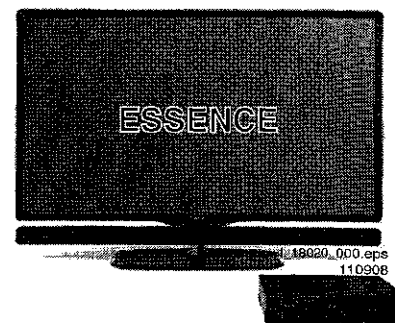


Service Service Service

Q529.1E
LC



Service Manual

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1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

- 1.1 Technical Specifications
- 1.2 Connections
- 1.3 Chassis Overview

Notes:

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

1.1 Technical Specifications

1.1.1 Vision

Display type	: LCD
Screen size	: 42" (107 cm), 16:9
Resolution (H × V pixels)	: 1920 × 1080
Min. light output (cd/m ²)	: 500
Min. contrast ratio	: 66000:1
Max. response time (ms)	: 2
Viewing angle (H × V degrees)	: 176 × 176
Tuning system	: PLL
TV Colour systems	: PAL B/G, D/K, I : SECAM B/G, D/K, L/L' : DVB-T : DVB-C (optional) : MPEG4 (optional)
Video playback	: NTSC, PAL, SECAM
Tuner bands	: UHF, VHF, S, Hyper
Supported video formats	
- 60 Hz	: 480i
- 60 Hz	: 480p
- 50 Hz	: 576i
- 50 Hz	: 576p
- 50, 60 Hz	: 720p
- 50, 60 Hz	: 1080i
- 24, 25, 30, 50, 60 Hz	: 1080p
Supported computer formats:	
- 60 Hz	: 640 × 480
- 60 Hz	: 800 × 600
- 60 Hz	: 1024 × 768
- 60 Hz	: 1280 × 768
- 60 Hz	: 1360 × 768
- 60 Hz	: 1920 × 1080i
- 60 Hz	: 1920 × 1080p
Presets/channels	: automatic channel management
Tuner bands	: VHF : UHF : S-band : Hyper-band

1.1.2 Sound

Sound systems	: Virtual Dolby Digital : BBE
Maximum power (W _{RMS})	: 2 × 15

1.1.3 Multimedia

Supported formats	: Slideshow.alb files : MPEG1 : MPEG2 : MP3 : JPEG
USB input	: USB1.1 (12 Mbps) : USB2.0 (480 Mbps)
Network	: DLNA PC Network link

1.1.4 Miscellaneous

Power supply:

- Mains voltage (V _{AC})	: 220 - 240 ±10%
- Mains frequency (Hz)	: 50 / 60

Ambient conditions:

- Temperature range (°C)	: +5 to +35 : 90% R.H.
--------------------------	---------------------------

Power consumption (values are indicative)

- Normal operation (W)	: ≈248
- Standby (W)	: < 0.40

Hub dimensions (W × H × D in mm)	: 320 × 84 × 320
----------------------------------	------------------

Hub weight (kg)	: 4.7
-----------------	-------

Screen dimensions (W × H × D in mm)	: 982 × 662.5 × 49.8
-------------------------------------	----------------------

Screen weight (kg)	: 16.5
--------------------	--------

1.2 Connections

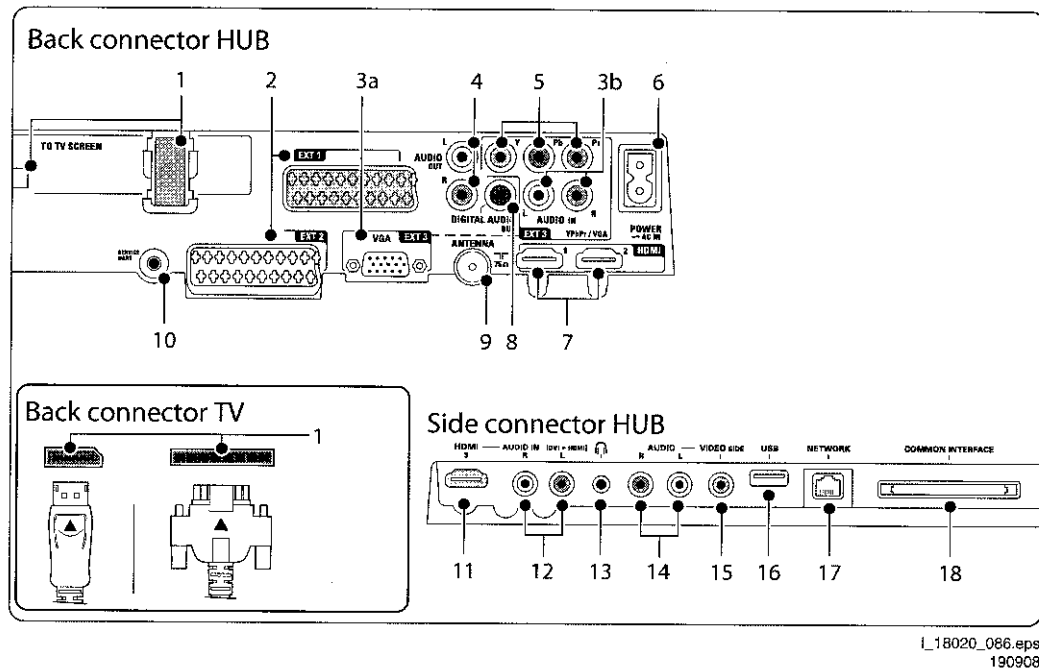


Figure 1-1 Connection overview

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

1.2.1 Connections

1 - Single cable connectors

Dedicated for Essence

2 - EXT1, EXT2: Video YPbPr - In, CVBS - In/Out, Audio - In/Out

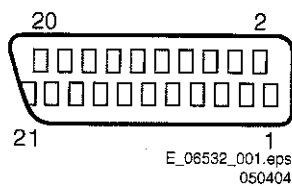


Figure 1-2 SCART connector

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 - Ground Audio	Gnd
5 - Ground Blue	Gnd
6 - Audio L	0.5 V _{RMS} / 10 kohm
7 - Video Pb	0.7 V _{PP} / 75 ohm
8 - Function Select	0 - 2 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3
9 - Ground	Gnd
10 - n.c.	
11 - Video Y	1 V _{PP} / 75 ohm
12 - n.c.	
13 - Ground	Gnd
14 - Ground	Gnd
15 - Video Pr	0.7 V _{PP} / 75 ohm

16 - Status/FBL	0 - 0.4 V: INT 1 - 3 V: EXT / 75 ohm
17 - Ground Video	Gnd
18 - Ground FBL	Gnd
19 - Video CVBS	1 V _{PP} / 75 ohm
20 - Video CVBS/Y	1 V _{PP} / 75 ohm
21 - Shield	Gnd

3a - EXT 3 VGA: Video RGB - In

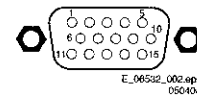


Figure 1-3 VGA Connector

1 - Video Red	0.7 V _{PP} / 75 Ω
2 - Video Green	0.7 V _{PP} / 75 Ω
3 - Video Blue	0.7 V _{PP} / 75 Ω
4 - n.c.	
5 - Ground	Gnd
6 - Ground Red	Gnd
7 - Ground Green	Gnd
8 - Ground Blue	Gnd
9 - +5V _{DC}	+5 V
10 - Ground Sync	Gnd
11 - n.c.	
12 - DDC_SDA	DDC data
13 - H-sync	0 - 5 V
14 - V-sync	0 - 5 V
15 - DDC_SCL	DDC clock

3b - Cinch: Audio - In

Rd - Audio R	0.5 V _{RMS} / 10 kΩ
Wh - Audio L	0.5 V _{RMS} / 10 kΩ

4 - Cinch: Audio - Out

Rd - Audio - R	0.5 V _{RMS} / 10 kΩ
Wh - Audio - L	0.5 V _{RMS} / 10 kΩ

5 - Cinch: Video YPbPr - In

Gn - Video Y	1 V _{PP} / 75 Ω
Bu - Video Pb	0.7 V _{PP} / 75 Ω
Rd - Video Pr	0.7 V _{PP} / 75 Ω



7, 11 - HDMI 1, 2, 3 Digital Video, Digital Audio - In

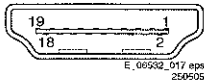
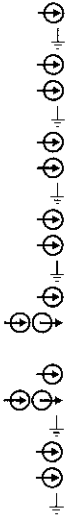


Figure 1-4 HDMI (type A) connector

1 - D2+	Data channel
2 - Shield	Gnd
3 - D2-	Data channel
4 - D1+	Data channel
5 - Shield	Gnd
6 - D1-	Data channel
7 - D0+	Data channel
8 - Shield	Gnd
9 - D0-	Data channel
10 - CLK+	Data channel
11 - Shield	Gnd
12 - CLK-	Data channel
13 - Easylink	Control channel
14 - n.c.	
15 - DDC_SCL	DDC clock
16 - DDC_SDA	DDC data
17 - Ground	Gnd
18 - +5V	
19 - HPD	Hot Plug Detect
20 - Ground	Gnd



8 - Cinch: S/PDIF - Out

Bk - Coaxial	0.4 - 0.6V _{PP} / 75 Ω
--------------	---------------------------------



9 - Aerial - In

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



10 - Service Connector (UART)

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



12 - Cinch: Audio - In

Rd - Audio - R	0.5 V _{RMS} / 10 kΩ
Wh - Audio - L	0.5 V _{RMS} / 10 kΩ



13 - Headphone (Output)

Bk - Headphone	32 - 600 Ω / 10 mW
----------------	--------------------



14 - Cinch: Audio - In

Rd - Audio - R	0.5 V _{RMS} / 10 kΩ
Wh - Audio - L	0.5 V _{RMS} / 10 kΩ



15 - Cinch: Video CVBS - In, Audio - In

Ye - Video CVBS	1 V _{PP} / 75 Ω
-----------------	--------------------------



16 - USB2.0

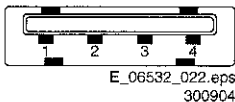


Figure 1-5 USB (type A)

1 - +5V	
2 - Data (-)	
3 - Data (+)	
4 - Ground	Gnd



17 - RJ45: Ethernet

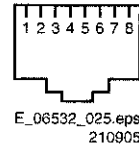


Figure 1-6 Ethernet connector

1 - TD+	Transmit signal
2 - TD-	Transmit signal
3 - RD+	Receive signal
4 - n.c.	
5 - n.c.	
6 - RD-	Receive signal
7 - n.c.	
8 - n.c.	



18 - Common Interface

68p - See diagram B03H



1.3 Chassis Overview

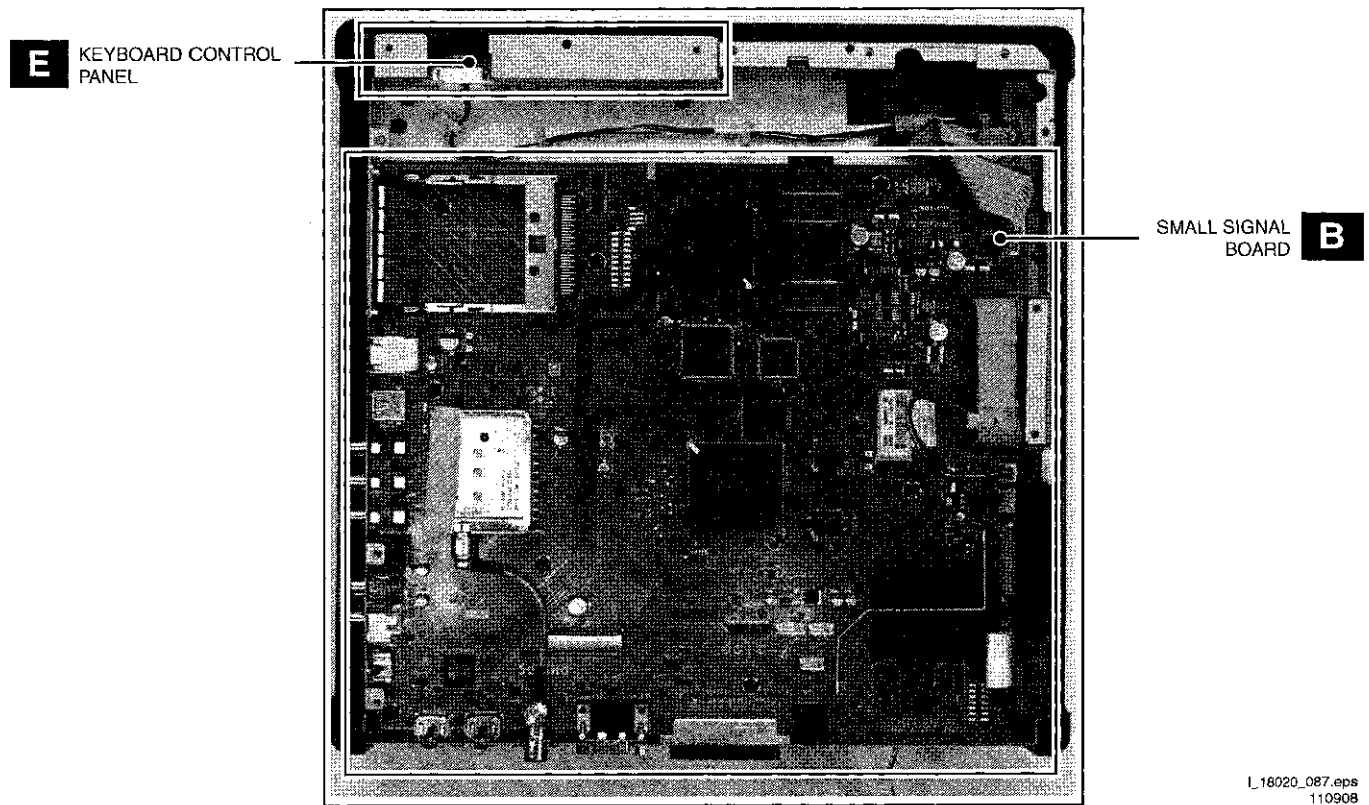


Figure 1-7 PWB/CBA locations Hub -1-

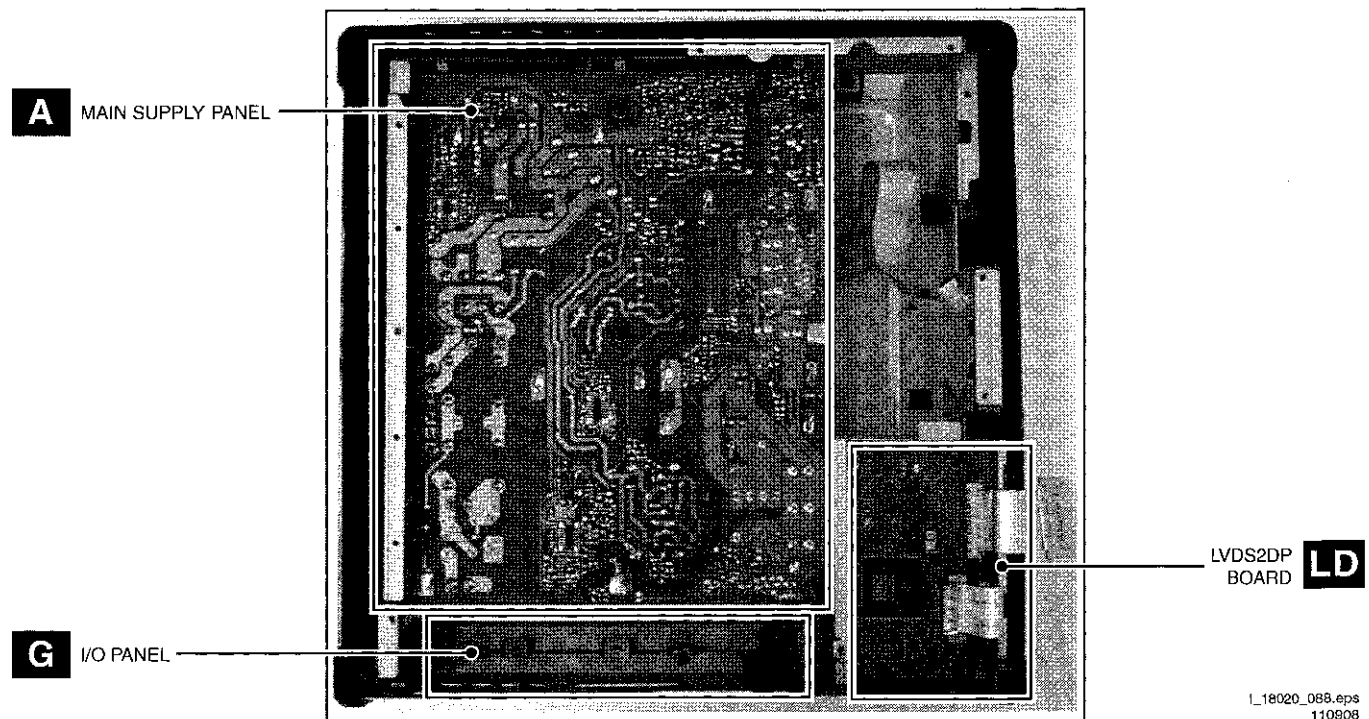


Figure 1-8 PWB/CBA locations Hub -2-

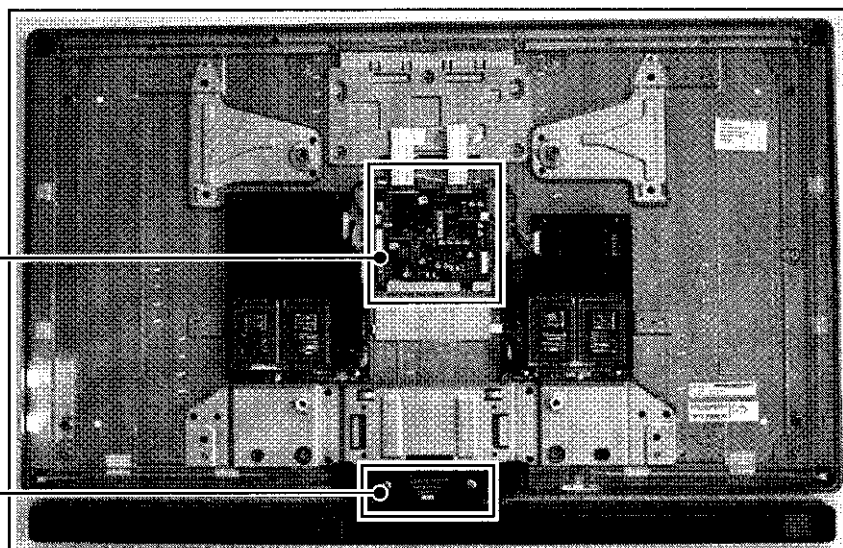
M MONITOR BOARD**J** IR & LED PANELi_18020_089.eps
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Figure 1-9 PWB/CBA locations Monitor

2. Safety Instructions, Warnings, and Notes

Index of this chapter:

- 2.1 Safety Instructions
- 2.2 Warnings
- 2.3 Notes

2.1 Safety Instructions

Safety regulations require the following **during** a repair:

- Connect the set to the Mains/AC Power via an isolation transformer (> 800 VA).
- Replace safety components, indicated by the symbol ▲, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that **after** a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

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

2.2 Warnings

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD ▲). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.
- Be careful during measurements in the high voltage section.
- Never replace modules or other components while the unit is switched "on".
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

2.3 Notes

2.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⊥), or hot ground (⤵), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode (see chapter 5) with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).

- Where necessary, measure the waveforms and voltages with (⊥) and without (⤵) aerial signal. Measure the voltages in the power supply section both in normal operation (Ⓢ) and in stand-by (Ⓢ). These values are indicated by means of the appropriate symbols.
- Manufactured under license from Dolby Laboratories. "Dolby", "Pro Logic" and the "double-D symbol", are trademarks of Dolby Laboratories.

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 kΩ).
- Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220 Ω).
- 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 Spare Parts List. Therefore, always check this list when there is any doubt.

2.3.3 BGA (Ball Grid Array) ICs

Introduction

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

BGA Temperature Profiles

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

2.3.4 Lead-free Soldering

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free soldering tin Philips SAC305 with order code 0622 149 00106. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
 - To reach a solder-tip temperature of at least 400°C.
 - To stabilize the adjusted temperature at the solder-tip.
 - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilized at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch "off" unused equipment or reduce heat.
- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly to

avoid mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.

2.3.5 Alternative BOM identification

It should be noted that on the European Service website, "Alternative BOM" is referred to as "Design variant".

The third digit in the serial number (example: AG2B0335000001) indicates the number of the alternative B.O.M. (Bill Of Materials) that has been used for producing the specific TV set. In general, it is possible that the same TV model on the market is produced with e.g. two different types of displays, coming from two different suppliers. This will then result in sets which have the same CTN (Commercial Type Number; e.g. 28PW9515/12) but which have a different B.O.M. number.

By looking at the third digit of the serial number, one can identify which B.O.M. is used for the TV set he is working with. If the third digit of the serial number contains the number "1" (example: AG1B0335000001), then the TV set has been manufactured according to B.O.M. number 1. If the third digit is a "2" (example: AG2B0335000001), then the set has been produced according to B.O.M. no. 2. ***This is important for ordering the correct spare parts!***

For the third digit, the numbers 1...9 and the characters A...Z can be used, so in total: 9 plus 26 = 35 different B.O.M.s can be indicated by the third digit of the serial number.

Identification: The bottom line of a type plate gives a 14-digit serial number. Digits 1 and 2 refer to the production center (e.g. AG is Bruges), digit 3 refers to the B.O.M. code, digit 4 refers to the Service version change code, digits 5 and 6 refer to the production year, and digits 7 and 8 refer to production week (in

example below it is 2006 week 17). The 6 last digits contain the serial number.



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Figure 2-1 Serial number (example)

2.3.6 Board Level Repair (BLR) or Component Level Repair (CLR)

If a board is defective, consult your repair procedure to decide if the board has to be exchanged or if it should be repaired on component level.

If your repair procedure says the board should be exchanged completely, do not solder on the defective board. Otherwise, it cannot be returned to the O.E.M. supplier for back charging!

2.3.7 Practical Service Precautions

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

3. Directions for Use

Directions for use can be downloaded from the following websites:

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

<http://www.p4c.philips.com>

4. Mechanical Instructions

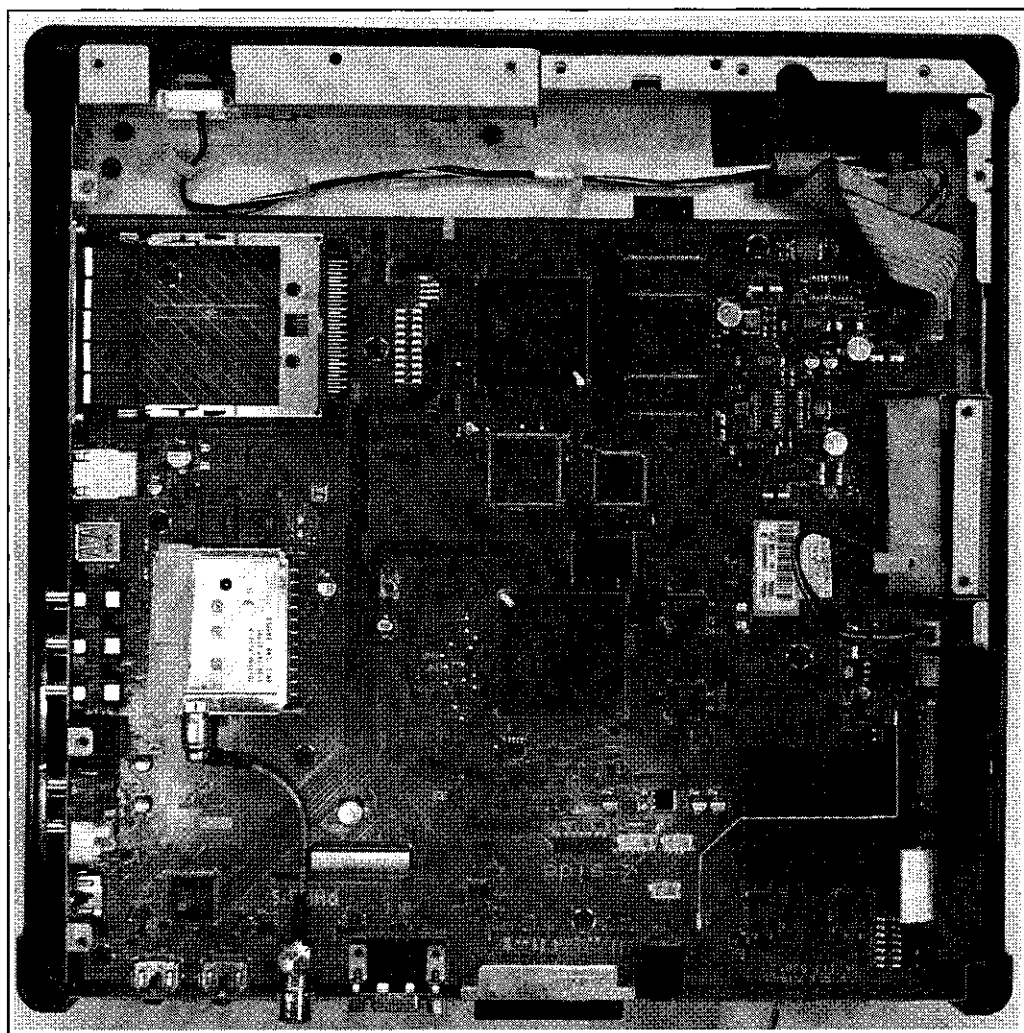
Index of this chapter:

- 4.1 Cable Dressing
- 4.2 Service Positions
- 4.3 Assy/Panel Removal Hub
- 4.4 Assy/Panel Removal Monitor
- 4.5 Set Re-assembly.

Notes:

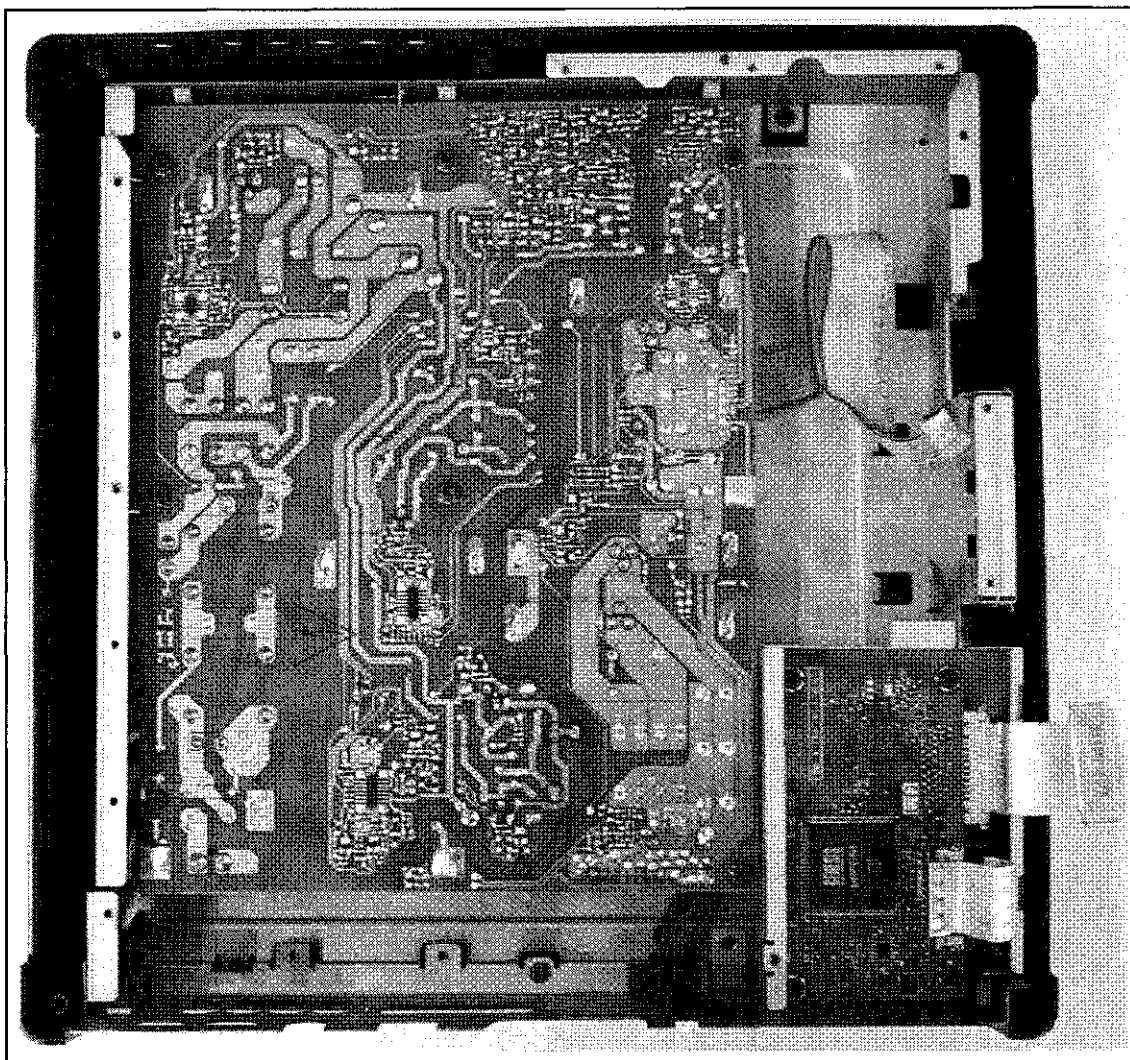
- Figures below can deviate slightly from the actual situation, due to the different set executions.

4.1 Cable Dressing



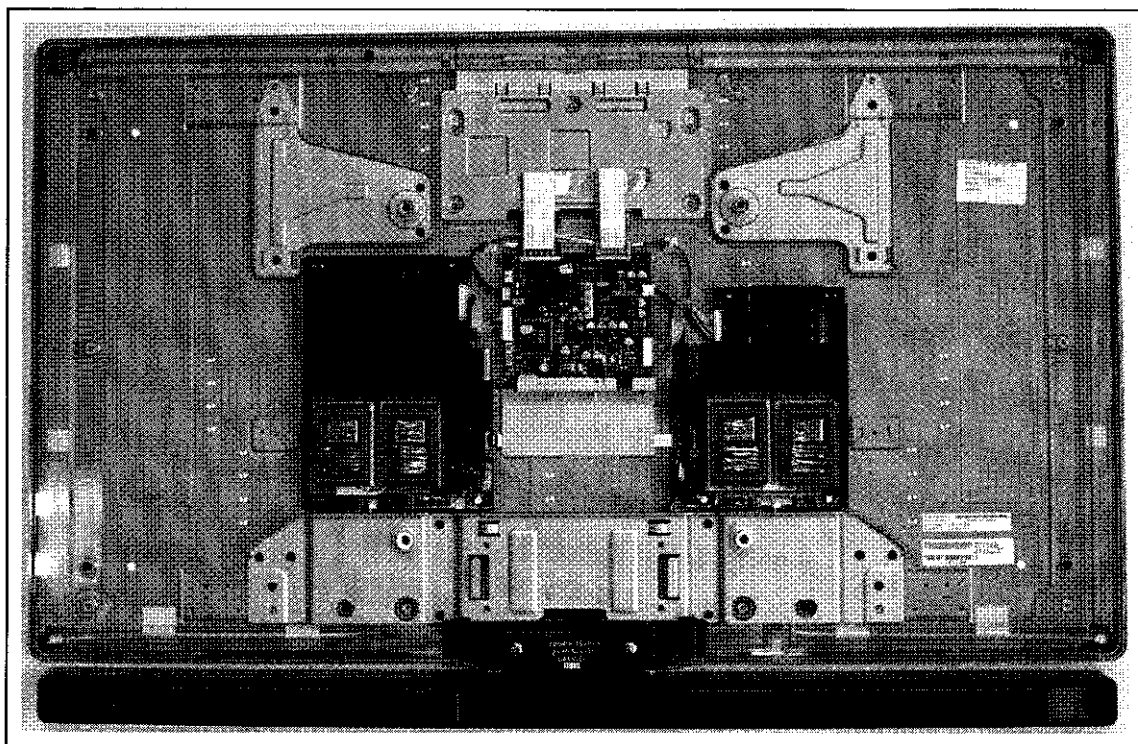
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Figure 4-1 Cable dressing hub; bottom view



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Figure 4-2 Cable dressing hub; bottom view (SSB removed)



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Figure 4-3 Cable dressing monitor

4.2 Service Positions

For easy servicing of the monitor of the set, there are a few possibilities created:

- The buffers from the packaging.
- Foam bars (created for Service).

4.2.1 Foam Bars

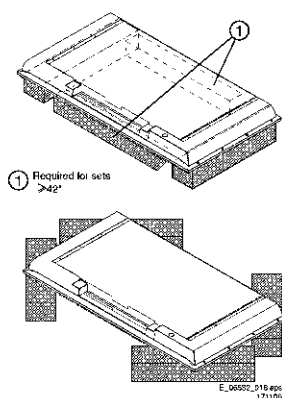


Figure 4-4 Foam bars

The foam bars (order code 3122 785 90580 for two pieces) can be used for all types and sizes of Flat TVs. See figure "Foam bars" for details. Sets with a display of 42" and larger, require **four** foam bars [1]. Ensure that the foam bars are always supporting the cabinet and **never** only the display.

Caution: Failure to follow these guidelines can seriously damage the display!

By laying the TV face down on the (ESD protective) foam bars, a stable situation is created to perform measurements and alignments. By placing a mirror under the TV, the screen can be monitored.

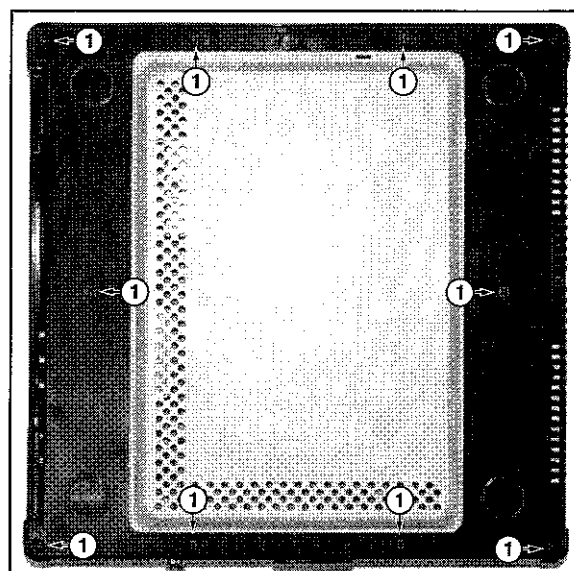
4.3 Assy/Panel Removal Hub

4.3.1 Bottom Cover and -Shield

Warning: Disconnect the mains power cord before removing the rear cover.

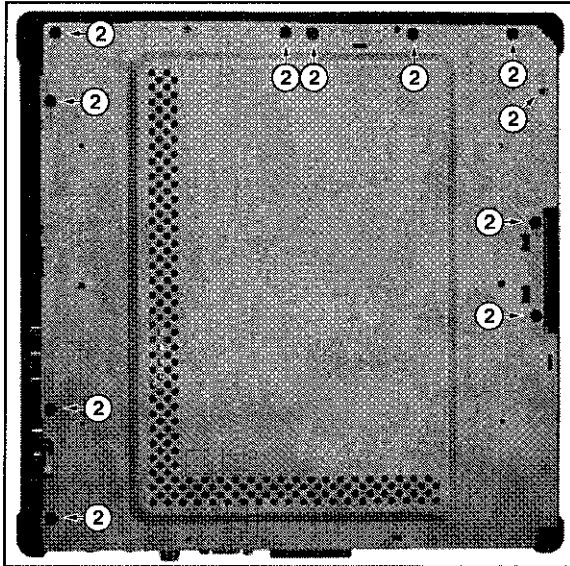
Refer to next figures for details.

1. Place the hub upside-down and remove the bottom cover by removing the screws [1].
2. Remove the bottom shield by removing the screws [2] indicated with an arrow.



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Figure 4-5 Bottom Cover and -Shield -1-



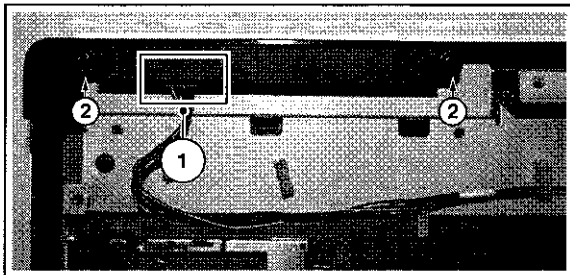
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Figure 4-6 Bottom Cover and -Shield -2-

4.3.2 Key Board

Refer to next figure for details.

1. Unplug the key board connector [1] from the IR & LED board.
 2. Remove the screws [2].
 3. Lift the unit and take it out of the set.
- When defective, replace the whole unit.



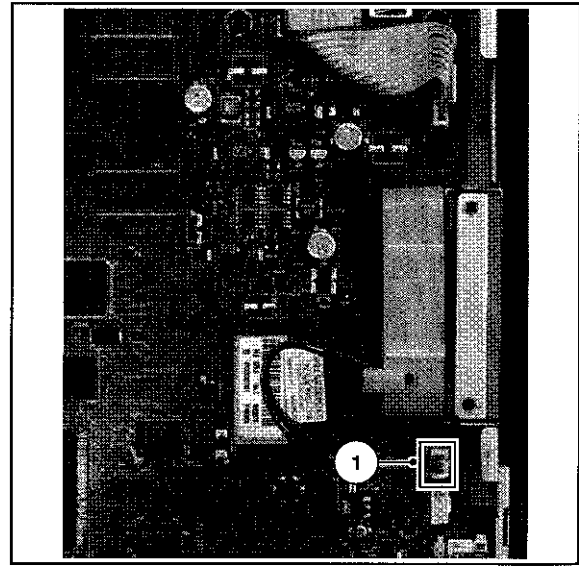
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Figure 4-7 Keyboard Control Panel

4.3.3 Fan

Refer to next figure for details.

1. Unplug connector [1].
 2. Lift the fan from the set. During replacement, ensure you replace it at its original position.
- When defective, replace the unit.



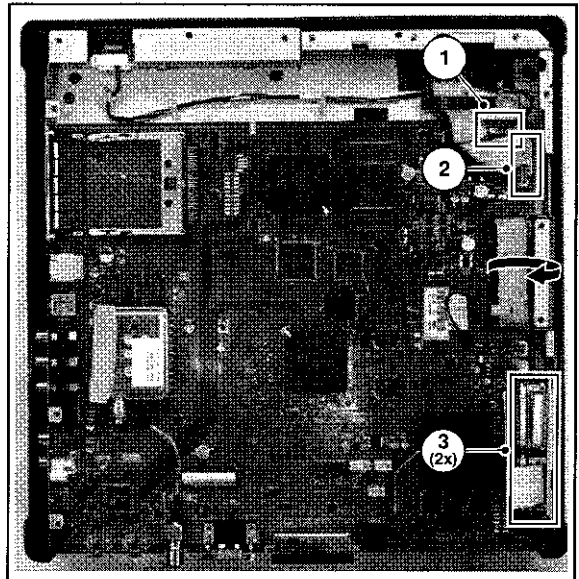
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Figure 4-8 Fan

4.3.4 Small Signal Board (SSB)

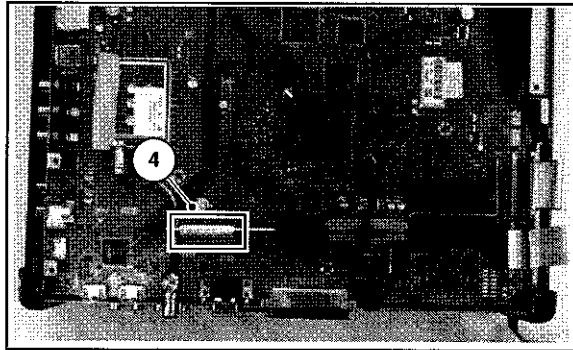
Refer to next figures or details.

1. Remove fan.
2. Unplug keyboard cable [1] on SSB.
3. Unplug flat cable [2] on SSB.
4. Unplug two LVDS connectors [3] on SSB. These are very fragile connectors!
5. Lift the flatcable gently with a screwdriver [4] that leads to the underlying I/O Panel.
6. Remove three screws near side I/O Panel.
7. Remove four screws near back I/O Panel (including the two screws of the VGA connector).
8. Remove all remaining screws that secure the SSB.
9. Slide the SSB sideways out of the hub.



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Figure 4-9 Small Signal Board -1-



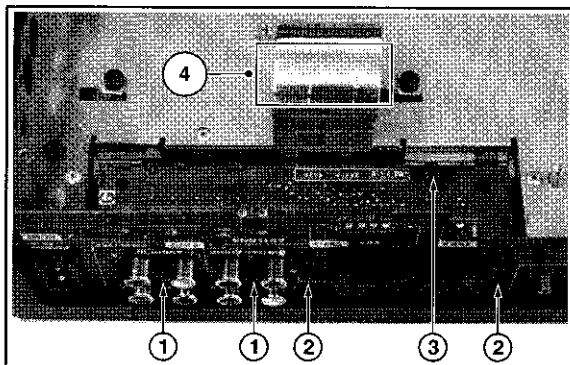
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Figure 4-10 Small Signal Board -2-

4.3.5 Subframe underneath SSB

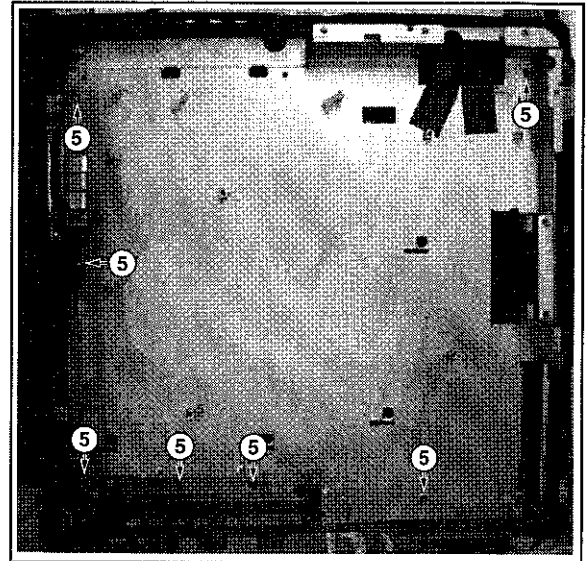
Refer to next figures for details.

1. Remove keyboard, fan and SSB.
2. Remove two screws [1] on Additional I/O Panel (near cinch plugs).
3. Remove two screw [2] on Additional I/O Panel (near SCART plug).
4. Remove screw [3].
5. Unclamp flat cable coming from Power Supply Unit [4].
6. Take the board out.
7. Remove screws on the subframe indicated with an arrow [5].
8. Lift the subframe on the right side, then lift the subframe forwards, then take the subframe out of the hub.



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Figure 4-11 Subframe -1-



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Figure 4-12 Subframe -2-

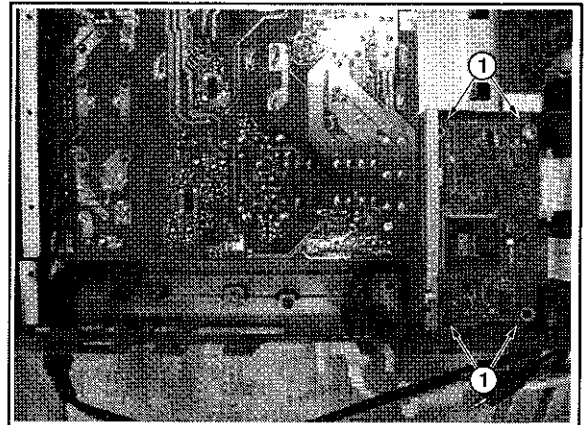
4.3.6 Additional I/O Panel

Refer to section "Subframe underneath SSB".
When defective, replace the whole unit.

4.3.7 Display Port Panel Hub

Refer to next figure for details.

1. Remove screws [1].
2. Unplug the other connectors.
3. Remove all fixation screws.
4. Take the board out.



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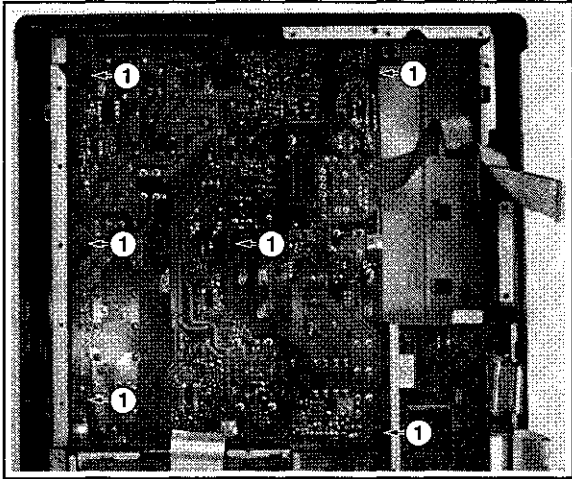
Figure 4-13 Display Port Panel Hub

4.3.8 Power Supply Unit

Refer to next figure for details.

1. Remove the fixation screws [1].
2. Lift the board.
3. Unplug the connector to the mains inlet.
4. Unplug the connector from the supply connector to the screen.
5. Take the supply out.

When defective, replace the whole unit.



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Figure 4-14 Power Supply Unit

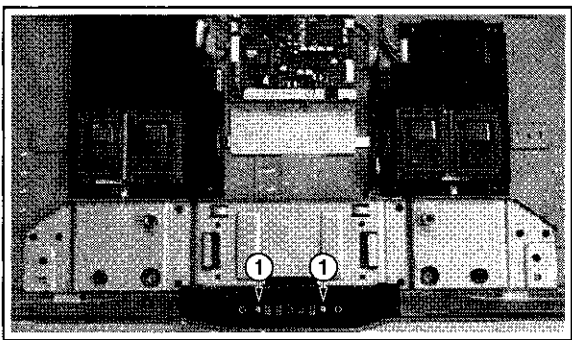
4.4 Assy/Panel Removal Monitor

4.4.1 Sound Interface

Refer to next figure for details.

1. Remove stand (four screws).
2. Lift set from stand.
3. Remove soundbar.
4. Remove sound interface by removing the screws [1].

When defective, replace the whole module.



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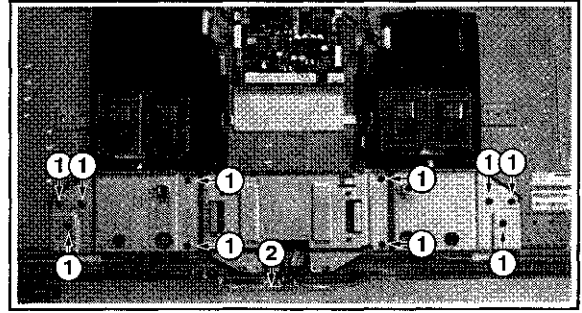
Figure 4-15 Sound Interface

4.4.2 IR & LED Board

Refer to next figures for details.

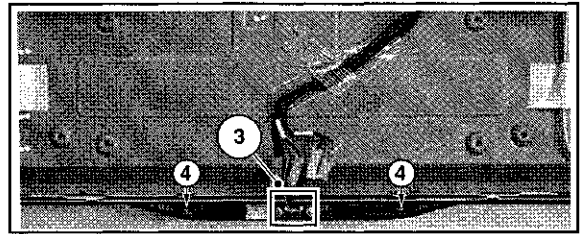
1. Remove lower part of VESA stand [1].
2. Remove flare [2] (six screws).
3. Unplug connector [3].
4. Remove screws [4].

When defective, replace the whole unit.



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Figure 4-16 IR & LED Panel -1-



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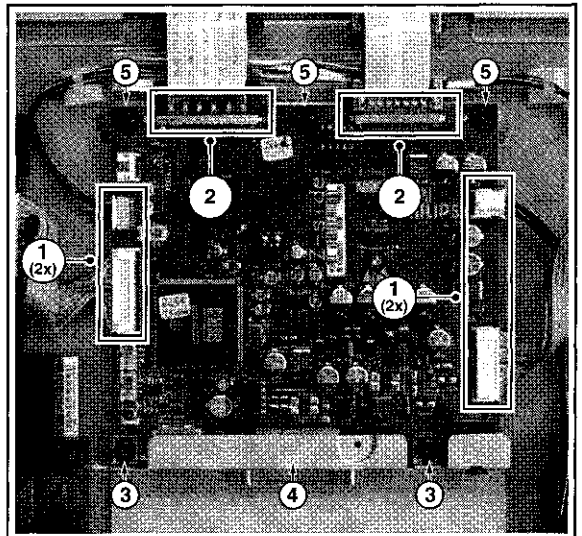
Figure 4-17 IR & LED Panel -2-

4.4.3 Display Port Panel

Refer to next figure for details.

1. Unplug connectors [1].
2. Unplug LVDS connectors [2]. Be careful, as these are very fragile connectors.
3. Remove screws [3] and subframe [4].
4. Remove screws [5].

When defective, replace the whole unit.



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Figure 4-18 Display Port Panel Monitor

4.4.4 LCD Panel

SPECIAL NOTICE

The dis-assembly, re-assembly and/or exchange of the LCD Panel is an elaborate process. Reason for this is the mounting method of the Panel in the cabinet. Due to physical restraints, no screws could be used, but instead adhesive foams and -tapes are used.

Use gloves where indicated to avoid **personal injury** and **pollution** of the LCD Panel (dust and/or fingerprints).

Exactly **follow the instructions** to avoid **warranty issues**, especially when a defective LCD Panel has to be returned to the supplier.

Step A. to F. describe the removal of the LCD Panel of the cabinet.

Step K. to N. describe the mounting of the LCD Panel back into the cabinet.

Step G. to J. describe which additional actions have to be taken in the event the original LCD Panel has to be replaced.

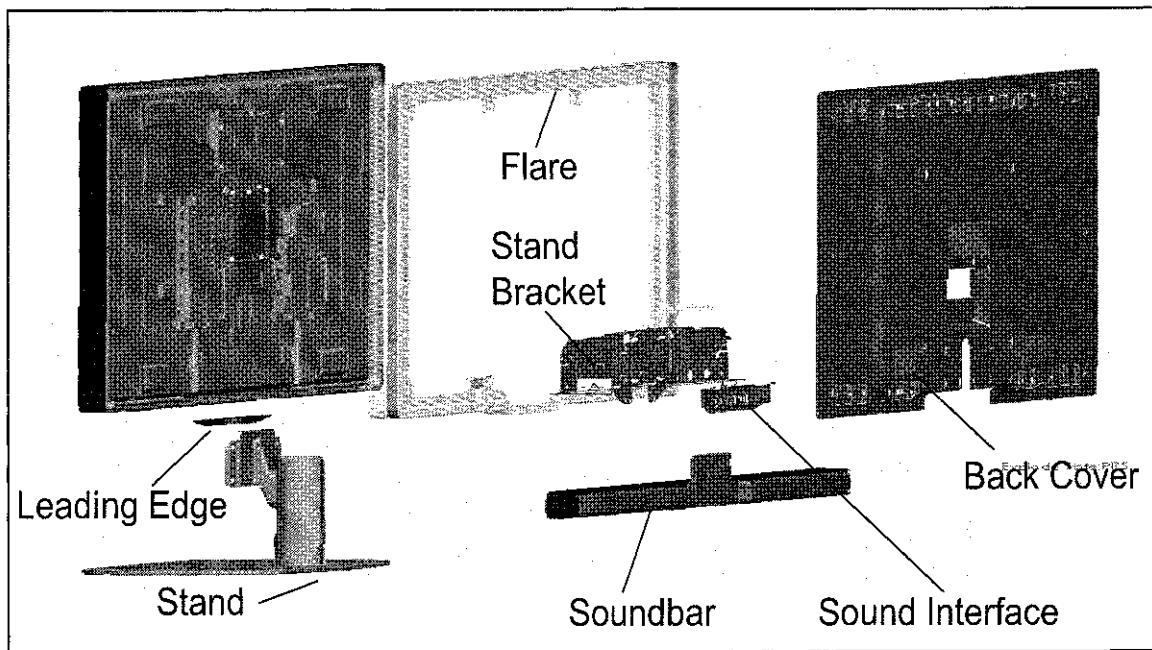
Additional Spare Parts are needed when remounting the (new) LCD Panel in the cabinet. These spare parts can be ordered as one Service Kit using ordering code 3122 785 91150. The kit contains the following items:

- 5 x Foam L x W x T = 20 x 43 x 0.5 mm.
- 6 x Foam L x W x T = 70 x 50 x 0.5 mm.
- 4 x Foam L x W x T = 30 x 43 x 0.5 mm.
- 1 x Foam L x W x T = 55 x 20 x 0.8 mm.
- 5 x Cable clamp (wire saddle) 11.2 mm.

LCD Panel Removal

A. Refer to next figure for details.

1. Remove stand.
2. Remove soundbar.
3. Remove backcover.
4. Remove sound interface.
5. Remove flare.
6. Remove stand bracket.
7. Remove leading edge.



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Figure 4-19 LCD Panel -1-

B. Bend metal lips in each corner of Front open.

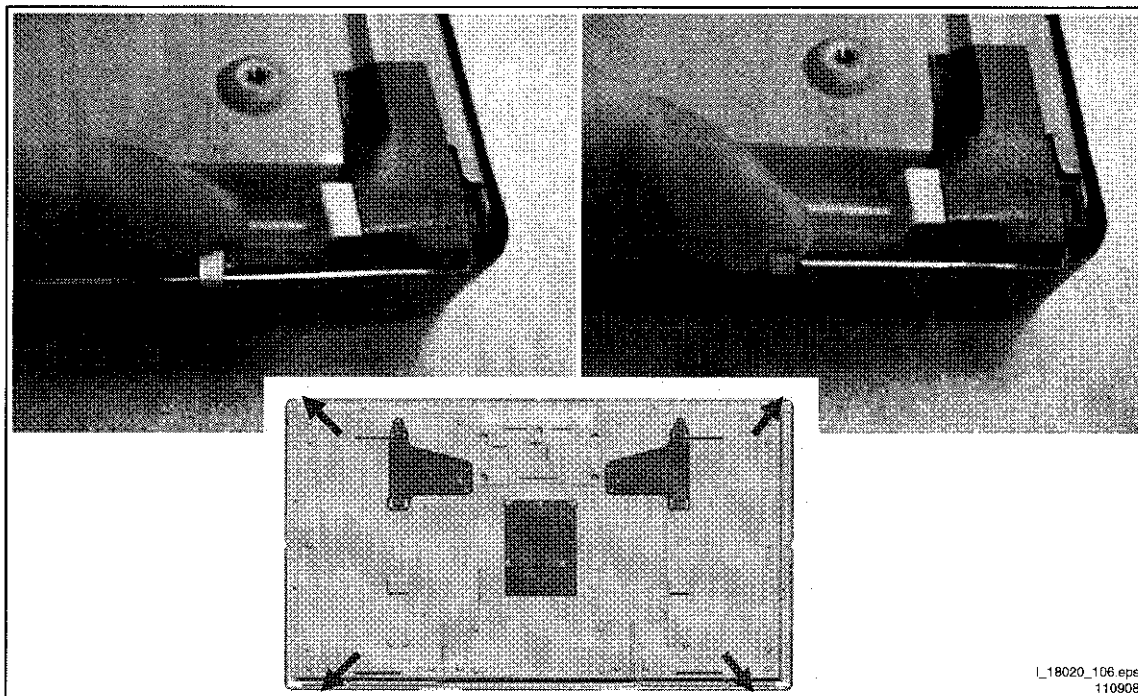


Figure 4-20 LCD Panel -2-

C. Remove thermal foams (3x) between LCD-panel and upper wall of metal Front.

1. Pull the upper bend open.
2. Move out the thermal foam with e.g. a screwdriver.
3. Pull out the thermal foam.

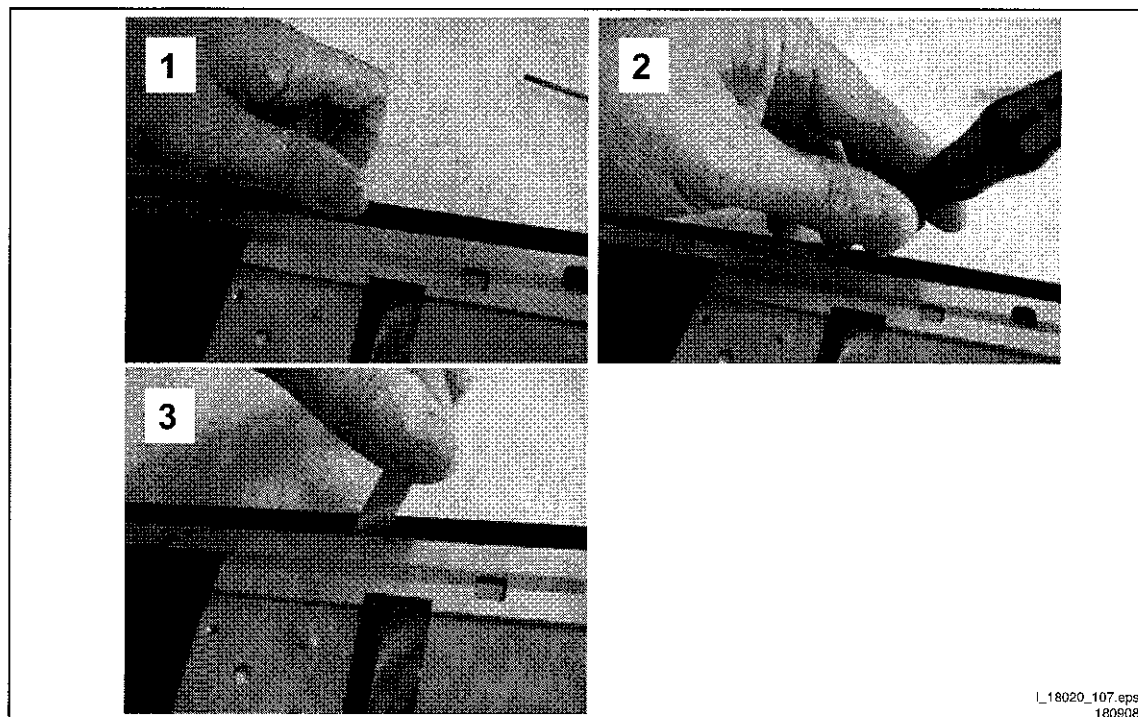
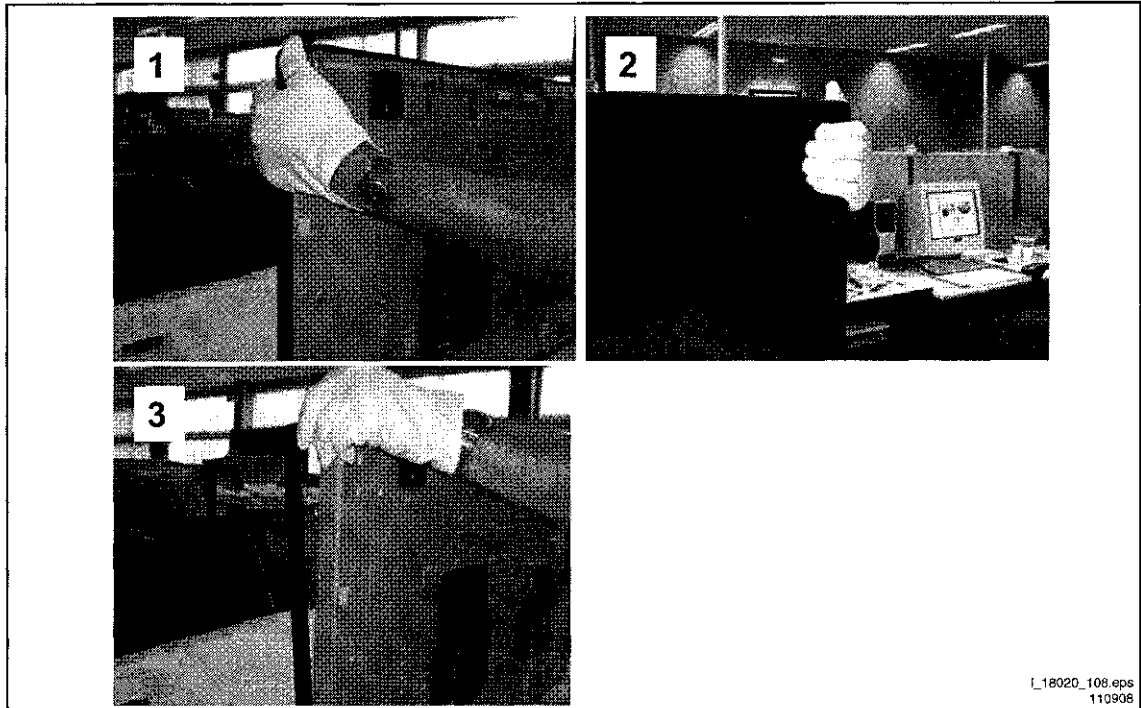


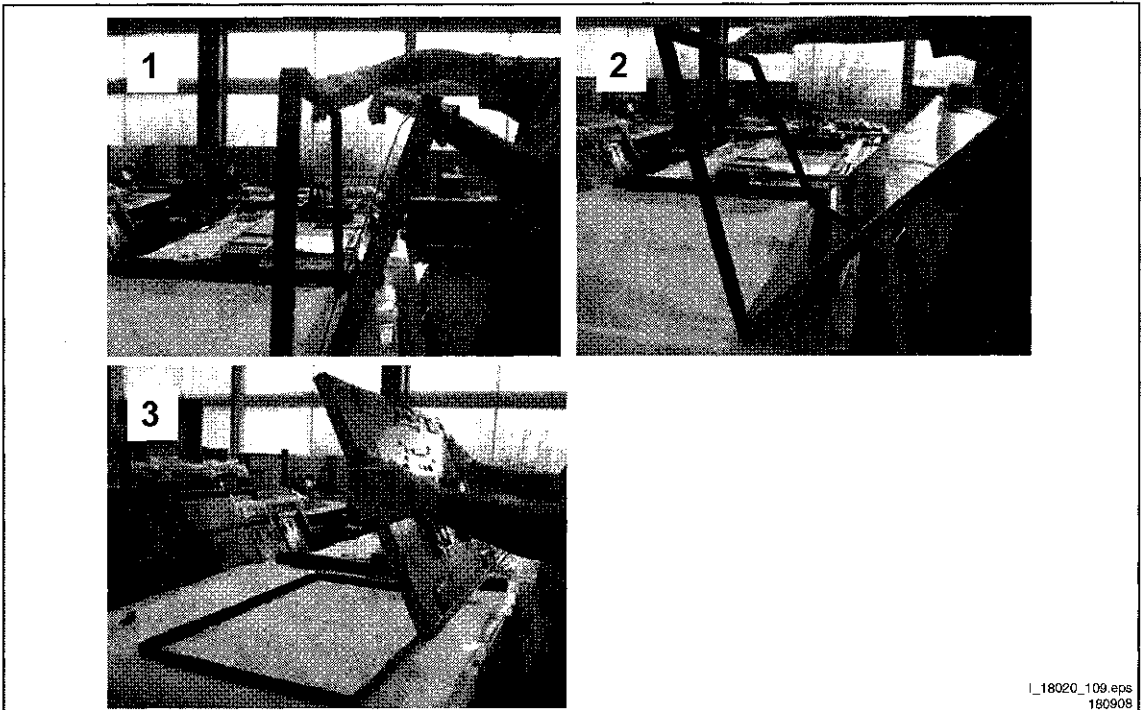
Figure 4-21 LCD Panel -3-

D. Release two side walls of metal Front (use gloves).

1. Place thumb against each upper corner of the metal Front.
2. Place fingers against LCD Panel.
3. Push out LCD Panel in each corner until tape in middle of side wall releases.

**Figure 4-22 LCD Panel -4-****E. Release bottom wall of metal Front (use gloves).**

1. Place hands in top/middle of metal Front and LCD Panel.
2. Pull metal Front and LCD Panel further apart until 2 tapes in bottom wall release.
3. Take out LCD Panel.

**Figure 4-23 LCD Panel -5-**

F. Removing tapes/foams from LCD Panel (use "Label Off 50"; "Intronics L50/200").

1. Remove remains of thermal foam on top of LCD Panel.
2. Remove remains of double-sided tapes (4x) on front of LCD Panel.
3. Remove protective foam on bottom of LCD Panel.

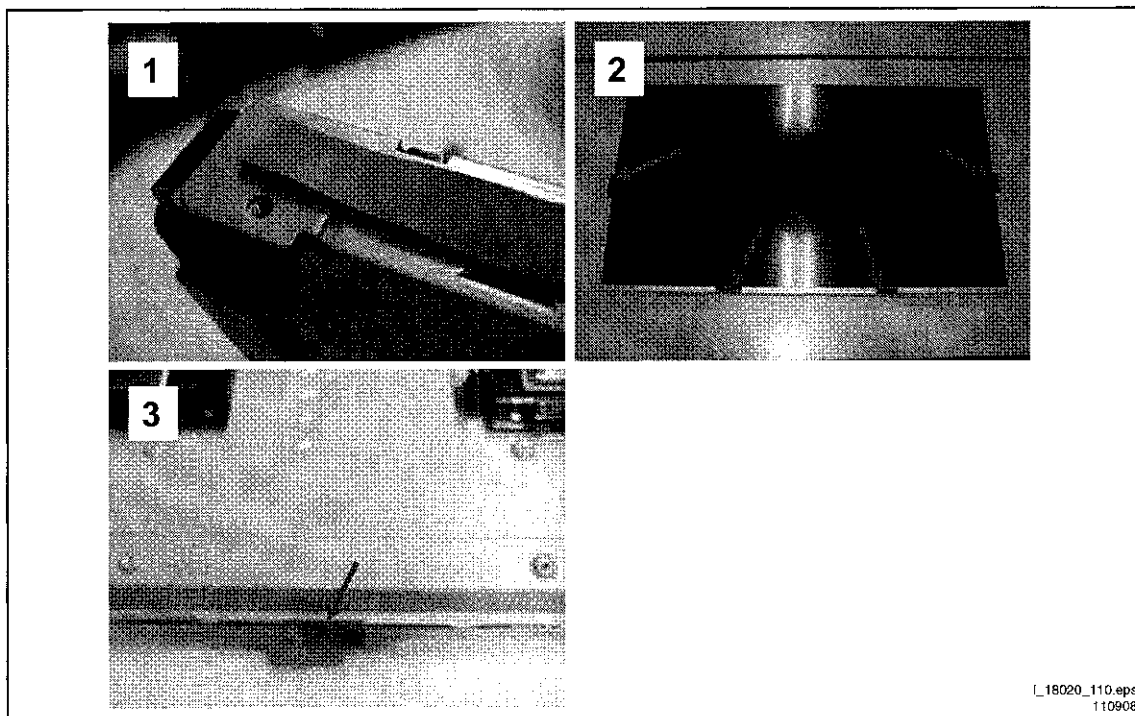


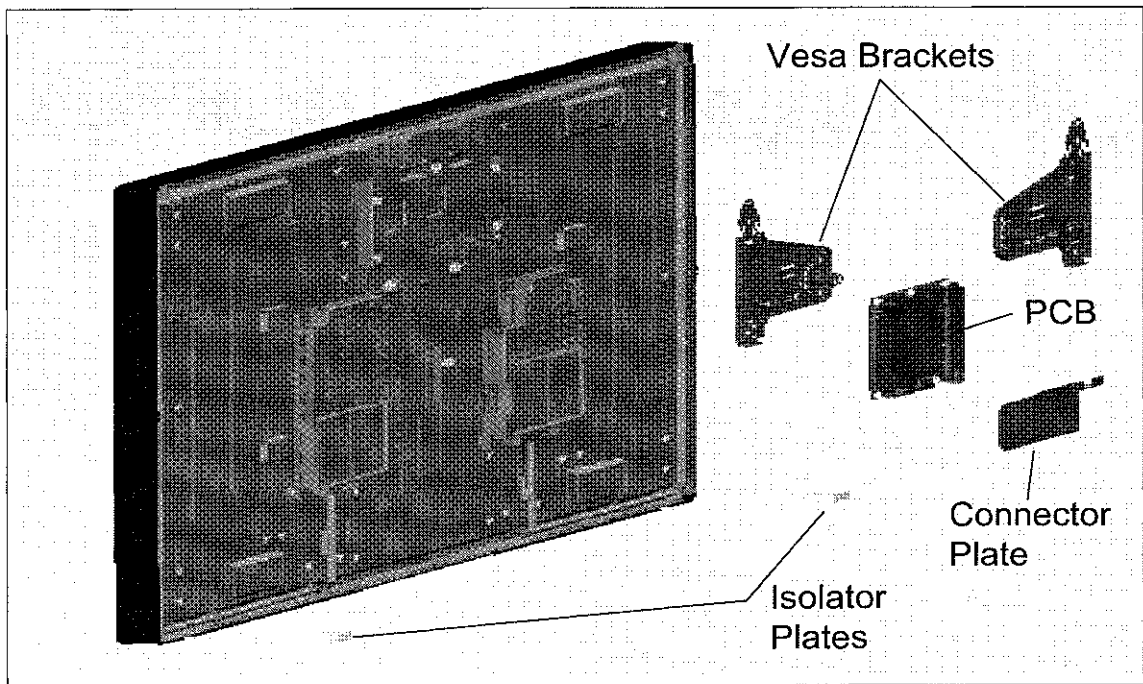
Figure 4-24 LCD Panel -6-

For re-assembly instructions, proceed with step K.

LCD Panel Replacement

Instructions G to J apply if you have to replace the LCD Panel.

G. Remove VESA brackets, PCB connector plate, wiring, and isolator plates.

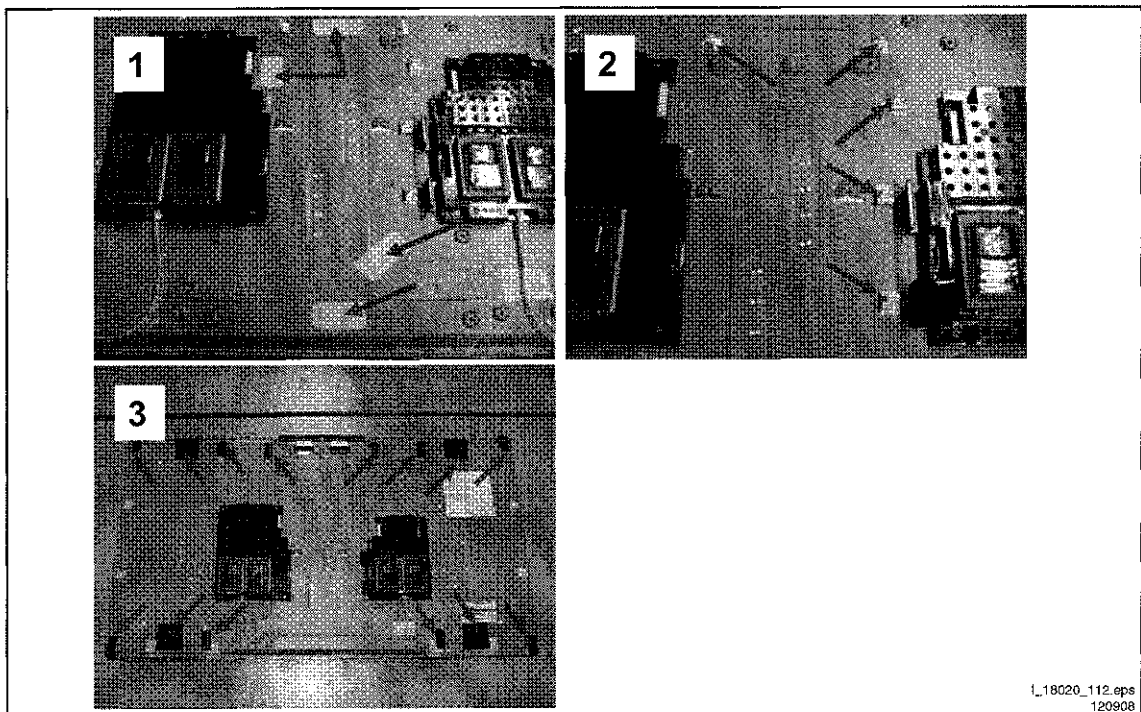


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Figure 4-25 LCD Panel -7-

H. Remove all remaining tapes/foams/cable clamps.

1. Remove remaining tapes for wiring.
2. Remove cable clamps (five times).
3. Remove all backlight blocking foams.
4. Remove all glue remains with "Label Off 50".

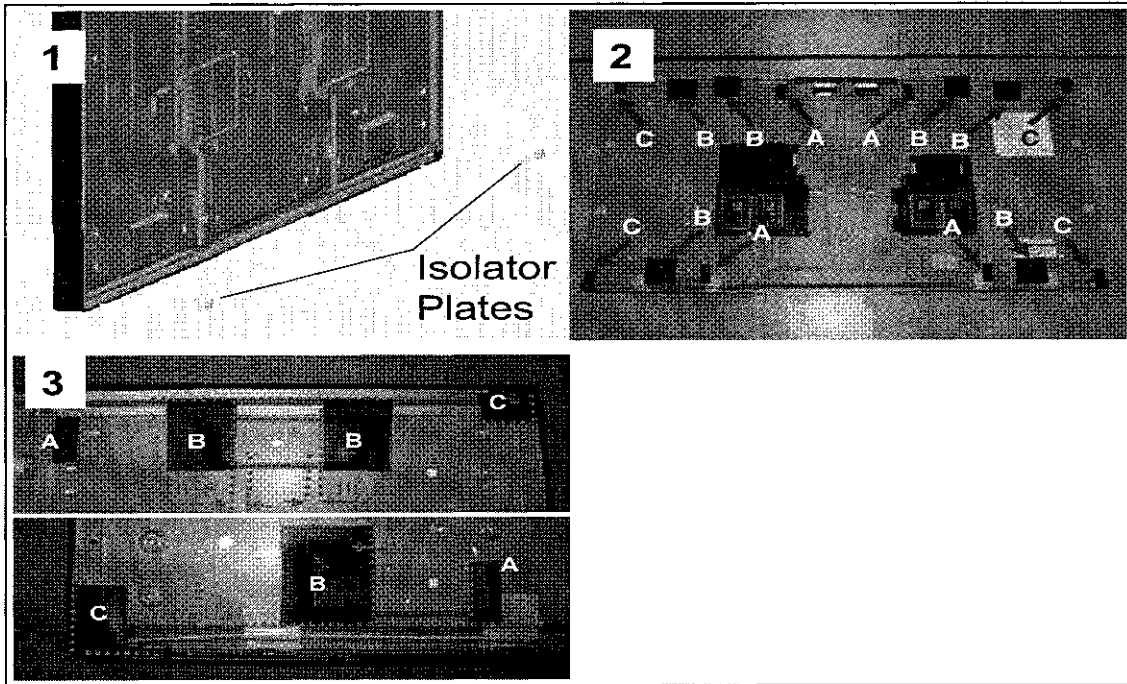


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Figure 4-26 LCD Panel -8-

I. Prepare new LCD Panel.

1. Take new LCD Panel and place two isolator plates.
2. Glue **new** foams on LCD Panel with the following specifications:
 - four times foam $L \times W \times T = 20 \times 43 \times 0.5$ mm [A].
 - six times foam $L \times W \times T = 70 \times 50 \times 0.5$ mm [B].
 - four times foam $L \times W \times T = 30 \times 43 \times 0.5$ mm [C].
3. Figure [3] show the upper- and lower foams.

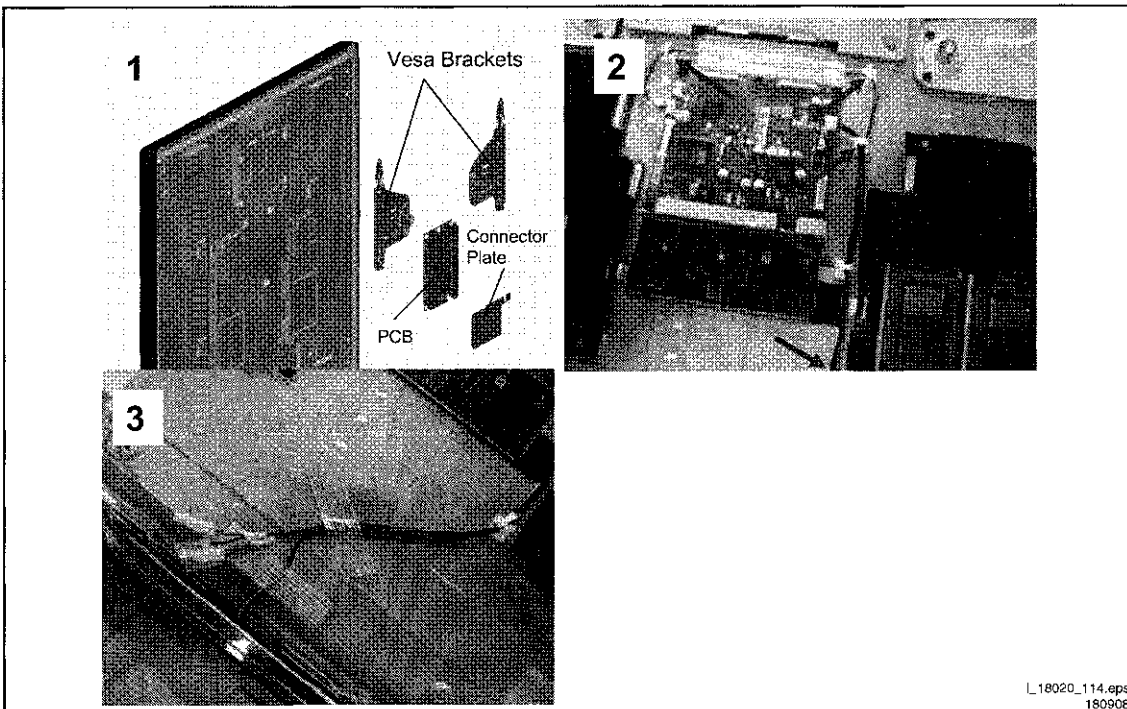


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Figure 4-27 LCD Panel -9-

J. Assemble VESA brackets, PCB, connector plate, and wiring.

1. Assemble VESA brackets, PCB and connector plate.
2. Assemble cable clamps:
 - five times cable clamp 11.2 mm.
3. Assemble wiring.

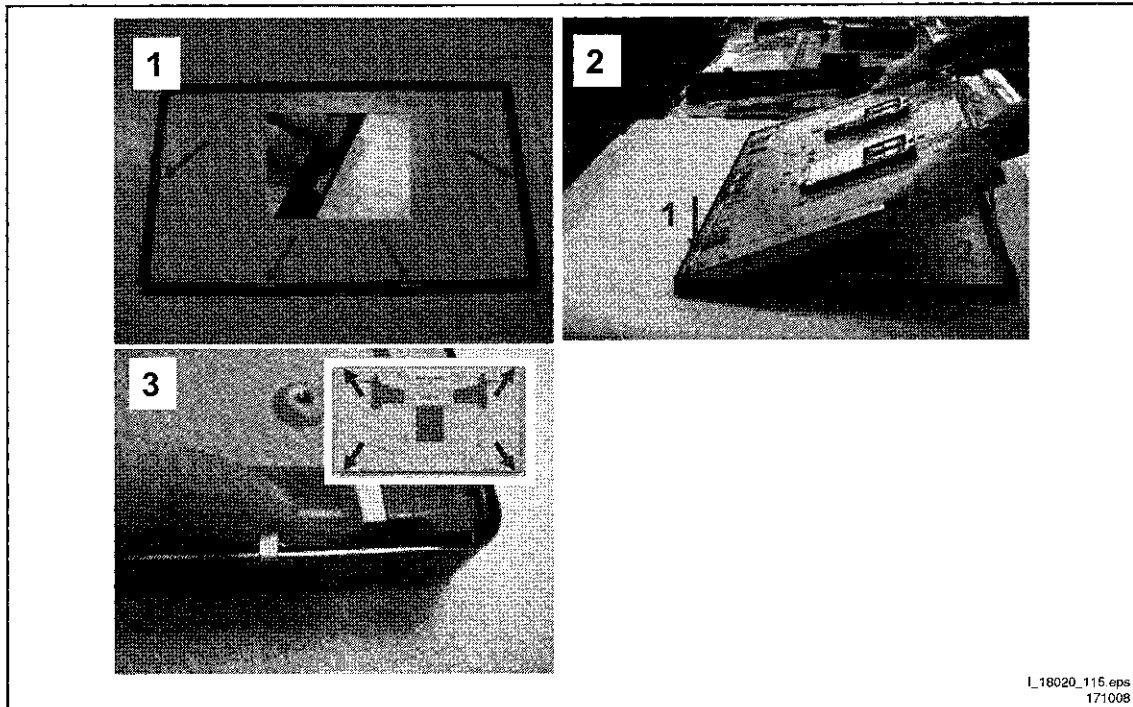


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Figure 4-28 LCD Panel -10-

K. Assemble metal Front and LCD Panel (use gloves).

1. Take a **new** metal Front and remove liners of double-sided tapes (four times).
2. Insert LCD Panel as shown in picture: first top side, then cantilever down.
3. Bend down metal lips in each corner (4 times).

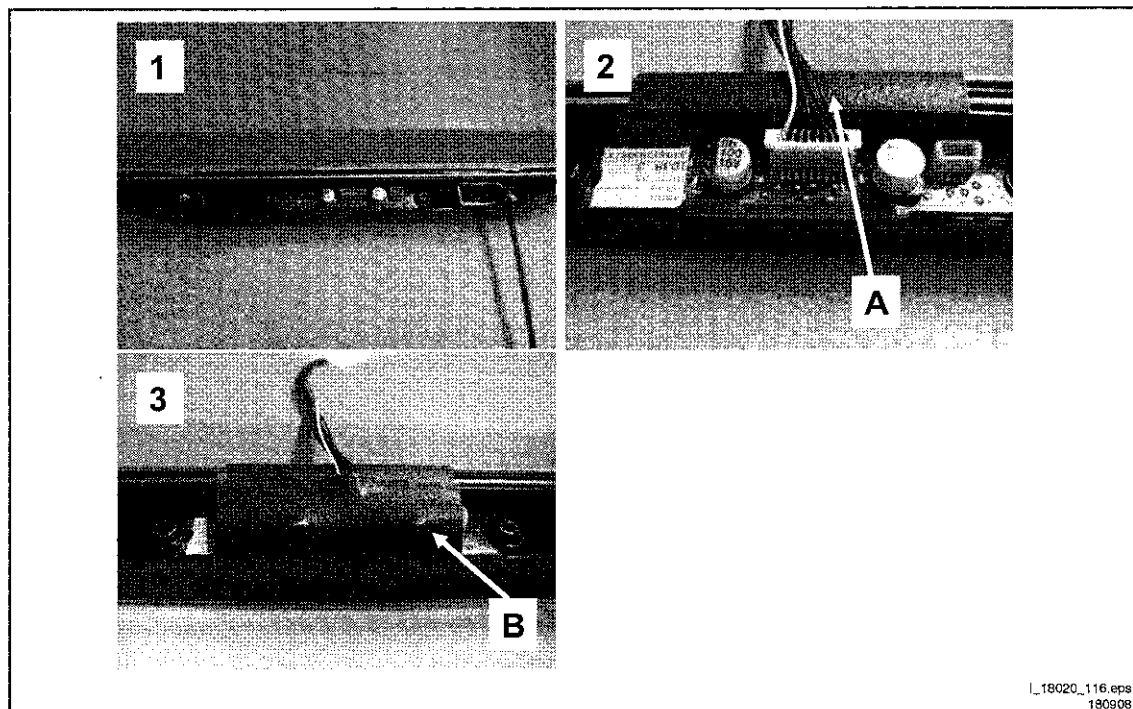


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Figure 4-29 LCD Panel -11-

L. Assemble Leading Edge.

1. Assemble Leading Edge on Front.
2. Glue protective foam across edge of metal Front and LCD Panel with the following specifications:
1 time foam $L \times W \times T = 55 \times 20 \times 0.8$ mm [A].
3. Glue light-blocking foam upon LED-PCB with the following specifications:
1 time foam $L \times W \times T = 20 \times 43 \times 0.5$ mm [B].

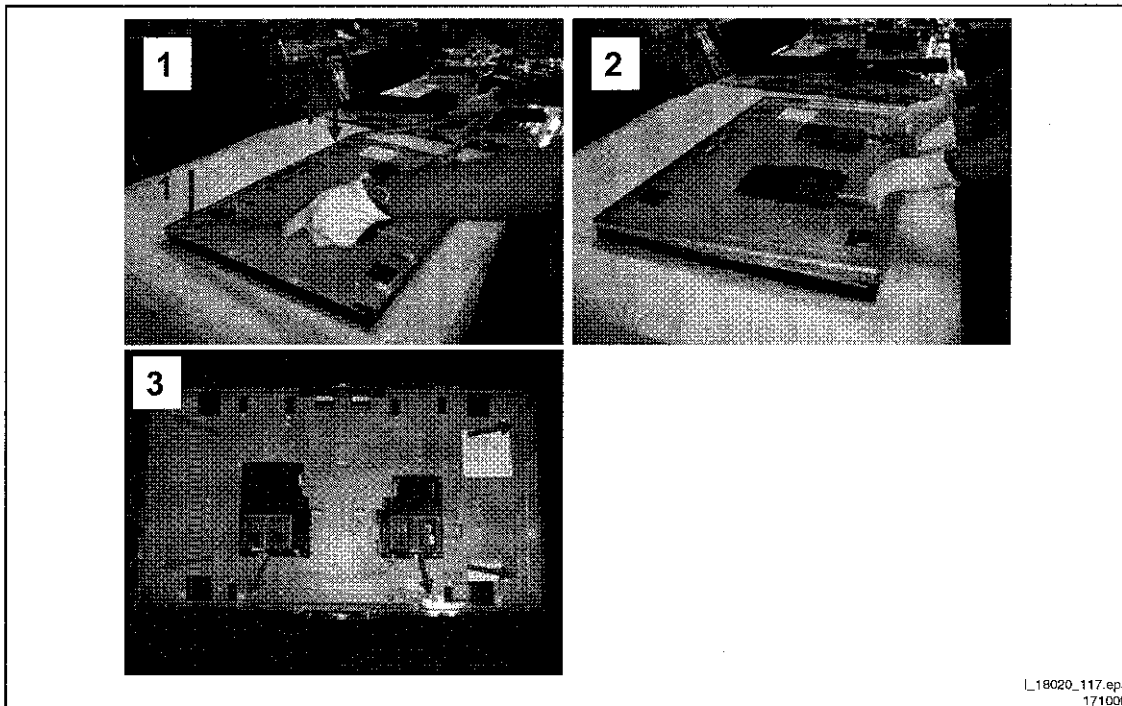


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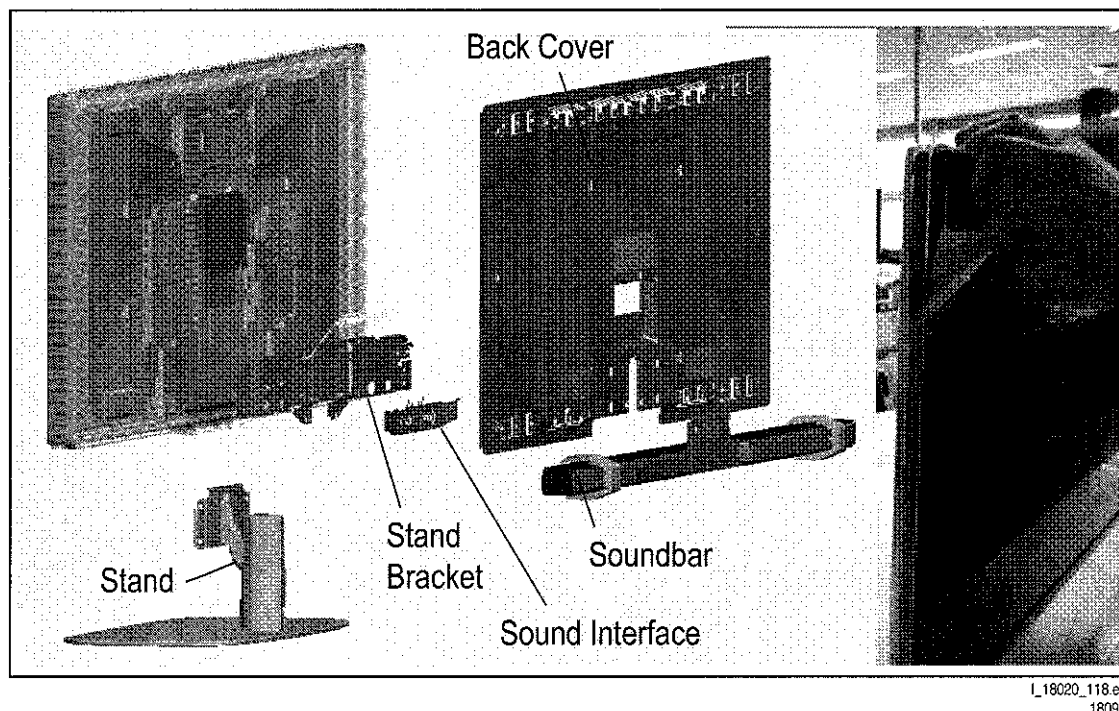
Figure 4-30 LCD Panel -12-

M. Assemble Flare.

1. Place flare upon LCD Panel as shown in picture: first on top side.
2. Cantilever flare down while pulling it slightly open (to avoid scratches from metal Front).
3. Fix flare on Panel (six screws).

**Figure 4-31 LCD Panel -13-****N. Assemble Stand Bracket, Sound Interface, Back Cover, Soundbar and Stand.**

1. Remove protective foils on both sides of Flare.

**Figure 4-32 LCD Panel -14-**

4.5 Set Re-assembly

To re-assemble the whole set, execute all processes in reverse order, except for the Monitor. To re-assembly the Monitor, follow the instructions in the applicable section of this Manual.

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original position. See figure "Cable dressing".
- Pay special attention not to damage the EMC foams on the SSB shields. Ensure that EMC foams are mounted correctly.

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

- 5.1 Test Points
- 5.2 Service Modes
- 5.3 Stepwise Start-up
- 5.4 Service Tools
- 5.5 Error Codes
- 5.6 The Blinking LED Procedure
- 5.7 Protections
- 5.8 Fault Finding and Repair Tips
- 5.9 Software Upgrading

5.1 Test Points

As most signals are digital, it will be difficult to measure waveforms with a standard oscilloscope. However, several key ICs are capable of generating test patterns, which can be controlled via ComPair. In this way it is possible to determine which part is defective.

Perform measurements under the following conditions:

- Service Default Mode.
- Video: Colour bar signal.
- Audio: 3 kHz left, 1 kHz right.

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 read-out for all chassis. (see also section "5.4.1 ComPair").

5.2.1 Service Default Mode (SDM)

Purpose

- To create a pre-defined setting, to get the same measurement results as given in this manual.
- To override SW protections detected by stand-by processor and make the TV start up to the step just before protection (a sort of automatic stepwise start up). See section "5.3 Stepwise Start-up".
- To start the blinking LED procedure where only layer 2 errors are displayed. (see also section "5.5 Error Codes")

Specifications

Table 5-1 SDM default settings

Region	Freq. (MHz)	Default system
Europe, AP(PAL/Multi)	475.25	PAL B/G
Europe, AP DVB-T	546.00 PID Video: 0B 06 PID PCR: 0B 06 PID Audio: 0B 07	DVB-T

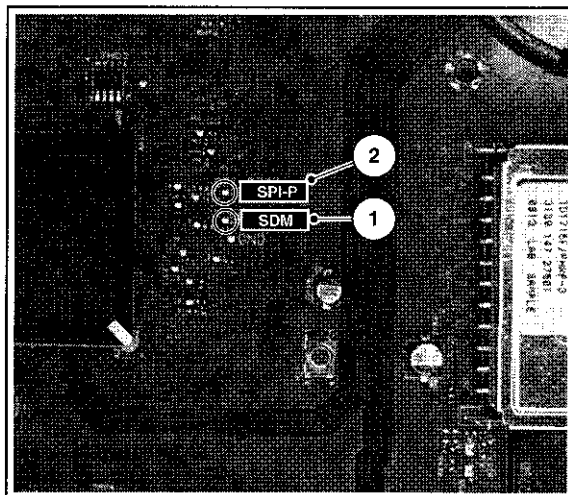
- All picture settings at 50% (brightness, colour, contrast).
- All sound settings at 50%, except volume at 25%.
- All service-unfriendly modes (if present) are disabled, like:
 - (Sleep) timer.
 - Child/parental lock.
 - Picture mute (blue mute or black mute).
 - Automatic volume levelling (AVL).

- Skip/blank of non-favourite pre-sets.

How to Activate SDM

For this chassis there are two kinds of SDM: an **analog SDM** and a **digital SDM**. Tuning will happen according table "SDM Default Settings".

- **Analog SDM:** use the standard RC-transmitter and key in the code "062596", directly followed by the "MENU" button. **Note:** It is possible that, together with the SDM, the main menu will appear. To switch it "off", push the "MENU" button again.
- **Digital SDM:** use the standard RC-transmitter and key in the code "062593", directly followed by the "MENU" button. **Note:** It is possible that, together with the SDM, the main menu will appear. To switch it "off", push the "MENU" button again.
- **Analog SDM** can also be activated by connecting for a moment the solder pad (see figure "Service mode pads") on the SSB with the indication "SDM" [1], to GND.



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Figure 5-1 Service mode pads

After activating this mode, "SDM" will appear in the upper right corner of the screen (when a picture is available).

How to Navigate

When the "MENU" button is pressed on the RC transmitter, the set will toggle between the SDM and the normal user menu (with the SDM mode still active in the background).

How to Exit SDM

Use one of the following methods:

- Switch the set to STAND-BY via the RC-transmitter.
- Via a standard customer RC-transmitter: key in "00"-sequence.

5.2.2 Service Alignment Mode (SAM)

Purpose

- To perform (software) alignments.
- To change option settings.
- To easily identify the used software version.
- To view operation hours.
- To display (or clear) the error code buffer.

How to Activate SAM

Via a standard RC transmitter: key in the code "062596" directly followed by the "INFO" button. After activating SAM

with this method a service warning will appear on the screen, continue by pressing the red button on the RC.

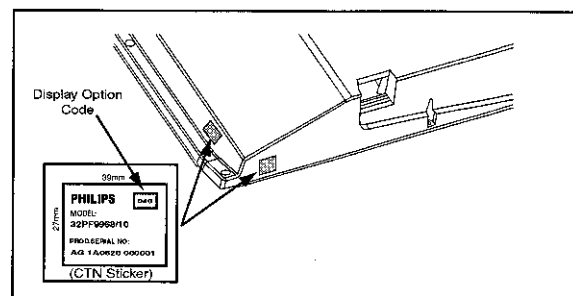
Contents of SAM:

• Hardware Info.

- **A. SW Version.** Displays the software version of the main software (**example:** Q591E-1.2.3.4 = AAAAB_X.Y.W.Z).
 - **AAAA=** the chassis name.
 - **B=** the region: A= AP, E= EU, L= Latam, U = US. For AP sets it is possible that the Europe software version is used.
 - **X.Y.W.Z=** the software version, where X is the main version number (different numbers are not compatible with one another) and Y.W.Z is the sub version number (a higher number is always compatible with a lower number).
- **B. SBY PROC Version.** Displays the software version of the stand-by processor.
- **C. Production Code.** Displays the production code of the TV, this is the serial number as printed on the back of the TV set. Note that if an NVM is replaced or is initialized after corruption, this production code has to be re-written to NVM. ComPair will foresee in a possibility to do this.
- **Operation Hours.** Displays the accumulated total of operation hours (not the stand-by hours). Every time the TV is switched "on/off", 0.5 hours is added to this number.
- **Errors** (followed by maximum 10 errors). The most recent error is displayed at the upper left (for an error explanation see section "5.5 Error Codes").
- **Reset Error Buffer.** When "cursor right" (or the "OK" button) is pressed followed by another "OK" button touch, the error buffer is reset.
- **Alignments.** This will activate the "ALIGNMENTS" sub-menu.
- **Dealer Options.** Extra features for the dealers.
- **Options.** Extra features for Service. For more info regarding option codes, see chapter 8 "Alignments". Note that if the option code numbers are changed, these have to be confirmed with pressing the "OK" button before the options are stored. Otherwise changes will be lost.
- **Initialize NVM.** The moment the processor recognizes a corrupted NVM, the "initialize NVM" line will be highlighted. Now, two things can be done (dependent of the service instructions at that moment):
 - Save the content of the NVM via ComPair for development analysis, **before** initializing. This will give the Service department an extra possibility for diagnosis (e.g. when Development asks for this).
 - Initialize the NVM.

Note: When the NVM is corrupted, or replaced, there is a high possibility that no picture appears because the display code is not correct. So, before initializing the NVM via the SAM, a picture is necessary and therefore the correct display option has to be entered. Refer to chapter 8 "Alignments" for details. To adapt this option, it's advised to use ComPair (the correct HEX values for the options can be found in chapter 8 "Alignments") or a method via a standard RC (described below).

Changing the display option via a standard RC: Key in the code "062598" directly followed by the "MENU" button and "XXX" (where XXX is the 3 digit decimal display code as mentioned in table "Option code overview" in chapter 8 "Alignments". Remark : there is only one display option code here "168" used for this chassis). If the above action is successful, the front LED will go out as an indication that the RC sequence was correct. After the display option is changed in the NVM, the TV will go to the Stand-by mode. If the NVM was corrupted or empty before this action, it will be initialized first (loaded with default values). This initializing can take up to 20 seconds.



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Figure 5-2 Location of Display Option Code sticker

- **Store - go right.** All options and alignments are stored when pressing "cursor right" (or the "OK" button) and then the "OK"-button.
- **SW Maintenance.**
 - **SW Events.** Not useful for Service purposes. In case of specific software problems, the development department can ask for this info.
 - **HW Events.** Not useful for Service purposes. In case of specific software problems, the development department can ask for this info.
- **Test settings.** For development purposes only.
- **Upload to USB.** To upload several settings from the TV to an USB stick, which is connected to the SSB. The items are "Channel list", "Personal settings", "Option codes", "Display-related alignments" and "History list". First a directory "repair" has to be created in the root of the USB stick. To upload the settings select each item separately, press "cursor right" (or the "OK" button), confirm with "OK" and wait until "Done" appears. In case the download to the USB stick was not successful "Failure" will appear. In this case, check if the USB stick is connected properly and if the directory "repair" is present in the root of the USB stick. Now the settings are stored onto the USB stick and can be used to download onto another TV or other SSB. Uploading is of course only possible if the software is running and if a picture is available. This method is created to be able to save the customer's TV settings and to store them into another SSB.
- **Download to USB.** To download several settings from the USB stick to the TV. Same way of working as with uploading. To make sure that the download of the channel list from USB to the TV is executed properly, it is necessary to restart the TV and tune to a valid preset if necessary. **Note:** The "History list item" can not be downloaded from USB to the TV. This is a "read-only" item. In case of specific problems, the development department can ask for this info.
- **Development file versions.** Not useful for Service purposes, this information is only used by the development department.

How to Navigate

- In SAM, the menu items can be selected with the "CURSOR UP/DOWN" key (or the scroll wheel) on the RC-transmitter. The selected item will be highlighted. When not all menu items fit on the screen, move the "CURSOR UP/DOWN" key to display the next/previous menu items.
- With the "CURSOR LEFT/RIGHT" keys (or the scroll wheel), it is possible to:
 - (De) activate the selected menu item.
 - (De) activate the selected sub menu.
- With the "OK" key, it is possible to activate the selected action.

How to Exit SAM

Use one of the following methods:

- Press the "MENU" button on the RC-transmitter.

- Switch the set to STAND-BY via the RC-transmitter.

5.2.3 Customer Service Mode (CSM)

Purpose

When a customer is having problems with his TV-set, he can call his dealer or the Customer Helpdesk. The service technician can then ask the customer to activate the CSM, in order to identify the status of the set. Now, the service technician can judge the severity of the complaint. In many cases, he can advise the customer how to solve the problem, or he can decide if it is necessary to visit the customer. The CSM is a read only mode; therefore, modifications in this mode are not possible.

When in this chassis CSM is activated, a test pattern will be displayed during 5 seconds (1 second Blue, 1 second Green and 1 second Red, then again 1 second Blue and 1 second Green). This test pattern is generated by the PNX5100. So if this test pattern is shown, it could be determined that the back end video chain (PNX5100, LVDS, and display) of the SSB is working.

New in this chassis are two test patterns with fixed colours:

- **When the Green key is pushed while in CSM (toggle function)** : a fixed testpattern by the "FPGA transmitter" device located on the LVDS panel will be generated. The selftest of this device is confirmed positive with a fully Green picture displayed on the screen.
- **When the Yellow key is pushed while in CSM (toggle function)** : a fixed testpattern by the "FPGA receiver" device located on the monitor will be generated. The selftest of this device is confirmed positive with a fully Yellow picture displayed on the screen.

When CSM is activated and there is a USB stick connected to the TV, the software will dump the complete CSM content to the USB stick. The file (CSM.txt) will be saved in the root of the USB stick. This info can be handy if no information is displayed.

Also when CSM is activated, the layer 1 error is displayed via blinking LED on the HUB. Only the latest error is displayed. (see also section "5.5 Error Codes").

How to Activate CSM

Key in the code "123654" via the standard RC transmitter.

Note: Activation of the CSM is only possible if there is no (user) menu on the screen!

How to Navigate

By means of the "CURSOR-DOWN/UP" knob (or the scroll wheel) on the RC-transmitter, can be navigated through the menus.

Contents of CSM

The contents are reduced to 4 pages: General, Software versions/General, Quality Items and Additional Info. The group names itself are not shown anywhere in the CSM menu.

General

- **Set Type.** This information is very helpful for a helpdesk/workshop as reference for further diagnosis. In this way, it is not necessary for the customer to look at the rear of the TV-set. Note that if an NVM is replaced or is initialized after corruption, this set type has to be re-written to NVM. ComPair will foresee in a possibility to do this.
- **Production Code.** Displays the production code (the serial number) of the TV. Note that if an NVM is replaced or is initialized after corruption, this production code has to be re-written to NVM. ComPair will foresee a in possibility to do this.
- **Installed date.** Indicates the date of the first installation of the TV. This date is acquired via time extraction.

- **Options 1.** Gives the option codes of option group 1 as set in SAM (Service Alignment Mode).
- **Options 2.** Gives the option codes of option group 2 as set in SAM (Service Alignment Mode).
- **12NC SSB.** Gives an identification of the SSB as stored in NVM. Note that if an NVM is replaced or is initialized after corruption, this identification number has to be re-written to NVM. ComPair will foresee in a possibility to do this. This identification number is the 12nc number of the SSB.
Remark: the content here can also be a part of the 12NC SSB in combination with the serial number.
- **12NC display.** Shows the 12NC of the display
- **12NC supply.** Shows the 12NC of the supply.
- **12NC "bolt-on".** Shows the 12NC of the "BOLT-ON"-module.
- **12NC LED dimming panel.** Shows the 12NC of the LED dimming panel.

Software versions/General

- **Current main SW.** Displays the built-in main software version. In case of field problems related to software, software can be upgraded. As this software is consumer upgradeable, it will also be published on the Internet. Example: Q591E_1.2.3.4
- **Standby SW.** Displays the built-in stand-by processor software version. Upgrading this software will be possible via ComPair or via USB (see chapter Software upgrade). Example: STDBY_3.0.1.2.
- **MOP ambient light SW.** Displays the MOP ambient light EPLD SW.
- **MPEG4 software.** Displays the MPEG4 software (optional for sets with MPEG4).
- **PNX5100 boot NVM.** Displays the SW-version that is used in the PNX5100 boot NVM.
- **LED dimming SW.** Displays the SW-version for the LED dimming panel.
- **MPEG4 (blue to toggle).** Displays the activation of MPEG4 reception functionality (on/off).

Quality items

- **Signal quality.** Bad / average / good
- **Child lock.** Not active / active. This is a combined item for locks. If any lock (Preset lock, child lock, lock after or parental lock) is active, the item shall show "active".
- **Table channel changed.** This item is for development purpose.
- **Key missing.** This is a combined item for keys. The keys have a separate bit and the sum is displayed in decimal value.
 - HDMI key valid = 001
 - MAC key valid = 010

Important remark here : due to a software bug, the MAC key is missing and not valid when "2" is displayed in CSM. So, if for instance the HDMI and MAC keys are both valid, the decimal value in CSM "1" is displayed and not "3".

 - BDS key valid = 100

If 3 keys are valid the value: "5" is displayed (should be "7" but due to the software bug it is not).

For value:

 - "0" in CSM: MAC stored, HDCP invalid.
 - "1" in CSM: MAC stored, HDCP valid.
 - "2" in CSM: no MAC, HDCP invalid.
 - "3" in CSM: no MAC, HDCP valid.
- **CI slot present.** If the common interface module is detected the result will be "YES", else "NO".
- **HDMI input format.** The detected input format of the HDMI.
- **HDMI audio input stream.** The HDMI audio input stream is displayed: present / not present.
- **HDMI video input stream.** The HDMI video input stream is displayed: present / not present.

Additional Info

- **12NC LVDS2DP board.** Displays the 12NC of the built-in LVDS-to-DisplayPort software.
- **12NC monitor board.** Displays the 12NC of the monitor board.
- **SW version DPTX.** Displays the built-in DisplayPort TX software version.
- **SW version DPRX.** Displays the built-in DisplayPort RX software version.
- **SW version FPGA e-box.** Displays the built-in FPGA e-box (HUB) software version.
- **SW version FPGA monitor.** Displays the built-in FPGA monitor software version.
- **SW version microP monitor.** Displays the built-in monitor microprocessor software version.
- **SW version NVM monitor.** Displays the built-in monitor NVM software version.

How to Exit CSM

Press "MENU" on the RC-transmitter.

5.3 Stepwise Start-up

When the TV is in a protection state due to an error detected by stand-by software (error blinking is displayed) and SDM is activated via shortcircuiting the pins on the SSB, the TV starts up until it reaches the situation just before protection. So, this is a kind of automatic stepwise start-up. In combination with the start-up diagrams below, you can see which supplies are present at a certain moment. Important to know is, that if e.g. the 3V3 detection fails and thus error layer 2 = 18 is blinking while the TV is restarted via SDM, the Stand-by Processor will enable the 3V3, but the TV set will not go to protection now. The TV will stay in this situation until it is reset (Mains/AC Power supply interrupted). **Caution:** in case the start up in this mode with a faulty FET 7U08 is done, you can destroy all IC's supplied by the +3V3, due to overvoltage (12V on 3V3-line). It is recommended to measure first the FET 7U08 or other FET's on shortcircuit before activating SDM via the service pads.

The abbreviations "SP" and "MP" in the figures stand for:

- SP: protection or error detected by the Stand-by Processor.
- MP: protection or error detected by the MIPS Main Processor.

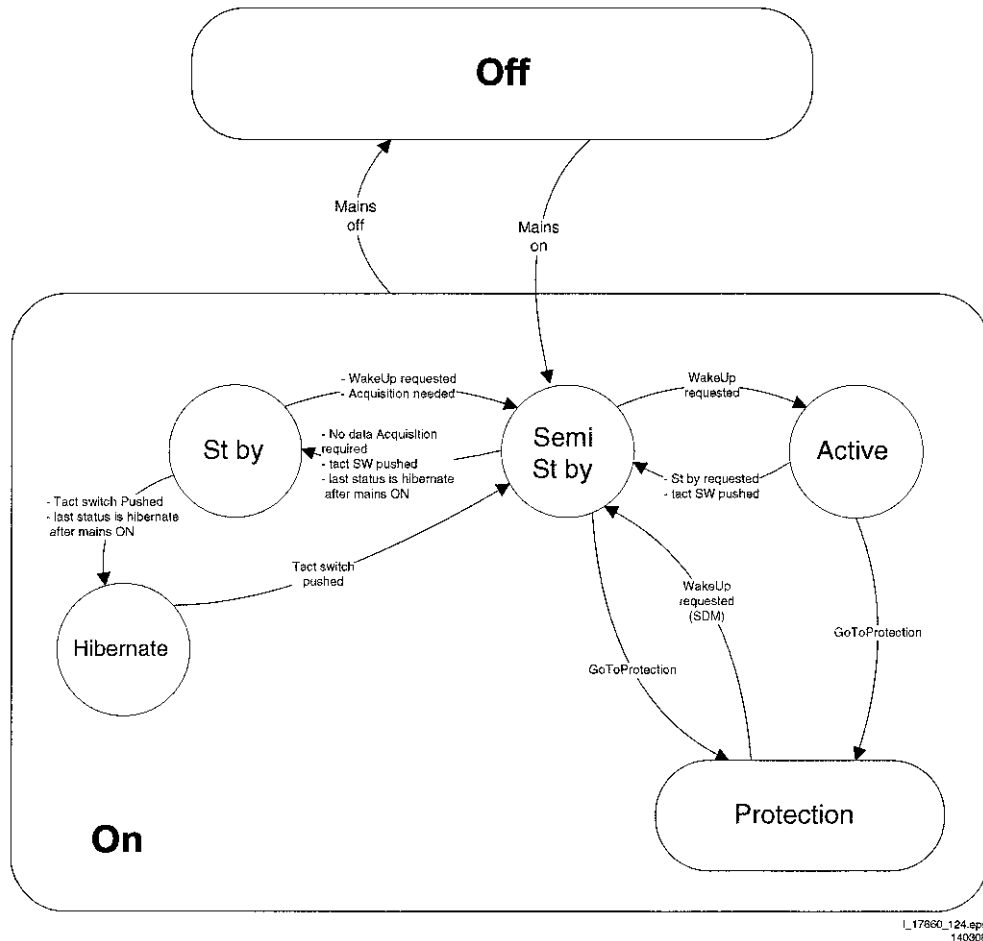


Figure 5-3 Transition diagram

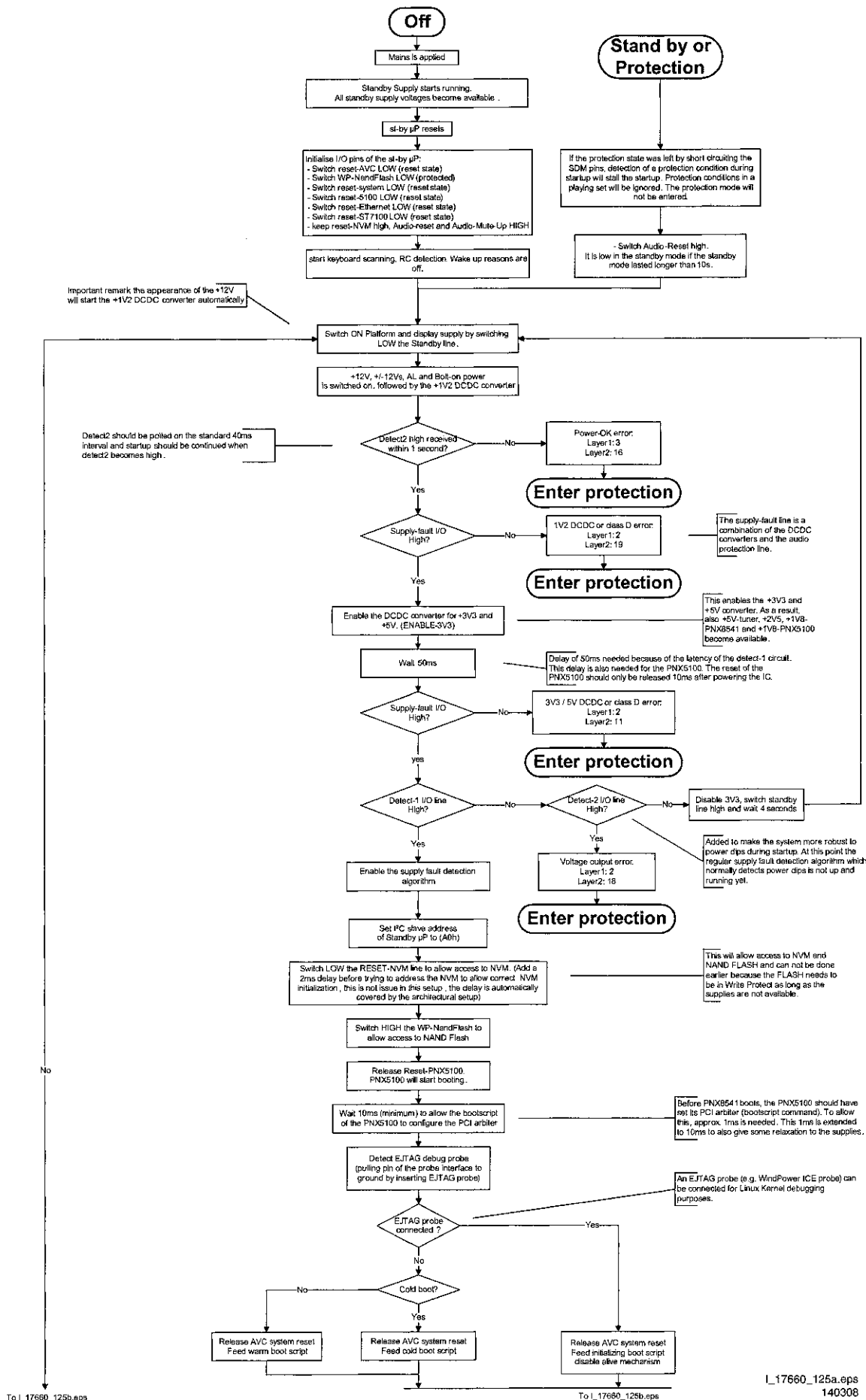


Figure 5-4 "Off" to "Semi Stand-by" flowchart (part 1)

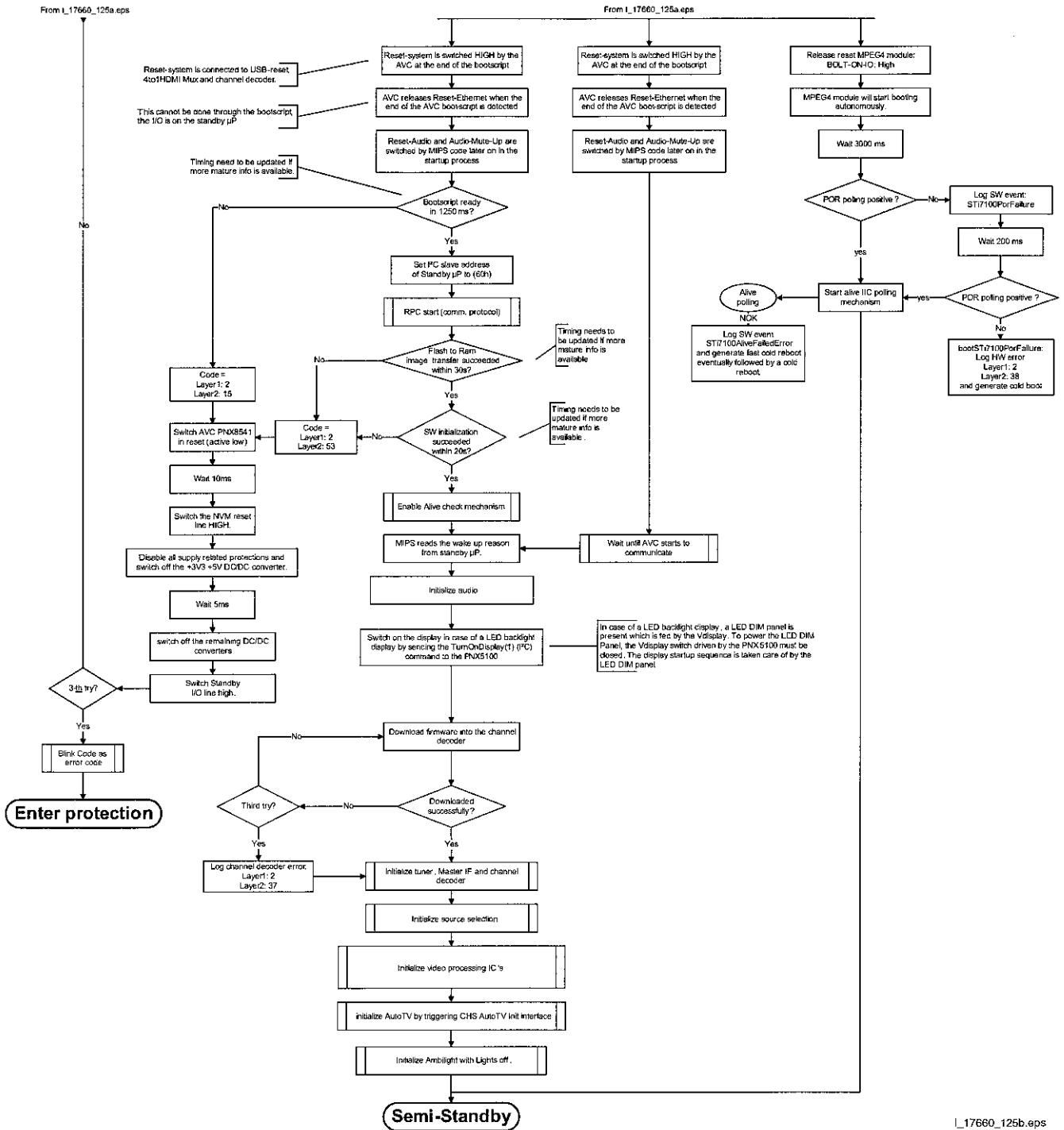


Figure 5-5 "Off" to "Semi Stand-by" flowchart (part 2)

Constraints taken into account:

- Display may only be started when valid LVDS output clock can be delivered by the AVC.
- Between 5 and 50 ms after power is supplied, display should receive valid lvds clock.
- minimum wait time to switch on the lamp after power up is 200ms.

action holder: AVC

action holder: St-by

autonomous action

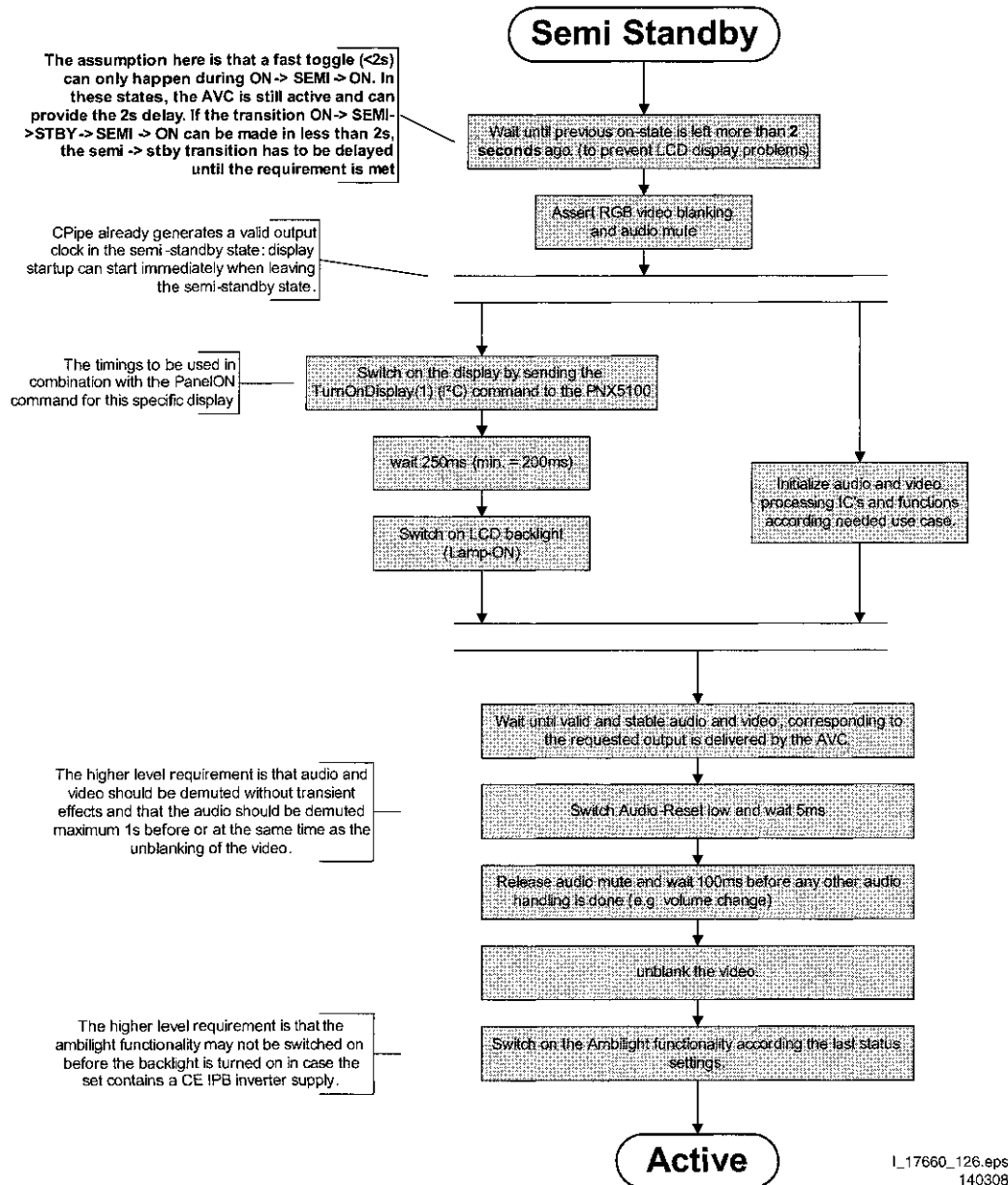


Figure 5-6 "Semi Stand-by" to "Active" flowchart

Constraints taken into account:

- Display may only be started when valid LVDS output clock can be delivered by the AVC.
- Between 5 and 50 ms after power is supplied, display should receive valid lvds clock.
- minimum wait time to switch on the lamp after power up is 200ms.
- To have a reliable operation of the backlight, the backlight should be driven with a PWM duty cycle of 100% during the first second. Only after this first one or two seconds, the PWM may be set to the required output level (Note that the PWM output should be present before the backlight is switched on). To minimize the artefacts, the picture should only be unblanked after these first seconds.

action holder: AVC

action holder: St-by

autonomous action

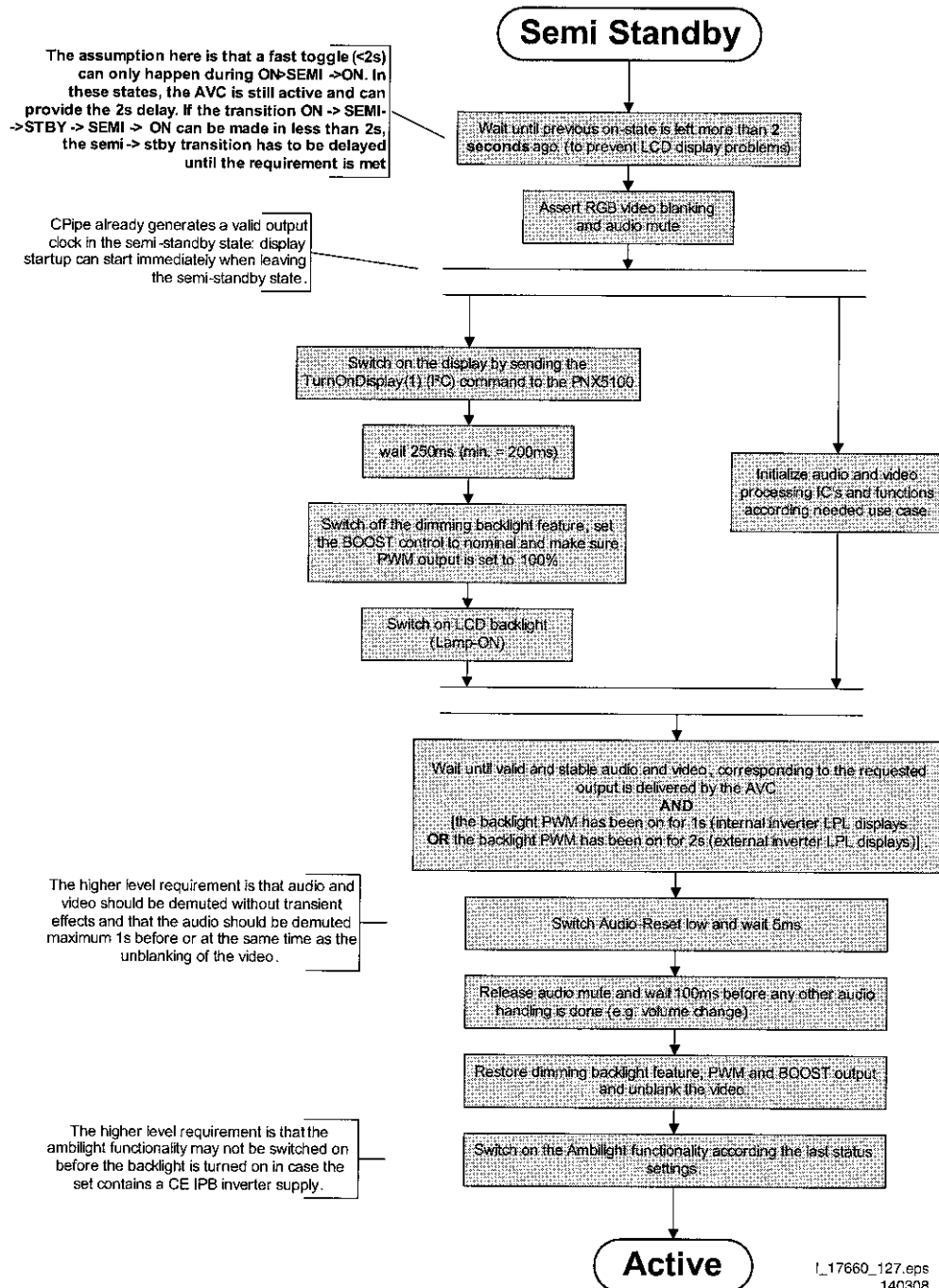


Figure 5-7 "Semi Stand-by" to "Active" flowchart LCD with preheat

Constraints taken into account:

- Display may only be started when valid LVDS output clock can be delivered by the AVC.
- Between 5 and 50 ms after power is supplied, display should receive valid lvds clock.
- minimum wait time to switch on the lamp after power up is 200ms.

action holder: AVC

action holder: St-by

autonomous action

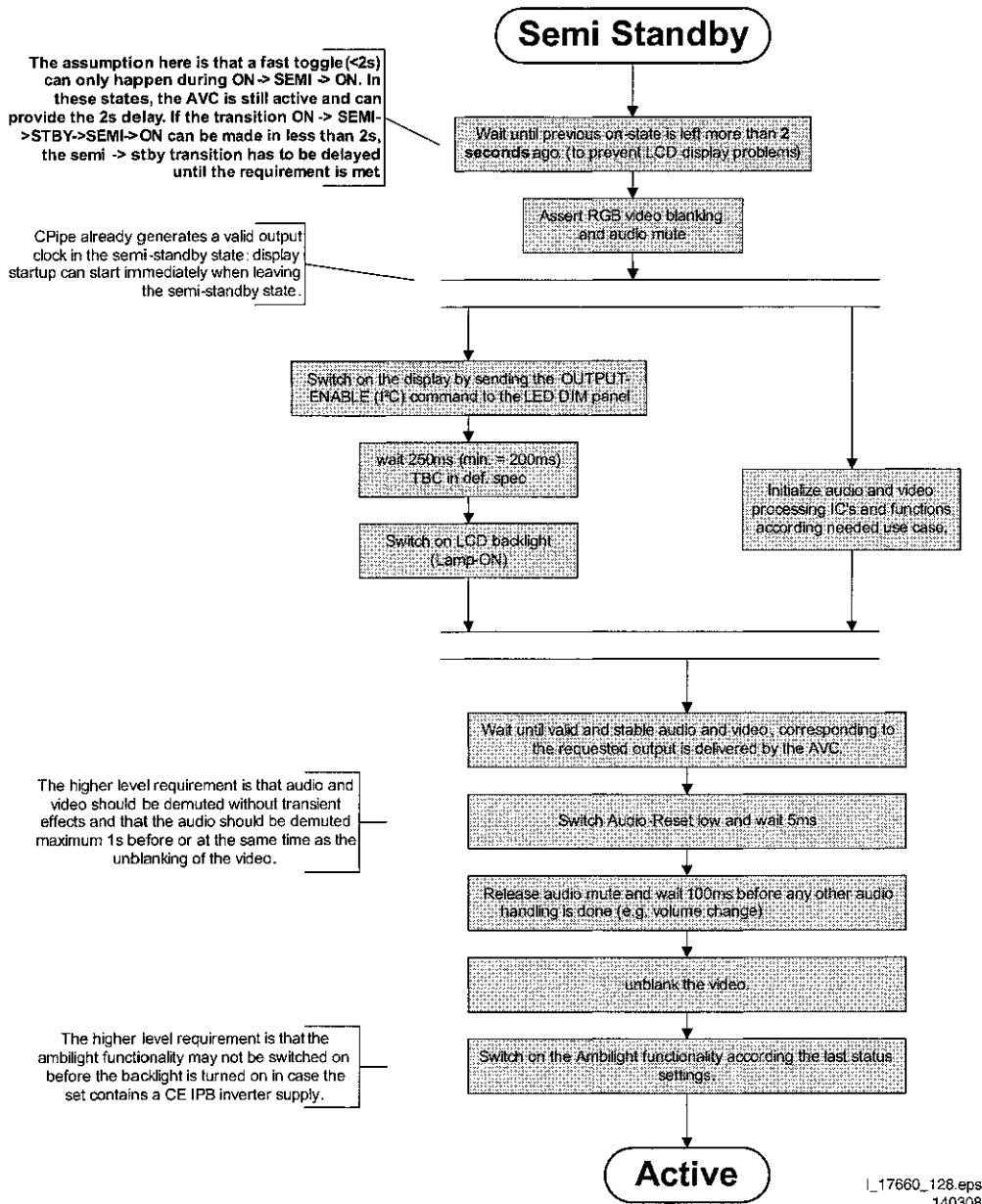


Figure 5-8 "Semi Stand-by" to "Active" flowchart (LED backlight)

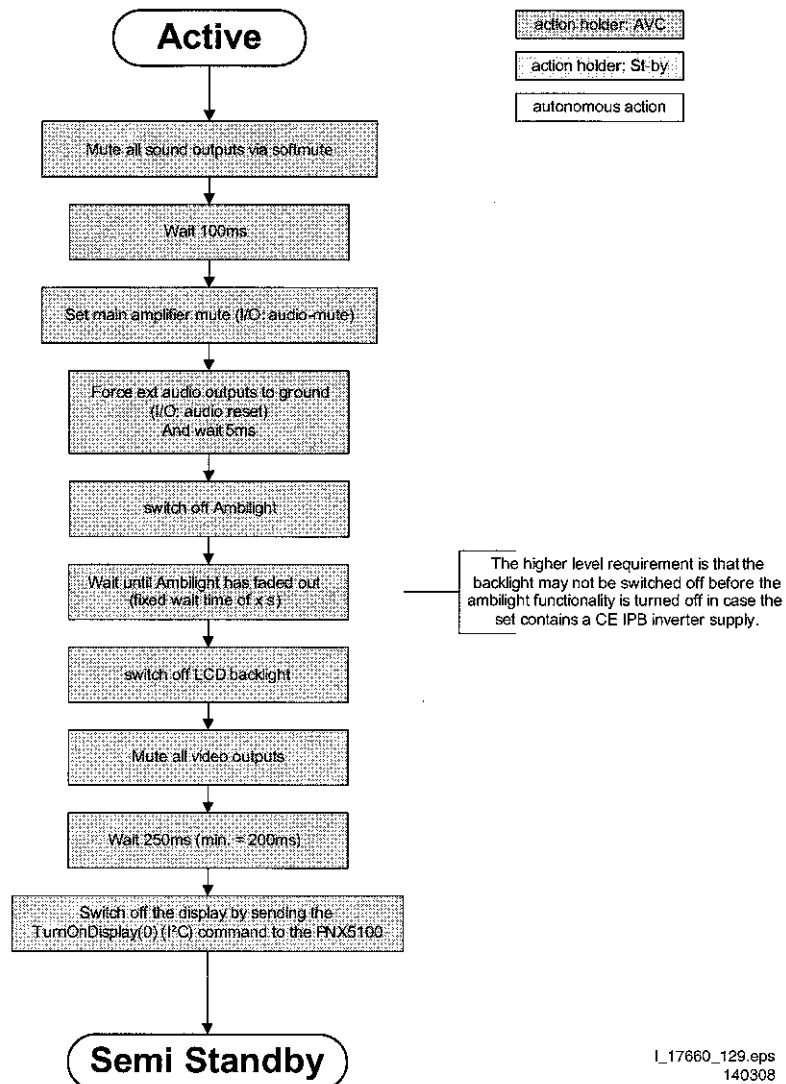


Figure 5-9 "Active" to "Semi Stand-by" flowchart (LCD non DFI)

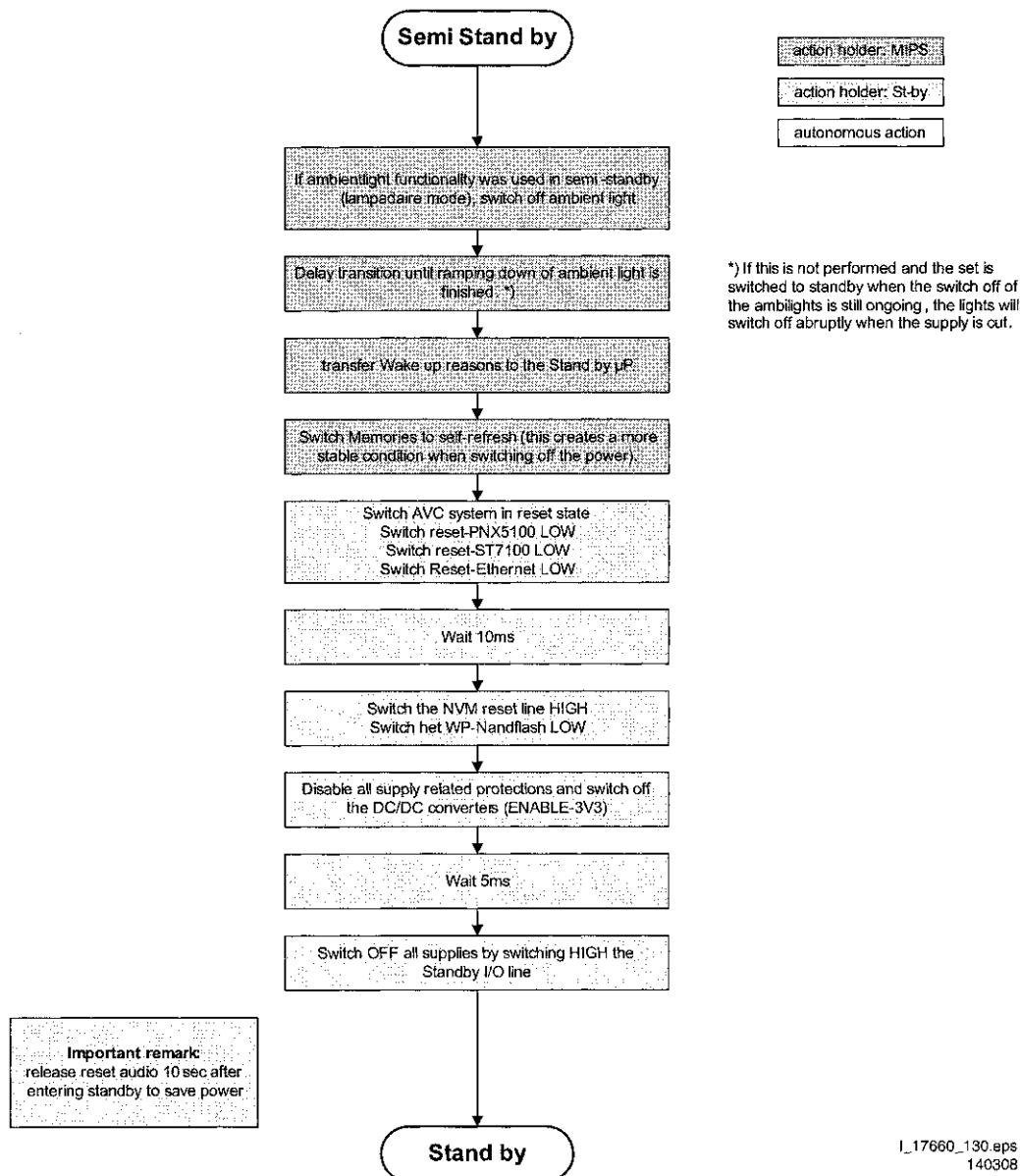


Figure 5-10 "Semi Stand-by" to "Stand-by" flowchart

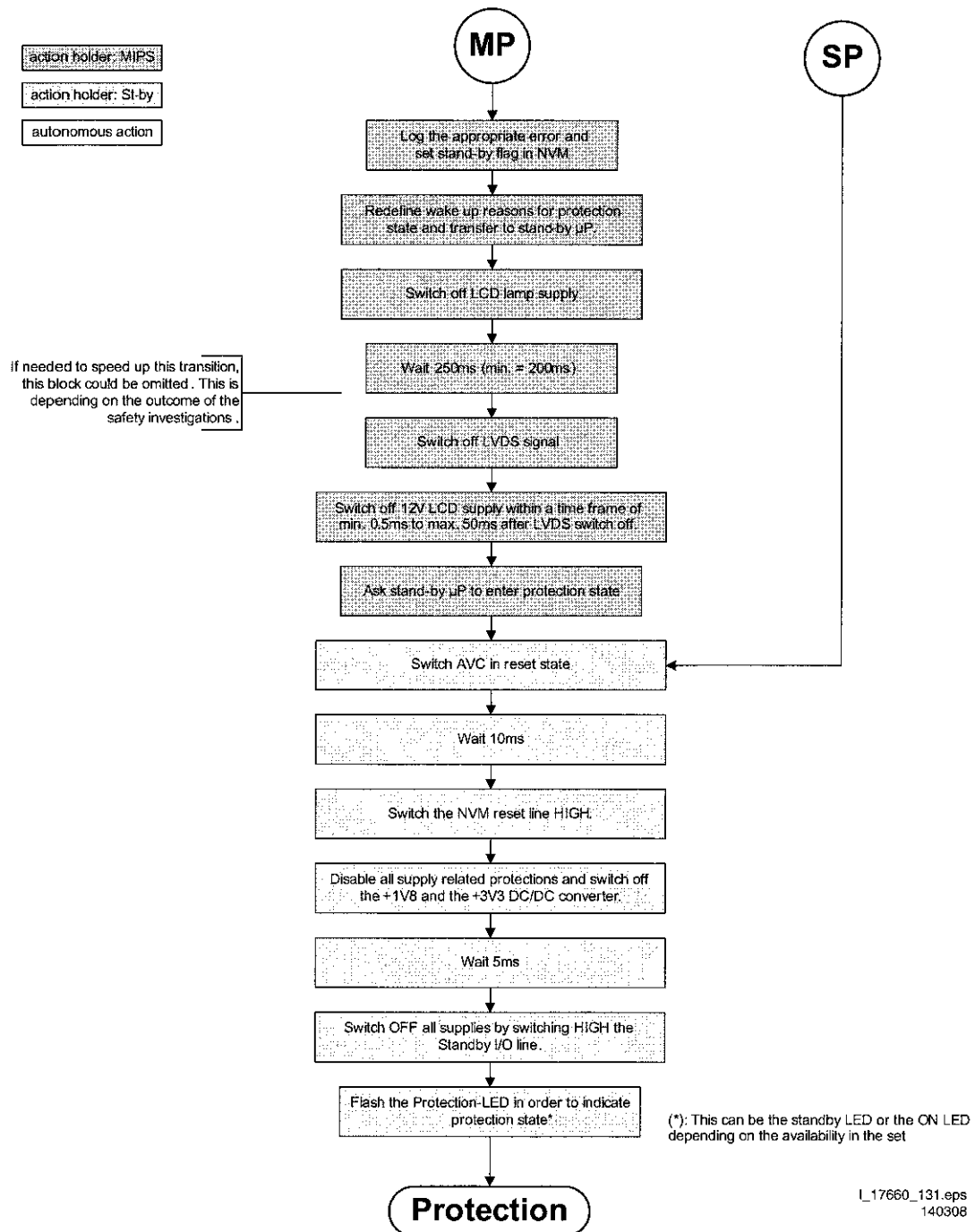


Figure 5-11 "To Protection State" flowchart

5.4 Service Tools

5.4.1 ComPair

Introduction

ComPair (Computer Aided Repair) is a Service tool for Philips Consumer Electronics products, and offers the following:

1. ComPair helps to quickly get an understanding on how to repair the chassis in a short and effective way.
2. ComPair allows very detailed diagnostics and is therefore capable of accurately indicating problem areas. No knowledge on I²C or UART commands is necessary, because ComPair takes care of this.

3. ComPair speeds up the repair time since it can automatically communicate with the chassis (when the uP is working) and all repair information is directly available.
4. ComPair features TV software up possibilities.

Specifications

ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The ComPair II interface box is connected to the PC via an USB cable. For the TV chassis, the ComPair interface box and the TV communicate via a bi-directional cable via the service connector(s).

The ComPair fault finding program is able to determine the problem of the defective television, by a combination of automatic diagnostics and an interactive question/answer procedure.

How to Connect

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

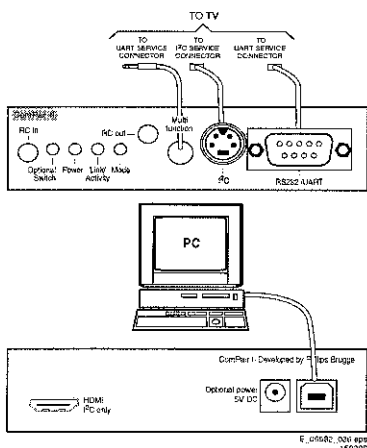


Figure 5-12 ComPair II interface connection

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

How to Order

ComPair II order codes:

- ComPair II interface: 3122 785 91020.
- Software is available via internet:
<http://www.atyourservice.ce.philips.com>
- ComPair UART interface cable for Q52x.x.
(using 3.5 mm Mini Jack connector): 3104 311 12742.

Note: While encountering problems, contact the local support desk.

5.4.2 Memory and Audio Test

With this tool you can test the memory of the PNX8541, as well as if the PNX5100 is enabled and audio-testing.

What is needed?

- An USB-stick.
- "TESTSCRIPT Q529" (3104 337 05021). Downloadable from the Philips Service website from the section "Software for Service only".
- A ComPair/service cable (3104 311 12742)

Procedure

Create a directory "JETTFILES" under the root of the USB-stick

- Place "MemoryTestPNX8635.bin" and "autojett.bin" (available in "TESTSCRIPT Q529") under the directory "JETTFILES"
- Install the computer program "BOARDTESTLOGGER" (available in "TESTSCRIPT Q529") on the PC
- Connect a "ComPair/service"-cable from the service-connector in the set to the COM1-port of the PC
- Start-up the program "BOARDTESTLOGGER" and select "COM1"
- Put the USB stick into the TV and startup the TV while pressing the "i+"-button on a Philips DVD RC6 remote control (it's also possible to use a TV remote in "DVD"-mode)
- On the PC the memory test is shown now. This is also visible on the TV screen.
- In "BOARDTESTLOGGER" an option "Send extra UART command" can be found where you can select "AUD1".

This command generates hear test tones of 200, 400, 1000, 2000, 3000, 5000, 8000 and 12500Hz.

5.4.3 LVDS Tool

Support of this LVDS Tool has been discontinued.

5.5 Error Codes

5.5.1 Introduction

The error code buffer contains all detected errors since the last time the buffer was erased. The buffer is written from left to right, new errors are logged at the left side, and all other errors shift one position to the right.

When an error occurs, it is added to the list of errors, provided the list is not full. When an error occurs and the error buffer is full, then the new error is not added, and the error buffer stays intact (history is maintained).

To prevent that an occasional error stays in the list forever, the error is removed from the list after more than 50 hrs. of operation.

When multiple errors occur (errors occurred within a short time span), there is a high probability that there is some relation between them.

Below the way errors will be displayed on the HUB:

- There is a simple blinking LED procedure for board level repair (home repair) so called LAYER 1 errors next to the existing errors which are LAYER 2 errors. (see table 5-2 error code overview).
 - LAYER 1 errors are one digit errors.
 - LAYER 2 errors are 2 digit errors.
- In protection mode.
 - From consumer mode: **LAYER 1**.
 - From SDM mode: **LAYER 2**.
- **Fatal errors, if I2C bus is blocked and the set reboots, CSM and SAM are not selectable.**
 - From consumer mode: **LAYER 1**.
 - From SDM mode: **LAYER 2**.

Important remark:
For all errors detected by MIPS which are fatal => rebooting of the TV set (reboot starts after LAYER error 1 blinking), one should short the solder paths at start-up from the power OFF state by mains interruption and not via the power button to trigger the SDM via the hardware pins.
- In CSM mode
 - When entering CSM: error **LAYER 1** will be displayed by blinking LED. Only the latest error is shown.
- In SDM mode
 - When SDM is entered via Remote Control code or the hardware pins, **LAYER 2** is displayed via blinking LED on the HUB.
- In the ON state
 - In "Display error mode", set with the RC commands "mute_06250X_OK" **LAYER 2** errors are displayed via blinking LED on the HUB.
- Error display on screen.
 - In CSM no error codes are displayed on screen.
 - In SAM the complete error list from the HUB only is shown!

Basically there are three kinds of errors:

- **Errors detected by the Stand-by software which lead to protection.** These errors will always lead to protection and an automatic start of the blinking LED (HUB) LAYER error 1. (see section "5.6 The Blinking LED Procedure").
- **Errors detected by the Stand-by software which not lead to protection.** In this case the LED from the HUB should blink the involved error. See also section "5.5 Error Codes, 5.5.4 Error Buffer, Extra Info". Note that it can take

up several minutes before the TV starts blinking the error (e.g. LAYER error 1 = 2, LAYER error 2 = 15 or 53).

- **Errors detected by main software (MIPS).** In this case the error will be logged into the error buffer and can be read out via ComPair, via blinking LED method LAYER error 1-2, or in case picture is visible, via SAM.

Important remark :

Errors on the monitor are displayed by blinking LED only during the start up. They will be displayed only once or twice.

5.5.2 How to Read the Error Buffer

Use one of the following methods:

- On screen via the SAM (only when a picture is visible).
E.g.:
 - **00 00 00 00 00:** No errors detected
 - **23 00 00 00 00:** Error code 23 is the last and only detected error.
 - **37 23 00 00 00:** Error code 23 was first detected and error code 37 is the last detected error.
 - Note that no protection errors can be logged in the error buffer.
- Via the blinking LED procedure. See section 5.5.3 How to Clear the Error Buffer.
- Via ComPair.

5.5.3 How to Clear the Error Buffer

Use one of the following methods:

- By activation of the "RESET ERROR BUFFER" command in the SAM menu.
- With a normal RC, key in sequence "MUTE" followed by "062599" and "OK".
- If the content of the error buffer has not changed for 50+ hours, it resets automatically.

5.5.4 Error Buffer

In case of non-intermittent faults, clear the error buffer before starting to repair (**before** clearing the buffer, write down the content, as this history can give significant information). This to ensure 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 code and not the actual cause (e.g. a fault in the protection detection circuitry can also lead to a protection).

There are several mechanisms of error detection:

- Via error bits in the status registers of ICs.
- Via polling on I/O pins going to the stand-by processor.
- Via sensing of analog values on the stand-by processor or the PNX8541.
- Via a "not acknowledge" of an I²C communication.

Take notice that some errors need several minutes before they start blinking or before they will be logged. So in case of problems wait 2 minutes from start-up onwards, and then check if the front LED is blinking or if an error is logged.

Table 5-2 Error code overview

Description	Layer 1	Layer 2	Monitored by	Error/Prot	Error Buffer/Blinking LED	Device	Defective Board
I ² C3	2	13	MIPS	E	BL / EB	SCL/D-SSB	SSB
I ² C4	5	14	MIPS	E	BL / EB	SCL/D-DISP	Display (LED back light only)
PNX doesn't boot (HW cause)	2	15	Stby μ P	E	BL	PNX8541 I ² C blocked	SSB
12V	3	16	Stby μ P	P	BL	/	Supply
1V2, 3V3, 5V to low	2	18	Stby μ P	P	BL	/	SSB
1V2 or Class D	2	19	Stby μ P	P	BL	/	SSB
3V3/5V DCDC to high	2	11	Stby μ P	P	BL	/	SSB
Temp protection	3	12	MIPS	P	BL/EB	LM75	SSB
PNX 5100	2	21	MIPS	E	EB	PNX5100	SSB
HDMI mux	2	23	MIPS	E	EB	AD8197A	SSB
I ² C switch	2	24	MIPS	E	EB	PCA9540	SSB
Master IF	2	26	MIPS	E	EB	TDA9898	SSB
FPGA Ambilight	2	28	MIPS	E	EB	/	SSB
Tuner	2	34	MIPS	E	EB	UV1783S/TD1716	SSB
Channel Decoder DVB-T	2	37	MIPS	E	EB	TDA10048	SSB
ST7100	2	38	MIPS	E	EB	ST7100	SSB
main NVM	2	/	MIPS	E	X	STM24C128	SSB
Channel decoder DVB-C	2	48	MIPS	E	EB	TDA 10023	SSB
PNX doesn't boot (SW cause)	2	53	Stby μ P	E	BL	PNX8541	SSB
DP Tx	6	54	MIPS	E	EB	GM60028	LVDS2DP
FPGA LVDS Rx	6	55	MIPS	E	EB		
DP port not connected	5	56	MIPS	E	EB	DP cable/monitor	/

Extra Info

- **Rebooting.** When a TV is constantly rebooting due to internal problems, most of the time no errors will be logged or blinked. This rebooting can be recognized via a ComPair interface and Hyperterminal (for Hyperterminal settings, see section "5.8 Fault Finding and Repair Tips, 5.8.5 Logging"). It's shown that the loggings which are generated by the main software keep continuing. In this case diagnose has to be done via ComPair.
- **Error 11 (3V3/5V too high).** This protection can occur during start up (LAYER error 1 = 2). Be careful to overrule this protection via SDM for the reason supply related devices can be possibly destroyed here.
- **Error 12 (Temp protection).** Current situation: when temperature rises above limit inside the HUB, the protection is triggered and the TV set is switched "OFF". No indication will be displayed on the LED of the HUB, yet error layer = 12 is logged and will be displayed when SDM is active.
- **Error 13 (I²C bus 3 blocked).** At the time of release of this manual, this error was not working as expected. Current situation: when this error occurs, the TV will constantly reboot due to the blocked bus. The best way for further diagnosis here, is to use ComPair.
- **Error 15 (PNX8541 doesn't boot).** Indicates that the main processor was not able to read his bootscript. This error will point to a hardware problem around the PNX8541 (supplies not OK, PNX 8541 completely dead, I²C link between PNX and Stand-by Processor broken, etc...). When error 15 occurs it is also possible that I²C2 bus is blocked (NVM). I²C2 can be indicated in the schematics as follows: SCL-UP-MIPS, SDA-UP-MIPS, SCL-2 or SDA-2. Other root causes for this error can be due to hardware problems with : NVM PNX5100, PNX5100 itself, DDR's.
- **Error 16 (12V).** This voltage is made in the power supply of the HUB and results in protection (LAYER error 1 = 3) in case of absence. When SDM is activated we see blinking LED LAYER error 2 = 16.
- **Error 18 (1V2-3V3-5V too low).** All these supplies are generated by the DC/DC supply on the SSB. If one of these supplies is too low, protection occurs and blinking LED LAYER error 1 = 2 will be displayed automatically. In SDM this gives LAYER error 2 = 18.
- **Error 19 (1V2 or class D).** If one of the 1V2 supplies is too high or too low in the start up procedure the supply fault becomes low.
- **Error 21 (PNX 5100).** At the time of release of this manual, this error was not working as expected. Current situation: when there is no I²C communication towards the PNX5100 after startup (power off by disconnection of the mains cord), LAYER error 2 will blink continuously via the blinking LED procedure in SDM. (startup the TV with the solder paths short to activate SDM).
- **Error 23 (HDMI).** When there is no I²C communication towards the HDMI mux after start up, LAYER error 2 = 23 will be logged and displayed via the blinking LED procedure if SDM is switched on.
- **Error 26 (Master IF).** When there is no I²C communication towards the Master IF after start up, LAYER error 2 = 26 will be logged and displayed via the blinking LED procedure when SDM is switched on.
- **Error 28 (FPGA ambilight).** When there is no I²C communication towards the FPGA ambilight after start up, LAYER error 2 = 28 will be logged and displayed via the blinking LED procedure if SDM is switched on. Note that it can take up several minutes before the TV starts blinking LAYER error 1 = 2 in CSM or in SDM, LAYER error 2 = 28.
- **Error 34 (Tuner).** When there is no I²C communication towards the tuner after start up, LAYER error 2 = 34 will be logged and displayed via the blinking LED procedure when SDM is switched on.
- **Error 37 (Channel decoder DVBT).** When there is no I²C communication towards the DVBT channel decoder after start up, LAYER error 2 = 37 will be logged and displayed via the blinking LED procedure if SDM is switched on.
- **Error 38 (STI7100).** When there is no I²C communication towards the STI7100 after startup (power off by disconnection of the mains cord), LAYER error 2 = 38 will be logged and displayed via the blinking LED procedure in SDM (startup the TV with the solder paths short to activate SDM). Remark : if the error occurs during the ON state, the TV will constantly reboot and no LED blinking will be displayed. This rebooting can be recognized via a ComPair interface and Hyperterminal (for Hyperterminal settings, see section "5.8 Fault Finding and Repair Tips, 5.8.5 Logging"). It is shown that the loggings which are

generated by the main software keep continuing. Check in the logging for keywords like e.g. "Device error 38".

- **Main NVM HUB.** When there is no I²C communication towards the main NVM, LAYER error 1 = 2 will be displayed via the blinking LED procedure. In SDM, LAYER error 2 can be 19 here. Check the logging for keywords like "I²C bus blocked".
- **Error 48 (Channel decoder DVBC).** When there is no I²C communication towards the DVBC channel decoder after start up, LAYER error 2 = 48 will be logged and displayed via the blinking LED procedure while SDM is active.
- **Error 53.** This error will indicate that the PNX8541 has read his bootscript (when this would have failed, error 15 would blink) but initialization was never completed because of hardware problems (NAND flash, ...) or software initialization problems. Possible cause could be that there is no valid software loaded (try to upgrade to the latest main software version). Note that it can take up to 2 minutes before the TV starts blinking LAYER error 1 = 2 or in SDM, LAYER error 2 = 53.
- **Error 55 (FPGA LVDS Rx).** At the time of release of this manual, this error was not working as expected. Current situation: When there is no I²C communication towards the

LVDS2DP panel, the TV set will start rebooting and no blinking on the hub will be displayed. The reset-start spacer is displayed on the monitor LED once in a while as start of the error blinking but none are logged. Because no picture is available, the only way to detect failure on the FPGA device is to check in the logging from the hub (via service connector hub) prints as: "setting lvdsrx output enable to 1, was 0". This betrays the failure of the FPGA LVDS Rx.

5.5.5 Monitor Errors for Essence

When an error of the monitor appears, it is displayed by a blinking LED on the monitor triggered via the acknowledge of the failing device. This is only once or twice. When the error disappears or when the I²C command is not repeated, the blinking LED stops. Resetting the errors of the monitor is not possible via the item "clear errors" in SAM and can not be read out either in the error buffer, they only will be displayed via blinking LED during start-up.

Table 5-3 Start-up errors Essence

Defect	Action	Error on E-box	Error on monitor
Supply cable and DP cable unplugged	Start up with mains cord or tact switch (HUB)	Blinking LED error 5 Logging error 56 (layer 2)	No LED
Supply cable and DP cable unplugged	Start up from Standby with RC6 (monitor)	No reaction	No LED and no RC6 blinking
Supply cable unplugged	Start up with mains cord or tact switch (HUB)	Blinking LED error 5 Logging error 56 (layer 2)	Standby
Supply cable unplugged	Start up from Standby with RC6 (monitor)	Blinking LED error 5 Logging error 56 (layer 2)	RC6 blinking, Standby LED, no error
DP cable unplugged	Start up with mains cord or tact switch (HUB)	Blinking LED error 5 Logging error 56 (layer 2)	No picture, no error
DP cable unplugged	Start up from Standby with RC6 (monitor)	No RC 6 blinking Standby	No picture, no error
E-box defect	Supply fault	Blinking LED error 3 Logging error layer 2 if possible	if no 24V : Standby 24V=OK : no picture, no error
E-box defect	SSB defect, DP initialized	Blinking LED error 2 Logging error layer 2	No error
E-box defect	SSB defect, DP not initialized	Blinking LED error 2 Logging error layer 2	No picture, no error
E-box defect	DP board defect	Blinking LED error 6 Logging error layer 2	No picture, no error
Monitor defect	FPGA	No error	Blinking LED error 2 Logging error 2
Monitor defect	3V3 monitor	Blinking LED error 5 Logging error 56 (layer 2)	Blinking LED error 3 Logging error 3
Monitor defect	12V monitor	Blinking LED error 5 Logging error 56 (layer 2)	Blinking LED error 4 Logging error 4
Monitor defect	DP port defect	Blinking LED error 5 Logging error 56 (layer 2)	No picture, no error
Monitor defect	DP RX	Blinking LED error 5 Logging error 56 (layer 2)	Blinking LED error 6 Logging error 6
Monitor defect	NVM	No error	Blinking LED error 7, No logging possible

Extra Info

- At the time of release of this manual, errors as mentioned above in table 5-3 can possibly not fully work as expected due to unresolved software bugs.

5.6 The Blinking LED Procedure

5.6.1 Introduction

The blinking LED procedure can be split up into two situations:

- **Blinking LED procedure LAYER error 1.** In this case the error is automatically blinked when the TV is put in CSM. This will be only one digit error, namely the one that is referring to the defective board (see table "Table 5-2 Error code overview") which causes the failure of the TV. This approach will especially be used for home repair and call centres. The aim here is to have service diagnosis from a distance.
- **Blinking LED procedure LAYER error 2.** Via this procedure, the content of the error buffer can be made visible via the front LED of the HUB. In this case the error contains 2 digits (see table "Table 5-2 Error code overview") and will be displayed when SDM (hardware pins) is activated. This is especially useful for fault finding and gives more details regarding the failure of the defective board.

Important remark:

For all errors detected by MIPS which are fatal => rebooting of the TV set (reboot starts after LAYER error 1 blinking), one should short the solder paths at start-up from the power OFF state by mains interruption and not via the power button to trigger the SDM via the hardware pins.

When one of the blinking LED procedures is activated, the front LED of the HUB will show (blink) the content of the error buffer. Error codes greater than 10 are shown as follows:

1. "n" long blinks (where "n" = 1 to 9) indicating decimal digit
2. A pause of 1.5 s
3. "n" short blinks (where "n" = 1 to 9)
4. A pause of approximately 3 s,
5. When all the error codes are displayed, the sequence finishes with a LED blink of 3 s
6. The sequence starts again.

Example: Error 12 8 6 0 0.

After activation of the SDM, the front LED will show:

1. One long blink of 750 ms (which is an indication of the decimal digit) followed by a pause of 1.5 s
2. Two short blinks of 250 ms followed by a pause of 3 s
3. Eight short blinks followed by a pause of 3 s
4. Six short blinks followed by a pause of 3 s
5. One long blink of 3 s to finish the sequence
6. The sequence starts again.

5.6.2 How to Activate

Use one of the following methods:

- **Activate the CSM.** The blinking front LED of the HUB will show only the latest layer error 1, this works in "normal operation" mode or automatically when the error/protection is monitored by the standby processor. At the time of this release, this layer error 1 blinking was not working as expected.
In case no picture is shown and there is no LED blinking, read the logging to detect whether "error devices" are mentioned. (see section "5.8 Fault Finding and Repair Tips, 5.8.5 Logging").
- **Activate the SDM.** The blinking front LED of the HUB will show the entire contents of the layer error 2 buffer, this works in "normal operation" mode or when SDM (via hardware pins) is activated when the tv set is in protection.

Important remark:

For all errors detected by MIPS which are fatal => rebooting of the TV set (reboot starts after LAYER error 1 blinking), one should short the solder paths at start up from the power OFF state by mains interruption and not via the power button to trigger the SDM via the hardware pins.

- **Transmit the commands "MUTE" - "062500" - "OK" with a normal RC.** The complete error buffer is shown. Take notice that it takes some seconds before the blinking LED starts.
- **Transmit the commands "MUTE" - "06250x" - "OK" with a normal RC** (where "x" is a number between 1 and 5). When x = 1 the last detected error is shown, x = 2 the second last error, etc.... Take notice that it takes some seconds before the blinking LED starts.

5.7 Protections

5.7.1 Software Protections

Most of the protections and errors use either the stand-by microprocessor or the MIPS controller as detection device. Since in these cases, checking of observers, polling of ADCs, and filtering of input values are all heavily software based, these protections are referred to as software protections. There are several types of software related protections, solving a variety of fault conditions:

- **Protections related to supplies:** check of the 12V, +5V, +3V3 and 1V2.
- **Protections related to breakdown of the safety check mechanism.** E.g. since the protection detections are done by means of software, failing of the software will have to initiate a protection mode since safety cannot be guaranteed any more.

Remark on the Supply Errors

The detection of a supply dip or supply loss during the normal playing of the set does not lead to a protection, but to a cold reboot of the set. If the supply is still missing after the reboot, the TV will go to protection.

Protections during Start-up

During TV start-up, some voltages and IC observers are actively monitored to be able to optimize the start up speed, and to assure good operation of all components. If these monitors do not respond in a defined way, this indicates a malfunction of the system and leads to a protection. As the observers are only used during start up, they are described in the start up flow in detail (see section "5.3 Stepwise Start-up").

5.7.2 Hardware Protections

The only real hardware protection in this chassis appears in case of an audio problem e.g. DC voltage on the speakers. The DC check circuit pulls the "A-STBY" line low and will paralyze the Class-D audio.

5.7.3 Important remark regarding the blinking LED indication

As for the blinking LED indication, the blinking of error layer 1 can be switched off by pushing the power button on the keyboard.

This condition is not valid after the set was unpowered (via mains interruption). The blinking LED starts again and can only be switched off by unplugging the mains connection. This can be explained by the fact that the MIPS can not load the keyboard functionality from software during the start up and doesn't recognizes the keyboard commands at this time.

5.8 Fault Finding and Repair Tips

Read also section "5.5 Error Codes, 5.5.4 Error Buffer, Extra Info".

5.8.1 Audio Amplifier

The Class D-IC 7D10 has a powerpad for cooling. When the IC is replaced it must be ensured that the powerpad is very well pushed to the PCB while the solder is still liquid. This is needed to insure that the cooling is guaranteed, otherwise the Class D-IC could break down in short time.

5.8.2 CSM

When CSM is activated and there is a USB stick connected to the TV, the software will dump the complete CSM content to the USB stick. The file (CSM.txt) will be saved in the root of the USB stick. If this mechanism works it can be concluded that a large part of the operating system is already working (MIPS, USB...)

5.8.3 DC/DC Converter

Introduction

The onboard supply consists of 5 DC/DC converters and 7 linear stabilizers. The DC/DC converters have all +12V input voltage and deliver:

1. +1V2-PNX8541 supply voltage, stabilised close to PNX8541 chip.
2. +1V2-PNX5100 supply voltage, stabilised close to PNX5100 chip.
3. +3V3 (overall 3.3 V for onboard IC's).
4. +5V for USB and Conditional Access Interface and +5V5-TUN tuner stabilizer.
5. +33VTUN for analogue only tuners (**AP diversity**).

The linear stabilizers are providing:

1. +1V supply voltage (out of +1V2-PNX8541), stabilized close to ST7101 chip (**MPEG4 diversity**).
2. +1V8-PNX5100.
3. +1V8-PNX8541 (**reserved** because +1V8-PNX5100 used also for DDR2 interface of PNX8541 via 5FB0).
4. +2V5 (**MPEG4 diversity**).
5. +1V2-STANDBY (out of +3V3-STANDBY).
6. +5V-TUN (out of +5V5-TUN).
7. +3V3-STANDBY (out of +12V, **reserved**).

+3V3-STANDBY and +1V2-STANDBY are permanent voltages. Supply voltages +1V2-PNX8541, +1V2-PNX5100 and +1V are started immediately when +12V incoming voltage is available (+12V is enabled by STANDBY signal, active low). Supply voltages +3V3, 2V5, +1V8-PNX5100, +1V8-PNX8541, +5V and +5V-TUN are switched-on directly by signal ENABLE-3V3 (active low) when +12V and previous mentioned voltages are all available.

Debugging

The best way to find a failure in the DC/DC converters is to check their starting-up sequence at power-on via the mains cord, presuming that the standby microprocessor and the external supply are operational. Take STANDBY signal high-to-low transition as reference.

When +12V rises above 10V then +1V2-PNX8541, +1V2-PNX5100 and +1V are started immediately. Then, after ENABLE-3V3 goes low, all the other supply voltages should rise within 10 ms. Boost voltages should be OK when +1V2-PNX8541, +1V2-PNX5100 are available (FU07 and FU8A, around 19V).

SUPPLY-FAULT signal should be high when all supply voltages are started-up.

Tips

- Usually, when supply voltage is short-circuited to GND, the corresponding DC/DC converter is making audible noise.
- The drop voltage across resistors 3U70 and 3U3T is 100 mV to 2000 mV.
- Defective (in short-circuit) power MOS-FET's lead usually to their controller IC broken; if one or more high-side MOS-FET's (7U05, 7U08, 7U0D-1 or 7U0H-1) is broken then the platform can be heavily damaged if started in SDM-mode (SUPPLY-FAULT signal is then ignored, while higher than normal supplies will be generated).
- The +33VTUN generator circuit (7U0P + 7U0Q + surrounding components) has low output current capability. In case of too low or no output voltage check transistor 7U0P (gate voltage pulses of about 10 V amplitude and drain voltage pulses of about 35 V amplitude) and the load (not more than 4.5 mA).
- High output ripple voltage of DC/DC converters can be caused by defective (cracked or bad soldered) ceramic capacitors in the feedback (DC or AC) input or output filtering.

5.8.4 Exit "Factory Mode"

When an "F" is displayed in the screen's right corner, this means that the set is in "Factory" mode, and it normally happens after a new SSB has been mounted. To exit this mode, push the "VOLUME minus" button on the TV's local keyboard control for 10 seconds (this disables the continuous mode). Now push the "MENU" button for 10 seconds until the "F" disappears from the screen.

5.8.5 Logging

When something is wrong with the TV set (f.i. the set is rebooting) you can check for more information via the logging in Hyperterminal. The Hyperterminal is available in every Windows application via Programs, Accessories, Communications, Hyperterminal. Connect a "ComPair UART"-cable (3104 311 12742) from the service connector in the TV set to the "COM1"-port of the PC. After start-up of the Hyperterminal, fill in a name (f.i. "logging") in the "Connection Description" box, then apply the following settings:

1. COM1
2. Bits per second = 38400
3. Data bits = 8
4. Parity = none
5. Stop bits = 1
6. Flow control = none

During the start-up of the TV set, the logging will be displayed. This is also the case during rebooting of the TV set (the same logging appears time after time). Also available in the logging is the "Display Option Code" (useful when there is no picture), look for item "DisplayRawNumber" in the beginning of the logging. Tip: when there is no picture available during rebooting you are able to check for "error devices" in the logging (LAYER 2 error) which can be very helpful to determine the failure cause of the reboot. For protection state, there is no logging.

5.8.6 Loudspeakers

Make sure that the volume is set to minimum during disconnecting the speakers in the ON-state of the TV. The audio amplifier can be damaged by disconnecting the speakers during ON-state of the set! Sometimes the set can go into protection, but that is not always the case.

5.8.7 Tuner

Attention: In case the tuner is replaced, always check the tuner options!

5.8.8 UI over PCI bus

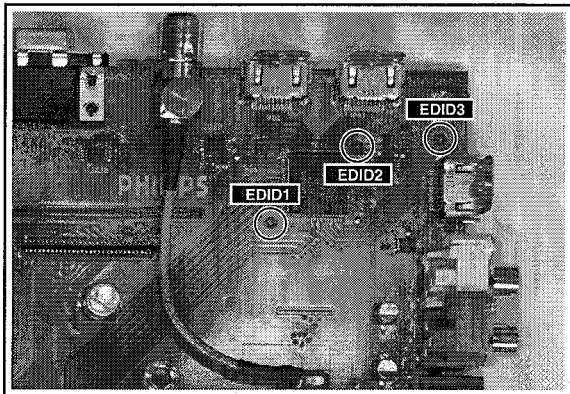
The UI is not integrated in the RGB signal but is send from PNX8541 to PNX5100 via the PCI bus. TXT and MHEG are integrated in the RGB signal. So when TXT signal is available but no UI, check the PCI bus.

5.8.9 Display option code

Attention: In case the SSB is replaced, always check the display option code in SAM, even when picture is available. Performance with the incorrect display option code can lead to unwanted side-effects for certain conditions.

5.8.10 Upgrade EDID NVM

To upgrade the EDID NVM pin 7 of the EDID NVM has to be short circuited to ground. Therefore some test points are foreseen (figure "EDID-NVM pins"). See ComPair for further instructions.



_18020_145.eps
190908

Figure 5-13 EDID-NVM pins

5.8.11 SSB Replacement

Follow the instructions in the flowchart in case a SSB has to be exchanged. See figure "SSB replacement flowchart".

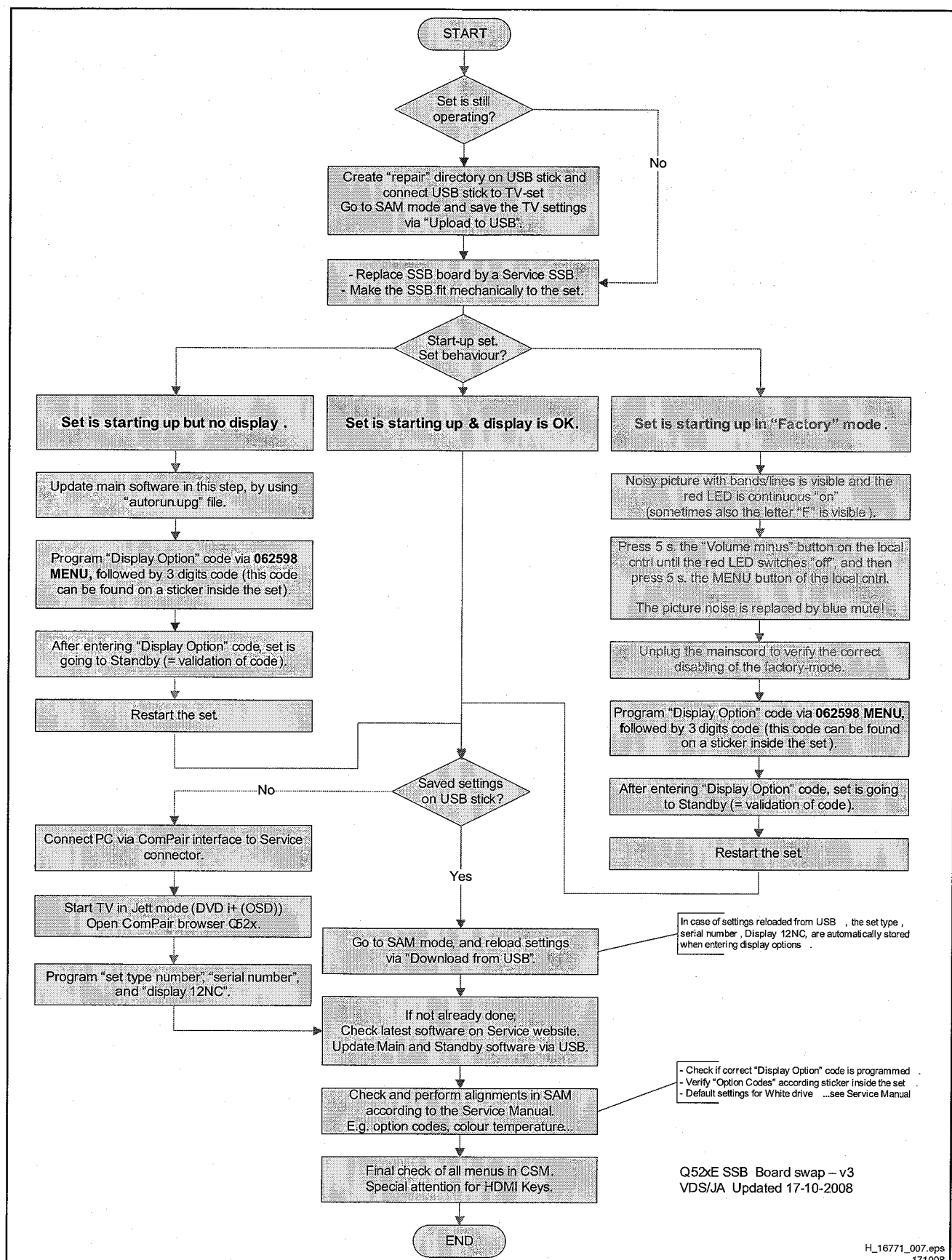


Figure 5-14 SSB replacement flowchart

5.9 Software Upgrading

5.9.1 Introduction

The set software and security keys are stored in a NAND-Flash, which is connected to the PNX8541 via the PCI bus.

It is possible **for the user** to upgrade the **main** software via the USB port. This allows replacement of a software image in a stand alone set, without the need of an E-JTAG debugger. A description on how to upgrade the main software can be found in the DFU.

Important: When the NAND-Flash must be replaced, a new SSB must be ordered, due to the presence of the security keys! (copy protection keys, MAC address, ...). It is however also possible to replace the NAND-Flash with a good one from a scrap-board.

Perform the following actions after SSB replacement:

1. Set the correct option codes (see sticker inside the TV).
2. Update the TV software (see the DFU for instructions).
3. Perform the alignments as described in chapter 8 (section "Reset of Repaired SSB").
4. Check in CSM if the HDMI keys are valid.

For the correct order number of a new SSB, always refer to the Spare Parts list!

5.9.2 Main Software Upgrade

- The "UpgradeAll.upg" file is only used in the factory.
- The "FlashUtils.upg" file is only used by service centra which are allowed to do component level repair on the SSB.

Automatic Software Upgrade

In "normal" conditions, so when there is no major problem with the TV, the main software and the default software upgrade application can be upgraded with the "AUTORUN.UPG" (FUS part of the one-zip file: e.g. 3104 337 04731 _FUS_Q591E_1.25.5.0_commercial.zip). This can also be done by the consumers themselves, but they will have to get their software from the commercial Philips website or via the Software Update Assistant in the user menu (see DFU). The "autorun.upg" file must be placed in the root of the USB stick. How to upgrade:

1. Copy "AUTORUN.UPG" to the root of the USB stick.
2. Insert USB stick in the set while the set is in ON MODE. The set will restart and the upgrading will start automatically. As soon as the programming is finished, a message is shown to remove the USB stick and restart the set.

Manual Software Upgrade

In case that the software upgrade application does not start automatically, it can also be started manually.

How to start the software upgrade application manually:

1. Disconnect the TV from the Mains/AC Power.
2. Press the "OK" button on a Philips TV remote control or a Philips DVD RC-6 remote control (it is also possible to use a TV remote in "DVD" mode). Keep the "OK" button pressed while reconnecting the TV to the Mains/AC Power.
3. The software upgrade application will start.

Attention!

In case the download application has been started **manually**, the "autorun.upg" will maybe not be recognized.

What to do in this case:

1. Create a directory "UPGRADES" on the USB stick.
2. Rename the "autorun.upg" to something else, e.g. to "software.upg". Do not use long or complicated names, keep it simple. Make sure that "AUTORUN.UPG" is no longer present in the root of the USB stick.
3. Copy the renamed "upg" file into this directory.

4. Insert USB stick into the TV.
5. The renamed "upg" file will be visible and selectable in the upgrade application.

Back-up Software Upgrade Application

If the default software upgrade application does not start (could be due to a corrupted boot 2 sector) via the above described method, try activating the "back-up software upgrade application".

How to start the "back-up software upgrade application" manually:

1. Disconnect the TV from the Mains/AC Power.
2. Press the "INFO"-button on a Philips remote control or "CURSOR DOWN" button on a Philips DVD RC-6 remote control (it is also possible to use a TV remote in "DVD" mode). Keep the "INFO"-button (or "cursor down" button) pressed while reconnecting the TV to the Mains/AC Power.
3. The software upgrade application will start.

5.9.3 Stand-by Software Upgrade via USB

In this chassis it is possible to upgrade the Stand-by software via a USB stick. The method is similar to upgrading the main software via USB.

Use the following steps:

1. Create a directory "UPGRADES" on the USB stick.
2. Copy the Stand-by software (part of the one-zip file, e.g. StandbySW_CFT55_35.0.0.0.upg) into this directory.
3. Insert the USB stick into the TV.
4. Start the download application manually (see section "Manual Software Upgrade").
5. Select the appropriate file and press the "red" button to upgrade.

5.9.4 Content and Usage of the One-Zip Software File

Below the content of the One-Zip file is explained, and instructions on how and when to use it.

- **1.1 Ambilight_PR FAM_x.x.x.x.zip.** Not to be used for Q529.1E LC sets.
- **1.2 bootProm_PNX5100_Q591X_x.x.x.x.zip.** A programmed device can be ordered via the regional Service organization.
- **1.3 Cabinet_ACOUS_x.x.x.x.zip.** Not to be used by Service technicians.
- **1.4 Ceisp2padII_P2PAD_x.x.x.x.zip.** Not to be used by Service technicians. For ComPair development only.
- **1.5 DDC_Q591X_x.x.x.x.zip.** Contains the content of the VGA NVM. See ComPair for further instruction.
- **1.6 Display_DISPT_x.x.x.x.zip.** Not to be used by Service technicians.
- **1.7 EDID_Q591X_x.x.x.x.zip.** Contains the EDID content of the different EDID NVM's. See ComPair for further instructions.
For sets with four HDMI connectors.
 - For HDMI 1 NVM, use "port 1*.bin"
 - For HDMI 2 NVM, use "port 2*.bin"
 - For HDMI 3 NVM, use "port 3*.bin"
- **1.8 EJTAGDownload_Q591X_x.x.x.x.zip.** Only used by service centra which are allowed to do component level repair.
- **1.9 Factory_Q591X_x.x.x.x_commercial.zip.** Only for production purposes, not to be used by Service technicians.
- **2.0 FlashUtils_Q591X_x.x.x.x_commercial.zip.** Not to be used by Service technicians.
- **2.1 LightGuide_TV522_x.x.x.x.zip.** Not to be used by Service Technicians.
- **2.2 FUS_Q591X_x.x.x.x_commercial.zip.** Contains the "autorun.upg" which is needed to upgrade the TV main software and the software download application.
- **2.3 MOP_RXSXX_x.x.x.x.zip.** Not to be used for Q529.1E LC sets.

- **2.4 OAD_Q591X_x.x.x.x.zip.** Not to be used by Service Technicians.
- **2.5 OpenSourceFile_Q591X_x.x.x.x.zip.** Not to be used by Service technicians.
- **2.6 PQPrivate_U5228_x.x.x.x.zip.** Not to be used by Service technicians.
- **2.7 PQPublic_U5228_x.x.x.x.zip.** Not to be used by Service technicians.
- **2.8 ProcessNVM_Q591X_x.x.x.x.zip.** Default NVM content. Must be programmed via ComPair.
- **2.9 StandbySW_CFTxx_x.x.x.x_commercial.zip.** Contains the Stand-by software in "upg" and "hex" format.
 - The "StandbySW_XXXXX_prod.upg" file can be used to upgrade the Stand-by software via USB.
 - The "StandbySW_XXXXX_hex" file can be used to upgrade the Stand-by software via ComPair.
 - The files "StandbySW_XXXXX_exhex.hex" and "StandbySW_XXXXX_dev.upg" may not be used by Service technicians (only for development purposes).
- **3.0 stmp4_XXXX.XXXX.XXXX.zip.** This is a separate MPEG4 SW (is also part of the FUS autorun.upg). Not to be used by Service Technicians.
- **3.1 UpgradeAll_Q591X_x.x.x.x_commercial.zip.** Only for production purposes, not to be used by Service technicians.
Caution: Never try to use this file, because it will overwrite the HDCP keys !!!
- **3.2 UpgradeExe_Q591X_x.x.x.x.zip.** Not to be used by Service Technicians.

5.9.5 Explanation UART log

How to log and change settings: see section 5.8.5 Logging.

What's inside the flash of a TV set

BFFS partition #3	- PNX5100 image
JFFS2 partition #1	Application R/W data Application 'data' partition
JFFS2 partition #0 (split in 2 virtual partitions on ceinfra level, based on path)	Application R/O once data Application R/O upgradable data Application 'Boot' partition
SQUASHFS partition	Root File System - minimal RFS - MIPS user-space TV app - Application R/O rfs data
BFFS partition #2	- boot batch file #3 - TM application - Linux Kernel including Ramdisk image with - minimal RFS - SW download app #2
BFFS partition #1	Backup - boot batch file #2 - Linux Kernel including Ramdisk image with - minimal RFS - SW download app #1 - JETT
BFFS partition #0	- JBL - version.txt - boot batch file #1
Block 0	µBTM partition table

L_17662_001.eps
110608

Figure 5-15 Sections in a flash device

Explanation of the sections

The flash of TV520 sets consists of a boot-block (block 0), a number of BFFS (Boot Flash File System) partitions, one SquashFS (compressed read-only filesystem for Linux. SquashFS is intended for general read-only filesystem use, for archival use) partition and a number of JFFS (Journaling Flash File System) partitions. The BFFS partitions contain the program code and compile-time data. The SquashFS partition contains the Linux roots including the standard RFS (Root File System) directory structures (dev,lib, modules, ...) and MIPS executables (elf).

For the purpose of SWUPG (SoftWare UPGrade application) the following points are important:

- The boot-block (block 0) contains also the partition table. This table indicates which partitions there are on this system and where they are located on the flash. All programs that want to access the flash contents should use this table.
- At system start-up the BTM (Boot Manager) loads the JBL (Jaguar Boot Loader) from /bffs0. The JBL then starts interpreting the boot.bat file from the highest available BFFS partition. If no boot.bat is found there, the next lower partition is tried.
- /bffs1 partition contains:
 1. kernel image.
 2. ramdisk image of RFS holding bare minimum (no debug tooling), including mod/libs , the SW backup upgrade executable, the Jett executable and the helper executable (init + MTD utils used to flash).
 3. boot batch file.
- The backup SWUPG is stored in the /boot1 BFFS partition in the factory, together with a boot.bat that by defaults loads this SWUPG. This way the set will always load this SWUPG if nothing is in /bffs2.
- /bffs2 partition contains:
 1. kernel image.
 2. ramdisk image of RFS holding bare minimum (no debug tooling), including mod/libs , the SW backup upgrade executable and the helper executable (init + MTD utils used to flash).
 3. TM image.
 4. boot batch file.
- In /boot2 an additional SWUPG shall always be written, either in the factory or by the end-user through an upgrade, which will overrule the one in /boot1. Here also the TM image is stored and a boot.bat which by default loads the main TV application, but falls back on the /boot2/SWUPG if that fails.
- /bffs3 partition contains PNX5100 images.
- In SquashFS, the TV application RFS flashed as a partition image. Content identical to the RAMDISK RFS at the exception that it includes the TV application in stead of SWUPG.
- JFFS2 partition0 contains the R/O once data, which can only written be written in the factory.
- JFFS2 partition1 contains the R/W data.

Startup sequence TV

The UART doesn't show the standby output.

```

U"Uretail Jan 16 2008 12:03:04
Boot deviceST NAND512W3A
BFFS init
OK
Searching BootLoader.tdfLoad /bffs0/BootLoader.tdf- Done
Start /bffs0/BootLoader.tdf
JBL (boottime improvement
BootLoader OS_R0.7.Zassert Feb 25 2008 12:49:28Searching boot.bat
Execute /bffs2/boot.bat from label [4]
* SR4->USB SW DL boot2
* On error goto 6
* Load /bffs2/Kernel.tdf - ok
* Load /bffs2/RFSBoot2.tdf - ok
* MemFill 0x87fff000 0x1000 0xff
* Signal 30
* Cmd Line
CMD_LINE arguments passed by JBL : console=ttyS0,38400n8 mem=60M kgdb=ttyS1 l
oglevel=3 init=/init ip=none jffs2_gc_delay=0 root=/dev/ram lpj=1196032 rd_sta
rt=0x80500000 rd_size=1568768* Start /bffs2/Kernel.tdf"htv520EU/92 startup script ..."
"Mounting file systems"
Total usertime mount for /proc: 0.000000 [Sec]
Total systertime mount for /proc: 0.000000 [Sec]
Total usertime mount for /sys: 0.000000 [Sec]
Total systertime mount for /sys: 0.010000 [Sec]
Total usertime mount for /dev/shm: 0.000000 [Sec]
Total systertime mount for /dev/shm: 0.000000 [Sec]
Total usertime mount for /dev/pts: 0.000000 [Sec]
Total systertime mount for /dev/pts: 0.000000 [Sec]
"Loading PNX5100 Image"
"Launching SW Download Application From Boot2"
checking hotboot: NO
Standby version 40.x.0.0
start_init clearing m_InitDoneBlunk
Using errlib version 0.9
Errlib 0.9 registered from process 147
3533 - ReferenRW partition: 4
mounting partition 4 to jffs2 file system passed RW partition: 5
mounting partition 5 to jffs2 file system passed
mounted: </dev/mtdblock6>
Mount check passes, 0 iterations
mounted: </dev/mtdblock7>
Mount check passes, 0 iterations
pffsN_OnMounted sets m_InitDoneBlunk to true
InitCehvData done
ReadCehvData ConfigVersion: [0.01] OK
ReadCehvData ProductID: [Q591E] OK
ReadCehvData OUI: [0000903E] OK
ReadCehvData HardwareModel: [0203] OK
ReadCehvData HardwareVersion: [0100] OK
ConvertAscii2Bin started
ConvertAscii2Bin done
ConvertAscii2Bin started
ConvertAscii2Bin done
ReadCehvData PublicKey: OK
ReadCehvData done, ConfigOK: TRUE
Could allocate 36701184,
>The amount of memory free to load the upg into. If upg size >
free memory, upg will not be programmed

redirecting 1 to 20
00 005.151 Startup m_InitDoneBlunk: 1, m_InitDoneMain: 1
00 005.151 /mnt/jffs0/rupg/tvplf/cctv/display found - Layoutcheck OK
00 005.151 Display flash file : Layout version = 8 ; Content version = 17
00 005.151 Display flash file : Project Id = 1 ; Branch Id = 0
00 005.151 version string: DISPT_001.000.008.017
00 005.151 Using screen option 142, name LCD LGD WUF SAA1 42"
00 005.151 MMIO address obtained from pnx5xxx drv = 0x28000000
00 005.151 redirecting 2 to 23
00 005.164 ***GVC: T2 - ceisusb_m.c (951): "usbdevspN_OnDeviceError( DeviceUnk
nownAttachedError, -1 )" notification given
00 005.165 ***GVC: T2 - ceisusb_m.c (951): "usbdevspN_OnDeviceError( DeviceUnk
nownAttachedError, -1 )" notification given
00 005.167 ***GVC: T2 - ceisusb_m.c (951): "usbdevspN_OnDeviceError( DeviceUnk
nownAttachedError, -1 )" notification given
00 005.169 ***GVC: T2 - ceisusb_m.c (951): "usbdevspN_OnDeviceError( DeviceUnk
nownAttachedError, -1 )" notification given
00 005.171 ***GVC: T2 - ceisusb_m.c (817): "usbdevspN_OnPhysicalDeviceConnecte
d( 0 )" notification given...
00 005.310 start_init
00 005.310 Startup m_InitDoneBlunk: 1, m_InitDoneMain: 1
00 005.413 gfxptr: 2dea0000
00 005.413 malloc 776605704
00 005.413 Starting STi710x device with i2c protocol version v0.5 !
00 005.413 ST TurnOn first attemptS18.0,Q591E_0.39.0.0
00 005.751 Go!!!!!!
00 005.850 Por: 1
00 005.860 ST start up OKST SW Version: MPEG4.001.000.000.029
00 005.870 ST HW Version: MP4HW.000.000.012.002
00 005.872 Amount of upgs on usb 0
00 005.874 No upg files found!
00 009.182 ***GVC: T2 - ceisusb_m.c (1199): "usbdevspN_OnNewDevice( 0 )" notification given.
00 009.271 ***GVC: T2 - ceisusb_m.c (1408): "usbdevspN_OnDriveMounted( 0 )" notification given
00 009.273 OnDriveMounted : 0
00 009.559 ceapps OnUpgradesChanged : 0
00 009.567 Amount of upgs on usb 20

----- Here Application is started up -----
00 009.772 20 upgs found on USB. Press right to enter the list.
>Amount of upgs found.

```

Figure 5-16 Example UART log during SWUPG startup (DVD OK).

```

U"Uretail Jan 16 2008 12:03:04
Boot deviceST NAND512W3A
BFFS init
OK
Searching BootLoader.tdfLoad /bfs0/BootLoader.tdf: Done
Start /bfs0/BootLoader.tdf
JBL (boottime improvement
BootLoader OS_R0.7.2assert Feb 25 2008 12:49:28Searching boot.bat
Execute /bfs2/boot.bat from label [6]
unknown command, line 302
Execute /bfs1/boot.bat from label [6]
* boot1: SR6->USB SW DL boot1
* On error goto 70
* Load /bfs1/Kernel.tdf - ok
* Load /bfs1/RFSBoot1.tdf - ok
* MemFill 0x87ff000 0x1000 0xff
* Signal 30
* Cmd Line
CMD: LINE arguments passed by JBL: console=ttyS0,38400n8 mem=60M kgdb=ttyS1 loglevel=3 init=/init ip=none root=/dev/ram lpj=1196032 rd_start=0x80500000 rd_
size=1818624* Start /bfs1/Kernel.tdf"htv520EU/92 startup script ..."
"Mounting file systems"
Total usertime mount for /proc: 0,000000 [Sec]
Total systemtime mount for /proc: 0,000000 [Sec]
Total usertime mount for /sys: 0,000000 [Sec]
Total systemtime mount for /sys: 0,000000 [Sec]
Total usertime mount for /dev/shm: 0,000000 [Sec]
Total systemtime mount for /dev/shm: 0,000000 [Sec]
Total usertime mount for /dev/pts: 0,000000 [Sec]
Total systemtime mount for /dev/pts: 0,000000 [Sec]
"Loading PNX5100 Image"
"Launching SW Download Application From Boot1"
checking hotboot: NO
Standby version 40.x.0.0
start_init clearing m_InitDoneBlunk
Using erlib version 0.9
Erllib 0.9 registered from process 147
3562 - ReferenRW partition: 4
mounting partition 4 to jffs2 file system passed
RW partition: 5
mounting partition 5 to jffs2 file system passed
mounted: </dev/mtdblock6>
Mount check passes, 0 iterations
mounted: </dev/mtdblock7>
Mount check passes, 0 iterations
pffsN_OnMounted sets m_InitDoneBlunk to true
InitCehvData done
ReadCehvData ConfigVersion: [0.01] OK
ReadCehvData ProductID: [Q591E] OK
ReadCehvData OUI: [0000903E] OK
ReadCehvData HardwareModel: [0203] OK
ReadCehvData HardwareVersion: [0100] OK
ConvertAscii2Bin started
ConvertAscii2Bin done
ConvertAscii2Bin started
ConvertAscii2Bin done
ReadCehvData PublicKey: OK
ReadCehvData done, ConfigOK: TRUE
Could allocate 36701184.
Startup m_InitDoneBlunk: 1, m_InitDoneMain: 1
/mnt/jffs0/rupg/tvplf/cevt/display found - Layoutcheck OK
Display flash file : Layout version = 8 ; Contentversion = 17
Display flash file : Project Id = 1 ; Branch Id = 0
version string: DISPT_001.000.008.017
Using screen option 142, name LCD LGD WUF SAA1 42"
MMIO address obtained from pnx5xxx drv = 0x28000000
redirecting 1 to 22
00 005.181 redirecting 2 to 23
00 005.185 ***GVC: T2 - ceisusb_m.c (951): "usbdevspN_OnDeviceError( DeviceUnknownAttachedError, -1 )" notification given
00 005.187 ***GVC: T2 - ceisusb_m.c (951): "usbdevspN_OnDeviceError( DeviceUnknownAttachedError, -1 )" notification given
00 005.188 ***GVC: T2 - ceisusb_m.c (951): "usbdevspN_OnDeviceError( DeviceUnknownAttachedError, -1 )" notification given
00 005.190 ***GVC: T2 - ceisusb_m.c (951): "usbdevspN_OnDeviceError( DeviceUnknownAttachedError, -1 )" notification given
00 005.192 ***GVC: T2 - ceisusb_m.c (817): "usbdevspN_OnPhysicalDeviceConnected( 0 )" notification given...
00 005.364 start_ init
00 005.364 Startup m_InitDoneBlunk: 1, m_InitDoneMain: 1
00 005.465 gfixpr: 2dea0000
00 005.465 malloc 776605704
00 005.465 Starting STi710x device with i2c protocol version v0.5 !
00 005.471 ST TurnOn first attemptS18,0,Q591E_0.39.0.0
00 005.806 Go!!!!!!
00 005.910 Por: 1
00 005.920 ST start up OKST SW Version: MPEG4.001.000.000.029
00 005.930 ST HW Version: MP4HW.000.000.012.002
00 005.932 Amount of upgs on usb 0
00 005.934 No upg files found!
00 009.212 ***GVC: T2 - ceisusb_m.c (1199): "usbdevspN_OnNewDevice( 0 )" notification given.
00 009.297 ***GVC: T2 - ceisusb_m.c (1408): "usbdevspN_OnDriveMounted( 0 )" notification given
00 009.299 OnDriveMounted : 0
00 009.586 ccapps OnUpgradesChanged : 0
00 009.594 Amount of upgs on usb 20
00 009.854 20 upgs found on USB. Press right to enter the list.

```

Figure 5-17 Example UART log during SWUPG startup (DVD down).

```

U"Uretail Jan 16 2008 12:03:04
Boot deviceST NAND512W3A
BFFS init
OK
Searching BootLoader.tdfLoad /bfs0/BootLoader.tdf- Done
Start /bfs0/BootLoader.tdf
JBL (boottime improvement
BootLoader OS_R0.7.2assert Feb 25 2008 12:49:28Searching boot.bat
Execute /bfs2/boot.bat from label [1]
* SR1->Coldboot
* On error goto 60
* Load /bfs2/atvTm0App.tdf - ok
* Load /bfs3/tmvpvPnx51xxApp.tdf - ok
* Load /bfs2/cdDownloadTm0.tdf - ok
* Starting earlyStartTM* Load /bfs3/tmvpvPnx51xxCoApp_tm2.tdf - ok
* Load /bfs3/tmvpvPnx51xxCoApp_tm3.tdf - ok
* Load /bfs2/Kernel.tdf - ok
* MemFill 0x87fff000 0x1000 0xff
* Signal 30
* Cmd Line
CMD_LINE arguments passed by JBL : console=ttyS0,38400n8 mem=48M kgdb=ttyS1 1
oglevel=3 root=/dev/mtdblock5 lpj=1196032 init=/init ip=none jffs2_...delay=30
* Start /bfs2/Kernel.tdf"htv520EU/92 startup script ..."
"Mounting file systems"
Total usertime mount for /proc: 0,000000 [Sec]
Total systemtime mount for /proc: 0,000000 [Sec]
Total usertime mount for /sys: 0,000000 [Sec]
Total systemtime mount for /sys: 0,000000 [Sec]
Total usertime mount for /dev/shm: 0,000000 [Sec]
Total systemtime mount for /dev/shm: 0,000000 [Sec]
Total usertime mount for /dev/pts: 0,000000 [Sec]
Total systemtime mount for /dev/pts: 0,010000 [Sec]
"Mounting the flash file systems"
Total usertime mount for /mnt/jffs0: 0,000000 [Sec]
Total systemtime mount for /mnt/jffs0: 0,080000 [Sec]
"Loading PNX5100 Image"
"Launching TV application"
----- Here TV Application is starting up -----
Using erllib version 0.9
Erllib communication with plfapp failed, will retry later
redirecting 1 to 14
00 002.414 128MB memory on board
00 002.414 128MB memory MAP
00 002.414 checking hotboot: NO
00 002.414 Standby version 40.x.0.0
00 002.414 start_init clearing m_initDoneBlunk
00 002.414 Using erllib version 0.9
00 002.414 Erllib 0.9 registered from process 118
00 002.414 2343 - Reference timestamp
00 002.414 mounted: </dev/mtdblock6>
00 002.414 Mount check passes, 0 iterations
-1 002.517 (*) FusionDale/Config: Parsing config file '/etc/fusiondalere'.
-1 002.517 *-----) FusionDale v0.1.1 (-----)
-1 002.517 (c) 2006-2007 directfb.org
-1 002.517 -----
-1 002.517 (*) Fusion/SHM: NOT using MADV_REMOVE (2.6.18.0 < 2.6.19.2)! [0x02061200]
-1 002.517 (*) Direct/Thread: Running 'Fusion Dispatch' (MESSAGING, 119)...
-1 002.527 redirecting 2 to 12
-1 002.527 starting : /philips/apps/ceplfapp
-1 002.527 amApp : InitFusionDale
-1 002.527 Erllib communication with plfapp failed, will retry later
00 002.639 /mnt/jffs0/rupg/tvplf/cetv/display found - Layoutcheck OK
00 002.639 Display flash file : Layout version = 8 ; Content version = 17
00 002.639 Display flash file : Project Id = 1 ; Branch Id = 0
00 002.639 version string: DISPT_001.000.008.017
00 002.639 Using screen option 142, name LCD LGD WUF SAA1 42"Erllib 0.9 registered from process 116
00 002.695 *-----) FusionDale v0.1.1 (-----)
00 002.695 (c) 2006-2007 directfb.org
00 002.695 -----
00 002.802 Diversity: BoardType=92, BoardVersion=3, Detected pnx8535 version=M2
00 002.802 AmbientLightGenerator : Epld
00 002.802 AmbientLightMode : LeftRight
00 002.802 AmbientLightTechnology : Led
00 002.802 CabinetNumber : 3
00 002.802 ChannelDecoderType : Tda10048
00 002.802 ChannelDecoder2Type : Tda10023
00 002.802 ClearLcdSupported : False
00 002.802 DimmingBacklightSupported : True
00 002.802 DisplayDelayCompensation : 36 - 190
00 002.802 DisplayRawNumber : 142
00 002.802 DvbHdSupported : False
00 002.802 EpldPresent : True
00 002.802 HDMI MuxPresent : Mux4
00 002.802 IfDemVersion : V2
00 002.802 LightSensor : Present
00 002.802 LightSensorType : Aura
00 002.802 Sti7100Present : True
00 002.802 PacificPresent : False
00 002.802 Region : Europe
00 002.802 Pnx5050Present : False
00 002.802 Pnx5100Present : True
00 002.802 SawVersion : New
00 002.802 IF Mode (DVB-C) : Direct IF
00 002.802 TunerI2cConfig : ViaChannelDecoder
00 002.802 TunerType : 26 (Phil4MkTd1716F)
-1 002.916 amApp: Platform returned wakeup reason [src: 0, sys: 0, cmd: 0]
-1 002.919 starting : /philips/apps/tveu 4 0 0
00 003.082 RU Flash file not found in /mnt/jffs0/rupg/tvplf/tv520avi/cabinet3

```

L_17662_004a.eps
110608

Figure 5-18 Example UART log during SWUPG startup (Normal startup) part 1.

```

00 003.082 RO Flash file not found in /mnt/jffs0/ro/tvplf/tv520avi/cabinet3
00 003.082 Local flash file not found in file/cabinet3
00 003.082 RU Flash file found in /mnt/jffs0/rupg/tvplf/tv520avi/cabinet
00 003.082 Cabinet flash file : Layout version = 4 ; Content version = 16
00 003.082 Cabinet flash file : Project Id = 0 ; Branch Id = 39
00 003.082 version string: ACSTS_000.039.004.016
-1 003.182 amApp : InitDirectFB
-1 003.182 Grabbing keyboard
-1 003.182 amApp : InitSaWMan
-1 003.182 AppMan: Process added (118) [1]!
-1 003.182 AppMan: Process added (116) [2]!
-1 003.182 AppMan: Window added (0,0-1x1) [1] - 1!
00 003.304 Using cabinet option 3, name MS7_speaker_B 2K7
00 003.304 /mnt/jffs0/rupg/tvplf/cetv/pqprivate found
00 003.304 PQ private flash file : Layout version = 8 ; Content version = 0
00 003.304 PQ private flash file : Project Id = 1 ; Branch Id = 0
00 003.304 version string: PRFPV_001.000.008.000
00 003.304 /mnt/jffs0/rupg/tvplf/cetv/ambientlight found
00 003.304 Ambientlight flash file : Layout version = 3 ; Content version = 9
00 003.304 Ambientlight flash file : Project Id = 1 ; Branch Id = 0
00 003.349 version string: PRFAM_001.000.003.009;5100pow_Init
00 003.382
00 003.382 /mnt/jffs0/rupg/tvplf/cetv/pqpublic found
00 003.382 PQ public flash file : Layout version = 4 ; Content version = 2
00 003.382 PQ public flash file : Project Id = 0 ; Branch Id = 0
00 003.406 version string: PRFPB_000.000.004.002plfdmx_mdms: DEBUG_ERROR_PRINT enabled
00 003.431 Platform Application from Apr 13 2008 22:31:30,
00 003.431 built on PC: BEQBRGBRGITSS15 by user: beq00908
00 003.431 CCM_build_id:
00 003.431 Startup m_InitDoneBlunk: 0, m_InitDoneMain: 1
00 003.782 Check TM download idrv_DspReady_Redy
01 003.879 tvApp : entered main....
01 003.885 amApp is passing 4 arguments
01 003.890 tvApp : Param 1 = 4 Param 2 = 0
01 003.892 Tvmain: start_Init called
00 003.974 Create Thread with priority 70 (=45)
00 003.974 Create Thread with priority 70 (=45)
00 003.974 Create Thread with priority 70 (=45)
00 003.974 Create Thread with priority 70 (=45)
00 003.974 Create Thread with priority 70 (=45)
00 003.974 Create Thread with priority 70 (=45)
01 003.985 Using errlib version 0.9
00 003.988 Starting STI710x device with i2c protocol version v0.5 !
00 003.995 ST TurnOn first attemptCreate Thread with priority 70 (=45)
00 003.995 Create Thread with priority 70 (=45)
00 003.995 Create Thread with priority 70 (=45)
00 003.995 Create Thread with priority 70 (=45)
00 004.004 PNX5100: Using PCI communication for all i2c write messages!!
00 004.007 PNX5100: Input Wdw: 1944 1104 Output Freq: 100
00 004.009 PNX5100: Input Wdw: 1944 1104 Output Freq: 120
00 004.013 Create Thread with priority 70 (=45)
00 004.015 PNX5100: Hardware Id [5100hwid]
00 004.017 Software Id [20080408]
00 004.019 BootNvm Id [ 8]
00 004.023 5100 Drv GetBootstatus via PCI : 0
00 004.038 Errlib 0.9 registered from process 164
00 004.064 TM download OK
01 004.067 (*) FusionDale/Config: Parsing config file /etc/fusiondalerc'.
01 004.072 *-----) FusionDale v0.1.1 (-----*
01 004.072 (c) 2006-2007 directfb.org
01 004.072 -----
01 004.078 (*) Fusion/SHM: NOT using MADV_REMOVE (2.6.18.0 < 2.6.19.2)! [0x02061200]
01 004.089 (*) Direct/Thread: Running 'Fusion Dispatch' (MESSAGING, 184)...
00 004.099 Por: 1
00 004.102 ST start up OKST SW Version: MPEG4.001.000.000.029
00 004.105 ST HW Version: MP4HW.000.000.012.002
00 004.107 5100 Drv GetBootstatus via PCI : 0
00 004.112 Firmware version 3.10 for TDA10048 successfully downloaded
00 004.263 5100 Drv GetBootstatus via PCI : 2
00 004.265 PNX5100&&&&& Bootstatus on 2 after 2 retries
-1 004.333 AppMan: Process added (164) [3]!
00 004.445 i5100pow_TurnOn
00 004.451 phatvEngine5100Proxy__pow_TurnOn using udma driver for autotv !!gOemRegTbl:0x3292D0
00 004.508 cetvbind_mpowon: iamb1_SetState onoff = 0
-1 004.517 icplfapisetup_powN_OnTvPowerChanged for state 2
01 004.702 svspow_m.c:2922::Start Init of svspow called.MsecSinceInit: 1791999581
01 004.707 svspow_m.c:2251::Wakeup Reason is coldboot
01 004.730 svspow_m.c:2954::Quick Turn On Initiated
01 004.730 svspow_m.c:1380::Double call in InitialiseSoftware
-1 004.804 AppMan: Window added (100,100-480x300) [2] - 0!
-1 004.804 Border window attached
-1 004.804 AppMan: Switch focus to 0x5132da00 [2]
-1 004.804 AppMan: Window added (100,100-480x300) [3] - 1!
-1 004.804 Audio node attached
-1 004.813 amApp: dst setup called for 2
-1 004.820 amApp: Enabling keyboard
-1 004.823 amApp: dst setup called for 3
01 004.975 FUNCTION:hsveuins__impow_Init, LINE:216, InsStatus.Medium:255
01 004.987 MAINVIDEOWINDOW=2,sizeof(NoClearData):8,retval:0,retval1:0
00 005.060 UNBLOCK CARD
01 005.203 svspow_m.c:1526::All Subsystems initied
01 005.236 mlock patch initied
-1 005.262 HK_REQUEST_PS received for 5
-1 005.262 Ungrabbing keyboard
01 005.267 svspow_m.c:2854::REQUEST_PS for cmd: 5
00 005.270 cetvbind_mpowon: powon_TurnOn
01 005.289 <S> 5278 ZAP_END - UnBlank GCK*****Hot key received by tvApp
01 005.289 svspow_m.c:4705::HK_PREPARE_PS received for cmd = 5
01 005.289 GCK*****Hot key prepare PS received by psc
01 005.289 svspow_m.c:4049::powetl_SetPowerMode to PscPowOn
-1 005.296 Called icplfapisetup_pow_SetTvPower(3)

```

Figure 5-19 Example UART log during SWUPG startup (Normal startup) part 2.

```

-1 005.296 Sending HK_PREPARE_PS to application index 1, window 0x5132da00
01 005.315 svspow_m.c:1575::Reached SW Turn On 1
-1 005.327 icplfapisetup_powN_OnTvPowerChanged for state 3
01 005.338 svspow_m.c:1634::Reached HandleTurnOn1Event with Event = 16
01 005.342 svspow_m.c:1634::Reached HandleTurnOn1Event with Event = 1
01 005.432 RB Analog file name /mnt/jffs0/boot/tv/hysvc/HsvAntennaAnalogTable
01 005.435 RB Digits file name /mnt/jffs0/boot/tv/hysvc/HsvAntennaDigPtcTable
01 005.437 RB digsrcv file name /mnt/jffs0/boot/tv/hysvc/HsvAntennaDigSrcvTable
01 005.439 FrequencyMap file name /mnt/jffs0/boot/tv/hysvc/HsvAntennaFreqMapTable
01 005.443 Analog file::IsImmediateFlashUpdateReqd set to:0
01 005.444 RB Analog file open Successful
01 005.446 Proceed I:1
01 005.448 generating dig tables
01 005.452 digts_Open::DigTslfp:18157056,tempval2:2
01 005.454 digts::IsImmediateFlashUpdateReqd set to:0
01 005.464 digsrcv_Open::DigSrcvcfp:18157424,tempval:2
01 005.466 DigSrcvcfp::IsImmediateFlashUpdateReqd set to:0
01 005.469 freqmap_Open::freqMapfp:18157792,tempval:2
01 005.471 freqMapfp::IsImmediateFlashUpdateReqd set to:0
01 005.475 ANTENNA_FLASH_ANALOG_TABLE: records:21
01 005.478 NoOfRecordsInFlash::ANTENNA_FLASH_DIG_PTC_TABLE:12
01 005.512 NoOfRecordsInFlash::ANTENNA_FLASH_DIG_SRCV_TABLE:117
01 005.514 NoOfRecordsInFlash::ANTENNA_FLASH_FREQMAP_TABLE:0
01 005.516 RB Analog file closed
00 005.519 cetvband_mpowon: cetvambi_ambilight_Disable
01 005.526 CurrentONID = 9018
01 005.528 euins_m:Medium from NVM = 0
01 005.544 svspow_m.c:3586::cesvc powntf received for Ssby
01 005.546 svspow_m.c:1634::Reached HandleTurnOn1Event with Event = 2
01 005.573 svspow_m.c:750::Set has reached Semisby state
00 005.577 cetvband_mpowon: iambl_SetState onoff = 0
01 005.582 cbmhgoad_mcallisto: mDownloadErrorOccurred = FALSE
01 005.584 cbmhgoad_mswupdt: mScanningRequired = FALSE - mMsgArrived = 0, MsgType = 65535
01 005.586 cbmhgpow_mpow: sbyoad_IsPending = FALSE
01 005.590 svspow_m.c:1718::Reached SW Turn On 2
00 005.704 cetvband_mpowon: iambl_SetState onoff = 0
01 005.784 cbmhgpow_mpow: selrqd_IsProgSelReqd = TRUE
01 005.792 <S> 5792 ZAP_BEGIN - SelectProgram
01 005.794 svspow_m.c:953::First Preset Seln made at 1792000672
01 005.827 svbas pgseIn_OnProgramChangeRequested
00 005.844 DVB-T decoder selected
00 005.846 avptda10023_menablc: ena_Disable()
01 005.896 svspow_m.c:1803::Reached HandleTurnOn2Event with Event = 1
00 006.059 ***Restoring Ad Routing and enable direct control
01 006.162 svspow_m.c:1803::Reached HandleTurnOn2Event with Event = 16
01 006.195 svspow_m.c:3634::cesvc powntf received for ON
01 006.197 svspow_m.c:1803::Reached HandleTurnOn2Event with Event = 2
00 006.211 ***Writing the Ad Routing parameters...
00 006.464 tmtv520avinst_vipN_OnImageFormatChanged
01 006.752 hsvprins_hsvprins_feapIn_OnStationFound
01 006.936 hseuins_mdig.c: 2178: hseuins_ictrlN_OnEvent:
01 006.936 sigstr_SetSigStrengthMeasured called with val = 1
00 007.131 ceplfresgate_vid_StopDemux
00 007.131 ceplfresgate_aud_StopDemux
00 007.146 ceplfresgate_pcr_StopDemux
01 007.148 Mohanan: ConvertToSTVideoType : 2
01 007.153 hsvdvbmpl: dmxxmed_SetVideoPid pid 600 type 2
00 007.163 ceplfresgate_vid_StartDemux
01 007.172 Mohanan: ConvertToSTAudioType : 0x2000000
01 007.174 hsvdvbmpl: dmxxmed_SetAudioPid pid 601 type 5
00 007.182 ceplfresgate_aud_StartDemux
01 007.185 hsvdvbmpl: dmxxmed_SetPcrPid pid 600
00 007.191 ceplfresgate_pcr_StartDemux
00 007.191 usecase = 4
00 007.484 tmtv520avinst_vipN_OnVideoPresentChanged
00 007.486 direct ceplfresgate_vipN_OnVideoPresentChanged to 2
00 007.491 m_FieldFreq = 50tmtv520avinst_vipN_OnNumberOfVisibleLinesChanged
00 007.494 direct ceplfresgate_vipN_OnNumberOfVisibleLinesChanged
00 007.507 tmtv520avinst_vipN_OnImageFormatChanged
01 007.571 svspow_m.c:4589::First pgseIn completed at 1792002449
00 007.575 cetvband_mpowon: cetvdisplay_preheatN_OnEvent
00 007.577 cetvband_mpowon: UpdateAmbientLight => cetvambi_ambl_SetState
01 007.587 <S> 7583 ZAP_END - UnBlank
01 007.589 svbas pgseIn_OnProgramChangeCompleted
01 007.960 svspow_m.c:4753::Detected Mute = FALSE in vmtN
01 007.964 <S> 7959 ZAP_END - UnBlank
01 007.966 svspow_m.c:1803::Reached HandleTurnOn2Event with Event = 2048
01 007.968 RFS not found in environment
01 007.977 RFS not found in environment
01 007.979 FLASH system, mount request for partition 2 accepted
00 008.331 Timeout on mountcheck
01 008.692 svspow_m.c:4760::flashopN_OnPartitionMounted::partitionid:2
00 008.769 cetvband_mpowon: cetvambi_ambilight_Disable
00 009.002 argv[0] is /philips/bin/networkhelper
00 009.002 udhpcp gave me deconfig
00 009.002 HandleUdhpcpNotif: msgq is 32769
01 009.155 svspow_m.c:4772::Sent flashopN_OnPartitionMounted::MOUNT_ON_EVENT
01 009.158 svspow_m.c:1872::gfx setpower ON
01 009.162 svspow_m.c:1875::gfx powntf for ON
01 009.164 cbmhgpow_mpow: SetPower to ON
01 009.166 cbmhgpow_mpow: OnPowerChanged
01 009.168 svspow_m.c:3428::cbmhg powntf received for ON
01 009.171 svspow_m.c:1913::cbmhg setpower On
01 009.267 svspow_m.c:1926::JUICE setpower On
01 009.279 svspow_m.c:1803::Reached HandleTurnOn2Event with Event = 16
01 009.282 svspow_m.c:1803::Reached HandleTurnOn2Event with Event = 256
-1 009.292 AppMan: Window added (0,0-852x480) [4] - 2!
01 009.298 Surface 0, PlaneId 2 in AttachSurface
00 009.989 argv[0] is /philips/bin/networkhelper
00 009.989 udhpcp gave me bound
00 009.989 udhpcp gave me bound

```

Figure 5-20 Example UART log during SWUPG startup (Normal startup) part 3.

```

00 009.989 IP address is 192.168.1.22
00 009.989 subnet mask is 255.255.255.0
00 009.989 $router is 192.168.1.1
00 009.989 First Gateway is 192.168.1.1
00 009.989 Sdns is 192.168.1.1
00 009.989 DNS1 is 192.168.1.1
00 009.989 Interface is eth0
00 009.989 HandleUdhcpeNotif : msgq is 32769
00 010.083 route: SIOC[ADD|DEL]RT: No such process
01 010.623 svspow_m.c:3497::juice powntf received for ON
01 010.626 svspow_m.c:1803::Reached HandleTurnOn2Event with Event = 512
01 010.641 svspow_m.c:1943::ceapps setpower On
-1 010.649 AppMan: Window config - unhiding window
-1 010.649 Relayout of window 4
-1 010.657 AppMan: Switch focus to 0x5132d600 [4]
00 010.702 (!!!) *** WARNING [color keying does not work on UPPER layer] *** [Philips/DirectFB/systems/cetvfb/primary.c:202 in get_color_minmax()]
01 010.868 svspow_m.c:3479::apps powntf received for ON
-1 010.881 AppMan: Window added (0,0-720x576) [5] - 0!
01 010.897 Surface 1, PlaneId 0 in AttachSurface
01 011.083 svspow_m.c:1803::Reached HandleTurnOn2Event with Event = 1024
01 011.086 svspow_m.c:693::Set Reached on state at 1792005965
01 011.088 svspow_m.c:755::Set has reached ON state
01 011.091 InitCetvData done
01 011.312 ReadCetvData ConfigVersion: [0.01] OK
01 011.312 ReadCetvData ProductID: [Q591E] OK
01 011.312 ReadCetvData OUI: [0000903E] OK
01 011.312 ReadCetvData HardwareModel: [0203] OK
01 011.312 ReadCetvData HardwareVersion: [0100] OK
01 011.312 ConvertAscii2Bin started
01 011.312 ConvertAscii2Bin done
01 011.312 ConvertAscii2Bin started
01 011.312 ConvertAscii2Bin done
01 011.312 ReadCetvData PublicKey: OK
01 011.339 ReadCetvData done, ConfigOK: TRUE
00 011.666 cetvband_mpown: iambl_SetState onoff = 1
00 011.668 cetvband_mpown: iambl_SetState onoff => cetvambi_ambl_SetState
00 011.672 cetvband_mpown: cetvambi_ambilight_Enable
-1 011.884 HK_PREPARE_PS_DONE received for cmd: 5, src: 1
-1 011.884 Remaining PowerChangeBitmap: 0
-1 011.884 starting : /philips/apps/spettApp
-1 011.884 starting : /philips/apps/media
01 011.905 svspow_m.c:2871::PREPARE_PS_DONE for cmd: 5
01 011.994 cbmhgpow_mpown: mRegisterAlarm - ClockSet
02 012.518 *-----* FusionDale v0.1.1 (-----*)
02 012.518 (c) 2006-2007 directfb.org
02 012.518 -----
02 012.524 Using erlib version 0.9
02 012.524 ***SPETT*** FusionDale Init done
02 012.524 ***SPETT*** Windows created
00 012.530 ErLib 0.9 registered from process 226
00 012.530 *** DirectFB Surface allocation FALLBACK! Acquiring id 7 with size 376320
-1 012.533 AppMan: Process added (226) [4]!
-1 012.533 AppMan: Window added (0,0-800x600) [6] - 0!
-1 012.533 Border window attached
-1 012.533 AppMan: Window added (100,100-672x280) [7] - 2!
-1 012.533 AppMan: Window config - unhiding window
-1 012.533 AppMan: Switch focus to 0x51334000 [7]
02 012.581 Event class: DFEC_WINDOW
01 012.791 NITParser: Else of sec_SctArrived
01 012.791 cbmhgoad_m: strapi notification on completed
01 012.852 cbmhgoad_m: TARGETNIT = 0, TARGETNID = 513, spid = -1
01 012.854 cbmhgoad_m:BarkerOadPumpHandler : mPrefFreqDirFound = 0
01 012.857 cbmhgoad: noofrecords = 0
03 013.196 MediaApp: Initialized and running
03 013.312 (*) FusionDale/Config: Parsing config file /etc/fusiondale.rc.
03 013.312 *-----* FusionDale v0.1.1 (-----*)
03 013.312 (c) 2006-2007 directfb.org
03 013.312 -----
03 013.312 (*) Fusion/SHM: NOT using MADV_REMOVE (2.6.18.0 < 2.6.19.2)! [0x020 61200]
03 013.312 (*) Direct/Thread: Running 'Fusion Dispatch' (MESSAGING, 244)...
03 013.334 Using erlib version 0.9
03 013.334 MediaApp: Call back Init from gplib
00 013.338 ErLib 0.9 registered from process 227
03 013.482 arunkp: mplfbsav2_m.c: 209: mplfbsav2_pow_Init:
-1 013.583 AppMan: Process added (227) [5]!
03 013.619 MediaApp: Gfx Init done
03 013.891 mediaApp: fusiondale Init, register called
03 013.891 nlock patch initied
-1 013.895 AppMan: Window added (100,100-480x300) [8] - 0!
-1 013.895 Border window attached
-1 013.895 AppMan: Switch focus to 0x51334e00 [8]
-1 013.895 AppMan: Window added (100,100-480x300) [9] - 1!
-1 013.895 Audio node attached
-1 013.907 AppMan: Switch focus to 0x51334e00 [8]
03 013.955 Network enabled and available - enabling allegro
03 013.958 allegroenb_Enable
02 014.072 ***SPETT*** All inits done
02 014.075 ***SPETT*** gplib.start.Init done
01 014.105 ReadCetvData done, ConfigOK: TRUE
01 014.107 cbmhgoad_mswupdt: chil_test_oui_only OUI = 0xd060, ret = 0
01 014.375 CEAPPS: TARGETNIT = 0, TARGETNID = 8, spid = -1
03 014.555 The address is: 192.168.1.22
03 014.559 arunkp: mplfbsav2_m.c: 219: mplfbsav2_pow_TurnOn:
-1 014.957 AppMan: Window added (0,0-852x480) [10] - 2!
00 015.002 *** DirectFB Surface allocation FALLBACK! Acquiring id 0 with size 410880
03 015.005 Surface 0, PlaneId 2 in AttachSurface
00 015.027 (!!!) *** WARNING [color keying does not work on UPPER layer] *** [Philips/DirectFB/systems/cetvfb/primary.c:202 in get_color_minmax()]
03 015.224 Infrastructure Resource Gained by mediaApp
03 015.226 (resourcechanged && !ResourceOwned & FULL_STATE) : Setting mappstate_medialdle
-1 015.276 AppMan: Window config - unhiding window
00 015.671 ***GVC: T2 - ceisusb_m.c (951): "usbdevspN_OnDeviceError( DeviceUnknownAttachedError, -1 )" notification given

```

Figure 5-21 Example UART log during SWUPG startup (Normal startup) part 4.

```

03 015.788 Census Found device uuid: c7a4be7e-547d-11dc-8034-cc1538aee30
03 015.792 DeviceType: schemas-upnp-org:device:MediaServer:1
-1 016.098 AppMan: Window config - unhiding window
-1 016.098 Relayout of window 5
00 017.948 ***GVC: T2 - ceisusb_m.c (951): "usbdevspN_OnDeviceError( DeviceUnknownAttachedError, -1 )" notification given
00 018.154 ***GVC: T2 - ceisusb_m.c (951): "usbdevspN_OnDeviceError( DeviceUnknownAttachedError, -1 )" notification given
00 018.727 ***GVC: T2 - ceisusb_m.c (951): "usbdevspN_OnDeviceError( DeviceUnknownAttachedError, -1 )" notification given
00 024.079 --- pass 0 ---
00 024.082 freeMem : 26620
00 024.084 pgmajfault : 0
00 024.086 sectorsread: 11440
01 035.636 Merging eit data
01 035.650 Merging eit data
01 035.656 1419 records after eliminating duplicates
01 035.663 1419 records after eliminating duplicates

```

L_17662_004e.eps
110608

Figure 5-22 Example UART log during SWUPG startup (Normal startup) part 5.

- The “Application selection startup” part in the logs shows which application is being started up: backup SWUPG, normal SWUPG, TV application, ...
- In the TV application (Normal startup) case, there is no print on the UART which shows the software has started up completely. When startup issues arise, the best way to tackle them is by comparing the bad UART print with a correct print of the same release.

Upgrade of a TV set.

Following cannot be seen during industrial mode!

- When the Industrial Mode is enabled with command 203, no prints can be seen anymore on the UART. This is to not interfere with the P2P protocol.
- When in normal mode, the UART will show what the actions are during the upgrade.
- At certain periods in time during programming, the total size currently flashed (Totalsize flashed) and the size which should be finally flashed (TotalProgramSize) will be printed.

```

13:51:07 Tv520_Eu_0.61_prod <--- Upgrade now
13:51:11
13:51:11
13:51:11 Software is equal or older,
13:51:11 - press OK to stop
13:51:11 - press down + OK to continue
13:51:11
13:51:12 L: 13%
13:51:15 L: 94%
13:51:16 V: 1%
13:51:29 V: 98%
13:51:30 P: 0%
13:51:31 P: 0%
13:51:31 /data/rupg/* is being scanned for size
13:51:31 current flashsize: 7949008:
13:51:31 current flashsize: 8006889:
13:51:31 current flashsize: 8016293:
13:51:31 /data/rw/* is being scanned for size
13:51:31 current flashsize: 8016309:
13:51:31 /squash/* is being scanned for size
13:51:31 current flashsize: 15196597:
13:51:31 /bifs2/* is being scanned for size
13:51:31 current flashsize: 15208584:
13:51:31 current flashsize: 15208658:
13:51:31 current flashsize: 19590958:
13:51:31 current flashsize: 21687842:
13:51:31 current flashsize: 22703738:
13:51:31 current flashsize: 24080366:
13:51:31 m_JffsMounted = 3
13:51:31 Sync called
13:51:31 Sync DONE
13:51:31 CheckUnMount: /mnt/jffs0
13:51:31 /mnt/jffs0 is mounted
13:51:31 Unmount /mnt/jffs0
13:51:31 /mnt/jffs0 is not mounted
13:51:31 umounting /mnt/jffs0 ok
13:51:31 unmounting partition 4 from jffs2 file system passed
13:51:31
13:51:31 Sync called
13:51:31 Sync DONE
13:51:31 CheckUnMount: /mnt/jffs1
13:51:31 /mnt/jffs1 is mounted
13:51:31 Unmount /mnt/jffs1
13:51:31 /mnt/jffs1 is not mounted
13:51:31 umounting /mnt/jffs1 ok
13:51:31 unmounting partition 5 from jffs2 file system passed
13:51:31 FORMAT 2
13:51:31 Totalsize flashed: 0, TotalProgramSize: 24080366
13:51:31 m_JffsMounted = 0
13:51:31 P: 0%
13:51:32 P: 0%
13:51:32 P: 0%
13:51:33 P: 0%
13:51:33 Format successfull
13:51:33 Totalsize flashed: 0, TotalProgramSize: 24080366
13:51:33 m_JffsMounted = 0
13:51:33 P: 0%
13:51:33 FORMAT 3
13:51:33 Totalsize flashed: 0, TotalProgramSize: 24080366
13:51:33 m_JffsMounted = 0
13:51:33 spawning flash_eraseall
13:51:33 param: flash_eraseall
13:51:33 param: -q
13:51:33 param: /dev/mtd5
13:51:33 P: 0%
13:51:34 P: 0%
13:51:34 P: 0%
13:51:34 status: 1 ,erasing partimage partition successfull
13:51:34 Totalsize flashed: 0, TotalProgramSize: 24080366
13:51:34 m_JffsMounted = 0
13:51:34 P: 0%
13:51:34 /data/rupg/
13:51:34 Totalsize flashed: 0, TotalProgramSize: 24080366
13:51:34 m_JffsMounted = 0
13:51:34 JFFS found to write /data/rupg/ceapps
13:51:35 mounting partition 4 to jffs2 file system passed
13:51:35
13:51:35 Totalsize flashed: 0, TotalProgramSize: 24080366
13:51:58 m_JffsMounted = 1
13:51:58 Sync called
13:51:58 Sync DONE
13:51:58 CheckUnMount: /mnt/jffs0
13:51:58 /mnt/jffs0 is mounted
13:51:58 Unmount /mnt/jffs0
13:51:58 /mnt/jffs0 is not mounted
13:51:58 umounting /mnt/jffs0 ok
13:51:58 unmounting partition 4 from jffs2 file system passed
13:51:58
13:51:58 P: 31%
13:51:58 /data/rw/
13:51:58 Totalsize flashed: 8016293, TotalProgramSize: 24080366
13:51:58 m_JffsMounted = 0
13:51:58 JFFS found to write /data/rw/cehtv

```

> Format 2 (bifs2 partition) successfull

> Format 3 (Squash partition) successfull

> Writing to JFFS

> Writing to JFFS

Figure 5-23 Example UART log during normal user upgrade part 1.

```

13:51:58 P: 31%
13:51:59 P: 31%
13:51:59 mounting partition 5 to jffs2 file system passed
13:51:59
13:51:59 Totalsize flashed: 8016293, TotalProgramSize: 24080366
13:51:59 m_JffsMounted = 2
13:51:59 Sync called
13:51:59 Sync DONE
13:51:59 CheckUnMount: /mnt/jffs1
13:51:59 /mnt/jffs1 is mounted
13:51:59 Unmount /mnt/jffs1
13:51:59 /mnt/jffs1 is not mounted
13:51:59 umounting /mnt/jffs1 ok
13:51:59 umounting partition 5 from jffs2 file system passed
13:51:59
13:51:59 P: 31%
13:51:59 WRITE /squashFS/
13:51:59 Totalsize flashed: 8016309, TotalProgramSize: 24080366
13:51:59 m_JffsMounted = 0
13:51:59 v1 squash
13:51:59
13:51:59 Totalsize flashed: 8016309, TotalProgramSize: 24080366
13:51:59 spawning nandwrite
13:51:59 param: nandwrite
13:51:59 param: -z
13:51:59 param: 7180288
13:51:59 param: /dev/mtd5
13:51:59 param: /philips/pipe
13:51:59 execute nandwrite OK
13:51:59 Writing data to block 0
13:51:59 P: 31%
13:51:59 Writing data to block 4000
13:52:09 /philips/pipe could be closed
13:52:09 m_JffsMounted = 0
13:52:10 P: 63%
13:52:10 WRITE /biffs2/
13:52:10 Totalsize flashed: 15196597, TotalProgramSize: 24080366
13:52:10 m_JffsMounted = 0
13:52:10 Totalsize flashed: 15196597, TotalProgramSize: 24080366
13:52:32 Totalsize flashed: 24080366, TotalProgramSize: 24080366
13:52:32 Completed !!
13:52:32 Operation Successful! Remove all inserted media and restart the TV set.

```

_____ > Writing to Squash

_____ > Finished writing to Squash

_____ > Writing to biffs2

_____ > Programming succesfull

L_17662_005b.eps
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Figure 5-24 Example UART log during normal user upgrade part 2.

Problem analysis of a TV set.

During programming:

- The amount of Bad Blocks is bigger then promised by the flash manufacture. This is checked on virgin boards.
- Bad blocks have been created during programming and there is not enough good block anymore in the partition to write data into. This can happen on boards which are being reprogrammed.
- Mounting of the JFFS partitions take to long.
- When the flashutil UPG is being programmed on a boards which already contains a different Partition Table, the writing of the bootblock (µBTM and partitionTable) will fail. This can only happen on non virgin boards.
- When the power drops the programming will be stop. Depending on when the power drop is the result will be different.
 1. FUS UPG. The SWUPG will try to reprogram the UPG once the power is back.
 2. Flashutil UPG. Cannot recover anymore, because nothing is in flash anymore. Has to be reprogrammed on the line again.
 3. Upgrade All. Depending when the power drop happens. When it happens in the beginning, the board will only be reprogrammable on the line.
- If a development UPG is used on a production SWUPG or visa versa. Validation will fail.
- If loading fails (cannot read file error), it is mostly due to a long USB cable or a bad USB stick.
- If the UPG size is bigger then the memory allocated by the software upgrade application, then the UPG will not be programmed. See the prints fo the SWUPG at startup.

During startup:

- Compare the UART logging on the problem board/set with a normal startup behaviour. Identify till which point the logging reaches.
- If a crash happens, it will be outputted on the UART. In the background the information of the dump will be written into JFFS0. The UPG to copy the dump content out of flash should be available for everybody.

```

13:47:58 Debug dump 000000: Fatal error: time = N/A, millis = 127020, error = test reboot, SW version = Q581E
13:47:58 -0.61.0.0 Release
13:47:59 Unmounting jffs2 filesystems
13:47:59 Unmounting </mnt/j>Restarting system.
13:47:59 ffs1>
13:47:59 UnmountinBUG: scheduling with irq's disabled: hrv520eu/0x00000000/147
13:47:59 g </mnt/jffs0>
13:47:59 ehci_hcd 0000:00:0b.2: dma_pool_destroy ehci_qtd, a12b4000 busy
13:47:59 ehci_hcd 0000:00:0b.2: dma_pool_destroy ehci_qh, a188e000 busy
13:48:05
13:48:05
13:48:06 uBTM NDK R5.2b retail Feb 7 2007 11:56:37
13:48:06 Boot device - ST NAND512W3A
13:48:06 BootFFS initialization - OK
13:48:06 uBTM has been enabled with ECC
13:48:06 Searching BootLoader.tdf
13:48:06 File System ID is BFFS_ID
13:48:06 Loading /bfs0/BootLoader.tdf:Done
13:48:06
13:48:06 Starting /bfs0/BootLoader.tdf
13:48:06 JBL enabled with ECC check
13:48:06
13:48:06 Initialize I2C module

```

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Figure 5-25 Example UART log during problem.

Problem solution.

When programming fails:

- Check in the NVM at address 0x1D02 (BadBlocksAmount). This items is 2 bytes.
 1. If, after programming the flashutil UPG, this value is still the same as the one of the process NVM, then the amount of bad blocks was bigger then described by the flash manufacturer.
 2. If the value is filled in, it has to be checked if it's not to close the maximum amount possible.
 3. If the value is low, no problem.
- If mounting fails, it will be shown on the UART. This can only be seen when industrial mode is disabled.
- As the UART logs are disabled when in industrial mode, it is always good to have a set (or minimal setup) where the problem board can be tested in. In this way the problem can be reproduced in the normal mode of the SWUPG and the prints will be visible!

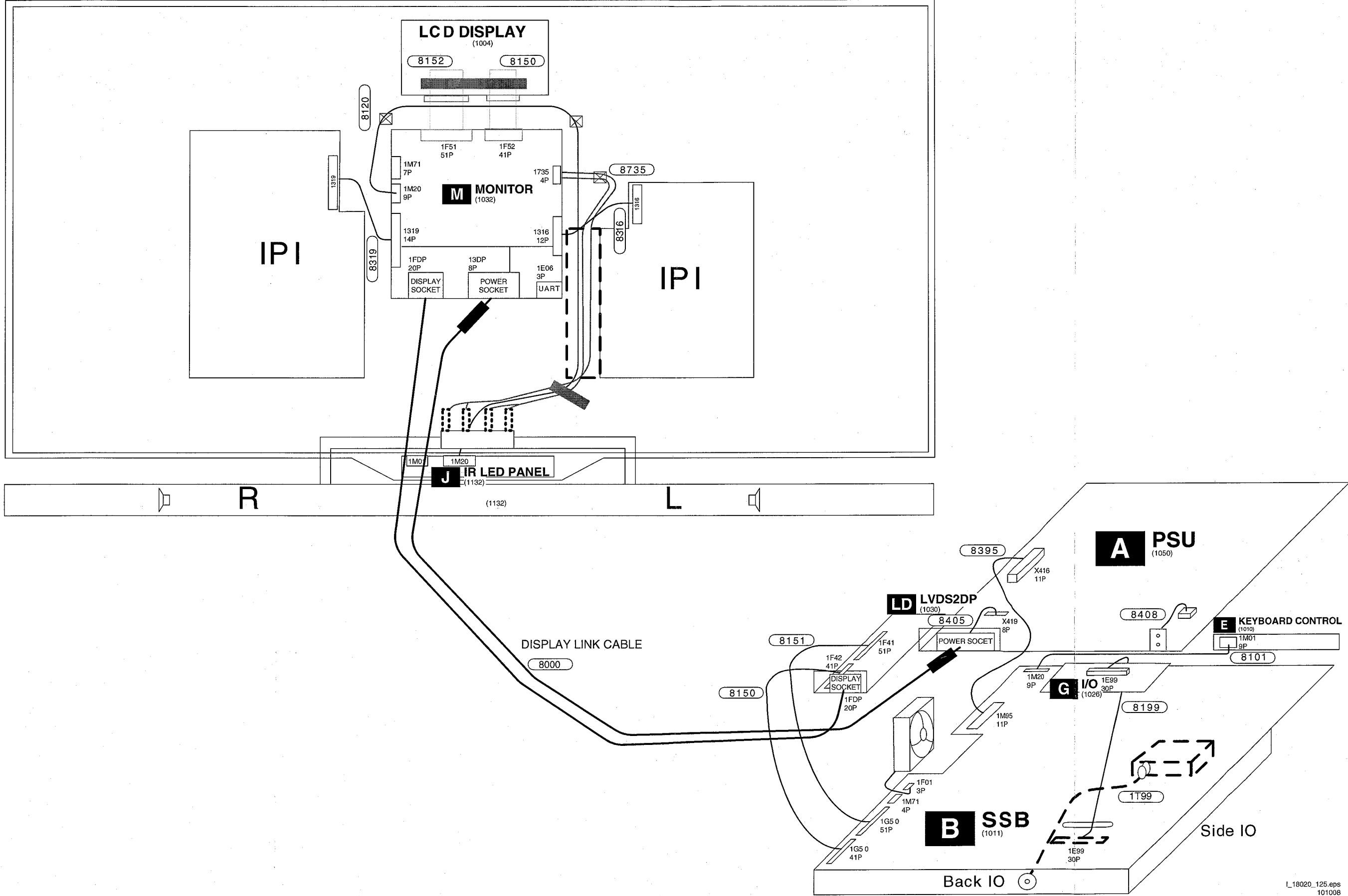
When startup fails:

- When a crash happens (only in the TV application!) and is followed by debug dump UART output, then a copy of the dump can put on a USB stick
 1. This can only be done in the TV application, so if the TV application keeps on crashing there is no way to copy the dump of the flash to a USB stick.
 2. When the TV application has started up completely, CSM can be entered by pressing 1, 2, 3, 6, 5, 4.
 3. Then put the remote in DVD mode and press 2, 6, 7, 9.
 4. The file Dump_seetypeplate_seetypeplate.bin can be found now on the USB storage device. The seetypeplate_seetypeplate will be filled in depending on the type of set.
 5. This .bin file can only be interpreted in a Philips development centre. Please give this input to your Philips Service contact person.
- Compare the UART logging on the problem board/set with a normal startup behaviour. Identify till which point the logging reaches.

Personal Notes:

6. Block Diagrams, Test Point Overview, and Waveforms

Wiring Diagram Essence
WIRING ESSENCE



The image is a technical drawing of a printed circuit board (PCB) layout, divided into four quadrants labeled Part 1, Part 2, Part 3, and Part 4. The drawing shows complex circuitry, including traces, pads, and component footprints. A coordinate grid is overlaid on the drawing, with columns numbered 1 through 8 and rows labeled A through G. The drawing is titled 'I_18020_061a.dwg' and 'I_18020_061b.dwg'.

Part 1
I_18020_061a.eps

Part 2
I_18020_061b.eps

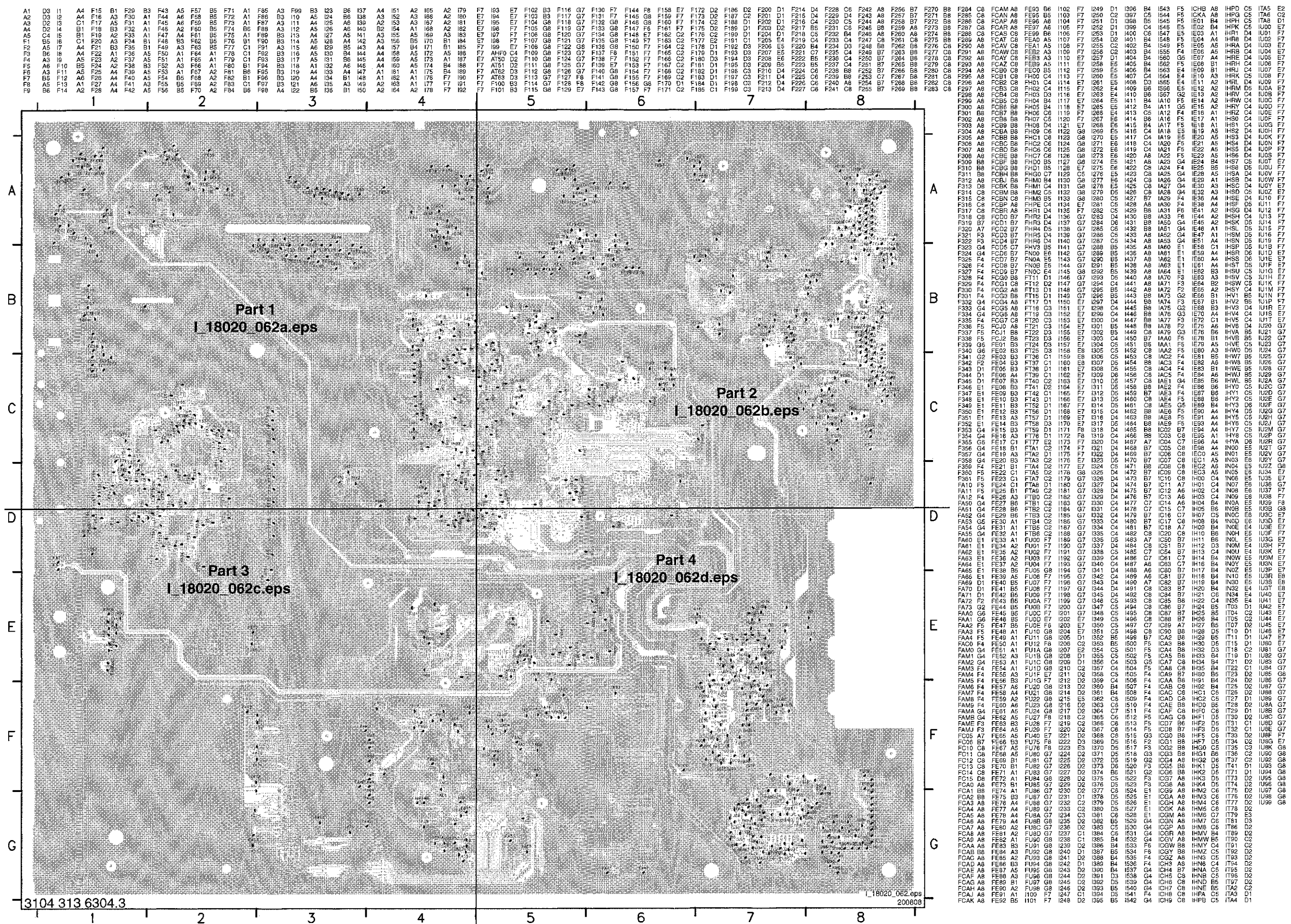
Part 3
I_18020_061c.eps

Part 4
I_18020_061d.eps

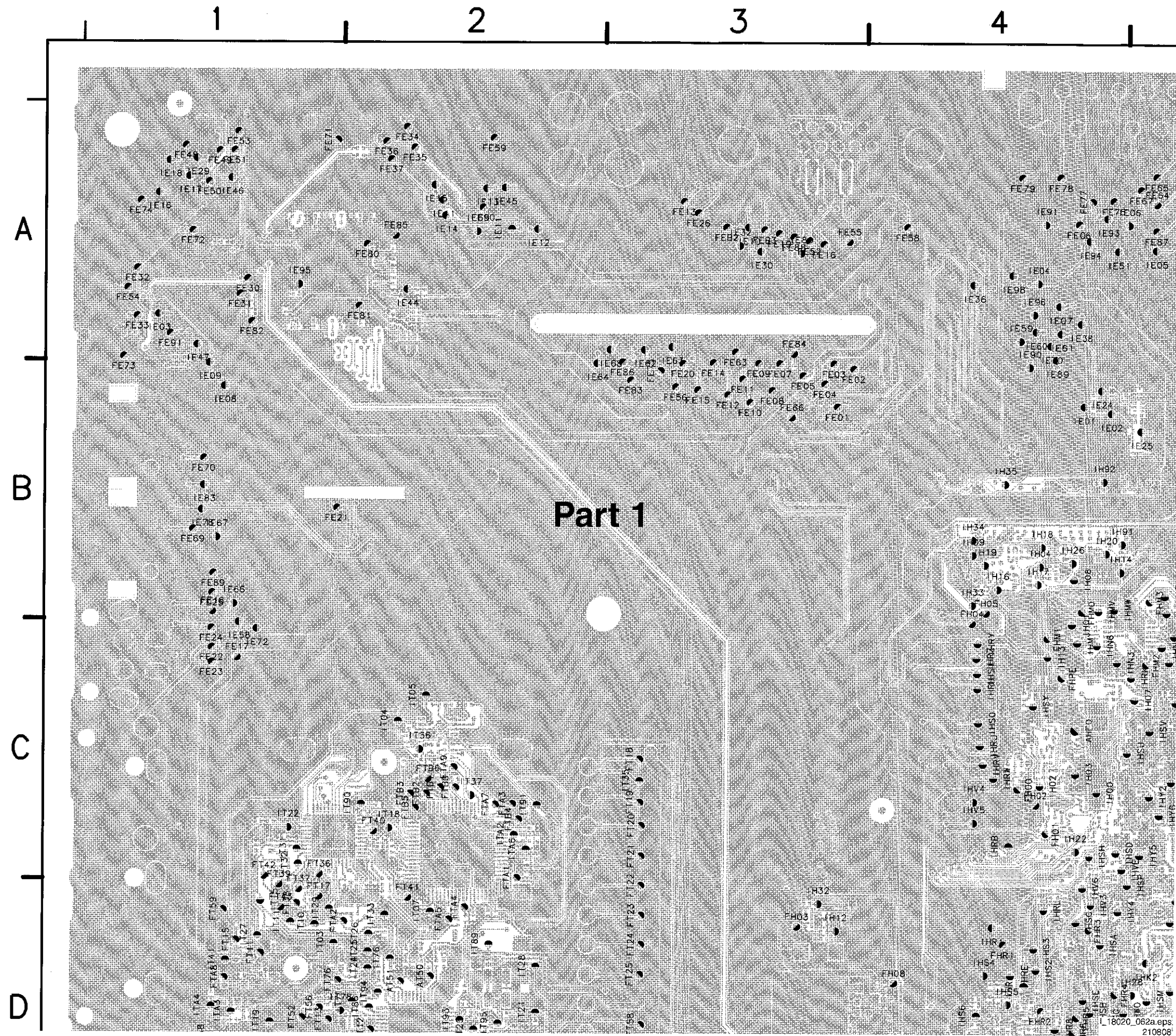
3104 313 6304.3

I_18020_061.eps
200808

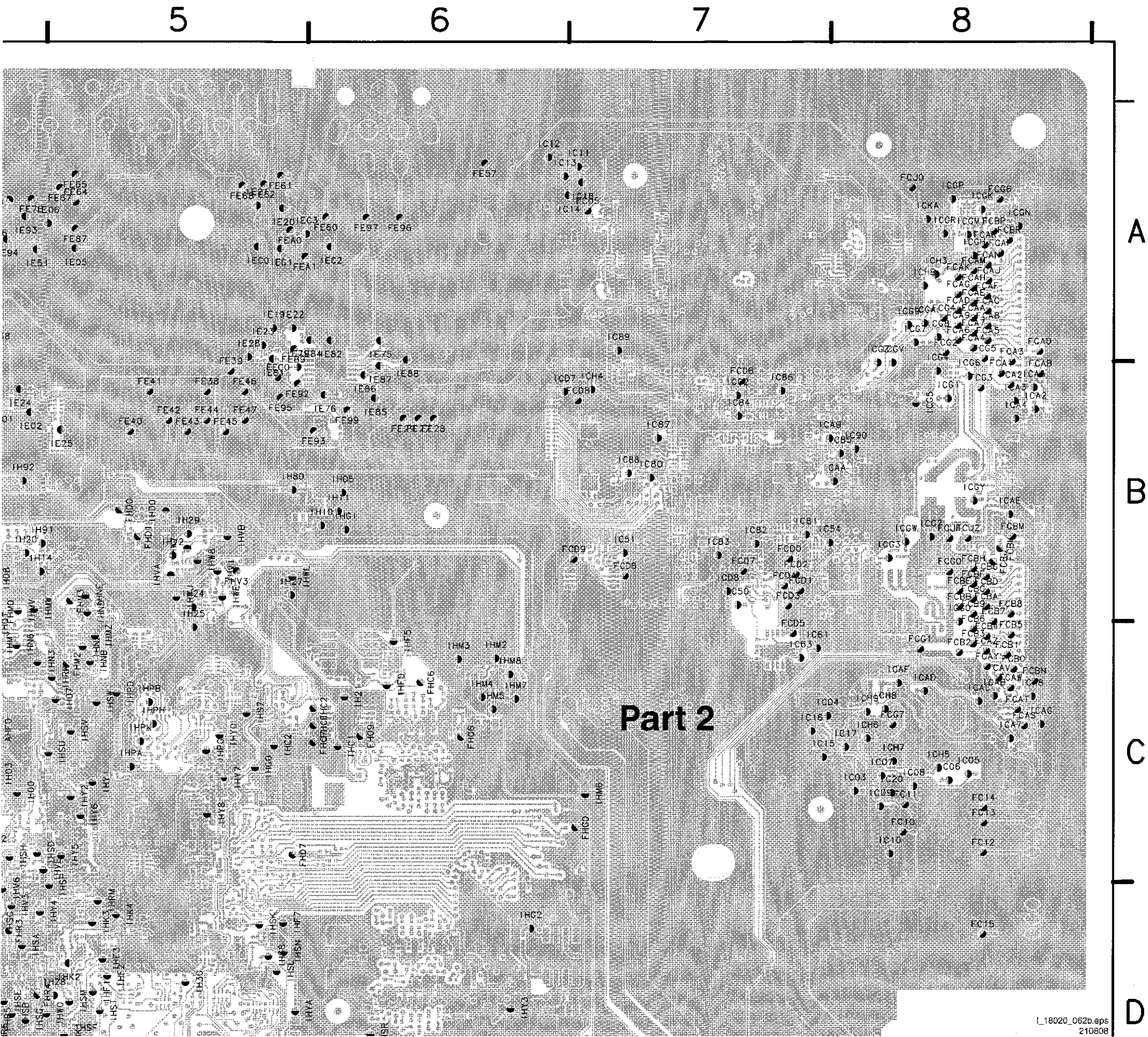
SSB: Test Points (Overview Bottom Side)



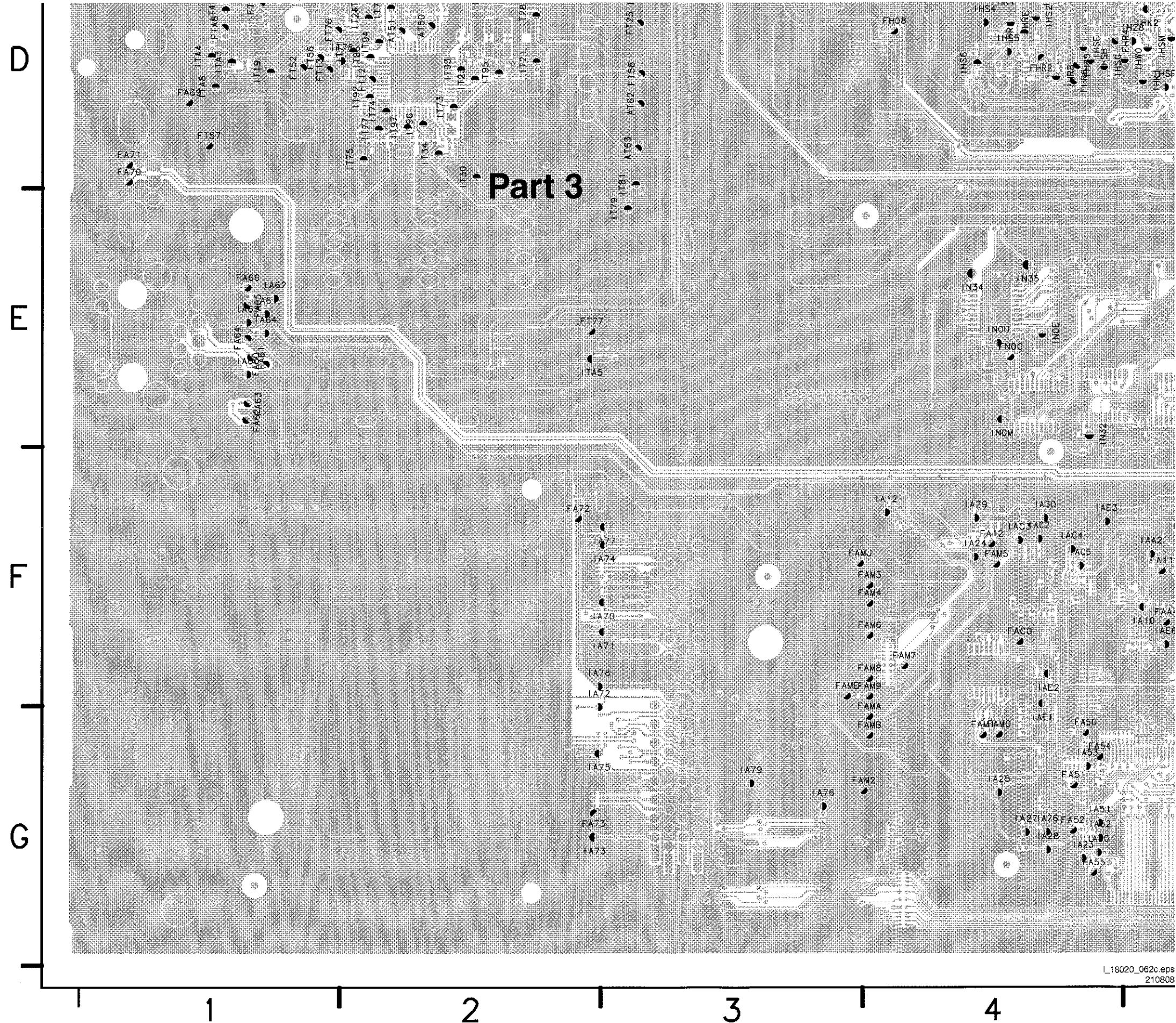
SSB: Test Points (Part 1 Bottom Side)



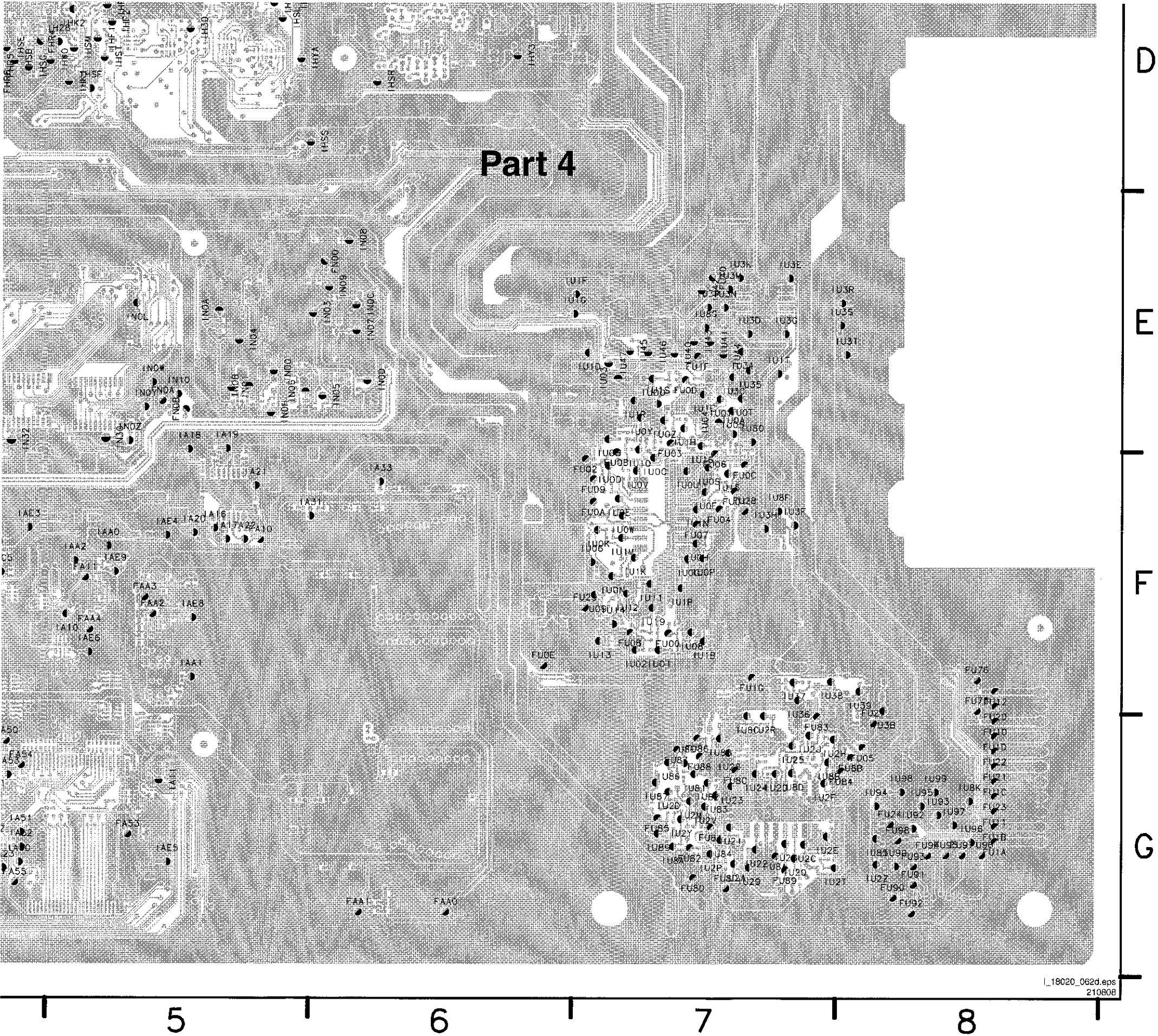
SSB: Test Points (Part 2 Bottom Side)

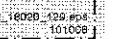


SSB: Test Points (Part 3 Bottom Side)



SSB: Test Points (Part 4 Bottom Side)

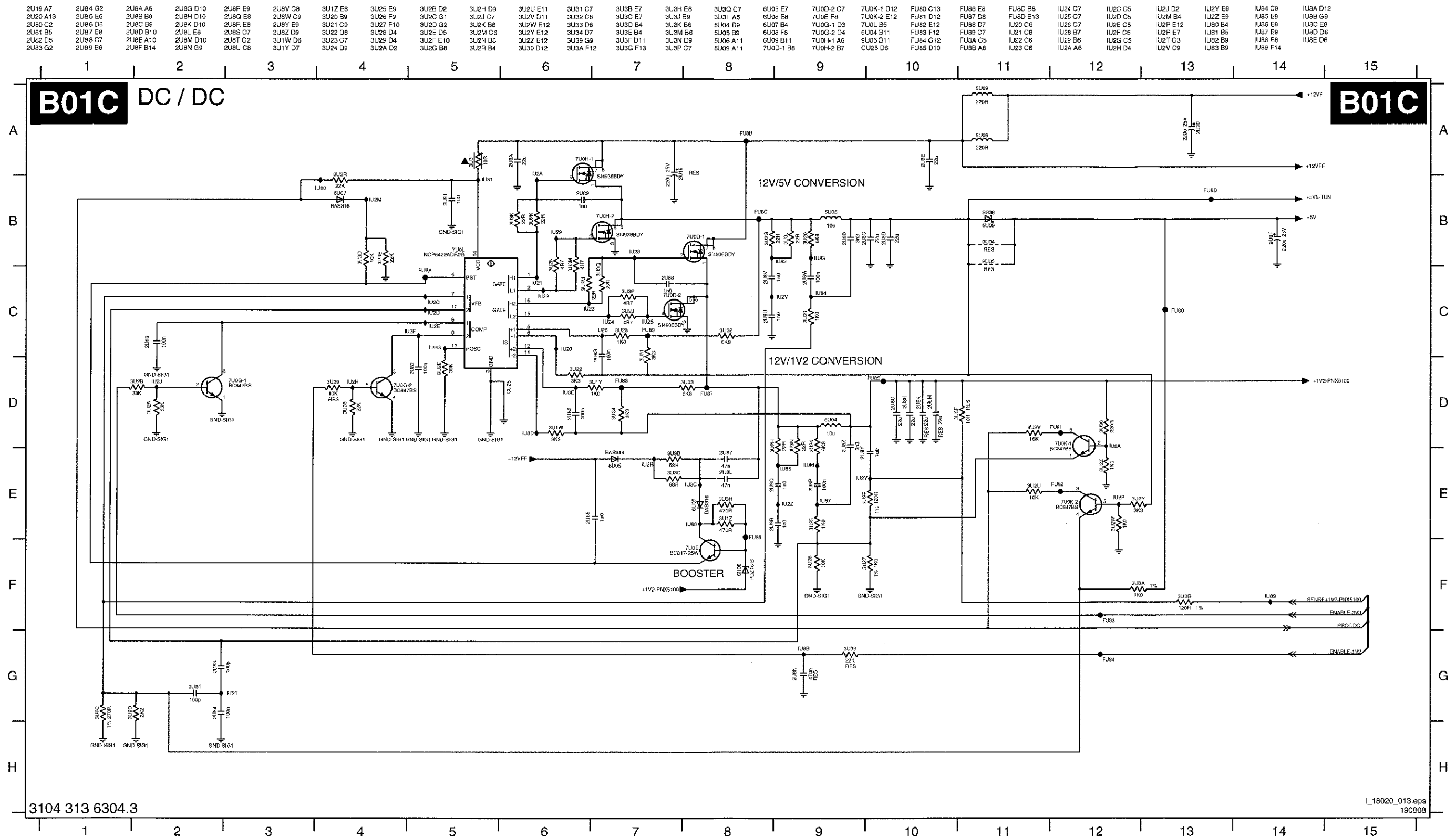


¹²C

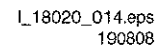
SUPPLY LINES OVERVIEW



SSB: DC / DC

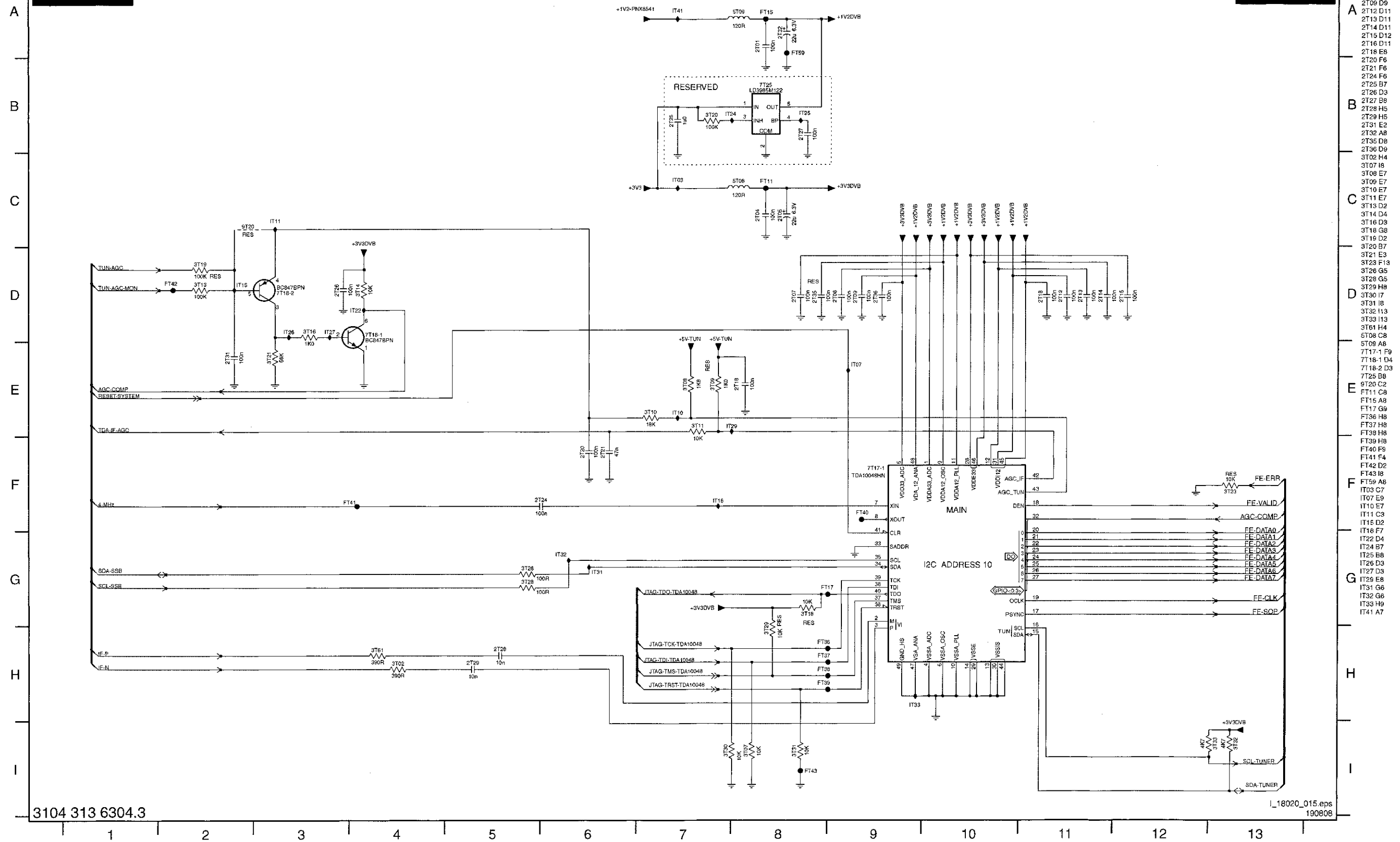


1M20 B4	2U93 B2	3U90 A2	3U94 B1	3U98 E2	7U91 D2	FU90 A3	FU94 B3	FU98 B2	IU94 C1	IU98 C1
2U90 A2	2U94 C2	3U91 B2	3U95 B2	3U99 C1	9U90 B2	FU91 B3	FU95 B3	IU90 A2	IU95 D1	IU99 D1
2U91 A2	2U95 E2	3U92 B2	3U96 D1	5U90 E1	9U91 C1	FU92 B3	FU96 C4	IU92 B2	IU96 E2	
2U92 B2	3U4B D1	3U93 B1	3U97 D1	7U90 C2	9U92 D1	FU93 B3	FU97 E3	IU93 B2	IU97 E1	



This image shows a full page of a document template. It consists of a series of evenly spaced, thin horizontal black lines across a white background, typical of lined paper used for writing or drawing. The lines extend from the left margin to the right edge of the page.

SSB: Channel Decoder

B02A CHANNEL DECODER**B02A**

3104 313 6304.3

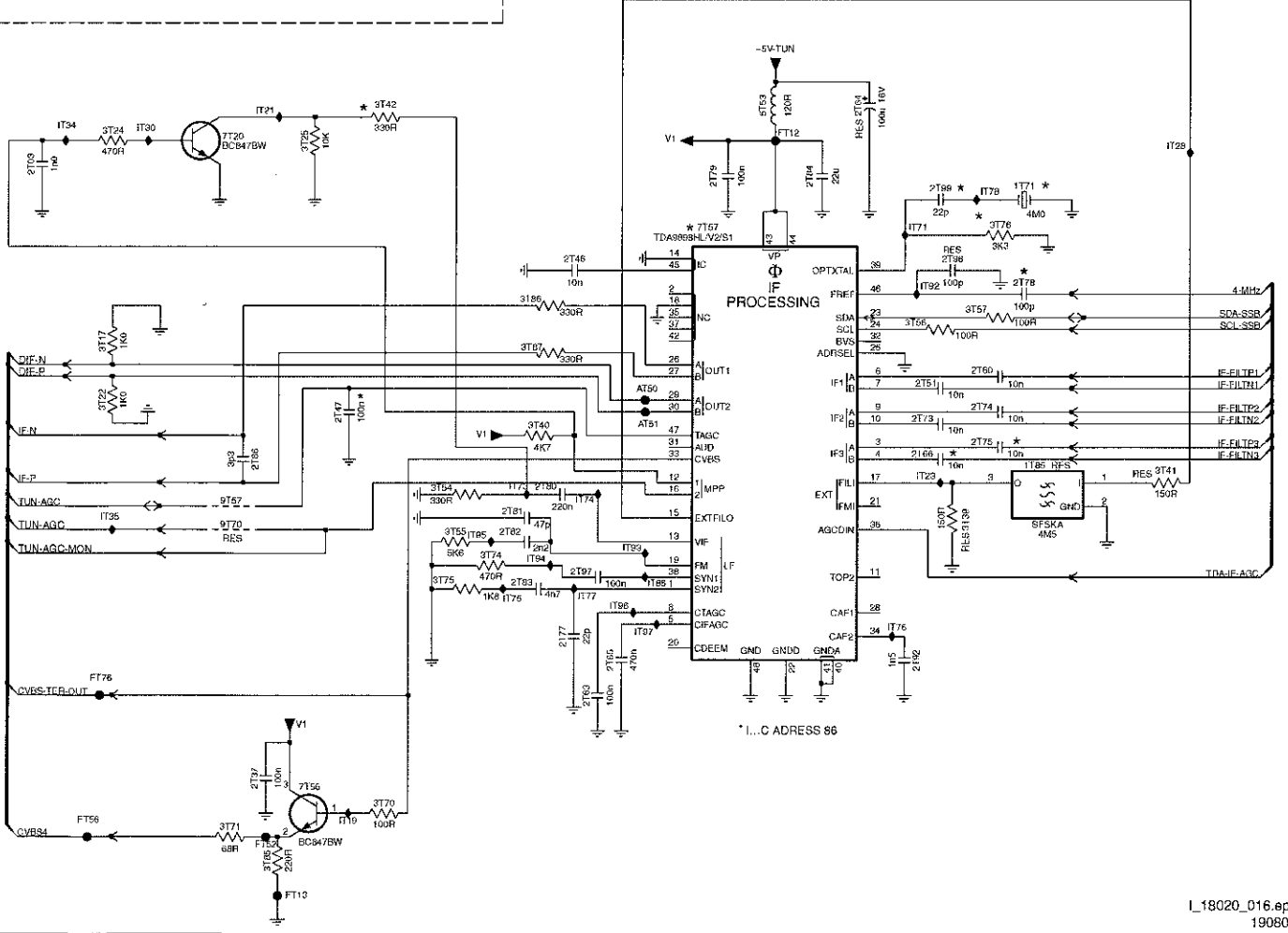
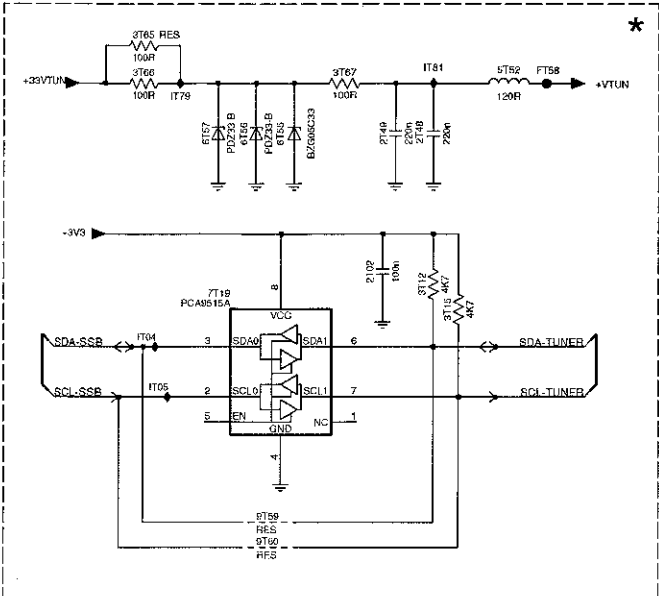
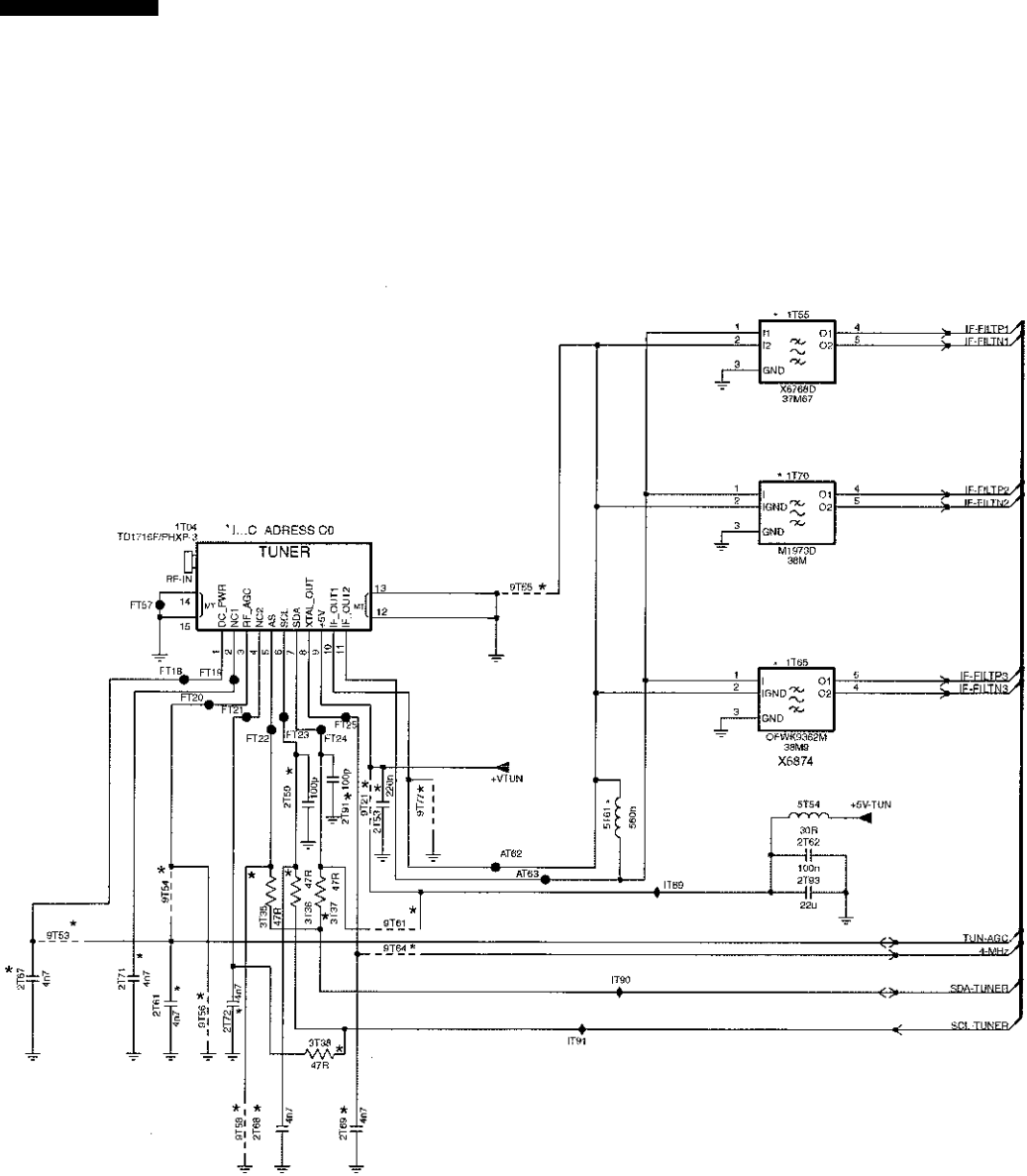
I_18020_015.eps
190808

SSB: Main Tuner

1T04 D2 1T70 D5 2T37 J9 2T51 F13 2T62 F5 2T67 F1 2T73 G13 2T79 E12 2T84 E13 2T96 F13 3T17 F8 3T36 F2 3T41 G15 3T57 F14 3T71 I9 3T86 F11 5T61 E4 7T20 E9 9T54 F2 9T59 D8 9T77 E3 FT12 E12 FT21 E2 FT52 I9 IT04 C8 IT28 E15 IT73 G11 IT78 E14 IT90 F4 IT95 G11
1T06 A2 1T71 E14 2T46 F11 2T53 E3 2T83 H11 2T88 G2 2T74 F14 2T80 G11 2T86 G9 2T97 G11 3T22 F8 3T37 F3 3T42 E10 3T65 A8 3T74 G11 3T87 F11 5T55 A9 7T56 I10 9T55 D4 9T60 D8 AT50 F12 FT13 I9 FT22 E2 FT56 J8 IT05 C8 IT30 E9 IT74 G11 IT79 A8 IT91 G4 IT96 H11
1T08 C2 1T85 G14 2T47 F10 2T56 E2 2T84 E13 2T69 G3 2T75 G14 2T81 G11 2T91 E3 2T99 E13 3T24 E8 3T38 G2 3T54 G10 3T66 A8 3T75 H10 5T52 A10 6T56 A8 7T57 E12 9T56 G2 9T61 F3 AT51 G12 FT18 E2 FT23 E2 FT57 D2 IT06 C8 IT34 E8 IT75 H11 IT81 A9 IT92 F13 IT97 H12
1T55 C5 2T02 B9 2T48 A9 2T60 F14 2T65 H11 2T71 F1 2T77 H11 2T82 G11 2T92 H13 3T12 B9 3T25 E10 3T39 G14 3T55 G10 3T67 A9 3T76 E14 5T53 E12 6T57 A8 9T21 E3 9T57 G9 9T64 F4 AT62 F4 FT19 E2 FT24 E3 FT58 A10 IT21 E9 IT35 G8 IT76 H12 IT86 H12 IT93 G11
1T65 E5 2T03 E8 2T49 A9 2T61 G2 2T72 G2 2T78 F14 2T83 H11 2T93 F5 3T15 B10 3T35 F2 3T40 G11 3T56 F13 3T70 I10 3T85 I9 5T54 E5 7T19 B8 9T24 F1 9T58 G2 9T70 G9 9T76 H6 FT25 E3 FT76 H6 IT23 G13 IT71 E13 IT77 H11 IT89 F5 IT94 G11

B02B MAIN TUNER

B02B



	EUR	AP/CH
1T04	TD1718	TD1716
1T06		
1T75	X3451 K (ana + dig ter.)	
1T55		X6768 (video not M)
1T70		M1973D (video + audio M)
1T65	X6874 (dig cable)	K9362M (audio not M)
7T57	TDA9898	TDA9897

3104 313 6304.3

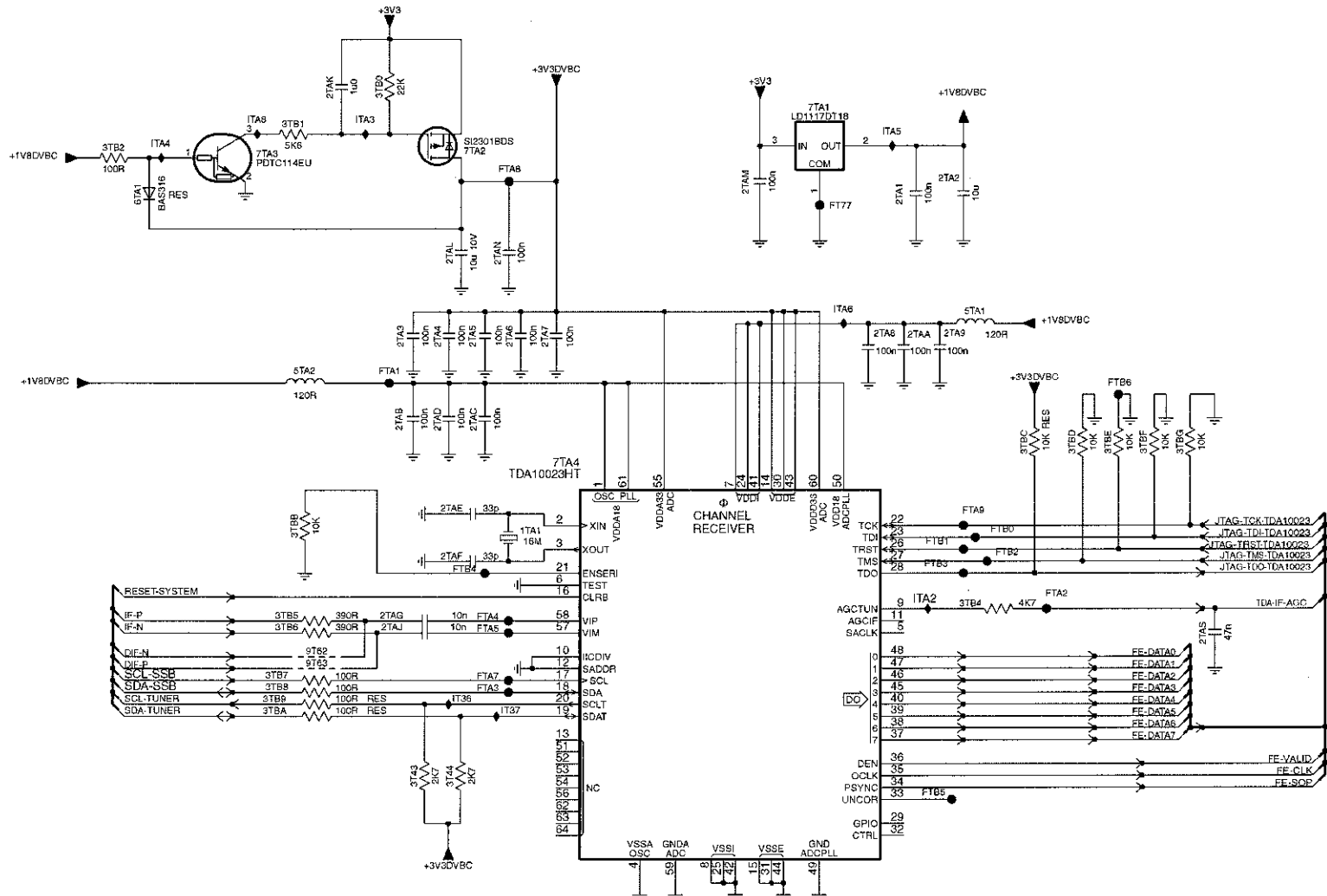
L_18020_016.eps
190808

SSB: Channel Decoder DVB-C

B02C

CHANNEL DECODER DVB-C

B02C

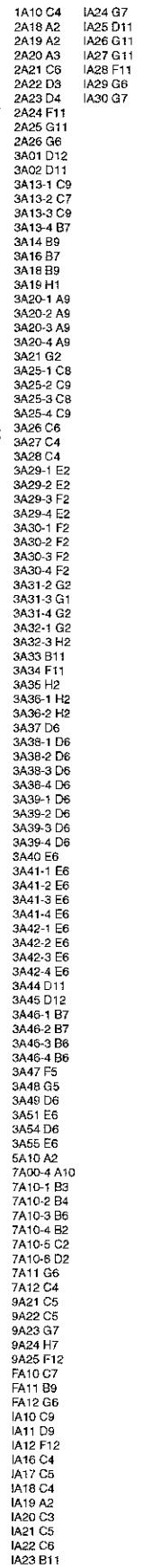


- 1TA1 E6
- 2TA1 C8
- 2TA2 D5
- 2TA3 D6
- 2TA4 D6
- 2TA5 D6
- 2TA6 D6
- 2TA7 D6
- 2TA8 D8
- 2TA9 D9
- 2TA0 D8
- 2TAB D5
- 2TAC D6
- 2TAD D6
- 2TAE E6
- 2TAF E6
- 2TAG F5
- 2TAJ F5
- 2TAK B5
- 2TAL C6
- 2TAM C7
- 2TAN C6
- 2TAS F10
- 3TA3 F5
- 3TA4 F6
- 3TB0 B5
- 3TB1 C5
- 3TB2 C4
- 3TB4 E9
- 3TB5 F5
- 3TB6 F5
- 3TB7 F5
- 3TB8 F5
- 3TB9 F5
- 3TBA F5
- 3TBB E5
- 3TBC D9
- 3TBD D9
- 3TBE D10
- 3TBF D10
- 3TBG D10
- 5TA1 D9
- 5TA2 D5
- 6TA1 C4
- 7TA1 B8
- 7TA2 C6
- 7TA3 C4
- 7TA4 E6
- 9TB2 F5
- 9TB3 F5
- FT77 C8
- FTA1 D5
- FTA2 E9
- FTA3 F6
- FTA4 F6
- FTA5 F6
- FTA7 F6
- FTA8 C6
- FTA9 E9
- FTB0 E9
- FTB1 E9
- FTB2 E9
- FTB3 E9
- FTB4 E6
- FTB5 G9
- FTB6 D10
- IT36 F6
- IT37 F6
- ITA2 E8
- ITA3 C5
- ITA4 C4
- ITA5 C8
- ITA6 D8
- ITA8 C5

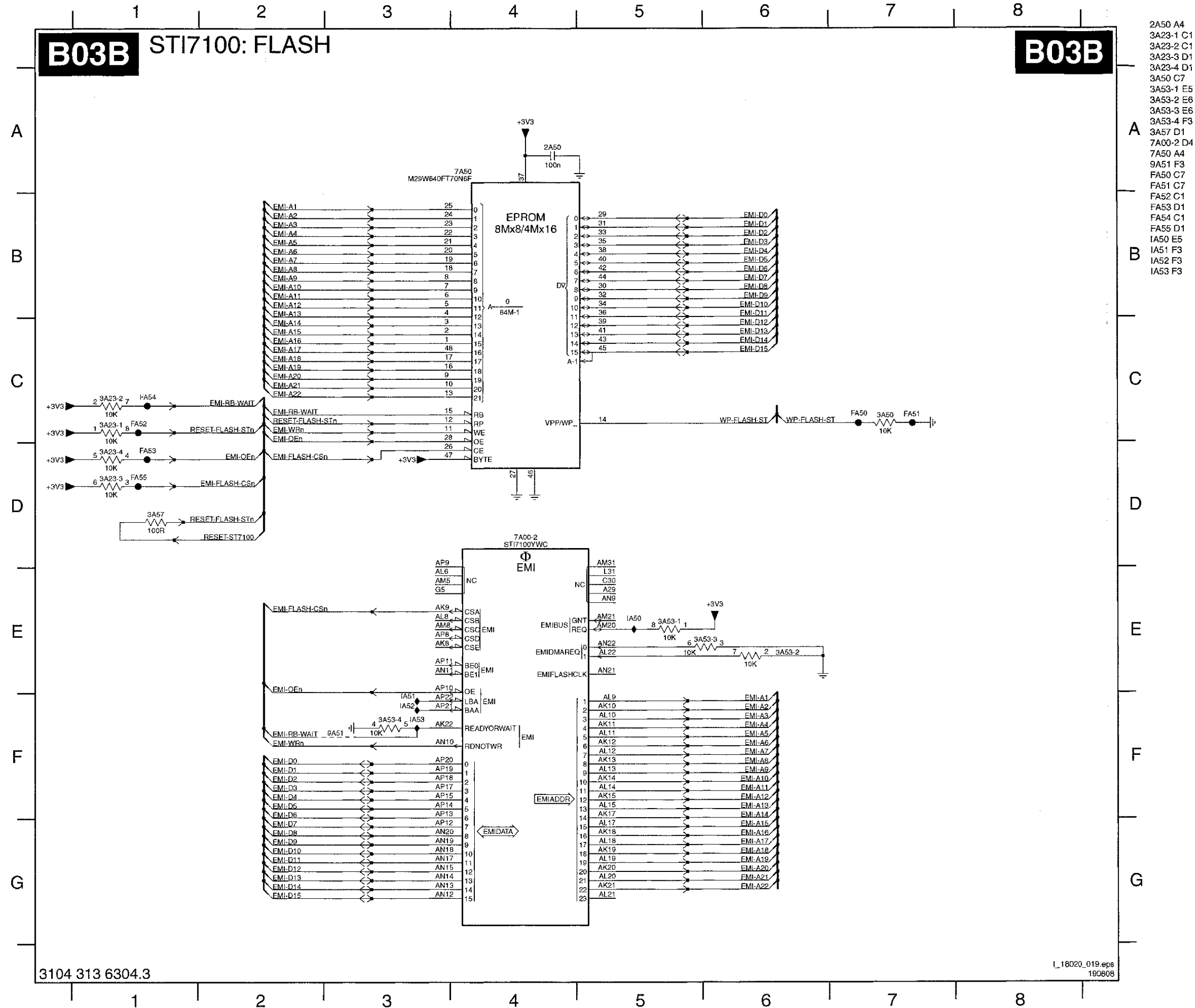
3104 313 6304.3

L_18020_017.eps
190808

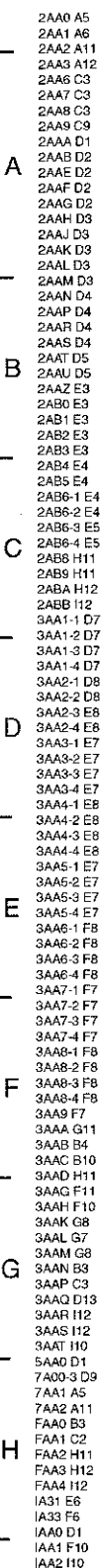
B03A



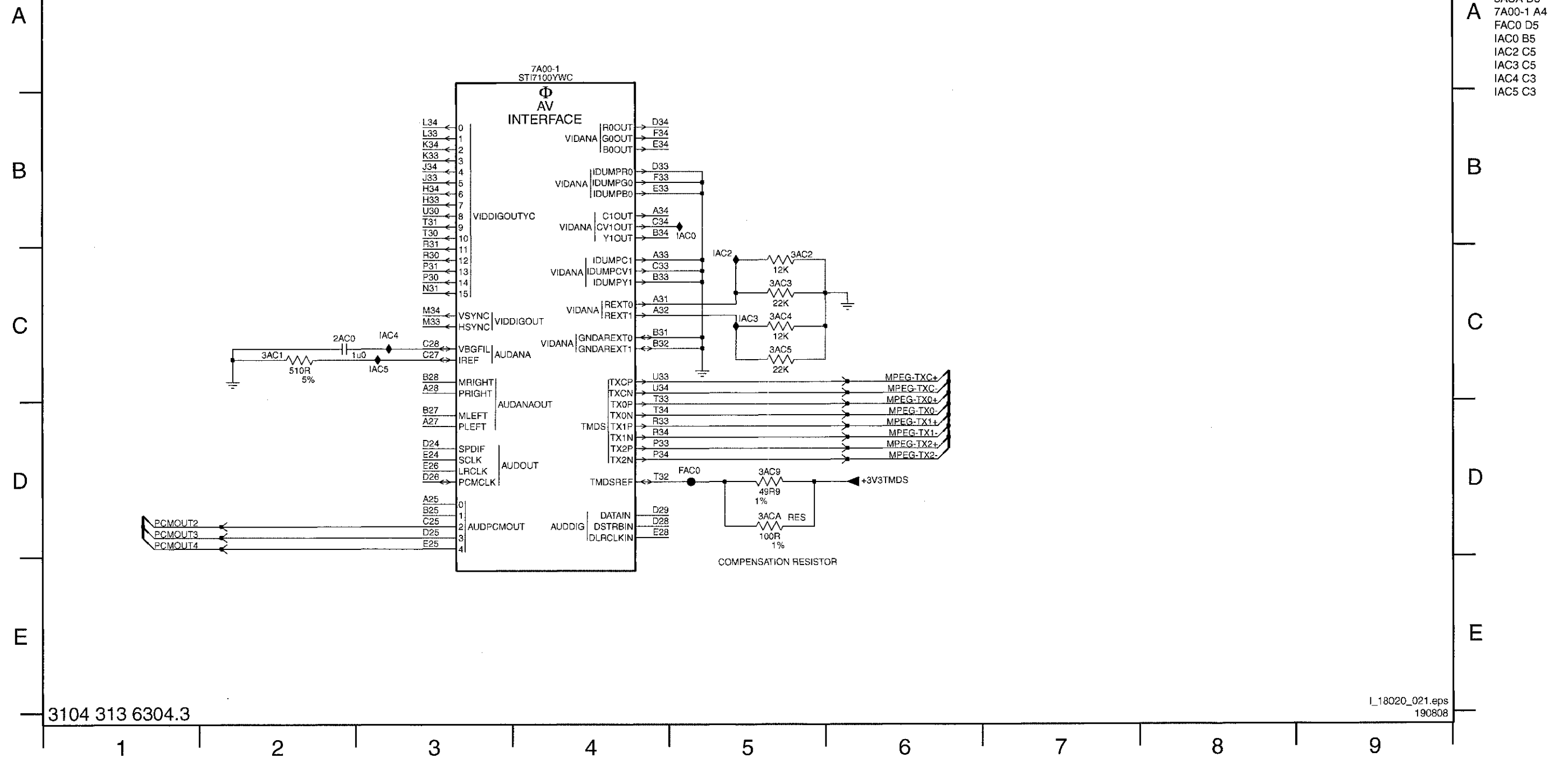
SSB: STI7100: Flash



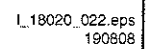
B03C STI7100: SDRAM



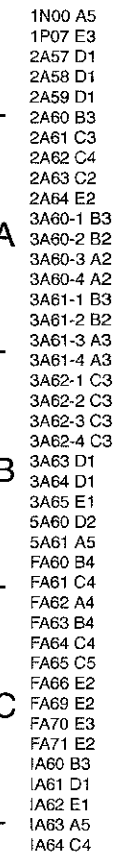
B03D STI7100: AV-INTERFACE



B03E STI7100: POWER



B03F USB + ETHERNET CONNECTOR

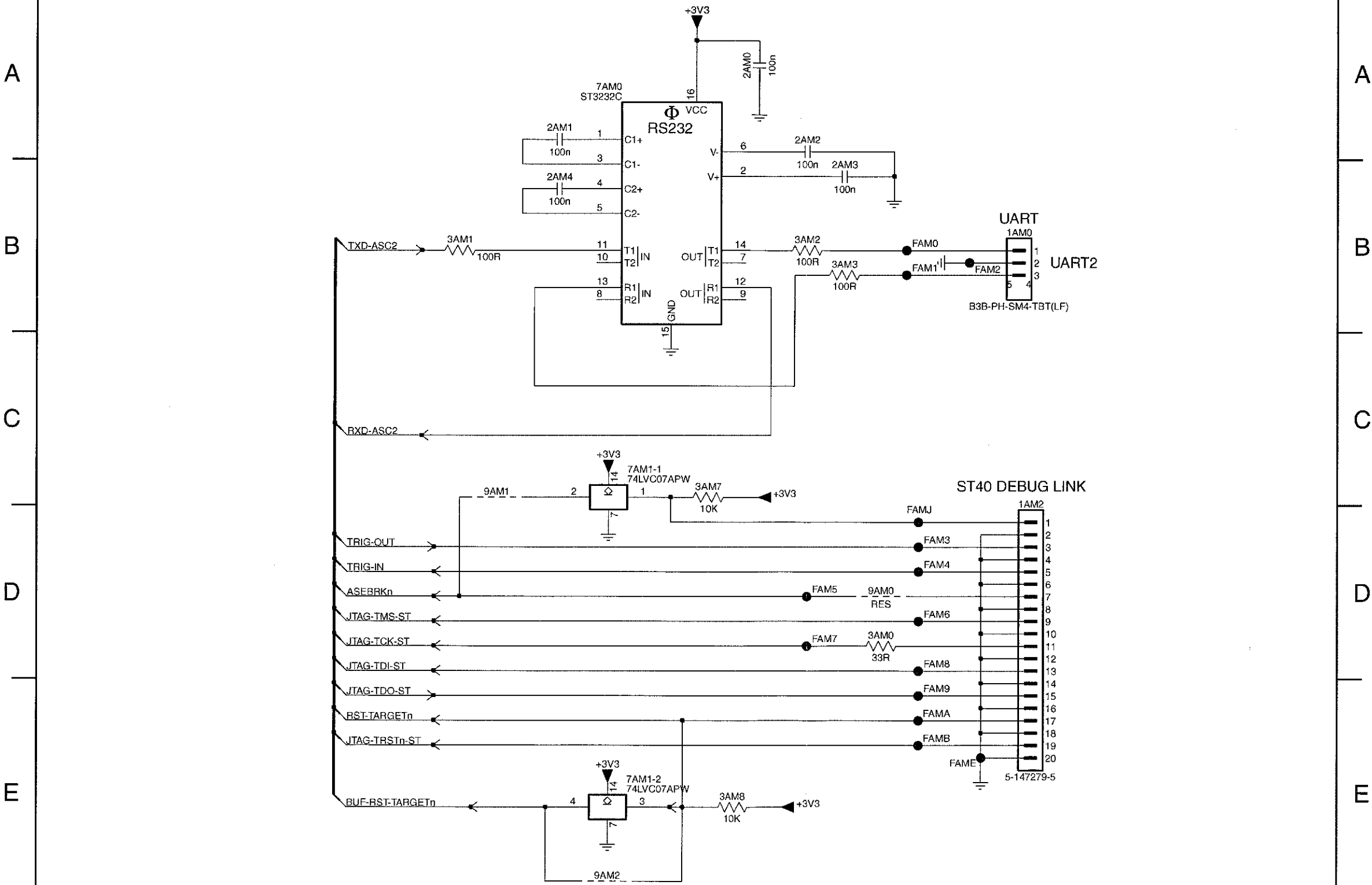


SSB: STI7100: Debug

B03G STI7100: DEBUG

B03G

- 1AM0 B6
- 1AM2 D6
- 2AM0 A4
- 2AM1 A3
- 2AM2 A5
- 2AM3 B5
- 2AM4 B3
- 3AM0 D5
- 3AM1 B3
- 3AM2 B5
- 3AM3 B5
- 3AM7 C4
- 3AM8 E4
- 7AM0 A4
- 7AM1-1 C4
- 7AM1-2 E4
- 9AM0 D5
- 9AM1 C3
- 9AM2 E4
- FAM0 B5
- FAM1 B5
- FAM2 B6
- FAM3 D5
- FAM4 D5
- FAM5 D5
- FAM6 D5
- FAM7 D5
- FAM8 D5
- FAM9 E5
- FAMA E5
- FAMB E5
- FAME E6
- FAMJ D5

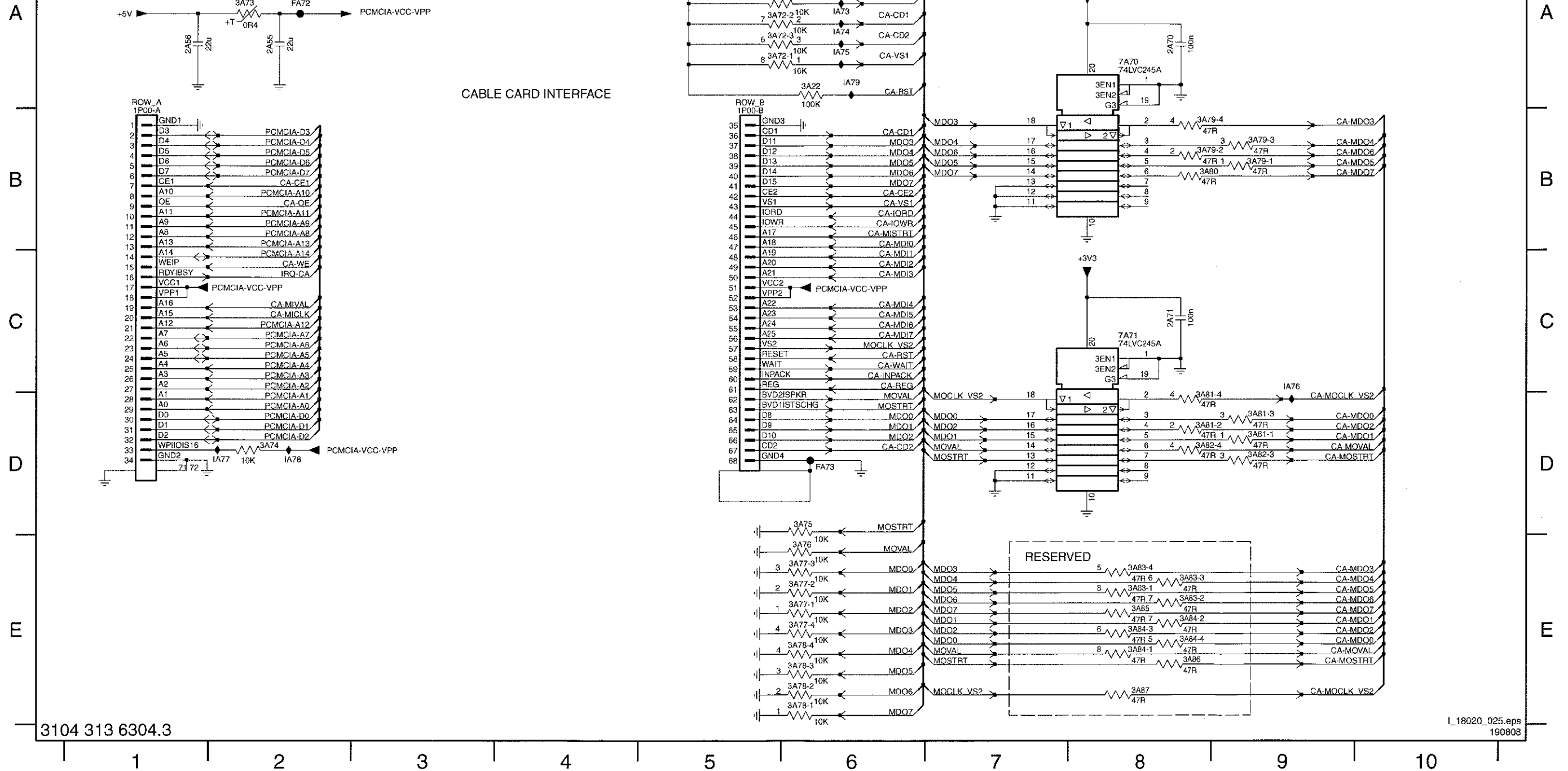


3104 313 6304.3

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SSB: CI: PCMCIA Connector

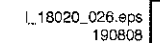
1P00-A B1	2A56 A1	3A22 A6	3A70-4 A5	3A72-2 A5	3A74 D2	3A77-1 E6	3A77-4 E6	3A78-3 E6	3A79-2 B8	3A80 B8	3A81-3 D9	3A82-4 D8	3A83-3 E8	3A84-2 E8	3A85 E8	7A70 A8	7A73 D6	IA72 A6	IA75 A6	IA78 D2
1P00-B B5	2A70 A8	3A70-1 A5	3A71 A5	3A72-3 A5	3A75 D6	3A77-2 E6	3A78-1 E6	3A78-4 E6	3A79-3 B9	3A81-1 D9	3A81-2 D8	3A82-3 D9	3A83-1 E8	3A84-3 E8	3A86 E8	7A71 C8	7A70 A6	IA73 A6	IA76 C9	IA79 A6
2A55 A2	2A71 C8	3A70-2 A5	3A72-1 A5	3A73 A2	3A76 E6	3A77-3 E6	3A78-2 E6	3A79-1 B9	3A79-4 B8	3A81-2 D8	3A82-3 D9	3A83-2 E8	3A84-1 E8	3A84-4 E8	3A87 E8	7A72 A2	7A71 A6	IA74 A6	IA77 D2	

B03H CI: PCMCIA CONNECTOR**B03H**

3104 313 6304.3

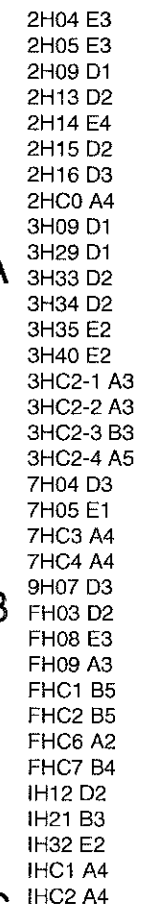
L_18020_025.eps
190808

B04A PNX 8541: STANDBY CONTROLLER



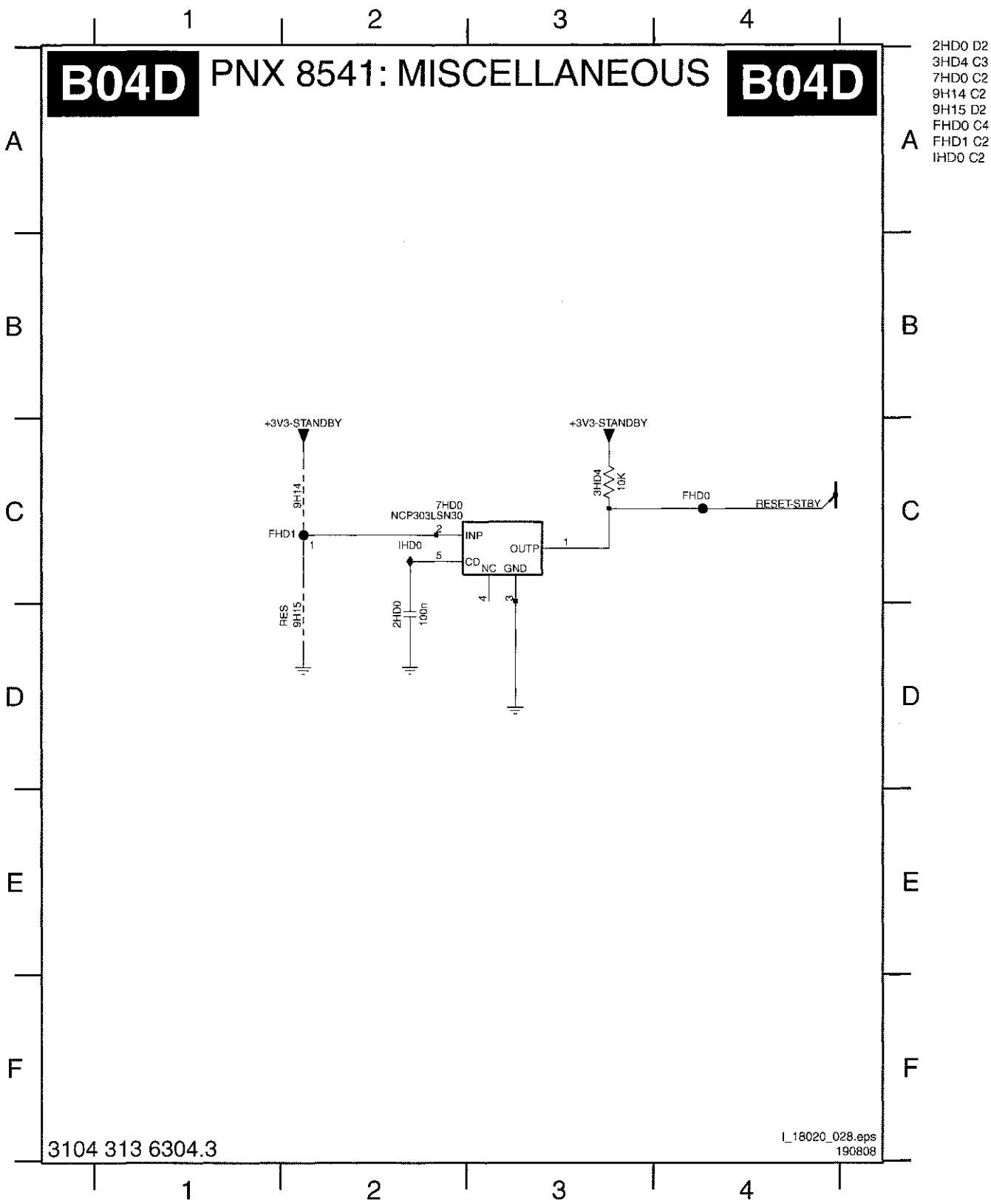
B04C PNX 8541: NVM

B04C



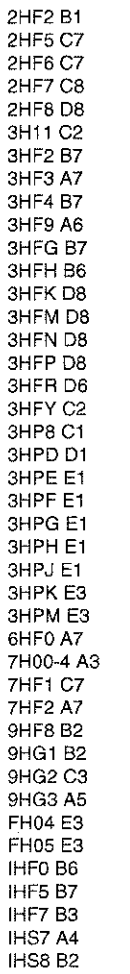
I_18020_027.eps
190808

SSB: PNX8541: Misc.



Personal Notes:

B04E PNX8541: CONTROL



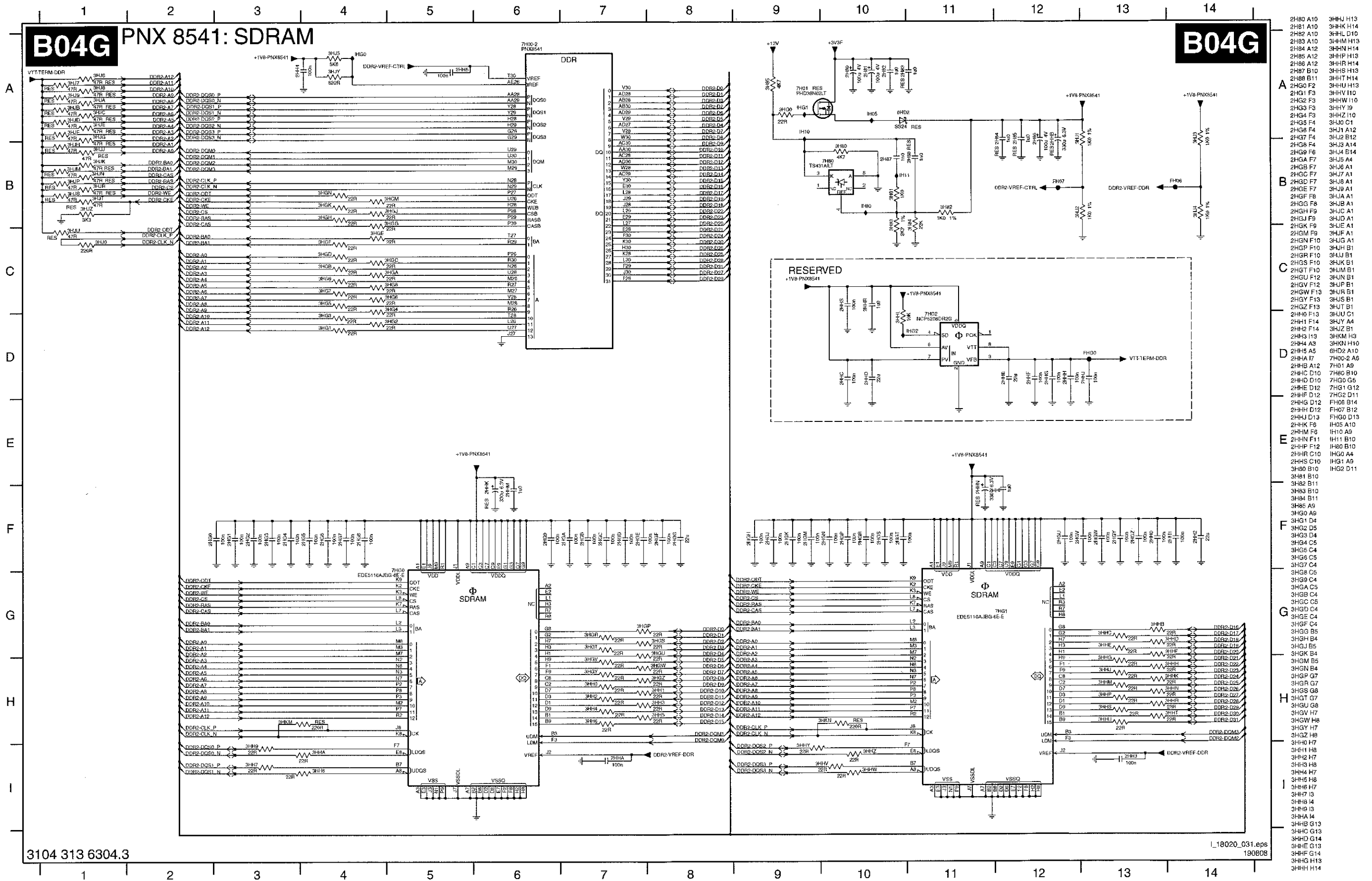
B04F PNX 8541: CONTROL

B04F

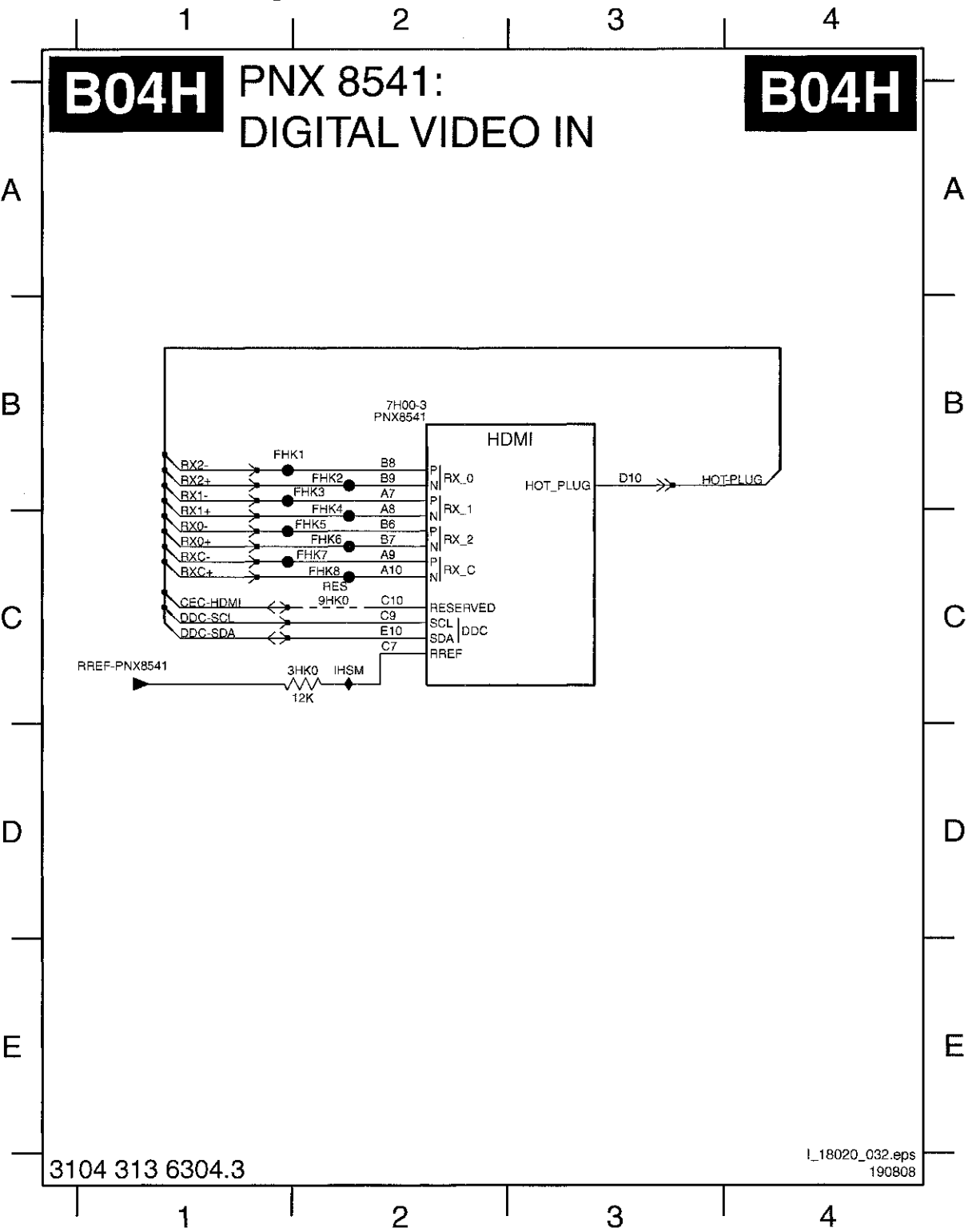


I_18020_030.eps
190808

SSB: PNX8541: SDRAM



SSB: PN8541: Digital Video In

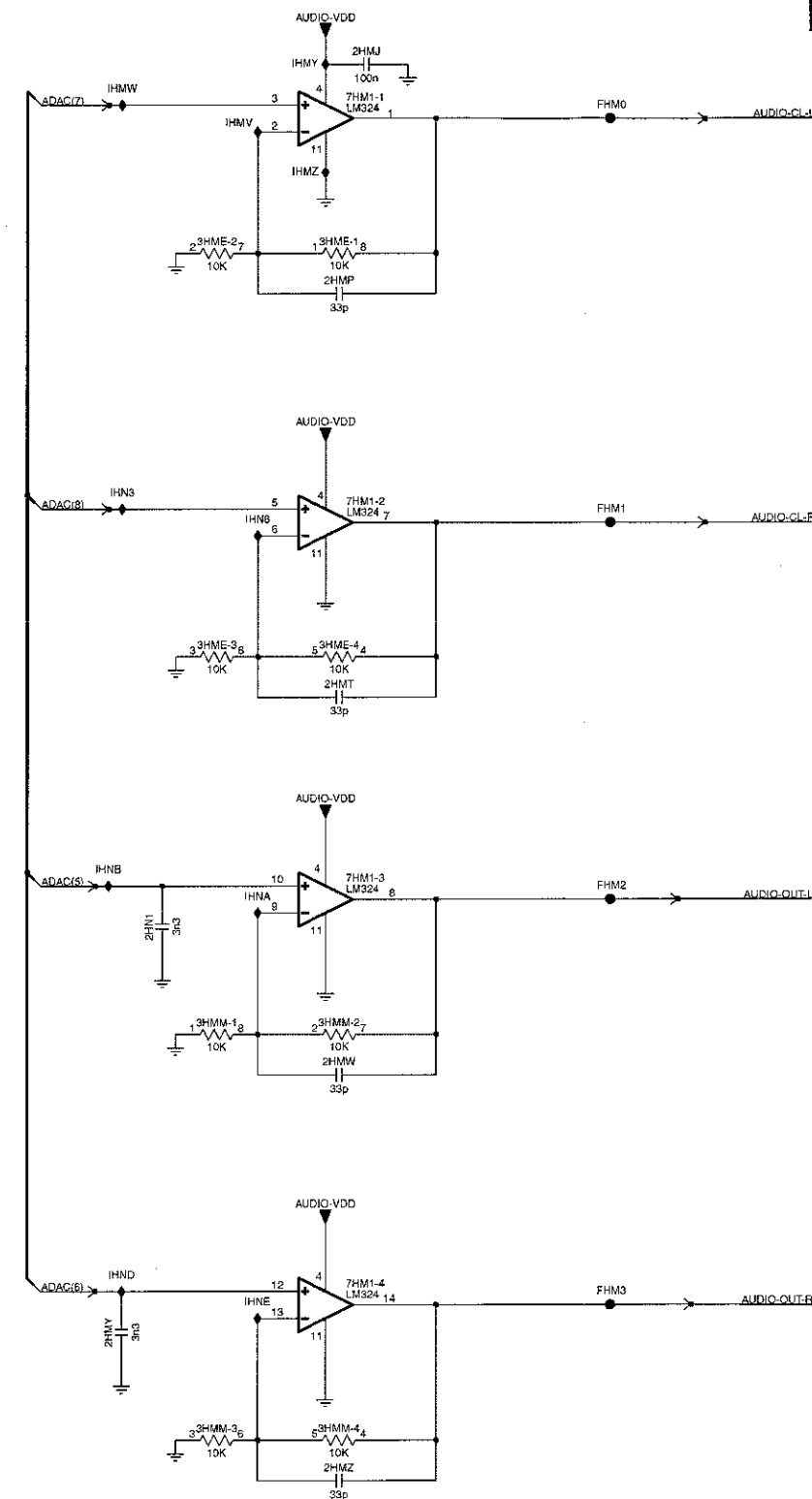
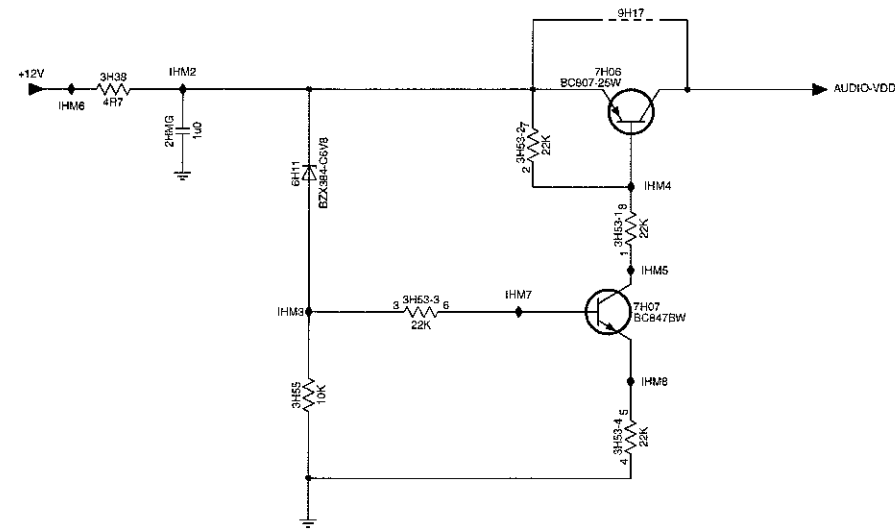


- 3HK0 C2
- 7H00-3 B2
- 9HK0 C2
- FHK1 B1
- FHK2 B2
- FHK3 B2
- FHK4 C2
- FHK5 C2
- FHK6 C2
- FHK7 C2
- FHK8 C2
- IHSM C2

Personal Notes:

Handwritten notes area with horizontal lines.

B04I PNX 8541: AUDIO



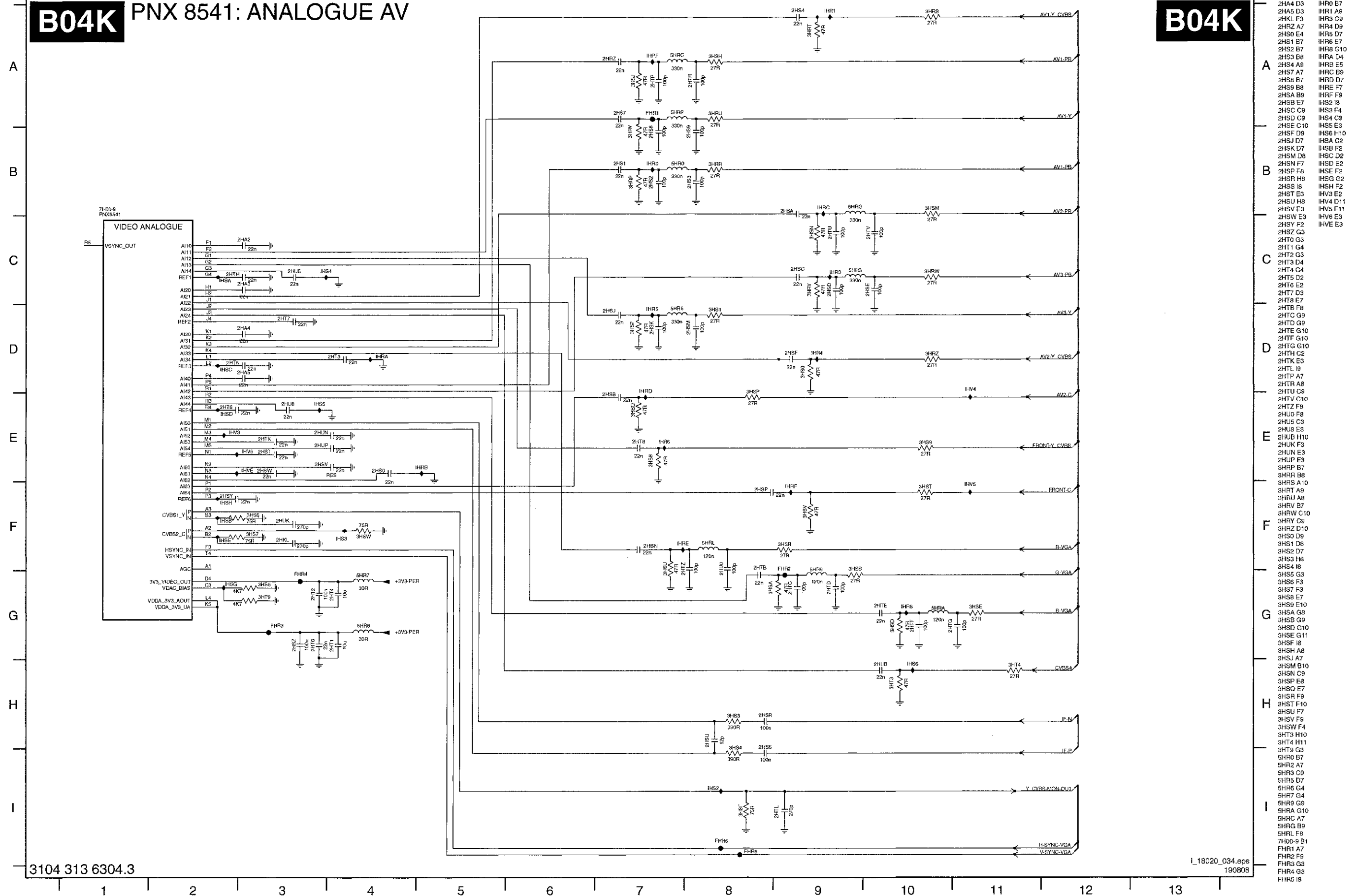
2HMG B2
2HMJ A10
2HMP D10
2HMT D10
2HMW F10
2HMY G9
2HMZ H10
2HN1 E9
3H3A A2
3H3-1 B5
3H3-2 B4
3H3-3 B4
3H3-4 C5
3H55 C3
3HMC-1 B9
3HMC-2 B10
3HMC-3 D9
3HMC-4 D10
3HMM-1 F9
3HMM-2 F10
3HMM-3 H9
3HMM-4 H10
6H11 B3
7H06 A5
7H07 B5
7HM1-1 A10
7HM1-2 C10
7HM1-3 E10
7HM1-4 G10
9H17 A5
FHM0 A11
FHM1 F11
FHM2 E11
FHM3 G11
HMG2 A2
HM3 B3
HM4 B5
HM5 B5
HM6 A2
HM7 B4
HM8 C5
HMV A9
HMV A9
HMY A10
HMZ A10
HN3 C9
HN6 C10
HNA E10
HNB E9
HND G9
HNE G10

I_18020_033.eps
190808

SSB: PN8541: Analogue AV

B04K PN8 541: ANALOGUE AV

B04K

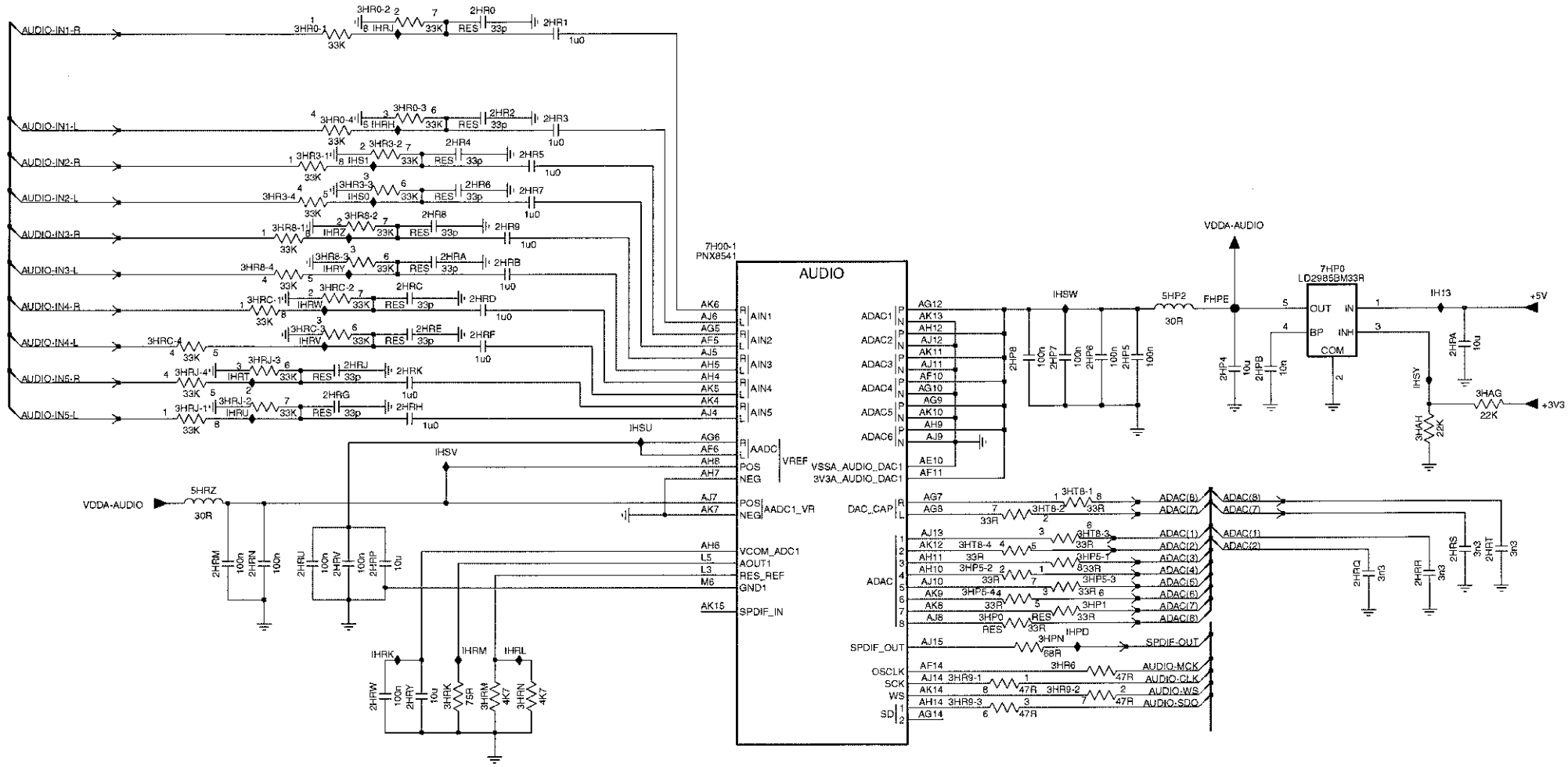


SSB: PNX8541: Audio

B04L

PNX 8541: AUDIO

B04L



- 2HP4 E9
- 2HP5 E8
- 2HP6 E8
- 2HP7 E8
- 2HP8 E7
- 2HPA E10
- 2HPB E9
- 2HR0 C4
- 2HR1 C5
- 2HR2 C4
- 2HR3 C5
- 2HR4 C4
- 2HR5 C5
- 2HR6 D4
- 2HR7 D5
- 2HR8 D4
- 2HR9 D4
- 2HRA D4
- 2HRB D4
- 2HRC D4
- 2HRD D4
- 2HRE D4
- 2HRF E4
- 2HRG E3
- 2HRH E4
- 2HRJ E4
- 2HRK E4
- 2HRM F3
- 2HRN F3
- 2HRP F4
- 2HRQ F9
- 2HRR F10
- 2HRS F10
- 2HRT F10
- 2HRU F3
- 2HRV F3
- 2HRW G4
- 2HRY G4
- 3HAG E10
- 3HAH E10
- 3HP0 F7
- 3HP1 F8
- 3HP5-1 F8
- 3HP5-2 F7
- 3HP5-3 F8
- 3HP5-4 F7
- 3HPN F8
- 3HR0-1 C3
- 3HR0-2 C4
- 3HR0-3 C4
- 3HR0-4 C3
- 3HR3-1 C3
- 3HR3-2 C4
- 3HR3-3 D4
- 3HR3-4 D3
- 3HR6 F8
- 3HR8-1 D3
- 3HR8-2 D4
- 3HR8-3 D3
- 3HR8-4 D3
- 3HR9-1 G8
- 3HR9-2 G7
- 3HR9-3 G7
- 3HRC-1 D3
- 3HRC-2 D3
- 3HRC-3 D3
- 3HRC-4 E2
- 3HRJ-1 E3
- 3HRJ-2 E3
- 3HRJ-3 E3
- 3HRJ-4 E3
- 3HRK G4
- 3HRM G4
- 3HRN G5
- 3HT8-1 E8
- 3HT8-2 F8
- 3HT8-3 F8
- 3HT8-4 F7
- 5HP2 D8
- 5HRZ E3
- 7H00-1 D6
- 7HP0 D9
- FHPE D9
- IH13 D10
- IHPD F8
- IHRH C4
- IHRJ C4
- IHRK F4
- IHRL F4
- IHRM F4
- IHRT E3
- IHRU E3
- IHRV E3
- IHRW D3
- IHRY D3
- IHRZ D3
- IHS0 D4
- IHS1 C4
- IHSU E5
- IHSV E4
- IHSW D8
- IHSY E10

L_18020_035.eps
200608

3104 313 6304.3

SSB: PNX8541: Audio

B04M PNX 8541: AUDIO

B04M

A

B

C

D

E

A

B

C

D

E

- 2H02 C2
- 2HVA A3
- 2HVB B3
- 2HVC B3
- 2HVD C1
- 2HVE C1
- 2HVG D6
- 3H18-1 C2
- 3H18-2 A3
- 3H18-3 C2
- 3H18-4 B3
- 3HV3 D1
- 3HV4-1 C8
- 3HV4-2 C8
- 3HV4-3 D6
- 3HV4-4 D6
- 7HV0 C2
- 7HVA-1 D8
- 7HVA-2 C8
- 9H08 B8
- 9H16 B8
- FHV3 D6
- IH22 D1
- IH24 C1
- IH25 C1
- IH27 C2
- IH29 C8
- IHV1 C3
- IHV2 B8
- IHVA C8
- IHVB D6
- IHW7 C7
- IHW8 C7
- IHWE C2
- IHWJ C3
- IHWL C2

3104 313 6304.3

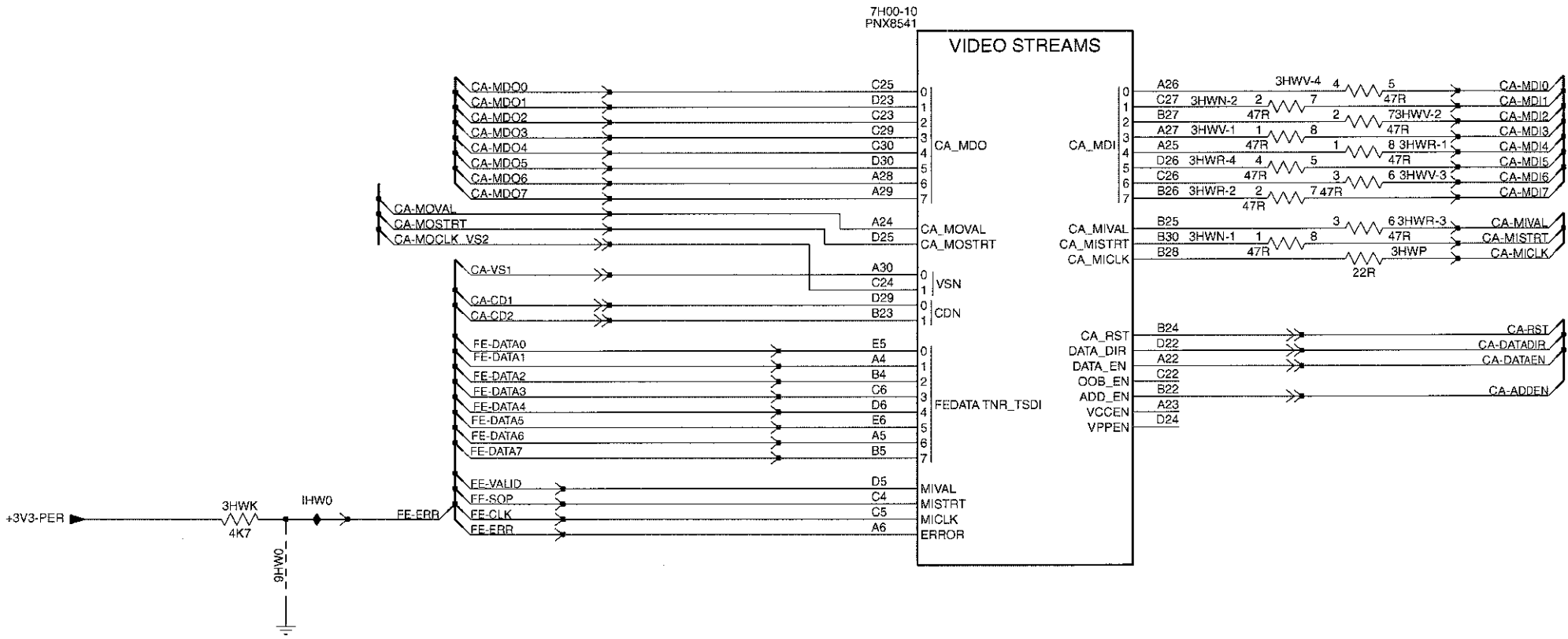
L_18020_036.eps
200808

SSB: PNx8541: Video Streams

B04N PNx 8541: VIDEO STREAMS

B04N

3HWK D2
3HWN-1 C6
3HWN-2 B6
3HWP C7
3HWR-1 B7
3HWR-2 B6
3HWR-3 B7
3HWR-4 B6
3HWV-1 B6
3HWV-2 B7
3HWV-3 B7
3HWV-4 B7
7H00-10 A5
9HW0 D2
1HW0 D2



3104 313 6304.3

I_18020_037.eps
200808

SSB: PNX8541: Digital Video Out / LVDS

B040

PNX8541: DIGITAL VIDEO OUT / LVDS

B040

A

B

C

D

E

F

A

B

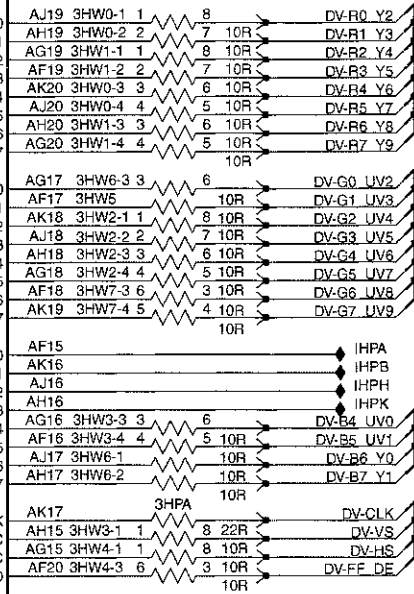
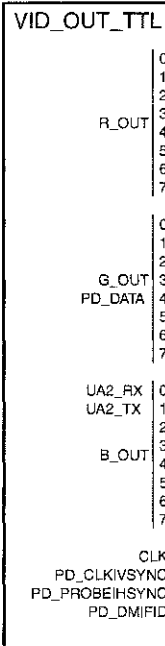
C

D

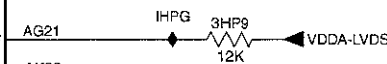
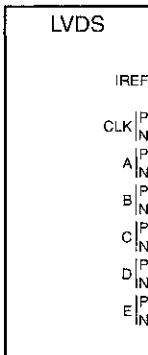
E

F

7H00-8
PNX8541



7H00-7
PNX8541

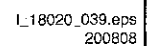


- 3HP9 B5
- 3HPA D2
- 3HW0-1 B2
- 3HW0-2 B2
- 3HW0-3 B2
- 3HW0-4 B2
- 3HW1-1 B2
- 3HW1-2 B2
- 3HW1-3 B2
- 3HW1-4 B2
- 3HW2-1 B2
- 3HW2-2 C2
- 3HW2-3 C2
- 3HW2-4 C2
- 3HW3-1 D2
- 3HW3-3 C2
- 3HW3-4 C2
- 3HW4-1 D2
- 3HW4-4 D2
- 3HW5 B2
- 3HW6-1 C2
- 3HW6-2 B2
- 3HW6-3 C2
- 3HW7-3 C2
- 3HW7-4 C2
- 7H00-7 B4
- 7H00-8 A1
- IHPA C3
- IHPB C3
- IHPG B5
- IHPH C3
- IHPK C3

3104 313 6304.3

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B04P PNX 8541: POWER

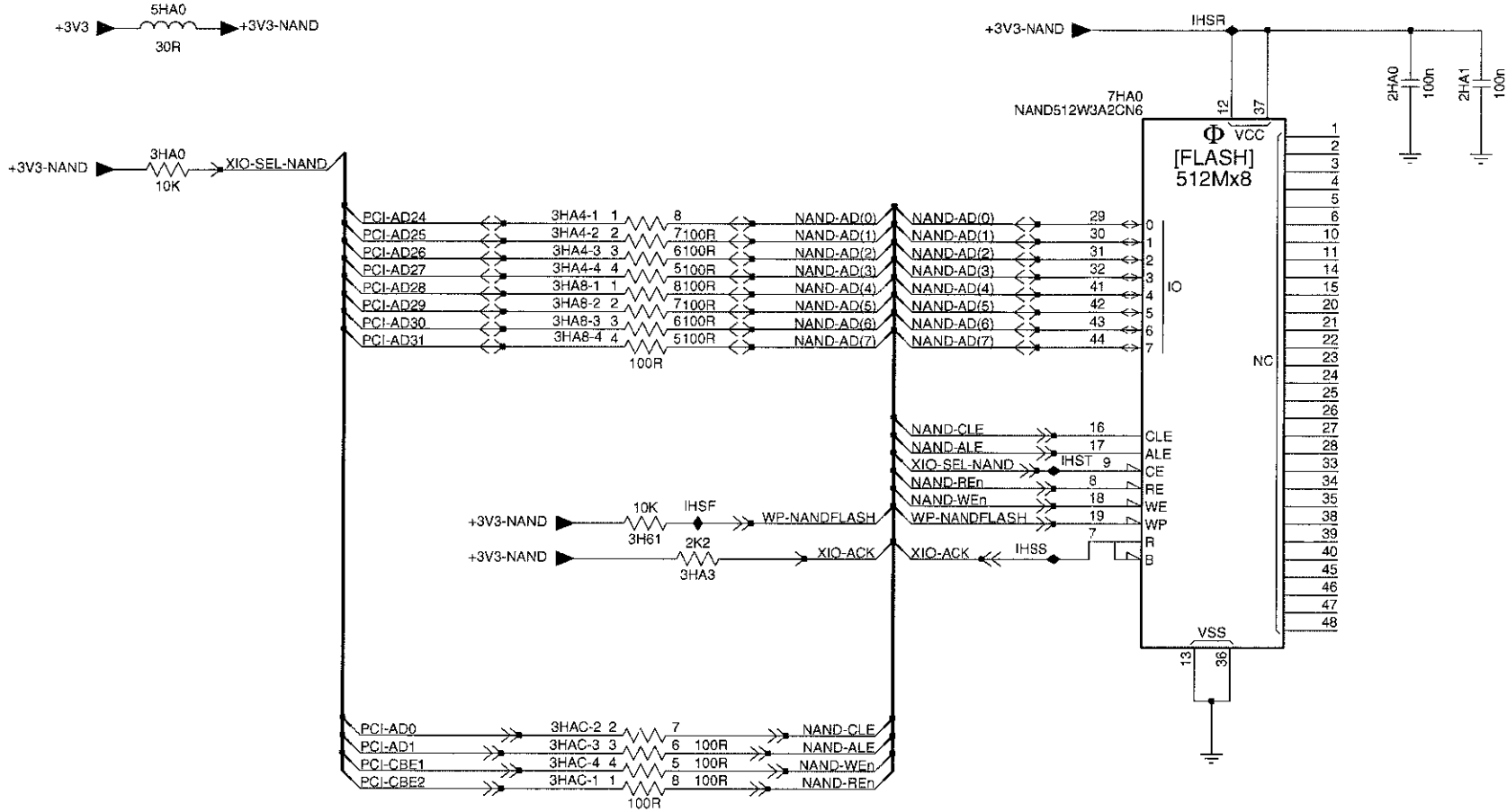


SSB: PNX8541: Flash

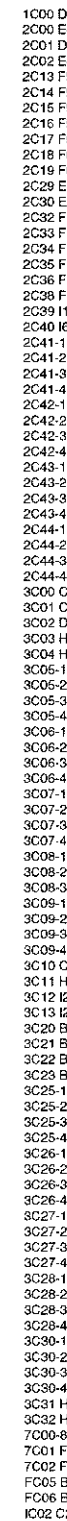
B04Q PNX 8541: FLASH

B04Q

- 2HA0 B7
- 2HA1 B7
- 3H61 C3
- 3HA0 B2
- 3HA3 D4
- 3HA4-1 B3
- 3HA4-2 B3
- 3HA4-3 B3
- 3HA4-4 B3
- 3HA8-1 B3
- 3HA8-2 C3
- 3HA8-3 C3
- 3HA8-4 C3
- 3HAC-1 D3
- 3HAC-2 D3
- 3HAC-3 D3
- 3HAC-4 D3
- 5HA0 A2
- 7HA0 B5
- IHSF C4
- IHSR A6
- IHSS C5
- IHST C5



B05A PN5100: SDRAM



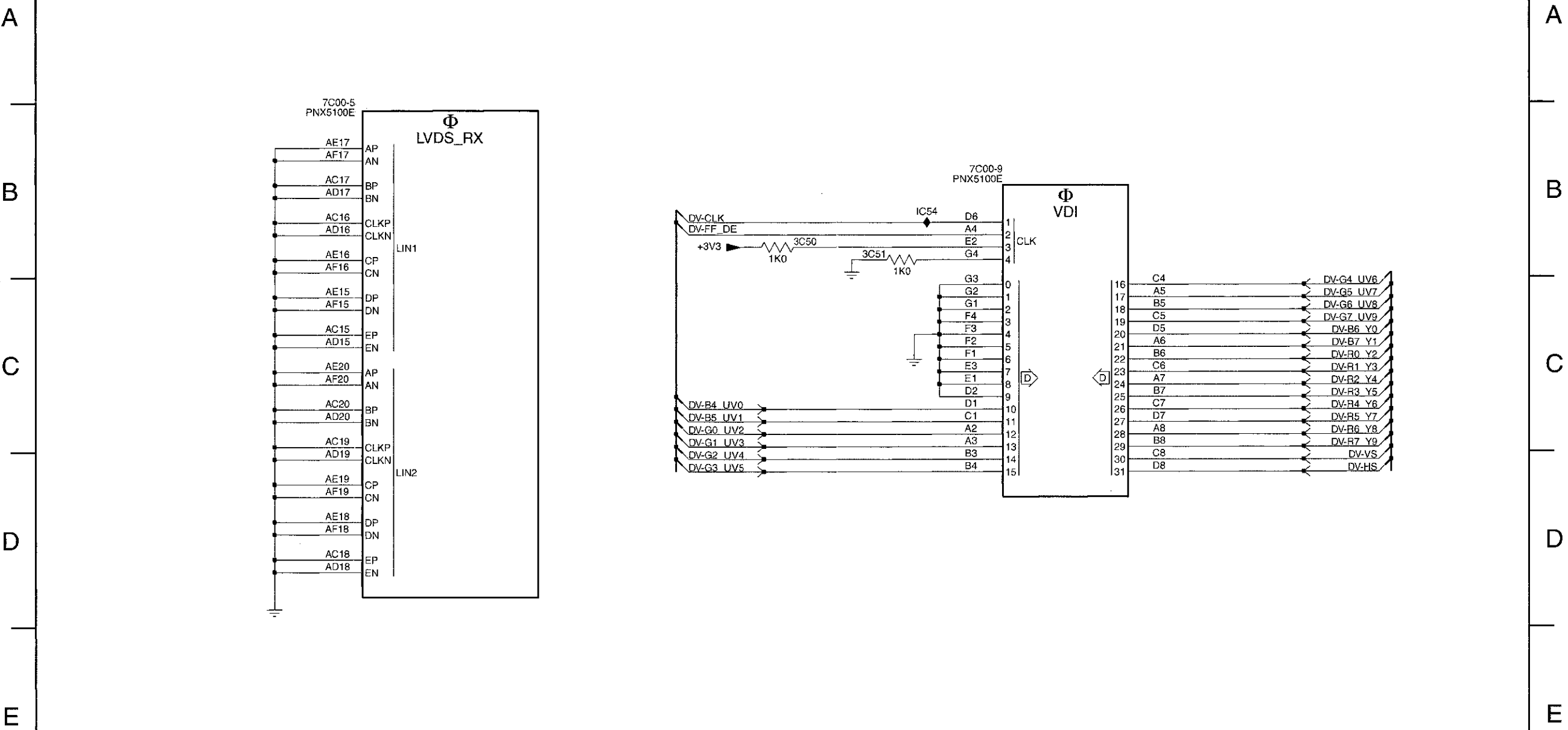
SSB: PNX5100: Video

B05B

PNX5100: VIDEO

B05B

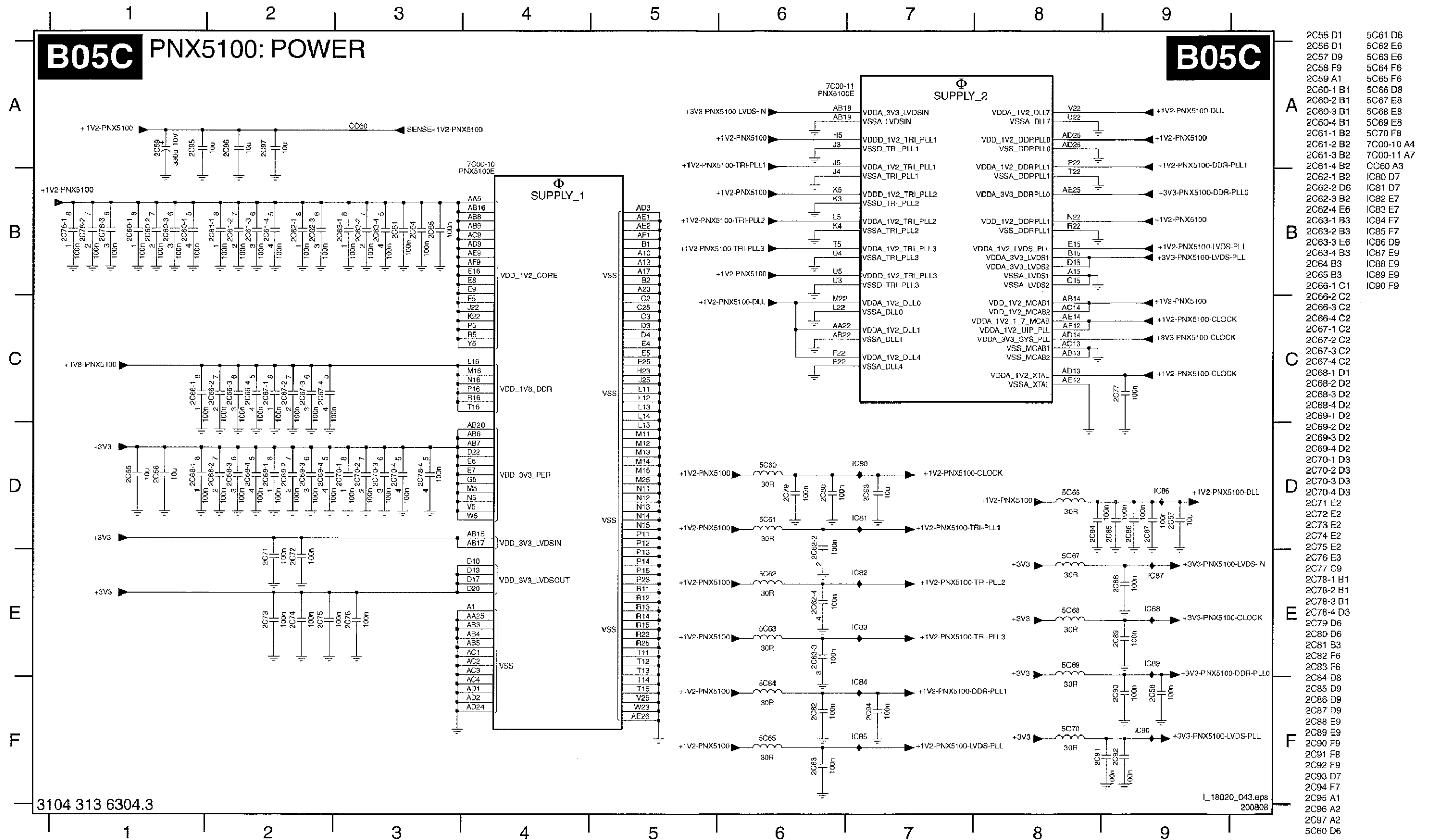
3C50 B5
3C51 B5
7C00-5 B2
7C00-9 B6
IC54 B5

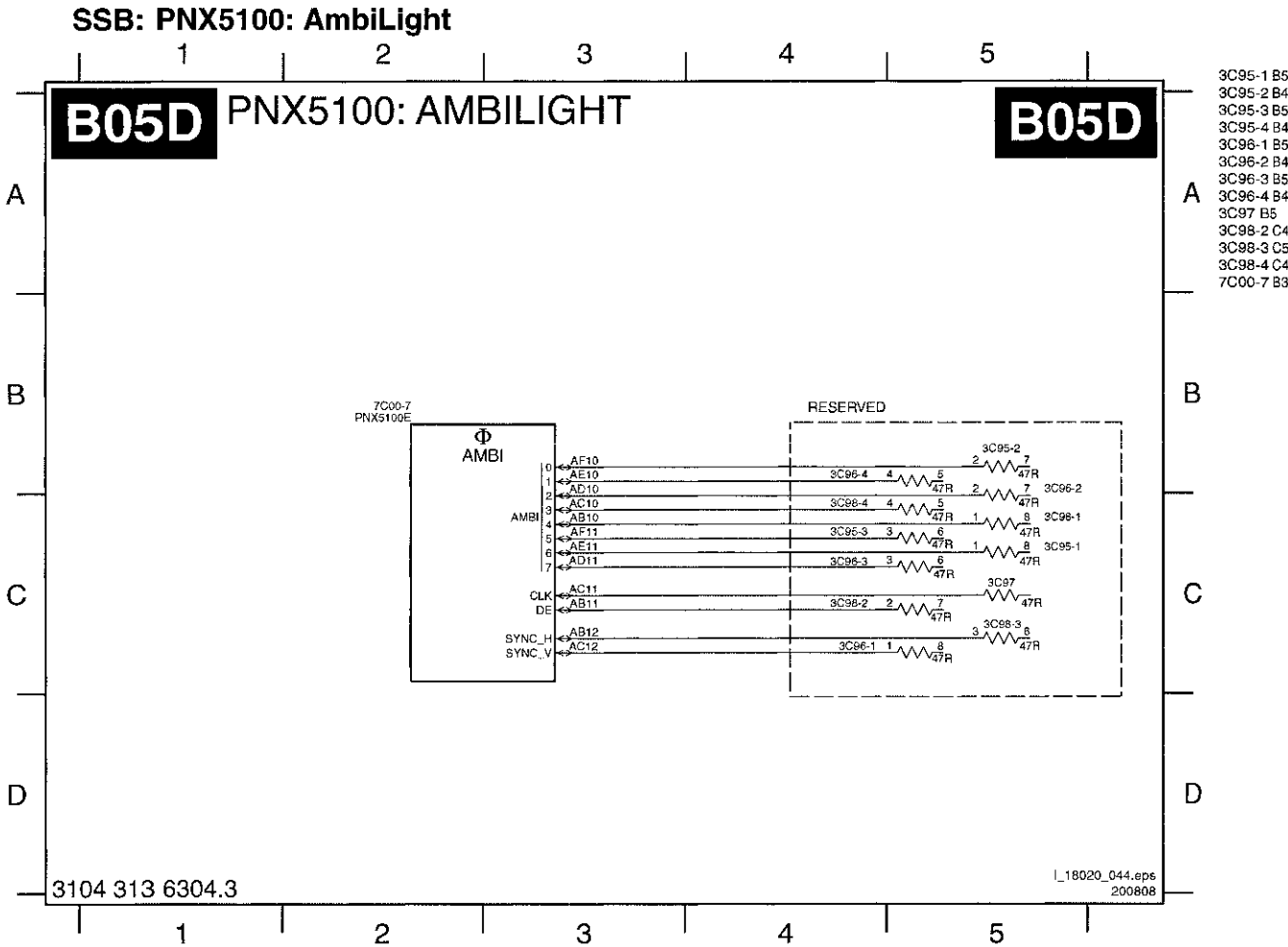


3104 313 6304.3

L_18020_042.eps
200808

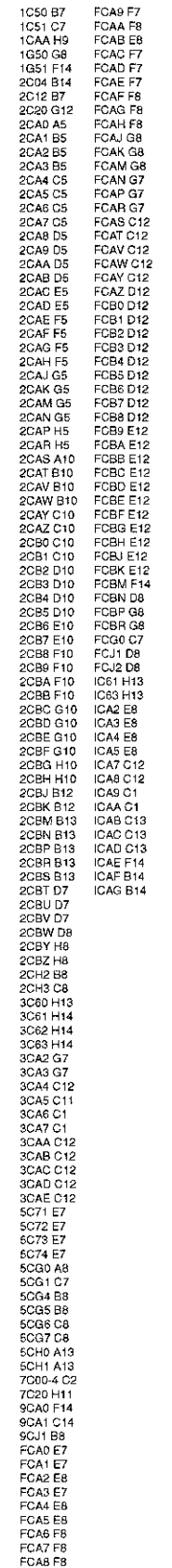
SSB: PNX5100: Power



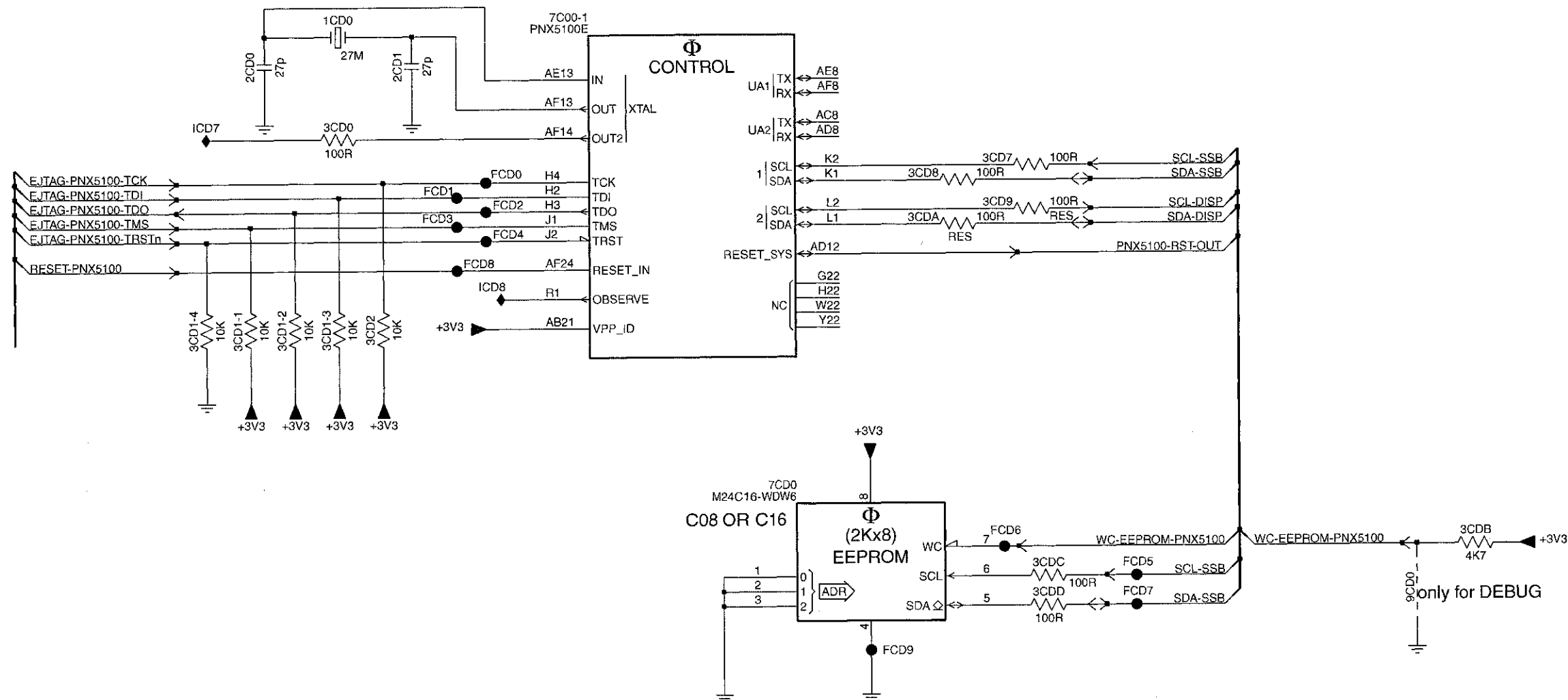


Personal Notes:

B05E

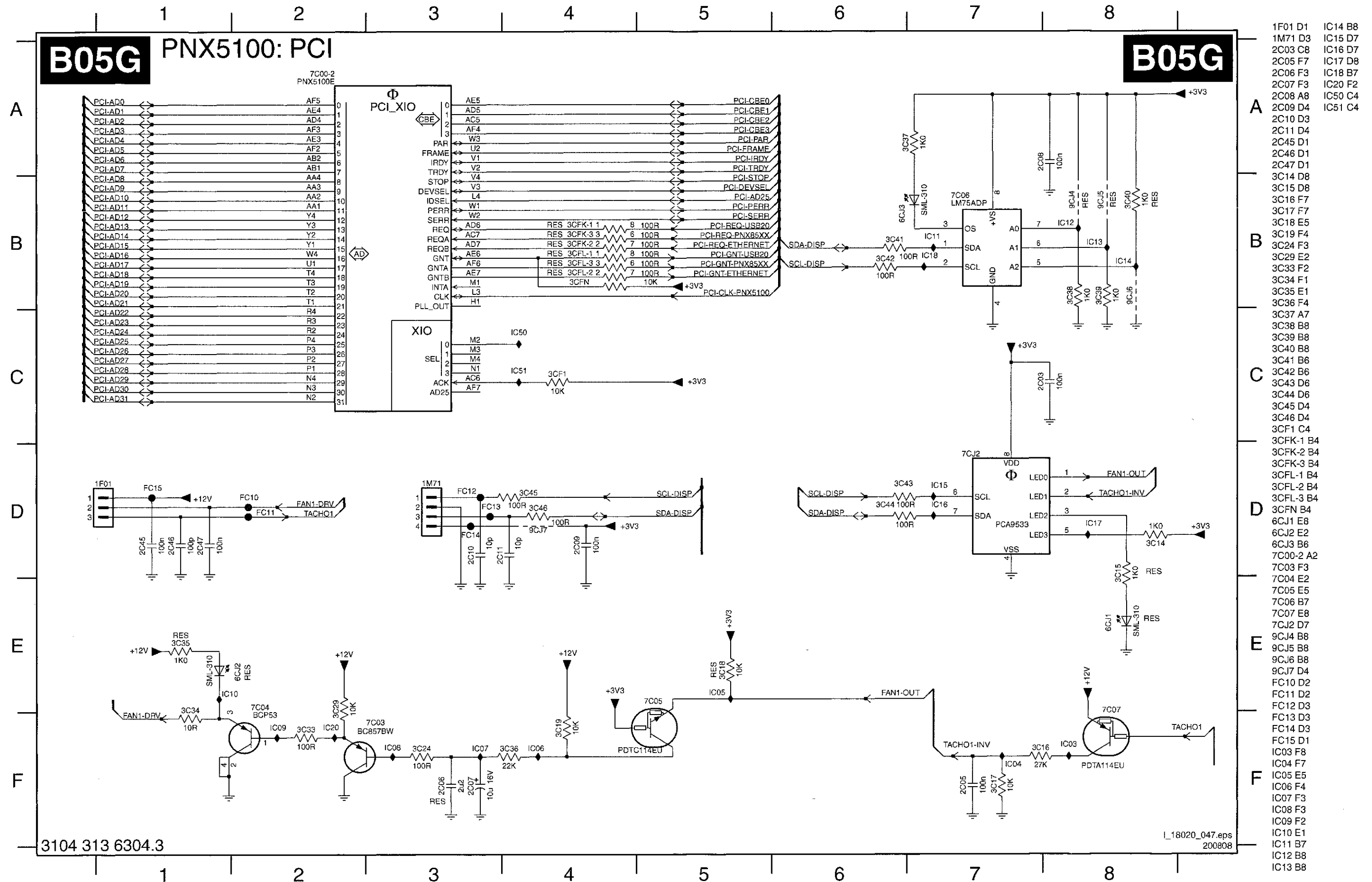


SSB: PNX5100: Control

B05F PNX5100: CONTROL**B05F**

1CD0 B2
2CD0 B2
2CD1 B3
3CD0 B2
3CD1-1 C2
3CD1-2 C2
3CD1-3 C2
3CD1-4 C2
3CD2 C3
3CD7 B6
3CD8 B5
3CD9 B6
3CDA C5
3CDB D8
3CDC D6
3CDD D6
7C00-1 B4
7CD0 D5
9CD0 D8
FCD0 B3
FCD1 B3
FCD2 B3
FCD3 C3
FCD4 C3
FCD5 D6
FCD6 D6
FCD7 D6
FCD8 C3
FCD9 E5
ICD7 B2
ICD8 C3

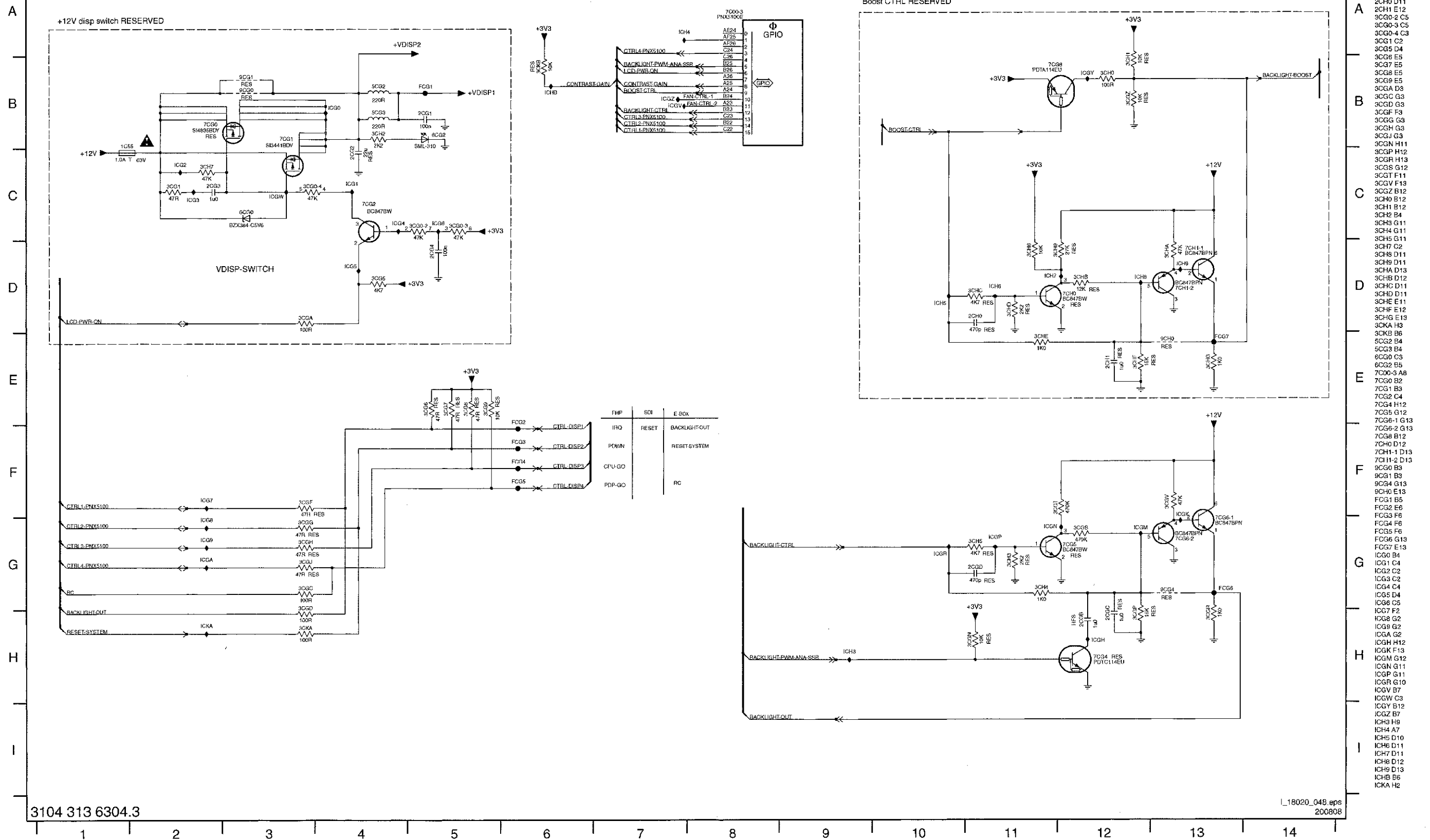
SSB: PNX5100: PCI



SSB: PN5100: Display Interfacing

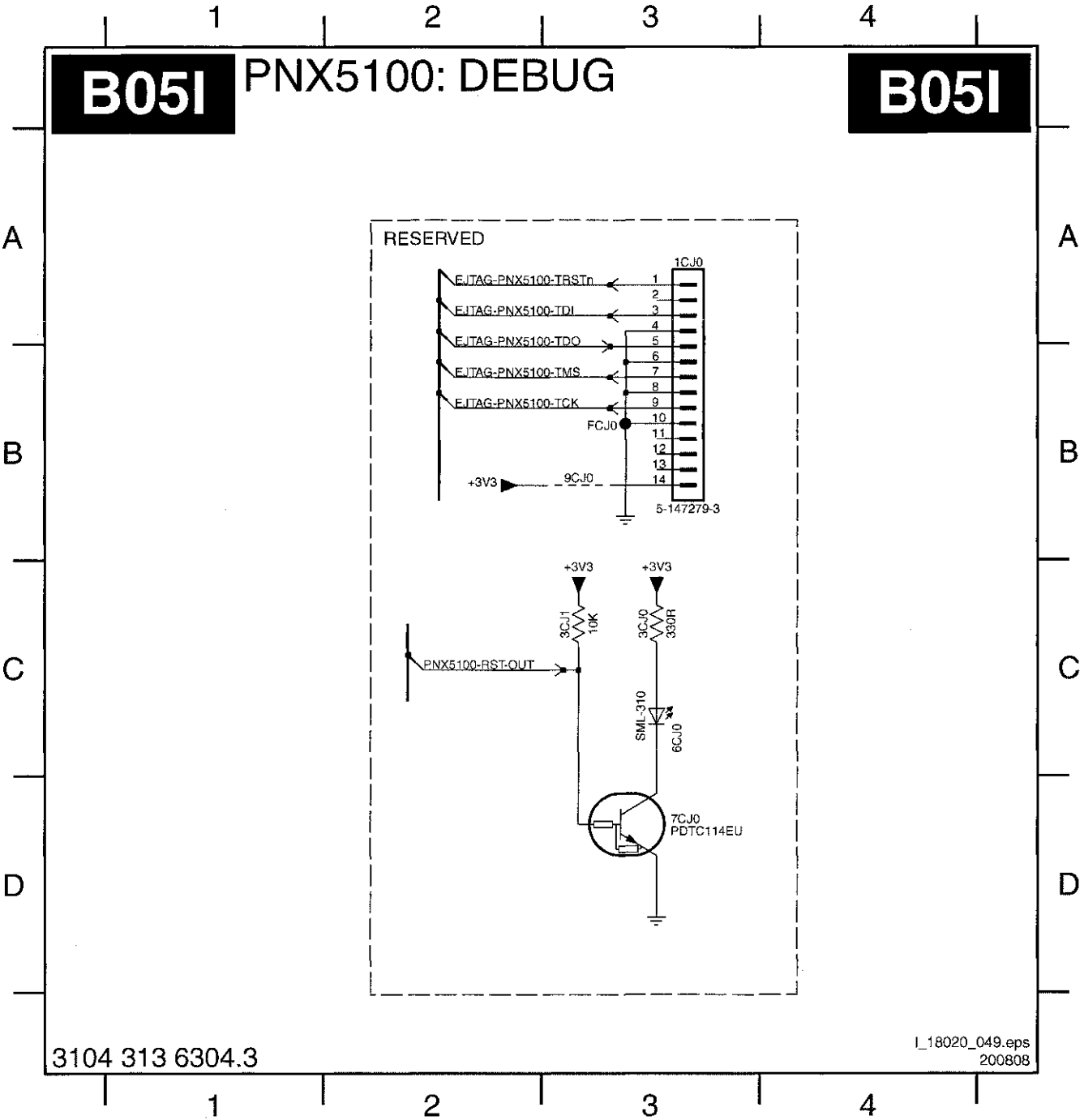
B05H PN5100: DISPLAY-INTERFACING

B05H



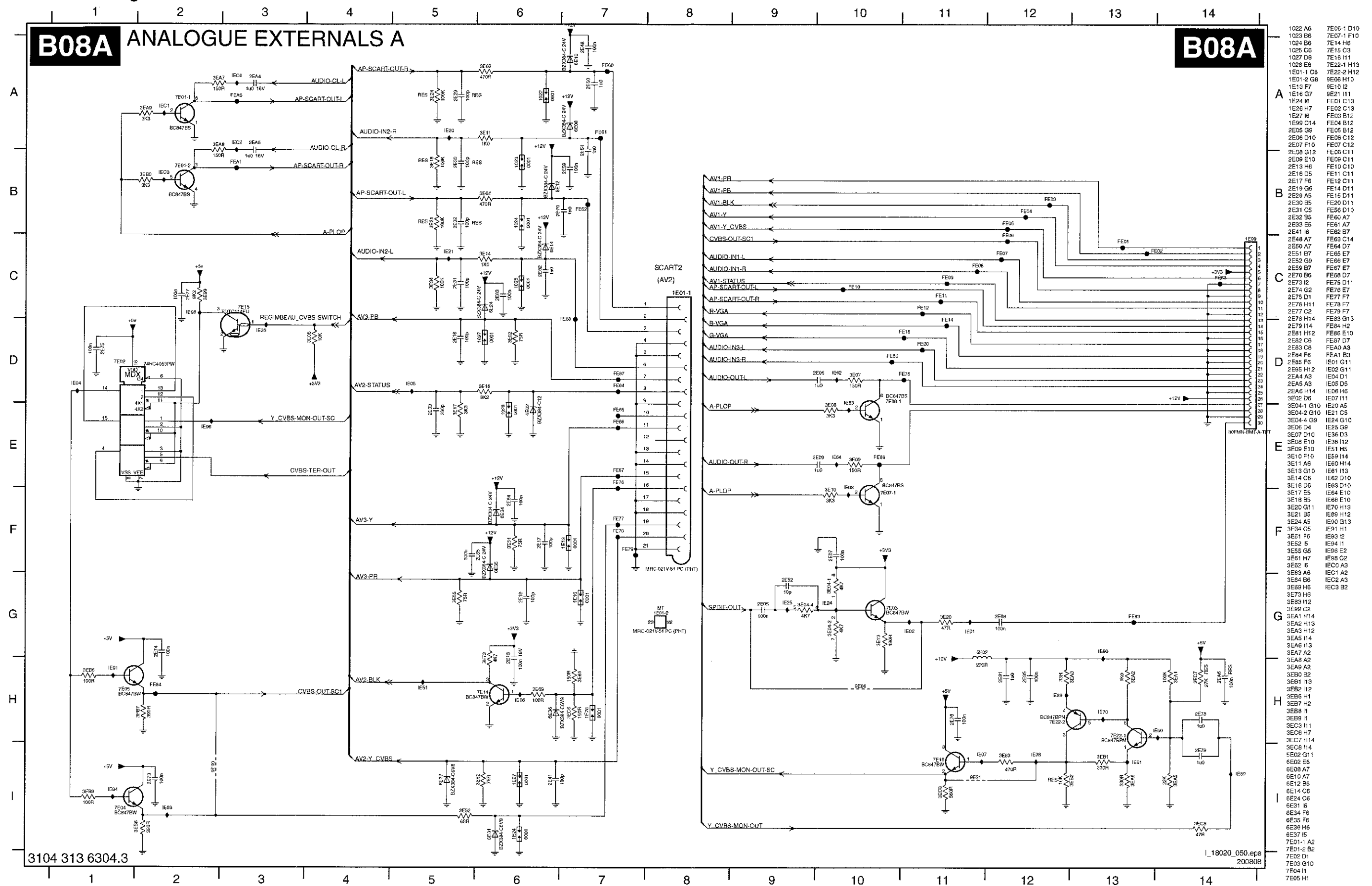
SSB: PNX5100: Debug

1CJ0 A3 3CJ0 C3 3CJ1 C3 6CJ0 C3 7CJ0 D3 9CJ0 B3 FCJ0 B3



Personal Notes:

SSB: Analogue Externals A

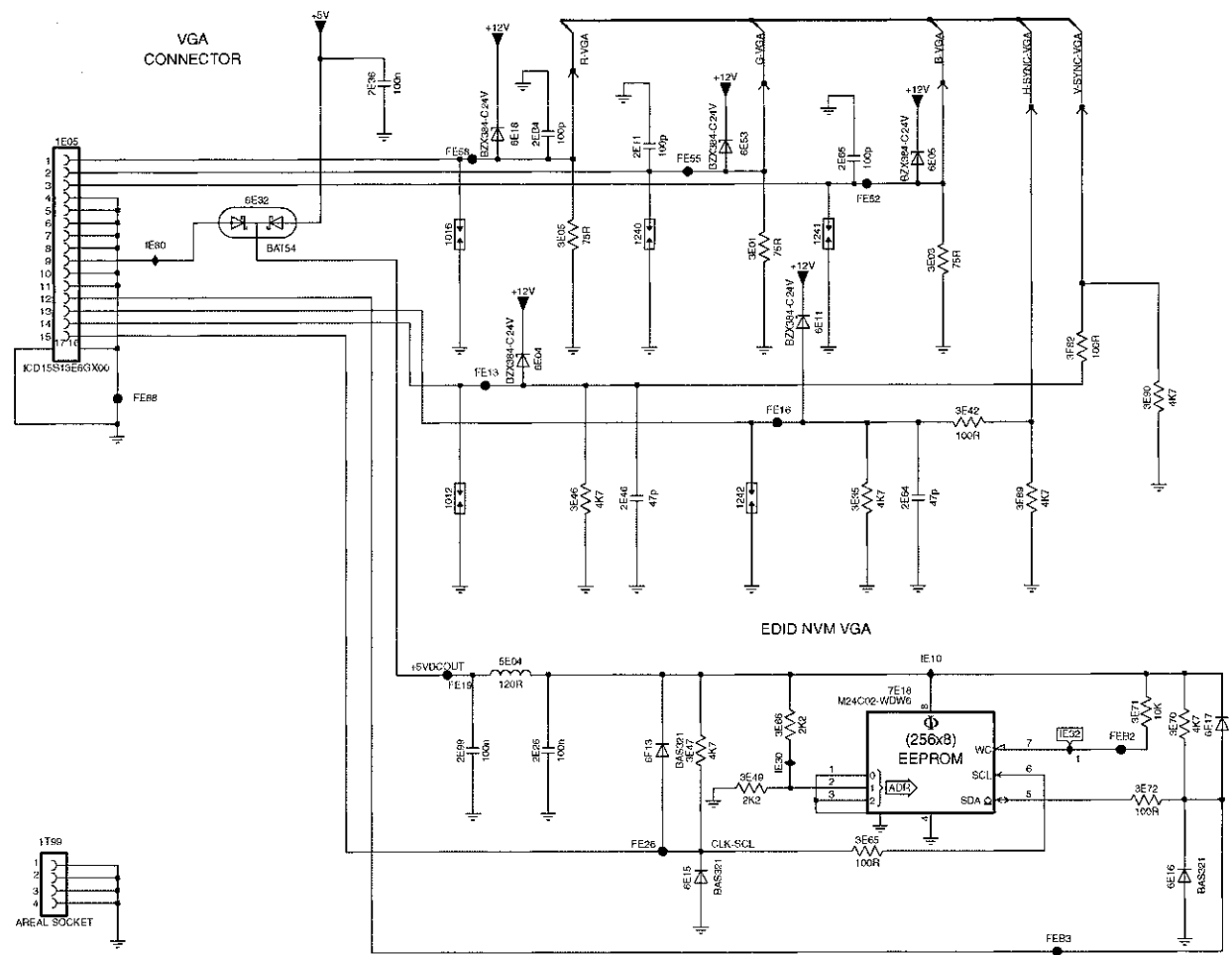


SSB: Analogue Externals B/C

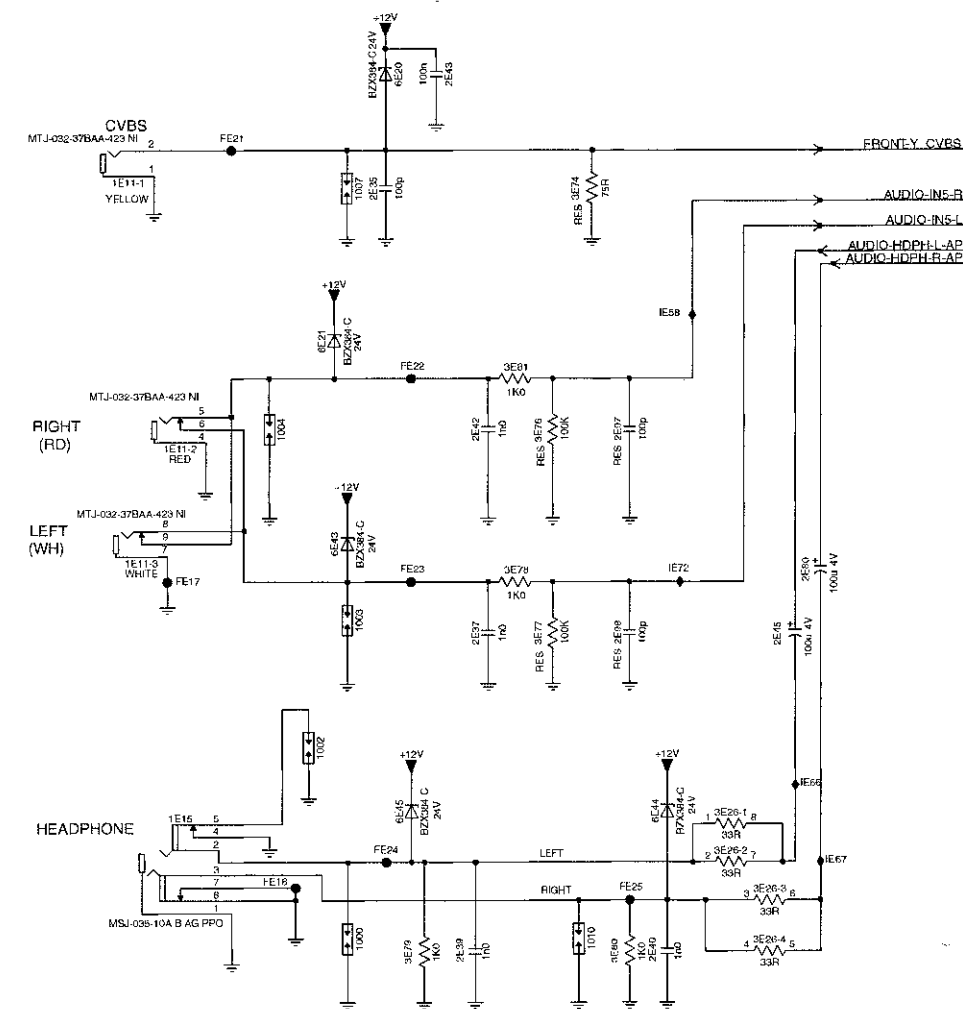
B08B ANALOGUE EXTERNALS B/C

B08B

ANALOGUE EXTERNALS B



ANALOGUE EXTERNALS C



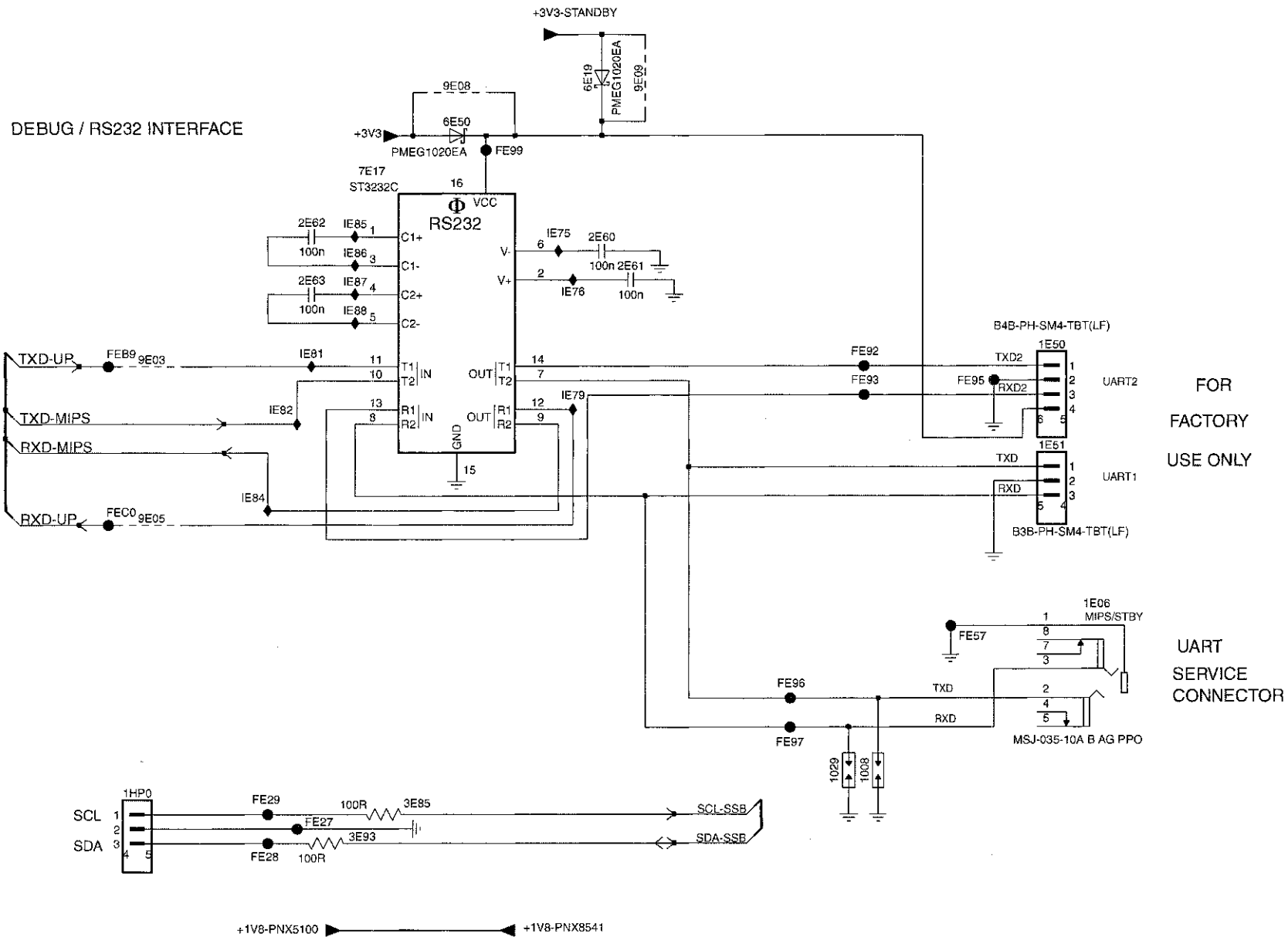
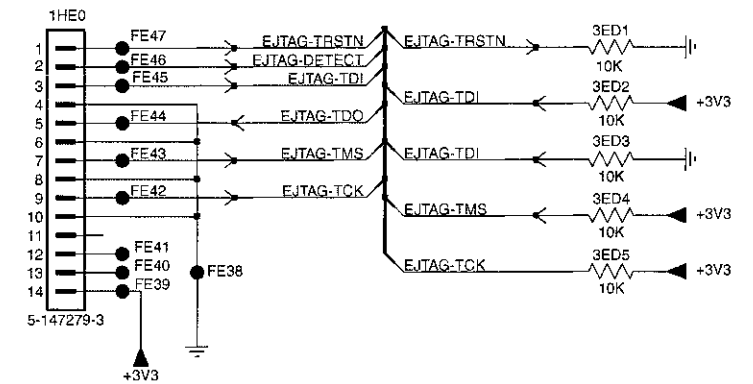
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200808

SSB: Analogue Externals D

B08D ANALOGUE EXTERNAL D

B08D

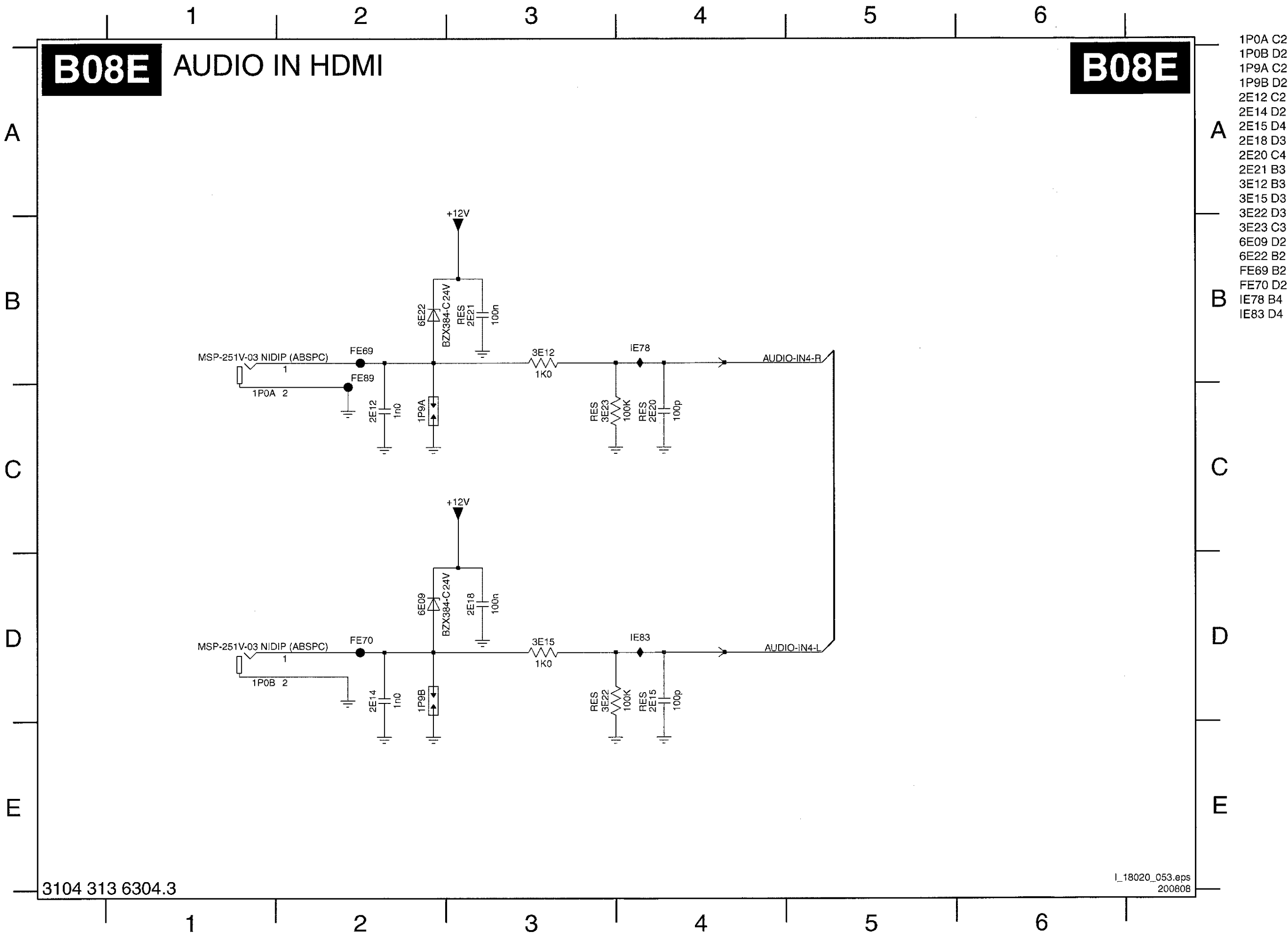
FOR FACTORY
USE ONLY

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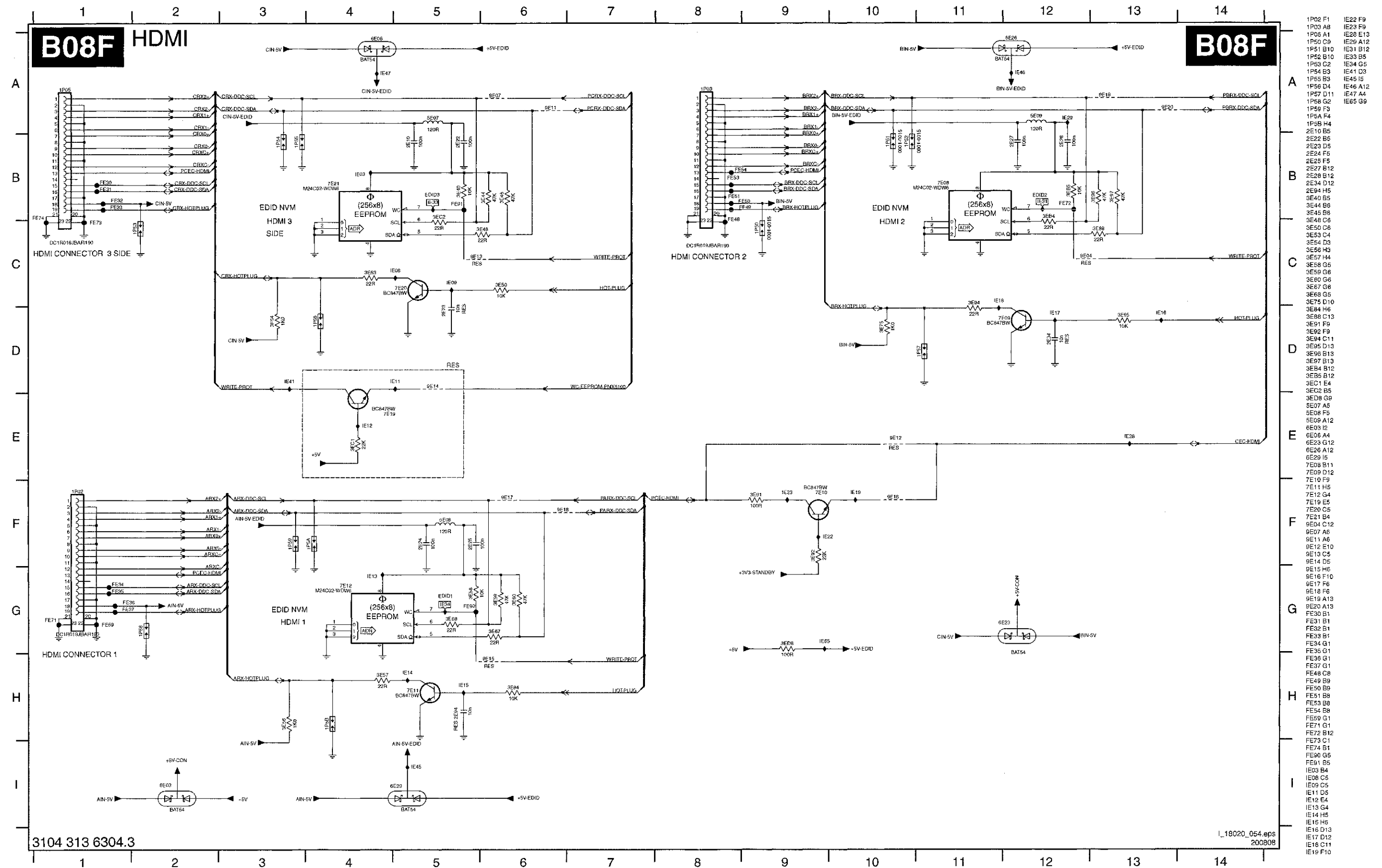
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1008 E5
1029 E5
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1E50 C6
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2E60 B3
2E61 B3
2E62 B2
2E63 B2
3E85 E2
3E93 E2
3ED1 B9
3ED2 B9
3ED3 B9
3ED4 B9
3ED5 C9
6E19 A3
6E50 B3
7E17 B2
9E03 C1
9E05 D1
9E08 B3
9E09 A4
9E27 E2
FE28 E2
FE29 E2
FE38 C8
FE39 C7
FE40 C7
FE41 C7
FE42 B7
FE43 B7
FE44 B7
FE45 B7
FE46 B7
FE47 B7
FE57 D5
FE92 C5
FE93 C5
FE95 C5
FE96 D4
FE97 E4
FE99 B3
FE89 C1
FE80 D1
IE75 B3
IE76 C3
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IE87 B2
IE88 C2

SSB: Audio in HDMI

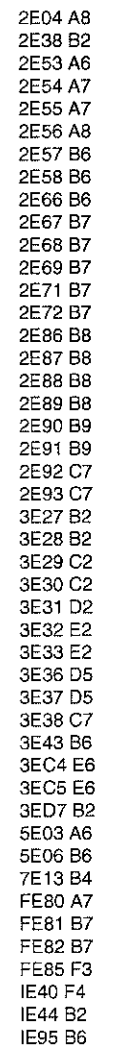


SSB: HDMI



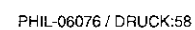
B08G HDMI SWITCH

B08G

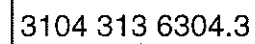


B09A USB 2.0

B09A



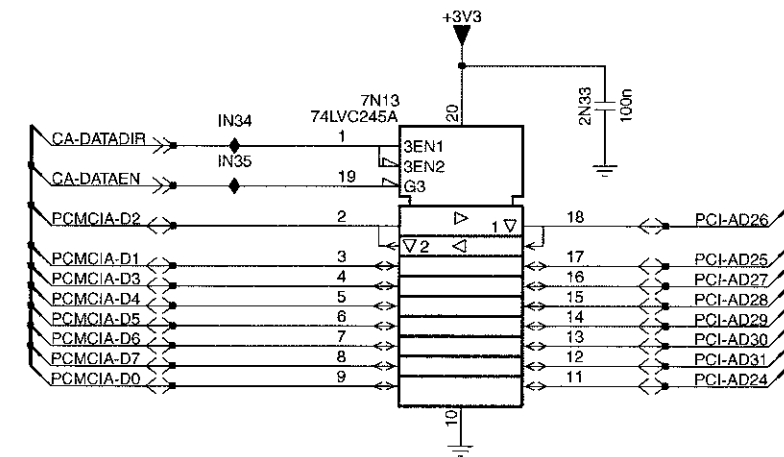
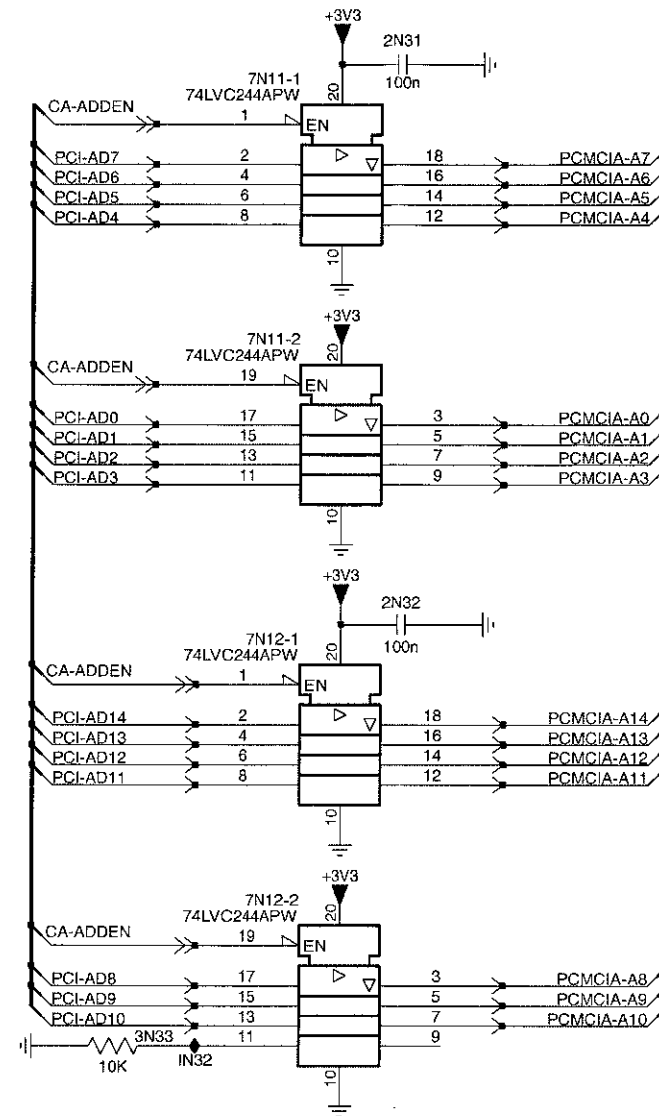
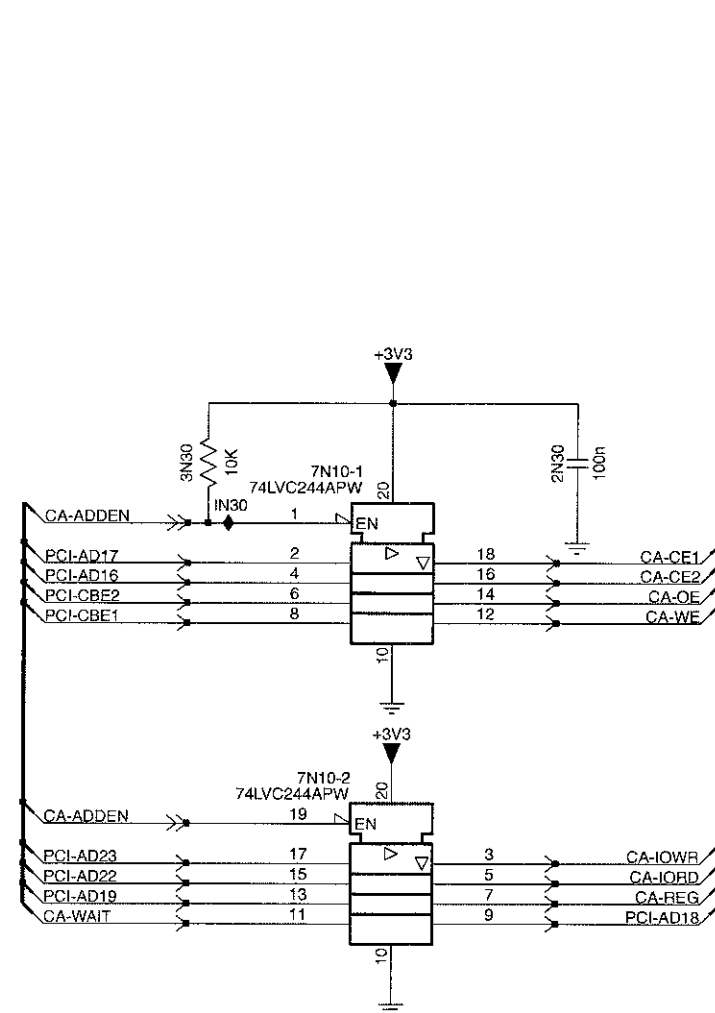
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1N02 C8	2N0M E3	2N0Q G10	2N0T B10	2N0W H10	2N10 G12	2N13 G11	2N16 G11	3N0F C7	3N0J F8	3N0L-2 A8	3N0N-1 A9	3N0N-4 A9	3N0T-3 C9	3N0W E8	5N07 H10	7N04-1 B3	9N06 D1	FN07 B10	FN0A E9	FN15 B10	IN0M C7	IN0T C8	IN0W E8		
2N0K D8	2N0N H4	2N0R B9	2N0U B10	2N0Y G12	2N11 G12	2N14 G12	2N17 G11	3N0G D3	3N0K F8	3N0L-3 A8	3N0N-2 A9	3N0T-1 B9	3N0T-4 C9	3N0Y D1	6N00 F8	7N04-2 H7	FN05 A10	FN08 B11	FN0B F9	IN0K E8	IN0N H3	IN0U H10	IN0Y F8		
	1		2		3		4		5		6		7		8		9		10		11		12		13



SSB: Buffering

B09C BUFFERING

B09C



2N30 B3
2N31 A5
2N32 C5
2N33 A8
3N30 B1
3N33 D4
7N10-1 B2
7N10-2 C2
7N11-1 A4
7N11-2 B4
7N12-1 C4
7N12-2 D4
7N13 A7
IN30 B1
IN32 D4
IN34 A7
IN35 A7

3104 313 6304.3

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SSB: SRP List Part 1

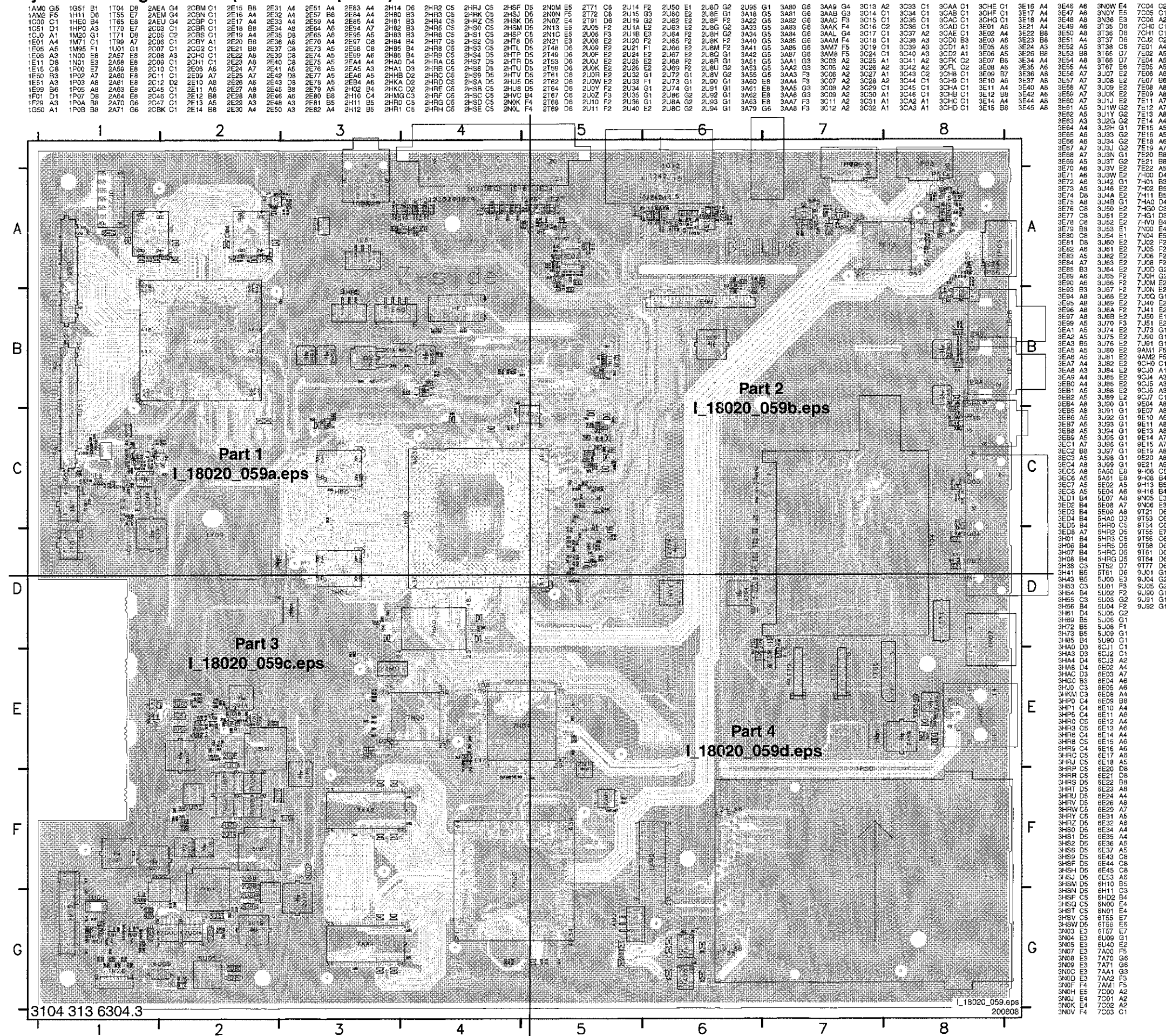
Netname	Diagram	ADAC(2)	B04L (1x)	CA-CD2	B03H (2x)	DDR2-A3	B04G (4x)	EMI-A11	B03B (2x)	JTAG-TMS-ST	B03A (2x)
+12V	B01A	ADAC(3)	B04L (1x)	CA-CD2	B04N (1x)	DDR2-A4	B04G (4x)	EMI-A12	B03A (1x)	JTAG-TMS-ST	B03G (1x)
+12V	B01B	ADAC(4)	B04L (1x)	CA-CE1	B03H (1x)	DDR2-A5	B04G (4x)	EMI-A13	B03B (1x)	JTAG-TMS-TDA10023	B02C (1x)
+12V	B04C	ADAC(5)	B04M (1x)	CA-CE2	B03H (1x)	DDR2-A6	B04G (4x)	EMI-A14	B03B (2x)	JTAG-TMS-TDA10048	B02A (1x)
+12V	B04D	ADAC(6)	B04L (1x)	CA-CE3	B03H (1x)	DDR2-A7	B04G (4x)	EMI-A15	B03B (2x)	JTAG-TRSTn-ST	B03A (2x)
+12V	B04E	ADAC(7)	B04L (1x)	CA-CE4	B03H (1x)	DDR2-A8	B04G (4x)	EMI-A16	B03B (2x)	JTAG-TRSTn-ST	B03G (1x)
+12V	B04F	ADAC(8)	B04L (1x)	CA-CE5	B03H (1x)	DDR2-A9	B04G (4x)	EMI-A17	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B04M	ADAC(9)	B04L (1x)	CA-CE6	B03H (1x)	DDR2-BA1	B04G (4x)	EMI-A18	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03G	ADAC(10)	B04L (1x)	CA-CE7	B03H (1x)	DDR2-BA2	B04G (4x)	EMI-A19	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03H	ADAC(11)	B04L (1x)	CA-CE8	B03H (1x)	DDR2-BA3	B04G (4x)	EMI-A20	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03A	ADAC(12)	B04L (1x)	CA-CE9	B03H (1x)	DDR2-BA4	B04G (4x)	EMI-A21	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03B	ADAC(13)	B04L (1x)	CA-CE10	B03H (1x)	DDR2-BA5	B04G (4x)	EMI-A22	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03C	ADAC(14)	B04L (1x)	CA-CE11	B03H (1x)	DDR2-BA6	B04G (4x)	EMI-A23	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03D	ADAC(15)	B04L (1x)	CA-CE12	B03H (1x)	DDR2-BA7	B04G (4x)	EMI-A24	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03E	ADAC(16)	B04L (1x)	CA-CE13	B03H (1x)	DDR2-BA8	B04G (4x)	EMI-A25	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03F	ADAC(17)	B04L (1x)	CA-CE14	B03H (1x)	DDR2-BA9	B04G (4x)	EMI-A26	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03G	ADAC(18)	B04L (1x)	CA-CE15	B03H (1x)	DDR2-BA10	B04G (4x)	EMI-A27	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03H	ADAC(19)	B04L (1x)	CA-CE16	B03H (1x)	DDR2-BA11	B04G (4x)	EMI-A28	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03A	ADAC(20)	B04L (1x)	CA-CE17	B03H (1x)	DDR2-BA12	B04G (4x)	EMI-A29	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03B	ADAC(21)	B04L (1x)	CA-CE18	B03H (1x)	DDR2-BA13	B04G (4x)	EMI-A30	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03C	ADAC(22)	B04L (1x)	CA-CE19	B03H (1x)	DDR2-BA14	B04G (4x)	EMI-A31	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03D	ADAC(23)	B04L (1x)	CA-CE20	B03H (1x)	DDR2-BA15	B04G (4x)	EMI-A32	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03E	ADAC(24)	B04L (1x)	CA-CE21	B03H (1x)	DDR2-BA16	B04G (4x)	EMI-A33	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03F	ADAC(25)	B04L (1x)	CA-CE22	B03H (1x)	DDR2-BA17	B04G (4x)	EMI-A34	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03G	ADAC(26)	B04L (1x)	CA-CE23	B03H (1x)	DDR2-BA18	B04G (4x)	EMI-A35	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03H	ADAC(27)	B04L (1x)	CA-CE24	B03H (1x)	DDR2-BA19	B04G (4x)	EMI-A36	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03A	ADAC(28)	B04L (1x)	CA-CE25	B03H (1x)	DDR2-BA20	B04G (4x)	EMI-A37	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03B	ADAC(29)	B04L (1x)	CA-CE26	B03H (1x)	DDR2-BA21	B04G (4x)	EMI-A38	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03C	ADAC(30)	B04L (1x)	CA-CE27	B03H (1x)	DDR2-BA22	B04G (4x)	EMI-A39	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03D	ADAC(31)	B04L (1x)	CA-CE28	B03H (1x)	DDR2-BA23	B04G (4x)	EMI-A40	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03E	ADAC(32)	B04L (1x)	CA-CE29	B03H (1x)	DDR2-BA24	B04G (4x)	EMI-A41	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03F	ADAC(33)	B04L (1x)	CA-CE30	B03H (1x)	DDR2-BA25	B04G (4x)	EMI-A42	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03G	ADAC(34)	B04L (1x)	CA-CE31	B03H (1x)	DDR2-BA26	B04G (4x)	EMI-A43	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03H	ADAC(35)	B04L (1x)	CA-CE32	B03H (1x)	DDR2-BA27	B04G (4x)	EMI-A44	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03A	ADAC(36)	B04L (1x)	CA-CE33	B03H (1x)	DDR2-BA28	B04G (4x)	EMI-A45	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03B	ADAC(37)	B04L (1x)	CA-CE34	B03H (1x)	DDR2-BA29	B04G (4x)	EMI-A46	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03C	ADAC(38)	B04L (1x)	CA-CE35	B03H (1x)	DDR2-BA30	B04G (4x)	EMI-A47	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03D	ADAC(39)	B04L (1x)	CA-CE36	B03H (1x)	DDR2-BA31	B04G (4x)	EMI-A48	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03E	ADAC(40)	B04L (1x)	CA-CE37	B03H (1x)	DDR2-BA32	B04G (4x)	EMI-A49	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03F	ADAC(41)	B04L (1x)	CA-CE38	B03H (1x)	DDR2-BA33	B04G (4x)	EMI-A50	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03G	ADAC(42)	B04L (1x)	CA-CE39	B03H (1x)	DDR2-BA34	B04G (4x)	EMI-A51	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03H	ADAC(43)	B04L (1x)	CA-CE40	B03H (1x)	DDR2-BA35	B04G (4x)	EMI-A52	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03A	ADAC(44)	B04L (1x)	CA-CE41	B03H (1x)	DDR2-BA36	B04G (4x)	EMI-A53	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03B	ADAC(45)	B04L (1x)	CA-CE42	B03H (1x)	DDR2-BA37	B04G (4x)	EMI-A54	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03C	ADAC(46)	B04L (1x)	CA-CE43	B03H (1x)	DDR2-BA38	B04G (4x)	EMI-A55	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03D	ADAC(47)	B04L (1x)	CA-CE44	B03H (1x)	DDR2-BA39	B04G (4x)	EMI-A56	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03E	ADAC(48)	B04L (1x)	CA-CE45	B03H (1x)	DDR2-BA40	B04G (4x)	EMI-A57	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03F	ADAC(49)	B04L (1x)	CA-CE46	B03H (1x)	DDR2-BA41	B04G (4x)	EMI-A58	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03G	ADAC(50)	B04L (1x)	CA-CE47	B03H (1x)	DDR2-BA42	B04G (4x)	EMI-A59	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03H	ADAC(51)	B04L (1x)	CA-CE48	B03H (1x)	DDR2-BA43	B04G (4x)	EMI-A60	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03A	ADAC(52)	B04L (1x)	CA-CE49	B03H (1x)	DDR2-BA44	B04G (4x)	EMI-A61	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03B	ADAC(53)	B04L (1x)	CA-CE50	B03H (1x)	DDR2-BA45	B04G (4x)	EMI-A62	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03C	ADAC(54)	B04L (1x)	CA-CE51	B03H (1x)	DDR2-BA46	B04G (4x)	EMI-A63	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03D	ADAC(55)	B04L (1x)	CA-CE52	B03H (1x)	DDR2-BA47	B04G (4x)	EMI-A64	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03E	ADAC(56)	B04L (1x)	CA-CE53	B03H (1x)	DDR2-BA48	B04G (4x)	EMI-A65	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03F	ADAC(57)	B04L (1x)	CA-CE54	B03H (1x)	DDR2-BA49	B04G (4x)	EMI-A66	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03G	ADAC(58)	B04L (1x)	CA-CE55	B03H (1x)	DDR2-BA50	B04G (4x)	EMI-A67	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03H	ADAC(59)	B04L (1x)	CA-CE56	B03H (1x)	DDR2-BA51	B04G (4x)	EMI-A68	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03A	ADAC(60)	B04L (1x)	CA-CE57	B03H (1x)	DDR2-BA52	B04G (4x)	EMI-A69	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03B	ADAC(61)	B04L (1x)	CA-CE58	B03H (1x)	DDR2-BA53	B04G (4x)	EMI-A70	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03C	ADAC(62)	B04L (1x)	CA-CE59	B03H (1x)	DDR2-BA54	B04G (4x)	EMI-A71	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03D	ADAC(63)	B04L (1x)	CA-CE60	B03H (1x)	DDR2-BA55	B04G (4x)	EMI-A72	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03E	ADAC(64)	B04L (1x)	CA-CE61	B03H (1x)	DDR2-BA56	B04G (4x)	EMI-A73	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03F	ADAC(65)	B04L (1x)	CA-CE62	B03H (1x)	DDR2-BA57	B04G (4x)	EMI-A74	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03G	ADAC(66)	B04L (1x)	CA-CE63	B03H (1x)	DDR2-BA58	B04G (4x)	EMI-A75	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03H	ADAC(67)	B04L (1x)	CA-CE64	B03H (1x)	DDR2-BA59	B04G (4x)	EMI-A76	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03A	ADAC(68)	B04L (1x)	CA-CE65	B03H (1x)	DDR2-BA60	B04G (4x)	EMI-A77	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03B	ADAC(69)	B04L (1x)	CA-CE66	B03H (1x)	DDR2-BA61	B04G (4x)	EMI-A78	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03C	ADAC(70)	B04L (1x)	CA-CE67	B03H (1x)	DDR2-BA62	B04G (4x)	EMI-A79	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03D	ADAC(71)	B04L (1x)	CA-CE68	B03H (1x)	DDR2-BA63	B04G (4x)	EMI-A80	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03E	ADAC(72)	B04L (1x)	CA-CE69	B03H (1x)	DDR2-BA64	B04G (4x)	EMI-A81	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03F	ADAC(73)	B04L (1x)	CA-CE70	B03H (1x)	DDR2-BA65	B04G (4x)	EMI-A82	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03G	ADAC(74)	B04L (1x)	CA-CE71	B03H (1x)	DDR2-BA66	B04G (4x)	EMI-A83	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03H	ADAC(75)	B04L (1x)	CA-CE72	B03H (1x)	DDR2-BA67	B04G (4x)	EMI-A84	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03A	ADAC(76)	B04L (1x)	CA-CE73	B03H (1x)	DDR2-BA68	B04G (4x)	EMI-A85	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03B	ADAC(77)	B04L (1x)	CA-CE74	B03H (1x)	DDR2-BA69	B04G (4x)	EMI-A86	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03C	ADAC(78)	B04L (1x)	CA-CE75	B03H (1x)	DDR2-BA70	B04G (4x)	EMI-A87	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03D	ADAC(79)	B04L (1x)	CA-CE76	B03H (1x)	DDR2-BA71	B04G (4x)	EMI-A88	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03E	ADAC(80)	B04L (1x)	CA-CE77	B03H (1x)	DDR2-BA72	B04G (4x)	EMI-A89	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03F	ADAC(81)	B04L (1x)	CA-CE78	B03H (1x)	DDR2-BA73	B04G (4x)	EMI-A90	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03G	ADAC(82)	B04L (1x)	CA-CE79	B03H (1x)	DDR2-BA74	B04G (4x)	EMI-A91	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03H	ADAC(83)	B04L (1x)	CA-CE80	B03H (1x)	DDR2-BA75	B04G (4x)	EMI-A92	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03A	ADAC(84)	B04L (1x)	CA-CE81	B03H (1x)	DDR2-BA76	B04G (4x)	EMI-A93	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03B	ADAC(85)	B04L (1x)	CA-CE82	B03H (1x)	DDR2-BA77	B04G (4x)	EMI-A94	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03C	ADAC(86)	B04L (1x)	CA-CE83	B03H (1x)	DDR2-BA78	B04G (4x)	EMI-A95	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03D	ADAC(87)	B04L (1x)	CA-CE84	B03H (1x)	DDR2-BA79	B04G (4x)	EMI-A96	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03E	ADAC(88)	B04L (1x)	CA-CE85	B03H (1x)	DDR2-BA80	B04G (4x)	EMI-A97	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03F	ADAC(89)	B04L (1x)	CA-CE86	B03H (1x)	DDR2-BA81	B04G (4x)	EMI-A98	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03G	ADAC(90)	B04L (1x)	CA-CE87	B03H (1x)	DDR2-BA82	B04G (4x)	EMI-A99	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03H	ADAC(91)	B04L (1x)	CA-CE88	B03H (1x)	DDR2-BA83	B04G (4x)	EMI-A100	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03A	ADAC(92)	B04L (1x)	CA-CE89	B03H (1x)	DDR2-BA84	B04G (4x)	EMI-A101	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03B	ADAC(93)	B04L (1x)	CA-CE90	B03H (1x)	DDR2-BA85	B04G (4x)	EMI-A102	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03C	ADAC(94)	B04L (1x)	CA-CE91	B03H (1x)	DDR2-BA86	B04G (4x)	EMI-A103	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03D	ADAC(95)	B04L (1x)	CA-CE92	B03H (1x)	DDR2-BA87	B04G (4x)	EMI-A104	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03E	ADAC(96)	B04L (1x)	CA-CE93	B03H (1x)	DDR2-BA88	B04G (4x)	EMI-A105	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03F	ADAC(97)	B04L (1x)	CA-CE94	B03H (1x)	DDR2-BA89	B04G (4x)	EMI-A106	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03G	ADAC(98)	B04L (1x)	CA-CE95	B03H (1x)	DDR2-BA90	B04G (4x)	EMI-A107	B03B (2x)	JTAG-TRSTn-ST	B02C (1x)
+12V	B03H	ADAC(99)	B04L (1x)	CA-CE96	B03H (1x)	DDR2-BA91	B04G (4x)	EMI-A108	B03B (2x)	JTAG-TRSTn-ST	B02A (1x)
+12V	B03A	ADAC(100)	B04L (1x)	CA-CE97	B03H (1x)	DDR2-					

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SSB: SRP List Part 2

Netname	Diagram	PCIA-D10	B08A (1X)	PCIA-D06	B08B (1X)	PCMCIA-D4	B03H (1X)	RX2-	B08G (1X)	TX2D+	B08E (2X)
LMI-A(0)	B03C (3X)	PCIA-D10	B08B (1X)	PCIA-D06	B08C (1X)	PCMCIA-D4	B03C (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-A(1)	B03C (3X)	PCIA-D10	B08C (1X)	PCIA-D06	B08C (1X)	PCMCIA-D5	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-A(10)	B03C (3X)	PCIA-D11	B04F (1X)	PCIA-D07	B08G (1X)	PCMCIA-D5	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-A(11)	B03C (3X)	PCIA-D11	B08A (1X)	PCIA-D07	B08A (1X)	PCMCIA-D6	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-A(12)	B03C (3X)	PCIA-D11	B08B (1X)	PCIA-D07	B08C (1X)	PCMCIA-D6	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-A(2)	B03C (3X)	PCIA-D11	B08C (1X)	PCIA-D07	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-A(3)	B03C (3X)	PCIA-D12	B04F (1X)	PCIA-D08	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-A(4)	B03C (3X)	PCIA-D12	B08A (1X)	PCIA-D08	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-A(5)	B03C (3X)	PCIA-D12	B08B (1X)	PCIA-D08	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-A(6)	B03C (3X)	PCIA-D12	B08C (1X)	PCIA-D08	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-A(7)	B03C (3X)	PCIA-D12	B08D (1X)	PCIA-D08	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-A(8)	B03C (3X)	PCIA-D13	B08A (1X)	PCIA-D09	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-A(9)	B03C (3X)	PCIA-D13	B08B (1X)	PCIA-D09	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-B(0)	B03C (3X)	PCIA-D13	B08C (1X)	PCIA-D09	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-B(1)	B03C (3X)	PCIA-D13	B08D (1X)	PCIA-D09	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-B(2)	B03C (3X)	PCIA-D13	B08E (1X)	PCIA-D09	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-B(3)	B03C (3X)	PCIA-D13	B08F (1X)	PCIA-D09	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-B(4)	B03C (3X)	PCIA-D13	B08A (1X)	PCIA-D09	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-B(5)	B03C (3X)	PCIA-D13	B08B (1X)	PCIA-D09	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-B(6)	B03C (3X)	PCIA-D13	B08C (1X)	PCIA-D09	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-B(7)	B03C (3X)	PCIA-D13	B08D (1X)	PCIA-D09	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-B(8)	B03C (3X)	PCIA-D13	B08E (1X)	PCIA-D09	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-B(9)	B03C (3X)	PCIA-D13	B08F (1X)	PCIA-D09	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-B(10)	B03C (3X)	PCIA-D13	B08A (1X)	PCIA-D09	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-B(11)	B03C (3X)	PCIA-D13	B08B (1X)	PCIA-D09	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-B(12)	B03C (3X)	PCIA-D13	B08C (1X)	PCIA-D09	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-B(13)	B03C (3X)	PCIA-D13	B08D (1X)	PCIA-D09	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-B(14)	B03C (3X)	PCIA-D13	B08E (1X)	PCIA-D09	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-B(15)	B03C (3X)	PCIA-D13	B08F (1X)	PCIA-D09	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-B(16)	B03C (3X)	PCIA-D13	B08A (1X)	PCIA-D09	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-B(17)	B03C (3X)	PCIA-D13	B08B (1X)	PCIA-D09	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-B(18)	B03C (3X)	PCIA-D13	B08C (1X)	PCIA-D09	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-B(19)	B03C (3X)	PCIA-D13	B08D (1X)	PCIA-D09	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(0)	B03C (2X)	PCIA-D14	B08A (1X)	PCIA-D10	B08B (1X)	PCMCIA-D4	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(1)	B03C (2X)	PCIA-D14	B08B (1X)	PCIA-D10	B08C (1X)	PCMCIA-D5	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(10)	B03C (2X)	PCIA-D14	B08C (1X)	PCIA-D10	B08C (1X)	PCMCIA-D5	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(11)	B03C (2X)	PCIA-D14	B08D (1X)	PCIA-D10	B08C (1X)	PCMCIA-D6	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(12)	B03C (2X)	PCIA-D14	B08E (1X)	PCIA-D10	B08C (1X)	PCMCIA-D6	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(13)	B03C (2X)	PCIA-D14	B08F (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(14)	B03C (2X)	PCIA-D14	B08A (1X)	PCIA-D10	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(15)	B03C (2X)	PCIA-D14	B08B (1X)	PCIA-D10	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(16)	B03C (2X)	PCIA-D14	B08C (1X)	PCIA-D10	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(17)	B03C (2X)	PCIA-D14	B08D (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(18)	B03C (2X)	PCIA-D14	B08E (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(19)	B03C (2X)	PCIA-D14	B08F (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(20)	B03C (2X)	PCIA-D14	B08A (1X)	PCIA-D10	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(21)	B03C (2X)	PCIA-D14	B08B (1X)	PCIA-D10	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(22)	B03C (2X)	PCIA-D14	B08C (1X)	PCIA-D10	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(23)	B03C (2X)	PCIA-D14	B08D (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(24)	B03C (2X)	PCIA-D14	B08E (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(25)	B03C (2X)	PCIA-D14	B08F (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(26)	B03C (2X)	PCIA-D14	B08A (1X)	PCIA-D10	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(27)	B03C (2X)	PCIA-D14	B08B (1X)	PCIA-D10	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(28)	B03C (2X)	PCIA-D14	B08C (1X)	PCIA-D10	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(29)	B03C (2X)	PCIA-D14	B08D (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(30)	B03C (2X)	PCIA-D14	B08E (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(31)	B03C (2X)	PCIA-D14	B08F (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(32)	B03C (2X)	PCIA-D14	B08A (1X)	PCIA-D10	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(33)	B03C (2X)	PCIA-D14	B08B (1X)	PCIA-D10	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(34)	B03C (2X)	PCIA-D14	B08C (1X)	PCIA-D10	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(35)	B03C (2X)	PCIA-D14	B08D (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(36)	B03C (2X)	PCIA-D14	B08E (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(37)	B03C (2X)	PCIA-D14	B08F (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(38)	B03C (2X)	PCIA-D14	B08A (1X)	PCIA-D10	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(39)	B03C (2X)	PCIA-D14	B08B (1X)	PCIA-D10	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(40)	B03C (2X)	PCIA-D14	B08C (1X)	PCIA-D10	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(41)	B03C (2X)	PCIA-D14	B08D (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(42)	B03C (2X)	PCIA-D14	B08E (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(43)	B03C (2X)	PCIA-D14	B08F (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(44)	B03C (2X)	PCIA-D14	B08A (1X)	PCIA-D10	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(45)	B03C (2X)	PCIA-D14	B08B (1X)	PCIA-D10	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(46)	B03C (2X)	PCIA-D14	B08C (1X)	PCIA-D10	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(47)	B03C (2X)	PCIA-D14	B08D (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(48)	B03C (2X)	PCIA-D14	B08E (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(49)	B03C (2X)	PCIA-D14	B08F (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(50)	B03C (2X)	PCIA-D14	B08A (1X)	PCIA-D10	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(51)	B03C (2X)	PCIA-D14	B08B (1X)	PCIA-D10	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(52)	B03C (2X)	PCIA-D14	B08C (1X)	PCIA-D10	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(53)	B03C (2X)	PCIA-D14	B08D (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(54)	B03C (2X)	PCIA-D14	B08E (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(55)	B03C (2X)	PCIA-D14	B08F (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(56)	B03C (2X)	PCIA-D14	B08A (1X)	PCIA-D10	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(57)	B03C (2X)	PCIA-D14	B08B (1X)	PCIA-D10	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(58)	B03C (2X)	PCIA-D14	B08C (1X)	PCIA-D10	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(59)	B03C (2X)	PCIA-D14	B08D (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(60)	B03C (2X)	PCIA-D14	B08E (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(61)	B03C (2X)	PCIA-D14	B08F (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(62)	B03C (2X)	PCIA-D14	B08A (1X)	PCIA-D10	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(63)	B03C (2X)	PCIA-D14	B08B (1X)	PCIA-D10	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(64)	B03C (2X)	PCIA-D14	B08C (1X)	PCIA-D10	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(65)	B03C (2X)	PCIA-D14	B08D (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(66)	B03C (2X)	PCIA-D14	B08E (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(67)	B03C (2X)	PCIA-D14	B08F (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(68)	B03C (2X)	PCIA-D14	B08A (1X)	PCIA-D10	B08G (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(69)	B03C (2X)	PCIA-D14	B08B (1X)	PCIA-D10	B08A (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(70)	B03C (2X)	PCIA-D14	B08C (1X)	PCIA-D10	B08B (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(71)	B03C (2X)	PCIA-D14	B08D (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B04H (1X)	TX2E+	B08E (2X)
LMI-D(72)	B03C (2X)	PCIA-D14	B08E (1X)	PCIA-D10	B08C (1X)	PCMCIA-D7	B03H (1X)	RX2+	B08G (1X)	TX2E+	B08E (2X)
LMI-D(73)	B03C (2X)	PCIA-D14	B08								

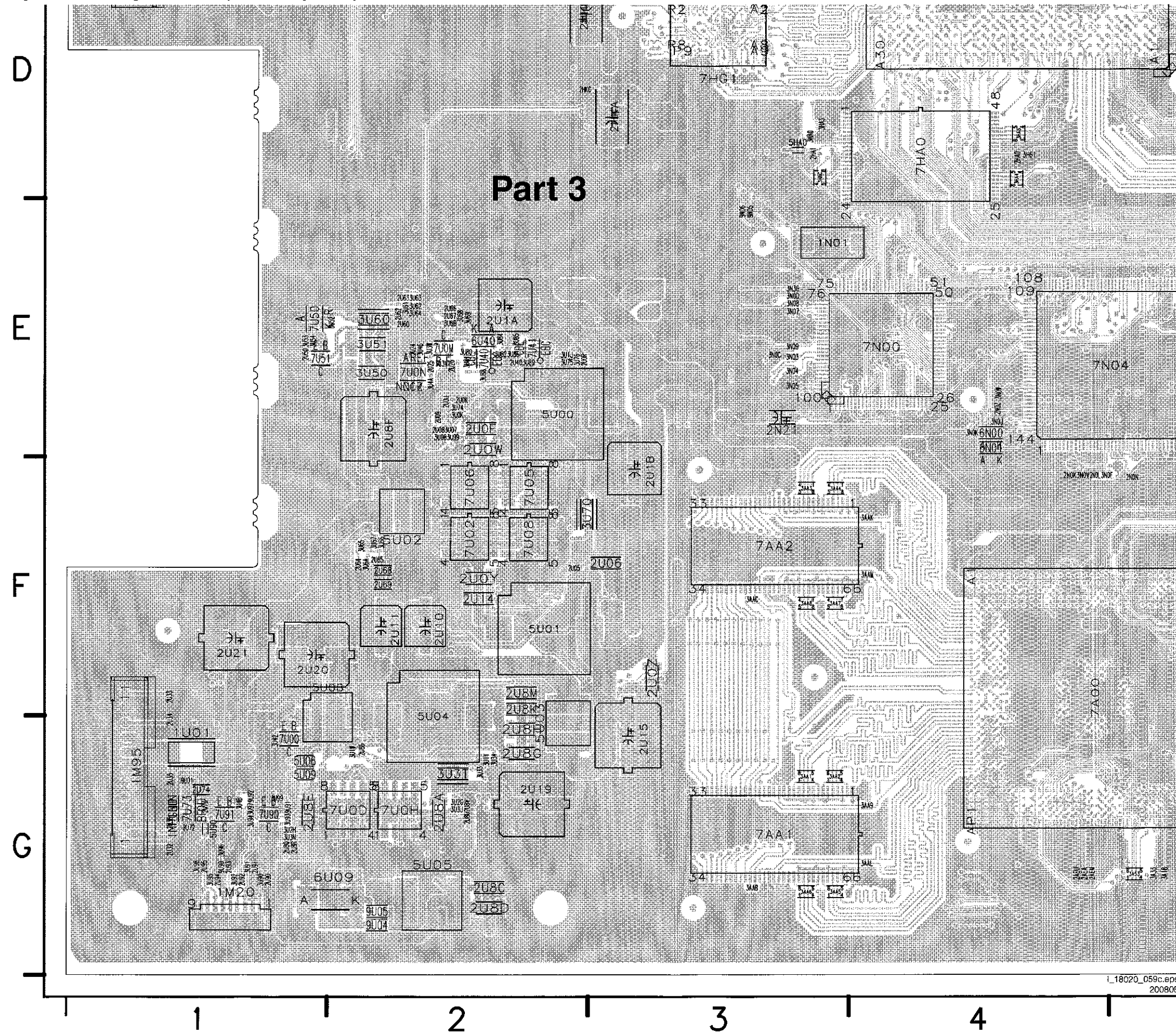
Layout Small Signal Board (Overview Top Side)



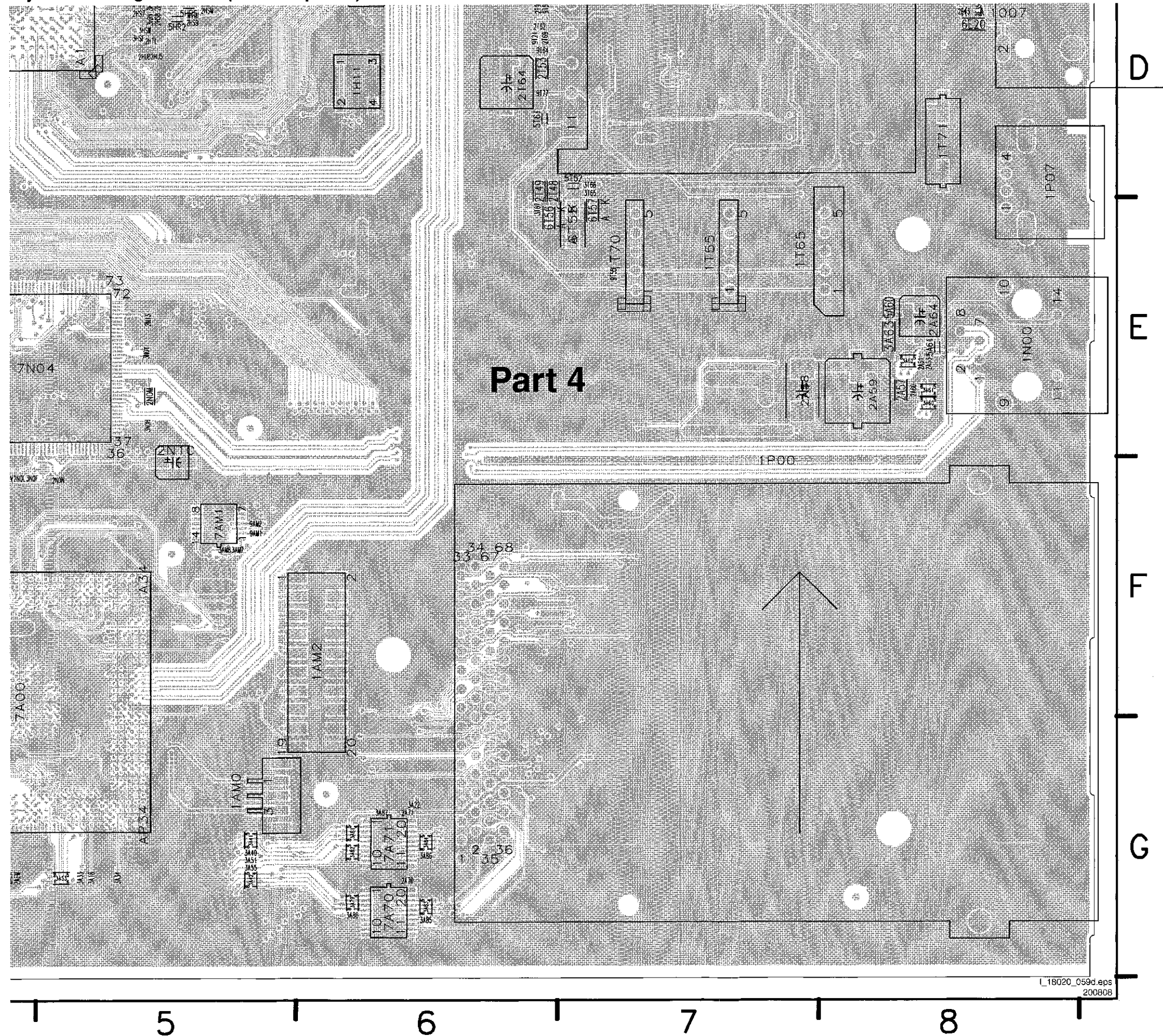
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Layout Small Signal Board (Part 3 Top Side)

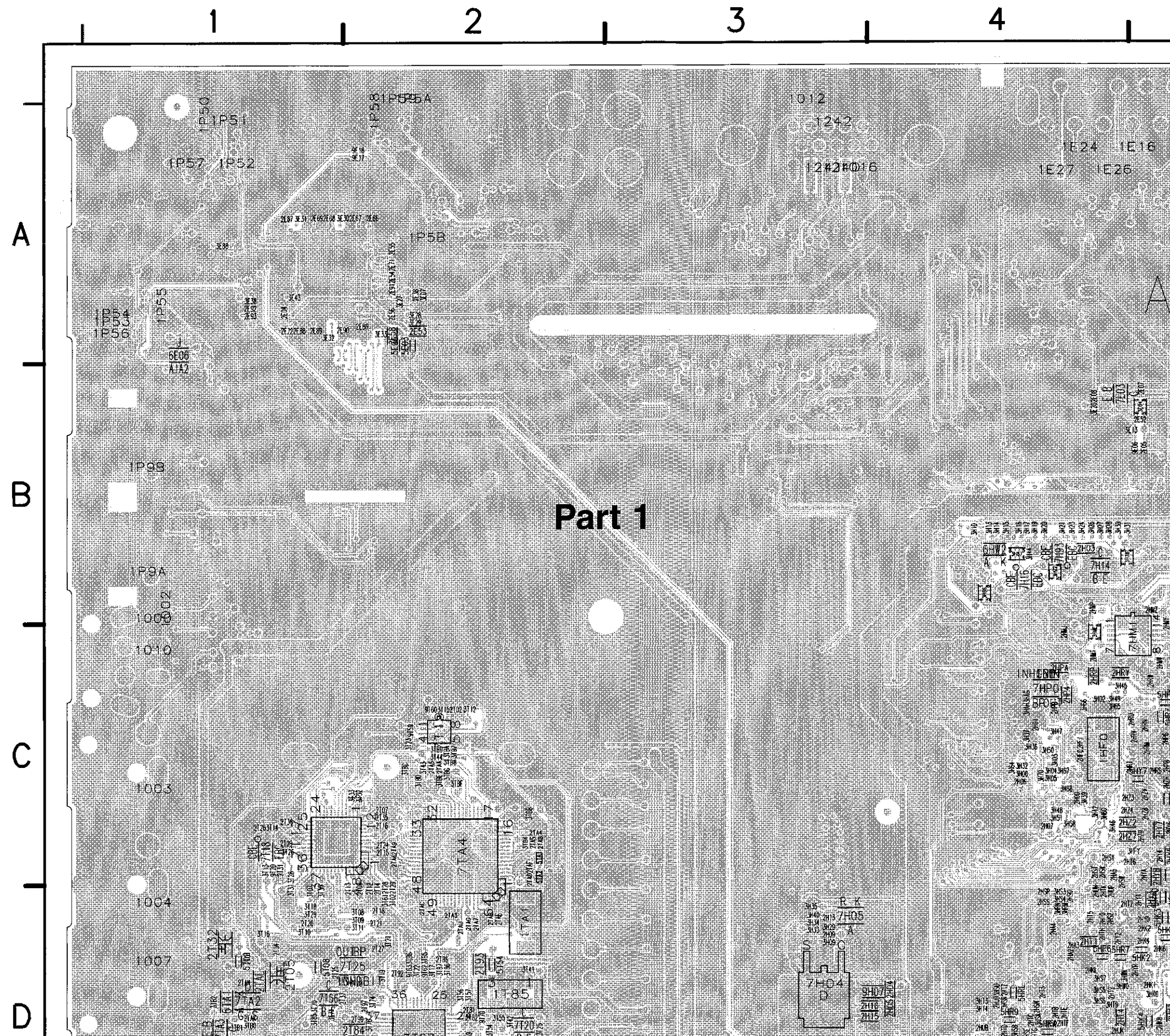


Layout Small Signal Board (Part 4 Top Side)

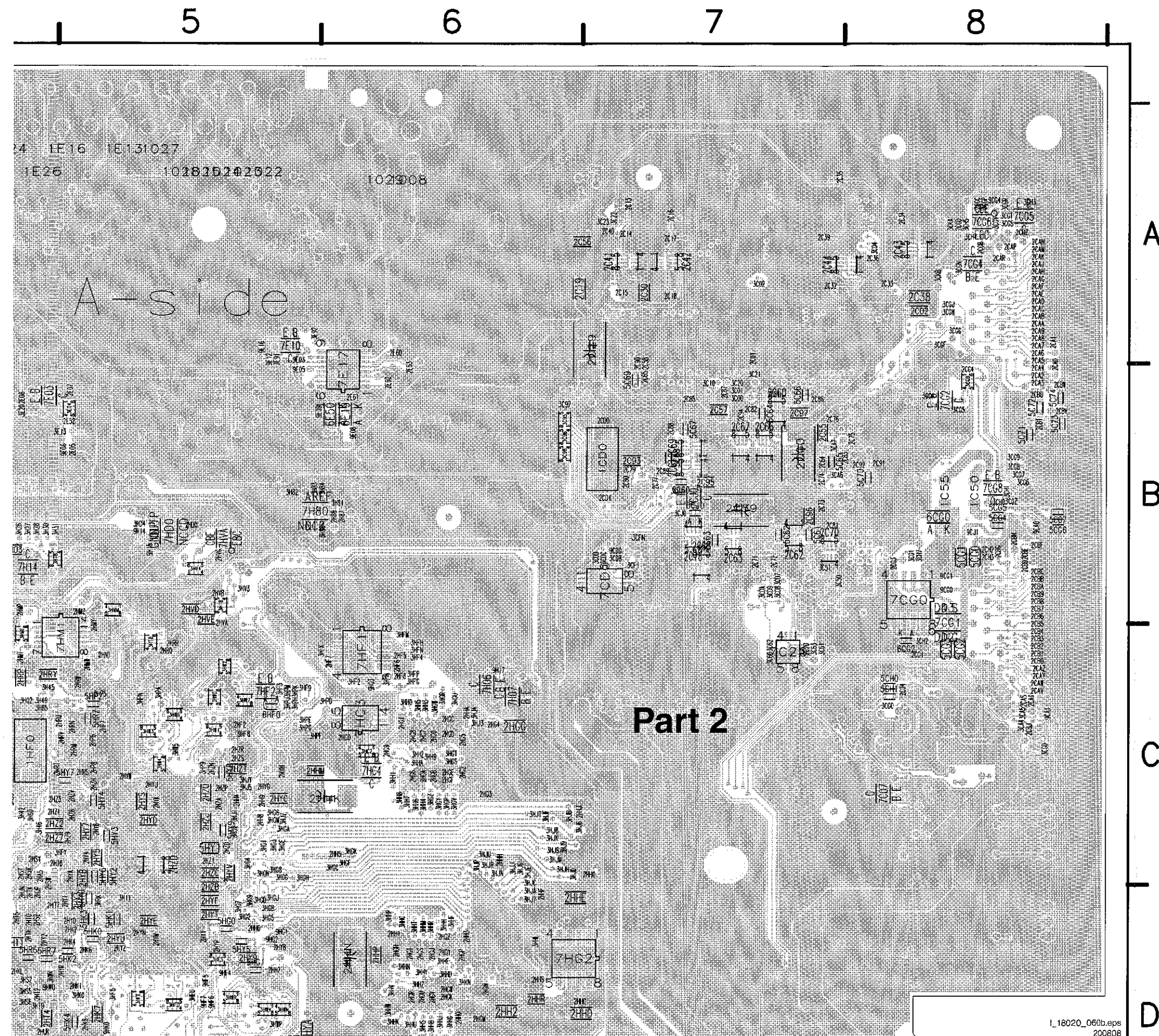


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Layout Small Signal Board (Part 1 Bottom Side)



Layout Small Signal Board (Part 2 Bottom Side)

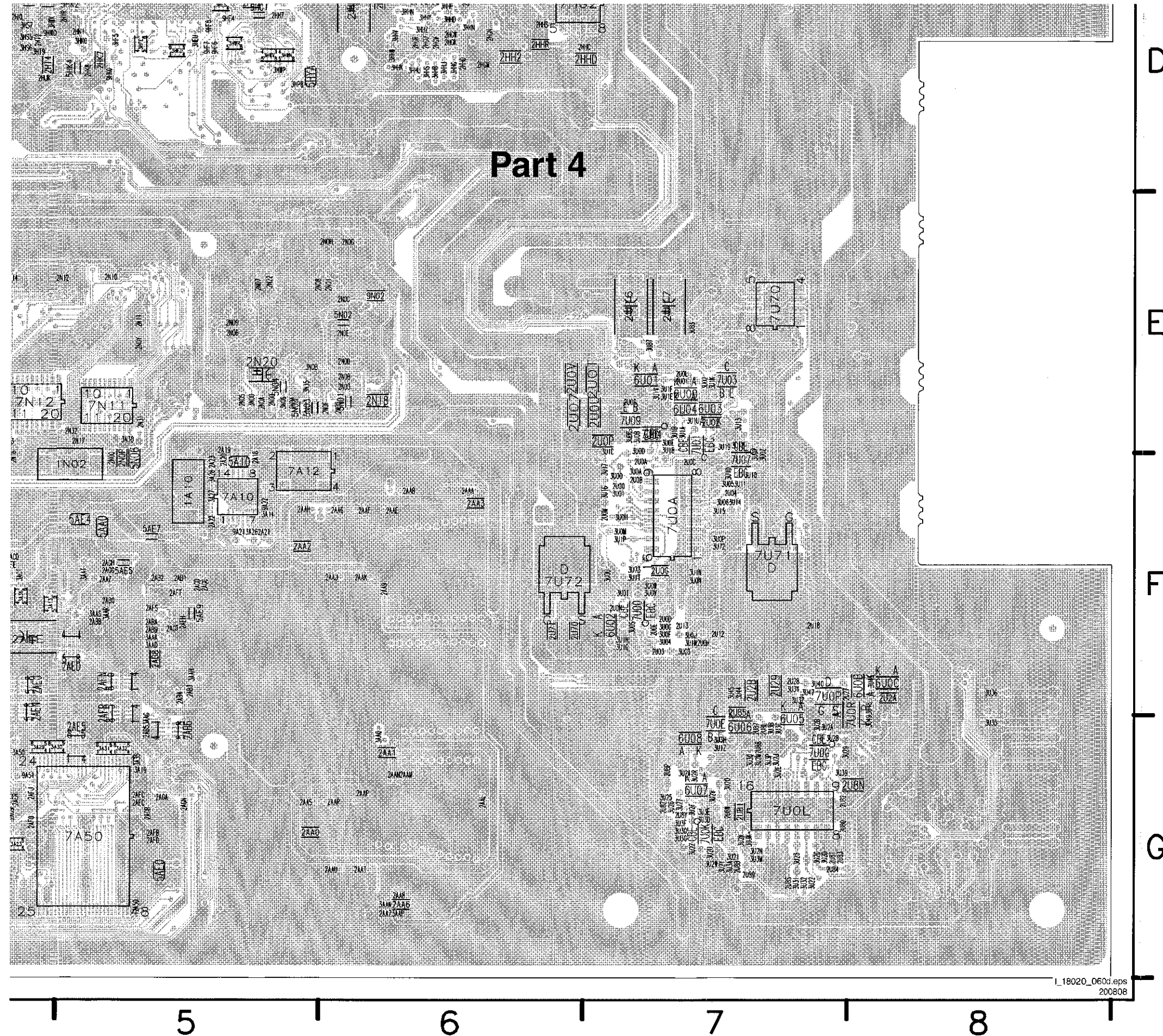


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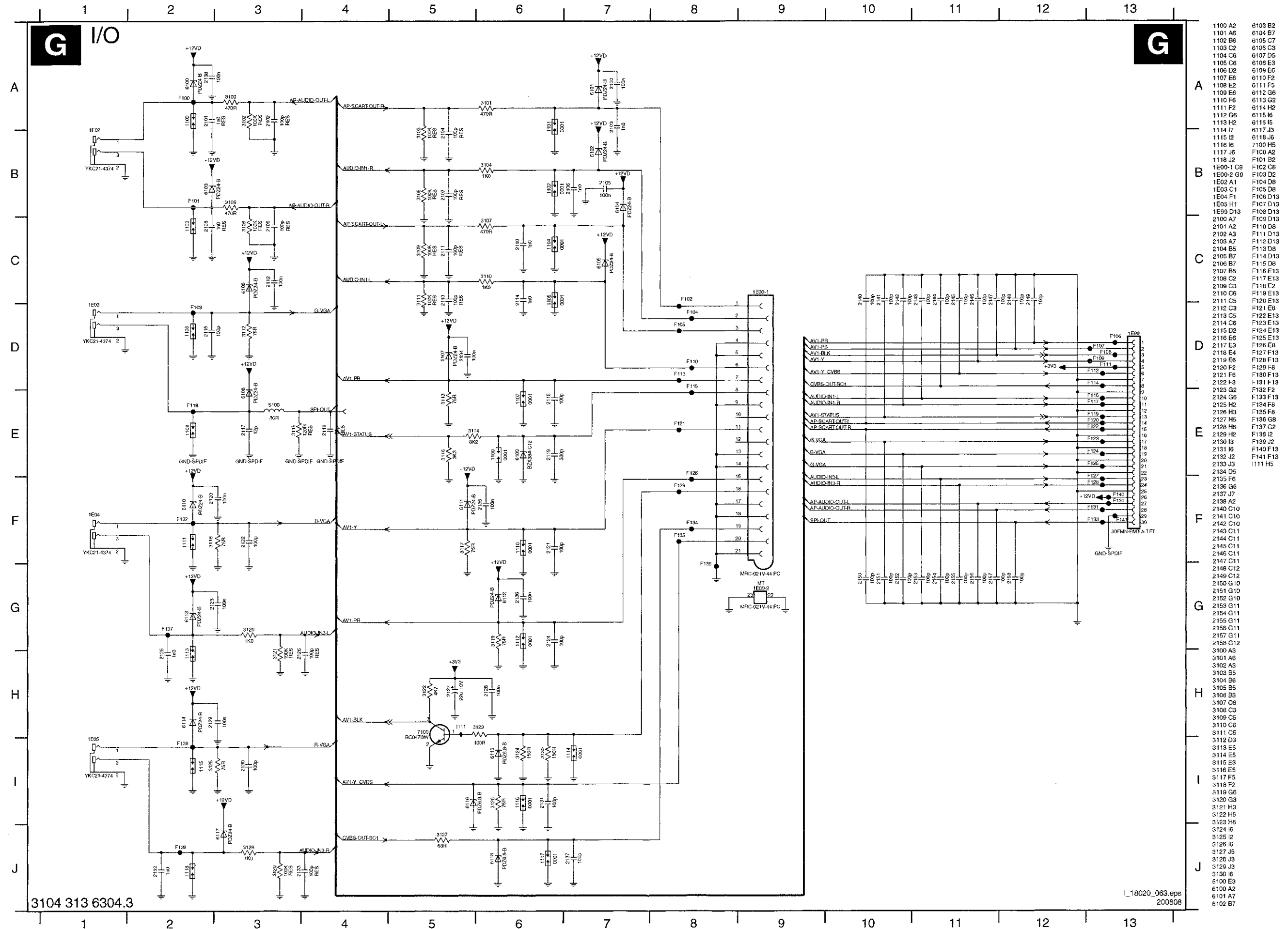


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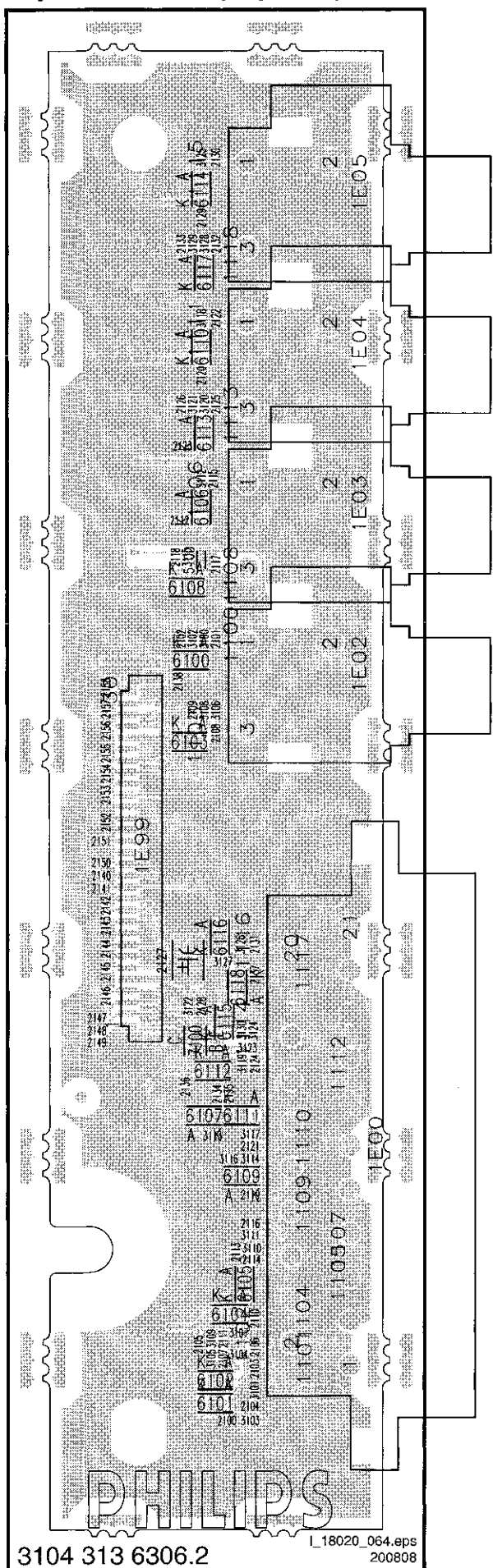
Layout Small Signal Board (Part 4 Bottom Side)



I/O Panel

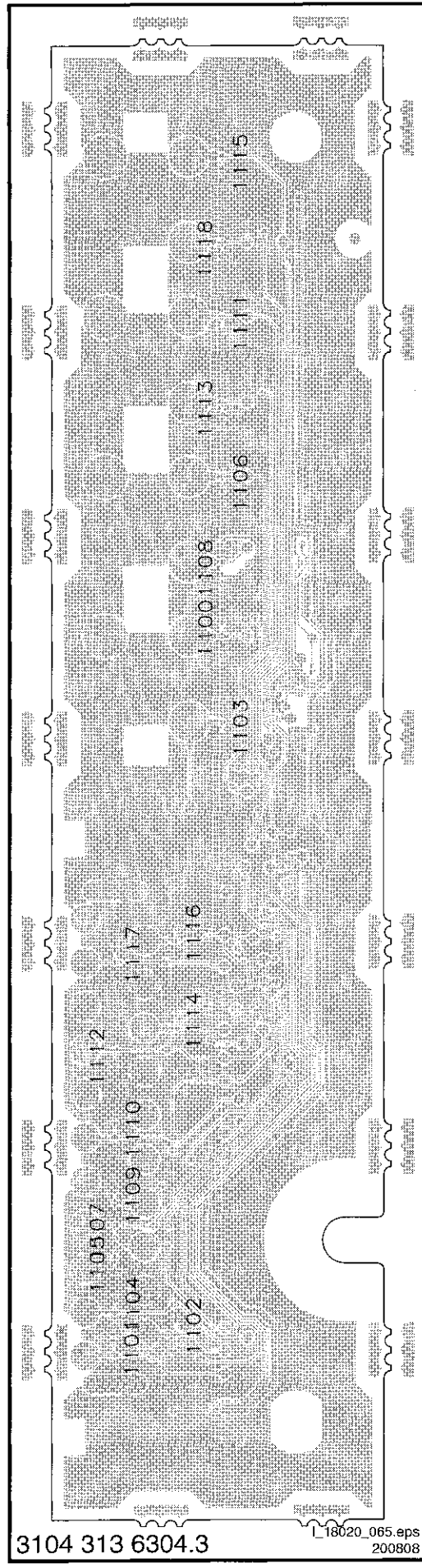


Layout I/O Panel (Top Side)

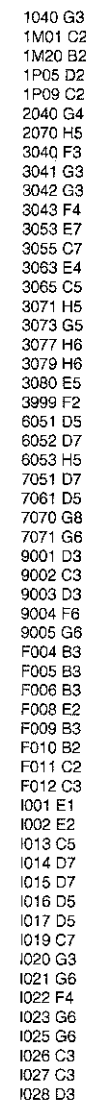


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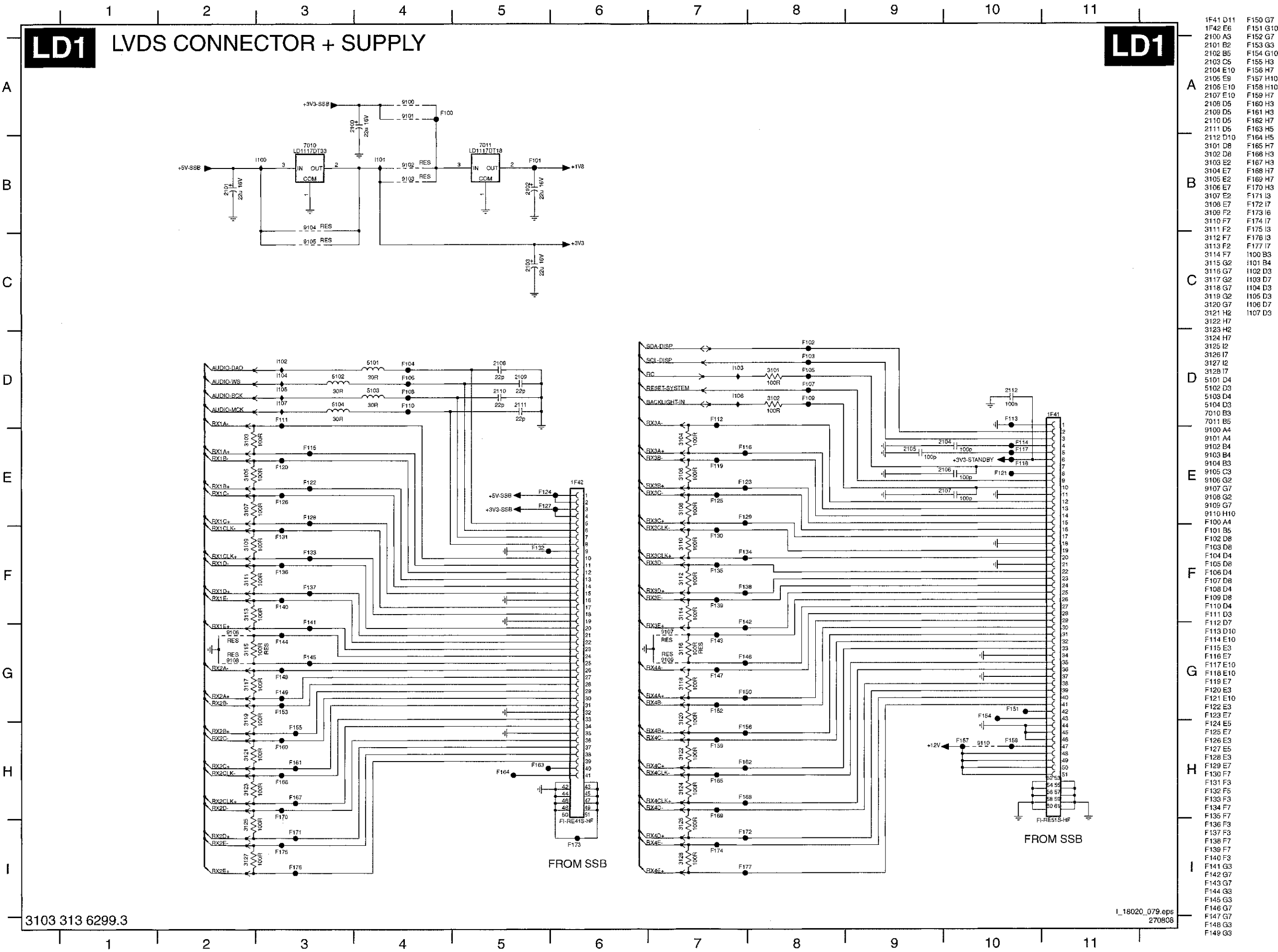
Layout I/O Panel (Bottom Side)



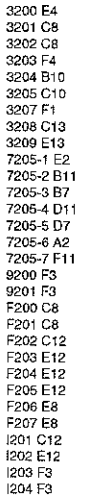
J IR LED PANEL



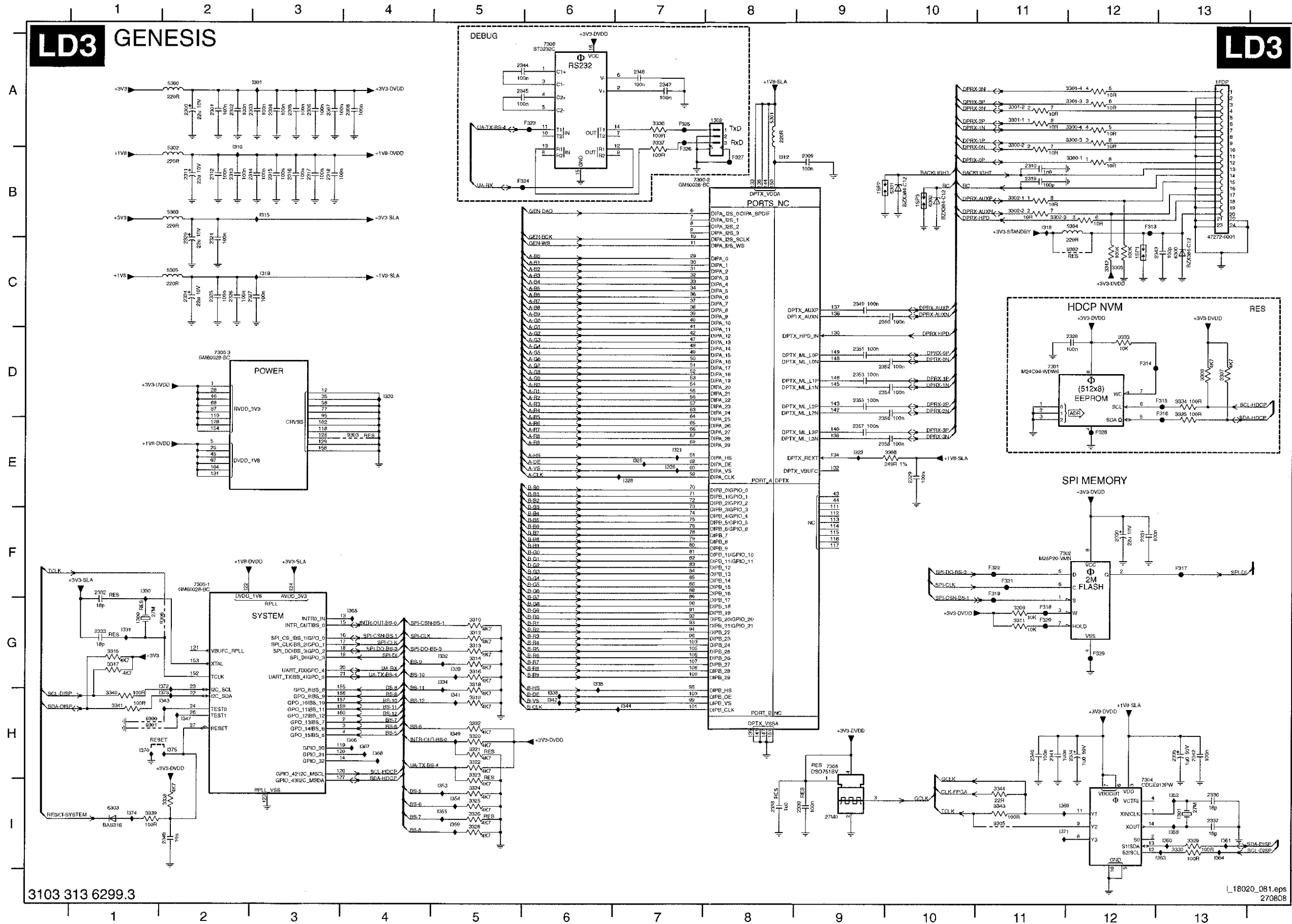
LVDS2DP Panel: Connector & Supply



LD2 FPGA: I/O BANKS



LVDS2DP Panel: Genesis



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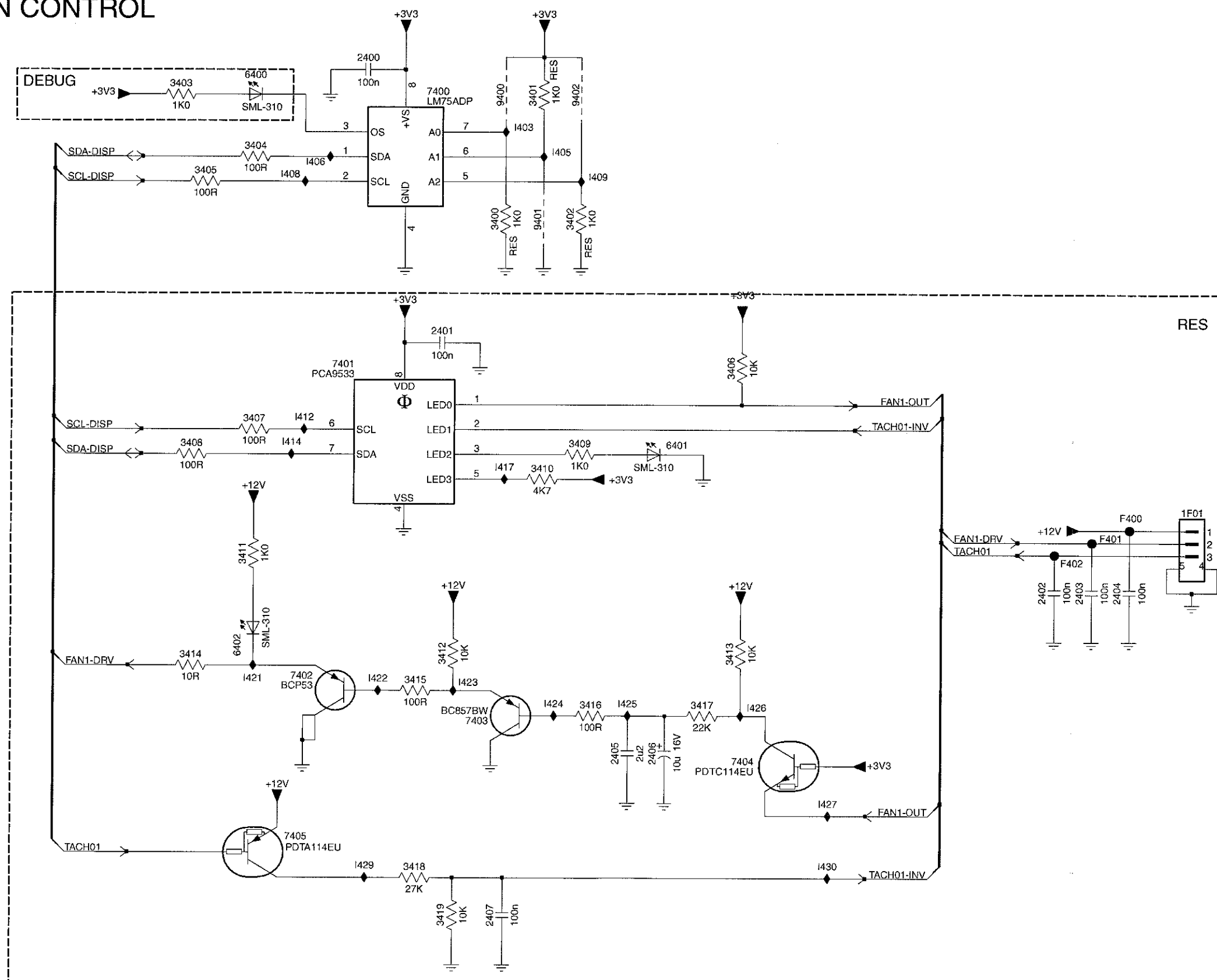
LG

LH

LVDS2DP Panel: Fan Control

LD4 FAN CONTROL

LD4

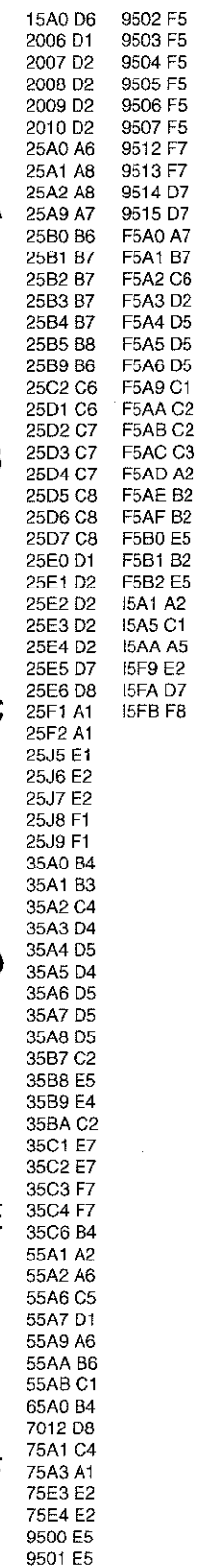


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2412 D3
2413 D4
2414 D4
2415 D5
2416 D5
2417 E6
2418 E3
2419 E3
2420 E6

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270808

LD5 FPGA: CONTROL
+3V3



LVDS2DP: SRP List

Netname	Diagram						
+12V	LD1	AUDIO-DAO	LD1 (1x)	BS-6	LD3 (1x)	RX3C-	LD2 (1x)
+12V	LD4	AUDIO-DAO	LD5 (2x)	BS-7	LD3 (1x)	RX3C+	LD1 (1x)
+1V2-FPGA	LD2	AUDIO-IN-BCK	LD2 (1x)	BS-8	LD3 (1x)	RX3C+	LD2 (1x)
+1V2-FPGA	LD6	AUDIO-IN-BCK	LD5 (1x)	BS-9	LD3 (1x)	RX3CLK-	LD1 (1x)
+1V2-PLL	LD2	AUDIO-IN-DAO	LD2 (1x)	B-VS	LD2 (1x)	RX3CLK-	LD2 (1x)
+1V2-PLL	LD6	AUDIO-IN-DAO	LD5 (1x)	B-VS	LD3 (1x)	RX3CLK+	LD1 (1x)
+1V2-STAB	LD5	AUDIO-IN-MCK	LD2 (1x)	CLK-FPGA	LD2 (1x)	RX3CLK+	LD2 (1x)
+1V8	LD1	AUDIO-IN-MCK	LD5 (1x)	CLK-FPGA	LD3 (1x)	RX3D-	LD1 (1x)
+1V8	LD3	AUDIO-IN-WS	LD2 (1x)	CONF-DONE	LD2 (1x)	RX3D-	LD2 (1x)
+1V8	LD5	AUDIO-IN-WS	LD5 (1x)	CONF-DONE	LD5 (1x)	RX3D+	LD1 (1x)
+1V8-DVDD	LD3	AUDIO-MCK	LD1 (1x)	DATA0	LD2 (1x)	RX3D+	LD2 (1x)
+1V8-SLA	LD3	AUDIO-MCK	LD5 (2x)	DATA0	LD5 (1x)	RX3E-	LD1 (1x)
+2V5-L41	LD2	AUDIO-OUT-BCK	LD2 (1x)	DCLK	LD2 (1x)	RX3E-	LD2 (1x)
+2V5-L41	LD6	AUDIO-OUT-BCK	LD5 (1x)	DCLK	LD5 (1x)	RX3E+	LD1 (1x)
+2V5-L51	LD2	AUDIO-OUT-DAO	LD2 (1x)	DPRX-0N	LD3 (2x)	RX3E+	LD2 (1x)
+2V5-L51	LD5	AUDIO-OUT-DAO	LD5 (1x)	DPRX-0P	LD3 (2x)	RX4A-	LD1 (1x)
+2V5-STAB	LD5	AUDIO-OUT-MCK	LD2 (1x)	DPRX-1N	LD3 (2x)	RX4A-	LD2 (1x)
+3V3	LD1	AUDIO-OUT-MCK	LD5 (1x)	DPRX-2N	LD3 (2x)	RX4A+	LD1 (1x)
+3V3	LD3	AUDIO-OUT-WS	LD2 (1x)	DPRX-2P	LD3 (2x)	RX4A+	LD2 (1x)
+3V3	LD4	AUDIO-OUT-WS	LD5 (1x)	DPRX-3N	LD3 (2x)	RX4B-	LD1 (1x)
+3V3	LD5	AUDIO-WS	LD5 (2x)	DPRX-3P	LD3 (2x)	RX4B-	LD2 (1x)
+3V3-DVDD	LD3	A-VS	LD2 (1x)	DPRX-AUXN	LD3 (2x)	RX4B+	LD1 (1x)
+3V3-FPGA	LD2	A-VS	LD3 (1x)	DPRX-AUXP	LD3 (2x)	RX4B+	LD2 (1x)
+3V3-FPGA	LD5	BACKLIGHT	LD3 (1x)	DPRX-HPD	LD3 (2x)	RX4C-	LD1 (1x)
+3V3-SLA	LD3	BACKLIGHT	LD5 (1x)	FAN1-DRV	LD4 (2x)	RX4C-	LD2 (1x)
+3V3-SSB	LD1	BACKLIGHT-IN	LD1 (1x)	FAN1-OUT	LD4 (2x)	RX4C+	LD1 (1x)
+3V3-STANDBY	LD1	BACKLIGHT-IN	LD2 (1x)	GCLK	LD3 (2x)	RX4C+	LD2 (1x)
+3V3-STANDBY	LD3	BACKLIGHT-IN	LD5 (1x)	GEN-BCK	LD3 (1x)	RX4CLK-	LD1 (1x)
+5V-SSB	LD1	BACKLIGHT-OUT	LD2 (1x)	GEN-BCK	LD5 (2x)	RX4CLK-	LD2 (1x)
A-B0	LD2 (1x)	BACKLIGHT-OUT	LD5 (1x)	GEN-DAO	LD3 (1x)	RX4CLK+	LD1 (1x)
A-B0	LD3 (1x)	B-B0	LD2 (1x)	GEN-DAO	LD5 (2x)	RX4D-	LD1 (1x)
A-B1	LD2 (1x)	B-B0	LD3 (1x)	GEN-MCK	LD5 (2x)	RX4D-	LD2 (1x)
A-B1	LD3 (1x)	B-B1	LD2 (1x)	GEN-WS	LD3 (1x)	RX4D+	LD1 (1x)
A-B2	LD2 (1x)	B-B1	LD3 (1x)	GEN-WS	LD5 (2x)	RX4D+	LD2 (1x)
A-B2	LD3 (1x)	B-B2	LD2 (1x)	INTR-OUT-BS-0	LD3 (1x)	RX4E-	LD1 (1x)
A-B3	LD2 (1x)	B-B2	LD3 (1x)	nCONFIG	LD2 (1x)	RX4E-	LD2 (1x)
A-B3	LD3 (1x)	B-B3	LD2 (1x)	nCONFIG	LD5 (1x)	RX4E+	LD1 (1x)
A-B4	LD2 (1x)	B-B3	LD3 (1x)	nCS0	LD2 (1x)	RX4E+	LD2 (1x)
A-B4	LD3 (1x)	B-B4	LD2 (1x)	nCS0	LD5 (1x)	SCL-DISP	LD1 (1x)
A-B5	LD2 (1x)	B-B4	LD3 (1x)	RC	LD1 (1x)	SCL-DISP	LD2 (1x)
A-B5	LD3 (1x)	B-B5	LD2 (1x)	RC	LD3 (1x)	SCL-DISP	LD3 (2x)
A-B6	LD2 (1x)	B-B5	LD3 (1x)	RESET-SYSTEM	LD1 (1x)	SCL-DISP	LD4 (2x)
A-B6	LD3 (1x)	B-B6	LD2 (1x)	RESET-SYSTEM	LD3 (1x)	SCL-HDCP	LD3 (2x)
A-B7	LD2 (1x)	B-B6	LD3 (1x)	RX1A-	LD1 (1x)	SDA-DISP	LD1 (1x)
A-B7	LD3 (1x)	B-B7	LD2 (1x)	RX1A-	LD2 (1x)	SDA-DISP	LD2 (1x)
A-B8	LD2 (1x)	B-B7	LD3 (1x)	RX1A+	LD1 (1x)	SDA-DISP	LD3 (2x)
A-B8	LD3 (1x)	B-B8	LD2 (1x)	RX1A+	LD2 (1x)	SDA-DISP	LD4 (2x)
A-B9	LD2 (1x)	B-B8	LD3 (1x)	RX1B-	LD1 (1x)	SDA-HDCP	LD3 (2x)
A-B9	LD3 (1x)	B-B9	LD2 (1x)	RX1B-	LD2 (1x)	SPI-CLK	LD3 (2x)
A-CLK	LD2 (1x)	B-B9	LD3 (1x)	RX1B+	LD1 (1x)	SPI-CSN-BS-1	LD3 (2x)
A-CLK	LD3 (1x)	B-CLK	LD2 (1x)	RX1B+	LD2 (1x)	SPI-DI	LD3 (2x)
A-DE	LD2 (1x)	B-CLK	LD3 (1x)	RX1C-	LD1 (1x)	SPI-DO-BS-3	LD3 (2x)
A-DE	LD3 (1x)	B-DE	LD2 (1x)	RX1C-	LD2 (1x)	TACH01	LD4 (2x)
A-G0	LD2 (1x)	B-DE	LD3 (1x)	RX1C+	LD1 (1x)	TACH01-INV	LD4 (2x)
A-G0	LD3 (1x)	B-G0	LD2 (1x)	RX1C+	LD2 (1x)	TCK	LD2 (1x)
A-G1	LD2 (1x)	B-G0	LD3 (1x)	RX1CLK-	LD1 (1x)	TCK	LD5 (1x)
A-G1	LD3 (1x)	B-G1	LD2 (1x)	RX1CLK-	LD2 (1x)	TCLK	LD3 (2x)
A-G2	LD2 (1x)	B-G1	LD3 (1x)	RX1CLK+	LD1 (1x)	TDI	LD2 (1x)
A-G2	LD3 (1x)	B-G2	LD2 (1x)	RX1CLK+	LD2 (1x)	TDI	LD5 (1x)
A-G3	LD2 (1x)	B-G2	LD3 (1x)	RX1D-	LD1 (1x)	TDO	LD2 (1x)
A-G3	LD3 (1x)	B-G3	LD2 (1x)	RX1D-	LD2 (1x)	TDO	LD5 (1x)
A-G4	LD2 (1x)	B-G3	LD3 (1x)	RX1D+	LD1 (1x)	TMS	LD2 (1x)
A-G4	LD3 (1x)	B-G4	LD2 (1x)	RX1D+	LD2 (1x)	TMS	LD5 (1x)
A-G5	LD2 (1x)	B-G4	LD3 (1x)	RX1E-	LD1 (1x)	UA-RX	LD3 (2x)
A-G5	LD3 (1x)	B-G5	LD2 (1x)	RX1E-	LD2 (1x)	UA-TX-BS-4	
A-G6	LD2 (1x)	B-G5	LD3 (1x)	RX1E+	LD1 (1x)		
A-G6	LD3 (1x)	B-G6	LD2 (1x)	RX1E+	LD2 (1x)		
A-G7	LD2 (1x)	B-G6	LD3 (1x)	RX2A-	LD1 (1x)		
A-G7	LD3 (1x)	B-G7	LD2 (1x)	RX2A-	LD2 (1x)		
A-G8	LD2 (1x)	B-G7	LD3 (1x)	RX2A+	LD1 (1x)		
A-G8	LD3 (1x)	B-G8	LD2 (1x)	RX2A+	LD2 (1x)		
A-G9	LD2 (1x)	B-G8	LD3 (1x)	RX2B-	LD1 (1x)		
A-G9	LD3 (1x)	B-G9	LD2 (1x)	RX2B-	LD2 (1x)		
A-HS	LD2 (1x)	B-G9	LD3 (1x)	RX2B+	LD1 (1x)		
A-HS	LD3 (1x)	B-HS	LD2 (1x)	RX2B+	LD2 (1x)		
A-R0	LD2 (1x)	B-HS	LD3 (1x)	RX2C-	LD1 (1x)		
A-R0	LD3 (1x)	B-R0	LD2 (1x)	RX2C-	LD2 (1x)		
A-R1	LD2 (1x)	B-R0	LD3 (1x)	RX2C+	LD1 (1x)		
A-R1	LD3 (1x)	B-R1	LD2 (1x)	RX2C+	LD2 (1x)		
A-R2	LD2 (1x)	B-R1	LD3 (1x)	RX2CLK-	LD1 (1x)		
A-R2	LD3 (1x)	B-R2	LD2 (1x)	RX2CLK-	LD2 (1x)		
A-R3	LD2 (1x)	B-R2	LD3 (1x)	RX2CLK+	LD1 (1x)		
A-R3	LD3 (1x)	B-R3	LD2 (1x)	RX2CLK+	LD2 (1x)		
A-R4	LD2 (1x)	B-R3	LD3 (1x)	RX2D-	LD1 (1x)		
A-R4	LD3 (1x)	B-R4	LD2 (1x)	RX2D-	LD2 (1x)		
A-R5	LD2 (1x)	B-R4	LD3 (1x)	RX2D+	LD1 (1x)		
A-R5	LD3 (1x)	B-R5	LD2 (1x)	RX2D+	LD2 (1x)		
A-R6	LD2 (1x)	B-R5	LD3 (1x)	RX2E-	LD1 (1x)		
A-R6	LD3 (1x)	B-R6	LD2 (1x)	RX2E-	LD2 (1x)		
A-R7	LD2 (1x)	B-R6	LD3 (1x)	RX2E+	LD1 (1x)		
A-R7	LD3 (1x)	B-R7	LD2 (1x)	RX2E+	LD2 (1x)		
A-R8	LD2 (1x)	B-R7	LD3 (1x)	RX3A-	LD1 (1x)		
A-R8	LD3 (1x)	B-R8	LD2 (1x)	RX3A-	LD2 (1x)		
A-R9	LD2 (1x)	B-R8	LD3 (1x)	RX3A+	LD1 (1x)		
A-R9	LD3 (1x)	B-R9	LD2 (1x)	RX3A+	LD2 (1x)		
ASDO	LD2 (1x)	B-R9	LD3 (1x)	RX3B-	LD1 (1x)		
ASDO	LD5 (1x)	BS-10	LD3 (1x)	RX3B-	LD2 (1x)		
AUDIO-BCK	LD1 (1x)	BS-11	LD3 (1x)	RX3B+	LD1 (1x)		
AUDIO-BCK	LD5 (2x)	BS-12	LD3 (1x)	RX3B+	LD2 (1x)		
		BS-5	LD3 (1x)	RX3C-	LD1 (1x)		

3104 313 6299.3

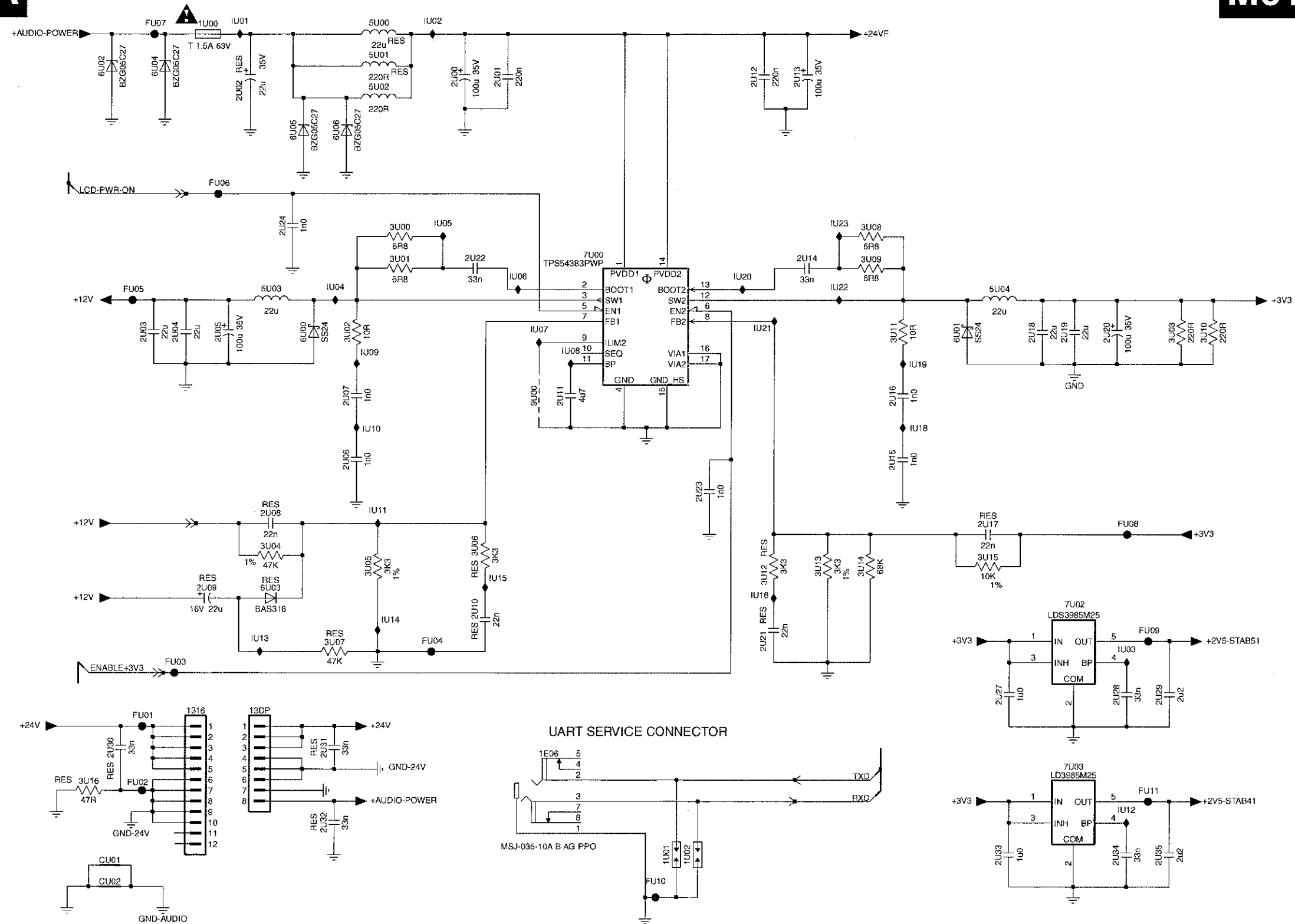
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120908

Monitor Panel: DC/DC

M01A

DC / DC

M01A

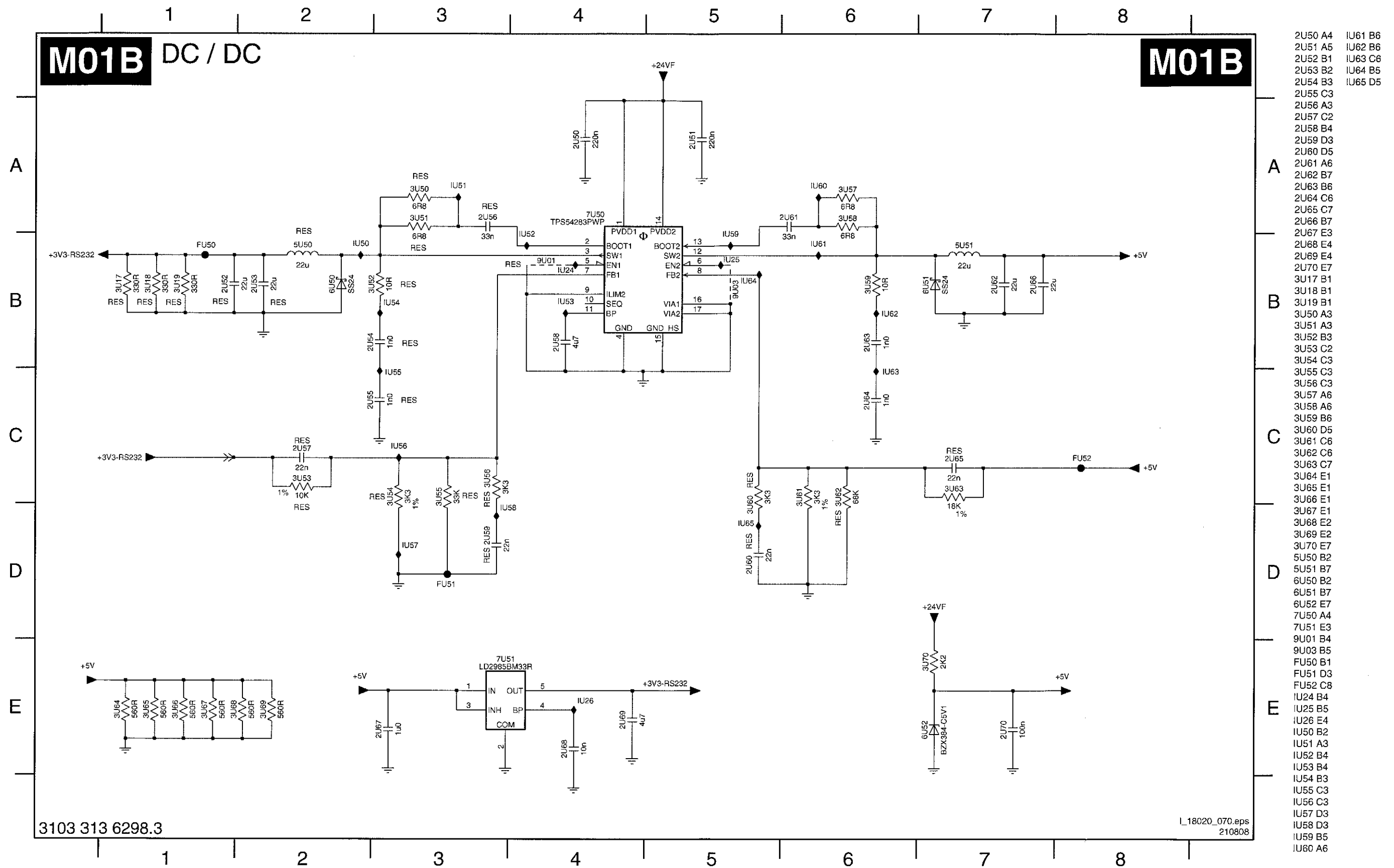


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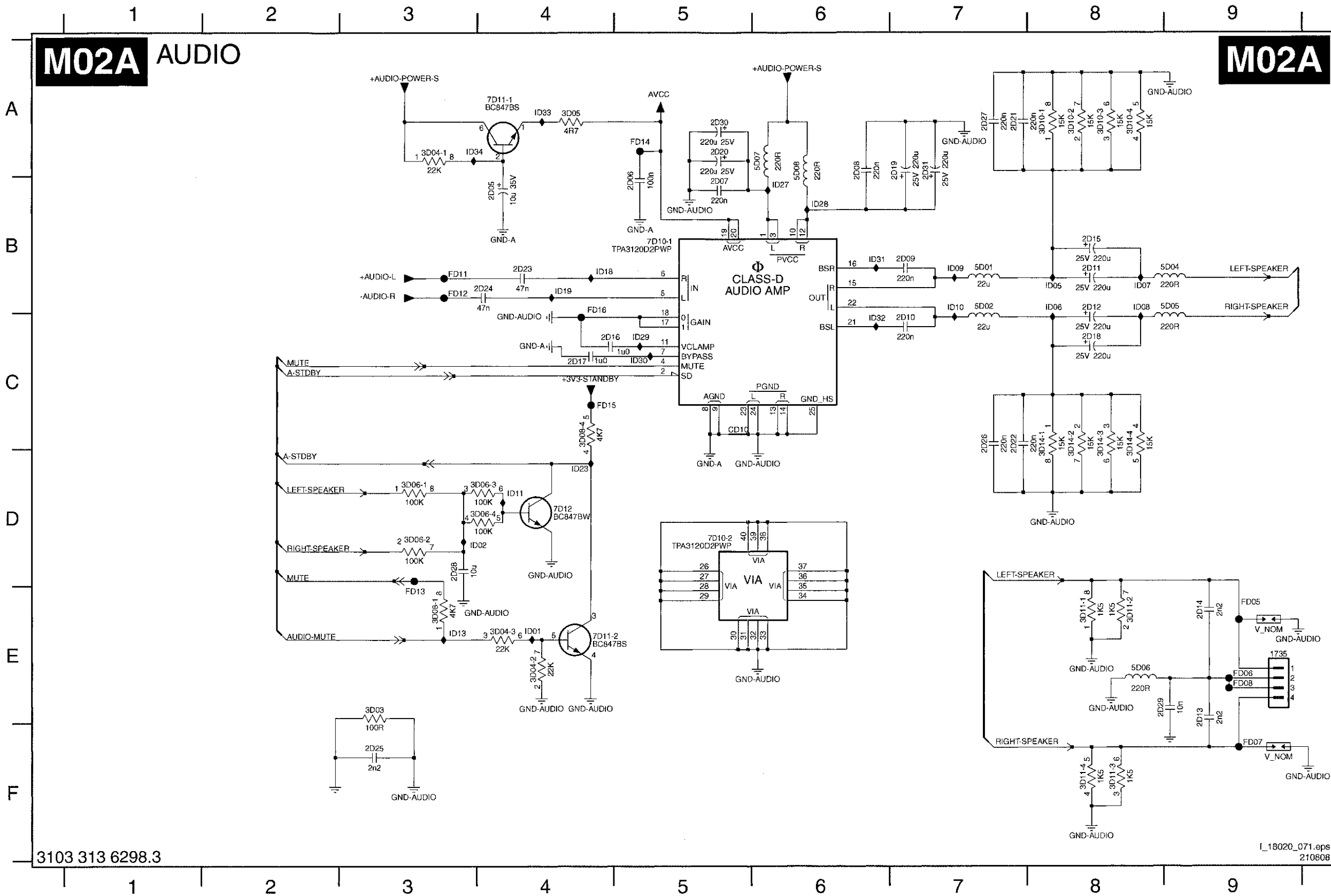
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210808

1316 E2	FU04 E4
13DP E3	FU05 B2
1E06 E5	FU06 B2
1U00 A2	FU07 A2
1U01 F5	FU08 D8
1U02 F5	FU09 E9
2U00 A4	FU10 F5
2U01 A4	FU11 F9
2U02 A2	IU01 A2
2U03 C2	IU02 A4
2U04 C2	IU03 E8
2U05 C2	IU04 B3
2U06 C3	IU05 B4
2U07 C3	IU06 B4
2U08 D3	IU07 C4
2U09 D2	IU08 C5
2U10 D4	IU09 C3
2U11 C5	IU10 C3
2U12 A6	IU11 D3
2U13 A6	IU12 F8
2U14 B6	IU13 E3
2U15 C7	IU14 D3
2U16 C7	IU15 D4
2U17 D7	IU16 D6
2U18 C8	IU18 C7
2U19 C8	IU19 C7
2U20 C8	IU20 B6
2U21 E6	IU21 C6
2U22 B4	IU22 B6
2U23 D6	IU23 B6
2U24 B3	
2U27 E8	
2U28 E8	
2U29 E9	
2U30 E2	
2U31 E3	
2U32 F3	
2U33 F8	
2U34 F8	
2U35 F9	
3U00 B4	
3U01 B4	
3U02 C3	
3U03 C9	
3U04 D3	
3U05 D3	
3U06 D4	
3U07 E3	
3U08 B7	
3U09 B7	
3U10 C9	
3U11 C7	
3U12 D6	
3U13 D6	
3U14 D7	
3U15 D7	
3U16 F1	
5U00 A3	
5U01 A3	
5U02 A3	
5U03 B3	
5U04 B8	
6U00 C3	
6U01 C7	
6U02 A2	
6U03 D3	
6U04 A2	
6U05 A3	
6U06 A3	
7U00 B5	
7U02 D8	
7U03 E8	
9U00 C4	
CU01 F2	
CU02 F2	
FU01 E2	
FU02 F2	
FU03 E2	

Monitor Panel: DC/DC



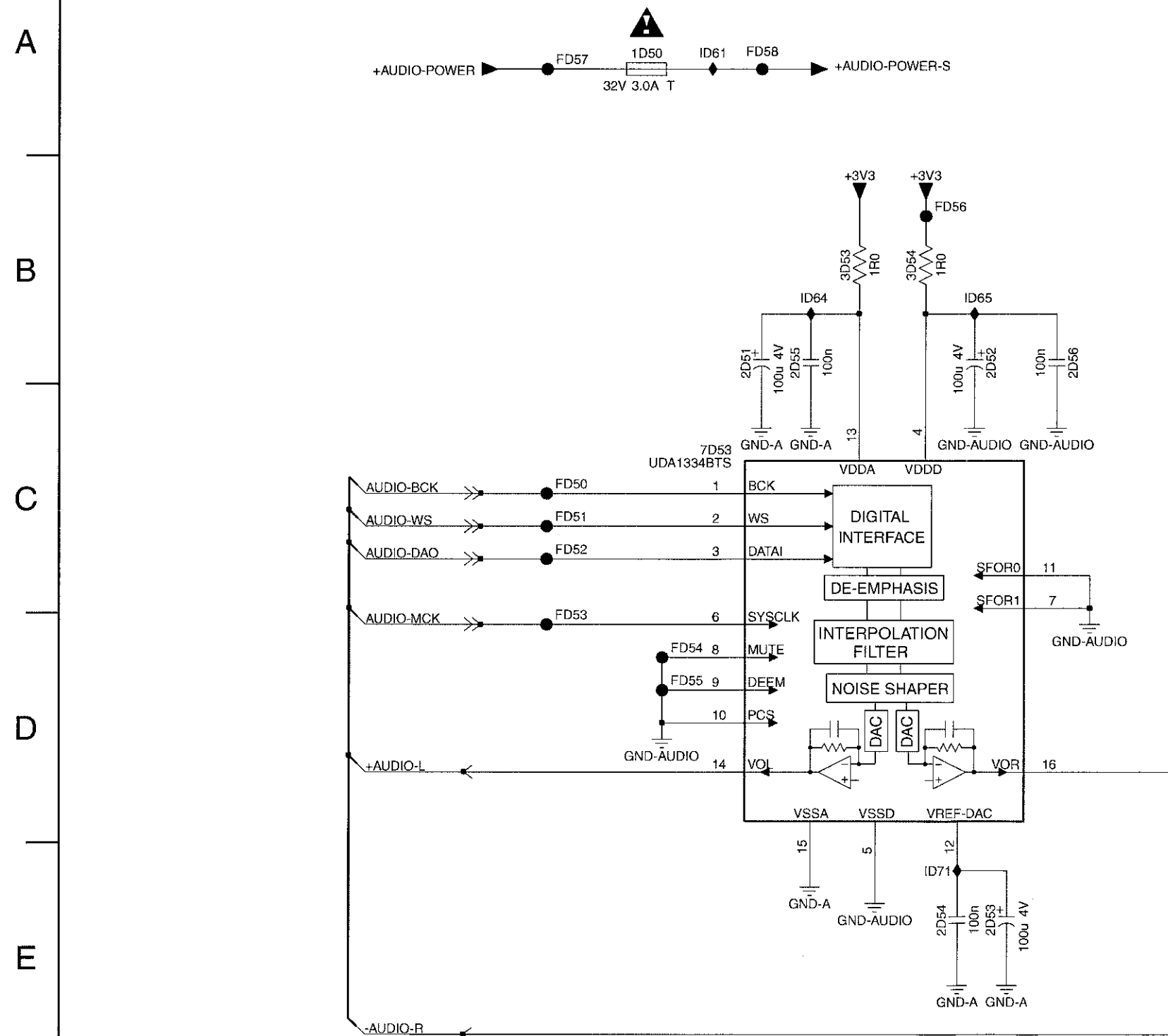
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- 1735 E9
- 2D05 B4
- 2D06 B5
- 2D07 B5
- 2D08 A6
- 2D09 B7
- 2D10 C7
- 2D11 B8
- 2D12 B8
- 2D13 E9
- 2D14 E9
- 2D15 B8
- 2D16 C4
- 2D17 C4
- 2D18 C8
- 2D19 A7
- 2D20 A5
- 2D21 A7
- 2D22 C7
- 2D23 B4
- 2D24 B4
- 2D25 F3
- 2D26 C7
- 2D27 A7
- 2D28 D3
- 2D29 E8
- 2D30 A5
- 2D31 A7
- 3D03 E3
- 3D04-1 A3
- 3D04-2 E4
- 3D04-3 E4
- 3D05 A4
- 3D06-1 D3
- 3D06-2 D3
- 3D06-3 D4
- 3D06-4 D4
- 3D08-1 E3
- 3D08-4 C4
- 3D10-1 A8
- 3D10-2 A8
- 3D10-3 A8
- 3D10-4 A8
- 3D11-1 E8
- 3D11-2 E8
- 3D11-3 F8
- 3D11-4 F8
- 3D14-1 C8
- 3D14-2 C8
- 3D14-3 C8
- 3D14-4 C8
- 5D01 B7
- 5D02 B7
- 5D04 B9
- 5D05 B9
- 5D06 E8
- 5D07 A6
- 5D08 A6
- 7D10-1 B5
- 7D10-2 D5
- 7D11-1 A4
- 7D11-2 E4
- 7D12 D4
- CD10 C5
- FD05 E9
- FD06 E9
- FD07 F9
- FD08 E9
- FD11 B3
- FD12 B3
- FD13 E3
- FD14 A5
- FD15 C4
- FD16 B4
- ID01 E4
- ID02 D4
- ID05 B8
- ID06 B8
- ID07 B8
- ID08 B8
- ID09 B7
- ID10 B7
- ID11 D4
- ID13 E3
- ID18 B4
- ID19 B4
- ID23 D4
- ID27 B6
- ID28 B6
- ID29 C5
- ID30 C5
- ID31 B6
- ID32 C6
- ID33 A4
- ID34 A3

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210608

M02B AUDIO

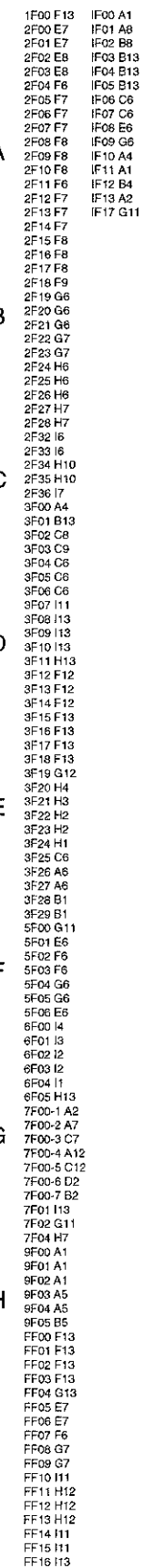
M02B

1D50 A3
2D51 B3
2D52 B4
2D53 E4
2D54 E4
2D55 B3
2D56 B5
3D53 B4
3D54 B4
7D53 C3
FD50 C2
FD51 C2
FD52 C2
FD53 D2
FD54 D3
FD55 D3
FD56 B4
FD57 A2
FD58 A3
ID61 A3
ID64 B3
ID65 B4
ID71 E4

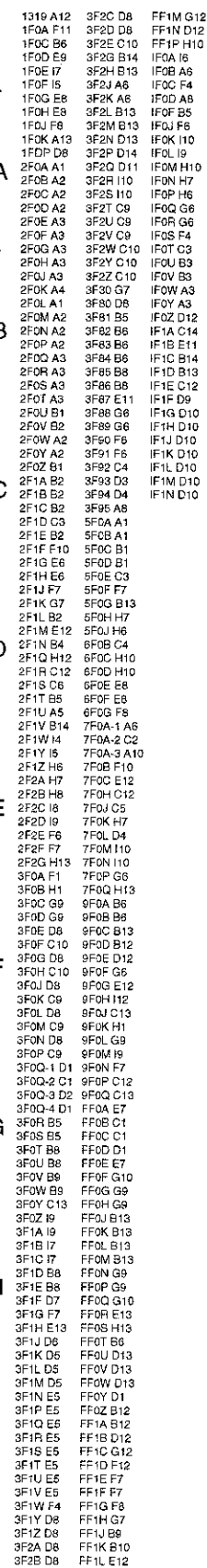
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M03A DP-Rx



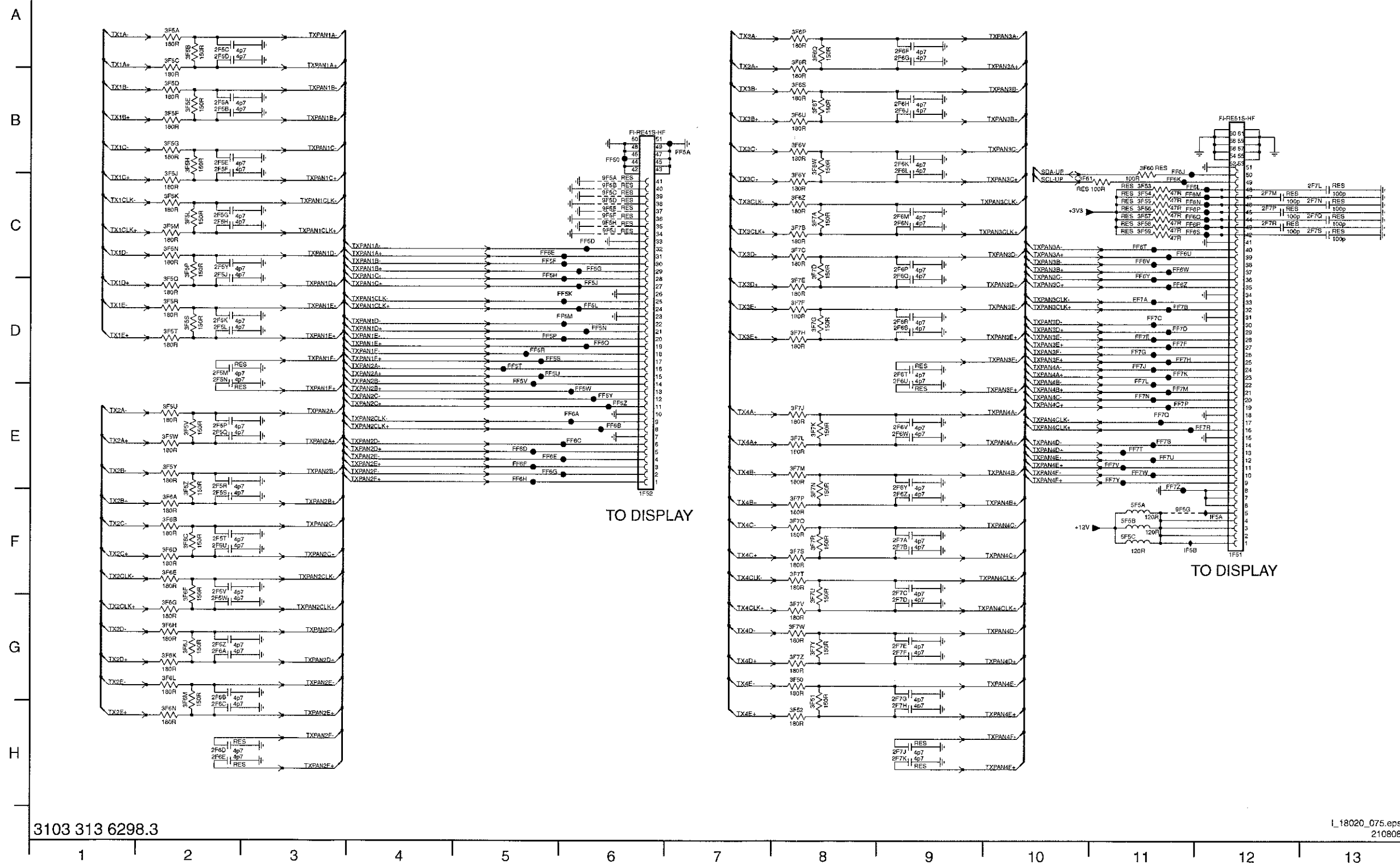
M03B DP RECEIVER & POWER SUPPLY



Monitor Panel: DP-Rx

M03C DP Rx

M03C

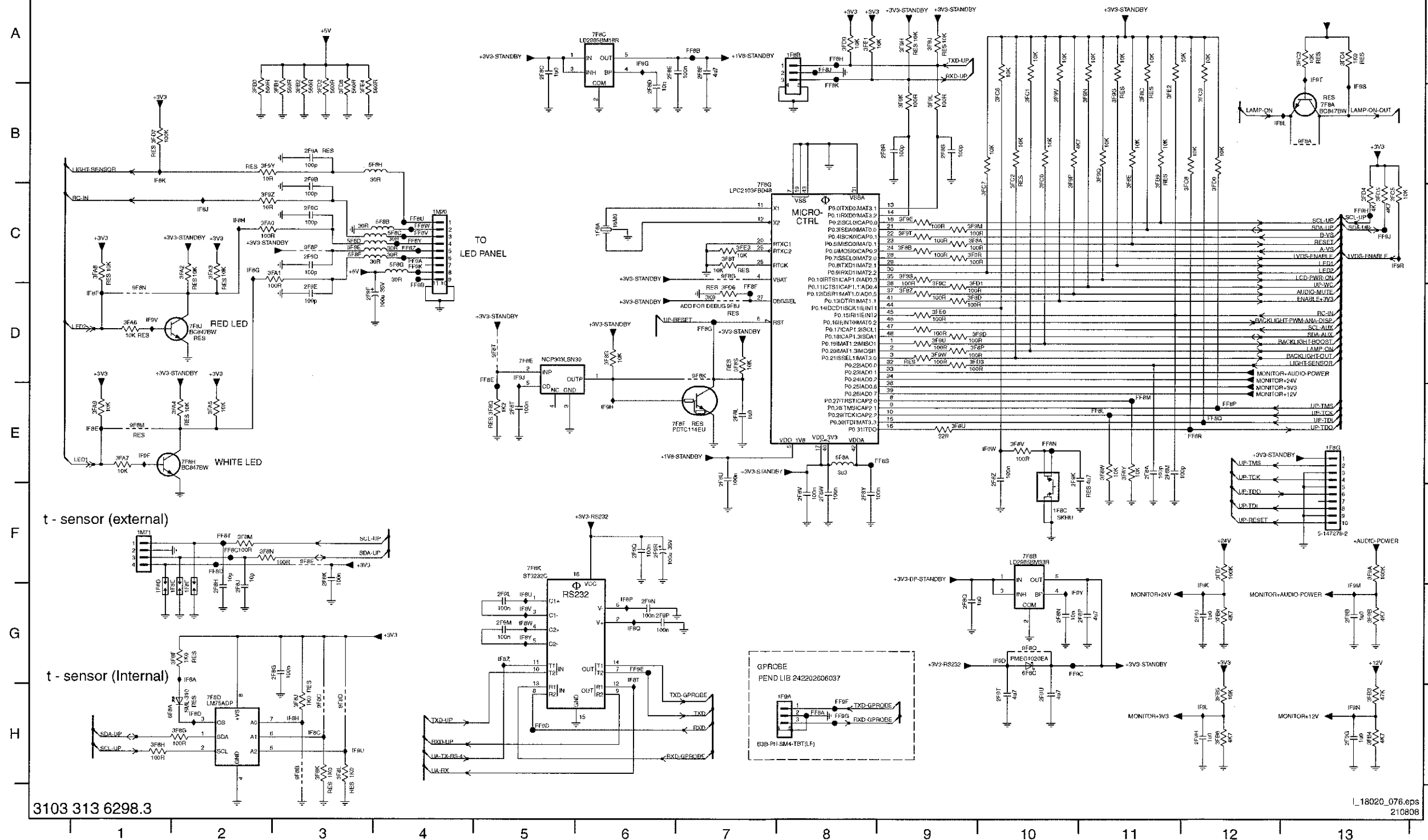


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2F5A B2	3F6F F2	FF7F D11
2F5B B2	3F6G G2	FF7G D11
2F5C A2	3F6H G2	FF7H D11
2F5D A2	3F6J G2	FF7J D11
2F5E B2	3F6K G2	FF7K D11
2F5F B2	3F6L G2	FF7L D11
2F5G C2	3F6M G2	FF7M E11
2F5H C2	3F6N H2	FF7N E11
2F5J C2	3F6P A8	FF7P E11
2F5K D2	3F6Q A8	FF7Q E11
2F5L D2	3F6R A8	FF7R E12
2F5M D2	3F6S B8	FF7S E11
2F5P E2	3F6T B8	FF7T E11
2F5Q E2	3F6U B8	FF7U E11
2F5R E2	3F6V B8	FF7V E11
2F5S F2	3F6W B8	FF7W E11
2F5T F2	3F6X C8	FF7X E11
2F5U F2	3F6Y C8	FF7Y E11
2F5V F2	3F6Z C8	FF7Z E11
2F5W G2	3F7A C8	IF5A F12
2F5X G2	3F7B C8	IF5B F11
2F5Y G2	3F7C C8	
2F5Z G2	3F7D C8	
2F6A G2	3F7E D8	
2F6B G2	3F7F D8	
2F6C H2	3F7G D8	
2F6D H2	3F7H D8	
2F6E H2	3F7J E8	
2F6F A9	3F7K E8	
2F6G A9	3F7L E8	
2F6H A9	3F7M E8	
2F6J B9	3F7N E8	
2F6K B9	3F7P F8	
2F6L B9	3F7Q F8	
2F6M C9	3F7R F8	
2F6N C9	3F7S F8	
2F6P C9	3F7T F8	
2F6Q C9	3F7U F8	
2F6R D9	3F7V G8	
2F6S D9	3F7W G8	
2F6T D9	3F7X G8	
2F6U D9	5F5A F11	
2F6V E9	5F5B F11	
2F6W E9	5F5C F11	
2F6X E9	9F5A C6	
2F6Y E9	9F5B C6	
2F6Z F9	9F5C C6	
2F7A F9	9F5D C6	
2F7B F9	9F5E C6	
2F7C F9	9F5F C6	
2F7D G9	9F5G C6	
2F7E G9	9F5H F11	
2F7F G9	9F5I C6	
2F7G G9	9F5J C6	
2F7H H9	FF5D B6	
2F7J H9	FF5A B7	
2F7K H9	FF5D C6	
2F7L C13	FF5E C5	
2F7M C12	FF5F C5	
2F7N C13	FF5G C6	
2F7P C12	FF5H C6	
2F7Q C13	FF5J D6	
2F7R C12	FF5K D6	
2F7S C13	FF5L D6	
3F5D G8	FF5M D6	
3F5I G8	FF5N D6	
3F5J H8	FF5P D5	
3F5K C11	FF5Q D6	
3F5L C11	FF5R D5	
3F5M C11	FF5S D5	
3F5N C11	FF5T D5	
3F5P C11	FF5U D5	
3F5Q C11	FF5V D5	
3F5R C11	FF5W E6	
3F5A A2	FF5Y E6	
3F5B A2	FF5Z E6	
3F5C A2	FF6A E6	
3F5D B2	FF6B E6	
3F5E B2	FF6C E6	
3F5F B2	FF6D E5	
3F5G B2	FF6E E5	
3F5H B2	FF6F E5	
3F5J C2	FF6G E5	
3F5K C2	FF6H E5	
3F5L C2	FF6J B11	
3F5M C2	FF6K C11	
3F5N C2	FF6L C11	
3F5P C2	FF6M C11	
3F5Q D2	FF6N C11	
3F5R D2	FF6P C11	
3F5S D2	FF6Q C11	
3F5T D2	FF6R C11	
3F5U E2	FF6S C11	
3F5V E2	FF6T C11	
3F5W E2	FF6U C11	
3F5X E2	FF6V C11	
3F5Z E2	FF6W C11	
3F6D B11	FF6Y C11	
3F6I C11	FF6Z D11	
3F6A F2	FF7A D11	
3F6B F2	FF7B D11	
3F6C F2	FF7C D11	

Monitor Panel: DP-Rx

M03D DP Rx

M03D



1F8A C6	3FA8 C1	1F8B H3
1F8B A8	3FA9 E1	1F8C H3
1F8C F10	3FB0 B2	1F8D H2
1F8D G1	3FB1 B3	1F8E E1
1F8E C2	3FB2 B3	1F8F D1
1F8F G2	3FB3 H3	1F8G C2
1F8G E13	3FB4 H3	1F8H C2
1F8A H8	3FB5 H12	1F8J C2
1M20 C4	3FB6 H12	1F8K B1
1M71 F1	3FB7 F12	1F8L B12
2F8A E11	3FB8 G12	1F8P G6
2F8B G13	3FB9 B11	1F8Q G6
2F8C A5	3FC0 B10	1F8T G6
2F8D B6	3FC1 B10	1F8U G5
2F8E A6	3FC2 B10	1F8V G5
2F8F A7	3FC3 A13	1F8W G5
2F8G G3	3FC4 A13	1F8Y G5
2F8H G2	3FC5 C13	1F8Z G5
2F8J G2	3FC6 B10	1F9D G10
2F8K F3	3FC7 C10	1F9F E1
2F8L E7	3FC8 B12	1F9G A6
2F8M E11	3FC9 B12	1F9H E6
2F8N G10	3FD0 B12	1F9J D6
2F8P G11	3FD1 D9	1F9K G12
2F8Q G9	3FD2 B3	1F9L H12
2F8R B9	3FD3 D9	1F9M G13
2F8S B9	3FD4 C13	1F9N H13
2F8T E5	3FD5 C13	1F9R C13
2F8U E7	3FD6 D7	1F9S B13
2F8V F8	3FD7 B1	1F9T A13
2F8W F8	3FD8 B3	1F9U H3
2F8Y F8	3FD9 A8	1F9V D1
2F9P G11	3FD0 E10	1F9W E10
2F9A B3	3FE1 A8	1F9Y G10
2F9B B3	3FE2 B11	
2F9C C3	3FE3 C7	
2F9D C3	3FE4 B3	
2F9E D3	3FE5 E8	
2F9F D3	3FE6 C4	
2F9G H13	3FE7 C4	
2F9H H12	3FE8 C3	
2F9J G12	3FE9 C3	
2F9K E10	3FE0 C3	
2F9L G5	3FE1 C4	
2F9M G5	3FE2 C4	
2F9N G6	3FE3 H2	
2F9P G6	3FE4 G10	
2F9Q F6	3FE5 B13	
2F9R F6	3FE6 F10	
2F9T H10	3FE7 A6	
2F9U H10	3FE8 H2	
2F9V H3	3FE9 D6	
3F8B C9	3FE0 C7	
3F8C B11	3FE1 C7	
3F8D D9	3FE2 E2	
3F8E B11	3FE3 D2	
3F8F G2	3FE4 F5	
3F8G H2	3FE5 B13	
3F8H H3	3FE6 H3	
3F8J H3	3FE7 H3	
3F8K H3	3FE8 H3	
3F8L H3	3FE9 F3	
3F8M F2	3FE0 C7	
3F8N F2	3FE1 D7	
3F8P D9	3FE2 D7	
3F8Q E5	3FE3 E1	
3F8R D6	3FE4 D1	
3F8S D7	3FE5 C3	
3F8T C7	3FE6 G10	
3F8U E9	3FE7 D5	
3F8V E10	3FE8 H8	
3F8W E11	3FE9 A7	
3F8Y E11	3FE0 F2	
3F8Z D9	3FE1 F2	
3F8A F13	3FE2 D5	
3F8B G13	3FE3 D7	
3F8C D9	3FE4 D7	
3F8D D10	3FE5 A8	
3F8E C9	3FE6 A8	
3F8F B11	3FE7 B8	
3F8G B9	3FE8 E11	
3F8H A9	3FE9 E11	
3F8J B9	3FE0 E11	
3F8K B9	3FE1 E12	
3F8L B9	3FE2 E12	
3F8M C9	3FE3 E12	
3F8N B11	3FE4 E12	
3F8P B10	3FE5 E9	
3F8Q B11	3FE6 F2	
3F8R C9	3FE7 C4	
3F8S C9	3FE8 C4	
3F8T C9	3FE9 C4	
3F8U D9	3FE0 C4	
3F8V B10	3FE1 C4	
3F8W D9	3FE2 C4	
3F8Y B2	3FE3 G10	
3F8Z C2	3FE4 H5	
3F8A C2	3FE5 G6	
3F8B C2	3FE6 H8	
3F8C C2	3FE7 H8	
3F8D E2	3FE8 C13	
3F8E E2	3FE9 C13	
3F8F D1	3FE0 C13	
3F8G E1	3FE1 G2	

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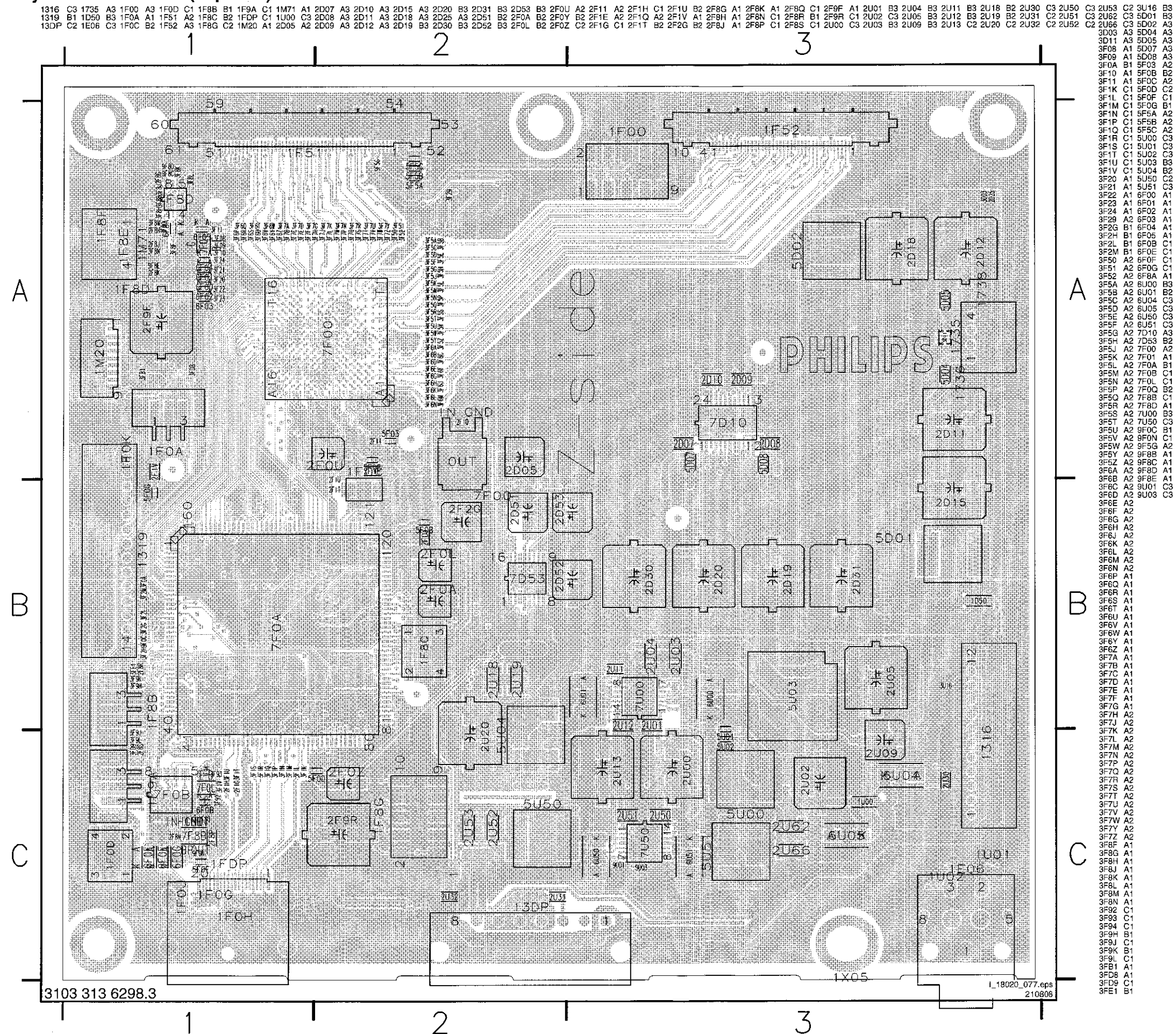
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Monitor: SRP List

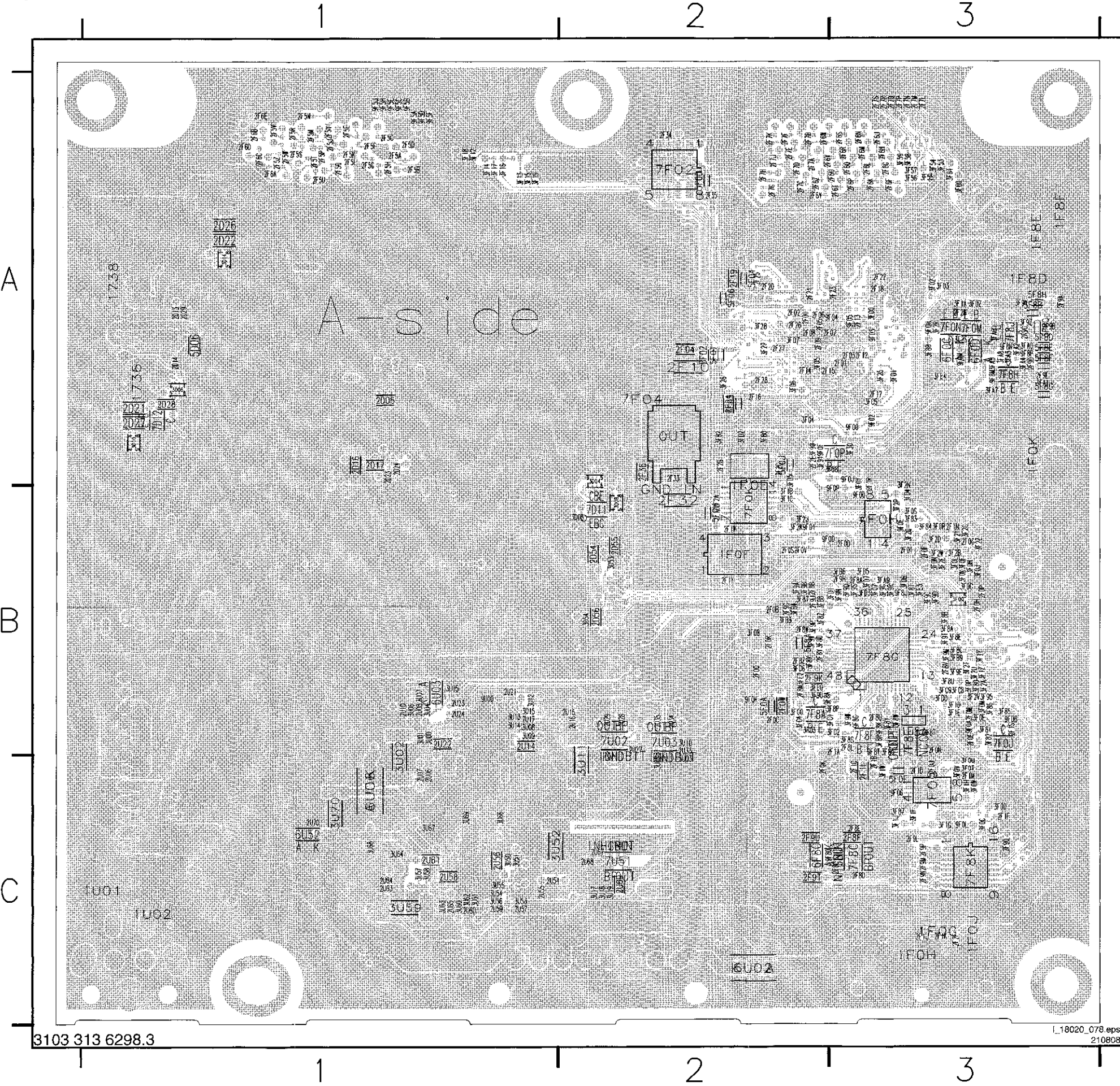
Netname	Diagram								
+12V	M1A	A-R3	M3B (2x)	B-R8	M3A (1x)	TX1B+	M3A (1x)	TXPAN1C+	M3C (2x)
+12V	M3C	A-R4	M3B (1x)	B-R8	M3B (1x)	TX1B+	M3C (1x)	TXPAN1CLK-	M3C (2x)
+12V	M3D	A-R4	M3B (2x)	B-R9	M3A (1x)	TX1C-	M3A (1x)	TXPAN1CLK+	M3C (2x)
+1V2	M3A	A-R5	M3B (1x)	B-R9	M3B (1x)	TX1C-	M3C (1x)	TXPAN1D-	M3C (2x)
+1V2-FPGA	M3A	A-R5	M3B (2x)	B-VS	M3A (1x)	TX1C+	M3A (1x)	TXPAN1D+	M3C (2x)
+1V2-PLL	M3A	A-R6	M3B (1x)	B-VS	M3B (1x)	TX1C+	M3C (1x)	TXPAN1E-	M3C (2x)
+1V8	M3B	A-R6	M3B (2x)	B-VS	M3D (1x)	TX1CLK-	M3A (1x)	TXPAN1E+	M3C (2x)
+1V8-DPA	M3B	A-R7	M3A (1x)	CLK-PLL	M3A (2x)	TX1CLK-	M3C (1x)	TXPAN1F-	M3C (2x)
+1V8-DVDD	M3B	A-R7	M3B (1x)	CONF-DONE	M3A (2x)	TX1CLK+	M3A (1x)	TXPAN1F+	M3C (2x)
+1V8-STANDBY	M3D	A-R8	M3A (1x)	DATA0	M3A (2x)	TX1CLK+	M3C (1x)	TXPAN2A-	M3C (2x)
+24V	M1A	A-R8	M3B (1x)	DCLK	M3A (2x)	TX1D-	M3A (1x)	TXPAN2A+	M3C (2x)
+24V	M3B	A-R9	M3A (1x)	DPRX-0N	M3B (2x)	TX1D-	M3C (1x)	TXPAN2B-	M3C (2x)
+24V	M3D	A-R9	M3B (1x)	DPRX-0P	M3B (2x)	TX1D+	M3A (1x)	TXPAN2B+	M3C (2x)
+24V	M1A	ASDO	M3A (2x)	DPRX-1N	M3B (2x)	TX1D+	M3C (1x)	TXPAN2C-	M3C (2x)
+24V	M3B	A-STDBY	M2A (2x)	DPRX-1P	M3B (2x)	TX1E-	M3A (1x)	TXPAN2C+	M3C (2x)
+24V	M1B	AUDIO-BCK	M2B (1x)	DPRX-2N	M3B (2x)	TX1E-	M3C (1x)	TXPAN2CLK-	M3C (2x)
+24V	M3A	AUDIO-BCK	M3B (1x)	DPRX-2P	M3B (2x)	TX1E+	M3A (1x)	TXPAN2CLK+	M3C (2x)
+2V5-L41	M3A	AUDIO-DAO	M2B (1x)	DPRX-3N	M3B (2x)	TX1E+	M3C (1x)	TXPAN2D-	M3C (2x)
+2V5-L51	M3A	AUDIO-DAO	M3B (1x)	DPRX-3P	M3B (2x)	TX2A-	M3A (1x)	TXPAN2D+	M3C (2x)
+2V5-STAB41	M1A	AUDIO-MCK	M2B (1x)	DPRX-AUXN	M3B (2x)	TX2A-	M3C (1x)	TXPAN2E-	M3C (2x)
+2V5-STAB41	M3A	AUDIO-MCK	M3B (1x)	DPRX-AUXP	M3B (2x)	TX2A+	M3A (1x)	TXPAN2E+	M3C (2x)
+2V5-STAB51	M1A	AUDIO-MUTE	M2A (1x)	DPRX-CABLE-DET	M3B (2x)	TX2A+	M3C (1x)	TXPAN2F-	M3C (2x)
+2V5-STAB51	M3A	AUDIO-MUTE	M3D (1x)	DPRX-HPD	M3B (2x)	TX2B-	M3A (1x)	TXPAN2F+	M3C (2x)
+3V3	M1A	-AUDIO-R	M2A (1x)	ENABLE+3V3	M1A (1x)	TX2B-	M3C (1x)	TXPAN3A-	M3C (2x)
+3V3	M2B	AUDIO-WS	M2B (1x)	ENABLE+3V3	M3D (1x)	TX2B+	M3A (1x)	TXPAN3A+	M3C (2x)
+3V3	M3A	AUDIO-WS	M3B (1x)	GCLK	M3A (2x)	TX2B+	M3C (1x)	TXPAN3B-	M3C (2x)
+3V3	M3B	AVCC	M2A (1x)	GCLK	M3B (3x)	TX2C-	M3A (1x)	TXPAN3B+	M3C (2x)
+3V3	M3C	A-VS	M3A (1x)	GND-24V	M1A (2x)	TX2C-	M3C (1x)	TXPAN3C-	M3C (2x)
+3V3	M3D	A-VS	M3B (1x)	GND-24V	M3B (3x)	TX2C+	M3A (1x)	TXPAN3C+	M3C (2x)
+3V3-DPA	M3B	A-VS	M3D (1x)	GND-A	M2A (4x)	TX2C+	M3C (1x)	TXPAN3CLK-	M3C (2x)
+3V3-DP-STANDBY	M3B	BACKLIGHT-BOOST	M3B (1x)	GND-A	M2B (5x)	TX2CLK-	M3A (1x)	TXPAN3CLK+	M3C (2x)
+3V3-DP-STANDBY	M3D	BACKLIGHT-BOOST	M3D (1x)	GND-AUDIO	M1A (1x)	TX2CLK-	M3C (1x)	TXPAN3D-	M3C (2x)
+3V3-DVDD	M3B	BACKLIGHT-IN	M3A (1x)	GND-AUDIO	M2A (17x)	TX2CLK+	M3A (1x)	TXPAN3D+	M3C (2x)
+3V3-FPGA	M3A	BACKLIGHT-IN	M3B (2x)	GND-AUDIO	M2B (5x)	TX2CLK+	M3C (1x)	TXPAN3E-	M3C (2x)
+3V3-RS232	M1B	BACKLIGHT-OUT	M3A (1x)	INTR-OUT-BS-0	M3B (2x)	TX2D-	M3A (1x)	TXPAN3E+	M3C (2x)
+3V3-RS232	M3D	BACKLIGHT-OUT	M3B (2x)	LAMP-ON	M3D (2x)	TX2D-	M3C (1x)	TXPAN3F-	M3C (2x)
+3V3-STANDBY	M2A	BACKLIGHT-OUT	M3D (1x)	LAMP-ON-OUT	M3B (1x)	TX2D+	M3A (1x)	TXPAN3F+	M3C (2x)
+3V3-STANDBY	M3B	BACKLIGHT-PWM-ANA-DISP	M3B (1x)	LAMP-ON-OUT	M3D (1x)	TX2D+	M3C (1x)	TXPAN4A-	M3C (2x)
+3V3-STANDBY	M3D	BACKLIGHT-PWM-ANA-DISP	M3D (1x)	LCD-PWR-ON	M1A (1x)	TX2E-	M3A (1x)	TXPAN4A+	M3C (2x)
+5V	M1B	B-B0	M3A (1x)	LCD-PWR-ON	M3A (1x)	TX2E-	M3C (1x)	TXPAN4B-	M3C (2x)
+5V	M3B	B-B0	M3B (1x)	LCD-PWR-ON	M3D (1x)	TX2E+	M3A (1x)	TXPAN4B+	M3C (2x)
+5V	M3D	B-B1	M3A (1x)	LED1	M3D (2x)	TX2E+	M3C (1x)	TXPAN4C-	M3C (2x)
+AUDIO-L	M2A	B-B1	M3B (1x)	LED2	M3D (2x)	TX3A-	M3A (1x)	TXPAN4C+	M3C (2x)
+AUDIO-POWER	M1A	B-B2	M3A (1x)	LEFT-SPEAKER	M2A (3x)	TX3A-	M3C (1x)	TXPAN4CLK-	M3C (2x)
+AUDIO-POWER	M2B	B-B2	M3B (1x)	LIGHT-SENSOR	M3D (2x)	TX3A+	M3A (1x)	TXPAN4CLK+	M3C (2x)
+AUDIO-POWER	M3D	B-B3	M3A (1x)	LVDS-ENABLE	M3A (1x)	TX3A+	M3C (1x)	TXPAN4D-	M3C (2x)
+AUDIO-POWER-S	M2A	B-B3	M3B (1x)	LVDS-ENABLE	M3D (2x)	TX3B-	M3A (1x)	TXPAN4D+	M3C (2x)
+AUDIO-POWER-S	M2B	B-B4	M3A (1x)	MONITOR+12V	M3D (3x)	TX3B-	M3C (1x)	TXPAN4E-	M3C (2x)
A-B0	M3A (1x)	B-B4	M3B (1x)	MONITOR+24V	M3D (2x)	TX3B+	M3A (1x)	TXPAN4E+	M3C (2x)
A-B0	M3B (1x)	B-B5	M3A (1x)	MONITOR+3V3	M3D (2x)	TX3B+	M3C (1x)	TXPAN4F-	M3C (2x)
A-B1	M3A (1x)	B-B5	M3B (1x)	MONITOR+AUDIO-POWER	M3D (2x)	TX3C-	M3A (1x)	TXPAN4F+	M3C (2x)
A-B1	M3B (1x)	B-B6	M3A (1x)	MP-LED1	M3A (2x)	TX3C+	M3C (1x)	UA-RX	M3B (1x)
A-B2	M3A (1x)	B-B6	M3B (1x)	MP-LED2	M3A (2x)	TX3C+	M3A (1x)	UA-RX	M3D (1x)
A-B2	M3B (1x)	B-B7	M3A (1x)	MP-LED3	M3A (2x)	TX3C+	M3C (1x)	UA-TX-BS-4	M3B (2x)
A-B3	M3A (1x)	B-B7	M3B (1x)	MP-LED4	M3A (2x)	TX3CLK-	M3A (1x)	UA-TX-BS-4	M3D (1x)
A-B3	M3B (1x)	B-B8	M3A (1x)	MP-LED5	M3A (2x)	TX3CLK-	M3C (1x)	UP-RESET	M3D (1x)
A-B4	M3A (1x)	B-B8	M3B (1x)	MSCL-I2C	M3B (3x)	TX3CLK+	M3A (1x)	UP-TCX	M3D (2x)
A-B4	M3B (1x)	B-B8	M3A (1x)	MSDA-I2C	M3B (3x)	TX3CLK+	M3C (1x)	UP-TDI	M3D (2x)
A-B5	M3A (1x)	B-B9	M3A (1x)	MSEL0	M3A (2x)	TX3D-	M3A (1x)	UP-TDO	M3D (2x)
A-B5	M3B (1x)	B-B9	M3B (1x)	MSEL1	M3A (2x)	TX3D+	M3C (1x)	UP-TMS	M3D (2x)
A-B6	M3A (1x)	B-CLK	M3A (1x)	MUTE	M2A (2x)	TX3D+	M3A (1x)	UP-WC	M3B (2x)
A-B6	M3B (1x)	B-CLK	M3B (1x)	nCONFIG	M3A (2x)	TX3D+	M3C (1x)	UP-WC	M3D (1x)
A-B7	M3A (1x)	B-DE	M3A (1x)	nCSO	M3A (2x)	TX3E-	M3A (1x)		
A-B7	M3B (1x)	B-DE	M3B (1x)	nSTATUS	M3A (2x)	TX3E+	M3C (1x)		
A-B8	M3A (1x)	B-G0	M3A (1x)	RC-IN	M3B (2x)	TX3E+	M3A (1x)		
A-B8	M3B (1x)	B-G0	M3B (1x)	RC-IN	M3D (2x)	TX3E+	M3C (1x)		
A-B9	M3A (1x)	B-G1	M3A (1x)	RC-OUT	M3B (3x)	TX4A-	M3A (1x)		
A-B9	M3B (1x)	B-G1	M3B (1x)	RESET	M3B (1x)	TX4A+	M3C (1x)		
A-CLK	M3A (1x)	B-G2	M3A (1x)	RESET	M3D (1x)	TX4A+	M3A (1x)		
A-CLK	M3B (1x)	B-G2	M3B (1x)	RESET-N	M3B (2x)	TX4A+	M3C (1x)		
A-DE	M3A (1x)	B-G3	M3A (1x)	RIGHT-SPEAKER	M2A (3x)	TX4B-	M3A (1x)		
A-DE	M3B (1x)	B-G3	M3B (1x)	RXD	M1A (1x)	TX4B-	M3C (1x)		
A-G0	M3A (1x)	B-G4	M3A (1x)	RXD	M3D (1x)	TX4B+	M3A (1x)		
A-G0	M3B (1x)	B-G4	M3B (1x)	RXD-GPROBE	M3D (2x)	TX4B+	M3C (1x)		
A-G1	M3A (1x)	B-G5	M3A (1x)	RXD-UP	M3D (2x)	TX4C-	M3A (1x)		
A-G1	M3B (1x)	B-G5	M3B (1x)	SCL-AUX	M3B (2x)	TX4C-	M3C (1x)		
A-G2	M3A (1x)	B-G6	M3A (1x)	SCL-AUX	M3D (1x)	TX4C+	M3A (1x)		
A-G2	M3B (1x)	B-G6	M3B (1x)	SCL-UP	M3A (1x)	TX4C+	M3C (1x)		
A-G3	M3A (1x)	B-G7	M3A (1x)	SCL-UP	M3B (3x)	TX4CLK-	M3A (1x)		
A-G3	M3B (1x)	B-G7	M3B (1x)	SCL-UP	M3C (1x)	TX4CLK-	M3C (1x)		
A-G4	M3A (1x)	B-G8	M3A (1x)	SCL-UP	M3D (4x)	TX4CLK+	M3A (1x)		
A-G4	M3B (1x)	B-G8	M3B (1x)	SDA-AUX	M3B (2x)	TX4CLK+	M3C (1x)		
A-G5	M3A (1x)	B-G9	M3A (1x)	SDA-AUX	M3D (1x)	TX4D-	M3A (1x)		
A-G5	M3B (1x)	B-HS	M3A (1x)	SDA-UP	M3A (1x)	TX4D-	M3C (1x)		
A-G6	M3A (1x)	B-HS	M3B (1x)	SDA-UP	M3B (3x)	TX4D+	M3A (1x)		
A-G6	M3B (1x)	B-R0	M3A (1x)	SDA-UP	M3C (1x)	TX4D+	M3C (1x)		
A-G7	M3A (1x)	B-R0	M3B (1x)	SPI-CLK	M3D (4x)	TX4E-	M3A (1x)		
A-G7	M3B (1x)	B-R1	M3A (1x)	SPI-CLK	M3B (3x)	TX4E+	M3C (1x)		
A-G8	M3A (1x)	B-R1	M3B (1x)	SPI-CSN-BS-1	M3B (3x)	TX4E+	M3A (1x)		
A-G8	M3B (1x)	B-R2	M3A (1x)	SPI-DI	M3B (2x)	TX4E+	M3C (1x)		
A-G9	M3A (1x)	B-R2	M3B (1x)	SPI-DO-BS-3	M3B (3x)	TXCLK	M3A (1x)		
A-G9	M3B (2x)	B-R3	M3A (1x)	TCX	M3A (2x)	TXCLK	M3B (2x)		
A-HS	M3A (1x)	B-R3	M3B (1x)	TDI	M3A (2x)	TXD	M1A (1x)		
A-HS	M3B (1x)	B-R4	M3A (1x)	TDO	M3A (2x)	TXD	M3D (1x)		
A-R0	M3A (1x)	B-R4	M3B (1x)	TMS	M3A (2x)	TXD-GPROBE	M3D (2x)		
A-R0	M3B (2x)	B-R5	M3A (1x)	TX1A-	M3A (1x)	TXD-UP	M3D (2x)		
A-R1	M3A (1x)	B-R5	M3B (1x)	TX1A+	M3C (1x)	TXPAN1A-	M3C (2x)		
A-R1	M3B (2x)	B-R6	M3A (1x)	TX1A+	M3A (1x)	TXPAN1A+	M3C (2x)		
A-R2	M3A (1x)	B-R6	M3B (1x)	TX1B-	M3C (1x)	TXPAN1B-	M3C (2x)		
A-R2	M3B (1x)	B-R7	M3A (1x)	TX1B-	M3A (1x)	TXPAN1B+	M3C (2x)		
A-R3	M3A (1x)	B-R7	M3B (1x)	TX1E-	M3C (1x)	TXPAN1C-	M3C (2x)		

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Layout Monitor Panel (Top Side)



Layout Monitor Panel (Bottom Side)



1F0E	A2	2F6B	A1	3F05	A2	3F9R	B3	7D11	B2
1F0F	B2	2F6C	A1	3F06	A2	3F9S	B3	7D12	A1
1F8A	B3	2F6D	A1	3F07	A2	3F9T	B3	7F02	A2
2D06	A1	2F6E	A1	3F0B	B2	3F9U	B2	7F04	A2
2D13	A1	2F6F	A3	3F0C	C3	3F9V	B2	7F0C	C3
2D14	A1	2F6G	A3	3F0D	C3	3F9W	B3	7F0H	B3
2D16	A1	2F6H	A3	3F0E	B3	3F9Y	A3	7F0J	C3
2D17	A1	2F6J	A3	3F0F	B3	3F9Z	A3	7F0K	B2
2D21	A1	2F6K	A3	3F0G	B3	3FA0	A3	7F0M	A3
2D22	A1	2F6L	A3	3F0H	B3	3FA1	A3	7F0N	A3
2D23	A1	2F6M	A3	3F0J	B3	3FA2	A3	7F0P	A3
2D24	A1	2F6N	A3	3F0K	B3	3FA3	A3	7F8A	B2
2D26	A1	2F6P	A3	3F0L	B3	3FA4	A3	7F8C	C3
2D27	A1	2F6Q	A3	3F0M	B3	3FA5	A3	7F8E	B3
2D28	A1	2F6R	A3	3F0N	B3	3FA6	A3	7F8F	B3
2D29	A1	2F6S	A3	3F0P	B3	3FA7	A3	7F8G	B3
2D54	B2	2F6T	A3	3F0Q	B3	3FA8	A3	7F8H	A3
2D55	B2	2F6U	A3	3F0R	B3	3FA9	B3	7F8J	A3
2D56	B2	2F6V	A2	3F0S	B3	3FB0	A2	7F8K	C3
2F00	A2	2F6W	A2	3F0T	C3	3FB2	A2	7U02	B2
2F01	A3	2F6Y	A2	3F0U	C3	3FB3	B2	7U03	B2
2F02	A2	2F6Z	A2	3F0V	C3	3FB4	B2	7U51	C2
2F03	A3	2F7A	A2	3F0W	C3	3FB5	B3	9F00	A3
2F04	A2	2F7B	A2	3F0Y	A3	3FB6	B3	9F01	B2
2F05	A2	2F7C	A2	3F0Z	A3	3FB7	B2	9F02	A3
2F06	A2	2F7D	A2	3F12	A1	3FB8	B2	9F03	A3
2F07	A3	2F7E	A2	3F13	A1	3FB9	B3	9F04	A3
2F08	A2	2F7F	A2	3F14	A1	3FC0	B2	9F05	A3
2F09	A2	2F7G	A2	3F15	A1	3FC1	B3	9F0A	B3
2F0B	B2	2F7H	A2	3F16	A1	3FC2	B3	9F0B	B3
2F0C	B2	2F7J	A2	3F17	A1	3FC3	B2	9F0D	B2
2F0D	B3	2F7K	A2	3F18	A1	3FC4	B2	9F0E	B3
2F0E	B3	2F7L	A3	3F19	A1	3FC5	A3	9F0F	A2
2F0F	B3	2F7M	A3	3F1A	A3	3FC6	B2	9F0G	C3
2F0G	B3	2F7N	A3	3F1B	B2	3FC7	B3	9F0H	A3
2F0H	B3	2F7P	A3	3F1C	B2	3FC8	B3	9F0J	A3
2F0J	C3	2F7Q	A3	3F1D	B3	3FC9	B3	9F0K	B2
2F0K	C2	2F7R	A3	3F1E	B3	3FD0	B3	9F0L	C3
2F0M	B3	2F7S	A3	3F1F	C3	3FD1	B3	9F0M	A3
2F0N	B3	2F7A	B3	3F1G	C3	3FD2	A2	9F0P	B3
2F0P	B3	2F7B	B2	3F1H	C3	3FD3	B3	9F0Q	B3
2F0Q	B2	2F7C	C3	3F1J	C3	3FD4	B3	9F5A	A1
2F0R	B2	2F7D	C3	3F1W	C3	3FD5	A2	9F5B	A1
2F0S	B2	2F7E	C3	3F1Y	B3	3FD6	B3	9F5C	A1
2F0T	B3	2F7F	C3	3F1Z	B3	3FD7	B3	9F5D	A1
2F0V	B2	2F7G	B3	3F25	A3	3FE0	B2	9F5E	A1
2F0W	B2	2F7H	B3	3F26	A2	3FE2	B2	9F5F	A1
2F0X	A2	2F7I	B3	3F28	A2	3FE3	B3	9F5H	A1
2F12	A3	2F7J	B3	3F2E	A2	3FE4	A3	9F5J	A1
2F13	A3	2F7V	B3	3F2A	B3	3U00	B1	9F5K	B3
2F14	A2	2F7W	B2	3F2B	B3	3U01	B1	9F8G	B3
2F15	A2	2F7Y	B2	3F2C	B3	3U02	B1	9F8J	B3
2F16	A2	2F7Z	B2	3F2D	B3	3U03	C2	9F8K	B3
2F17	A3	2F7A	A3	3F2E	B3	3U04	B1	9F8M	A3
2F18	A3	2F7B	A3	3F2J	B2	3U05	B1	9F8N	A3
2F19	A2	2F7C	A3	3F2K	B2	3U06	B1	9F8P	A3
2F1A	B3	2F7D	A3	3F2L	B3	3U07	B1	9F8Q	C2
2F1B	B3	2F7E	A3	3F2M	B3	3U08	B1	9F8R	B3
2F1C	C3	2F7G	B2	3F2Q	B3	3U09	B1	9U00	B1
2F1D	C3	2F7H	B3	3F2R	A3	3U10	B2		
2F1F	C3	2F7J	B2	3F2S	A3	3U11	C2		
2F1J	C3	2F7K	B2	3F2T	B3	3U12	B1		
2F1K	C3	2F7L	C3	3F2U	B3	3U13	B1		
2F1L	C3	2F7M	C3	3F2V	B3	3U14	B1		
2F1M	C3	2F7N	C3	3F2W	B3	3U15	B1		
2F1N	B3	2F7P	C3	3F2Y	B3	3U17	C2		
2F1R	A3	2F7Q	C3	3F2Z	B3	3U18	C2		
2F1S	B3	2F7R	C3	3F30	A3	3U19	C2		
2F1W	B3	2F7U	C2	3F35	A3	3U50	C1		
2F1Y	B2	2U06	C1	3F54	A3	3U51	C1		
2F1Z	B2	2U07	C1	3F55	A3	3U52	C2		
2F20	A2	2U08	B1	3F56	A3	3U53	C1		
2F21	A2	2U10	B1	3F57	A3	3U54	C1		
2F22	A3	2U14	B1	3F58	A3	3U55	C1		
2F23	A3	2U15	B2	3F59	A3	3U56	C1		
2F24	A2	2U16	B2	3F60	A3	3U57	C1		
2F25	A2	2U17	B1	3F61	A3	3U58	C1		
2F26	A2	2U21	B1	3F62	A3	3U59	C1		
2F27	A2	2U22	B1	3F6I	B3	3U60	C1		
2F28	A2	2U23	B1	3F6E	B3	3U61	C1		
2F2A	B2	2U24	B1	3F6B	B3	3U62	C1		
2F2B	A2	2U27	B2	3F64	B3	3U63	C1		
2F2C	A2	2U28	B2	3F65	B3	3U64	C1		
2F2D	A3	2U29	B2	3F66	B3	3U65	C2		
2F2E	A2	2U33	B2	3F67	C3	3U66	C1		
2F2F	C3	2U34	B2	3F68	A3	3U67	C1		
2F2G	B2	2U35	B2	3F69	B3	3U68	C1		
2F2H	A2	2U36	C1	3F6A	B3	3U69	C1		
2F2J	A2	2U37	C1	3F6B	B3	3U70	C1		
2F2K	A2	2U38	C1	3F6C	B3	3U71	C1		
2F2L	A1	2U39	C1	3F6D	B3	3U72	C1		
2F2M	A1	2U40	C1	3F6E	B3	3U73	C1		
2F2N	A1	2U41	C1	3F6F	B3	3U74	C1		
2F2P	A1	2U42	C1	3F6G	B3	3U75	C1		
2F2Q	A1	2U43	C1	3F6H	B3	3U76	C1		
2F2R	A1	2U44	C1	3F6I	B3	3U77	C1		
2F2S	A1	2U45	C1	3F6J	B3	3U78	C1		
2F2T	A1	2U46	C1	3F6K	B3	3U79	C1		
2F2U	A1	2U47	C1	3F6L	B3	3U80	C1		
2F2V	A1	2U48	C1	3F6M	B3	3U81	C1		
2F2W	A1	2U49	C1	3F6N	B3	3U82	C1		
2F2X	A1	2U50	C1	3F6O	B3	3U83	C1		
2F2Y	A1	2U51	C1	3F6P	B3	3U84	C1		
2F2Z	A1	2U52	C1	3F6Q	B3	3U85	C1		
2F3A	A1	2U53	C1	3F6R	B3	3U86	C1		
2F3B	A1	2U54	C1	3F6S	B3	3U87	C1		
2F3C	A1	2U55	C1	3F6T	B3	3U88	C1		
2F3D	A1	2U56	C1	3F6U	B3	3U89	C1		
2F3E	A1	2U57	C1	3F6V	B3	3U90	C1		
2F3F	A1	2U58	C1	3F6W	B3	3U91	C1		
2F3G	A1	2U59	C1	3F6X	B3	3U92	C1		
2F3H	A1	2U60	C1	3F6Y	B3	3U93	C1		
2F3I	A1	2U61	C1	3F6Z	B3	3U94	C1		
2F3J	A1	2U62	C1	3F70	B3	3U95	C1		
2F3K	A1	2U63	C1	3F71	B3	3U96	C1		
2F3L	A1	2U64	C1	3F72	B3	3U97	C1		
2F3M	A1	2U65	C1	3F73	B3	3U98	C1		
2F3N	A1	2U66	C1	3F74	B3	3U99	C1		
2F3P	A1	2U67	C1	3F75	B3	3U100	C1		
2F3Q	A1	2U68	C1	3F76	B3	3U101	C1		
2F3R	A1	2U69	C1	3F77	B3	3U102	C1		
2F3S	A1	2U70	C1	3F78	B3	3U103	C1		
2F3T	A1	2U71	C1	3F79	B3	3U104	C1		
2F3U	A1	2U72	C1	3F7A	B3	3U105	C1		
2F3V	A1	2U73	C1	3F7B	B3	3U106	C1		
2F3W	A1	2U74	C1	3F7C	B3	3U107	C1		
2F3X	A1	2U75	C1	3F7D	B3	3U108	C1		
2F3Y	A1	2U76	C1	3F7E	B3	3U109	C1		
2F3Z	A1	2U77	C1	3F7F	B3	3U110	C1		
2F4A	A1	2U78	C1	3F7G	B3	3U111	C1		
2F4B	A1	2U79	C1	3F7H	B3	3U112	C1		
2F4C	A1	2U80	C1	3F7I	B3	3U113	C1		
2F4D	A1	2U81	C1	3F7J	B3	3U114	C1		
2F4E	A1	2U82	C1	3F7K	B3	3U115	C1		
2F4F	A1	2U83	C1	3F7L	B3	3U116	C1		
2F4G	A1	2U84	C1	3F7M	B3	3U117	C1		
2F4H	A1	2U85	C1	3F7N	B3	3U118	C1		
2F4I	A1	2U86	C1	3F7O	B3	3U119	C1		
2F4J	A1	2U87	C1	3F7P	B3	3U120	C1		
2F4K	A1	2U88	C1	3F7Q	B3	3U121	C1		
2F4L	A1	2U89	C1	3F7R	B3	3U122	C1		
2F4M	A1	2U90	C1	3F7S	B3	3U123	C1		
2F4N	A1	2U91	C1	3F7T	B3	3U124	C1		
2F4P	A1	2U92	C1	3F7U	B3	3U125	C1		
2F4Q	A1	2U93	C1	3F7V	B3	3U126	C1		
2F4R	A1	2U94	C1	3F7W	B3	3U127	C1		
2F4S	A1	2U95	C1	3F7X	B3	3U128	C1		
2F4T	A1	2U96	C1	3F7Y	B3	3U129	C1		
2F4U	A1	2U97	C1	3F7Z	B3	3U130	C1		
2F4V	A1	2U98	C1	3F80	B3	3U131	C1		
2F4W	A1	2U99	C1	3F81	B3	3U132	C1		
2F4X	A1	2U100	C1	3F82	B3	3U133	C1		
2F4Y	A1	2U101	C1	3F83	B3	3U134	C1		
2F4Z	A1	2U102	C1	3F84	B3	3U135	C1		
2F5A	A1	2U103	C1	3F85	B3	3U136	C1		
2F5B	A1	2U104	C1	3F86	B3	3U137	C1		
2F5C	A1	2U105	C1	3F87	B3	3U138	C1		
2F5D	A1	2U106	C1	3F88	B3	3U139	C1		
2F5E	A1	2U107	C1	3F89	B3	3U140	C1		
2F5F	A1	2U108	C1	3F8A	B3	3U141	C1		
2F5G	A1	2U109	C1	3F8B	B3	3U142	C1		
2F5H	A1	2U110	C1	3F8C					

8. Alignments

Index of this chapter:

- 8.1 General Alignment Conditions
- 8.2 Hardware Alignments
- 8.3 Software Alignments
- 8.4 Option Settings
- 8.5 Reset of Repaired SSB

Note: 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:

- Power supply voltage (depends on region):
 - AP-NTSC: 120 V_{AC} or 230 V_{AC} / 50 Hz (± 10%).
 - AP-PAL-multi: 120 - 230 V_{AC} / 50 Hz (± 10%).
 - EU: 230 V_{AC} / 50 Hz (± 10%).
 - LATAM-NTSC: 120 - 230 V_{AC} / 50 Hz (± 10%).
 - US: 120 V_{AC} / 60 Hz (± 10%).
 - Connect the set to the mains via an isolation transformer with low internal resistance.
 - Allow the set to warm up for approximately 15 minutes.
 - Measure voltages and waveforms in relation to correct ground (e.g. measure audio signals in relation to AUDIO_GND).
- Caution:** It is not allowed to use heatsinks as ground.
- Test probe: R_i > 10 Mohm, C_i < 20 pF.
 - Use an isolated trimmer/screwdriver to perform alignments.

8.1.1 Alignment Sequence

- First, set the correct options:
 - In SAM, select "Options", and then "Option numbers".
 - Fill in the option settings for "Group 1" and "Group 2" according to the set sticker (see also paragraph "Option Settings").
 - Press OK on the remote control **before** the cursor is moved to the left.
 - In submenu "Option numbers" select "Store" and press OK on the RC.
- OR:
 - In main menu, select "Store" again and press OK on the RC.
 - Switch the set to Stand-by.
- Warming up (>15 minutes).

8.2 Hardware Alignments

Not applicable.

8.3 Software Alignments

Put the set in SAM mode (see Chapter 5 "Service Modes, Error Codes and Fault Finding"). The SAM menu will now appear on the screen. Select ALIGNMENTS and go to one of the sub menus. The alignments are explained below.

The following item can be aligned:

- Whitepoint.

To store the data:

- Press OK on the RC **before** the cursor is moved to the left.
- In main menu select "Store" and press OK on the RC.
- Press MENU on the RC to switch back to the main menu.

- Switch the set to stand-by mode.

For the next alignments, supply the following test signals via a video generator to the RF input:

- **EU/AP-PAL** models: a PAL B/G TV-signal with a signal strength of at least 1 mV and a frequency of 475.25 MHz
- **US/AP-NTSC** models: an NTSC M/N TV-signal with a signal strength of at least 1 mV and a frequency of 61.25 MHz (channel 3).
- **LATAM** models: an NTSC M TV-signal with a signal strength of at least 1 mV and a frequency of 61.25 MHz (channel 3).
- **DVB-T** models: see table "SDM default settings" in chapter 5.

8.3.1 White Point

- Set "Active control" to "Off".
- Choose "TV menu", "TV Settings" and then "Picture" and put:
 - "Dynamic contrast" to "Off".
 - "Colour enhancement" to "Off".
 - "Light sensor" to "Off" where applicable.
 - "Clear LCD" to "On" where applicable.
 - "Brightness" to "50".
 - "Colour" to "0".
 - "Contrast" to "100".
- Go to the SAM and select "Alignments" -> "Whitepoint".

White point alignment LCD screens:

- Use a 100% white screen as input signal and set the following values:
 - "Colour temperature": "Normal".
 - All "Whitepoint" values to: "127".
 - "Red BL offset" values to "8".
 - "Green BL offset" values to "8".

In case you have a colour analyser:

- Measure with a calibrated (phosphor- independent) colour analyser in the centre of the screen. Consequently, the measurement needs to be done in a dark environment.
- Adjust the correct x,y coordinates (while holding one of the White point registers R, G or B on 127) by means of decreasing the value of one or two other white points to the correct x,y coordinates (see table "White D alignment values"). Tolerance: dx: ± 0.004, dy: ± 0.004.
- Repeat this step for the other colour temperatures that need to be aligned.
- When finished press OK on the RC and then press STORE (in the SAM root menu) to store the aligned values to the NVM.
- Restore the initial picture settings after the alignments.

Table 8-1 White D alignment values

Value	Cool (11000 K)	Normal (9000 K)	Warm (6500 K)
x	0.273	0.282	0.306
y	0.278	0.286	0.309

If you do not have a colour analyser, you can use the default values. This is the next best solution. The default values are average values coming from production (statistics).

- Select a COLOUR TEMPERATURE (e.g. COOL, NORMAL, or WARM).
- Set the RED, GREEN and BLUE default values according to the values in the "Tint settings" table.
- When finished press OK on the RC, then press STORE (in the SAM root menu) to store the aligned values to the NVM.
- Restore the initial picture settings after the alignments.

Table 8-2 Tint settings

Colour Temp.	R	G	B
Cool	113	119	123
Normal	124	117	115
Warm	127	105	77

8.4 Option Settings

8.4.1 Introduction

The microprocessor communicates with a large number of I²C ICs in the set. To ensure good communication and to make

8.4.2 Dealer Options

For dealer options, in SAM select "Dealer options" and then "Personal options".

Table 8-3 Dealer options

Menu item	Subjects	Options	Description
Personal Options	Picture Mute	On	Picture is muted / not muted in case no input signal is detected at input connectors
		Off	
	Virgin Mode	On	TV starts up / does not start up (once) with a language selection menu after the Mains switch is turned "on" for the first time (virgin mode)
		Off	

8.4.3 (Service) Options

Select the sub menu's to set the initialization codes (options) of the set via text menus.

Table 8-4 Service options

Menu-item	Subjects	Options	Description
Data	8 days EPG	Off	No possibility to program 8 days in advance using EPG
		On	Possibility to program 8 days in advance using EPG
Display	Screen	"Value"	Used screen size, type, and resolution (see table "Option code overview" in this chapter)
	Display fans	Not present / Present	Feature present / not present
	Temperature sensor	No sensor / Sensor on backside / Sensor in display	Location and presence of temperature sensor
	Temperature LUT	x	
	E-box & monitor	Off / On	E-box & monitor off / on
Video Repro	Perfect Pixel	Off / On	Perfect Pixel off / on
	Ambilight	None / Stereo / Triple / Quad	Inverter not present / one inverter / two inverters / three inverters / four inverters
	Ambilight technology	LED / Future use	LED (/future use)
	MOP ambient light	Not present / Present	MOP not present / present
	Light sensor	Not Present / Present	Light sensor not present / present
	Light sensor type	Glass / Plastic	Sensor type
Source selection	EXT1 type	"Value"	Specification
	EXT2 type	"Value"	Specification
	EXT3 type	"Value"	Specification
	HDMI 1	Present	Present
	HDMI 2	Present	Present
	HDMI 3	Present	Present
	HDMI CEC extended	Off / On	Feature not present / present
	HDMI CEC	Off / On	Feature not present / present
	USB version	"Value"	Specification
	Ethernet	Not present / Present	Feature not present / present
	Online services	Not present / Present	Feature not present / present
	PTP (Picture Transfer Protocol)	Not present / Present	Feature not present / present
	Connection assistant	Not present / Present	Feature not present / present
	Riva scroll RC support	Not present / Present	Feature not present / present
	System RC support	Not present / Present	Feature not present / present
Audio Repro	Acoustic System (Cabinet design, used for setting dynamic audio parameters)	11 / Essence 2K8 42	Cabinet specification

digital diagnosis possible, the microprocessor has to know which ICs to address. The presence/absence of these specific ICs (or functions) is made known by the option codes.

Notes:

- After changing the option(s), save them by pressing the OK button on the RC **before** the cursor is moved to the left, select STORE in the SAM root menu and press OK on the RC.
- The new option setting is only active after the TV is switched "off" / "stand-by" and "on" again with the Mains switch (the NVM is then read again).

Menu-item	Subjects	Options	Description
Miscellaneous	Region	Europe / AP-PAL-Multi / Australia / China	Region indication
	ATSC / DVB	On / Off	ATSC / DVB-T active / not active
	Over the air download	Off / Country dependent / On	Specification
	DVB-T installation	Off / Country dependent / On	Specification
	DVB-C	Off / On	Feature not present / present
	DVB-C installation	Off / Country dependent / On	Specification
	MPEG4	Not present / present	Feature not present / present
	Tuner type	TD1716 Mk3 / TD1716 Mk4 / VA1Y9ED2008	Tuner type
	I ² C configuration	None / With PCA 9540	Specification
	Channel decoder	TDA10048	Channel decoder type
	Hotel mode	Off	Hotel mode not supported
	Video playback	Off / On	Feature present / not present
	Update assistant	Present	Feature present
	Board identifier	On	Board identifier supported
	LightGuide	Off / On	LightGuide off / LightGuide on
Opt. no.	Group 1		xxxxx xxxxx xxxxx xxxxx (see set sticker)
	Group 2		xxxxx xxxxx xxxxx xxxxx (see set sticker)
	Store - go right	Store - press OK	Store option settings

8.4.4 Opt. No. (Option numbers)

Select this sub menu to set all options at once (expressed in two long strings of numbers).

An option number (or "option byte") represents a number of different options. When you change these numbers directly, you can set all options very quickly. All options are controlled via eight option numbers.

When the NVM is replaced, all options will require resetting. To be certain that the factory settings are reproduced exactly, you must set both option number lines. You can find the correct option numbers on a sticker inside the TV set and in Table "Option code overview".

Example: The options sticker gives the following option numbers:

- 04368 00005 01066 08707
- 00000 00032 00512 00000

The first line (group 1) indicates hardware options 1 to 4, the second line (group 2) indicates software options 5 to 8.

Every 5-digit number represents 16 bits (so the maximum value will be 65536 if all options are set).

When all the correct options are set, the sum of the decimal values of each Option Byte (OB) will give the option number. See tables "Option code overview" for the options.

Diversity

Not all sets with the same Commercial Type Number (CTN) necessarily have the same option code!

Use of Alternative BOM

An alternative BOM number usually indicates the use of an alternative display or power supply. This results in another display code thus in another Option code. For the power supply there is no difference. Refer to chapter 2 "Safety Instructions, Warnings, and Notes".

8.4.5 Option Code Overview

Table 8-5 Option code overview

CTN_alt BOM#	Options Group 1	Options Group 2	Displ. (code)
42PES0001D/10	16897 01419 37079 45160	10152 21792 07041 0001	168
42PES0001H/10	16897 01419 37079 45160	10152 21924 07073 0001	168

Important: after having edited the option numbers as described above, you **must** press OK on the remote control **before** the cursor is moved to the left!

8.5 Reset of Repaired SSB

A very important issue towards a repaired SSB from a service repair shop, implies the reset of the NVM on the SSB.

A repaired SSB in service should get the service Set type "00PF0000000000" and Production code "00000000000000". Also the virgin bit is to be set. To set all this, you can use the ComPair tool.

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

Index of this chapter:

- 9.1 Introduction
- 9.2 Main Supply
- 9.3 On-board DC/DC Converters
- 9.4 Additional Monitor DC/DC Converters
- 9.5 Front-End
- 9.6 PNX85xx
- 9.7 Back-end
- 9.8 Audio
- 9.9 DLNA
- 9.10 Abbreviation List
- 9.11 IC Data Sheets

Notes:

- Only **new** circuits (circuits that are not published recently) are described.
- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use the wiring, block (chapter 6) and circuit diagrams (chapter 7). Where necessary, you will find a separate drawing for clarification.

- ST7101-output is connected to HDMI multiplexer input 4.
- None of the HDMI inputs is associated with L/R side I/O.
- No SVHS on side I/O.
- Fan control added.
- No AmbiLight implementation > no AL EPLD.
- Audio via I²S.
- Possible other startup/shutdown behaviour (due to standby SW).
- Dedicated Essence Display Port functionality (the display ports perform the interface between hub/monitor and interconnection cable).

9.1.3 TV522/Essence Architecture Overview

For details about the chassis block diagrams refer to chapter "Block diagrams, Test Point Overview, and Waveforms". An overview of the TV522/92 architecture can be found in next figure "Architecture of TV522/92 platform". The sets use the PNX85xx SoC and the PNX5100 Video Back-end Processor for video processing.

9.1 Introduction

This chassis (member of the "TV522/92" platform) is a derivative from the Q529.1E LA/LB chassis. It is a new concept, introducing the separation between monitor and supporting hardware/software in a separate hub. The styling name is "ESSENCE". Hub and monitor are connected with a single cable. All I/O connectors are present on the hub, avoiding cable clutter around the screen.

The platform incorporates an improved (faster tuning, better phase noise performance, etc.) tuner block with separate support for DVB-C and DVB-T.

It's built around the PNX85xx "System on Chip" (SoC), which handles the video and audio processing, while the PNX51xx takes care of the video back-end processing. The CYCLONE II FPGA is used to process the data for the GENESIS Display Port, which transmits the data from hub to monitor.

9.1.1 Features

The main features for this chassis are:

- 1080p resolution @ 100 Hz.
- High performance back-end processing Perfect Pixel HD engine capable of 300 Mpixels/sec. With this technology, each pixel of the incoming picture is enhanced to better match the surrounding pixels, resulting in a more natural picture. Artifacts and noise in all sources from multimedia to standard TV to highly-compressed high-definition (HD) are detected and reduced. This results in a clean and razor sharp image.
- ClearLCD, a technology that uses scanning and back light dimming technology to reduce the motion blur on an LCD screen, caused by the slow response time and the "sample and hold" characteristic of LCD.
- The separation of panel and supporting electronics by introducing a separate monitor and hub, connected by a single-cable connection.
- The introduction of the Essence Smart Levelling Bracket, allowing hassle-free mounting of the screen on the wall.
- Improved tuner compared to Q528.1E LA chassis.
- Support of DVB-C reception (in some sets).
- For all other features: refer to the Q528.1E LA/LB Service Manual.

9.1.2 Delta's with respect to Q529.1E LA/LB chassis

- 3 HDMI inputs (inputs are swapped).

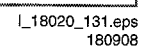


Figure 9-1 Architecture of Essence - Hub

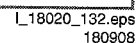
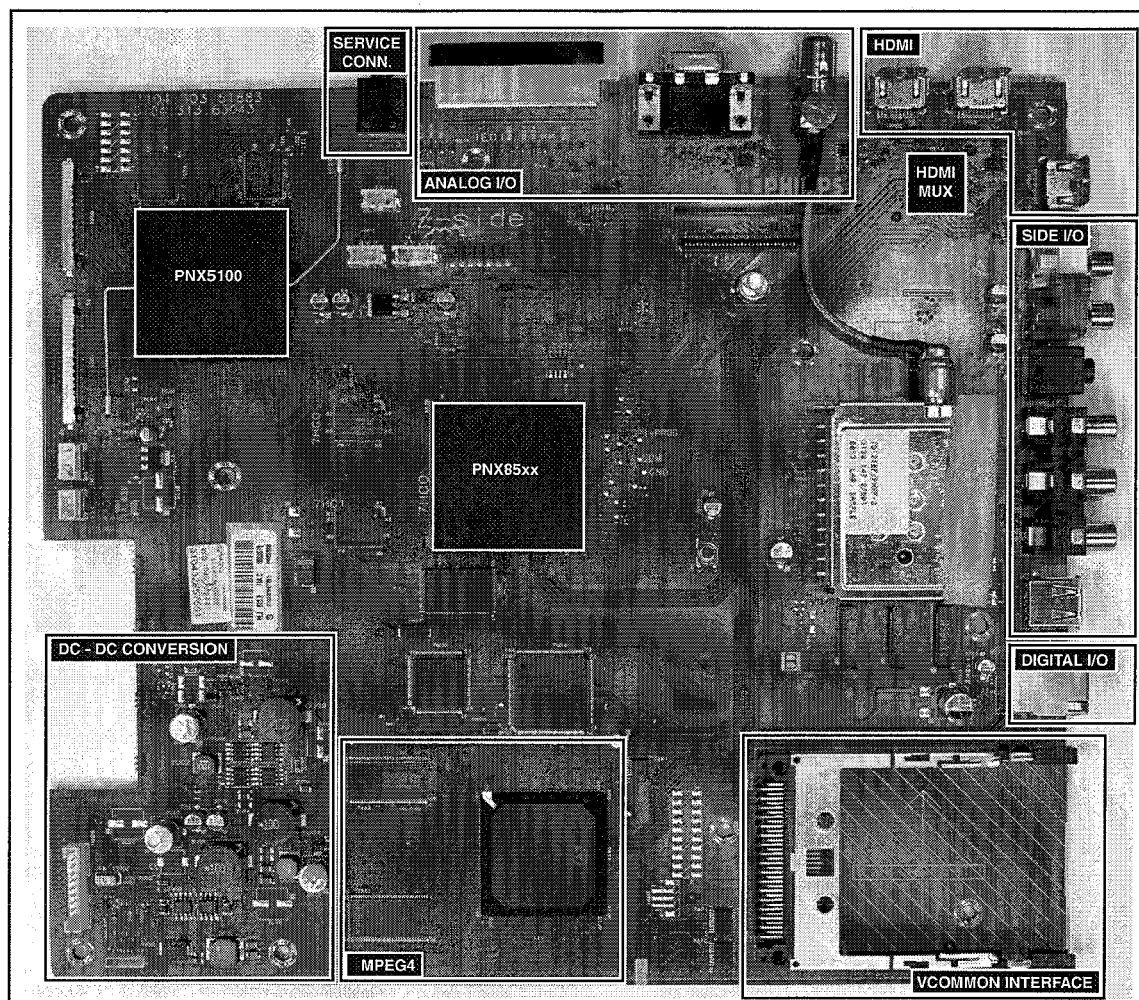


Figure 9-2 Architecture of Essence - Monitor

9.1.4 SSB Cell Layout



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Figure 9-3 SSB top view

9.2 Main Supply

The sets in this chassis comes with a buy-in "Bobitrans" supply unit.

When defective, a new panel must be ordered and the defective panel must be sent for repair, unless the main fuse of

the panel is broken. Always replace a defective fuse with one with the correct specifications! This part is available in the regular market.

Refer to the Spare Parts list for the order number of the supply unit

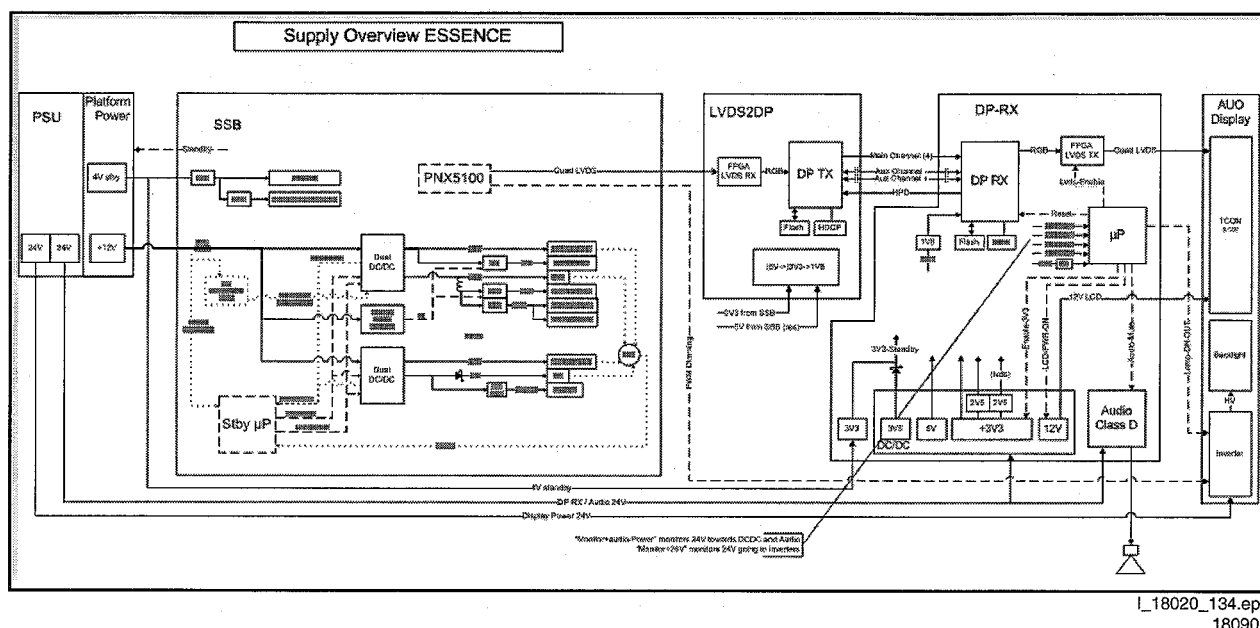


Figure 9-4 High level Power Architecture ESSENCE

9.3 On-board DC/DC Converters

In this platform, on-board DC/DC converters have been foreseen. See also diagrams B01A, B01B and B01C.

9.3.1 PSU Start-up Sequence

1. If the input voltage of the DC/DC converters is around 12 V (measured on the decoupling capacitors 2U01/2U02) and the ENABLE signals are "low" (active), then the output voltages should have their normal values.
2. First, the Stand-by Processor activates the +1V2 supply (via ENABLE-1V2).
3. Then, after this voltage becomes present and is detected OK (about 100 ms), the other voltage of +3V3 will be activated (via ENABLE-3V3).
4. The current consumption of controller IC 7U00 is around 20 mA (that means around 200 mV drop voltage across resistor 3U01).

9.3.2 Internal Protection

- Provides a SUPPLY-FAULT signal (active “low”), when the output voltage of any DC/DC converter is out of its limits ($\pm 10\%$ of the normal value). In such cases, the Stand-by Processor will immediately stop the supplies by sending a “high” control signal towards the external and internal supplies: ENABLE-xVx, POD-MODE, ON-MODE, and STAND-BY.
- Note:** The SUPPLY-FAULT control signal is “low” when any DC/DC converter is disabled by its control signal (ENABLE-xVx) and +12VSW is present, therefore it is ignored during start-up!
- The internal protection works together with the output over-voltage detector transistors 7U07-1 and 7U07-2.

9.3.3 1.2V and 3.3V DC/DC Converters

Introduction

The circuit used is a so-called “synchronous buck converter”.
Some characteristics:

- Switching frequency: approx. 250 kHz.
 - Efficiency: approx. 90%.
-
- Built-in output over-voltage and over-current protections
 - Soft start.
 - Software controlled "on/off" (via ENABLE line).

Block diagram

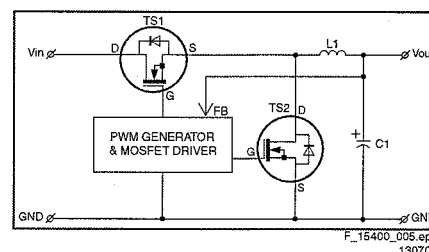


Figure 9-5 Block diagram synchronous buck converter.

The advantage of a “synchronous buck converter” over a “classical buck converter” is its better efficiency (about 90%). The difference between the two is that in a synchronous buck converter the “low -side” diode is replaced by a MOSFET TS2 (item 7U05). This, because the voltage drop across a MOSFET is smaller than the forward voltage drop of a diode. This second MOSFET TS2 conducts current during the “off” times of the first MOSFET TS1 (item 7U08 at the input side). The upper MOSFET TS1 conducts, to transfer energy from the input to the inductor L_1 and load R_L , while the lower MOSFET TS2 conducts to circulate the inductor current (free wheel). The synchronous PWM control block regulates the output voltage by modulating the conduction intervals of the upper and lower MOSFETs.

PWM Generator and MOSFET Drivers

This circuit is a one-chip solution (item 7U0A). It contains all the circuitry for two independent buck regulators (3V3 and 1V2). The MOSFETs 7U08, 7U02, 7U05 and 7U06 are the switching transistors, they are conducting alternatively.

- Time sequence 1: 7U08/7U02 is conducting; energy is stored in coil 5U01/5U00. The current is flowing from the +12VSW power supply source.
- Time sequence 2: 7U08/7U02 is blocked; energy is stored in coil 5U01/5U00.
- Time sequence 3: 7U05/7U06 is conducting, and the current circuit is now closed via 7U05/7U06, 5U01, 5U00, 2U06/2U0Z/2U07/2U0T/2U0U/2U0V, and the load. So the energy stored in the coil during time sequence T1 is consumed during sequence T3. The signal on the gate 7U05/7U06 is 180 degrees turned compared with the signal on the gate 7U08/7U02.

Voltage Booster

This circuit is built around capacitors 2U29 and 2U26, resistor 3U62/3U0A1, diodes 6U01 and 6U00, and transistor 7U03. It generates the +18 V boost voltage on pin 4 of item 7U00, to drive the "high-side" power MOS-FET 7U08/7U02. The voltage is generated only during normal operation of the converter; therefore, any drop in its value means an internal fault condition, which is sensed by the internal protection circuit. The AC component of the voltage on the source of transistor 7U08/7U02 is rectified by the diodes and added to the input voltage, resulting into the boost voltage. The resistor 3U02/3U1K limits the peak current through the rectifier diodes.

Over-current Detection

Over-current detection is done via components 3U05, 3U06, 3U15, 3U14, and 2U04 for the 3.3 V converter and 3U00, 3U01, 3U16, 3U17, and 2U00 for the 1.2 V converter.

Under-voltage Detection

There is an additional circuit (7U01-1, 7U01-2 and 6U04) to switch "Off" the 3.3 V converter in case the +12VS drops below 9 V.

Service Tips

- When a power MOS-FET is found defective, replace the other power MOS-FET as well.
- For a normal operation of the converter, it is important to check the switching frequency and the value of the boost voltage.

9.4 Additional Monitor DC/DC Converters

In the monitor, additional DC/DC receivers are located to eliminate a voltage drop across the interconnection cable between monitor and hub. Refer to diagrams M01A and M01B.

A +12V feedback-loop is built around items 2U09, 2U08, 3U04, 6U03, 3U07, 3U05 and 3U06.

A +3V feedback-loop is built around items 2U21, 3U12, 3U13, 3U14, 2U17 and 3U15.

Just as with the DC/DC converters in the hub, the circuit used is a so-called "synchronous buck converter". Switching frequency is approx. 300 kHz.

Following figures depict the additional Monitor DC/DC converters.

- Gain to obtain optimised channel decoder level. Control

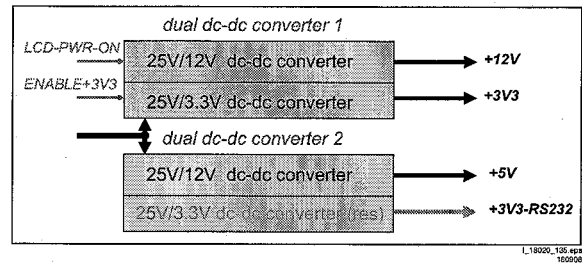


Figure 9-6 ESSENCE monitor DC/DC converters -1-

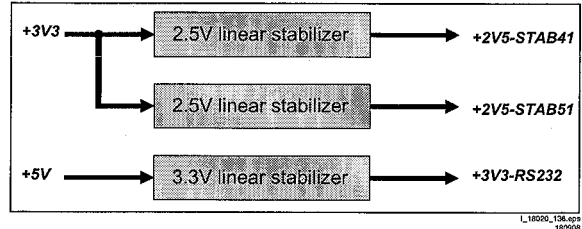


Figure 9-7 ESSENCE monitor DC/DC converters -2-

9.5 Front-End

Refer to figure "9-1 Architecture of Essence - Hub" earlier in this chapter for details. Refer also to block diagrams B02A, B02B and B02C.

9.5.1 Device specifications

Tuner (TD1716)

The tuner has the following specifications:

- Hybrid tuner with symmetrical IF output.
- Down conversion from RF to IF frequency (picture carrier 39.875 MHz at analogue reception, centre frequency 36.166 MHz at digital reception).
- AGC control signal is coming from master IF device (TDA9898).
- Only 5 V external supply needed (internal DC-DC conversion to 3.3 V).
- 4 MHz output is used by channel decoder (TDA10048) and master IF device (TDA9898).

The application in this chassis is as follows:

- I²C address C0.
- Broadband AGC, no IF section.
- I²C communication buffered via MUX.
- Gain to obtain optimised Master IF input level; AGC control is completely inside the tuner.
- Output level ca. 110 dBμV (for strong input signal).

Repair tip: after replacement of the tuner, the option code should be checked, even when the set appears to function correctly! Refer also to chapter 5 "Service Modes, Error Codes, and Fault Finding".

Master IF (TDA9898)

- Down conversion from IF to low-IF frequency.
- Down conversion from IF to SIF.
- CVBS output.

The application in this chassis is as follows:

- I²C address 0x86.
- Down conversion from IF to low-IF frequency (5.166 MHz centre frequency).
- Advanced filtering (for further rejection of adjacent channels). signal is coming from channel decoder.

SAW filter**X6874D and X3451K**

- Analogue sound for BG, I, DK, L, L'.
- DVB-T (digital reception sound and video).

For digital reception, the application in this chassis is as follows:

- Rejection of adjacent channels.
- Switching is done by Master IF (3 inputs).
- One SAW covering both 7 and 8 MHz channels.

X6774D

- Analogue video for BG, I, DK, L, L'.

Channel decoder (TDA10048) DVB-T

The channel decoder has the following specifications:

- I²C address 0x10.
- Decoding from low-IF to MPEG transport stream.
- During decoding: de-modulation, de-interleaving and error correction.

- External clock buffer required.
- No start-up requirements.
- AGC monitor.

Channel decoder (TDA10023) DVB-C

The channel decoder has the following specifications:

- I²C address 0x1C.
- Decoding from low-IF to MPEG transport stream.
- During decoding: de-modulation, de-interleaving and error correction.
- External clock buffer required.
- No start-up requirements.
- AGC monitor.

9.5.2 Digital signal processing (front-end)

Refer to figure "9-8 DVB-C signal broadcast reception block diagram" and "9-9 DVB-T signal broadcast reception block diagram" for details of digital signal processing.

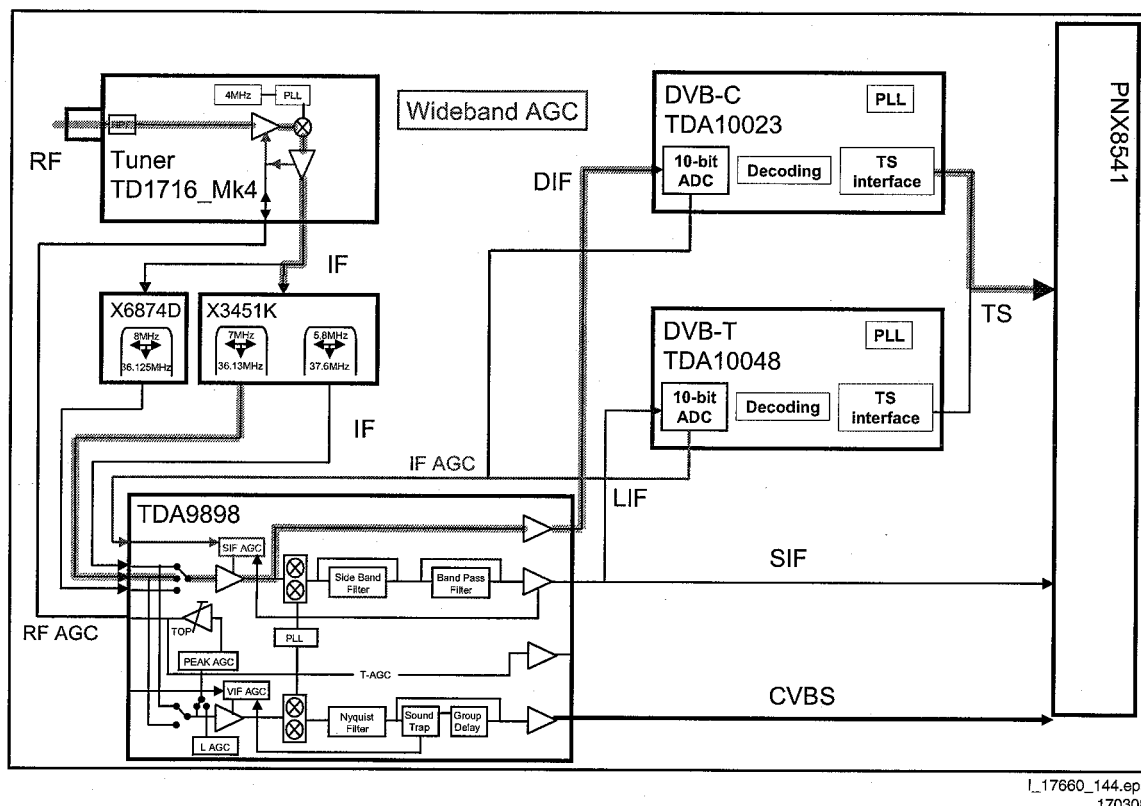
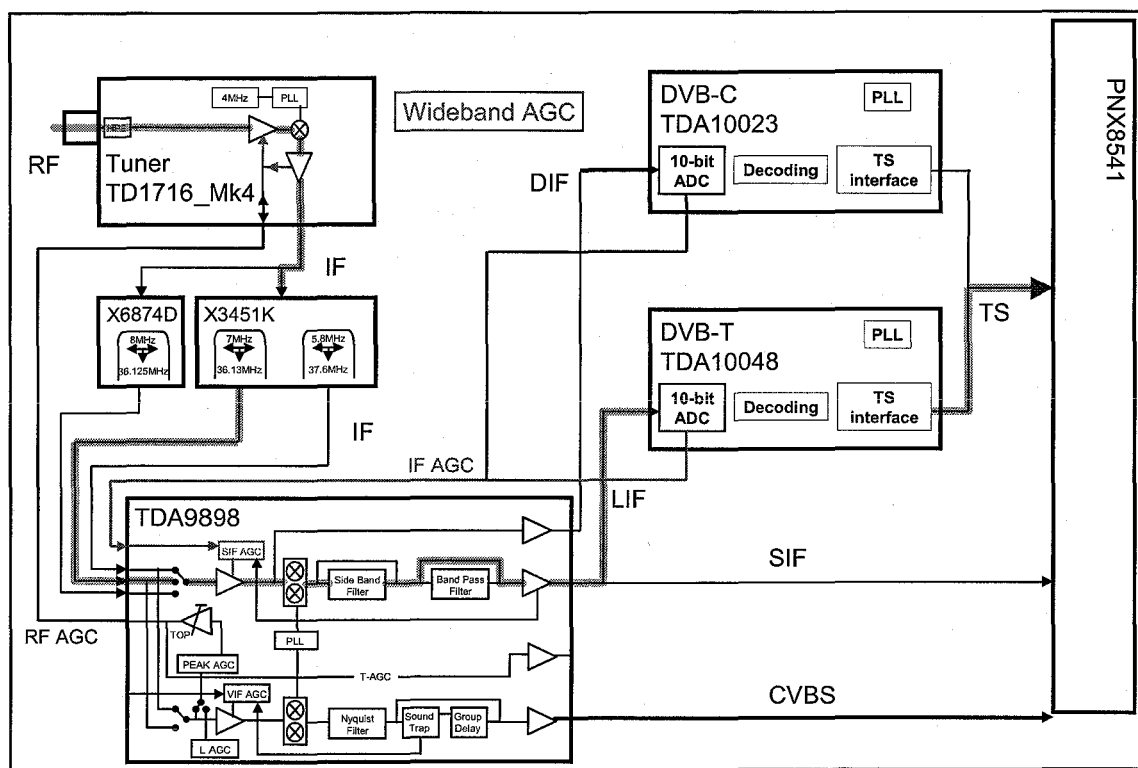


Figure 9-8 DVB-C signal broadcast reception block diagram

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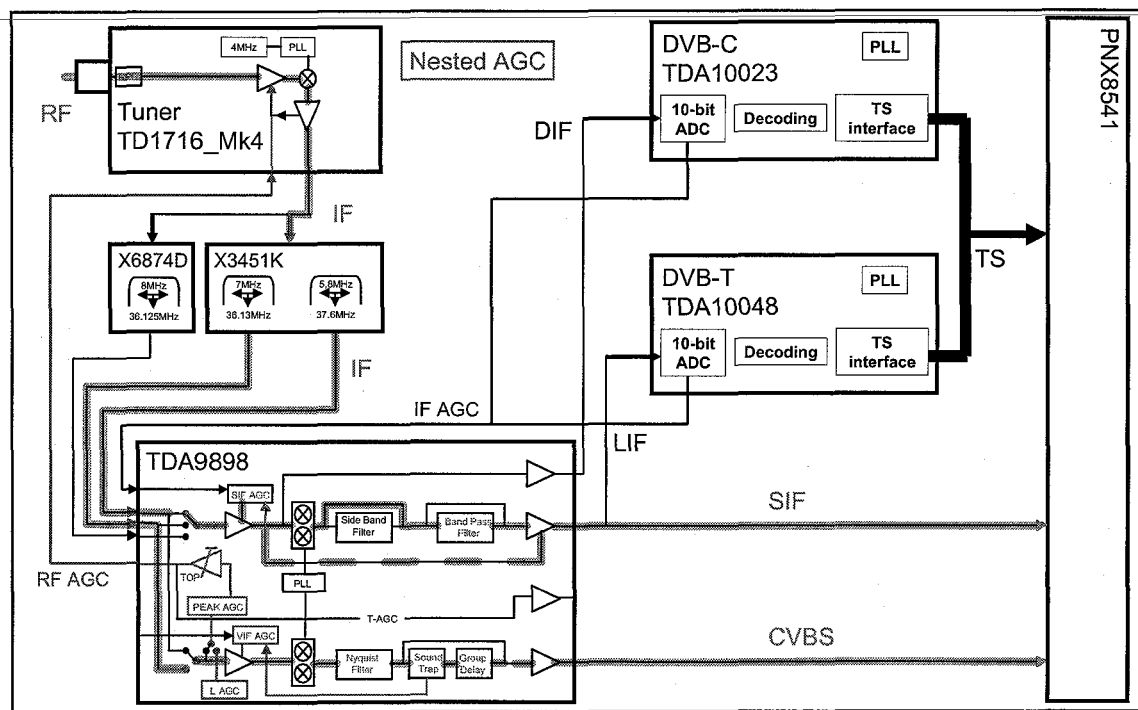


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Figure 9-9 DVB-T signal broadcast reception block diagram

9.5.3 Analogue signal processing (front-end)

Refer to figure "9-10 Analog video broadcast reception block diagram" for details of analogue signal processing.



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Figure 9-10 Analog video broadcast reception block diagram

9.6 PNX85xx

In this chassis, the PNX85xx is responsible for the audio/video source decode functions and video improvement processing on both digital and analogue sources. It includes a multi-standard digital video decoder for MPEG2, and a multi-standard analogue video decoder for support of PAL, NTSC, and SECAM standards. Refer to diagram B04 for details.

9.6.1 Video Subsystem

Refer to figure "9-11 PNX85xx video flow diagram" for a clarification of the blocks that are used in this device.

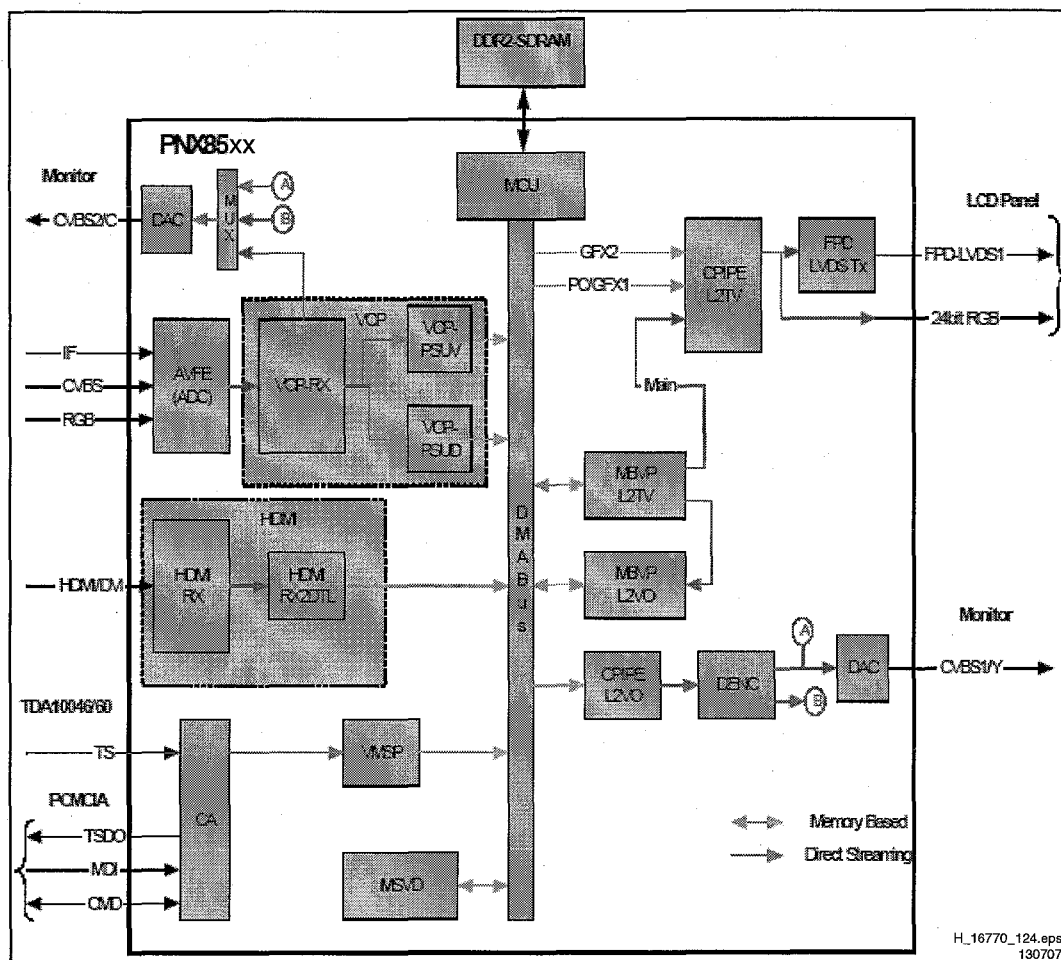


Figure 9-11 PNX85xx video flow diagram

The Analogue Video Front-End (AVFE) provides the interface to external analogue baseband video sources and IF inputs. It supports the following inputs:

- 1fh - CVBS, Y/C, YPbPr, RGB.
- 2fh - YPbPr, RGB.
- IF - low-IF, SSIF.

The Video Capture Pipe (VCP) is used to capture analogue video inputs and consists of a number of blocks:

- The VCP-RX block that contains digital IF processing, a Video Decoder, a 3D-combfilter, and a VBI-Data Capture unit together with a number of smaller control functions.
- The VCP-PSUD which allows VBI data, such as Teletext and Closed Captioning, to be stored in memory.
- The VCP-PSUV which allows captured video data to be stored in memory.

The HDMI receiver interface supports the capture of signals compliant with the HDMI V1.3 specification. It consists of two blocks:

- Block HDMI-RX contains the de-serializer, HDCP, audio and video data capture and info packet extraction, together with audio formatting.
- Block HDMI-RX2DTL allows captured video data to be stored in memory.

The Memory Based Video Processor TV (MBVP_L2TV) is used on the main video channel for de-interlacing and scaling of images, together with video measurement functions.

The Video Composition Pipe TV (CPIPE_L2TV) is used to perform picture improvements on video and merge the video layer and 2 graphics layers into a single stream.

The Flat Panel Display-LVDS (FPD-LVDS) provides a serial interface for 10-bit RGB output data towards the LCD panel.

The Memory Based Video Processor VO (MBVP_L2VO) is used on the main video channel for scaling of images for monitor out.

The Video Composition Pipe VO (CPIPE_VO) is used to merge a video and a graphics layer into a single stream together with insertion of VBI and CGMS data.

The Digital Encoder (DENC) supports encoding of a digital video stream from the CPIPE_VO into Analogue CVBS or Y/C.

9.6.2 Audio Subsystem

Refer to figure "9-12 PNX85xx audio flow diagram" for a clarification of the blocks that are used in this device.

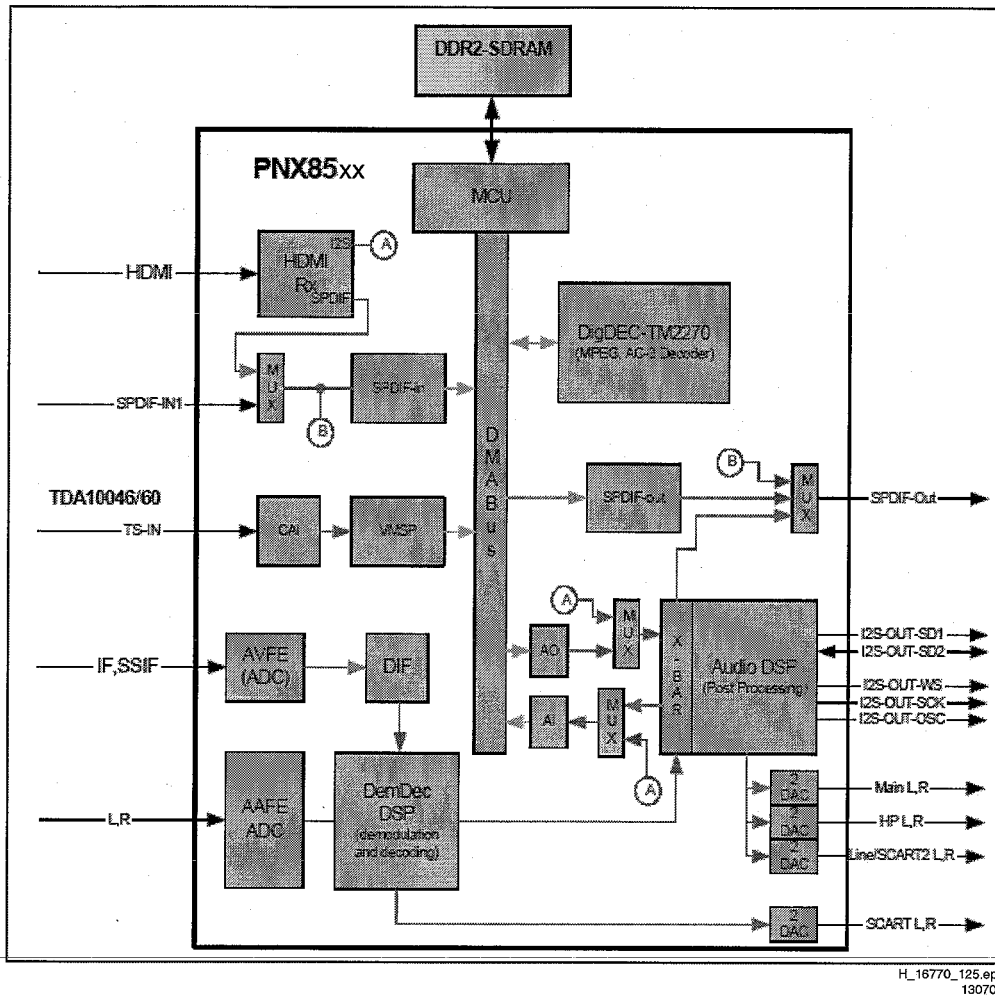


Figure 9-12 PNX85xx audio flow diagram

The Analogue Audio Front-End Input (AAFE) block is used to capture Baseband Audio Inputs.

The Sony/Philips Digital Interface (SPDIF) input is used to get compressed data into the system memory. The multiplexer in front of the block allows two possible sources of SPDIF signals.

The SPDIF Output is used to generate either PCM data or a compliant IEC-61937 compressed stream containing MPEG/Dolby Digital format.

The Audio Input (AI) block is used to transfer stereo audio (I²S channel) from the Audio DSP into the system memory for "lip-sync" delay.

The Audio Output (AO) block supports output of up to four stereo I²S channels. The AO is used to transfer data from the system memory to the Audio DSP, for post processing of the signal at a sampling frequency of 48 kHz (max.).

Demodulation & Decoding DSP is used for demodulation and decoding of all analogue terrestrial TV sound standards that the TV520 platform covers.

The Audio Post-Processing DSP supports DPLII together with volume and tone control, spatializers, and equalizers for 6 channels (max.)

Digital Audio Decoder DSP is used to decode digital compressed streams such as MPEG and AC-3. This runs as SW Codecs on the AV-DSP.

9.6.3 Audio-Video Codec Subsystem

The AV Codec subsystem consists of the modules required to capture and de-scramble Transport stream inputs together with decoding of Audio/video Streams. Refer to figure "PNX85xx video flow diagram" for a clarification.

The sub-system consists of the following modules:

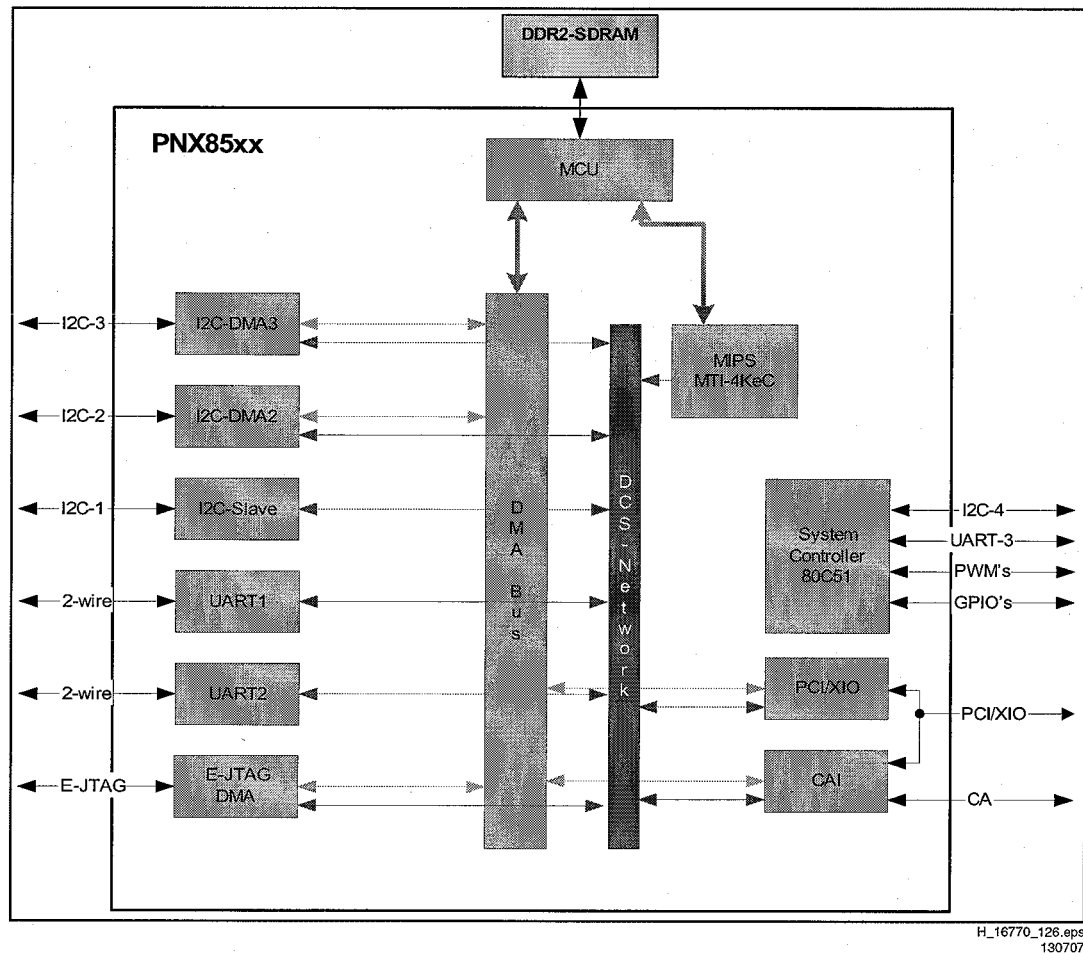
The Conditional Access Interface block provides a direct interface towards a PCMCIA socket for Conditional Access. It supports both the DVB CI-CA Specification and the CableCard (POD) Interface.

The MPEG System Processor (VMSP) provides parsing an MPEG-2 transport stream, including de-scrambling, de-multiplexing and appropriate routing of data to the memory.

The Video MPEG Decoder (VMPG) performs MPEG2 decoding for both MP@ML and MP@HL streams.

9.6.4 Control and Compute Subsystem

Refer to figure "Control and compute subsystem" for a clarification of the blocks that are used in this device.



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Figure 9-13 Control and compute subsystem

The Control and compute subsystem consists of the main processor, control peripherals and the memory system.

The MIPS 4KEc is a 32-bit MIPS RISC core. It has direct access to connectivity peripherals to support system features via PCI, I²C, UART or General Purpose I/O. A JTAG interface provides processor software debug capabilities.

The Memory Control Unit (MCU) is a 32-bit DDR2 SDRAM interface supporting DDR2-533 with an address range of 128 MB (max.).

The PCI/XIO interface supports PCI Rev2.2 and can be used to access 8/16-bit external NAND-Flash memory.

The Conditional Access Interface supports direct control and communication to the PC-Card attached to a PCMCIA interface. The interface supports the DVB CI-CA and CableCard specification.

9.7 Back-end

Refer to figures "9-1 Architecture of Essence - Hub" earlier in this chapter for details. Refer also to block diagrams B05, B05, B06 and AB.

In HD sets (50 / 100 Hz), the output signal coming from the PNX85xx is fed to the PNX5100 and then to the Spartan-3 FPGA for driving the AmbiLight units. The PNX5100 3 also generates the pulse-width modulated signal needed for the "Dimming Backlight" feature, which ensures additional motion sharpness. As some displays require an analogue signal to switch the LCD, a multiplexer is added to transform the pulse width modulated signal. An additional signal, coming from the PNX85xx, makes the selection between analogue and pulse-width modulation, depending on which display is used. Scanning back light displays require an analogue signal, and all other displays a pulse-width modulated.

Refer to figure "9-14. PNX5100 Detailed Video Block diagram".

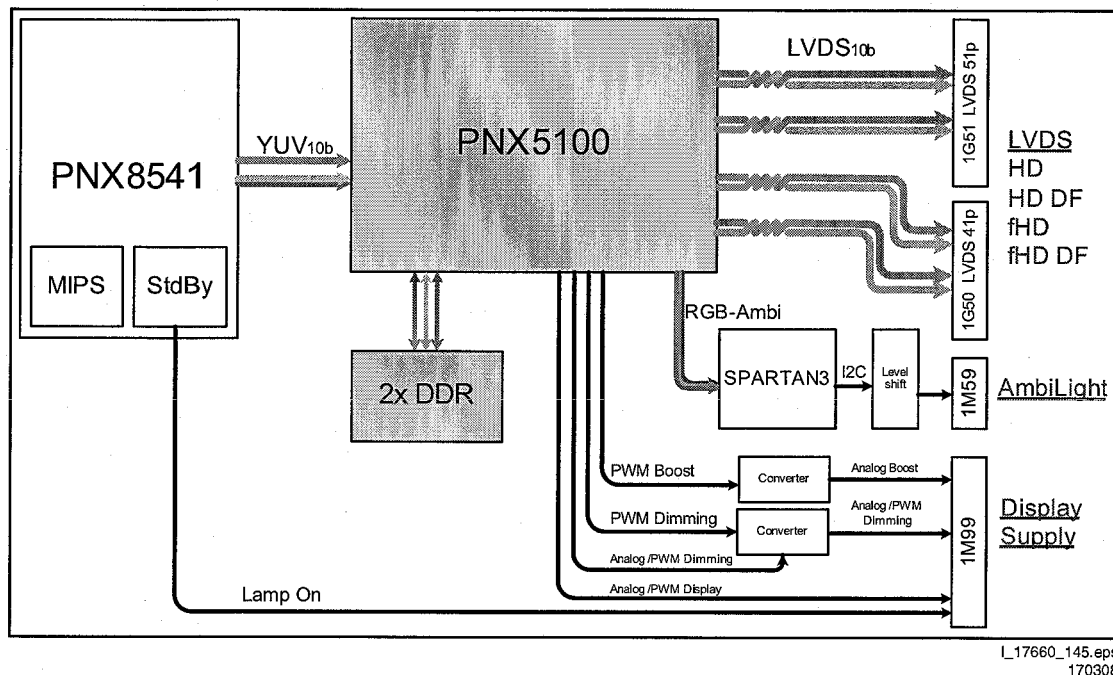


Figure 9-14 PNX5100 Detailed Video Block diagram

9.7.1 PNX5100

The PNX5100 performs the following tasks:

- Picture quality improvement (Natural Motion, etc.).
- Video and graphics (On Screen Display) mixing.
- Up conversion from 50/60 to 100/120 Hz.
- Colour processing
- Sharpness processing
- Backlight control
- AmbiLight pre processing
- Switching On and Off of the display
- Pattern generator

The PNX5050 interfaces:

- Video input (CMOS).
- Graphics input (PCI).
- I²C.
- Field memory (2 × DDR).
- Video output: LVDS (single, dual or quad) to display
- Backlight control: PWM for dimming and boost
- AmbiLight: CMOS sequential RGB to FPGA
- GPIO

Refer to figure "9-14 PNX5100 Detailed Video Block diagram" for details.

9.8 Audio

As a result of separation between monitor and supporting electronics (hub), some modifications are made w.r.t. previous chassis (Q529.1E LA/LB).

The delta's are:

- All audio I/O, except side I/O, has been moved to a separate I/O panel.
- One HDMI connector less on SSB.
- Audio Amplifier is moved to Monitor panel (DPRX)
- Audio for the amplifier is sent via I²S.
The conversion to I²S format is done in the FPGA.
- The amplifier type is the same as for the earlier Q529.1E LA/LB chassis.
- Application however is different as a single supply is used.

- An extra fuse is implemented in the audio supply on the monitor board as a result of the (long) supply cable
- Extra audio supply decoupling is implemented.
- DC-protection is self-contained: it will only affect the operation of the amplifier. The amplifier will go in a one-second switch on/switch off cycle when in protection.
- Audio DAC is added to convert the I²S signal into the analog domain.

As a result of the audio application in this chassis, you can disconnect the speakers without the risk of damaging the amplifier. Also, the set will not go into protection anymore.

9.9 DLNA

Is an international, cross-industry collaboration of consumer electronics, computing industry and mobile device companies standard. The main objective of DLNA is the establishment of a wired and wireless inter operable network of personal computers (PC), consumer electronics (CE) and mobile devices in the home and on the road, enabling a seamless environment for sharing new digital media and content services. DLNA is focused on delivering an inter operability framework of design guidelines based on open industry standards to complete the cross-industry digital convergence. The TV522 platform is set up as Digital Media Player. It can find and play or display the content that is shared on your network by server devices. In this chassis, an Ethernet MAC/PHY for wired Ethernet is incorporated to support DLNA.

Main features:

- National Semiconductors DP83816
- Controlled over PCI interface
- Physical layer uses a top-entry RJ45 with integrated magnetics (UTP)
- Supports 10M and 100M (full and half duplex)
- Uses 3V3 only (divided into separate analog and digital supply planes)
- The network controller shares the interrupt with the USB host controller
- The network controller can access the DRAM to dump/fetch packets.

9.10 Abbreviation List

0/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV), 6 = play 16 : 9 format, 12 = play 4 : 3 format	D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz
2DNR	Spatial (2D) Noise Reduction	DFI	Dynamic Frame Insertion
3DNR	Temporal (3D) Noise Reduction	DFU	Directions For Use: owner's manual
AARA	Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeps the original aspect ratio	DLNA	Digital Living Network Alliance
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page	DMR	Digital Media Reader: card reader
ADC	Analogue to Digital Converter	DNM	Digital Natural Motion
AFC	Automatic Frequency Control: control signal used to tune to the correct frequency	DNR	Digital Noise Reduction: noise reduction feature of the set
AGC	Automatic Gain Control: algorithm that controls the video input of the feature box	DRAM	Dynamic RAM
AM	Amplitude Modulation	DRM	Digital Rights Management
ANR	Automatic Noise Reduction: one of the algorithms of Auto TV	DSP	Digital Signal Processing
AP	Asia Pacific	DST	Dealer Service Tool: special remote control designed for service technicians
AR	Aspect Ratio: 4 : 3 or 16 : 9	DTCP	Digital Transmission Content Protection; A protocol for protecting digital audio/video content that is traversing a high speed serial bus, such as IEEE-1394
ASF	Auto Screen Fit: algorithm that adapts aspect ratio to remove horizontal black bars without discarding video information	DVB-C	Digital Video Broadcast - Cable
ATSC	Advanced Television Systems Committee, the digital TV standard in the USA	DVB-T	Digital Video Broadcast - Terrestrial
ATV	See Auto TV	DVD	Digital Versatile Disc
Auto TV	A hardware and software control system that measures picture content, and adapts image parameters in a dynamic way	DVI(-d)	Digital Visual Interface (d= digital only)
AV	External Audio Video	E-DDC	Enhanced Display Data Channel (VESA standard for communication channel and display). Using E-DDC, the video source can read the EDID information from the display.
AVC	Audio Video Controller	EDID	Extended Display Identification Data (VESA standard)
AVIP	Audio Video Input Processor	EEPROM	Electrically Erasable and Programmable Read Only Memory
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz	EMI	Electro Magnetic Interference
BLR	Board-Level Repair	EPLD	Erasable Programmable Logic Device
BTSC	Broadcast Television Standard Committee. Multiplex FM stereo sound system, originating from the USA and used e.g. in LATAM and AP-NTSC countries	EU	Europe
B-TXT	Blue TeleteXT	EXT	EXTERNAL (source), entering the set by SCART or by cinches (jacks)
C	Centre channel (audio)	FBL	Fast BLanking: DC signal accompanying RGB signals
CEC	Consumer Electronics Control bus: remote control bus on HDMI connections	FDS	Full Dual Screen (same as FDW)
CL	Constant Level: audio output to connect with an external amplifier	FDW	Full Dual Window (same as FDS)
CLR	Component Level Repair	FLASH	FLASH memory
COLUMBUS	COLOUR LUMinance Baseband Universal Sub-system	FM	Field Memory or Frequency Modulation
ComPair	Computer aided rePair	FPGA	Field-Programmable Gate Array
CP	Connected Planet / Copy Protection	FTV	Flat TeleVision
CSM	Customer Service Mode	Gb/s	Giga bits per second
CTI	Colour Transient Improvement: manipulates steepness of chroma transients	G-TXT	Green TeleteXT
CVBS	Composite Video Blanking and Synchronization	GPIO	General Purpose Input/Output
DAC	Digital to Analogue Converter	H	H_sync to the module
DBE	Dynamic Bass Enhancement: extra low frequency amplification	HD	High Definition
DDC	See "E-DDC"	HDD	Hard Disk Drive
		HDCP	High-bandwidth Digital Content Protection: A "key" encoded into the HDMI/DVI signal that prevents video data piracy. If a source is HDCP coded and connected via HDMI/DVI without the proper HDCP decoding, the picture is put into a "snow vision" mode or changed to a low resolution. For normal content distribution the source and the display device must be enabled for HDCP "software key" decoding.
		HDMI	High Definition Multimedia Interface
		HP	HeadPhone
		I	Monochrome TV system. Sound carrier distance is 6.0 MHz
		I ² C	Inter IC bus
		I ² D	Inter IC Data bus
		I ² S	Inter IC Sound bus
		IF	Intermediate Frequency
		Interlaced	Scan mode where two fields are used to form one frame. Each field contains

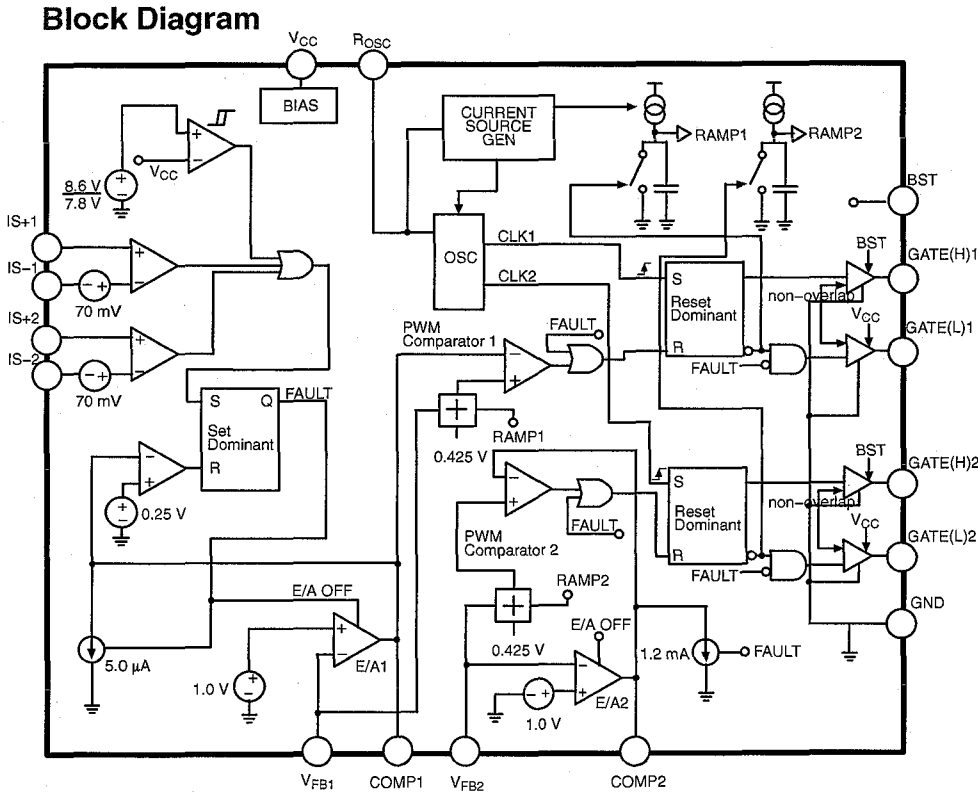
	half the number of the total amount of lines. The fields are written in "pairs", causing line flicker.		America (colour carrier
IR	Infra Red	PCB	PAL M = 3.575612 MHz and
IRQ	Interrupt Request	PCM	PAL N = 3.582056 MHz)
ITU-656	The ITU Radio communication Sector (ITU-R) is a standards body subcommittee of the International Telecommunication Union relating to radio communication. ITU-656 (a.k.a. SDI), is a digitized video format used for broadcast grade video. Uncompressed digital component or digital composite signals can be used. The SDI signal is self-synchronizing, uses 8 bit or 10 bit data words, and has a maximum data rate of 270 Mbit/s, with a minimum bandwidth of 135 MHz.	PDP	Printed Circuit Board (same as "PWB")
		PFC	Pulse Code Modulation
		PIP	Plasma Display Panel
		PLL	Power Factor Corrector (or Pre-conditioner)
			Picture In Picture
			Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency
		POR	Power On Reset, signal to reset the uP
		Progressive Scan	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.
			Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.
		PTC	Positive Temperature Coefficient, non-linear resistor
ITV	Institutional TeleVision; TV sets for hotels, hospitals etc.	PWB	Printed Wiring Board (same as "PCB")
JOP	Jaguar Output Processor	PWM	Pulse Width Modulation
LS	Last Status; The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according to the customer's preferences	QRC	Quasi Resonant Converter
		QTNR	Quality Temporal Noise Reduction
		QVCP	Quality Video Composition Processor
		RAM	Random Access Memory
		RGB	Red, Green, and Blue. The primary colour signals for TV. By mixing levels of R, G, and B, all colours (Y/C) are reproduced.
LATAM	Latin America		Red, Green, and Blue. The primary colour signals for TV. By mixing levels of R, G, and B, all colours (Y/C) are reproduced.
LCD	Liquid Crystal Display	RC	Remote Control
LED	Light Emitting Diode	RC5 / RC6	Signal protocol from the remote control receiver
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I	RESET	RESET signal
		ROM	Read Only Memory
LORE	Local REgression approximation noise reduction	R-TXT	Red TeleteXT
LPL	LG.Philips LCD (supplier)	SAM	Service Alignment Mode
LS	Loudspeaker	S/C	Short Circuit
LVDS	Low Voltage Differential Signalling	SCART	Syndicat des Constructeurs d'Appareils Radiorecepteurs et Televisieurs
Mbps	Mega bits per second		Syndicat des Constructeurs d'Appareils Radiorecepteurs et Televisieurs
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz	SCL	Serial Clock I ² C
		SCL-F	CLock Signal on Fast I ² C bus
MIPS	Microprocessor without Interlocked Pipeline-Stages; A RISC-based microprocessor	SD	Standard Definition
		SDA	Serial Data I ² C
MOP	Matrix Output Processor	SDA-F	Data Signal on Fast I ² C bus
MOSFET	Metal Oxide Silicon Field Effect Transistor, switching device	SDI	Serial Digital Interface, see "ITU-656"
		SDRAM	Synchronous DRAM
MPEG	Motion Pictures Experts Group	SECAM	SEquence Couleur Avec Memoire. Colour system mainly used in France and East Europe. Colour carriers= 4.406250 MHz and 4.250000 MHz
MPIF	Multi Platform InterFace		Colour system mainly used in France and East Europe. Colour carriers= 4.406250 MHz and 4.250000 MHz
MUTE	MUTE Line		Sound Intermediate Frequency
NC	Not Connected	SIF	Switched Mode Power Supply
NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.	SMPS	System on Chip
		SoC	System on Chip
NTC	Negative Temperature Coefficient, non-linear resistor	SOG	Sync On Green
		SOPS	Self Oscillating Power Supply
NTSC	National Television Standard Committee. Colour system mainly used 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
		SRAM	Static RAM
		SSB	Small Signal Board
		STBY	STand-BY
		SVGA	800 x 600 (4 : 3)
		SVHS	Super Video Home System
		SW	Software
NVM	Non-Volatile Memory; IC containing TV related data such as alignments	SWAN	Spatial temporal Weighted Averaging Noise reduction
O/C	Open Circuit		1280 x 1024
OSD	On Screen Display	SXGA	1280 x 1024
OTC	On screen display Teletext and Control; also called Artistic (SAA5800)	TFT	Thin Film Transistor
		THD	Total Harmonic Distortion
P50	Project 50: communication protocol between TV and peripherals	TMD5	Transmission Minimized Differential Signalling
			TeleteXT
PAL	Phase Alternating Line. Colour system mainly used in West Europe (colour carrier = 4.433619 MHz) and South	TXT	TeleteXT
		TXT-DW	Dual Window with TeleteXT
		UI	User Interface
		uP	Microprocessor
		UXGA	1600 x 1200 (4 : 3)

V	V-sync to the module
VCR	Video Cassette Recorder
VESA	Video Electronics Standards Association
VGA	640 × 480 (4 : 3)
VL	Variable Level out: processed audio output toward external amplifier
VSF	Vestigial Side Band; modulation method
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
WXGA	1280 × 768 (15 : 9)
XTAL	Quartz crystal
XGA	1024 × 768 (4 : 3)
Y	Luminance signal
Y/C	Luminance (Y) and Chrominance (C) signal
YPbPr	Component video. Luminance and scaled colour difference signals (B-Y and R-Y)
YUV	Component video

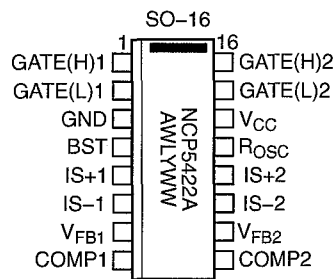
9.11 IC Data Sheets

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

9.11.1 Diagram B01A, B01C, NCP5422AD (IC 7U0A, 7U0L)



Pin Configuration



A = Assembly Location
 WL = Wafer Lot
 Y = Year
 WW = Work Week

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 240505

Figure 9-15 Internal block diagram and pin configuration

9.11.2 Diagram B01B, LD2985BM33R (IC7U73)

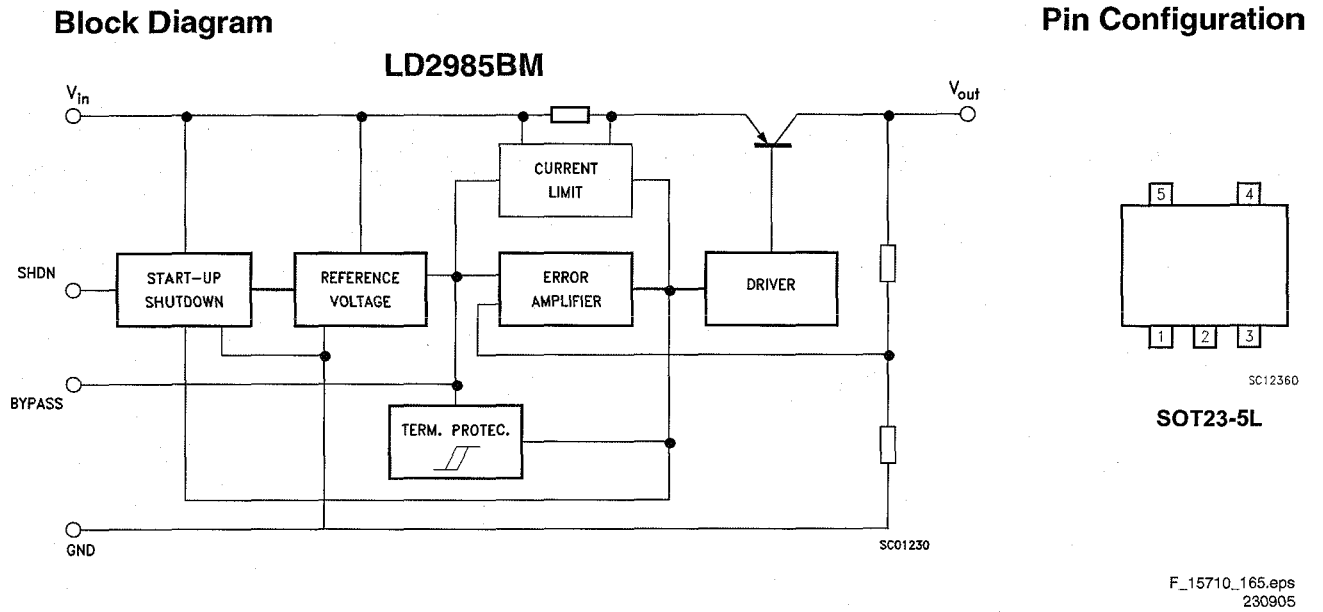
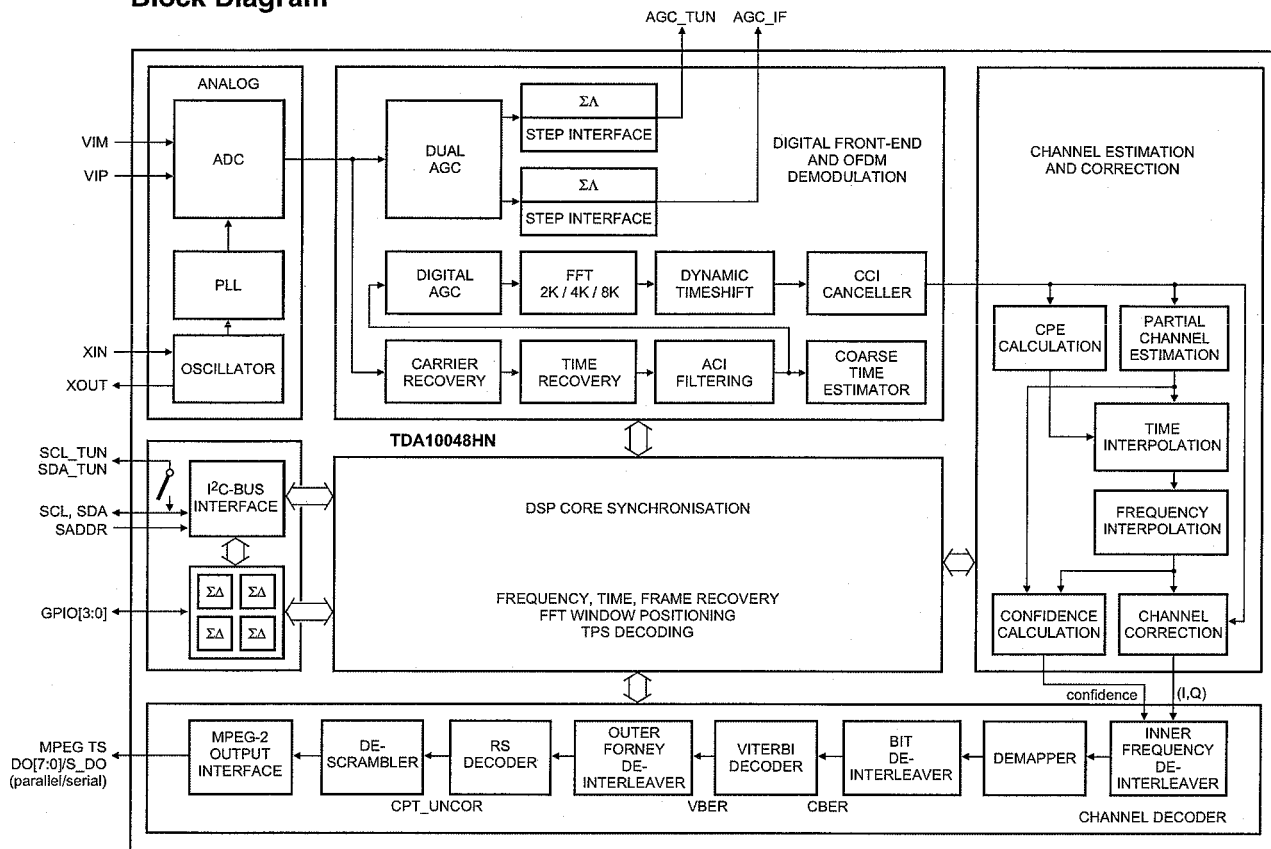


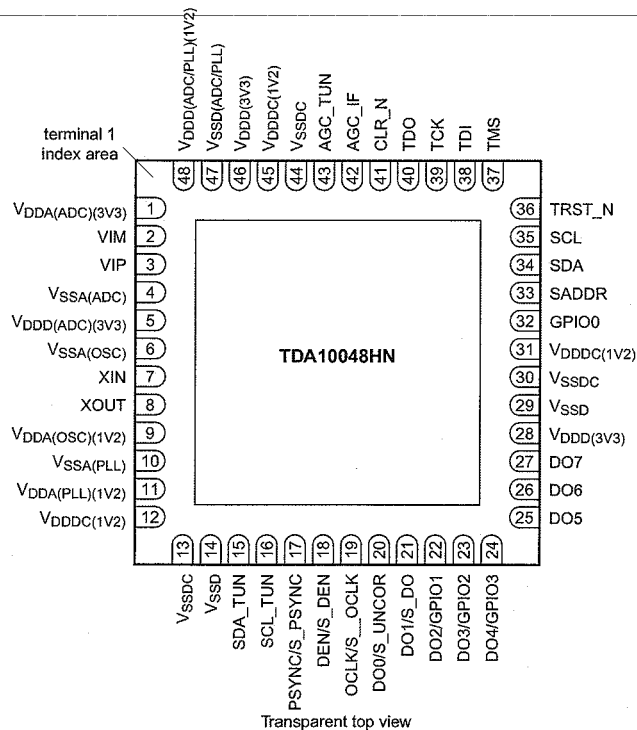
Figure 9-16 Internal block diagram and pin configuration

9.11.3 Diagram B02A, TDA10048HN (IC7T17-1)

Block Diagram



Pin Configuration



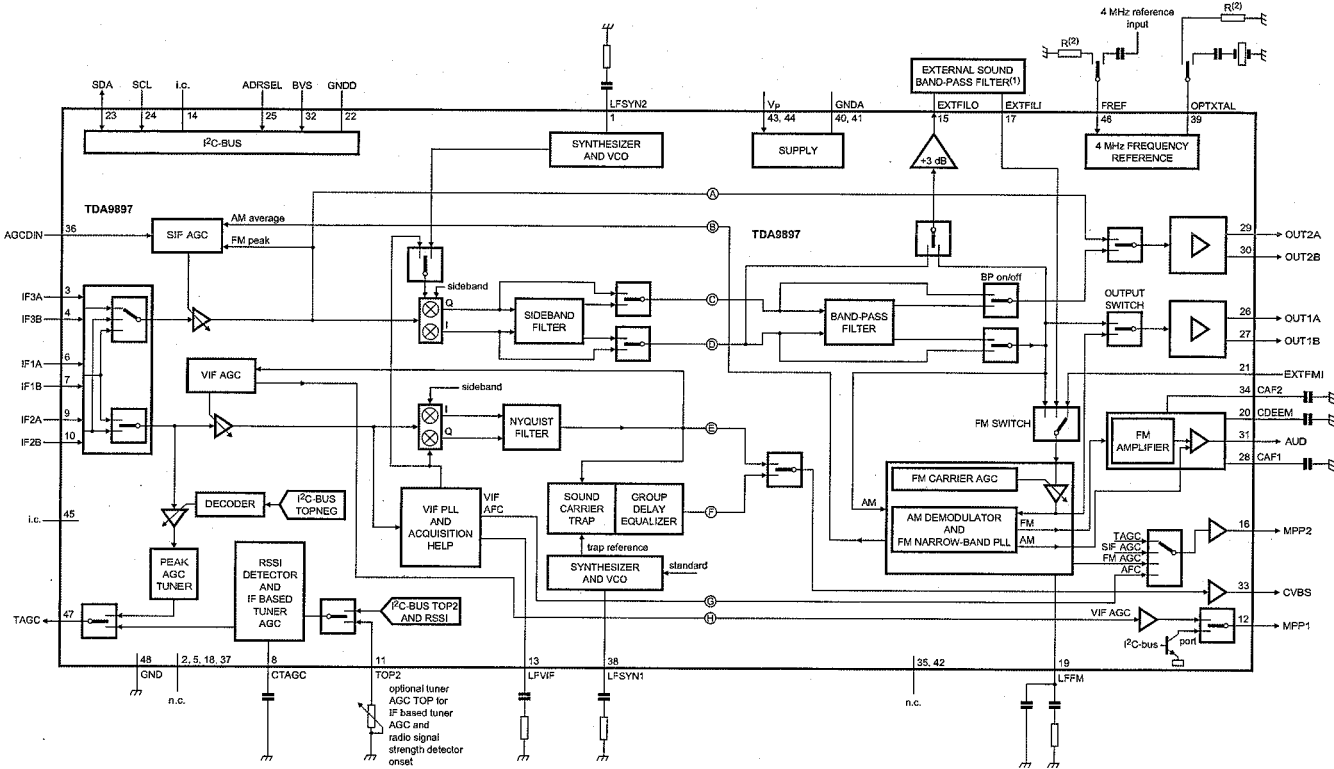
Transparent top view

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Figure 9-17 Internal block diagram and pin configuration

9.11.4 Diagram B02B, TDA9898HL (IC7T57)

Block Diagram



Pin Configuration

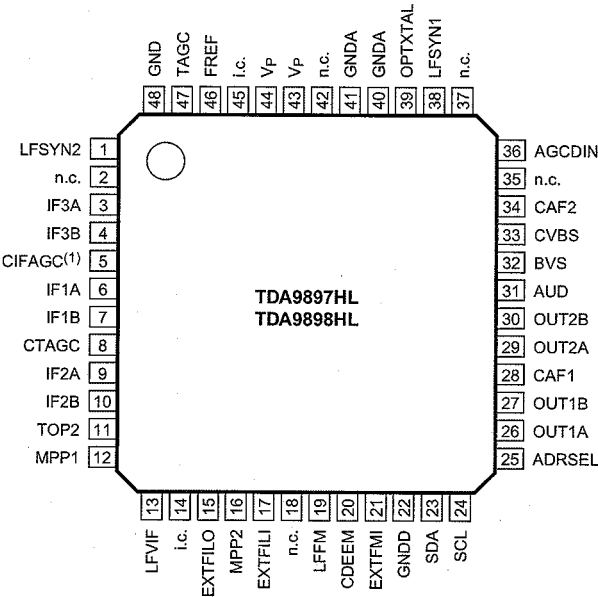
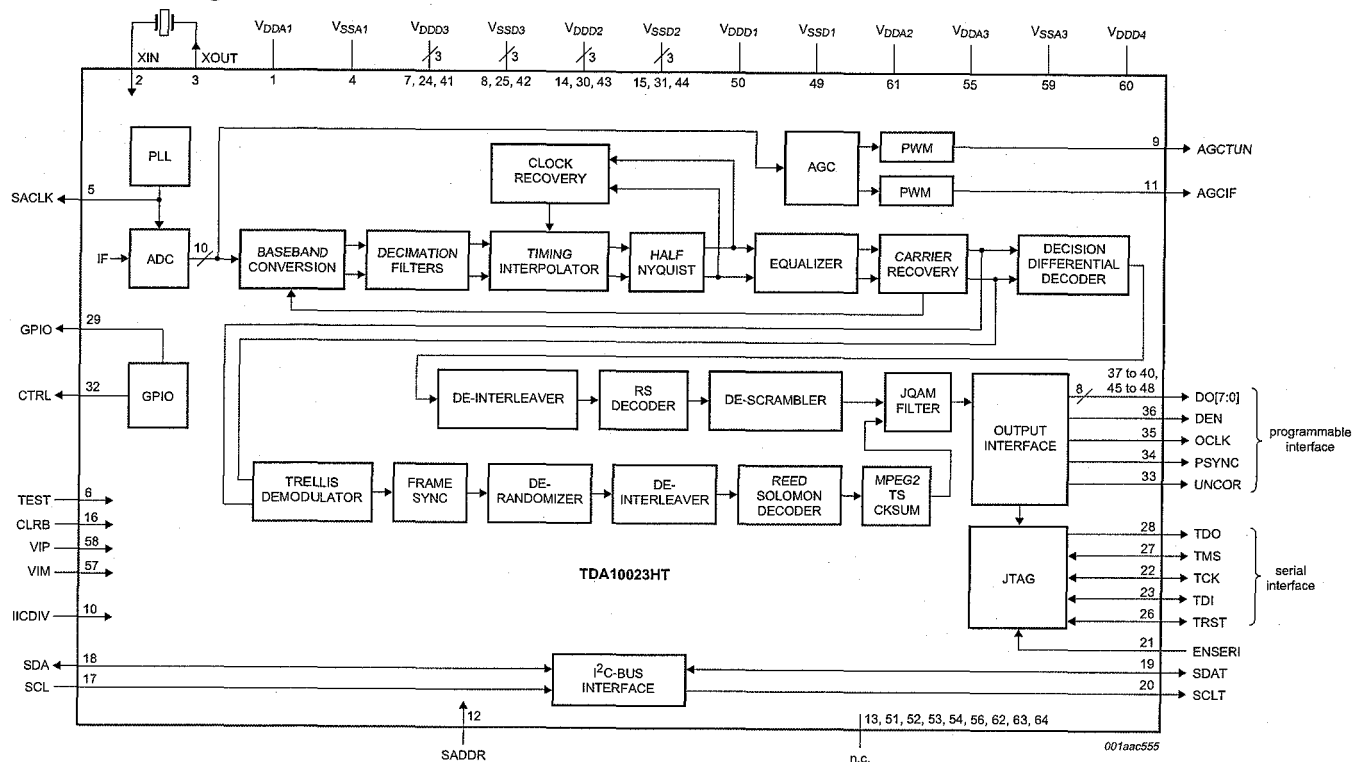


Figure 9-18 Pin configuration

9.11.5 Diagram B02C, TDA10023HT (IC7TA4)

Block Diagram



Pin Configuration

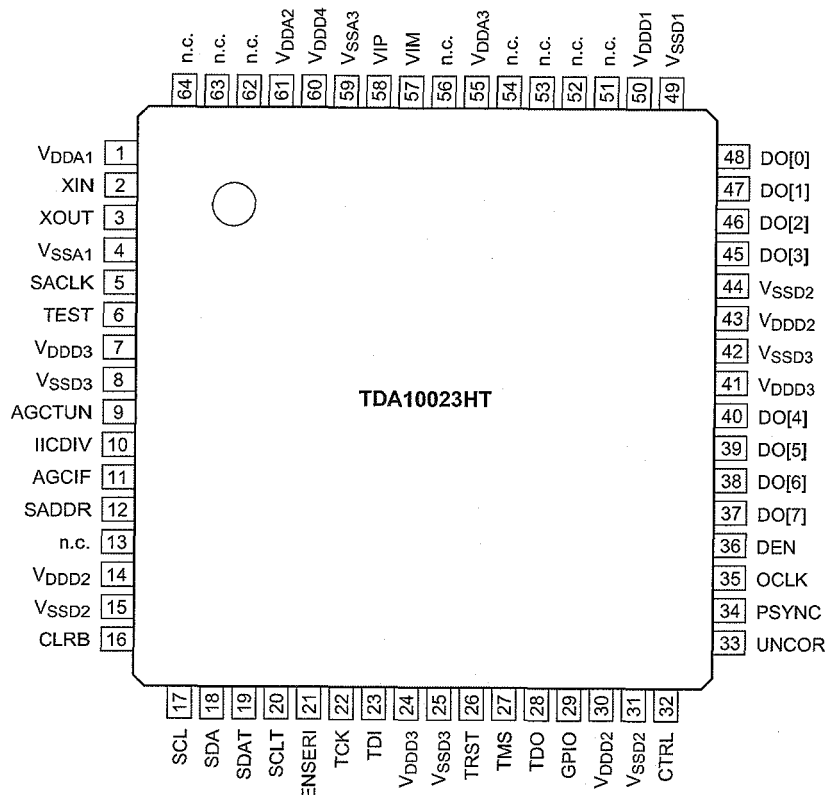


Figure 9-19 Internal block diagram and pin configuration

9.11.6 Diagram B03x, STi7100 (IC7A00)

Block Diagram

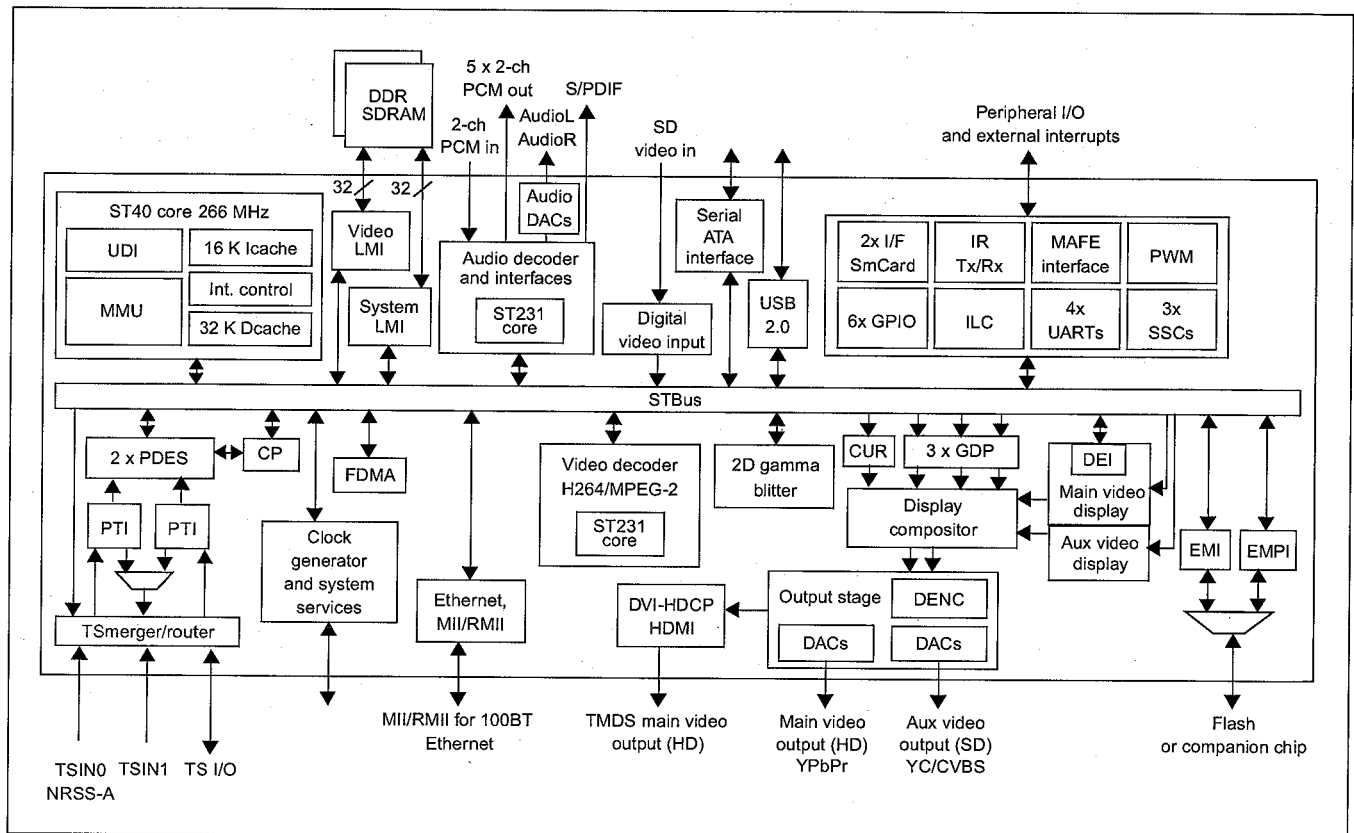
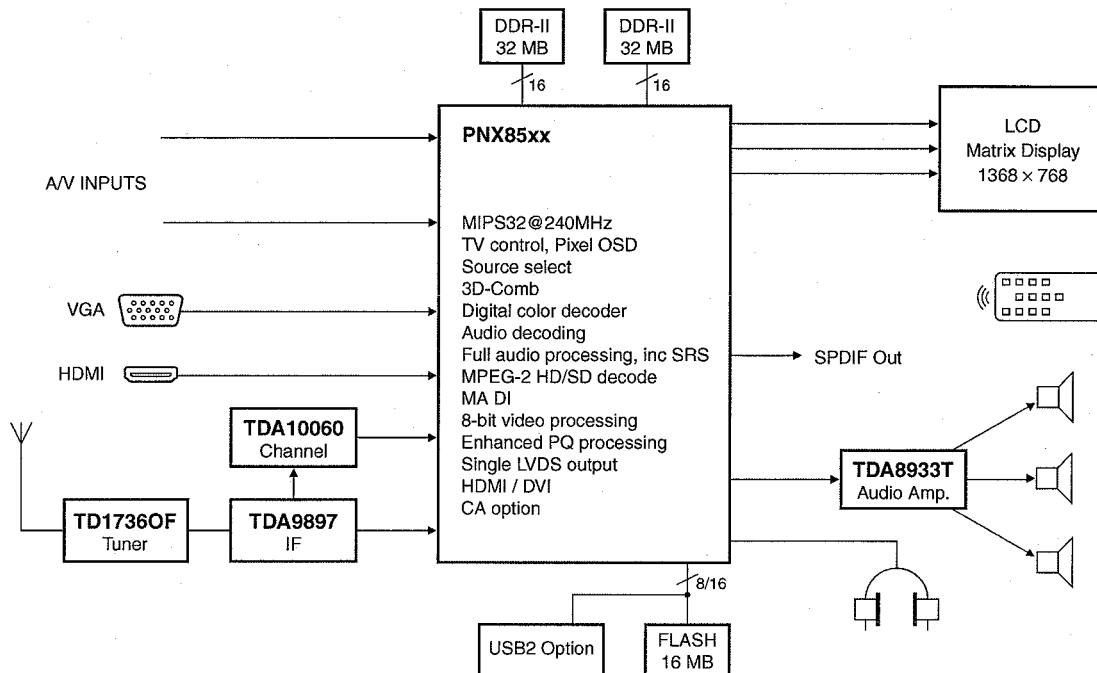
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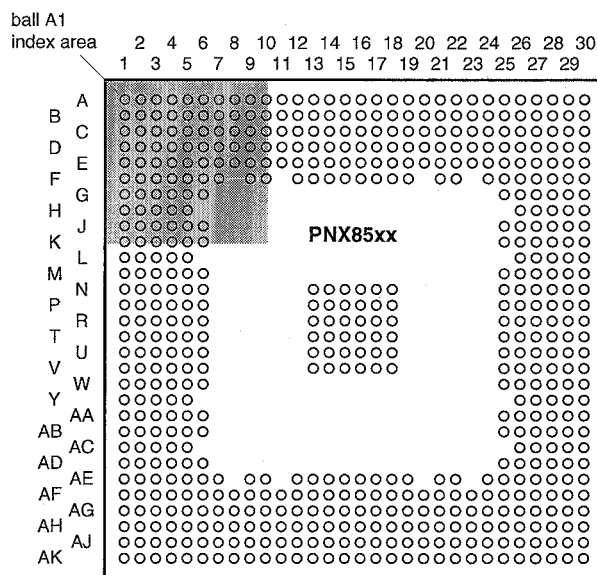
Figure 9-20 Internal block diagram and pin configuration

9.11.7 Diagram B04x, PNX85xx (IC 7H00)

Block Diagram



Pin Configuration



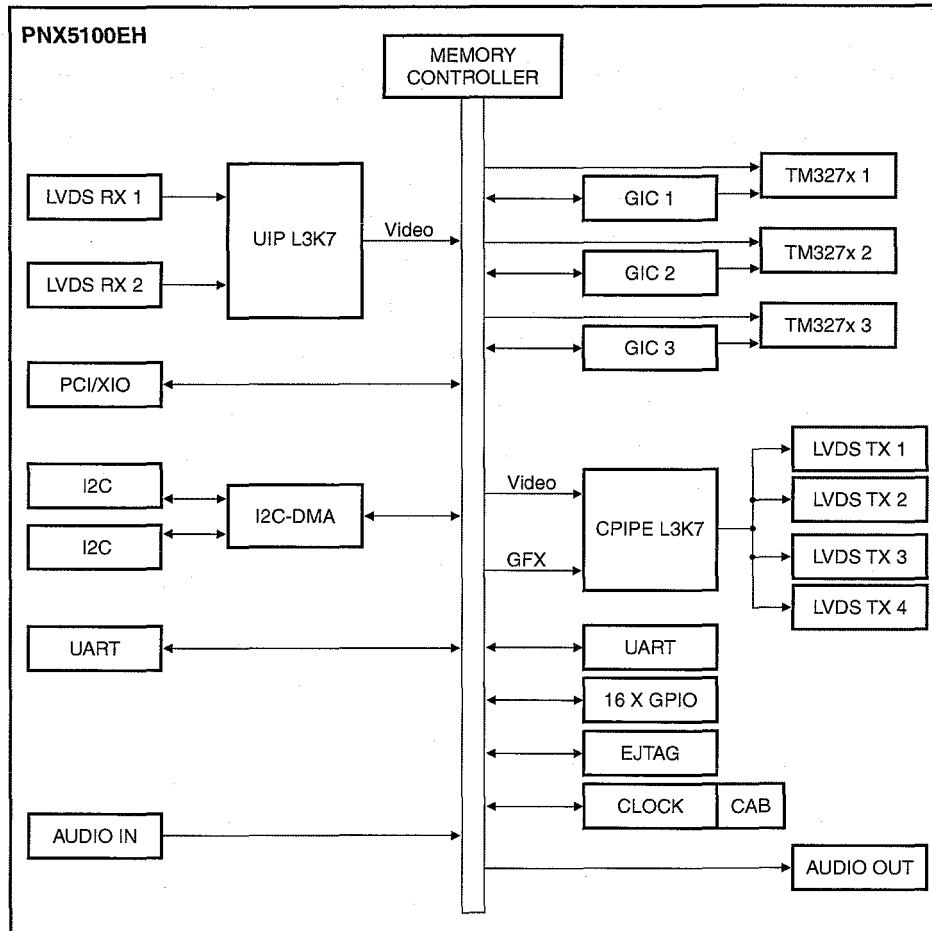
Transparent top view

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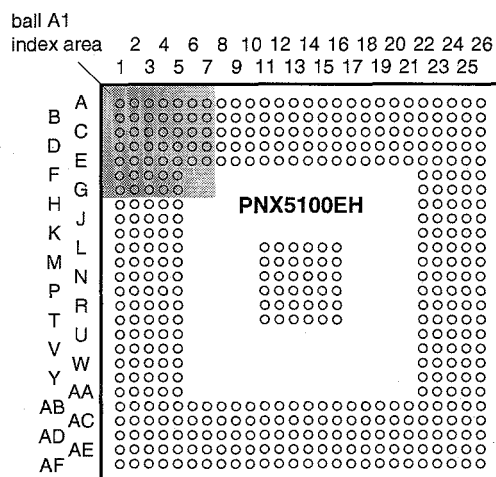
Figure 9-21 Pin configuration

9.11.8 Diagram B05x, PNX5100 (IC 7C00)

Block Diagram



Pin Configuration

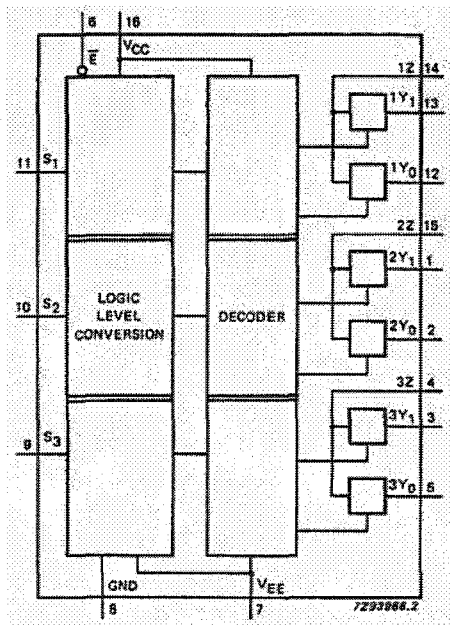


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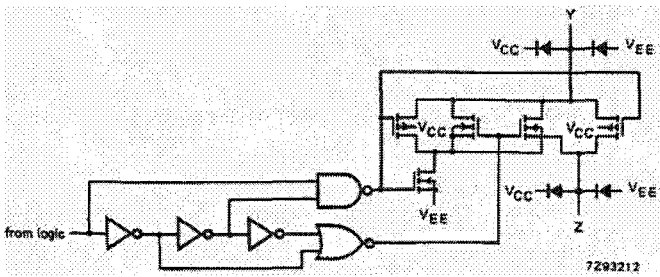
Figure 9-22 Pin configuration

9.11.9 Diagram B08A, 74HC4053PW (IC7E02)

Block Diagram



74HC4053PW



Pin Configuration

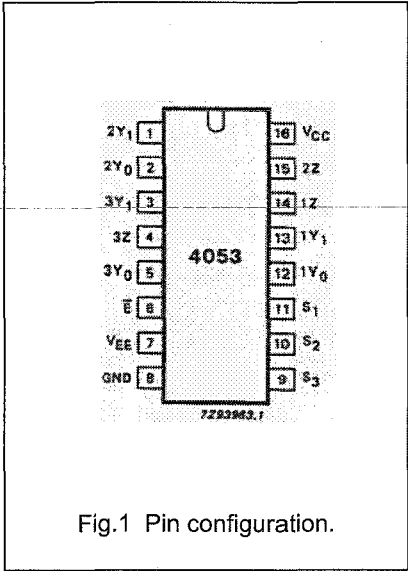


Fig.1 Pin configuration.

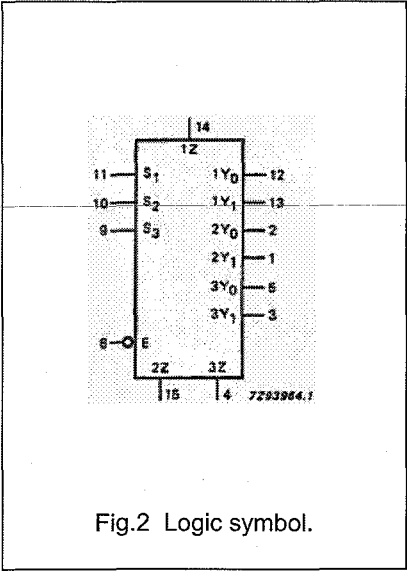


Fig.2 Logic symbol.

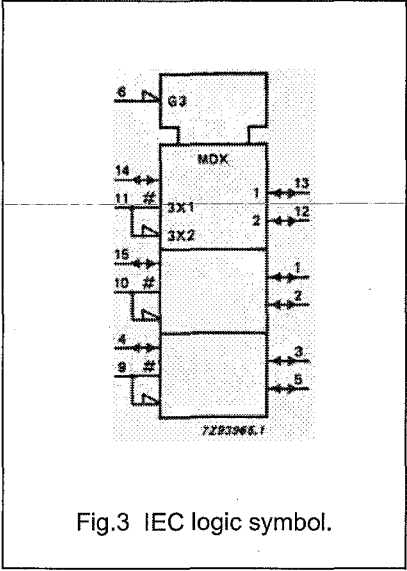


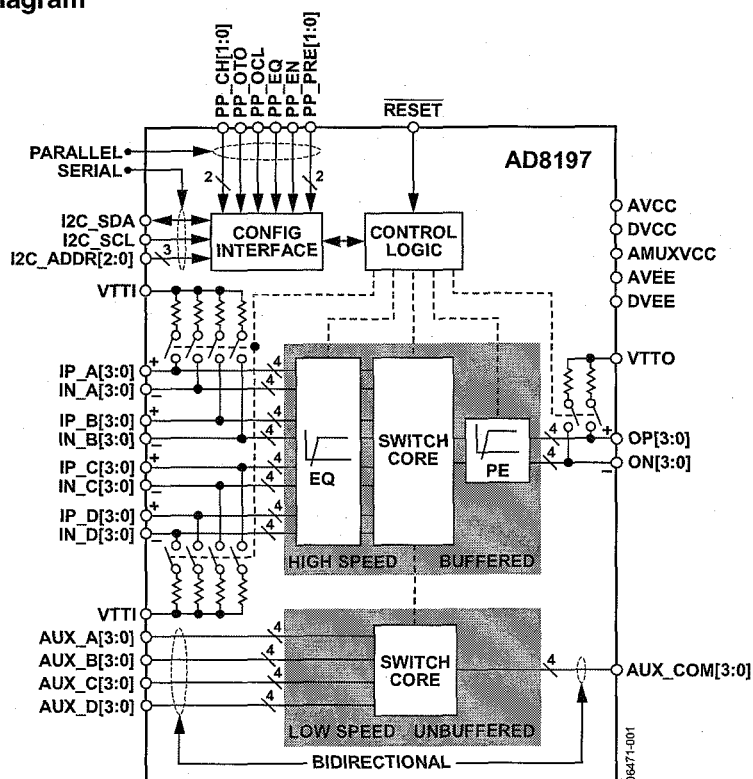
Fig.3 IEC logic symbol.

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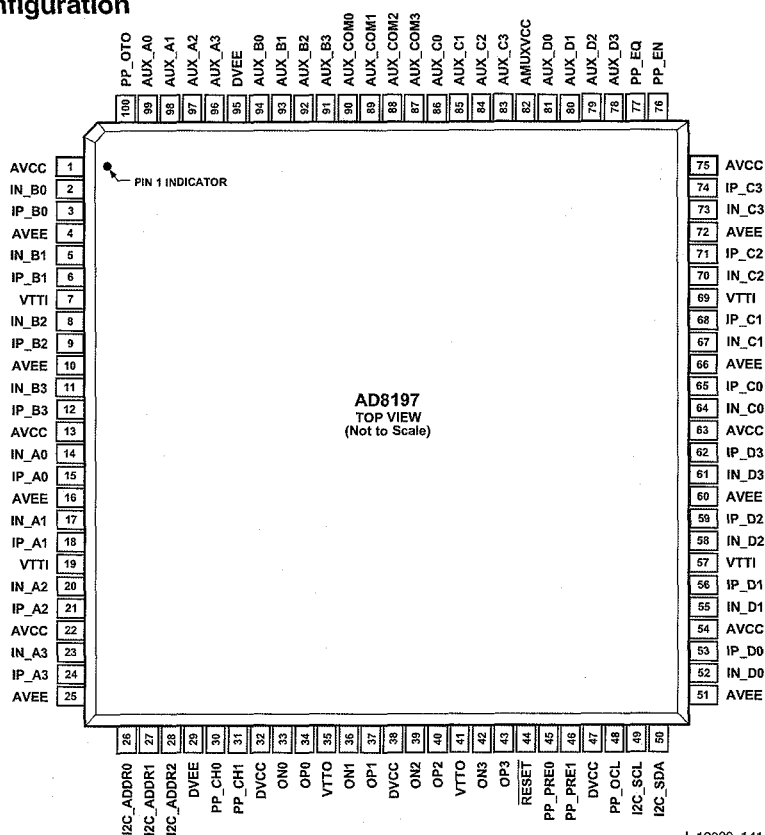
Figure 9-23 Pin configuration

9.11.10 Diagram B08G, AD8197A (IC7E13)

Block Diagram

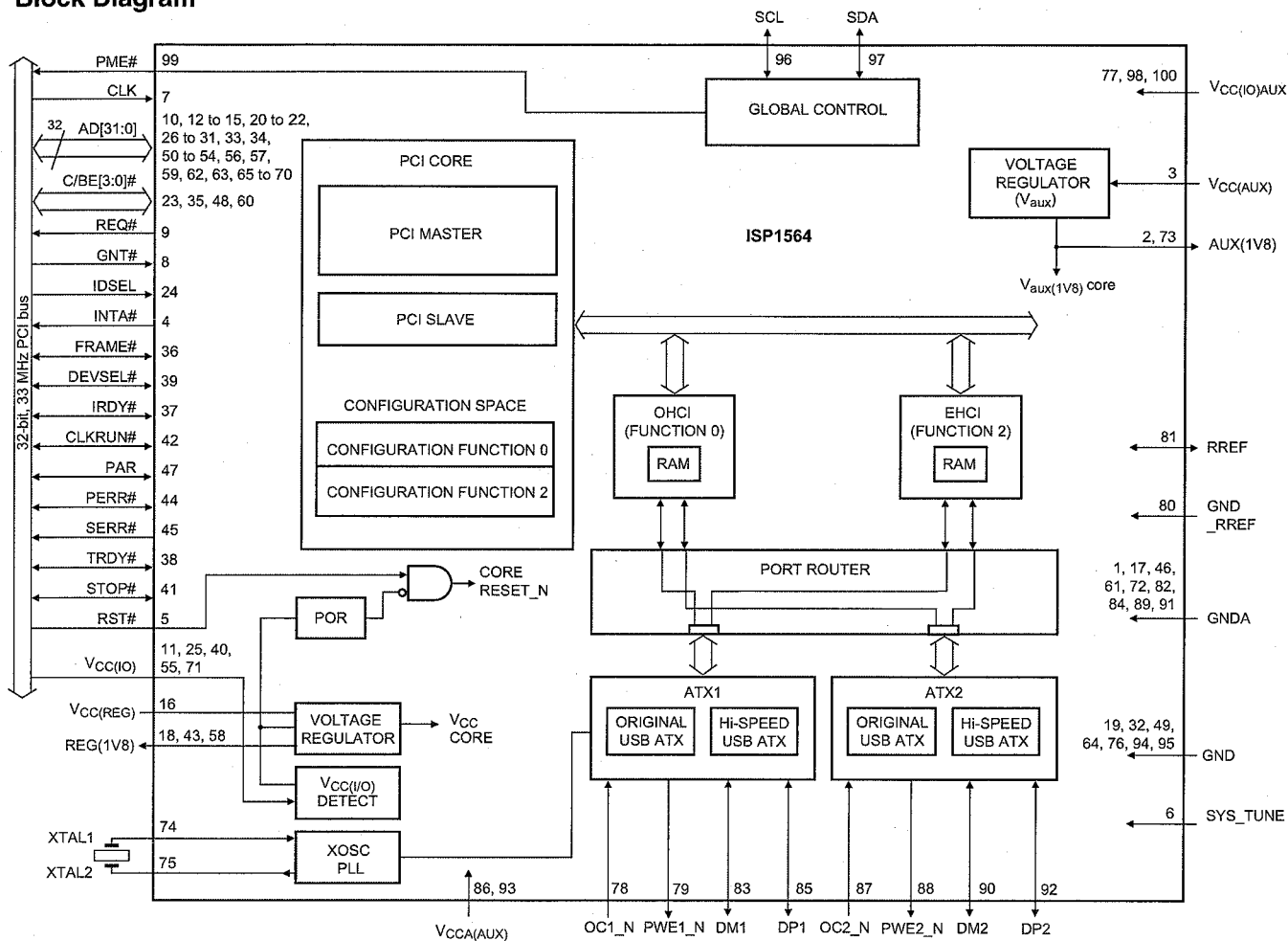


Pin Configuration



9.11.11 Diagram B09A, ISP1564HL (IC 7N00)

Block Diagram



Pin Configuration

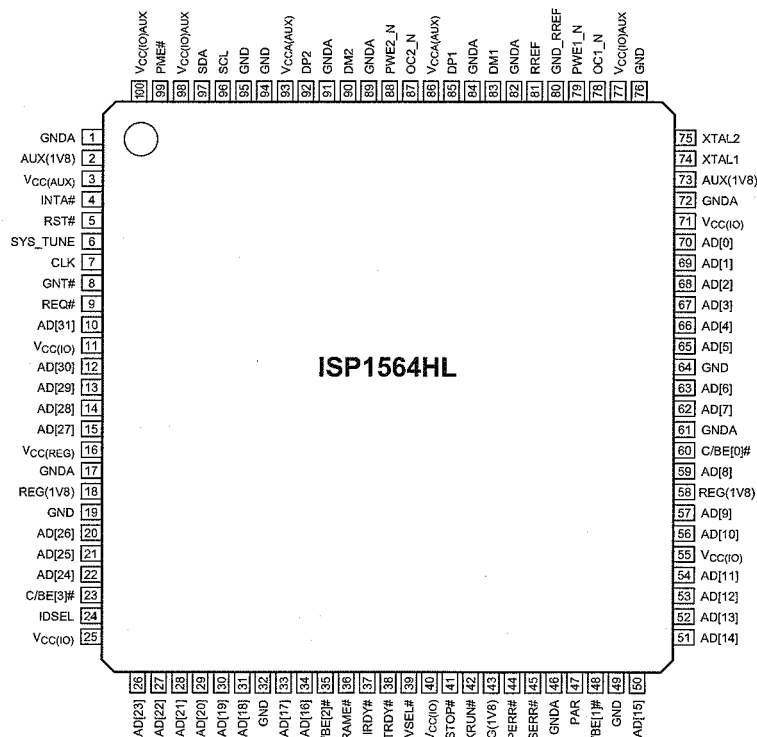
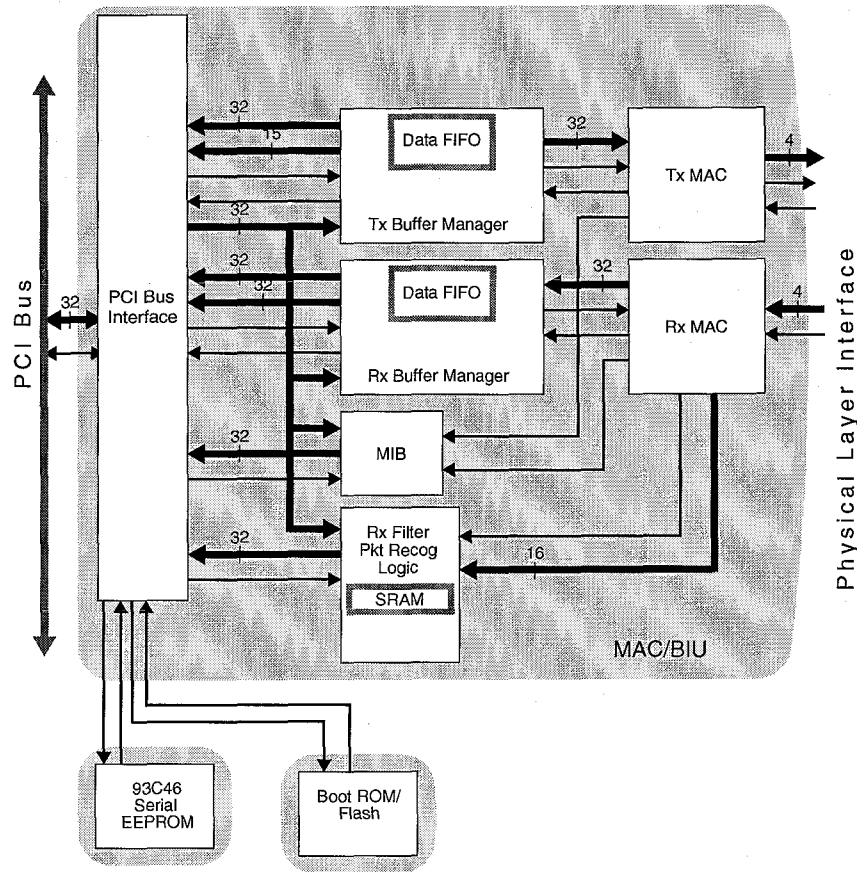


Figure 9-25 Internal block diagram and pin configuration

9.11.12 Diagram B09B, DP83816AVNG (IC7N04)

Block Diagram



Pin Configuration

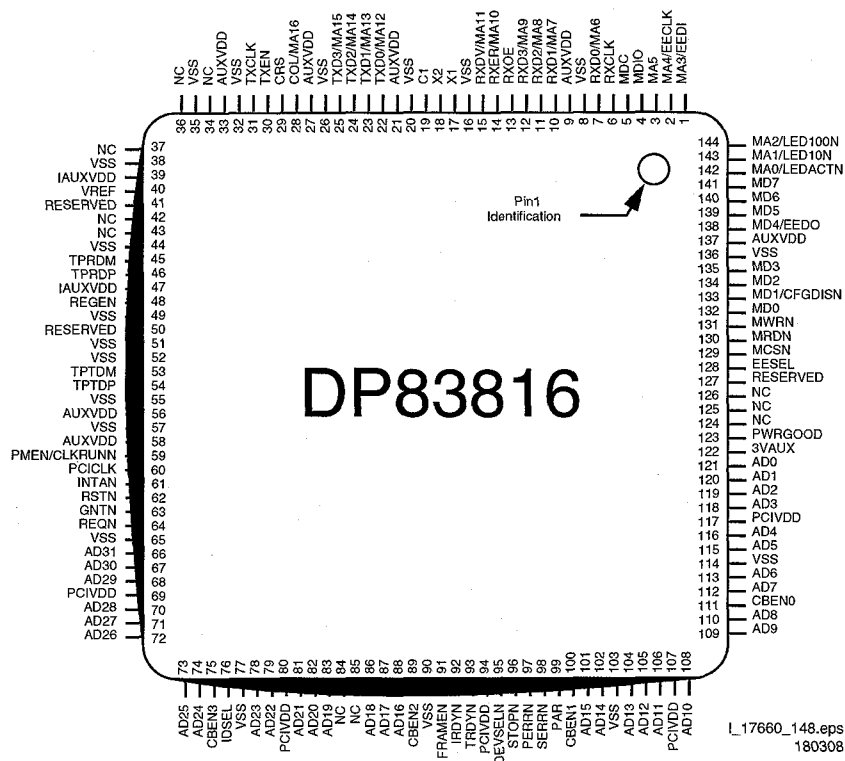


Figure 9-26 Internal block diagram and pin configuration

9.11.13 Diagram LD3, GM60028 (IC7300)

Block Diagram

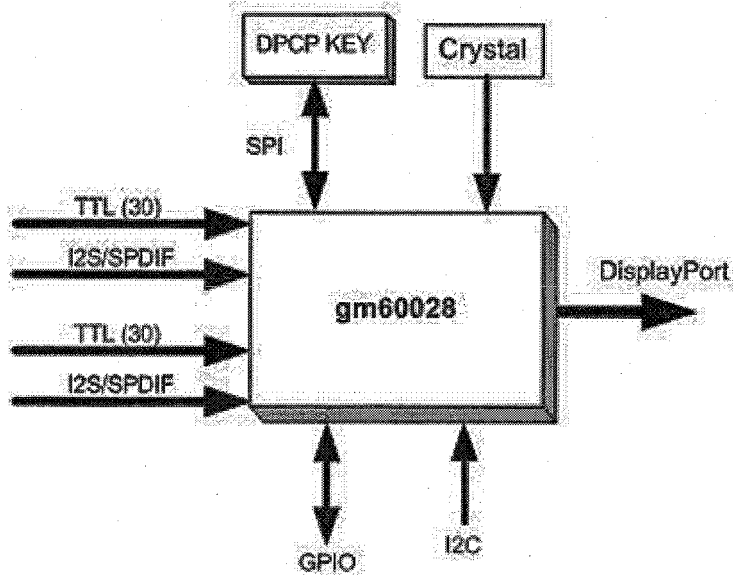
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Figure 9-27 Internal block diagram

9.11.14 Diagram M03B, GM68020 (IC7F0A)

Block Diagram

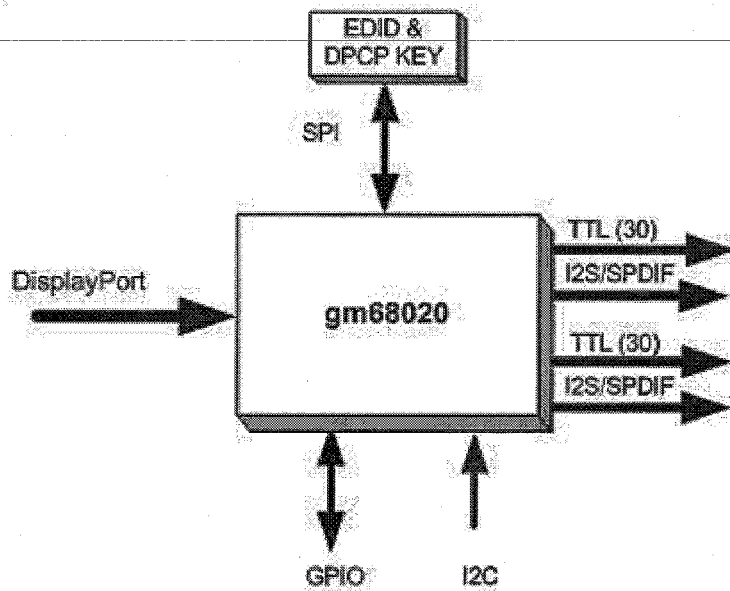
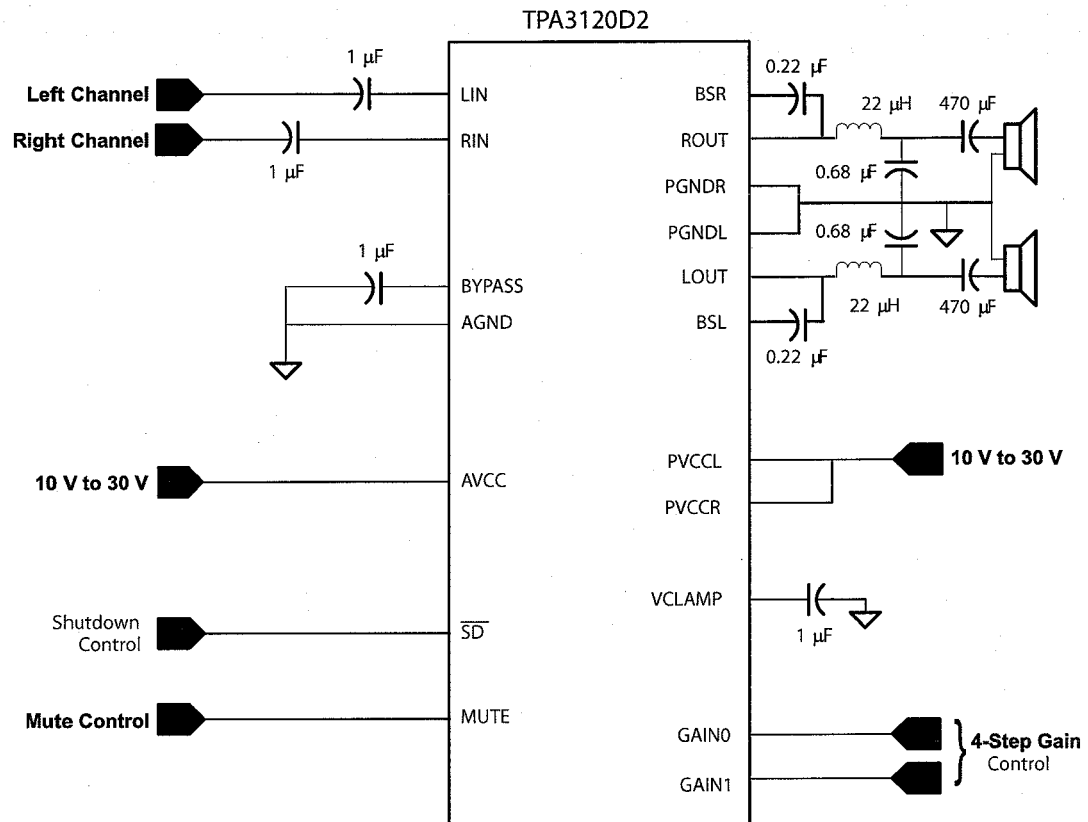
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Figure 9-28 Internal block diagram

9.11.15 Diagram M02A, TPA3120DP (IC7D10)

Block Diagram

SIMPLIFIED APPLICATION CIRCUIT



Pin Configuration

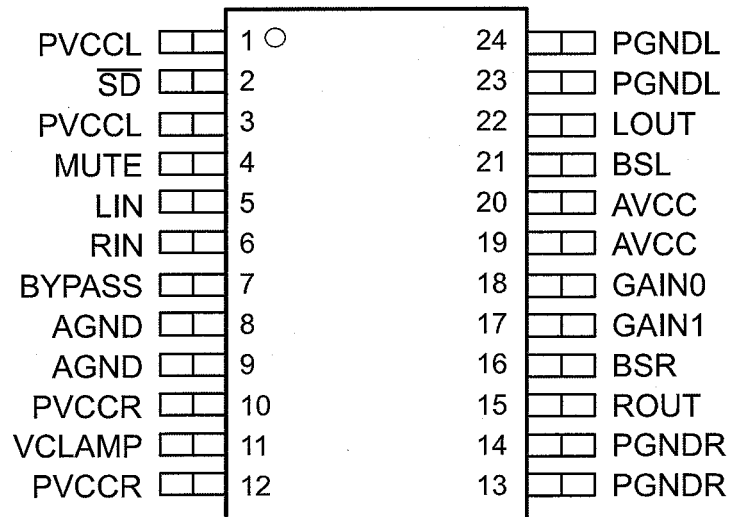
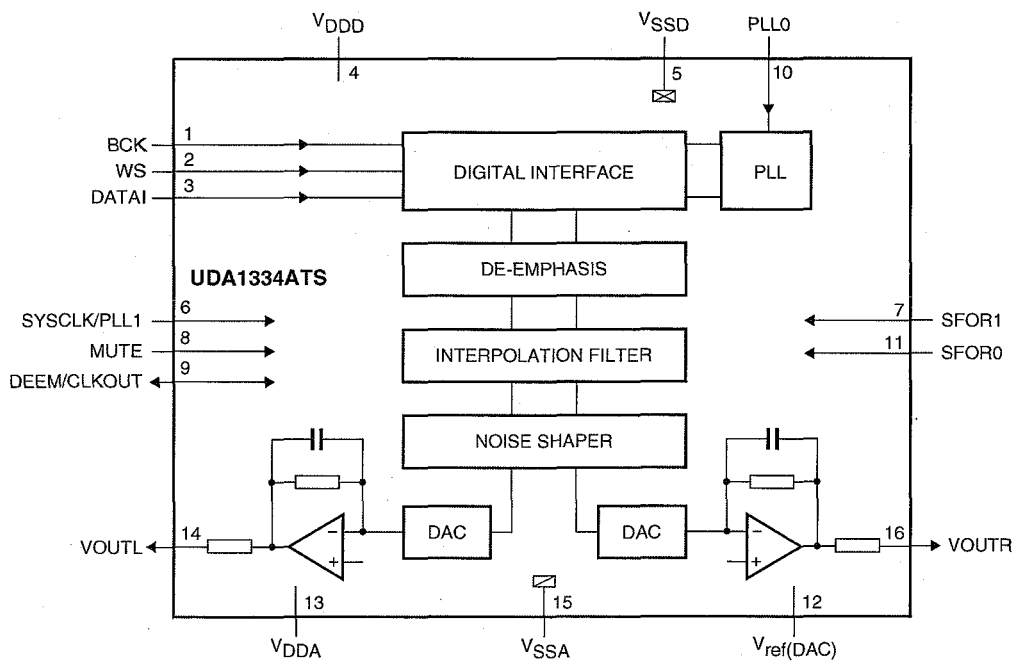
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(TOP VIEW)I_18020_142.eps
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Figure 9-29 Internal block diagram and pin configuration

9.11.16 Diagram M02B, UDA1334 (IC7D53)

Block Diagram



Pin Configuration

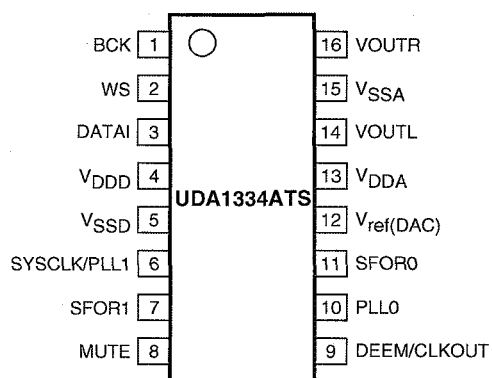
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220207

Figure 9-30 Internal block diagram and pin configuration

10. Spare Parts List & CTN Overview

For the latest spare part overview, please consult the Philips Service website.

Table 10-1 Sets described in this manual:

CTN	Styling	Published in:
42PES0001D/10	Essence	3122 785 18020
42PES0001H/10	Essence	3122 785 18020

11. Revision List

Manual xxxx xxx xxxx.0

- First release.

Manual xxxx xxx xxxx.1

- **All Chapters:** various textual changes.
- **Chapter 1:** Specification of SCART connectors changed, specification of HDMI connectors changed.
- **Chapter 4:** Instructions for LCD Panel replacement changed; introduction of one Spare Part Service Kit.
- **Chapter 5:** Contents of CSM changed to reflect current situation.
- **Chapter 8:** Contents of Service Options changed to reflect current situation.