to it, before it can do a temporal or vertical-temporal Comb filter action. When no external memory is connected, field or frame Comb filtering is impossible.

Block Diagram
In the next block diagram, two main parts of the Columbus 2D/3D Comb filter can be seen:

- The upper part is what is called the luminance Comb filter. It tries to make an as clean as possible luminance signal out of the CVBS signal at the input.
- The lower part receives U and V signals (sequentially) that are normally only band pass filtered in front of the 3D Comb filter. It filters all left over luminance signals out of it, in order to make an as clean as possible U and V signal.

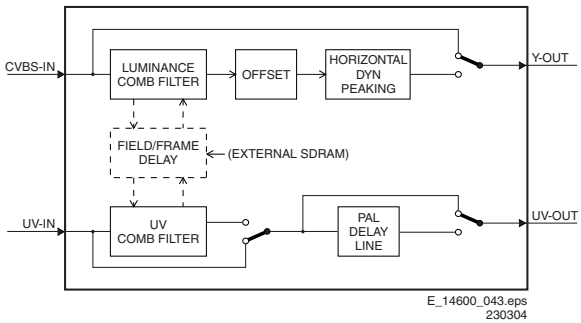


Figure 9-4 Columbus 2D/3D Comb Filter block diagram

The Comb filter has two inputs. One is the CVBS where clean luminance (Y) will be extracted from; the other one is UV where a clean U and V signal will be extracted. Both input signals are **digital** signals.

The field or frame delay is used for the Field and Frame Comb filter mode. An external memory connected to the Columbus IC provides this delay.

Phase correction is done at the inputs of both the Comb filter blocks. There is a phase correction for spatial filtering (called the spatial phase corrector) and a separate phase correction on the signals used for temporal (Frame or Field) Comb filtering (called the temporal phase corrector).

The offset block receives the motion dependant 2D/3D Comb filtered signal as input. The black level of the luminance signal is restored and the result is output. The black level restoration is corrected continuously. However, on VCR signals, this restoration can become unstable. Therefore, on VCR signals, a fixed black level restoration value must be forced.

A horizontal dynamic peaking can be done on the luminance signal. This peaking is adaptive in order not to amplify any cross luminance distortion. It detects where there could be left over sub carrier in the luminance signal and reduces the peaking over there. The detection of the left over cross luminance is different depending on the pre-filter or post-filter mode.
The amount of peaking and coring can be chosen. The peaking algorithm behind it is a simplified copy of the luminance peaking of picnic. After the peaking block, the signal is output as clean luminance.

The bypass switches have the obvious purpose of bypassing the input signal, in case no Comb filtering is wanted.

A PAL delay line is added in the UV path. This is done because a delay line in front of the 3D Comb filter does need an extra vertical filter action on the UV signals. This vertical filtering deteriorates the vertical transient performance for colours. The Columbus Comb filter cannot undo this. However, this reduction in performance can be omitted by putting the PAL delay line after the 3D Comb filter block.
For PAL signals, the PAL delay line in front of the Columbus 3D Comb filter is bypassed and the Columbus delay line is switched “on”. In cases where the delay line in front of Columbus cannot be bypassed, the Columbus PAL delay line is bypassed.
For NTSC signals, the PAL delay line is bypassed as usual.

9.6.3 Noise Reduction and Noise Estimator

The noise reduction function is a sophisticated successor of the noise reduction module from the PICNIC-chip, also known as “LIMERIC”.

Besides the noise reduction part, the Columbus noise reduction module also comprises a noise estimator. This noise estimator (the LORE-noise estimator) is a new design with the ambition of more accuracy and with less control complexity than the existing noise estimators.

9.7 Video: Scaler Part (Diagram B7, B8 and B9)

The Genesis gm1501 Scaler is a dual channel graphics and video processing IC for LCD monitors and televisions incorporating Picture in Picture, up to SXGA output resolutions. The Scaler controls the display processing in an LCD TV, e.g. like the deflection circuit in a CRT-based TV. It controls all the view modes (e.g. like "zooming" and "shifting"). Features like PC (VGA) or HD inputs, are also handled by this part.

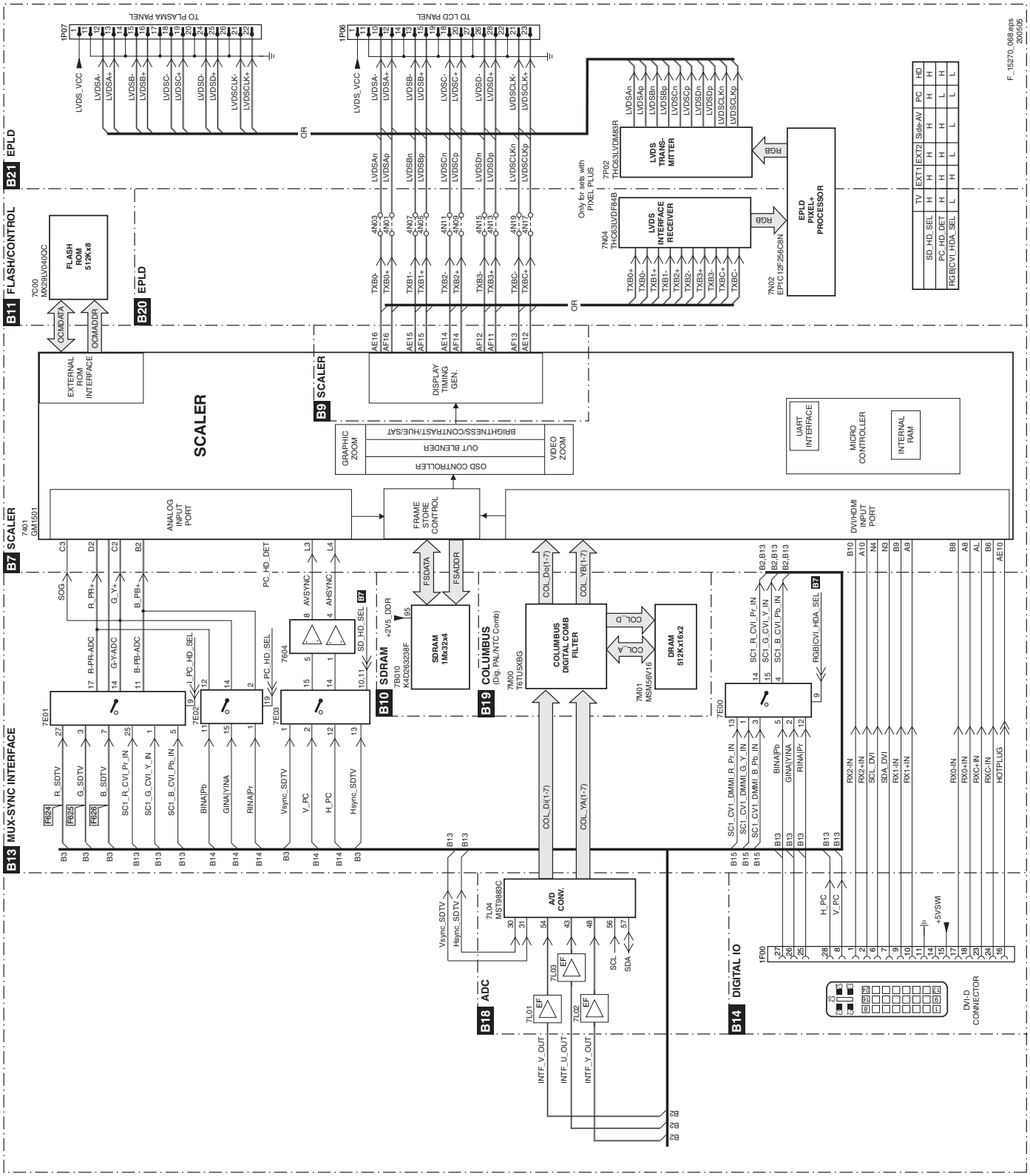


Figure 9-5 Block diagram scaler part

9.7.1 Teletext Path

In Pixel Plus and Digital Crystal Clear models, which have an ADC (B18) and Columbus 3D combfilter (B19), the digital input of the scaler is used for the digital video signal (Columbus output), whereas the analogue RGB input input of the scaler is used for teletext. This means that no mixed mode (video plus teletext simultaneously) is possible. In Crystal Clear models, which do not have an ADC and Columbus, the analogue RGB input of scaler is used for both video and teletext (generated by the Hercules). The digital input of the Scaler is not used in Crystal Clear TV sets. See also the block diagrams at the beginning of this chapter. When faultfinding, checking the teletext path may be useful: if there is sound and teletext, but no video and user menu (blank screen), the digital path (Hercules - ADC - Columbus - Scaler) is faulty. If there is sound but no teletext, the back-end part (Scaler - LCD panel) is faulty.

9.7.2 Features

The Scaler provides several key IC functions:
- Scaling.
- Auto-configuration/ Auto-Detection.
- Various Input Ports:
  - Analog RGB.
  - Video Graphics.
- Integrated LVDS Transmitter.
- On-chip Micro-controller

9.7.3 Inputs

Analog RGB
The RGB input is fed to pins B2, C2 and D2 of the Scaler IC (Genesis GM1501, item 7801, see circuit diagram B8). This input consists of either the Hercules RGB output or the RGB/ YpbPr input of the VGA connector. The Scaler can switch between the two signals via the PC_HD_SEL signal and selection IC SM5301 (see circuit diagram B13).

PC (VGA) Input
The VGA input is processed by the VGA block of the Scaler. The Scaler supports pixel frequencies up to 165MHz. YpbPr format is also supported via the VGA interface and covers a resolution of 480p/560p/720p/1080i.

9.7.4 Output

The Display Output Port provides data and control signals that permit the Scaler to connect to a variety of display devices using a TTL or LVDS interface. The output interface is configurable for single or dual wide TTL/LVDS in 18, 24 or 30-bit RGB pixels format. All display data and timing signals are synchronous with the DCLK output clock. The integrated LVDS transmitter is programmable to allow the data and control signals to be mapped into any sequence depending on the specified receiver format.

9.8 Audio Processing

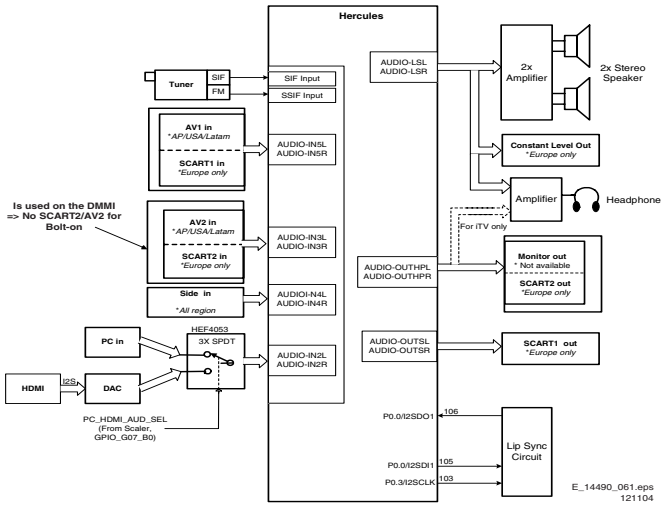


Figure 9-6 Block diagram audio processing

The audio decoding is done entirely via the Hercules. The IF output from the Tuner is fed directly to either the Video-IF or the Sound-IF input depending on the type of concept chosen. There are mainly two types of decoder in the Hercules, an analogue decoder that decodes only Mono, regardless of any standards, and a digital decoder (or DEMDEC) that can decode both Mono as well as Stereo, again regardless of any standards.

In this chassis, the analogue decoder is used in two cases:
- It is used for AM Sound demodulation in the Europe SECAM LL' transmission.
- It is used for all FM demodulation in AV-Stereo sets.

9.8.1 Diversity

The diversity for the Audio decoding can be broken up into two main concepts:
- The Quasi Split Sound concept used in Europe and some AP sets.
- The Inter Carrier concept, used in NAFTA and LATAM.

The UOC-III family makes no difference anymore between QSS- and Intercarrier IF, nearly all types are software-switchable between the two SAW-filter constructions.

Simple data settings are required for the set to determine whether it is using the Inter Carrier or the QSS concept. These settings are done via the "QSS" and "FMI" bit found in SAM mode. Due to the diversity involved, the data for the 2 bits are placed in the NVM location and it is required to write once during startup.

On top of that, it can be further broken down into various systems depending on the region. The systems or region chosen, will in turn affect the type of sound standard that is/are allowed to be decoded.
- For the case of Europe, the standard consists of BG/DK/I/ LL' for a Multi-System set. There are also versions of Eastern Europe and Western Europe set and the standard for decoding will be BG/DK and I/DK respectively. FM Radio is a feature diversity for the Europe sets. The same version can have either FM Radio or not, independent of the system (e.g. sets with BG/DK/I/LL' can have or not have FM radio).
- For the case of NAFTA and LATAM, there is only one transmission standard, which is the M standard. The diversity then will be based on whether it has a dBx noise reduction or a Non-dBx (no dBx noise reduction).
- For the case of AP, the standard consists of BG/DK/I/M for a Multi-System set. The diversity here will then depend on

the region. AP China can have a Multi-System and I/DK version. For India, it might only be BG standard.

9.8.2 Functionality

The features available in the Hercules are as follows:
- Treble and Bass Control.
- Surround Sound Effect that includes:
  - Incredible Stereo.
  - Incredible Mono.
  - 3D Sound (not for AV Stereo).
  - TruSurround (not for AV Stereo).
  - Virtual Dolby Surround, VDS422 (not for AV Stereo).
  - Virtual Dolby Surround, VDS423 (not for AV Stereo).
  - Dolby Pro-Logic (not for AV Stereo).
- Bass Feature that includes:
  - Dynamic Ultra-Bass.
  - Dynamic Bass Enhancement.
  - BBE (not for AV Stereo).
- Auto-Volume Leveler.
- 5 Band Equalizer.
- Loudness Control.

All the features stated are available for the Full Stereo versions and limited features for the AV Stereo

9.8.3 Audio Amplifier

The audio amplifier part is very straightforward. It uses two integrated TDA8931T power amplifiers for the L and R channels; each amplifier IC is able to deliver a maximum output of 20 W_{RMS} continuously in a 4-6 ohm speaker without needing a heatsink.
The operating supply for the amplifier may range from 12 V to 32 V; in the LC04x TV set, depending on the model, supply voltages of 18 V (for the 5 W / 8 ohm version) or 24 V (for the 15 W / 4 ohm version) are used.
Muting is done via the SOUND_ENABLE line connected to pins 7 of both amplifier-ICs, which comes from the Hercules.

9.8.4 Audio: Lip Sync

No Lip Sync adjustments are neccessary in this model.

9.9 Control

9.9.1 Hercules

The System Board has two main micro-controllers on board. These are:
- On-chip x86 micro-controller (OCM) from Genesis LCD TV/ Monitor Controller.
- On-chip 80C51 micro-controller from Philips Semiconductor UOCIII (Hercules) series.

Each micro-controller has it own I^2C bus which hosts its own internal devices.
The Hercules is integrated with the Video and Audio Processor. For dynamic data storage, such as SMART PICTURE and SMART SOUND settings, an external NVM IC is being used. Another feature includes an optional Teletext/Closed Caption decoder with the possibility of different page storage depending on the Hercules type number.

9.9.2 Block Diagram

The block diagram of the Micro Controller application is shown below.

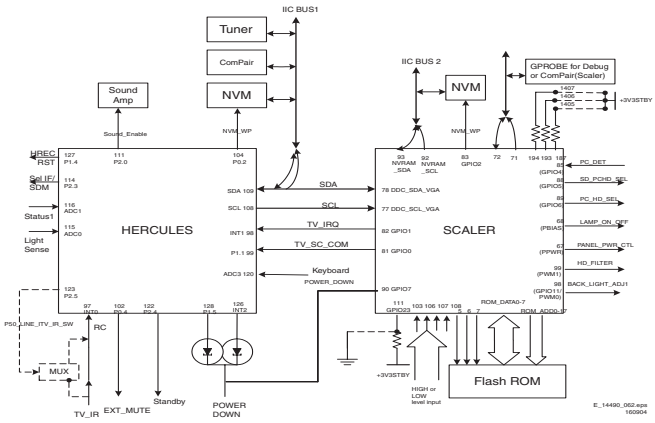


Figure 9-7 Micro Controller block diagram

9.9.3 Basic Specification

The Micro Controller operates at the following supply voltages:
- +3.3 V_{DC} at pins 4, 88, 94, and 109.
- +1.8 V_{DC} at pins 93, 96, and 117.
- I^2C pull up supply: +3.3V_{DC}.

9.9.4 Pin Configuration and Functionality

The ports of the Micro Controller can be configured as follows:
- A normal input port.
- An input ADC port.
- An output Open Drain port.
- An output Push-Pull port.
- An output PWM port.
- Input/Output Port

The following table shows the ports used for the LC04 control:

Table 9-2 Micro Controller ports overview

Pin	Name	Description	Configuration
97	INT0/ P0.5	IR	INT0
98	P1.0/ INT1	TV_IRQ	INT2
99	P1.1/ T0	TV_SC_COM	P1.1
102	P0.4/ I2SWS	EXT_MUTE	P0.4
103	P0.3/ I2SCLK	Lip Sync	I2SCLK
104	P0.2/ I2SDO2	NVM_WP	P0.2
105	P0.1/ I2SDO1	Lip Sync	I2SDO1
106	P0.0/ I2SDI/O	Lip Sync	I2SDI/O
107	P1.3/ T1	PC-TV_LED	P1.3
108	P1.6/ SCL	SCL	SCL
109	P1.7/ SDA	SDA	SDA
111	P2.0/ TPWM	SOUND_ENABLE	P2.0
112	P2.1/ PWM0	(for future use)	-
113	P2.2/ PWM1	(for future use)	-
114	P2.3/ PWM2	SEL_IF	P2.3
115	P3.0/ ADC0	Light Sensor - SDM	ADC0
116	P3.1/ ADC1	STATUS_1	ADC1
119	P3.2/ ADC2	STATUS_2	ADC2
120	P3.3/ ADC3	KEYBOARD	ADC3
122	P2.4/ PWM3	STANDBY	P2.4
123	P2.5/ PWM4	(for future use)	-
126	P1.2/ INT2	(for future use)	-
127	P1.4/ RX	HERC_RESET	-
128	P1.5/ TX	POWER_DOWN	P1.5

The description of each functional pin is explained below:

- **LED.** This signal is used as an indication for the Standby, Remote and Error Indicator. Region diversity:
  - During protection mode, the LED blinks and the set is in standby mode.
  - During error conditions it blinks at a predefined rate.
  - After receiving a valid RC-5 or local keyboard command it flashes once.
  - For sets with error message indication, the LED blinks when message is active and the set is in standby mode.
- **SCL.** This is the clock wire of the two-wire single master bi-directional I^2C bus.
- **SDA.** This is the data wire of the two-wire single master bi-directional I^2C bus.
- **STANDBY.** The Hercules generates this signal. This can enable the power supply in normal operation and disable it during Standby. It is of logic “high” (3.3 V) under normal operation and “low” (0 V) during Standby.
- **IR.** This input pin is connected to an RC5 remote control receiver.
- **SEL-IF.** This is an output pin to switch the Video SAW filter between M system and other systems.
  - 0: NTSC M (default)
  - 1: PAL B/G, DK, I, L
- **NVM_WP.** The global protection line is used to enable and disable write protection to the NVM. When write to the NVM is required, pin 7 of the NVM must be pulled to logic ‘0’ first (via Write_Protect of the micro-controller pin) before a write is performed. Otherwise pin 7 of NVM must always be at logic “1”
  - 0: Disabled
  - 1: Enabled (default)
- **SOUND_ENABLE.** This pin is used to MUTE the audio amplifier. It is configured as push pull.
- **STATUS_1.** This signal is used to read the status of the SCART 1 input.
- **STATUS_2.** This signal is used to read the status of the SCART 2 input.
- **HERC_RESET.** This pin is used to switch the +1.8V supply.
- **POWER_DOWN**. The power supply generates this signal. Logic “high” (3.3 V) under normal operation of the TV and goes “low” (0 V) when the Mains input voltage supply goes below 70 V_{AC}.
- **KEYBOARD**. Following are the Keyboard functions and the step values (8 bit) for it.

Table 9-3 Local keyboard values

Function	Voltage (V_{DC})	Step values (8 bit)
NAFTA Standby	0	0 - 6
Ch +	0.43	7 - 33
Exit Factory (Ch- and Vol-)	0.69	34 - 53
Ch -	0.93	54 - 73
Menu (Vol - and Vol +)	1.19	74 - 96
Vol -	1.49	97 - 121
DVD Eject	1.8	122 - 147
Vol +	2.12	148 - 169

- **TV_IRQ.** This signal is the interrupt from the Scaler IC.
- **TV_SC_COM.** This signal is used for the communication with the Scaler IC.
- **EXT_MUTE.** This signal is used to reduce the Switch-off plop.

9.10 Abbreviation List

0/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV), 6 = play 16:9 format, 12 = play 4:3 format
1080i	1080 visible lines, interlaced
1080p	1080 visible lines, progressive scan
2CS	2 Carrier Sound (or 2 Channel Stereo)
480i	480 visible lines, interlaced
480p	480 visible lines, progressive scan
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page
ADC	Analogue to Digital Converter
AFC	Automatic Frequency Control; Control signal used to tune and lock to the correct frequency
AGC	Automatic gain control (feedback) signal to the tuner. This circuit ensures a constant output amplitude regardless of the input amplitude
AM	Amplitude Modulation; A "data encoding to a carrier" method, such that the carrier amplitude is proportional to the data value
AP or A/P	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
ASD	Automatic Standard Detection
AV	External Audio Video
B-SC1-IN	Blue SCART1/EXT1 in
B-SC2-IN	Blue SCART2/EXT2 in
B-TXT	Blue TeleteXT
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz. B= VHF-band, G= UHF-band
BOCMA	Bimos one Chip Mid-end Architecture: video and chroma decoder
C-FRONT	Chrominance front input
CBA	Circuit Board Assembly (also called PCB or PWB)
CL	Constant Level: audio output to connect with an external amplifier
CLUT	Colour Look-Up Table
COLUMBUS	COLour LUMinance Baseband Universal Subsystem. IC performing noise reduction and 2D/3D comb filtering
ComPair	Computer aided rePair. A tool for diagnosing a TV through a PC controlled interface
CSM	Customer Service Mode
CVBS	Composite Video and Blanking Signal; A single video signal that contains luminance, colour, and timing information
CVBS-EXT	CVBS signal from external source (VCR, VCD, etc.)
CVBS-INT	CVBS signal from internal Tuner
CVBS-MON	CVBS monitor signal
CVBS-TER-OUT	CVBS TERrestrial OUTput signal
DAC	Digital to Analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DFU	Directions For Use: Owner's manual
DNR	Dynamic Noise Reduction / Digital Noise Reduction; Noise reduction feature of the set
DRAM	Dynamic RAM; dynamically refreshed RAM
DSP	Digital Signal Processing
DST	Dealer Service Tool; Special remote control designed for dealers to enter

	e.g. service mode (a DST-emulator is available in ComPair)
DTS	Digital Theatre System; A multi-channel surround sound format, similar to Dolby Digital
DVD	Digital Versatile Disc
EEPROM	Electrically Erasable and Programmable Read Only Memory
EPG	Electronic Program Guide: system used by broadcasters to transmit TV guide information (= NexTView)
EU	Europe
EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)
FBL	Fast BLanking; DC signal accompanying RGB signals. To blank the video signal when it is returning from the right side of the screen to the left side. The video level is brought down below the black video level
FBL-SC1-IN	Fast blanking signal for SCART1 in
FBL-SC2-IN	Fast blanking signal for SCART2 in
FBL-TXT	Fast Blanking Teletext
FM	Field Memory; A memory chip that is capable of storing one or more TV picture fields / Frequency Modulation; A technique that sends data as frequency variations of a carrier signal
FMR	Radio receiver that can receive the FM Band 87.5 - 108 MHz
FRC	Frame Rate Converter
FRONT-C	Front input chrominance (SVHS)
FRONT-DETECT	Control line for detection of headphone insertion, Service Mode jumper, power failure detection
FRONT-Y_CVBS	Front input luminance or CVBS (SVHS)
G-SC1-IN	Green SCART1/EXT1 in
G-SC2-IN	Green SCART2/EXT2 in
G-TXT	Green teletext
H	H_sync to the module
HA	Horizontal Acquisition; horizontal sync pulse
HD	High Definition
HP	HeadPhone
I	Monochrome TV system. Sound carrier distance is 6.0 MHz. VHF- and UHF-band
I^2C	Integrated IC bus
I^2S	Integrated IC Sound bus
IC	Integrated Circuit
IF	Intermediate Frequency
Interlaced	Scan mode where two fields are used to form one frame. Each field contains half the number of the total amount of lines. The fields are written in "pairs", causing line flicker.
IR	Infra Red
IRQ	Interrupt ReQuest
Last Status	The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according to the customer's preferences
LATAM	LATin AMerica
LC04	Philips chassis name for LCD TV 2004 project
LCD	Liquid Crystal Display
LED	Light Emitting Diode; A semiconductor diode that emits light when a current is passed through it
LINE-DRIVE	Horizontal (line) deflection drive signal (for the Line transistor)
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
LS	LoudSpeaker
LVDS	Low Voltage Differential Signalling, data transmission system for high speed and low EMI communication.
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz. M= 525 lines @ 60 Hz, N= 625 lines @ 50 Hz
MOSFET	Metal Oxide Semiconductor Field Effect Transistor
MPEG	Motion Pictures Experts Group. An ISO/IEC body that has given its name to an image compressing scheme for moving video
MSP	Multi-standard Sound Processor: ITT sound decoder
MUTE	MUTE Line
NC	Not Connected
NICAM	Near Instantaneously Companded Audio Multiplexing; This is a digital sound system, mainly used in Europe
NTSC	National Television Standard Committee. Colour system used mainly in North America and Japan. Colour carrier NTSC M/N = 3.579545 MHz, NTSC 4.43 = 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
NVM	Non Volatile Memory; IC containing data such as alignment values, preset stations
O/C	Open Circuit
ON/OFF LED	On/Off control signal for the LED
OSD	On Screen Display
PAL	Phase Alternating Line. Colour system used mainly in Western Europe (colour carrier = 4.433619 MHz) and South America (colour carrier PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)
PC	Personal Computer
PCB	Printed Circuit Board (or PWB)
PIG	Picture In Graphic
PIP	Picture In Picture
PLL	Phase Locked Loop. Used, for example, in FST tuning systems. The customer can directly provide the desired frequency
Progressive Scan	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.
PWB	Printed Wiring Board (also called PCB or CBA)
RAM	Random Access Memory
RC	Remote Control transmitter
RC5 or 6	Remote Control system 5 or 6, the signal from the remote control receiver
RGB	Red, Green, and Blue colour space; The primary colour signals for TV. By mixing levels of R, G, and B, all colours (Y/C) are reproduced
RGBHV	Red, Green, Blue, Horizontal sync, and Vertical sync
ROM	Read Only Memory
SAM	Service Alignment Mode
SC	SandCastle: two-level pulse derived from sync signals
SC-IN	SCART in
SC-OUT	SCART out
S/C	Short Circuit
SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et

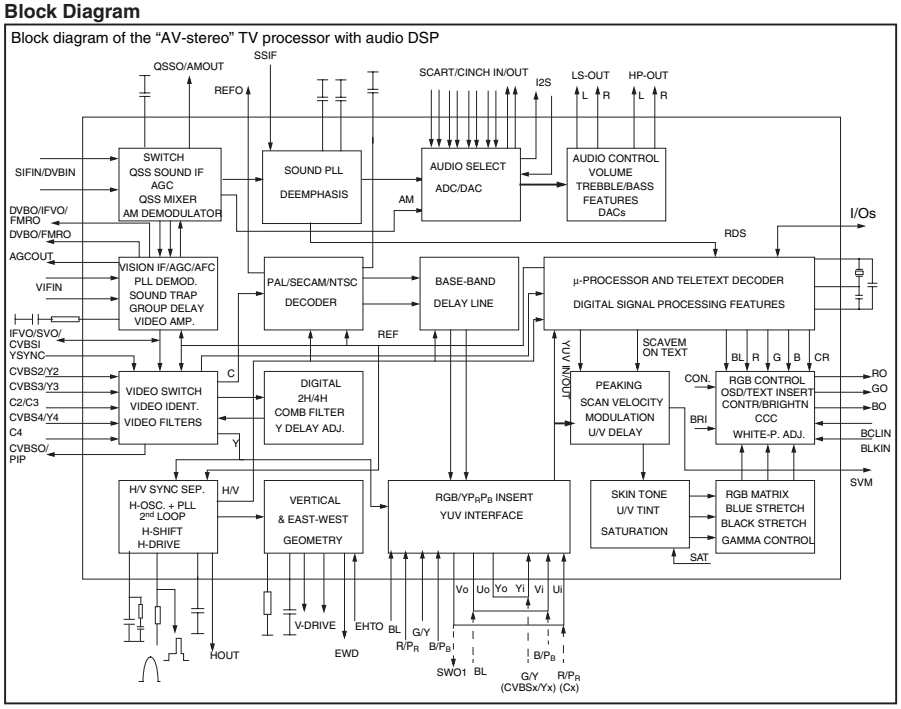
	Téléviseurs; This is a 21-pin connector used in EU, that carries various audio, video, and control signals (it is also called Péritel connector)
SCL	Serial CLock Signal on I^2C bus
SD	Standard Definition
SDA	Serial DAta Signal on I^2C bus
SDRAM	Synchronous DRAM
SECAM	SÉquence Couleur Avec Mémoire; Colour system mainly used in France and East Europe. The chroma is FM modulated and the R-Y and B-Y signals are transmitted line sequentially. Colour carriers= 4.406250 MHz and 4.250000 MHz
SIF	Sound Intermediate Frequency
SMPS	Switched Mode Power Supply
SND	SouND
SNDL-SC1-IN	Sound left SCART1 in
SNDL-SC1-OUT	Sound left SCART1 out
SNDL-SC2-IN	Sound left SCART2 in
SNDL-SC2-OUT	Sound left SCART2 out
SNDR-SC1-IN	Sound right SCART1 in
SNDR-SC1-OUT	Sound right SCART1 out
SNDR-SC2-IN	Sound right SCART2 out
SNDR-SC2-OUT	Sound right SCART2 out
SOPS	Self Oscillating Power Supply
S/PDIF	Sony Philips Digital InterFace; This is a consumer interface used to transfer digital audio
SRAM	Static RAM
STBY	STandBY
SVHS	Super Video Home System
SW	Software or Subwoofer or Switch
THD	Total Harmonic Distortion
TXT	Teletext; TXT is a digital addition to analogue TV signals that contain textual and graphical information (25 rows x 40 columns). The information is transmitted within the first 25 lines during the Vertical Blank Interval (VBI)
uP	Microprocessor
VA	Vertical Acquisition
VL	Variable Level out: processed audio output towards external amplifier
VCR	Video Cassette Recorder
VGA	Video Graphics Array; 640x480 (4:3)
WD	Watch Dog
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
XTAL	Quartz crystal
Y	Luminance signal
Y/C	Y consists of luminance signal, blanking level and sync; C consists of chroma (colour) signal
YPbPr	This is a scaled version of the YUV colour space. Y= Luminance, Pb/Pr= Colour difference signals B-Y and R-Y, other amplitudes w.r.t. to YUV
YUV	Colour space used by the NTSC and PAL video systems. Y is the luminance and U/V are the colour difference signals

9.11 IC Data Sheets

This section shows the internal block diagrams and pin layouts of ICs that are drawn as "black boxes" in the electrical diagrams (with the exception of "memory" and "logic" ICs).

9.11.1 Diagram B2, Type TDA15021H (IC7217, Hercules)

Block Diagram



Pin Configuration

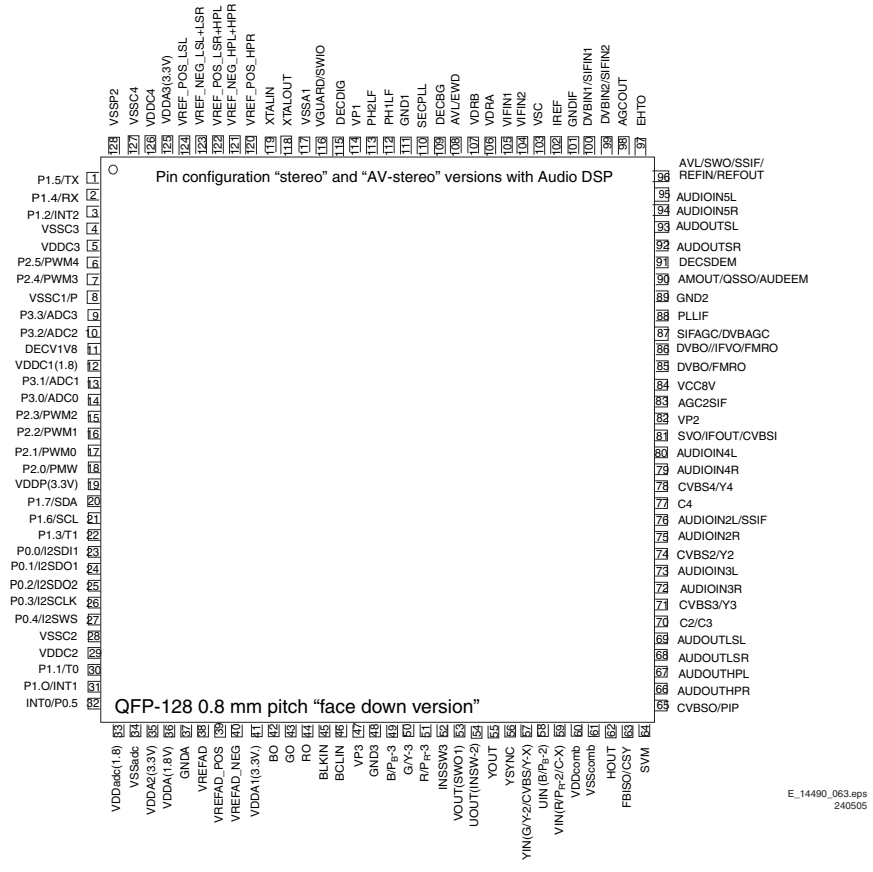


Figure 9-8 Internal block diagram and pin configuration

9.11.2 Diagram B19, Type T6TU5XB (IC7M00, Columbus)

Figure 1 Package outline (top view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
A	WEB/ DAVB	UVA0 /Di0	UVA2 /Di2	UVA4 /Di4	UVA6 /Di6	UVA8 /Di8	SEL656	TST1	YA2	YA4	YA6	YA8	VA	HREF	SDA	A
B	YB8	VSS	UVA1 /Di1	UVA3 /Di3	UVA5 /Di5	UVA7 /Di7	YA0 /Di9	BISTEN	YA1	YA3	YA5	YA7	WEA/ DAVA	VSS	SCL	B
C	YB7	YB6	VSS	VDDS	VSS	VSS	VDDC	VDDC	VSS	VSS	VDDC	VDDS	VSS	SNDA	SNRST	C
D	YB5	YB4	VDDC	N.C.									VSS	SNCL	TCK	D
E	YB3	YB2	VSS										VDDC	TMS	TDO	E
F	TST2	YB1	VSS										VSS	TRST	TDI	F
G	CLKASB	YB0 /Do9	VDDS										VDDS	A0ICC	RESET	G
H	CLKASA	UVB8/ Do8	TST3										VDDC	CLK EXT	CLKSEL	H
J	UVB7 /Do7	UVB6/ Do6	VSS										VSS	CLK	WEN	J
K	UVB5 /Do5	UVB4/ Do4	VDDC										VSS	CASN	RASN	K
L	UVB3 /Do3	UVB2 /Do2	VSS										VDDS	DQM	DQ16	L
M	UVB1 /Do1	UVB0 /Do0	VDDS										VSS	DQ14	DQ15	M
N	AVD	N.C.	VDDS	VSS	VSS	VDDC	VSS	VDDS	VDDC	VSS	VDDS	VSS	VSS	VDDS	DQ13	N
P	AVS	VSS	A7	A9	A2	A0	A11	DQ7	DQ6	DQ4	DQ3	DQ1	VDDS	VSS	DQ12	P
R	A4	A5	A6	A8	A3	A1	A10	DQ8	VSS	DQ5	VSS	DQ2	DQ9	DQ10	DQ11	R
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	

COLUMBUS TOP-VIEW

PPA Version 2.7

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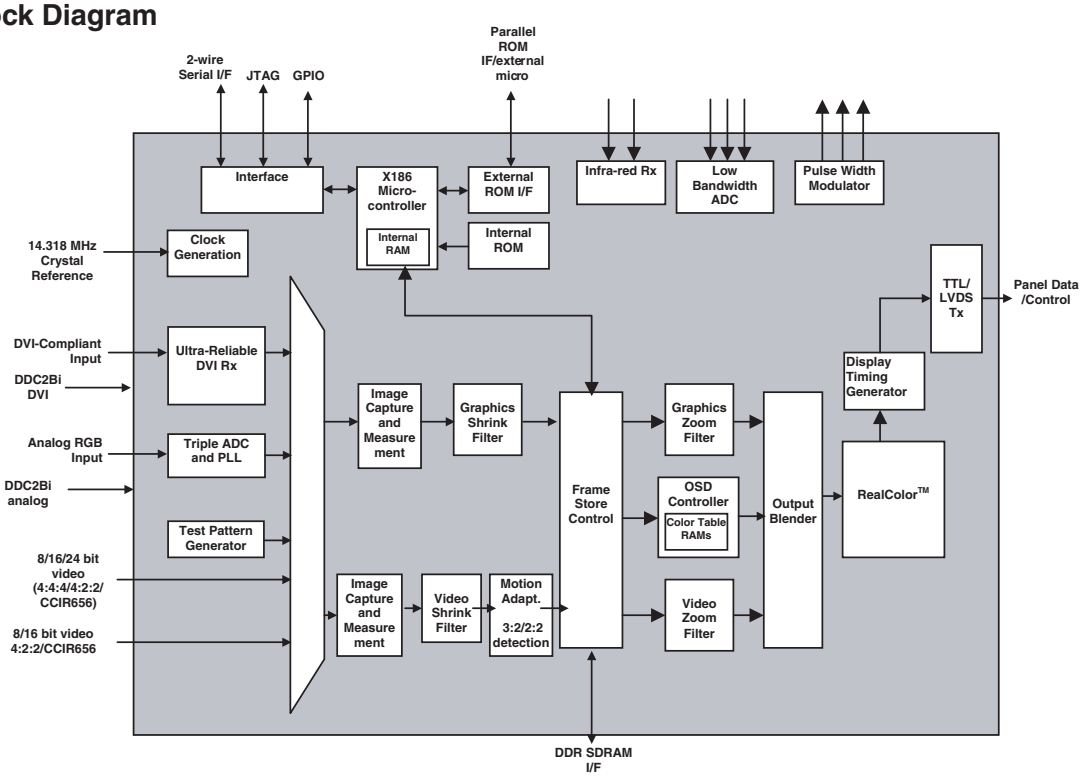
Figure 9-9 Pin configuration

9.11.3 Diagram B7+B8+B9, Type GM1501 (IC7401, Genesis)

Block Diagram



Pin Configuration

	1	2	3	4	5	6	7	8	9	10	11	12	13
A	NC	ADC_3.3	ADC_1.8	ADC_1.8	ADC_DGND	RXC+	DVI_GND	RX0+	RX1+	RX2+	DVI_GND	LBADC_IN3	D_GND
B	BLUE-	BLUE+	ADC_3.3	ADC_DGND	DVI_GND	RXC-	DVI_GND	RX0-	RX1-	RX2-	REXT	LBADC_IN2	D_GND
C	GREEN-	GREEN+	SOG	ADC_AGND	NC	DVI_3.3	DVI_GND	DVI_3.3	DVI_3.3	DVI_3.3	DVI_3.3	LBADC_IN1	LBADC_33
D	RED-	RED+	ADC_3.3	ADC_AGND	NC	DVI_1.8	DVI_GND	DVI_1.8	DVI_1.8	DVI_1.8	DVI_GND	LBADC_ RETURN	LBADC_GND
E	ADC_AGND	ADC_AGND	ADC_3.3	ADC_AGND									
F	NC	VDDD33_ PLL	VSSA33_ RPLL	VDDA33_ RPLL									
G	VDDA33_ FPLL	VSSD33_ PLL	TCLK	XTAL									
H	VDDD33_ SDDS	VSSA33_ SDDS	VDDA33_ SDDS	VSSA33_ FPLL									
J	VDDD33_ DDDS	VSSA33_ DDDS	VDDA33_ DDDS	VSSD33_ SDDS									
K	RESETn	ACS_ RSET_HD	NC	VSSD33_ DDDS						CORE_1.8	CORE_1.8	D_GND	D_GND
L	OCM_INT2	OCM_INT1	AVSYNC	AHSYNC						D_GND	CORE_1.8	D_GND	D_GND
M	OCM_UDO	OCM_UDI	IR0	IR1						D_GND	D_GND	D_GND	D_GND
N	VGA_SDA	VGA_SCL	DVI_SDA	DVI_SCL						D_GND	D_GND	D_GND	D_GND
P	OCM_CS1n	OCM_CS2n	MSTR_SDA	MSTR_SCL						D_GND	D_GND	D_GND	D_GND
R	ROM_CSn	OCM_REn	OCM_WEn	EXTCLK						D_GND	D_GND	D_GND	D_GND
T	OCMADDR 17	OCMADDR 18	OCMADDR 19	OCM_CS0n						D_GND	CORE_1.8	D_GND	D_GND
U	OCMADDR 13	OCMADDR 14	OCMADDR 15	OCMADDR 16						CORE_1.8	CORE_1.8	D_GND	D_GND
V	OCMADDR 9	OCMADDR 10	OCMADDR 11	OCMADDR 12									
W	OCMADDR 6	OCMADDR 7	OCMADDR 8	IO_3.3									
Y	OCMADDR 3	OCMADDR 4	OCMADDR 5	IO_3.3									
AA	OCMADDR 0	OCMADDR 1	OCMADDR 2	IO_3.3									
AB	OCMDATA13	OCMDATA14	OCMDATA15	IO_3.3									
AC	OCMDATA10	OCMDATA11	OCMDATA12	IO_3.3	GPIO_G09_ B2 (DEGRN0)	IO_3.3	DCLK	IO_3.3	GPIO_G07_ B2 (DERED4)	IO_3.3	SHIELD[1] (DEGRN3)	LVDSB_3.3	LVDSB_GND
AD	OCMDATA9	OCMDATA6	OCMDATA3	OCMDATA0	GPIO_G09_ B3 (DEGRN1)	GPIO_G08_ B0 (DORED0)	DEN	GPIO_G08_ B5 (DOBLU1)	GPIO_G07_ B3 (DERED5)	GPIO_G07_ B6 (DERED8)	SHIELD[2] (DEGRN4)	LVDSB_3.3	LVDSB_3.3
AE	OCMDATA8	OCMDATA5	OCMDATA2	GPIO_G09_ B0 (DERED0)	GPIO_G09_ B4 (DEBLU0)	GPIO_G08_ B1 (DORED1)	GPIO_G08_ B3 (DOGRN1)	GPIO_G07_ B0 (DERED2)	GPIO_G07_ B4 (DERED6)	GPIO_G07_ B7 (DERED9)	SHIELD[3] (DEGRN5)	BC+ (DEGRN8)	SHIELD[4] (DEBLU2)
AF	OCMDATA7	OCMDATA4	OCMDATA1	GPIO_G09_ B1 (DERED1)	GPIO_G09_ B5 (DEBLU1)	GPIO_G08_ B2 (DOGRN0)	GPIO_G08_ B4 (DOBLU0)	GPIO_G07_ B1 (DERED3)	GPIO_G07_ B5 (DERED7)	SHIELD[0] (DEGRN2)	B3+ (DEGRN6)	B3- (DEGRN7)	BC- (DEGRN9)

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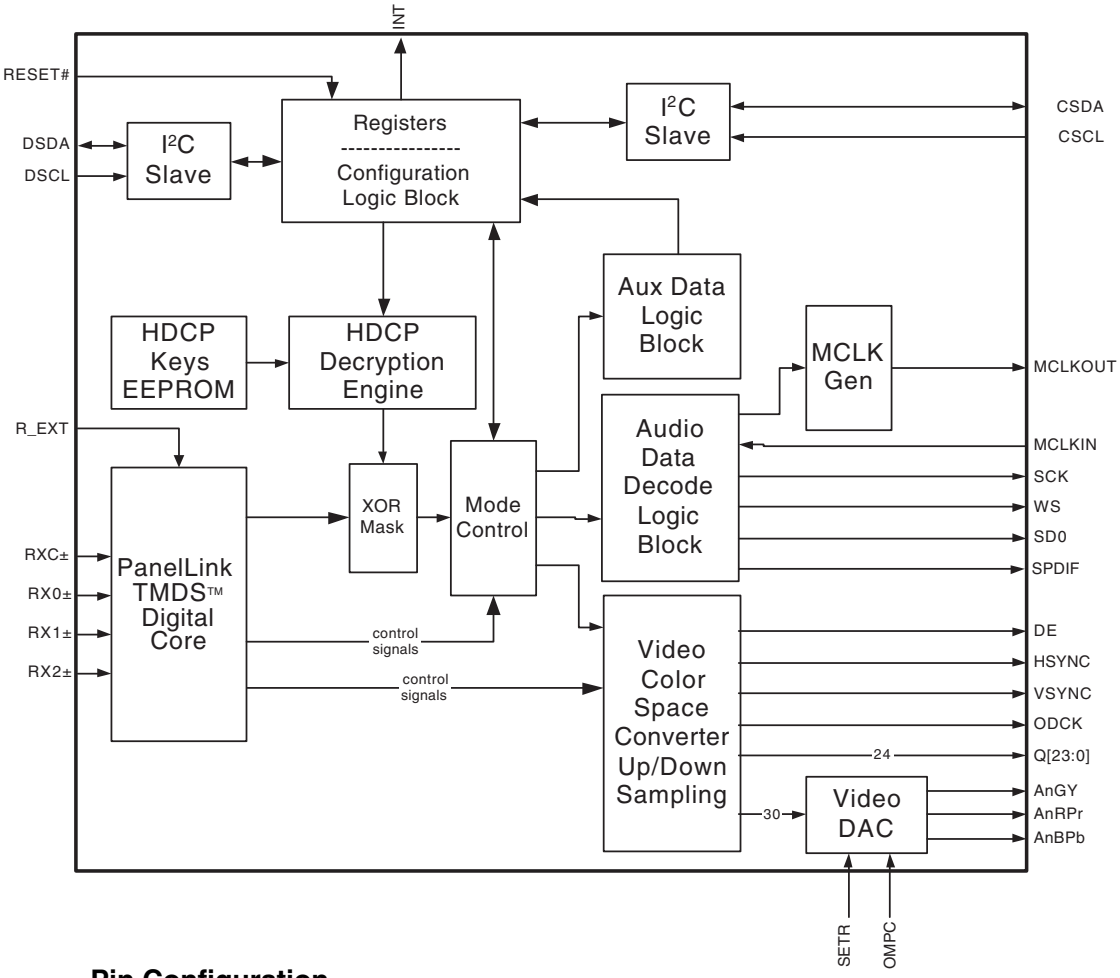
241204

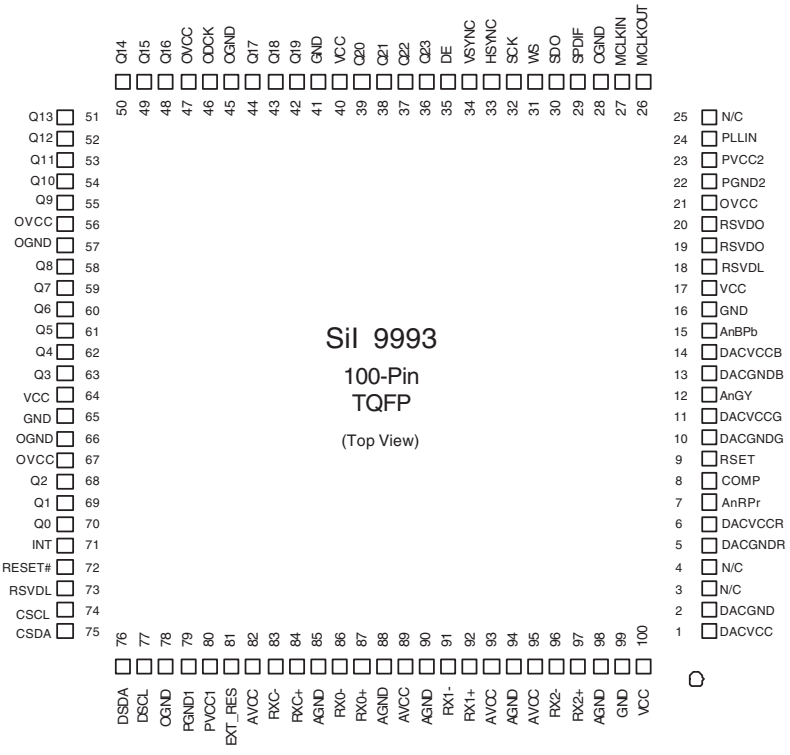
Figure 9-10 Internal block diagram and pin configuration

9.11.4 Diagram B12, Type S9993CT (IC7D03, HDMI Panellink), Reserved

Block Diagram



Pin Configuration



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170305

Figure 9-11 Internal block diagram and pin configuration

10. Spare Parts List

Set Level

Various

0032	3122 137 23171	Power Supply Unit (32 inch)
0032	3122 137 23191	Power Supply Unit (26 inch)
8188	2422 070 98151	MAINSCORD EUR 1M5 BK B
8903	3104 311 09141	Cable 4P/560
8903	3139 131 05771	Cable 04P/280

—〰—

5213	2422 264 00506	Loudsp. 8Ω 5W fullrange
5213	2422 264 00536	Loudsp. 5W fullrange

Small Signal Board [B]

Various

0601	3139 127 04122	Hercules SW (check Prod. Survey)
0611	3139 127 04112	Scaler SW (check Prod. Survey)
1101	2422 025 18749	Connector 3p m
1102	3139 147 19801	Tuner UV1318S/A IH -3
1104	2422 549 44372	SAW 38.9MHz K3953L
1106	2422 549 44369	SAW 38.9MHz K9656L
1107	2422 025 18749	Connector 3p m
1202	2422 543 01414	Xtal 24.576MHz
1801	2422 543 01133	Xtal 14.32MHz 20pF
1F00	2422 033 00515	Socket DVI-I 29p f
1F01	2422 026 05703	Socket 1P f
1G01	4822 265 10703	Socket scart 21p
1G02	4822 265 10703	Socket scart 21p
1J02	2422 025 10772	Connector 12p m
1J03	2422 025 10768	Connector 3p m
1J04	2422 025 10769	Connector 9p m
1K00	2422 025 08149	Connector 6p m
1K01	2422 025 10772	Connector 12p m
1K02	2422 025 10768	Connector 3p m
1K03	2422 025 14531	20p f
1N01	2422 025 17274	Connector 10p m
1N02	2422 025 18779	Connector 4P m
1N05	2722 171 08825	Xtal 14.31818Mhz 15pF
1P01	2422 549 45325	Bead 67Ω at 100MHz
1P02	2422 549 45325	Bead 67Ω at 100MHz
1P03	2422 549 45325	Bead 67Ω at 100MHz
1P04	2422 549 45325	Bead 67Ω at 100MHz
1P05	2422 549 45325	Bead 67Ω at 100MHz
1P06	2422 025 18772	Connector 30p m
8J02	3139 131 05901	Cable 12P/280/12P
8J03	3139 110 27651	Cable 03P/100/03P
8J04	3104 311 09251	Cable 9P/140/9P
8K01	3139 131 05901	Cable 12P/280/12P

—⊣⊢—

2101	4822 124 12095	100µF 20% 16V
2102	5322 126 11583	10nF 10% 50V 0603
2103	5322 126 11583	10nF 10% 50V 0603
2104	4822 122 33761	22pF 5% 50V
2105	4822 122 33761	22pF 5% 50V
2106	5322 126 11583	10nF 10% 50V 0603
2107	3198 024 44730	47nF 50V 0603
2109	5322 124 41945	22µF 20% 35V
2113	4822 124 12095	100µF 20% 16V
2203	4822 124 23002	10µF 16V
2206	2020 552 00035	2.2µF 6.3V 10% 0603
2207	2020 552 96718	220nF 10% 6.3V 0402
2208	4822 124 12084	1µF 20% 50V
2209	4822 124 23002	10µF 16V
2210	2020 552 96718	220nF 10% 6.3V 0402
2211	2020 552 96628	10nF 10% 16V 0402
2214	2020 552 96618	1nF 10% 50V 0402
2216	2020 552 96618	1nF 10% 50V 0402
2218	3198 035 71040	100nF 10% 16V 0402
2221	4822 124 12095	100µF 20% 16V
2223	2238 869 15101	100pF 5% 50V 0402
2225	2020 552 96618	1nF 10% 50V 0402
2226	3198 035 03320	3.3nF 5% 50V 0402
2227	2020 552 96618	1nF 10% 50V 0402
2228	3198 035 71040	100nF 10% 16V 0402
2230	3198 035 71040	100nF 10% 16V 0402
2231	2020 552 96718	220nF 10% 6.3V 0402
2232	3198 035 71040	100nF 10% 16V 0402
2233	4822 124 23002	10µF 16V
2234	2020 552 96718	220nF 10% 6.3V 0402
2235	2020 552 96718	220nF 10% 6.3V 0402
2236	4822 126 14076	220nF +80/-20% 25V
2237	2020 552 96718	220nF 10% 6.3V 0402
2238	2020 552 96718	220nF 10% 6.3V 0402
2239	3198 035 71040	100nF 10% 16V 0402
2240	2020 552 96718	220nF 10% 6.3V 0402
2241	2020 552 96718	220nF 10% 6.3V 0402
2242	3198 035 71040	100nF 10% 16V 0402
2243	4822 124 23002	10µF 16V
2244	3198 035 71040	100nF 10% 16V 0402
2245	3198 035 71040	100nF 10% 16V 0402
2246	3198 035 71040	100nF 10% 16V 0402
2250	2020 552 96618	1nF 10% 50V 0402
2251	2020 552 96656	10µF 20% 25V 1210
2252	3198 035 71040	100nF 10% 16V 0402
2253	3198 035 71040	100nF 10% 16V 0402
2254	3198 035 71040	100nF 10% 16V 0402
2255	3198 035 71040	100nF 10% 16V 0402
2256	4822 124 23002	10µF 16V
2257	3198 035 71040	100nF 10% 16V 0402
2258	2020 552 96637	10µF 10% 6.3V 0805
2259	3198 035 71040	100nF 10% 16V 0402
2260	2020 552 96637	10µF 10% 6.3V 0805
2262	4822 124 12082	10µF 20% 50V
2263	3198 035 26820	6.8nF 10% 16V 0402
2264	3198 017 44740	470nF 10V 0603
2265	3198 017 41050	1µF 10V 0603
2266	3198 035 71040	100nF 10% 16V 0402
2267	2020 552 96718	220nF 10% 6.3V 0402
2269	2020 012 00003	470µF 16V 20% SMD
2270	3198 035 71040	100nF 10% 16V 0402
2271	4822 124 12095	100µF 20% 16V
2272	3198 035 71040	100nF 10% 16V 0402
2273	2020 552 96718	220nF 10% 6.3V 0402
2274	3198 017 31540	150nF 10V 0603
2277	3198 035 71040	100nF 10% 16V 0402
2280	2020 552 00027	4.7µF 2% 6.3V 0603
2281	2020 552 00027	4.7µF 2% 6.3V 0603
2285	3198 035 71040	100nF 10% 16V 0402
2286	3198 035 71040	100nF 10% 16V 0402
2289	4822 051 30151	150Ω 5% 0.062W
2290	2222 240 59872	4.7µF 5% 10V 0805
2291	3198 035 71040	100nF 10% 16V 0402
2449	3198 035 71040	100nF 10% 16V 0402
2603	2020 552 96834	1µF 20% 6.3V 0402
2604	3198 035 04710	470pF 50V 0402
2605	2020 552 96834	1µF 20% 6.3V 0402
2608	2020 552 96834	1µF 20% 6.3V 0402
2609	3198 035 04710	470pF 50V 0402
2610	2020 552 96834	1µF 20% 6.3V 0402
2611	4822 124 12095	100µF 20% 16V
2613	3198 017 41050	1µF 10V 0603
2614	3198 035 71040	100nF 10% 16V 0402
2615	2020 012 00003	470µF 16V 20% SMD
2616	2020 552 00035	2.2µF 6.3V 10% 0603
2617	2020 552 00035	2.2µF 6.3V 10% 0603
2618	2020 012 00003	470µF 16V 20% SMD
2619	2020 552 96738	47µF 6.3V
2701	2238 869 15101	100pF 5% 50V 0402
2704	4822 124 23002	10µF 16V
2716	2020 012 00028	470µF 20% 16V
2730	2020 552 96656	10µF 20% 25V 1210
2731	2020 012 00003	470µF 16V 20% SMD
2733	3198 035 02210	220pF 5% 50V 0402
2734	2238 787 16641	22nF 10% 16V 0402
2735	3198 035 04710	470pF 50V 0402
2736	2022 031 00308	22µF 20% 35V
2737	2020 012 00003	470µF 16V 20% SMD
2738	4822 124 80151	47µF 16V
2739	4822 124 80151	47µF 16V
2750	2020 552 00035	2.2µF 6.3V 10% 0603
2751	3198 035 71040	100nF 10% 16V 0402
2752	4822 124 80151	47µF 16V
2753	2020 012 00003	470µF 16V 20% SMD
2755	3198 035 14720	4.7nF 5% 25V 0402
2756	3198 035 04710	470pF 50V 0402
2757	2020 012 00003	470µF 16V 20% SMD
2758	2020 012 00003	470µF 16V 20% SMD
2760	2020 552 96671	1µF 10% 25V
2800	2020 021 91557	100µF 20% 16V
2801	3198 035 71040	100nF 10% 16V 0402
2802	3198 035 71040	100nF 10% 16V 0402
2803	3198 035 71040	100nF 10% 16V 0402
2804	3198 035 71040	100nF 10% 16V 0402
2805	3198 035 71040	100nF 10% 16V 0402
2806	3198 035 71040	100nF 10% 16V 0402
2807	3198 035 71040	100nF 10% 16V 0402
2808	3198 035 71040	100nF 10% 16V 0402
2809	3198 035 71040	100nF 10% 16V 0402
2810	3198 035 71040	100nF 10% 16V 0402
2811	3198 035 71040	100nF 10% 16V 0402
2812	3198 035 71040	100nF 10% 16V 0402
2813	3198 035 71040	100nF 10% 16V 0402
2814	3198 035 71040	100nF 10% 16V 0402
2815	5322 124 41945	22µF 20% 35V
2816	3198 035 71040	100nF 10% 16V 0402
2817	3198 035 71040	100nF 10% 16V 0402
2818	3198 035 71040	100nF 10% 16V 0402
2819	3198 035 71040	100nF 10% 16V 0402
2820	3198 035 71040	100nF 10% 16V 0402
2821	3198 035 71040	100nF 10% 16V 0402
2822	3198 035 71040	100nF 10% 16V 0402
2823	4822 126 14519	22pF 5% 50V 0402
2824	4822 126 14519	22pF 5% 50V 0402
2900	3198 035 71040	100nF 10% 16V 0402
2901	2020 552 96618	1nF 10% 50V 0402
2902	2020 021 00046	470µF 20% 16V
2903	3198 035 71040	100nF 10% 16V 0402
2904	4822 124 80151	47µF 16V
2905	2020 021 91557	100µF 20% 16V
2906	3198 035 71040	100nF 10% 16V 0402
2907	3198 035 71040	100nF 10% 16V 0402
2908	3198 035 71040	100nF 10% 16V 0402
2909	3198 035 71040	100nF 10% 16V 0402
2910	3198 035 71040	100nF 10% 16V 0402
2911	3198 035 71040	100nF 10% 16V 0402
2912	3198 035 71040	100nF 10% 16V 0402
2913	3198 035 71040	100nF 10% 16V 0402
2914	3198 035 71040	100nF 10% 16V 0402
2915	3198 035 71040	100nF 10% 16V 0402
2916	3198 035 71040	100nF 10% 16V 0402
2917	2020 021 91557	100µF 20% 16V
2918	3198 035 71040	100nF 10% 16V 0402
2919	3198 035 71040	100nF 10% 16V 0402
2920	3198 035 71040	100nF 10% 16V 0402
2921	3198 035 71040	100nF 10% 16V 0402
2922	3198 035 71040	100nF 10% 16V 0402
2923	3198 035 71040	100nF 10% 16V 0402
2924	3198 035 71040	100nF 10% 16V 0402
2925	3198 035 71040	100nF 10% 16V 0402
2926	3198 035 71040	100nF 10% 16V 0402
2927	3198 035 71040	100nF 10% 16V 0402
2928	3198 035 71040	100nF 10% 16V 0402
2929	3198 035 71040	100nF 10% 16V 0402
2930	3198 035 71040	100nF 10% 16V 0402
2931	3198 035 71040	100nF 10% 16V 0402
2932	3198 035 71040	100nF 10% 16V 0402
2933	3198 035 71040	100nF 10% 16V 0402
2934	4822 124 80151	47µF 16V
2935	3198 035 71040	100nF 10% 16V 0402
2936	3198 035 71040	100nF 10% 16V 0402
2937	3198 035 71040	100nF 10% 16V 0402
2938	3198 035 71040	100nF 10% 16V 0402
2939	3198 035 71040	100nF 10% 16V 0402
2940	4822 124 80151	47µF 16V
2941	3198 035 71040	100nF 10% 16V 0402
2942	3198 035 71040	100nF 10% 16V 0402
2945	5322 124 41945	22µF 20% 35V
2946	3198 035 71040	100nF 10% 16V 0402
2947	3198 035 71040	100nF 10% 16V 0402
2948	3198 035 71040	100nF 10% 16V 0402
2949	3198 035 71040	100nF 10% 16V 0402
2950	5322 124 41945	22µF 20% 35V
2951	3198 035 71040	100nF 10% 16V 0402
2952	3198 035 71040	100nF 10% 16V 0402
2953	3198 035 71040	100nF 10% 16V 0402
2954	3198 035 71040	100nF 10% 16V 0402
2955	5322 124 41945	22µF 20% 35V
2956	3198 035 71040	100nF 10% 16V 0402
2957	3198 035 71040	100nF 10% 16V 0402
2958	3198 035 71040	100nF 10% 16V 0402
2959	3198 035 71040	100nF 10% 16V 0402
2B01	4822 124 80151	47µF 16V
2B02	4822 124 11131	47µF 6.3V
2B03	3198 035 71040	100nF 10% 16V 0402
2B04	3198 035 71040	100nF 10% 16V 0402
2B05	3198 035 71040	100nF 10% 16V 0402
2B06	3198 035 71040	100nF 10% 16V 0402
2B07	3198 035 71040	100nF 10% 16V 0402
2B08	3198 035 71040	100nF 10% 16V 0402
2B09	3198 035 71040	100nF 10% 16V 0402
2B10	3198 035 71040	100nF 10% 16V 0402
2B11	3198 035 71040	100nF 10% 16V 0402
2B12	3198 035 71040	100nF 10% 16V 0402

2B13	3198 035 71040	100nF 10% 16V 0402
2B14	3198 035 71040	100nF 10% 16V 0402
2B15	3198 035 71040	100nF 10% 16V 0402
2B16	3198 035 71040	100nF 10% 16V 0402
2B17	3198 035 71040	100nF 10% 16V 0402
2B18	5322 124 41945	22µF 20% 35V
2C00	3198 035 71040	100nF 10% 16V 0402
2C01	4822 124 23002	10µF 16V
2C02	3198 035 71040	100nF 10% 16V 0402
2C03	3198 035 71040	100nF 10% 16V 0402
2E00	2020 552 00005	4.7µF 10% 6.3V 0603
2E01	2020 552 00005	4.7µF 10% 6.3V 0603
2E02	2020 552 00005	4.7µF 10% 6.3V 0603
2E03	3198 035 71040	100nF 10% 16V 0402
2E04	2020 552 96834	1µF 20% 6.3V 0402
2E05	2020 552 96834	1µF 20% 6.3V 0402
2E06	2020 552 96834	1µF 20% 6.3V 0402
2E07	4822 126 14324	33pF 5% 50V 0402
2E08	2020 552 00005	4.7µF 10% 6.3V 0603
2E09	4822 126 14324	33pF 5% 50V 0402
2E10	2020 552 00005	4.7µF 10% 6.3V 0603
2E11	4822 126 14324	33pF 5% 50V 0402
2E12	2020 552 00005	4.7µF 10% 6.3V 0603
2E13	3198 017 41050	1µF 10V 0603
2E14	4822 126 14324	33pF 5% 50V 0402
2E15	3198 035 71040	100nF 10% 16V 0402
2E16	3198 035 71040	100nF 10% 16V 0402
2E17	3198 035 71040	100nF 10% 16V 0402
2E18	3198 035 71040	100nF 10% 16V 0402
2E19	3198 035 71040	100nF 10% 16V 0402
2E20	4822 124 11131	47µF 6.3V
2E21	2020 552 00005	4.7µF 10% 6.3V 0603
2E22	2020 552 00005	4.7µF 10% 6.3V 0603
2E23	2020 552 00005	4.7µF 10% 6.3V 0603
2E24	3198 035 71040	100nF 10% 16V 0402
2E25	3198 035 71040	100nF 10% 16V 0402
2E26	3198 035 71040	100nF 10% 16V 0402
2E27	3198 035 71040	100nF 10% 16V 0402
2E28	3198 035 71040	100nF 10% 16V 0402
2E29	3198 035 71040	100nF 10% 16V 0402
2E30	3198 035 71040	100nF 10% 16V 0402
2E31	3198 035 71040	100nF 10% 16V 0402
2E32	3198 035 71040	100nF 10% 16V 0402
2E33	2020 552 00005	4.7µF 10% 6.3V 0603
2E34	2020 552 00005	4.7µF 10% 6.3V 0603
2E35	2020 552 00005	4.7µF 10% 6.3V 0603
2E36	3198 035 71040	100nF 10% 16V 0402
2F04	2020 552 94427	100pF 5% 50V
2F07	2238 586 59812	100nF 20% 50V 0603
2F08	4822 126 14241	330pF 0603 50V
2F09	4822 126 14241	330pF 0603 50V
2F10	2020 552 94427	100pF 5% 50V
2F11	4822 126 14241	330pF 0603 50V
2F12	4822 126 14241	330pF 0603 50V
2F13	4822 126 14508	180pF 5% 50V 0603
2F14	4822 126 14508	180pF 5% 50V 0603
2F15	2020 552 00035	2.2µF 6.3V 10% 0603
2F16	2020 552 00035	2.2µF 6.3V 10% 0603
2G05	4822 126 14241	330pF 0603 50V
2G06	4822 126 14508	180pF 5% 50V 0603
2G07	4822 124 23002	10µF 16V
2G08	2020 552 00035	2.2µF 6.3V 10% 0603
2G09	4822 126 14241	330pF 0603 50V
2G10	4822 126 14508	180pF 5% 50V 0603
2G11	4822 124 23002	10µF 16V
2G12	2020 552 00035	2.2µF 6.3V 10% 0603
2G18	4822 126 14241	330pF 0603 50V
2G19	4822 126 14508	180pF 5% 50V 0603
2G20	4822 124 23002	10µF 16V
2G21	2020 552 00035	2.2µF 6.3V 10% 0603
2G22	4822 126 14241	330pF 0603 50V
2G23	4822 126 14508	180pF 5% 50V 0603
2G24	4822 124 23002	10µF 16V
2G25	2020 552 00035	2.2µF 6.3V 10% 0603
2G26	2020 552 00005	4.7µF 10% 6.3V 0603
2G28	2020 552 00005	4.7µF 10% 6.3V 0603
2G47	2238 586 59812	100nF 20% 50V 0603
2G55	2020 552 00005	4.7µF 10% 6.3V 0603
2G56	2020 552 00005	4.7µF 10% 6.3V 0603
2J02	2020 552 96618	1nF 10% 50V 0402
2J03	2020 552 96618	1nF 10% 50V 0402
2J17	2238 869 15101	100pF 5% 50V 0402
2J18	2238 869 15101	100pF 5% 50V 0402
2J19	2238 869 15101	100pF 5% 50V 0402
2J21	2238 869 15101	100pF 5% 50V 0402
2J22	2238 869 15101	100pF 5% 50V 0402
2J23	2238 869 15101	100pF 5% 50V 0402
2J26	2238 869 15101	100pF 5% 50V 0402
2J27	2238 869 15101	100pF 5% 50V 0402
2J28	2238 869 15101	100pF 5% 50V 0402
2J29	2238 869 15101	100pF 5% 50V 0402
2J30	2020 552 96618	1nF 10% 50V 0402
2J35	2020 552 96618	1nF 10% 50V 0402
2K00	2020 552 96618	1nF 10% 50V 0402
2K01	2020 552 96618	1nF 10% 50V 0402
2K02	2238 869 15109	10pF 5% 50V 0402
2K03	2238 869 15109	10pF 5% 50V 0402
2K04	2238 869 15109	10pF 5% 50V 0402
2K05	2238 869 15109	10pF 5% 50V 0402
2K06	2238 869 15101	100pF 5% 50V 0402
2K07	2238 869 15101	100pF 5% 50V 0402
2K08	2020 552 00035	2.2µF 6.3V 10% 0603
2K10	2238 869 15101	100pF 5% 50V 0402
2K11	2238 869 15101	100pF 5% 50V 0402
2K12	2020 552 00035	2.2µF 6.3V 10% 0603
2K13	2238 869 15101	100pF 5% 50V 0402
2K14	2238 869 15101	100pF 5% 50V 0402
2K15	2238 869 15101	100pF 5% 50V 0402
2K16	2238 869 15101	100pF 5% 50V 0402
2K17	2238 869 15101	100pF 5% 50V 0402
2K18	2238 869 15101	100pF 5% 50V 0402
2K19	2020 552 96618	1nF 10% 50V 0402
2K20	2020 552 96618	1nF 10% 50V 0402
2K21	2238 869 15101	100pF 5% 50V 0402
2K22	2238 869 15101	100pF 5% 50V 0402
2K23	2238 869 15101	100pF 5% 50V 0402
2K24	2238 869 15101	100pF 5% 50V 0402
2K25	2238 869 15101	100pF 5% 50V 0402
2K26	2238 869 15101	100pF 5% 50V 0402
2K27	2238 869 15101	100pF 5% 50V 0402
2K28	2238 869 15101	100pF 5% 50V 0402
2L02	2020 552 96637	10µF 10% 6.3V 0805
2L03	3198 035 71040	100nF 10% 16V 0402
2L04	3198 035 71040	100nF 10% 16V 0402
2L05	3198 035 71040	100nF 10% 16V 0402
2L06	3198 035 71040	100nF 10% 16V 0402
2L07	2020 552 96637	10µF 10% 6.3V 0805
2L08	3198 035 71040	100nF 10% 16V 0402
2L09	3198 035 71040	100nF 10% 16V 0402
2L10	3198 035 71040	100nF 10% 16V 0402
2L11	3198 035 71040	100nF 10% 16V 0402
2L13	3198 035 74730	47nF 5% 16V 0402
2L17	3198 035 74730	47nF 5% 16V 0402
2L20	3198 035 71040	100nF 10% 16V 0402
2L21	3198 035 71040	100nF 10% 16V 0402
2L22	2020 552 96637	10µF 10% 6.3V 0805
2L23	3198 035 71040	100nF 10% 16V 0402
2L24	3198 035 71040	100nF 10% 16V 0402
2L26	2020 552 96718	220nF 10% 6.3V 0402
2L27	4822 124 23002	10µF 16V
2L28	4822 124 23002	10µF 16V
2L29	4822 124 23002	10µF 16V
2L30	4822 124 23002	10µF 16V
2L31	4822 124 12095	100µF 20% 16V
2L32	4822 124 12095	100µF 20% 16V
2L33	3198 035 71040	100nF 10% 16V 0402
2L34	3198 035 71040	100nF 10% 16V 0402
2L37	4822 126 14524	68pF 5% 50V 0402
2L39	2238 869 15829	82pF 5% 50V 0402
2M00	3198 035 71040	100nF 10% 16V 0402
2M01	3198 035 71040	100nF 10% 16V 0402
2M02	3198 035 71040	100nF 10% 16V 0402
2M03	3198 035 71040	100nF 10% 16V 0402
2M04	3198 035 71040	100nF 10% 16V 0402
2M05	3198 035 71040	100nF 10% 16V 0402
2M06	3198 035 71040	100nF 10% 16V 0402
2M07	3198 035 71040	100nF 10% 16V 0402
2M08	3198 035 71040	100nF 10% 16V 0402
2M09	3198 035 71040	100nF 10% 16V 0402
2M10	3198 035 71040	100nF 10% 16V 0402
2M11	3198 035 71040	100nF 10% 16V 0402
2M12	3198 035 71040	100nF 10% 16V 0402
2M13	3198 035 71040	100nF 10% 16V 0402
2M14	3198 035 71040	100nF 10% 16V 0402
2M15	3198 035 71040	100nF 10% 16V 0402
2M16	3198 035 71040	100nF 10% 16V 0402
2M17	3198 035 71040	100nF 10% 16V 0402
2M18	3198 035 71040	100nF 10% 16V 0402
2M19	3198 035 71040	100nF 10% 16V 0402
2M20	3198 035 71040	100nF 10% 16V 0402
2M21	2020 552 00035	2.2µF 6.3V 10% 0603
2M22	3198 035 71040	100nF 10% 16V 0402
2M23	4822 124 12095	100µF 20% 16V
2M24	3198 035 71040	100nF 10% 16V 0402
2M25	3198 035 71040	100nF 10% 16V 0402
2M26	3198 035 71040	100nF 10% 16V 0402
2M27	3198 035 71040	100nF 10% 16V 0402
2M28	3198 035 71040	100nF 10% 16V 0402
2M29	3198 035 71040	100nF 10% 16V 0402
2M30	3198 035 71040	100nF 10% 16V 0402
2M31	4822 124 12095	100µF 20% 16V
2M32	4822 124 12095	100µF 20% 16V
2M56	4822 124 12095	100µF 20% 16V
2M65	3198 035 71040	100nF 10% 16V 0402
2M66	4822 124 12095	100µF 20% 16V
2M67	3198 035 71040	100nF 10% 16V 0402
2M68	4822 124 12095	100µF 20% 16V
2N01	3198 035 71040	100nF 10% 16V 0402
2N02	3198 035 71040	100nF 10% 16V 0402
2N03	2020 552 96834	1µF 20% 6.3V 0402
2N04	2020 552 96618	1nF 10% 50V 0402
2N05	3198 035 71040	100nF 10% 16V 0402
2N06	3198 035 71040	100nF 10% 16V 0402
2N07	3198 035 71040	100nF 10% 16V 0402
2N08	3198 035 71040	100nF 10% 16V 0402
2N09	3198 035 71040	100nF 10% 16V 0402
2N10	3198 035 71040	100nF 10% 16V 0402
2N11	2238 869 15101	100pF 5% 50V 0402
2N12	2238 869 15101	100pF 5% 50V 0402
2N13	2238 869 15101	100pF 5% 50V 0402
2N14	2238 869 15101	100pF 5% 50V 0402
2N15	2238 869 15101	100pF 5% 50V 0402
2N16	2238 869 15101	100pF 5% 50V 0402
2P01	2020 552 00035	2.2µF 6.3V 10% 0603
2P02	3198 035 71040	100nF 10% 16V 0402
2P03	3198 035 71040	100nF 10% 16V 0402
2P04	3198 035 71040	100nF 10% 16V 0402
2P05	3198 035 71040	100nF 10% 16V 0402
2P06	3198 035 71040	100nF 10% 16V 0402
2P07	3198 035 71040	100nF 10% 16V 0402
2P08	3198 035 71040	100nF 10% 16V 0402
2P09	3198 035 71040	100nF 10% 16V 0402
2P10	3198 035 71040	100nF 10% 16V 0402
2P11	3198 035 71040	100nF 10% 16V 0402
2P12	3198 035 71040	100nF 10% 16V 0402
2P13	3198 035 71040	100nF 10% 16V 0402
2P14	3198 035 71040	100nF 10% 16V 0402
2P15	4822 124 12095	100µF 20% 16V
2P16	3198 035 71040	100nF 10% 16V 0402
2P17	2020 552 00035	2.2µF 6.3V 10% 0603
2P18	2020 552 00035	2.2µF 6.3V 10% 0603
2P19	3198 035 71040	100nF 10% 16V 0402
2P20	3198 035 71040	100nF 10% 16V 0402
2P21	3198 035 71040	100nF 10% 16V 0402
2P22	2020 552 00035	2.2µF 6.3V 10% 0603
2P23	3198 035 71040	100nF 10% 16V 0402
2P24	3198 035 71040	100nF 10% 16V 0402
2P25	3198 035 71040	100nF 10% 16V 0402
2P26	3198 035 71040	100nF 10% 16V 0402
2P27	3198 035 71040	100nF 10% 16V 0402
2P28	3198 035 71040	100nF 10% 16V 0402
2P29	3198 035 71040	100nF 10% 16V 0402
2P30	3198 035 71040	100nF 10% 16V 0402
2P31	3198 035 71040	100nF 10% 16V 0402
2P32	3198 035 71040	100nF 10% 16V 0402
2P33	3198 035 71040	100nF 10% 16V 0402
2P34	3198 035 71040	100nF 10% 16V 0402
2P35	3198 035 71040	100nF 10% 16V 0402
2P36	2238 869 15109	10pF 5% 50V 0402
2P37	2238 869 15109	10pF 5% 50V 0402
2P38	2238 869 15109	10pF 5% 50V 0402
2P39	2238 869 15109	10pF 5% 50V 0402
2P40	2238 869 15109	10pF 5% 50V 0402
2P41	2238 869 15109	10pF 5% 50V 0402
2P42	2238 869 15109	10pF 5% 50V 0402
2P43	2238 869 15109	10pF 5% 50V 0402
2P44	2238 869 15109	10pF 5% 50V 0402
2P45	2238 869 15109	10pF 5% 50V 0402

–WW–

3103	4822 117 13606	10kΩ 5% 0.01W 0402
3104	4822 051 30103	10kΩ 5% 0.062W
3105	4822 117 13548	1kΩ 5% 0402
3107	4822 051 30682	6.8Ω 5% 0.062W
3108	4822 051 30222	2.2kΩ 5% 0.062W
3109	4822 051 30222	2.2kΩ 5% 0.062W
3111	4822 051 30223	22kΩ 5% 0.062W
3112	4822 051 30183	18kΩ 5% 0.062W
3120	4822 117 13606	10kΩ 5% 0.01W 0402
3121	4822 117 13606	10kΩ 5% 0.01W 0402
3122	4822 117 13545	100Ω 1% 0402
3123	4822 117 13545	100Ω 1% 0402
3124	4822 117 13545	100Ω 1% 0402
3125	4822 117 13545	100Ω 1% 0402
3207	3198 031 06810	680Ω 5% 0.01W 0402
3208	4822 117 13545	100Ω 1% 0402
3209	4822 117 13545	100Ω 1% 0402
3210	4822 117 13545	100Ω 1% 0402
3211	4822 117 13545	100Ω 1% 0402
3212	4822 117 13545	100Ω 1% 0402
3213	4822 117 13545	100Ω 1% 0402
3214	3198 031 06810	680Ω 5% 0.01W 0402
3215	3198 031 02710	270Ω 5% 0.1W 0402
3216	4822 117 13597	330Ω 5% 0402 0.01W
3217	4822 117 13548	1kΩ 5% 0402
3218	4822 117 11297	100kΩ 5% 0.1W
3219	4822 117 13545	100Ω 1% 0402
3220	3198 031 04730	47Ω 5% 0402
3222	4822 117 13545	100Ω 1% 0402
3223	3198 031 01090	10Ω 5% 0.01W 0402

3224	3198 031 04720	4.7kΩ 5% 0402
3225	3198 031 04720	4.7kΩ 5% 0402
3226	4822 117 13545	100Ω 1% 0402
3227	4822 117 13545	100Ω 1% 0402
3229	3198 031 04720	4.7kΩ 5% 0402
3230	4822 117 13606	10kΩ 5% 0.01W 0402
3231	4822 117 13602	2.2kΩ 5% 0.01W 0402
3232	3198 031 03320	3.3kΩ 5% 0402
3233	3198 031 03320	3.3kΩ 5% 0402
3234	3198 031 04720	4.7kΩ 5% 0402
3235	3198 031 04720	4.7kΩ 5% 0402
3236	3198 031 04720	4.7kΩ 5% 0402
3238	4822 117 13545	100Ω 1% 0402
3239	4822 117 13545	100Ω 1% 0402
3240	2322 704 61002	1kΩ 1%
3241	4822 117 13545	100Ω 1% 0402
3242	4822 117 13606	10kΩ 5% 0.01W 0402
3243	3198 031 04720	4.7kΩ 5% 0402
3245	3198 031 02240	220kΩ 5% 0.1W 0402
3246	3198 031 04720	4.7kΩ 5% 0402
3247	4822 117 13545	100Ω 1% 0402
3248	4822 117 13545	100Ω 1% 0402
3249	3198 031 04720	4.7kΩ 5% 0402
3250	4822 117 13545	100Ω 1% 0402
3251	4822 117 13545	100Ω 1% 0402
3252	4822 117 13545	100Ω 1% 0402
3253	4822 117 13545	100Ω 1% 0402
3255	4822 117 13605	Jumper 0402
3256	4822 117 13605	Jumper 0402
3257	4822 117 13605	Jumper 0402
3258	4822 117 13548	1kΩ 5% 0402
3259	4822 117 13548	1kΩ 5% 0402
3260	4822 117 13548	1kΩ 5% 0402
3262	4822 117 13601	22kΩ 5% 0402
3263	2322 702 70398	3.9Ω 5% 0603
3264	4822 117 13601	22kΩ 5% 0402
3265	2322 702 70398	3.9Ω 5% 0603
3266	3198 031 05620	5.6kΩ 5% 0.01W 0402
3267	3198 031 05620	5.6kΩ 5% 0.01W 0402
3268	4822 117 13545	100Ω 1% 0402
3272	3198 031 04720	4.7kΩ 5% 0402
3273	4822 117 13548	1kΩ 5% 0402
3274	3198 031 03910	390Ω 1% 0402
3275	4822 117 13545	100Ω 1% 0402
3276	3198 031 07590	75Ω 5% 0402
3277	3198 031 01520	1.2kΩ 5% 0.01W 0402
3280	4822 117 11151	1Ω 5%
3281	3198 031 03930	39kΩ 5% 0402
3285	4822 117 13605	Jumper 0402
3286	4822 117 13545	100Ω 1% 0402
3292	3198 031 01230	12kΩ 5% 0402
3294	3198 031 04730	47Ω 5% 0402
3295	4822 117 11297	100kΩ 5% 0.1W
3431	4822 117 13548	1kΩ 5% 0402
3451	3198 031 04720	4.7kΩ 5% 0402
3453	4822 117 13545	100Ω 1% 0402
3454	4822 117 13545	100Ω 1% 0402
3455	4822 117 13545	100Ω 1% 0402
3456	4822 117 13545	100Ω 1% 0402
3458	4822 117 13545	100Ω 1% 0402
3459	4822 117 13545	100Ω 1% 0402
3461	4822 117 13545	100Ω 1% 0402
3462	4822 117 13545	100Ω 1% 0402
3604	4822 117 13601	22kΩ 5% 0402
3605	4822 117 13601	22kΩ 5% 0402
3609	4822 117 13601	22kΩ 5% 0402
3610	4822 117 11297	100kΩ 5% 0.1W
3611	4822 117 11297	100kΩ 5% 0.1W
3612	4822 117 13601	22kΩ 5% 0402
3615	4822 117 13606	10kΩ 5% 0.01W 0402
3618	4822 117 13601	22kΩ 5% 0402
3623	3198 031 04730	47Ω 5% 0402
3625	3198 031 03320	3.3kΩ 5% 0402
3627	4822 117 13601	22kΩ 5% 0402
3630	4822 117 13597	330Ω 5% 0402 0.01W
3631	4822 117 13597	330Ω 5% 0402 0.01W
3732	2322 704 61002	1kΩ 1%
3733	2322 704 63302	3.3kΩ 1% 0603
3734	4822 117 13602	2.2kΩ 5% 0.01W 0402
3735	4822 117 13548	1kΩ 5% 0402
3736	3198 031 04720	4.7kΩ 5% 0402
3750	4822 117 13601	22kΩ 5% 0402
3751	3198 021 31080	1Ω 5% 0603
3752	3198 021 31080	1Ω 5% 0603
3753	2322 704 61002	1kΩ 1%
3754	2322 704 63302	3.3kΩ 1% 0603
3755	4822 117 13606	10kΩ 5% 0.01W 0402
3758	3198 031 01530	15kΩ 5% 0.01W 0402
3759	3198 031 01230	12kΩ 5% 0402
3760	4822 117 13545	100Ω 1% 0402
3800	4822 117 13606	10kΩ 5% 0.01W 0402
3801	2350 035 10229	4 x 22Ω 5% 1206
3802	2350 035 10229	4 x 22Ω 5% 1206
3803	2350 035 10229	4 x 22Ω 5% 1206
3804	2350 035 10229	4 x 22Ω 5% 1206
3805	2350 035 10229	4 x 22Ω 5% 1206
3806	2350 035 10229	4 x 22Ω 5% 1206
3807	2350 035 10229	4 x 22Ω 5% 1206
3808	2350 035 10229	4 x 22Ω 5% 1206
3809	2350 035 10229	4 x 22Ω 5% 1206
3810	2350 035 10229	4 x 22Ω 5% 1206
3811	2350 035 10229	4 x 22Ω 5% 1206
3812	2350 035 10229	4 x 22Ω 5% 1206
3813	2350 035 10229	4 x 22Ω 5% 1206
3814	3198 031 02290	22Ω 5% 0.1W 0402
3815	3198 031 02290	22Ω 5% 0.1W 0402
3816	3198 031 02290	22Ω 5% 0.1W 0402
3817	4822 117 13606	10kΩ 5% 0.01W 0402
3818	4822 117 13606	10kΩ 5% 0.01W 0402
3820	4822 117 13606	10kΩ 5% 0.01W 0402
3822	4822 117 13545	100Ω 1% 0402
3824	3198 031 03320	3.3kΩ 5% 0402
3825	3198 031 11030	4 x 10kΩ 5% 1206
3826	3198 031 11030	4 x 10kΩ 5% 1206
3827	4822 117 13606	10kΩ 5% 0.01W 0402
3828	4822 117 13606	10kΩ 5% 0.01W 0402
3829	4822 117 13606	10kΩ 5% 0.01W 0402
3831	4822 117 13545	100Ω 1% 0402
3832	4822 117 13545	100Ω 1% 0402
3833	3198 031 01090	10Ω 5% 0.01W 0402
3834	4822 117 13606	10kΩ 5% 0.01W 0402
3835	4822 117 13606	10kΩ 5% 0.01W 0402
3836	4822 117 13606	10kΩ 5% 0.01W 0402
3837	4822 117 13606	10kΩ 5% 0.01W 0402
3838	4822 117 13606	10kΩ 5% 0.01W 0402
3839	4822 117 13545	100Ω 1% 0402
3840	3198 031 02290	22Ω 5% 0.1W 0402
3841	4822 117 13606	10kΩ 5% 0.01W 0402
3900	3198 031 03320	3.3kΩ 5% 0402
3901	4822 117 13606	10kΩ 5% 0.01W 0402
3902	4822 117 13606	10kΩ 5% 0.01W 0402
3903	4822 117 13545	100Ω 1% 0402
3904	4822 117 13545	100Ω 1% 0402
3A02	4822 117 13548	1kΩ 5% 0402
3B01	4822 117 12706	10kΩ 1% 0.063W 0603
3B02	4822 117 12706	10kΩ 1% 0.063W 0603
3B03	2322 704 61501	150Ω 1% 0603
3C00	4822 117 13606	10kΩ 5% 0.01W 0402
3C01	4822 117 13606	10kΩ 5% 0.01W 0402
3C02	4822 117 13548	1kΩ 5% 0402
3C04	3198 031 11030	4 x 10kΩ 5% 1206
3C05	4822 117 13606	10kΩ 5% 0.01W 0402
3C06	3198 031 11030	4 x 10kΩ 5% 1206
3C07	3198 031 11030	4 x 10kΩ 5% 1206
3C08	3198 031 11030	4 x 10kΩ 5% 1206
3C09	3198 031 11030	4 x 10kΩ 5% 1206
3C10	3198 031 11030	4 x 10kΩ 5% 1206
3C16	3198 031 11030	4 x 10kΩ 5% 1206
3C17	4822 117 13606	10kΩ 5% 0.01W 0402
3C18	4822 117 13606	10kΩ 5% 0.01W 0402
3E00	2322 705 70569	56Ω 5% 0402
3E01	2322 705 70569	56Ω 5% 0402
3E02	2322 705 70569	56Ω 5% 0402
3E06	3198 031 04730	47Ω 5% 0402
3E07	3198 031 04730	47Ω 5% 0402
3E08	3198 031 04730	47Ω 5% 0402
3E09	3198 031 04730	47Ω 5% 0402
3E10	3198 031 04730	47Ω 5% 0402
3E11	3198 031 04730	47Ω 5% 0402
3E12	4822 117 13606	10kΩ 5% 0.01W 0402
3E13	4822 117 13597	330Ω 5% 0402 0.01W
3E14	4822 117 13597	330Ω 5% 0402 0.01W
3E15	4822 117 13597	330Ω 5% 0402 0.01W
3E16	4822 117 13597	330Ω 5% 0402 0.01W
3E17	4822 117 13597	330Ω 5% 0402 0.01W
3E18	4822 117 13597	330Ω 5% 0402 0.01W
3E19	2322 705 70569	56Ω 5% 0402
3E20	2322 705 70569	56Ω 5% 0402
3E21	2322 705 70569	56Ω 5% 0402
3E22	4822 117 13632	100kΩ 1% 0603 0.62W
3E23	3198 031 08210	820Ω 5% 0.5W
3E24	4822 117 13543	470Ω 5% 0402
3E25	2322 705 70399	39Ω 5% 0402
3E26	3198 031 02290	22Ω 5% 0.1W 0402
3E27	2322 705 70399	39Ω 5% 0402
3E28	3198 031 02290	22Ω 5% 0.1W 0402
3E29	2322 705 70399	39Ω 5% 0402
3E30	3198 031 02290	22Ω 5% 0.1W 0402
3E31	4822 117 13545	100Ω 1% 0402
3E32	4822 117 13545	100Ω 1% 0402
3E33	4822 117 13545	100Ω 1% 0402
3E34	4822 117 13545	100Ω 1% 0402
3E35	4822 117 13545	100Ω 1% 0402
3E36	4822 117 13545	100Ω 1% 0402
3E37	3198 031 02290	22Ω 5% 0.1W 0402
3E38	4822 117 13545	100Ω 1% 0402
3E39	4822 117 13545	100Ω 1% 0402
3E41	4822 117 13545	100Ω 1% 0402
3E42	4822 117 13545	100Ω 1% 0402
3E43	4822 117 13545	100Ω 1% 0402
3E44	4822 117 13545	100Ω 1% 0402
3E45	4822 117 13545	100Ω 1% 0402
3E49	3198 031 02290	22Ω 5% 0.1W 0402
3E50	3198 031 04730	47Ω 5% 0402
3E51	3198 031 04730	47Ω 5% 0402
3E52	3198 031 04730	47Ω 5% 0402
3E53	3198 031 04730	47Ω 5% 0402
3E54	3198 031 04730	47Ω 5% 0402
3E55	3198 031 04730	47Ω 5% 0402
3F00	4822 051 30759	75Ω 5% 0.062W
3F09	4822 051 30759	75Ω 5% 0.062W
3F10	3198 021 31080	1Ω 5% 0603
3F11	4822 051 30759	75Ω 5% 0.062W
3F16	4822 051 30103	10kΩ 5% 0.062W
3F17	4822 051 30103	10kΩ 5% 0.062W
3F18	4822 051 30103	10kΩ 5% 0.062W
3F19	3198 021 31080	1Ω 5% 0603
3F20	4822 051 30101	100Ω 5% 0.062W
3F21	4822 051 30102	1kΩ 5% 0.062W
3F22	4822 051 30103	10kΩ 5% 0.062W
3F23	4822 051 30102	1kΩ 5% 0.062W
3F24	4822 051 30103	10kΩ 5% 0.062W
3F25	4822 051 30103	10kΩ 5% 0.062W
3F26	4822 051 30153	15kΩ 5% 0.062W
3F27	4822 051 30153	15kΩ 5% 0.062W
3F28	4822 051 30101	100Ω 5% 0.062W
3F29	4822 051 30101	100Ω 5% 0.062W
3G00	4822 051 30151	150Ω 5% 0.062W
3G01	4822 051 30103	10kΩ 5% 0.062W
3G02	4822 117 12891	220kΩ 1%
3G03	4822 051 30153	15kΩ 5% 0.062W
3G04	4822 051 30151	150Ω 5% 0.062W
3G05	4822 051 30103	10kΩ 5% 0.062W
3G06	4822 117 12891	220kΩ 1%
3G07	4822 051 30153	15kΩ 5% 0.062W
3G08	4822 051 30151	150Ω 5% 0.062W
3G12	2122 118 06408	91Ω 5% 0603
3G13	2122 118 06408	91Ω 5% 0603
3G14	2122 118 06408	91Ω 5% 0603
3G15	4822 051 30101	100Ω 5% 0.062W
3G16	4822 051 30101	100Ω 5% 0.062W
3G17	4822 051 30101	100Ω 5% 0.062W
3G26	4822 051 30273	27kΩ 5% 0.062W
3G27	4822 051 30682	6.8Ω 5% 0.062W
3G28	4822 051 30759	75Ω 5% 0.062W
3G29	4822 051 30331	330Ω 5% 0.062W
3G30	4822 051 30689	68Ω 5% 0.063W 0603
3G31	4822 051 30759	75Ω 5% 0.062W
3G32	4822 051 30102	1kΩ 5% 0.062W
3G33	4822 051 30101	100Ω 5% 0.062W
3G34	4822 051 30102	1kΩ 5% 0.062W
3G37	4822 051 30151	150Ω 5% 0.062W
3G38	4822 051 30103	10kΩ 5% 0.062W
3G39	4822 117 12891	220kΩ 1%
3G40	4822 051 30153	15kΩ 5% 0.062W
3G41	4822 051 30151	150Ω 5% 0.062W
3G42	4822 051 30103	10kΩ 5% 0.062W
3G43	4822 117 12891	220kΩ 1%
3G44	4822 051 30153	15kΩ 5% 0.062W
3G45	4822 051 30759	75Ω 5% 0.062W
3G46	4822 051 30101	100Ω 5% 0.062W
3G47	4822 117 12925	47kΩ 1% 0.063W 0603
3G48	4822 117 12925	47kΩ 1% 0.063W 0603
3G51	4822 051 30273	27kΩ 5% 0.062W
3G52	4822 051 30682	6.8Ω 5% 0.062W
3G53	4822 051 30689	68Ω 5% 0.063W 0603
3G54	4822 051 30102	1kΩ 5% 0.062W
3G57	4822 051 30759	75Ω 5% 0.062W
3G58	4822 051 30101	100Ω 5% 0.062W
3G59	4822 117 12925	47kΩ 1% 0.063W 0603
3G60	4822 117 12925	47kΩ 1% 0.063W 0603
3G96	4822 117 12925	47kΩ 1% 0.063W 0603
3G99	4822 117 12925	47kΩ 1% 0.063W 0603
3J03	3198 031 06890	68Ω 5% 0402
3J04	3198 031 06890	68Ω 5% 0402
3J05	3198 031 06890	68Ω 5% 0402
3K00	4822 117 13545	100Ω 1% 0402
3K01	4822 117 13545	100Ω 1% 0402
3K02	4822 117 13606	10kΩ 5% 0.01W 0402
3K03	3198 031 01530	15kΩ 5% 0.01W 0402
3K05	4822 117 13606	10kΩ 5% 0.01W 0402
3K06	3198 031 01530	15kΩ 5% 0.01W 0402
3K07	2322 705 70399	39Ω 5% 0402
3K08	3198 031 06890	68Ω 5% 0402
3K09	2322 705 70399	39Ω 5% 0402
3K11	3198 031 06890	68Ω 5% 0402
3K12	3198 031 06890	68Ω 5% 0402
3K13	3198 031 06890	68Ω 5% 0402
3L00	4822 117 13548	1kΩ 5% 0402
3L04	4822 117 13605	Jumper 0402
3L05	3198 031 01510	150Ω 5% 0.01W 0402
3L06	4822 117 13605	Jumper 0402

3L10	4822 117 13597	330Ω 5% 0402 0.01W
3L11	3198 031 01510	150Ω 5% 0.01W 0402
3L12	4822 117 13548	1kΩ 5% 0402
3L16	4822 117 13605	Jumper 0402
3L17	3198 031 01510	150Ω 5% 0.01W 0402
3L19	3198 031 01510	150Ω 5% 0.01W 0402
3L20	3198 031 01510	150Ω 5% 0.01W 0402
3L21	4822 117 13602	2.2kΩ 5% 0.01W 0402
3L22	4822 117 13602	2.2kΩ 5% 0.01W 0402
3L24	4822 117 13602	2.2kΩ 5% 0.01W 0402
3L25	2350 035 10229	4 x 22Ω 5% 1206
3L26	2350 035 10229	4 x 22Ω 5% 1206
3L27	2350 035 10229	4 x 22Ω 5% 1206
3L28	2350 035 10229	4 x 22Ω 5% 1206
3L30	3198 031 02290	22Ω 5% 0.1W 0402
3L31	3198 031 02290	22Ω 5% 0.1W 0402
3L32	4822 117 13602	2.2kΩ 5% 0.01W 0402
3L33	4822 117 13596	220Ω 5% 0.01W 0402
3L34	4822 117 13605	Jumper 0402
3L35	4822 117 13596	220Ω 5% 0.01W 0402
3L36	3198 031 03320	3.3kΩ 5% 0402
3L37	3198 031 03320	3.3kΩ 5% 0402
3M01	2350 035 10689	4 x 68Ω 5%
3M02	2350 035 10689	4 x 68Ω 5%
3M03	2350 035 10689	4 x 68Ω 5%
3M04	2350 035 10689	4 x 68Ω 5%
3M06	2350 035 10229	4 x 22Ω 5% 1206
3M07	2350 035 10229	4 x 22Ω 5% 1206
3M08	2350 035 10229	4 x 22Ω 5% 1206
3M09	2350 035 10229	4 x 22Ω 5% 1206
3M11	3198 031 04720	4.7kΩ 5% 0402
3M13	3198 031 04720	4.7kΩ 5% 0402
3M14	4822 117 13545	100Ω 1% 0402
3M15	4822 117 13545	100Ω 1% 0402
3M16	3198 031 04720	4.7kΩ 5% 0402
3M26	4822 117 13605	Jumper 0402
3M27	4822 117 13605	Jumper 0402
3M50	4822 117 13606	10kΩ 5% 0.01W 0402
3M51	4822 117 13606	10kΩ 5% 0.01W 0402
3M52	4822 117 13606	10kΩ 5% 0.01W 0402
3M53	4822 117 13546	47Ω 5% 0402
3M54	4822 117 13546	47Ω 5% 0402
3M55	4822 117 13546	47Ω 5% 0402
3M56	4822 117 13606	10kΩ 5% 0.01W 0402
3M57	4822 117 13546	47Ω 5% 0402
3M58	4822 117 13606	10kΩ 5% 0.01W 0402
3M59	4822 117 13546	47Ω 5% 0402
3M78	4822 117 13548	1kΩ 5% 0402
3M79	3198 031 03320	3.3kΩ 5% 0402
3M87	4822 117 13605	Jumper 0402
3M89	3198 031 02290	22Ω 5% 0.1W 0402
3M90	3198 031 02290	22Ω 5% 0.1W 0402
3N01	4822 117 13606	10kΩ 5% 0.01W 0402
3N02	4822 117 13606	10kΩ 5% 0.01W 0402
3N03	4822 117 13606	10kΩ 5% 0.01W 0402
3N04	4822 117 13606	10kΩ 5% 0.01W 0402
3N05	4822 117 13606	10kΩ 5% 0.01W 0402
3N06	4822 117 13606	10kΩ 5% 0.01W 0402
3N07	4822 051 30333	33kΩ 5% 0.062W
3N08	4822 117 13606	10kΩ 5% 0.01W 0402
3N09	4822 117 13548	1kΩ 5% 0402
3N10	4822 117 13603	33kΩ 5% 0402
3N11	4822 117 13546	47Ω 5% 0402
3N12	4822 117 13606	10kΩ 5% 0.01W 0402
3N13	4822 117 13606	10kΩ 5% 0.01W 0402
3N14	4822 117 13606	10kΩ 5% 0.01W 0402
3N15	4822 117 13546	47Ω 5% 0402
3N16	4822 117 13546	47Ω 5% 0402
3N17	4822 117 13546	47Ω 5% 0402
3N18	4822 117 13546	47Ω 5% 0402
3N19	4822 117 13606	10kΩ 5% 0.01W 0402
3N20	4822 117 13546	47Ω 5% 0402
3N21	4822 117 13545	100Ω 1% 0402
3N22	4822 117 13545	100Ω 1% 0402
3N23	4822 117 13545	100Ω 1% 0402
3N24	4822 117 13545	100Ω 1% 0402
3N25	4822 117 13545	100Ω 1% 0402
3N26	3198 031 04720	4.7kΩ 5% 0402
3N27	4822 117 13546	47Ω 5% 0402
3N28	4822 051 30181	180Ω 5% 0.062W
3N29	4822 117 13545	100Ω 1% 0402
3N30	4822 117 13545	100Ω 1% 0402
3N31	4822 117 13545	100Ω 1% 0402
3N32	4822 117 13545	100Ω 1% 0402
3N33	4822 117 13545	100Ω 1% 0402
3N34	4822 117 13545	100Ω 1% 0402
3N35	4822 117 13545	100Ω 1% 0402
3N46	4822 117 13545	100Ω 1% 0402
3N47	4822 117 13545	100Ω 1% 0402
3P01	3198 031 04720	4.7kΩ 5% 0402
3P03	4822 117 13546	47Ω 5% 0402
3S00	4822 117 12925	47kΩ 1% 0.063W 0603
3S03	4822 117 12925	47kΩ 1% 0.063W 0603
4206	4822 051 20008	Jumper 0805
4211	4822 117 13605	Jumper 0402
4212	4822 117 13605	Jumper 0402
4436	4822 117 13605	Jumper 0402
4437	4822 117 13605	Jumper 0402
4440	4822 117 13605	Jumper 0402
4441	4822 117 13605	Jumper 0402
4801	4822 117 13605	Jumper 0402
4A05	4822 117 13605	Jumper 0402
4A06	4822 117 13605	Jumper 0402
4K04	4822 117 13605	Jumper 0402
4K05	4822 117 13605	Jumper 0402
4K06	4822 117 13605	Jumper 0402
4L02	4822 117 13605	Jumper 0402
4M00	4822 117 13605	Jumper 0402
4M01	4822 117 13605	Jumper 0402
4M02	4822 117 13605	Jumper 0402
4M03	4822 117 13605	Jumper 0402
4M05	4822 117 13605	Jumper 0402
4M08	4822 117 13605	Jumper 0402
4M09	4822 117 13605	Jumper 0402
4M10	4822 117 13605	Jumper 0402
4M16	4822 117 13605	Jumper 0402
4M17	4822 117 13605	Jumper 0402
4N01	4822 117 13605	Jumper 0402
4N02	4822 117 13605	Jumper 0402
4N03	4822 117 13605	Jumper 0402
4N04	4822 117 13605	Jumper 0402
4N05	4822 117 13605	Jumper 0402
4N06	4822 117 13605	Jumper 0402
4N07	4822 117 13605	Jumper 0402
4N08	4822 117 13605	Jumper 0402
4N09	4822 117 13605	Jumper 0402
4N10	4822 117 13605	Jumper 0402
4N11	4822 117 13605	Jumper 0402
4N12	4822 117 13605	Jumper 0402
4N13	4822 117 13605	Jumper 0402
4N14	4822 117 13605	Jumper 0402
4N15	4822 117 13605	Jumper 0402
4N16	4822 117 13605	Jumper 0402
4N17	4822 117 13605	Jumper 0402
4N18	4822 117 13605	Jumper 0402
4N19	4822 117 13605	Jumper 0402
4N20	4822 117 13605	Jumper 0402
4N21	4822 117 13605	Jumper 0402
4N22	4822 117 13605	Jumper 0402

5101	3198 018 33970	0.39µF 10% 0805
5103	4822 157 71334	0.68µH 5% 1008
5107	4822 051 30101	100Ω 5% 0.062W
5108	4822 051 30101	100Ω 5% 0.062W
5201	4822 157 11716	Bead 30Ω at 100MHz
5202	4822 157 11716	Bead 30Ω at 100MHz
5203	4822 157 11716	Bead 30Ω at 100MHz
5204	2422 549 42896	Bead 120Ω 100MHz
5205	4822 157 11716	Bead 30Ω at 100MHz
5206	4822 157 11716	Bead 30Ω at 100MHz
5207	2422 549 42896	Bead 120Ω 100MHz
5208	4822 157 11716	Bead 30Ω at 100MHz
5209	4822 157 11716	Bead 30Ω at 100MHz
5210	4822 157 11716	Bead 30Ω at 100MHz
5211	4822 157 11716	Bead 30Ω at 100MHz
5212	4822 157 11716	Bead 30Ω at 100MHz
5213	4822 157 11716	Bead 30Ω at 100MHz
5214	2422 536 00667	1000µF 20% 7032
5216	4822 157 11716	Bead 30Ω at 100MHz
5218	2422 549 45333	Bead 120Ω 100MHz
5700	2422 549 45333	Bead 120Ω 100MHz
5730	2422 535 94134	10µH 20% 0805
5733	2422 536 00689	220µF 20%
5735	2422 536 00667	1000µF 20% 7032
5737	2422 535 94134	10µH 20% 0805
5738	2422 549 45333	Bead 120Ω 100MHz
5752	2422 535 94134	10µH 20% 0805
5753	2422 536 00689	220µF 20%
5754	2422 535 94134	10µH 20% 0805
5756	2422 549 45333	Bead 120Ω 100MHz
5757	2422 549 45333	Bead 120Ω 100MHz
5900	2422 549 45333	Bead 120Ω 100MHz
5901	2422 549 45333	Bead 120Ω 100MHz
5902	2422 549 45333	Bead 120Ω 100MHz
5903	2422 549 45333	Bead 120Ω 100MHz
5904	2422 549 45333	Bead 120Ω 100MHz
5905	2422 549 45333	Bead 120Ω 100MHz
5906	2422 549 45333	Bead 120Ω 100MHz
5907	2422 549 45333	Bead 120Ω 100MHz
5908	2422 549 45333	Bead 120Ω 100MHz
5909	2422 549 45333	Bead 120Ω 100MHz
5910	2422 549 45333	Bead 120Ω 100MHz
5911	2422 549 45333	Bead 120Ω 100MHz
5C00	2422 549 45333	Bead 120Ω 100MHz
5E00	2422 549 45333	Bead 120Ω 100MHz
5E01	2422 549 45333	Bead 120Ω 100MHz
5E02	2422 549 45333	Bead 120Ω 100MHz
5E03	2422 549 45333	Bead 120Ω 100MHz
5F00	2422 549 45333	Bead 120Ω 100MHz
5F01	2422 549 45333	Bead 120Ω 100MHz
5F02	2422 549 45333	Bead 120Ω 100MHz
5F03	2422 549 45333	Bead 120Ω 100MHz
5G02	2422 549 45333	Bead 120Ω 100MHz
5J01	2422 549 42896	Bead 120Ω 100MHz
5J02	2422 549 42896	Bead 120Ω 100MHz
5J03	2422 549 45333	Bead 120Ω 100MHz
5L00	2422 549 45333	Bead 120Ω 100MHz
5L01	2422 549 45333	Bead 120Ω 100MHz
5L02	2422 549 45333	Bead 120Ω 100MHz
5M00	2422 549 45333	Bead 120Ω 100MHz
5M01	2422 549 45333	Bead 120Ω 100MHz
5M02	2422 549 45333	Bead 120Ω 100MHz
5M03	2422 549 45333	Bead 120Ω 100MHz
5M04	2422 549 45333	Bead 120Ω 100MHz
5M05	2422 549 45333	Bead 120Ω 100MHz
5N01	4822 157 11716	Bead 30Ω at 100MHz
5N02	4822 157 11716	Bead 30Ω at 100MHz
5N03	4822 157 11716	Bead 30Ω at 100MHz
5N04	4822 157 11716	Bead 30Ω at 100MHz
5N05	4822 157 11716	Bead 30Ω at 100MHz
5P01	4822 157 11716	Bead 30Ω at 100MHz
5P02	4822 157 11716	Bead 30Ω at 100MHz
5P03	4822 157 11716	Bead 30Ω at 100MHz
5P04	4822 157 11716	Bead 30Ω at 100MHz
5P05	4822 157 11716	Bead 30Ω at 100MHz
5P06	4822 157 11716	Bead 30Ω at 100MHz

6101	4822 130 11416	PDZ6.8B
6102	4822 130 11416	PDZ6.8B
6103	4822 130 11397	BAS316
6104	4822 130 11525	1SS356
6204	4822 130 80622	BAT54
6205	4822 130 80622	BAT54
6430	9340 548 42115	PDZ2.4B
6431	9965 000 20150	1N4148WS SOD-323
6601	4822 130 10838	UDZ3.3B
6733	9322 128 70685	SMSS14
6735	5322 130 34337	BAV99
6736	9340 548 71115	PDZ33B
6751	9322 128 70685	SMSS14
6E01	9322 102 64685	UDZ2.7B
6E03	9322 102 64685	UDZ2.7B
6F00	4822 130 11397	BAS316
6F01	4822 130 11397	BAS316
6G03	4822 130 11416	PDZ6.8B
6G04	4822 130 11416	PDZ6.8B
6G05	4822 130 11416	PDZ6.8B
6G06	4822 130 11416	PDZ6.8B
6G07	4822 130 11416	PDZ6.8B
6G08	4822 130 11416	PDZ6.8B
6G09	4822 130 11416	PDZ6.8B
6G10	4822 130 11416	PDZ6.8B
6N01	9322 085 77685	TLMG3100

7101	3198 010 42310	BC847BW
7201	9340 550 49115	PUMH7
7202	9340 550 49115	PUMH7
7206	4822 130 60373	BC856B
7207	9322 214 45668	M24C16-WMN6P
7208	3198 010 42310	BC847BW
7209	3198 010 42310	BC847BW
7210	3198 010 42310	BC847BW
7214	9339 693 90135	BCP69-25
7215	9339 693 90135	BCP69-25
7216	9340 425 20115	BC847BS
7217	9352 780 22557	TDA15021H/N1B91
7219	4822 209 60792	74HC4053D
7430	4822 130 11155	PDTC114ET
7436	9352 607 39118	74LVC14APW
7601	9322 183 05668	TS482ID
7602	9351 742 70118	74HC08PW
7605	9340 310 50215	PDTA143ET
7606	9340 425 20115	BC847BS
7607	3198 010 42310	BC847BW
7730	9322 191 07668	IC SM L5970D
7735	4822 130 42804	BC817-25
7738	9322 163 24668	L78M08CDT
7752	5322 209 90529	MC34063AD
7754	9322 214 00668	SI2301BDS-E3
7755	4822 130 11155	PDTC114ET
7756	4822 130 11155	PDTC114ET
7758	9322 212 14668	SI4423DY
7801	9322 219 57671	GM1501H-LF-BD

7900	9322 142 88668	LF25CDT
7901	9322 189 19668	LD1086D2T18
7B01	9322 214 42671	K4D263238F-QC50
7C00	9322 205 12671	MX29LV040QC-70G
7C01	9322 206 23668	M24C32-WMN6P
7C02	9322 215 39685	PST596JN
7E00	9322 195 23668	ADG733BRU
7E01	9322 199 80668	SM5301BS-G
7E02	9322 199 56668	ADG781BCP
7E03	4822 209 60792	74HC4053D
7E04	9352 607 39118	74LVC14APW
7E05	9352 607 39118	74LVC14APW
7F03	9322 206 24668	M24C02-WMN6P
7G03	3198 010 42310	BC847BW
7G05	3198 010 42310	BC847BW
7G10	4822 209 60792	74HC4053D
7L01	3198 010 42310	BC847BW
7L02	3198 010 42310	BC847BW
7L03	3198 010 42310	BC847BW
7L04	9322 212 77672	MST9883C-LF-110
7L05	4822 209 17398	LD1117DT33
7L06	9965 000 04199	BSN20
7L07	9965 000 04199	BSN20
7M00	9322 204 76671	T6TU5XBG-0001
7M01	9322 206 19672	MSM56V16160F-7T3-FG
7M03	9322 170 14668	LF15ABDT
7N01	9322 210 01668	EPCS4SI8N
7N02	9322 217 35671	EP1C12F256C8N
7N03	9340 425 20115	BC847BS
7N04	9322 210 59668	THC63LVDF84B
7P01	9322 170 14668	LF15ABDT
7P02	9322 201 03668	THC63LVDM83R

Audio Amplifier Panel [C]

Various

1001	2422 025 09406	Connector 4p m
1002	2422 025 10769	Connector 9p m
1003	2422 025 10768	Connector 3p m

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2001	2020 024 00023	220µ 35V
2002	2238 586 59812	100nF 20% 50V 0603
2003	2238 586 59812	100nF 20% 50V 0603
2004	2020 024 00023	220µ 35V
2006	2020 552 94427	100pF 5% 50V
2007	2020 552 94427	100pF 5% 50V
2008	2020 552 94427	100pF 5% 50V
2009	2020 552 94427	100pF 5% 50V
2010	2238 586 59812	100nF 20% 50V 0603
2011	4822 051 30562	5.6kΩ 5% 0.063W 0603
2012	2020 024 00023	220µ 35V
2013	4822 126 13879	220nF +80-20% 16V
2014	4822 126 14238	2.2nF 50V 0603
2015	4822 126 14238	2.2nF 50V 0603
2016	4822 126 14238	2.2nF 50V 0603
2017	2238 586 59812	100nF 20% 50V 0603
2018	3198 017 31530	15nF 20% 50V 0603
2019	3198 037 52280	2.2µ 50V
2020	4822 126 13883	220pF 5% 50V
2021	4822 126 13883	220pF 5% 50V
2022	4822 126 14076	220nF +80/-20% 25V
2023	4822 121 51252	470nF 5% 63V
2024	2020 012 00036	1000µ 25V
2026	4822 126 13879	220nF +80-20% 16V
2027	2238 586 59812	100nF 20% 50V 0603
2028	2238 586 59812	100nF 20% 50V 0603
2029	2020 024 00023	220µ 35V
2030	4822 126 14238	2.2nF 50V 0603
2031	4822 126 14238	2.2nF 50V 0603
2032	4822 126 14238	2.2nF 50V 0603
2033	4822 126 13879	220nF +80-20% 16V
2034	2238 586 59812	100nF 20% 50V 0603
2035	4822 126 13883	220pF 5% 50V
2036	4822 126 13883	220pF 5% 50V
2037	3198 037 52280	2.2µ 50V
2038	3198 017 31530	15nF 20% 50V 0603
2039	2020 552 96656	10µF 20% 25V 1210
2040	4822 126 13879	220nF +80-20% 16V
2041	2020 552 96656	10µF 20% 25V 1210
2042	4822 121 51252	470nF 5% 63V
2043	2020 012 00036	1000µ 25V
2044	2238 586 59812	100nF 20% 50V 0603
2045	4822 126 14076	220nF +80/-20% 25V
2047	3198 017 41050	1µF 10V 0603
2048	2238 586 59812	100nF 20% 50V 0603
2051	2020 552 94427	100pF 5% 50V
2052	4822 126 14238	2.2nF 50V 0603
2053	4822 126 14238	2.2nF 50V 0603
2054	4822 126 14238	2.2nF 50V 0603
2055	4822 126 14238	2.2nF 50V 0603
2060	4822 126 14238	2.2nF 50V 0603
2061	4822 126 14238	2.2nF 50V 0603
2062	3198 017 34730	47nF 16V 0603
2063	3198 017 34730	47nF 16V 0603
2064	5322 126 11579	3.3nF 10% 63V
2065	5322 126 11579	3.3nF 10% 63V

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3001	5322 117 11726	10Ω 5%
3003	4822 051 30223	22kΩ 5% 0.062W
3004	4822 051 30103	10kΩ 5% 0.062W
3006	4822 051 30102	1kΩ 5% 0.062W
3007	4822 117 12925	47kΩ 1% 0.063W 0603
3008	4822 051 30222	2.2kΩ 5% 0.062W
3009	4822 117 12891	220kΩ 1%
3010	4822 051 30682	6.8Ω 5% 0.062W
3011	4822 051 30222	2.2kΩ 5% 0.062W
3012	4822 051 20109	10Ω 5% 0.1W
3013	4822 051 30103	10kΩ 5% 0.062W
3014	2322 762 60229	22Ω 5% 1005
3019	4822 051 30103	10kΩ 5% 0.062W
3020	4822 051 30103	10kΩ 5% 0.062W
3021	4822 051 30472	4.7Ω 5% 0.062W
3022	9965 000 23109	22Ω 5% 0603
3023	4822 051 30102	1kΩ 5% 0.062W
3024	4822 117 12925	47kΩ 1% 0.063W 0603
3025	4822 051 30222	2.2kΩ 5% 0.062W
3026	4822 051 30682	6.8Ω 5% 0.062W
3027	4822 117 12891	220kΩ 1%
3028	4822 051 30103	10kΩ 5% 0.062W
3029	4822 051 30222	2.2kΩ 5% 0.062W
3030	4822 051 20109	10Ω 5% 0.1W
3031	2322 762 60229	22Ω 5% 1005
3032	4822 051 30392	3.9Ω 5% 0.063W 0603
3033	4822 051 30103	10kΩ 5% 0.062W
3034	4822 051 30392	3.9Ω 5% 0.063W 0603
3037	4822 051 30392	3.9Ω 5% 0.063W 0603
3039	4822 051 30103	10kΩ 5% 0.062W
3040	4822 051 30103	10kΩ 5% 0.062W
3041	4822 051 30103	10kΩ 5% 0.062W
3042	4822 051 30103	10kΩ 5% 0.062W
3043	4822 051 30103	10kΩ 5% 0.062W
3046	4822 051 30102	1kΩ 5% 0.062W
3047	4822 051 30102	1kΩ 5% 0.062W

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5001	2422 549 44197	Bead 220Ω at 100MHz
5002	3198 018 52280	2.2µF 10% 1008
5003	3198 018 52280	2.2µF 10% 1008
5004	3198 018 52280	2.2µF 10% 1008
5005	3198 018 52280	2.2µF 10% 1008
5006	2422 536 01034	33µ
5007	2422 536 01034	33µ

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6002	4822 130 80622	BAT54
6003	4822 130 80622	BAT54

7000	9352 760 45118	TDA8931T/N1
7001	9352 760 45118	TDA8931T/N1
7004	9322 209 56685	TL431ACDBV

Keyboard Control Panel [E]

Various

0100	3139 129 90041	PROCESS BOX PCB PNL LFS
0229	3122 120 01701	FACTORY PLATE
1309	4822 276 13775	Switch 1p 0.1A 12V
1310	4822 276 13775	Switch 1p 0.1A 12V
1311	4822 276 13775	Switch 1p 0.1A 12V
1312	4822 276 13775	Switch 1p 0.1A 12V
1313	4822 276 13775	Switch 1p 0.1A 12V
1314	4822 276 13775	Switch 1p 0.1A 12V
1684	4822 267 10459	Connector 3p
8684	3139 131 04421	Cable 03P/340/03P

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3318	4822 051 30151	150Ω 5% 0.062W
3319	4822 051 30391	390Ω 5% 0.062W
3320	3198 021 31820	1.8kΩ 5% 0.062W 0603
3321	4822 117 12968	820Ω 5% 0.62W
3322	4822 051 30008	Jumper 0603
3323	4822 051 30008	Jumper 0603
3324	4822 051 30561	560Ω 5% 0.062W

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6306	4822 130 11148	UDZ4.7B

Side AV Panel [G]

Various

1301	2422 025 14531	20p f
1301	4822 267 10484	YKF51-5359
1302	2422 025 10738	Connector 6p m
1302	2422 026 05655	Socket CINCH 3P F RDWDYE
1303	2422 026 05059	Connector Phone
1304	2422 025 10772	Connector 12p m
1306	2422 026 05059	Connector Phone
1307	4822 267 10484	YKF51-5359
1308	2422 026 05513	Soc phone 1p

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2301	3198 017 41050	1µF 10V 0603
2302	4822 126 11785	47pF 5% 50V 0603
2302	4822 126 14241	330pF 0603 50V
2303	3198 017 41050	1µF 10V 0603
2304	4822 126 11785	47pF 5% 50V 0603
2304	4822 126 14241	330pF 0603 50V
2305	4822 126 14241	330pF 0603 50V
2306	4822 126 14241	330pF 0603 50V
2307	4822 126 14241	330pF 0603 50V
2308	5322 126 11583	10nF 10% 50V 0603
2309	5322 126 11583	10nF 10% 50V 0603
2310▲	3198 017 41050	1µF 10V 0603
2326	3198 017 41050	1µF 10V 0603

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3301	4822 051 30101	100Ω 5% 0.062W
3301	4822 051 30759	75Ω 5% 0.062W
3302	4822 051 30109	10Ω 5% 0.062W
3302	4822 051 30759	75Ω 5% 0.062W
3303	4822 051 30109	10Ω 5% 0.062W
3303	4822 051 30221	220Ω 5% 0.062W
3304	4822 051 30223	22kΩ 5% 0.062W
3304	4822 051 30759	75Ω 5% 0.062W
3305	4822 117 12925	47kΩ 1% 0.063W 0603
3305	4822 117 13632	100kΩ 1% 0603 0.62W
3306	4822 051 30153	15kΩ 5% 0.062W
3306	4822 051 30759	75Ω 5% 0.062W
3307	4822 051 30102	1kΩ 5% 0.062W
3307	4822 051 30223	22kΩ 5% 0.062W
3308	4822 051 30153	15kΩ 5% 0.062W
3308	4822 117 12925	47kΩ 1% 0.063W 0603
3309▲	4822 051 30759	75Ω 5% 0.062W
3310▲	4822 051 30563	56kΩ 5% 0.062W
3311	4822 051 30103	10kΩ 5% 0.062W
3325	4822 051 30759	75Ω 5% 0.062W
3326	4822 051 30102	1kΩ 5% 0.062W
3327	4822 117 13632	100kΩ 1% 0603 0.62W
3328	4822 051 30101	100Ω 5% 0.062W
3329	4822 051 30563	56kΩ 5% 0.062W

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6301	9322 129 41685	BZM55-C12
6302	9322 129 41685	BZM55-C12
6303	9322 129 41685	BZM55-C12
6304	9322 129 41685	BZM55-C12
6305	9322 129 41685	BZM55-C12
6306	9322 129 41685	BZM55-C12
6307	9322 129 41685	BZM55-C12
6308	9322 129 41685	BZM55-C12
6310	4822 130 11416	PDZ6.8B
6311	4822 130 11416	PDZ6.8B

7301▲	4822 130 60373	BC856B
7326	4822 130 60373	BC856B

IR/LED/Light-sensor Panel [J]

Various

0080	3139 120 10171	Light sensor holder
1540	2422 025 10738	Connector 6p m
1870	4822 265 31067	Connector 7p m

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2540	4822 124 41643	100µF 20% 16V
2541	3198 017 41050	1µF 10V 0603
2801	2020 552 96637	10µF 10% 6.3V 0805
2802	2020 552 96637	10µF 10% 6.3V 0805
2803	3198 017 41050	1µF 10V 0603

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3540	4822 051 30331	330Ω 5% 0.062W
3542	4822 051 30221	220Ω 5% 0.062W
3544	4822 051 30332	3.3Ω 5% 0.062W
3547	3198 021 32250	2.2MΩ 5% 0603
3801	4822 051 30332	3.3Ω 5% 0.062W
3802	4822 051 30331	330Ω 5% 0.062W
3803	4822 051 30221	220Ω 5% 0.062W
3809	3198 021 32250	2.2MΩ 5% 0603

6540	9322 192 35676	SPR-325MVW
6541	9322 207 16667	TSOP34836LL1B
6801	9322 192 35676	SPR-325MVW
6803	4822 130 11564	UDZ3.9B

7540	4822 130 60373	BC856B
7541	5322 130 60159	BC846B
7542	5322 130 60159	BC846B
7543	9322 190 43682	BPW34
7801	4822 130 60373	BC856B
7802	9322 207 16667	TSOP34836LL1B
7803	5322 130 60159	BC846B
7804	5322 130 60159	BC846B
7808	9322 190 43682	BPW34

11. Revision List

Manual xxxx xxx xxxx.0

- First release.

Manual xxxx xxx xxxx.1

- Corrected several errors in the text, drawings and spare parts list.

Manual xxxx xxx xxxx.2

- Corrected several errors in the text, drawings and spare parts list.