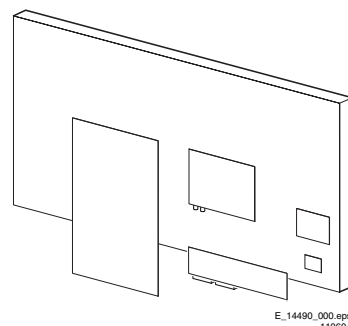


Service Service Service



E_14490_000.eps
110604

Service Manual

Contents

	Page
1. Technical Specifications, Connections, and Chassis Overview	2
2. Safety and Maintenance Instructions, Warnings, and Notes	5
3. Directions for Use	7
4. Mechanical Instructions	8
5. Service Modes, Error Codes, and Faultfinding	11
6. <i>Block Diagrams, Testpoint Overviews, and Waveforms</i>	
Wiring Diagram	19
Block Diagram Tuner and IF Video	20
Block Diagram Scaler	21
Testpoint Overview Tv & Scaler Board	22-23
I2C Overview	24
Supply Voltage Overview	25
7. <i>Circuit Diagrams and PWB Layouts</i>	<i>Diagram PWB</i>
Tuner + VIF (Diagram A1)	26 38-47
Hercules (Diagram A2)	27 38-47
Histogram (Diagram A3)	28 38-47
Audio Amplifier (Diagram A5)	29 38-47
TV-Supply (Diagram A6)	30 38-47
Scaler (Diagram A7)	31 38-47
Scaler Interface (Diagram A9)	32 38-47
SDRAM (Diagram A10)	33 38-47
Flash / Control (Diagram A11)	34 38-47
HDMI (Diagram A12)	35 38-47
PCHD-MUX (Diagram A13)	36 38-47
Supply (Diagram A14)	37 38-47
Side IO and LKB Panel (Diagram D)	48 49
Rear IO Panel: Scart (17") (Diagram H1)	50 52
Rear IO Panel: PCHD-IO (17") (Diagram H2)	51 52
Rear IO Panel: Scart (23/26") (Diagram H1)	53 55
Rear IO Panel: PCHD-IO (23/26") (Diagram H2)	54 55
Front IR / LED Panel (Diagram J)	56 56

Contents

	Page
Pixel Plus Panel: EPLD Control (Diagram PP1)	57 61
Pixel Plus Panel: LVDS In (Diagram PP2)	58 61
Pixel Plus Panel: EPLD I/O (Diagram PP3)	59 61
Pixel Plus Panel: Power Supply (Diagram PP4)	60 61
8. Alignments	63
9. Circuit Descriptions	66
Abbreviation List	72
IC Data Sheets	74
10. Spare Parts List	77
11. Revision List	82

©Copyright 2004 Philips Consumer Electronics B.V. Eindhoven, The Netherlands.
All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise without the prior permission of Philips.



1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

1. Technical Specifications
2. Connections
3. Chassis Overview

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

1.1 Technical Specifications

1.1.1 Vision

Display type	: LCD, S-IPS
	: 16:9
Screen size	: 17 inch (44 cm)
	: 23 inch (59 cm)
	: 26 inch (66 cm)
Resolution (HxV)	: 1280(*3)x768 pixels
	: WXGA
Contrast ratio	: 400:1
Light output	: 450 cd/m ²
Viewing angle (HxV)	: 176x176 deg.
Tuning system	: PLL
Colour systems	: PAL B/G, D/K, I
	: SECAM B/G, D/K, L, L1
Video playback	: NTSC 4.43
	: NTSC 3.58
	: NTSC Play Back
	: PAL 60
	: PAL B/G Play Back
	: SECAM Play Back
Channel selections	: 100 presets
	: UVSH
Aerial input	: 75 ohm, IEC-type
Antenna	: 75 ohm, FM
Dimensions (WxHxD) in mm	: 17 inch: 578x375x240
	: 23 inch: 690x433x240
	: 26 inch: 788x504x270

1.1.2 Sound

Sound systems	: FM/FM (5.5-5.74)
	: BI NICAM BG - 2CS BG
	: NICAM B/G (5.5-5.85)
	: NICAM D/K (6.5-5.85) (Hung)
	: NICAM I (6.0-6.52)
	: NICAM L (6.5(AM)-5.85)
Maximum power	: 17 inch: 2 x 3 W _{rms}
	: 23 inch: 2 x 5 W _{rms}
	: 26 inch: 2 x 5 W _{rms}

1.1.3 Miscellaneous

Power supply:	
Mains voltage	: 95 - 240 V _{ac}
Mains frequency	: 50 / 60 Hz
Ambient conditions:	
- Temperature range	: +5 to +40 deg. C
- Maximum humidity	: 90 % R.H.
Power consumption	
- Normal operation	: 17 inch: 55 W
	: 23 inch: 96 W
	: 26 inch: 110 W

- Standby : < 3 W

1.2 Connections

1.2.1 Rear Connections

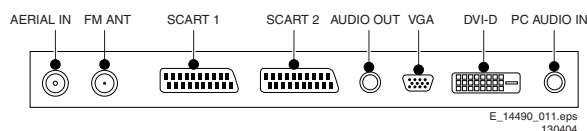


Figure 1-1 Rear connections

Aerial - In
- IEC-type Coax, 75 ohm

FM Ant
- IEC-type Coax, 75 ohm

External 1: RGB/YUV - In and CVBS - In/Out

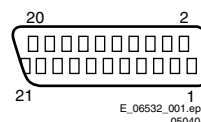
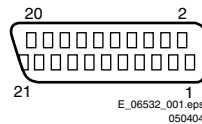


Figure 1-2 SCART connector

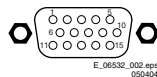
1	- Audio - R	0.5 V _{rms} / 1 kohm	⊕
2	- Audio - R	0.5 V _{rms} / 10 kohm	⊕
3	- Audio - L	0.5 V _{rms} / 1 kohm	⊕
4	- Audio - gnd	Ground	⊥
5	- Blue - gnd	Ground	⊥
6	- Audio - L	0.5 V _{rms} / 10 kohm	⊕
7	- Blue/U - in	0.7 V _{pp} / 75 ohm	⊕
8	- CVBS - status 0 - 2 V: INT		
		4.5 - 7 V: EXT 16:9	
		9.5 - 12 V: EXT 4:3	
9	- Green - gnd	Ground	⊥
10	- n.c.		
11	- Green/Y - in	0.7 V _{pp} / 75 ohm	⊕
12	- n.c.		
13	- Red - gnd	Ground	⊥
14	- FBL - gnd	Ground	⊥
15	- Red/V - in	0.7 V _{pp} / 75 ohm	⊕
16	- Status/FBL	0 - 0.4 V: INT	
		1 - 3 V: EXT / 75 ohm	
17	- Video	Ground	⊥
18	- Video	Ground	⊥
19	- CVBS - out	1 V _{pp} / 75 ohm	⊕
20	- CVBS - in	1 V _{pp} / 75 ohm	⊕
21	- Shielding	Ground	⊥

External 2: RGB/YUV - In and CVBS - In/Out**Figure 1-3 SCART connector**

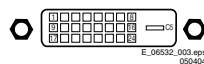
1	- Audio - R	0.5 V _{rms} / 1 kohm
2	- Audio - R	0.5 V _{rms} / 10 kohm
3	- Audio - L	0.5 V _{rms} / 1 kohm
4	- Audio - gnd	Ground
5	- Blue - gnd	Ground
6	- Audio - L	0.5 V _{rms} / 10 kohm
7	- n.c.	
8	- CVBS - status 0 - 2 V: INT	
		4.5 - 7 V: EXT 16:9
		9.5 - 12 V: EXT 4:3
9	- Green - gnd	Ground
10	- n.c.	
11	- n.c.	
12	- n.c.	
13	- Red - gnd	Ground
14	- FBL - gnd	Ground
15	- C - in	0.3 V _{pp} / 75 ohm
16	- n.c.	
17	- Video	Ground
18	- Video	Ground
19	- CVBS - out	1 V _{pp} / 75 ohm
20	- CVBS/Y - in	1 V _{pp} / 75 ohm
21	- Shielding	Ground

Audio - out

3	- Audio - R	0.5 V _{rms} / 1 kohm
2	- Audio - L	0.5 V _{rms} / 1 kohm

VGA**Figure 1-4 VGA Connector**

1	- Red	0.7 V _{pp} / 75 ohm
2	- Green	0.7 V _{pp} / 75 ohm
3	- Blue	0.7 V _{pp} / 75 ohm
4	-	Ground
5	-	Ground
6	-	Ground
7	-	Ground
8	-	Ground
9	- 5V_DC	+5 V _{dc}
10	-	Ground
11	-	Ground
12	- DDC_SDA	
13	- H-sync	0 - 5 V
14	- V-sync	0 - 5 V
15	- DDC_SCL	

DVI (for 23 and 26 inch models)**Figure 1-5 DVI connector**

1	- RX2-	
2	- RX2+	
3	- Ground	GND
4	-	n.c.
5	-	n.c.

6	- SCL_DVI	
7	- SDA_DVI	
8	-	n.c.
9	- RX1-	
10	- RX1+	
11	- Ground	GND
12	-	n.c.
13	-	n.c.
14	- +5V	
15	- Ground	GND
16	- + 5V Hot Plug	
17	- RX0-	
18	- RX0+	
19	- Ground	GND
20	-	n.c.
21	-	n.c.
22	- Ground	GND
23	- RXC+	
24	- RXC-	
C5	- Ground	GND

PC Audio - in

3	- Audio - R	0.5 V _{rms} / 1 kohm
2	- Audio - L	0.5 V _{rms} / 1 kohm

1.2.2 Side connections**Figure 1-6 Side connections****Hosiden: SVHS - In**

1	- Y	Ground
2	- C	Ground
3	- Y	1 V _{pp} / 75 ohm
4	- C	0.3 V _{pp} / 75 ohm

Mini Jack: Audio - in

2	- Audio - L	0.5 V _{rms} / 10 kohm
3	- Audio - R	0.5 V _{rms} / 10 kohm

Mini Jack: Headphone - Out

- Headphone 32 - 600 ohm / 10 mW



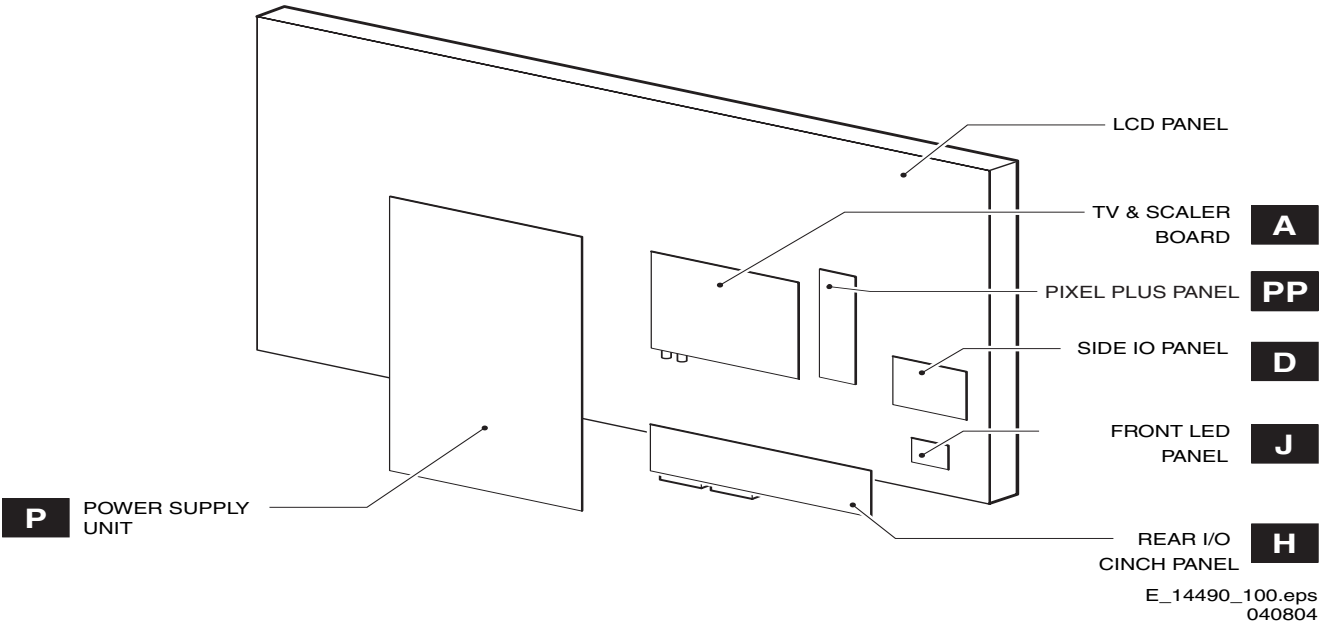


Figure 1-7 Chassis Overview

2. Safety Instructions, Warnings, and Notes

2.1 Safety Instructions

Safety regulations require that **during** a repair:

- Connect the set to the Mains 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 lead for external damage.
- Check the strain relief of the Mains cord for proper function.
- Check the electrical DC resistance between the Mains plug and the secondary side (only for sets which have a Mains isolated power supply):
 1. Unplug the Mains cord and connect a wire between the two pins of the Mains plug.
 2. Set the Mains switch to the "on" position (keep the Mains cord unplugged!).
 3. Measure the resistance value between the pins of the Mains plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 Mohm and 12 Mohm.
 4. Switch "off" the set, and remove the wire between the two pins of the Mains plug.
- Check the cabinet for defects, to avoid 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 standby (⏏). 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.
- Manufactured under license from Dolby Laboratories. "Dolby", "Pro Logic" and the "double-D symbol", are trademarks of Dolby Laboratories.

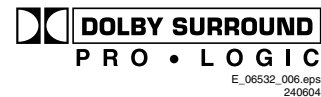


Figure 2-1 Dolby PL Symbol

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 ($\mu = \times 10^{-6}$), nano-farads ($n = \times 10^{-9}$), or pico-farads ($p = \times 10^{-12}$).
- 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 Electrical Replacement 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, it is essential when removing an (LF)BGA, 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 chance 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 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. To reflow the solder, apply a temperature profile according to the *IC data sheet*. 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: <http://www.atyourservice.ce.philips.com> (needs subscription). 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

Some PWBs in this chassis are "lead-free **prepared**". This is indicated on the PWB by the PHILIPS lead-free logo (either by a service-printing or by a sticker). It does not mean that lead-free solder is actually used!

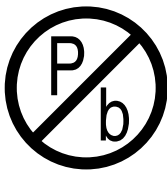


Figure 2-2 Lead-free logo

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 - 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 website:

<http://www.philips.com/support>

4. Mechanical Instructions

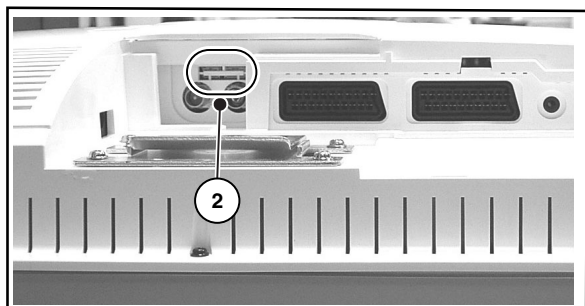
Index of this chapter:

1. Service Position
2. Rear Cover Removal
3. Power Supply Unit Removal
4. TV & Scaler Board Removal
5. I/O Panel Removal
6. Side I/O & Keyboard Panel and Front LED Panel Removal
7. Pixel Plus Panel Removal
8. Exchanging the LCD Panel
9. Re-assembly

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

Note: To diagnose the set with ComPair it is **not** needed to open the set entirely.

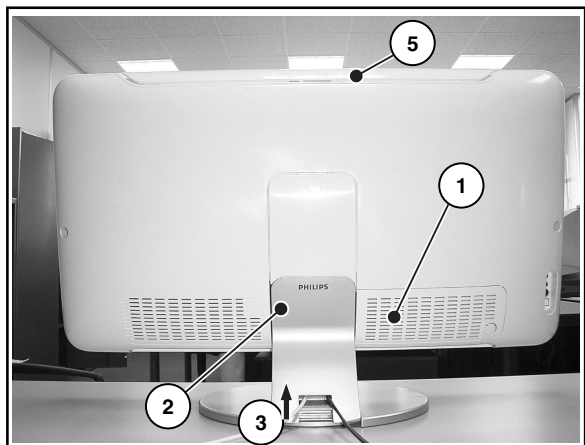
1. *Manually unlock and remove the cover cap (1). See figure "TV set rear view".*
2. Break away the protective plate (2) at the I/O panel bracket to get access to the needed plugs. See figure "Protective plate".



E_14490_001.eps
130404

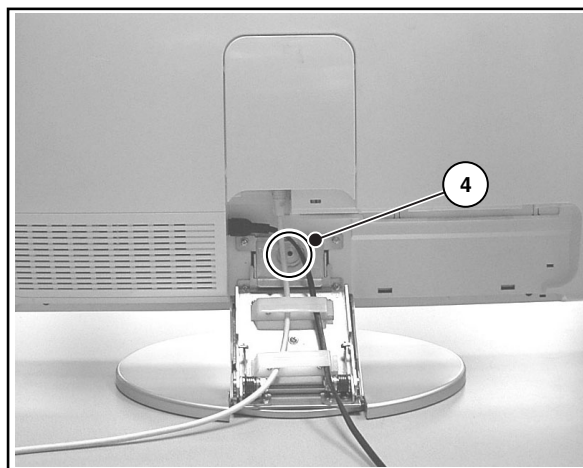
Figure 4-1 Protective plate

4.1 Service Position



E_14490_002.eps
130404

Figure 4-2 TV set rear view

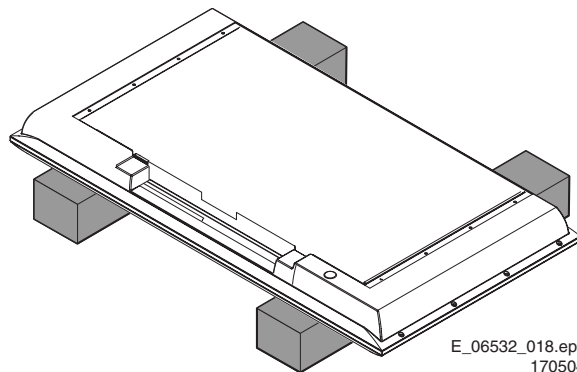


E_14490_003.eps
130404

Figure 4-3 TV stand removal

1. Carefully pull upwards the cover plate (2) (from it's left side) to unlock it (3) and remove the plate from the stand.
2. Unplug the AC power and the antenna cables.
3. Be sure to remove the coin slotted mounting screw (4) from the stand.
4. Carefully lift the TV from the swivel base (it uses a vertical sliding mechanism).
5. Place the TV upside down on a tabletop (use a protection sheet or foam bars). Take care, that this is flat and free from obstacles like screws, to prevent damaging the fragile LCD screen.

4.1.1 Foam Bars

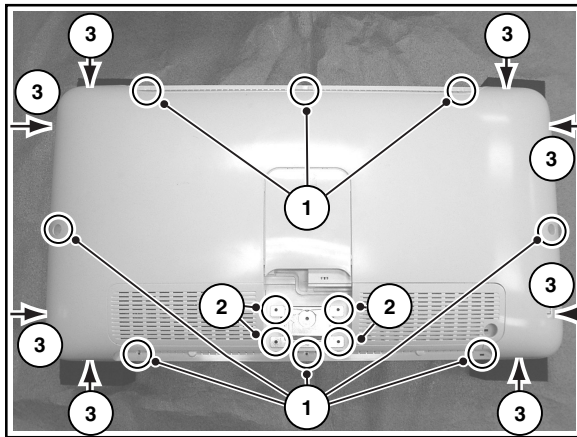


E_06532_018.eps
170504

Figure 4-4 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 placing a mirror under the TV, you can easily monitor the screen.

4.2 Rear Cover Removal



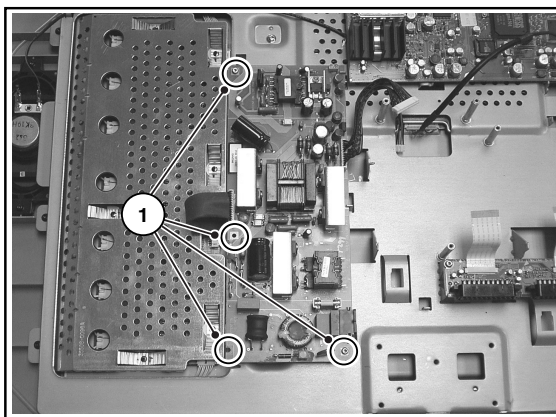
E_14490_004.eps
130404

Figure 4-5 Rear cover removal

1. Manually unlock and remove the top cover cap (5). See Figure: "TV set rear view".
2. Make sure all power-, audio-, video- and coax- cables are unplugged.
3. Remove all Torx screws (1) around the edges of the rear cover.
4. Remove the four silver coloured Torx screws (2) around the stand holder. See figure "Rear cover removal".
5. Carefully use a flat screwdriver to release the clamps (3). See figure "Rear cover removal".
6. Remove the rear cover and store it in a safe place.

Note: avoid holding the button-area during removal (it can be easily damaged).

4.3 Power Supply Unit Removal

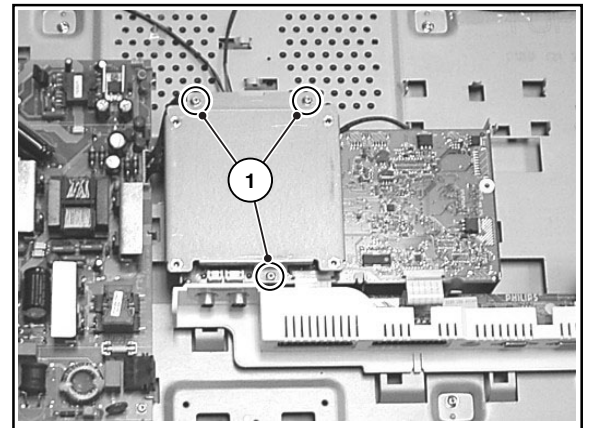


E_14520_005.eps
100204

Figure 4-6 Power supply unit

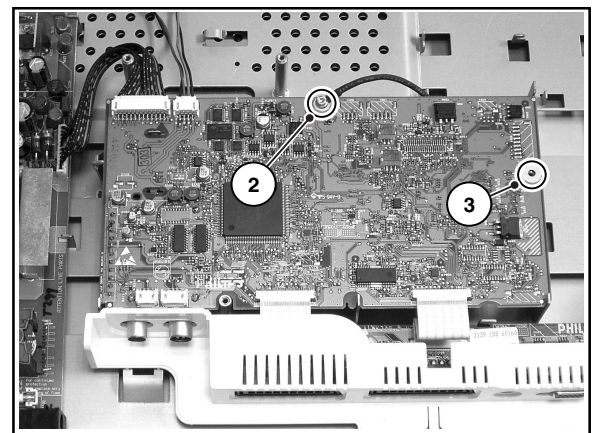
1. Disconnect all cables from the Power supply unit.
2. Remove all mounting screws (1) from the Power supply unit.
3. Take out the Power supply unit.

4.4 TV & Scaler Board Removal



E_14490_006.eps
130404

Figure 4-7 : TV & Scaler board shield removal

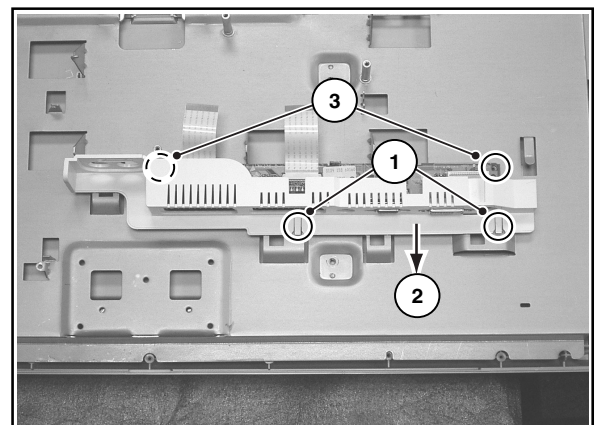


E_14490_007.eps
130404

Figure 4-8 : TV & Scaler board removal

1. Disconnect all cables from the TV & Scaler board.
2. Remove all shield mounting screws (1) and remove the shield.
3. Remove the screw from the grounding cable (2).
4. Remove the mounting screw (3) and remove the board.

4.5 I/O Panel Removal

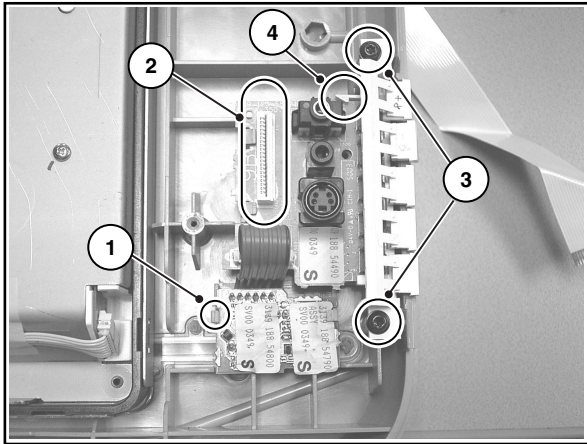


E_14490_008.eps
130404

Figure 4-9 I/O panel removal

1. Release the two clamps (1) at the I/O panel bracket. Carefully pull the bracket in the direction (2), as shown at the figure "I/O panel removal", and remove it.
2. Disconnect all cables from the I/O panel.
3. Remove all mounting screws from the I/O panel (3).
4. Take out the I/O panel.

4.6 Side I/O & Keyboard Panel and Front LED Panel Removal

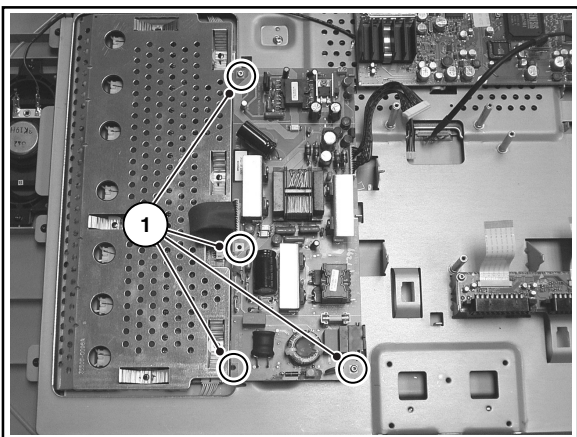


E_14490_009.eps
130404

Figure 4-10 Side I/O & Keyboard panel and Front LED panel removal

1. Release the clamp (1) and take out the Front LED panel.
2. Disconnect the cable (2) from the Side I/O & Keyboard panel.
3. Remove all mounting screws (3) from the Side I/O & Keyboard panel bracket.
4. Unlock this unit by shifting it to the outside direction of the monitor.
5. Release the clamp (4) and take out the Side I/O & Keyboard panel from the bracket.

4.7 Pixel Plus Panel Removal

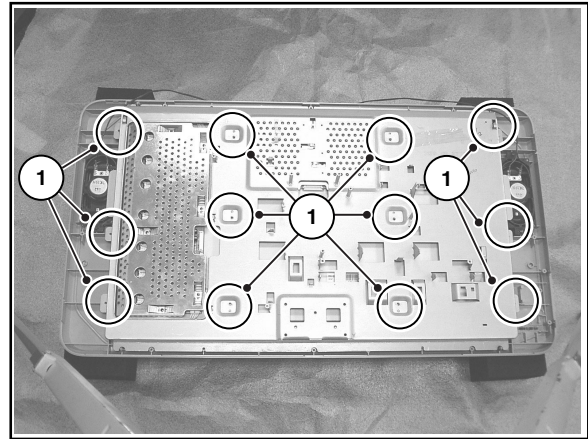


E_14520_005.eps
100204

Figure 4-11 Pixel Plus panel removal

1. Disconnect all cables from the Pixel Plus panel.
2. Remove all mounting screws from the Pixel Plus panel.
3. Take out the Pixel Plus panel.

4.8 Exchanging the LCD Panel



E_14490_010.eps
130404

Figure 4-12 Exchanging the LCD panel

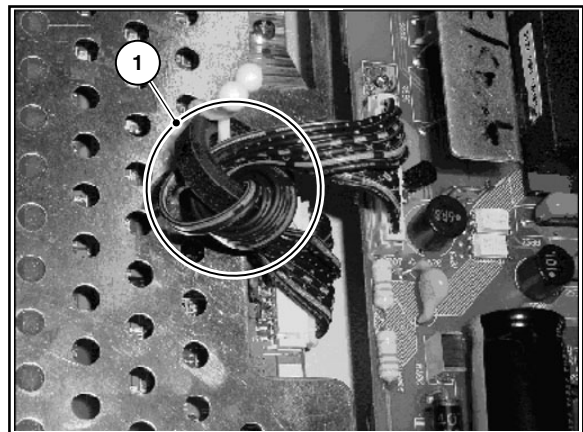
1. Disconnect all cables from the LCD Panel.
2. Remove all mounting screws (1) from the metal cover.
3. Lift and take off the metal cover.
4. Now you can exchange the LCD panel.

4.9 Re-Assembly

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

Notes:

- Do **not** forget to replace the ground cable of the TV & Scaler board, while mounting the screw at the board topside. See figure "TV & Scaler board removal".
- Make sure the ferrite ring (1) is properly tightened to the clip (this is valid only for 26 inch sets).



E_14490_055.eps
070504

Figure 4-13 Ferrite ring

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

1. Test Points
2. Service Modes
3. Problems and Solving Tips (related to CSM)
4. ComPair
5. Error Codes
6. The Blinking LED Procedure
7. Fault Finding and Repair Tips
8. Power Supply

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. These test points are specifically mentioned in the service manual as "half moons" with a dot in the centre.

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 abilities 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.

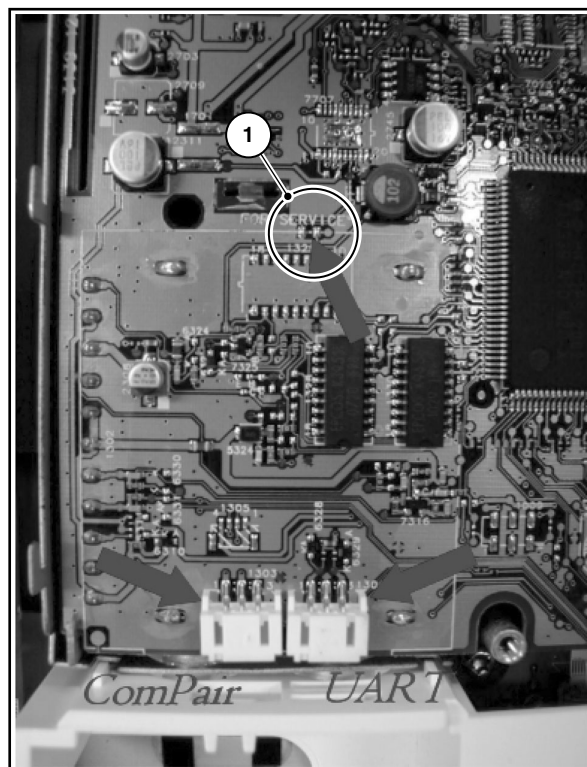
Specifications

- 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.



E_14490_056.eps
070504

Figure 5-1 E 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 Alignment Mode.

```
00022 LC42EP1 0.08/S42GV1 0.90 SDM
ERR 0 0 0 0 0
OP 000 057 140 032 120 128 000
```

E_14490_051.eps
220404

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 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.

```
00022 LC42EP1 0.08/S42GV1 0.90 SAM
ERR 0 0 0 0 0

OP 000 057 140 032 120 128 000

. Clear                      Clear ? ►
. Options                    ►
. Tuner                      ►
. White Tone                 ►
. Audio                      ►
. NVM Editor                 ►
. SC NVM Editor              ►
. ComPair Mode               ► On
```

E_14490_052eps
220404

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. **AAAABCD-X.Y/ EEEEE F.GG**. This is the software identification of the main microprocessor followed by the software identification for the scaler IC:
 - **A**= the project name (LC42).
 - **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).
 - **EEEEEE**= the scaler sw cluster
 - **F**= the main sw version no.
 - **GG**= the sub-version no.
3. **SAM**. Indication of the Service Alignment Mode.
4. **Error Buffer**. Shows all errors detected since the last time the buffer was erased. Five errors possible.
5. **Option Bytes**. Used to set the option bytes. See "Options" in the Alignments section for a detailed description. Seven codes are possible.
6. **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.
7. **Options**. Used to set the option bits. See "Options" in the Alignments section for a detailed description.
8. **Tuner**. Used to align the tuner. See "Tuner" in the Alignments section for a detailed description.
9. **White Tone**. Used to align the white tone. See "White Tone" in the Alignments section for a detailed description.
10. **Audio**. No audio alignment is necessary for this television set.

11. **NVM Editor.** Can be used to change the NVM data in the television set. See table "NVM data" further on.
12. **SC NVM Editor.** Can be used to edit Scaler NVM.
13. **ComPair.** 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:

```

1 00022 LC42EP1 0.08/S42GV1 0.90 CSM
2 CODES 0 0 0 0 0
3 OP 000 057 140 032 120 128 000
4
5
6 NOT TUNED
7 PAL
8 STEREO
9 CO 50 CL 50 BR 50
0 AVL Off
  
```

E_14490_053.eps
230404

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 COLOUR.

6. Press the MENU RIGHT key to increase the COLOUR 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 I2C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I2C 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 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 faultfinding program and an interface box between PC and the (defective) product. The ComPair interface box is connected to the PC via a serial or RS232 cable.

In this chassis, the ComPair interface box and the TV communicate via a bi-directional service cable via the service connector.

The ComPair faultfinding 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 I2C level. ComPair can access the I2C bus of the television. ComPair can send and receive I2C 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 I2C busses 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 extent. When this is not the case, ComPair will guide you through the faultfinding 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 waveform 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 faultfinding 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.

Beside fault finding, ComPair provides some **additional features** like:

- Up- or downloading of pre-sets.
- Managing of pre-set lists.
- If both ComPair and SearchMan (Electronic Service Manual) are installed, all the schematics and the PWBs of the set are available by clicking on the appropriate hyperlink. **Example:** *Measure the DC-voltage on capacitor C2568 (Schematic/Panel) at the Mono-carrier.*
 - Click on the 'Panel' hyperlink to automatically show the PWB with a highlighted capacitor C2568.
 - Click on the 'Schematic' hyperlink to automatically show the position of the highlighted capacitor.

5.4.3 How To Connect

1. First, install the ComPair Browser software (see the Quick Reference Card for installation instructions).
2. Connect the RS232 interface cable between a free serial (COM) port of your PC and the PC connector (marked with 'PC') of the ComPair interface.
3. Connect the mains adapter to the supply connector (marked with 'POWER 9V DC') of the ComPair interface.
4. Switch the ComPair interface "off".
5. Switch the television set "off" with the mains switch.
6. Connect the ComPair interface cable with the connector on the rear side of the ComPair interface (marked with 'I2C') and the additional ComPair interface cable. Connect the other side of the additional ComPair interface cable with the ComPair (or *Service*) connector at the rear side of the TV.
7. Plug the mains adapter in a mains outlet, and switch the interface "on". The green and red LEDs light up together. The red LED extinguishes after approx. 1 second while the green LED remains lit.
8. Start the ComPair program and read the 'Introduction' chapter.

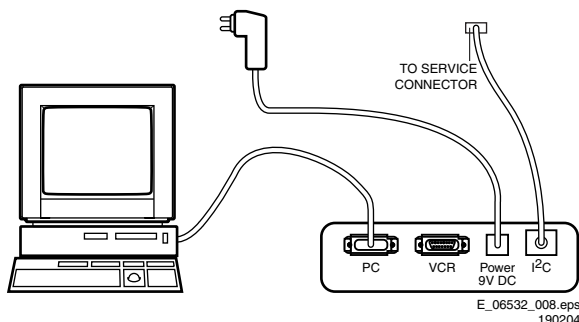


Figure 5-5 ComPair Interface connection

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 (excluding 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).
- SearchMan32 CD (update): 3122 785 60080 (year 2002), 3122 785 60120 (year 2003), 3122 785 60130 (year 2004).
- ComPair interface cable: 3122 785 90004.
- ComPair firmware upgrade IC: 3122 785 90510.
- Transformer (non-UK): 4822 727 21632.
- Transformer UK: 4822 727 21633.
- Additional ComPair interface cable: 3139 131 0379.

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	-	-	-
2	Not applicable	-	-	-
3	Not applicable	-	-	-
4	GM1501	I2C error while communicating with the Genesis Scaler and/or Flash-ROM is faulty/empty	7401 7530	A7A11
5	Not applicable	+5v protection	7930	A6
6	I2C bus	General I2C error	7011, 3088, 3096	A2
7	Not applicable	-	-	-
8	M24C32	I2C error while communicating with the Scaler EEPROM	7531	A11
9	M24C16	I2C error while communicating with the EEPROM	7099	A2
10	Tuner	I2C error while communicating with the PLL tuner	1302, 3302, 3303, 3327	A1
11	Not applicable	-	-	-
12	Not applicable	-	-	-
13	Not applicable	-	-	-
14	K4D263238M	Read-write error with the Scaler SDRAM	7501	A10
15	TDA9178T/N1	I2C error while communicating with Histogram	7560	A3
16	EPIC12F	I2C error while communicating with EPLD on Pixel Plus panel	7101	PP1

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 starts 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 at 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.

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. 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 via the mains switch
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 mains switch
5. When the set has started up the P+/Ch+ button can be released and the short circuit of the SDM jumpers can be removed.
6. The red LED will be on continuously to indicate that the download is initiated (normally when SDM is activated the red LED will start with the Blinking LED sequence).
7. Wait +/- 30 Seconds (time needed to download default values to the NVM)

Result: The set is in SDM, the NVM is loaded with default values and the blinking LED is not activated (The blinking LED is not activated in this case to show that the download has been performed), the LED will be on.

5.7.3 Tuner and IF

No Picture in RF mode

1. Check whether picture is present in AV. If not, go to Video processing troubleshooting section.
2. If present, check that the Option settings are correct.
3. Check that all supply voltages are present.
4. Check if I2C lines are working correctly (3.3V).
5. Manually store a known channel and check if there is IF output at Tuner pin 11.
6. Feed in 105 dBuV at Tuner pin 11 and check whether there is RGB output from Video Processing IC. If yes, Tuner may be defected. Change 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

1. Check whether the Service jumper (#4022, 08 05 size) is present. If yes, remove it.
2. Check whether SEL_IF pin is according to what is specified.

5.7.4 Video Processing

No power

1. Check +12 V and 3V3 at position 1910.
2. If no supply, check the connector 1910.
3. If it is correct, check the power supply board.

Power supply is correct but no green light

1. Check the two connectors 1005 and 1601, if they are properly inserted.
2. If they are inserted correctly, check if the 3V3 is present.

No picture display

1. Check the RGB signal.
2. If it is present, check 3-IC7016 (NE555).
3. If it has output, the problem is in SCALER part.
4. Otherwise, check H-out on pin 2 of NE555. If the input signal of pin2 is present, but no output, the IC is failed.

Note:

- If the H-out (pin 67) doesn't have signal or the level is low, check the output of NE555 (pin 3) during start up.
- If the H-out (pin 67) has a signal (or has a signal for a very short time), change IC7016 (NE555).

No TV but PC is present

1. Check if HSYNC and VSYNC are present at PIN 3 of 7071 and 7015.
2. If they are present, check RGB output.
3. If there is no RGB output, the IC TDA120xx can be failed.

Comb Filter not working

1. Check the option bit 5 in SAM.
2. Check NVM setting. Address 1229 is 0000.

5.7.5 Power Supply

Check fuses

This power supply contains three fuses. One is near the mains inlet (marked on the board as 1102) and two other are near the output connectors (marked 1610 and 1660).

1. Check with power supply in off state by means of ohmic measurement.
2. Fuse 1102 may open in case of severe lightning strikes and/or failures in the power supply. Despite the fact, that this fuse is mounted in a fuse holder and the marking text on the board, it is not meant to be field replaceable.
3. Fuses 1610 and 1660 may open in case a severe overload of the 12 V outputs. Replacement of the power supply is needed, but not before the cause of the overload conditions is resolved.

Standby mode

1. Apply a 12 ohm load resistor of sufficient power rating to all outputs (+3 V3, +12 VAL, +12 VL and +24 V). Connect the STBY pin to GND.
2. Over an input voltage range of 90 V_{ac} to 264 V_{ac} only the +3 V3 output shall be up and within regulation ($\pm 5\%$). The voltage on the POWER DOWN pin shall be < 0.3 V at an input voltage below 160 V_{ac}, and 3.3 V $\pm 10\%$ at an input voltage higher than 240 V_{ac}.

Normal mode:

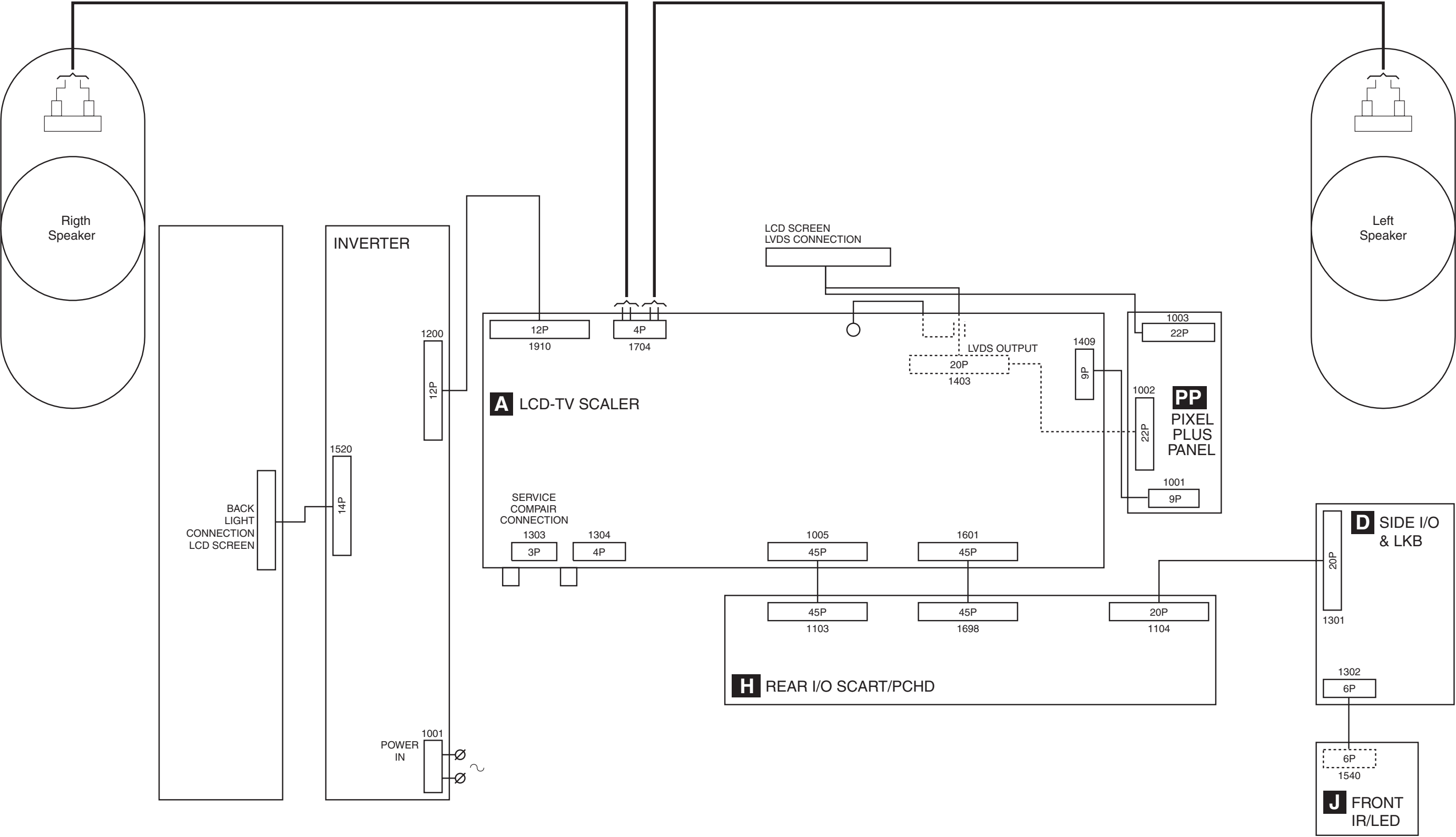
1. Apply a 12 ohm load resistor of sufficient power rating to all outputs (+3 V3, +12 VAL, +12 VL and +24 V). Connect the STBY pin to the +3 V3 output.
2. Over an input voltage range of 90 V_{ac} to 264 V_{ac} all outputs shall be up and within regulation ($\pm 5\%$). The voltage on the POWER DOWN pin shall be 3.3 V $\pm 10\%$ over the entire input voltage range. Additionally, the voltage on the big capacitor mounted flat on the PCB shall be 400 V $\pm 10\%$.

Personal Notes:

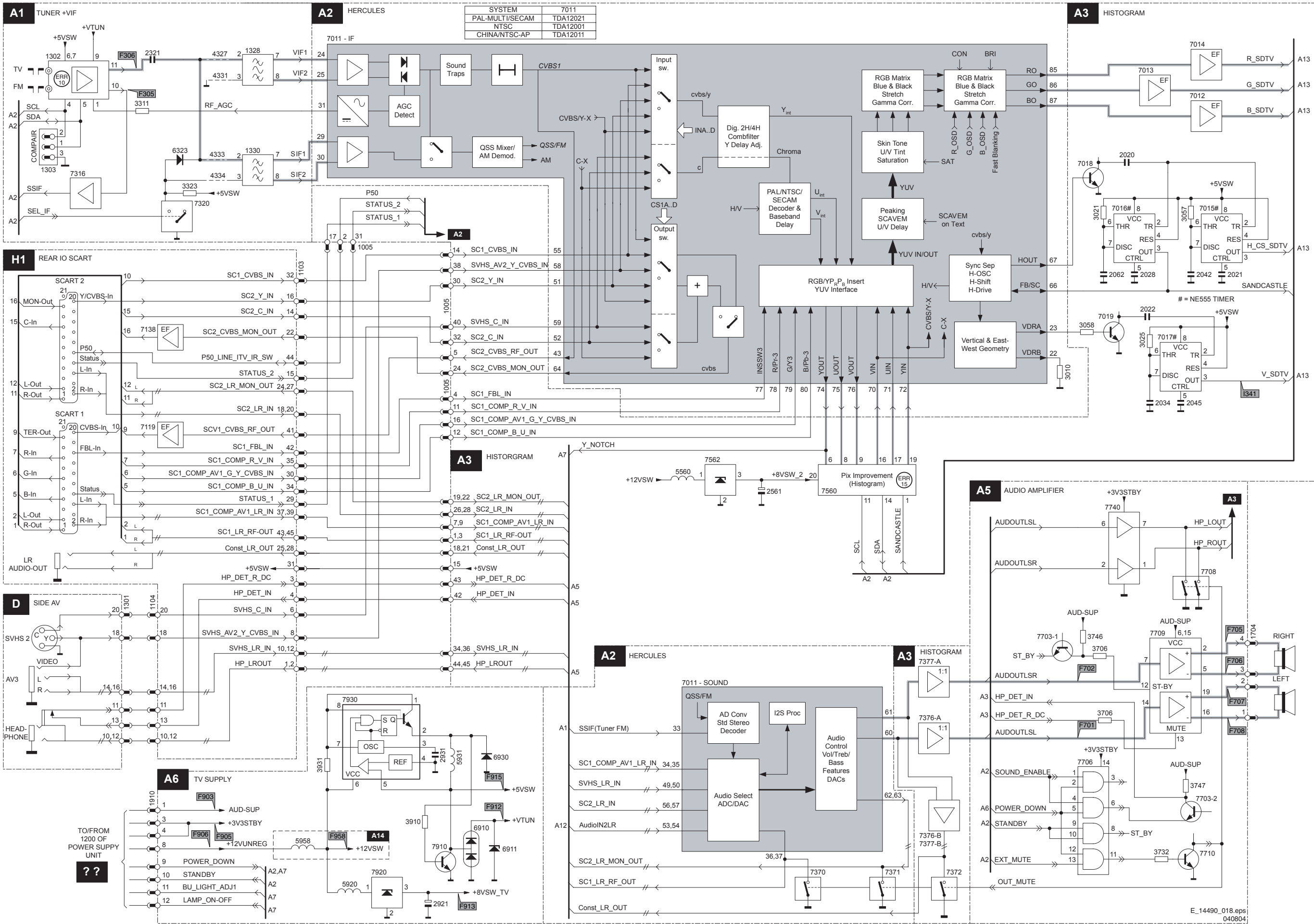
6. Block Diagrams, Testpoint Overviews, and Waveforms

Wiring Diagram

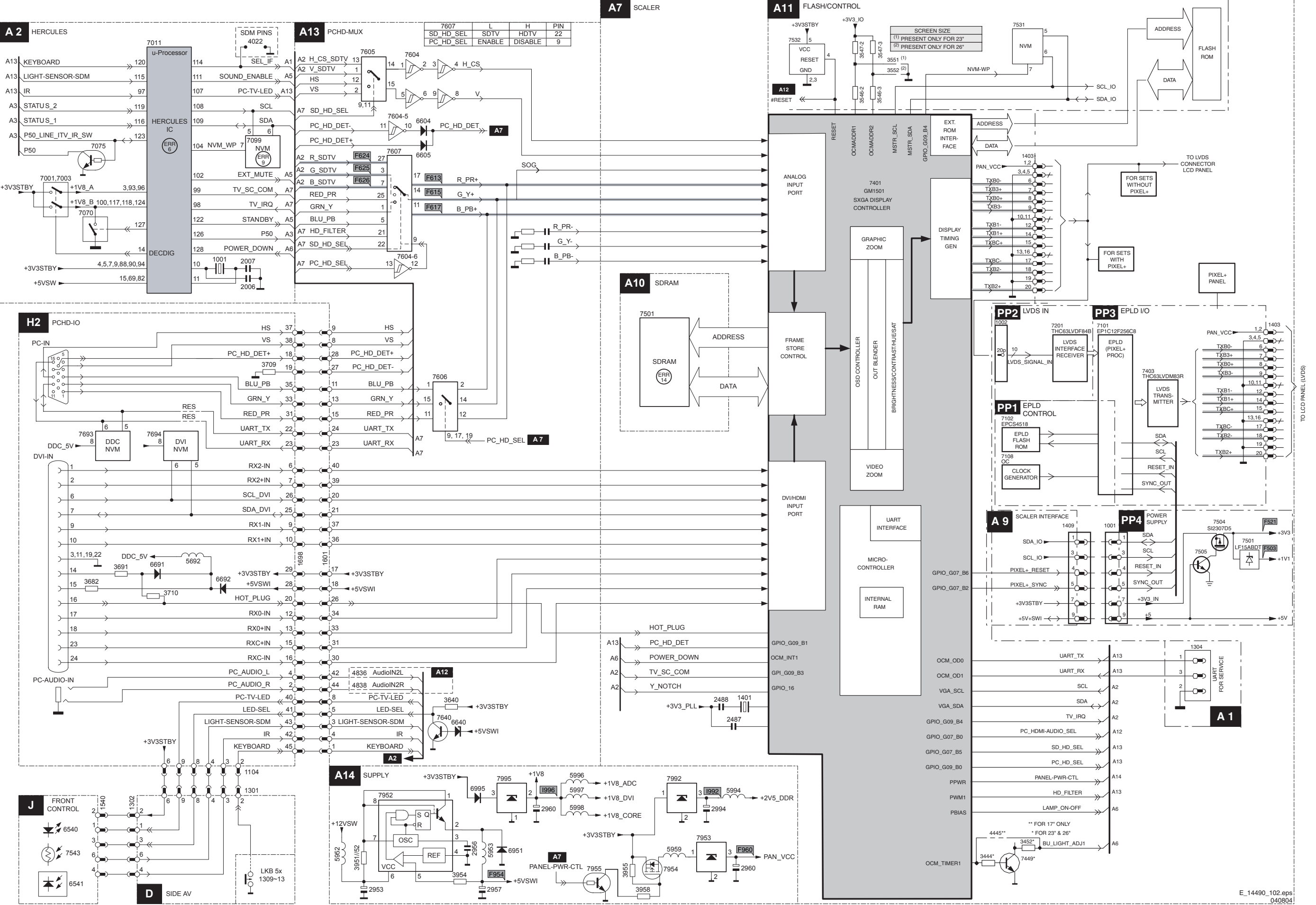
Wiring Diagram 26" LVDS Connection



Block Diagram Tuner and IF Video

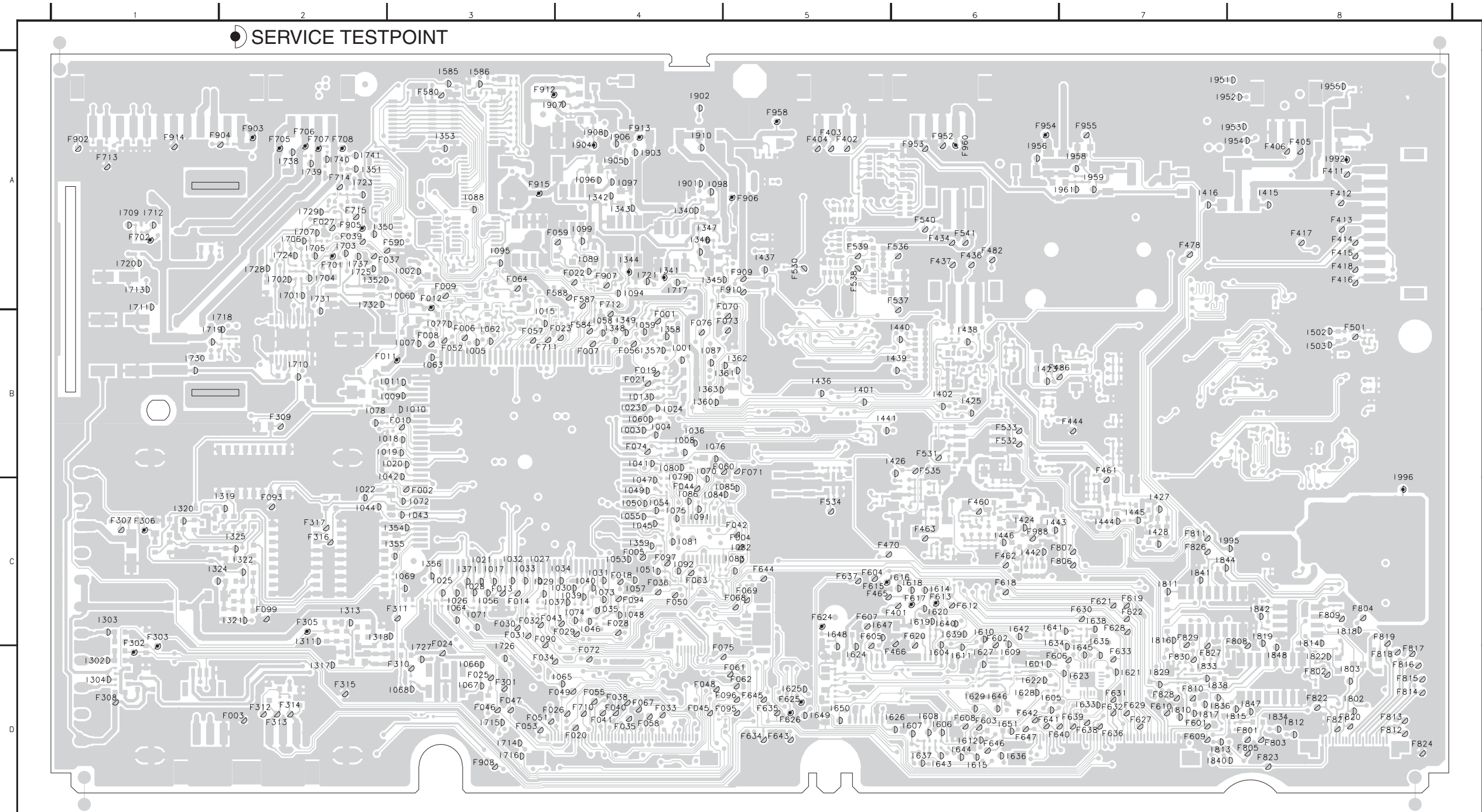


Block Diagram Scaler



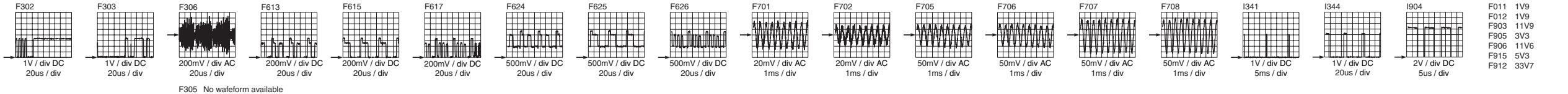
Testpoint Overview TV & Scaler Board (Bottom Side)

F001 B4	F018 C4	F032 C3	F046 D3	F061 D5	F090 C3	F309 B2	F406 A8	F461 C7	F534 C5	F602 C6	F619 C7	F634 D5	F701 A2	F803 D8	F817 D8	F903 A2	F954 A6	I010 B3	I027 C3	I042 B3	I057 C4	I072 C3	I086 C4	I304 D1	I343 A4	I357 B4	I425 B6	I728 A2
F002 C3	F019 B4	F033 D4	F047 D3	F062 D5	F093 C2	F310 D3	F411 A8	F462 C6	F535 B6	F603 D6	F620 C6	F635 D5	F702 A1	F804 C8	F818 D8	F904 A2	F955 A7	I011 B3	I028 C3	I043 C4	I058 B4	I073 C4	I087 B4	I311 C2	I344 A4	I358 B4	I426 B6	I729 A2
F003 D2	F020 D4	F034 D3	F048 D4	F063 C4	F094 C4	F311 C3	F412 A8	F463 C6	F536 A6	F604 C5	F621 C7	F636 D7	F705 A2	F805 D8	F819 C8	F905 A2	F958 A5	I013 B4	I029 C3	I044 C2	I059 B4	I074 C4	I088 A3	I313 C2	I345 A5	I359 C4	I427 C7	I730 B1
F004 C5	F021 B4	F035 D4	F049 D4	F064 A3	F095 D5	F312 D2	F413 A8	F465 C5	F537 A6	F605 C5	F622 C7	F637 C5	F706 A2	F806 C7	F820 D8	F906 A5	F960 A6	I015 B3	I030 C4	I045 C4	I060 B4	I075 C4	I089 A4	I317 D2	I346 A4	I360 B4	I428 C7	I731 B2
F005 C4	F022 A4	F036 C4	F050 C4	F067 D4	F096 D5	F313 D2	F414 A8	F466 C6	F538 A5	F606 D7	F624 C5	F638 D7	F707 A2	F807 C7	F821 D8	F907 A4	F988 C6	I017 C3	I031 C4	I046 C4	I062 B3	I076 B4	I091 C4	I318 C3	I347 A4	I361 B5	I436 B5	I732 A2
F006 B3	F023 B4	F037 A2	F051 D3	F068 C5	F097 C4	F314 D2	F415 A8	F470 C5	F539 A5	F607 C5	F625 D5	F639 D7	F708 A2	F808 C8	F822 D8	F908 D3	I001 B4	I018 B3	I032 C3	I047 C4	I063 B3	I077 B3	I092 C4	I319 C2	I348 B4	I362 B5	I437 A5	I737 A2
F007 B4	F024 D3	F038 D4	F052 B3	F069 C5	F099 C2	F315 D2	F416 A8	F478 A7	F540 A6	F608 D6	F626 D5	F640 D6	F710 D4	F809 C8	F823 D8	F909 A5	I002 A3	I019 B3	I033 C3	I048 C4	I064 C3	I078 B2	I094 A4	I320 C1	I349 B4	I363 B4	I438 B6	I738 A2
F008 B3	F025 D3	F039 A2	F053 D3	F070 B5	F301 D3	F316 C2	F417 A8	F482 A6	F541 A6	F609 D7	F627 D7	F641 D6	F711 B3	F810 D7	F824 D8	F910 A5	I003 B4	I020 B3	I034 C4	I049 C4	I065 D4	I079 B4	I095 A3	I321 C2	I350 A2	I371 C3	I439 B6	I739 A2
F009 A3	F026 D4	F040 D4	F055 D4	F071 B5	F302 D1	F317 C2	F418 A8	F486 B6	F580 A3	F610 D7	F628 C7	F642 D6	F712 B4	F811 C7	F826 C7	F912 A3	I004 B4	I021 C3	I035 C4	I050 C4	I066 D3	I080 B4	I096 A4	I322 C2	I351 A2	I401 B5	I440 B6	I740 A2
F010 B3	F027 A2	F041 D4	F056 B4	F072 D4	F303 D1	F401 C6	F434 A6	F501 B8	F584 B4	F612 C6	F629 D7	F643 D5	F713 A1	F812 D8	F827 C7	F913 A4	I005 B3	I022 C2	I036 B4	I051 C4	I067 D3	I081 C4	I097 A4	I324 C1	I352 A2	I402 B6	I441 B5	I741 A2
F011 B3	F028 C4	F042 C5	F057 B3	F073 B5	F305 C2	F402 A5	F436 A6	F530 A5	F587 A4	F613 C6	F630 C7	F644 C5	F714 A2	F813 D8	F828 D7	F914 A1	I006 A3	I023 B4	I037 C4	I053 C4	I068 D3	I082 C5	I098 A4	I325 C2	I353 A3	I415 A8	I442 C6	I802 D8
F012 A3	F029 C4	F043 C4	F058 D4	F074 B4	F306 C1	F403 A5	F437 A6	F531 B6	F588 A4	F615 C5	F631 D7	F645 D5	F715 A2	F814 D8	F829 C7	F915 A3	I007 B3	I024 B4	I039 C4	I054 C4	I069 C3	I083 C5	I099 A4	I340 A4	I354 C3	I416 A7	I443 C6	I803 D8
F013 C3	F030 C3	F044 C4	F059 A4	F075 D4	F307 C1	F404 A5	F444 B7	F532 B6	F590 A2	F617 C6	F632 D7	F646 D6	F801 D8	F815 D8	F830 D7	F952 A6	I008 B4	I025 C3	I040 C4	I055 C4	I070 C4	I084 C5	I302 D1	I341 A4	I355 C3	I423 B6	I444 C7	I810 D7
F014 C3	F031 C3	F045 D4	F060 B5	F076 B4	F308 D1	F405 A8	F460 C6	F533 B6	F601 D7	F618 C6	F633 D7	F647 D6	F802 D8	F816 D8	F902 A1	F953 A6	I009 B3	I026 C3	I041 B4	I056 C3	I071 C3	I085 C5	I303 C1	I342 A4	I356 C3	I424 C6	I445 C7	I811 C7



3139 123 5804.2

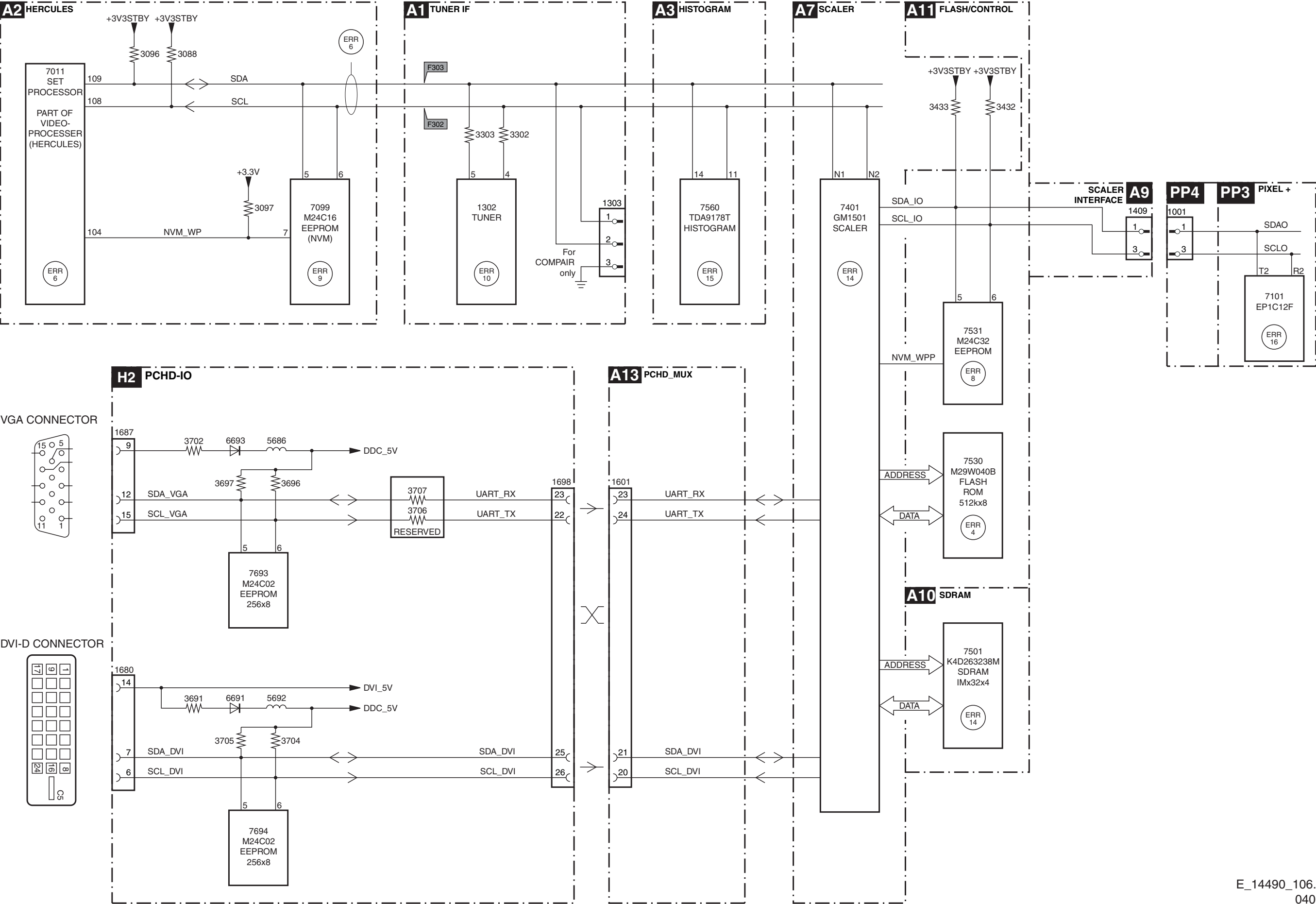
E_14490_021.eps
030604



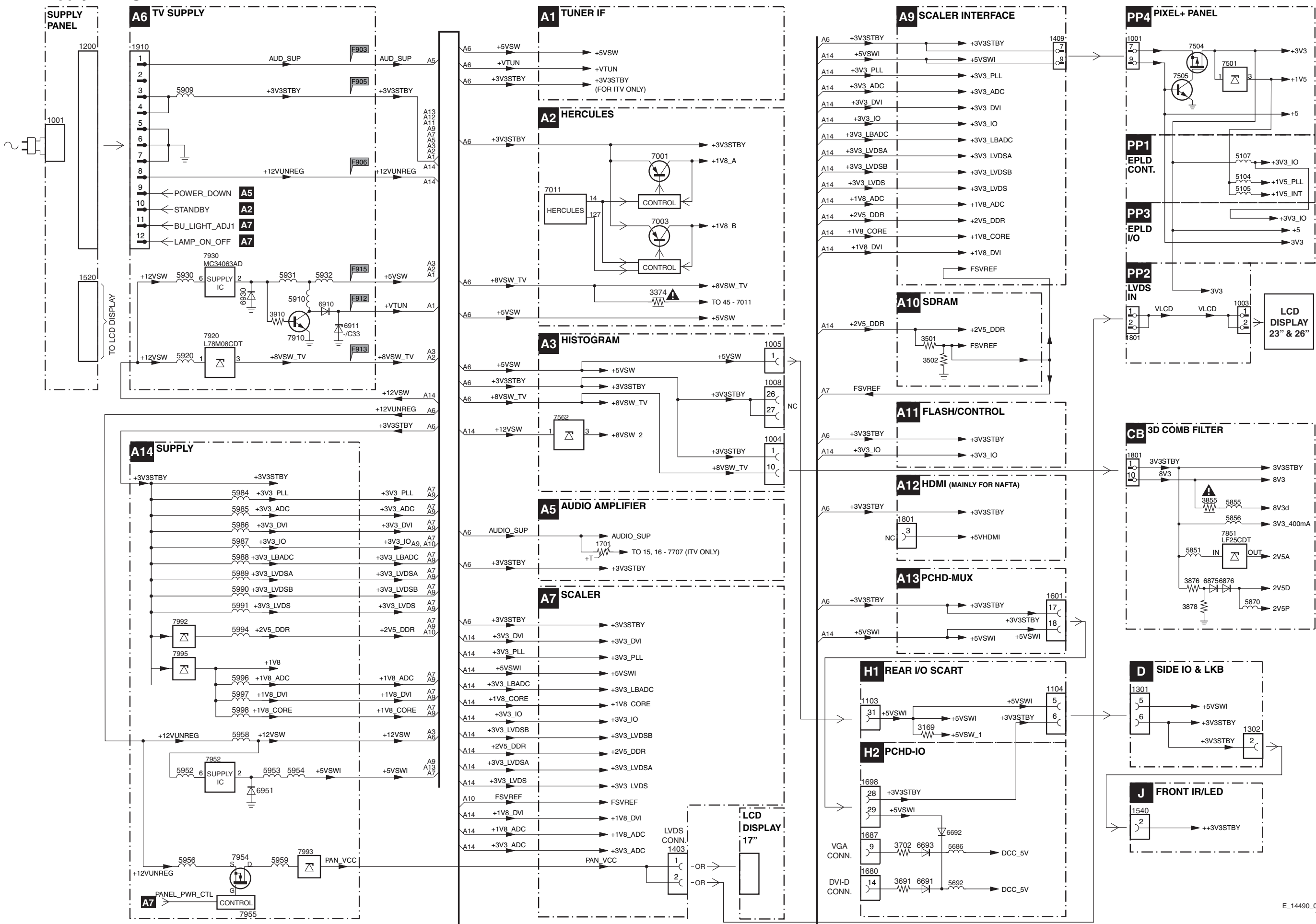
This image shows a full page of white paper with horizontal blue or grey ruling lines, typical of notebook paper. The lines are evenly spaced and run across the width of the page. In the bottom right corner, there is small black text that reads "E_06532_012.eps" and "130204".

I2C IC Overview

I2C BUS INTERCONNECTION DIAGRAM

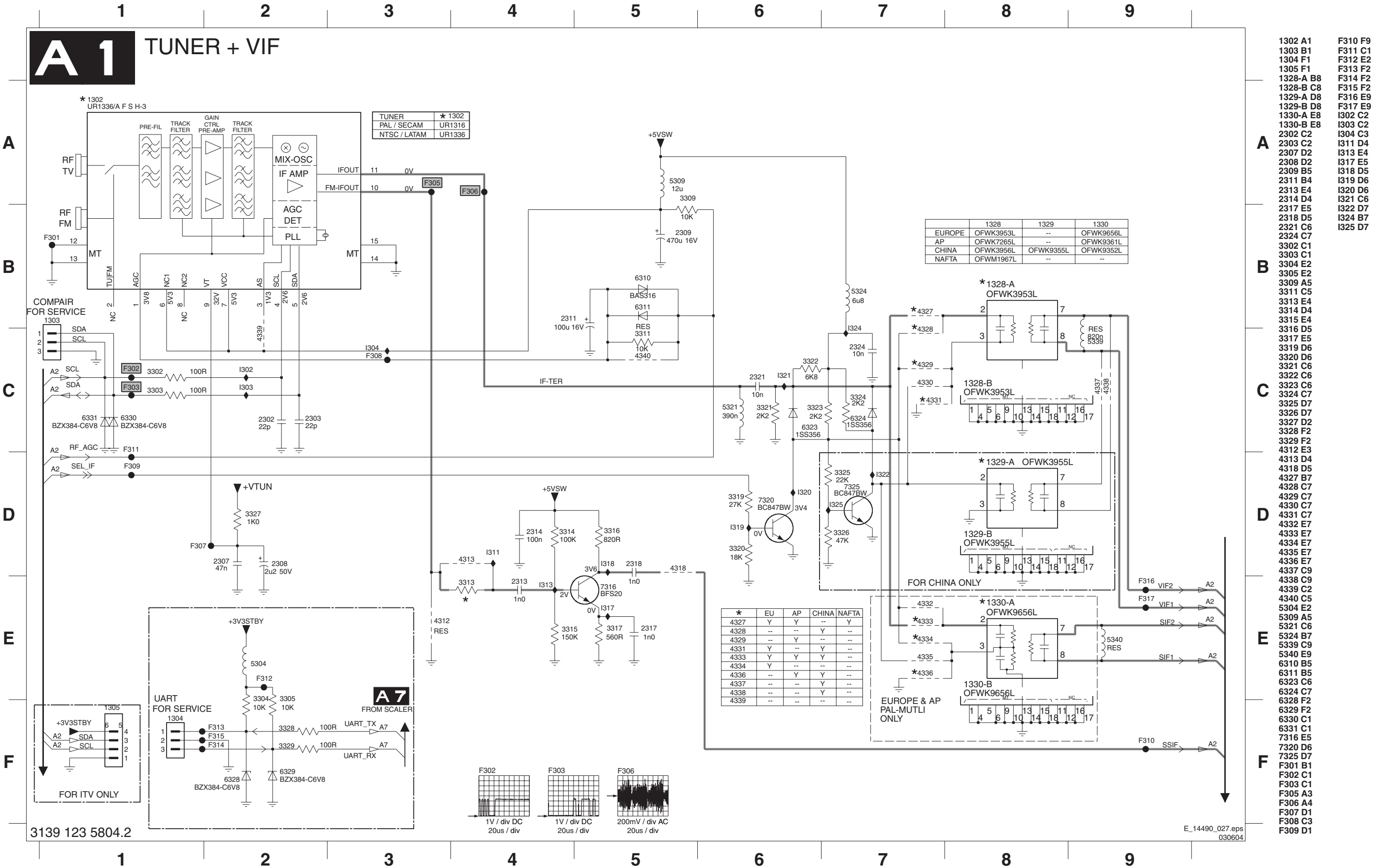


Supply Voltage Overview

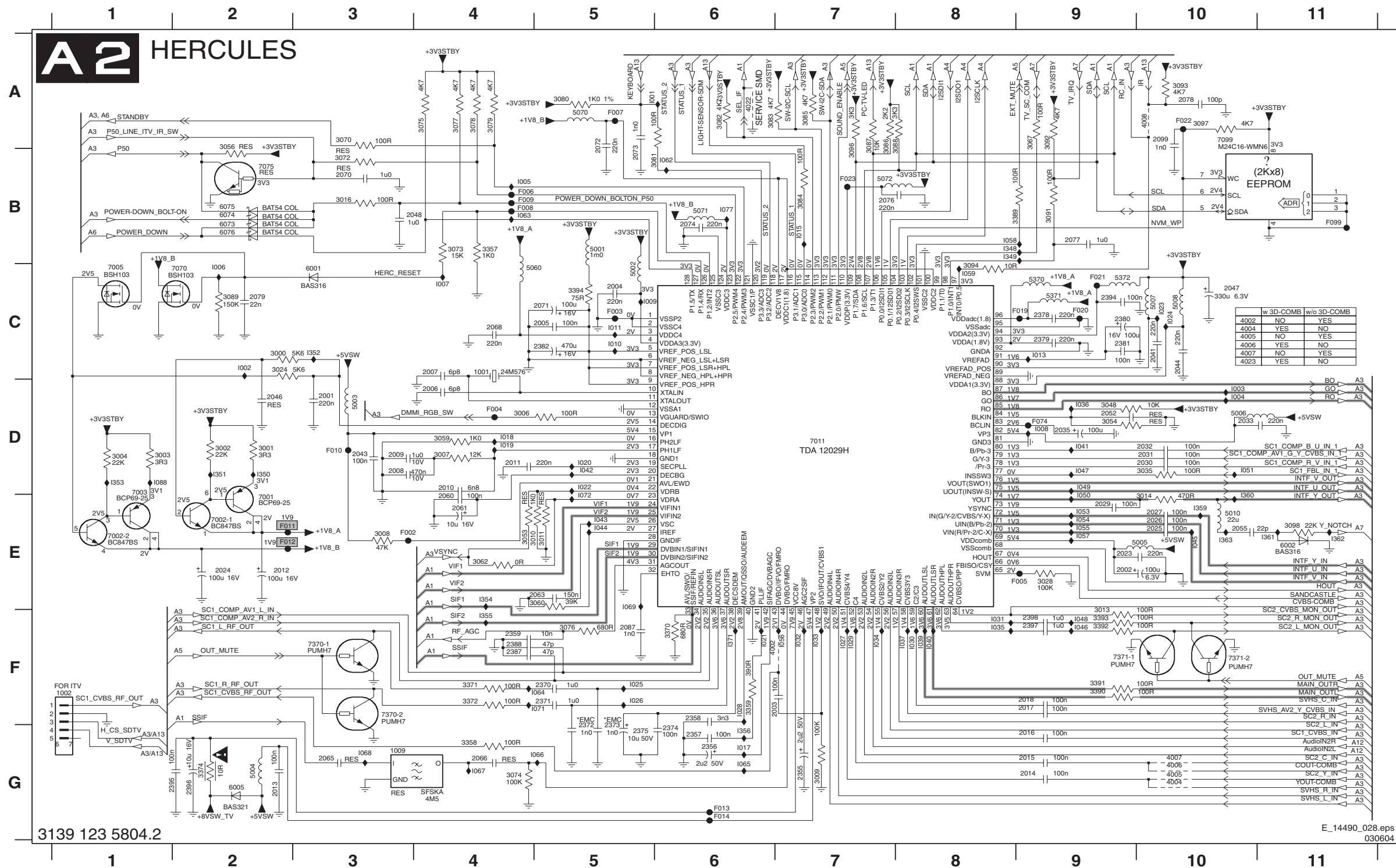


7. Circuit Diagrams and PWB Layouts

TV & Scaler Board: Tuner + VIF

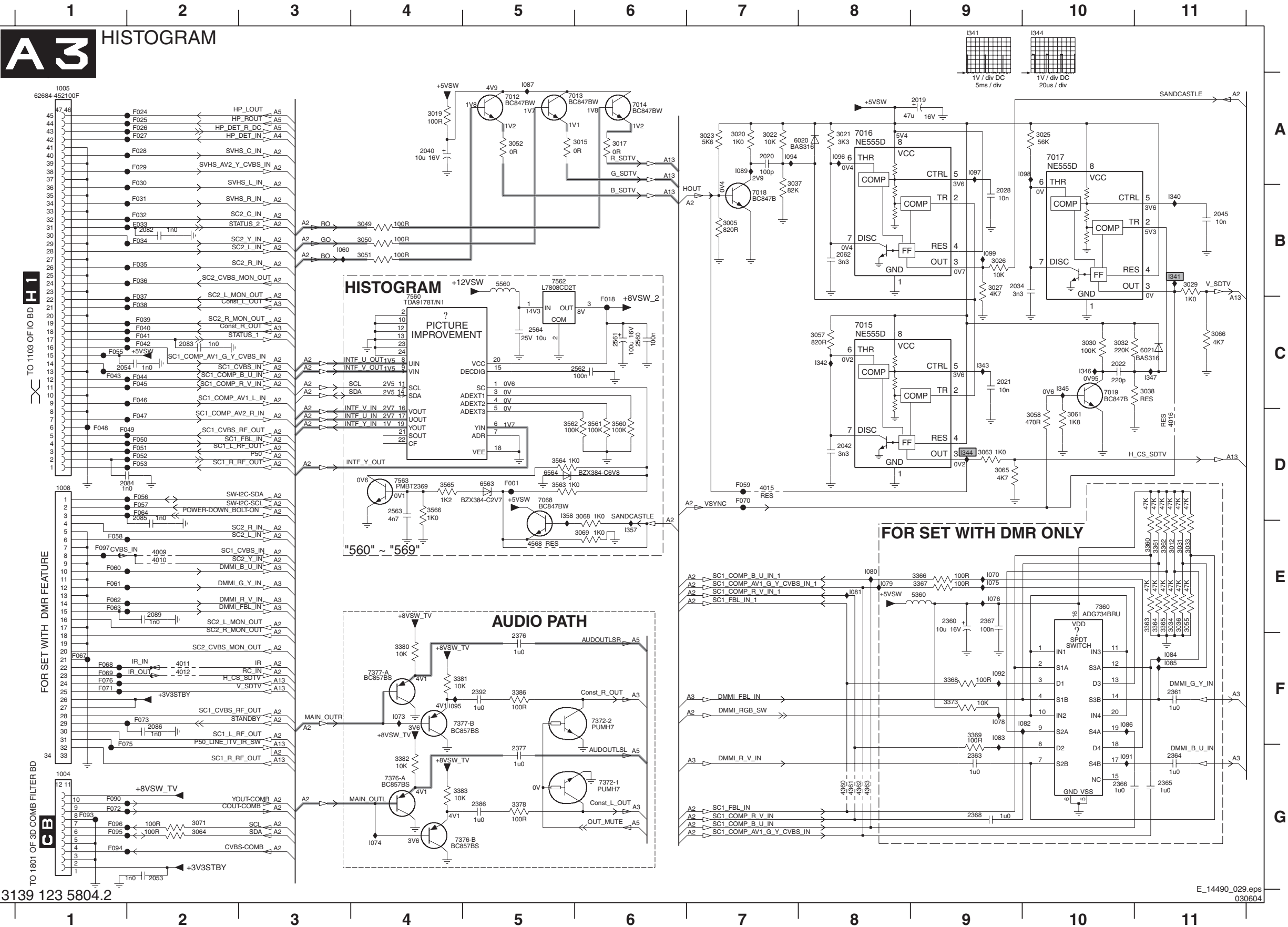


A2 HERCULES



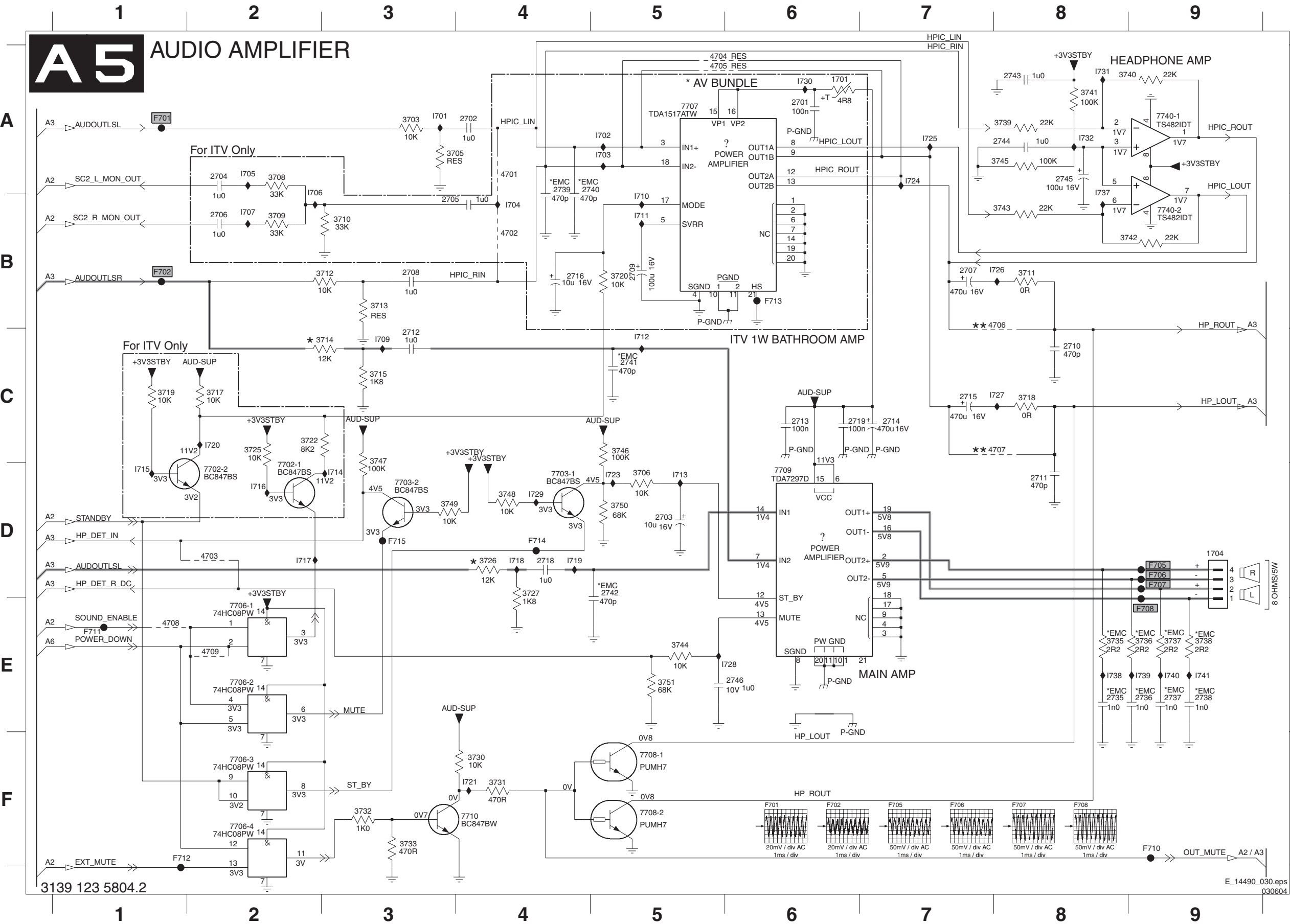
1001 C4	3006 D4	6073 B2
1002 F1	3007 D4	6074 B2
1009 G3	3008 E3	6075 B2
2001 D3	3009 G7	6076 B2
2002 E9	3010 E5	7001 E2
2003 F7	3011 E5	7002-1 E2
2004 C5	3013 E9	7002-2 E1
2005 C5	3014 E10	7003 E1
2006 D4	3016 B3	7005 C1
2007 C4	3024 C2	7011 D7
2008 D3	3028 E9	7070 C2
2009 D3	3035 D10	7075 B2
2010 D4	3048 D9	7099 A10
2011 D4	3053 E4	7370-1 F3
2012 E2	3054 D9	7370-2 F3
2013 G2	3056 B2	7371-1 F9
2014 G9	3059 D4	7371-2 F10
2015 G9	3060 E5	F002 E3
2016 G9	3062 E4	F003 C5
2017 F9	3067 B9	F004 D4
2018 F9	3070 A3	F005 E9
2023 E9	3072 B3	F006 B4
2024 E2	3073 B4	F007 A5
2025 E10	3074 G4	F008 B4
2026 E10	3075 A4	F009 B4
2027 E10	3076 F5	F010 D3
2029 E9	3077 A4	F011 E2
2030 D10	3078 A4	F012 E2
2031 D10	3079 A4	F013 G6
2032 D10	3080 A5	F014 G6
2033 D10	3081 B6	F019 C9
2035 D9	3082 A6	F020 C9
2041 C10	3083 A6	F021 C9
2043 D3	3084 B7	F022 A10
2044 C10	3085 A7	F023 B7
2046 D2	3086 A7	F074 D9
2047 C10	3087 A7	F099 B11
2048 B4	3088 A8	I001 A5
2052 D9	3089 C2	I002 C2
2055 E10	3091 B9	I003 D10
2060 E4	3092 B9	I004 D10
2061 E4	3093 A10	I005 B4
2063 E5	3094 C8	I006 C2
2065 G3	3096 B7	I007 C4
2066 G4	3097 A10	I008 D9
2068 C4	3098 E11	I009 C5
2070 B3	3357 B4	I010 C5
2071 C5	3358 G4	I011 C5
2072 A5	3359 F6	I013 C9
2073 B5	3370 F6	I015 B7
2074 B6	3371 F4	I017 G6
2076 B7	3372 F4	I018 D4
2077 B9	3374 G2	I019 D4
2078 A10	3389 B9	I020 D5
2079 C2	3390 F9	I021 F6
2079 E5	3391 F9	I022 D5
2099 A10	3382 F9	I024 C10
2355 G7	3393 F9	I024 C10
3566 G6	3394 C5	I025 F5
3567 G6	4002 F6	I026 F5
3568 F6	4004 G10	I027 F7
3569 F4	4005 G10	I028 F6
3730 F5	4006 G10	I029 F7
3731 F5	4007 G10	I030 F8
3732 F5	4008 A10	I031 F8
3733 F5	4022 A6	I032 F7
3734 G6	5001 B5	I033 F7
3735 G5	5002 C5	I034 F7
3738 C9	5003 D3	I035 F8
3739 C9	5004 G2	I036 D9
3800 C9	5005 E10	I037 F8
3801 C9	5006 D10	I039 F8
3802 C5	5007 C10	I040 F8
3807 F4	5008 C10	I041 D9
3808 F4	5010 E10	I042 D5
3934 C9	5060 C4	I043 E5
3935 G2	5070 A5	I044 E5
3936 G2	5071 B6	I045 E10
3937 F9	5072 B7	I046 F9
3938 F9	5370 C9	I047 D9
3000 C2	5371 C9	I048 F9
3001 D2	5372 C9	I049 D9
3002 D2	6001 C3	I050 E9
3003 D1	6002 E11	I051 D10
3004 D1	6005 G2	I053 E9

TV & Scaler Board: Histogram



1004 G1	3562 D5	F093 G1
1005 A1	3563 D5	F094 G1
1008 D1	3564 D5	F095 G1
2019 A9	3565 D4	F096 G1
2020 A7	3566 D4	F097 E1
2021 C9	4009 E2	I060 B3
2022 C10	4010 E2	I070 E9
2028 B9	4011 F2	I073 F4
2034 B9	4012 F2	I074 G4
2040 A4	4015 D7	I075 E9
2042 D8	4016 D11	I076 E9
2045 B11	4360 G8	I078 F9
2053 G2	4361 G8	I079 E8
2054 C1	4362 G8	I080 E8
2062 B8	4363 G8	I081 E8
2082 B2	4568 E5	I082 F10
2083 C2	5360 E9	I083 F9
2084 D2	5560 B5	I084 F11
2085 D2	6020 A8	I085 F11
2086 F2	6021 C11	I086 F10
2089 E2	6563 D5	I087 A5
2360 E9	6564 D5	I089 A7
2361 F11	7012 A5	I091 G10
2363 G9	7013 A5	I092 F9
2364 G11	7014 A6	I094 A7
2365 G11	7015 C8	I095 F4
2366 G10	7016 A8	I096 A8
2367 E9	7017 A10	I097 A9
2368 G9	7018 B7	I098 A10
2376 F5	7019 C10	I099 B9
2377 G5	7068 D5	I340 B11
2386 G5	7360 E10	I341 B11
2392 F5	7372-1 G6	I342 C8
2560 C6	7372-2 F6	I343 C9
2561 C6	7376-A G4	I344 D9
2562 C6	7376-B G4	I345 C10
2563 D4	7377-A F4	I346 C10
2564 C5	7377-B F4	I347 C11
3005 B7	7560 C4	I357 E6
3012 E11	7562 B5	I358 D5
3015 A6	7563 D4	
3017 A6	F001 D5	
3019 A4	F018 C6	
3020 A7	F024 A2	
3021 A8	F025 A2	
3022 A7	F026 A2	
3023 A7	F027 A2	
3025 A10	F028 A2	
3026 B9	F029 A2	
3027 B9	F030 B2	
3029 B11	F031 B2	
3030 C10	F032 B2	
3031 E11	F033 B2	
3032 C10	F034 B2	
3033 E11	F035 B2	
3034 E11	F036 B2	
3036 E11	F037 C2	
3037 A7	F038 C2	
3038 C11	F039 C2	
3049 B4	F040 C2	
3050 B4	F041 C2	
3051 B4	F042 C2	
3052 A5	F043 C1	
3055 E11	F044 C2	
3057 C8	F045 C2	
3058 D10	F046 C2	
3061 D10	F047 D2	
3063 D9	F048 D1	
3064 G2	F049 D2	
3065 D9	F050 D2	
3066 C11	F051 D2	
3068 D6	F052 D2	
3069 E6	F053 D2	
3071 G2	F055 C1	
3360 E11	F056 D2	
3361 E11	F057 D2	
3362 E11	F058 E1	
3363 E11	F059 D7	
3364 E11	F060 E1	
3365 E11	F061 E1	
3366 E9	F062 E1	
3367 E9	F063 E1	
3368 F9	F064 D2	
3369 F9	F067 F1	
3373 F9	F068 F1	
3378 G5	F069 F1	
3380 F4	F070 D7	
3381 F4	F071 F1	
3382 G4	F072 G1	
3383 G4	F073 F2	
3386 F5	F075 G1	
3560 D6	F076 F1	
3561 D6	F090 G1	

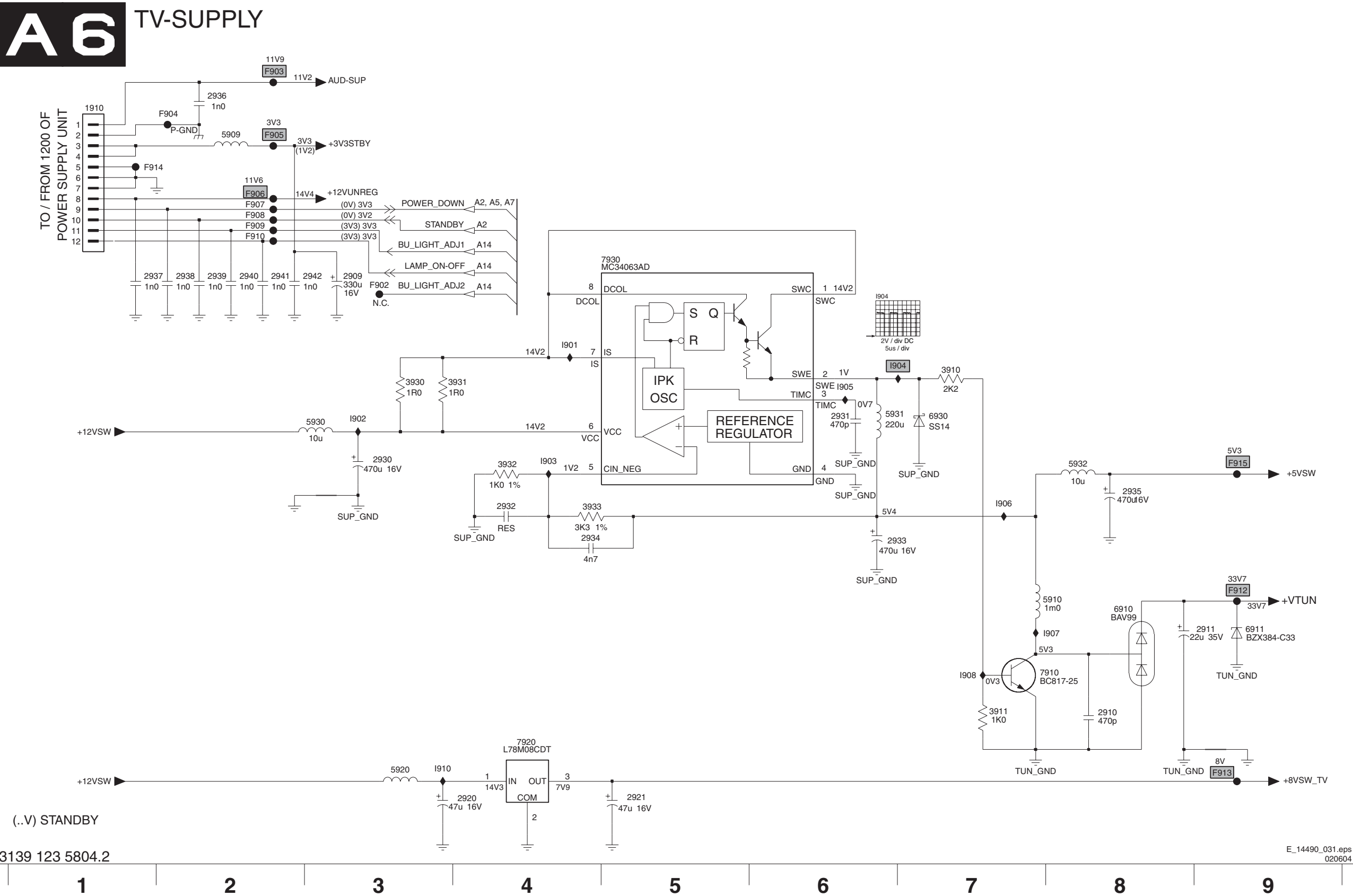
TV & Scaler Board: Audio Amplifier



1701 A6	7706-4 F2
1704 D9	7707 A5
2701 A6	7708-1 F5
2702 A4	7708-2 F5
2703 D5	7709 D6
2704 A2	7710 F4
2705 B3	7740-1 A9
2706 B2	7740-2 B9
2707 B7	F701 A1
2708 B3	F702 B1
2709 B5	F705 D9
2710 C8	F706 D9
2711 D8	F707 D9
2712 C3	F708 E9
2713 C6	F710 F9
2714 C7	F711 E1
2715 C7	F712 F1
2716 B4	F713 B6
2718 D4	F714 D4
2719 C6	F715 D3
2735 E8	I701 A3
2736 E9	I702 A5
2737 E9	I703 A5
2738 E9	I704 B4
2739 A4	I705 A2
2740 A5	I706 A2
2741 C5	I707 B2
2742 D5	I709 C3
2743 A8	I710 B5
2744 A8	I711 B5
2745 A8	I712 C5
2746 E6	I713 D5
3703 A3	I714 D3
3705 A3	I715 D1
3706 D5	I716 D2
3708 A2	I717 D2
3709 B2	I718 D4
3710 B3	I719 D4
3711 B8	I720 C2
3712 B3	I721 F4
3713 B3	I723 D5
3714 C3	I724 A7
3715 C3	I725 A7
3717 C2	I726 B8
3718 C8	I727 C8
3719 C1	I728 E6
3720 B5	I729 D4
3722 C2	I730 A6
3725 C2	I731 A8
3726 D4	I732 A8
3727 D4	I737 A8
3730 F4	I738 E8
3731 F4	I739 E9
3732 F3	I740 E9
3733 F3	I741 E9
3735 E8	
3736 E9	
3737 E9	
3738 E9	
3739 A8	
3740 A8	
3741 A8	
3742 B9	
3743 B8	
3744 E5	
3745 A8	
3746 C5	
3747 D3	
3748 D4	
3749 D3	
3750 D5	
3751 E5	
4701 A4	
4702 B4	
4703 D2	
4704 A5	
4705 A5	
4706 B8	
4707 C8	
4708 E1	
4709 E2	
7702-1 D2	
7702-2 D2	
7703-1 D4	
7703-2 D3	
7706-1 E2	
7706-2 E2	
7706-3 F2	

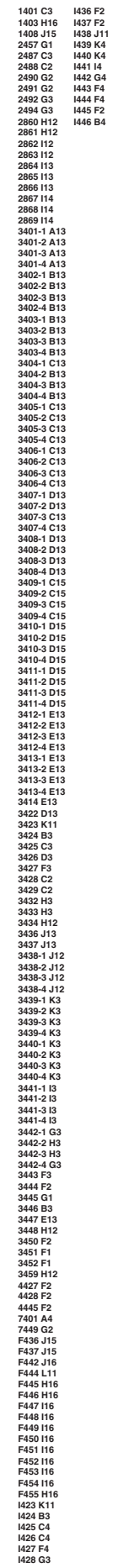
TV & Scaler Board: TV-Supply

A6 TV-SUPPLY



- 1910 A1
- 2909 B3
- 2910 E8
- 2911 D9
- 2920 E4
- 2921 E5
- 2930 C3
- 2931 C6
- 2932 C4
- 2933 D6
- 2934 D4
- 2935 C8
- 2936 A2
- 2937 B1
- 2938 B2
- 2939 B2
- 2940 B2
- 2941 B2
- 2942 B3
- 3910 B7
- 3911 E7
- 3930 B3
- 3931 B4
- 3932 C4
- 3933 C4
- 5909 A2
- 5910 D8
- 5920 E3
- 5930 C3
- 5931 C6
- 5932 C8
- 6910 D8
- 6911 D9
- 6930 C7
- 7910 D7
- 7920 E4
- 7930 B5
- F902 B3
- F903 A2
- F904 A2
- F905 A2
- F906 A2
- F907 A2
- F908 A2
- F909 A2
- F910 B2
- F912 D9
- F913 E9
- F914 A1
- F915 C9
- I901 B4
- I902 C3
- I903 C4
- I904 B7
- I905 C6
- I906 C7
- I907 D8
- I908 D7
- I910 E3

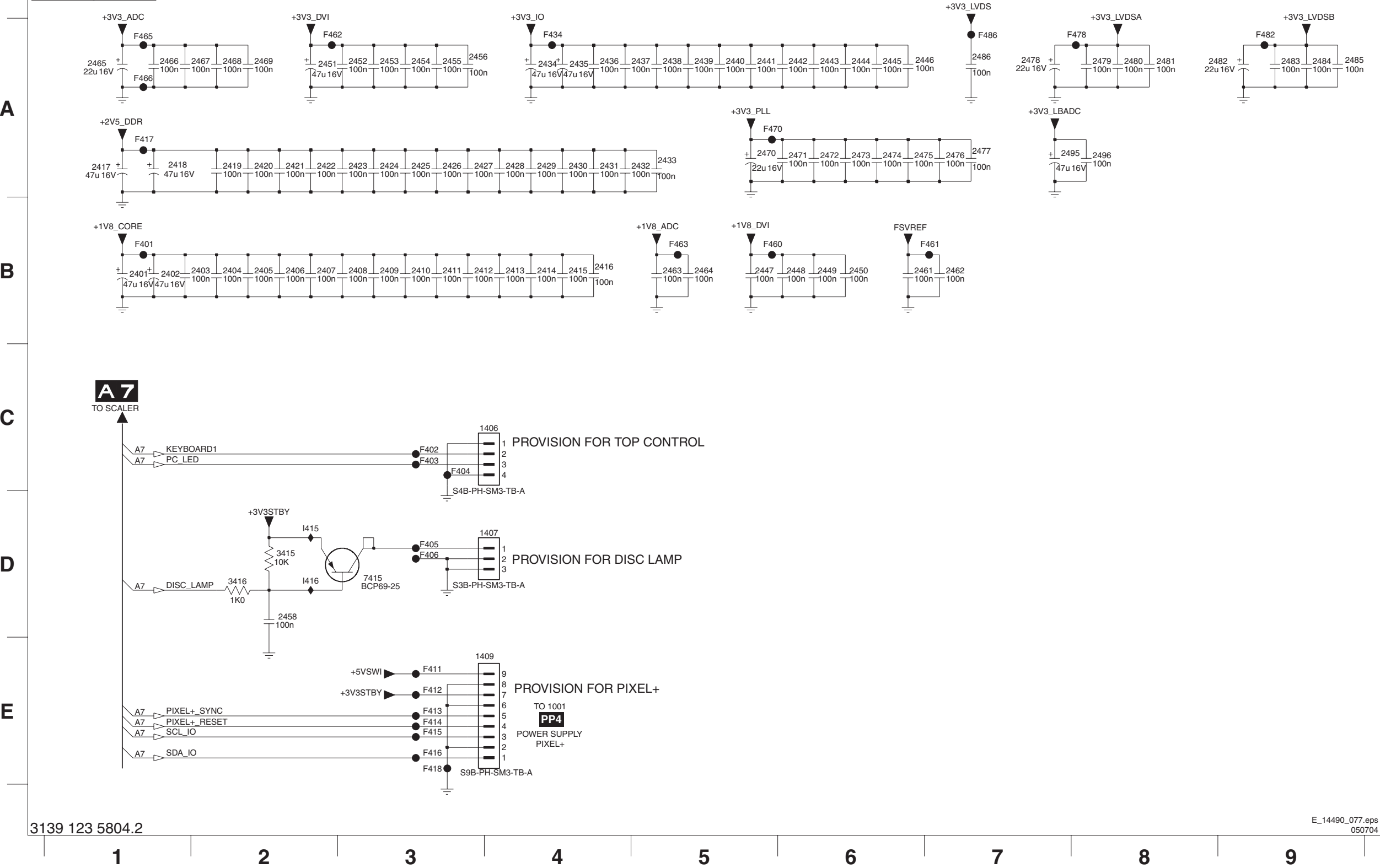
A 7 SCALER



TV & Scaler Board: Scaler Interface

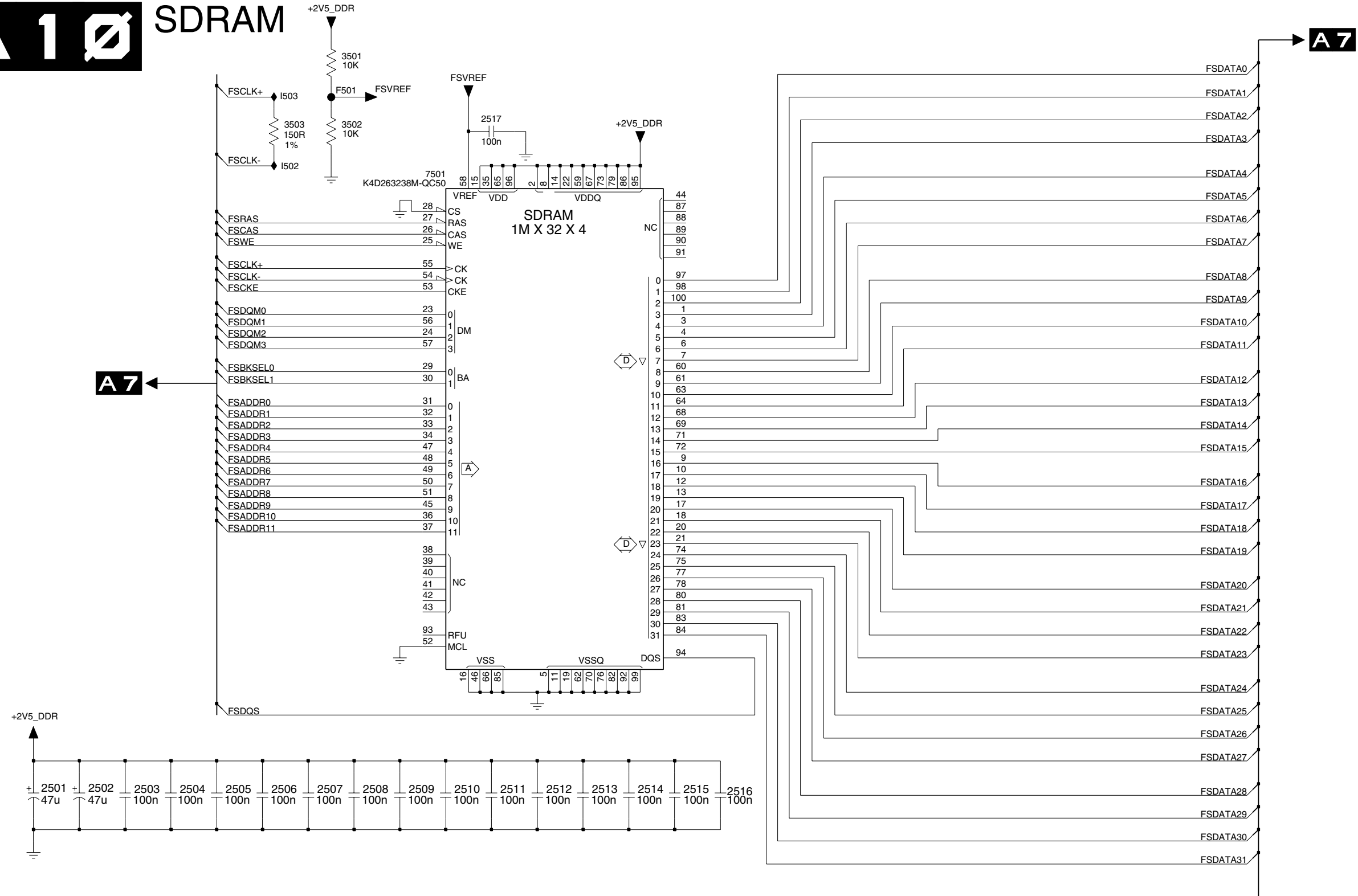
A9

SCALER INTERFACE



1406 C4	2470 A5
1407 D4	2471 A6
1409 E4	2472 A6
2401 B1	2473 A6
2402 B1	2474 A6
2403 B2	2475 A6
2404 B2	2476 A7
2405 B2	2477 A7
2406 B2	2478 A7
2407 B2	2479 A8
2408 B3	2480 A8
2409 B3	2481 A8
2410 B3	2482 A9
2411 B3	2483 A9
2412 B3	2484 A9
2413 B4	2485 A9
2414 B4	2486 A7
2415 B4	2495 A7
2416 B4	2496 A8
2417 A1	3415 D2
2418 A1	3416 D2
2419 A2	7415 D3
2420 A2	F401 B1
2421 A2	F402 C3
2422 A2	F403 C3
2423 A3	F404 C3
2424 A3	F405 D3
2425 A3	F406 D3
2426 A3	F411 E3
2427 A3	F412 E3
2428 A4	F413 E3
2429 A4	F414 E3
2430 A4	F415 E3
2431 A4	F416 E3
2432 A5	F417 A1
2433 A5	F418 E3
2434 A4	F434 A4
2435 A4	F460 B5
2436 A4	F461 B7
2437 A5	F462 A2
2438 A5	F463 B5
2439 A5	F465 A1
2440 A5	F466 A1
2441 A5	F470 A5
2442 A6	F478 A8
2443 A6	F482 A9
2444 A6	F486 A7
2445 A6	I415 D2
2446 A7	I416 D2
2447 B5	
2448 B6	
2449 B6	
2450 B6	
2451 A2	
2452 A3	
2453 A3	
2454 A3	
2455 A3	
2456 A3	
2458 D2	
2461 B6	
2462 B7	
2463 B5	
2464 B5	
2465 A1	
2466 A1	
2467 A2	
2468 A2	
2469 A2	

A 1 Ø



2501 E
2502 E
2503 E
2504 E
2505 E
2506 E
2507 E
2508 E
2509 E
2510 E
2511 E
2512 E
2513 E
2514 E
2515 E
2516 E
2517 A
3501 A
3502 A
3503 A
7501 A
F501 A
I502 A3
I503 A3

A

B

C

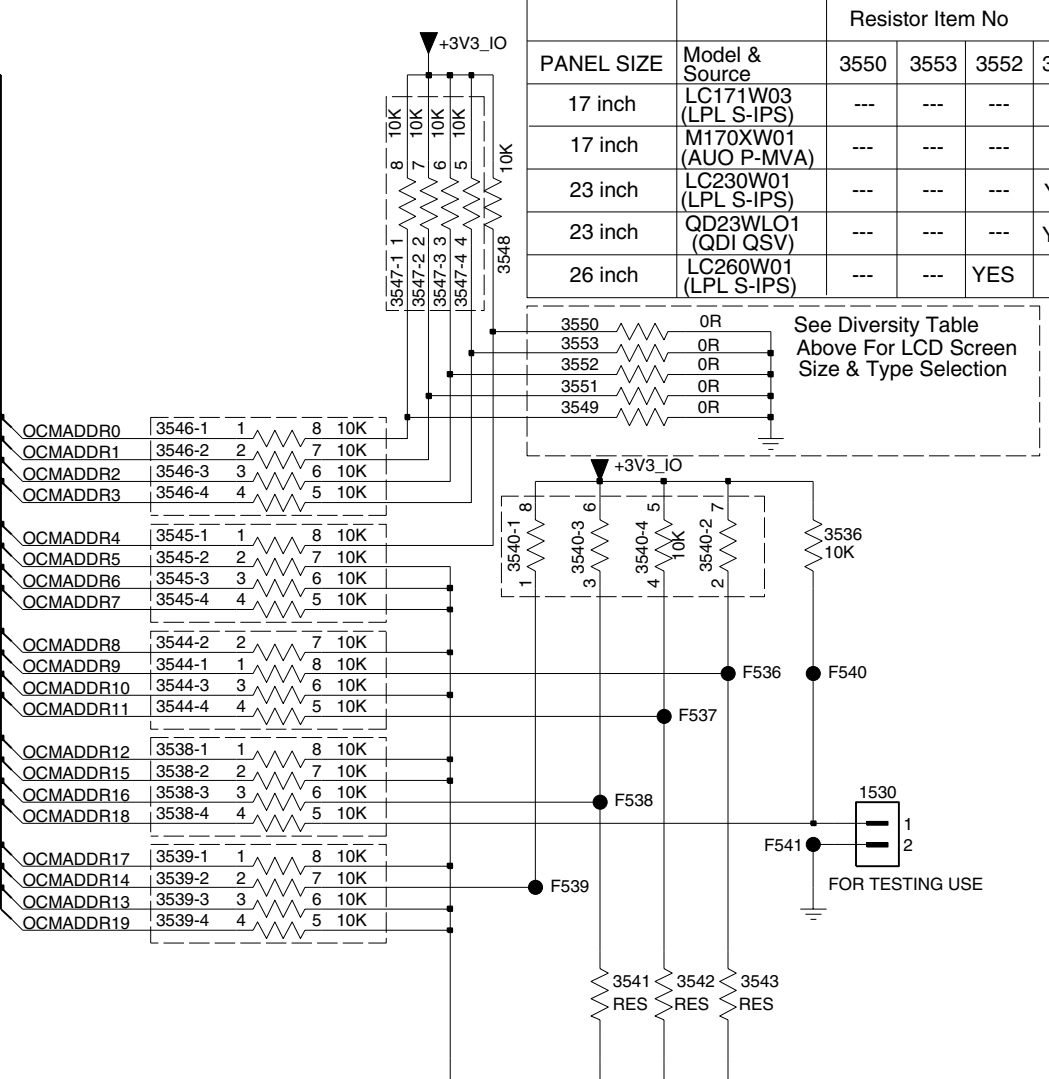
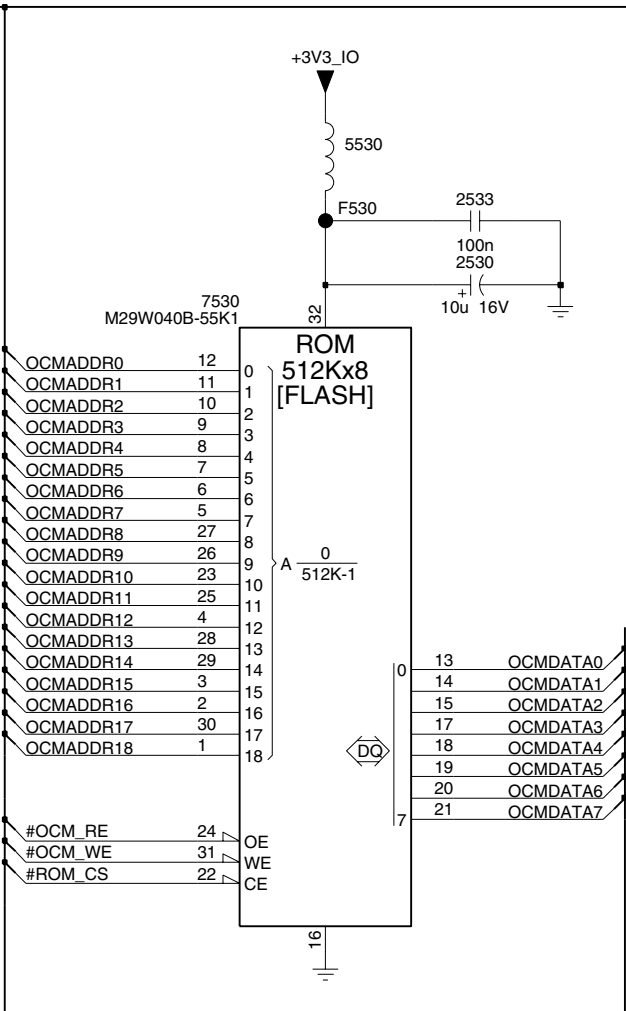
D

E

TV & Scaler Board: Flash / Control

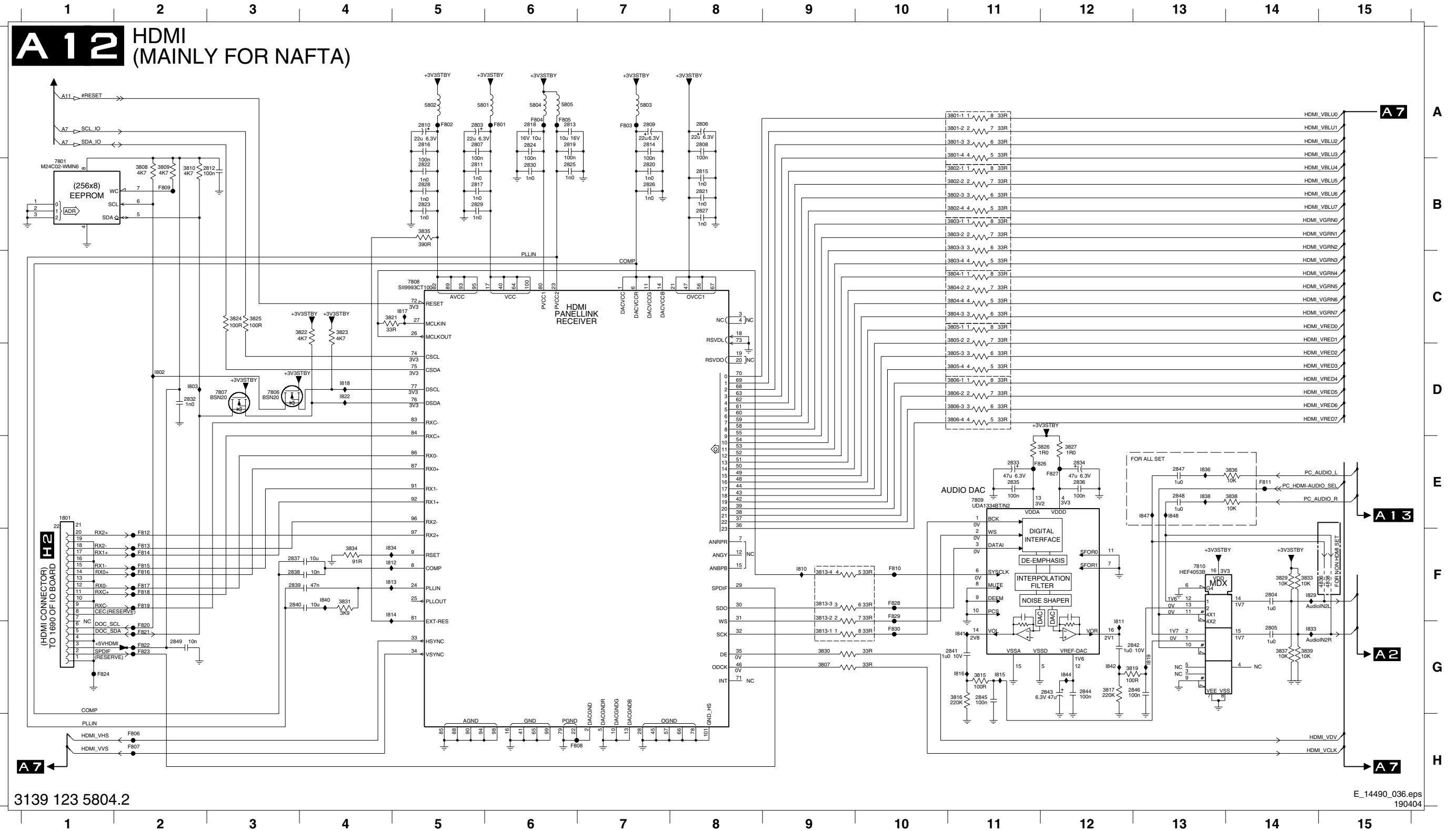
A 1 1 FLASH / CONTROL

A 7



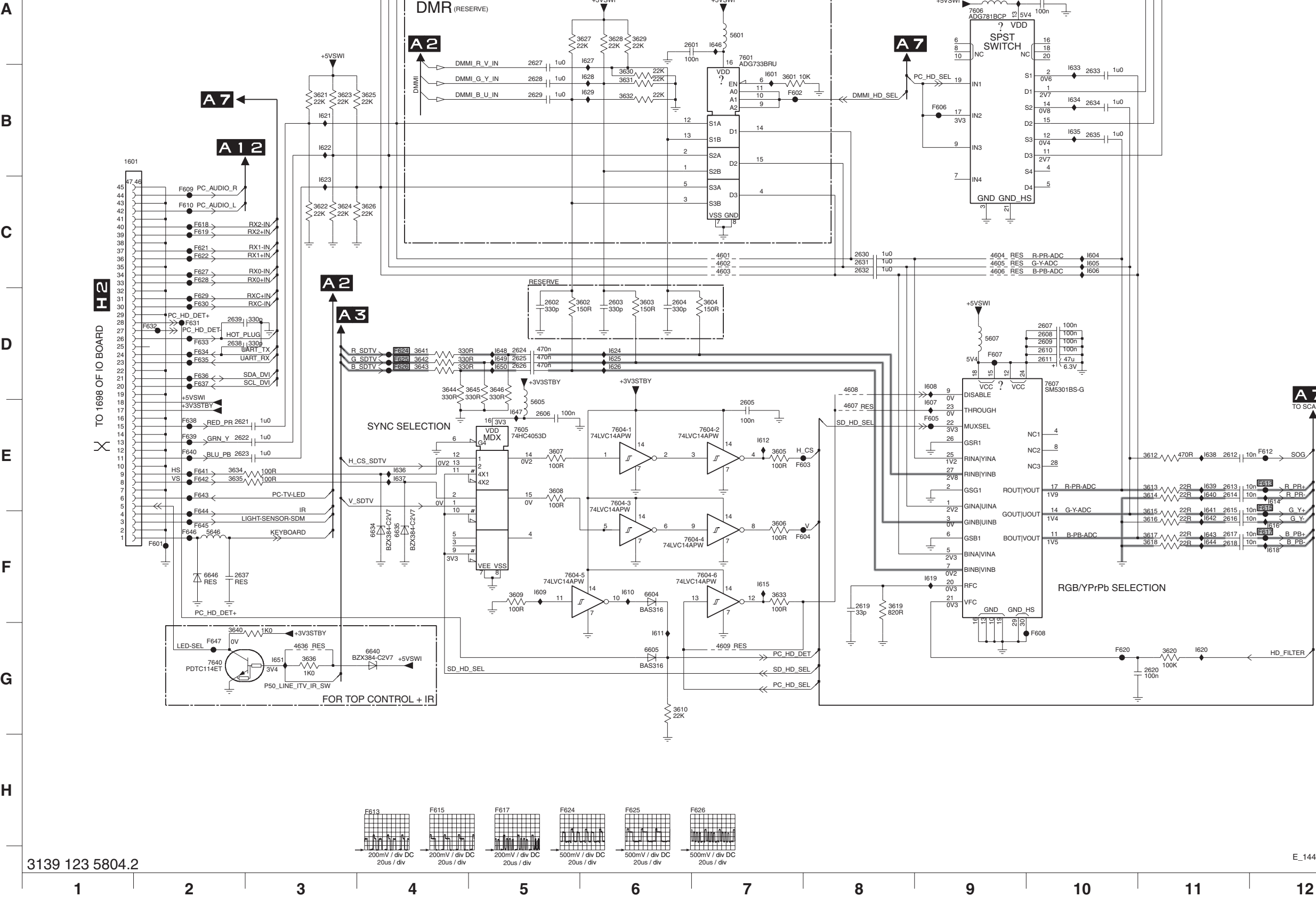
- 1530 C7
- 1532 E4
- 2530 A3
- 2531 D2
- 2532 D4
- 2533 A3
- 3531 D2
- 3532 E4
- 3533 E6
- 3534 D6
- 3536 B7
- 3538-1 C5
- 3538-2 C5
- 3538-3 C5
- 3538-4 C5
- 3539-1 C5
- 3539-2 C5
- 3539-3 C5
- 3539-4 C5
- 3540-1 B6
- 3540-2 B6
- 3540-3 B6
- 3540-4 B6
- 3541 C6
- 3542 C6
- 3543 C7
- 3544-1 B5
- 3544-2 B5
- 3544-3 B5
- 3544-4 B5
- 3545-1 B5
- 3545-2 B5
- 3545-3 B5
- 3545-4 B5
- 3546-1 B5
- 3546-2 B5
- 3546-3 B5
- 3546-4 B5
- 3547-1 A5
- 3547-2 A6
- 3547-3 A6
- 3547-4 A6
- 3548 A6
- 3549 A6
- 3550 A6
- 3551 A6
- 3552 A6
- 3553 A6
- 5530 A2
- 7530 A2
- 7531 D3
- 7532 E5
- F530 A2
- F531 E2
- F532 E2
- F533 E2
- F534 E4
- F535 E5
- F536 B7
- F537 B6
- F538 C6
- F539 C6
- F540 B7
- F541 C7

18001 E1	28008 A8	2814 A7	2820 B7	2826 B7	2833 E11	2839 F3	2845 G11	3801-2 A11	3802-4 A11	3804-2 C11	3805-4 D11	3808 B2	3813-9 F9	3822 C4	3829 F14	3836 E14	5801 A5	7806 D3	F802 A5	F808 H6	F814 F2	F820 G2	F827 E12	8810 F9	8816 G11	8833 G14	8842 G12
28003 A5	28009 A7	2815 B8	2827 B8	2832 B8	2834 E12	2840 F3	2846 G13	3803-1 B11	3803-3 B11	3803-9 F9	3806 D11	3808 B2	3813 G11	3823 C4	3830 G9	3837 G14	5802 A5	7807 D3	F803 A7	F809 B2	F815 F2	F821 G2	F828 F10	8811 G12	8817 C5	8834 F4	8844 G12
2804 F4	2810 A5	2816 A5	2822 B5	2828 B5	2835 E11	2841 G11	2847 E13	3801-4 A11	3803-2 B11	3804-4 C11	3806-2 D11	3810 B2	3816 G11	3824 C3	3831 F4	3838 E14	5803 A7	7808 C5	F804 A6	F810 F10	F816 F2	F822 G2	F829 G10	8812 F4	8818 D4	8836 E13	8847 E13
2805 G14	2811 B5	2817 B5	2823 B5	2829 B5	2836 E12	2842 G13	2848 E13	3801-2 B11	3807-1 C11	3808-1 C11	3806-3 D11	3811 G3	3817 G12	3825 C3	3833 F14	3839 G14	5804 A6	7809 E11	F805 A6	F811 E14	F817 F2	F823 G2	F830 F10	8813 F4	8819 G13	8838 E13	8848 E13
2806 A8	2812 B3	2818 A6	2824 A6	2830 B6	2837 F3	2843 G12	2849 G2	3803-4 C11	3805-2 C11	3806-4 D11	3808-4 D11	3812-3 F9	3819 G12	3826 E12	3834 F4	4836 F15	5805 A6	7810 F13	F806 H2	F812 F2	F818 F2	F824 G1	8802 D2	8814 F4	8822 D4	8840 F4	
2807 A5	2813 A6	2819 A6	2825 B6	2832 D2	2838 F3	2844 G12	3801-1 A11	3802-2 B11	3804-1 C11	3805-3 D11	3807 G9	3813-3 F9	3821 C4	3827 E12	3835 B5	4838 F15	7801 B1	F801 A6	F807 H2	F813 F2	F819 F2	F826 E11	8803 D2	8815 G11	8829 F14	8841 G11	



TV & Scaler Board: PCHD-MUX

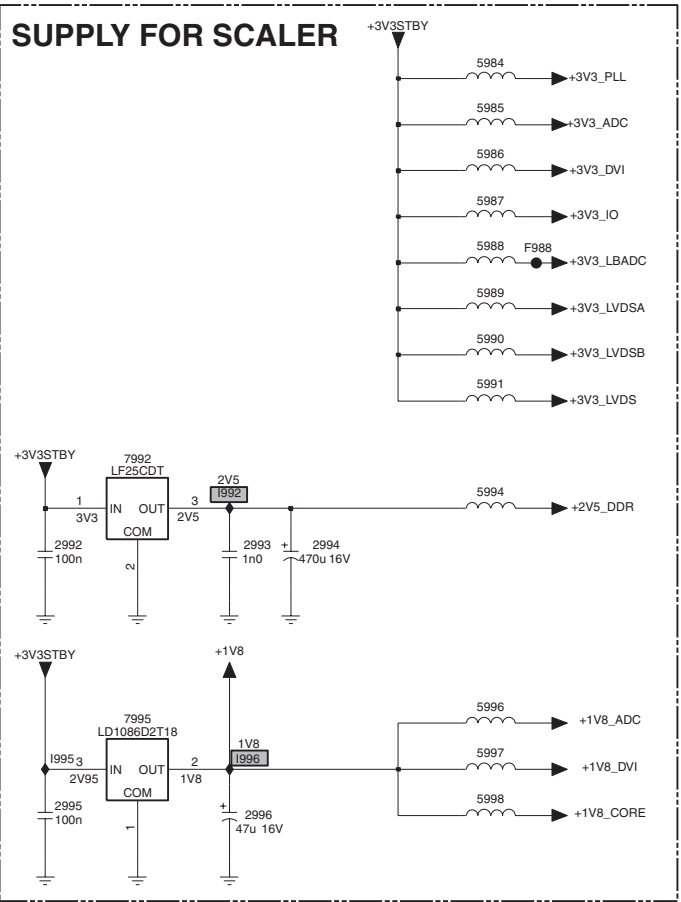
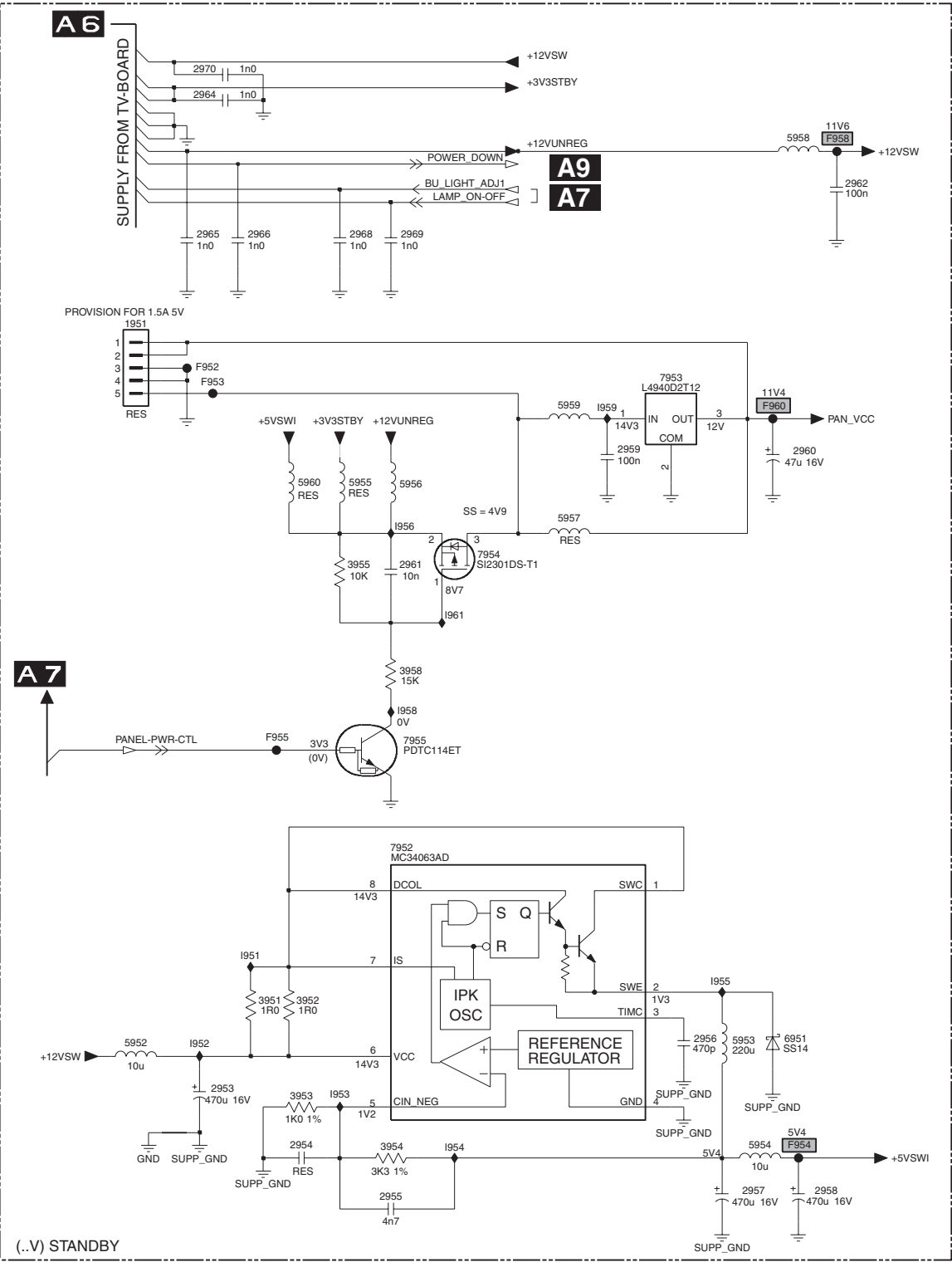
A 1 3 PCHD-MUX



1601 B1	6640 G4
2601 A7	6646 F2
2602 D5	7601 A7
2603 D6	7604-1 E6
2604 D6	7604-2 E7
2605 E7	7604-3 E6
2606 E5	7604-4 F7
2607 D10	7604-5 F6
2608 D10	7604-6 F7
2609 D10	7605 E5
2610 D10	7606 A9
2611 D10	7607 D10
2612 E11	7640 G2
2613 E11	F601 F2
2614 E11	F602 B7
2615 F11	F603 E8
2616 F11	F604 F8
2617 F11	F605 E9
2618 F11	F606 B9
2619 F8	F607 D9
2620 G11	F608 G10
2621 E2	F609 C2
2622 E2	F610 C2
2623 E2	F612 E12
2624 D5	F613 E12
2625 D5	F615 E12
2626 D5	F617 F12
2627 A5	F618 C2
2628 B5	F619 C2
2629 B5	F620 G10
2630 C8	F621 C2
2631 C8	F622 C2
2632 C8	F624 D4
2633 B10	F625 D4
2634 B10	F626 D4
2635 B10	F627 C2
2636 A10	F628 C2
2637 F2	F629 D2
2638 D2	F630 D2
2639 D2	F631 D2
3601 B7	F632 D2
3602 D6	F633 D2
3603 D6	F634 D2
3604 D7	F635 D2
3605 E7	F636 D2
3606 F7	F637 D2
3607 E5	F638 E2
3608 E5	F639 E2
3609 F5	F640 E2
3610 G6	F641 E2
3612 E11	F642 E2
3613 E11	F643 E2
3614 E11	F644 F2
3615 F11	F645 F2
3616 F11	F646 F2
3617 F11	F647 G2
3618 F11	I601 B7
3619 F8	I604 C10
3620 G11	I605 C10
3621 B3	I606 C10
3622 C3	I607 E9
3623 B3	I608 D9
3624 C3	I609 F5
3625 B4	I610 F6
3626 C4	I611 G6
3627 A6	I612 E7
3628 A6	I614 E12
3629 A6	I615 F7
3630 B6	I616 F12
3631 B6	I618 F12
3632 B6	I619 F9
3633 F7	I620 G11
3634 E2	I621 B3
3635 E2	I622 B3
3636 G3	I623 C3
3640 G2	I624 D6
3641 D4	I625 D6
3642 D4	I626 D6
3643 D4	I627 A6
3644 D4	I628 B6
3645 D5	I629 B6
3646 D5	I633 B10
4601 C7	I634 B10
4602 C7	I635 B10
4603 C7	I636 E4
4604 C9	I637 E4
4605 C9	I638 E11
4606 C9	I639 E11
4607 E8	I640 E11
4608 D8	I641 E11
4609 G7	I642 F11
4636 G3	I643 F11
5601 A7	I644 F11
5605 E5	I645 A9
5607 D9	I646 A7
5636 A9	I647 E5
5646 F2	I648 D5
5604 F6	I649 D5
6605 G6	I650 D5
6634 F4	I651 G3
6635 F4	

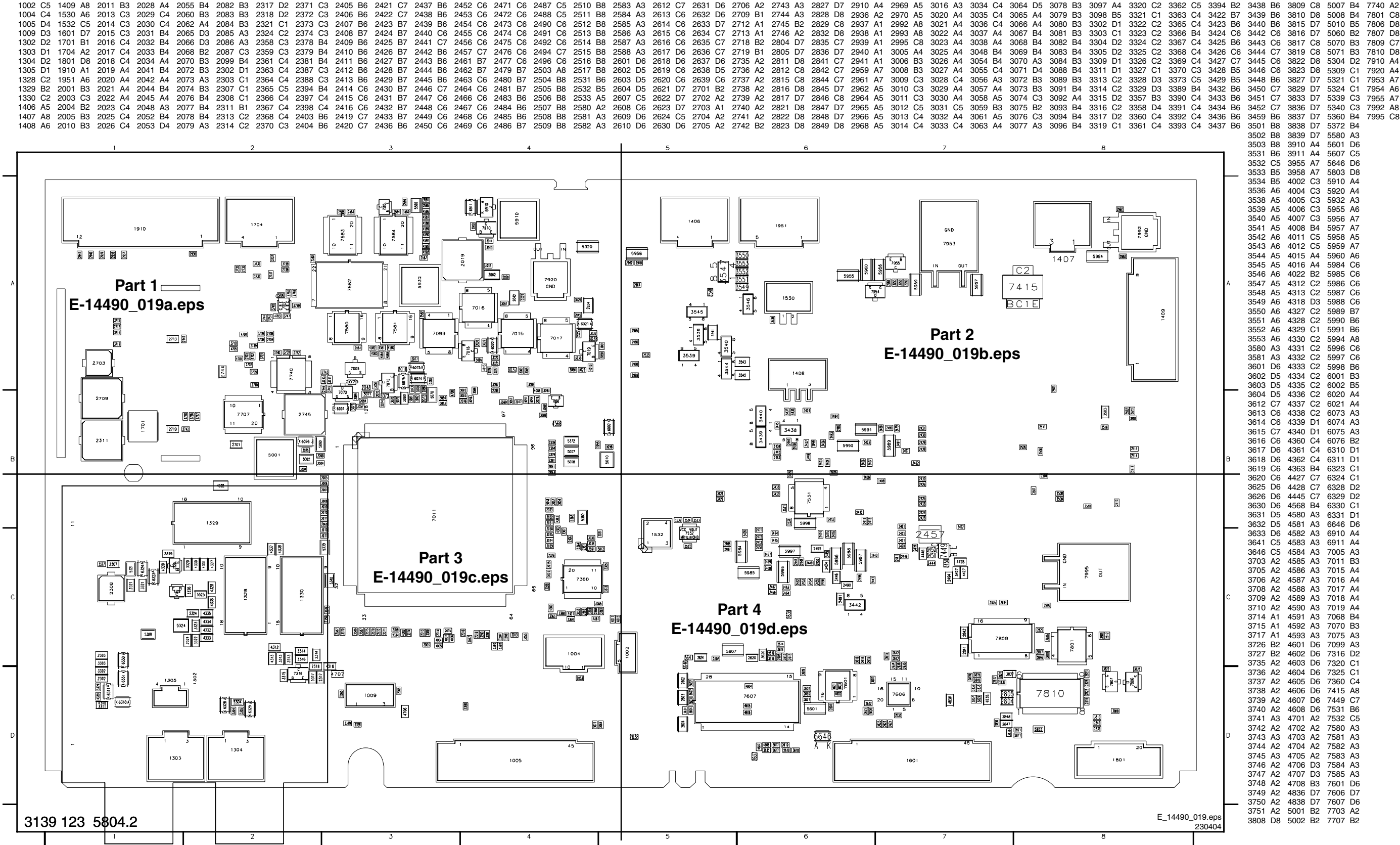
TV & Scaler Board: Supply

A 1 4 SUPPLY



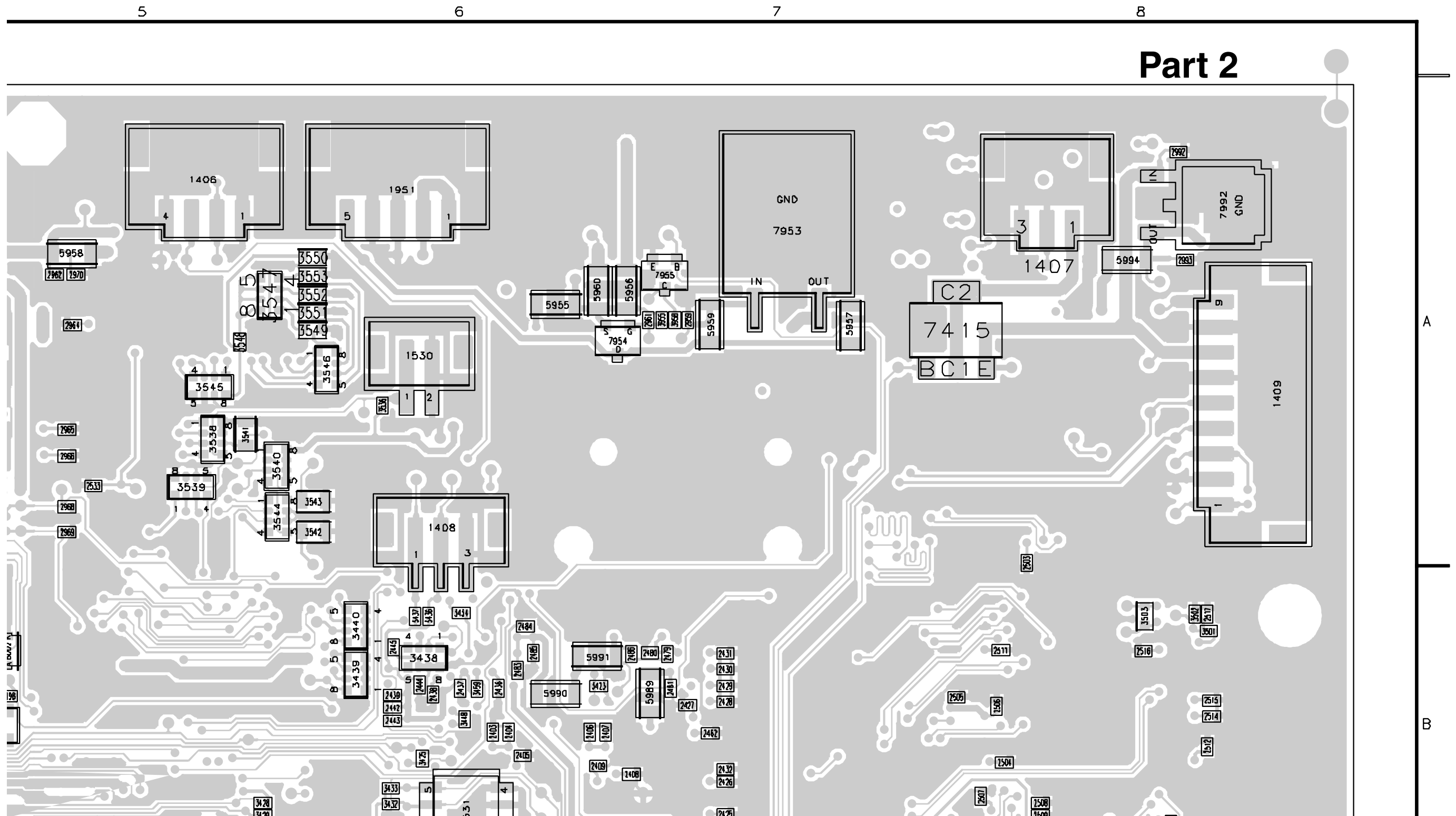
- 1951 C2
- 2953 G3
- 2954 G3
- 2955 G4
- 2956 F5
- 2957 G6
- 2958 G6
- 2959 C5
- 2960 C6
- 2961 D4
- 2962 B6
- 2964 A3
- 2965 B3
- 2966 B3
- 2968 B3
- 2969 B4
- 2970 A3
- 2992 E8
- 2993 E9
- 2994 E10
- 2995 G8
- 2996 G9
- 3951 F3
- 3952 F3
- 3953 G3
- 3954 G4
- 3955 D3
- 3958 D4
- 5952 G2
- 5953 G6
- 5954 G6
- 5955 C3
- 5956 C4
- 5957 D5
- 5958 A6
- 5959 C5
- 5960 C3
- 5984 C10
- 5985 C10
- 5986 D10
- 5987 D10
- 5988 D10
- 5989 D10
- 5990 D10
- 5991 E10
- 5994 E10
- 5996 F10
- 5997 F10
- 5998 G10
- 6951 G6
- 7952 E4
- 7953 C5
- 7954 D4
- 7955 E4
- 7992 E9
- 7995 F9
- F952 C3
- F953 C3
- F954 G6
- F955 E3
- F958 A6
- F960 C6
- F988 D11
- I951 F3
- I952 G3
- I953 G3
- I954 G4
- I955 F5
- I956 D4
- I958 E4
- I959 C5
- I961 D4
- I992 E9
- I995 F8
- I996 F9

Layout TV & Scaler Board: (Overview Top Side)

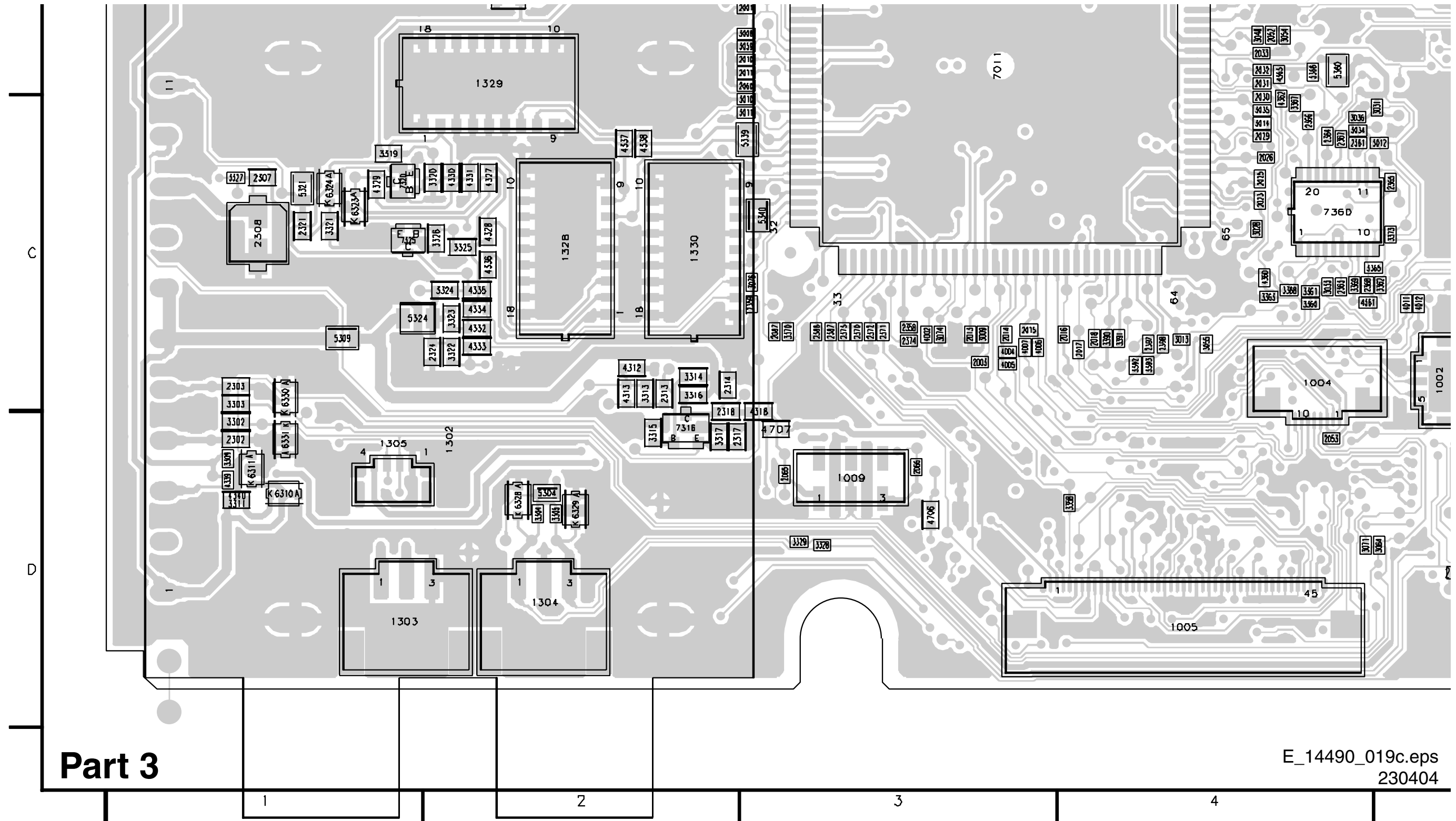


E_14490_019a.eps
230404

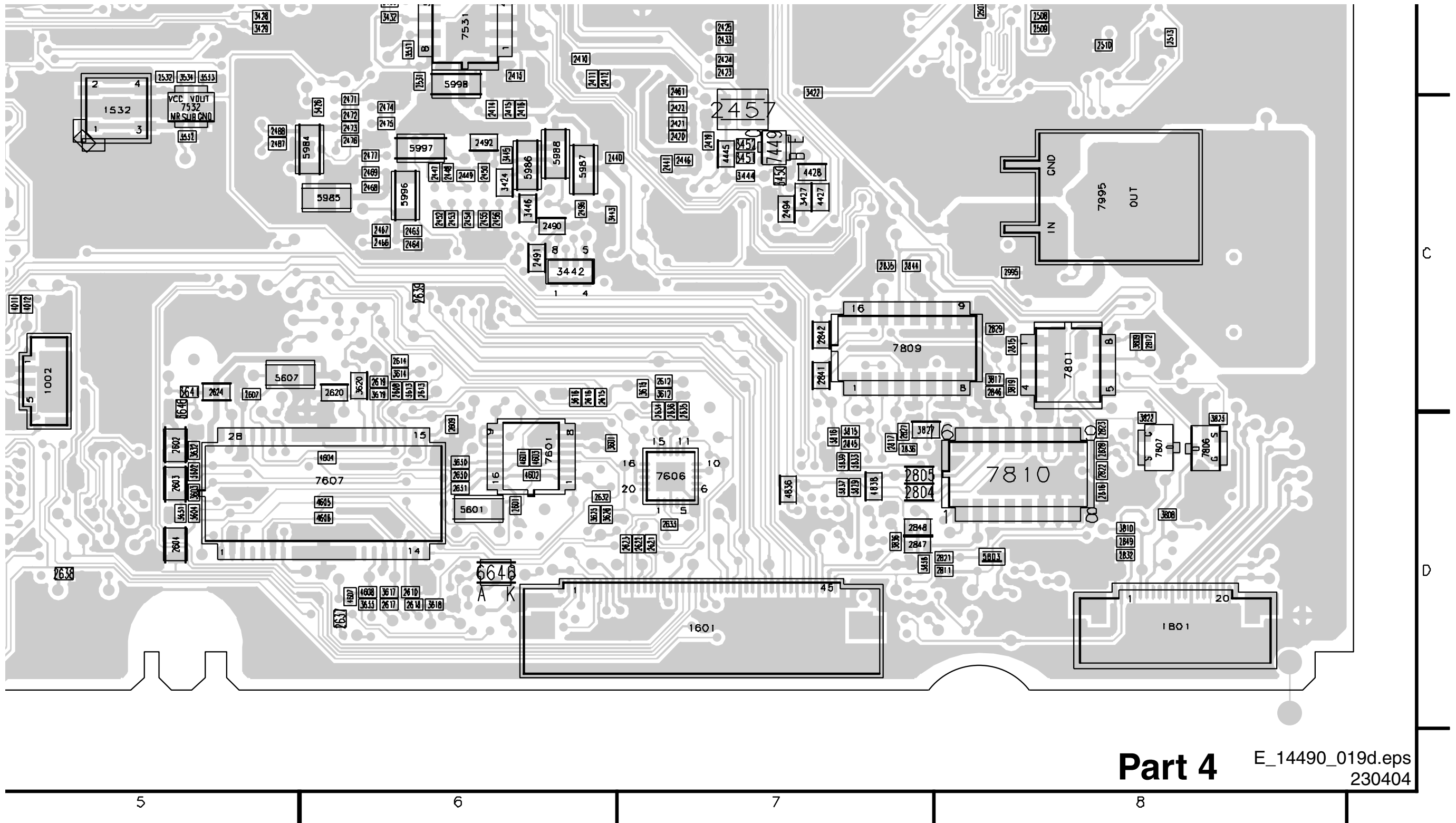
Layout TV & Scaler Board: (Part 2 Top Side)



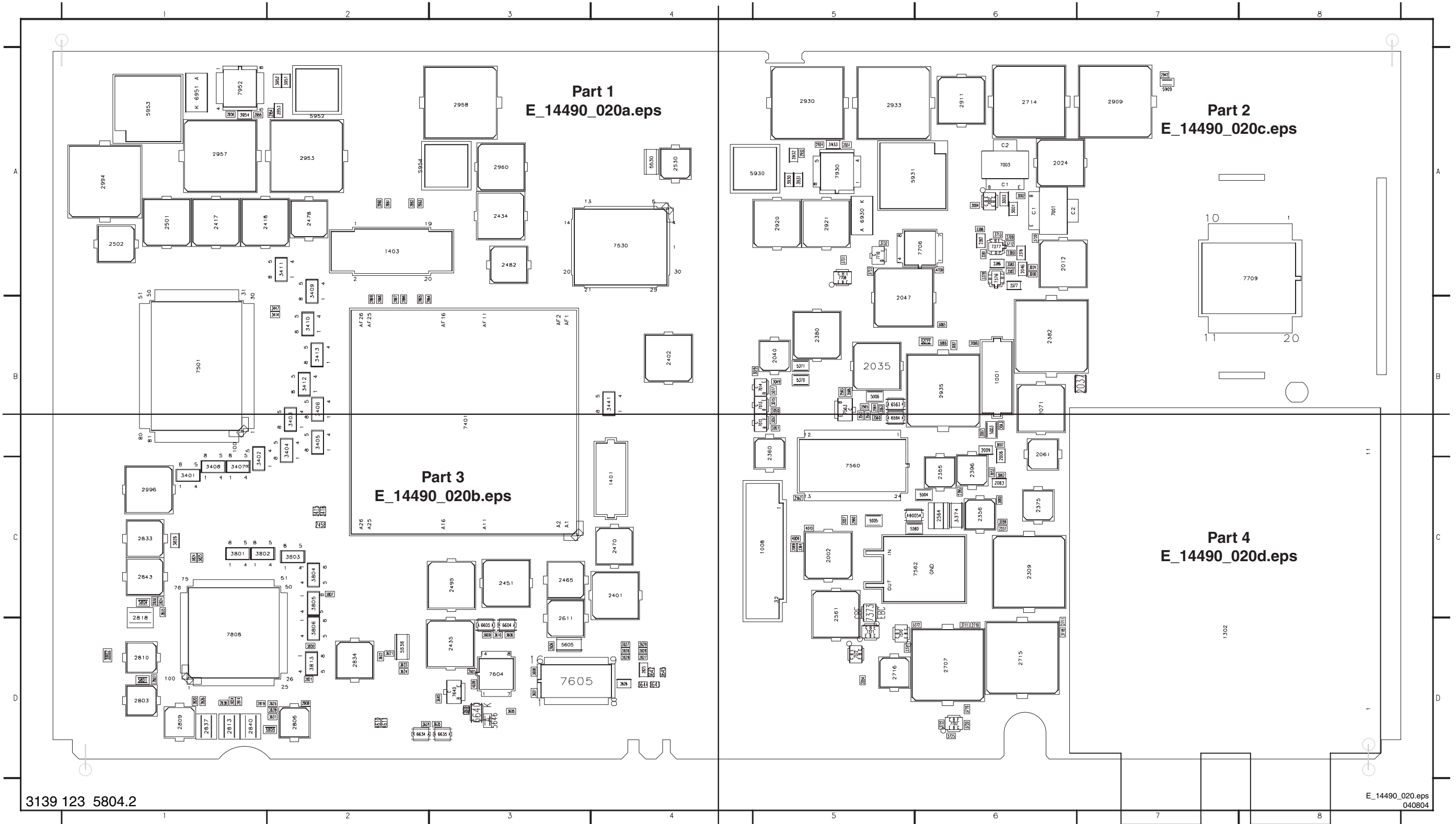
Layout TV & Scaler Board: (Part 3 Top Side)



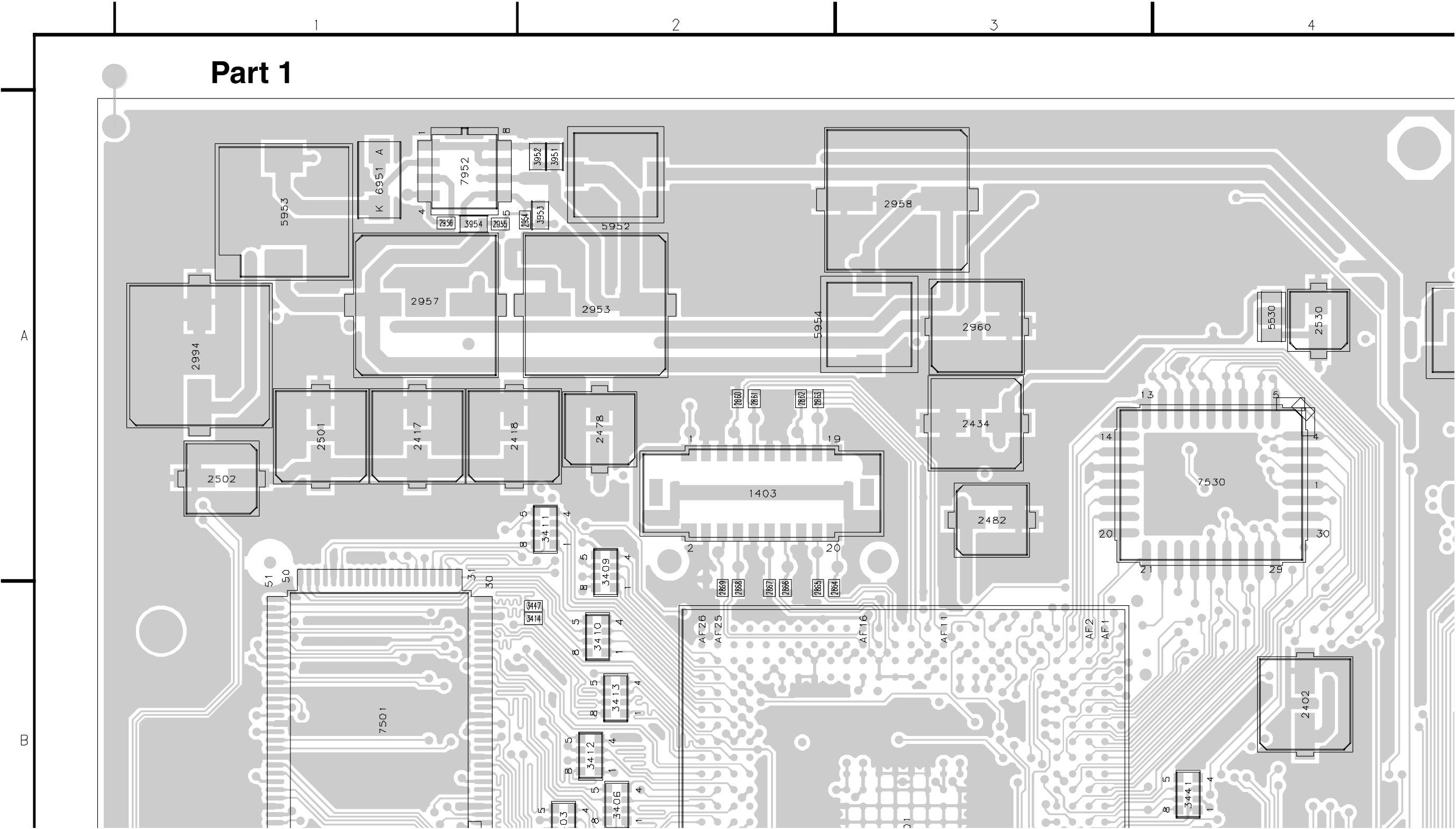
Layout TV & Scaler Board: (Part 4 Top Side)



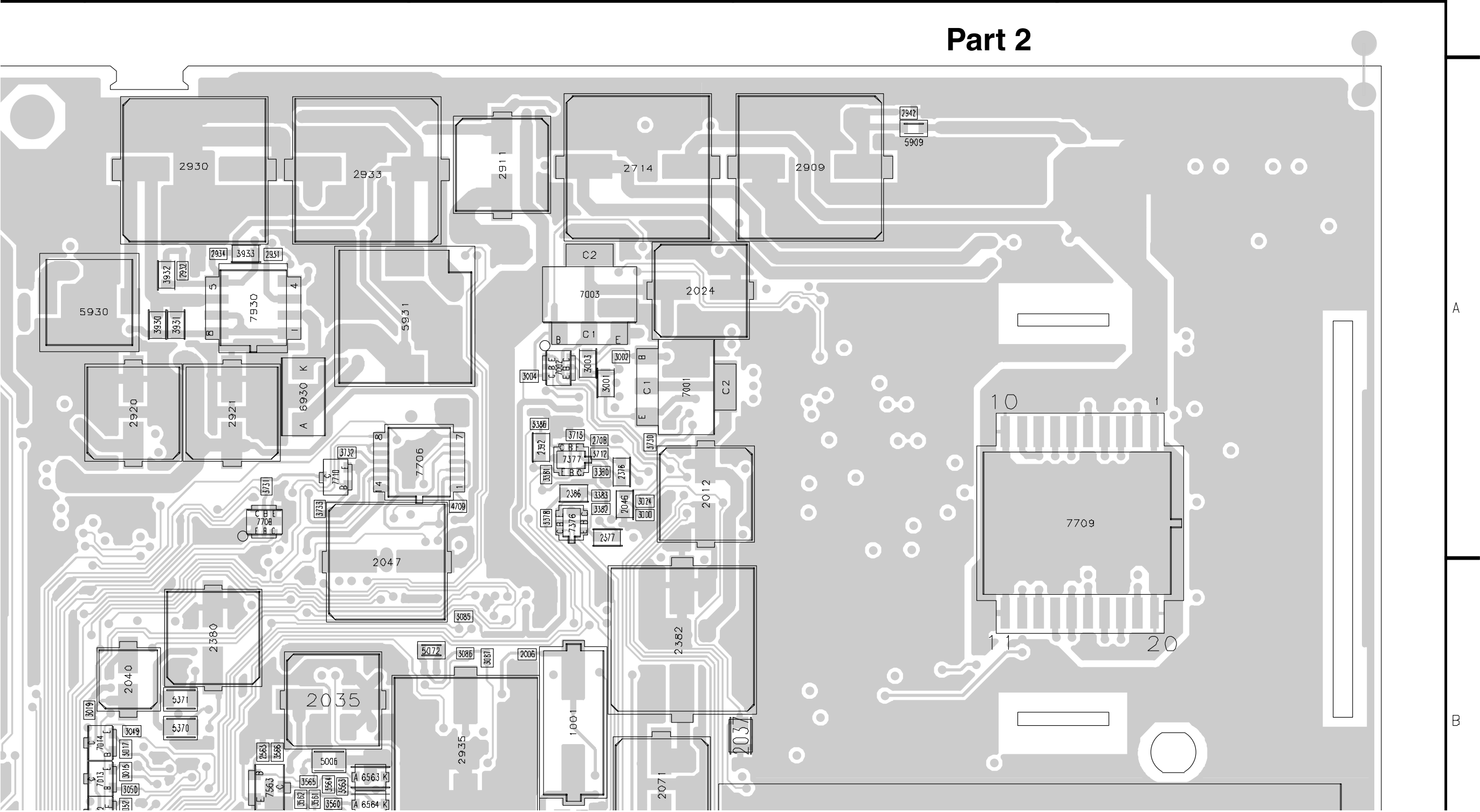
2001	B6	2027	C5	2309	C6	2392	A6	2465	C3	2563	B5	2708	A6	2810	D1	2834	D2	2865	B2	2932	A5	2960	A3	3019	B5	3087	B6	3386	A6	3411	A2	3563	B5	3622	D2	3643	D4	3730	A6	3813	D2	3932	A5	5003	B6	5801	D1	6563	B5	7003	A6	7630	A4	7710	A5
1008	C5	2035	B5	2355	C6	2395	C6	2470	C4	2563	B6	2710	D6	2813	D1	2837	D1	2866	B2	2933	A5	2994	A1	3024	A6	3359	C6	3401	C1	3412	B2	3564	B5	3623	D2	3644	D4	3731	A5	3821	D2	3933	A5	5004	C6	5802	D1	6564	B5	7012	B5	7560	C5	7808	D1
1401	C4	2040	B5	2356	C6	2396	C6	2478	A2	2605	D3	2711	D6	2814	D1	2838	D1	2867	B2	2934	A5	2996	C1	3049	B5	3364	C5	3402	C1	3413	B2	3565	B5	3624	D2	3645	D4	3732	A5	3824	C1	3951	A2	5005	C5	5804	C1	6604	D3	7013	B5	7562	C6	7930	A5
1403	A2	2043	B6	2357	C6	2401	C4	2482	A3	2606	D3	2714	A6	2818	D1	2839	D2	2868	B2	2935	B6	3000	A6	3050	B5	3371	D5	3403	B2	3414	B2	3566	B5	3627	D4	3711	D6	3733	A5	3825	C1	3952	A2	5006	B5	5805	D2	6605	D3	7014	B5	7563	B5		
2002	C5	2046	A6	2360	B5	2402	B4	2495	C3	2611	D3	2715	D6	2819	D1	2840	D1	2869	B2	2942	A7	3001	A6	3051	B5	3372	D6	3404	B2	3415	C2	3605	D3	3628	D4	3712	A6	3801	C1	3826	C1	3953	A2	5072	B6	5909	A7	6634	D2	7370	D5	7604	D3		
2006	B6	2047	B5	2375	C6	2417	A1	2501	A1	2625	D4	2716	D5	2820	D1	2843	C1	2909	A7	2953	A2	3002	A6	3052	B5	3374	C6	3405	B2	3416	C2	3606	D3	3629	D4	3713	A6	3802	C1	3830	D2	3954	A1	5370	B5	5930	A5	6635	D3	7371	D5	7605	D3		
2007	B6	2054	D5	2376	A6	2418	A1	2502	A1	2626	D4	2803	D1	2824	C1	2860	A2	2911	A6	2954	A2	3003	A6	3053	C6	3378	A6	3406	B2	3441	B4	3607	D3	3634	D2	3718	D6	3803	C2	3831	D2	4009	C5	5371	B5	5931	A5	6640	D3	7372	D5	7640	D3		
2008	B6	2061	B6	2377	A6	2434	A3	2530	A4	2627	D4	2806	D2	2825	D2	2861	A2	2920	A5	2955	A1	3004	A6	3060	C6	3380	A6	3407	C1	3447	B2	3608	D3	3635	D3	3719	D6	3804	C2	3834	D1	4010	C5	5530	A4	5952	A2	6930	A5	7376	A6	7702	D6		
2009	B6	2063	C6	2380	B5	2435	D3	2560	C5	2628	D4	2807	D1	2826	D1	2862	A2	2921	A5	2956	A1	3007	B6	3062	C6	3381	A6	3408	C1	3560	B5	3609	D3	3636	D3	3720	D6	3805	C2	3835	C1	4609	D3	5560	C5	5953	A1	6951	A1	7377	A6	7706	A6		
2012	A6	2071	B6	2382	B6	2451	C3	2561	C5	2629	D4	2808	D2	2830	C1	2863	A2	2930	A5	2957	A1	3015	B5	3085	B6	3382	A6	3409	A2	3561	B5	3610	D3	3640	D3	3722	D6	3806	D2	3930	A5	4636	D3	5605	D3	5954	A2	7001							



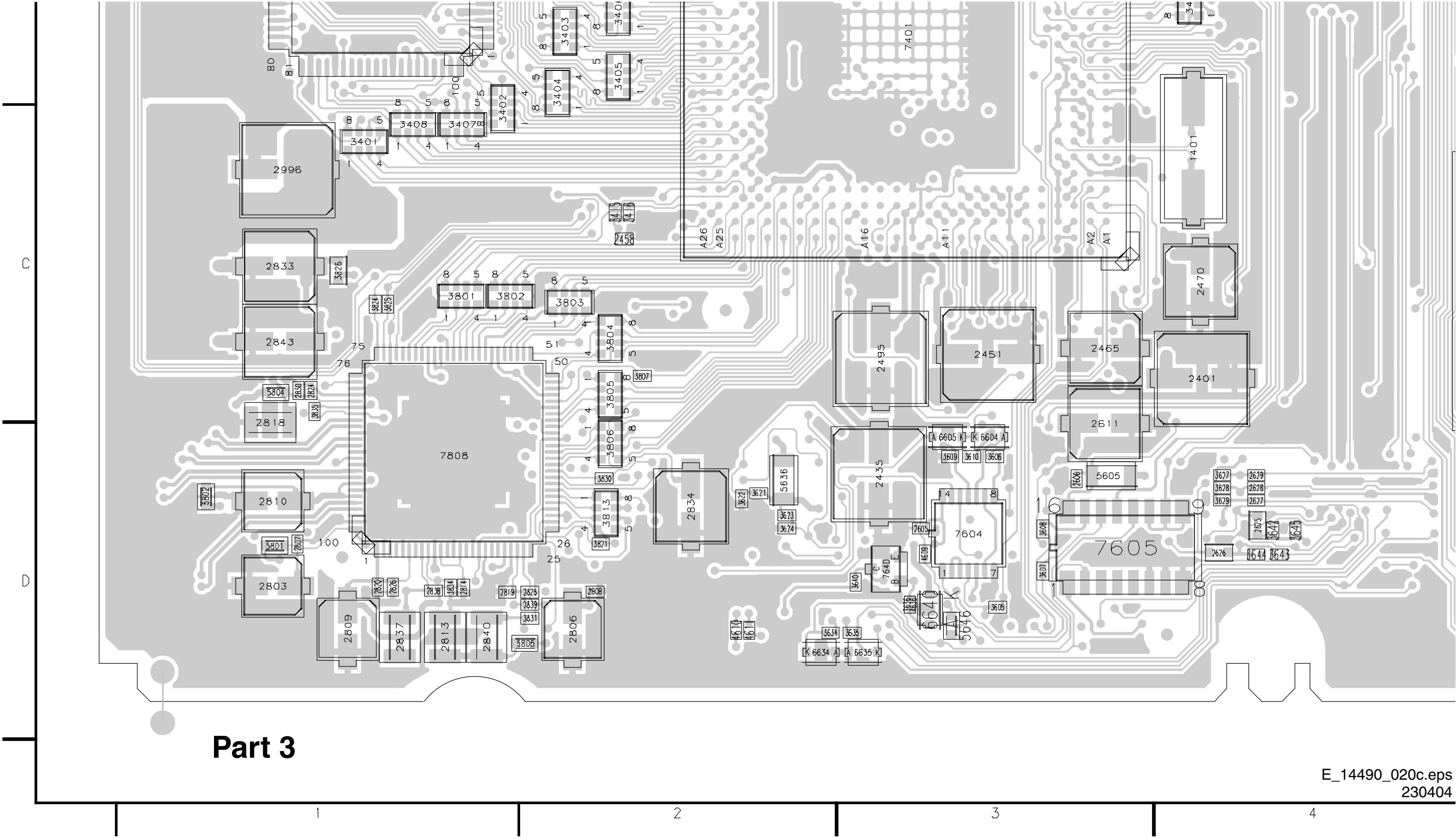
Layout TV & Scaler Board: (Part 1 Bottom Side)



Layout TV & Scaler Board: (Part 2 Bottom Side)

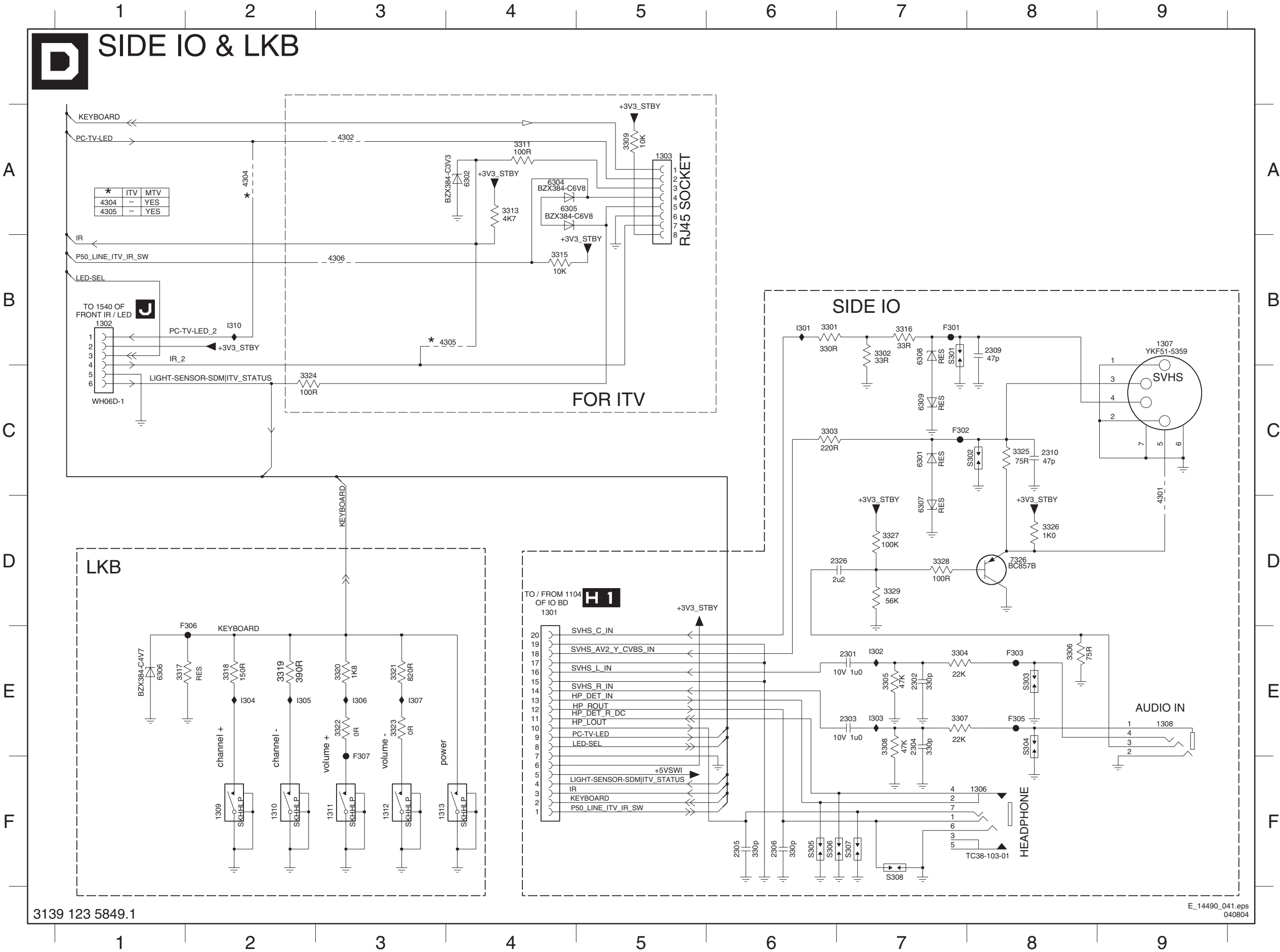


Layout TV & Scaler Board: (Part 3 Bottom Side)



E_14490_020d.eps
230404

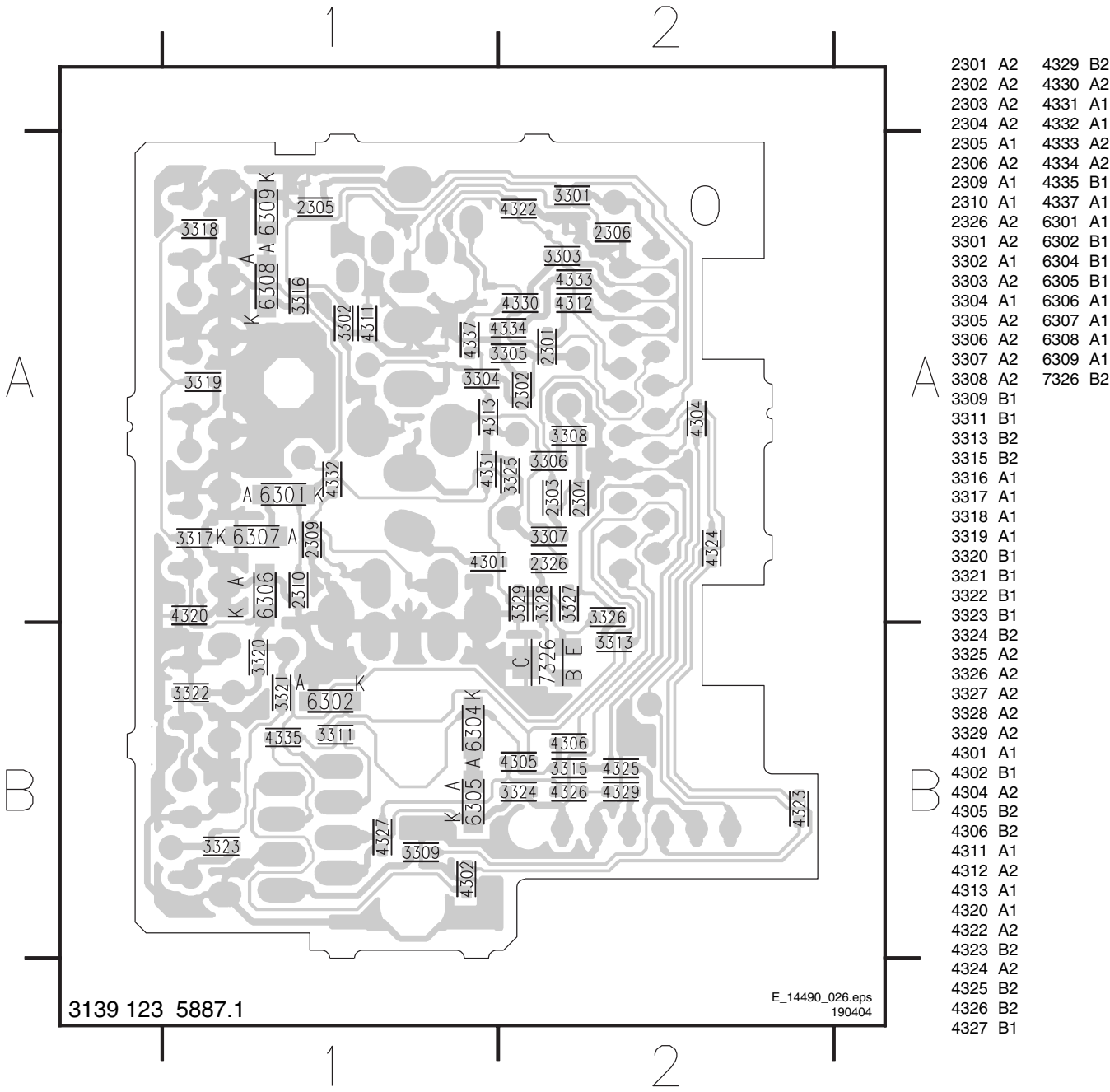
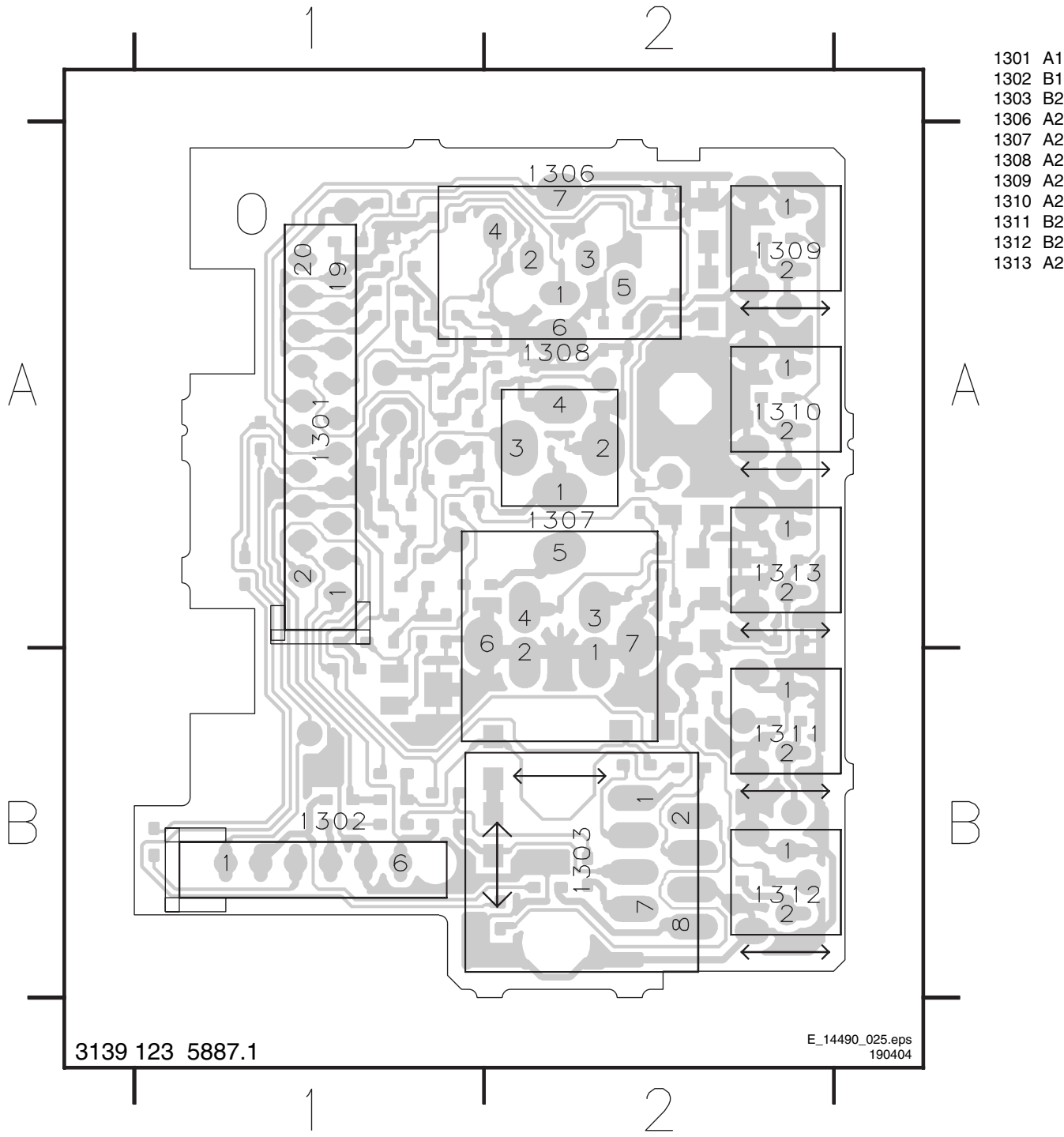
Side IO and LKB Panel



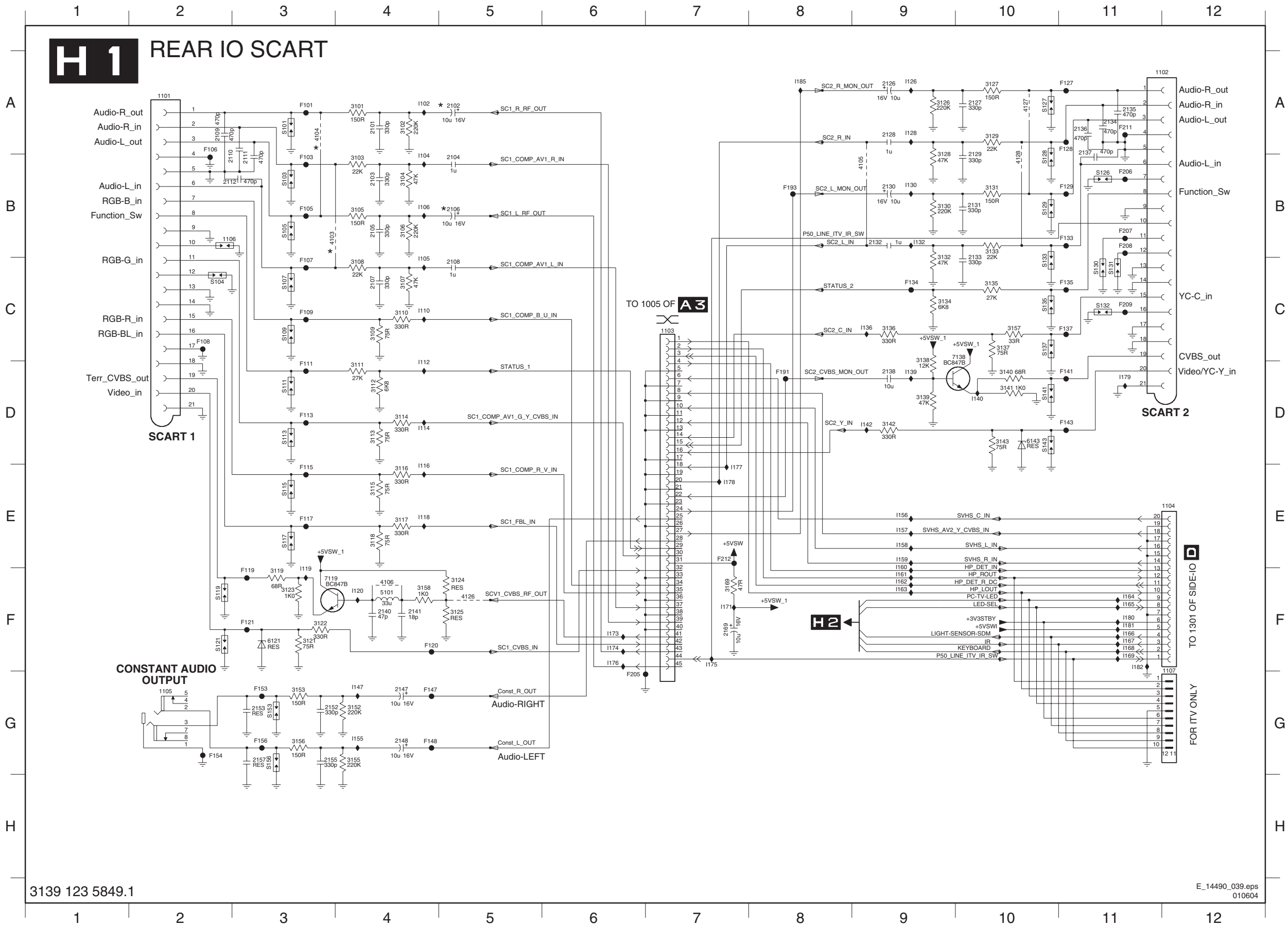
- 1301 D4
- 1302 B1
- 1303 A5
- 1306 F8
- 1307 B9
- 1308 E9
- 1309 F2
- 1310 F2
- 1311 F3
- 1312 F3
- 1313 F3
- 2301 E7
- 2302 E7
- 2303 E7
- 2304 E7
- 2305 F6
- 2306 F6
- 2309 B8
- 2310 C8
- 2326 D7
- 3301 B6
- 3302 B7
- 3303 C6
- 3304 E7
- 3305 E7
- 3306 E8
- 3307 E7
- 3308 E7
- 3309 A5
- 3311 A4
- 3313 A4
- 3315 B4
- 3316 B7
- 3317 E1
- 3318 E2
- 3319 E2
- 3320 E3
- 3321 E3
- 3322 E3
- 3323 E3
- 3324 C2
- 3325 C8
- 3326 D8
- 3327 D7
- 3328 D7
- 3329 D7
- 4301 C9
- 4302 A3
- 4304 A2
- 4305 B4
- 4306 B3
- 6301 C7
- 6302 A4
- 6304 A4
- 6305 A4
- 6306 E1
- 6307 D7
- 6308 B7
- 6309 C7
- 7326 D8
- F301 B7
- F302 C7
- F303 E8
- F305 E8
- F306 E2
- F307 F3
- I301 B6
- I302 E7
- I303 E7
- I304 E2
- I305 E2
- I306 E3
- I307 E3
- I310 B2
- S301 B7
- S302 C8
- S303 E8
- S304 E8
- S305 F6
- S306 F6
- S307 F7
- S308 F7

Layout Side IO and LKB Panel (Top Side)

Layout Side IO and LKB Panel (Bottom Side)

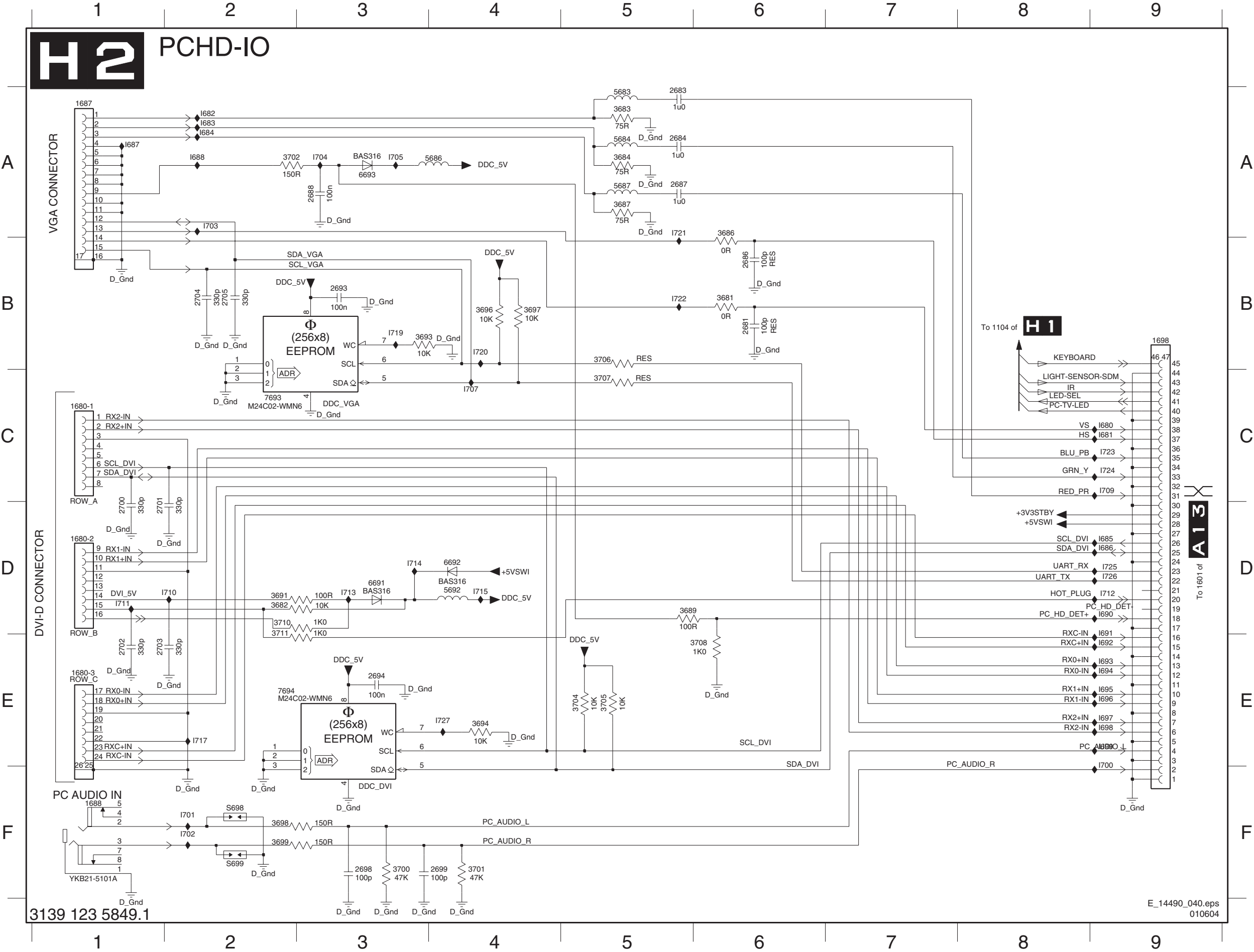


Rear IO Panel: Scart (17")



1101 A2	7138 C9	S130 C11
1102 A11	F101 A3	S131 C11
1103 C7	F103 B3	S132 C11
1104 E12	F105 B3	S133 C10
1105 G2	F106 A2	S135 C10
1106 B2	F107 C3	S137 C10
1107 G12	F108 C2	S141 D10
2101 A4	F109 C3	S143 D10
2102 A5	F111 D3	S153 G3
2103 B4	F113 D3	S156 G3
2104 B5	F115 E3	
2105 B4	F117 E3	
2106 B5	F119 F3	
2107 C4	F120 F4	
2108 C5	F121 F3	
2109 A2	F127 A11	
2110 B2	F128 A11	
2111 B3	F129 B11	
2112 B2	F133 B11	
2126 A9	F134 C9	
2127 A10	F135 C11	
2128 A9	F137 C11	
2129 B10	F141 D11	
2130 B9	F143 D11	
2131 B10	F147 G4	
2132 B9	F148 G4	
2133 C10	F153 G3	
2134 A11	F154 G2	
2135 A11	F156 G3	
2136 A11	F191 D8	
2137 A11	F193 B8	
2138 D9	F205 G6	
2140 F4	F206 B11	
2141 F4	F207 B11	
2147 G4	F208 B11	
2148 G4	F209 C11	
2152 G3	F211 A11	
2153 G3	F212 E7	
2155 G3	I102 A4	
2157 G3	I104 B4	
2169 F7	I105 C4	
3101 A4	I106 B4	
3102 A4	I110 C4	
3103 B4	I112 D4	
3104 B4	I114 D4	
3105 B4	I116 E4	
3106 B4	I118 E4	
3107 C4	I119 F3	
3108 C4	I120 F4	
3109 C4	I126 A9	
3110 C4	I128 A9	
3111 D4	I130 B9	
3112 D4	I132 B9	
3113 D4	I136 C9	
3114 D4	I139 D9	
3115 E4	I140 D10	
3116 E4	I142 D9	
3117 E4	I147 G4	
3118 E4	I155 G4	
3119 F3	I156 E9	
3121 F3	I157 E9	
3122 F3	I158 E9	
3123 F3	I159 E9	
3124 F5	I160 E9	
3125 F5	I161 F9	
3126 A9	I162 F9	
3127 A10	I163 F11	
3128 B9	I164 F11	
3129 A10	I165 F11	
3130 B9	I166 F11	
3131 B10	I167 F11	
3132 C9	I168 F11	
3133 B10	I169 F11	
3134 C9	I171 F7	
3135 C10	I173 F6	
3136 C9	I174 F6	
3137 C10	I175 F7	
3138 C9	I176 F6	
3139 D9	I177 E7	
3140 D10	I178 E7	
3141 D10	I179 D11	
3142 D9	I180 F11	
3143 D10	I181 F11	
3152 G4	I182 F11	
3153 G3	I185 A8	
3155 G4	S101 A3	
3156 G3	S103 B3	
3157 C10	S104 C2	
3158 F4	S105 B3	
3169 F7	S107 C3	
4103 B3	S109 C3	
4104 A3	S111 D3	
4105 B9	S113 D3	
4106 F4	S115 E3	
4126 F5	S117 E3	
4127 A10	S119 F2	
4128 B10	S121 F2	
5101 F4	S126 B11	
6121 F3	S127 A10	
6143 D10	S128 B10	
7119 F4	S129 B10	

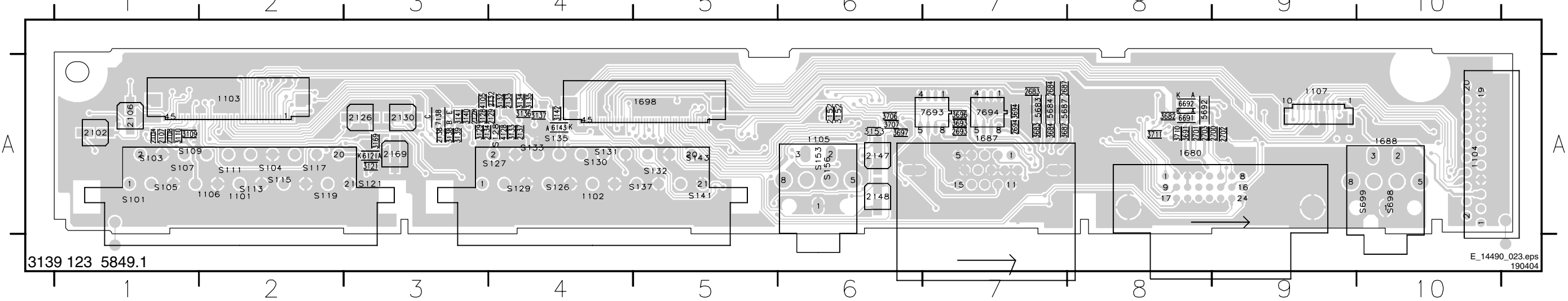
Rear IO Panel: PCHD-IO (17")



1680-1 C1	I701 F2
1680-2 D1	I702 F2
1680-3 E1	I703 A2
1687 A1	I704 A3
1688 F1	I705 A3
1698 B9	I707 C4
2681 B6	I709 C9
2683 A5	I710 D2
2684 A5	I711 D1
2686 B6	I712 D9
2687 A5	I713 D3
2688 A3	I714 D3
2693 B3	I715 D4
2694 E3	I717 E2
2698 F3	I719 B3
2699 F4	I720 B4
2700 D1	I721 A5
2701 D1	I722 B5
2702 E1	I723 C9
2703 E1	I724 C9
2704 B2	I725 D9
2705 B2	I726 D9
3681 B6	I727 E4
3682 D2	S698 F2
3683 A5	S699 F2
3684 A5	
3686 A6	
3687 A5	
3689 D5	
3691 D2	
3693 B3	
3694 E4	
3696 B4	
3697 B4	
3698 F2	
3699 F2	
3700 F3	
3701 F4	
3702 A2	
3704 E5	
3705 E5	
3706 B5	
3707 C5	
3708 E6	
3710 D2	
3711 E2	
5683 A5	
5684 A5	
5686 A4	
5687 A5	
5692 D4	
6691 D3	
6692 D4	
6693 A3	
7693 C2	
7694 E2	
I680 C9	
I681 C9	
I682 A2	
I683 A2	
I684 A2	
I685 D9	
I686 D9	
I687 A1	
I688 A2	
I690 D9	
I691 D9	
I692 E9	
I693 E9	
I694 E9	
I695 E9	
I696 E9	
I697 E9	
I698 E9	
I699 E9	
I700 E9	

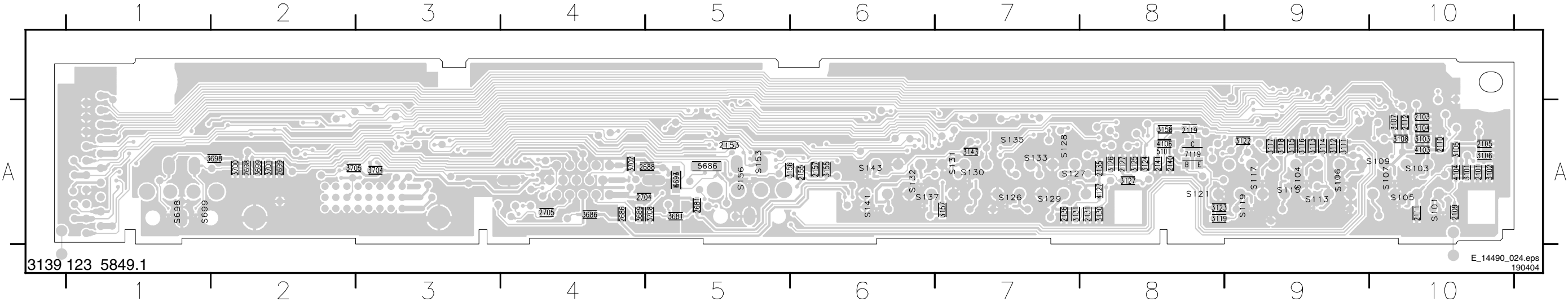
Layout Rear IO Panel (17") (Top Side)

1101 A2	1105 A6	1688 A10	2106 A1	2128 A3	2133 A4	2147 A6	2683 A7	2694 A7	2703 A8	3128 A3	3134 A4	3138 A3	3142 A4	3682 A8	3691 A8	3697 A6	3711 A8	5684 A7	6143 A4	7693 A7
1102 A4	1107 A9	1698 A5	2107 A1	2129 A4	2134 A3	2148 A6	2684 A7	2700 A9	3109 A1	3129 A3	3135 A4	3139 A3	3152 A6	3683 A7	3693 A7	3706 A6	4105 A3	5687 A7	6691 A8	7694 A7
1103 A2	1680 A8	2102 A1	2108 A1	2130 A3	2137 A4	2152 A6	2687 A7	2701 A8	3110 A1	3132 A4	3136 A4	3140 A3	3153 A6	3684 A7	3694 A7	3707 A6	4128 A4	5692 A8	6692 A8	
1104 A10	1687 A7	2104 A1	2126 A3	2132 A4	2138 A3	2169 A3	2693 A7	2702 A9	3121 A3	3133 A4	3137 A4	3141 A3	3169 A3	3687 A7	3696 A7	3710 A8	5683 A7	6121 A3	7138 A3	

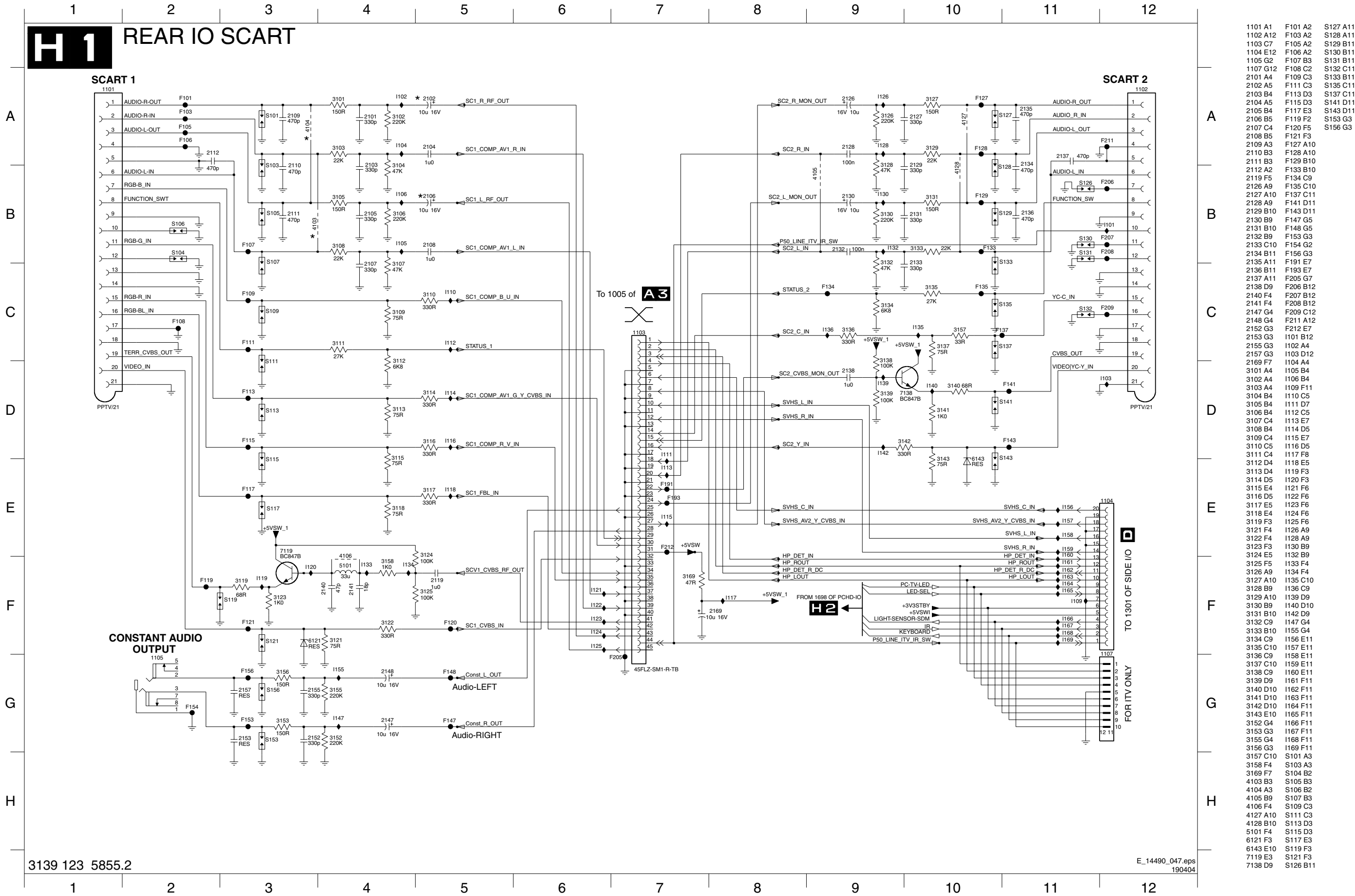


Layout Rear IO Panel(17") (Bottom Side)

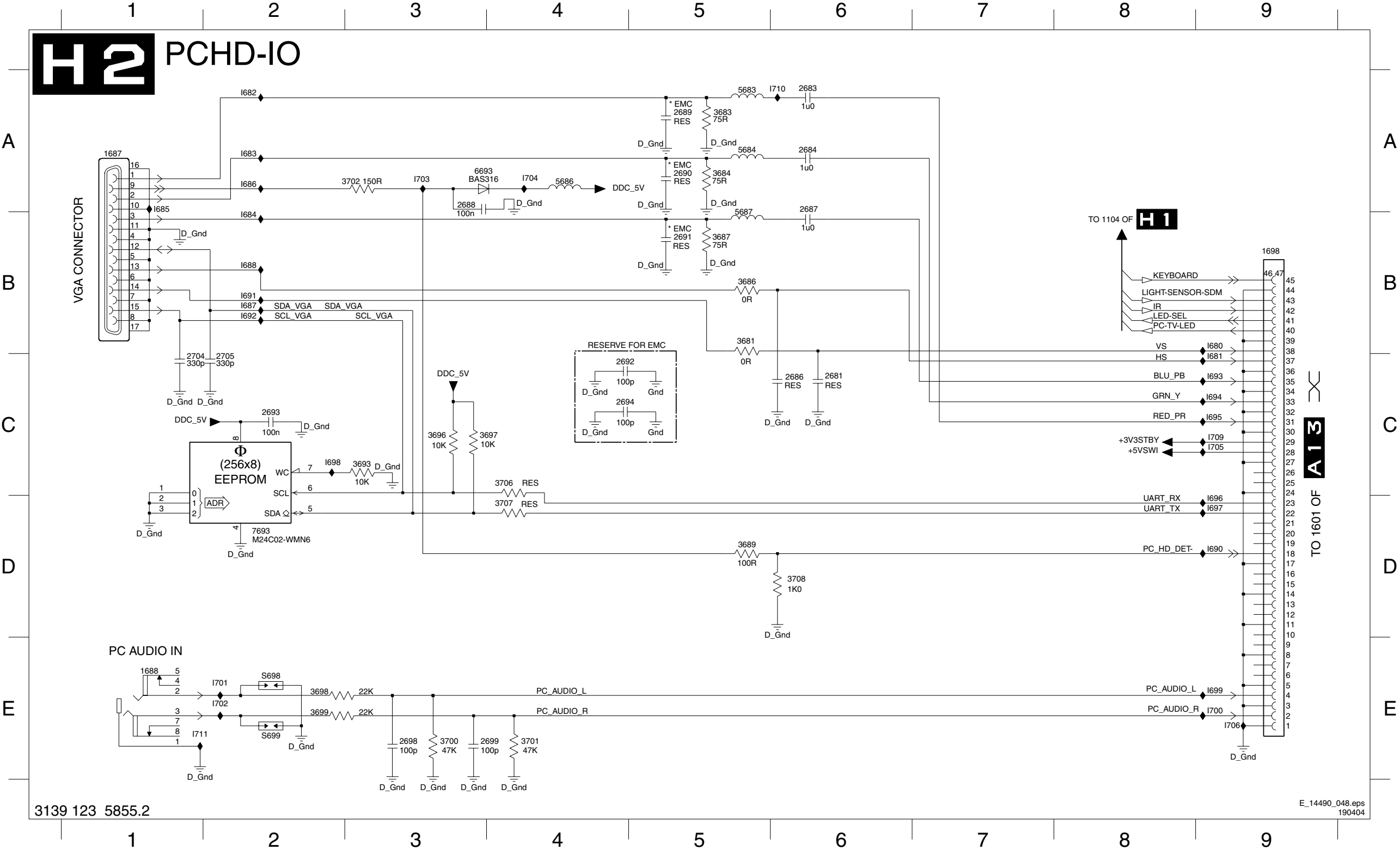
2105 A10	2119 A8	2140 A8	2681 A5	2704 A4	3104 A10	3111 A9	3116 A9	3123 A8	3130 A8	3157 A7	3698 A2	3704 A3	4106 A8	7119 A8
2109 A10	2127 A8	2141 A8	2686 A4	2705 A4	3105 A10	3112 A9	3117 A9	3124 A8	3131 A7	3158 A8	3699 A2	3705 A2	4127 A8	
2110 A10	2131 A8	2153 A5	2688 A5	3101 A10	3106 A10	3113 A9	3118 A9	3125 A8	3143 A7	3681 A5	3700 A2	3708 A5	5101 A8	



Rear IO Panel: Scart (23"/26")



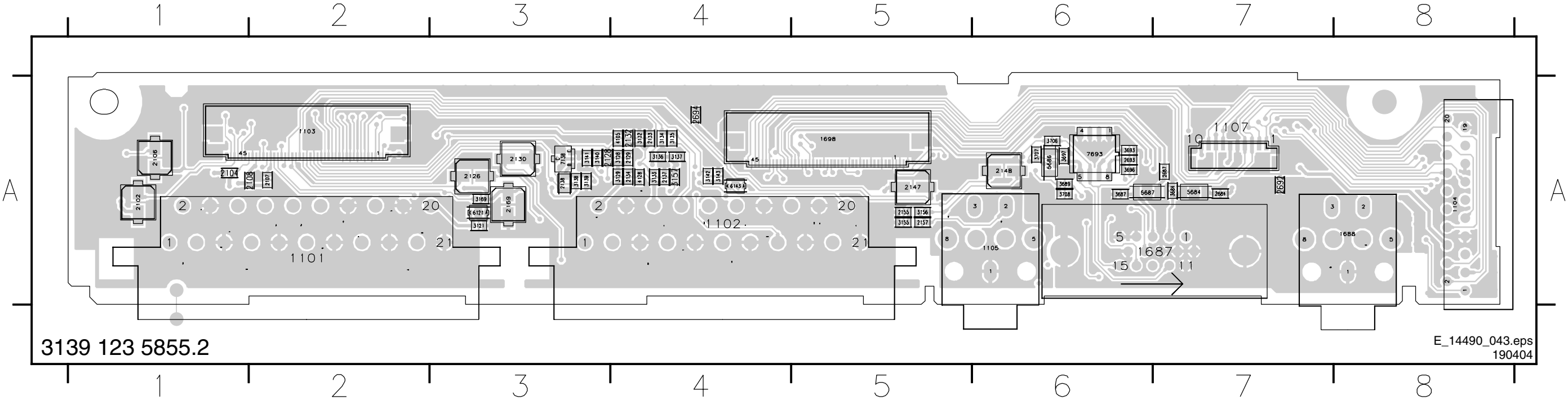
Rear IO Panel: PCHD-IO (23"/26")



- 1687 A1
- 1688 E1
- 1698 B9
- 2681 C6
- 2683 A6
- 2684 A6
- 2686 C6
- 2687 B6
- 2688 A3
- 2689 A5
- 2690 A5
- 2691 B5
- 2692 C4
- 2693 C2
- 2694 C4
- 2698 E3
- 2699 E4
- 2704 C1
- 2705 C2
- 3681 B5
- 3683 A5
- 3684 A5
- 3686 B5
- 3687 B5
- 3689 D5
- 3693 C3
- 3696 C3
- 3697 C4
- 3698 E2
- 3699 E2
- 3700 E3
- 3701 E4
- 3702 A3
- 3706 C4
- 3707 D4
- 3708 D6
- 5683 A5
- 5684 A5
- 5686 A4
- 5687 B5
- 6693 A3
- 7693 D2
- I680 B9
- I681 C9
- I682 A2
- I683 A2
- I684 B2
- I685 A1
- I686 A2
- I687 B2
- I688 B2
- I690 D9
- I691 B2
- I692 B2
- I693 C9
- I694 C9
- I695 C9
- I696 D9
- I697 D9
- I698 C2
- I699 E9
- I700 E9
- I701 E2
- I702 E2
- I703 A3
- I704 A4
- I705 C9
- I706 E9
- I709 C9
- I710 A6
- I711 E1
- S698 E2
- S699 E2

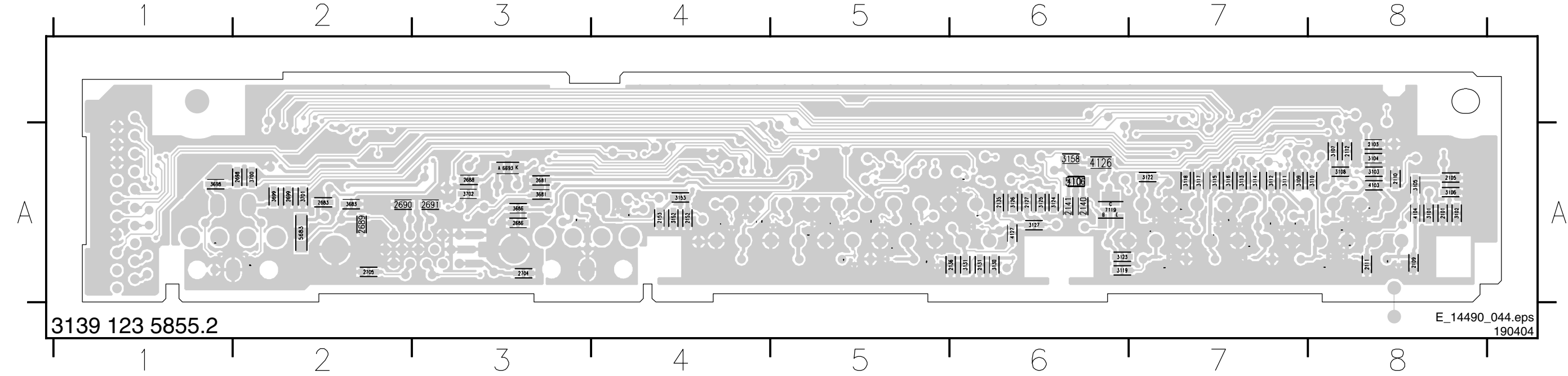
Layout Rear IO Panel (23"/26") (Top Side)

1101 A2	1105 A6	1698 A5	2107 A2	2129 A4	2134 A4	2148 A6	2684 A7	2694 A4	3132 A4	3136 A4	3140 A3	3155 A5	3684 A7	3696 A6	3708 A6	5686 A6	7138 A3
1102 A4	1107 A7	2102 A1	2108 A2	2130 A3	2137 A4	2155 A5	2687 A7	3121 A3	3133 A4	3137 A4	3141 A3	3156 A5	3687 A6	3697 A6	4105 A4	5687 A6	7693 A6
1103 A2	1687 A7	2104 A1	2126 A3	2132 A4	2138 A3	2157 A5	2692 A7	3128 A4	3134 A4	3138 A3	3142 A4	3157 A4	3689 A6	3706 A6	4128 A4	6121 A3	
1104 A8	1688 A8	2106 A1	2128 A3	2133 A4	2147 A5	2169 A3	2693 A6	3129 A4	3135 A4	3139 A3	3143 A4	3169 A3	3693 A6	3707 A6	5684 A7	6143 A4	

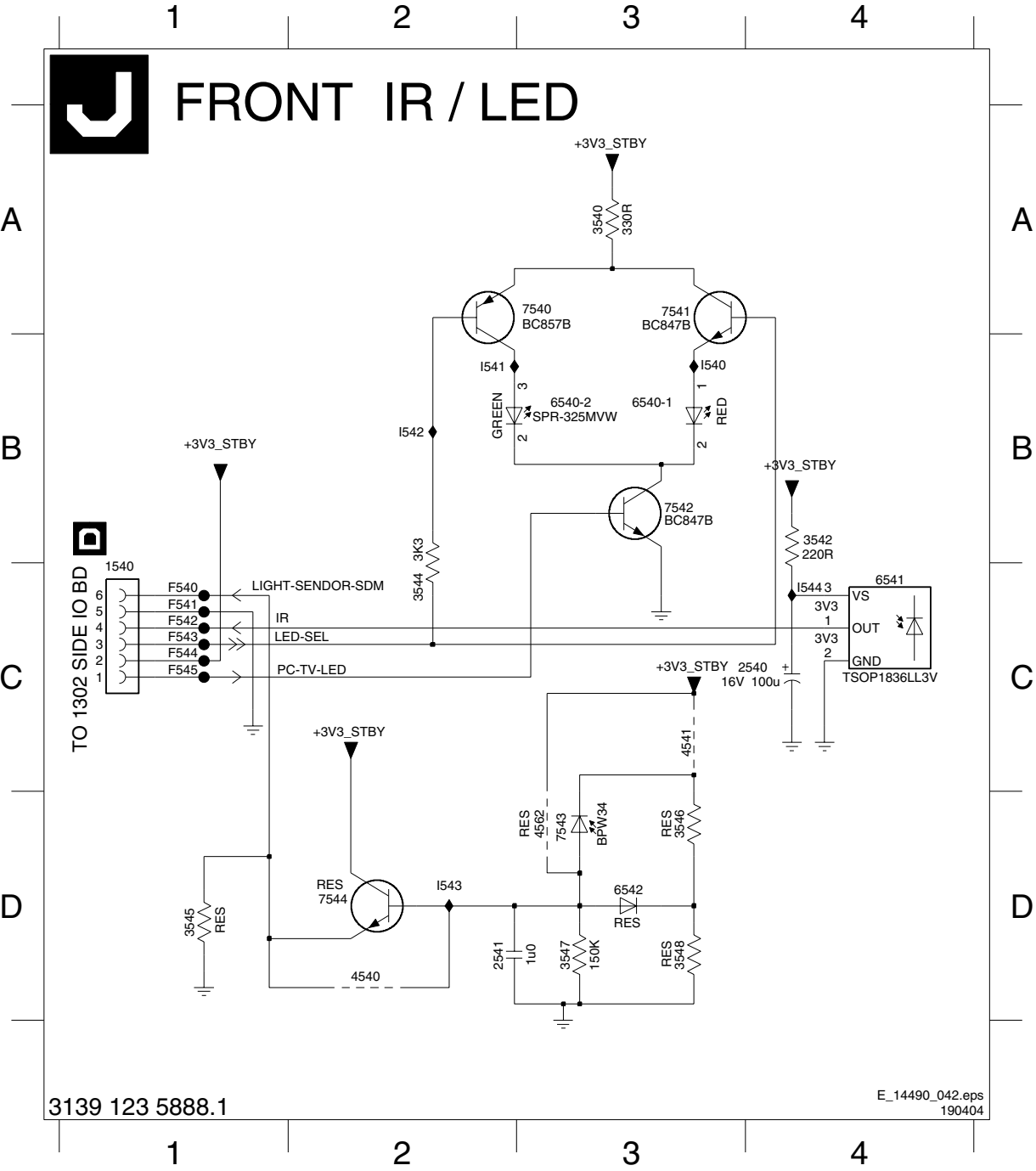


Layout Rear IO Panel (23"/26") (Bottom Side)

2101 A8	2110 A8	2131 A6	2141 A6	2683 A2	2690 A2	2704 A3	3103 A8	3107 A8	3111 A7	3115 A7	3119 A6	3125 A6	3131 A6	3681 A3	3699 A2	4103 A8	4127 A6	7119 A6
2103 A8	2111 A8	2135 A6	2152 A4	2686 A3	2691 A3	2705 A2	3104 A8	3108 A8	3112 A7	3116 A7	3122 A7	3126 A6	3152 A4	3683 A2	3700 A2	4104 A8	5101 A6	
2105 A8	2112 A8	2136 A6	2153 A4	2688 A3	2698 A2	3101 A8	3105 A8	3109 A7	3113 A7	3117 A7	3123 A6	3127 A6	3153 A4	3686 A3	3701 A2	4106 A6	5683 A2	
2109 A8	2127 A6	2140 A6	2681 A3	2689 A2	2699 A2	3102 A8	3106 A8	3110 A8	3114 A7	3118 A7	3124 A6	3130 A6	3158 A6	3698 A1	3702 A3	4126 A6	6693 A3	

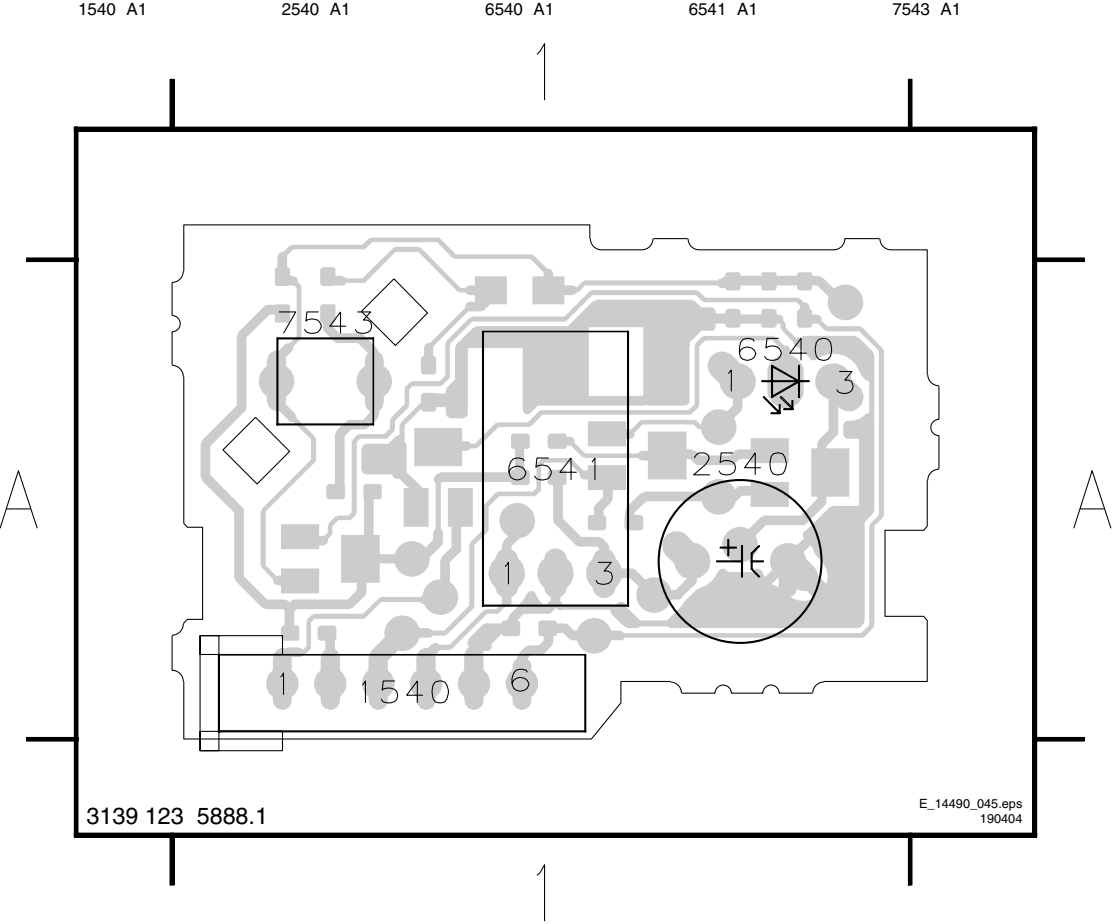


Front IR / LED Panel

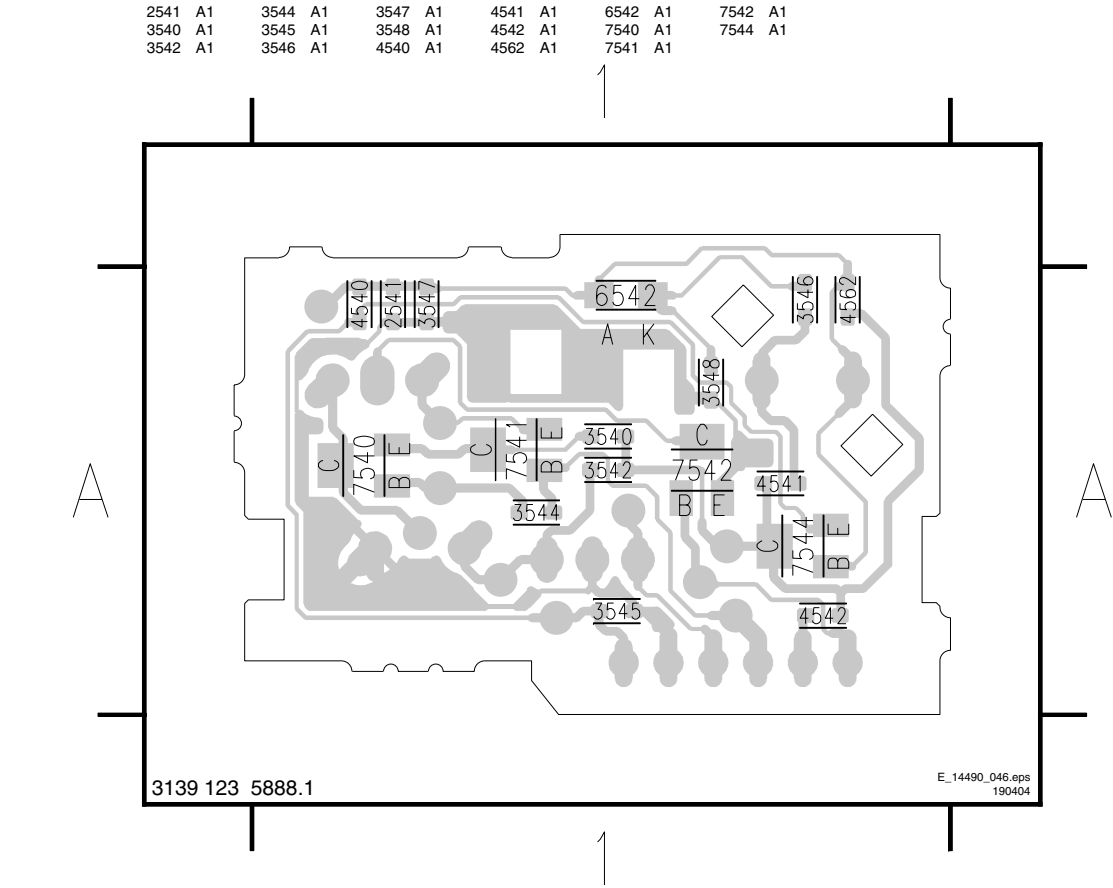


- 1540 B1
- 2540 C4
- 2541 D2
- 3540 A3
- 3542 B4
- 3544 C2
- 3545 D1
- 3546 D3
- 3547 D3
- 3548 D3
- 4540 D2
- 4541 C3
- 4562 D3
- 6540-1 B3
- 6540-2 B3
- 6541 C4
- 6542 D3
- 7540 A3
- 7541 A3
- 7542 B3
- 7543 D3
- 7544 D2
- F540 C1
- F541 C1
- F542 C1
- F543 C1
- F544 C1
- F545 C1
- I540 B3
- I541 B2
- I542 B2
- I543 D2
- I544 C4

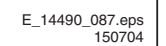
Layout Front IR / LED Panel (Top Side)



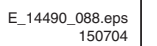
Layout Front IR / LED Panel (Bottom Side)



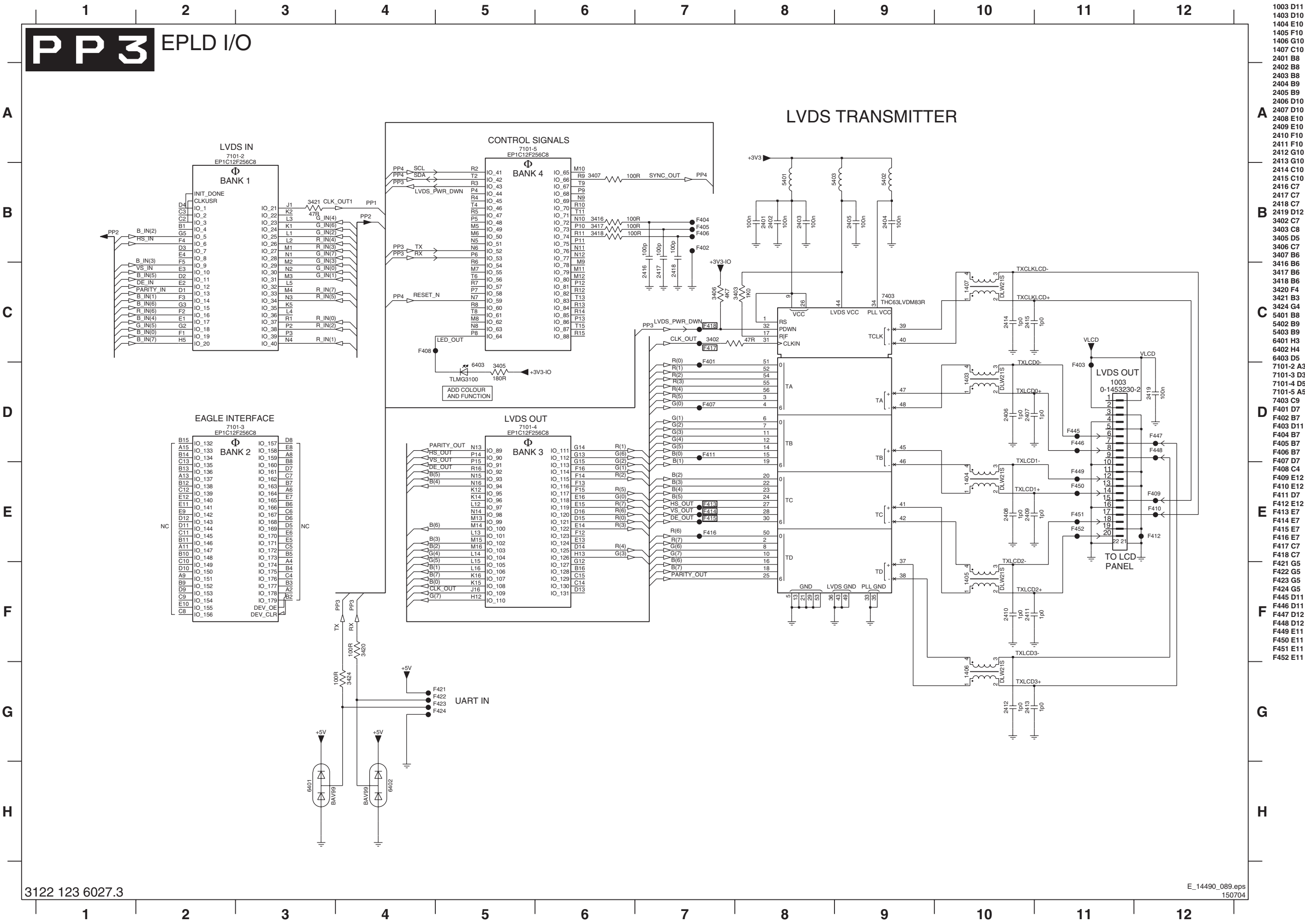
PP1 EPLD CONTROL



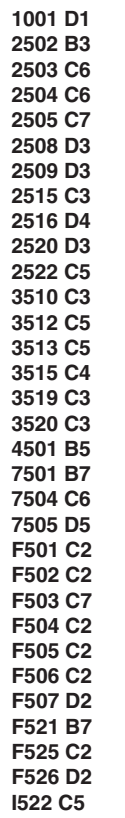
12002 C1 12006 B4	12007 C4 12009 D4	12100 D4 12111 E4	12201 B8 12202 B8	12203 B8 12204 B7	12205 B7 12206 C3	12207 C3 12208 E2	12209 E2 12210 E3	12211 E3 12212 E3	12213 E3 12214 E2	12215 E3 12216 C2	12302 B6 12304 B4	12307 C4 12310 D4	12313 D4 12316 E4	12501 A8 12502 A8	12503 A7 12701 C7	12701 E7 12702 C9	12703 C9 12706 D9	12707 E9 12708 D9	12709 D9 12710 D9	12712 C2 12713 C2	12714 D2 12715 D2	12716 D2 12717 D2	12718 C1 12719 D1	12720 D1 12721 D1	12702 C6
		1	2		3		4		5		6		7		8		9						10		



Pixel Plus Panel: EPLD I/O



PP4 POWER SUPPLY



1206	C1	2403	B1	3520	D1
1207	C1	2404	A1	4501	D1
1209	C1	2405	A1	5101	B1
1210	C1	2406	A1	5104	B1
1211	C1	2407	A1	5105	B1
1403	A1	2408	A1	5107	C1
1404	A1	2409	A1	5201	C1
1405	A1	2410	A1	5202	C1
1406	A1	2411	A1	5203	C1
1407	A1	2412	A1	5401	A1
2101	B1	2413	A1	5402	A1
2102	A1	2414	A1	5403	A1
2103	A1	2415	A1	6401	D1
2104	B1	2416	C1	6402	D1
2106	A1	2417	C1	7102	C1
2107	B1	2418	C1	7108	A1
2108	B1	2502	D1	7110	B1
2110	B1	2504	D1	7501	D1
2112	B1	2505	D1	7504	D1
2113	B1	2508	D1	7505	D1
2114	C1	2509	D1		
2115	B1	2515	D1		
2116	B1	2516	D1		
2121	B1	2520	D1		
2122	B1	2522	D1		
2123	B1	3101	B1		
2124	B1	3102	B1		
2130	B1	3103	B1		
2131	B1	3104	B1		
2132	B1	3105	B1		
2133	B1	3106	B1		
2134	B1	3107	B1		
2135	C1	3108	B1		
2139	B1	3109	B1		
2140	B1	3110	A1		
2141	B1	3111	C1		
2142	B1	3113	C1		
2143	B1	3114	C1		
2144	B1	3115	C1		
2145	B1	3116	B1		
2146	B1	3117	B1		
2147	B1	3118	B1		
2148	C1	3122	A1		
2149	B1	3125	B1		
2150	C1	3204	C1		
2201	C1	3207	C1		
2202	C1	3210	C1		
2203	C1	3213	C1		
2204	C1	3216	C1		
2205	C1	3402	B1		
2206	C1	3403	A1		
2207	C1	3405	B1		
2208	C1	3407	B1		
2209	C1	3416	C1		
2210	C1	3417	C1		
2211	C1	3418	C1		
2212	C1	3421	B1		
2213	C1	3510	D1		
2214	C1	3512	D1		
2215	C1	3513	D1		
2401	B1	3515	D1		
2402	B1	3519	D1		

This image shows a full page of blank, lined paper. It features approximately 30 evenly spaced horizontal grey lines across the entire width of the page. The lines are thin and consistent in color and thickness. There are no margins, text, or other markings present on the paper.

8. Alignments

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: $R_i > 10 \text{ M ohm}$; $C_i < 2.5 \text{ pF}$.

8.3.1 SAM Menu

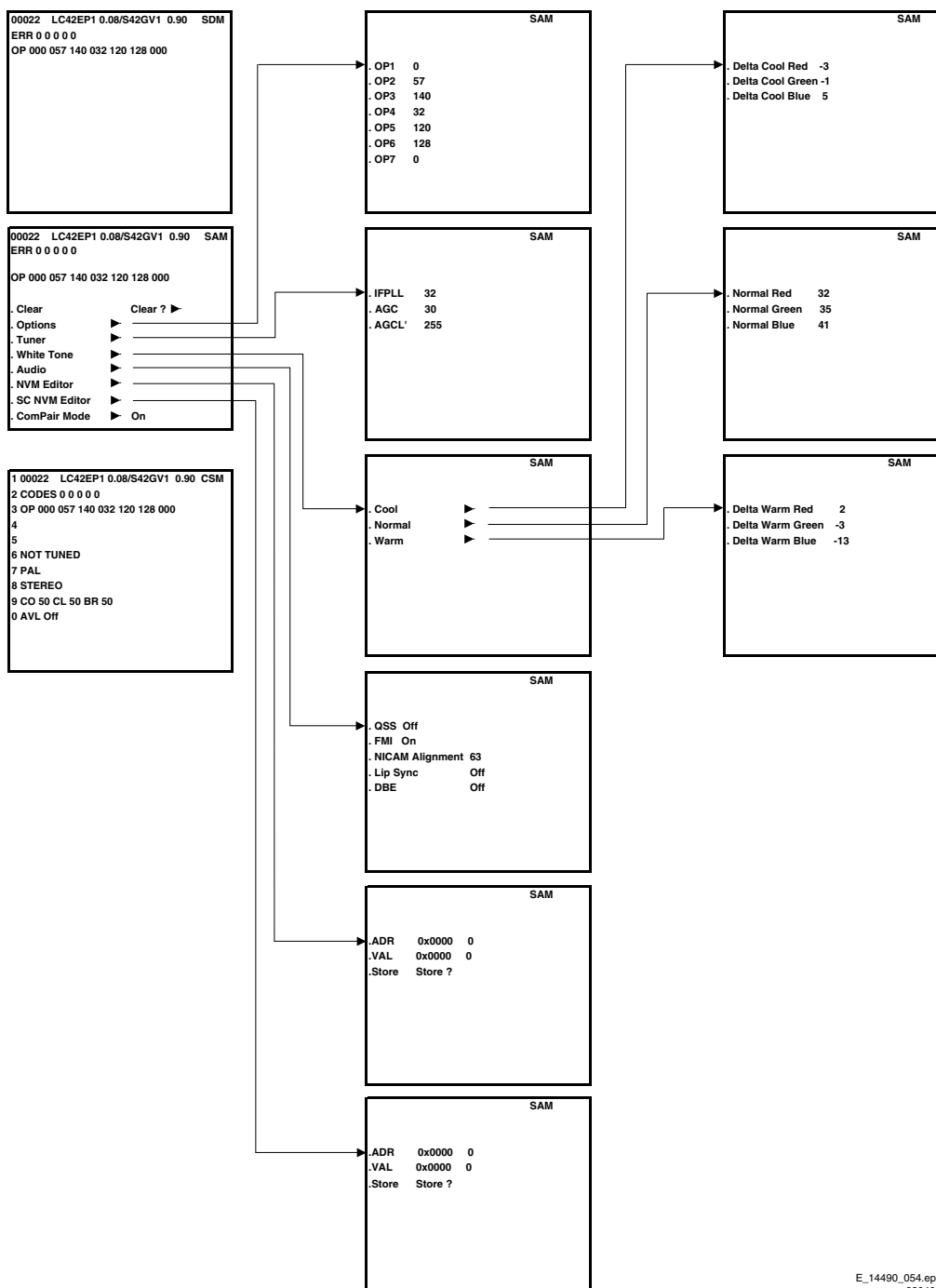


Figure 8-1 SAM Menu

8.3.2 White Tone

In the White Tone sub menu the colour values for the colour temperature values can be changed.
 The colour temperature mode (Normal, Delta Cool, Delta Warm) or the colour (R, G, B) can be selected with the Right/ Left cursor keys. The mode or value can be changed with the Up/Down cursor keys.
 First the values for the Normal colour temperature should be selected. Range: 0-255, 128 represent the middle of the value (no offset difference). Then the offset values for the Delta Cool and Delta Warm mode can be selected. Note that the alignment values are non-linear. The range is: -50 to +50, 0 represents the middle value, (no offset difference).

Input signal strength: >=10 mV rms (80 dBμV) terminal voltage.
 Input injection point: Aerial input.

Alignment Method

Initial Set-up

- 12 minutes soaking time before carrying out Colour Temp alignment.
- Incredible Picture/Contrast+ and Active Control & Light Sensor must be switched Off for proper tracking.
- Set all colour temperature settings to their initial values, i.e. Red=135; Green=128; Blue=133.
- The offset values for Cool & Warm should be preloaded into NVM.
- The alignment is done for Normal only.

Method of alignments

1. Place the colour sensor of the meter at the centre of the screen with standard orientation (at 0 degree orientation).
2. Set the meter in (T, delta UV, Y) mode.
3. Set Brightness and Colour to nominal (Factory mode, Brightness 60).
4. Set Colour temp to normal.
5. Set Contrast to make the light output Y on the meter 250 nit +/-10%.
6. Set Green=128.
7. Adjust Red and Blue to bring delta UV and T to the value as in the table.
8. Repeat the procedure if necessary to obtain the values as in the table.

Expected Results

- Measured parameters: Refer to table,
- Specifications: Refer to table,
- Units of measurement: Kelvin.

Table 8-1 Colour temperatures

Colour temp.	NORMAL		COOL		WARM	
	T (K)	ΔUV	T (K)	ΔUV	T (K)	ΔUV
EUROPE	8500	-003	11500	-005	7000	-005
Tolerance	+/-10%	+/-003	+/-10%	+/-003	+/-10%	+/-003

8.3.3 Tuner Adjustment

AGC (RF AGC Take Over Point)
 Set pattern generator (e.g. PM5580) with colour bar pattern and connect to aerial input with RF signal amplitude - 10mV and set frequency for PAL/SECAM to 475.25 MHz. For France select the L'-signal.

- Activate the SAM-menu. Go to the sub-menu Tuner, select the sub-menu option AFC Window and adjust the value to 100kHz.
- Select the AGC sub-menu.
- Connect a DC multi-meter to F306 pin1 of the tuner.

- Adjust the AGC until the voltage at pin 1 of the tuner is 3.3 Volts +0.5 / -1.0.
- The value can be incremented or decremented by pressing the right/left Menu-button on the RC.
- Switch the set to standby to store the data.

8.3.4 Grey Scale Adjustment

SDTV Grey Scale Adjustment

Equipment and setting

- E.g. Fluke 54200 or Philips PM5580.
- 100% "8-step grey scale" pattern.

Alignment Method

- Switch to TV mode,
- Press the MUTE button on RC,
- Set SMART PICTURE to SOFT mode,
- Activate the auto color function by pressing key-sequence: "INFO - MUTE - MUTE - MUTE - INFO - MENU - INFO"

Expected Results

- Visual check if the 8 Grey levels are correct.

Analog PC Grey Scale Adjustment

Equipment and setting

- Quantum Data 802B.
- PC input signal, with 64 levels Grey scale pattern, 1024x768 @ 60Hz (Format= 81:DMT1060, Pattern= 123:Grey 64).
- PC input at D-sub VGA connector.

Alignment Method

- Switch to "PC" mode.
- Press the MUTE button on RC.
- Set BRIGHTNESS and CONTRAST to nominal "50".
- Activate the auto color function by pressing key-sequence: "INFO - MUTE - MUTE - MUTE - INFO - MENU - INFO".

Expected Results

- Visual check if the 64 Grey levels are correct.

HD Grey Scale Adjustment

Equipment and setting

- Quantum Data 802B.
- HD input signal, Top half 100% color bar and bottom half Grey scale pattern, 1920x1080i@60Hz YPbPr (Format= 1080i30, Pattern= HDBar100).
- HD input at D-sub VGA connector.

Alignment Method

- Switch to HD mode.
- Press the MUTE button on RC.
- Activate the auto color function by pressing key-sequence: "INFO - MUTE - MUTE - MUTE - INFO - MENU - INFO".

Expected Results

- Visual check if Color bar tint and Grey scale is correct.

8.3.5 Sound

No adjustments needed for sound.

The default values for the audio alignments are:

- QSS: On
- FMI: Off
- NICAM Alignment: 63
- Lip Sync: Off
- DBE: Off

8.3.6 Options

Options are used to control the presence/absence of certain features and hardware.

How to change an Option Byte

An Option Byte represents a number of different options. Changing these bytes directly makes it possible to set all 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 value.

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).

Note: The option values mentioned in the table below are subject to change.

Table 8-2 Option values per model

	17PF9946/12		23PF9946/12		26PF9946/12	
Option Byte	Total Dec Values	Total Hex Values	Total Dec Values	Total Hex Values	Total Dec Values	Total Hex Values
OP1	154	9A	154	9A	154	9A
OP2	21	15	21	15	21	15
OP3	14	0E	14	0E	14	0E
OP4	17	11	17	11	17	11
OP5	252	FC	252	FC	252	FC
OP6	27	1B	27	1B	27	1B
OP7	3	03	3	03	3	03

	23PF9956/12		26PF9956/12	
Option Byte	Total Dec Values	Total Hex Values	Total Dec Values	Total Hex Values
OP1	154	9A	154	9A
OP2	21	15	21	15
OP3	14	0E	14	0E
OP4	17	11	17	11
OP5	252	FC	252	FC
OP6	27	1B	27	1B
OP7	3	03	3	03

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

Index of this chapter

1. Introduction
2. Block Diagram
3. Power Supply
4. Input/Output
5. Tuner and IF
6. Video: TV Part
7. Video: Scaler Part
8. Audio Processing
9. Control
10. LCD Display
11. Abbreviation List
12. IC Data Sheets

9.1 Introduction

The LC4.2 LCD TV is a global LCD TV for the year 2004. It is the successor of the LC03 LCD TV and covers screens sizes 17, 23 and 26 inch (all in 16:9 ratio) and has a new styling, called Disc.

This chassis has the following (new) features:

- **Audio:** The sound processor is part of the UOC processor (called "Hercules"). The chassis has a FM Radio with 40 preset channels.
- **Video:** Enhanced video features, video drivers, Active Control and multiple PIP.

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 (TDA120xx, item 7011), 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 color decoder.
- One Xtal reference for all functions (microprocessor, RCP, TXT/CC, RDS, color decoder, and stereo sound processor).

9.2 Block Diagram

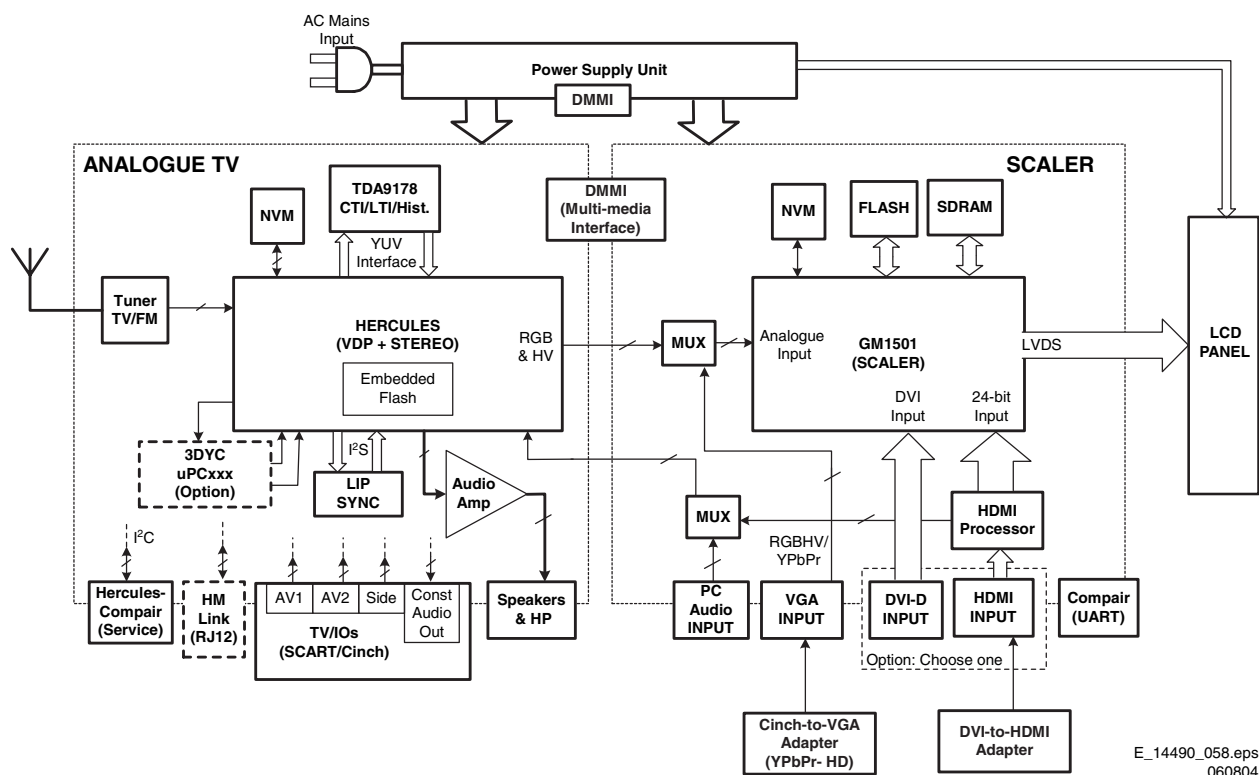


Figure 9-1 Block Diagram LC4.2

The PLL tuner UR1316 (with FM radio) 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 fully equipped and SCART2 is meant for VCR. Pin 10 of SCART2 is used for Easylink (P50) and there is a possibility for Y/C in. The CVBS-out on pin 19 can be used for WYSIWYR (What You See Is What You Record).

The video part delivers the RGB signals to the Scaler IC.

The Genesis GM1501 Malibu Scaler IC can receive two video input signals: SDTV (from Hercules), DVI (from external DVI source), or PC (from external computer).

After the video processing, the digital data is send 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 I2C 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 Power Supply

For Service, this supply panel is a black box. When defect (this can be traced via the fault-finding tips, or by strange phenomena), a new panel must be ordered (see table below for ordering codes), and after receipt, the defective panel must be send for repair.

Table 9-1 Ordering Codes Power Supply

Screen size (inches)	Ordering Code
17	3122 137 23040
23	3122 137 23070
26	3122 137 23080

9.4 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 (VGA) input, a DVI input, and an Audio input. The side has a CVBS and Y/C (SVHS) input.

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 (VGA) in: This input is directly going to the Scaler IC. See paragraph "Video: Scaler Part".

DVI-D in: This input is directly going to the Scaler IC. See paragraph "Video: Scaler Part".

9.5 Tuner and IF

A Philips UR13xx Tuner with second input (for FM Radio) is used in the TV board. The SIF and FM signals are decoded by the Hercules. Tuning is done via I2C.

9.5.1 Video IF amplifier

The IF-filter is integrated in a SAW (Surface Acoustic Wave) filter. One for filtering IF-video (1328) and one for IF-audio (1330). The type of these filters is depending of the standard(s) that has 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.

9.6 Video: TV Part (diagrams A1, A2, and A3)

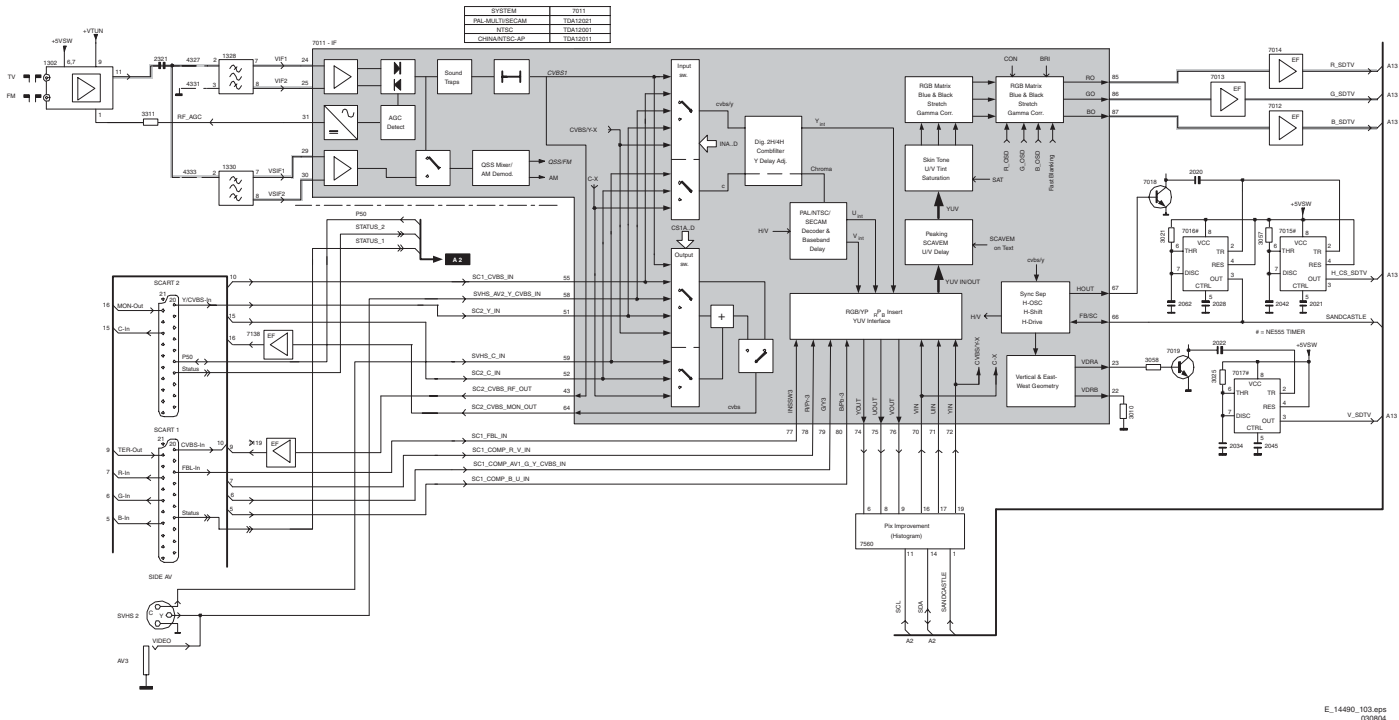


Figure 9-2 Block diagram video processing

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 build 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.

9.6.1 Histogram (YUV picture improvement) IC

The demodulated video-signal can be checked on pins 74, 75, and 76 of IC7011 and is fed to pins 70, 71, and 72. In this path, the Histogram IC TDA9171 is inserted.

This TDA9178 can control various picture improvements:

- Histogram processing.
- Colour transient improvement.
- Luminance transient improvement.
- Black and white stretch.
- Skin tone correction.
- Green enhancement.
- Blue stretch.
- Smart peaking.
- Video dependent coring.
- Colour dependent stretching.

Since the TDA9171 is connected to the Hercules, picture improvement works only for signals that are routed trough the Hercules and not for signals directly connected to the Scaler.

9.7 Video: Scaler Part (diagram A7 and A13)

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.

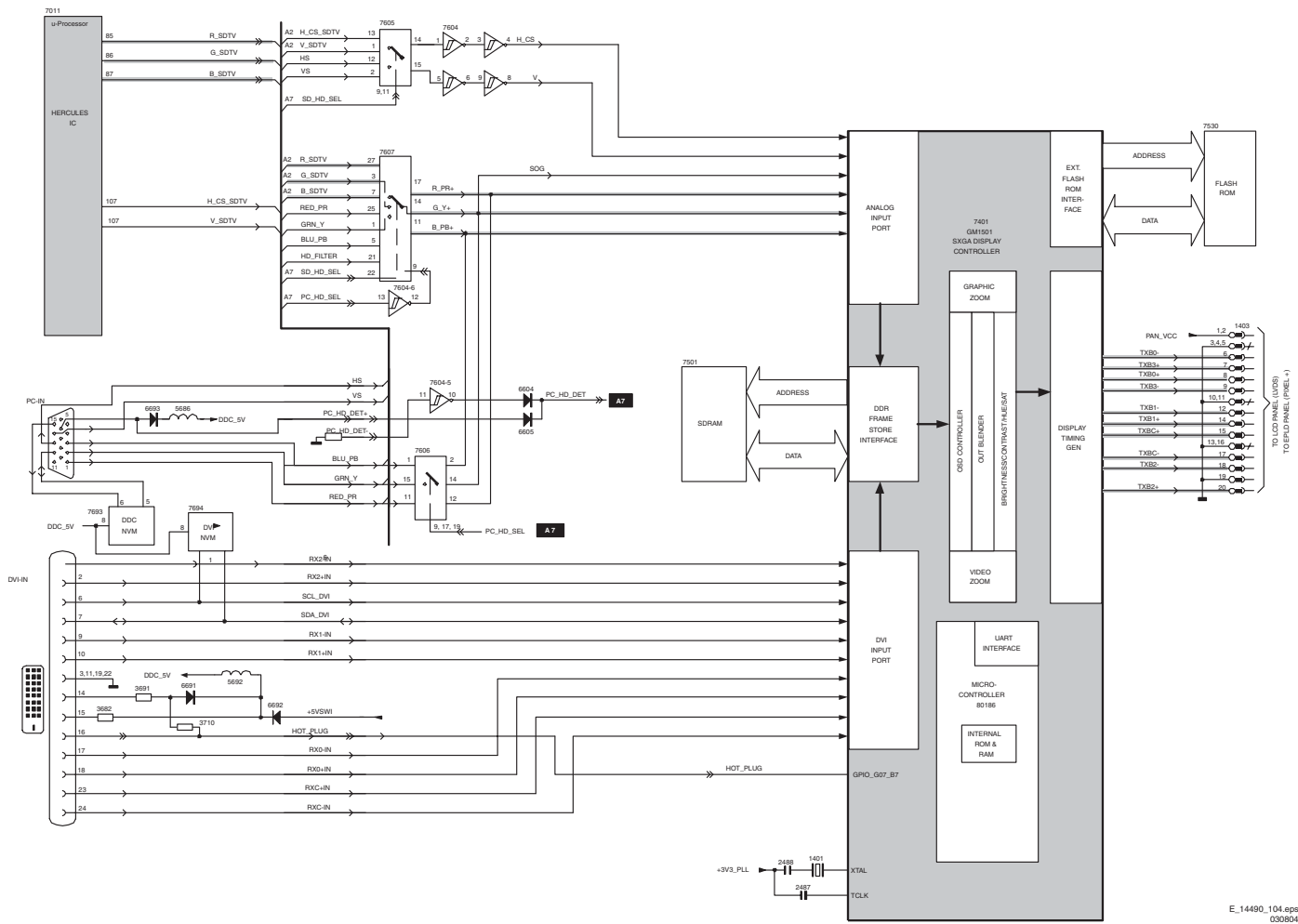


Figure 9-3 Block diagram Scaler Part

9.7.1 Features

The Scaler provides several key IC functions:

- Scaling.
- Auto-configuration/ Auto-Detection.
- Various Input Ports:
 - Analog RGB.
 - DVI Compliant.
 - Video Graphics.
- Integrated LVDS Transmitter.
- On-chip Micro-controller

9.7.2 Inputs

Analog RGB

The RGB input is fed to pins B2, C2 and D2. 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.

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.

DVI-D input

The DVI-D input is processed by the Scaler and supports DVI sources with a pixel clock frequency up to 81MHz.

9.7.3 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 Video: Pixel Plus Part (diagram PP1 to PP4)

The Pixel Plus functionality is completely handled by an Electronic Programmable Logic Device, EPLD (item 7101 on diagram PP1, PP3). The LVDS output from the TV & Scaler Board is fed through a LVDS receiver (item 7201 on diagram PP2) and then delivered to the EPLD. The EPLD processes the signal and it is fed to the LCD panel via a LVDS transmitter (item 7403 on diagram PP3).

The EPLD takes care of all picture improvement processing, like:

- Colour improvement
 - Blue stretch
 - Green enhancement
 - Saturation control
- Sharpness enhancement
 - Non-linear horizontal peaking
 - Non-linear vertical peaking
 - Coring, clipping

- Sharpness meter
 - Contrast improvement
 - Gamma Look-Up Table
- All other picture improvement processing is done in the Scaler.

9.9 Audio Processing

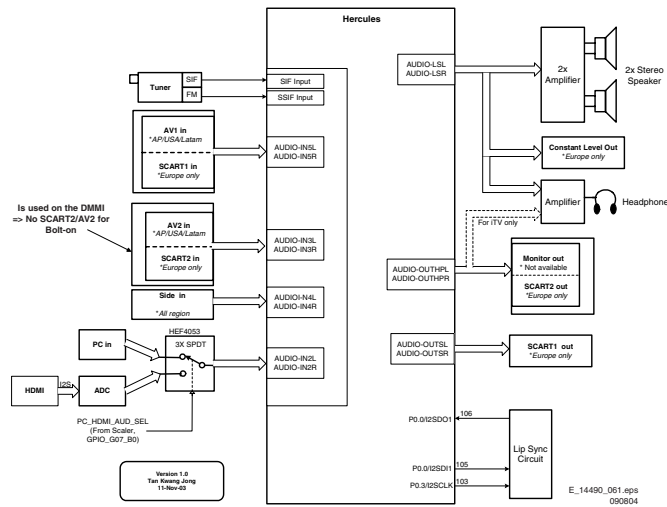


Figure 9-4 Block diagram audio processing

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.

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

9.9.2 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

9.9.3 Audio Amplifier

The audio amplifier part is very straightforward. It uses the integrated power amplifier TDA7297D, and delivers a maximum output of 2 x 15 W_{rms}.

The maximum operating condition for this amplifier is 20 V unloaded. Normal operating supply is from 6.5 V to 18 V. Muting is done via the SOUND_ENABLE line connected to pin 13 of the amplifier-IC and coming from the Hercules.

9.9.4 Audio: Lip Sync

The LC4.2E is not equipped with Lip Sync. This is not needed.

9.10 Control

9.10.1 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 its own I2C 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.

The Micro Controller ranges in ROM from 128 kB with no TXT-decoder to 128 kB with a 10 page Teletext or with Closed Caption.

9.10.2 Block Diagram

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

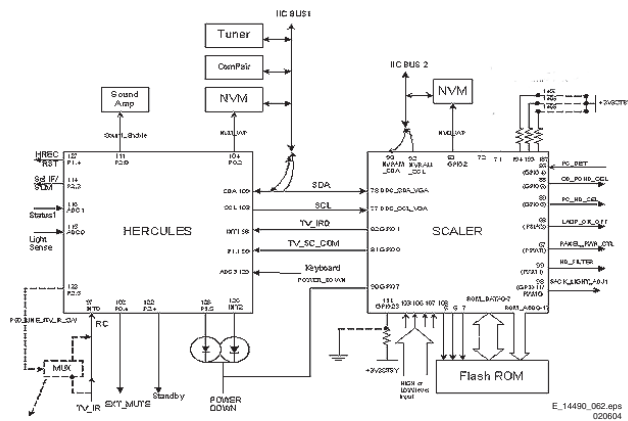


Figure 9-5 Micro Controller block diagram

9.10.3 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.
- I2C pull up supply: +3.3V_{dc}.

9.10.4 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 L04 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 I2C bus.
- **SDA.** This is the data wire of the two-wire single master bi-directional I2C 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 use 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 use 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 pop.

9.11 LCD Display

9.11.1 Specifications

Panel model

: LC171W03-A4K3
(17")

	: LC230W01-A2K8 (23")
	: LC260W01-A5K6 (26")
Resolution (HxV)	: 1080x768 pixels (17") : 1280x768 pixels (23") : 1280x768 pixels (26")
Luminance	: 450 nit (17") : 450 nit (23") : 450 nit (26")
Supplier	: LG.Philips LCD

EPG	Electronic Program Guide: system used by broadcasters to transmit TV guide information (= NexTVView)
EPLD	Electronic Programmable Logic Device
EU	EUrope
EXT	EXternal (source), entering the set by SCART or by cinches (jacks)
FBL	Fast Blanking: DC signal accompanying RGB signals
FBL-SC1-IN	Fast blanking signal for SCART1 in
FBL-SC2-IN	Fast blanking signal for SCART2 in
FBL-TXT	Fast Blanking Teletext
FLASH	FLASH memory
FM	Field Memory / Frequency Modulation
FMR	FM Radio
FRC	Frame Rate Converter
FRONT-C	Front input chrominance (SVHS)
FRONT-DETECT	Front input detection
FRONT-Y_CVBS	Front input luminance or CVBS (SVHS)

9.12 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 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 to the correct frequency
AGC	Automatic Gain Control: algorithm that controls the video input of the feature box
AM	Amplitude Modulation
AP	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
ASD	Automatic Standard Detection
AV	Audio Video
B-SC1-IN	Blue SCART1 in
B-SC2-IN	Blue SCART2 in
B-TXT	Blue teletext
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BOCMA	Bimos one Chip Mid-end Architecture: video and chroma decoder
C-FRONT	Chrominance front input
CBA	Circuit Board Assembly (or PWB)
CL	Constant Level: audio output to connect with an external amplifier
CLUT	Colour Look Up Table
ComPair	Computer aided rePair
CSM	Customer Service Mode
CVBS	Composite Video Blanking and Synchronisation
CVBS-EXT	CVBS signal from external source (VCR, VCD, etc.)
CVBS-INT	CVBS signal from Tuner
CVBS-MON	CVBS monitor signal
CVBS-TER-OUT	CVBS terrestrial out
DAC	Digital to Analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DFU	Directions For Use: owner's manual
DNR	Dynamic Noise Reduction
DRAM	Dynamic RAM
DSP	Digital Signal Processing
DST	Dealer Service Tool: special (European) remote control designed for service technicians
DTS	Digital Theatre Sound
DVD	Digital Video Disc
EEPROM	Electrically Erasable and Programmable Read Only Memory

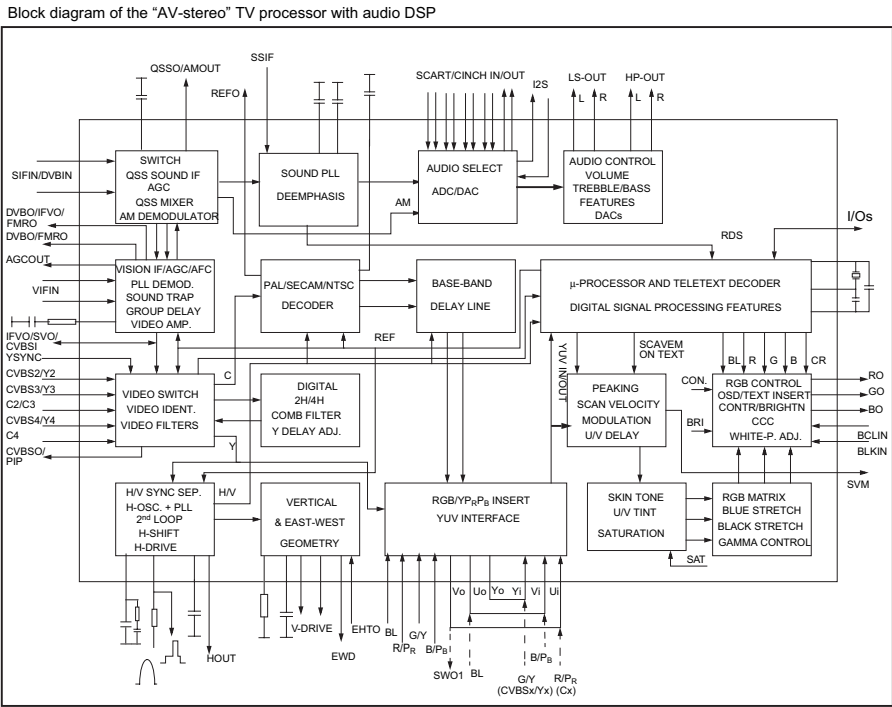
G-SC1-IN	Green SCART1 in
G-SC2-IN	Green SCART2 in
G-TXT	Green teletext
H	H_sync to the module
HA	Horizontal Acquisition: horizontal sync pulse coming out of the BOCMA
HD	High Definition
HP	HeadPhone
I	Monochrome TV system. Sound carrier distance is 6.0 MHz
I2C	Integrated IC bus
I2S	Integrated IC Sound 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 customers wishes
LATAM	LATin AMerica
LC04	Philips chassis name for LCD TV 2004 project
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LINE-DRIVE	Line drive signal
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
MOSFET	Metal Oxide Semiconductor Field Effect Transistor
MPEG	Motion Pictures Experts Group
MSP	Multi-standard Sound Processor: ITT sound decoder
MUTE	MUTE Line
NC	Not Connected
NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, used mainly 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)	S/PDIF	Sony Philips Digital InterFace
	Non Volatile Memory: IC containing TV related data (for example, options)	SRAM	Static RAM
NVM	Open Circuit	STBY	STandBY
O/C	On/Off control signal for the LED	SVHS	Super Video Home System
ON/OFF LED	On Screen Display	SW	SubWoofers / SoftWare
OSD	Project 50 communication: protocol between TV and peripherals	THD	Total Harmonic Distortion
P50	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)	TXT	TeleteXT
PAL	Personal Computer	uP	Microprocessor
PC	Printed Circuit Board (or PWB)	VA	Vertical Acquisition
PCB	Picture In Graphic	VL	Variable Level out: processed audio output toward external amplifier
PIG	Picture In Picture	VCR	Video Cassette Recorder
PIP	Phase Locked Loop. Used, for example, in FST tuning systems. The customer can directly provide the desired frequency	VGA	Video Graphics Array
PLL	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.	WD	Watch Dog
Progressive Scan	Printed Wiring Board (or PCB)	WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
PWB	Random Access Memory	XTAL	Quartz crystal
RAM	Remote Control transmitter	YPbPr	Component video (Y= Luminance, Pb/Pr= Colour difference signals)
RC	Remote Control system 5, the signal from the remote control receiver	Y/C	Luminance (Y) and Chrominance (C) signal
RC5	Red, Green, and Blue. The primary colour signals for TV. By mixing levels of R, G, and B, all colours (Y/C) are reproduced.	Y-OUT	Luminance-signal
RGB	Red, Green, Blue, Horizontal sync, and Vertical sync	YUV	Component video
RGBHV	Read Only Memory		
ROM	Service Alignment Mode		
SAM	Sound Intermediate Frequency		
SIF	SandCastle: two-level pulse derived from sync signals		
SC	SCART output of the MSP audio IC		
SC1-OUT	SCART2 Blue in		
SC2-B-IN	SCART2 chrominance in		
SC2-C-IN	SCART output of the MSP audio IC		
SC2-OUT	Short Circuit		
S/C	Syndicat des Constructeurs d'Appareils Radiorecepteurs et Televisieurs		
SCART	Clock Signal on I2C bus		
SCL	Standard Definition		
SD	DATA Signal on I2C bus		
SDA	Synchronous DRAM		
SDRAM	SEquence Couleur Avec Memoire. Colour system used mainly in France and Eastern Europe. Colour carriers = 4.406250 MHz and 4.250000 MHz		
SECAM	Sound Intermediate Frequency		
SIF	Switch Mode Power Supply		
SMPS	SouND		
SND	Sound left SCART1 in		
SNDL-SC1-IN	Sound left SCART1 out		
SNDL-SC1-OUT	Sound left SCART2 in		
SNDL-SC2-IN	Sound left SCART2 out		
SNDL-SC2-OUT	Sound right SCART1 in		
SNDR-SC1-IN	Sound right SCART1 out		
SNDR-SC1-OUT	Sound right SCART2 in		
SNDR-SC2-IN	Sound right SCART2 out		
SNDR-SC2-OUT	Surround sound left variable level out		
SNDS-VL-OUT	Surround sound right variable level out		
SNDS-VR-OUT	Self Oscillating Power Supply		
SOPS			

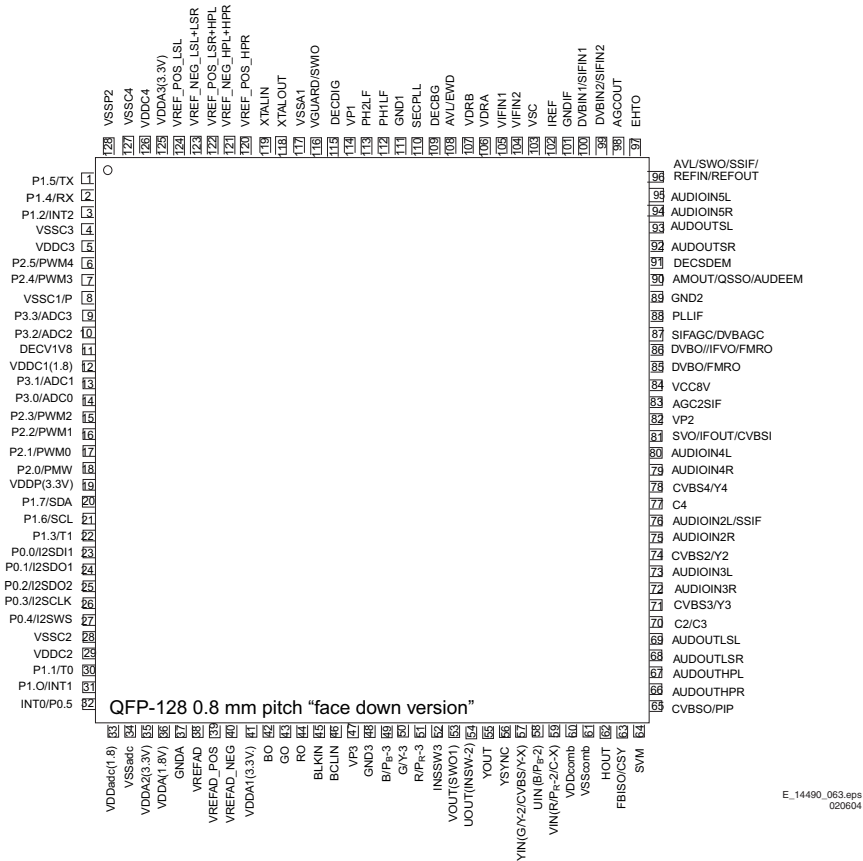
9.13 IC Data Sheets

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).

9.13.1 Diagram A2, Type TDA12029H (IC7011)

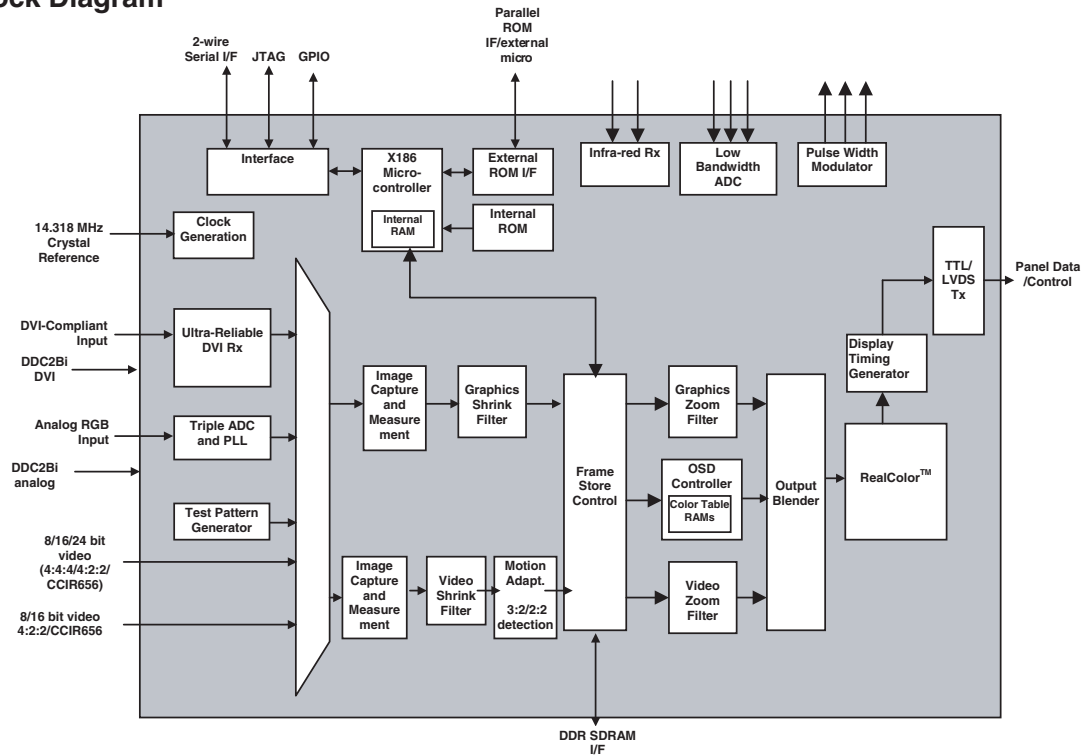


Pin configuration "stereo" and "AV-stereo" versions with Audio DSP



9.13.2 Diagram A7, Type GM1501 (IC7401)

Block Diagram



Pin Configuration

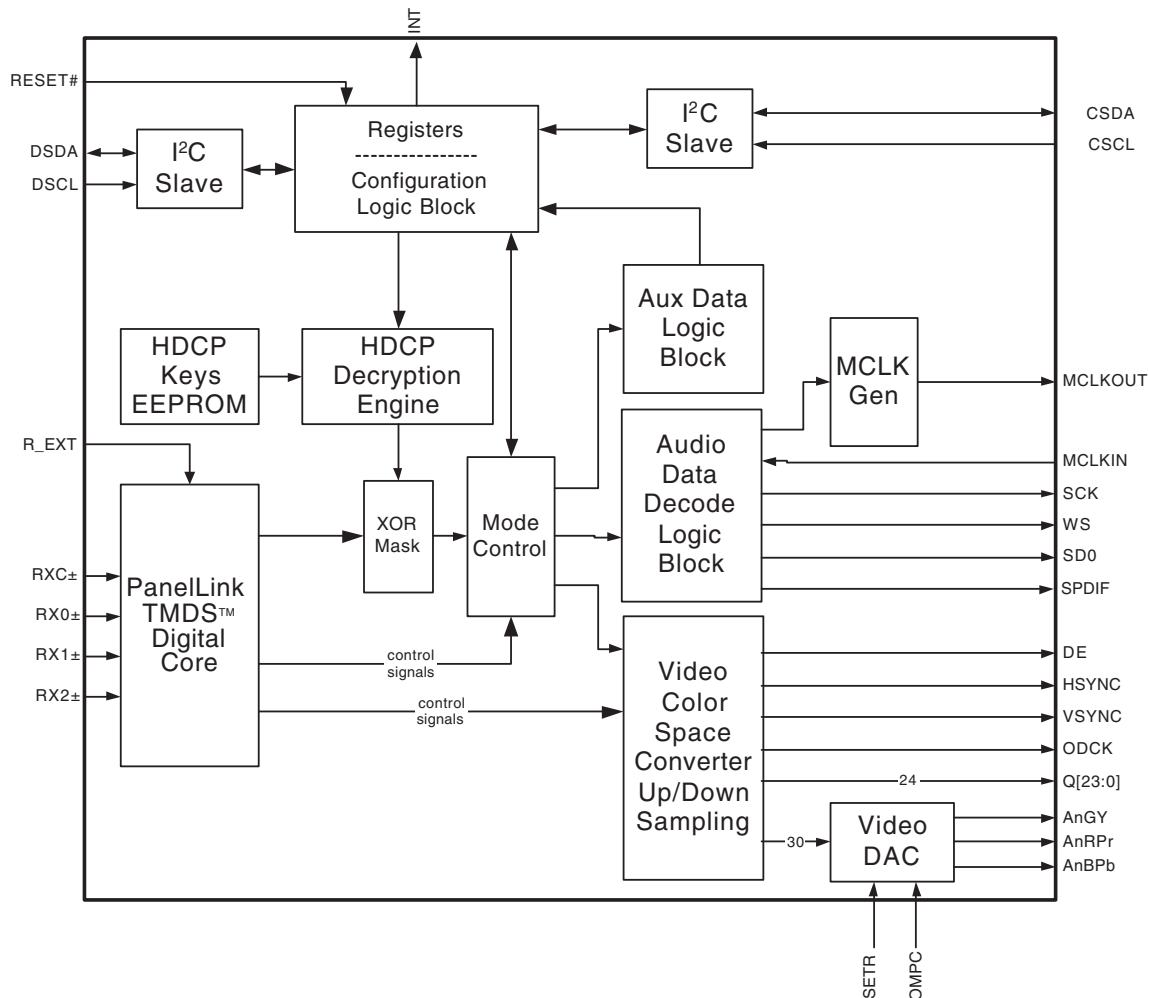
A	NC	ADC_3.3	ADC_1.8	ADC_1.8	ADC_DGND	RXC+	DVI_GND	RX0+	RX1+	RX2+	DVI_GND	LBADC_IN3	D_GND
B	BLUE-	BLUE+	ADC_3.3	ADC_DGND	DVI_GND	RXC-	DVI_GND	RX0-	RX1-	RX2-	REXT	LBADC_N2	D_GND
C	GREEN-	GREEN+	SOG	ADC_AGND	NC	DVI_3.3	DVI_GND	DVI_3.3	DVI_3.3	DVI_3.3	DVI_3.3	LBADC_N1	LBADC_33
D	RED-	RED+	ADC_3.3	ADC_AGND	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	VDD33_PLL	VSSA33_RPLL	VDDA33_RPLL									
G	VDDA33_FPLL	VSSD33_PLL	TCLK	XTAL									
H	VDD33_SDDS	VSSA33_SDDS	VDDA33_SDDS	VSSA33_FPLL									
J	VDD33_DDSD	VSSA33_DDSD	VDDA33_DDSD	VSSD33_DDSD									
K	RESETn	ACS_RESET_HD	NC	VSSD33_DDSD						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_UD0	OCM_UD1	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	OCMADDR17	OCMADDR18	OCMADDR19	OCM_CS0n						D_GND	CORE_1.8	D_GND	D_GND
U	OCMADDR13	OCMADDR14	OCMADDR15	OCMADDR16						CORE_1.8	CORE_1.8	D_GND	D_GND
V	OCMADDR9	OCMADDR10	OCMADDR11	OCMADDR12									
W	OCMADDR6	OCMADDR7	OCMADDR8	IO_3.3									
Y	OCMADDR3	OCMADDR4	OCMADDR5	IO_3.3									
AA	OCMADDR0	OCMADDR1	OCMADDR2	IO_3.3									
AB	OCMDATA13	OCMDATA14	OCMDATA15	IO_3.3									
AC	OCMDATA10	OCMDATA11	OCMDATA12	IO_3.3	GPIO_G08_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 (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_G08_B5 (DOGRN0)	GPIO_G08_B4 (DOBLU0)	GPIO_G07_B1 (DERED3)	GPIO_G07_B5 (DERED7)	SHIELD[0] (DEGRN2)	B3+ (DEGRN6)	B3- (DEGRN7)	BC- (DEGRN9)
	1	2	3	4	5	6	7	8	9	10	11	12	13

E_14490_099.eps
060804

Figure 9-7 Internal Block Diagram and Pin Configuration

9.13.3 Diagram A12, Type S9993CT (IC7808)

BLOCK DIAGRAM



PIN CONFIGURATION

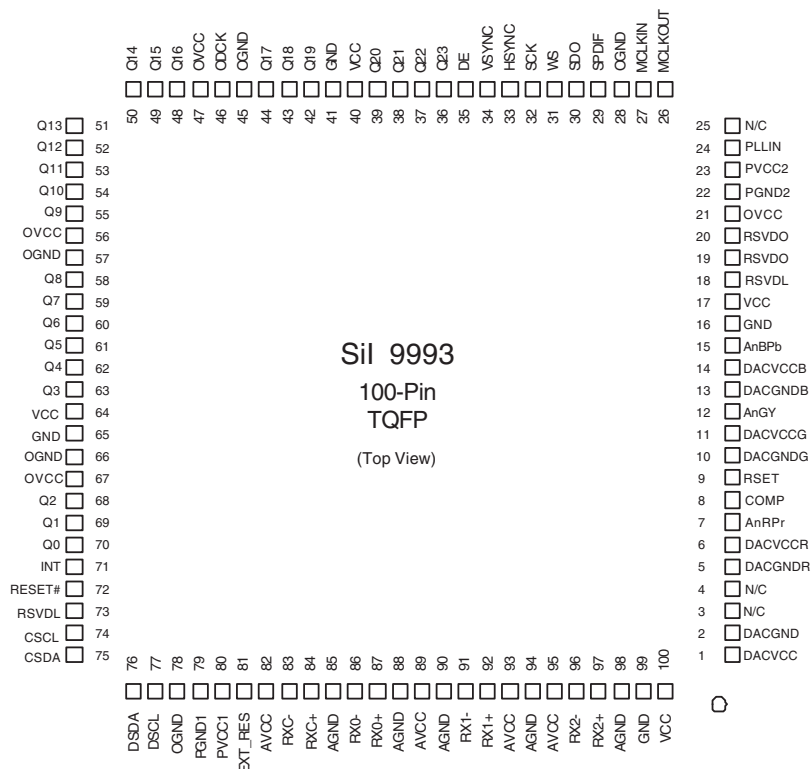


Figure 9-8 Internal Block Diagram

10. Spare Parts List

Set Level

Various

1099▲	9322 194 30682	TFT-LCD LC230W01
8301	3139 131 03961	FFC Foil 20P
8403▲	3139 131 03581	Cable 20P
8990	3139 131 03861	Cable 12P

TV Scalerboard [A]

Various

1001	2422 543 01255	Crystal 24.576MHz
1005	2422 025 18249	45P Female
1302▲	3139 147 19701	UR1316/A I H-3
1303	2422 025 16835	3P Male
1304	2422 025 16835	3P Male
1328	2422 549 44372	Filter K3953L
1330	2422 549 44369	Filter K9656L
1401	2422 543 01133	Crystal 14.32MHz
1704	2422 025 16543	4P Male
1910	2422 025 16705	12P Male
8910	3139 110 28271	Cable 12P

—||—

2000	3198 017 41050	1μF 10V 0603
2001	2020 552 96718	220nF 10% 6.3V 0402
2002	2020 021 91679	100μF 20% 6.3V
2004	2020 552 96718	220nF 10% 6.3V 0402
2005	3198 035 71040	100nF 10% 16V 0402
2006	3198 034 08280	8.2pF 50V 0402
2007	3198 034 08280	8.2pF 50V 0402
2008	3198 017 44740	470nF 10V 0603
2009	3198 017 41050	1μF 10V 0603
2010	3198 035 26820	6.8nF 10% 16V 0402
2011	2020 552 96718	220nF 10% 6.3V 0402
2012	2020 021 91557	100μF 20% 16V
2013	3198 035 71040	100nF 10% 16V 0402
2014	3198 035 71040	100nF 10% 16V 0402
2015	3198 035 71040	100nF 10% 16V 0402
2016	3198 035 71040	100nF 10% 16V 0402
2017	3198 035 71040	100nF 10% 16V 0402
2018	3198 035 71040	100nF 10% 16V 0402
2019	2020 021 91617	47μF 20% 16V
2020	2238 869 15101	100pF 5% 50V 0402
2021	2020 552 96628	10nF 10% 16V 0402
2022	3198 035 02210	220pF 5% 50V 0402
2023	2020 552 96718	220nF 10% 6.3V 0402
2024	2020 021 91557	100μF 20% 16V
2025	3198 035 71040	100nF 10% 16V 0402
2026	3198 035 71040	100nF 10% 16V 0402
2027	3198 035 71040	100nF 10% 16V 0402
2028	2020 552 96628	10nF 10% 16V 0402
2029	3198 035 71040	100nF 10% 16V 0402
2030	3198 035 71040	100nF 10% 16V 0402
2031	3198 035 71040	100nF 10% 16V 0402
2032	3198 035 71040	100nF 10% 16V 0402
2033	2020 552 96718	220nF 10% 6.3V 0402
2034	2020 552 00002	3.3nF 2% 50V 0805
2035	4822 124 12095	100μF 20% 16V
2040	2020 021 91616	10μF
2041	2020 552 96718	220nF 10% 6.3V 0402
2042	2020 552 00002	3.3nF 2% 50V 0805
2043	3198 035 71040	100nF 10% 16V 0402
2044	2020 552 96718	220nF 10% 6.3V 0402
2045	2020 552 96628	10nF 10% 16V 0402
2046	3198 017 41050	1μF 10V 0603
2048	2020 552 96834	1μF 20% 6.3V 0402
2052	2020 552 96618	1nF 10% 50V 0402
2053	2020 552 96618	1nF 10% 50V 0402
2054	2020 552 96618	1nF 10% 50V 0402
2055	4822 126 14519	22pF 5% 50V 0402
2060	3198 035 71040	100nF 10% 16V 0402
2061	2020 021 91616	10μF 16V
2062	2020 552 00002	3.3nF 2% 50V 0805
2063	3198 017 31540	150nF 10V 0603
2068	2020 552 96718	220nF 10% 6.3V 0402
2071	2020 021 91557	100μF 20% 16V
2072	2020 552 96718	220nF 10% 6.3V 0402
2073	2020 552 96618	1nF 10% 50V 0402
2074	2020 552 96718	220nF 10% 6.3V 0402
2076	2020 552 96718	220nF 10% 6.3V 0402
2077	2020 552 96834	1μF 20% 6.3V 0402
2078	2238 869 15101	100pF 5% 50V 0402

2079	2020 552 96632	22nF 10% 16V 0402
2082	2020 552 96618	1nF 10% 50V 0402
2083	2020 552 96618	1nF 10% 50V 0402
2084	2020 552 96618	1nF 10% 50V 0402
2085	2020 552 96618	1nF 10% 50V 0402
2086	2020 552 96618	1nF 10% 50V 0402
2087	2020 552 96618	1nF 10% 50V 0402
2089	2020 552 96618	1nF 10% 50V 0402
2099	2020 552 96618	1nF 10% 50V 0402
2302	4822 122 33761	22pF 5% 50V
2303	4822 122 33761	22pF 5% 50V
2307	3198 024 44730	47nF 50V 0603
2308	3198 030 82280	2.2μF 20% 50V
2309	2020 021 91871	470μF 16V
2311	2020 021 91557	100μF 20% 16V
2313	3198 016 31020	1nF 25V 0603
2314	2238 586 59812	100nF 20% 50V 0603
2317	3198 016 31020	1nF 25V 0603
2318	3198 016 31020	1nF 25V 0603
2321	5322 126 11583	10nF 10% 50V 0603
2324	5322 126 11583	10nF 10% 50V 0603
2355	2020 021 91601	470μF 50V
2356	2020 021 91601	470μF 50V
2357	3198 035 71040	100nF 10% 16V 0402
2358	3198 035 03320	3.3nF 5% 50V 0402
2359	2020 552 96628	10nF 10% 16V 0402
2370	2020 552 96834	1μF 20% 6.3V 0402
2371	2020 552 96834	1μF 20% 6.3V 0402
2372	2020 552 96618	1nF 10% 50V 0402
2373	2020 552 96618	1nF 10% 50V 0402
2374	3198 035 71040	100nF 10% 16V 0402
2375	2020 021 91616	10μF 16V
2376	3198 017 41050	1μF 10V 0603
2377	3198 017 41050	1μF 10V 0603
2378	2020 552 96718	220nF 10% 6.3V 0402
2379	2020 552 96718	220nF 10% 6.3V 0402
2380	2020 021 91617	47μF 20% 16V
2381	3198 035 71040	100nF 10% 16V 0402
2382	2020 021 91871	470μF 16V
2386	3198 017 41050	1μF 10V 0603
2387	4822 126 14324	33pF 5% 50V 0402
2388	4822 126 14324	33pF 5% 50V 0402
2389	2020 012 93761	330μF 6.3V
2392	3198 017 41050	1μF 10V 0603
2394	3198 035 71040	100nF 10% 16V 0402
2395	3198 035 71040	100nF 10% 16V 0402
2396	4822 124 23002	10μF 16V
2397	2020 552 96834	1μF 20% 6.3V 0402
2398	2020 552 96834	1μF 20% 6.3V 0402
2401	4822 124 80151	47μF 16V
2402	4822 124 80151	47μF 16V
2403	3198 035 71040	100nF 10% 16V 0402
2404	3198 035 71040	100nF 10% 16V 0402
2405	3198 035 71040	100nF 10% 16V 0402
2406	3198 035 71040	100nF 10% 16V 0402
2407	3198 035 71040	100nF 10% 16V 0402
2408	3198 035 71040	100nF 10% 16V 0402
2409	3198 035 71040	100nF 10% 16V 0402
2410	3198 035 71040	100nF 10% 16V 0402
2411	3198 035 71040	100nF 10% 16V 0402
2412	3198 035 71040	100nF 10% 16V 0402
2413	3198 035 71040	100nF 10% 16V 0402
2414	3198 035 71040	100nF 10% 16V 0402
2415	3198 035 71040	100nF 10% 16V 0402
2416	3198 035 71040	100nF 10% 16V 0402
2417	4822 124 80151	47μF 16V
2418	4822 124 80151	47μF 16V
2419	3198 035 71040	100nF 10% 16V 0402
2420	3198 035 71040	100nF 10% 16V 0402
2421	3198 035 71040	100nF 10% 16V 0402
2422	3198 035 71040	100nF 10% 16V 0402
2423	3198 035 71040	100nF 10% 16V 0402
2424	3198 035 71040	100nF 10% 16V 0402
2425	3198 035 71040	100nF 10% 16V 0402
2426	3198 035 71040	100nF 10% 16V 0402
2427	3198 035 71040	100nF 10% 16V 0402
2428	3198 035 71040	100nF 10% 16V 0402
2429	3198 035 71040	100nF 10% 16V 0402
2430	3198 035 71040	100nF 10% 16V 0402
2431	3198 035 71040	100nF 10% 16V 0402
2432	3198 035 71040	100nF 10% 16V 0402
2433	3198 035 71040	100nF 10% 16V 0402
2434	4822 124 80151	47μF 16V
2435	4822 124 80151	47μF 16V
2436	3198 035 71040	100nF 10% 16V 0402
2437	3198 035 71040	100nF 10% 16V 0402
2438	3198 035 71040	100nF 10% 16V 0402
2439	3198 035 71040	100nF 10% 16V 0402
2440	3198 035 71040	100nF 10% 16V 0402
2441	3198 035 71040	100nF 10% 16V 0402
2442	3198 035 71040	100nF 10% 16V 0402
2443	3198 035 71040	100nF 10% 16V 0402
2444	3198 035 71040	100nF 10% 16V 0402
2445	3198 035 71040	100nF 10% 16V 0402
2446	3198 035 71040	100nF 10% 16V 0402
2447	3198 035 71040	100nF 10% 16V 0402
2448	3198 035 71040	100nF 10% 16V 0402
2449	3198 035 71040	100nF 10% 16V 0402
2450	3198 035 71040	100nF 10% 16V 0402
2451	4822 124 80151	47μF 16V
2452	3198 035 71040	100nF 10% 16V 0402
2453	3198 035 71040	100nF 10% 16V 0402
2454	3198 035 71040	100nF 10% 16V 0402
2455	3198 035 71040	100nF 10% 16V 0402
2456	3198 035 71040	100nF 10% 16V 0402
2457	2020 552 96675	10μF 10% 16V 1210
2461	3198 035 71040	100nF 10% 16V 0402
2462	3198 035 71040	100nF 10% 16V 0402
2463	3198 035 71040	100nF 10% 16V 0402
2464	3198 035 71040	100nF 10% 16V 0402
2465	5322 124 41945	22μF 20% 35V
2466	3198 035 71040	100nF 10% 16V 0402
2467	3198 035 71040	100nF 10% 16V 0402
2468	3198 035 71040	100nF 10% 16V 0402
2469	3198 035 71040	100nF 10% 16V 0402
2470	5322 124 41945	22μF 20% 35V
2471	3198 035 71040	100nF 10% 16V 0402
2472	3198 035 71040	100nF 10% 16V 0402
2473	3198 035 71040	100nF 10% 16V 0402
2474	3198 035 71040	100nF 10% 16V 0402
2475	3198 035 71040	100nF 10% 16V 0402
2476	3198 035 71040	100nF 10% 16V 0402
2477	3198 035 71040	100nF 10% 16V 0402
2478	5322 124 41945	22μF 20% 35V
2479	3198 035 71040	100nF 10% 16V 0402
2480	3198 035 71040	100nF 10% 16V 0402
2481	3198 035 71040	100nF 10% 16V 0402
2482	5322 124 41945	22μF 20% 35V
2483	3198 035 71040	100nF 10% 16V 0402
2484	3198 035 71040	100nF 10% 16V 0402
2485	3198 035 71040	100nF 10% 16V 0402
2486	3198 035 71040	100nF 10% 16V 0402
2487	4822 126 14519	22pF 5% 50V 0402
2488	4822 126 14519	22pF 5% 50V 0402
2490	2238 586 59812	100nF 20% 50V 0603
2491	2238 586 59812	100nF 20% 50V 0603
2492	2238 586 59812	100nF 20% 50V 0603
2495	4822 124 80151	47μF 16V
2496	3198 035 71040	100nF 10% 16V 0402
2501	4822 124 80151	47μF 16V
2502	4822 124 11131	47μF 6.3V
2503	3198 035 71040	100nF 10% 16V 0402
2504	3198 035 71040	100nF 10% 16V 0402
2505	3198 035 71040	100nF 10% 16V 0402
2506	3198 035 71040	100nF 10% 16V 0402
2507	3198 035 71040	100nF 10% 16V 0402
2508	3198 035 71040	100nF 10% 16V 0402
2509	3198 035 71040	100nF 10% 16

2617	2020 552 96628	10nF 10% 16V 0402			3321	4822 051 30222	2.2kΩ 5% 0.062W	
2618	2020 552 96628	10nF 10% 16V 0402	~W~		3322	4822 051 30682	6.8kΩ 5% 0.062W	
2619	4822 126 14324	33pF 5% 50V 0402			3323	4822 051 30222	2.2kΩ 5% 0.062W	
2620	2238 586 59812	100nF 20% 50V 0603	3000	3198 031 04720	4.7kΩ 5% 0402	3327	4822 117 13548	1kΩ 5% 0402
2621	2020 552 96834	1μF 20% 6.3V 0402	3001	2322 702 70398	22kΩ 0603	3328	4822 117 13545	100Ω 1% 0402
2622	2020 552 96834	1μF 20% 6.3V 0402	3002	4822 117 13601	22kΩ 5% 0402	3329	4822 117 13545	100Ω 1% 0402
2623	2020 552 96834	1μF 20% 6.3V 0402	3003	2322 702 70398	3.9Ω	3357	4822 117 13548	1kΩ 5% 0402
2624	3198 017 44740	470nF 10V 0603	3004	4822 117 13601	22kΩ 5% 0402	3358	4822 117 13545	100Ω 1% 0402
2625	3198 017 44740	470nF 10V 0603	3005	3198 031 08210	820Ω 5% 0.5W	3359	3198 031 03910	390Ω 1% 0402
2626	3198 017 44740	470nF 10V 0603	3006	4822 117 13545	100Ω 1% 0402	3370	3198 031 06810	680Ω 5% 0.01W 0402
2630	2020 552 96834	1μF 20% 6.3V 0402	3007	3198 031 04720	4.7kΩ 5% 0402	3371	4822 117 13545	100Ω 1% 0402
2631	2020 552 96834	1μF 20% 6.3V 0402	3008	3198 031 04730	4.7Ω 5% 0402	3372	4822 117 13545	100Ω 1% 0402
2632	2020 552 96834	1μF 20% 6.3V 0402	3009	4822 117 11297	100kΩ 5% 0.1W	3374	5322 117 11726	10Ω 5%
2633	2020 552 96834	1μF 20% 6.3V 0402	3010	4822 117 13548	1kΩ 5% 0402	3378	4822 117 13545	100Ω 1% 0402
2634	2020 552 96834	1μF 20% 6.3V 0402	3012	3198 031 04730	47Ω 5% 0402	3380	4822 117 13606	10kΩ 5% 0.01W 0402
2635	2020 552 96834	1μF 20% 6.3V 0402	3013	4822 117 13545	100Ω 1% 0402	3381	4822 117 13606	10kΩ 5% 0.01W 0402
2636	3198 035 71040	100nF 10% 16V 0402	3014	4822 117 13543	470Ω 5% 0402	3382	4822 117 13606	10kΩ 5% 0.01W 0402
2638	3198 035 03310	330pF 5% 50V 0402	3015	4822 117 13605	Jumper 0402	3383	4822 117 13606	10kΩ 5% 0.01W 0402
2639	3198 035 03310	330pF 5% 50V 0402	3016	4822 117 13545	100Ω 1% 0402	3386	4822 117 13545	100Ω 1% 0402
2702	2020 552 96834	1μF 20% 6.3V 0402	3017	4822 117 13605	Jumper 0402	3389	4822 117 13545	100Ω 1% 0402
2703	2020 021 91616	10μF 16V	3019	4822 117 13545	100Ω 1% 0402	3390	4822 117 13545	100Ω 1% 0402
2707	2020 021 91871	470μF 16V	3020	4822 117 13548	1kΩ 5% 0402	3391	4822 117 13545	100Ω 1% 0402
2708	2020 552 96834	1μF 20% 6.3V 0402	3021	2322 706 72702	2.7kΩ 1% 0402	3392	4822 117 13545	100Ω 1% 0402
2710	3198 035 04710	470pF 50V 0402	3022	4822 117 13606	10kΩ 5% 0.01W 0402	3393	4822 117 13545	100Ω 1% 0402
2711	3198 035 04710	470pF 50V 0402	3023	4822 117 13602	2.2kΩ 5% 0.01W 0402	3394	3198 031 07590	75Ω 5% 0402
2712	2020 552 96834	1μF 20% 6.3V 0402	3024	3198 031 04720	4.7kΩ 5% 0402	3401	3198 031 13390	33Ω
2713	2238 586 59812	100nF 20% 50V 0603	3025	2322 706 75603	56kΩ 1% 0402	3402	3198 031 13390	33Ω
2714	2020 021 91871	470μF 16V	3026	4822 117 13606	10kΩ 5% 0.01W 0402	3403	3198 031 13390	33Ω
2715	2020 021 91871	470μF 16V	3027	3198 031 04720	4.7kΩ 5% 0402	3404	3198 031 13390	33Ω
2718	2020 552 96834	1μF 20% 6.3V 0402	3028	4822 117 11297				

3615	3198 031 02290	22Ω 5% 0.1W 0402
3616	3198 031 02290	22Ω 5% 0.1W 0402
3617	3198 031 02290	22Ω 5% 0.1W 0402
3618	3198 031 02290	22Ω 5% 0.1W 0402
3619	3198 031 08210	820Ω 5% 0.5W
3620	4822 117 13632	100kΩ 1% 0603 0.62W
3621	4822 117 13601	22kΩ 5% 0402
3622	4822 117 13601	22kΩ 5% 0402
3623	4822 117 13601	22kΩ 5% 0402
3624	4822 117 13601	22kΩ 5% 0402
3625	4822 117 13601	22kΩ 5% 0402
3626	4822 117 13601	22kΩ 5% 0402
3633	4822 117 13545	100Ω 1% 0402
3634	4822 117 13545	100Ω 1% 0402
3635	4822 117 13545	100Ω 1% 0402
3640	4822 117 13602	2.2kΩ 5% 0.01W 0402
3641	4822 117 13597	330Ω 5% 0402 0.01W
3642	4822 117 13597	330Ω 5% 0402 0.01W
3643	4822 117 13597	330Ω 5% 0402 0.01W
3644	4822 117 13597	330Ω 5% 0402 0.01W
3645	4822 117 13597	330Ω 5% 0402 0.01W
3646	4822 117 13597	330Ω 5% 0402 0.01W
3703	4822 117 13606	10kΩ 5% 0.01W 0402
3706	4822 117 13606	10kΩ 5% 0.01W 0402
3711	4822 117 13605	Jumper 0402
3712	4822 117 13606	10kΩ 5% 0.01W 0402
3714	3198 031 08220	8.2kΩ 5% 0.5W
3715	3198 031 01820	1.8kΩ 5% 0.01W 0402
3717	4822 117 13606	10kΩ 5% 0.01W 0402
3718	4822 117 13605	Jumper 0402
3719	4822 117 13606	10kΩ 5% 0.01W 0402
3722	3198 031 08220	8.2kΩ 5% 0.5W
3725	4822 117 13606	10kΩ 5% 0.01W 0402
3726	3198 031 08220	8.2kΩ 5% 0.5W
3727	3198 031 01820	1.8kΩ 5% 0.01W 0402
3730	4822 117 13606	10kΩ 5% 0.01W 0402
3731	4822 117 13543	470Ω 5% 0402
3732	4822 117 13548	1kΩ 5% 0402
3733	4822 117 13543	470Ω 5% 0402
3735	3198 031 02280	2.2Ω 5% 0.1W 0402
3736	3198 031 02280	2.2Ω 5% 0.1W 0402
3737	3198 031 02280	2.2Ω 5% 0.1W 0402
3738	3198 031 02280	2.2Ω 5% 0.1W 0402
3739	4822 117 13601	22kΩ 5% 0402
3740	4822 117 13601	22kΩ 5% 0402
3741	4822 117 11297	100kΩ 5% 0.1W
3742	4822 117 13601	22kΩ 5% 0402
3743	4822 117 13601	22kΩ 5% 0402
3744	4822 117 13606	10kΩ 5% 0.01W 0402
3745	4822 117 11297	100kΩ 5% 0.1W
3746	4822 117 11297	100kΩ 5% 0.1W
3747	4822 117 11297	100kΩ 5% 0.1W
3748	4822 117 13606	10kΩ 5% 0.01W 0402
3749	4822 117 13606	10kΩ 5% 0.01W 0402
3750	3198 031 06830	68kΩ 5% 0.01W 0402
3751	3198 031 06830	68kΩ 5% 0.01W 0402
3836	4822 117 13606	10kΩ 5% 0.01W 0402
3838	4822 117 13606	10kΩ 5% 0.01W 0402
3910	4822 117 13602	2.2kΩ 5% 0.01W 0402
3911	4822 117 13548	1kΩ 5% 0402
3930	4822 117 12917	1Ω 5% 0.062W
3931	4822 117 12917	1Ω 5% 0.062W
3932	2322 704 61002	1kΩ 1%
3933	2322 704 63302	3.3kΩ 1% 0603
3951	4822 117 12917	1Ω 5% 0.062W
3952	4822 117 12917	1Ω 5% 0.062W
3953	2322 704 61002	1kΩ 1%
3954	2322 704 63302	3.3kΩ 1% 0603
3955	4822 117 13606	10kΩ 5% 0.01W 0402
3958	3198 031 01530	15kΩ 5% 0.01W 0402
4xxx	4822 117 13605	Jumper 0402



5001	2422 536 00667	1mF 20%
5002	4822 157 11716	Bead 30Ω 100MHz
5003	4822 157 11716	Bead 30Ω at 100MHz
5004	4822 157 11716	Bead 30Ω at 100MHz
5005	4822 157 11716	Bead 30Ω at 100MHz
5006	4822 157 11716	Bead 30Ω at 100MHz
5007	4822 157 11716	Bead 30Ω at 100MHz
5008	4822 157 11716	Bead 30Ω at 100MHz
5010	3198 018 64790	47μH
5060	4822 157 11716	Bead 30Ω at 100MHz
5070	4822 157 11716	Bead 30Ω at 100MHz
5071	2422 549 42896	Bead 120Ω 100MHz
5072	2422 549 42896	Bead 120Ω 100MHz
5304	4822 157 11499	Bead 60Ω 100MHz
5309	3198 018 31290	12μH 10%
5321	3198 018 33970	0.39μH
5324	4822 157 71334	0.68μH
5370	4822 157 11716	Bead 30Ω at 100MHz
5371	4822 157 11716	Bead 30Ω at 100MHz

5372	2422 549 44197	Bead 220Ω at 100MHz
5530	2422 549 45333	Bead 120Ω 100MHz
5560	4822 157 11716	Bead 30Ω at 100MHz
5605	2422 549 45333	Bead 120Ω 100MHz
5607	2422 549 45333	Bead 120Ω 100MHz
5636	2422 549 45333	Bead 120Ω 100MHz
5646	2422 549 42896	Bead 120Ω 100MHz
5909	2422 549 45843	100MHz
5910	2422 536 00667	1000μF 20% 7032
5920	2422 549 45333	Bead 120Ω 100MHz
5930	2422 535 94134	10μH 20% 0805
5931	2422 536 00689	220μH
5932	2422 535 94134	10μH 20% 0805
5952	2422 535 94134	10μH 20% 0805
5953	2422 536 00689	220μH
5954	2422 535 94134	10μH 20% 0805
5956	2422 549 45333	Bead 120Ω 100MHz
5958	2422 549 45333	Bead 120Ω 100MHz
5959	2422 549 45333	Bead 120Ω 100MHz
5984	2422 549 45333	Bead 120Ω 100MHz
5985	2422 549 45333	Bead 120Ω 100MHz
5986	2422 549 45333	Bead 120Ω 100MHz
5987	2422 549 45333	Bead 120Ω 100MHz
5988	2422 549 45333	Bead 120Ω 100MHz
5989	2422 549 45333	Bead 120Ω 100MHz
5990	2422 549 45333	Bead 120Ω 100MHz
5991	2422 549 45333	Bead 120Ω 100MHz
5994	2422 549 45333	Bead 120Ω 100MHz
5996	2422 549 45333	Bead 120Ω 100MHz
5997	2422 549 45333	Bead 120Ω 100MHz
5998	2422 549 45333	Bead 120Ω 100MHz



6001	4822 130 11397	BAS316
6002	4822 130 11397	BAS316
6005	9340 553 52115	BAS321
6020	4822 130 11397	BAS316
6021	4822 130 11397	BAS316
6073	4822 130 80622	BAT54
6076	4822 130 80622	BAT54
6310	4822 130 11397	BAS316
6323	4822 130 11525	1SS356
6328	4822 130 11416	PDZ6.8B
6329	4822 130 11416	PDZ6.8B
6563	9322 102 64685	UDZ2.7B
6564	4822 130 11416	PDZ6.8B
6604	4822 130 11397	BAS316
6605	4822 130 11397	BAS316
6634	9322 102 64685	UDZ2.7B
6635	9322 102 64685	UDZ2.7B
6640	9322 102 64685	UDZ2.7B
6910	5322 130 34337	BAV99
6911	9340 548 71115	PDZ33B
6930	9322 128 70685	SMSS14
6951	9322 128 70685	SMSS14



7001	9339 693 90135	BCP69-25
7002	9340 425 20115	BC847BS
7003	9339 693 90135	BCP69-25
7005	9340 547 13215	BSH103
7011	9352 747 88557	TDA12021H/N1B11
7012	3198 010 42310	BC847BW
7013	3198 010 42310	BC847BW
7014	3198 010 42310	BC847BW
7015	9322 208 05668	NE555D
7016	9322 208 05668	NE555D
7017	9322 208 05668	NE555D
7018	5322 130 60159	BC846B
7019	5322 130 60159	BC846B
7068	3198 010 42310	BC847BW
7070	9340 547 13215	BSH103
7099	4822 209 17226	M24C08-WMN6
7316	5322 130 42718	BFS20
7320	3198 010 42310	BC847BW
7370	9340 550 49115	PUMH7
7371	9340 550 49115	PUMH7
7372	9340 550 49115	PUMH7
7376	9340 425 10115	BC857BS
7377	9340 425 10115	BC857BS
7401	9322 206 86671	GM1501-BD
7449	3198 010 42310	BC847BW
7501	9322 199 17671	K4D263238M-QC50
7530	9322 205 12671	MX29LV040QC-70G
7531	9322 156 81668	M24C32-WMN6TNKSA
7532	9352 691 71115	NE56610-27GW
7560	9352 334 10118	TDA9178T/N1
7562	9322 199 24668	L7808CD2T
7563	4822 209 73852	PMBT2369
7604	9352 607 39118	74LVC14APW

7605	4822 209 60792	74HC4053D
7606	9322 199 56668	ADG781BCP
7607	9322 199 80668	SM5301BS-G
7640	4822 130 11155	PDTC114ET
7702	9340 425 20115	BC847BS
7703	9340 425 20115	BC847BS
7706	9351 742 70118	74HC08PW
7708	9340 550 49115	PUMH7
7709	9322 206 09668	TDA7297D
7710	3198 010 42310	BC847BW
7740	9322 183 05668	TS482ID
7910	4822 130 42804	BC817-25
7920	9322 163 24668	L78M08CDT
7930	5322 209 90529	MC34063AD
7952	5322 209 90529	MC34063AD
7954	9322 157 51685	SL12301DS
7955	4822 130 11155	PDTC114ET
7992	9322 142 88668	LF25CDT
7995	9322 189 19668	LD1086D2T18

Side AV/HP Panel [D]

Various

1301	2422 025 14531	20P Female
1302	2422 025 04854	6P Female
1306	2422 026 05059	Connector Phone
1307	4822 267 10484	YKF51-5359
8540	3139 131 03641	Cable 6P



2301	3198 017 41050	1μF 10V 0603
2302	4822 126 14241	330pF 0603 50V
2303	3198 017 41050	1μF 10V 0603
2304	4822 126 14241	330pF 0603 50V
2305	4822 126 14241	330pF 0603 50V
2306	4822 126 14241	330pF 0603 50V
2326	3198 017 41050	1μF 10V 0603



3301	4822 051 30331	330Ω 5% 0.062W
3302	4822 051 30339	33Ω 5% 0.062W
3303	4822 051 30221	220Ω 5% 0.062W
3304	4822 051 30223	22kΩ 5% 0.062W
3305	4822 117 12925	47kΩ 1% 0.063W 0603
3306	4822 051 30759	75Ω 5% 0.062W
3307	4822 051 30223	22kΩ 5% 0.062W
3308	4822 117 12925	47kΩ 1% 0.063W 0603
3316	4822 051 30339	33Ω 5% 0.062W
3318	4822 051 30151	150Ω 5% 0.062W
3319	4822 051 30391	390Ω 5% 0.062W
3320	4822 117 12903	1.8kΩ 1% 0.063W 0603
3321	4822 117 12968	820Ω 5% 0.62W
3322	4822 051 30008	Jumper 0603
3323	4822 051 30008	Jumper 0603
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
4xxx	4822 051 30008	Jumper 0603



6306	4822 130 11148	UDZ4.7B
------	----------------	---------



7326	4822 130 60373	BC856B
------	----------------	--------

IO Panel [H]

Various

1101	2422 025 14911	21p Female
1102	2422 025 14911	21p Female
1103	2422 025 18249	45P Female
1104	2422 025 14551	20P Female
1105	4822 267 31014	Socket headphone
1680	2422 033 00007	Socket DVI 24P
1687	2438 031 00416	Connector 15P Female
1688	4822 267 31014	Socket headphone
1698	2422 025 18249	45P Female
8103▲	3139 131 03511	FFC Foil 45P
8698▲	3139 131 03511	FFC Foil 45P

			
2101	4822 126 14241	330pF 0603 50V	
2102	4822 124 23002	10µF 16V	
2103	4822 126 14241	330pF 0603 50V	
2104	3198 017 41050	1µF 10V 0603	
2105	4822 126 14241	330pF 0603 50V	
2106	4822 124 23002	10µF 16V	
2107	4822 126 14241	330pF 0603 50V	
2108	3198 017 41050	1µF 10V 0603	
2109	4822 126 13881	470pF 5% 50V	
2110	4822 126 13881	470pF 5% 50V	
2111	4822 126 13881	470pF 5% 50V	
2112	4822 126 13881	470pF 5% 50V	
2119	3198 017 41050	1µF 10V 0603	
2126	4822 124 23002	10µF 16V	
2127	4822 126 14241	330pF 0603 50V	
2128	2238 586 59812	100nF 20% 50V 0603	
2129	4822 126 14241	330pF 0603 50V	
2130	4822 124 23002	10µF 16V	
2131	4822 126 14241	330pF 0603 50V	
2132	2238 586 59812	100nF 20% 50V 0603	
2133	4822 126 14241	330pF 0603 50V	
2134	4822 126 13881	470pF 5% 50V	
2135	4822 126 13881	470pF 5% 50V	
2136	4822 126 13881	470pF 5% 50V	
2137	4822 126 13881	470pF 5% 50V	
2138	3198 017 41050	1µF 10V 0603	
2147	4822 124 23002	10µF 16V	
2148	4822 124 23002	10µF 16V	
2152	4822 126 14241	330pF 0603 50V	
2153	4822 126 14241	330pF 0603 50V	
2155	4822 126 14241	330pF 0603 50V	
2157	4822 126 14241	330pF 0603 50V	
2169	4822 124 23002	10µF 16V	
2683	3198 017 41050	1µF 10V 0603	
2684	3198 017 41050	1µF 10V 0603	
2687	3198 017 41050	1µF 10V 0603	
2693	2238 586 59812	100nF 20% 50V 0603	
2694	2238 586 59812	100nF 20% 50V 0603	
2698	2020 552 94427	100pF 5% 50V	
2699	2020 552 94427	100pF 5% 50V	
2700	4822 126 14241	330pF 0603 50V	
2701	4822 126 14241	330pF 0603 50V	
2702	4822 126 14241	330pF 0603 50V	
2703	4822 126 14241	330pF 0603 50V	
2704	4822 126 14241	330pF 0603 50V	
2705	4822 126 14241	330pF 0603 50V	



3101	4822 051 30151	150Ω 5% 0.062W	
3102	4822 117 12891	220kΩ 1%	
3103	4822 051 30223	22kΩ 5% 0.062W	
3104	4822 117 12925	47kΩ 1% 0.063W 0603	
3105	4822 051 30151	150Ω 5% 0.062W	
3106	4822 117 12891	220kΩ 1%	
3107	4822 117 12925	47kΩ 1% 0.063W 0603	
3108	4822 051 30223	22kΩ 5% 0.062W	
3109	4822 051 30759	75Ω 5% 0.062W	
3110	4822 051 30331	330Ω 5% 0.062W	
3111	4822 051 30273	27kΩ 5% 0.062W	
3112	4822 051 30682	6.8Ω 5% 0.062W	
3113	4822 051 30759	75Ω 5% 0.062W	
3114	4822 051 30331	330Ω 5% 0.062W	
3115	4822 051 30759	75Ω 5% 0.062W	
3116	4822 051 30331	330Ω 5% 0.062W	
3117	4822 051 30331	330Ω 5% 0.062W	
3118	4822 051 30759	75Ω 5% 0.062W	
3119	4822 051 30689	68Ω 5% 0.063W 0603	
3121	4822 051 30759	75Ω 5% 0.062W	
3122	4822 051 30331	330Ω 5% 0.062W	
3123	4822 051 30102	1kΩ 5% 0.062W	
3124	4822 117 13632	100kΩ 1% 0603 0.62W	
3125	4822 117 13632	100kΩ 1% 0603 0.62W	
3126	4822 117 12891	220kΩ 1%	
3127	4822 051 30151	150Ω 5% 0.062W	
3128	4822 117 12925	47kΩ 1% 0.063W 0603	
3129	4822 051 30223	22kΩ 5% 0.062W	
3130	4822 117 12891	220kΩ 1%	
3131	4822 051 30151	150Ω 5% 0.062W	
3132	4822 117 12925	47kΩ 1% 0.063W 0603	
3133	4822 051 30223	22kΩ 5% 0.062W	
3134	4822 051 30682	6.8Ω 5% 0.062W	
3135	4822 051 30273	27kΩ 5% 0.062W	
3136	4822 051 30331	330Ω 5% 0.062W	
3137	4822 051 30759	75Ω 5% 0.062W	
3138	4822 117 13632	100kΩ 1% 0603 0.62W	
3139	4822 117 13632	100kΩ 1% 0603 0.62W	
3140	4822 051 30689	68Ω 5% 0.063W 0603	
3141	4822 051 30102	1kΩ 5% 0.062W	
3142	4822 051 30331	330Ω 5% 0.062W	

3143	4822 051 30759	75Ω 5% 0.062W	
3152	4822 117 12891	220kΩ 1%	
3153	4822 051 30151	150Ω 5% 0.062W	
3155	4822 117 12891	220kΩ 1%	
3156	4822 051 30151	150Ω 5% 0.062W	
3157	4822 051 30339	33Ω 5% 0.062W	
3158	4822 051 30102	1kΩ 5% 0.062W	
3169	4822 051 30479	47Ω 5% 0.062W	
3681	4822 051 30008	Jumper 0603	
3682	4822 051 30103	10kΩ 5% 0.062W	
3683	4822 051 30759	75Ω 5% 0.062W	
3684	4822 051 30759	75Ω 5% 0.062W	
3686	4822 051 30008	Jumper 0603	
3687	4822 051 30759	75Ω 5% 0.062W	
3691	4822 051 30101	100Ω 5% 0.062W	
3693	4822 051 30103	10kΩ 5% 0.062W	
3694	4822 051 30103	10kΩ 5% 0.062W	
3696	4822 051 30103	10kΩ 5% 0.062W	
3697	4822 051 30103	10kΩ 5% 0.062W	
3698	4822 051 30223	22kΩ 5% 0.062W	
3699	4822 051 30223	22kΩ 5% 0.062W	
3700	4822 117 12925	47kΩ 1% 0.063W 0603	
3701	4822 117 12925	47kΩ 1% 0.063W 0603	
3704	4822 051 30103	10kΩ 5% 0.062W	
3705	4822 051 30103	10kΩ 5% 0.062W	
3710	4822 051 30102	1kΩ 5% 0.062W	
4106	4822 051 30008	Jumper 0603	



5683	2422 549 45333	Bead 120Ω 100MHz	
5684	2422 549 45333	Bead 120Ω 100MHz	
5687	2422 549 45333	Bead 120Ω 100MHz	
5692	2422 549 45333	Bead 120Ω 100MHz	



6121	4822 130 11416	PDZ6.8B	
6143	4822 130 11416	PDZ6.8B	
6691	4822 130 11397	BAS316	
6692	4822 130 11397	BAS316	



7119	5322 130 60159	BC846B	
7138	5322 130 60159	BC846B	
7693	9322 145 26668	M24C02-WMN6	
7694	9322 145 26668	M24C02-WMN6	

Front Interface + Keyboard [J]

Various

0041	3139 124 60061	Lens	
8704	3139 131 03781	Cable 4P	



2540	4822 124 41643	100µF 20% 16V	
2541	3198 017 41050	1µF 10V 0603	



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	
4540	4822 051 30008	Jumper 0603	
4541	4822 051 30008	Jumper 0603	
4542	4822 051 30008	Jumper 0603	



6540	9322 192 35676	SPR-325MVW	
------	----------------	------------	--



7540	4822 130 60373	BC856B	
7541	5322 130 60159	BC846B	
7542	5322 130 60159	BC846B	
7543	9322 190 34682	BPW34	

Pixel Plus Panel [PP]

Various

1001	2422 025 17192	Connector 9p m	
------	----------------	----------------	--

1002	2422 025 18314	Connector 20p m v 1.25	
1003	2422 025 18314	Connector 20p m v 1.25	
1206	2422 549 45325	Bead 67Ω at 100MHz	
1207	2422 549 45325	Bead 67Ω at 100MHz	
1209	2422 549 45325	Bead 67Ω at 100MHz	
1210	2422 549 45325	Bead 67Ω at 100MHz	
1211	2422 549 45325	Bead 67Ω at 100MHz	
1403	2422 549 45325	Bead 67Ω at 100MHz	
1404	2422 549 45325	Bead 67Ω at 100MHz	
1405	2422 549 45325	Bead 67Ω at 100MHz	
1406	2422 549 45325	Bead 67Ω at 100MHz	
1407	2422 549 45325	Bead 67Ω at 100MHz	



2101	2020 552 94427	100pF 5% 50V
2102	2020 552 94427	100pF 5% 50V
2103	2020 552 94427	100pF 5% 50V
2104	2020 552 94427	100pF 5% 50V
2105	2238 586 59812	100nF 20% 50V 0603
2106	2020 552 94427	100pF 5% 50V
2107	2238 586 59812	100nF 20% 50V 0603
2108	2022 552 05614	1µF 10% 6V3 0603
2110	3198 016 31020	1nF 25V 0603
2112	2238 586 59812	100nF 20% 50V 0603
2113	2238 586 59812	100nF 20% 50V 0603
2114	2022 552 05682	2.2µF 10% 6.3V
2115	2238 586 59812	100nF 20% 50V 0603
2116	2022 552 05682	2.2µF 10% 6.3V
2121	2238 586 59812	100nF 20% 50V 0603
2122	2238 586 59812	100nF 20% 50V 0603
2123	2238 586 59812	100nF 20% 50V 0603
2124	2238 586 59812	100nF 20% 50V 0603
2130	2238 586 59812	100nF 20% 50V 0603
2131	2238 586 59812	100nF 20% 50V 0603
2132	2238 586 59812	100nF 20% 50V 0603
2133	2238 586 59812	100nF 20% 50V 0603
2134	2238 586 59812	100nF 20% 50V 0603
2135	2022 552 05682	2.2µF 10% 6.3V
2136	2238 586 59812	100nF 20% 50V 0603
2139	2238 586 59812	100nF 20% 50V 0603
2140	2238 586 59812	100nF 20% 50V 0603
2141	2238 586 59812	100nF 20% 50V 0603
2142	2238 586 59812	100nF 20% 50V 0603
2143	2238 586 59812	100nF 20% 50V 0603
2144	2238 586 59812	100nF 20% 50V 0603
2145	2238 586 59812	100nF 20% 50V 0603
2146	2238 586 59812	100nF 20% 50V 0603
2147	2238 586 59812	100nF 20% 50V 0603
2148	2238 586 59812	100nF 20% 50V 0603
2149	2238 586 59812	100nF 20% 50V 0603
2150	2238 586 59812	100nF 20% 50V 0603
2201	2238 586 59812	100nF 20% 50V 0603
2202	2238 586 59812	100nF 20% 50V 0603
2203	2238 586 59812	100nF 20% 50V 0603
2204	2238 586 59812	100nF 20% 50V 0603
2205	2238 586 59812	100nF 20% 50V 0603
2206	3198 016 31080	1pF 25% 50V 0603
2207	3198 016 31080	1pF 25% 50V 0603
2208	3198 016 31080	1pF 25% 50V 0603
2209	3198 016 31080	1pF 25% 50V 0603
2210	3198 016 31080	1pF 25% 50V 0603
2211	3198 016 31080	1pF 25% 50V 0603
2212	3198 016 31080	1pF 25% 50V 0603
2213	3198 016 31080	1pF 25% 50V 0603
2214	3198 016 31080	1pF 25% 50V 0603
2215	3198 016 31080	1pF 25% 50V 0603
2216	2238 586 59812	100nF 20% 50V 0603
2401	2238 586 59812	100nF 20% 50V 0603
2402	2238 586 59812	100nF 20% 50V 0603
2403	2238 586 59812	100nF 20% 50V 0603
2404	2238 586 59812	100nF 20% 50V 0603
2405	2238 586 59812	100nF 20% 50V 0603
2406	3198 016 31080	1pF 25% 50V 0603
2407	3198 016 31080	1pF 25% 50V 0603
2408	3198 016 31080	1pF 25% 50V 0603
2409	3198 016 31080	1pF 25% 50V 0603
2410	3198 016 31080	1pF 25% 50V 0603
2411	3198 016 31080	1pF 25% 50V 0603
2412	3198 016 31080	1pF 25% 50V 0603
2413	3198 016 31080	1pF 25% 50V 0603
2414	3198 016 31080	1pF 25% 50V 0603
2415	3198 016 31080	1pF 25% 50V 0603
2419	2238 586 59812	100nF 20% 50V 0603
2502	2238 586 59812	100nF 20% 50V 0603
2503	4822 124 12095	100µF 20% 16V
2504	2238 586 59812	100nF 20% 50V 0603
2505	2022 552 05682	2.2µF 10% 6.3V
2508	4822 122 33761	22pF 5% 50V
2509	4822 122 33761	22pF 5% 50V
2515	2238 586 59812	100nF 20% 50V 0603
2516	4822 122 33761	22pF 5% 50V
2520	4822 122 33761	22pF 5% 50V

2522 5322 126 11583 10nF 10% 50V 0603

—W—

3101	4822 051 30103	10kΩ 5% 0.062W
3102	4822 051 30479	47Ω 5% 0.062W
3103	4822 051 30479	47Ω 5% 0.062W
3104	4822 051 30103	10kΩ 5% 0.062W
3105	4822 051 30103	10kΩ 5% 0.062W
3106	4822 051 30103	10kΩ 5% 0.062W
3107	4822 051 30103	10kΩ 5% 0.062W
3108	4822 051 30103	10kΩ 5% 0.062W
3109	4822 051 30103	10kΩ 5% 0.062W
3110	4822 051 30479	47Ω 5% 0.062W
3111	4822 051 30103	10kΩ 5% 0.062W
3112	4822 051 30103	10kΩ 5% 0.062W
3113	4822 051 30103	10kΩ 5% 0.062W
3114	4822 051 30479	47Ω 5% 0.062W
3115	4822 051 30102	1kΩ 5% 0.062W
3116	4822 051 30333	33kΩ 5% 0.062W
3117	4822 051 30103	10kΩ 5% 0.062W
3118	4822 051 30333	33kΩ 5% 0.062W
3122	4822 051 30479	47Ω 5% 0.062W
3125	4822 051 30479	47Ω 5% 0.062W
3202	4822 051 30472	4.7Ω 5% 0.062W
3204	4822 051 30101	100Ω 5% 0.062W
3207	4822 051 30101	100Ω 5% 0.062W
3210	4822 051 30101	100Ω 5% 0.062W
3213	4822 051 30101	100Ω 5% 0.062W
3216	4822 051 30101	100Ω 5% 0.062W
3402	4822 051 30479	47Ω 5% 0.062W
3403	4822 051 30102	1kΩ 5% 0.062W
3406	4822 051 30472	4.7Ω 5% 0.062W
3407	4822 051 30101	100Ω 5% 0.062W
3421	4822 051 30479	47Ω 5% 0.062W
3510	4822 051 30472	4.7Ω 5% 0.062W
3512	4822 051 30103	10kΩ 5% 0.062W
3513	4822 051 30102	1kΩ 5% 0.062W
3515	4822 051 30472	4.7Ω 5% 0.062W
3519	4822 051 30472	4.7Ω 5% 0.062W
3520	4822 051 30472	4.7Ω 5% 0.062W

—

5101	4822 157 11716	Bead 30Ω at 100MHz
5104	4822 157 11716	Bead 30Ω at 100MHz
5105	4822 157 11716	Bead 30Ω at 100MHz
5106	4822 157 11716	Bead 30Ω at 100MHz
5107	4822 157 11716	Bead 30Ω at 100MHz
5201	4822 157 11716	Bead 30Ω at 100MHz
5202	4822 157 11716	Bead 30Ω at 100MHz
5203	4822 157 11716	Bead 30Ω at 100MHz
5401	4822 157 11716	Bead 30Ω at 100MHz
5402	4822 157 11716	Bead 30Ω at 100MHz
5403	4822 157 11716	Bead 30Ω at 100MHz



7101	9322 200 14671	EP1C12F256C8
7102	3122 357 00601	Softw. (See Prod.Surv.)
7108	2722 171 08825	Xtal 14.31818MHz 15pF SMD
7110	9340 425 20115	BC847BS
7201	9322 210 59668	THC63LVDF84B
7403	9322 201 03668	THC63LVDM83R
7501	9322 170 14668	LF15ABDT
7504	9322 190 77685	SI2307DS
7505	4822 130 11155	PDTC114ET

11. Revision List

Manual xxxx xxx xxxx.0

- First release.

Manual xxxx xxx xxxx.1

The manual is updated with information for models with Pixel Plus. This information is only applicable for xxPF9956 models.

- Chapter: Mechanical Instructions, added Pixel Plus Panel removal instructions.
- Chapter: Service Modes, Error Codes, and Fault Finding, some layout issues fixed.
- Chapter: Block Diagrams, Testpoint Overviews, and Waveforms: Pixel Plus Panel added.
- Chapter: Circuit Diagrams and PWB Layouts: Pixel Plus Panel added.
- Chapter: Circuit Descriptions, Abbreviations List, and IC Data Sheets: Pixel Plus Panel descriptions added.
- Chapter: Spare Parts list, Pixel Plus Panel added.